

M E M O R A N D U M

DATE: February 14, 2020
TO: Zoning Review Office
FROM: Office of Administrative Hearings
RE: Case No. 2019-0526-SPH - Appeal Period Expired

The appeal period for the above-referenced case expired on February 13, 2020. There being no appeal filed, the subject file is ready for return to the Zoning Review Office and is placed in the 'pick up box.'

/dlw

c: ✓ Case File
Office of Administrative Hearings

IN RE: PETITION FOR SPECIAL HEARING	*	BEFORE THE
(8228 Belair Road)		
14 th Election District	*	OFFICE OF
5 th Council District		
Mark J. McQuade	*	ADMINISTRATIVE HEARINGS
<i>Legal Owner</i>		
BSS White Marsh, LLC	*	FOR BALTIMORE COUNTY
<i>Contract Purchaser</i>		
	*	Case No. 2019-0526-SPH
Petitioners		
	* * * * *	

OPINION AND ORDER

This matter comes before the Office of Administrative Hearings (OAH) for consideration of a Petition for Special Hearing filed on behalf of Mark J. McQuade, legal owner and BSS White Marsh, LLC, contract purchaser ("Petitioners"). The Special Hearing was filed pursuant to § 500.7 of the Baltimore County Zoning Regulations ("BCZR") for approval of a waiver pursuant to § 32-4-107(b) of the Baltimore County Code ("BCC") and/or § 500.7 of the BCZR to waive the requirements of § 32-4-414 of the BCC and Part 125 of the Baltimore County Building Code (Baltimore County Council Bill 40-15) to permit development within a riverine floodplain, as described herein. A site plan was marked and admitted as Petitioners' Exhibit 1.

Johnny Sweeny, an agent of the Contract Purchaser, BSS White Marsh, LLC appeared in support of the petition. Adam D. Baker, Esq. represented Petitioner. Also in attendance was Nicholas Leffner of Kimley Horn, the engineer who prepared and sealed the site plan. His *curriculum vitae* was admitted as Petitioner's Exhibit 2. There were no protestants or interested citizens in attendance. The Petition was advertised and posted as required by the BCZR. Substantive Zoning Advisory Committee (ZAC) comments were received from the Department of Environmental Protection and Sustainability ("DEPS"), the Department of Public Works ("DPW"), and the State Highway Administration ("SHA"). Subject to these comments none of

ORDER RECEIVED FOR FILING

Date 1/14/2020
By SEN

these agencies opposed the requested relief.

SPECIAL HEARING

Counsel for the Petitioner filed a detailed Supplement to the Floodplain Waiver request which explains the existing conditions and structures on the site, as well as a description of the proposed project – a 150,000 square foot self-storage facility. That Supplement is hereby expressly incorporated into this Opinion and Order.

Because there were no protestants present at the Hearing counsel for the Petitioner, Adam Baker, was allowed to present the case by way of a proffer of the evidence. He explained that the surrounding area consists of a mix of similar commercial uses and structures. This site presents a number of design issues because it is adjacent to White Marsh Run and partially within the Baltimore County (but not the FEMA) floodplain. Mr Baker explained that a Steep Slopes and Erodible Soils Analysis (SSEA) was prepared and approved by DEPS on January 28, 2019. A forest conservation variance was also approved on August 27, 2019 (tracking number 05-19-2997). Further, a forest and stream buffer exists on the northwestern portion of the Property and, therefor, a Forest Buffer Determination was prepared and also approved on January 28, 2019.

As Mr. Baker explains in the Supplement to the Waiver Request:

“Given the various constraints, as described herein and as shown on the accompanying Site Plan, development of the Property is limited in all directions. The only viable option to carry out the proposed development is to build out the rear of the Property towards White Marsh Run. The impacts to these identified sensitive areas has been minimized and mitigated by the following design elements: (1) locating the building as close to Belair Road as possible, (2) building vertically (multiple stories and basement) as opposed to horizontally, and (3) adding a retaining wall along the majority of the site improvements. Variances for impacts to the northwest have been approved by the appropriate agencies as noted herein.

Per the Floodplain Study (pending Baltimore County approval) for Whitemarsh Run, the proposed building will not be in the Ultimate Developed Floodplain and will adhere to the Baltimore County Design Manual Plates DF-1 and DF-2 for building setbacks from the Floodplain Elevation and Freeboard from the 100-year water surface elevation. The building has been raised out of the floodplain through the implementation of a retaining wall and the proposed

ORDER RECEIVED FOR FILING

2

Date 1/14/2020
By sen

site grading. Existing structures within the Ultimate Developed Floodplain are to be removed from the floodplain with the proposed development, improving the overall safety of the site during such storm events. Additionally, the building setback requirements of the front, rear, and side yards are satisfied per Baltimore County Code Section 238 *B.R. Zone Area Regulations*. The use and development of the Property for the proposed Beyond Self-Storage facility meet all of the applicable sections of the Baltimore County Zoning Regulations as well as the Baltimore County Landscape Manual. The proposed use of the Property is consistent with the surrounding land uses along Belair Road, which is comprised of a blend of commercial developments. The construction of the project would help promote Baltimore County's growth as a major corporate economic development area."

I find this reasoning sound and convincing. I specifically questioned Mr. Baker and Mr. Leffner, the engineer, about the Floodplain Study and they acknowledged that it is still under County review. They further explained that if the County does not ultimately approve the study then this proposed development cannot be built. As the Supplement explains in some detail:

"The Ultimate Developed Floodplain is more restrictive than the floodplain identified within the current Federal Emergency Management Agency ("FEMA") Flood Insurance Rate Map ("FIRM") and has a greater impact to the Property than the floodplain established under the FEMA FIRM. Although a small portion of the proposed development (grading and part of the proposed retaining wall) will be located within the Ultimate Developed Floodplain, the proposed development will improve the existing conditions on the Property. Among other things, the development will add stormwater management where there is none now, remove structures which are currently located within the floodplain, and it will increase the amount of trees and forested buffer from what exists on the Property now. In light of the foregoing, there is good and sufficient cause to approve the waiver request."

The Supplement then addresses all the factors required by BCC Sec. 32-8-303 in order to grant a floodplain waiver request. In conclusion the Petitioner urges that:

"The existing site constraints not only create exceptional hardships for the proposed development of the Property, but likely for *any* development of the Property. The requested waiver relief is the minimum relief necessary and will not pose a threat to the health, safety and welfare of the general public. If granted, the waiver relief will allow the site to be developed in a manner that is consistent with the applicable state and local laws and regulations and in a way that is beneficial to the surrounding properties on account of the improvements that are integral to the development (e.g. stormwater management, removing existing structures for the floodplain, and adding trees and other vegetation to the site)."

Again, I find that Petitioner has met its burden of establishing entitlement to the floodplain waiver. I also note that the Director of DPW has submitted a Memorandum to the

ORDER RECEIVED FOR FILING

Date 11/14/2020
By sen

Director of PAI dated January 6, 2020 in which he references the Petitioner's Floodplain Study and concludes that "[t]he Department of Public Works takes no exception to the approval of the waiver request."

THEREFORE, IT IS ORDERED this **14th** day of **January, 2020** by this Administrative Law Judge, that the Petition for Special Hearing for approval of a waiver pursuant to § 32-4-107(b) of the Baltimore County Code ("BCC") and/or § 500.7 of the BCZR to waive the requirements of § 32-4-414 of the BCC and Part 125 of the Baltimore County Building Code (Baltimore County Council Bill 40-15 to permit development within a riverine floodplain, as described herein, be and is hereby GRANTED

The relief granted herein shall be subject to the following:

1. Petitioners may apply for necessary permits and/or licenses upon receipt of this Order. However, Petitioners are hereby made aware that proceeding at this time is at their own risk until 30 days from the date hereof, during which time an appeal can be filed by any party. If for whatever reason this Order is reversed, Petitioners would be required to return the subject property to its original condition.
2. Petitioners must comply with ZAC comments submitted by DEPS and SHA, copies of which are attached hereto and made a part hereof.
3. This waiver request is conditioned upon the County's final approval of Petitioner's Floodplain Study (Petitioner's Exhibit 3).

Any appeal of this decision must be filed within thirty (30) days of the date of this Order.



PAUL M. MAYHEW
Managing Administrative Law Judge
for Baltimore County

PMM:sln

ORDER RECEIVED FOR FILING

Date 1/14/2020
By Sen



PETITION FOR ZONING HEARING(S)

To be filed with the Department of Permits, Approvals and Inspections

To the Office of Administrative Law of Baltimore County for the property located at:

Address 8228 Belair Road, Baltimore, MD 21236

which is presently zoned BR/DR 16/DR 1

Deed References: 6420 / 73

10 Digit Tax Account # 1 4 1 8 0 0 0 6 2 5

Property Owner(s) Printed Name(s) Mark J. McQuade

(SELECT THE HEARING(S) BY MARKING **X** AT THE APPROPRIATE SELECTION AND PRINT OR TYPE THE PETITION REQUEST)

The undersigned legal owner(s) of the property situate in Baltimore County and which is described in the description and plan attached hereto and made a part hereof, hereby petition for:

1. **X** a **Special Hearing** under Section 500.7 of the Zoning Regulations of Baltimore County, to determine whether or not the Zoning Commissioner should approve

SEE ATTACHED

2. a **Special Exception** under the Zoning Regulations of Baltimore County to use the herein described property for

3. a **Variance** from Section(s)

of the zoning regulations of Baltimore County, to the zoning law of Baltimore County, for the following reasons:
(Indicate below your hardship or practical difficulty or indicate below "TO BE PRESENTED AT HEARING". If you need additional space, you may add an attachment to this petition)

see attached - to be supplemented at hearing

Property is to be posted and advertised as prescribed by the zoning regulations.

I, or we, agree to pay expenses of above petition(s), advertising, posting, etc. and further agree to and are to be bounded by the zoning regulations and restrictions of Baltimore County adopted pursuant to the zoning law for Baltimore County.

Legal Owner(s) Affirmation: I / we do so solemnly declare and affirm, under the penalties of perjury, that I / We are the legal owner(s) of the property which is the subject of this / these Petition(s).

Contract Purchaser/Lessee:

BSS White Marsh, LLC

By: NPD Management, LLC, its manager

Name- Type or Print
Nathaniel Hagedorn, manager

Signature

8225 NW 41st St., Ste. 500 Riverside MO
Mailing Address City State

64150 / 816-281-2901 / jsweeney@northpointkc.com
Zip Code Telephone # Email Address

Attorney for Petitioner:

Adam D. Baker

Name- Type or Print

Signature Rosenberg Martin Greenberg LLP

25 S. Charles St., 21st Floor Baltimore MD
Mailing Address City State

21201 / 410-727-6600 / abaker@rosenbergmartin.com
Zip Code Telephone # Email Address

Legal Owners (Petitioners):

Mark J. McQuade

Name #1 - Type or Print Name #2 - Type or Print

Signature #1

Signature #2

8228 Belair Road Baltimore MD
Mailing Address City State

21236 / /
Zip Code Telephone # Email Address

Representative to be contacted:

Adam D. Baker

Name - Type or Print

Signature Rosenberg Martin Greenberg LLP

25 S. Charles St., 21st Floor Baltimore MD
Mailing Address City State

21201 / 410-727-6600 / abaker@rosenbergmartin.com
Zip Code Telephone # Email Address

CASE NUMBER 2019-0526 SPH Filing Date 11/26/19 Do Not Schedule Dates: Reviewer JS

Supplement to the Petition for Floodplain Waiver for 8228 Belair Road, Baltimore County, Maryland

Petitioner is seeking approval of a waiver request pursuant to Section 32-4-107(b) of the Baltimore County Code and/or Section 500.7 of the Baltimore County Zoning Regulations to waive the requirements of § 32-4-414 of the Baltimore County Code & Part 125 of the Baltimore County Building Code (Baltimore County Council Bill 40-15) to permit development within a riverine floodplain, as described herein.



Part A. Applicant Information.**Applicant/Developer:**

Name(s): Mr. Johnny Sweeney
Company: BSS White Marsh, LLC Phone #: (816) 281 - 2901
Street: 4825 NW 41st Street, Suite 500
City: Riverside State: MO Zip Code: 64150

Property Owner(s):

Name(s): Mr. Mark J. McQuade
Company: N/A Phone #: (410) 440 - 5658
Street: 8228 Belair Rd
City: Baltimore State: MD Zip Code: 21236

Engineer/Representative:

Name(s): Mr. Nicholas J. Leffner, P.E.
Company: Kimley-Horn and Associates, Inc. Phone #: (443) 743 - 3470
Street: 1801 Porter Street, Suite 401
City: Baltimore State: MD Zip Code: 21230

Principal Contact:

Name(s): Mr. Adam Baker
Company: Rosenberg Martin Greenberg, LLP Phone #: (410) 727 - 6600
Street: 25 South Charles Street, 21st Floor
City: Baltimore State: MD Zip Code: 21201

Land Use Attorney:

Name(s): Mr. Adam Baker
Company: Rosenberg Martin Greenberg, LLP Phone #: (410) 727 - 6600
Street: 25 South Charles Street, 21st Floor
City: Baltimore State: MD Zip Code: 21201



Part B. Property Information.

Property address/information: 8228 Belair Road, Nottingham, Maryland 21236

Tax account number(s): 14-1418000625

Subdivision: N/A

Tax Map: 71 Parcel number(s): 501

Acreage/Lot size: 5.42± acres Deeds: 06420/00073

Zoning: Business Roadside (BR), Density Residential (DR-1-NC and DR-16)

Part C. Property Description.

The subject property is a 5.42 acre parcel located at 8228 Belair Road in the Nottingham area of Baltimore County, tax map 71, parcel number 501 (the "Property"). This tract of land is predominately zoned BR (Business Roadside) with areas of DR-1 NC and DR-16 (Density Residential) located along the western and northern edge of the Property. The DR zoned portions of the Property are located outside of the proposed project limits. Through a mapping error DR-1 NC zoning previously extended into the southeastern portion of the Property but has since been removed from the area needed for development by a zoning map correction (Baltimore County Board of Appeals Case No. MC-19-01). The Property is currently developed with the following: a tractor repair shop, a residence, several storage sheds and storage containers, a storage garage, maintained lawn areas, gravel/paved driveways, and parking areas.

The site is bound to the north by Whitemarsh Run, along which steep slopes are present. There is an existing State Highway Administration ("SHA") easement along the eastern portion of the Property, under deed reference L. 8188, F. 584. There is existing Baltimore Gas & Electric Company ("BGE") right-of-way to the south and west of the site. A forest stand and forested stream buffer are located along Whitemarsh Run. The existing FEMA effective 100-year floodplain is delineated along Whitemarsh Run.

Part D. Project Description.

The current proposal is to develop the Property with a 150,000 square foot Beyond Self-Storage facility and associated infrastructure. The proposed development includes the mini-warehouse self-storage building, access entrance for ingress and egress from Belair Road, a parking area adjacent to the proposed mini-warehouse, a retaining wall along the egress and ingress road, two stormwater management (SWM) Environmental Site Design (ESD) facilities, and associated utilities and infrastructure. The implementation of the ESD stormwater management facilities on the Property will provide an opportunity for an improvement to the stormwater quantity and quality management where none presently exists.

A Steep Slopes and Erodible Soils Analysis (SSEA) was prepared and approved by the Baltimore County Department of Environmental Protection and Sustainability (EPS) on January 28, 2019. Specimen trees are present on the Property, and a Forest Conservation variance was submitted and approved by Baltimore County on August 27, 2019 under tracking number 05-19-2997. A forest and stream buffer exists on the northwestern portion of the Property, and a Forest Buffer Determination was prepared and approved on January 28, 2019.



Given the various constraints, as described herein and as shown on the accompanying Site Plan, development of the Property is limited in all directions. The only viable option to carry out the proposed development is to build out the rear of the Property towards White Marsh Run. The impacts to these identified sensitive areas has been minimized and mitigated by the following design elements: (1) locating the building as close to Belair Road as possible, (2) building vertically (multiple stories and basement) as opposed to horizontally, and (3) adding a retaining wall along the majority of the site improvements. Variances for impacts to the northwest have been approved by the appropriate agencies as noted herein.

Per the Floodplain Study (pending Baltimore County approval) for Whitemarsh Run, the proposed building will not be in the Ultimate Developed Floodplain and will adhere to the Baltimore County Design Manual Plates DF-1 and DF-2 for building setbacks from the Floodplain Elevation and Freeboard from the 100-year water surface elevation. The building has been raised out of the floodplain through the implementation of a retaining wall and the proposed site grading. Existing structures within the Ultimate Developed Floodplain are to be removed from the floodplain with the proposed development, improving the overall safety of the site during such storm events. Additionally, the building setback requirements of the front, rear, and side yards are satisfied per Baltimore County Code Section 238 *B.R. Zone Area Regulations*.

The use and development of the Property for the proposed Beyond Self-Storage facility meet all of the applicable sections of the Baltimore County Zoning Regulations as well as the Baltimore County Landscape Manual. The proposed use of the Property is consistent with the surrounding land uses along Belair Road, which is comprised of a blend of commercial developments. The construction of the project would help promote Baltimore County's growth as a major corporate economic development area.

Part E. Sections of the Baltimore County Code and Baltimore County Building Code from which waiver relief is being requested:

Baltimore County Code Section 32-4-414 *Floodplain and Wetland Protection*.

C) "Development in floodplain prohibited; exceptions. The county may not permit development in a riverine floodplain except for:

- (1) The establishment of property subdivision lines; and*
- (2) The installation of a pond, culvert, bridge, street, utility, or drainage facility that the county finds is not detrimental to floodplain management programs."*

The Applicant requests a waiver from this Section of the Baltimore County Code pursuant to Section 32-4-107(b) of the Baltimore County Code in order to permit development within a floodplain to:

- Construct a self-storage building, associated drive aisle/parking areas, stormwater management facilities, and a retaining wall, as depicted on the Plan to Accompany Administrative Special Hearing.

Part 125, Baltimore County Building Code *Areas Subject to Inundation by Riverine Surface Waters Within the 100-Year Floodplain*.

"Part 125 areas subject to inundation by riverine surface waters within the 100-year floodplain. Part 125.1 no new buildings or additions. No new buildings or additions shall be constructed in any riverine floodplain. The 100-year floodplain shall be based upon the federal flood insurance study areas

established by the director of public works, whichever is the more restrictive. This determination shall include planned future development of the watershed area."

The Applicant requests a waiver from the Section of the Baltimore County Building Code referenced above for construction of new buildings in the riverine floodplain to:

- Construct a self-storage building, parking areas, and a retaining wall as depicted on the Plan to Accompany Administrative Special Hearing.

Part F. Reasons for Granting the Waiver.

a. Good and Sufficient Cause.

Without relief from the strict application of Section 32-4-414 of the Baltimore County Code and Part 125 of the Baltimore County Building Code (Bill 40-12) *Areas Subject to Inundation by Riverine Surface Waters Within the 100-Year Floodplain*, the proposed development of the Property would not be feasible. The Property's size, topography, location and existing site conditions coupled with the location of the floodplain create an exceptional hardship for any attempt to develop the Property.

The Riverine Floodplain currently extends into the northwestern portion of the Property and thereby shifts the developable area towards Belair Road. The Riverine Floodplain is defined in Baltimore County Code Section 32-8-101 as "that land which is inundated by the storm water runoff created by a 100-year frequency flood and which is based on maximum development of the watershed using the current zoning and based on the current standards approved by the Department of Public Works." It is referred to in the Floodplain Study for the Property (currently pending County approval) and in this Waiver Petition as the Ultimate Developed Floodplain.

The Ultimate Developed Floodplain is more restrictive than the floodplain identified within the current Federal Emergency Management Agency ("FEMA") Flood Insurance Rate Map ("FIRM") and has a greater impact to the Property than the floodplain established under the FEMA FIRM. Although a small portion of the proposed development (grading and part of the proposed retaining wall) will be located within the Ultimate Developed Floodplain, the proposed development will improve the existing conditions on the Property. Among other things, the development will add stormwater management where there is none now, remove structures which are currently located within the floodplain, and it will increase the amount of trees and forested buffer from what exists on the Property now. In light of the foregoing, there is good and sufficient cause to approve the waiver request.

b. Failure to grant the waiver would result in exceptional hardship.

The Property's size, location, topography, and existing site conditions result in a situation where strict compliance with the requirements of the Ultimate Developed Floodplain constrains the development without the commensurate benefits of preventing floodplain impacts.

The western portion of the Property contains a maintained BGE right-of-way, which must be avoided for development purposes. In addition, a SHA slope easement exists along the length of the frontage on Belair Road (L. 8188, F. 584), which must also be avoided. On account of these title constraints, along with the Property's irregular shape and natural features, the developable area is limited to the southern and eastern portions of the property. Further complicating matters is the fact that SHA recently reconstructed the sidewalk and entrance along the site frontage (along the southeastern portion of the Property) which has further increased grades into the site, requiring additional space and grading to

allow for adequate grade transitions. Coupled with the floodplain, these site constraints create an exceptional hardship for the applicant in improving the conditions on site and in developing the site.

- c. Granting the waiver will not increase flood heights, impact public safety, incur extraordinary public expense, create nuisances, cause fraud or victimization of the public, or conflict with existing local and state laws and ordinances.**

The Ultimate Developed Floodplain currently extends into the northwestern portion of the Property and thereby shifts the developable area towards Belair Road. As noted previously, the Ultimate Developed Floodplain is more restrictive than the floodplain identified under the current FEMA FIRM and has a greater impact to the Property than the floodplain established under the FEMA FIRM. As set forth in the Floodplain Study and as will be established at the hearing on the waiver requests before the Administrative Law Judge, the proposed development within the Ultimate Development Floodplain will not increase flood heights, nor will it create any public safety concerns or threats to the health, safety or general welfare of the general public. The development will comply with all existing local and state laws and regulations. Lastly, the development is being privately funded and therefore will not require any public expense.

- d. The waiver action will be the minimum necessary to afford relief.**

The Property currently has improvements that are within the Ultimate Developed Floodplain. These existing structures are to be removed from the floodplain in accordance with the proposed development.

Through multiple iterations, the proposed development on the Property has evolved to the current Site Plan attached to this Petition. The various iterations of the plan, as described below, were developed in an effort to avoid and minimize impacts to the Ultimate Developed Floodplain.

Alternative 1: Locate the building as close to the southeast portion of the site as possible.

Summary: The building was moved to be adjacent to the existing SHA easement along Belair Road with no impacts to the easement. Previously, a portion of the DR-1 NC zone extended into the property and would have forced additional building area to be placed in the floodplain and impact environmental areas. The applicant processed a zoning map amendment to remove the DR-1 NC zone from the subject property which allows the building to be located in the southeast corner of the site.

Alternative 2: Site circulation and drive aisle widths have been reconfigured in an effort to minimize improvements within floodplain and associated buffers.

Summary: Previous site plans depicted a drive aisle wrapping around the proposed self-storage building to allow for more efficient circulation. The added drive aisle width, however, pushed the disturbed site area further into the floodplain. A less preferred option for a full 180-degree turnaround area was selected to minimize the footprint of the proposed improvements and therefore reduce any impacts to the floodplain. The proposed drive aisle widths are the minimum that can be safely provided.

Alternative 3: Requested Baltimore County Floodplain Model

Summary: The model was routed with the proposed fill in the floodplain and shown to not impact the floodplain.

Alternative 4: Revise the Baltimore County Floodplain Model to reflect recent State Highway Road Improvements.

Summary: The recent improvements along the Belair Road bridge/culvert crossing were not modeled by Baltimore County staff. These improvements included the construction of a sidewalk and wall on the upstream side of Belair Road. This wall was incorporated in the county model and shown to increase the 100-year floodplain elevation. The proposed project was further analyzed with this new model and determined to not impact the floodplain.

Alternative 5: Minimize and avoid impacts to the FEMA Effective Floodplain

Summary: Impacts to the FEMA floodplain are avoided through the implementation of a retaining wall, a smaller building footprint, and a minimal drive aisle layout.

Alternative 6: Minimize fill and grading footprint

Summary: Development in the Ultimate Developed Floodplain is further minimized through the utilization of a retaining wall. The proposed retaining wall on the northern portion of the development reduces the extent of grading required to develop the subject property. Without the retaining wall, in order to create a flat developable area additional grading would be required. This additional grading would further intrude into the Ultimate Developed Floodplain. Additionally, the combination of the retaining wall and proposed grading raise the proposed building to be above the floodplain, per the Floodplain Study for Whitemarsh Run, under review by Baltimore County. Additional freeboard is provided than required and associated building setbacks are maintained from floodplain to building.

e. Conclusion.

The existing site constraints not only create exceptional hardships for the proposed development of the Property, but likely for *any* development of the Property. The requested waiver relief is the minimum relief necessary and will not pose a threat to the health, safety and welfare of the general public. If granted, the waiver relief will allow the site to be developed in a manner that is consistent with the applicable state and local laws and regulations and in a way that is beneficial to the surrounding properties on account of the improvements that are integral to the development (e.g. stormwater management, removing existing structures for the floodplain, and adding trees and other vegetation to the site). In light of the foregoing, the applicant respectfully requests that the requested waivers be granted so that the proposed development of the Property can proceed.



1 NASHUA COURT, SUITE A
BALTIMORE, MD 21221
410-560-0002
WWW.MTPLS.NET

ZONING PROPERTY DESCRIPTION FOR 8228 BELAIR ROAD

BEGINNING AT A POINT ON THE WEST SIDE OF BELAIR ROAD, VARIABLE WIDTH PUBLIC RIGHT OF WAY, AT THE SOUTHERN LINE OF DIVISION OF THAT PARCEL OF LAND BY DEED DATED DECEMBER 17, 2015, AND RECORDED AMONG THE LAND RECORDS OF BALTIMORE COUNTY, IN LIBER 36999, FOLIO 456 WAS GRANTED AND CONVEYED BY SARJU SINGH TO ACME AUTO OF MARYLAND, LLC ; THENCE LEAVING SAID POINT OF BEGINNING AND RUNNING THE FOLLOWING BEARINGS AND DISTANCES WITH ALL BEARING BEING REFERENCED TO THE MARYLAND COORDINATE SYSTEM:

- 1) S 38°02'17" W 1.55 FEET; THENCE
- 2) S 43°07'34" W 93.52 FEET; THENCE
- 3) S 36°59'46" W 145.00 FEET; THENCE
- 4) N 61°27'57" W 97.31 FEET; THENCE
- 5) N 63°14'19" W 111.60 FEET; THENCE
- 6) N 63°19'23" W 122.86 FEET; THENCE
- 7) N 82°12'21" W 97.99 FEET; THENCE
- 8) N 82°19'46" W 20.38 FEET; THENCE
- 9) N 53°26'49" W 616.44 FEET; THENCE
- 10) N 75°30'27" E 64.34 FEET; THENCE
- 11) N 75°30'27" E 67.66 FEET; THENCE
- 12) N 75°03'57" E 173.19 FEET; THENCE
- 13) S 03°49'05" W 130.74 FEET; THENCE
- 14) S 68°48'50" E 189.17 FEET; THENCE
- 15) S 24°23'26" E 96.48 FEET; THENCE
- 16) S 79°31'55" E 201.00 FEET; THENCE
- 17) N 21°58'05" E 172.00 FEET; THENCE
- 18) S 84°58'49" E 275.39 FEET; THENCE
- 19) S 21°51'34" E 19.68 FEET; THENCE
- 20) S 36°30'27" W 169.30 FEET; THENCE
- 21) S 53°10'55" E 142.31 FEET TO THE POINT OF BEGINNING, AS RECORDED IN DEED LIBER EHK 6420, FOLIO 73, CONTAINING 22782 SQUARE FEET OR 5.218 ACRES. LOCATED IN THE 14TH ELECTION DISTRICT AND THE 5TH COUNCIL DISTRICT.



I, MICHAEL DANIEL TRENT, A MARYLAND PROFESSIONAL LAND SURVEYOR LICENSE NUMBER 21409, PERSONALLY PREPARED THIS LEGAL DESCRIPTION ON NOVEMBER 22, 2019 AND MY CURRENT LICENSE EXPIRES ON JUNE 9, 2020.


2019-11-22

2019-0526-SPH

Baltimore County

NOTICE OF ZONING HEARING

The Administrative Law Judge of Baltimore County, by authority of the Zoning Act and Regulations of Baltimore County, will hold a public hearing in Towson, Maryland on the property identified herein as follows:

CASE NUMBER: 2019-0526-SPH

8228 Belair Road

West side of Belair Road, 155 ft. s/west of centerline of intersection with Still Meadow Road

14th Election District - 5th Councilmanic District

Legal Owners: Mark McQuade

Contract Purchaser/Lessee: BSS White Marsh, LLC

Special Hearing for the approval of a waiver request pursuant to Section 32-4-107(b) of the Baltimore County Code and/or Section 500.7 of the Baltimore County Zoning Regulations to waive the requirements of 32-4-414 of the Baltimore County Code and Part 125 of the Baltimore County Building Code (Baltimore County Council Bill 40-15) to permit development within a riverine floodplain, as described herein.

Hearing: Thursday, January 9, 2020 at 11:00 a.m. in Room 205, Jefferson Building, 105 West Chesapeake Avenue, Towson 21204

Michael Mallinoff

Director of Permits, Approvals and Inspections for Baltimore County

NOTES: (1) HEARINGS ARE HANDICAPPED ACCESSIBLE; FOR SPECIAL ACCOMMODATIONS, PLEASE CONTACT THE ADMINISTRATIVE HEARINGS OFFICE AT 410-887-3868.

(2) FOR INFORMATION CONCERNING THE FILE AND/OR HEARING, CONTACT THE ZONING REVIEW OFFICE AT 410-887-3391.

d20

PM 1-9-2020
11:11am

Debra Wiley

From: Linda Okeefe <luckylinda1954@yahoo.com>
Sent: Wednesday, January 8, 2020 6:10 PM
To: Administrative Hearings
Cc: Debra Wiley
Subject: 2nd Certifications Hazelwood Avenue & Belair Rd.
Attachments: Hazelwood Ave. Cert..jpeg; Hazelwood Ave. Photos.docx; Belair Rd. Cert..jpeg; Belair Rd. Photos.docx

CAUTION: This message from luckylinda1954@yahoo.com originated from a non Baltimore County Government or non BCPL email system. Hover over any links before clicking and use caution opening attachments.

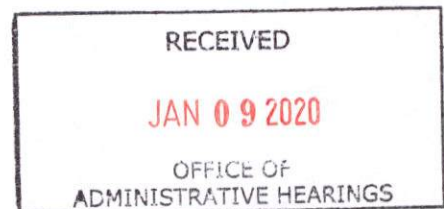
Hi Debbie,

I am attaching the second Certifications along with photos for Hazelwood Ave and another for Belair Road.

Have a nice day,

Linda

Linda O'Keefe
523 Penny Lane
Hunt Valley MD 21030
Phone # 410-666-5366
Cell# 443-604-6431
Fax# 410-666-0929
luckylinda1954@yahoo.com



RECEIVED

JAN 09 2020

OFFICE OF
ADMINISTRATIVE HEARINGS

SECOND CERTIFICATE OF POSTING

ATTENTION: SHERRY NUFFER

DATE: 1/8/2020

Case Number: 2019-0526-SPH

Petitioner / Developer: ADAM BAKER, ESQ. ~

NATHANIEL HAGEDORN ~ MARK McQUADE

Date of Hearing: JANUARY 9, 2020

This is to certify under the penalties of perjury that the necessary sign(s)
required by law were posted conspicuously on the property located at:
8228 BELAIR ROAD

The sign(s) were posted on: DECEMBER 20, 2019

The sign(s) were re-photographed on: JANUARY 8, 2020

ZONING NOTICE

CASE # 2019-0526-SPH

A PUBLIC HEARING WILL BE HELD BY
THE ADMINISTRATIVE LAW JUDGE
IN TOWSON, MD

ROOM 205, JEFFERSON BUILDING

PLACE: 105 W. CHESAPEAKE AVE. TOWSON MD 21204

DATE AND TIME: THURSDAY, JANUARY 9, 2020

AT 11:00 A.M.

SPECIAL HEARING FOR THE APPROVAL OF A WAIVER
REQUEST PURSUANT TO SECTION 32-4-107(B) OF THE
BALTIMORE COUNTY CODE AND/OR SECTION 500.7 OF
THE BALTIMORE COUNTY ZONING REGULATIONS TO
WAVE THE REQUIREMENTS OF 32-4-114 OF THE
BALTIMORE COUNTY CODE AND PART 122 OF THE
BALTIMORE COUNTY BUILDING CODE (BALTIMORE
COUNTY RESUB. NO. 14-18) TO PERMIT DEVELOPMENT
WITHIN THE FLOODPLAIN AS DESCRIBED HEREIN.

Linda O'Keefe
(Signature of Sign Poster)

Linda O'Keefe
(Printed Name of Sign Poster)

523 Penny Lane
(Street Address of Sign Poster)

Hunt Valley, Maryland 21030
(City, State, Zip of Sign Poster)

410 - 666 - 5366
(Telephone Number of Sign Poster)

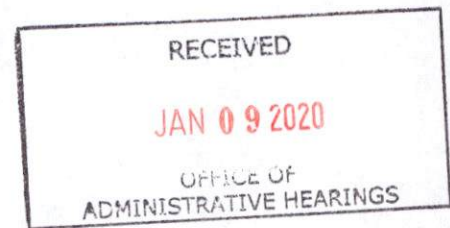


Re-Photographed 1st Sign @ 8228 Belair Rd. ~ 1/8/2020



Re-Photographed 2nd Sign @ 8228 Belair Rd. ~ 1/8/2020

CASE # 2019-0526-SPH



CERTIFICATE OF POSTING

ATTENTION: KRISTEN LEWIS

DATE: 12/20/2019

Case Number: 2019-0526-SPH

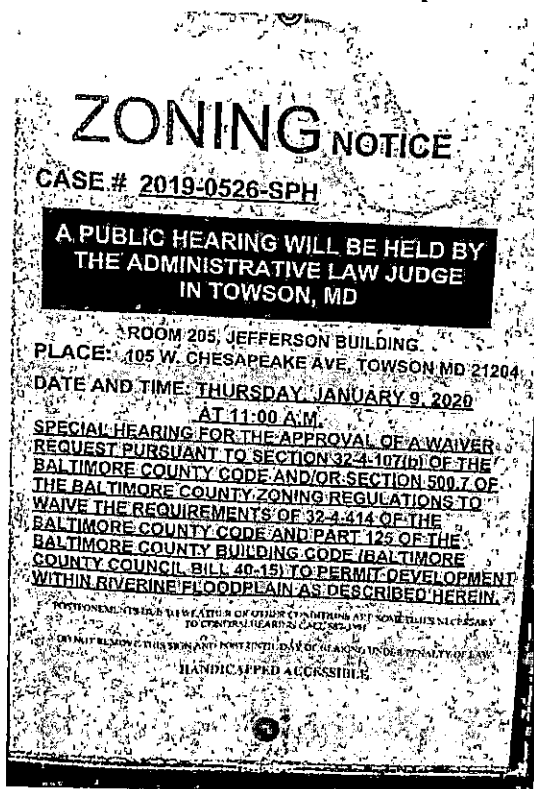
Petitioner / Developer: ADAM BAKER, ESQ. ~

NATHANIEL HAGEDORN ~ MARK McQUADE

Date of Hearing: JANUARY 9, 2020

This is to certify under the penalties of perjury that the necessary sign(s) required by law were posted conspicuously on the property located at:
8228 BELAIR ROAD

The sign(s) were posted on: **DECEMBER 20, 2019**



Linda O'Keefe
(Signature of Sign Poster)

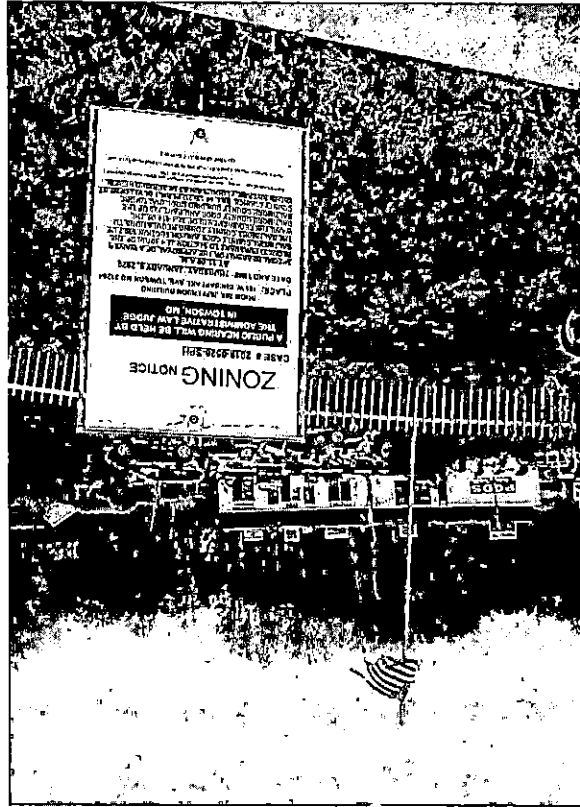
Linda O'Keefe
(Printed Name of Sign Poster)

523 Penny Lane
(Street Address of Sign Poster)

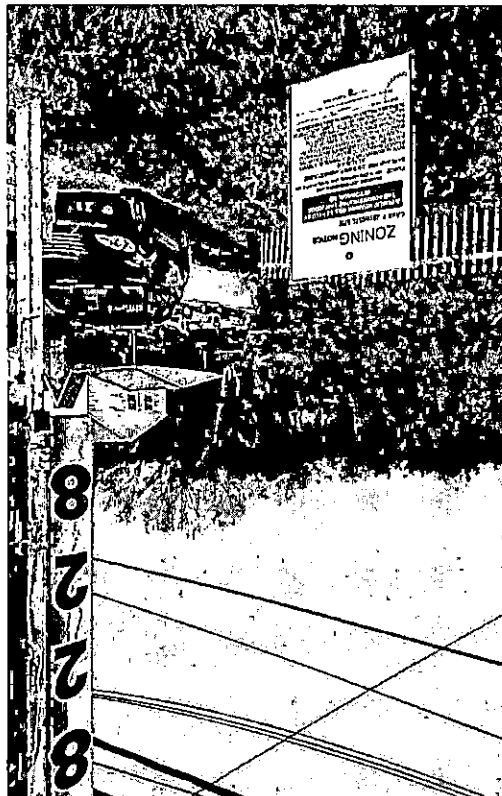
Hunt Valley, Maryland 21030
(City, State, Zip of Sign Poster)

410 - 666 - 5366
(Telephone Number of Sign Poster)

Background Photo 2nd Sign @ 8228 Belair Rd. ~ 12/20/2019
CASE # 2019-0526-SPH



Background Photo 1st Sign @ 8228 Belair Rd. ~ 12/20/2019



RE: PETITION FOR SPECIAL HEARING * BEFORE THE OFFICE
8228 Belair Road; W/S of Belair Road *
14th Election & 5th Councilmanic Districts * OF ADMINISTRATIVE
Legal Owner(s): Mark J. McQuade HEARINGS FOR
Contract Purchaser(s): BSS White Marsh, LLC*
Petitioner(s) * BALTIMORE COUNTY
* 2019-526-SPH

* * * * *

ENTRY OF APPEARANCE

Pursuant to Baltimore County Charter § 524.1, please enter the appearance of People's Counsel for Baltimore County as an interested party in the above-captioned matter. Notice should be sent of any hearing dates or other proceedings in this matter and the passage of any preliminary or final Order. All parties should copy People's Counsel on all correspondence sent and all documentation filed in the case.

RECEIVED

DEC 11 2019

Peter Max Zimmerman

PETER MAX ZIMMERMAN
People's Counsel for Baltimore County

Carole S. Demilio

CAROLE S. DEMILIO
Deputy People's Counsel
Jefferson Building, Room 204
105 West Chesapeake Avenue
Towson, MD 21204
(410) 887-2188

CERTIFICATE OF SERVICE

I HEREBY CERTIFY that on this 11th day of December, 2019, a copy of the foregoing Entry of Appearance was mailed to Adam D. Baker, Esquire, 25 S. Charles Street, 21st Floor, Baltimore, Maryland 21201, Attorney for Petitioner(s).

Peter Max Zimmerman

PETER MAX ZIMMERMAN
People's Counsel for Baltimore County



JOHN A. OLSZEWSKI, JR.
County Executive

MICHAEL D. MALLINOFF, *Director*
Department of Permits,
Approvals & Inspections

December 10, 2019

NOTICE OF ZONING HEARING

The Administrative Law Judge of Baltimore County, by authority of the Zoning Act and Regulations of Baltimore County, will hold a public hearing in Towson, Maryland on the property identified herein as follows:

CASE NUMBER: 2019-0526-SPH

8228 Belair Road

West side of Belair Road, 155 ft. s/west of centerline of intersection with Still Meadow Road

14th Election District – 5th Councilmanic District

Legal Owners: Mark McQuade

Contract Purchaser/Lessee: BSS White Marsh, LLC

Special Hearing for the approval of a waiver request pursuant to Section 32-4-107(b) of the Baltimore County Code and/or Section 500.7 of the Baltimore County Zoning Regulations to waive the requirements of 32-4-414 of the Baltimore County Code and Part 125 of the Baltimore County Building Code (Baltimore County Council Bill 40-15) to permit development within a riverine floodplain, as described herein.

Hearing: Thursday, January 9, 2020 at 11:00 a.m. in Room 205, Jefferson Building,
105 West Chesapeake Avenue, Towson 21204

A handwritten signature in cursive script, appearing to read "Michael Mallinoff".

Michael Mallinoff
Director

MM:kl

C: Adam Baker, 25 S. Charles Street, 21st Fl., Baltimore 21201
Nathaniel Hagedorn, 4825 NW 41st Street, Ste. 500, Riverside MO 64150
Mark McQuade, 8228 Belair Road, Baltimore 21236

- NOTES: (1) **THE PETITIONER MUST HAVE THE ZONING NOTICE SIGN POSTED BY AN APPROVED POSTER ON THE PROPERTY BY FRIDAY, DECEMBER 20, 2019**
- (2) **HEARINGS ARE HANDICAPPED ACCESSIBLE; FOR SPECIAL ACCOMMODATIONS PLEASE CALL THE ADMINISTRATIVE HEARINGS OFFICE AT 410-887-3868.**
- (3) **FOR INFORMATION CONCERNING THE FILE AND/OR HEARING, CONTACT THE ZONING REVIEW OFFICE AT 410-887-3391.**

TO: THE DAILY RECORD
Friday, December 20, 2019 – Issue

Please forward billing to:

Adam Baker
Rosenberg, Martin & Greenberg, LLP
25 S. Charles Street, 21st Fl.
Baltimore, MD 21201

410-727-6600

NOTICE OF ZONING HEARING

The Administrative Law Judge of Baltimore County, by authority of the Zoning Act and Regulations of Baltimore County, will hold a public hearing in Towson, Maryland on the property identified herein as follows:

CASE NUMBER: 2019-0526-SPH

8228 Belair Road

West side of Belair Road, 155 ft. s/west of centerline of intersection with Still Meadow Road

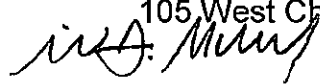
14th Election District – 5th Councilmanic District

Legal Owners: Mark McQuade

Contract Purchaser/Lessee: BSS White Marsh, LLC

Special Hearing for the approval of a waiver request pursuant to Section 32-4-107(b) of the Baltimore County Code and/or Section 500.7 of the Baltimore County Zoning Regulations to waive the requirements of 32-4-414 of the Baltimore County Code and Part 125 of the Baltimore County Building Code (Baltimore County Council Bill 40-15) to permit development within a riverine floodplain, as described herein.

Hearing: Thursday, January 9, 2020 at 11:00 a.m. in Room 205, Jefferson Building,
105 West Chesapeake Avenue, Towson 21204



Michael Mallinoff

Director of Permits, Approvals and Inspections for Baltimore County

- NOTES: (1) HEARINGS ARE HANDICAPPED ACCESSIBLE; FOR SPECIAL ACCOMODATIONS, PLEASE CONTACT THE ADMINISTRATIVE HEARINGS OFFICE AT 410-887-3868.
- (2) FOR INFORMATION CONCERNING THE FILE AND/OR HEARING, CONTACT THE ZONING REVIEW OFFICE AT 410-887-3391.

**DEPARTMENT OF PERMITS, APPROVALS AND INSPECTIONS
ZONING REVIEW OFFICE**

ADVERTISING REQUIREMENTS AND PROCEDURES FOR ZONING HEARINGS

The Baltimore County Zoning Regulations (BCZR) require that notice be given to the general public/neighbor property owners relative to property which is the subject of an upcoming zoning hearing. For those petitions which require a public hearing, this notice is accomplished by posting a sign on the property (responsibility of the legal owner/petitioner) and placement of a notice in a newspaper of general circulation in the County, both at least twenty (20) days before the hearing.

Zoning Review will ensure that the legal requirements for advertising are satisfied. However, the legal owner/petitioner is responsible for the costs associated with these requirements. The newspaper will bill the person listed below for the advertising. This advertising is due upon receipt and should be remitted directly to the newspaper.

OPINIONS MAY NOT BE ISSUED UNTIL ALL ADVERTISING COSTS ARE PAID.

For Newspaper Advertising:

Case Number: 2019-0526-JPH

Property Address: 8228 BELAIR RD, BALTIMORE, MD 21236

Property Description: _____

Legal Owners (Petitioners): MARK McQUADE

Contract Purchaser/Lessee: BSS WHITE MARSH, LLC

PLEASE FORWARD ADVERTISING BILL TO:

Name: ADAM BAKER

Company/Firm (if applicable): ROSENBERG MARTIN GREENBERG, LLP

Address: 25 S. CHARLES ST, BALTIMORE, MD 21201

Telephone Number: 410.727.6600

Revised 7/9/2015



JOHN A. OLSZEWSKI, JR.
County Executive

MICHAEL D. MALLINOFF, *Director*
Department of Permits,
Approvals & Inspections

December 30, 2019

Adam D. Baker
25 S. Charles St 21ST Floor
Baltimore MD 21201

RE: Case Number: 2019-0526-SPH, 8228 Belair Road

To Whom It May Concern:

The above referenced petition was accepted for processing **ONLY** by the Bureau of Zoning Review, Department of Permits, Approvals, and Inspection (PAI) on November 26, 2019. This letter is not an approval, but only a **NOTIFICATION**.

The Zoning Advisory Committee (ZAC), which consists of representatives from several approval agencies, has reviewed the plans that were submitted with your petition. All comments submitted thus far from the members of the ZAC are attached. These comments are not intended to indicate the appropriateness of the zoning action requested, but to ensure that all parties (zoning commissioner, attorney, petitioner, etc.) are made aware of plans or problems with regard to the proposed improvements that may have a bearing on this case. All comments will be placed in the permanent case file.

If you need further information or have any questions, please do not hesitate to contact the commenting agency.

Very truly yours,

A handwritten signature in black ink, appearing to read "W. Carl Richards, Jr.", is written over a horizontal line.

W. Carl Richards, Jr.
Supervisor, Zoning Review

WCR/kl

Enclosures

c: People's Counsel
BBS White Marsh LLC 4825 NW 41ST ST Ste 500 Riverside MO 64150
Mark J. McQuade 8228 Belair Road Baltimore MD 21236

BALTIMORE COUNTY, MARYLAND

Inter-Office Correspondence



TO: Hon. Paul M. Mayhew; Managing Administrative Law Judge
Office of Administrative Hearings

FROM: Jeff Livingston, Department of Environmental Protection and
Sustainability (EPS) - Development Coordination

DATE: December 4, 2019

SUBJECT: DEPS Comment for Zoning Item # 2019-0526-SPH
Address 8228 Belair Road
(McQuade Property)

Zoning Advisory Committee Meeting of November 29, 2019.

The Department of Environmental Protection and Sustainability offers the following comments on the above-referenced zoning item:

1. Development of the property must comply with Baltimore County Code Article 33. Environmental Protection And Sustainability, Title 3. Protection of Water Quality, Streams, Wetlands, and Floodplains. This includes compliance with all conditions of the variance to this code granted on August 27, 2019.
2. Development of this property must comply with Baltimore County Code Article 33. Environmental Protection And Sustainability, Title 6. Forest Conservation.

Reviewer: Paul Dennis, Environmental Impact Review

BALTIMORE COUNTY, MARYLAND

Inter-Office Correspondence



TO: Hon. Paul M. Mayhew; Managing Administrative Law Judge
Office of Administrative Hearings

FROM: Jeff Livingston, Department of Environmental Protection and
Sustainability (EPS) - Development Coordination

DATE: December 4, 2019

SUBJECT: DEPS Comment for Zoning Item # 2019-0526-SPH
Address 8228 Belair Road
(McQuade Property)

Zoning Advisory Committee Meeting of November 29, 2019.

The Department of Environmental Protection and Sustainability offers the following comments on the above-referenced zoning item:

1. Development of the property must comply with Baltimore County Code Article 33. Environmental Protection And Sustainability, Title 3. Protection of Water Quality, Streams, Wetlands, and Floodplains. This includes compliance with all conditions of the variance to this code granted on August 27, 2019.
2. Development of this property must comply with Baltimore County Code Article 33. Environmental Protection And Sustainability, Title 6. Forest Conservation.

Reviewer: Paul Dennis, Environmental Impact Review

Date: 12/5/19

Ms. Kristen Lewis
Baltimore County Department of
Permits, Approvals and Inspections
County Office Building, Room 109
111 West Chesapeake Avenue
Towson, Maryland 21204

Dear Ms. Lewis:

We have reviewed the site plan to accompany the petition for variance on the subject of the Case number referenced below, which was received on 12/4/19. A field inspection and internal review reveals that an entrance onto 451 consistent with current State Highway Administration guidelines is required. As a condition of approval for Special Hearing, Case Number 2019-0526-SPH.

Mark J. McQuade
8228 Belair Road

★ The applicant must contact the State Highway Administration to obtain an entrance permit. Should you have any questions regarding this matter feel free to contact Richard Zeller at 410-229-2332 or 1-866-998-0367 (in Maryland only) extension 2332, or by email at (rzeller@mdot.maryland.gov).

Sincerely,

Richard Zeller

for Wendy Wolcott, P.L.A.
Metropolitan District Engineer
Maryland Department of Transportation
State Highway Administration
District 4 - Baltimore and Harford Counties

WW/RAZ

cc: Mr. Michael Pasquariello, Utility Engineer, SHA

★ The MDOT SHA is currently reviewing plans toward the issuance of an access permit, so MDOT SHA has already been contacted

Date: 12/5/19

Ms. Kristen Lewis
Baltimore County Department of
Permits, Approvals and Inspections
County Office Building, Room 109
111 West Chesapeake Avenue
Towson, Maryland 21204

Dear Ms. Lewis:

We have reviewed the site plan to accompany the petition for variance on the subject of the Case number referenced below, which was received on 12/4/19. A field inspection and internal review reveals that an entrance onto US1 consistent with current State Highway Administration guidelines is required. As a condition of approval for Special Hearing Case Number 2019-0526-SPH.

Mark J. McQuade
8228 Belair Road

★ The applicant must contact the State Highway Administration to obtain an entrance permit. Should you have any questions regarding this matter feel free to contact Richard Zeller at 410-229-2332 or 1-866-998-0367 (in Maryland only) extension 2332, or by email at (rzeller@mdot.maryland.gov).

Sincerely,

Richard Zeller

for Wendy Wolcott, P.L.A.
Metropolitan District Engineer
Maryland Department of Transportation
State Highway Administration
District 4 - Baltimore and Harford Counties

WW/RAZ

cc: Mr. Michael Pasquariello, Utility Engineer, SHA

★ The MDOT SHA is currently reviewing plans toward the issuance of an access permit, so MDOT SHA has already been contacted

ORDER RECEIVED FOR FILING

Date 1/14/2020

By Sen

BALTIMORE COUNTY, MARYLAND

Inter-Office Correspondence



TO: Hon. Paul M. Mayhew; Managing Administrative Law Judge
Office of Administrative Hearings

FROM: Jeff Livingston, Department of Environmental Protection and
Sustainability (EPS) - Development Coordination

DATE: December 4, 2019

SUBJECT: DEPS Comment for Zoning Item # 2019-0526-SPH
Address 8228 Belair Road
(McQuade Property)

Zoning Advisory Committee Meeting of November 29, 2019.

The Department of Environmental Protection and Sustainability offers the following comments on the above-referenced zoning item:

1. Development of the property must comply with Baltimore County Code Article 33. Environmental Protection And Sustainability, Title 3. Protection of Water Quality, Streams, Wetlands, and Floodplains. This includes compliance with all conditions of the variance to this code granted on August 27, 2019.
2. Development of this property must comply with Baltimore County Code Article 33. Environmental Protection And Sustainability, Title 6. Forest Conservation.

Reviewer: Paul Dennis, Environmental Impact Review

ORDER RECEIVED FOR FILING

Date 1/14/2020

By sen

**BALTIMORE COUNTY, MARYLAND
INTER OFFICE CORRESPONDENCE**

TO: Michael Mallinoff, Director,
Department of Permits, Approvals and Inspections

ATTN: Kristen Lewis
MS 1105

FROM: Steven A. Walsh, Director 
Department of Public Works

DATE: January 6, 2020

SUBJECT: Case No: 2019-0526-SPH
Tax Account 14-18-000625
8228 Belair Road, Baltimore, Maryland 21236

This is a Special Hearing to approve a waiver to allow construction within a 100-year riverine flood plain.

The project site as shown on the "Plan to Accompany Administrative Special Hearing" for Beyond Self-Storage dated November 21, 2019, shows that the proposed building, driveway, parking, grading, associated utilities, etc. are inside of the special flood hazard area (100-year flood plain) as described by Baltimore County regulations.

Baltimore County Code Sections 32-4-414, 32-8 and the 2015 Baltimore County Building Code Part 125 all state "no building in a riverine flood plain".

A Flood Study performed by Kimley Horn and Associates, Inc. dated October, 2019 signed and sealed by a Maryland Professional Engineer has been submitted to Baltimore County. On Page 10 of the report, the engineer states "*Although the proposed grading and improvements extend into the limits of ultimate condition Baltimore County floodplain, the proposed improvements do not cause increased in 100-year water surface elevations.*"

The Department of Public Works takes no exception for the approval of the waiver request.

SAW/TWC/s

CC: Vishnubhai K. Desai, Chief, Development Plans Review and Building Plan Review
Peter M. Zimmerman, People's Council

CASE NAME 8226 RELIANCE RD
CASE NUMBER 2019-0526-SPH
DATE January 9, 2020

NAME	ADDRESS	CITY, STATE, ZIP	E - MAIL
------	---------	------------------	----------

[illegible]

Supplement to the Petition for Floodplain Waiver for 8228 Belair Road, Baltimore County, Maryland

Petitioner is seeking approval of a waiver request pursuant to Section 32-4-107(b) of the Baltimore County Code and/or Section 500.7 of the Baltimore County Zoning Regulations to waive the requirements of § 32-4-414 of the Baltimore County Code & Part 125 of the Baltimore County Building Code (Baltimore County Council Bill 40-15) to permit development within a riverine floodplain, as described herein.

Part A. Applicant Information.

Applicant/Developer:

Name(s): Mr. Johnny Sweeney
Company: BSS White Marsh, LLC Phone #: (816) 281 - 2901
Street: 4825 NW 41st Street, Suite 500
City: Riverside State: MO Zip Code: 64150

Property Owner(s):

Name(s): Mr. Mark J. McQuade
Company: N/A Phone #: (410) 440 - 5658
Street: 8228 Belair Rd
City: Baltimore State: MD Zip Code: 21236

Engineer/Representative:

Name(s): Mr. Nicholas J. Leffner, P.E.
Company: Kimley-Horn and Associates, Inc. Phone #: (443) 743 - 3470
Street: 1801 Porter Street, Suite 401
City: Baltimore State: MD Zip Code: 21230

Principal Contact:

Name(s): Mr. Adam Baker
Company: Rosenberg Martin Greenberg, LLP Phone #: (410) 727 - 6600
Street: 25 South Charles Street, 21st Floor
City: Baltimore State: MD Zip Code: 21201

Land Use Attorney:

Name(s): Mr. Adam Baker
Company: Rosenberg Martin Greenberg, LLP Phone #: (410) 727 - 6600
Street: 25 South Charles Street, 21st Floor
City: Baltimore State: MD Zip Code: 21201

Part B. Property Information.

Property address/information: 8228 Belair Road, Nottingham, Maryland 21236

Tax account number(s): 14-1418000625

Subdivision: N/A

Tax Map: 71 Parcel number(s): 501

Acreage/Lot size: 5.42± acres Deeds: 06420/00073

Zoning: Business Roadside (BR), Density Residential (DR-1-NC and DR-16)

Part C. Property Description.

The subject property is a 5.42 acre parcel located at 8228 Belair Road in the Nottingham area of Baltimore County, tax map 71, parcel number 501 (the "Property"). This tract of land is predominately zoned BR (Business Roadside) with areas of DR-1 NC and DR-16 (Density Residential) located along the western and northern edge of the Property. The DR zoned portions of the Property are located outside of the proposed project limits. Through a mapping error DR-1 NC zoning previously extended into the southeastern portion of the Property but has since been removed from the area needed for development by a zoning map correction (Baltimore County Board of Appeals Case No. MC-19-01). The Property is currently developed with the following: a tractor repair shop, a residence, several storage sheds and storage containers, a storage garage, maintained lawn areas, gravel/paved driveways, and parking areas.

The site is bound to the north by Whitemarsh Run, along which steep slopes are present. There is an existing State Highway Administration ("SHA") easement along the eastern portion of the Property, under deed reference L. 8188, F. 584. There is existing Baltimore Gas & Electric Company ("BGE") right-of-way to the south and west of the site. A forest stand and forested stream buffer are located along Whitemarsh Run. The existing FEMA effective 100-year floodplain is delineated along Whitemarsh Run.

Part D. Project Description.

The current proposal is to develop the Property with a 150,000 square foot Beyond Self-Storage facility and associated infrastructure. The proposed development includes the mini-warehouse self-storage building, access entrance for ingress and egress from Belair Road, a parking area adjacent to the proposed mini-warehouse, a retaining wall along the egress and ingress road, two stormwater management (SWM) Environmental Site Design (ESD) facilities, and associated utilities and infrastructure. The implementation of the ESD stormwater management facilities on the Property will provide an opportunity for an improvement to the stormwater quantity and quality management where none presently exists.

A Steep Slopes and Erodible Soils Analysis (SSEA) was prepared and approved by the Baltimore County Department of Environmental Protection and Sustainability (EPS) on January 28, 2019. Specimen trees are present on the Property, and a Forest Conservation variance was submitted and approved by Baltimore County on August 27, 2019 under tracking number 05-19-2997. A forest and stream buffer exists on the northwestern portion of the Property, and a Forest Buffer Determination was prepared and approved on January 28, 2019.

Given the various constraints, as described herein and as shown on the accompanying Site Plan, development of the Property is limited in all directions. The only viable option to carry out the proposed development is to build out the rear of the Property towards White Marsh Run. The impacts to these identified sensitive areas has been minimized and mitigated by the following design elements: (1) locating the building as close to Belair Road as possible, (2) building vertically (multiple stories and basement) as opposed to horizontally, and (3) adding a retaining wall along the majority of the site improvements. Variances for impacts to the northwest have been approved by the appropriate agencies as noted herein.

Per the Floodplain Study (pending Baltimore County approval) for Whitemarsh Run, the proposed building will not be in the Ultimate Developed Floodplain and will adhere to the Baltimore County Design Manual Plates DF-1 and DF-2 for building setbacks from the Floodplain Elevation and Freeboard from the 100-year water surface elevation. The building has been raised out of the floodplain through the implementation of a retaining wall and the proposed site grading. Existing structures within the Ultimate Developed Floodplain are to be removed from the floodplain with the proposed development, improving the overall safety of the site during such storm events. Additionally, the building setback requirements of the front, rear, and side yards are satisfied per Baltimore County Code Section 238 *B.R. Zone Area Regulations*.

The use and development of the Property for the proposed Beyond Self-Storage facility meet all of the applicable sections of the Baltimore County Zoning Regulations as well as the Baltimore County Landscape Manual. The proposed use of the Property is consistent with the surrounding land uses along Belair Road, which is comprised of a blend of commercial developments. The construction of the project would help promote Baltimore County's growth as a major corporate economic development area.

Part E. Sections of the Baltimore County Code and Baltimore County Building Code from which waiver relief is being requested:

Baltimore County Code Section 32-4-414 *Floodplain and Wetland Protection*.

C) "Development in floodplain prohibited; exceptions. The county may not permit development in a riverine floodplain except for:

- (1) The establishment of property subdivision lines; and*
- (2) The installation of a pond, culvert, bridge, street, utility, or drainage facility that the county finds is not detrimental to floodplain management programs."*

The Applicant requests a waiver from this Section of the Baltimore County Code pursuant to Section 32-4-107(b) of the Baltimore County Code in order to permit development within a floodplain to:

- Construct a self-storage building, associated drive aisle/parking areas, stormwater management facilities, and a retaining wall, as depicted on the Plan to Accompany Administrative Special Hearing.

Part 125, Baltimore County Building Code *Areas Subject to Inundation by Riverine Surface Waters Within the 100-Year Floodplain*.

"Part 125 areas subject to inundation by riverine surface waters within the 100-year floodplain. Part 125.1 no new buildings or additions. No new buildings or additions shall be constructed in any riverine floodplain. The 100-year floodplain shall be based upon the federal flood insurance study areas

established by the director of public works, whichever is the more restrictive. This determination shall include planned future development of the watershed area."

The Applicant requests a waiver from the Section of the Baltimore County Building Code referenced above for construction of new buildings in the riverine floodplain to:

- Construct a self-storage building, parking areas, and a retaining wall as depicted on the Plan to Accompany Administrative Special Hearing.

Part F. Reasons for Granting the Waiver.

a. Good and Sufficient Cause.

Without relief from the strict application of Section 32-4-414 of the Baltimore County Code and Part 125 of the Baltimore County Building Code (Bill 40-12) *Areas Subject to Inundation by Riverine Surface Waters Within the 100-Year Floodplain*, the proposed development of the Property would not be feasible. The Property's size, topography, location and existing site conditions coupled with the location of the floodplain create an exceptional hardship for any attempt to develop the Property.

The Riverine Floodplain currently extends into the northwestern portion of the Property and thereby shifts the developable area towards Belair Road. The Riverine Floodplain is defined in Baltimore County Code Section 32-8-101 as "that land which is inundated by the storm water runoff created by a 100-year frequency flood and which is based on maximum development of the watershed using the current zoning and based on the current standards approved by the Department of Public Works." It is referred to in the Floodplain Study for the Property (currently pending County approval) and in this Waiver Petition as the Ultimate Developed Floodplain.

The Ultimate Developed Floodplain is more restrictive than the floodplain identified within the current Federal Emergency Management Agency ("FEMA") Flood Insurance Rate Map ("FIRM") and has a greater impact to the Property than the floodplain established under the FEMA FIRM. Although a small portion of the proposed development (grading and part of the proposed retaining wall) will be located within the Ultimate Developed Floodplain, the proposed development will improve the existing conditions on the Property. Among other things, the development will add stormwater management where there is none now, remove structures which are currently located within the floodplain, and it will increase the amount of trees and forested buffer from what exists on the Property now. In light of the foregoing, there is good and sufficient cause to approve the waiver request.

b. Failure to grant the waiver would result in exceptional hardship.

The Property's size, location, topography, and existing site conditions result in a situation where strict compliance with the requirements of the Ultimate Developed Floodplain constrains the development without the commensurate benefits of preventing floodplain impacts.

The western portion of the Property contains a maintained BGE right-of-way, which must be avoided for development purposes. In addition, a SHA slope easement exists along the length of the frontage on Belair Road (L. 8188, F. 584), which must also be avoided. On account of these title constraints, along with the Property's irregular shape and natural features, the developable area is limited to the southern and eastern portions of the property. Further complicating matters is the fact that SHA recently reconstructed the sidewalk and entrance along the site frontage (along the southeastern portion of the Property) which has further increased grades into the site, requiring additional space and grading to

allow for adequate grade transitions. Coupled with the floodplain, these site constraints create an exceptional hardship for the applicant in improving the conditions on site and in developing the site.

- c. Granting the waiver will not increase flood heights, impact public safety, incur extraordinary public expense, create nuisances, cause fraud or victimization of the public, or conflict with existing local and state laws and ordinances.**

The Ultimate Developed Floodplain currently extends into the northwestern portion of the Property and thereby shifts the developable area towards Belair Road. As noted previously, the Ultimate Developed Floodplain is more restrictive than the floodplain identified under the current FEMA FIRM and has a greater impact to the Property than the floodplain established under the FEMA FIRM. As set forth in the Floodplain Study and as will be established at the hearing on the waiver requests before the Administrative Law Judge, the proposed development within the Ultimate Development Floodplain will not increase flood heights, nor will it create any public safety concerns or threats to the health, safety or general welfare of the general public. The development will comply with all existing local and state laws and regulations. Lastly, the development is being privately funded and therefore will not require any public expense.

- d. The waiver action will be the minimum necessary to afford relief.**

The Property currently has improvements that are within the Ultimate Developed Floodplain. These existing structures are to be removed from the floodplain in accordance with the proposed development.

Through multiple iterations, the proposed development on the Property has evolved to the current Site Plan attached to this Petition. The various iterations of the plan, as described below, were developed in an effort to avoid and minimize impacts to the Ultimate Developed Floodplain.

Alternative 1: Locate the building as close to the southeast portion of the site as possible.

Summary: The building was moved to be adjacent to the existing SHA easement along Belair Road with no impacts to the easement. Previously, a portion of the DR-1 NC zone extended into the property and would have forced additional building area to be placed in the floodplain and impact environmental areas. The applicant processed a zoning map amendment to remove the DR-1 NC zone from the subject property which allows the building to be located in the southeast corner of the site.

Alternative 2: Site circulation and drive aisle widths have been reconfigured in an effort to minimize improvements within floodplain and associated buffers.

Summary: Previous site plans depicted a drive aisle wrapping around the proposed self-storage building to allow for more efficient circulation. The added drive aisle width, however, pushed the disturbed site area further into the floodplain. A less preferred option for a full 180-degree turnaround area was selected to minimize the footprint of the proposed improvements and therefore reduce any impacts to the floodplain. The proposed drive aisle widths are the minimum that can be safely provided.

Alternative 3: Requested Baltimore County Floodplain Model

Summary: The model was routed with the proposed fill in the floodplain and shown to not impact the floodplain.

Alternative 4: Revise the Baltimore County Floodplain Model to reflect recent State Highway Road Improvements.

Summary: The recent improvements along the Belair Road bridge/culvert crossing were not modeled by Baltimore County staff. These improvements included the construction of a sidewalk and wall on the upstream side of Belair Road. This wall was incorporated in the county model and shown to increase the 100-year floodplain elevation. The proposed project was further analyzed with this new model and determined to not impact the floodplain.

Alternative 5: Minimize and avoid impacts to the FEMA Effective Floodplain

Summary: Impacts to the FEMA floodplain are avoided through the implementation of a retaining wall, a smaller building footprint, and a minimal drive aisle layout.

Alternative 6: Minimize fill and grading footprint

Summary: Development in the Ultimate Developed Floodplain is further minimized through the utilization of a retaining wall. The proposed retaining wall on the northern portion of the development reduces the extent of grading required to develop the subject property. Without the retaining wall, in order to create a flat developable area additional grading would be required. This additional grading would further intrude into the Ultimate Developed Floodplain. Additionally, the combination of the retaining wall and proposed grading raise the proposed building to be above the floodplain, per the Floodplain Study for Whitemarsh Run, under review by Baltimore County. Additional freeboard is provided than required and associated building setbacks are maintained from floodplain to building.

e. Conclusion.

The existing site constraints not only create exceptional hardships for the proposed development of the Property, but likely for *any* development of the Property. The requested waiver relief is the minimum relief necessary and will not pose a threat to the health, safety and welfare of the general public. If granted, the waiver relief will allow the site to be developed in a manner that is consistent with the applicable state and local laws and regulations and in a way that is beneficial to the surrounding properties on account of the improvements that are integral to the development (e.g. stormwater management, removing existing structures for the floodplain, and adding trees and other vegetation to the site). In light of the foregoing, the applicant respectfully requests that the requested waivers be granted so that the proposed development of the Property can proceed.

**BALTIMORE COUNTY, MARYLAND
INTER OFFICE CORRESPONDENCE**

TO: Michael Mallinoff, Director,
Department of Permits, Approvals and Inspections

ATTN: Kristen Lewis
MS 1105

FROM: Steven A. Walsh, Director
Department of Public Works

DATE: January 6, 2020

SUBJECT: Case No: 2019-0526-SPH
Tax Account 14-18-000625
8228 Belair Road, Baltimore, Maryland 21236

This is a Special Hearing to approve a waiver to allow construction within a 100-year riverine flood plain.

The project site as shown on the "Plan to Accompany Administrative Special Hearing" for Beyond Self-Storage dated November 21, 2019, shows that the proposed building, driveway, parking, grading, associated utilities, etc. are inside of the special flood hazard area (100-year flood plain) as described by Baltimore County regulations.

Baltimore County Code Sections 32-4-414, 32-8 and the 2015 Baltimore County Building Code Part 125 all state "no building in a riverine flood plain".

A Flood Study performed by Kimley Horn and Associates, Inc. dated October, 2019 signed and sealed by a Maryland Professional Engineer has been submitted to Baltimore County. On Page 10 of the report, the engineer states "*Although the proposed grading and improvements extend into the limits of ultimate condition Baltimore County floodplain, the proposed improvements do not cause increased in 100-year water surface elevations.*"

The Department of Public Works takes no exception for the approval of the waiver request.

SAW/TWC/s

CC: Vishnubhai K. Desai, Chief, Development Plans Review and Building Plan Review
Peter M. Zimmerman, People's Council

CHECKLIST

<u>Comment Received</u>	<u>Department</u>	<u>Support/Oppose/ Conditions/ Comments/ No Comment</u>
_____	DEVELOPMENT PLANS REVIEW (if not received, date e-mail sent _____)	_____
12/14	DEPS (if not received, date e-mail sent _____)	Comment
_____	FIRE DEPARTMENT	_____
_____	PLANNING (if not received, date e-mail sent _____)	_____
12/5	STATE HIGHWAY ADMINISTRATION	Comment
_____	TRAFFIC ENGINEERING	_____
_____	COMMUNITY ASSOCIATION	_____
_____	ADJACENT PROPERTY OWNERS	_____
ZONING VIOLATION	(Case No. _____)	
PRIOR ZONING	(Case No. _____)	
NEWSPAPER ADVERTISEMENT	Date: 12/20/19	
SIGN POSTING (1 st)	Date: 12/20/19	by O'Keefe
SIGN POSTING (2 nd)	Date: 11/8/20	by 11
PEOPLE'S COUNSEL APPEARANCE	Yes ☒ No ☐	
PEOPLE'S COUNSEL COMMENT LETTER	Yes ☐ No ☐	

Comments, if any: _____

Real Property Data Search

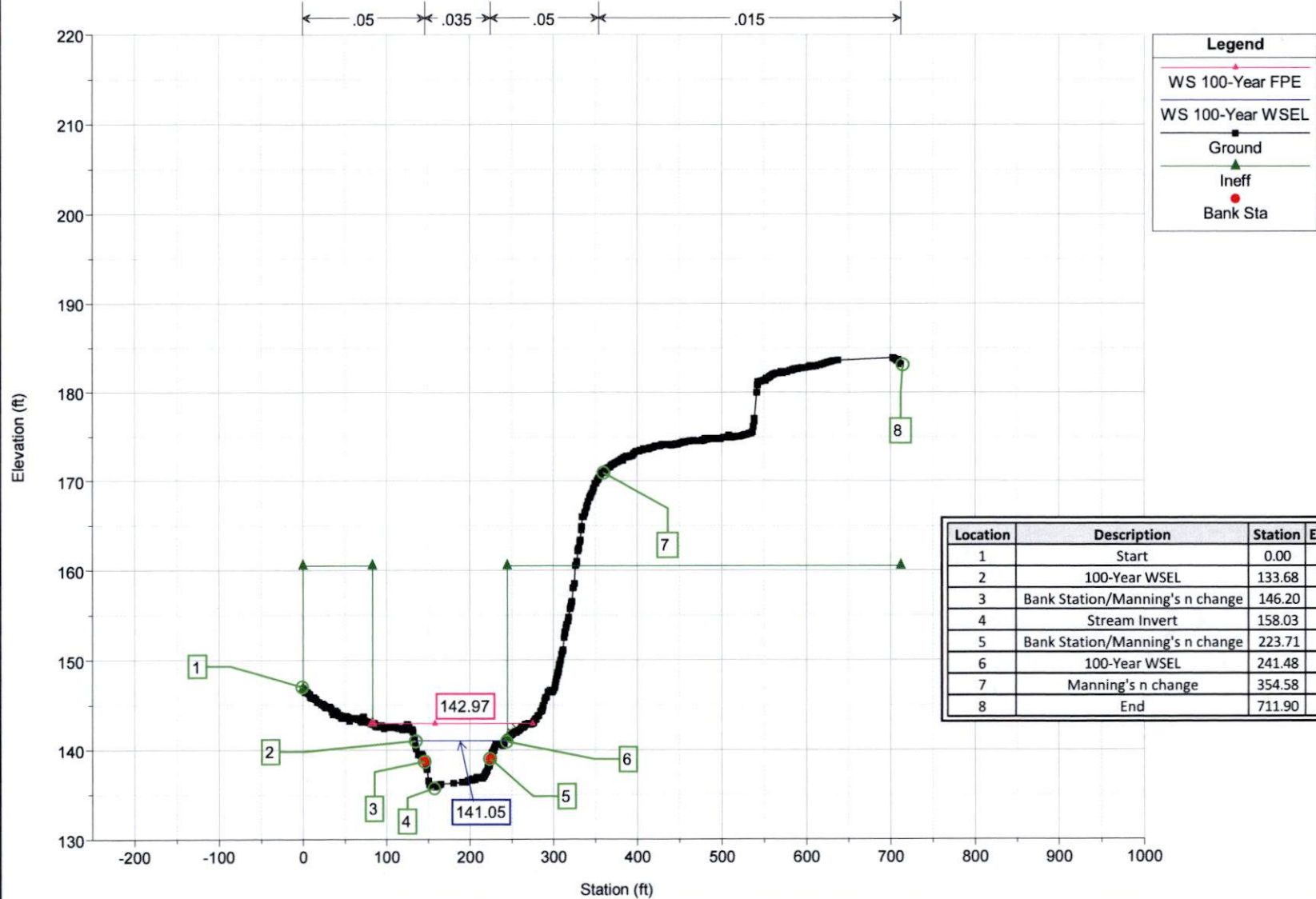
Search Result for BALTIMORE COUNTY

View Map		View GroundRent Redemption		View GroundRent Registration	
Special Tax Recapture: None					
Account Identifier:		District - 14 Account Number - 1418000625			
Owner Information					
Owner Name:	MCQUADE MARK J		Use:	COMMERCIAL	
Mailing Address:	8228 BELAIR RD BALTIMORE MD 21236-3403		Principal Residence:	YES	
			Deed Reference:	/06420/ 00073	
Location & Structure Information					
Premises Address:	8228 BELAIR RD 0-0000		Legal Description:	5.4243 AC NWS BELAIR RD 700FT SW OF LOUISA AVE	
Map:	Grid:	Parcel:	Neighborhood:	Subdivision:	Section: Block: Lot: Assessment Year: Plat No: Plat Ref:
0071	0023	0501	10000.04	0000	2019 Plat Ref:
Special Tax Areas: None			Town:	None	
			Ad Valorem:	None	
			Tax Class:	None	
Primary Structure Built	Above Grade Living Area	Finished Basement Area	Property Land Area	County Use	
1951	6,118 SF		5.4200 AC	06	
Stories	Basement	Type	Exterior	Quality	Full/Half Bath
1 1/2	YES	STANDARD UNIT	BRICK/SIDING	4	2 full
Garage Last Notice of Major Improvements					
Value Information					
	Base Value	Value	Phase-in Assessments		
		As of 01/01/2019	As of 07/01/2019	As of 07/01/2020	
Land:	1,485,000	1,485,000			
Improvements	308,700	315,800			
Total:	1,793,700	1,800,800	1,796,067	1,798,433	
Preferential Land:	0			0	
Transfer Information					
Seller: RAPPOLD RUSSELL W		Date: 08/04/1982		Price: \$125,000	
Type: ARMS LENGTH IMPROVED		Deed1: /06420/ 00073		Deed2:	
Seller:		Date:		Price:	
Type:		Deed1:		Deed2:	
Seller:		Date:		Price:	
Type:		Deed1:		Deed2:	
Exemption Information					
Partial Exempt Assessments:	Class	07/01/2019		07/01/2020	
County:	000	0.00			
State:	000	0.00			
Municipal:	000	0.00 0.00		0.00 0.00	
Special Tax Recapture: None					
Homestead Application Information					
Homestead Application Status: Approved 12/31/2012					

Homeowners' Tax Credit Application Status: No Application

Date:

HEC-RAS Model Plan: Existing_Ultimate 7/25/2019
 River = Whitemarsh Run Reach = 1 RS = 16.80 FEMA Effective Cross Section Q



Belair Road.rep

HEC-RAS HEC-RAS 5.0.3 September 2016
U.S. Army Corps of Engineers
Hydrologic Engineering Center
609 Second Street
Davis, California

```
X   X XXXXXX   XXXX   XXXX   XX   XXXX
X   X X   X   X   X   X   X X   X
X   X X   X   X   X   X   X X   X
XXXXXXXX XXXX   X   XXX XXXX XXXXXX XXXX
X   X X   X   X   X X   X X   X
X   X X   X   X   X X   X X   X
X   X XXXXXX   XXXX   X   X   X   X XXXXX
```

PROJECT DATA

Project Title: HEC-RAS Model
Project File : Belair Road.prj
Run Date and Time: 10/23/2019 4:59:32 PM

Project in English units

PLAN DATA

Plan Title: Proposed_Ultimate
Plan File : k:\DAL_Hydro\114037001 - 8228 Belair Road\Submittals\20191016 - Floodplain Study
Resubmittal_Unsigned\Appendix E - Digital Files\HEC-RAS v5.0.3\Belair Road.p03

Geometry Title: Proposed
Geometry File : k:\DAL_Hydro\114037001 - 8228 Belair Road\Submittals\20191016 - Floodplain Study
Resubmittal_Unsigned\Appendix E - Digital Files\HEC-RAS v5.0.3\Belair Road.g02

Flow Title : Ultimate_Freeboard
Flow File : k:\DAL_Hydro\114037001 - 8228 Belair Road\Submittals\20191016 - Floodplain Study
Resubmittal_Unsigned\Appendix E - Digital Files\HEC-RAS v5.0.3\Belair Road.f03

Plan Summary Information:

Number of: Cross Sections =	16	Multiple Openings =	0
Culverts =	1	Inline Structures =	0
Bridges =	0	Lateral Structures =	0

Computational Information

Water surface calculation tolerance =	0.01
Critical depth calculation tolerance =	0.01
Maximum number of iterations =	20
Maximum difference tolerance =	0.33
Flow tolerance factor =	0.001

Computation Options

Critical depth computed at all cross sections
Conveyance Calculation Method: At breaks in n values only
Friction Slope Method: Average Conveyance
Computational Flow Regime: Subcritical Flow

FLOW DATA

Flow Title: Ultimate_Freeboard
Flow File : k:\DAL_Hydro\114037001 - 8228 Belair Road\Submittals\20191016 - Floodplain Study
Resubmittal_Unsigned\Appendix E - Digital Files\HEC-RAS v5.0.3\Belair Road.f03

Belair Road.rep

Flow Data (cfs)

River	Reach	RS	100-Year WSEL	100-Year FPE
Whitemarsh Run	1	17.59	3940	3940
Whitemarsh Run	1	17.52	3940	3940
Whitemarsh Run	1	17.41	3940	3940
Whitemarsh Run	1	17.39	3940	3940
Whitemarsh Run	1	17.37	3940	3940
Whitemarsh Run	1	17.35	3940	3940
Whitemarsh Run	1	17.33	3940	3940
Whitemarsh Run	1	17.29	3940	3940
Whitemarsh Run	1	17.27	3940	3940
Whitemarsh Run	1	17.25	3940	3940
Whitemarsh Run	1	17.22	3940	3940
Whitemarsh Run	1	17.20	3940	3940
Whitemarsh Run	1	17.13	3940	3940
Whitemarsh Run	1	17.09	3940	3940
Whitemarsh Run	1	16.86	3940	3940
Whitemarsh Run	1	16.80	3940	3940

Boundary Conditions

River	Reach	Profile	Upstream	Downstream
Whitemarsh Run	1	100-Year WSEL		Normal S = 0.020698
Whitemarsh Run	1	100-Year FPE		Known WS = 142.97

Changes in WS and EG

River	Reach	RS	Profile	Type	Value
Whitemarsh Run	1	17.59	100-Year FPE	Known WS	163.96
Whitemarsh Run	1	17.52	100-Year FPE	Known WS	163.87
Whitemarsh Run	1	17.41	100-Year FPE	Known WS	163.82
Whitemarsh Run	1	17.39	100-Year FPE	Known WS	163.77
Whitemarsh Run	1	17.37	100-Year FPE	Known WS	163.77
Whitemarsh Run	1	17.35	100-Year FPE	Known WS	163.77
Whitemarsh Run	1	17.33	100-Year FPE	Known WS	163.77
Whitemarsh Run	1	17.29	100-Year FPE	Known WS	163.76
Whitemarsh Run	1	17.27	100-Year FPE	Known WS	163.77
Whitemarsh Run	1	17.25	100-Year FPE	Known WS	163.76
Whitemarsh Run	1	17.22	100-Year FPE	Known WS	163.77
Whitemarsh Run	1	17.20	100-Year FPE	Known WS	163.76
Whitemarsh Run	1	17.13	100-Year FPE	Known WS	163.71
Whitemarsh Run	1	17.09	100-Year FPE	Known WS	163.67
Whitemarsh Run	1	16.86	100-Year FPE	Known WS	143.8
Whitemarsh Run	1	16.80	100-Year FPE	Known WS	142.97

GEOMETRY DATA

Geometry Title: Proposed

Geometry File : k:\DAL_Hydro\114037001 - 8228 Belair Road\Submittals\20191016 - Floodplain Study
Resubmittal_Unsigned\Appendix E - Digital Files\HEC-RAS v5.0.3\Belair Road.g02

CROSS SECTION

RIVER: Whitemarsh Run
REACH: 1 RS: 17.59

INPUT

Description:

Station Elevation Data		num=	493						
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	212.54	.47	212.42	2.41	212.05	4.75	211.76	6.29	211.72
7.16	211.63	8.22	211.59	10.16	211.4	12.1	211.63	14.04	211.27

						Belair	Road.rep		
16.26	211.11	17.92	211.06	19.3	210.92	22.34	210.68	23.73	210.64
25.67	210.13	27.61	209.98	29.55	209.79	31.44	209.74	33.43	209.54
34.48	209.26	36.93	208.74	40.55	208.25	41.18	208.2	43.12	207.76
43.59	207.68	45.06	207.22	46.62	206.88	47	206.84	48.93	206.26
49.66	206.12	50.87	205.76	54.75	204.44	55.73	204.14	56.69	203.9
58.38	203.26	61.8	202.08	62.5	201.91	63.74	201.49	66.38	200.7
68.32	199.98	70.26	199.38	72.2	198.56	76.07	196.97	76.98	196.64
78.01	196.35	80.02	195.73	81.89	195.07	83.83	194.45	85.77	193.94
87.7	193.71	89.13	193.41	90.55	193.2	91.58	193.11	93.52	192.86
97.4	192.58	99.34	192.29	101.27	192.23	103.21	191.87	105.15	191.61
106.64	191.45	109.03	191.27	112	191.28	112.91	191.25	114.84	190.89
116.78	190.76	118.72	190.72	120.66	190.56	122.73	190.52	124.54	190.36
126.48	190.45	128.6	190.41	130.35	190.23	132.29	190.24	134.67	190.22
136.17	190.27	138.11	190.44	140.05	190.75	143.78	190.89	145.86	190.85
147.8	190.98	149.85	190.97	151.68	191.01	153.61	191.15	155.55	190.88
155.92	190.9	157.49	191.2	158.96	191.33	161.37	191.45	163.31	191.7
165.03	192.24	165.63	192.39	167.18	192.63	168.06	192.81	169.12	192.94
170.99	193.02	174.94	192.92	177.17	193.07	180.21	193.08	182.69	193.22
184.63	193.23	186.57	193.39	188.51	193.31	190.45	193.08	192.44	192.69
194.32	192.2	195.39	192.03	197.81	191.51	198.2	191.4	200.14	190.35
201.46	189.98	203.17	189.39	205.96	188.56	207.89	188.38	209.83	187.82
210.57	187.82	211.77	187.71	213.71	187.9	215.65	187.61	216.64	187.59
217.59	187.65	219.68	187.6	221.46	187.44	225.34	187.2	227.28	186.92
228.78	186.77	229.98	186.45	233.09	185.25	234.86	184.27	236.97	183.17
237.89	182.73	240.71	181.48	242.79	181.01	244.73	180.82	246.66	180.29
248.6	180.05	252.48	179.27	254.42	179.07	256.11	178.7	256.8	178.58
259.14	178.29	262.16	178.05	264.11	177.79	265.22	177.59	267.52	177.29
268.25	177.25	269.93	177.33	271.87	177.34	273.8	177.05	275.74	176.54
279.62	176.68	281.56	176.7	283.61	176.76	285.44	176.87	289.31	176.89
291.25	177.05	293.19	177.12	295.13	177.08	297.07	177.12	299.01	177.23
300.94	177.31	301.6	177.3	302.88	177.28	305.06	177.19	306.76	177.18
308.7	177.2	310.42	177.17	314.51	177.05	316.83	176.94	318.39	176.98
320.33	176.91	322.9	177.06	324.21	177.22	326.14	177.4	328.08	177.51
328.97	177.49	333.9	177.62	335.04	177.43	335.84	177.24	338.08	177
339.71	176.72	342.6	176.53	343.59	176.28	345.53	175.16	347.19	174.5
347.47	174.31	347.96	174.2	350.23	173.45	353.28	172.61	355.22	172.2
357.16	171.91	359.33	171.77	361.04	171.61	362.98	172.1	364.05	172.12
365.41	172.05	366.85	172.02	368.44	171.87	370.73	171.53	372.67	170.82
374.51	170.23	376.55	169.72	377.55	169.43	378.49	169.07	380.42	168.73
382.36	168.7	384.3	168.5	386.24	168.45	388.18	168.3	390.12	168.09
392.05	167.6	392.73	167.6	393.99	167.45	395.77	167.37	397.87	167.41
398.8	167.55	399.81	167.53	401.59	168.07	401.84	168.1	403.69	168.06
405.62	167.8	409.5	166.69	410.95	166.3	413.38	165.79	417.02	165.47
417.33	165.42	419.42	164.65	423.6	164.03	425.69	163.52	426.79	162.66
427.78	162.11	428.56	160.72	429.87	158.03	431.97	155.16	432.28	154.63
432.73	154.02	434.06	152.15	436.01	151.22	438.24	150.89	439.73	150.95
442.42	150.78	448.69	150.73	450.79	151.04	461.24	152.02	463.33	153.23
464.96	153.93	465.78	154.21	467.51	154.04	469.5	153.25	471.7	152.68
473.23	152.39	473.79	152.33	475.88	151.95	476.95	151.98	477.97	151.96
479.28	152.02	480.67	152	482.15	151.83	484.39	152.35	488.42	152.85
490.52	152.84	492.61	153.12	493.59	153.16	494.7	153.1	496.79	153.43
498.88	153.7	500.97	153.83	503	154.16	505.15	154.21	507.24	154.87
507.91	155.01	510.45	155.46	511.43	155.53	513.52	155.38	515.61	154.99
517.7	154.75	519.94	154.84	522.03	154.89	524.11	154.97	525.12	154.91
526.2	154.92	528.29	155.16	530.37	155.18	532.62	155.44	536.63	155.06
538.71	155.25	540.8	155.37	542.89	155.27	544.97	155.04	547.06	155.05
549.14	155.14	551.38	155.05	553.31	155.09	555.73	155.24	558.89	155.32
560.43	155.29	563.74	155.31	565.83	155.27	567.92	155.11	570.15	154.97
572.09	155	573.9	154.83	574.52	154.85	576.26	155.06	578.34	155.18
582.52	155.17	584.6	155.29	586.69	155.22	588.77	155.34	592.66	155.24
595.03	155.49	596.41	155.66	597.12	155.68	600.17	155.95	601.29	156.15
601.6	156.19	603.92	156.5	605.46	156.68	607.67	157.08	609.63	157.51
611.72	157.77	615.18	158.86	616.78	159.33	617.97	159.62	618.93	159.76
620.06	159.86	622.15	160.72	624.23	161.26	626.17	161.85	630.87	163.4
633.94	164.26	634.66	164.44	636.75	165.19	638.83	165.74	640.92	166.44
643	166.97	645.19	167.7	647.17	167.95	648.95	168.35	651.35	168.82
653.43	169.13	655.52	169.48	657.6	169.69	660.2	169.91	661.78	169.98
663.74	170.14	665.95	170.54	667.71	170.79	671.46	171.72	672.2	171.83
673.13	172.17	675.21	172.78	676.38	173.08	677.83	173.51	678.97	173.79

Belair Road.rep									
682.63	174.34	684.72	174.59	687.22	175	688.89	175.37	691.92	175.84
693.06	175.99	695.15	176.1	697.23	176.49	699.32	176.69	701.41	177.07
703.49	177.41	705.58	177.68	707.66	177.87	709.75	178	712.74	178.46
713.92	178.59	716.01	178.74	718.09	178.96	722.26	179.43	724	179.71
724.79	179.8	726.43	179.92	727.75	180.12	730.61	180.48	731.5	180.52
735.25	180.95	736.86	181.17	738.88	181.4	741.04	181.68	745.21	182.16
748.27	182.41	749.38	182.61	750.26	182.97	751.46	183.59	753.55	184.28
754.02	184.37	755.64	184.46	757.77	184.35	759.81	184	761.89	183.39
763.98	183.03	765.27	183.33	766.06	183.57	767.05	184.05	768.15	184.37
769.03	185.09	770.24	185.75	772.32	186.23	774.41	187.24	776.49	187.75
778.58	188	780.66	187.82	781.14	187.82	782.75	187.65	784.84	187.58
789.01	187.06	790.53	186.96	793.18	186.88	795.23	187.18	797.35	187.54
799.93	187.74	802.8	188.18	804.62	188.5	806.55	189.03	807.78	189.64
809.32	189.98	810.3	190.15	811.95	190.33	814.01	190.48	816.12	190.88
818.21	191.09	820.29	191.35	822.38	191.46	824.47	191.63	826.55	192.01
830.72	192.54	832.8	193.08	834.9	193.23	836.98	193.44	839.07	193.73
841.15	193.79	843.24	193.92	845.32	194.12	847.41	194.56	849.5	194.63
851.58	194.76	853.67	194.92	855.75	195.15	857.84	195.21	859.92	195.3
862.84	195.56	864.1	195.6	866.18	195.75	868.27	196	870.37	196.17
872.44	196.48	874.53	196.96	876.61	197.07	878.7	197.09	880.78	197.07
882.87	197.11	884.95	197.2	889.13	197.48	891.21	197.58	893.3	197.72
895.38	198.18	896.61	198.41	897.47	198.45	900.36	198.44	903.24	198.54
904.11	198.6	905.81	198.82	907.9	198.93	911.62	199.31	914.16	199.71
916.24	200.1	919.12	200.76	920.41	201.14	922.5	201.99	922.88	202.07
924.58	202.62	926.63	203.72	928.76	205.1	930.84	206.36	932.93	207.08
934.13	207.71	935.01	208.28	936.11	208.9	937.1	209.52	939.18	210.24
940.81	210.49	943.36	211.1	945.39	211.19	947.53	211.34	949.14	211.23
949.61	211.16	951.7	210.47	952.35	210.37				

Manning's n Values		num= 4					
Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
0	.013	361.04	.08	432.73	.035	465.78	.08
Bank Sta:	Left	Right	Lengths:	Left	Channel	Right	Coeff Contr.
	432.73	465.78		324.06	285.46	241.07	.1
							Expan.
							.3

CROSS SECTION

RIVER: Whitemarsh Run
 REACH: 1 RS: 17.52

INPUT									
Description:									
Station Elevation Data		num= 492							
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	207.74	3.58	207.97	7.64	207.97	9.05	208.05	11.34	208.03
13.19	207.85	15.04	207.77	16.9	207.55	19.99	207.39	21.82	207.11
23.64	207.08	25.46	206.88	28	206.86	29.11	206.95	30.93	206.78
31.7	206.8	33.55	206.57	36.4	206.55	40.05	206.2	41.87	206.12
43.7	205.94	47.34	206.12	50.99	206.11	55.77	206.87	57.62	206.88
58.28	207.02	60.1	207.24	61.32	207.15	61.93	207.23	63.17	207.87
63.75	208	66.87	208.25	67.4	208.2	68.72	207.83	69.22	207.83
70.58	207.49	72.43	206.81	74.69	206.55	76.51	206.56	78.34	206.37
81.98	205.69	83.53	205.25	85.63	204.74	87.45	203.89	89.09	203.75
91.1	203.3	92.92	202.5	94.75	202.26	96.49	202.21	100.19	201.71
102.04	201.57	103.86	201.26	105.69	201.11	107.6	201.01	109.45	200.57
111.3	200.46	112.98	200.11	114.8	200.32	116.63	200.34	120.27	200.07
122.1	199.9	123.92	199.81	126.11	199.86	127.57	199.74	127.96	199.63
129.39	199.75	131.21	199.51	133.04	199.15	133.51	199.17	134.86	198.83
135.36	198.55	137.21	197.97	138.51	197.4	139.06	197.33	140.33	196.9
142.15	196.44	143.98	195.79	144.62	195.71	145.8	195.27	146.47	194.8
147.62	194.36	148.32	194.27	149.45	193.89	150.17	193.47	151.27	193.17
153.87	191.58	154.92	191.47	155.72	190.98	156.74	190.74	157.57	190.06
158.56	189.08	159.43	188.96	161.28	187.93	162.21	187.22	163.13	186.28
164.03	185.88	164.98	185.78	165.86	185.51	167.68	184.72	168.68	184.57
169.5	184.03	170.53	184.04	171.32	183.73	173.15	183.51	174.97	183.64
176.79	183.39	178.62	183.56	180.44	183.27	181.64	183.29	184.09	183.08
185.34	182.46	185.91	182.41	187.19	182.5	189.04	182.32	189.56	182.17

						Belair Road.rep				
191.38	182	193.2	182.11	195.03	181.97	196.85	182	198.3	181.81	
200.15	181.87	202.32	181.84	205.97	181.91	207.55	181.73	209.61	181.6	
211.44	181.56	213.26	181.84	215.08	181.54	216.91	181.41	218.66	181.66	
220.51	181.48	222.36	181.38	224.2	181.42	226.02	181.34	227.85	181.32	
229.67	181.15	231.62	181.07	235.32	181.02	236.96	180.89	240.87	180.8	
242.72	180.53	244.26	180.62	246.43	180.55	249.73	180.38	251.55	180.15	
253.83	180.04	255.2	180.11	259.38	179.8	261.23	179.77	266.14	179.45	
266.79	179.52	268.64	179.46	269.78	179.3	270.49	179.44	273.43	179.69	
274.19	179.63	275.25	179.83	277.08	179.74	278.9	179.81	280.72	179.77	
282.55	179.64	284.37	179.61	286.19	179.8	289	179.86	289.84	179.81	
290.85	179.96	292.7	180.57	294.55	180.77	295.31	180.97	297.13	182.18	
298.25	182.48	300.11	182.57	300.78	182.77	301.96	182.93	302.6	182.91	
303.81	182.69	304.42	182.79	306.25	182.65	308.07	182.22	309.89	182.29	
311.21	182.03	311.72	182.03	313.06	181.68	314.91	181.52	315.36	181.25	
317.19	180.96	317.43	180.9	320.47	180.08	320.83	180.03	322.32	179.5	
324.48	178.88	326.3	177.97	327.87	177.77	329.72	177.38	331.77	177.1	
333.6	176.19	335.42	175.48	337.13	174.94	338.98	174.26	340.83	173.77	
342.71	172.89	344.53	172.14	346.36	171.51	348.18	170.95	350.08	170.21	
351.83	169.91	353.79	169.23	355.48	169.02	357.3	168.44	359.34	167.61	
360.95	167.19	362.77	166.88	364.59	166.42	366.42	166.16	368.24	165.34	
370.06	165.06	371.89	164.65	373.71	164.51	374.15	164.33	376	163.85	
377.36	163.34	381.55	162.33	382.83	161.88	383.4	161.87	385.25	161.26	
386.47	161.26	390.81	160.17	393.77	159.38	395.59	159.52	398.21	158.86	
402.88	157.85	404.71	157.52	405.62	157.45	407.47	157.03	410.18	156.7	
412	156.82	413.82	156.19	414.87	155.91	416.72	155.65	417.47	155.39	
419.29	154.99	422.94	153.98	424.76	153.64	426.58	153.69	428.41	153.57	
430.23	153.21	432.05	153.46	433.38	153.33	435.7	153.29	437.08	153.56	
441.17	153.65	442.99	153.62	444.82	153.29	446.64	152.73	448.46	151.56	
450.29	150.91	452.11	149.64	453.93	149.72	472.17	149.19	474.1	149.16	
475.81	149.03	477.64	149.93	479.46	150.7	481.28	150.95	483.36	150.7	
484.93	150.96	486.75	150.68	487.06	150.72	488.58	150.58	490.76	150.98	
492.22	150.76	494.05	151.16	496.32	151.54	497.69	151.96	500.02	152.13	
501.87	152.02	503.16	152.1	503.72	152.25	504.99	152.8	506.81	152.97	
507.57	153.1	508.65	153.44	509.64	153.64	511.71	153.64	513.78	153.59	
514.15	153.65	515.99	153.62	517.92	153.41	521.49	152.87	524.13	152.86	
525.16	152.94	527	152.8	528.27	152.83	530.67	153.07	532.41	152.96	
536.55	153.32	538.01	153.58	539.84	153.53	541.67	153.56	545.34	153.73	
550.85	154.05	552.68	154.09	555.18	153.95	556.35	153.99	560.02	153.81	
563.69	153.48	565.53	153.5	567.36	153.91	569.2	154.01	572.87	154.97	
573.81	155.4	576.54	156.13	577.95	156.25	578.37	156.38	580.02	156.62	
583.88	156.99	585.71	157.46	587.55	157.56	589.38	157.89	590.37	157.88	
591.21	157.69	593.05	157.84	594.88	157.84	596.59	157.74	598.66	158.06	
600.73	158.3	602.8	159.08	604.87	159.41	605.89	159.77	606.94	160.29	
609.56	160.71	611.4	161.58	613.23	161.57	615.07	162.62	616.9	162.88	
617.43	162.99	618.75	163.27	624.12	164.9	626.88	165.69	628.11	165.82	
629.98	166.52	631.75	166.97	633.72	167.2	635.59	167.9	636.63	168.04	
637.46	168.26	639.34	168.56	641.21	168.74	643.95	169.48	646.39	170.29	
648.83	170.63	650.57	170.95	652.44	170.99	653.7	171.19	658.58	171.82	
659.93	172.03	661.8	172.52	663.46	172.66	665.9	173.1	671.16	173.67	
672.41	173.77	674.9	174.12	675.65	174.13	676.77	174.5	678.64	174.78	
680.53	175.14	682.97	175.11	688	175.34	690.29	175.74	692.73	175.88	
693.62	176.08	695.49	176.18	697.36	176.47	699.23	176.44	701.1	176.77	
702.98	176.84	704.92	177.2	707.36	177.15	709.8	177.5	712.24	177.74	
714.21	177.77	717.95	178.28	719.55	178.26	721.99	178.46	724.43	178.53	
729.18	179.03	731.75	179.2	732.92	179.23	734.79	179.17	736.63	179.43	
738.54	179.49	741.5	179.76	743.94	180.11	748.82	180.32	751.26	180.28	
753.51	180.49	755.38	180.44	757.26	180.5	758.58	180.64	760.94	180.81	
762.87	180.8	764.74	181.01	768.33	181.06	770.77	181.19	772.23	181.21	
774.1	181.32	778.09	181.67	781.59	182.09	785.33	182.33	787.84	182.32	
789.07	182.52	790.28	182.59	793.14	182.58	795.16	182.65	796.56	182.78	
798.43	182.88	801.19	183.09	805.92	183.57	807.79	183.64	809.66	183.64	
811.54	183.79	813.41	184.05	814.67	184.14	815.28	184.29	817.28	184.32	
820.89	184.59	824.64	184.73	826.51	184.72	829.31	185.02	832.12	185.4	
834.18	185.95	835.87	186.31	837.74	186.82	839.61	187.53	843.35	188.38	
845.23	188.62	847.1	188.61	848.82	188.08	852.71	186.09	853.69	185.39	
854.59	184.88	856.46	183.96	858.33	184.07	860.2	185.1	861.01	185.49	
862.07	186.17	863.94	187.18	865.89	187.49	867.69	187.69	869.56	187.84	
871.43	188.17	873.3	188.13	875.17	188.46	877.05	188.52	878.92	188.86	
880.79	188.98	882.66	189.17	884.53	189.2	888.28	189.65	890.28	189.7	

Belair Road.rep									
892.72	189.88	893.89	190.08	895.76	190.09	897.6	190.41	900.03	190.68
901.38	190.75	903.25	191.08	905.12	191.14	906.99	191.31	908.87	191.38
909.79	191.49	912.61	191.6	914.67	191.62	917.11	191.82	918.22	191.82
920.1	192.04	921.91	192.14	924.42	192.65	925.71	192.99	927.58	193.34
931.33	194.25	935.07	194.92	936.62	195.44	939.06	195.93	940.68	196.13
941.5	196.41	942.56	196.91	944.43	197.04	948.17	197.97	950.04	198.48
951.92	199.65	953.36	200.25						

Manning's n Values			num= 4						
Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
0	.013	304.42	.08	448.46	.035	481.28	.08		
Bank Sta:	Left	Right	Lengths:	Left	Channel	Right	Coeff	Contr.	Expan.
	448.46	481.28		503.81	443.88	439.17		.1	.3

CROSS SECTION

RIVER: Whitemarsh Run
 REACH: 1 RS: 17.41

INPUT

Description:

Station Elevation Data			num= 397						
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	171.91	1.56	172.43	3.57	173.02	5.17	173.46	5.58	173.59
7	174.13	7.59	174.15	8.83	174.24	36.28	166.47	38.12	166.26
39.95	166.26	41.75	166.01	43.61	166.2	45.44	166.12	47.27	165.98
47.78	166.05	49.1	166.06	51.8	165.94	52.76	165.93	53.81	165.71
54.59	165.62	55.82	165.77	56.42	165.77	57.83	165.57	59.84	165.51
60.08	165.48	61.91	165.7	63.74	165.42	65.57	165.51	67.4	165.45
67.87	165.46	69.23	165.59	69.88	165.59	71.06	165.47	71.89	165.46
73.9	165.4	75.91	165.39	78.38	165.27	81.94	165.17	83.87	165.32
85.7	165.27	87.53	165.11	89.36	165.23	91.19	165.28	93.02	165.12
94.85	165.08	96.01	164.91	96.69	164.91	98.02	165.22	98.52	165.25
100.03	165.19	102.18	165.41	103.59	165.65	105.84	166.01	107.67	166.03
108.07	166.07	109.5	166.12	110.08	166.12	111.33	166.02	113.16	166.09
114.1	166.21	114.99	166.21	116.1	166.08	116.82	166.07	118.65	166.16
120.12	166.43	120.48	166.43	122.13	166.29	122.31	166.3	124.11	166.58
125.97	166.28	128.16	166.36	129.63	166.35	160.75	166.91	162.33	166.92
162.58	166.9	164.41	167.14	166.24	166.58	168.07	166.29	168.35	166.33
169.9	166.35	170.36	166.25	171.73	166.26	173.56	166.05	175.39	165.88
177.22	165.96	178.4	165.74	179.05	165.55	180.41	165.24	182.71	164.86
184.43	164.78	186.37	164.58	188.2	164.37	188.45	164.32	190.46	164.23
191.86	164.13	193.69	164.08	194.48	164.01	195.52	163.98	197.35	163.97
199.18	164.04	200.51	163.94	201.01	163.85	202.84	164	204.67	164.07
206.54	163.9	208.33	163.7	210.17	163.78	210.56	163.75	212	163.73
212.57	163.77	213.83	163.78	214.58	163.75	216.59	163.74	217.49	163.81
218.6	163.83	219.32	163.8	222.61	163.97	222.98	163.93	224.62	163.85
224.81	163.86	226.63	163.81	228.64	163.86	230.3	163.86	232.66	163.88
233.96	163.98	235.79	163.93	237.62	163.92	238.69	163.97	240.7	164.12
241.28	164.19	242.71	164.21	243.11	164.25	244.72	164.23	244.94	164.2
247.2	164.21	248.6	164.25	250.43	164.65	250.75	164.64	252.26	164.77
254.09	164.76	254.77	164.9	255.92	165.19	256.78	165.34	257.75	165.41
258.79	165.61	259.58	165.8	261.41	165.96	265.07	166.18	294.36	160.06
296.19	159.92	298.02	159.82	299.85	159.77	300.99	159.77	303.51	159.72
305.34	159.75	307.02	159.61	307.17	159.58	309	159.53	310.83	159.42
311.04	159.39	313.05	159.32	314.49	159.19	316.32	159.1	317.07	159.01
317.9	158.95	319.08	158.86	319.98	158.84	321.09	158.88	321.81	158.86
323.65	158.87	325.11	158.65	325.48	158.65	327.11	158.81	327.31	158.81
329.26	158.59	331.13	158.58	332.8	158.83	333.14	158.83	334.63	158.73
335.15	158.59	336.46	158.33	337.16	158.26	338.29	158.06	339.17	158.17
340.12	158.25	341.95	158.61	343.19	158.91	343.78	159.08	345.2	159.36
345.61	159.4	347.44	159.93	349.22	160.35	351.1	160.57	354.76	160.89
359.27	161.09	360.25	161.16	362.08	161.16	363.29	161.11	363.91	161.13
365.3	161.09	367.57	161.18	369.32	161.34	373.06	161.44	374.89	161.26
376.72	161.15	377.36	161.18	380.38	161.19	381.37	161.13	381.63	161.14
382.26	161.18	382.85	161.11	384.23	160.73	385.65	160.44	387.05	160.26
388.17	160.2	388.44	160.13	389.13	160.1	389.84	159.99	390.13	160.01

Belair Road.rep									
391.24	159.63	392.1	159.21	392.64	159.04	394.07	158.33	395.44	157.93
396.04	157.72	396.84	157.21	398.24	156.61	399.63	155.69	399.98	155.64
401.03	155.33	401.95	155.03	402.43	154.91	403.91	154.27	405.23	154.03
405.88	153.86	406.63	153.77	409.43	153.11	410.82	152.42	411.79	152.11
412.22	151.9	413.76	151.53	415.02	151.19	415.73	150.85	416.42	150.72
417.69	150.64	418.12	150.49	419.22	150.18	419.45	150.11	422.68	150.12
425.04	150.12	444.17	150.35	444.5	150	444.76	149.77	445.65	149
445.89	148.73	446.5	148	447.09	147.39	447.19	147.32	447.62	147
448.53	146.22	448.74	146	448.88	145.86	456.1	145.83	458.66	145.36
460.2	145.33	467.9	145.57	480.73	145.97	480.8	146	483.32	146.73
483.97	147	484.63	147.14	486.8	147.6	489.34	148	491.23	148.27
496.3	149	498.1	149.46	500.3	150	501.95	150.78	502.46	151
504.29	151.73	504.88	152	506.63	152.77	507.19	153	509.07	153.8
509.54	154	511.55	154.88	511.84	155	512.21	155.16	514.18	156
514.43	156.1	516.61	157	517.42	157.35	519.07	157.95	519.23	158
519.33	158.04	521.97	159	522.62	159.24	525.22	159.92	525.44	159.99
525.55	160	525.84	160.03	531.22	160.49	537.01	161	544.83	161.71
546.42	161.84	548.28	162	554.16	162.51	555.91	162.5	557.85	162.46
560.16	162.43	560.89	162.44	561.5	162.43	566.51	163	570.5	163.46
571.75	163.65	574.59	164	577.71	164.38	580.77	164.71	582.36	164.86
582.88	164.91	584.16	165	585.28	165.04	585.33	165.05	585.57	165.07
593.28	165.71	596.01	165.91	596.65	166	598.51	166.29	603.56	167
605.16	167.18	612.9	168	614.36	168.16	622.62	169	623.75	169.11
632.06	169.78	636.08	169.94	636.64	169.96	636.95	169.97	637.03	170
637.09	170.04	637.33	170.08	637.83	170.14	642.39	171	647.22	171.97
647.37	172	647.62	172.05	652.8	173	653.73	173.17	658.35	174
660.89	174.48	663.7	175	667.6	175.73	669.07	175.96	669.35	176
673.28	176.62	673.63	176.72	674.13	176.93	674.3	177	675.23	177.37
676.91	178	677.97	178.45	679.26	179	680.22	179.38	681.79	180
683.09	180.56	684.13	181	685.55	181.58	686.53	182	688.01	182.57
689.1	183	690.24	183.48	691.52	184	692.63	184.38	693.95	185
696.05	185.81	696.43	186	696.63	186.07	697.16	186.26	698.8	187
700.71	187.81	701.14	188	702.11	188.38	702.54	188.56	703.49	189
703.93	189.19	705.66	190	706.11	190.2	707.85	191	708.3	191.19
710.06	192	710.59	192.23	712.28	193	712.86	193.29	714.42	194
715.77	194.61	716.46	194.91						

Manning's n	Values	num=	4
Sta	n Val	Sta	n Val
0	.013	380.38	.08

Bank Sta:	Left	Right	Lengths:	Left	Channel	Right	Coeff	Contr.	Expan.
	444.17	501.95		78.82	87.09	85.54		.1	.3
Blocked Obstructions	num= 3								
Sta L	Sta R	Elev	Sta L	Sta R	Elev	Sta L	Sta R	Elev	
0	39.95	174	124.11	166.24	174	258.79	299.85	174	

CROSS SECTION

RIVER: Whitemarsh Run
 REACH: 1 RS: 17.39

INPUT

Description:

Station Elevation Data		num= 358							
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	167.43	1.24	167.51	2.68	167.45	4.21	167.52	5.57	167.44
6.13	167.36	7.01	167.34	8.05	167.21	8.45	167.2	9.9	167.29
11.34	167.04	11.89	167.06	12.78	167.02	13.81	166.86	14.23	166.86
15.73	166.69	17.11	166.78	17.65	166.83	18.56	166.81	20	166.93
21.49	167.04	22.89	166.9	23.41	166.9	24.33	166.93	25.77	166.8
27.22	166.69	28.66	166.5	29.17	166.45	31.55	166.44	32.92	166.3
34.43	166.13	34.93	166.05	35.87	165.8	37.32	165.59	38.73	165.3
40.69	165.31	41.65	165.29	43.09	165.32	44.54	165.11	45.98	165.44
46.45	165.49	47.42	165.27	48.86	165.37	50.35	165.15	51.75	165.03
53.19	164.96	54.13	164.97	54.64	165.02	56.05	164.98	57.52	164.99
57.97	164.95	58.97	165.02	59.89	164.97	60.41	164.91	61.81	164.98
63.29	164.91	63.73	164.95	64.74	164.87	65.65	164.83	66.18	164.85

Belair Road.rep									
67.57	164.64	67.78	164.65	69.07	164.81	70.41	164.84	70.55	164.85
71.36	164.81	72.48	164.78	74.42	164.8	75.02	164.76	76.35	164.72
78.67	164.71	80.22	164.77	82.32	165.1	84.09	165.41	85.97	165.36
87.8	165.28	89.62	165.42	89.9	165.42	91.84	165.52	93.28	165.63
95.1	165.69	96.93	165.83	97.64	165.87	98.75	165.84	100.58	165.99
101.51	166.08	102.41	166.09	103.45	166	104.23	166.2	105.39	166.99
106.06	167.2	107.32	167.37	107.88	167.56	109.26	167.4	109.71	167.33
117.25	165.99	118.84	163.07	129.8	160.07	131.62	159.99	132.48	159.99
133.45	160.01	135.27	160	136.35	160.01	137.1	160.05	138.29	160.03
138.93	160.09	140.23	159.98	142.16	159.55	142.58	159.42	144.1	159.49
144.4	159.49	146.03	159.17	146.23	159.14	147.97	159.09	149.9	159.18
151.84	159.09	153.53	159.27	155.36	159.61	157.19	159.57	157.65	159.59
159.01	159.57	159.58	159.55	160.84	159.66	162.66	159.41	163.45	159.46
165.39	159.36	166.32	159.37	167.32	159.17	168.14	159.07	169.26	158.78
169.97	158.58	171.19	158.33	171.79	158.13	173.62	158.29	175.07	158.52
175.45	158.57	177	158.71	177.27	158.75	179.1	159.15	180.87	159.32
181.77	159.43	182.75	159.57	184.58	159.85	184.74	159.86	186.4	160.13
186.68	160.11	188.23	160.12	188.61	160.16	190.05	160.45	190.55	160.53
192.49	160.56	193.71	160.63	195.53	160.65	196.36	160.81	197.36	160.86
198.29	160.96	199.18	161.13	201.01	161.19	202.16	161.4	202.84	161.41
204.1	161.27	204.66	161.25	206.03	161.11	207.97	161.3	208.31	161.29
209.91	161.42	211.97	161.38	213.78	161.21	215.71	161.1	217.44	161.11
219.58	160.94	221.1	160.88	221.52	160.85	222.92	160.8	223.45	160.77
224.75	160.78	225.39	160.72	226.57	160.68	227.33	160.72	228.4	160.68
229.26	160.68	230.23	160.73	231.2	160.81	233.13	160.92	233.88	161.1
235.07	160.8	235.7	160.54	237	160.29	237.53	160.12	238.94	159.88
239.36	159.84	240.87	159.39	241.18	159.31	242.81	159.19	244.75	158.87
244.83	158.84	246.66	158.47	248.49	157.93	248.62	157.91	250.31	156.92
250.55	156.83	252.14	156.48	252.49	156.31	254.42	155.53	255.79	154.9
256.36	154.73	258.29	154.11	259.44	153.61	260.23	153.21	261.27	152.81
262.17	152.59	263.09	152.29	264.1	152	264.92	151.68	266.04	151.21
266.75	151.11	267.97	150.72	268.57	150.62	269.91	150.35	270.4	150.27
272.22	149.55	273.78	149.35	274.05	149.3	274.91	149.22	300.58	149
301.16	149	301.88	149	302.48	148.98	303.95	148.98	304.94	148.97
306.31	149	309.18	149.07	317.92	149.07	323.74	149.11	332.48	149.05
333.13	149.04	333.19	149	333.27	149	333.38	148.86	333.54	148.67
334.26	148	334.94	147.02	335.17	146.8	335.87	146.22	336.11	146
336.42	145.74	337.29	145	337.73	144.63	339.07	144.67	340.04	144.7
344.35	144.57	347.49	144.63	349.99	144.66	357.35	144.53	358.65	144.55
364.86	144.67	368.68	145	369.09	145.24	370.43	146	370.93	146.28
372.23	147	373.39	147.72	373.89	148	374.45	148.31	375.84	149
377.18	149.77	377.62	150	378.06	150.23	379.49	151	379.85	151.2
381.3	152	381.63	152.2	383	153	383.39	153.22	384.82	154
385.18	154.21	386.52	155	387.89	155.68	388.22	155.84	388.51	156
389.1	156.28	390.43	157	390.85	157.2	391.12	157.33	391.64	158
393	158.61	395.97	159	398.84	159.36	404.31	160	405.36	160.14
409.58	160.67	412.41	161	415.56	161.39	420.63	162	424.37	162.47
424.94	162.51	426.96	162.76	433.92	163	436.49	163.09	437.82	163.17
445.85	163.7	446.63	163.81	447.93	164	451.34	164.46	455.15	165
459.19	165.55	462.57	166	465.42	166.39	469.67	166.98	469.9	167
474.68	167.67	478.02	168	479.28	168.12	485.65	168.73	488.49	169
490.82	169.21	493.67	169.49	498.42	170	499.31	170.19	505.49	170.73
506.31	171	506.57	171.07	509.85	171.98	509.9	172	513.22	173
513.86	173.17	515.75	173.73	517.32	174	518.39	174.22	522.29	175
525.76	175.66	526.5	176	526.78	176.12	528.91	177	529.82	177.39
531.23	178	532.66	178.61	533.53	179	534.38	179.36	535.9	180
537.35	180.62	538.21	181	539.69	181.63	540.53	182	541.59	182.46
542.91	183	544.11	183.52	545.21	184	546.58	184.6	547.48	185
548.45	185.42	549.86	186	551.18	186.58	552.13	187	553.13	187.43
554.49	188	555.69	188.47	556.65	188.91				

Manning's n Values									
Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
0	.013	107.88	.08	333.54	.035	375.84	.08	505.49	.03
Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.									
333.54	375.84		37.31	60.85	73.16		.1		.3
Ineffective Flow									
Sta L	Sta R	Elev	Permanent						

479.28 556.65 175 T
 Blocked Obstructions num= 1
 Sta L Sta R Elev
 93.28 142.16 172

CROSS SECTION

RIVER: Whitemarsh Run
 REACH: 1 RS: 17.37

INPUT

Description:

Station	Elevation	Data	num=	356						
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	
0	166.98	.41	166.94	1.17	166.93	2.43	166.88	3	166.81	
4.44	166.77	4.83	166.78	6.46	166.9	6.66	166.89	8.47	166.31	
8.69	166.32	10.49	166.46	12.15	166.32	12.5	166.25	13.98	166.07	
14.51	165.96	15.81	165.65	16.53	165.73	17.64	165.82	18.54	165.7	
19.47	165.59	20.56	165.5	21.31	165.51	22.57	165.67	23.14	165.69	
24.59	165.57	24.97	165.53	26.6	165.5	26.8	165.51	28.62	165.43	
30.46	165.45	30.63	165.46	32.64	165.51	34.12	165.57	34.66	165.54	
35.95	165.59	36.67	165.59	37.78	165.48	38.69	165.56	39.61	165.62	
40.7	165.74	41.44	165.72	42.72	165.71	43.27	165.7	44.73	165.57	
45.1	165.53	46.75	165.46	46.93	165.47	48.76	165.36	50.6	165.37	
52.43	165.3	54.26	165.24	54.8	165.29	56.09	165.33	56.82	165.36	
57.92	165.53	58.83	165.54	59.75	165.61	60.85	165.6	61.58	165.58	
62.86	165.62	63.41	165.62	64.88	165.71	65.24	165.77	66.89	166.17	
67.07	166.18	68.87	166.35	70.73	167.06	100.02	160.05	101.85	160.08	
103.15	160.22	103.68	160.24	105.17	159.73	105.52	159.63	107.18	159.52	
108.99	159.56	109.19	159.56	111.01	159.47	112.84	159.46	113.22	159.5	
114.67	159.52	115.24	159.46	116.5	159.55	118.33	159.45	119.27	159.46	
120.16	159.45	121.28	159.48	121.99	159.51	123.3	159.54	123.82	159.53	
125.31	159.4	125.65	159.36	127.48	159.35	129.06	159.24	129.31	159.21	
131.14	159.08	132.97	159.17	133.37	159.12	134.81	158.98	136.64	158.85	
137.4	158.85	138.47	158.79	139.41	158.81	140.3	158.81	141.43	158.67	
142.13	158.64	143.44	158.62	143.96	158.6	145.46	158.7	145.79	158.68	
147.47	159.07	147.62	159.14	149.48	159.19	151.28	159.17	151.5	159.16	
153.11	159.3	153.51	159.36	154.94	159.42	155.53	159.4	156.77	159.42	
157.54	159.47	158.6	159.63	160.43	159.71	161.57	159.86	162.27	159.91	
163.59	159.99	164.1	160.01	165.6	160.03	165.93	160.05	167.61	160.11	
167.76	160.11	169.18	160.23	169.59	160.27	171.42	160.69	171.64	160.7	
173.25	160.47	173.66	160.45	175.08	160.42	175.67	160.46	176.91	160.45	
177.69	160.46	179.7	160.56	180.57	160.63	181.72	160.63	182.4	160.6	
183.73	160.58	184.23	160.6	185.75	160.58	186.06	160.56	187.76	160.62	
187.89	160.62	189.73	160.78	189.77	160.77	191.56	160.65	191.79	160.66	
193.39	160.66	193.8	160.71	195.22	160.78	195.82	160.68	197.83	160.57	
198.88	160.5	199.85	160.46	200.71	160.37	202.54	160.34	203.88	160.15	
204.37	160.12	205.89	160.21	206.2	160.22	207.9	159.91	208.03	159.9	
209.92	160	211.69	159.9	211.93	159.91	213.52	159.89	213.95	159.82	
215.35	159.64	215.96	159.71	217.19	159.91	217.98	159.92	219.02	159.91	
220.85	159.55	222.01	159.55	222.68	159.5	224.02	159.38	224.51	159.38	
226.03	159.26	226.34	159.21	228.05	158.78	228.17	158.76	229.36	158.64	
230	158.59	231.83	158.34	232.08	158.27	233.66	158.04	235.49	157.74	
236.11	157.68	237.32	157.37	238.12	157.08	239.15	156.85	240.14	156.9	
240.98	156.55	242.15	155.74	242.81	155.53	244.16	155.06	244.64	155.03	
246.18	153.23	246.48	153.03	248.19	152.12	248.31	152.01	249.42	151.54	
250.21	151.23	252.22	150.57	253.8	150.2	254.24	150.12	255.63	149.7	
256.25	149.63	257.46	149.55	258.27	149.37	259.29	149.07	260.28	149.11	
261.12	149.19	262.3	149.13	262.95	149.08	263.84	148.66	267.67	148.72	
275.87	148.86	280.87	149	284.72	149.11	295.12	149.41	307.41	149.2	
315.48	149.07	318.64	149.01	318.9	149	318.92	149	319.04	149	
332.24	148.06	332.47	148	333.39	147.77	334.84	147	335	146.93	
336.2	146	339.82	145.42	342.52	145	350.79	144.19	351.92	144	
352.58	143.78	353.15	143.77	356.38	143.52	358.85	143.35	361.94	143.13	
362.84	143.05	363.47	143.02	364.06	143.02	364.71	143.17	364.78	143.27	
365.12	144	365.61	144.41	366.45	145	366.91	145.39	367.61	146	
368.11	146.42	368.79	147	369.57	147.62	370.08	148	370.55	148.44	
371.16	149	371.76	149.47	372.44	150	373	150.49	373.54	151	

Belair Road.rep									
374.21	151.55	374.72	152	375.49	152.65	375.99	153	376.83	153.7
377.19	154	378.21	154.83	378.37	155	378.91	155.42	379.97	156
380.15	156.1	381.46	156.91	381.72	157	383.09	157.78	383.46	158
384.71	158.79	385.03	159	385.18	159.07	385.41	159.18	393.22	159.86
394.97	160	398.8	160.32	401.61	161.7	402.02	161.9	404.18	162.96
405.58	162.99	406.19	163	406.85	162.78	410.71	161.5	415.25	161.5
417.03	161.5	419.28	162.14	422.29	163	430.47	165.77	433.97	166.96
435.57	166.99	436.31	167	441.46	165.53	441.56	165.5	441.62	165.5
449.29	165.5	455.26	165.5	456.33	165.5	459.29	165.5	462.95	165.5
467.57	165.5	472.34	165.5	475.85	165.5	478.76	166.4	480.69	167
484.42	168.73	485.86	169.4	488.68	169.57	489.96	169.91	490.65	170
491.85	170.14	499.01	171	500.76	171.21	507.23	172	509.53	172.29
515.43	173	518.74	173.82	520.92	174	523.03	174.86	523.77	175
524.95	175.22	526.67	176	527.64	176.41	529.17	177	530.81	177.81
531.28	178	531.59	178.16	533.51	179	533.74	179.1	535.91	180
536.76	180.41	538.24	181	540.05	181.76	540.63	182	541.21	182.25
542.25	182.71	542.84	183	545.18	183.94	545.33	184	545.74	184.16
546.15	184.38								

Manning's n Values									
Sta	n Val	Sta	num=	n Val	Sta	n Val	Sta	n Val	Sta
0	.013	70.73	.08	333.39	.035	370.08	.08	394.97	.03

Bank Sta:	Left	Right	Lengths:	Left	Channel	Right	Coeff	Contr.	Expan.
	333.39	370.08		49.75	65.61	71.57		.1	.3
Ineffective Flow	num=		2						
Sta L	Sta R	Elev	Permanent						
406.19	422.29	162.78	T						
427.42	546.15	175	T						
Blocked Obstructions	num=		1						
Sta L	Sta R	Elev							
65.73	103.68	172							

CROSS SECTION

RIVER: Whitemarsh Run
 REACH: 1 RS: 17.35

INPUT

Description:

Station Elevation Data									
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	166.1	.92	165.95	2.07	166.09	2.77	166.13	4.32	166.05
4.62	166.05	6.58	166	8.33	165.99	8.83	166.01	10.18	165.94
12.03	166	13.34	166.01	13.88	166.04	15.59	166.09	16.41	165.99
17.59	165.81	17.84	165.83	19.44	165.92	20.09	165.85	21.29	165.91
22.35	165.95	23.14	165.9	24.6	165.91	24.99	165.9	26.81	165.76
28.7	165.76	29.11	165.74	30.55	165.77	32.4	165.69	33.61	165.71
34.25	165.67	35.86	165.68	36.1	165.69	37.96	165.94	38.12	165.93
39.81	166.05	40.37	166.05	41.66	166.02	42.62	166.03	43.51	166.01
44.88	166.07	45.36	166.08	47.13	165.99	47.61	165.96	49.07	165.84
49.38	165.84	50.92	165.79	51.63	165.72	52.77	165.63	53.89	165.63
54.62	165.58	56.14	165.53	56.47	165.49	58.01	165.56	60.18	165.58
60.65	165.6	62.03	165.46	62.9	165.64	63.88	166	65.15	166.02
67.4	165.93	67.58	165.94	68.41	165.89	69.44	165.87	71.29	166.15
71.91	166.15	73.14	166.29	74.16	166.86	74.99	167.14	76.42	167.07
76.84	167.08	78.67	167.47	80.55	167.44	80.92	167.3	82.4	166.71
83.17	166.49	84.25	166.13	86.1	166.01	87.68	165.83	89.21	165.77
89.81	165.74	89.93	165.71	91.66	165.46	92.19	165.47	94.44	165.31
95.36	165.19	96.69	165.09	97.21	165.07	98.94	165.19	99.06	165.18
99.61	164.96	100.92	164.36	101.2	164.24	102.77	163.66	103.45	163.52
104.62	163.54	105.7	162.79	106.47	161.97	107.96	161.68	108.32	161.57
110.02	161.09	110.17	161.04	112.03	160.2	112.46	160.17	113.88	160.29
114.71	160.31	115.73	160.06	116.97	159.86	117.58	159.85	119.22	159.91
119.43	159.9	121.28	160.12	121.47	160.15	123.14	159.9	123.73	159.88
124.99	159.95	125.98	160.1	126.84	160.21	128.23	160.28	128.69	160.26
130.48	160.57	130.82	160.55	132.4	160.26	132.74	160.24	134.25	160.42
134.99	160.44	136.1	160.18	137.24	160.14	137.95	160.08	139.5	160.11

Belair Road.rep									
141.75	160.03	143.51	160.1	144	160.08	146.25	160.33	147.21	160.28
148.51	160.35	149.06	160.33	151.62	160.51	152.76	160.55	153.01	160.54
154.62	160.4	155.27	160.44	156.47	160.65	157.52	160.64	158.32	160.6
159.77	160.66	162.02	160.64	163.88	160.66	164.28	160.65	165.73	160.69
166.53	160.65	167.58	160.63	169.43	160.52	171.04	160.73	171.28	160.73
172.42	160.64	173.29	160.56	174.99	160.64	176.84	160.83	177.79	160.79
178.69	160.78	180.05	160.72	180.54	160.67	182.39	160.77	184.24	160.56
186.1	160.45	186.81	160.45	187.95	160.56	189.06	160.5	189.8	160.44
191.31	160.36	191.65	160.33	193.22	160.58	193.56	160.61	195.35	160.32
195.82	160.32	198.07	160.21	199.06	160.17	200.91	160.07	202.76	159.94
203.62	159.94	204.83	159.91	206.47	159.76	207.08	159.77	208.32	159.7
209.33	159.66	210.17	159.65	211.59	159.58	212.02	159.55	213.84	159.4
215.72	159.63	217.58	159.41	218.35	159.27	219.43	159.11	220.6	159.18
221.28	159.17	223.13	159.09	224.42	159.01	225.1	158.94	226.83	158.52
227.36	158.54	228.69	158.71	229.61	158.58	230.54	158.7	231.86	158.08
232.39	157.78	234.12	156.7	234.24	156.65	234.82	156.5	236.09	156.15
236.37	155.97	237.94	154.64	238.62	154.2	239.8	153.52	240.87	153.2
241.65	152.71	243.13	152.03	243.5	151.89	245.35	151.06	247.2	150.11
247.63	149.98	249.06	149.76	249.89	149.56	250.91	149.2	252.14	149.24
254.61	149.15	255.62	149.13	256.46	149.09	256.64	149.06	258.31	148.68
258.9	148.66	260.08	148.83	261.79	148.77	264.45	148.66	279.62	148
281.51	147.92	283.31	147.98	284.76	147.91	285.36	147.94	286.49	147.98
287.71	148	288.32	148.02	289.46	148.03	294.97	148.34	314.29	149
319.97	149.02	320.2	149.03	320.99	149.03	321.05	149	322.21	148.14
322.41	148	322.73	147.77	324.02	147	324.57	146.65	325.85	146
326.85	145.33	327.38	145	328.81	144.03	328.9	144	329.08	143.97
333.21	143	335.45	142.99	335.86	142.99	336.4	142.99	339.7	142.97
339.91	142.97	343.28	142.84	343.56	142.87	346.08	142.8	346.15	142.8
348.17	142.85	351.88	143	352.53	143.52	353.12	144	353.4	144.21
354.43	145	355.39	145.74	355.72	146	356.72	146.76	357.02	147
357.38	147.26	358.41	148	359.39	148.81	359.61	149	359.9	149.21
360.98	150	361.46	150.34	362.26	151	362.81	151.44	363.73	152
364.33	152.52	365.04	153	366.27	153.91	366.38	154	366.62	154.21
367.85	155	368.04	155.12	369.37	156	369.73	156.22	370.67	157
372.51	157.32	374.09	157.98	374.25	158	381.92	158.9	382.82	159
384.07	159.15	385.67	159.34	386.84	159.45	390.92	159.53	391	159.63
391.11	159.71	391.23	159.75	391.85	159.89	393.92	159.96	394.13	160.07
398.39	162.2	400.56	162.52	400.89	162.57	404.33	163.09	406.57	163.42
408.75	163.73	411.58	164.16	413.67	164.47	416.58	164.86	418.16	165.13
420.89	165.4	423.72	165.5	425.22	165.5	425.68	165.5	425.73	165.5
425.92	165.5	426.35	165.5	426.76	165.5	431.58	165.5	433.37	165.5
436.58	165.5	438.29	165.5	441.58	165.5	443.21	165.5	446.58	165.5
448.14	165.5	451.58	165.5	453.06	165.5	456.58	165.5	457.98	165.5
461.58	165.5	462.91	165.5	466.58	165.5	467.83	165.5	471.58	165.5
472.75	165.5	476.58	165.5	477.68	165.5	481.58	165.5	482.6	165.5
486.58	165.5	487.53	165.5	491.59	165.5	492.45	165.5	496.59	165.5
497.37	165.5	501.59	165.5	502.3	165.5	506.59	165.5	507.22	165.5
511.59	165.5	512.14	165.5	516.59	165.5	517.22	165.5	517.91	165.5
518.01	167.66	518.18	171.45	518.58	171.42	519.27	171.37	521.45	171.35
521.59	171.35	521.99	171.34	530.24	171.26	530.32	171.26	532.32	170.57
532.53	170.49	532.85	170.68	534.3	171.51	534.51	171.61	534.52	171.61
540.63	172	549.3	172.66	550.17	172.75	552.54	173	560.97	173.84

Manning's n Values		num= 5							
Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
0	.013	80.55	.08	320.99	.035	359.39	.08	386.84	.03
Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff	Contr.	Expan.		
320.99	359.39	56.25	69.36	74.19		.1	.3		
Ineffective Flow	num= 1								
Sta L	Sta R	Elev	Permanent						
71.29	103.45	172	T						

CROSS SECTION

RIVER: Whitemarsh Run

REACH: 1

RS: 17.33

Belair Road.rèp

INPUT

Description:

Station Elevation Data		num=		374					
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	166.03	.36	166.05	1.63	166.18	2.21	166.18	3.91	166.03
4.07	166.04	4.76	165.95	5.92	165.82	6.19	165.81	7.78	165.86
8.47	165.79	9.63	165.77	10.75	165.78	11.49	165.68	13.03	165.66
13.34	165.67	14.7	165.79	15.31	165.83	17.05	165.75	17.59	165.68
18.91	165.58	19.87	165.65	20.76	165.63	22.15	165.65	22.61	165.65
24.43	165.46	24.64	165.45	26.32	165.44	26.71	165.4	28.18	165.38
28.99	165.44	30.03	165.46	31.89	165.44	33.74	165.46	34.58	165.59
35.6	165.71	35.83	165.7	37.45	165.57	38.11	165.46	39.31	165.21
40.39	165.17	41.16	165.17	42.67	165.13	44.52	165	44.87	164.98
46.72	164.77	47.23	164.77	48.58	165.1	49.51	165.05	50.43	164.95
51.79	164.88	52.29	164.9	54.46	165.05	56	165.15	56.35	165.21
57.85	165.22	58.63	165.21	59.71	165.28	60.91	165.18	61.56	165.08
63.19	165.12	64.4	165.04	65.27	164.96	65.47	164.97	68.98	165.08
70.03	165.08	70.83	165.1	72.31	165.05	72.69	165.05	74.59	164.99
76.87	164.83	78.25	164.72	80.11	164.67	81.43	164.69	81.96	164.68
83.71	164.74	83.81	164.73	85.67	164.65	85.99	164.63	88.27	164.39
89.38	164.36	91.23	164.14	92.83	164.05	93.09	164.01	94.94	163.89
95.11	163.86	96.8	163.7	97.39	163.62	98.65	163.48	99.67	163.51
100.5	163.46	101.94	163.44	102.36	163.41	104.17	163.3	106.07	163.21
106.5	163.23	107.92	163.22	108.78	163.1	109.78	162.98	111.06	162.87
111.63	162.85	113.49	162.89	115.34	162.67	117.2	162.53	117.9	162.53
119.05	162.46	120.18	162.44	120.9	162.51	122.46	162.48	122.76	162.46
124.05	162.49	124.74	162.49	126.47	162.32	127.02	162.31	128.32	162.21
129.3	162.33	130.18	162.37	131.58	162.2	132.03	162.18	133.86	162.13
135.74	162.16	136.14	162.14	137.6	162.15	138.42	162.1	139.45	162.02
140.7	162.09	141.3	162.11	142.98	161.85	143.16	161.84	145.01	161.81
145.26	161.8	146.87	161.82	147.54	161.8	148.72	161.69	150.58	161.6
152.1	161.58	152.43	161.57	153.87	161.63	154.29	161.63	156.14	161.4
156.66	161.42	158	161.41	158.94	161.42	159.85	161.46	161.22	161.5
161.7	161.49	163.5	161.43	165.41	161.41	167.27	161.31	168.06	161.33
169.12	161.32	170.34	161.23	170.98	161.23	172.83	161.21	174.9	161.1
177.18	160.91	178.4	160.84	179.46	160.85	180.25	160.88	181.74	160.69
182.1	160.6	183.7	160.53	186.3	160.38	187.67	160.14	188.58	160.05
189.68	159.93	190.29	159.95	191.85	160.04	193.66	159.88	194.02	159.83
196.19	159.63	197.03	159.59	198.36	159.5	200.39	159.3	202.69	159.11
203.76	159.07	204.86	159.15	206.86	159.01	207.03	158.99	209.2	158.63
211.37	157.84	212.95	157.46	213.54	157.33	213.86	157.21	215.7	156.28
217.23	155.58	217.87	155.33	219.04	154.71	220.59	154.05	222.21	153.32
223.96	151.96	225.13	151.33	226.55	150.6	228.72	149.97	230.88	149.38
231.23	149.32	233.05	148.88	234.06	149.03	235.22	149.05	237.39	148.8
239.56	148.99	240.79	149.02	241.73	149	243.05	148.66	243.2	148.67
245.09	148.59	259.49	148	265.3	147.76	265.58	147.76	266.76	147.74
268.44	147.77	268.85	147.78	269.19	147.78	283.19	147.64	284.89	147.63
287.22	147.54	291.46	147.34	296.97	147.22	297.29	147	297.61	146.8
298.8	146	299.85	145.3	300.21	145	300.32	144.94	300.93	144.59
301.78	144	303	143.21	303.15	143	304.03	142.98	305.47	142.96
312.23	142.79	312.27	142.79	312.69	142.8	317.2	142.9	319.91	142.95
321.23	143	321.36	143	322.4	143.05	323.1	143.09	323.82	143.78
324.13	144	325.26	144.92	325.37	145	325.47	145.11	326.54	145.94
326.6	146.01	327.18	146.52	327.71	147	327.92	147.16	328.78	148
329.62	148.67	329.93	149	330.06	149.12	330.98	150	331.2	150.18
332.16	151	332.77	151.49	333.26	152	333.76	152.4	334.32	153
334.7	153.34	335.45	154	335.89	154.39	336.55	155	337.13	155.48
337.75	156	338.5	156.58	338.94	156.92	340.49	157	340.61	157
340.74	157	348.64	157.05	349.05	157.05	352.16	157.12	369.38	157.48
372.56	157.58	373.04	166.47	373.56	176.02	382.2	175.7	386.06	175.69
393.81	175.65	394.91	175.67	397.06	175.9	400.4	175.93	401.13	175.27
401.89	175.28	404.81	175.32	406.85	175.35	409.88	175.37	411.17	175.39
414.96	175.42	415.5	175.43	418.66	175.46	420.04	175.48	420.61	175.49
421.95	175.5	422.06	171.13	422.21	165.5	424.11	165.5	425.1	165.5
428.48	165.5	430.18	165.5	432.81	165.5	435.25	165.5	437.14	165.5
440.33	165.5	441.46	165.5	445.4	165.5	445.79	165.5	448.05	165.5
450.12	165.5	450.47	165.5	454.44	165.5	455.55	165.5	458.77	165.5
460.62	165.5	463.1	165.5	465.69	165.5	467.42	165.5	470.77	165.5
471.75	165.5	475.84	165.5	476.08	165.5	477.44	165.5	480.41	165.5

Belair Road.rep										
480.92	165.5	484.73	165.5	485.99	165.5	489.06	165.5	491.06	165.5	
493.39	165.5	496.14	165.5	497.71	165.5	501.21	165.5	502.04	165.5	
506.29	165.5	506.37	165.5	506.84	165.5	510.69	165.5	511.36	165.5	
515.02	165.5	516.43	165.5	519.35	165.5	521.51	165.5	523.68	165.5	
526.58	165.5	528	165.5	531.66	165.5	532.33	165.5	536.23	165.5	
536.66	165.5	536.73	165.5	540.98	165.5	541.8	165.5	545.31	165.5	
546.88	165.5	549.64	165.5	551.95	165.5	553.96	165.5	557.03	165.5	
558.29	165.5	562.1	165.5	562.62	165.5	565.63	165.5	567.08	165.5	
567.41	165.5	567.61	170.51	568.09	172.24	568.72	172.2	568.9	172.2	
570.66	172.15	572.25	172.12	573.63	172.08	575.29	172.04			

Manning's n Values		num=		6							
Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
0	.013	174.9	.08	296.97	.035	327.92	.08	349.05	.03		
420.61	.03										

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	296.97	327.92		165.95	146.59		127.68	
Ineffective Flow	num=		1					
Sta L	Sta R	Elev	Permanent					
74.59	83.71	172	T					

CROSS SECTION

RIVER: Whitemarsh Run
 REACH: 1 RS: 17.29

INPUT

Description:

Station Elevation Data		num=		445							
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-238.27	170.7	-218.32	165.04	-215.43	164.9	-212.54	164.86	-209.65	164.7		
-208.32	164.53	-206.77	164.18	-205.97	164.09	-203.88	164.07	-200.99	163.98		
-198.92	163.86	-198.1	163.83	-195.21	163.87	-194.21	163.78	-191.86	163.76		
-189.44	163.62	-187.16	163.54	-186.55	163.46	-184.81	163.3	-183.66	163.46		
-182.46	163.42	-180.11	163.31	-177.89	163.07	-175.41	162.89	-173.06	162.82		
-172.11	162.75	-170.71	162.76	-169.22	162.68	-168.36	162.59	-166.01	162.43		
-163.66	162.31	-163.45	162.32	-161.31	162.18	-160.56	162.1	-156.6	162.18		
-154.78	162.26	-151.93	162.78	-149.55	163.03	-149.01	163.12	-146.12	163.01		
-144.85	163.05	-142.5	163.23	-139.3	163.33	-137.8	163.35	-137.46	163.4		
-135.45	163.46	-134.57	163.45	-130.75	163.51	-128.4	163.5	-126.05	163.58		
-123.7	163.62	-123.02	163.61	-121.34	163.74	-118.99	163.61	-117.24	163.54		
-116.64	163.46	-114.35	163.33	-111.46	163.54	-108.58	163.33	-107.5	163.36		
-106.27	163.4	-104.31	163.52	-102.59	163.46	-100.39	163.3	-98.43	163.38		
-96.1	163.28	-94.51	163.28	-92.86	163.34	-89.62	163.14	-86.38	163.2		
-84.71	163.21	-82.75	163.11	-80.79	163.18	-79.89	163.19	-78.83	163.1		
-76.65	163	-74.91	162.95	-72.95	162.99	-70.98	162.88	-70.17	162.88		
-69.02	162.82	-66.93	162.75	-65.1	162.71	-63.14	162.42	-61.18	162.39		
-59.22	162.23	-57.2	162.21	-55.3	162.08	-53.34	162.05	-52.68	162.08		
-51.44	162.15	-49.56	162.05	-48.7	162.08	-47.69	162.02	-45.81	162.12		
-43.93	162.07	-41.27	162.05	-40.18	162.1	-36.78	161.95	-34.55	161.84		
-33.84	161.87	-32.68	161.86	-30.8	161.81	-28.89	161.66	-27.05	161.72		
-25.17	161.6	-23.93	161.61	-21.45	161.67	-19.55	161.69	-18.98	161.74		
-17.67	161.77	-16.5	161.59	-15.79	161.55	-13.59	161.65	-12.04	161.62		
-11.54	161.58	-10.17	161.38	-8.29	161.32	-6.41	161.11	-4.54	161.07		
-4.11	160.99	-2.66	160.8	-1.63	160.72	-.79	160.7	.84	160.62		
2.97	160.47	4.84	160.21	5.8	160.32	6.72	160.37	8.27	160.19		
8.59	160.21	10.47	159.87	12.35	159.78	14.22	159.94	15.71	160.03		
16.1	160.01	17.97	160.18	21.73	160.16	23.14	160.56	23.6	160.61		
25.48	160.37	27.35	160.49	28.09	160.44	29.23	160.5	30.57	160.53		
31.11	160.47	33.05	160.8	34.86	160.56	35.52	160.5	36.74	160.54		
38.61	160.57	40.48	160.52	42.36	160.63	42.96	160.71	44.24	160.63		
46.12	160.45	47.99	160.72	49.87	160.54	51.74	160.57	52.87	160.73		
53.62	160.64	55.34	159.98	57.37	159.9	57.82	159.8	59.25	159.15		
61.12	159.3	65.25	158.94	67.73	158.81	70.21	158.74	72.68	158.52		
74.26	158.49	75.16	158.39	76.13	158.37	77.64	158.45	80.12	158.38		
81.76	158.65	83.64	158.58	85.07	158.59	85.51	158.53	86.89	158.97		
87.55	159.06	89.26	158.18	90.02	158	91.14	157.9	92.5	157.84		

Belair Road.rep									
93.02	157.73	94.98	157.75	96.77	157.87	97.46	157.85	98.64	157.89
100.52	157.61	102.4	157.52	104.27	157.67	106.15	157.75	107.37	158.2
109.84	158.53	110.84	158.7	111.95	158.89	113.57	159.48	113.81	159.62
115.4	159.81	115.67	159.8	117.22	159.95	117.52	160.03	119.04	160.01
119.38	160.07	120.87	160.54	121.24	160.55	122.69	160.69	124.51	160.69
124.96	160.66	126.34	160.75	128.16	160.43	128.67	160.45	129.98	160.25
130.53	160.22	132.39	160.38	134.25	160.26	135.45	160.22	137.97	160.28
139.1	160.25	140.92	160.36	142.75	160.27	143.54	160.32	144.57	160.28
145.4	160.2	146.39	160.24	147.26	160.24	149.11	160.12	150.04	160.21
150.49	160.21	150.97	160.21	151.86	160.16	152.83	159.99	154.69	159.75
156.55	159.36	157.33	159.22	158.41	159.22	159.16	159.17	160.26	159.01
160.98	158.99	162.12	158.52	162.8	158.43	163.98	158.57	164.63	158.42
165.84	158.21	166.45	158.14	167.7	157.65	168.27	157.58	169.56	157.06
170.1	156.95	171.41	156.49	173.27	156.22	173.74	155.76	175.13	154.78
175.57	154.43	176.99	153.95	177.39	153.88	178.85	153.06	179.21	152.72
180.71	151.97	181.04	151.85	182.56	151.68	182.86	151.7	184.69	151.21
186.51	151.08	188.14	150.99	190.16	150.78	191.85	150.46	193.8	150.37
195.57	150.08	197.43	149.9	201.1	149.47	202.47	149.2	206.09	149.12
207.94	149	212.83	148.96	216.25	148.6	217.34	148.6	222.56	148.6
222.89	148.56	223.83	148	223.9	148.01	224.12	147.9	225.26	147
225.3	146.97	225.52	146.79	226.73	146	227.38	145.41	227.87	145
228.47	144.45	228.97	144	229.73	143.35	230.11	143	231.02	142.36
231.4	142	231.88	141.5	245.74	141.02	246.02	141	246.1	141
248.07	140.94	248.24	140.97	248.33	141	248.37	141	250.31	141.68
250.7	141.81	251.27	142	253.18	142.67	254.19	143	254.87	143.24
257.19	144	257.36	144.08	257.68	144.19	258.68	144.37	262	145
265.52	145.67	268.72	146	270.37	146.18	270.71	146.32	272.46	147
274.03	147.66	274.47	147.84	274.89	148	275.28	148.16	277.38	149
279.23	149.77	279.85	150	280.44	150.23	282.35	151	283.36	151.43
284.8	152	286.1	152.52	287.33	153	287.9	153.27	297.44	153.82
299.44	154	299.47	154	310.37	155	320.89	155.57	324.28	155.76
328.24	155.99	328.46	156	338.77	156.56	338.78	156.56	339.02	156.58
339.27	156.59	342.56	156.72	344.33	156.79	345.44	156.83	349.54	156.99
349.66	158.73	350.34	168.87	350.77	174.88	351.58	174.89	353.36	174.94
354.51	174.96	354.93	174.57	355.34	174.3	356.36	174.31	357.73	174.33
361.57	174.39	361.77	174.4	362.44	174.41	365.8	174.46	366.78	174.47
369.84	174.52	371.98	174.55	373.87	174.58	377.19	174.64	377.91	174.65
380.42	174.69	381.95	174.71	382.39	174.72	385.98	174.78	387.6	174.8
390.02	174.84	392.8	174.89	394.06	174.91	398.01	174.97	398.09	174.97
398.39	174.97	402.13	175.03	403.21	175.05	406.17	175.09	408.42	175.12
410.2	175.15	413.62	175.2	414.24	175.2	416.36	175.23	418.28	175.25
418.83	175.26	422.31	175.3	424.04	175.32	426.35	175.34	429.24	175.37
430.39	175.38	434.34	175.42	434.42	175.42	438.46	175.44	439.65	175.45
442.49	175.47	444.86	175.48	446.53	175.49	447.14	175.49	449.71	175.5
449.81	171.43	449.96	165.5	450.29	165.5	452.31	165.5	454.6	165.5
455.27	165.5	458.64	165.5	460.47	165.5	462.68	165.5	465.68	165.5
466.71	165.5	470.28	165.5	470.75	165.5	470.88	165.5	474.79	165.5
476.09	165.5	478.82	165.5	481.3	165.5	482.86	165.5	486.5	165.5
486.9	165.5	488.26	165.5	490.93	165.5	491.71	165.5	494.97	165.5
496.91	165.5	499	165.5	502.12	165.5	503.04	165.5	506.23	165.5
507.08	165.5	507.32	165.5	511.11	165.5	512.53	165.5	515.15	165.5
517.73	165.5	519.19	165.5	522.94	165.5	523.22	165.5	523.62	165.5

Manning's	n	Values	num=	5					
Sta	n	Val	Sta	n	Val	Sta	n	Val	Sta
-238.27	.013	150.49	.08	222.89	.035	275.28	.08	338.78	.03
Bank Sta:	Left	Right	Lengths:	Left	Channel	Right	Coeff	Contr.	Expan.
	222.89	275.28		78.52	69.25	65.48		.1	.3
Ineffective Flow			num=	2					
Sta L	Sta R	Elev	Permanent						
-238.27	117.22	163	T						
349.73	600	163	T						

CROSS SECTION

RIVER: Whitemarsh Run
 REACH: 1

RS: 17.27

Belair Road.rep

INPUT

Description:

Station Elevation Data				num=	464				
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-160.61	167.87	-160.13	167.89	-158.65	167.43	-157.55	167.14	-156.51	166.96
-156.01	166.84	-153.38	165.96	-152.4	165.58	-151.11	165.48	-149.82	164.99
-147.24	164.4	-146.41	164.35	-145.95	164.39	-144.66	164.21	-143.88	163.97
-142.84	163.91	-142.08	164	-140.79	164.04	-139.5	164.02	-138.21	163.91
-136.92	163.91	-135.63	163.85	-133.78	163.89	-132.3	163.85	-130.48	163.72
-129.19	163.6	-127.9	163.82	-127.03	163.62	-126.61	163.56	-125.32	163.62
-124.03	163.52	-122.74	163.58	-121.76	163.55	-120.16	163.56	-119.12	163.53
-117.58	163.43	-116.11	163.49	-115	163.37	-113.58	163.3	-112.42	163.21
-109.85	163.17	-108.58	162.85	-107.27	163.48	-106.01	163.32	-104.69	163.53
-103.4	163.51	-102.11	163.61	-100.96	163.63	-99.53	163.51	-98.43	163.51
-96.95	163.55	-95.91	163.42	-95.41	163.32	-94.37	163.27	-92.77	163.07
-90.86	162.71	-90.14	162.5	-89.22	162.29	-88.33	161.95	-85.35	161.8
-84.06	161.6	-82.77	161.63	-81.48	161.5	-79.6	161.46	-78.9	161.38
-78.23	161.4	-77.61	161.36	-76.32	161.36	-75.03	161.32	-73.74	161.16
-71.16	160.99	-69.87	161	-69.06	160.9	-68.58	160.78	-66.01	160.72
-64.72	160.53	-61.15	160.6	-60.85	160.59	-59.56	160.3	-58.27	160.37
-56.98	160.16	-54.4	160.1	-52.98	160.09	-50.46	159.97	-49.24	159.94
-47.98	159.66	-46.66	159.79	-45.34	159.79	-44.09	159.61	-42.8	159.46
-41.51	159.39	-40.07	159.36	-38.93	159.38	-37.83	159.18	-36.35	159.23
-35.31	159.31	-34.8	159.3	-33.77	159.15	-32.48	159.05	-31.19	158.89
-29.9	159	-26.03	158.64	-24.74	158.55	-23.46	158.59	-22.68	158.53
-22.17	158.42	-20.16	158.32	-19.59	158.23	-18.99	158.25	-18.3	158.16
-17.63	158.15	-16.36	158.39	-15.72	158.63	-14.43	158.7	-13.14	158.61
-12.58	158.52	-11.09	158.42	-10.06	158.39	-9.52	158.38	-6.96	158.34
-5.46	158.23	-3.61	158.19	-1.76	158.33	.1	158.21	.33	158.22
2.16	158.03	3.98	157.98	5.65	158.05	7.63	158.02	9.45	157.94
11.27	157.9	13.06	157.97	14.91	157.88	16.74	157.68	18.57	157.53
20.46	157.7	24.04	157.63	26.02	157.74	27.68	157.68	29.51	157.87
31.33	157.73	31.57	157.74	33.42	158.02	35.27	158.05	36.8	158.19
37.13	158.19	38.98	158.05	40.45	157.79	40.83	157.8	42.27	157.99
44.09	157.85	45.92	157.9	47.74	157.97	49.56	157.98	51.38	158.06
53.21	158.22	55.03	158.19	56.85	158.21	58.68	158.3	59.34	158.31
60.5	158.44	68.6	158.3	69.62	158.24	71.44	158.28	72.3	158.21
73.26	158.06	75.09	158.06	76.01	158.12	76.91	158.14	77.86	158.23
78.73	158.26	79.71	158.14	80.56	158.1	81.56	158.1	84.2	157.96
85.27	157.83	86.03	157.79	87.12	157.83	87.85	157.82	88.97	157.75
89.67	157.76	91.5	157.68	92.67	157.7	94.52	157.49	95.14	157.5
96.97	157.46	98.23	157.62	98.79	157.64	100.61	157.55	102.44	157.55
103.78	157.62	104.26	157.6	106.08	157.68	107.91	157.6	109.34	157.46
109.73	157.45	111.55	157.49	113.04	157.46	113.38	157.42	114.89	157.38
115.21	157.37	116.45	157.31	118.02	157.43	119.58	157.33	121.15	157.32
122.71	157.41	124.48	157.45	125.84	157.57	126.33	157.52	127.4	157.58
130.53	157.58	132.1	157.67	133.75	157.97	135.6	158.1	136.79	158.31
138.36	158.53	139.31	158.86	139.92	159.01	141.48	159.12	143.02	159.46
144.61	159.23	146.18	159.14	146.72	159.14	147.74	159	148.58	158.85
149.31	158.83	150.87	158.67	152.43	158.96	154	158.57	155.56	158.67
156	158.63	157.85	158.85	158.69	158.81	159.7	158.69	161.56	158.71
163.39	158.84	165.27	158.64	167.12	158.65	168.08	158.77	168.97	158.84
169.38	158.78	169.64	158.75	170.83	158.7	172.68	159.07	173.25	159.03
176.39	158.71	177.46	158.58	178.24	158.6	179.03	158.47	180.59	158.39
181.95	158.26	183.81	158.23	185.66	158.31	187.51	158.18	188.41	158.15
189.37	158.17	191.22	157.68	191.54	157.66	193.08	157.36	194.67	157.17
194.93	157.08	196.24	156.5	196.78	156.49	197.8	156.34	198.64	156.15
199.37	156.04	200.49	155.72	200.93	155.54	202.35	155.36	204.06	154.71
205.62	154.21	207.19	153.59	207.91	153.24	208.75	152.92	210.32	152.62
211.88	152.36	213.44	152.07	215.33	151.81	216.57	151.45	218.14	151.08
219.03	150.92	219.7	150.85	220.89	150.6	222.74	150.16	224.6	149.83
226.45	149.46	227.52	149.54	228.3	149.53	230.16	149.67	232.01	150.11
233.78	149.33	235.72	148.84	236.91	148.62	238.47	148.38	241.28	148.21
241.6	148.24	243.14	148.23	244.13	148.51	256.72	148.1	265.65	148.04
268.46	148.01	269.66	148	270.9	148	270.95	147.94	271.18	147.89
271.57	147	272.6	146.21	272.87	146	273.83	145.15	274.02	145
274.21	144.84	275.12	144	275.92	143.28	276.26	143	276.64	142.73
277.24	142	277.59	141.11	277.78	141.04	277.9	141.1	278.37	141.02

Belair Road.rep									
279.05	141.02	280.76	141.08	290.67	141.44	292.7	141.58	299.42	141.88
302.12	142	310.27	142.35	310.76	142.56	311.82	143	313.64	143.81
314.07	144	314.52	144.21	316.35	145	317.08	145.31	318.66	146
319.41	146.33	320.99	147	321.01	147.01	322.38	147.62	323.18	148
324.24	148.45	325.54	149	326.69	149.51	327.74	150	329.08	150.58
330.05	151	331.42	151.7	332.1	152	333.01	152.42	334.47	153
335.05	153.28	336.64	154	338.78	154.96	338.87	155	339	155.06
339.32	155.21	340.41	156	340.57	156.12	340.68	156.14	341.37	156.44
342.42	156.45	350.41	156.78	352.22	156.86	352.24	156.86	353.93	156.92
363.55	161.34	379.12	168.22	379.3	169.2	380.13	174.41	382.18	174.45
383.13	174.47	383.6	173.93	383.72	173.8	383.9	173.81	384.72	173.83
389.47	173.94	391.39	173.98	394.71	174.05	395.37	174.06	397.47	174.11
399.36	174.14	399.95	174.15	403.34	174.22	405.2	174.25	407.33	174.29
410.44	174.35	411.31	174.36	414.09	174.41	415.3	174.44	415.68	174.44
419.29	174.51	420.92	174.54	423.27	174.58	426.17	174.63	427.26	174.65
430.71	174.71	431.24	174.72	431.41	174.72	435.23	174.79	436.65	174.82
439.21	174.86	441.89	174.91	443.2	174.93	447.14	175	447.19	175
447.34	175.01	451.17	175.07	452.38	175.1	455.16	175.15	457.62	175.19
459.14	175.22	462.87	175.28	463.13	175.29	463.96	175.3	467.11	175.36
468.11	175.38	471.1	175.43	473.35	175.47	474.53	175.49	475.04	175.5
475.22	168.49	475.3	165.5	475.75	165.5	478.59	165.5	479.07	165.5
480.59	165.5	483.84	165.5	485.33	165.5	489.08	165.5	492.99	165.5
494.32	165.5	497.21	165.5	499	165.5	499.57	165.5	502.99	165.5
504.81	165.5	506.97	165.5	510.05	165.5	510.96	165.5	513.83	165.5
514.94	165.5	515.29	165.5	518.93	165.5	520.54	165.5	522.91	165.5
525.78	165.5	526.9	165.5	530.46	165.5	530.89	165.5	531.02	165.5
534.87	165.5	536.26	165.5	538.86	165.5	541.51	165.5	542.84	165.5
546.75	165.5	546.83	165.5	547.08	165.5	550.82	165.5	551.99	165.5
554.8	165.5	557.24	165.5	558.79	165.5	559.26	165.5		

Manning's n Values									
Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
-160.61	.013	169.38	.08	270.9	.035	323.18	.08	352.22	.03

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	270.9	323.18		77.71	84.1		.1	.3
Ineffective Flow								
		num=	2					
Sta L	Sta R	Elev	Permanent					
-160.61	130.53	163	T					
374.47	600	163	T					
Blocked Obstructions								
		num=	1					
Sta L	Sta R	Elev						
.1	130.53	165						

CROSS SECTION

RIVER: Whitemarsh Run
 REACH: 1 RS: 17.25

INPUT

Description:

Station Elevation Data									
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-39.71	171.1	-38.57	171.17	-37.18	171.16	-35.79	171.32	-34.4	171.4
-33.22	171.31	-31.63	171.29	-31.23	171.26	-28.85	171.29	-27.9	171.48
-27.27	171.54	-26.07	171.36	-25.29	171.38	-23.26	171.3	-21.9	171.38
-20.51	171.14	-19.12	171.2	-17.73	170.97	-17.36	170.98	-16.34	171.14
-15.38	171.22	-13.97	171.22	-13.39	171.19	-11.41	170.71	-10.79	170.66
-9.43	170.85	-8.01	170.78	-6.62	170.68	-5.23	171.01	-4.69	170.72
-3.84	170.19	-3.48	170.23	-2.45	170.13	-1.5	169.79	-1.06	169.86
.33	169.11	1.71	168.48	3.1	168.29	4.6	167.74	6.43	167.28
7.27	167.19	8.41	167.01	10.05	166.47	10.39	166.44	11.44	166.18
12.38	166.3	12.83	166.17	14.22	164.55	14.36	164.56	15.61	164.94
16.34	164.73	17	164.63	18.53	164.19	19.77	164.15	20.31	163.96
21.16	163.51	22.29	162.85	22.55	162.85	23.94	163.34	24.27	163.26
25.33	162.87	26.25	162.45	26.72	162.29	28.24	162.31	30.22	161.76
30.89	161.61	32.2	161.38	34.18	161.15	35.05	160.88	37.83	160.52
39.22	160.13	40.61	159.88	42.11	159.93	43.39	159.65	46.17	159.79

Belair Road.rep

48.06	159.54	48.95	159.46	52.02	159.47	54.5	159.46	55.99	159.34
57.97	159.36	58.67	159.39	61.93	159.29	62.84	159.32	64.23	159.26
65.9	159.23	67.01	159.16	68.39	159.14	69.86	159.04	71.17	158.99
72.56	159.07	73.83	159.03	75.34	159.06	76.73	158.95	78.12	158.92
79.51	158.85	81.76	158.87	83.68	158.75	85.06	158.7	86.45	158.62
89.23	158.53	89.69	158.49	91.67	158.61	92.01	158.56	93.65	158.62
94.79	158.57	96.18	158.55	97.45	158.57	99.6	158.55	101.73	158.47
103.12	158.23	104.51	158.07	105.54	158.3	107.53	158.43	109.51	158.86
110.07	158.95	111.46	158.93	113.47	159.41	114.24	159.47	115.46	159.82
117.02	159.87	118.4	160.09	119.42	160.14	119.79	160.25	121.18	160.79
122.57	160.76	123.96	161.01	127.35	161.33	128.13	161.46	129.33	161.55
129.95	161.7	130.91	162.04	132.3	162.72	133.69	162.78	135.28	163.11
136.46	163.24	137.26	163.29	137.85	163.41	139.24	163.47	140.63	163.43
141.23	163.49	142.02	163.47	143.88	163.53	144.8	163.52	147.17	163.56
147.58	163.52	148.97	163.25	150.36	163.04	151.75	163	153.12	162.73
154.52	162.78	155.1	162.88	157.08	163.07	158.69	162.96	159.07	162.99
161.05	163	161.47	162.91	163.03	162.33	164.25	161.74	165.64	160.84
167.1	160.16	168.42	159.81	170.96	158.74	171.19	158.74	172.58	158.35
172.94	158.3	175.36	158.22	176.75	157.98	178.14	158.03	178.89	157.87
179.53	157.8	180.87	157.92	182.58	157.83	182.69	157.82	184.47	157.8
186.25	157.87	188.03	157.9	189.99	157.88	191.81	157.79	193.64	157.74
195.46	157.78	196.35	157.85	196.94	157.9	197.29	157.89	198.72	157.73
199.11	157.75	200.93	158.12	202.76	158.18	204.58	157.95	206.4	157.79
207.62	157.58	208.23	157.55	209.4	157.61	211.18	157.53	213.7	157.36
214.74	157.33	216.52	157.19	218.3	157.1	220.08	157.13	220.99	157.01
221.86	156.83	223.64	156.64	224.64	156.63	227.2	156.38	228.29	156.18
228.98	156.19	230.11	156.07	231.93	155.29	232.55	155.2	233.76	155.12
236.11	154.65	237.4	154.56	239.23	154.39	241.05	153.85	242.88	153.67
244.7	153.14	245.01	153.02	246.52	152.59	248.35	152.44	248.57	152.3
250.17	151.7	250.35	151.71	252.13	151.28	253.82	150.69	255.64	150.02
257.46	149.76	259.25	148.86	261.11	148.51	262.94	148.41	266.37	147.96
268.15	147.69	269.93	147.48	270.23	147.42	271.71	147.54	275.28	147.46
277.06	147.44	277.52	147.4	278.84	147.42	280.62	147.19	281.17	147.21
282.4	147.13	284.18	147.19	284.82	147.15	285.96	147.27	286.64	147.21
287.74	146.96	288.47	147.02	289.52	147.19	290.29	147.38	290.59	146.99
291.61	147	309.58	147.26	311.37	147.15	311.72	147.11	313.29	147.12
319.98	147.13	320.3	147	322.54	146.06	322.69	146	323.78	145.54
324.66	145	324.85	144.88	326.29	144	326.79	143.71	327.93	143
328.89	142.44	329.57	142	340.18	141.56	349.07	141.18	351.69	141
353.08	140.97	353.13	141	353.3	141.12	354.56	142	355.15	142.4
355.99	143	356.62	143.42	357.43	144	358.19	144.53	358.83	145
359.6	145.46	360.37	146	361.07	146.48	361.81	147	362.51	147.51
363.16	148	363.94	148.49	364.7	149	365.37	149.49	366.07	150
366.86	150.51	367.58	151	368.33	151.52	369.01	152	369.66	152.48
370.36	153	371.06	153.49	371.8	154	372.62	154.52	373.32	155
373.96	155.44	374.72	156	375.03	156.32	375.68	156.73	376.07	157
376.65	157.56	377.18	157.79	379.12	158	379.29	158.02	380.56	158.11
381.33	158.17	381.73	158.19	388.5	158.52	388.51	158.52	391.87	158.81
392.55	158.87	393.82	159	395.68	159.19	403.56	160	406.68	160.31
410.33	160.33	422.8	160.41	426.16	160.54	434.58	160.8	436.25	160.85
436.99	160.89	438.92	161	448.15	161.49	461.01	162	461.6	162.03
461.95	162.03	462.95	162.11	465.7	162.28	474.26	162.72	478.25	162.91
479.75	163	483.16	163.19	486.32	163.4	486.93	163.66	488.04	164.15
489.64	164.84	491.11	165.48	491.81	171.1	492.09	173.62	492.29	175.32
493.99	175.35	495.33	175.38	495.58	175.39	496.09	174.93	496.31	174.72
497.67	174.75	500.96	174.81	501.97	174.83	502.82	174.85	504.39	174.88
506.51	174.93	507.65	174.95	510.2	175	513.33	175.07	513.9	175.08
514.96	175.1	517.59	175.16	519	175.18	521.28	175.23	524.68	175.3
524.97	175.31	525.52	175.32	528.67	175.39	530.35	175.43	532.41	175.47
533.82	175.5	533.98	168.86	534.07	165.5	536.03	165.5	536.05	165.5
539.74	165.5	541.71	165.5	543.43	165.5	546.65	165.5	547.13	165.5
547.38	165.5	550.82	165.5	553.06	165.5	554.51	165.5	557.22	165.5
558.2	165.5	558.73	165.5	561.9	165.5	564.41	165.5	565.59	165.5
567.78	165.5	569.28	165.5	570.08	165.5	572.97	165.5	575.76	165.5
576.67	165.5	578.35	165.5	580.36	165.5	581.44	165.5	584.05	165.5
587.11	165.5	587.74	165.5	588.91	165.5	591.43	165.5	592.79	165.5
595.13	165.5	598.46	165.5	598.82	165.5	599.44	165.5		

Belair Road.rep									
Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
-39.71	.013	196.35	.08	319.98	.035	361.81	.08	388.51	.03
Bank Sta: Left		Right	Lengths: Left Channel		Right	Coeff	Contr.	Expan.	
319.98		361.81	107.02 107.92		97.7		.1	.3	
Ineffective Flow		num=	2						
Sta L	Sta R	Elev	Permanent						
-39.71	132.3	163	T						
381.33	599.44	163	T						

CROSS SECTION

RIVER: Whitemarsh Run
 REACH: 1 RS: 17.22

INPUT

Description:

Station Elevation Data		num=	383							
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	
31.53	168.12	32.69	168.38	33.22	168.43	34.92	168.49	36.34	168.4	
36.61	168.33	38.17	168.33	39.95	168.38	41.69	168.46	43.38	168.36	
43.66	168.38	45.08	168.27	45.49	168.21	47.32	168.2	48.47	168.04	
50.16	167.5	51.85	167.11	52.8	166.66	53.55	166.41	54.63	166.13	
55.24	166	56.46	166.03	58.29	165.35	58.63	165.32	60.12	165.01	
62.01	164.55	63.71	164.62	65.61	163.97	67.1	163.32	67.43	163.24	
69.26	162.96	70.48	162.89	71.09	162.75	72.92	162.27	73.87	162.05	
74.75	162.05	76.58	161.56	77.26	161.46	80.24	160.9	82.06	160.73	
82.34	160.68	83.89	160.65	85.72	160.4	87.55	160.07	89.11	159.71	
91.21	159.39	93.04	159.22	94.87	159.11	95.89	159.1	96.7	159.03	
97.58	158.7	98.52	158.17	99.27	157.82	100.97	157.63	104.35	156.88	
106.05	156.11	107.67	155.98	109.44	155.49	111.33	154.76	113.16	154.27	
114.52	154.23	114.98	154.25	116.81	154.22	117.9	154.16	118.64	154.19	
119.6	154.14	120.47	154.21	121.29	154.51	122.3	154.98	122.98	155.18	
124.13	155.18	125.96	155.41	127.79	155.95	128.07	156.05	129.76	156.78	
131.44	157.08	133.15	157.55	133.27	157.56	134.84	157.99	135.1	158.02	
136.53	157.94	136.93	157.95	138.76	157.76	139.92	157.73	141.61	157.79	
142.42	157.79	144.25	157.84	145	157.84	146.7	157.72	147.9	157.75	
148.23	157.72	148.39	157.71	149.73	157.29	150.08	157.21	151.56	157.17	
153.47	157.21	156.86	157.37	157.05	157.4	158.55	157.46	160.24	157.27	
161.94	157.32	162.54	157.31	163.63	157.35	164.36	157.34	165.33	157.26	
166.19	157.29	167.02	157.36	168.02	157.39	169.85	157.34	170.41	157.3	
172.1	157.33	173.51	157.14	175.3	157.09	175.49	157.09	177.17	156.88	
179	156.96	180.57	157.53	180.82	157.57	182.26	157.51	182.65	157.54	
184.48	157.37	185.65	157.44	186.31	157.41	188.14	157.45	189.04	157.38	
189.97	157.25	190.73	157.1	192.42	156.81	193.63	156.53	194.12	156.36	
195.46	155.6	197.28	154.84	197.5	154.72	200.94	153.73	202.59	152.82	
202.77	152.75	204.28	151.94	204.6	151.69	205.97	150.96	206.43	150.86	
207.67	150.47	208.26	150.21	209.36	149.63	210.09	149.34	211.05	149.13	
211.92	148.87	212.75	148.66	213.74	148.37	215.57	147.68	216.13	147.49	
217.83	147.09	219.23	146.82	219.52	146.79	221.22	146.47	222.89	146.33	
224.72	145.99	226.55	145.83	227.99	145.73	228.38	145.74	230.2	145.69	
231.38	145.83	233.07	145.75	233.86	145.79	235.69	145.64	236.46	145.61	
237.52	145.64	238.15	145.71	239.35	145.69	239.85	145.53	241.18	145.38	
241.54	145.42	243.01	145.36	243.23	145.39	244.93	145.3	248.49	144.98	
250.01	144.87	250.32	144.82	251.7	144.76	252.15	144.77	253.39	144.69	
253.98	144.74	255.09	144.72	255.81	144.62	256.78	144.64	258.48	144.48	
259.47	144.46	260.17	144.37	261.3	144.1	261.86	144.04	263.12	143.48	
263.56	143.34	264.95	143.02	266.94	142.38	268.61	142.94	270.44	143.35	
272.27	142.98	274.1	143.03	275.41	143.43	275.93	143.48	277.1	143.75	
277.76	143.84	278.8	143.91	279.58	144	280.49	143.88	282.19	143.91	
283.88	143.82	285.07	143.7	285.57	143.47	286.9	143.15	288.67	142.14	
288.73	142.11	290.56	141.18	290.65	141.16	292.35	140.42	294.04	140.66	
294.22	140.64	296.29	140.64	296.84	140.63	296.85	140.63	301.66	140.62	
303.53	140.72	308.16	140.67	311.02	140.64	314.76	140.63	316.63	140.65	
318.51	140.6	320.38	140.41	322.25	140.81	323.15	141.04	324.67	141.39	
325.99	141.63	326.19	141.64	329.23	142.22	329.73	142.16	330.75	142.59	
331.6	142.9	332.26	143.34	332.27	143.35	333.48	144.44	333.79	144.65	
335.31	145.78	336.82	146.96	337.22	147.1	338.34	148.56	339.09	148.46	

Belair Road.rep									
339.86	148.43	340.96	149.89	341.38	150.08	342.83	151.05	344.42	152.38
345.94	152.59	346.58	152.63	347.46	152.94	348.45	153.63	348.98	153.56
350.5	153.99	351.28	154.3	352.19	154.61	352.73	150.58	353.59	151
355.4	151.88	355.5	151.93	355.65	152	355.74	152.04	357.72	153
357.89	153.08	359.79	154	360.24	154.22	360.62	154.4	361.86	155
362.86	155.49	363.3	155.7	363.92	156	364.27	156.17	365.99	157
367.61	157.78	368.05	158	368.5	158.22	370.12	159	371.31	159.58
372.18	160	372.94	160.37	374.17	161	374.34	161.04	374.86	161.29
381.1	161.62	382.62	161.68	390.01	162	390.02	162	402.36	162.51
406.47	162.66	416.49	163	418.51	163.1	420.68	163.23	430.81	164
447.35	164.73	447.41	164.73	452.29	164.97	452.6	165	452.89	165
453.12	165.01	453.77	165.01	455.93	165.13	455.94	165.13	463.35	165.55
466.98	165.74	468.83	165.85	469.44	165.89	469.45	165.97	469.58	166.87
469.61	167	475.98	167.26	476.73	167.23	477.57	167.2	477.83	167.2
480.5	167.22	480.76	167.01	480.81	167.01	480.88	167	481.72	167
488.64	167.06	489.44	166.39	491.67	166.19	493.52	166.11	493.69	166.11
495.4	166.16	499.3	166.36	513.51	167	515.22	167.07	515.56	167.09
516.04	167.11	525.41	167.44	526.95	167.5	533.04	170.2	536.31	171.69
536.61	171.83	536.83	171.94	540.17	173.45	543.18	174.79	543.9	175.1
544.95	175.57	546.41	175.57	547.29	175.57	547.54	175.57	547.97	175.57
548.37	175.26	548.64	175	550.12	175.02	552.54	175.05	554.41	175.09
555.88	175.11	557.98	175.14	560.65	175.18	562.23	175.2	565.1	175.24
568.58	175.28	568.66	175.28	568.76	175.28	572.22	175.32	574.93	175.35
575.78	175.36	576.87	175.37	579.35	175.39	581.28	175.41	582.86	175.42
584.44	175.44	584.49	173.79	584.69	165.5	585.74	165.5	587.63	165.5
590.03	165.5	593.09	165.5	593.59	165.5	593.98	165.5	597.15	165.5
600.33	165.5	600.72	165.5	601.2	165.5	604.28	165.5	606.68	165.5
607.84	165.5	609.32	165.5	610.54	165.5				

Manning's n Values. num= 7									
Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
31.53	.08	148.23	.013	175.3	.08	286.9	.035	332.26	.08
390.01	.03	455.93	.045						

Bank Sta:	Left	Right	Lengths:	Left	Channel	Right	Coeff	Contr.	Expan.
	286.9	332.26		84.87	72.33	64.28		.1	.3
Ineffective Flow	num= 2								
Sta L	Sta R	Elev	Permanent						
31.53	134.84	163	T						
352.18	610.54	163	T						

CROSS SECTION

RIVER: Whitemarsh Run
 REACH: 1 RS: 17.20

INPUT

Description: FEMA Effective Cross Section R									
Station Elevation Data num= 458									
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	168.08	1.73	168.24	2.14	168.36	4.01	168.2	4.77	168.22
7.75	167.87	9.62	167.96	11.49	167.87	12.37	167.99	15.23	168.1
17.1	167.95	18.45	167.65	20.84	167.85	24.31	167.66	27.58	167.66
30.62	167.61	33.94	167.51	38.22	167.55	39.55	167.62	41.26	167.4
43.3	167.24	45.17	167.43	48.91	167.12	50.78	167.06	52.65	166.91
54.94	167.08	56.39	166.92	57.98	167.1	60.13	167.21	60.21	167.2
62.22	167.04	64.83	167	67.45	167.12	68.76	166.94	72.68	166.91
73.52	166.86	75.3	167.05	76.61	166.94	77.91	167.07	79.22	166.77
81.84	166.73	83.15	166.53	85.76	166.68	88.38	166.28	90.99	166.12
93.59	166.16	94.92	166.02	96.22	165.54	98.08	165.5	98.84	165.57
100.32	165.19	101.46	165.35	104.07	164.87	105.38	164.82	106.69	164.99
107.99	164.43	109.25	164.62	111.48	164.52	114.53	164.09	115.69	164.12
117.15	163.96	118.18	164.05	119.77	163.93	121.07	164.04	122.65	163.98
124.88	164.01	126.31	163.88	131.58	163.84	132.84	163.74	134.15	163.8
135.46	163.57	139.38	163.28	140.52	163.52	142	163.31	143.31	163.3
144.98	162.99	145.92	162.93	147.25	163.04	148.54	162.62	151.68	162.33
153.92	162.24	155.08	162.06	156.39	161.99	157.69	162.14	159	161.82
161.62	161.64	162.93	161.49	165.54	161.55	168.16	161.4	169.35	161.15

Belair Road.rep

171.78	161.23	173.39	161.1	176	161.04	177.31	160.94	179.93	161.08
181.24	161.03	182.54	160.81	183.85	161.07	185.13	160.98	187.42	160.96
189.65	161.02	191.88	160.54	194.6	160.19	195.62	160.16	196.35	159.82
196.96	159.81	198.24	159.78	200.81	159.16	202.16	159.01	203.05	159.08
204.78	158.49	206.09	158.87	207.51	158.48	208.7	158.02	209.75	157.96
211.32	158.1	215.24	158.06	217.86	157.89	219.16	158.03	220.91	157.92
223.01	158.06	225.7	158	227.01	157.88	229.32	158.08	230.94	158.15
232.24	158.07	233.55	158.15	234.86	157.93	236.55	158.08	238.78	158.18
242.71	157.38	244.01	157.4	245.48	157.06	249.25	156.89	249.95	156.77
251.41	156.88	253.17	156.86	254.57	156.67	257.09	156.43	258.4	156.12
260.88	156.08	262.33	155.93	263.63	155.6	264.94	155.61	266.25	155.33
268.86	155.49	270.35	154.86	271.48	155	272.79	154.83	274.1	154.8
275.4	154.43	276.75	154.62	278.02	154.55	278.98	154.14	279.82	154.27
281.21	154.99	282.98	155.39	284.56	155.2	285.87	154.46	287.91	154.79
288.48	154.98	291.1	155.31	292.38	154.73	293.71	155.3	294.61	155.05
296.85	155.55	297.64	155.43	298.76	155.56	300.25	155.5	301.56	155.65
302.87	155.4	305.78	155.28	308.01	154.88	310.72	154.76	313.33	154.85
315.95	154.59	317.7	154.55	320.85	155.06	322.49	155.2	323.64	155.53
325.1	155.26	325.88	155.39	327.72	155.46	329.03	155.86	330.32	155.97
331.64	155.71	335.57	155.27	338.18	155.13	339.79	154.77	343.41	154.65
345.98	154.06	348.65	153.74	351.26	153.33	352.57	153.31	353.88	153.07
355.57	152.98	357.14	152.72	358.73	152.55	360.42	152.6	363.03	151.92
364.34	152.03	365.65	151.64	366.96	151.54	368.2	151.17	370.88	151.03
372.19	151.15	373.5	150.97	375.01	151.15	376.11	151.08	378.73	151.21
379.48	151.09	382.65	150.87	387.88	150.61	389.19	150.69	390.29	150.57
391.81	150.54	393.11	150.42	395.73	150.45	397.34	150.28	398.34	150.32
400.96	150.16	404.04	150.37	406.07	150.45	408.81	150.45	410.12	150.68
411.42	150.66	414.04	151.15	415.35	151.77	416.66	151.99	417.96	152.37
419.67	152.1	420.58	152.19	421.91	152.86	423.19	152.81	424.14	152.98
427.12	153.9	428.43	154.47	429.73	154.46	431.04	154.88	432.35	155.55
433.07	155.69	434.48	155.55	435.31	155.71	436.27	156.47	437.54	157.27
439.77	157.63	441.51	158.01	442.81	158.72	444.24	158.46	445.43	159.21
448.71	160.06	449.35	160.03	450.26	160.23	451.75	160.34	451.97	160.36
454.58	160.27	458.51	160.28	461.12	160.16	462.11	160.01	464.34	159.5
466.57	159.37	468.81	159.5	471.59	159.56	474.2	159.36	475.51	159.52
479.97	159.35	483.36	159.26	484.67	159.28	485.97	159.11	487.21	159.15
488.59	159.2	491.3	159.07	493.37	159.08	495.13	158.97	496.44	159.11
497.84	159.41	499.05	159.44	501.67	159.37	502.31	159.47	503.92	159.47
505.59	158.94	508.21	158.3	509.01	158.24	510.24	157.86	510.82	157.57
512.13	157.18	513.39	156.64	514.75	155.72	516.55	155.19	517.94	154.61
518.67	154.17	520.17	153.57	521.29	153.34	522.4	152.58	523.9	151.86
525.21	151.61	526.52	150.9	527.83	149.88	529.1	149	530.44	149.1
531.75	148.6	533.57	148.04	535.49	146.19	536.98	144.2	538.04	142.9
539.6	142.16	540.27	142.23	541.8	142.12	543.52	141.84	546.14	141.96
547.44	141.79	549.2	141.71	550.06	141.81	551.44	141.76	552.68	141.24
553.67	141.21	554.42	141.54	555.9	142.42	556.6	142.51	559.21	143.5
560.74	143.63	561.83	143.49	563.89	143.36	565.75	143.32	567.05	142.41
568.37	142.43	569.68	142.16	570.99	142.2	572.29	142.41	573.6	142.31
576.52	142.54	577.52	142.53	578.83	142.67	580.14	143.07	581.45	142.87
584.06	143.56	585.99	143.64	587.99	143.83	590.6	143.76	591.64	143.58
593.87	142.89	594.53	142.56	596.1	142.03	597.14	141.83	598.61	140.78
599.76	140.44	601.07	139.87	602.14	139.6	602.37	139.54	605.04	139.53
608.32	139.67	615.92	139.99	632.46	140.7	634.07	140.55	636.3	140.78
637.69	141.69	638.53	141.8	640.3	141.66	641.61	141.91	643	141.49
644.23	142.24	645.96	142.01	646.84	142.25	648.15	142.4	649.7	143.1
650.77	142.96	653.38	142.77	656.4	142.86	657.31	143	658.58	143.02
661.23	143.29	662.54	143.27	663.1	143.38	664.9	144.05	665.33	144.13
668.05	144.26	669.08	144.41	670.38	144.94	671.69	144.98	673	145.64
674.37	146.7	675.62	146.73	676.5	147.33	677.52	147.68	678.23	148.07
678.73	148.14	679.54	148.65	680.68	148.9	680.97	149.11	682.16	150.56
683.84	151.39	684.77	151.95	686.99	152.81	688.69	153.85	689.9	154.26
692.13	155.45	692.62	155.86	693.93	156.54	694.37	156.97	696.46	158.23
697.85	158.4	700.47	159.77	701.77	160.03	703.08	160.13	704.39	160.63
708.31	161.48	710.93	161.65	712.23	161.56	714.47	161.83	715.73	161.78
716.16	161.76	720.08	161.92	721.39	162.19	722.7	162.05	723.4	162.09
725.32	161.98	728.02	162	729.37	162.02	735.29	162.32	746.74	162.9
747.15	162.92	748.89	163	754.68	163.28	757.37	163.39	765.62	163.75
768.87	163.87	771.37	164	783.05	164.48	795.78	165	796.67	165.03
802.18	165.28	816.2	166	826.1	166.44	838.36	167	838.8	167.01

Belair Road.rep									
839.51	167.01	840.38	167.01	841.74	167.06	847.61	167.11	848.28	167.16
862.17	168	869.14	168.57	870.5	168.64	875.76	169	881.93	169.56
882.38	169.58	882.47	169.59	882.56	169.6	882.67	169.61	882.78	169.63
883.02	169.66	883.12	169.67	884	169.77	884.84	169.88	889.87	171.93
892.34	172.94	893.67	173.47	894.16	173.67				

Manning's n Values		num=		7					
Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
0	.03	196.96	.08	451.75	.013	487.21	.08	597.14	.035
637.69	.08	715.73	.03						

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff	Contr.	Expan.
597.14	637.69	36.99	38.09	41.26	.1	.3	
Ineffective Flow		num=		2			
Sta L	Sta R	Elev	Permanent				
0	529.1	160.96	T				
678.23	894.16	165.7	T				

CROSS SECTION

RIVER: Whitemarsh Run
 REACH: 1 RS: 17.13

INPUT

Description:

Station Elevation Data		num=		451					
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	165.02	1.71	165	2.68	164.89	3.99	164.56	5.3	164.55
6.61	164.24	7.78	164.16	10.55	164.17	13.17	163.88	14.56	163.88
17.1	163.78	19.72	163.76	21.07	163.89	22.34	163.92	24.19	164.12
24.96	164.13	26.28	164.35	27.59	164.14	28.9	164.22	29.93	164.35
31.52	164.08	32.14	164.07	34.35	164.24	38.07	164.34	39.38	163.97
40.69	164	42	164.12	43.31	163.79	44.63	164.03	45.43	163.41
45.46	163.38	45.94	162.89	46.68	162.99	47.25	163.18	48.56	163.21
49.85	163.05	51.18	163	52.07	162.86	54.28	163.1	56.5	163.08
57.73	162.83	59.04	163.01	60.35	162.85	61.67	163.03	62.98	162.99
64.29	163.47	65.35	163.31	66.91	163.5	68.22	163.45	69.78	163.78
70.84	163.66	72	163.63	74.21	163.73	74.77	163.6	76.08	162.96
77.39	163.34	78.8	163.3	80.02	163.15	80.85	163.43	81.33	163.36
82.01	163.5	83.07	163.41	83.95	163.24	85.28	163.86	86.57	163.35
87.88	163.13	88.43	163.11	90.5	163.19	91.93	162.79	93.12	162.66
96.35	163.28	97.05	163.3	98.07	163.58	98.57	163.59	99.68	163.28
100.78	163.22	102.3	162.89	104.92	162.73	106.23	162.79	107.54	162.76
108.85	162.96	112.78	162.88	115.4	162.67	116.28	162.56	117.34	162.53
118.03	162.6	120.55	162.71	121.96	162.57	123.27	162.38	125.14	162.42
128.51	161.97	129.82	161.93	132.44	161.6	133.75	161.36	135.07	161.21
136.38	160.82	137.69	160.81	138.43	160.66	139.83	160.55	140.31	160.45
141.62	160.5	142.86	160.45	145.07	159.69	145.55	159.71	146.86	159.56
148.17	159.31	149.46	159.21	150.79	158.72	152.1	158.69	153.42	158.16
153.93	158.11	156.04	158.08	157.35	157.81	159.1	157.2	159.97	156.84
162.31	156.28	163.9	156.1	165	155.54	166.52	155.48	167.83	155.13
169.14	155.16	170.45	154.72	171.64	154.63	174.39	154.23	176.07	153.88
178.28	153.75	182.25	153.64	183.56	153.52	184.93	153.57	186.18	153.8
187.49	153.77	188.81	153.93	190.12	154.16	191.43	154	192.74	154.44
194.05	154.63	195.36	154.98	197.98	155.24	199.29	155.82	200.6	155.68
201.91	156.32	203.22	156.56	204.07	156.81	204.53	156.83	205.84	157.25
207.07	157.03	208.47	157.55	209.28	157.7	209.78	157.91	211.09	158.26
212.4	158.76	213.7	159.09	215.02	159.24	216.33	159.88	218.95	160.26
220.36	160.62	221.57	160.58	225.51	160.78	226.82	160.89	228.13	160.8
229.21	160.83	230.57	160.73	230.75	160.72	232.06	160.84	233.37	160.88
234.68	160.7	235.86	160.8	237.3	160.64	240.28	160.01	241.23	159.92
244.71	159.89	246.48	159.84	247.79	159.88	249.04	160	251.36	159.9
254.34	159.94	255.78	159.84	258	159.89	259.58	159.78	262.43	159.73
263.52	159.74	264.83	159.63	266.14	159.69	267.04	159.62	268.76	159.48
271.52	159.56	273.5	159.67	276.62	159.96	277.94	160.03	279.24	159.88
280.56	159.64	281.87	159.69	283.18	159.54	285.8	159.38	288.42	158.95
290.79	157.99	293.66	157.19	294.97	156.18	296.28	155.64	297.86	154.51
300.07	153.54	301.53	152.51	302.84	151.76	304.15	151.42	304.5	151.18

Belair Road.rep

305.46	150.77	306.71	149.85	308.08	149.45	309.39	148.75	311.14	148.26
312.01	148.13	313.28	148.04	314.63	147.22	316.49	146.41	317.78	146.09
318.57	146.01	319.7	145.7	321.19	145.48	322.5	145.36	323.81	145.41
325.12	145.27	326.43	144.84	327.74	144.86	328.86	144.72	331.67	144.63
332.55	144.7	333.28	144.66	334.3	144.42	335.76	144.35	336.92	144.19
339.54	144.07	342.14	143.64	343.47	143.73	344.78	143.68	346.09	143.39
347.4	143.63	348.61	143.32	350.02	143.09	351.82	142.95	353.96	143.04
355.43	142.91	356.58	143	359.2	142.82	360.51	142.81	363.13	142.53
365.75	142.13	369.68	141.66	370.93	141.33	372.31	141.26	374.93	141.03
377.59	140.9	386.32	140.49	391.15	140.26	397.5	139.96	398.52	139.92
399.71	139.99	401.14	140.18	402.45	139.98	404.14	140.4	405.07	140.98
406.43	140.94	407.7	142.15	408.57	142.56	409.01	143.06	409.64	143.19
410.78	143.72	411.63	144	413	144.26	414.25	143.74	415.21	143.86
416.87	143.79	417.43	143.6	419.28	143.49	420.8	143.84	421.86	143.66
423.42	142.94	424.07	142.82	426.05	142.96	427.36	143.22	428.5	143.27
429.98	143.57	431.29	143.73	432.12	143.74	432.93	143.85	433.91	144.14
435.34	144.11	436.53	144.41	437.36	144.42	438.55	144.59	440.46	145.12
441.76	145.65	444.4	145.76	445.71	146.04	447.02	145.79	448.33	145.92
449.64	145.88	450.64	146.27	451.4	146.3	452.86	145.8	453.57	145.63
454.61	145.55	456.19	145.52	457.28	145.22	458.81	145.51	460.12	145.17
461.44	144.26	462.75	144.68	463.93	144.27	465.37	144.33	466.68	144.65
467.46	143.52	467.99	143.12	468.36	143.07	469.3	143.92	470.67	143.26
471.92	143.87	472.78	144.1	473.23	144.48	473.88	143.92	474.54	143.8
475	143.84	477.09	144.71	478.47	145.13	479.79	145.86	480.3	145.97
481.1	145.94	481.64	146.36	482.41	146.6	483.52	147.58	483.86	147.79
485.03	147.77	486.34	149	487.65	149.75	488.28	149.97	488.96	150.58
489.94	150.6	491.58	151.06	492.71	151.69	494.2	153.65	494.93	154.13
495.51	154.19	496.36	154.77	496.82	154.93	497.14	155.39	498.14	155.82
499.36	156.76	499.58	156.85	500.76	156.64	501.57	157.34	503.38	157.72
504.69	158.3	505.25	158.36	506	158.44	507.31	159.14	508.21	159.75
508.62	159.93	509.21	159.92	509.93	159.77	512.43	160.04	513.86	160.01
515.18	160.36	515.64	160.15	516.49	159.98	517.8	160.03	519.11	159.53
519.29	159.76	520.42	160.35	521.5	159.87	522.06	160.43	523.04	161.75
523.71	162.19	524.35	162.4	526.97	162.85	528.49	163.2	530.9	163.15
531.7	163.17	534.79	163.47	536.15	163.35	537	163.56	537.46	163.57
539.21	163.42	541.39	163.55	543.91	163.74	548.99	164	557.4	164.6
563.03	165	564.28	165.11	564.33	165.11	569.47	165.41	574.5	165.65
581.22	166	588.54	166.41	590.01	166.51	598.97	167	607.97	167.49
612.72	167.77	616.87	168	617.77	168.05	618.13	168.07	637.79	169
639.5	169.08	639.98	169.11	655.57	169.77	659.89	169.96	660.42	170
660.49	170.01	661.22	170.11	661.25	170.11	663.75	170.47	663.94	170.5
667.36	171	669.41	171.29	673.46	171.88	673.62	171.89	677.02	173.03
691.35	178.6	692.68	178.6	694.87	178.6	696.66	178.6	699.26	178.6
700.51	178.6	701.35	178.6	702.62	178.7	703.85	178.94	703.96	178.94
704.03	178.96	704.47	178.54	704.71	178.3	707.23	178.46	707.44	178.47
708.07	178.51	711.04	178.69	713.09	178.82	714.63	178.92	716.88	179.07
718.23	179.16	719.16	179.22	721.82	179.4	725.23	179.64	725.42	179.65
725.69	179.67	729.01	179.91	731.31	180.08	733.88	180.3	735.18	180.4
735.37	180.59	735.85	181.07	736.12	181.07	737.38	181.04	738.17	181.03
739.56	181.03								

Manning's n	Values	num=	7						
Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
0	.03	45.46	.08	230.57	.013	267.04	.08	360.51	.035
409.01	.08	505.25	.03						

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff	Contr.	Expan.
360.51	409.01	21.67	21.88	21.95		.3	.5
Ineffective Flow	num=	2					
Sta L	Sta R	Elev	Permanent				
0	342.14	160.96	T				
441.76	739.56	165.7	T				

CROSS SECTION

RIVER: Whitemarsh Run

REACH: 1

RS: 17.09

Belair Road.rep

INPUT

Description:

Station Elevation Data		num=		456					
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	168.26	.62	168.1	2.29	167.96	3.89	167.91	6.08	167.97
8.27	167.72	9.82	167.85	12.45	167.68	14.85	167.75	16.39	167.48
17.7	167.35	21.65	167.03	22.96	167.06	24.27	166.86	25.82	166.7
28.01	166.63	29.53	166.53	30.85	166.32	32.16	166.2	33.47	166.3
36.1	166.21	38.36	165.97	41.36	165.48	42.67	165.67	43.99	165.42
45.3	165.27	47.93	165.35	49.25	165.22	49.95	165.24	51.48	165.14
53.19	165.1	54.33	165	55.82	165.09	57.13	165	59.76	165.03
60.91	165.21	62.39	165.02	63.7	164.99	66.33	165.1	67.87	165.04
70.27	165.03	71.88	164.9	72.9	164.95	74.43	164.93	75.53	165.02
78.46	164.83	79.47	164.83	80.99	164.74	82.1	164.8	83.42	164.71
84.73	164.78	86.04	164.7	88.67	164.8	89.99	165.14	91.62	165.12
91.9	165.08	92.62	164.96	95.24	164.93	96	164.74	96.56	164.71
97.87	164.4	99.19	164.39	101.82	164.52	103.13	164.62	103.95	164.48
104.78	164.47	105.76	164.64	107.23	164.76	108.39	164.76	109.7	164.65
111.02	164.87	112.33	164.6	113.79	164.45	114.96	164.41	116.27	164.21
117.59	164.2	118.9	164.09	120.34	163.9	121.53	163.9	124.52	163.6
125.47	163.46	128.1	163.33	129.41	163.22	130.18	163.08	132.04	162.99
133.46	162.84	134.67	162.65	135.99	162.78	137.67	162.71	138.61	162.53
139.87	162.56	142.56	162.38	144.25	162.42	145.19	162.3	146.45	161.89
148.64	161.43	149.13	161.39	150.83	160.85	153.03	160.37	154.39	160.14
155.7	159.78	157.01	159.61	158.33	159.14	159.61	158.88	160.96	158.51
162.27	158.28	163.99	157.67	166.25	157.13	167.53	157.02	168.84	156.69
170.16	156.53	171.47	156.47	172.77	156.18	175.41	156.12	176.73	156.22
178.04	156.75	179.36	156.93	180.67	156.74	181.99	156.67	183.73	156.93
185.93	157.12	188.12	157.55	191.18	157.92	192.49	158.19	193.81	158.18
196.89	158.37	197.76	158.61	199.05	158.57	201.28	158.96	201.7	158.93
203.47	159.12	204.33	159.42	205.61	159.45	206.96	159.94	208.27	160.12
209.58	160.44	210.9	160.85	212.21	160.8	214.84	161.03	217.47	161.02
220.1	161.19	221.41	161.22	222.73	161.16	224.04	161.18	227.98	161.03
228.12	161.03	229.3	161.02	230.61	160.9	233.24	160.28	234.18	160.18
235.87	160.24	237.18	160.11	239.81	160.26	241.13	160.22	242.95	160.26
243.76	160.22	245.07	160.04	246.38	160.15	249.01	160.21	250.33	160.16
251.72	160.22	254.27	160.24	256.9	160.21	258.08	160.09	260.84	160.13
262.15	160.06	263.47	160.09	264.78	159.89	266.1	160.01	270.04	160.03
271.46	159.93	272.67	159.97	273.03	160.08	273.98	160.36	275.85	160.71
277.93	161.01	280.23	160.6	281.87	160.45	283.18	160.42	284.5	160.48
285.81	160.36	287.59	159.89	288.44	159.74	289.75	159.31	291.2	158.4
292.38	157.83	293.39	157.18	294.15	156.78	295.01	156.59	295.59	156.21
296.33	156.03	297.43	155.61	298.95	154.87	299.97	154.47	300.71	154.03
302.17	152.94	303.99	151.93	305.53	151.48	307.27	150.88	308.15	150.49
309.47	150.15	310.94	149.88	312.1	149.19	313.13	148.46	313.83	148.39
314.72	148.53	315.33	148.37	316.04	148.32	317.52	147.96	319.71	147.79
321.3	147.29	321.91	147.16	323.92	147.03	326.55	146.68	327.87	146.38
329.18	146.47	330.68	146.03	331.81	145.91	333.5	145.85	334.44	145.7
335.75	145.79	337.26	145.7	338.38	145.3	339.7	145.49	340.06	145.48
342.32	145.68	343.84	145.91	346.27	145.9	348.9	145.69	350.21	145.32
351.52	145.35	352.61	144.87	354.15	144.87	354.8	144.79	356.46	144.42
358.1	144.45	359.74	144.16	361.38	143.47	362.04	143.05	363.58	142.76
364.67	142.46	367.3	142.38	368.61	142.46	370.16	142.34	371.24	141.96
372.35	141.86	372.38	141.85	373.87	141.35	375.18	141.73	376.74	141.82
377.81	141.54	379.12	141.28	386.03	140.77	399.09	139.81	400.09	139.79
402.37	139.74	403.06	139.7	404.09	139.93	405.65	139.76	406.72	140.16
407.44	140.54	408.04	141.93	408.93	142.61	409.35	143.24	409.63	143.22
410.67	143.69	412.21	143.94	413.29	144.4	414.61	144.34	415.49	143.89
416.21	143.71	417.24	143.6	418.55	143.96	418.84	143.95	419.86	143.97
420.66	144.04	421.16	144.21	421.83	144.13	422.46	144.23	422.93	144.16
424.89	144.86	426.37	145.57	427.68	144.98	429.74	145.82	430.28	145.99
431.59	145.88	432.89	146.41	434.28	146.67	435.5	146.61	438.1	146.67
439.41	146.86	440.19	147.15	442.01	147.53	443.36	147.48	444.62	147.79
445.92	148.25	447.22	148.59	447.9	148.56	448.53	148.68	449.83	149.41
452.44	149.74	454.71	149.71	455.04	149.64	456.98	149.51	457.65	149.34
459.25	149.34	460.26	149.5	461.52	150.29	462.86	150.78	463.79	151.37
465.47	152.56	466.06	152.81	466.77	153.26	468.08	153.88	468.33	153.92
470.6	155.22	470.8	155.24	471.99	155.78	473.29	156.52	475.14	157.05
477.2	158.24	478.5	158.55	481.11	160.05	481.95	160.32	482.41	160.63

Belair Road.rep									
483.71	160.77	485.02	161.38	486.48	161.79	489.16	162.13	490.23	161.78
491.02	161.91	491.53	161.73	492.84	161.64	494.14	161.48	495.56	162.11
496.75	162.35	498.05	162.85	499.35	163.01	500.1	163.2	500.66	163.22
502.37	163.05	504.46	163.06	505.87	163.31	509.18	163.45	509.78	163.53
511.08	163.49	512.39	163.66	513.69	164.03	514.99	163.92	517.6	164.39
518.9	164.52	520.53	164.54	521.51	164.83	522.8	164.8	524.11	165.19
525.42	165.22	526.29	165.16	527.34	165.09	528.02	165.2	528.95	165.17
530.63	165.58	531.88	165.43	533.24	165.34	534.15	165.13	535.84	165.26
537.15	165.27	538.45	165.2	538.69	165.27	541.19	165.5	542.36	165.37
543.23	164.82	544.97	164.22	547.31	164.12	548.88	164.1	550.04	163.66
550.37	163.69	551.48	164.38	552.78	163.96	553.43	164.03	554.58	164.47
555.63	164.58	556.44	164.64	557.21	164.59	559.27	164.71	559.9	164.78
562.66	165	563.4	165.11	564.29	165.3	565.69	165.43	566.79	165.66
569.34	165.85	570.37	166	573.72	166.37	579.86	166.06	580.5	166.03
583.25	166.28	587.27	166.62	593.22	166.97	594.23	166.97	595.08	167
596.42	167.08	607.92	167.8	611.17	168	613.84	168.03	613.96	168.03
614.46	168.03	623.69	168.64	627.57	169	627.67	169.01	628.11	169.01
628.35	169.01	631.08	169.07	633.35	169.09	635.09	169.09	639.95	169.6
641.22	169.86	641.9	170	642.13	170.05	645.86	170.37	649.04	170.64
653.86	171	665.32	171.86	665.65	171.87	666.59	172	670.54	172.5
673.39	172.9	685.86	176.03	690.98	177.32	692.45	177.69	693.14	177.86
694.9	178.44	695.39	178.48	698.38	178.85	701.61	178.99	701.95	179.01
702.41	179.03	708.02	179.36	708.59	179.39	709.23	178.78	709.29	178.72
710.06	178.78	714.06	179.1	716.25	179.26	719.2	179.48	719.82	179.52
720.29	179.55	723.4	179.77	726.51	180	726.97	180.04	727.59	180.09
730.55	180.3	732.74	180.47	734.12	180.58	735.99	180.73	738.61	180.94
740.26	181.19								

Manning's n Values		num= 7							
Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
0	.03	91.9	.08	228.12	.013	273.03	.08	359.74	.035
409.35	.08	526.29	.03						

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	359.74	409.35		139.9	136.02		.3	.5
Ineffective Flow	num= 2							
Sta L	Sta R	Elev	Permanent					
0	356.46	160.96	T					
429.74	740.26	165.7	T					

CULVERT

RIVER: Whitemarsh Run
 REACH: 1 RS: 16.98

INPUT
 Description:
 Distance from Upstream XS = 30
 Deck/Roadway Width = 94
 Weir Coefficient = 2.6
 Upstream Deck/Roadway Coordinates

num= 15							
Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord	Sta	Hi Cord
0	175.5		25.5	173		141.7	166
178.2	164		201.8	163		228	162
318.87	160.96		318.87	163.63	0	356.54	163.9
416.13	165.7	0	497.13	170.13		497.13	167.46
522.83	168		550	169		692.93	178.68

Upstream Bridge Cross Section Data									
Station Elevation Data		num= 456							
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	168.26	.62	168.1	2.29	167.96	3.89	167.91	6.08	167.97
8.27	167.72	9.82	167.85	12.45	167.68	14.85	167.75	16.39	167.48
17.7	167.35	21.65	167.03	22.96	167.06	24.27	166.86	25.82	166.7
28.01	166.63	29.53	166.53	30.85	166.32	32.16	166.2	33.47	166.3
36.1	166.21	38.36	165.97	41.36	165.48	42.67	165.67	43.99	165.42
45.3	165.27	47.93	165.35	49.25	165.22	49.95	165.24	51.48	165.14

						Belair	Road.rep		
53.19	165.1	54.33	165	55.82	165.09	57.13	165	59.76	165.03
60.91	165.21	62.39	165.02	63.7	164.99	66.33	165.1	67.87	165.04
70.27	165.03	71.88	164.9	72.9	164.95	74.43	164.93	75.53	165.02
78.46	164.83	79.47	164.83	80.99	164.74	82.1	164.8	83.42	164.71
84.73	164.78	86.04	164.7	88.67	164.8	89.99	165.14	91.62	165.12
91.9	165.08	92.62	164.96	95.24	164.93	96	164.74	96.56	164.71
97.87	164.4	99.19	164.39	101.82	164.52	103.13	164.62	103.95	164.48
104.78	164.47	105.76	164.64	107.23	164.76	108.39	164.76	109.7	164.65
111.02	164.87	112.33	164.6	113.79	164.45	114.96	164.41	116.27	164.21
117.59	164.2	118.9	164.09	120.34	163.9	121.53	163.9	124.52	163.6
125.47	163.46	128.1	163.33	129.41	163.22	130.18	163.08	132.04	162.99
133.46	162.84	134.67	162.65	135.99	162.78	137.67	162.71	138.61	162.53
139.87	162.56	142.56	162.38	144.25	162.42	145.19	162.3	146.45	161.89
148.64	161.43	149.13	161.39	150.83	160.85	153.03	160.37	154.39	160.14
155.7	159.78	157.01	159.61	158.33	159.14	159.61	158.88	160.96	158.51
162.27	158.28	163.99	157.67	166.25	157.13	167.53	157.02	168.84	156.69
170.16	156.53	171.47	156.47	172.77	156.18	175.41	156.12	176.73	156.22
178.04	156.75	179.36	156.93	180.67	156.74	181.99	156.67	183.73	156.93
185.93	157.12	188.12	157.55	191.18	157.92	192.49	158.19	193.81	158.18
196.89	158.37	197.76	158.61	199.05	158.57	201.28	158.96	201.7	158.93
203.47	159.12	204.33	159.42	205.61	159.45	206.96	159.94	208.27	160.12
209.58	160.44	210.9	160.85	212.21	160.8	214.84	161.03	217.47	161.02
220.1	161.19	221.41	161.22	222.73	161.16	224.04	161.18	227.98	161.03
228.12	161.03	229.3	161.02	230.61	160.9	233.24	160.28	234.18	160.18
235.87	160.24	237.18	160.11	239.81	160.26	241.13	160.22	242.95	160.26
243.76	160.22	245.07	160.04	246.38	160.15	249.01	160.21	250.33	160.16
251.72	160.22	254.27	160.24	256.9	160.21	258.08	160.09	260.84	160.13
262.15	160.06	263.47	160.09	264.78	159.89	266.1	160.01	270.04	160.03
271.46	159.93	272.67	159.97	273.03	160.08	273.98	160.36	275.85	160.71
277.93	161.01	280.23	160.6	281.87	160.45	283.18	160.42	284.5	160.48
285.81	160.36	287.59	159.89	288.44	159.74	289.75	159.31	291.2	158.4
292.38	157.83	293.39	157.18	294.15	156.78	295.01	156.59	295.59	156.21
296.33	156.03	297.43	155.61	298.95	154.87	299.97	154.47	300.71	154.03
302.17	152.94	303.99	151.93	305.53	151.48	307.27	150.88	308.15	150.49
309.47	150.15	310.94	149.88	312.1	149.19	313.13	148.46	313.83	148.39
314.72	148.53	315.33	148.37	316.04	148.32	317.52	147.96	319.71	147.79
321.3	147.29	321.91	147.16	323.92	147.03	326.55	146.68	327.87	146.38
329.18	146.47	330.68	146.03	331.81	145.91	333.5	145.85	334.44	145.7
335.75	145.79	337.26	145.7	338.38	145.3	339.7	145.49	340.06	145.48
342.32	145.68	343.84	145.91	346.27	145.9	348.9	145.69	350.21	145.32
351.52	145.35	352.61	144.87	354.15	144.87	354.8	144.79	356.46	144.42
358.1	144.45	359.74	144.16	361.38	143.47	362.04	143.05	363.58	142.76
364.67	142.46	367.3	142.38	368.61	142.46	370.16	142.34	371.24	141.96
372.35	141.86	372.38	141.85	373.87	141.35	375.18	141.73	376.74	141.82
377.81	141.54	379.12	141.28	386.03	140.77	399.09	139.81	400.09	139.79
402.37	139.74	403.06	139.7	404.09	139.93	405.65	139.76	406.72	140.16
407.44	140.54	408.04	141.93	408.93	142.61	409.35	143.24	409.63	143.22
410.67	143.69	412.21	143.94	413.29	144.4	414.61	144.34	415.49	143.89
416.21	143.71	417.24	143.6	418.55	143.96	418.84	143.95	419.86	143.97
420.66	144.04	421.16	144.21	421.83	144.13	422.46	144.23	422.93	144.16
424.89	144.86	426.37	145.57	427.68	144.98	429.74	145.82	430.28	145.99
431.59	145.88	432.89	146.41	434.28	146.67	435.5	146.61	438.1	146.67
439.41	146.86	440.19	147.15	442.01	147.53	443.36	147.48	444.62	147.79
445.92	148.25	447.22	148.59	447.9	148.56	448.53	148.68	449.83	149.41
452.44	149.74	454.71	149.71	455.04	149.64	456.98	149.51	457.65	149.34
459.25	149.34	460.26	149.5	461.52	150.29	462.86	150.78	463.79	151.37
465.47	152.56	466.06	152.81	466.77	153.26	468.08	153.88	468.33	153.92
470.6	155.22	470.8	155.24	471.99	155.78	473.29	156.52	475.14	157.05
477.2	158.24	478.5	158.55	481.11	160.05	481.95	160.32	482.41	160.63
483.71	160.77	485.02	161.38	486.48	161.79	489.16	162.13	490.23	161.78
491.02	161.91	491.53	161.73	492.84	161.64	494.14	161.48	495.56	162.11
496.75	162.35	498.05	162.85	499.35	163.01	500.1	163.2	500.66	163.22
502.37	163.05	504.46	163.06	505.87	163.31	509.18	163.45	509.78	163.53
511.08	163.49	512.39	163.66	513.69	164.03	514.99	163.92	517.6	164.39
518.9	164.52	520.53	164.54	521.51	164.83	522.8	164.8	524.11	165.19
525.42	165.22	526.29	165.16	527.34	165.09	528.02	165.2	528.95	165.17
530.63	165.58	531.88	165.43	533.24	165.34	534.15	165.13	535.84	165.26
537.15	165.27	538.45	165.2	538.69	165.27	541.19	165.5	542.36	165.37
543.23	164.82	544.97	164.22	547.31	164.12	548.88	164.1	550.04	163.66

Belair Road.rep

550.37	163.69	551.48	164.38	552.78	163.96	553.43	164.03	554.58	164.47
555.63	164.58	556.44	164.64	557.21	164.59	559.27	164.71	559.9	164.78
562.66	165	563.4	165.11	564.29	165.3	565.69	165.43	566.79	165.66
569.34	165.85	570.37	166	573.72	166.37	579.86	166.06	580.5	166.03
583.25	166.28	587.27	166.62	593.22	166.97	594.23	166.97	595.08	167
596.42	167.08	607.92	167.8	611.17	168	613.84	168.03	613.96	168.03
614.46	168.03	623.69	168.64	627.57	169	627.67	169.01	628.11	169.01
628.35	169.01	631.08	169.07	633.35	169.09	635.09	169.09	639.95	169.6
641.22	169.86	641.9	170	642.13	170.05	645.86	170.37	649.04	170.64
653.86	171	665.32	171.86	665.65	171.87	666.59	172	670.54	172.5
673.39	172.9	685.86	176.03	690.98	177.32	692.45	177.69	693.14	177.86
694.9	178.44	695.39	178.48	698.38	178.85	701.61	178.99	701.95	179.01
702.41	179.03	708.02	179.36	708.59	179.39	709.23	178.78	709.29	178.72
710.06	178.78	714.06	179.1	716.25	179.26	719.2	179.48	719.82	179.52
720.29	179.55	723.4	179.77	726.51	180	726.97	180.04	727.59	180.09
730.55	180.3	732.74	180.47	734.12	180.58	735.99	180.73	738.61	180.94
740.26	181.19								

Manning's n Values		num=		7					
Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
0	.03	91.9	.08	228.12	.013	273.03	.08	359.74	.035
409.35	.08	526.29	.03						

Bank Sta: Left		Right	Coeff Contr.		Expan.
359.74		409.35	.3		.5
Ineffective Flow		num=	2		
Sta L	Sta R	Elev	Permanent		
0	356.46	160.96	T		
429.74	740.26	165.7	T		

Downstream Deck/Roadway Coordinates							
num=							
13							
Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord	Sta	Hi Cord
-116.2	173		0	166		28.2	164
51.8	163		78	162		168.87	160.96
168.87	163.63		206.54	163.9	0	266.13	165.7
347.13	170.13		347.13	167.46		372.83	168
398.83	169						

Downstream Bridge Cross Section Data											
Station Elevation Data											
num=											
490											
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-74.16	169.33	-73.43	169.34	-69.57	169.05	-68.21	169.04	-66.91	169.08		
-65.6	168.95	-64.3	168.96	-63.26	169.1	-61.69	169.23	-60.54	169.23		
-59.08	169.08	-58.29	168.95	-56.03	168.75	-55.17	168.64	-53.99	168.39		
-52.56	168.16	-51.25	167.82	-49.26	167.36	-47.8	166.97	-46.03	166.26		
-44.74	165.83	-43.42	165.66	-42.48	165.34	-40.81	164.95	-40.23	164.67		
-39.51	164.56	-38.53	164.59	-37.97	164.67	-35.43	164.78	-34.29	164.78		
-32.99	164.71	-31.2	164.87	-28.94	164.72	-26.16	164.57	-25.16	164.54		
-22.17	164.17	-21.24	164.13	-19.98	164.17	-18.63	164.11	-17.33	163.81		
-15.4	163.74	-14.72	163.62	-13.42	163.11	-13.14	163.06	-10.88	163.03		
-9.5	162.7	-8.2	162.6	-7.61	162.43	-6.89	162.07	-6.37	162.01		
-5.59	161.75	-4.52	161.67	-4.11	161.53	-2.98	160.82	-1.67	159.88		
-.37	159.51	.4	159.22	.94	158.72	1.54	158.46	2.24	157.76		
3.55	156.96	4.85	156.56	6.06	155.74	7.46	154.84	8.32	154.98		
8.77	154.93	9.38	154.64	10.07	154.14	11.37	153.48	12.84	153.05		
13.98	152.62	15.1	152.37	17.36	152.11	17.9	152.02	19.62	152.04		
20.51	151.91	21.88	152.05	23.11	151.68	24.8	151.49	25.72	151.27		
26.4	151.31	27.03	151.21	27.88	151.18	29.64	150.88	30.94	150.82		
32.24	150.67	34.05	150.66	34.85	150.6	37.46	150.14	38.77	149.96		
40.21	149.96	41.37	149.87	42.22	149.68	43.98	149.44	44.49	149.43		
45.29	149.28	46.38	149.2	46.75	149.12	47.9	149.04	49.01	149.06		
50.5	148.97	51.81	149.08	53.11	148.84	53.53	148.82	54.42	148.63		
55.63	148.62	57.03	148.4	58.05	148.02	58.71	147.84	59.63	147.68		
60.94	147.81	62.24	147.71	63.55	147.85	64.83	147.71	66.16	147.64		
68.76	147.44	70.07	147.42	71.37	147.14	72.68	147.13	73.87	147.04		
75.29	146.87	76.13	146.93	76.59	146.87	77.89	146.53	80.65	146.7		
81.81	146.63	82.91	146.45	84.42	146.43	85.72	146.31	87.02	146.42		
88.33	146.13	89.69	145.98	90.94	145.57	92.63	145.3	93.55	145.28		

94.85	145.33	96.48	145.1	97.46	145.01	100.07	145.28	101	145.2
102.68	144.8	103.98	144.77	105.52	144.69	107.78	144.84	109.2	144.72
110.5	144.41	111.81	144.5	113.11	144.54	114.56	144.35	115.72	144.48
117.02	144.34	118.33	144.38	119.08	144.3	120.94	144.28	122.24	144.22
123.6	144.09	124.85	144.15	127.46	143.93	129.64	143.83	132.64	143.8
133.98	143.83	134.9	143.76	135.8	143.82	137.89	144.03	139.42	143.81
140.5	143.78	141.69	143.64	143.95	144.29	145.05	144.26	147.02	144
148.33	143.99	149.63	144.25	151.22	144.5	153.54	144.42	154.85	144.18
156.15	144.45	157.39	144.88	158.76	144.81	160.07	144.86	161.37	144.6
162.68	144.5	163.98	144.68	165.28	144.38	166.55	144.33	168.81	144.18
170.5	144.11	173.33	143.85	175.59	143.9	177.85	143.87	178.33	143.91
179.63	143.8	180.94	143.77	182.24	143.82	183.54	143.6	184.63	143.51
186.15	143.56	187.46	143.55	188.76	143.64	190.07	143.57	191.42	143.09
192.67	142.3	193.98	141.66	195.28	140.08	195.94	139.79	196.59	139.6
197.48	139.09	198.2	138.48	199.2	137.73	200.56	137.13	201.8	136.67
202.72	136.18	204.41	136	205.72	136.08	207.24	136.1	208.33	136.07
209.81	136.11	211.76	136.22	213.54	136.27	217.46	136.3	218.54	136.28
221.37	136.29	223.06	136.34	236.26	136.36	239.8	136.37	256.91	136.39
257.9	136.38	260.51	136.17	261.41	136.33	263.13	136.46	263.66	136.65
264.43	136.77	265.74	136.89	265.92	136.83	268.17	136.71	268.59	136.76
269.65	137.22	270.42	137.35	272.26	137.86	274.87	138.9	276.18	139
277.18	138.85	277.91	139.02	278.79	139.34	279.43	139.4	280.09	139.65
281.01	140.32	281.68	140.7	282.71	141.05	283.93	141.05	284.12	141.17
285.32	142.51	286.19	142.62	287.22	142.65	288.44	142.76	289.23	142.91
290.69	142.95	291.84	143.07	292.94	143.35	294.45	143.23	295.2	143.24
297.45	143.11	299.64	143.22	300.98	143.36	302.29	143.36	303.59	143.56
304.9	143.69	306.46	143.71	307.51	143.89	308.71	143.96	310.12	144.14
310.96	144.3	312.06	144.33	313.21	144.53	314.03	144.78	315.47	144.76
316.64	144.64	317.72	144.81	319.97	145.24	321.37	145.43	322.22	145.5
323.17	145.5	324.47	145.72	327.58	145.93	328.98	146.16	330.68	146.11
331.23	146.17	332.31	146.45	333.61	146.58	334.92	146.3	336.22	146.21
337.53	146.34	338.83	146.39	340.27	146.73	341.44	146.94	342.97	147.32
344.85	147.98	345.34	148.24	347.14	148.42	347.94	148.44	349.24	148.58
349.42	148.65	350.54	148.73	351.71	150.22	352.02	150.48	353.15	150.51
354	151.21	357.05	151.73	358.05	152.22	359.65	152.91	361.07	153.31
363.15	154.51	364.09	155.02	364.86	155.59	365.44	155.77	366.16	156.22
367.1	156.63	367.73	157.05						

Belair Road.rep

653.76	182.57	655.03	182.64	656.33	182.77	657.63	182.62	658.93	182.7
661.53	182.67	662.83	182.79	664.13	182.73	665.2	182.73	667.35	182.79

Manning's n Values num= 4

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
-74.16	.05	197.48	.035	274.87	.05	394.16	.015

Bank Sta: Left Right Coeff Contr. Expan.

197.48	274.87	.3	.5
--------	--------	----	----

Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
0	205.72	160.5	F
268.59	665.2	160.5	F

Upstream Embankment side slope = 3 horiz. to 1.0 vertical
Downstream Embankment side slope = 3 horiz. to 1.0 vertical
Maximum allowable submergence for weir flow = .98
Elevation at which weir flow begins =
Energy head used in spillway design =
Spillway height used in design =
Weir crest shape = Broad Crested

Number of Culverts = 1

Culvert Name Shape Rise Span
Culvert #1 Circular 9
FHWA Chart # 2 - Corrugated Metal Pipe Culvert
FHWA Scale # 2 - Mitered to conform to slope
Solution Criteria = Highest U.S. EG
Culvert Upstrm Dist Length Top n Bottom n Depth Blocked Entrance Loss Coef Exit Loss Coef

30	94	.024	.024	0		.7	1
----	----	------	------	---	--	----	---

Number of Barrels = 3
Upstream Elevation = 139.8

Centerline Stations

Sta.	Sta.	Sta.
380	392	404

Downstream Elevation = 138.2

Centerline Stations

Sta.	Sta.	Sta.
230	242	254

CROSS SECTION

RIVER: Whitemarsh Run
REACH: 1 RS: 16.86

INPUT

Description:

Station Elevation Data num= 490

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-74.16	169.33	-73.43	169.34	-69.57	169.05	-68.21	169.04	-66.91	169.08
-65.6	168.95	-64.3	168.96	-63.26	169.1	-61.69	169.23	-60.54	169.23
-59.08	169.08	-58.29	168.95	-56.03	168.75	-55.17	168.64	-53.99	168.39
-52.56	168.16	-51.25	167.82	-49.26	167.36	-47.8	166.97	-46.03	166.26
-44.74	165.83	-43.42	165.66	-42.48	165.34	-40.81	164.95	-40.23	164.67
-39.51	164.56	-38.53	164.59	-37.97	164.67	-35.43	164.78	-34.29	164.78
-32.99	164.71	-31.2	164.87	-28.94	164.72	-26.16	164.57	-25.16	164.54
-22.17	164.17	-21.24	164.13	-19.98	164.17	-18.63	164.11	-17.33	163.81
-15.4	163.74	-14.72	163.62	-13.42	163.11	-13.14	163.06	-10.88	163.03
-9.5	162.7	-8.2	162.6	-7.61	162.43	-6.89	162.07	-6.37	162.01
-5.59	161.75	-4.52	161.67	-4.11	161.53	-2.98	160.82	-1.67	159.88
-.37	159.51	.4	159.22	.94	158.72	1.54	158.46	2.24	157.76
3.55	156.96	4.85	156.56	6.06	155.74	7.46	154.84	8.32	154.98
8.77	154.93	9.38	154.64	10.07	154.14	11.37	153.48	12.84	153.05
13.98	152.62	15.1	152.37	17.36	152.11	17.9	152.02	19.62	152.04
20.51	151.91	21.88	152.05	23.11	151.68	24.8	151.49	25.72	151.27
26.4	151.31	27.03	151.21	27.88	151.18	29.64	150.88	30.94	150.82
32.24	150.67	34.05	150.66	34.85	150.6	37.46	150.14	38.77	149.96

							Belair	Road.rep		
40.21	149.96	41.37	149.87	42.22	149.68	43.98	149.44	44.49	149.43	
45.29	149.28	46.38	149.2	46.75	149.12	47.9	149.04	49.01	149.06	
50.5	148.97	51.81	149.08	53.11	148.84	53.53	148.82	54.42	148.63	
55.63	148.62	57.03	148.4	58.05	148.02	58.71	147.84	59.63	147.68	
60.94	147.81	62.24	147.71	63.55	147.85	64.83	147.71	66.16	147.64	
68.76	147.44	70.07	147.42	71.37	147.14	72.68	147.13	73.87	147.04	
75.29	146.87	76.13	146.93	76.59	146.87	77.89	146.53	80.65	146.7	
81.81	146.63	82.91	146.45	84.42	146.43	85.72	146.31	87.02	146.42	
88.33	146.13	89.69	145.98	90.94	145.57	92.63	145.3	93.55	145.28	
94.85	145.33	96.48	145.1	97.46	145.01	100.07	145.28	101	145.2	
102.68	144.8	103.98	144.77	105.52	144.69	107.78	144.84	109.2	144.72	
110.5	144.41	111.81	144.5	113.11	144.54	114.56	144.35	115.72	144.48	
117.02	144.34	118.33	144.38	119.08	144.3	120.94	144.28	122.24	144.22	
123.6	144.09	124.85	144.15	127.46	143.93	129.64	143.83	132.64	143.8	
133.98	143.83	134.9	143.76	135.8	143.82	137.89	144.03	139.42	143.81	
140.5	143.78	141.69	143.64	143.95	144.29	145.05	144.26	147.02	144	
148.33	143.99	149.63	144.25	151.22	144.5	153.54	144.42	154.85	144.18	
156.15	144.45	157.39	144.88	158.76	144.81	160.07	144.86	161.37	144.6	
162.68	144.5	163.98	144.68	165.28	144.38	166.55	144.33	168.81	144.18	
170.5	144.11	173.33	143.85	175.59	143.9	177.85	143.87	178.33	143.91	
179.63	143.8	180.94	143.77	182.24	143.82	183.54	143.6	184.63	143.51	
186.15	143.56	187.46	143.55	188.76	143.64	190.07	143.57	191.42	143.09	
192.67	142.3	193.98	141.66	195.28	140.08	195.94	139.79	196.59	139.6	
197.48	139.09	198.2	138.48	199.2	137.73	200.56	137.13	201.8	136.67	
202.72	136.18	204.41	136	205.72	136.08	207.24	136.1	208.33	136.07	
209.81	136.11	211.76	136.22	213.54	136.27	217.46	136.3	218.54	136.28	
221.37	136.29	223.06	136.34	236.26	136.36	239.8	136.37	256.91	136.39	
257.9	136.38	260.51	136.17	261.41	136.33	263.13	136.46	263.66	136.65	
264.43	136.77	265.74	136.89	265.92	136.83	268.17	136.71	268.59	136.76	
269.65	137.22	270.42	137.35	272.26	137.86	274.87	138.9	276.18	139	
277.18	138.85	277.91	139.02	278.79	139.34	279.43	139.4	280.09	139.65	
281.01	140.32	281.68	140.7	282.71	141.05	283.93	141.05	284.12	141.17	
285.32	142.51	286.19	142.62	287.22	142.65	288.44	142.76	289.23	142.91	
290.69	142.95	291.84	143.07	292.94	143.35	294.45	143.23	295.2	143.24	
297.45	143.11	299.64	143.22	300.98	143.36	302.29	143.36	303.59	143.56	
304.9	143.69	306.46	143.71	307.51	143.89	308.71	143.96	310.12	144.14	
310.96	144.3	312.06	144.33	313.21	144.53	314.03	144.78	315.47	144.76	
316.64	144.64	317.72	144.81	319.97	145.24	321.37	145.43	322.22	145.5	
323.17	145.5	324.47	145.72	327.58	145.93	328.98	146.16	330.68	146.11	
331.23	146.17	332.31	146.45	333.61	146.58	334.92	146.3	336.22	146.21	
337.53	146.34	338.83	146.39	340.27	146.73	341.44	146.94	342.97	147.32	
344.85	147.98	345.34	148.24	347.14	148.42	347.94	148.44	349.24	148.58	
349.42	148.65	350.54	148.73	351.71	150.22	352.02	150.48	353.15	150.51	
354	151.21	357.05	151.73	358.05	152.22	359.65	152.91	361.07	153.31	
363.15	154.51	364.09	155.02	364.86	155.59	365.44	155.77	366.16	156.22	
367.1	156.63	367.73	157.05	368.76	158.03	370.02	158.69	371.36	159.54	
372.31	159.98	373.14	160.15	373.97	160.41	375.27	161.09	376.57	161.44	
377.87	162.57	379.17	164.07	380.47	165	381.46	165.26	382.19	165.19	
383.07	165.31	383.75	165.48	384.38	165.95	385.68	167.34	388.32	167.97	
389.58	168.66	392.18	169.06	393.48	168.97	394.16	169.13	394.78	169.28	
397.27	169.22	399.77	169.36	402.59	169.77	403.89	169.92	406.5	170.04	
407.8	169.81	408.92	170.13	411.7	170.27	413	170.44	414.3	170.46	
416.91	170.61	419.51	170.67	422.11	170.58	424.42	170.86	426.01	170.92	
427.43	171.03	428.62	171.18	429.51	171.06	430.45	171.1	432.52	171.31	
433.82	171.55	435.12	171.46	438.67	171.7	439.5	171.71	441.63	171.83	
443.24	172.03	445.53	172.02	447.82	172.07	450.74	172.27	452.04	172.22	
453.34	172.47	455.94	172.62	457.24	172.63	459.26	172.73	459.84	172.71	
461.15	172.8	463.84	173.04	466.35	173.2	467.65	173.23	468.95	173.41	
469.66	173.35	470.7	173.36	472.68	173.5	475.28	173.64	476.76	173.67	
478.06	173.77	480.66	173.91	484.43	174.19	487.17	174.34	488.47	174.27	
489.77	174.26	494.98	174.35	496.28	174.44	497.58	174.45	498.88	174.52	
501.48	174.61	504.09	174.65	505.39	174.64	506.69	174.71	508.88	174.72	
510.59	174.8	511.89	174.97	513.19	174.93	514.5	174.83	515.8	174.89	
517.1	175.02	521	174.96	523.96	175.07	527.91	175	530	175.11	
534.01	175.22	536.03	175.21	537.92	175.24	539.35	175.23	541.82	175.3	
543.12	175.24	546.21	175.4	548.33	175.41	549.63	175.57	552.23	175.81	
553.08	175.76	554.13	175.79	554.83	175.91	557.66	176.2	558.74	176.19	
560.16	176.3	561.34	176.47	562.23	176.48	563.94	176.73	565.24	176.8	
566.54	176.99	567.84	176.96	569.15	177.02	570.45	177.26	572.23	177.44	

Belair Road.rep									
574.35	177.56	575.96	177.69	576.95	177.83	578.25	177.9	580.54	178.16
582.83	178.45	584.76	178.74	586.06	178.76	588.66	179.13	591.98	179.44
595.17	179.81	596.47	179.93	597.77	180.16	598.84	180.18	600.37	180.32
601.68	180.37	602.98	180.61	604.28	180.75	608	180.96	609.48	181.1
612.09	181.25	612.57	181.21	614.69	181.29	617.15	181.6	618.59	181.55
621.19	181.62	622.5	181.76	625.1	181.83	626.52	181.84	629.54	181.95
630.3	182.04	632.9	182.14	634.21	182.23	636.81	182.3	639.41	182.41
640.71	182.32	641.61	182.32	643.31	182.42	644.61	182.38	645.92	182.42
646.9	182.53	648.52	182.59	649.82	182.49	651.47	182.47	652.42	182.55
653.76	182.57	655.03	182.64	656.33	182.77	657.63	182.62	658.93	182.7
661.53	182.67	662.83	182.79	664.13	182.73	665.2	182.73	667.35	182.79

Manning's n Values				num= 4			
Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
-74.16	.05	197.48	.035	274.87	.05	394.16	.015
Bank Sta: Left		Right	Lengths: Left Channel		Right	Coeff Contr.	Expan.
197.48		274.87	40.7 36.32		32.18	.3	.5
Ineffective Flow				num= 2			
Sta L	Sta R	Elev	Permanent				
0	205.72	160.5	F				
268.59	665.2	160.5	F				

Belair Road.rep									
231.46	140.67	234.04	140.7	235.39	140.64	236.63	140.71	238.16	140.53
239.21	140.48	240.14	140.57	240.92	140.82	241.8	141.19	243.09	141.34
244.38	141.39	244.99	141.45	245.67	141.45	248.25	141.6	249.55	141.7
250.84	141.76	251.97	141.94	253.42	141.99	254.71	142.1	256.01	141.97
257.3	142.16	258.59	142.14	259.88	142.25	261.17	142.45	261.97	142.63
262.46	142.67	263.76	142.57	264.4	142.55	265.79	142.67	266.34	142.79
267.63	142.85	268.92	142.84	270.22	142.96	271.87	142.96	272.95	142.85
274.33	142.94	275.7	142.95	276.19	143.01	277.07	143.22	278.44	143.42
279.49	143.43	279.82	143.54	281.19	143.82	282.56	143.86	284.85	144.28
285.52	144.37	286.68	144.38	287.53	144.69	288.05	144.97	289.54	145.52
290.8	145.85	292.17	145.88	293.56	146.47	294.91	146.47	295.57	146.52
296.29	146.66	297.58	146.44	299.03	146.48	300.4	146.65	301.6	146.93
302.16	147.21	303.15	147.59	303.61	147.92	304.52	148.3	305.62	148.65
305.89	148.63	306.48	149.03	307.27	149.51	307.63	149.58	308.64	150.01
310.01	150.69	311.39	150.98	311.65	151.14	312.76	152.52	313.66	153.14
314.13	153.01	315.14	153.66	315.67	153.96	317.68	154.37	318.25	154.81
319.69	155.74	320.99	155.99	321.7	156.36	322.37	156.57	323.71	158.02
323.79	158.08	325.11	158.55	326.48	160.55	327.86	160.78	328.12	161
329.23	162.18	329.74	162.36	330.6	162.5	331.75	163.23	331.97	163.45
333.35	164.52	333.76	164.91	334.72	166	336.09	166.03	337.46	166.42
337.78	166.56	339.79	167.08	340.21	167.26	341.58	167.74	342.95	168.14
343.82	168.22	344.33	168.4	345.83	168.6	347.07	168.88	347.84	169.16
348.44	169.26	349.82	169.75	351.19	169.73	352.56	170.07	353.87	170.19
354.58	170.38	355.31	170.57	355.88	170.64	356.68	170.86	359.42	170.97
359.9	170.97	360.8	171.04	361.91	171.26	363.92	171.41	364.92	171.44
366.29	171.56	367.94	171.59	369.03	171.78	370.41	171.88	371.96	171.87
373.15	172.01	374.52	172.11	375.72	172.14	377.27	172.24	377.99	172.26
380	172.4	381.39	172.48	382.01	172.36	382.76	172.35	384.02	172.64
385.5	172.66	386.88	172.83	388.04	172.75	390.05	172.72	392.06	172.87
393.03	172.84	394.07	172.86	395.11	173.04	396.48	173.15	398.09	173.31
399.23	173.38	400.1	173.36	401.97	173.4	403.35	173.49	404.72	173.47
406.09	173.51	407.46	173.64	408.14	173.6	408.84	173.63	410.15	173.62
411.58	173.65	412.95	173.62	414.33	173.71	415.7	173.75	417.07	173.75
418.99	173.83	421.19	173.96	422.56	173.91	423.94	174.01	425.31	173.95
426.68	173.95	427.64	174.04	429.43	174.13	430.25	174.13	430.8	174.07
431.97	174.11	433.54	174.07	436.3	174.1	437.66	174.08	439.03	174.15
440.3	174.06	443.15	174.13	444.33	174.11	445.9	174.23	447.27	174.14
448.35	174.2	450.36	174.28	452.37	174.3	452.76	174.34	454.38	174.41
455.5	174.37	456.39	174.37	459.62	174.48	460.99	174.47	462.26	174.54
463.74	174.52	465.11	174.54	466.44	174.59	467.86	174.54	470.46	174.53
473.35	174.56	475.24	174.52	476.09	174.53	477.47	174.63	478.84	174.59
480.21	174.79	481.58	174.73	482.96	174.7	484.53	174.76	485.7	174.73
487.07	174.78	488.55	174.79	489.82	174.75	491.19	174.75	492.55	174.82
493.94	174.77	495.31	174.78	496.68	174.76	498.05	174.77	498.6	174.81
502.62	174.9	504.92	174.92	506.29	174.91	507.66	174.98	509.03	175.21
510.41	174.98	511.78	174.93	513.15	174.99	515.9	175	516.69	175.03
518.64	175.03	520.01	175.07	521.39	175.04	524.13	175.09	524.73	175.15
526.88	175.17	528.25	175.23	529.62	175.25	532.37	175.36	534.78	175.4
536.49	175.52	537.86	176.12	538.8	176.73	539.23	177.07	541.98	179.96
542.83	180.79	543.35	181.2	544.84	181.18	546.85	181.23	548.8	181.3
550.21	181.3	550.87	181.33	551.58	181.31	552.96	181.58	554.33	181.59
555.7	181.7	556.9	181.73	558.45	181.84	559.82	181.98	560.92	182
562.56	182.09	563.94	182.11	565.31	182.18	566.68	182.14	570.44	182.32
570.97	182.32	572.17	182.19	573.54	182.32	574.99	182.3	576.29	182.33
577.66	182.28	581.02	182.45	583.15	182.46	584.53	182.56	585.9	182.57
587.05	182.66	588.64	182.62	590.02	182.64	591.07	182.7	592.76	182.74
594.13	182.71	595.09	182.76	597.1	182.79	599.11	182.76	602.37	182.85
603.74	182.91	605.11	183	606.49	182.91	607.86	182.9	609.38	182.97
611.17	182.99	611.98	182.97	614.72	183.03	616.09	183.03	617.47	183.12
618.84	183.17	620.21	183.15	621.58	183.25	623.23	183.29	625.24	183.4
625.7	183.38	628.45	183.42	629.82	183.47	632.56	183.53	637.3	183.58
702.57	183.89	703.94	183.8	705.65	183.73	707.66	183.57	708.06	183.56
709.43	183.66	710.8	183.21	711.9	183.16				

Manning's n Values num= 4

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
0	.05	146.2	.035	223.71	.05	354.58	.015

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.

Page 31

146.2 223.71 0 0 0 Belair Road.rep .1 .3
 Ineffective Flow num= 2
 Sta L Sta R Elev Permanent
 0 83.43 160.5 F
 244.38 711.9 160.5 F

SUMMARY OF MANNING'S N VALUES

River:Whitemarsh Run

Reach	River Sta.	n1	n2	n3	n4	n5	n6	n7
1	17.59	.013	.08	.035	.08			
1	17.52	.013	.08	.035	.08			
1	17.41	.013	.08	.035	.08			
1	17.39	.013	.08	.035	.08	.03		
1	17.37	.013	.08	.035	.08	.03		
1	17.35	.013	.08	.035	.08	.03		
1	17.33	.013	.08	.035	.08	.03	.03	
1	17.29	.013	.08	.035	.08	.03		
1	17.27	.013	.08	.035	.08	.03		
1	17.25	.013	.08	.035	.08	.03		
1	17.22	.08	.013	.08	.035	.08	.03	.045
1	17.20	.03	.08	.013	.08	.035	.08	.03
1	17.13	.03	.08	.013	.08	.035	.08	.03
1	17.09	.03	.08	.013	.08	.035	.08	.03
1	16.98	Culvert						
1	16.86	.05	.035	.05	.015			
1	16.80	.05	.035	.05	.015			

SUMMARY OF REACH LENGTHS

River: Whitemarsh Run

Reach	River Sta.	Left	Channel	Right
1	17.59	324.06	285.46	241.07
1	17.52	503.81	443.88	439.17
1	17.41	78.82	87.09	85.54
1	17.39	37.31	60.85	73.16
1	17.37	49.75	65.61	71.57
1	17.35	56.25	69.36	74.19
1	17.33	165.95	146.59	127.68
1	17.29	78.52	69.25	65.48
1	17.27	77.71	84.1	87.23
1	17.25	107.02	107.92	97.7
1	17.22	84.87	72.33	64.28
1	17.20	36.99	38.09	41.26
1	17.13	21.67	21.88	21.95
1	17.09	139.9	136.02	133.64
1	16.98	Culvert		
1	16.86	40.7	36.32	32.18
1	16.80	0	0	0

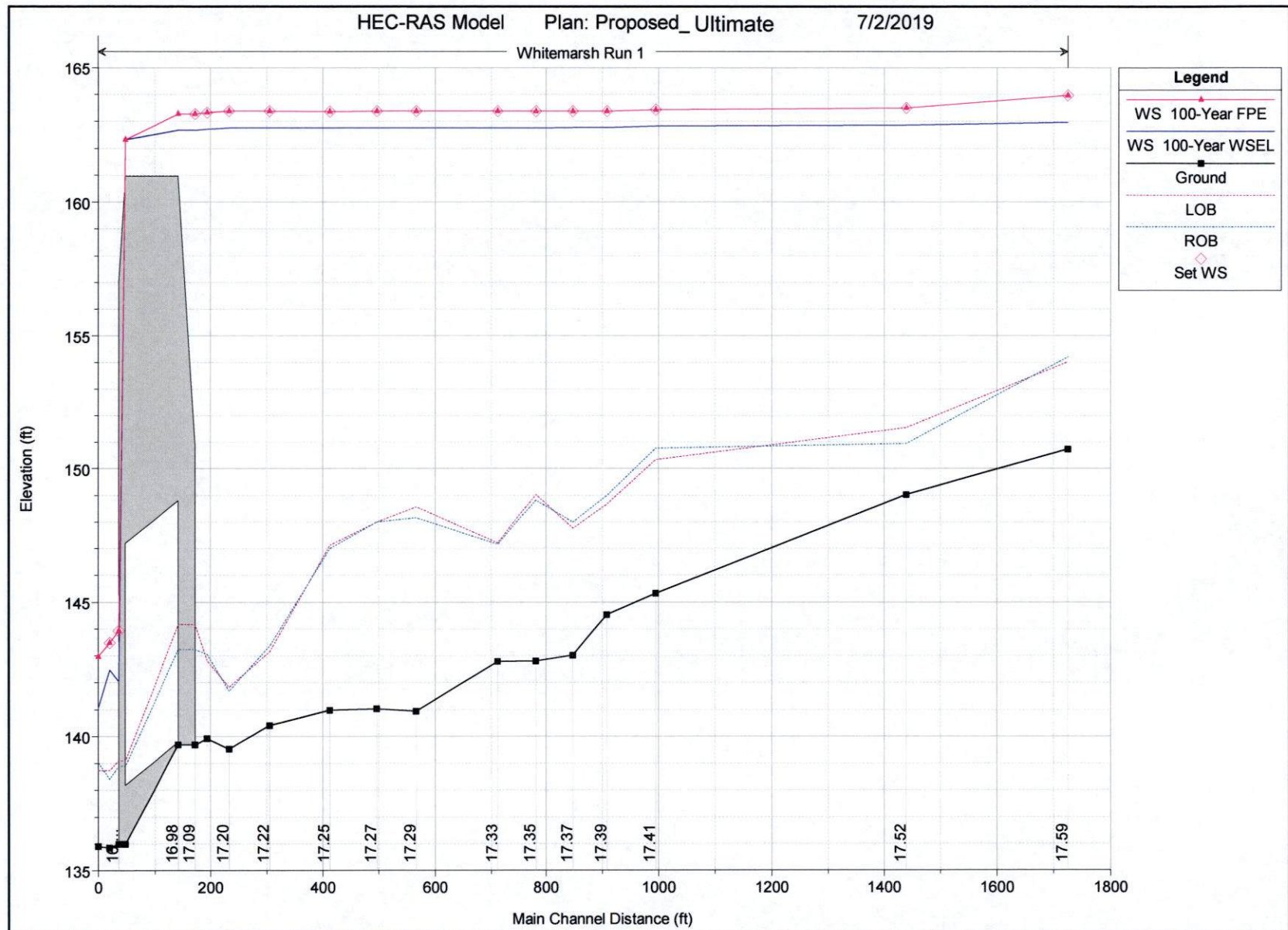
SUMMARY OF CONTRACTION AND EXPANSION COEFFICIENTS

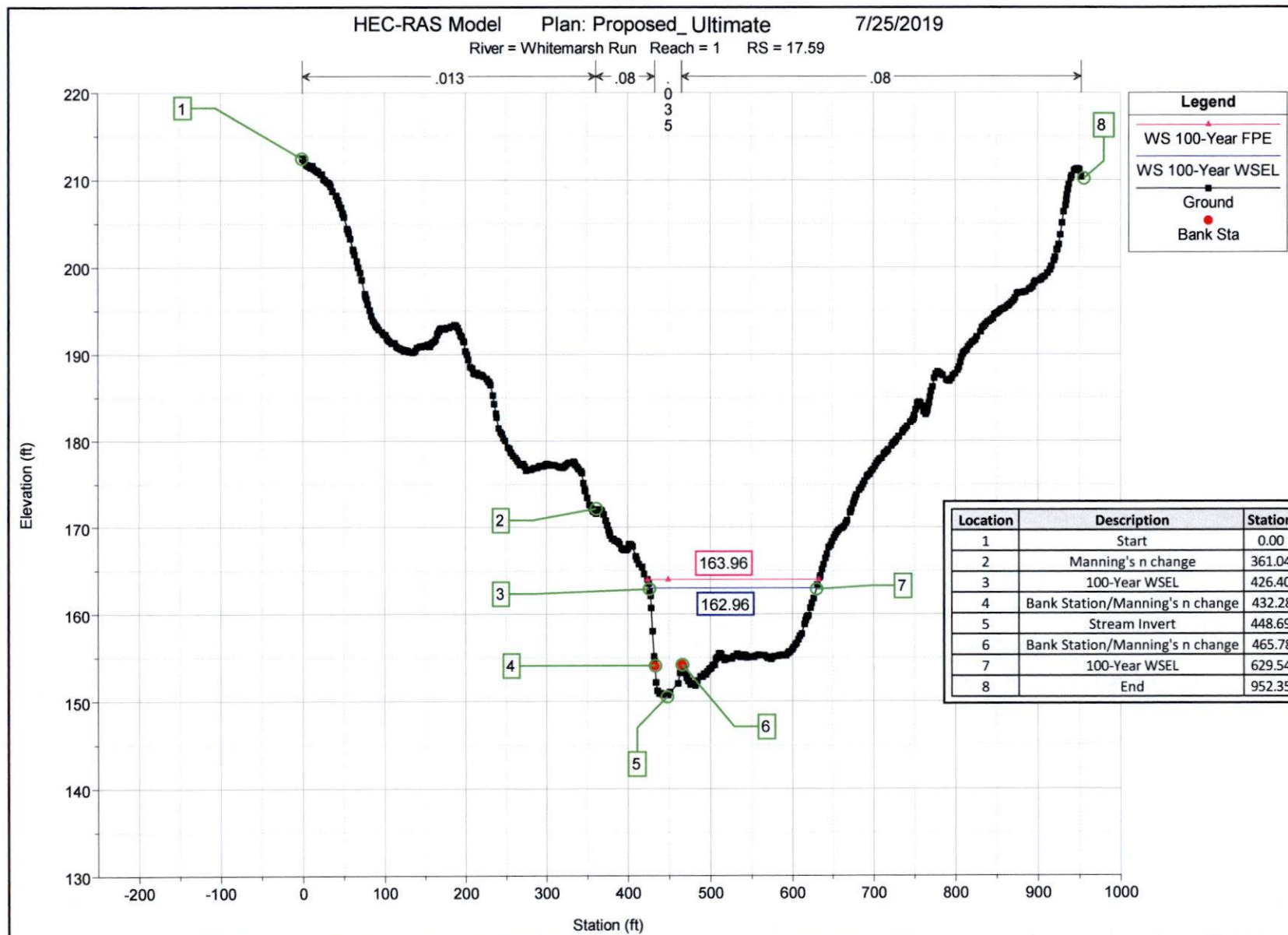
River: Whitemarsh Run

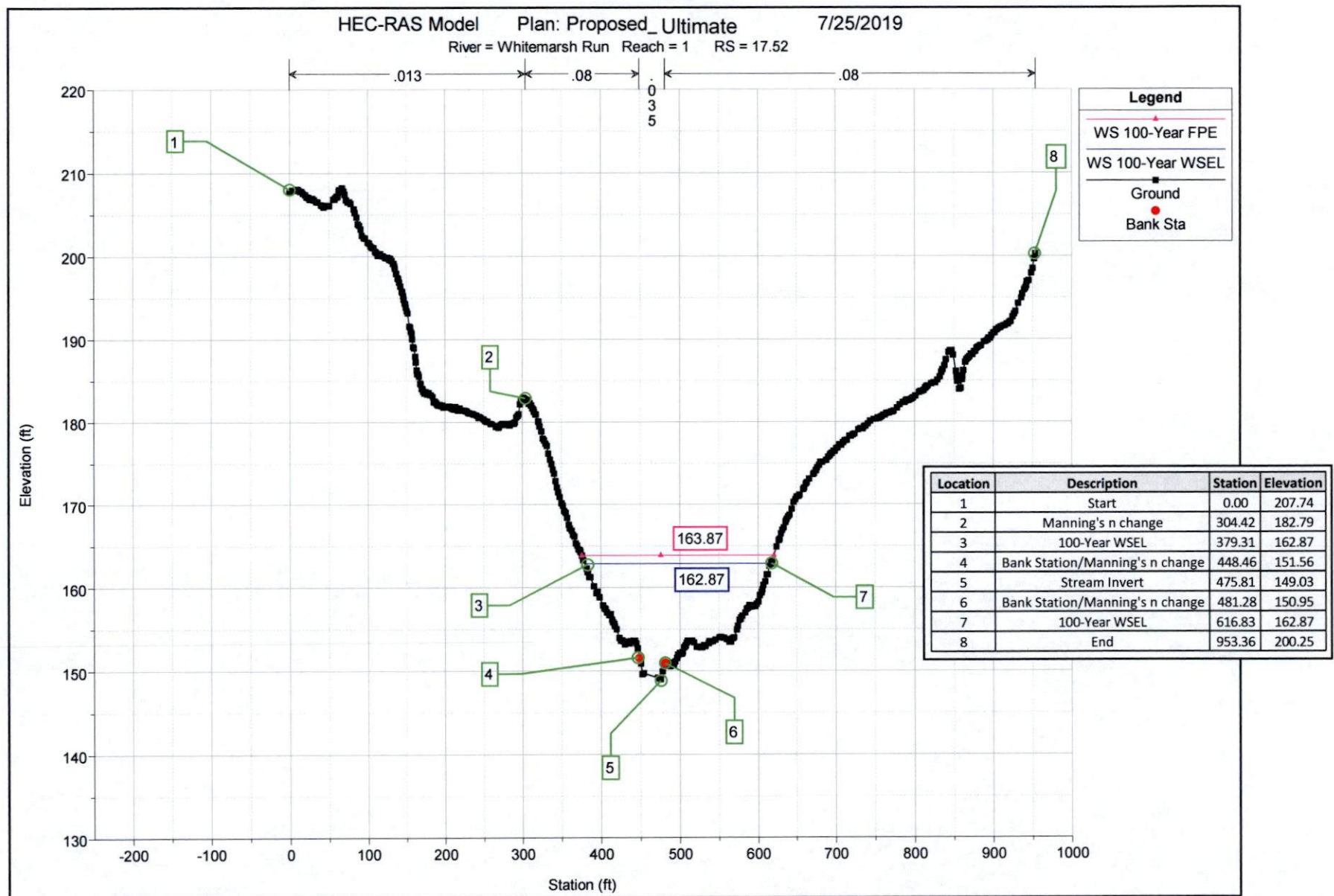
Reach	River Sta.	Contr.	Expan.
1	17.59	.1	.3

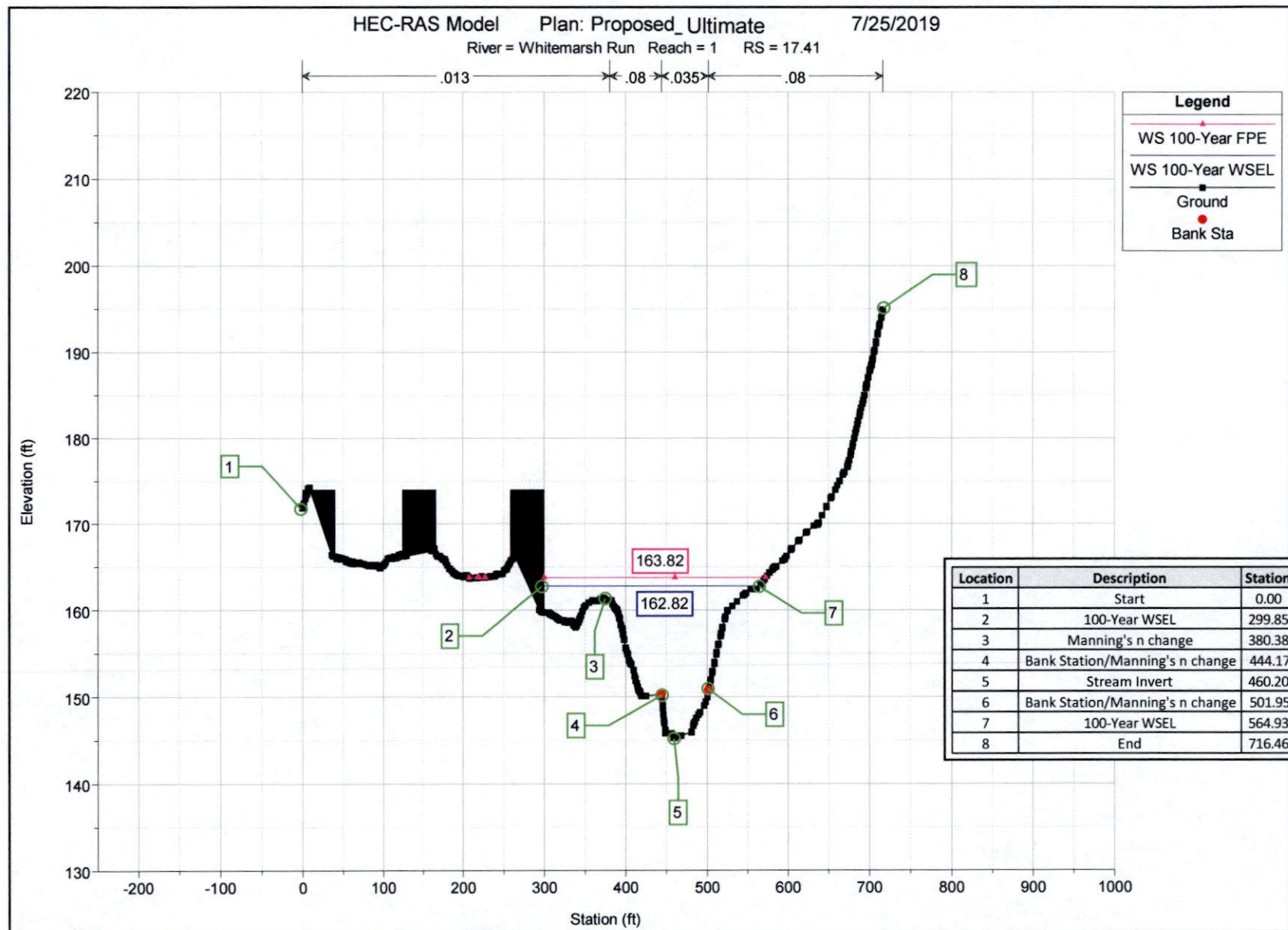
			Belair Road.rep
1	17.52	.1	.3
1	17.41	.1	.3
1	17.39	.1	.3
1	17.37	.1	.3
1	17.35	.1	.3
1	17.33	.1	.3
1	17.29	.1	.3
1	17.27	.1	.3
1	17.25	.1	.3
1	17.22	.1	.3
1	17.20	.1	.3
1	17.13	.3	.5
1	17.09	.3	.5
1	16.98	Culvert	
1	16.86	.3	.5
1	16.80	.1	.3

HEC-RAS Plan Proposed ULT River Whitemarsh Run Reach: 1 Profile: 100-Year WSEL													
Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crt W.S.	E.G. Elev	E.G. Slope	Vel Cntl	Flow Area	Top Width	Froude # Ctl	
		(cfs)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft/s)	(ft/s)	(sq ft)	(ft)		
1	17.69	100-Year WSEL	3940.00	160.73	162.89	167.53	163.16	0.000543	4.85	1856.64	203.15	0.25	
1	17.52	100-Year WSEL	3940.00	148.03	162.87	156.12	163.03	0.000352	4.36	1973.02	237.56	0.21	
1	17.41	100-Year WSEL	3940.00	145.33	162.82	152.16	162.92	0.000125	2.93	1957.24	285.10	0.13	
1	17.39	100-Year WSEL	3940.00	144.53	162.77	151.66	162.91	0.000165	3.54	2321.91	285.21	0.15	
1	17.37	100-Year WSEL	3940.00	143.02	162.77	151.69	162.90	0.000162	3.55	2502.01	314.75	0.15	
1	17.35	100-Year WSEL	3940.00	142.80	162.76	151.14	162.89	0.000159	3.52	2425.04	298.42	0.14	
1	17.33	100-Year WSEL	3940.00	142.79	162.78	151.29	162.87	0.000159	3.60	2203.50	259.21	0.15	
1	17.29	100-Year WSEL	3940.00	140.84	162.78	146.43	162.85	0.000069	2.74	2401.21	437.40	0.11	
1	17.27	100-Year WSEL	3940.00	141.02	162.77	146.71	162.83	0.000071	2.49	2561.92	327.51	0.10	
1	17.25	100-Year WSEL	3940.00	140.97	162.78	149.51	162.83	0.000083	2.71	2562.60	421.56	0.11	
1	17.22	100-Year WSEL	3940.00	140.41	162.77	147.07	162.81	0.000047	2.23	3078.89	339.59	0.09	
1	17.20	100-Year WSEL	3940.00	139.53	162.78	145.83	162.81	0.000048	2.31	3695.74	595.53	0.09	
1	17.13	100-Year WSEL	3940.00	139.92	162.71	146.50	162.80	0.000072	2.76	2406.69	412.09	0.10	
1	17.09	100-Year WSEL	3940.00	139.70	162.87	146.93	162.79	0.000093	3.07	1857.03	359.98	0.12	
1	16.88		Channel										
1	16.86	100-Year WSEL	3940.00	136.00	141.32	141.32	143.80	0.070463	12.63	311.92	89.99	1.00	
1	16.80	100-Year WSEL	3940.00	135.80	141.05	141.05	142.97	0.009794	11.21	373.08	107.80	0.94	



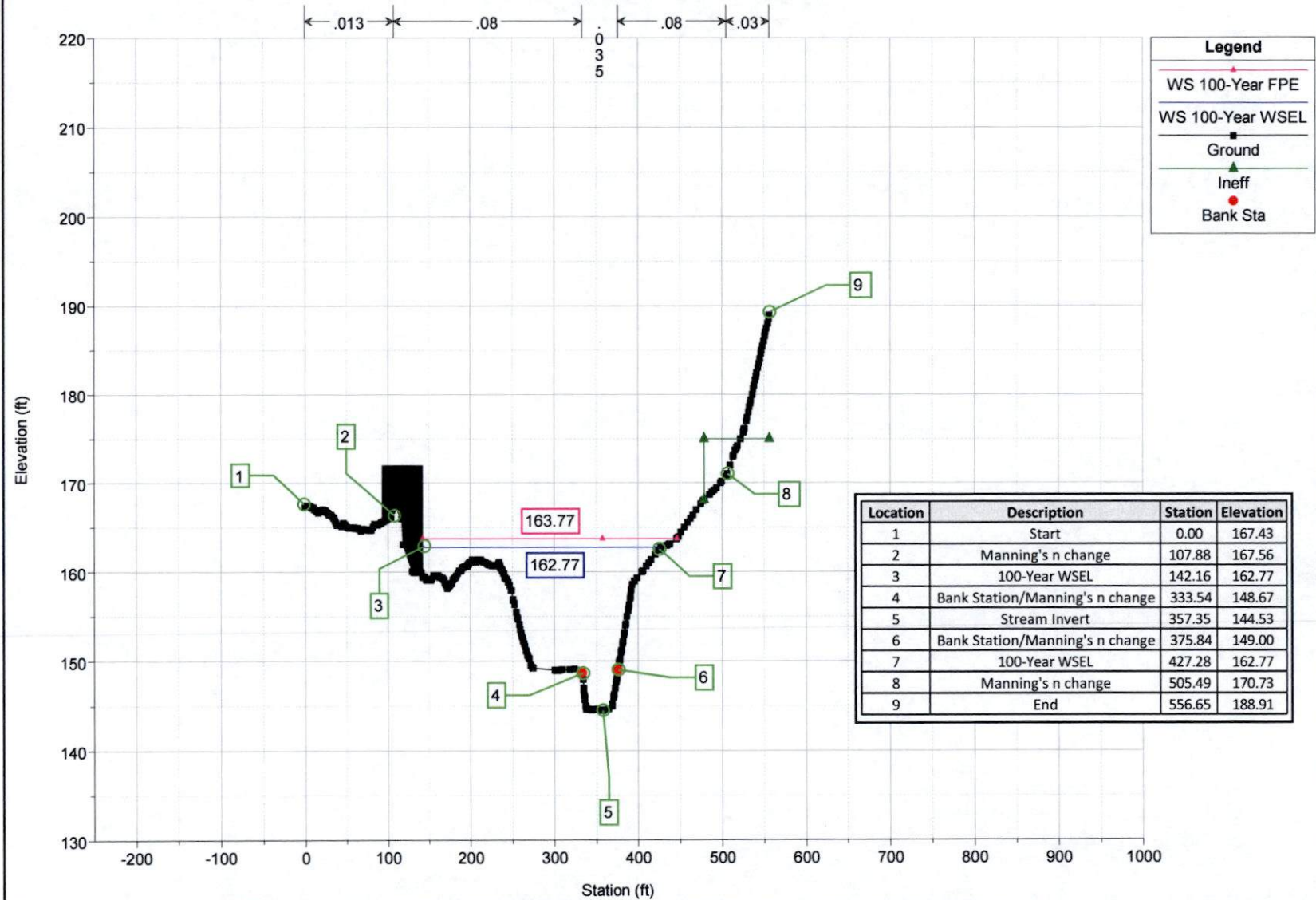






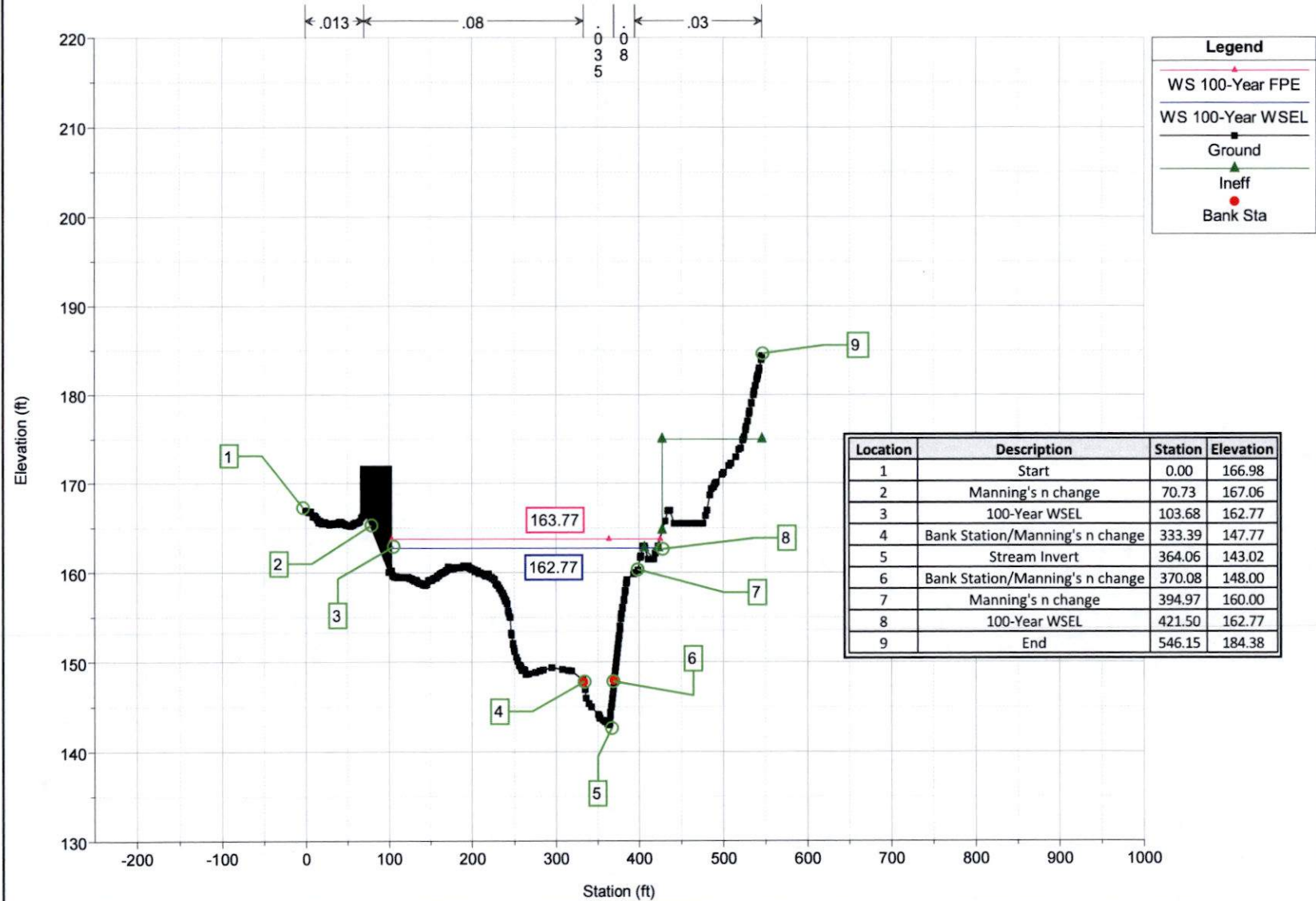
HEC-RAS Model Plan: Proposed_Ultimate 7/25/2019

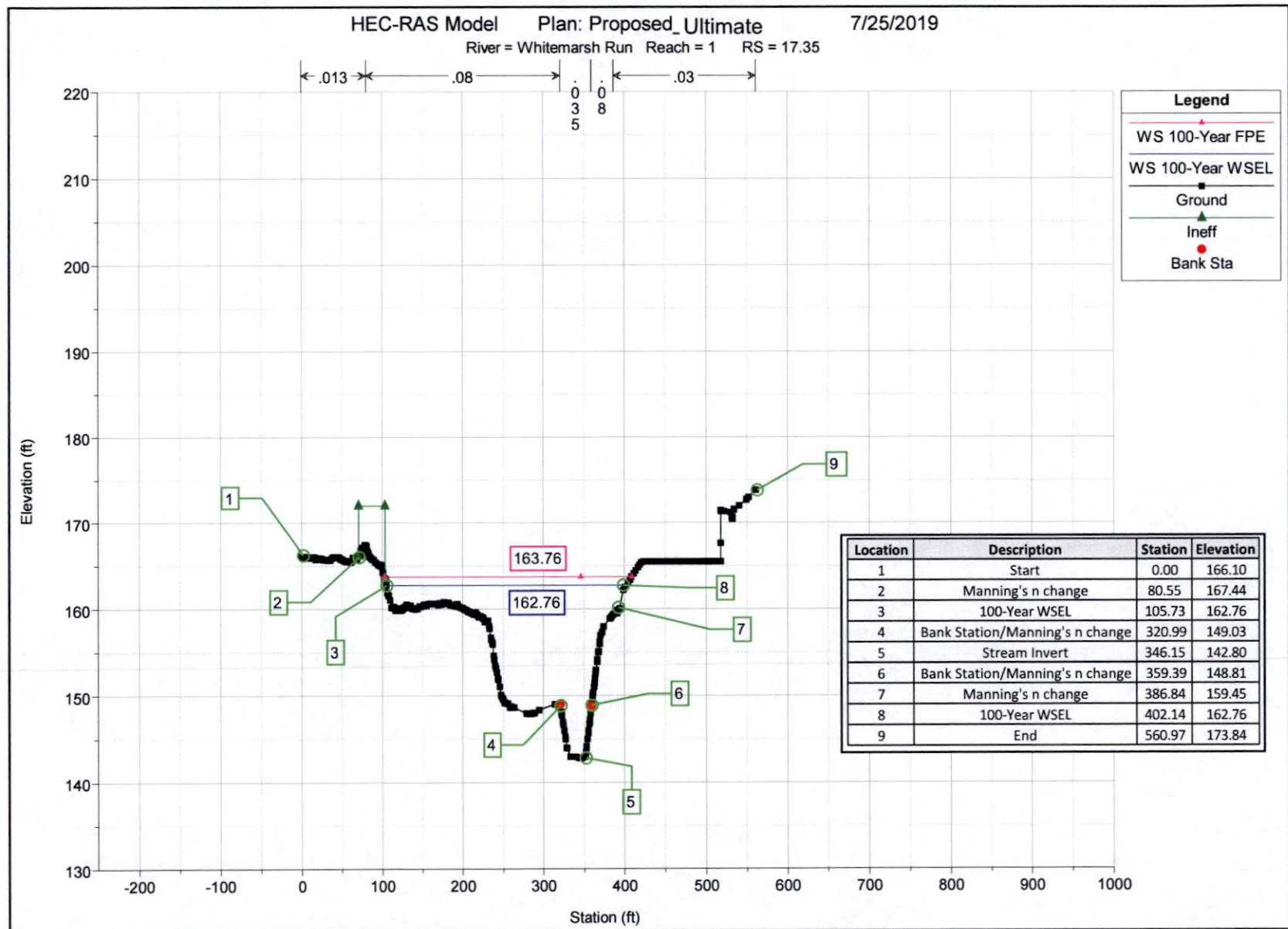
River = Whitemarsh Run Reach = 1 RS = 17.39



HEC-RAS Model Plan: Proposed_Ultimate 7/25/2019

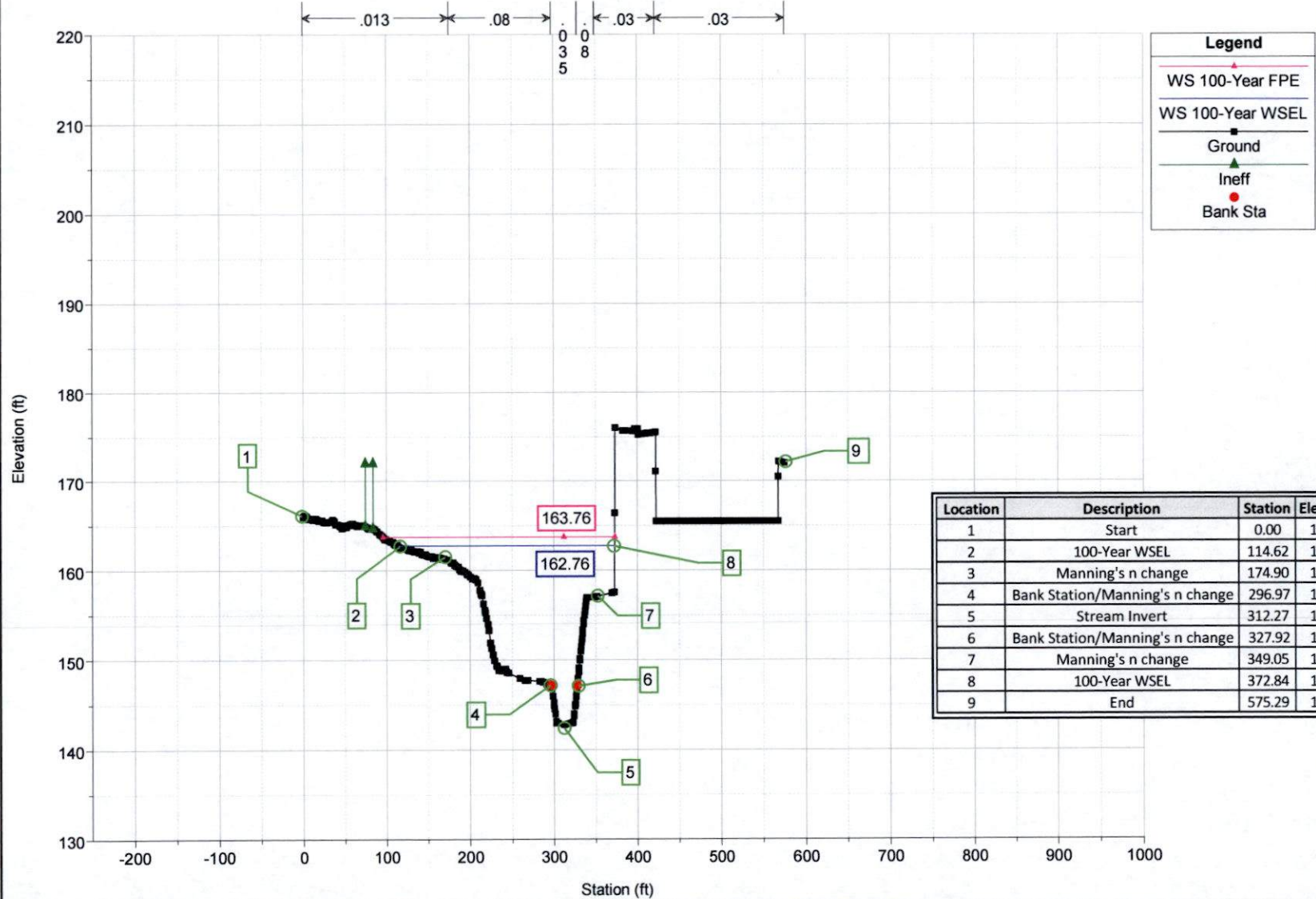
River = Whitmarsh Run Reach = 1 RS = 17.37





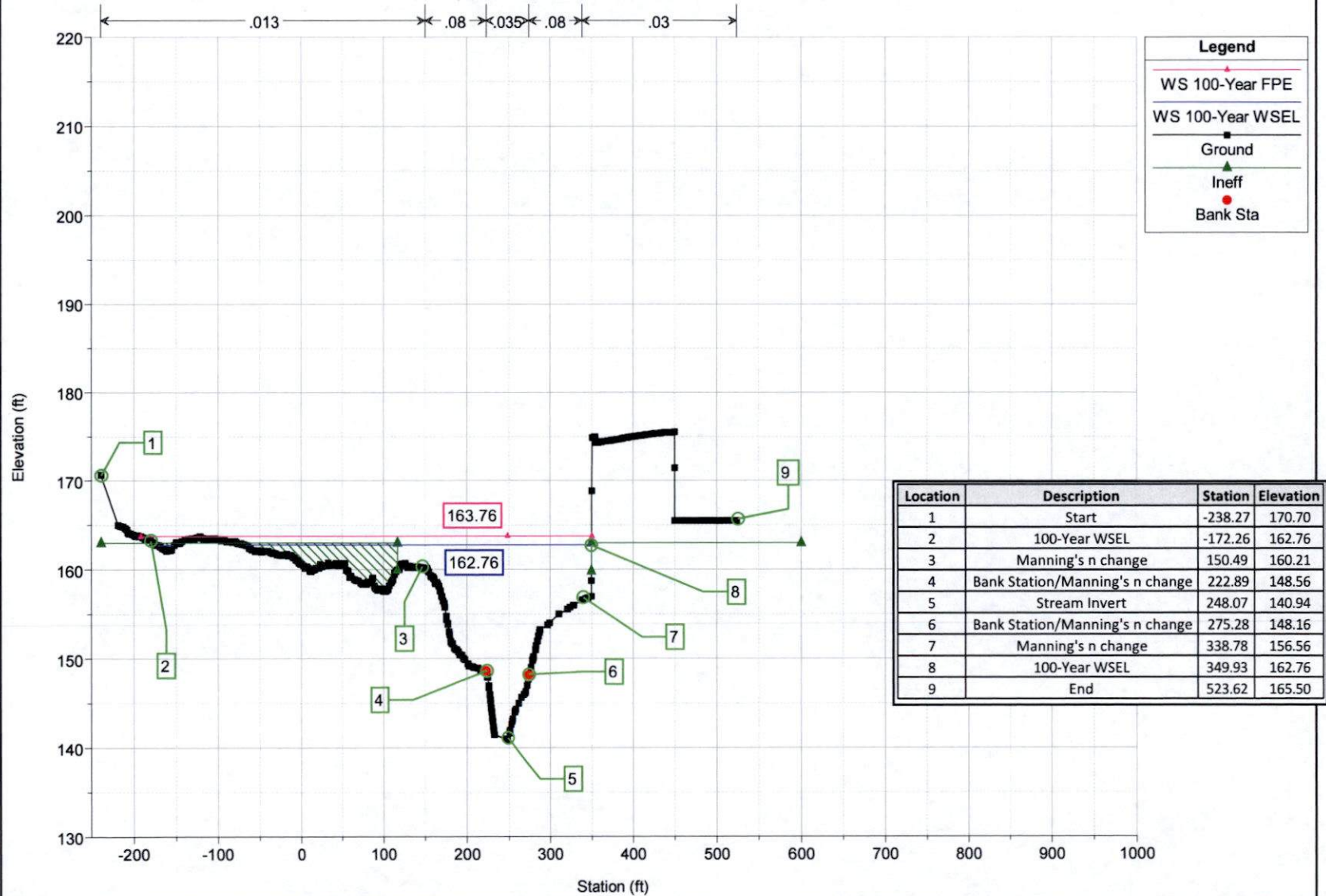
HEC-RAS Model Plan: Proposed_Ultimate 7/25/2019

River = Whitmarsh Run Reach = 1 RS = 17.33



HEC-RAS Model Plan: Proposed_Ultimate 7/25/2019

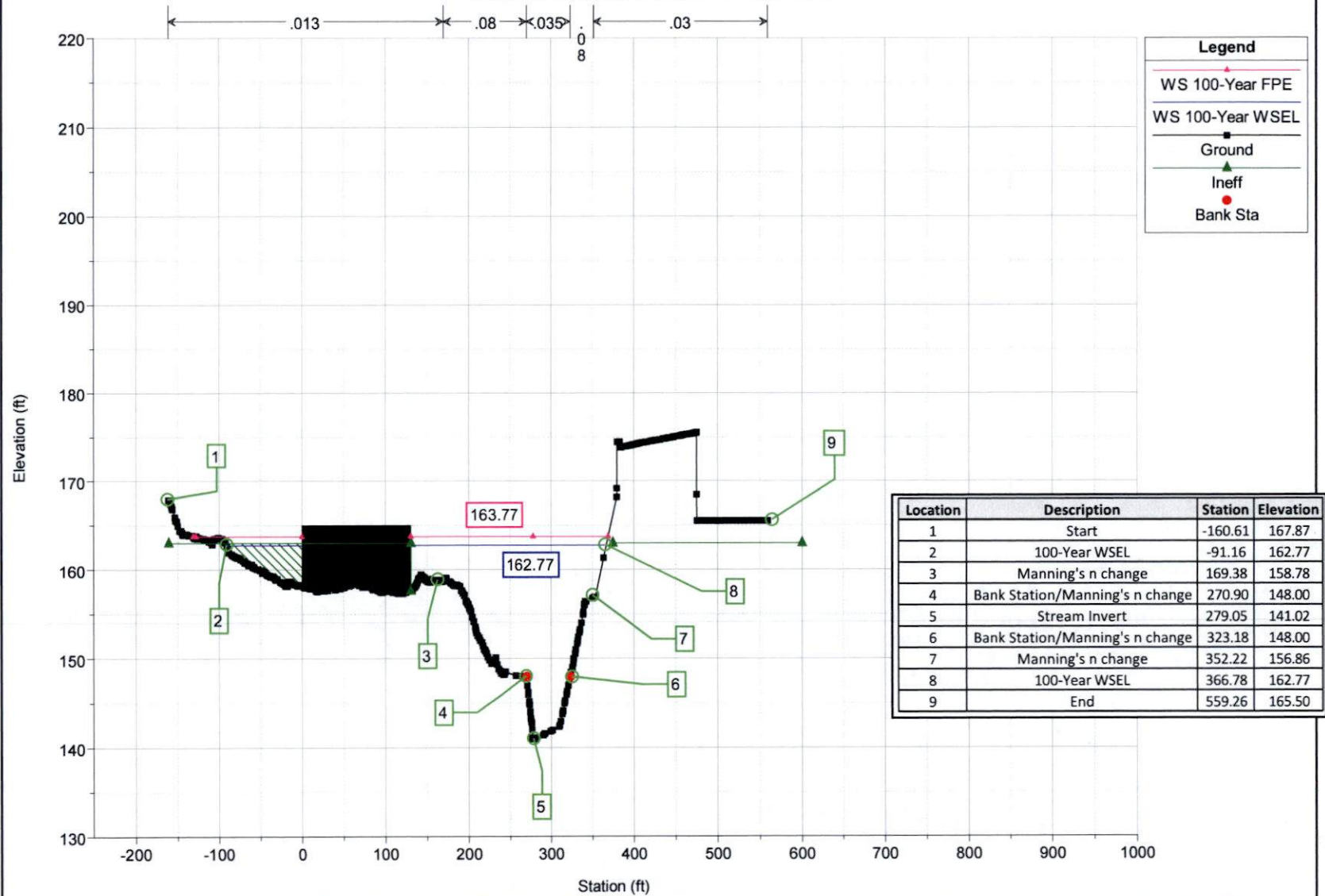
River = Whitmarsh Run Reach = 1 RS = 17.29



HEC-RAS Model Plan: Proposed_Ultimate

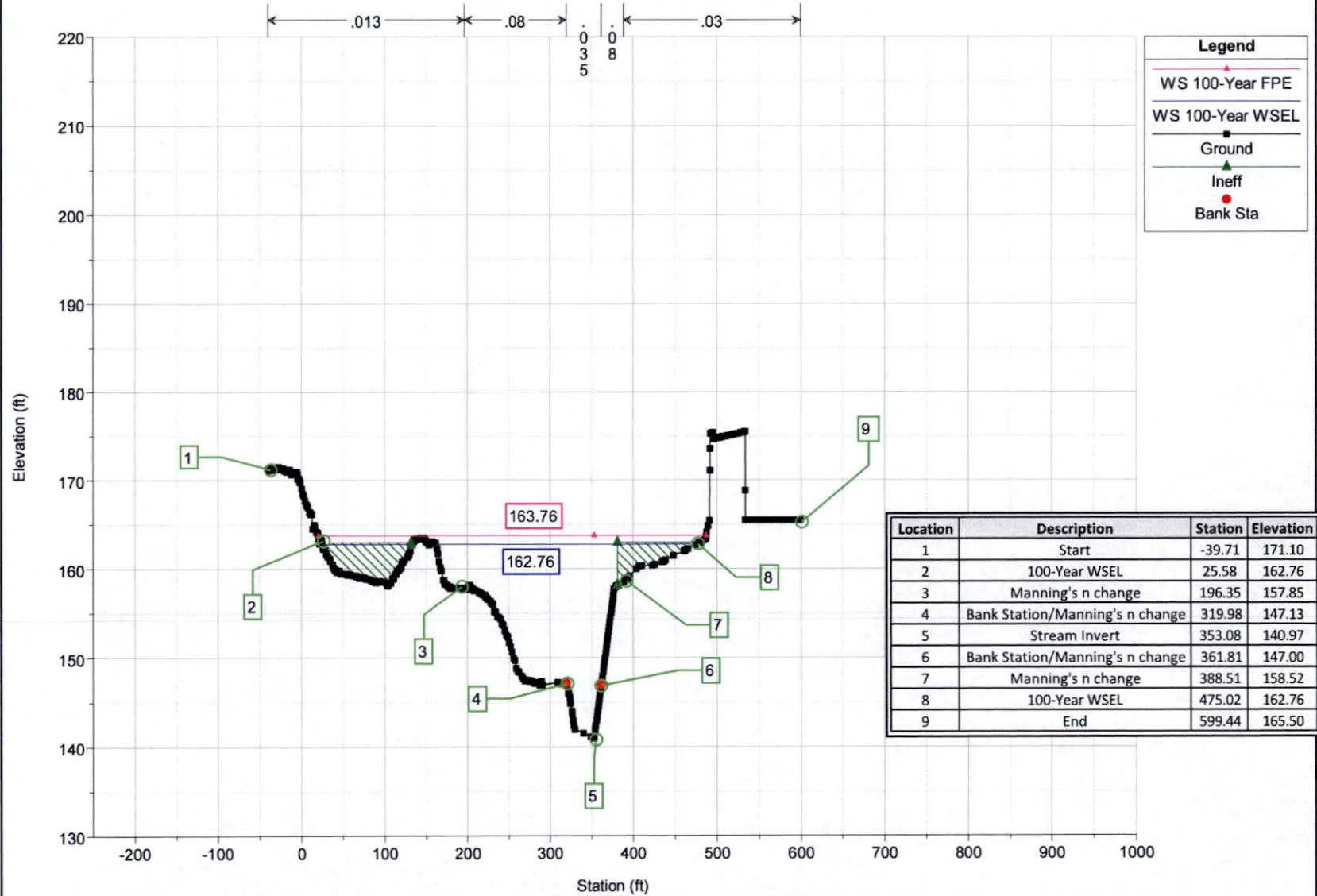
7/25/2019

River = Whitemarsh Run Reach = 1 RS = 17.27



HEC-RAS Model Plan: Proposed_Ultimate 7/25/2019

River = Whitemarsh Run Reach = 1 RS = 17.25

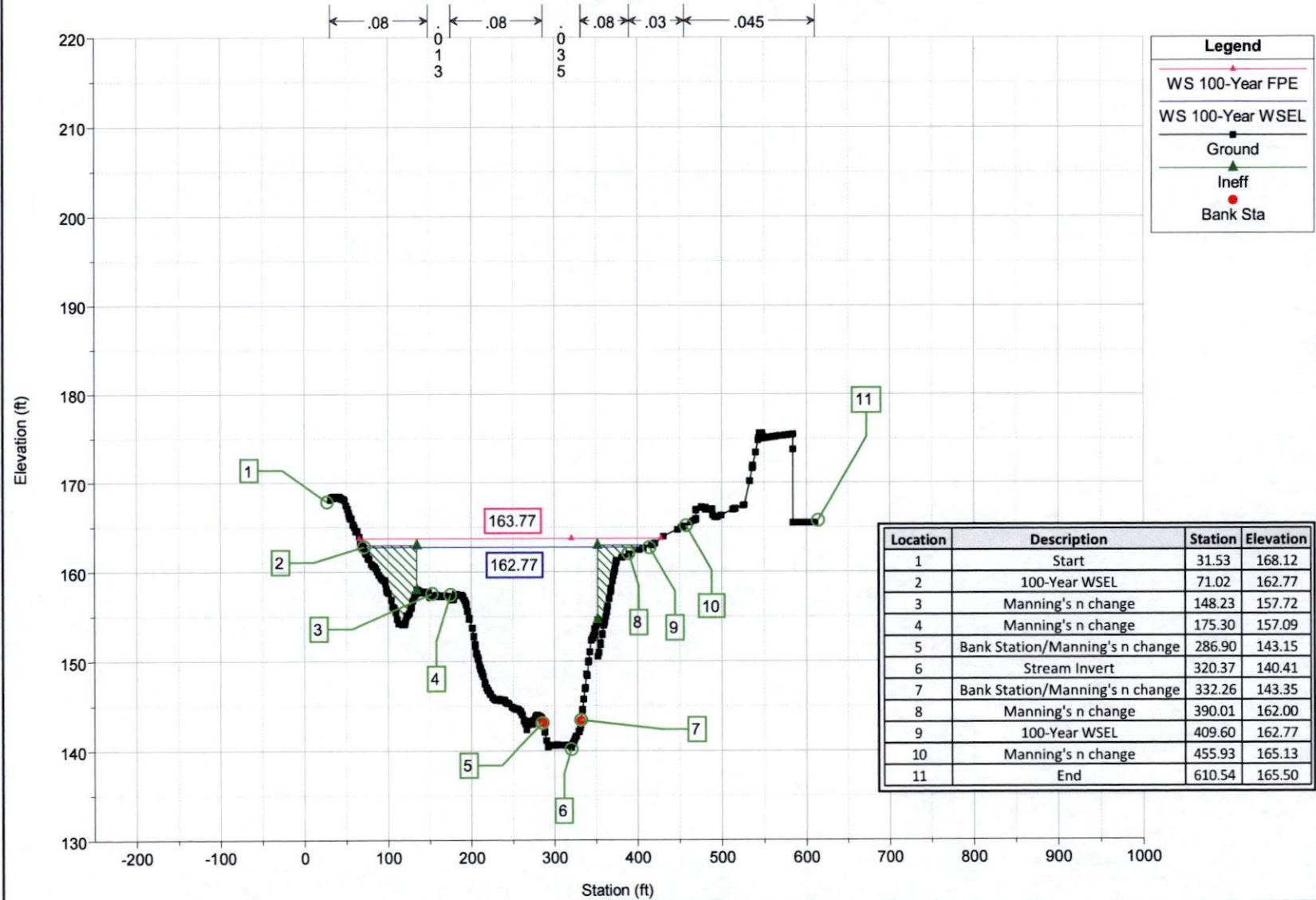


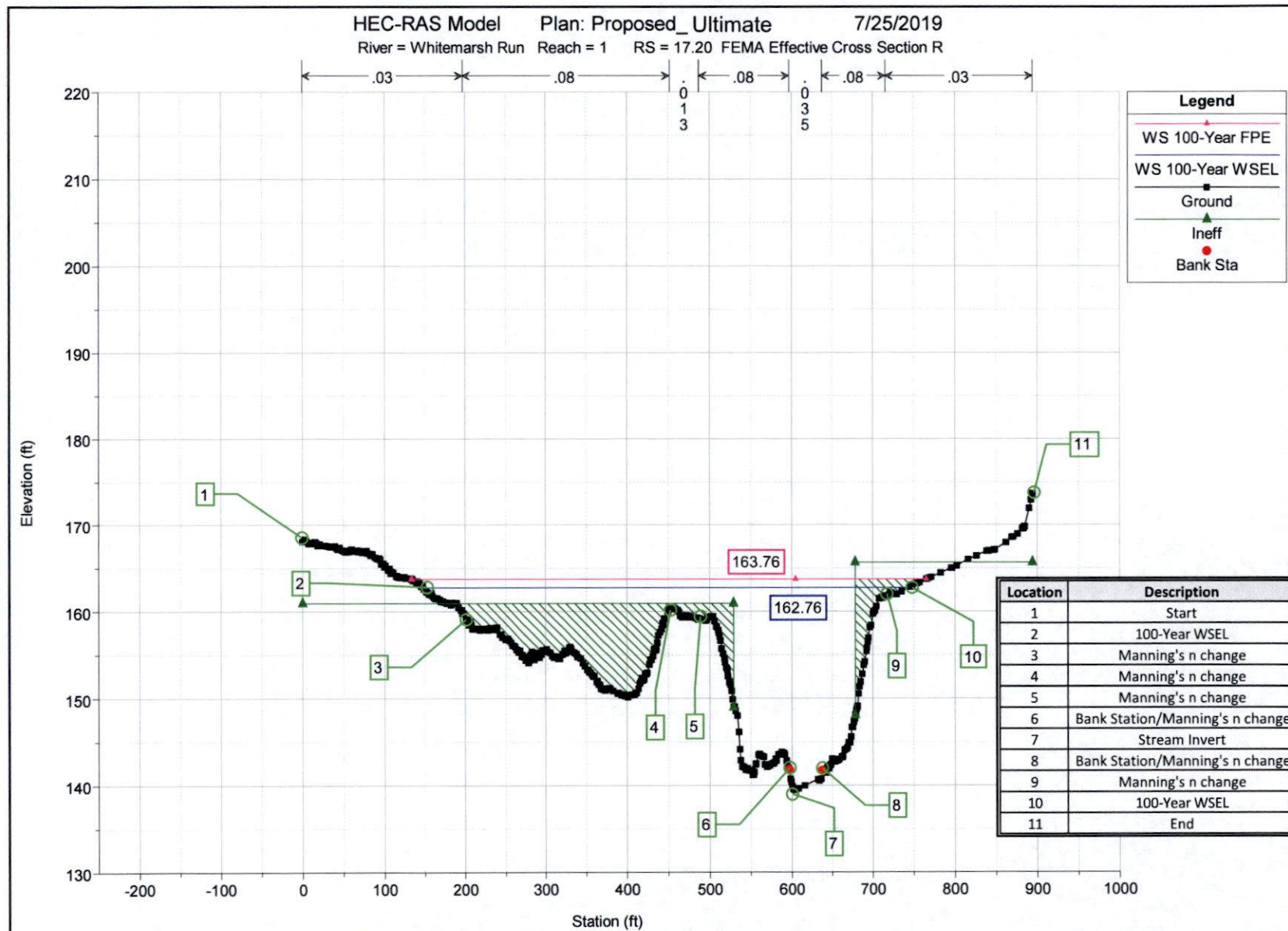
HEC-RAS Model

Plan: Proposed_Ultimate

7/25/2019

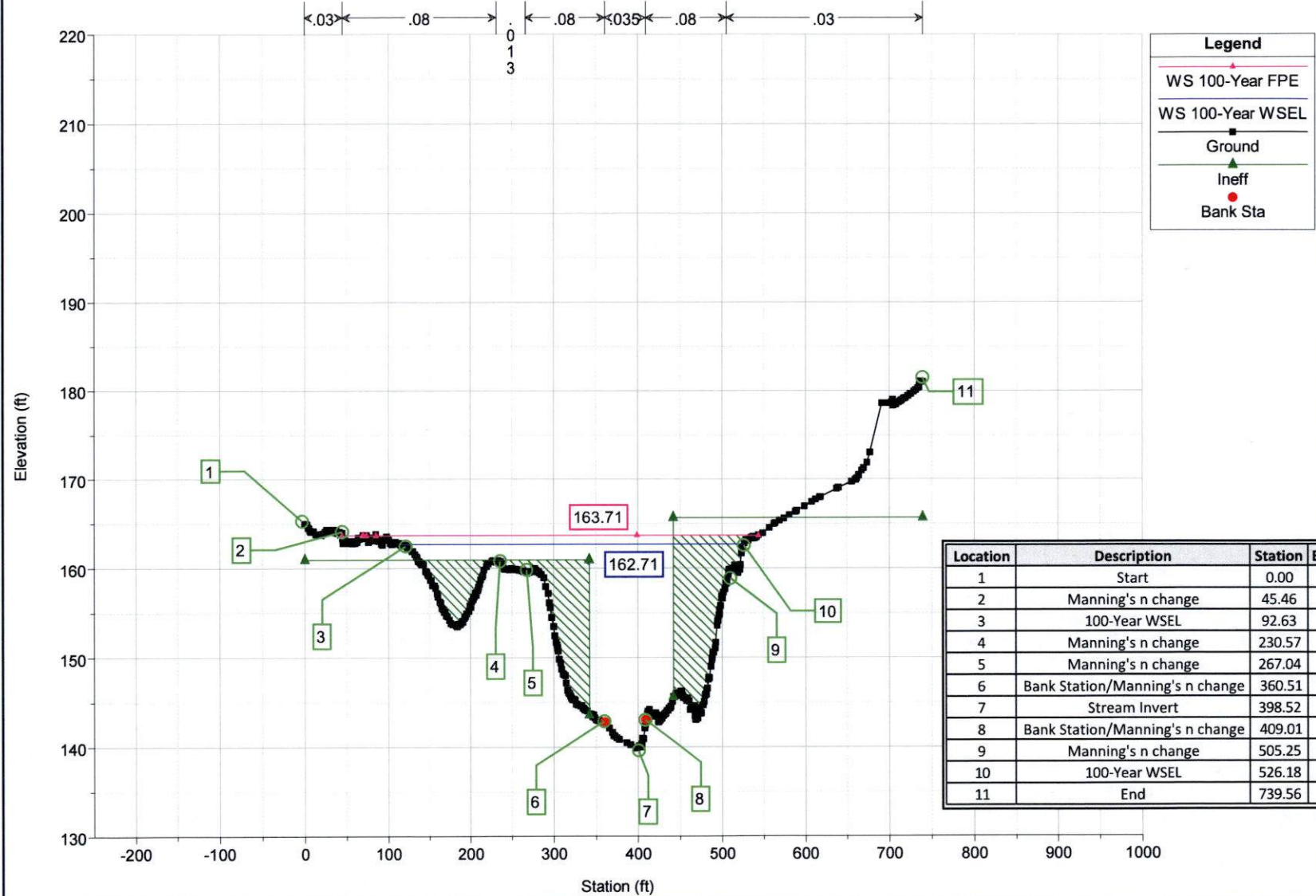
River = Whitemarsh Run Reach = 1 RS = 17.22

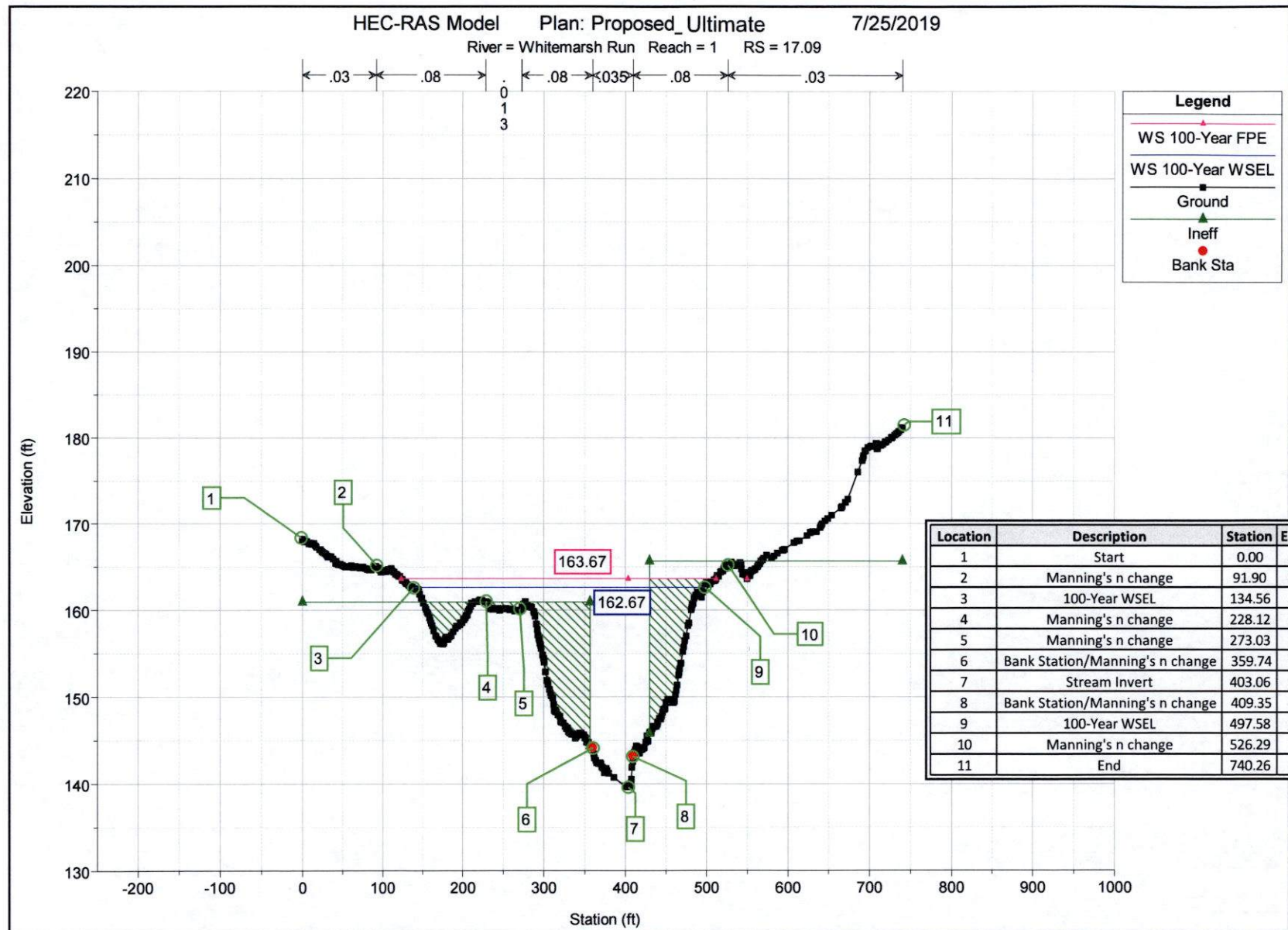


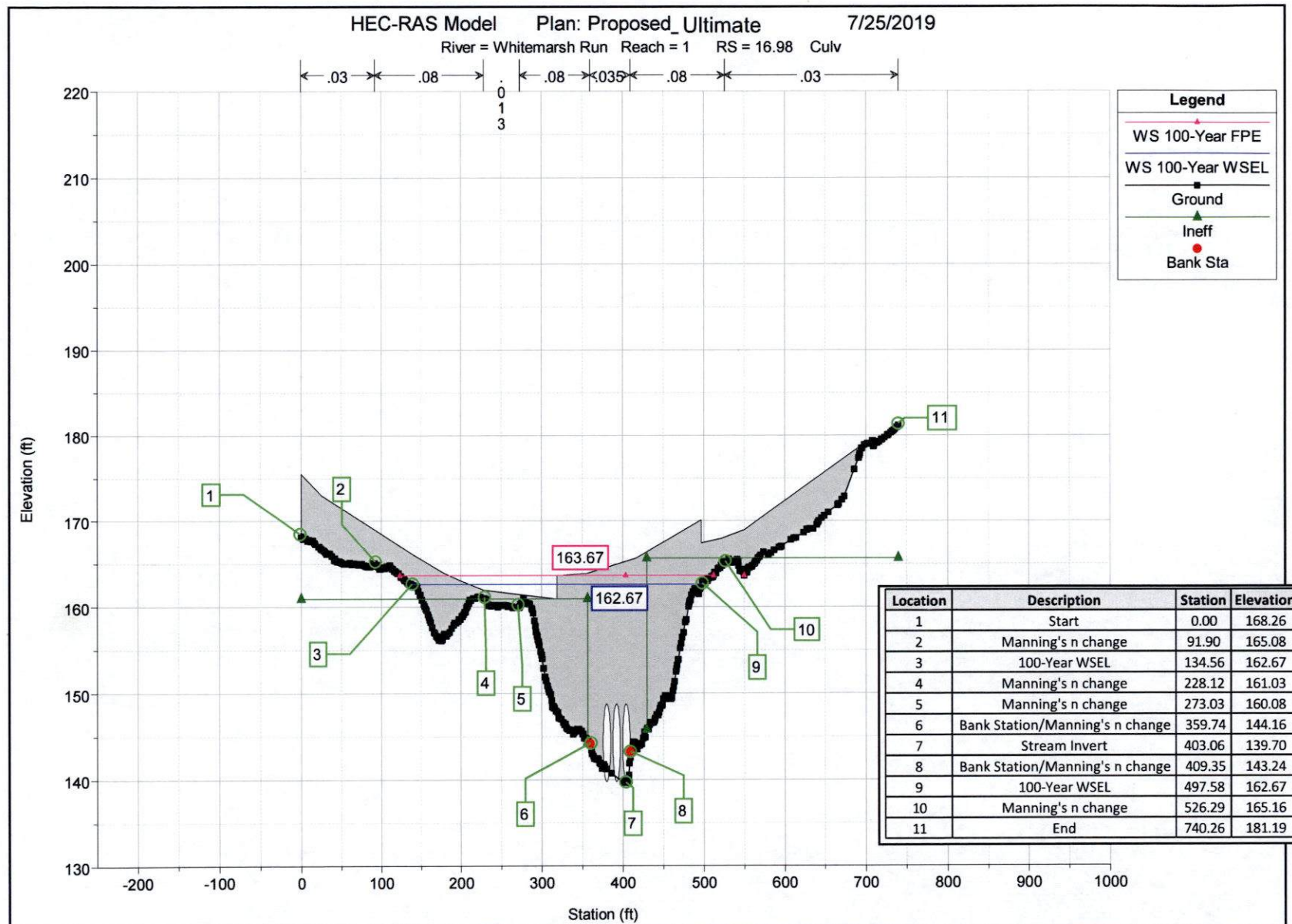


HEC-RAS Model Plan: Proposed_Ultimate 7/25/2019

River = Whitemarsh Run Reach = 1 RS = 17.13







Kimley»Horn

RESUME

Nicholas J. Leffner, P.E.
Kimley-Horn and Associates, Inc.
1801 Porter Street, Suite 401
Baltimore, MD 21230

Civil Engineer

Education: Bachelor of Science in Civil Engineering
Virginia Polytechnic Institute and State University, Blacksburg, VA

Registration: Registered Professional Engineer in Maryland (#441113)

Professional Organizations: Urban Land Institute (ULI)

Professional Experience: Civil Engineer, Bowman Consulting Group, Ltd. – 6 years

- Provided design, entitlement, and permitting consulting services to support a variety of land development projects; including, residential, commercial, retail, industrial, institutional, and mixed-use land development projects.
- Prepared conceptual, final, and construction document level design plans, computations, and reports for a variety of civil engineering related disciplines; including, site planning/feasibility, site design, grading and drainage, utilities, roadways, stormwater management, soil erosion and sediment control, and construction phase services.

Civil Engineer/Project Manager, Kimley-Horn and Associates, Inc – 5 years

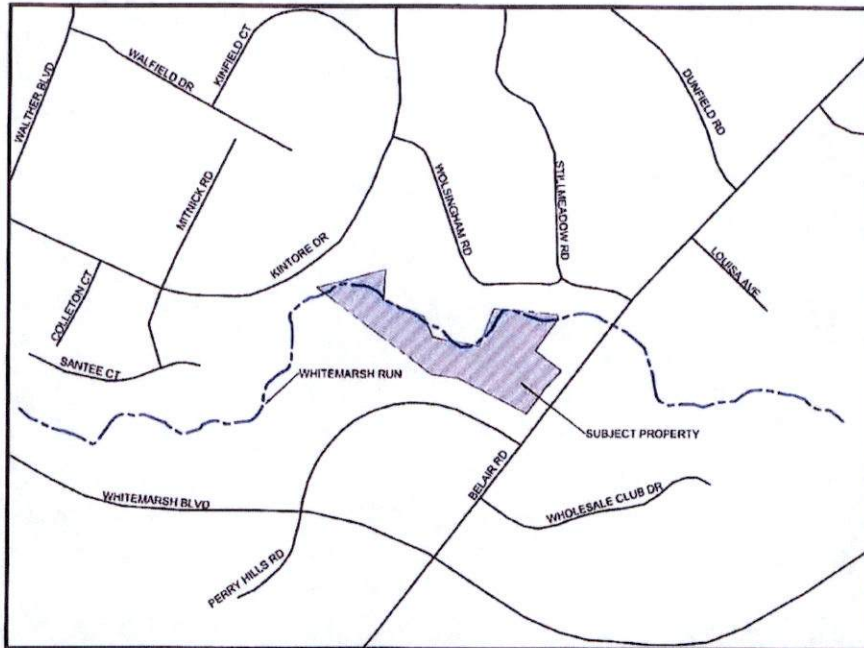
- Serves as project manager and civil engineering consultant
- Responsible for the design, entitlement, and permitting services for a variety of land development projects; including, residential, commercial, retail, industrial, institutional, mixed-use, and energy (solar) land development projects.

Project Experience: Maryland – Baltimore City, Baltimore County, Howard County, Montgomery County, Frederick County, Prince George's County, Anne Arundel County, Calvert County, St. Mary's County, Dorchester County, Harford County, Cecil County

Other States – Kansas, Oklahoma, Pennsylvania, Virginia, South Carolina

Beyond Self Storage – White Marsh, Floodplain Study for White Marsh Run

8228 Belair Road, Nottingham, Baltimore County, Maryland



Vicinity Map (N.T.S.)

Prepared for:

NorthPoint Development, LLC
4825 NW 41st Street, Suite 500
Riverside, MO 64150

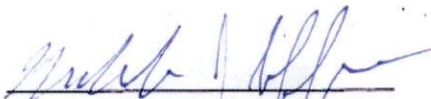
Prepared by:

Kimley»Horn

*NOT APPROVAL
CONDITIONED
ON THIS
APPROVAL*

100-YEAR FLOODPLAIN CERTIFICATION

I certify that the 100-year floodplain outline shown on this plan is correct and done in accordance with the Department of Permits and Development Management, Bureau of Development Plans Review's Policy Manual, Appendix B, Recommendations and Procedures for Watershed Studies-Floodplain Studies and Waterway Crossing Studies.


Signature

I hereby certify that these documents were prepared or approved by me, and that I am duly licensed professional engineer under the laws of the State of Maryland, License No. 44113.
Expiration Date: 6/10/2021.

Table of Contents

Kimley»Horn

Table of Contents

1.0	Introduction	1
1.1	Authority	1
1.2	Purpose of Study	1
1.3	Existing Site Characteristics	1
1.4	Methodology	1
2.0	Survey and Mapping Information	2
2.1	Field Survey Information	2
2.2	Mapping	2
3.0	Hydrology	3
3.1	Effective Hydrology	3
3.2	Suitable Outfall	3
4.0	Ultimate Condition Hydraulics	4
4.1	History and Methodology	4
4.2	Workmaps	4
4.3	Parameter Estimation	4
4.4	Model Description	4
4.5	Results	5
5.0	FEMA Information	7
5.1	History and Methodology	7
5.2	Model Description	7
5.3	Results	7
5.4	FEMA Model Comparison	8
6.0	References	10

List of Tables

Table 1:	100-Year Flows for Whitemarsh Run.....	3
Table 2:	Manning’s “n” Values	5
Table 3:	100-Year Ultimate Condition Water Surface Elevation Summary	6
Table 4:	100-Year Ultimate Condition Floodplain Elevations	6
Table 5:	100-Year Existing Condition Water Surface Elevation Summary	9

This document, together with the concepts and designs presented herein, as an instrument of services is intended only for the specific purpose and client for which it was prepared. Reuse of and improper reliance on this document without written authorization and adaptation by Kimley-Horn and Associates, Inc. shall be without liability to Kimley-Horn and Associates, Inc.

Index of Appendices

Appendix A	Checklists Floodplain Study Checklists
Appendix B	Effective Hydrology MD Rte 43 Drainage Area Map NRCS Soil Type Map
Appendix C	Ultimate Condition Hydraulics Pre-Project HEC-RAS Output Post-Project HEC-RAS Output Base Map Ultimate Floodplain Workmap Floodplain Profile Structure and Channel Photos Check-RAS
Appendix D	FEMA Information Pre-Project HEC-RAS Output Post-Project HEC-RAS Output FEMA Floodplain Workmap Effective FEMA FIRM Panel Annotated FEMA FIRM Panel FEMA FIS Floodway Data FEMA FIS Profile
Appendix E	Digital Files HEC-RAS v.5.0.3 Model HEC-2 Effective Hydraulic Input/Output Belair Road Record Drawings Maryland Rte 43 Whitemarsh Run Hydrologic Report Joint Permit Application Approval

1.0 Introduction

1.1 AUTHORITY

NorthPoint Development, LLC (“The Client”) has retained the services of Kimley-Horn and Associates, Inc. (KH) to evaluate the 100-year floodplain limits along the subject reach of Whitemarsh Run for the subject property located at 8228 Belair Road. The contacts for the study are as follows:

Nicholas J. Leffner, P.E.
Carolyn Cox, P.E., CFM (TX)
Deanna Abbruzese, E.I.T. (TX)
1801 Porter Street, Suite 401
Baltimore, MD 21230
(443) 743-3470

1.2 PURPOSE OF STUDY

The purpose of this submittal is to delineate the 100-year ultimate condition floodplain limits, establish minimum finished floor elevations, establish drainage easements, and show proposed improvements are in compliance with Baltimore County requirements. The study limits extend from approximately 100 feet downstream of Belair Road at FEMA lettered cross section Q to approximately 1,600 feet upstream of Belair Road. The subject reach adjacent to the proposed development extends from the upstream face of Belair Road to approximately 700 feet upstream of Belair Road. The proposed grading for the site is outside of the FEMA effective 100-year floodplain and floodway. A submittal to FEMA is not planned for the proposed development.

1.3 EXISTING SITE CHARACTERISTICS

The subject property is bound by Belair Road to the east and Whitemarsh Run to the north. Whitemarsh Run flows along the northern boundary of the subject property.

The subject property is approximately 5.42 acres and is currently developed. The property is treed and vegetated outside of the existing Value Equipment site. The subject reach of Whitemarsh Run is clean and straight with some stones.

1.4 METHODOLOGY

Hydraulic calculations were performed using the U.S. Army Corps of Engineers HEC-RAS version 5.0.3 software. Ultimate condition flows were taken from the MD Rte 43 – White Marsh Run Hydrologic Report prepared in July 2000 by Dewberry & Davis. Existing condition flows were taken from FEMA Effective HEC-2 output. More details on the flow source and methodologies are provided in the following sections.

2.0 Survey and Mapping Information

2.1 FIELD SURVEY INFORMATION

An on-ground field survey was conducted by MTPLS Land Surveyors, LLC (MTPLS) in August 2018. Topographic information obtained from this survey is based on the NAVD88 vertical datum.

The on-ground field survey was supplemented with aerial topographic information published by Baltimore County in 2015. The aerial topographic data is based on the NAVD88 vertical datum. The aerial topography can be seen on the floodplain workmaps in **Appendix C** and **Appendix D**.

2.2 MAPPING

The on-ground survey and aerial topography were used to delineate the existing and ultimate condition 100-year floodplain limits. The floodplain delineations can be found on the floodplain workmaps in **Appendix C** and **Appendix D**.

3.0 Hydrology

3.1 EFFECTIVE HYDROLOGY

KH requested available hydrologic and hydraulic information from the County and FEMA for Whitemarsh Run. KH received the MD Rte 43 – White Marsh Run Hydrologic Report prepared in July 2000 by Dewberry & Davis from the County. A digital copy of the study is included in **Appendix E**. The Drainage Area Map from the MD Rte 43 – White Marsh Run Hydrologic Report with the approximate location of the study limits and an NRCS Soil Map for the subject property is included in **Appendix B**. The watershed for Whitemarsh Run at Belair Road is greater than 30 acres. A scanned copy of HEC-2 input and output that corresponds to the FIS Study was received from FEMA in May 2019. The HEC-2 output for Whitemarsh Run from FEMA is dated 1981. A digital copy of the scanned HEC-2 input and output can be found in **Appendix E**.

The existing condition peak flows used for the subject reach of Whitemarsh Run were taken from the FEMA effective HEC-2 output. The ultimate condition peak flows were taken from MD Rte 43 – White Marsh Run Hydrologic Report. Peak flows at Belair Road were taken at cross section 19 from the TR-20 Model output of the MD Rte 43 report. The following table shows the 100-year existing and ultimate condition flows for the subject reach of Whitemarsh Run.

Table 1: 100-Year Flows for Whitemarsh Run

Location	Flow Description	Source	100-Year Flow
			(cfs)
Belair Road (U.S. Route 1)	Effective Existing Condition Flow	FEMA HEC-2 Output (1981)	3,550
Belair Road (U.S. Route 1)	Ultimate Condition Flow	Maryland Route 43 Hydrologic Study (2000)	3,940

3.2 SUITABLE OUTFALL

The runoff from the subject property outfalls into Whitemarsh Run. The subject property is located upstream of the Belair Road culvert crossing. The existing Belair Road structure appears to be operating as designed from a hydraulic perspective. There are no other drainage structures downstream of Belair Road within 1,000 feet. Conditions in Whitemarsh Run, which is the considered the outfall for the subject property, are controlled by peak flows from the contributing watershed which is approximately 1,500 acres. The peak flows from the watershed and the subject property do not occur at the same time. Whitemarsh Run was considered a suitable outfall and negative impacts to downstream conditions are not anticipated as a result of the proposed development based on this analysis. Channel and structure photographs can be seen in **Appendix C**.

4.0 Ultimate Condition Hydraulics

4.1 HISTORY AND METHODOLOGY

The proposed site was designed using the 100-year ultimate condition flows per County criteria. Since MDE approval is not required for the site, 2- and 10-year storm events were not included in the analysis. The drainage area for Whitemarsh run is greater than 30 acres. The 100-year floodplain freeboard elevation limits were set 1.0 ft above the 100-year floodplain elevation as surveyed data was obtained. The building first floor elevation is at least 1.0 ft higher than the floodplain freeboard elevation.

Hydraulic models were created using HEC-RAS v.5.0.3 since an executable HEC-2 model was not available for the FEMA effective model. The study limits extend from approximately 100 feet downstream of Belair Road at FEMA lettered cross section Q to approximately 1,600 feet upstream of Belair Road in order to tie in to FEMA water surface elevations within 0.5 feet. The subject reach adjacent to the proposed development extends from the upstream face of Belair Road to approximately 700 feet upstream of Belair Road which is just upstream of the proposed site limits.

4.2 WORKMAPS

A Base Map that includes a vicinity map, surveyed property line information, liber/folio property information for adjacent properties and topographic information is included in **Appendix C**. Cross section locations, 100-year ultimate condition water surface elevation limits and 100-year floodplain elevation limits (higher of EGL or 100-year water surface plus one foot of freeboard) for the study limits are shown on the Ultimate Floodplain Workmap in **Appendix C**.

4.3 PARAMETER ESTIMATION

The majority of the existing channel consists of a clean streambed with some deep pools and shoal. The overbanks are vegetated with brush and trees. Roughness coefficients (Manning's "n" Values) used in the hydraulic computations of the cross sections were based on guidance from "Open Channel Hydraulics" [Chow, 1959], engineering judgment, and aerial imagery of the creek and floodplain. See Table 2 below for descriptions and manning's "n" values used within the model. Developed areas and roads were considered concrete. Any disturbed areas which would remain natural were assumed to return to their existing vegetative state to represent the worst hydraulic condition. Photos of the channel are included in **Appendix C**.

Table 2: Manning's "n" Values

Description	Manning's "n" Value
Floodplain, heavy sand of timber, a few down trees, little undergrowth, flood stage below branches (minimum)	0.08
Streams, clean, straight, full stage, no rifts or deep pools, more stones and weeds (normal)	0.035
Pasture, no brush, short grass (normal)	0.03
Concrete, Trowel finish (normal)	0.013

A normal depth was used as the downstream boundary condition for the ultimate condition models. The normal depth slope was calculated to be 0.021 ft/ft by taking the representative slope at the downstream cross section. The Belair Road culvert crossing is undersized and operates in inlet control during the 100-year storm event, so the downstream boundary condition was considered sufficiently far enough downstream.

4.4 MODEL DESCRIPTION

The Pre-Project model was created using HEC-RAS v.5.0.3 and extends from approximately 100 feet downstream of Belair Road at FEMA lettered cross section Q to approximately 1,600 feet upstream of Belair Road. Cross sections were added throughout the study limits and include the FEMA lettered cross sections Q and R. Cross section geometry is based on the on-ground survey and Baltimore County aerial topographic data described above. Ineffective flow areas (artificial levees) were added upstream and downstream of Belair Road.

The existing Belair Road culvert crossing was modeled using information from the Maryland Department of Transportation US Route 1 (Belair Road) Record Drawings (March 2017). The culvert crossing consists of 3-9' CMPs. The solid wall railing was added into the model as part of the road deck geometry. A digital copy of the record drawing is included in **Appendix E**.

The Post-Project model was created by updating the existing model to reflect the proposed grading associated with the development. The proposed grading is outside of the FEMA effective 100-year floodplain and floodway.

4.5 RESULTS

Table 3 lists the 100-year pre- and post-project ultimate condition water surface elevations within the study limits for Whitemarsh Run. **Table 4** summarizes the 100-year ultimate condition floodplain elevations. Belair Road overtops so a dramatic change in water surface elevation can be seen. The results show no increase in 100-year ultimate condition water surface elevations as a result of the proposed development and associated grading. The basement floor elevation is at 165.5 which is 2.7 ft above the 100-year ultimate condition water surface elevation and the first floor elevation is 175.5.

4.0 Ultimate Condition Hydraulics

Table 3: 100-Year Ultimate Condition Water Surface Elevation Summary

Cross Section	Pre-Project WSEL (ft)	Post-Project WSEL (ft)	Difference (Post-Pre)
16.80	141.05	141.05	0.00
16.86	141.32	141.32	0.00
16.98	Belair Road		
17.09	162.67	162.67	0.00
17.13	162.71	162.71	0.00
17.20	162.76	162.76	0.00
17.22	162.77	162.77	0.00
17.25	162.76	162.76	0.00
17.27	162.77	162.77	0.00
17.29	162.76	162.76	0.00
17.33	162.77	162.76	-0.01
17.35	162.77	162.76	-0.01
17.37*	162.77	162.77	0.00
17.39	162.77	162.77	0.00
17.41	162.82	162.82	0.00
17.52	162.87	162.87	0.00
17.59	162.96	162.96	0.00

*Cross Section at upstream limit of proposed site.

Table 4: 100-Year Ultimate Condition Floodplain Elevations

Cross Section Number	Flow (cfs)	100-Year WSEL (Post-Project)	100-Year WSEL 1' Freeboard	Energy Gradient Elevation	100-Year Floodplain Elevation
16.80	3,940	141.05	142.05	142.97	142.97
16.86	3,940	141.32	142.32	143.80	143.80
16.98	3,940	Belair Road			
17.09	3,940	162.67	163.67	162.79	163.67
17.13	3,940	162.71	163.71	162.80	163.71
17.20	3,940	162.76	163.76	162.81	163.76
17.22	3,940	162.77	163.77	162.81	163.77
17.25	3,940	162.76	163.76	162.83	163.76
17.27	3,940	162.77	163.77	162.84	163.77
17.29	3,940	162.76	163.76	162.85	163.76
17.33	3,940	162.76	163.77	162.86	163.77
17.35	3,940	162.76	163.77	162.88	163.77
17.37*	3,940	162.77	163.77	162.89	163.77

4.0 Ultimate Condition Hydraulics

Cross Section Number	Flow (cfs)	100-Year WSEL (Post-Project)	100-Year WSEL 1' Freeboard	Energy Gradient Elevation	100-Year Floodplain Elevation
17.39	3,940	162.77	163.77	162.91	163.77
17.41	3,940	162.82	163.82	163.92	163.82
17.52	3,940	162.87	163.87	163.03	163.87
17.59	3,940	162.96	163.96	163.15	163.96

*Cross Section at upstream limit of proposed site.

Detailed HEC-RAS Output can be found in **Appendix C**. The 100-year floodplain elevation is shown on the cross sections and profile. The stream invert stations and elevations are included on the cross section profiles.

5.0 FEMA Information

5.1 HISTORY AND METHODOLOGY

Kimley-Horn made a FEMA data request for the effective Whitemarsh Run information in May 2019. A scanned copy of the HEC-2 input and output was received from FEMA. The vertical datum for the HEC-2 model was based on the Baltimore County Datum (BCD). The conversion from NAVD88 to BCD included in the FEMA Effective Baltimore County Flood Insurance Study (FIS) is shown below.

$$NAVD88 = BCD - 1.7ft$$

5.2 MODEL DESCRIPTION

Kimley-Horn updated the models described in Section 4.4 to reflect the FEMA existing condition flows. The boundary condition for the existing condition models was updated to a known water surface elevation. The known water surface elevation was taken from cross section Q from the Baltimore County FIS Study dated May 5, 2014.

5.3 RESULTS

Table 5 lists the 100-year pre- and post-project existing condition water surface elevations within the study limits for Whitemarsh Run using the Kimley-Horn prepared model. Detailed HEC-RAS Output can be found in **Appendix D**.

The results show no increase in 100-year existing condition water surface from pre-project to post-project as a result of the proposed development and associated grading.

The FEMA effective 100-year water surface elevations are significantly different than the existing condition 100-year water surface elevations from the Kimley-Horn prepared models. Explanation based on a comparison of model assumptions from the FEMA effective information is outlined in Section 5.4.

Table 5: 100-Year Existing Condition Water Surface Elevation Summary

Cross Section	FEMA Effective WSEL (ft)	Pre-Project WSEL (ft)	Post-Project WSEL (ft)	Difference (Pre-FEMA)	Difference (Post-Pre)
16.80	140.9	140.90	140.90	0.0	0.00
16.86	144.0*	140.98	140.98	-3.0	0.00
16.98	Belair Road				
17.09	155.5*	161.81	161.81	6.3	0.00
17.13	155.6*	161.85	161.85	6.3	0.00
17.20	155.7	161.90	161.90	6.2	0.00
17.22	156.0*	161.90	161.90	5.9	0.00
17.25	156.5*	161.89	161.89	5.4	0.00
17.27	156.8*	161.91	161.90	5.1	-0.01
17.29	157.1*	161.90	161.90	4.8	0.00
17.33	157.7*	161.91	161.89	4.2	-0.02
17.35	158.0*	161.90	161.89	3.9	-0.01
17.37	158.3*	161.91	161.91	3.6	0.00
17.39	158.5*	161.91	161.91	3.4	0.00
17.41	158.9*	161.95	161.95	3.0	0.00
17.52	160.8*	162.02	162.02	1.2	0.00
17.59	162.0*	162.12	162.12	0.1	0.00

*Values Interpolated.

5.4 FEMA MODEL COMPARISON

A digital and executable HEC-2 model was not available from FEMA. Kimley-Horn prepared a hydraulic model for the study limits using HEC-RAS, available topographic data, and record drawings. A comparison of the 100-year existing condition water surface elevations to the FEMA effective Base Flood Elevations (BFEs) revealed significant differences in water surface elevations. Results often vary some when switching modeling programs or versions. However, the differences in this case were not considered typical. Upon further evaluation, Kimley-Horn identified two main reasons, besides the modeling version, which are likely the reason for the discrepancies.

The Belair Road crossing in the FEMA effective model is modeled as a bridge with 3-10' diameter openings. The record drawings referenced previously show 3-9' diameter CMPs at the channel crossing. The crossing is not overtopping in the FEMA effective model but does overtop in the HEC-RAS model prepared for this study using the 3-9' diameter CMPs modeled as culverts. Differences in water surface elevations are a result of both the opening size and bridge vs. culvert calculations.

5.0 FEMA Information

Kimley»Horn

K:\DAL_Hydro\114037001 - 8228 Belair Road\Docs\FP Study Report.docx
Copyright © 2019 Kimley-Horn and Associates, Inc.

The study limits for the hydraulic model prepared for this study start at FEMA lettered cross section Q and extend to just downstream of FEMA lettered cross section S. The HEC-2 model cross sections within the study limits and just upstream to cross section S include cross section 16.8 (Q), 16.9, 17.1, 17.2 (R), and 18.0 (S). Cross section 17.2 is approximately 90 feet upstream of Belair Road. Cross section 18.0 is 3,042 ft upstream of cross section 17.2. As a result, the 100-year water surface elevation and channel flowline shown on the FIS profile between these two cross sections is a linear interpolation which does not capture the effect from the undersized Belair Road crossing.

The pre- and post-project models prepared for this study tie into the FEMA effective BFEs within 0.5 feet at cross section 17.59 which is approximately 900 ft upstream of the property. Cross section locations and existing condition 100-year floodplain limits for the study limits are shown on the FEMA Floodplain Workmap in **Appendix D**.

The proposed improvements do not cause increases in water surface elevations and the proposed grading for the site does not extend into the current FEMA effective 100-year floodplain limits or floodway. The project does not impact current FEMA floodplain limits; therefore, no LOMR is anticipated. Additionally, a LOMR could result in additional structure being mapped within the FEMA regulatory floodplain.

Although the proposed grading and improvements extend into the limits of ultimate condition Baltimore County floodplain, the proposed improvements do not cause increased in 100-year water surface elevations.

6.0 References

Chow, Ven Te. *Open Channel Hydraulics*. McGraw-Hill, 1959.

Federal Emergency Management Agency. *Flood Insurance Study, Baltimore County*.
Federal Emergency Management Agency, 2014.

Maryland State Highway Association. *MD Rte 43 – Whitemarsh Run, Hydrologic Report*.
Dewberry and Davis, LLC, July 2000.

U.S. Army Corps of Engineers. *HEC-RAS, v. 5.0.3 (software package)*. U.S. Army
Corps of Engineers, January 2010.

Appendix A: Checklists

Floodplain Study Checklists

FLOOD PLAIN STUDY REPORT FORMAT

1. ✓ Introduction (location, number of streams, drainage area acreage, etc.) See Report Narrative.
2. ✓ Vicinity map with site shown and shaded on it. See Report Narrative Cover Page.
3. ✓ Soil type map with the site shown on it. See Appendix B.
4. ✓ Drainage area map with the site and acreages shown on it. Hydrology was not updated for this floodplain study. A Copy of MD RTE 43 White Marsh Run Hydrologic Report (July 2000) is provided digitally in Appendix C. TR-20 hydrologic output is included within the report. Reference to the study and information used for the analysis is included in Section 3.0 of the Report.
5. ✓ Hydrology (TR-55, Tr-20, etc.) See note above. The digital copy of the MD RTE 43 White Marsh Run Hydrologic Report, located in Appendix C, includes TR-20 input/output.
6. ✓ Hydraulics (HEC-RAS, HEC-2, etc.) HEC-RAS v. 5.0.3 - See Appendix E for digital copies of the models.
7. ✓ The Following table shall appear in the report and flood plain plan:

CROSS SECTION NUMBER	FLOW (C.F.S.)	100-YEAR WSEL	100-YEAR WSEL X' FREEBOARD**	ENERGY GRADIENT ELEVATION	100-YEAR FLOOD PLAIN ELEVATION *
----------------------------	------------------	------------------	------------------------------------	---------------------------------	--

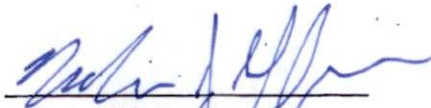
* Higher of E.G.L. or 100-Year W.S.E.L. plus 1' freeboard.

** X is as defined by the Bureau of Development plans Review Policy Manual (Feb. 27, 2002) in Appendix B

8. ✓ Cross-sections with 100-year Water Surface Elevation (WSEL) and 100-year Flood Plain Elevation shown (FPE). See Appendix C (Ultimate Condition Floodplain Workmap, Exhibit C.4).
9. ✓ Stream profile with Water Surface Elevations (WSEL) and Flood Plain Elevations (FPE) shown. See Appendix C (Floodplain Profile, Exhibit C.5).
10. ✓ 100-year flood plain study with the certification shown on cover sheet of the report and flood plain plan. See Report Narrative Cover Page and Floodplain Workmaps.

100-YEAR FLOODPLAIN CERTIFICATION

I certify that the 100-year floodplain outline shown on this plan is correct and done in accordance with the Department of Permits and Development Management, Bureau of Development Plans Review's Policy Manual, Appendix B, Recommendations and Procedures for Watershed Studies-Floodplain Studies and Waterway Crossing Studies.


Signature

I herby certify that these documents were prepared or approved by me, and that I am duly licensed professional engineer under the laws of the State of Maryland, License No. 44113.
Expiration Date: 6/10/2021.

CHECK LIST

FLOODPLAIN HYDROLOGY SUBMITTAL

PROJECT Beyond Self Storage - White Marsh

J.O. _____ DATE _____

CHECKED BY _____

APPROVED _____ DATE _____

Hydrology not updated for this Floodplain Study. Peak flows from *MD RTE 43 White Marsh Run Hydrologic Report* (Dewberry & Davis, July 2000). A digital copy of the report is included in Appendix C.

DRAINAGE AREA MAP

Omitted - "O"

- ☐ 1. Scale: 1"=200' preferred; Smaller for large watersheds-fit major sub-watershed on 1 sheet
- ☐ 2. Subareas shown (II B 3)
- ☐ 3. Time of Concentration Paths shown, segments labeled (II B 5)
- ☐ 4. Land use - Existing & Proposed shown
- ☐ 5. Zoning, Soil Types & Hydrologic Soil Groups shown (II B 1)
- ☐ 6. Note indicating Watershed location
- ☐ 7. County & State storm drains shown with size & drawing number (II B 1)
- ☐ 8. Show location of TR-20 cross-sections & Structures (II B 1)
- ☐ 9. Provide watershed schematic for multiple subareas (II D 3)

HYDROLOGY COMPUTATIONS

- ☐ 1. Use TR-55 or TR-20 only (GIS methods with permission) (II A 4, II D 2)
- ☐ 2. Std. Computer Programs only (II A 5), Version (II D 1)
- ☐ 3. Drainage areas (acres & square miles)
- ☐ 4. Runoff Curve Numbers (RCN) (II D 4)
 - ☐ a. Uses soil classification table dated 1/10/97 (II D 4 g)
 - ☐ b. Soil classification NOT adjusted for compaction (II D 4 g)
 - ☐ c. Tabular computation form used (II D 4 c,d) (No Fig.2.1 or Table 2.1 interpolation)
 - ☐ d. Based on SCS "good" hydrologic condition (II D 4 c)
 - ☐ e. Ultimate land use based on zoning (except for calibration runs to match storms of record, or for FEMA (with permission). (II D 4 f)
 - ☐ f. Connected/Unconnected Impervious Areas, or Connected Areas assumed
 - ☐ g. Adjustments
 - ☐ h. Other _____
- ☐ 5. Time of Concentration Calculations (II D 5)
 - ☐ a. Selected Path "typical" of area (II D 5 a)
 - ☐ b. Tabular determination used (II D 5 c)
 - ☐ c. Proper n-factors used (Sheet flow)
100 feet (II D 5 d)
 - ☐ e. Proper velocities used (Shallow Concentrated & Channel Flow)

☐ f. Minimum $T_c = 0.1$ hr. for TR-55

☐ g. Closest hundredth of hour inputted for TR-20

☐ h. Capacity of drains in T_c path not exceeded (II D 5 b)

☐ 6. Time of Travel calculations-required when T_c path leaves drainage area. T_c & T_t correctly rounded. (II D 7)

☐ 7. Hydrograph Computation

☐ a. I_a/P rounded or hydrograph values linearly interpolated between adjacent charted I_a/P values. (II D 6)

☐ b. TR-20 used when subareas differ by ratio of 5 or more. (II D 2)

☐ c. TR-20 Type II Rain Table used (II D 6)

☐ d. AMC 2 used. (II D 6)

☐ e. 484 Dimensionless Unit Hydrograph used, as noted. (II D 6 c)

☐ f. 24 Hour Storm used.

☐ 8. Reservoir Routing (II D 8)

☐ a. Flood Control Structures only.

☐ d. Structure must have "significant" storage volume.

☐ 9. Appropriate Storms modeled (II D 6 g)

☐ a. 2, 10, 100 Year req'd.

☐ b. 1 Year req'd. where erosion is a consideration.

☐ c. Additional storms as required for calibration.

☐ 10. Inches of Runoff-correct tabular values used

☐ 11. Peak Discharges (Computed hydrographs for manual storage-indication routing)

FIELD INVESTIGATION (by reviewer)

- ☐ 1. Drainage Area Maps from record drawings are to be field-verified. (II B 6)
- ☐ 2. Drainage area ridge lines correct. (II B 3)
- ☐ 3. Time of Concentration Paths
- ☐ 4. Ground Cover
- ☐ 5. Downstream Hazards
- ☐ 6. Suitable Outfall available
- ☐ 7. Use of Natural Topography & Land Cover where possible

CALIBRATION (II D 9)

- ☐ 1. Check discharge against available gage data. (II A 3)
- ☐ 2. Use other accepted methods for comparison.

CHECK LIST

FLOODPLAIN DELINEATION SUBMITTAL

PROJECT Beyond Self Storage - White Marsh

J.O. _____ DATE _____

CHECKED BY _____

PROJECT ENGINEER SHALL COMPLETE,
SIGN AND SEAL THIS CHECKLIST AND
INCLUDE THE ORIGINAL WHEN SUBMIT-
TING PLANS FOR REVIEW.

LOMA/LOMR REQUIRED FOR WATERSHED > 1 SQ.MI.

See previously approved MD Rte 43 White Marsh Run Hydrologic Study (Dewberry & Davis, July 2000) included in Appendix C. Reference to the study and information used for the analysis is included in Section 3.0 of the Report.

APPROVED _____ DATE _____

HYDROLOGY

*See Section 3.0 of Report for additional information on hydrology.
See Section 2.0 of Report for additional information on topographic information.

- ✓ 1. Hydrology submittal has been approved in accordance with Section II-D of the Storm Drainage Section of the Design Manual.
- ✓ 2. Floodplain is riverine.

Dramatic change in water surface elevation occurs at Belair Road. See Report, Section 4.0 for additional explanation on culvert crossing and the overtopping road.

- ✓ a. Drainage area is in excess of 30 acres. (V-A-1) Freeboard per Design Plate DF-1A. Use of County GIS contours requires 2.0' freeboard rather than 1.0' specified for use with surveyed data.
- N/A b. Drainage area does NOT exceed 30 acres. This area's discharge will be conveyed using storm drains in accordance with applicable provisions of this Design Manual. (V-A-2)
- N/A c. Drainage area does NOT exceed 30 acres. Discharge requires design in accordance with floodplain regulations to protect the public interest, as directed by BCBEC. (V-A-2) Freeboard not required; setback 10 feet from 100 year water surface boundary; set first floor elevation 2.0' above water surface elevation. (V-F-2)

Survey data obtained for subject property. County GIS contours used to supplement survey data. Reference to the topographic information used for the analysis is included in Section 2.0 of the Report. Watershed size is referenced in Section 3.0 and 4.1.

- N/A 3. Regulations in the Baltimore County Building Code pertaining to TIDAL floodplains are applicable to this area. (V-A-3). Mapping in accordance with FEMA Flood Insurance Rate Maps.

Area is not within an area subject to TIDAL floodplain. Mapping provided is in accordance with the FEMA FIRM Maps. FIRM map included in Appendix D.

Subject property located upstream of Belair Rd. Model extends approximately 100 ft downstream. Culvert crossing is undersized and in inlet control so downstream boundary condition was considered sufficiently far downstream. See Section 4.3 of Report for additional information.

COMPUTATIONS

*See Section 4.0 & 5.0 of Report for additional information on hydraulics.

- N/A 1. Manning Equation (V-E) may be used if:
- N/A a. No backwater exists,
- N/A b. Study purpose is limited to determining floodplain boundary for establishing lot, easement, reservation boundaries,
- N/A c. Study vicinity is limited to 1 acre or larger lots.
- N/A d. Requires use of 5.0' freeboard. (V-F-1)
- N/A 2. Steep slopes about stream. Manual methods (Manning) may be considered.
- ✓ 3. Std. Computer Programs (HEC-2, HEC-RAS, HY-8) used. HEC-RAS v. 5.0.3
- ✓ 4. Storm runs required (V-G-1):
- ✓ a. Development Studies: 100 Year Storm 2 and 10 year may be required for MDE.
- N/A b. DPW Watershed Studies: 1, 2, 10, 100 Year
- N/A c. Calibration storms as necessary.
- ✓ 5. Explain any of the following in computations:
- N/A a. WSEL for lower year storm exceeds WSEL for higher year storm.

MDE Approval is not required, 2- and 10-year storm events were not included.

Survey data obtained for subject property. County GIS contours used to supplement survey data. See Floodplain Workmaps in Appendix C and D.

- ✓ b. Dramatic changes in WSEL, energy gradient or top width from section to section. Top width is to agree with plotted cross-section.
- N/A c. Shifts from subcritical to supercritical flow without apparent reason.
- N/A d. Sectional velocities higher in overbanks than channel. Does most of Q shift from channel to overbanks and back?

MODELING

*See Section 4.0 and 5.0 of Report for information on hydraulic modeling.
HEC-RAS output included in Appendix C & D.

- ✓ 1. Cross-sections located at points defining changes in flow direction and section, set perpendicular to flow. Sections re-oriented for different storms if flow path differs. (V-G-2)
- ✓ 2. Ineffective flow areas – use artificial levee to model. (V-G-3)
- ✓ 3. Supercritical flow – (HEC-2 critical flow repeatedly encountered) - water surface at greater of computed or critical depth; freeboard at greater of water surface +1.0', or supercritical energy grade line. (V-G-4)
- ✓ 4. Roughness coefficients (V-G-5,6,7,8)
- ✓ a. Based upon accepted references.
- ✓ b. Based upon worst hydraulic conditions anticipated, including summer conditions debris and future maintenance needs.
- N/A c. Adjusted 10% upward for re-forestation impacts – no impacts to adjacent private properties allowed.
- ✓ 5. Profile begun sufficiently far downstream to allow WSEL to stabilize before reaching area of interest. Use an exact elevation only if this can't be done and a value can be reliably determined.

Open Channel Hydraulics [Chow, 1959] was used to select Manning's "n" values. See Section 4.3 of Report for additional information.

CROSS-SECTIONS

*See HEC-RAS Output Cross sections in Appendix C and D.

- ✓ 1. Cross-sections based upon field-run topo; may be extended in overbanks using GIS topo with approval of reviewing agency.
- ✓ 2. Cross-sections may be submitted on 8.5" x 11" paper if part of report or on 24" x 36" mylar if requested by reviewing agency.
- ✓ 3. Cross-section plots shall show:
- ✓ a. Labeling of section by number;
- ✓ b. Use appropriate scales in accordance with General Instructions Section V-A-6 or in accordance with instructions from reviewing agency. Scale indicated on each sheet.
- ✓ c. n-factors shown clearly relative to applicable portion of cross-section.
- ✓ d. Elevation and offset coordinate shown for each break point in cross-section.

- ✓ e. Stream inverts and limits of top of stream channel labeled & coordinated.
- ✓ f. Label stream invert.

CULVERT & BRIDGE DESIGN

*No Proposed Culvert or Bridge Crossings

- N/A 1. Culverts – Private roadway crossing culverts in accordance with Section IV-C of Storm Drainage section.
- N/A 2. Culvert – 100 year WSEL is 3 feet or more below sump in County road grade and is 3 feet or less above crown of culvert pipe at entrance. (IV-A-4)
- N/A 3. Culvert – 100 year WSEL shall not exceed the top of banks adjacent to improved properties and shall not flow outside of floodplain reservations/easements. (IV-A-4)
- N/A 4. Culverts – Multiple pipe installations in accordance with Section IV-A-8.
- N/A 5. Open-bottom structures are in accordance with culvert requirements.
- N/A 6. Bridges – Minimum 2 foot freeboard between 100 year design high water and lowest point on suspended bridge structure. (IV-B-2)
- N/A 7. Bridges – Recommendations to prevent scour of bridge supports provided in accordance with MdSHA procedures. (IV-B-2)

See attachment C.5 for floodplain profile sheets in Appendix C.

MDE Approval is not required, 2- and 10-year storm events were not included.

There are no houses or buildings directly adjacent to subject property with LOMA finished floor elevation information available.

- ✓ c. Shade & label ineffective flow areas.
- ✓ 3. Floodplain profile - on 24" x 36" mylar
 - ✓ a. Use scale compatible with mapping scale (same horizontal scale, 5x to 10x vertical scale)
 - N/A b. Where possible, show profile on same sheet under corresponding section of map.
 - ✓ c. Show 2, 10 and 100 year storm water surface profiles. Show water surface elevations and associated flow rates at cross-sections in tabular form.
 - ✓ d. Show channel invert, left and right top of channel.
 - N/A e. Show basement and first floor elevations of adjacent houses and buildings at appropriate point along profile.
 - ✓ f. Show cross-section locations, labeled with number corresponding to numbered sections on plan view.
 - ✓ g. Show profile of upstream and downstream culverts, bridges and crossings.

FIELD INVESTIGATION (by reviewer)

- ___ 1. Topography shown on map is in agreement with observed field contours.
- ___ 2. Roughness coefficients used are acceptable for each reach.
- ___ 3. Cross-section locations reflect changes in flow direction for storm being modeled.
- ___ 4. Structure sizes are correctly noted.
- ___ 5. Verify entrance coefficients for each structure.
- ___ 6. Map indicates all buildings and obstructions (including fences) adjacent to stream and floodplain.
- ___ 7. Buildings located within floodplain have flooding susceptibilities noted in report.
- ___ 8. Observable high water lines on buildings, etc. are noted for calibration purposes. Try to verify these with area residents.
- ___ 9. Check for conditions such as scour indicating whirlpools, eddy currents and other localized non-linear losses that could invalidate a linear (HEC-2, HEC-RAS) model within that reach.

RIVERINE MAPPING

*See Hydraulic Workmaps included in Appendix C & D

- ✓ 1. Base map:
 - ✓ a. Use 1" = 100' scale or larger, labeled.
 - ✓ b. Include vicinity map, 1" = 500' scale minimum.
 - ✓ c. Label Datum, show contours. Map elevations supported by local survey data throughout extent of study.
 - ✓ d. North arrow, 3 coordinate ticks at multiples of 250' apart. Label North arrow with datum.
 - ✓ e. Show and label area roads by name, County bridges and culverts by size and number, if applicable.
 - ✓ f. Show cross-section locations and extents. Also indicate location of hydrologic cross-sections and structures, to be labeled.
 - ✓ g. Show all building improvements within 100 feet of determined floodplain.
 - ✓ h. For projects that will use floodplain map to determine easements and/or reservations, provide surveyed property line information.
 - ✓ i. Provide liber/folio property information for all adjacent properties.
 - ✓ k. Include watershed and stream branch names, as applicable.
 - ✓ l. Indicate data source and date for topography and cross-sections.
 - ✓ m. Map originals and associated report signed and sealed by Professional Engineer registered in Maryland.
- ✓ 2. Mapping – on 24" x 36" mylar
 - ✓ a. Show pre-construction 100 year, post-construction 100 year, freeboard line.
 - N/A b. Other storms shown as directed.

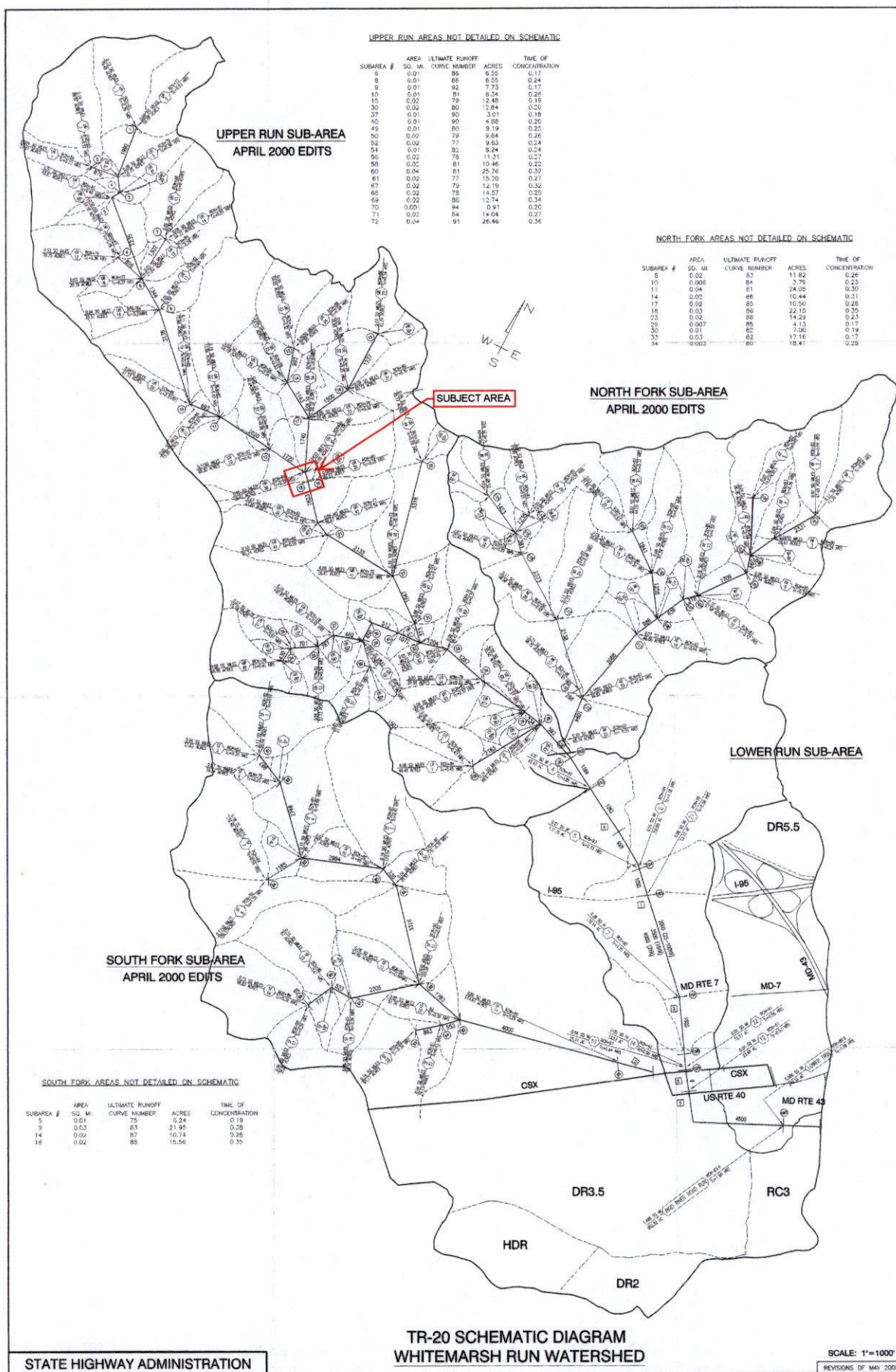
CALIBRATION (II D 9)

*Hydrology not updated for this floodplain study

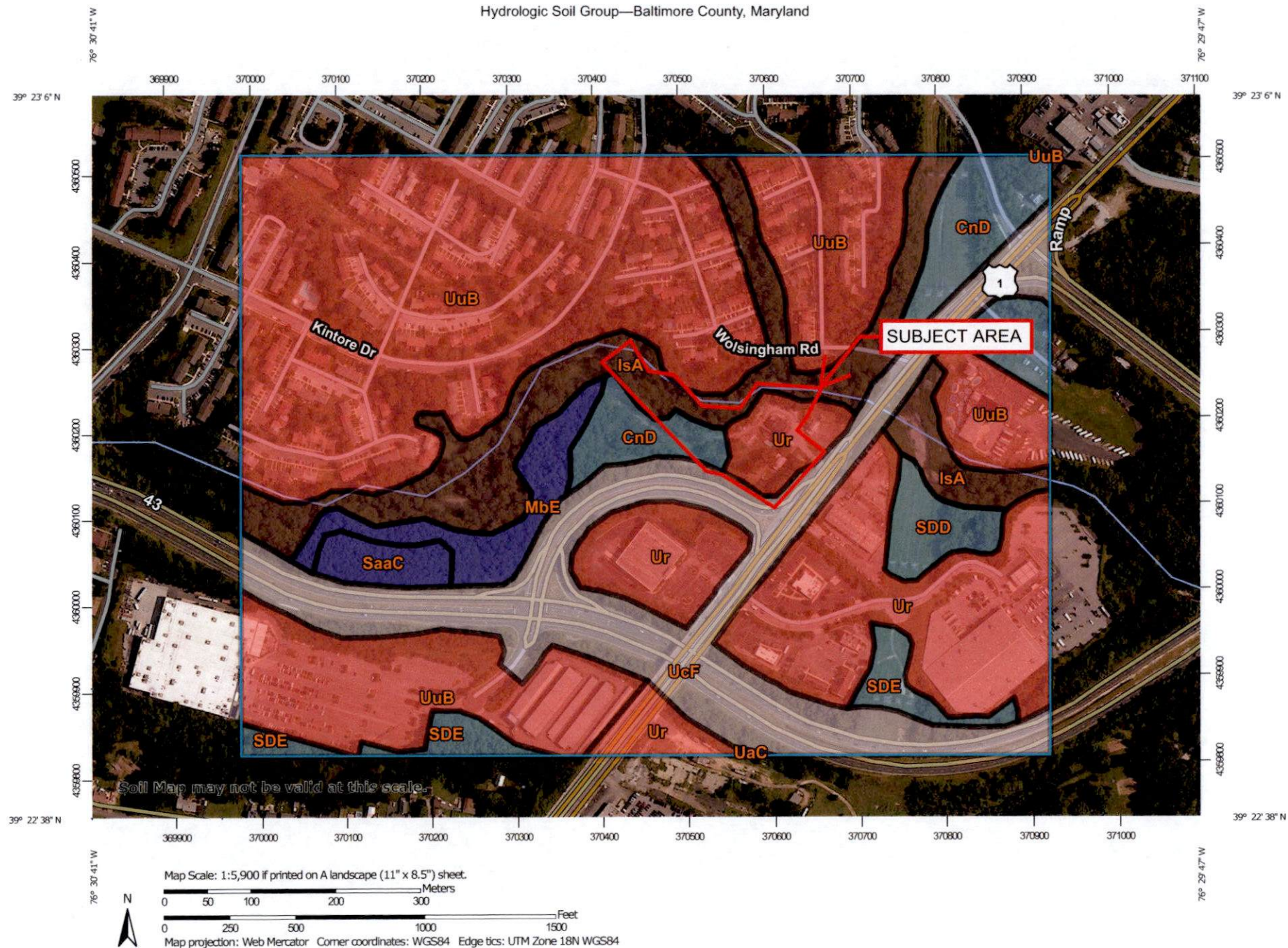
- N/A 1. Report to include runs made to verify accuracy of computer model for existing storm and existing known water surface elevations.
- N/A 2. Coordinate calibration of model with County reviewer.
- N/A 3. Report to include analysis of changes made to model in order to calibrate it to existing storms and water surface elevations.
- N/A 4. Determine sensitivity of model to changes in roughness coefficients, antecedent moisture condition, exclusion of ineffective areas, etc. Include commentary in report.
- N/A 5. Provide photos of channel, overbanks & structures in or adjacent to floodplain.

Appendix B: Effective Hydrology

MD Rte 43 Drainage Area Map
NRCS Soil Type Map



Hydrologic Soil Group—Baltimore County, Maryland



Natural Resources
Conservation Service

Web Soil Survey
National Cooperative Soil Survey

6/27/2019
Page 1 of 4

MAP LEGEND

Area of Interest (AOI)

 Area of Interest (AOI)

Soils

Soil Rating Polygons

 A
 A/D
 B
 B/D
 C
 C/D
 D
 Not rated or not available

Soil Rating Lines

 A
 A/D
 B
 B/D
 C
 C/D
 D
 Not rated or not available

Soil Rating Points

 A
 A/D
 B
 B/D

 C
 C/D
 D
 Not rated or not available

Water Features

 Streams and Canals

Transportation

 Rails
 Interstate Highways
 US Routes
 Major Roads
 Local Roads

Background

 Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:12,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
 Web Soil Survey URL:
 Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Baltimore County, Maryland
 Survey Area Data: Version 13, Sep 10, 2018

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Jul 5, 2014—Aug 15, 2014

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Hydrologic Soil Group

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
CnD	Croom gravelly sandy loam, 10 to 15 percent slopes	C	7.3	4.5%
CoD	Croom-Urban land complex, 5 to 15 percent slopes	C	2.0	1.2%
IsA	Issue silt loam, occasionally flooded	B/D	17.9	11.0%
MbE	Manor channery loam, 25 to 45 percent slopes	B	4.5	2.7%
SaaC	Sassafras sandy loam, 5 to 10 percent slopes, Northern Coastal Plain	B	2.0	1.2%
SDD	Sassafras and Croom soils, 10 to 15 percent slopes	C	2.7	1.6%
SDE	Sassafras and Croom soils, 15 to 25 percent slopes	C	3.7	2.3%
UaC	Udorthents, 8 to 15 percent slopes	C	0.0	0.0%
UcF	Udorthents, highway, 0 to 65 percent slopes		26.0	15.9%
Ur	Urban land, 0 to 8 percent slopes	D	26.9	16.5%
UuB	Urban land-Udorthents complex, 0 to 8 percent	D	70.0	42.9%
Totals for Area of Interest			163.1	100.0%

Description

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

The soils in the United States are assigned to four groups (A, B, C, and D) and three dual classes (A/D, B/D, and C/D). The groups are defined as follows:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas. Only the soils that in their natural condition are in group D are assigned to dual classes.

Rating Options

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher

Appendix C:

Ultimate Condition Hydraulics

Pre-Project HEC-RAS Output
Post-Project HEC-RAS Output
Base Map
Ultimate Floodplain Workmap
Floodplain Profile
Structure and Channel Photos
Check-RAS

Belair Road.rep

HEC-RAS HEC-RAS 5.0.3 September 2016
U.S. Army Corps of Engineers
Hydrologic Engineering Center
609 Second Street
Davis, California

```
X   X XXXXXX   XXXX   XXXX   XX   XXXX
X   X X   X   X   X   X   X   X   X
X   X X   X   X   X   X   X   X   X
XXXXXXXX XXXX   X   XXX XXXX   XXXXXX   XXXX
X   X X   X   X   X   X   X   X   X
X   X X   X   X   X   X   X   X   X
X   X XXXXXX   XXXX   X   X   X   X   XXXXX
```

PROJECT DATA

Project Title: HEC-RAS Model
Project File : Belair Road.prj
Run Date and Time: 10/23/2019 4:57:56 PM

Project in English units

PLAN DATA

Plan Title: Existing_Ultimate
Plan File : k:\DAL_Hydro\114037001 - 8228 Belair Road\Submittals\20191016 - Floodplain Study
Resubmittal_Unsigned\Appendix E - Digital Files\HEC-RAS v5.0.3\Belair Road.p02

Geometry Title: Existing
Geometry File : k:\DAL_Hydro\114037001 - 8228 Belair Road\Submittals\20191016 - Floodplain Study
Resubmittal_Unsigned\Appendix E - Digital Files\HEC-RAS v5.0.3\Belair Road.g01

Flow Title : Ultimate_Freeboard
Flow File : k:\DAL_Hydro\114037001 - 8228 Belair Road\Submittals\20191016 - Floodplain Study
Resubmittal_Unsigned\Appendix E - Digital Files\HEC-RAS v5.0.3\Belair Road.f03

Plan Summary Information:

Number of: Cross Sections =	16	Multiple Openings =	0
Culverts =	1	Inline Structures =	0
Bridges =	0	Lateral Structures =	0

Computational Information

Water surface calculation tolerance =	0.01
Critical depth calculation tolerance =	0.01
Maximum number of iterations =	20
Maximum difference tolerance =	0.33
Flow tolerance factor =	0.001

Computation Options

Critical depth computed at all cross sections
Conveyance Calculation Method: At breaks in n values only
Friction Slope Method: Average Conveyance
Computational Flow Regime: Subcritical Flow

FLOW DATA

Flow Title: Ultimate_Freeboard
Flow File : k:\DAL_Hydro\114037001 - 8228 Belair Road\Submittals\20191016 - Floodplain Study
Resubmittal_Unsigned\Appendix E - Digital Files\HEC-RAS v5.0.3\Belair Road.f03

Belair Road.rep

Flow Data (cfs)

River	Reach	RS	100-Year WSEL	100-Year FPE
Whitemarsh Run	1	17.59	3940	3940
Whitemarsh Run	1	17.52	3940	3940
Whitemarsh Run	1	17.41	3940	3940
Whitemarsh Run	1	17.39	3940	3940
Whitemarsh Run	1	17.37	3940	3940
Whitemarsh Run	1	17.35	3940	3940
Whitemarsh Run	1	17.33	3940	3940
Whitemarsh Run	1	17.29	3940	3940
Whitemarsh Run	1	17.27	3940	3940
Whitemarsh Run	1	17.25	3940	3940
Whitemarsh Run	1	17.22	3940	3940
Whitemarsh Run	1	17.20	3940	3940
Whitemarsh Run	1	17.13	3940	3940
Whitemarsh Run	1	17.09	3940	3940
Whitemarsh Run	1	16.86	3940	3940
Whitemarsh Run	1	16.80	3940	3940

Boundary Conditions

River	Reach	Profile	Upstream	Downstream
Whitemarsh Run	1	100-Year WSEL		Normal S = 0.020698
Whitemarsh Run	1	100-Year FPE		Known WS = 142.97

Changes in WS and EG

River	Reach	RS	Profile	Type	Value
Whitemarsh Run	1	17.59	100-Year FPE	Known WS	163.96
Whitemarsh Run	1	17.52	100-Year FPE	Known WS	163.87
Whitemarsh Run	1	17.41	100-Year FPE	Known WS	163.82
Whitemarsh Run	1	17.39	100-Year FPE	Known WS	163.77
Whitemarsh Run	1	17.37	100-Year FPE	Known WS	163.77
Whitemarsh Run	1	17.35	100-Year FPE	Known WS	163.77
Whitemarsh Run	1	17.33	100-Year FPE	Known WS	163.77
Whitemarsh Run	1	17.29	100-Year FPE	Known WS	163.76
Whitemarsh Run	1	17.27	100-Year FPE	Known WS	163.77
Whitemarsh Run	1	17.25	100-Year FPE	Known WS	163.76
Whitemarsh Run	1	17.22	100-Year FPE	Known WS	163.77
Whitemarsh Run	1	17.20	100-Year FPE	Known WS	163.76
Whitemarsh Run	1	17.13	100-Year FPE	Known WS	163.71
Whitemarsh Run	1	17.09	100-Year FPE	Known WS	163.67
Whitemarsh Run	1	16.86	100-Year FPE	Known WS	143.8
Whitemarsh Run	1	16.80	100-Year FPE	Known WS	142.97

GEOMETRY DATA

Geometry Title: Existing

Geometry File : k:\DAL_Hydro\114037001 - 8228 Belair Road\Submittals\20191016 - Floodplain Study
Resubmittal_Unsigned\Appendix E - Digital Files\HEC-RAS v5.0.3\Belair Road.g01

CROSS SECTION

RIVER: Whitemarsh Run

REACH: 1 RS: 17.59

INPUT

Description:

Station Elevation Data		num=	492								
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	212.54	.47	212.42	2.41	212.05	4.75	211.76	6.29	211.72		
7.16	211.63	8.22	211.59	10.16	211.4	12.1	211.63	14.04	211.27		

						Belair	Road.rep		
16.26	211.11	17.92	211.06	19.3	210.92	22.34	210.68	23.73	210.64
25.67	210.13	27.61	209.98	29.55	209.79	31.44	209.74	33.43	209.54
34.48	209.26	36.93	208.74	40.55	208.25	41.18	208.2	43.12	207.76
43.59	207.68	45.06	207.22	46.62	206.88	47	206.84	48.93	206.26
49.66	206.12	50.87	205.76	54.75	204.44	55.73	204.14	56.69	203.9
58.38	203.26	61.8	202.08	62.5	201.91	63.74	201.49	66.38	200.7
68.32	199.98	70.26	199.38	72.2	198.56	76.07	196.97	76.98	196.64
78.01	196.35	80.02	195.73	81.89	195.07	83.83	194.45	85.77	193.94
87.7	193.71	89.13	193.41	90.55	193.2	91.58	193.11	93.52	192.86
97.4	192.58	99.34	192.29	101.27	192.23	103.21	191.87	105.15	191.61
106.64	191.45	109.03	191.27	112	191.28	112.91	191.25	114.84	190.89
116.78	190.76	118.72	190.72	120.66	190.56	122.73	190.52	124.54	190.36
126.48	190.45	128.6	190.41	130.35	190.23	132.29	190.24	134.67	190.22
136.17	190.27	138.11	190.44	140.05	190.75	143.78	190.89	145.86	190.85
147.8	190.98	149.85	190.97	151.68	191.01	153.61	191.15	155.55	190.88
155.92	190.9	157.49	191.2	158.96	191.33	161.37	191.45	163.31	191.7
165.03	192.24	165.63	192.39	167.18	192.63	168.06	192.81	169.12	192.94
170.99	193.02	174.94	192.92	177.17	193.07	180.21	193.08	182.69	193.22
184.63	193.23	186.57	193.39	188.51	193.31	190.45	193.08	192.44	192.69
194.32	192.2	195.39	192.03	197.81	191.51	198.2	191.4	200.14	190.35
201.46	189.98	203.17	189.39	205.96	188.56	207.89	188.38	209.83	187.82
210.57	187.82	211.77	187.71	213.71	187.9	215.65	187.61	216.64	187.59
217.59	187.65	219.68	187.6	221.46	187.44	225.34	187.2	227.28	186.92
228.78	186.77	229.98	186.45	233.09	185.25	234.86	184.27	236.97	183.17
237.89	182.73	240.71	181.48	242.79	181.01	244.73	180.82	246.66	180.29
248.6	180.05	252.48	179.27	254.42	179.07	256.11	178.7	256.8	178.58
259.14	178.29	262.16	178.05	264.11	177.79	265.22	177.59	267.52	177.29
268.25	177.25	269.93	177.33	271.87	177.34	273.8	177.05	275.74	176.54
279.62	176.68	281.56	176.7	283.61	176.76	285.44	176.87	289.31	176.89
291.25	177.05	293.19	177.12	295.13	177.08	297.07	177.12	299.01	177.23
300.94	177.31	301.6	177.3	302.88	177.28	305.06	177.19	306.76	177.18
308.7	177.2	310.42	177.17	314.51	177.05	316.83	176.94	318.39	176.98
320.33	176.91	322.9	177.06	324.21	177.22	326.14	177.4	328.08	177.51
328.97	177.49	333.9	177.62	335.04	177.43	335.84	177.24	338.08	177
339.71	176.72	342.6	176.53	343.59	176.28	345.53	175.16	347.19	174.5
347.47	174.31	347.96	174.2	350.23	173.45	353.28	172.61	355.22	172.2
357.16	171.91	359.33	171.77	361.04	171.61	362.98	172.1	364.05	172.12
365.41	172.05	366.85	172.02	368.44	171.87	370.73	171.53	372.67	170.82
374.51	170.23	376.55	169.72	377.55	169.43	378.49	169.07	380.42	168.73
382.36	168.7	384.3	168.5	386.24	168.45	388.18	168.3	390.12	168.09
392.05	167.6	392.73	167.6	393.99	167.45	395.77	167.37	397.87	167.41
398.8	167.55	399.81	167.53	401.59	168.07	401.84	168.1	403.69	168.06
405.62	167.8	409.5	166.69	410.95	166.3	413.38	165.79	417.02	165.47
417.33	165.42	419.42	164.65	423.6	164.03	425.69	163.52	426.79	162.66
427.78	162.11	428.56	160.72	429.87	158.03	431.97	155.16	432.28	154.63
434.06	152.15	436.01	151.22	438.24	150.89	439.73	150.95	442.42	150.78
448.69	150.73	450.79	151.04	461.24	152.02	463.33	153.23	464.96	153.93
465.78	154.21	467.51	154.04	469.5	153.25	471.7	152.68	473.23	152.39
473.79	152.33	475.88	151.95	476.95	151.98	477.97	151.96	479.28	152.02
480.67	152	482.15	151.83	484.39	152.35	488.42	152.85	490.52	152.84
492.61	153.12	493.59	153.16	494.7	153.1	496.79	153.43	498.88	153.7
500.97	153.83	503	154.16	505.15	154.21	507.24	154.87	507.91	155.01
510.45	155.46	511.43	155.53	513.52	155.38	515.61	154.99	517.7	154.75
519.94	154.84	522.03	154.89	524.11	154.97	525.12	154.91	526.2	154.92
528.29	155.16	530.37	155.18	532.62	155.44	536.63	155.06	538.71	155.25
540.8	155.37	542.89	155.27	544.97	155.04	547.06	155.05	549.14	155.14
551.38	155.05	553.31	155.09	555.73	155.24	558.89	155.32	560.43	155.29
563.74	155.31	565.83	155.27	567.92	155.11	570.15	154.97	572.09	155
573.9	154.83	574.52	154.85	576.26	155.06	578.34	155.18	582.52	155.17
584.6	155.29	586.69	155.22	588.77	155.34	592.66	155.24	595.03	155.49
596.41	155.66	597.12	155.68	600.17	155.95	601.29	156.15	601.6	156.19
603.92	156.5	605.46	156.68	607.67	157.08	609.63	157.51	611.72	157.77
615.18	158.86	616.78	159.33	617.97	159.62	618.93	159.76	620.06	159.86
622.15	160.72	624.23	161.26	626.17	161.85	630.87	163.4	633.94	164.26
634.66	164.44	636.75	165.19	638.83	165.74	640.92	166.44	643	166.97
645.19	167.7	647.17	167.95	648.95	168.35	651.35	168.82	653.43	169.13
655.52	169.48	657.6	169.69	660.2	169.91	661.78	169.98	663.74	170.14
665.95	170.54	667.71	170.79	671.46	171.72	672.2	171.83	673.13	172.17
675.21	172.78	676.38	173.08	677.83	173.51	678.97	173.79	682.63	174.34

Belair Road.rep

684.72	174.59	687.22	175	688.89	175.37	691.92	175.84	693.06	175.99
695.15	176.1	697.23	176.49	699.32	176.69	701.41	177.07	703.49	177.41
705.58	177.68	707.66	177.87	709.75	178	712.74	178.46	713.92	178.59
716.01	178.74	718.09	178.96	722.26	179.43	724	179.71	724.79	179.8
726.43	179.92	727.75	180.12	730.61	180.48	731.5	180.52	735.25	180.95
736.86	181.17	738.88	181.4	741.04	181.68	745.21	182.16	748.27	182.41
749.38	182.61	750.26	182.97	751.46	183.59	753.55	184.28	754.02	184.37
755.64	184.46	757.77	184.35	759.81	184	761.89	183.39	763.98	183.03
765.27	183.33	766.06	183.57	767.05	184.05	768.15	184.37	769.03	185.09
770.24	185.75	772.32	186.23	774.41	187.24	776.49	187.75	778.58	188
780.66	187.82	781.14	187.82	782.75	187.65	784.84	187.58	789.01	187.06
790.53	186.96	793.18	186.88	795.23	187.18	797.35	187.54	799.93	187.74
802.8	188.18	804.62	188.5	806.55	189.03	807.78	189.64	809.32	189.98
810.3	190.15	811.95	190.33	814.01	190.48	816.12	190.88	818.21	191.09
820.29	191.35	822.38	191.46	824.47	191.63	826.55	192.01	830.72	192.54
832.8	193.08	834.9	193.23	836.98	193.44	839.07	193.73	841.15	193.79
843.24	193.92	845.32	194.12	847.41	194.56	849.5	194.63	851.58	194.76
853.67	194.92	855.75	195.15	857.84	195.21	859.92	195.3	862.84	195.56
864.1	195.6	866.18	195.75	868.27	196	870.37	196.17	872.44	196.48
874.53	196.96	876.61	197.07	878.7	197.09	880.78	197.07	882.87	197.11
884.95	197.2	889.13	197.48	891.21	197.58	893.3	197.72	895.38	198.18
896.61	198.41	897.47	198.45	900.36	198.44	903.24	198.54	904.11	198.6
905.81	198.82	907.9	198.93	911.62	199.31	914.16	199.71	916.24	200.1
919.12	200.76	920.41	201.14	922.5	201.99	922.88	202.07	924.58	202.62
926.63	203.72	928.76	205.1	930.84	206.36	932.93	207.08	934.13	207.71
935.01	208.28	936.11	208.9	937.1	209.52	939.18	210.24	940.81	210.49
943.36	211.1	945.39	211.19	947.53	211.34	949.14	211.23	949.61	211.16
951.7	210.47	952.35	210.37						

Manning's	n Values	num=	4						
Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
0	.013	361.04	.08	432.28	.035	465.78	.08		

Bank Sta:	Left	Right	Lengths:	Left	Channel	Right	Coeff	Contr.	Expan.
	432.28	465.78		324.06	285.46	241.07		.1	.3

CROSS SECTION

RIVER: Whitemarsh Run
REACH: 1 RS: 17.52

INPUT

Description:

Station	Elevation	Data	num=	492					
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	207.74	3.58	207.97	7.64	207.97	9.05	208.05	11.34	208.03
13.19	207.85	15.04	207.77	16.9	207.55	19.99	207.39	21.82	207.11
23.64	207.08	25.46	206.88	28	206.86	29.11	206.95	30.93	206.78
31.7	206.8	33.55	206.57	36.4	206.55	40.05	206.2	41.87	206.12
43.7	205.94	47.34	206.12	50.99	206.11	55.77	206.87	57.62	206.88
58.28	207.02	60.1	207.24	61.32	207.15	61.93	207.23	63.17	207.87
63.75	208	66.87	208.25	67.4	208.2	68.72	207.83	69.22	207.83
70.58	207.49	72.43	206.81	74.69	206.55	76.51	206.56	78.34	206.37
81.98	205.69	83.53	205.25	85.63	204.74	87.45	203.89	89.09	203.75
91.1	203.3	92.92	202.5	94.75	202.26	96.49	202.21	100.19	201.71
102.04	201.57	103.86	201.26	105.69	201.11	107.6	201.01	109.45	200.57
111.3	200.46	112.98	200.11	114.8	200.32	116.63	200.34	120.27	200.07
122.1	199.9	123.92	199.81	126.11	199.86	127.57	199.74	127.96	199.63
129.39	199.75	131.21	199.51	133.04	199.15	133.51	199.17	134.86	198.83
135.36	198.55	137.21	197.97	138.51	197.4	139.06	197.33	140.33	196.9
142.15	196.44	143.98	195.79	144.62	195.71	145.8	195.27	146.47	194.8
147.62	194.36	148.32	194.27	149.45	193.89	150.17	193.47	151.27	193.17
153.87	191.58	154.92	191.47	155.72	190.98	156.74	190.74	157.57	190.06
158.56	189.08	159.43	188.96	161.28	187.93	162.21	187.22	163.13	186.28
164.03	185.88	164.98	185.78	165.86	185.51	167.68	184.72	168.68	184.57
169.5	184.03	170.53	184.04	171.32	183.73	173.15	183.51	174.97	183.64
176.79	183.39	178.62	183.56	180.44	183.27	181.64	183.29	184.09	183.08
185.34	182.46	185.91	182.41	187.19	182.5	189.04	182.32	189.56	182.17

Belair Road.rep

191.38	182	193.2	182.11	195.03	181.97	196.85	182	198.3	181.81
200.15	181.87	202.32	181.84	205.97	181.91	207.55	181.73	209.61	181.6
211.44	181.56	213.26	181.84	215.08	181.54	216.91	181.41	218.66	181.66
220.51	181.48	222.36	181.38	224.2	181.42	226.02	181.34	227.85	181.32
229.67	181.15	231.62	181.07	235.32	181.02	236.96	180.89	240.87	180.8
242.72	180.53	244.26	180.62	246.43	180.55	249.73	180.38	251.55	180.15
253.83	180.04	255.2	180.11	259.38	179.8	261.23	179.77	266.14	179.45
266.79	179.52	268.64	179.46	269.78	179.3	270.49	179.44	273.43	179.69
274.19	179.63	275.25	179.83	277.08	179.74	278.9	179.81	280.72	179.77
282.55	179.64	284.37	179.61	286.19	179.8	289	179.86	289.84	179.81
290.85	179.96	292.7	180.57	294.55	180.77	295.31	180.97	297.13	182.18
298.25	182.48	300.11	182.57	300.78	182.77	301.96	182.93	302.6	182.91
303.81	182.69	304.42	182.79	306.25	182.65	308.07	182.22	309.89	182.29
311.21	182.03	311.72	182.03	313.06	181.68	314.91	181.52	315.36	181.25
317.19	180.96	317.43	180.9	320.47	180.08	320.83	180.03	322.32	179.5
324.48	178.88	326.3	177.97	327.87	177.77	329.72	177.38	331.77	177.1
333.6	176.19	335.42	175.48	337.13	174.94	338.98	174.26	340.83	173.77
342.71	172.89	344.53	172.14	346.36	171.51	348.18	170.95	350.08	170.21
351.83	169.91	353.79	169.23	355.48	169.02	357.3	168.44	359.34	167.61
360.95	167.19	362.77	166.88	364.59	166.42	366.42	166.16	368.24	165.34
370.06	165.06	371.89	164.65	373.71	164.51	374.15	164.33	376	163.85
377.36	163.34	381.55	162.33	382.83	161.88	383.4	161.87	385.25	161.26
386.47	161.26	390.81	160.17	393.77	159.38	395.59	159.52	398.21	158.86
402.88	157.85	404.71	157.52	405.62	157.45	407.47	157.03	410.18	156.7
412	156.82	413.82	156.19	414.87	155.91	416.72	155.65	417.47	155.39
419.29	154.99	422.94	153.98	424.76	153.64	426.58	153.69	428.41	153.57
430.23	153.21	432.05	153.46	433.38	153.33	435.7	153.29	437.08	153.56
441.17	153.65	442.99	153.62	444.82	153.29	446.64	152.73	448.46	151.56
450.29	150.91	452.11	149.64	453.93	149.72	472.17	149.19	474.1	149.16
475.81	149.03	477.64	149.93	479.46	150.7	481.28	150.95	483.36	150.7
484.93	150.96	486.75	150.68	487.06	150.72	488.58	150.58	490.76	150.98
492.22	150.76	494.05	151.16	496.32	151.54	497.69	151.96	500.02	152.13
501.87	152.02	503.16	152.1	503.72	152.25	504.99	152.8	506.81	152.97
507.57	153.1	508.65	153.44	509.64	153.64	511.71	153.64	513.78	153.59
514.15	153.65	515.99	153.62	517.92	153.41	521.49	152.87	524.13	152.86
525.16	152.94	527	152.8	528.27	152.83	530.67	153.07	532.41	152.96
536.55	153.32	538.01	153.58	539.84	153.53	541.67	153.56	545.34	153.73
550.85	154.05	552.68	154.09	555.18	153.95	556.35	153.99	560.02	153.81
563.69	153.48	565.53	153.5	567.36	153.91	569.2	154.01	572.87	154.97
573.81	155.4	576.54	156.13	577.95	156.25	578.37	156.38	580.02	156.62
583.88	156.99	585.71	157.46	587.55	157.56	589.38	157.89	590.37	157.88
591.21	157.69	593.05	157.84	594.88	157.84	596.59	157.74	598.66	158.06
600.73	158.3	602.8	159.08	604.87	159.41	605.89	159.77	606.94	160.29
609.56	160.71	611.4	161.58	613.23	161.57	615.07	162.62	616.9	162.88
617.43	162.99	618.75	163.27	624.12	164.9	626.88	165.69	628.11	165.82
629.98	166.52	631.75	166.97	633.72	167.2	635.59	167.9	636.63	168.04
637.46	168.26	639.34	168.56	641.21	168.74	643.95	169.48	646.39	170.29
648.83	170.63	650.57	170.95	652.44	170.99	653.7	171.19	658.58	171.82
659.93	172.03	661.8	172.52	663.46	172.66	665.9	173.1	671.16	173.67
672.41	173.77	674.9	174.12	675.65	174.13	676.77	174.5	678.64	174.78
680.53	175.14	682.97	175.11	688	175.34	690.29	175.74	692.73	175.88
693.62	176.08	695.49	176.18	697.36	176.47	699.23	176.44	701.1	176.77
702.98	176.84	704.92	177.2	707.36	177.15	709.8	177.5	712.24	177.74
714.21	177.77	717.95	178.28	719.55	178.26	721.99	178.46	724.43	178.53
729.18	179.03	731.75	179.2	732.92	179.23	734.79	179.17	736.63	179.43
738.54	179.49	741.5	179.76	743.94	180.11	748.82	180.32	751.26	180.28
753.51	180.49	755.38	180.44	757.26	180.5	758.58	180.64	760.94	180.81
762.87	180.8	764.74	181.01	768.33	181.06	770.77	181.19	772.23	181.21
774.1	181.32	778.09	181.67	781.59	182.09	785.33	182.33	787.84	182.32
789.07	182.52	790.28	182.59	793.14	182.58	795.16	182.65	796.56	182.78
798.43	182.88	801.19	183.09	805.92	183.57	807.79	183.64	809.66	183.64
811.54	183.79	813.41	184.05	814.67	184.14	815.28	184.29	817.28	184.32
820.89	184.59	824.64	184.73	826.51	184.72	829.31	185.02	832.12	185.4
834.18	185.95	835.87	186.31	837.74	186.82	839.61	187.53	843.35	188.38
845.23	188.62	847.1	188.61	848.82	188.08	852.71	186.09	853.69	185.39
854.59	184.88	856.46	183.96	858.33	184.07	860.2	185.1	861.01	185.49
862.07	186.17	863.94	187.18	865.89	187.49	867.69	187.69	869.56	187.84
871.43	188.17	873.3	188.13	875.17	188.46	877.05	188.52	878.92	188.86
880.79	188.98	882.66	189.17	884.53	189.2	888.28	189.65	890.28	189.7

Belair Road.rep									
892.72	189.88	893.89	190.08	895.76	190.09	897.6	190.41	900.03	190.68
901.38	190.75	903.25	191.08	905.12	191.14	906.99	191.31	908.87	191.38
909.79	191.49	912.61	191.6	914.67	191.62	917.11	191.82	918.22	191.82
920.1	192.04	921.91	192.14	924.42	192.65	925.71	192.99	927.58	193.34
931.33	194.25	935.07	194.92	936.62	195.44	939.06	195.93	940.68	196.13
941.5	196.41	942.56	196.91	944.43	197.04	948.17	197.97	950.04	198.48
951.92	199.65	953.36	200.25						

Manning's n Values		num=		4					
Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
0	.013	304.42	.08	448.46	.035	481.28	.08		
Bank Sta:	Left	Right	Lengths:	Left	Channel	Right	Coeff	Contr.	Expan.
	448.46	481.28		503.81	443.88	439.17		.1	.3

CROSS SECTION

RIVER: Whitemarsh Run
 REACH: 1 RS: 17.41

INPUT

Description:

Station Elevation Data		num=		397					
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	171.91	1.56	172.43	3.57	173.02	5.17	173.46	5.58	173.59
7	174.13	7.59	174.15	8.83	174.24	36.28	166.47	38.12	166.26
39.95	166.26	41.75	166.01	43.61	166.2	45.44	166.12	47.27	165.98
47.78	166.05	49.1	166.06	51.8	165.94	52.76	165.93	53.81	165.71
54.59	165.62	55.82	165.77	56.42	165.77	57.83	165.57	59.84	165.51
60.08	165.48	61.91	165.7	63.74	165.42	65.57	165.51	67.4	165.45
67.87	165.46	69.23	165.59	69.88	165.59	71.06	165.47	71.89	165.46
73.9	165.4	75.91	165.39	78.38	165.27	81.94	165.17	83.87	165.32
85.7	165.27	87.53	165.11	89.36	165.23	91.19	165.28	93.02	165.12
94.85	165.08	96.01	164.91	96.69	164.91	98.02	165.22	98.52	165.25
100.03	165.19	102.18	165.41	103.59	165.65	105.84	166.01	107.67	166.03
108.07	166.07	109.5	166.12	110.08	166.12	111.33	166.02	113.16	166.09
114.1	166.21	114.99	166.21	116.1	166.08	116.82	166.07	118.65	166.16
120.12	166.43	120.48	166.43	122.13	166.29	122.31	166.3	124.11	166.58
125.97	166.28	128.16	166.36	129.63	166.35	160.75	166.91	162.33	166.92
162.58	166.9	164.41	167.14	166.24	166.58	168.07	166.29	168.35	166.33
169.9	166.35	170.36	166.25	171.73	166.26	173.56	166.05	175.39	165.88
177.22	165.96	178.4	165.74	179.05	165.55	180.41	165.24	182.71	164.86
184.43	164.78	186.37	164.58	188.2	164.37	188.45	164.32	190.46	164.23
191.86	164.13	193.69	164.08	194.48	164.01	195.52	163.98	197.35	163.97
199.18	164.04	200.51	163.94	201.01	163.85	202.84	164	204.67	164.07
206.54	163.9	208.33	163.7	210.17	163.78	210.56	163.75	212	163.73
212.57	163.77	213.83	163.78	214.58	163.75	216.59	163.74	217.49	163.81
218.6	163.83	219.32	163.8	222.61	163.97	222.98	163.93	224.62	163.85
224.81	163.86	226.63	163.81	228.64	163.86	230.3	163.86	232.66	163.88
233.96	163.98	235.79	163.93	237.62	163.92	238.69	163.97	240.7	164.12
241.28	164.19	242.71	164.21	243.11	164.25	244.72	164.23	244.94	164.2
247.2	164.21	248.6	164.25	250.43	164.65	250.75	164.64	252.26	164.77
254.09	164.76	254.77	164.9	255.92	165.19	256.78	165.34	257.75	165.41
258.79	165.61	259.58	165.8	261.41	165.96	265.07	166.18	294.36	160.06
296.19	159.92	298.02	159.82	299.85	159.77	300.99	159.77	303.51	159.72
305.34	159.75	307.02	159.61	307.17	159.58	309	159.53	310.83	159.42
311.04	159.39	313.05	159.32	314.49	159.19	316.32	159.1	317.07	159.01
317.9	158.95	319.08	158.86	319.98	158.84	321.09	158.88	321.81	158.86
323.65	158.87	325.11	158.65	325.48	158.65	327.11	158.81	327.31	158.81
329.26	158.59	331.13	158.58	332.8	158.83	333.14	158.83	334.63	158.73
335.15	158.59	336.46	158.33	337.16	158.26	338.29	158.06	339.17	158.17
340.12	158.25	341.95	158.61	343.19	158.91	343.78	159.08	345.2	159.36
345.61	159.4	347.44	159.93	349.22	160.35	351.1	160.57	354.76	160.89
359.27	161.09	360.25	161.16	362.08	161.16	363.29	161.11	363.91	161.13
365.3	161.09	367.57	161.18	369.32	161.34	373.06	161.44	374.89	161.26
376.72	161.15	377.36	161.18	380.38	161.19	381.37	161.13	381.63	161.14
382.26	161.18	382.85	161.11	384.23	160.73	385.65	160.44	387.05	160.26
388.17	160.2	388.44	160.13	389.13	160.1	389.84	159.99	390.13	160.01

Belair Road.rep									
391.24	159.63	392.1	159.21	392.64	159.04	394.07	158.33	395.44	157.93
396.04	157.72	396.84	157.21	398.24	156.61	399.63	155.69	399.98	155.64
401.03	155.33	401.95	155.03	402.43	154.91	403.91	154.27	405.23	154.03
405.88	153.86	406.63	153.77	409.43	153.11	410.82	152.42	411.79	152.11
412.22	151.9	413.76	151.53	415.02	151.19	415.73	150.85	416.42	150.72
417.69	150.64	418.12	150.49	419.22	150.18	419.45	150.11	422.68	150.12
425.04	150.12	444.17	150.35	444.5	150	444.76	149.77	445.65	149
445.89	148.73	446.5	148	447.09	147.39	447.19	147.32	447.62	147
448.53	146.22	448.74	146	448.88	145.86	456.1	145.83	458.66	145.36
460.2	145.33	467.9	145.57	480.73	145.97	480.8	146	483.32	146.73
483.97	147	484.63	147.14	486.8	147.6	489.34	148	491.23	148.27
496.3	149	498.1	149.46	500.3	150	501.95	150.78	502.46	151
504.29	151.73	504.88	152	506.63	152.77	507.19	153	509.07	153.8
509.54	154	511.55	154.88	511.84	155	512.21	155.16	514.18	156
514.43	156.1	516.61	157	517.42	157.35	519.07	157.95	519.23	158
519.33	158.04	521.97	159	522.62	159.24	525.22	159.92	525.44	159.99
525.55	160	525.84	160.03	531.22	160.49	537.01	161	544.83	161.71
546.42	161.84	548.28	162	554.16	162.51	555.91	162.5	557.85	162.46
560.16	162.43	560.89	162.44	561.5	162.43	566.51	163	570.5	163.46
571.75	163.65	574.59	164	577.71	164.38	580.77	164.71	582.36	164.86
582.88	164.91	584.16	165	585.28	165.04	585.33	165.05	585.57	165.07
593.28	165.71	596.01	165.91	596.65	166	598.51	166.29	603.56	167
605.16	167.18	612.9	168	614.36	168.16	622.62	169	623.75	169.11
632.06	169.78	636.08	169.94	636.64	169.96	636.95	169.97	637.03	170
637.09	170.04	637.33	170.08	637.83	170.14	642.39	171	647.22	171.97
647.37	172	647.62	172.05	652.8	173	653.73	173.17	658.35	174
660.89	174.48	663.7	175	667.6	175.73	669.07	175.96	669.35	176
673.28	176.62	673.63	176.72	674.13	176.93	674.3	177	675.23	177.37
676.91	178	677.97	178.45	679.26	179	680.22	179.38	681.79	180
683.09	180.56	684.13	181	685.55	181.58	686.53	182	688.01	182.57
689.1	183	690.24	183.48	691.52	184	692.63	184.38	693.95	185
696.05	185.81	696.43	186	696.63	186.07	697.16	186.26	698.8	187
700.71	187.81	701.14	188	702.11	188.38	702.54	188.56	703.49	189
703.93	189.19	705.66	190	706.11	190.2	707.85	191	708.3	191.19
710.06	192	710.59	192.23	712.28	193	712.86	193.29	714.42	194
715.77	194.61	716.46	194.91						

Manning's n Values									
Sta	n Val	Sta	num=	4	Sta	n Val	Sta	n Val	Sta
0	.013	380.38	.08	444.17	.035	501.95	.08		
Bank Sta:	Left	Right	Lengths:	Left	Channel	Right	Coeff	Contr.	Expan.
	444.17	501.95		78.82	87.09	85.54		.1	.3
Blocked Obstructions									
Sta L	Sta R	Elev	num=	3	Sta L	Sta R	Elev	Sta L	Sta R
0	39.95	174			124.11	166.24	174	258.79	299.85

CROSS SECTION

RIVER: Whitemarsh Run
 REACH: 1 RS: 17.39

INPUT									
Description:									
Station	Elevation	Data	num=	358	Sta	Elev	Sta	Elev	Sta
0	167.43	1.24	167.51	2.68	167.45	4.21	167.52	5.57	167.44
6.13	167.36	7.01	167.34	8.05	167.21	8.45	167.2	9.9	167.29
11.34	167.04	11.89	167.06	12.78	167.02	13.81	166.86	14.23	166.86
15.73	166.69	17.11	166.78	17.65	166.83	18.56	166.81	20	166.93
21.49	167.04	22.89	166.9	23.41	166.9	24.33	166.93	25.77	166.8
27.22	166.69	28.66	166.5	29.17	166.45	31.55	166.44	32.92	166.3
34.43	166.13	34.93	166.05	35.87	165.8	37.32	165.59	38.73	165.3
40.69	165.31	41.65	165.29	43.09	165.32	44.54	165.11	45.98	165.44
46.45	165.49	47.42	165.27	48.86	165.37	50.35	165.15	51.75	165.03
53.19	164.96	54.13	164.97	54.64	165.02	56.05	164.98	57.52	164.99
57.97	164.95	58.97	165.02	59.89	164.97	60.41	164.91	61.81	164.98
63.29	164.91	63.73	164.95	64.74	164.87	65.65	164.83	66.18	164.85

Belair Road.rep									
67.57	164.64	67.78	164.65	69.07	164.81	70.41	164.84	70.55	164.85
71.36	164.81	72.48	164.78	74.42	164.8	75.02	164.76	76.35	164.72
78.67	164.71	80.22	164.77	82.32	165.1	84.09	165.41	85.97	165.36
87.8	165.28	89.62	165.42	89.9	165.42	91.84	165.52	93.28	165.63
95.1	165.69	96.93	165.83	97.64	165.87	98.75	165.84	100.58	165.99
101.51	166.08	102.41	166.09	103.45	166	104.23	166.2	105.39	166.99
106.06	167.2	107.32	167.37	107.88	167.56	109.26	167.4	109.71	167.33
117.25	165.99	118.84	163.07	129.8	160.07	131.62	159.99	132.48	159.99
133.45	160.01	135.27	160	136.35	160.01	137.1	160.05	138.29	160.03
138.93	160.09	140.23	159.98	142.16	159.55	142.58	159.42	144.1	159.49
144.4	159.49	146.03	159.17	146.23	159.14	147.97	159.09	149.9	159.18
151.84	159.09	153.53	159.27	155.36	159.61	157.19	159.57	157.65	159.59
159.01	159.57	159.58	159.55	160.84	159.66	162.66	159.41	163.45	159.46
165.39	159.36	166.32	159.37	167.32	159.17	168.14	159.07	169.26	158.78
169.97	158.58	171.19	158.33	171.79	158.13	173.62	158.29	175.07	158.52
175.45	158.57	177	158.71	177.27	158.75	179.1	159.15	180.87	159.32
181.77	159.43	182.75	159.57	184.58	159.85	184.74	159.86	186.4	160.13
186.68	160.11	188.23	160.12	188.61	160.16	190.05	160.45	190.55	160.53
192.49	160.56	193.71	160.63	195.53	160.65	196.36	160.81	197.36	160.86
198.29	160.96	199.18	161.13	201.01	161.19	202.16	161.4	202.84	161.41
204.1	161.27	204.66	161.25	206.03	161.11	207.97	161.3	208.31	161.29
209.91	161.42	211.97	161.38	213.78	161.21	215.71	161.1	217.44	161.11
219.58	160.94	221.1	160.88	221.52	160.85	222.92	160.8	223.45	160.77
224.75	160.78	225.39	160.72	226.57	160.68	227.33	160.72	228.4	160.68
229.26	160.68	230.23	160.73	231.2	160.81	233.13	160.92	233.88	161.1
235.07	160.8	235.7	160.54	237	160.29	237.53	160.12	238.94	159.88
239.36	159.84	240.87	159.39	241.18	159.31	242.81	159.19	244.75	158.87
244.83	158.84	246.66	158.47	248.49	157.93	248.62	157.91	250.31	156.92
250.55	156.83	252.14	156.48	252.49	156.31	254.42	155.53	255.79	154.9
256.36	154.73	258.29	154.11	259.44	153.61	260.23	153.21	261.27	152.81
262.17	152.59	263.09	152.29	264.1	152	264.92	151.68	266.04	151.21
266.75	151.11	267.97	150.72	268.57	150.62	269.91	150.35	270.4	150.27
272.22	149.55	273.78	149.35	274.05	149.3	274.91	149.22	300.58	149
301.16	149	301.88	149	302.48	148.98	303.95	148.98	304.94	148.97
306.31	149	309.18	149.07	317.92	149.07	323.74	149.11	332.48	149.05
333.13	149.04	333.19	149	333.27	149	333.38	148.86	333.54	148.67
334.26	148	334.94	147.02	335.17	146.8	335.87	146.22	336.11	146
336.42	145.74	337.29	145	337.73	144.63	339.07	144.67	340.04	144.7
344.35	144.57	347.49	144.63	349.99	144.66	357.35	144.53	358.65	144.55
364.86	144.67	368.68	145	369.09	145.24	370.43	146	370.93	146.28
372.23	147	373.39	147.72	373.89	148	374.45	148.31	375.84	149
377.18	149.77	377.62	150	378.06	150.23	379.49	151	379.85	151.2
381.3	152	381.63	152.2	383	153	383.39	153.22	384.82	154
385.18	154.21	386.52	155	387.89	155.68	388.22	155.84	388.51	156
389.1	156.28	390.43	157	390.85	157.2	391.12	157.33	391.64	158
393	158.61	395.97	159	398.84	159.36	404.31	160	405.36	160.14
409.58	160.67	412.41	161	415.56	161.39	420.63	162	424.37	162.47
424.94	162.51	426.96	162.76	433.92	163	436.49	163.09	437.82	163.17
445.85	163.7	446.63	163.81	447.93	164	451.34	164.46	455.15	165
459.19	165.55	462.57	166	465.42	166.39	469.67	166.98	469.9	167
474.68	167.67	478.02	168	479.28	168.12	485.65	168.73	488.49	169
490.82	169.21	493.67	169.49	498.42	170	499.31	170.19	505.49	170.73
506.31	171	506.57	171.07	509.85	171.98	509.9	172	513.22	173
513.86	173.17	515.75	173.73	517.32	174	518.39	174.22	522.29	175
525.76	175.66	526.5	176	526.78	176.12	528.91	177	529.82	177.39
531.23	178	532.66	178.61	533.53	179	534.38	179.36	535.9	180
537.35	180.62	538.21	181	539.69	181.63	540.53	182	541.59	182.46
542.91	183	544.11	183.52	545.21	184	546.58	184.6	547.48	185
548.45	185.42	549.86	186	551.18	186.58	552.13	187	553.13	187.43
554.49	188	555.69	188.47	556.65	188.91				

Manning's n Values		num=		5					
Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
0	.013	107.88	.08	333.54	.035	375.84	.08	505.49	.03
Bank Sta: Left		Right	Lengths: Left Channel		Right	Coeff Contr.		Expan.	
333.54		375.84	37.31		60.85	73.16		.1 .3	
Blocked Obstructions		num=		1					
Sta L	Sta R	Elev							

93.28 142.16 172

CROSS SECTION

RIVER: Whitemarsh Run

REACH: 1

RS: 17.37

INPUT

Description:

Station	Elevation	Data	num=	352	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	166.98	.41	166.94	1.17	166.93	2.43	166.88	3	166.81			
4.44	166.77	4.83	166.78	6.46	166.9	6.66	166.89	8.47	166.31			
8.69	166.32	10.49	166.46	12.15	166.32	12.5	166.25	13.98	166.07			
14.51	165.96	15.81	165.65	16.53	165.73	17.64	165.82	18.54	165.7			
19.47	165.59	20.56	165.5	21.31	165.51	22.57	165.67	23.14	165.69			
24.59	165.57	24.97	165.53	26.6	165.5	26.8	165.51	28.62	165.43			
30.46	165.45	30.63	165.46	32.64	165.51	34.12	165.57	34.66	165.54			
35.95	165.59	36.67	165.59	37.78	165.48	38.69	165.56	39.61	165.62			
40.7	165.74	41.44	165.72	42.72	165.71	43.27	165.7	44.73	165.57			
45.1	165.53	46.75	165.46	46.93	165.47	48.76	165.36	50.6	165.37			
52.43	165.3	54.26	165.24	54.8	165.29	56.09	165.33	56.82	165.36			
57.92	165.53	58.83	165.54	59.75	165.61	60.85	165.6	61.58	165.58			
62.86	165.62	63.41	165.62	64.88	165.71	65.24	165.77	66.89	166.17			
67.07	166.18	68.87	166.35	70.73	167.06	100.02	160.05	101.85	160.08			
103.15	160.22	103.68	160.24	105.17	159.73	105.52	159.63	107.18	159.52			
108.99	159.56	109.19	159.56	111.01	159.47	112.84	159.46	113.22	159.5			
114.67	159.52	115.24	159.46	116.5	159.55	118.33	159.45	119.27	159.46			
120.16	159.45	121.28	159.48	121.99	159.51	123.3	159.54	123.82	159.53			
125.31	159.4	125.65	159.36	127.48	159.35	129.06	159.24	129.31	159.21			
131.14	159.08	132.97	159.17	133.37	159.12	134.81	158.98	136.64	158.85			
137.4	158.85	138.47	158.79	139.41	158.81	140.3	158.81	141.43	158.67			
142.13	158.64	143.44	158.62	143.96	158.6	145.46	158.7	145.79	158.68			
147.47	159.07	147.62	159.14	149.48	159.19	151.28	159.17	151.5	159.16			
153.11	159.3	153.51	159.36	154.94	159.42	155.53	159.4	156.77	159.42			
157.54	159.47	158.6	159.63	160.43	159.71	161.57	159.86	162.27	159.91			
163.59	159.99	164.1	160.01	165.6	160.03	165.93	160.05	167.61	160.11			
167.76	160.11	169.18	160.23	169.59	160.27	171.42	160.69	171.64	160.7			
173.25	160.47	173.66	160.45	175.08	160.42	175.67	160.46	176.91	160.45			
177.69	160.46	179.7	160.56	180.57	160.63	181.72	160.63	182.4	160.6			
183.73	160.58	184.23	160.6	185.75	160.58	186.06	160.56	187.76	160.62			
187.89	160.62	189.73	160.78	189.77	160.77	191.56	160.65	191.79	160.66			
193.39	160.66	193.8	160.71	195.22	160.78	195.82	160.68	197.83	160.57			
198.88	160.5	199.85	160.46	200.71	160.37	202.54	160.34	203.88	160.15			
204.37	160.12	205.89	160.21	206.2	160.22	207.9	159.91	208.03	159.9			
209.92	160	211.69	159.9	211.93	159.91	213.52	159.89	213.95	159.82			
215.35	159.64	215.96	159.71	217.19	159.91	217.98	159.92	219.02	159.91			
220.85	159.55	222.01	159.55	222.68	159.5	224.02	159.38	224.51	159.38			
226.03	159.26	226.34	159.21	228.05	158.78	228.17	158.76	229.36	158.64			
230	158.59	231.83	158.34	232.08	158.27	233.66	158.04	235.49	157.74			
236.11	157.68	237.32	157.37	238.12	157.08	239.15	156.85	240.14	156.9			
240.98	156.55	242.15	155.74	242.81	155.53	244.16	155.06	244.64	155.03			
246.18	153.23	246.48	153.03	248.19	152.12	248.31	152.01	249.42	151.54			
250.21	151.23	252.22	150.57	253.8	150.2	254.24	150.12	255.63	149.7			
256.25	149.63	257.46	149.55	258.27	149.37	259.29	149.07	260.28	149.11			
261.12	149.19	262.3	149.13	262.95	149.08	263.84	148.66	267.67	148.72			
275.87	148.86	280.87	149	284.72	149.11	295.12	149.41	307.41	149.2			
315.48	149.07	318.64	149.01	318.9	149	318.92	149	319.04	149			
332.24	148.06	332.47	148	333.39	147.77	334.84	147	335	146.93			
336.2	146	339.82	145.42	342.52	145	350.79	144.19	351.92	144			
352.58	143.78	353.15	143.77	356.38	143.52	358.85	143.35	361.94	143.13			
362.84	143.05	363.47	143.02	364.06	143.02	364.71	143.17	364.78	143.27			
365.12	144	365.61	144.41	366.45	145	366.91	145.39	367.61	146			
368.11	146.42	368.79	147	369.57	147.62	370.08	148	370.55	148.44			
371.16	149	371.76	149.47	372.44	150	373	150.49	373.54	151			
374.21	151.55	374.72	152	375.49	152.65	375.99	153	376.83	153.7			
377.19	154	378.21	154.83	378.37	155	378.91	155.42	379.97	156			
380.15	156.1	381.46	156.91	381.72	157	383.09	157.78	383.46	158			

Belair Road.rep

384.71	158.79	385.03	159	385.18	159.07	385.41	159.18	393.22	159.86
394.97	160	404.37	160.82	406.39	160.98	406.58	161	409.27	161.24
415.69	161.58	416.66	161.58	420.59	161.78	423.5	162	425.79	162.12
427.74	162.22	429.63	162.76	430.35	163	431.88	163.51	432.76	163.79
434.34	164	435.82	164.15	443.11	165	449.64	165.63	453.59	166
456.33	166.27	461.34	166.76	464.04	167	468.69	167.44	468.98	167.47
472.69	167.87	473.88	168	475.5	168.17	482.58	169	488.8	169.77
490.65	170	491.85	170.14	499.01	171	500.76	171.21	507.23	172
509.53	172.29	515.43	173	518.74	173.82	520.92	174	523.03	174.86
523.77	175	524.95	175.22	526.67	176	527.64	176.41	529.17	177
530.81	177.81	531.28	178	531.59	178.16	533.51	179	533.74	179.1
535.91	180	536.76	180.41	538.24	181	540.05	181.76	540.63	182
541.21	182.25	542.25	182.71	542.84	183	545.18	183.94	545.33	184
545.74	184.16	546.15	184.38						

Manning's	n Values	num=	5						
Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
0	.013	70.73	.08	333.39	.035	370.08	.08	394.97	.03

Bank Sta:	Left	Right	Lengths:	Left	Channel	Right	Coeff	Contr.	Expan.
	333.39	370.08		49.75	65.61	71.57		.1	.3
Blocked Obstructions			num=	1					
Sta L	Sta R	Elev							
65.73	103.68	172							

CROSS SECTION

RIVER: Whitemarsh Run
REACH: 1 RS: 17.35

INPUT

Description:

Station	Elevation	Data	num=	366					
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	166.1	.92	165.95	2.07	166.09	2.77	166.13	4.32	166.05
4.62	166.05	6.58	166	8.33	165.99	8.83	166.01	10.18	165.94
12.03	166	13.34	166.01	13.88	166.04	15.59	166.09	16.41	165.99
17.59	165.81	17.84	165.83	19.44	165.92	20.09	165.85	21.29	165.91
22.35	165.95	23.14	165.9	24.6	165.91	24.99	165.9	26.81	165.76
28.7	165.76	29.11	165.74	30.55	165.77	32.4	165.69	33.61	165.71
34.25	165.67	35.86	165.68	36.1	165.69	37.96	165.94	38.12	165.93
39.81	166.05	40.37	166.05	41.66	166.02	42.62	166.03	43.51	166.01
44.88	166.07	45.36	166.08	47.13	165.99	47.61	165.96	49.07	165.84
49.38	165.84	50.92	165.79	51.63	165.72	52.77	165.63	53.89	165.63
54.62	165.58	56.14	165.53	56.47	165.49	58.01	165.56	60.18	165.58
60.65	165.6	62.03	165.46	62.9	165.64	63.88	166	65.15	166.02
67.4	165.93	67.58	165.94	68.41	165.89	69.44	165.87	71.29	166.15
71.91	166.15	73.14	166.29	74.16	166.86	74.99	167.14	76.42	167.07
76.84	167.08	78.67	167.47	80.55	167.44	80.92	167.3	82.4	166.71
83.17	166.49	84.25	166.13	86.1	166.01	87.68	165.83	89.21	165.77
89.81	165.74	89.93	165.71	91.66	165.46	92.19	165.47	94.44	165.31
95.36	165.19	96.69	165.09	97.21	165.07	98.94	165.19	99.06	165.18
99.61	164.96	100.92	164.36	101.2	164.24	102.77	163.66	103.45	163.52
104.62	163.54	105.7	162.79	106.47	161.97	107.96	161.68	108.32	161.57
110.02	161.09	110.17	161.04	112.03	160.2	112.46	160.17	113.88	160.29
114.71	160.31	115.73	160.06	116.97	159.86	117.58	159.85	119.22	159.91
119.43	159.9	121.28	160.12	121.47	160.15	123.14	159.9	123.73	159.88
124.99	159.95	125.98	160.1	126.84	160.21	128.23	160.28	128.69	160.26
130.48	160.57	130.82	160.55	132.4	160.26	132.74	160.24	134.25	160.42
134.99	160.44	136.1	160.18	137.24	160.14	137.95	160.08	139.5	160.11
141.75	160.03	143.51	160.1	144	160.08	146.25	160.33	147.21	160.28
148.51	160.35	149.06	160.33	151.62	160.51	152.76	160.55	153.01	160.54
154.62	160.4	155.27	160.44	156.47	160.65	157.52	160.64	158.32	160.6
159.77	160.66	162.02	160.64	163.88	160.66	164.28	160.65	165.73	160.69
166.53	160.65	167.58	160.63	169.43	160.52	171.04	160.73	171.28	160.73
172.42	160.64	173.29	160.56	174.99	160.64	176.84	160.83	177.79	160.79
178.69	160.78	180.05	160.72	180.54	160.67	182.39	160.77	184.24	160.56
186.1	160.45	186.81	160.45	187.95	160.56	189.06	160.5	189.8	160.44

Belair Road.rep

191.31	160.36	191.65	160.33	193.22	160.58	193.56	160.61	195.35	160.32
195.82	160.32	198.07	160.21	199.06	160.17	200.91	160.07	202.76	159.94
203.62	159.94	204.83	159.91	206.47	159.76	207.08	159.77	208.32	159.7
209.33	159.66	210.17	159.65	211.59	159.58	212.02	159.55	213.84	159.4
215.72	159.63	217.58	159.41	218.35	159.27	219.43	159.11	220.6	159.18
221.28	159.17	223.13	159.09	224.42	159.01	225.1	158.94	226.83	158.52
227.36	158.54	228.69	158.71	229.61	158.58	230.54	158.7	231.86	158.08
232.39	157.78	234.12	156.7	234.24	156.65	234.82	156.5	236.09	156.15
236.37	155.97	237.94	154.64	238.62	154.2	239.8	153.52	240.87	153.2
241.65	152.71	243.13	152.03	243.5	151.89	245.35	151.06	247.2	150.11
247.63	149.98	249.06	149.76	249.89	149.56	250.91	149.2	252.14	149.24
254.61	149.15	255.62	149.13	256.46	149.09	256.64	149.06	258.31	148.68
258.9	148.66	260.08	148.83	261.79	148.77	264.45	148.66	279.62	148
281.51	147.92	283.31	147.98	284.76	147.91	285.36	147.94	286.49	147.98
287.71	148	288.32	148.02	289.46	148.03	294.97	148.34	314.29	149
319.97	149.02	320.2	149.03	320.99	149.03	321.05	149	322.21	148.14
322.41	148	322.73	147.77	324.02	147	324.57	146.65	325.85	146
326.85	145.33	327.38	145	328.81	144.03	328.9	144	329.08	143.97
333.21	143	335.45	142.99	335.86	142.99	336.4	142.99	339.7	142.97
339.91	142.97	343.28	142.84	343.56	142.87	346.08	142.8	346.15	142.8
348.17	142.85	351.88	143	352.53	143.52	353.12	144	353.4	144.21
354.43	145	355.39	145.74	355.72	146	356.72	146.76	357.02	147
357.38	147.26	358.41	148	359.39	148.81	359.61	149	359.9	149.21
360.98	150	361.46	150.34	362.26	151	362.81	151.44	363.73	152
364.33	152.52	365.04	153	366.27	153.91	366.38	154	366.62	154.21
367.85	155	368.04	155.12	369.37	156	369.73	156.22	370.67	157
372.51	157.32	374.09	157.98	374.25	158	381.92	158.9	382.82	159
384.07	159.15	385.67	159.34	386.84	159.45	391.85	159.79	394.13	159.98
394.44	160	398.84	160.24	400.89	160.13	403.34	160	403.93	159.96
406.48	159.91	411.09	159.72	412.98	159.66	413.28	159.64	418.26	159.81
423	159.96	423.87	160	423.93	160	426.9	160.12	428.01	160.16
430.06	160.23	430.77	160.32	431.38	160.39	431.87	160.46	432.27	160.51
432.65	160.56	432.96	160.61	433.24	160.65	435.82	161	438.96	161.44
442.95	162	444.85	162.26	450.2	163	456.2	163.88	457.05	164
458.8	164.19	459.06	164.22	462.37	164.68	465.41	165	468.65	165.34
473	165.8	474.96	166	475.59	166.07	484.68	167	487.93	167.34
494.27	168	498.37	168.43	503.26	168.95	503.78	169	513.46	169.99
513.54	170	513.67	170.01	516.92	170.3	525.57	170.84	527.69	171
529.37	171.13	540.62	172	549.29	172.66	550.16	172.75	552.53	173
560.97	173.84								

Manning's n Values		num= 5							
Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
0	.013	80.55	.08	320.99	.035	359.39	.08	386.84	.03

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	320.99	359.39		56.25	69.36		.1	.3
Ineffective Flow	num=		1					
Sta L	Sta R	Elev	Permanent					
71.29	103.45	172	T					

CROSS SECTION

RIVER: Whitemarsh Run
 REACH: 1 RS: 17.33

INPUT

Description:

Station Elevation Data		num= 333							
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	166.03	.36	166.05	1.63	166.18	2.21	166.18	3.91	166.03
4.07	166.04	4.76	165.95	5.92	165.82	6.19	165.81	7.78	165.86
8.47	165.79	9.63	165.77	10.75	165.78	11.49	165.68	13.03	165.66
13.34	165.67	14.7	165.79	15.31	165.83	17.05	165.75	17.59	165.68
18.91	165.58	19.87	165.65	20.76	165.63	22.15	165.65	22.61	165.65
24.43	165.46	24.64	165.45	26.32	165.44	26.71	165.4	28.18	165.38
28.99	165.44	30.03	165.46	31.89	165.44	33.74	165.46	34.58	165.59
35.6	165.71	35.83	165.7	37.45	165.57	38.11	165.46	39.31	165.21

Belair Road.rep									
40.39	165.17	41.16	165.17	42.67	165.13	44.52	165	44.87	164.98
46.72	164.77	47.23	164.77	48.58	165.1	49.51	165.05	50.43	164.95
51.79	164.88	52.29	164.9	54.46	165.05	56	165.15	56.35	165.21
57.85	165.22	58.63	165.21	59.71	165.28	60.91	165.18	61.56	165.08
63.19	165.12	64.4	165.04	65.27	164.96	65.47	164.97	68.98	165.08
70.03	165.08	70.83	165.1	72.31	165.05	72.69	165.05	74.59	164.99
76.87	164.83	78.25	164.72	80.11	164.67	81.43	164.69	81.96	164.68
83.71	164.74	83.81	164.73	85.67	164.65	85.99	164.63	88.27	164.39
89.38	164.36	91.23	164.14	92.83	164.05	93.09	164.01	94.94	163.89
95.11	163.86	96.8	163.7	97.39	163.62	98.65	163.48	99.67	163.51
100.5	163.46	101.94	163.44	102.36	163.41	104.17	163.3	106.07	163.21
106.5	163.23	107.92	163.22	108.78	163.1	109.78	162.98	111.06	162.87
111.63	162.85	113.49	162.89	115.34	162.67	117.2	162.53	117.9	162.53
119.05	162.46	120.18	162.44	120.9	162.51	122.46	162.48	122.76	162.46
124.05	162.49	124.74	162.49	126.47	162.32	127.02	162.31	128.32	162.21
129.3	162.33	130.18	162.37	131.58	162.2	132.03	162.18	133.86	162.13
135.74	162.16	136.14	162.14	137.6	162.15	138.42	162.1	139.45	162.02
140.7	162.09	141.3	162.11	142.98	161.85	143.16	161.84	145.01	161.81
145.26	161.8	146.87	161.82	147.54	161.8	148.72	161.69	150.58	161.6
152.1	161.58	152.43	161.57	153.87	161.63	154.29	161.63	156.14	161.4
156.66	161.42	158	161.41	158.94	161.42	159.85	161.46	161.22	161.5
161.7	161.49	163.5	161.43	165.41	161.41	167.27	161.31	168.06	161.33
169.12	161.32	170.34	161.23	170.98	161.23	172.83	161.21	174.9	161.1
177.18	160.91	178.4	160.84	179.46	160.85	180.25	160.88	181.74	160.69
182.1	160.6	183.7	160.53	186.3	160.38	187.67	160.14	188.58	160.05
189.68	159.93	190.29	159.95	191.85	160.04	193.66	159.88	194.02	159.83
196.19	159.63	197.03	159.59	198.36	159.5	200.39	159.3	202.69	159.11
203.76	159.07	204.86	159.15	206.86	159.01	207.03	158.99	209.2	158.63
211.37	157.84	212.95	157.46	213.54	157.33	213.86	157.21	215.7	156.28
217.23	155.58	217.87	155.33	219.04	154.71	220.59	154.05	222.21	153.32
223.96	151.96	225.13	151.33	226.55	150.6	228.72	149.97	230.88	149.38
231.23	149.32	233.05	148.88	234.06	149.03	235.22	149.05	237.39	148.8
239.56	148.99	240.79	149.02	241.73	149	243.05	148.66	243.2	148.67
245.09	148.59	259.49	148	265.3	147.76	265.58	147.76	266.76	147.74
268.44	147.77	268.85	147.78	269.19	147.78	283.19	147.64	284.89	147.63
287.22	147.54	291.46	147.34	296.97	147.22	297.29	147	297.61	146.8
298.8	146	299.85	145.3	300.21	145	300.32	144.94	300.93	144.59
301.78	144	303	143.21	303.15	143	304.03	142.98	305.47	142.96
312.23	142.79	312.27	142.79	312.69	142.8	317.2	142.9	319.91	142.95
321.23	143	321.36	143	322.4	143.05	323.1	143.09	323.82	143.78
324.13	144	325.26	144.92	325.37	145	325.47	145.11	326.54	145.94
326.6	146	326.61	146.01	327.18	146.52	327.71	147	327.92	147.16
328.78	148	329.62	148.67	329.93	149	330.06	149.12	330.98	150
331.2	150.18	332.16	151	332.77	151.49	333.26	152	333.76	152.4
334.32	153	334.7	153.34	335.45	154	335.89	154.39	336.55	155
337.13	155.48	337.75	156	338.5	156.58	338.94	156.92	340.49	157
340.61	157	340.74	157	348.64	157.05	349.05	157.05	352.16	157.12
369.38	157.48	380.04	157.76	381.76	157.79	384.85	157.83	386.06	157.85
392.24	157.96	393.36	157.98	394.18	157.99	395.26	158	395.33	158
396.38	158.03	407.84	158.63	408.05	158.64	408.26	158.64	408.46	158.65
408.66	158.66	408.84	158.67	415.27	159	418.23	159.17	420.61	159.28
421.37	159.31	425.86	159.69	430.43	160	438.65	160.75	440.62	160.89
442.1	161	445.47	161.25	446.36	161.32	452.44	161.77	456.92	162
464.53	162.5	474.3	163	477.56	163.3	483.55	163.72	483.87	163.75
485.43	164	490.56	164.82	491.65	165	495.04	165.38	500.17	166
501.54	166.12	509.67	167	512.96	167.35	518.93	168	521.42	168.27
527.95	169	533.81	169.67	534.52	169.73	537.74	170	539.96	170.18
549.12	171	556.04	171.6	560.39	172	563.86	172.3	564.87	172.37
569.3	172.76	572.78	173	575.29	173.2				

Manning's n Values		num= 5							
Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
0	.013	174.9	.08	296.97	.035	327.92	.08	349.05	.03
Bank Sta: Left		Right	Lengths: Left		Channel	Right	Coeff	Contr.	Expan
296.97		327.92	165.95		146.59	127.68		.1	.3
Ineffective Flow		num= 1							
Sta L	Sta R	Elev	Permanent						
74.59	83.71	172	T						

Belair Road.rep

CROSS SECTION

RIVER: Whitemarsh Run

REACH: 1

RS: 17.29

INPUT

Description:

Station Elevation Data		num= 398							
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-238.27	170.7	-218.32	165.04	-215.43	164.9	-212.54	164.86	-209.65	164.7
-208.32	164.53	-206.77	164.18	-205.97	164.09	-203.88	164.07	-200.99	163.98
-198.92	163.86	-198.1	163.83	-195.21	163.87	-194.21	163.78	-191.86	163.76
-189.44	163.62	-187.16	163.54	-186.55	163.46	-184.81	163.3	-183.66	163.46
-182.46	163.42	-180.11	163.31	-177.89	163.07	-175.41	162.89	-173.06	162.82
-172.11	162.75	-170.71	162.76	-169.22	162.68	-168.36	162.59	-166.01	162.43
-163.66	162.31	-163.45	162.32	-161.31	162.18	-160.56	162.1	-156.6	162.18
-154.78	162.26	-151.93	162.78	-149.55	163.03	-149.01	163.12	-146.12	163.01
-144.85	163.05	-142.5	163.23	-139.3	163.33	-137.8	163.35	-137.46	163.4
-135.45	163.46	-134.57	163.45	-130.75	163.51	-128.4	163.5	-126.05	163.58
-123.7	163.62	-123.02	163.61	-121.34	163.74	-118.99	163.61	-117.24	163.54
-116.64	163.46	-114.35	163.33	-111.46	163.54	-108.58	163.33	-107.5	163.36
-106.27	163.4	-104.31	163.52	-102.59	163.46	-100.39	163.3	-98.43	163.38
-96.1	163.28	-94.51	163.28	-92.86	163.34	-89.62	163.14	-86.38	163.2
-84.71	163.21	-82.75	163.11	-80.79	163.18	-79.89	163.19	-78.83	163.1
-76.65	163	-74.91	162.95	-72.95	162.99	-70.98	162.88	-70.17	162.88
-69.02	162.82	-66.93	162.75	-65.1	162.71	-63.14	162.42	-61.18	162.39
-59.22	162.23	-57.2	162.21	-55.3	162.08	-53.34	162.05	-52.68	162.08
-51.44	162.15	-49.56	162.05	-48.7	162.08	-47.69	162.02	-45.81	162.12
-43.93	162.07	-41.27	162.05	-40.18	162.1	-36.78	161.95	-34.55	161.84
-33.84	161.87	-32.68	161.86	-30.8	161.81	-28.89	161.66	-27.05	161.72
-25.17	161.6	-23.93	161.61	-21.45	161.67	-19.55	161.69	-18.98	161.74
-17.67	161.77	-16.5	161.59	-15.79	161.55	-13.59	161.65	-12.04	161.62
-11.54	161.58	-10.17	161.38	-8.29	161.32	-6.41	161.11	-4.54	161.07
-4.11	160.99	-2.66	160.8	-1.63	160.72	-.79	160.7	.84	160.62
2.97	160.47	4.84	160.21	5.8	160.32	6.72	160.37	8.27	160.19
8.59	160.21	10.47	159.87	12.35	159.78	14.22	159.94	15.71	160.03
16.1	160.01	17.97	160.18	21.73	160.16	23.14	160.56	23.6	160.61
25.48	160.37	27.35	160.49	28.09	160.44	29.23	160.5	30.57	160.53
31.11	160.47	33.05	160.8	34.86	160.56	35.52	160.5	36.74	160.54
38.61	160.57	40.48	160.52	42.36	160.63	42.96	160.71	44.24	160.63
46.12	160.45	47.99	160.72	49.87	160.54	51.74	160.57	52.87	160.73
53.62	160.64	55.34	159.98	57.37	159.9	57.82	159.8	59.25	159.15
61.12	159.3	65.25	158.94	67.73	158.81	70.21	158.74	72.68	158.52
74.26	158.49	75.16	158.39	76.13	158.37	77.64	158.45	80.12	158.38
81.76	158.65	83.64	158.58	85.07	158.59	85.51	158.53	86.89	158.97
87.55	159.06	89.26	158.18	90.02	158	91.14	157.9	92.5	157.84
93.02	157.73	94.98	157.75	96.77	157.87	97.46	157.85	98.64	157.89
100.52	157.61	102.4	157.52	104.27	157.67	106.15	157.75	107.37	158.2
109.84	158.53	110.84	158.7	111.95	158.89	113.57	159.48	113.81	159.62
115.4	159.81	115.67	159.8	117.22	159.95	117.52	160.03	119.04	160.01
119.38	160.07	120.87	160.54	121.24	160.55	122.69	160.69	124.51	160.69
124.96	160.66	126.34	160.75	128.16	160.43	128.67	160.45	129.98	160.25
130.53	160.22	132.39	160.38	134.25	160.26	135.45	160.22	137.97	160.28
139.1	160.25	140.92	160.36	142.75	160.27	143.54	160.32	144.57	160.28
145.4	160.2	146.39	160.24	147.26	160.24	149.11	160.12	150.04	160.21
150.49	160.21	150.97	160.21	151.86	160.16	152.83	159.99	154.69	159.75
156.55	159.36	157.33	159.22	158.41	159.22	159.16	159.17	160.26	159.01
160.98	158.99	162.12	158.52	162.8	158.43	163.98	158.57	164.63	158.42
165.84	158.21	166.45	158.14	167.7	157.65	168.27	157.58	169.56	157.06
170.1	156.95	171.41	156.49	173.27	156.22	173.74	155.76	175.13	154.78
175.57	154.43	176.99	153.95	177.39	153.88	178.85	153.06	179.21	152.72
180.71	151.97	181.04	151.85	182.56	151.68	182.86	151.7	184.69	151.21
186.51	151.08	188.14	150.99	190.16	150.78	191.85	150.46	193.8	150.37
195.57	150.08	197.43	149.9	201.1	149.47	202.47	149.2	206.09	149.12
207.94	149	212.83	148.96	216.25	148.6	217.34	148.6	222.56	148.6
222.89	148.56	223.83	148	223.9	148.01	224.12	147.9	225.26	147
225.3	146.97	225.52	146.79	226.73	146	227.38	145.41	227.87	145

Belair Road.rep										
228.47	144.45	228.97	144	229.73	143.35	230.11	143	231.02	142.36	
231.4	142	231.88	141.5	245.74	141.02	246.02	141	246.1	141	
248.07	140.94	248.24	140.97	248.33	141	248.37	141	250.31	141.68	
250.7	141.81	251.27	142	253.18	142.67	254.19	143	254.87	143.24	
257.19	144	257.36	144.08	257.68	144.19	258.68	144.37	262	145	
265.52	145.67	268.72	146	270.37	146.18	270.71	146.32	272.46	147	
274.03	147.66	274.47	147.84	274.89	148	275.28	148.16	277.38	149	
279.23	149.77	279.85	150	280.44	150.23	282.35	151	283.36	151.43	
284.8	152	286.1	152.52	287.33	153	287.9	153.27	297.44	153.82	
299.44	154	299.47	154	310.37	155	320.89	155.57	324.28	155.76	
328.24	155.99	328.46	156	338.77	156.56	338.78	156.56	339.02	156.58	
339.27	156.59	342.56	156.72	344.33	156.79	345.44	156.83	349.73	157	
350.07	157.01	353.74	157.14	364.41	157.36	377.18	157.64	380.19	157.73	
384	157.92	385.78	158	394.2	158.35	408.83	159	412.04	159.13	
413.77	159.35	413.88	159.35	416.12	159.42	419.24	159.45	423.08	159.66	
423.51	159.66	425.25	159.76	427.32	159.89	429.12	160	431.12	160.29	
440.57	161.79	441.45	161.83	446.09	162	446.39	162.01	448.61	162.09	
451.7	162.07	451.84	162.08	452.5	162.1	452.69	162.1	453.47	162.12	
470.47	162.66	476.86	162.97	476.97	162.98	477.39	163	477.55	163.01	
482.29	163.16	485.86	163.78	487.81	164	491.91	164.48	495.7	164.87	
497.05	165	503.16	165.54	507.36	166	515.92	166.8	517.17	166.91	
518.28	167	522.24	167.29	523.62	167.39					

Manning's n Values										
Sta	n Val	Sta	num=	5	Sta	n Val	Sta	n Val	Sta	n Val
-238.27	.013	150.49	.08	222.89	.035	275.28	.08	338.78	.03	

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff	Contr.	Expan.
222.89	275.28	78.52	69.25	65.48	.1	.3	

Ineffective Flow				num=	2
Sta L	Sta R	Elev	Permanent		
-238.27	117.22	163	T		
349.73	600	163	T		

Blocked Obstructions				num=	1
Sta L	Sta R	Elev			
377.18	431.12	170			

CROSS SECTION

RIVER: Whitemarsh Run
 REACH: 1 RS: 17.27

INPUT

Description:

Station Elevation Data										
Sta	Elev	Sta	num=	421	Sta	Elev	Sta	Elev	Sta	Elev
-160.61	167.87	-160.13	167.89	-158.65	167.43	-157.55	167.14	-156.51	166.96	
-156.01	166.84	-153.38	165.96	-152.4	165.58	-151.11	165.48	-149.82	164.99	
-147.24	164.4	-146.41	164.35	-145.95	164.39	-144.66	164.21	-143.88	163.97	
-142.84	163.91	-142.08	164	-140.79	164.04	-139.5	164.02	-138.21	163.91	
-136.92	163.91	-135.63	163.85	-133.78	163.89	-132.3	163.85	-130.48	163.72	
-129.19	163.6	-127.9	163.82	-127.03	163.62	-126.61	163.56	-125.32	163.62	
-124.03	163.52	-122.74	163.58	-121.76	163.55	-120.16	163.56	-119.12	163.53	
-117.58	163.43	-116.11	163.49	-115	163.37	-113.58	163.3	-112.42	163.21	
-109.85	163.17	-108.58	162.85	-107.27	163.48	-106.01	163.32	-104.69	163.53	
-103.4	163.51	-102.11	163.61	-100.96	163.63	-99.53	163.51	-98.43	163.51	
-96.95	163.55	-95.91	163.42	-95.41	163.32	-94.37	163.27	-92.77	163.07	
-90.86	162.71	-90.14	162.5	-89.22	162.29	-88.33	161.95	-85.35	161.8	
-84.06	161.6	-82.77	161.63	-81.48	161.5	-79.6	161.46	-78.9	161.38	
-78.23	161.4	-77.61	161.36	-76.32	161.36	-75.03	161.32	-73.74	161.16	
-71.16	160.99	-69.87	161	-69.06	160.9	-68.58	160.78	-66.01	160.72	
-64.72	160.53	-61.15	160.6	-60.85	160.59	-59.56	160.3	-58.27	160.37	
-56.98	160.16	-54.4	160.1	-52.98	160.09	-50.46	159.97	-49.24	159.94	
-47.98	159.66	-46.66	159.79	-45.34	159.79	-44.09	159.61	-42.8	159.46	
-41.51	159.39	-40.07	159.36	-38.93	159.38	-37.83	159.18	-36.35	159.23	
-35.31	159.31	-34.8	159.3	-33.77	159.15	-32.48	159.05	-31.19	158.89	
-29.9	159	-26.03	158.64	-24.74	158.55	-23.46	158.59	-22.68	158.53	
-22.17	158.42	-20.16	158.32	-19.59	158.23	-18.99	158.25	-18.3	158.16	

Belair Road.rep									
-17.63	158.15	-16.36	158.39	-15.72	158.63	-14.43	158.7	-13.14	158.61
-12.58	158.52	-11.09	158.42	-10.06	158.39	-9.52	158.38	-6.96	158.34
-5.46	158.23	-3.61	158.19	-1.76	158.33	.1	158.21	.33	158.22
2.16	158.03	3.98	157.98	5.65	158.05	7.63	158.02	9.45	157.94
11.27	157.9	13.06	157.97	14.91	157.88	16.74	157.68	18.57	157.53
20.46	157.7	24.04	157.63	26.02	157.74	27.68	157.68	29.51	157.87
31.33	157.73	31.57	157.74	33.42	158.02	35.27	158.05	36.8	158.19
37.13	158.19	38.98	158.05	40.45	157.79	40.83	157.8	42.27	157.99
44.09	157.85	45.92	157.9	47.74	157.97	49.56	157.98	51.38	158.06
53.21	158.22	55.03	158.19	56.85	158.21	58.68	158.3	59.34	158.31
60.5	158.44	68.6	158.3	69.62	158.24	71.44	158.28	72.3	158.21
73.26	158.06	75.09	158.06	76.01	158.12	76.91	158.14	77.86	158.23
78.73	158.26	79.71	158.14	80.56	158.1	81.56	158.1	84.2	157.96
85.27	157.83	86.03	157.79	87.12	157.83	87.85	157.82	88.97	157.75
89.67	157.76	91.5	157.68	92.67	157.7	94.52	157.49	95.14	157.5
96.97	157.46	98.23	157.62	98.79	157.64	100.61	157.55	102.44	157.55
103.78	157.62	104.26	157.6	106.08	157.68	107.91	157.6	109.34	157.46
109.73	157.45	111.55	157.49	113.04	157.46	113.38	157.42	114.89	157.38
115.21	157.37	116.45	157.31	118.02	157.43	119.58	157.33	121.15	157.32
122.71	157.41	124.48	157.45	125.84	157.57	126.33	157.52	127.4	157.58
130.53	157.58	132.1	157.67	133.75	157.97	135.6	158.1	136.79	158.31
138.36	158.53	139.31	158.86	139.92	159.01	141.48	159.12	143.02	159.46
144.61	159.23	146.18	159.14	146.72	159.14	147.74	159	148.58	158.85
149.31	158.83	150.87	158.67	152.43	158.96	154	158.57	155.56	158.67
156	158.63	157.85	158.85	158.69	158.81	159.7	158.69	161.56	158.71
163.39	158.84	165.27	158.64	167.12	158.65	168.08	158.77	168.97	158.84
169.38	158.78	169.64	158.75	170.83	158.7	172.68	159.07	173.25	159.03
176.39	158.71	177.46	158.58	178.24	158.6	179.03	158.47	180.59	158.39
181.95	158.26	183.81	158.23	185.66	158.31	187.51	158.18	188.41	158.15
189.37	158.17	191.22	157.68	191.54	157.66	193.08	157.36	194.67	157.17
194.93	157.08	196.24	156.5	196.78	156.49	197.8	156.34	198.64	156.15
199.37	156.04	200.49	155.72	200.93	155.54	202.35	155.36	204.06	154.71
205.62	154.21	207.19	153.59	207.91	153.24	208.75	152.92	210.32	152.62
211.88	152.36	213.44	152.07	215.33	151.81	216.57	151.45	218.14	151.08
219.03	150.92	219.7	150.85	220.89	150.6	222.74	150.16	224.6	149.83
226.45	149.46	227.52	149.54	228.3	149.53	230.16	149.67	232.01	150.11
233.78	149.33	235.72	148.84	236.91	148.62	238.47	148.38	241.28	148.21
241.6	148.24	243.14	148.23	244.13	148.51	256.72	148.1	265.65	148.04
268.46	148.01	269.66	148	270.9	148	270.95	147.94	271.18	147.89
271.57	147	272.6	146.21	272.87	146	273.83	145.15	274.02	145
274.21	144.84	275.12	144	275.92	143.28	276.26	143	276.64	142.73
277.24	142	277.59	141.11	277.78	141.04	277.9	141.1	278.37	141.02
279.05	141.02	280.76	141.08	290.67	141.44	292.7	141.58	299.42	141.88
302.12	142	310.27	142.35	310.76	142.56	311.82	143	313.64	143.81
314.07	144	314.52	144.21	316.35	145	317.08	145.31	318.66	146
319.41	146.33	320.99	147	321.01	147.01	322.38	147.62	323.18	148
324.24	148.45	325.54	149	326.69	149.51	327.74	150	329.08	150.58
330.05	151	331.42	151.7	332.1	152	333.01	152.42	334.47	153
335.05	153.28	336.64	154	338.78	154.96	338.87	155	339	155.06
339.32	155.21	340.41	156	340.57	156.12	340.68	156.14	341.37	156.44
342.42	156.45	350.41	156.78	352.22	156.86	352.24	156.86	355.95	157
374.47	157.7	375.74	157.75	389.82	157.96	391.46	158	392.17	158.02
403.04	158.66	404.57	158.76	405.07	158.77	405.21	158.77	409.11	159
412.58	159.2	421.61	159.75	424.8	159.57	425.41	157.81	429.51	157.93
429.59	158.21	431.02	158.25	459.09	161.6	462.3	161.86	462.37	161.87
472.94	162.11	489.03	163.65	497.65	164.29	500.59	164.87	500.69	164.87
504.66	164.7	509.41	164.66	511.63	164.64	514.27	164.78	514.68	164.82
515.12	164.8	515.85	164	515.96	163.82	532.46	163.89	535.72	163.95
536	163.96	536.15	164	536.2	164.71	536.47	165	536.59	165.22
536.85	166.29	536.92	166	537.01	166	537.36	165.5	537.57	165
538.59	164.85	539.41	165	543.86	165.56	545.04	165.68	546.53	165.91
546.83	166	547.01	166.07	549.68	167	553.53	167.61	557.13	168
559.26	168.23								

Manning's		n Values		num=		5			
Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
-160.61	.013	169.38	.08	270.9	.035	323.18	.08	352.22	.03
Bank Sta:	Left	Right	Lengths:	Left	Channel	Right	Coeff	Contr.	Expan.

Belair Road.rep
 270.9 323.18 77.71 84.1 87.23 .1 .3
 Ineffective Flow num= 2
 Sta L Sta R Elev Permanent
 -160.61 130.53 163 T
 374.47 600 163 T
 Blocked Obstructions num= 2
 Sta L Sta R Elev Sta L Sta R Elev
 .1 130.53 165 421.61 500.69 170

CROSS SECTION

RIVER: Whitemarsh Run
 REACH: 1 RS: 17.25

INPUT

Description:

Station	Elevation	Data	num=	367						
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	
-39.71	171.1	-38.57	171.17	-37.18	171.16	-35.79	171.32	-34.4	171.4	
-33.22	171.31	-31.63	171.29	-31.23	171.26	-28.85	171.29	-27.9	171.48	
-27.27	171.54	-26.07	171.36	-25.29	171.38	-23.26	171.3	-21.9	171.38	
-20.51	171.14	-19.12	171.2	-17.73	170.97	-17.36	170.98	-16.34	171.14	
-15.38	171.22	-13.97	171.22	-13.39	171.19	-11.41	170.71	-10.79	170.66	
-9.43	170.85	-8.01	170.78	-6.62	170.68	-5.23	171.01	-4.69	170.72	
-3.84	170.19	-3.48	170.23	-2.45	170.13	-1.5	169.79	-1.06	169.86	
.33	169.11	1.71	168.48	3.1	168.29	4.6	167.74	6.43	167.28	
7.27	167.19	8.41	167.01	10.05	166.47	10.39	166.44	11.44	166.18	
12.38	166.3	12.83	166.17	14.22	164.55	14.36	164.56	15.61	164.94	
16.34	164.73	17	164.63	18.53	164.19	19.77	164.15	20.31	163.96	
21.16	163.51	22.29	162.85	22.55	162.85	23.94	163.34	24.27	163.26	
25.33	162.87	26.25	162.45	26.72	162.29	28.24	162.31	30.22	161.76	
30.89	161.61	32.2	161.38	34.18	161.15	35.05	160.88	37.83	160.52	
39.22	160.13	40.61	159.88	42.11	159.93	43.39	159.65	46.17	159.79	
48.06	159.54	48.95	159.46	52.02	159.47	54.5	159.46	55.99	159.34	
57.97	159.36	58.67	159.39	61.93	159.29	62.84	159.32	64.23	159.26	
65.9	159.23	67.01	159.16	68.39	159.14	69.86	159.04	71.17	158.99	
72.56	159.07	73.83	159.03	75.34	159.06	76.73	158.95	78.12	158.92	
79.51	158.85	81.76	158.87	83.68	158.75	85.06	158.7	86.45	158.62	
89.23	158.53	89.69	158.49	91.67	158.61	92.01	158.56	93.65	158.62	
94.79	158.57	96.18	158.55	97.45	158.57	99.6	158.55	101.73	158.47	
103.12	158.23	104.51	158.07	105.54	158.3	107.53	158.43	109.51	158.86	
110.07	158.95	111.46	158.93	113.47	159.41	114.24	159.47	115.46	159.82	
117.02	159.87	118.4	160.09	119.42	160.14	119.79	160.25	121.18	160.79	
122.57	160.76	123.96	161.01	127.35	161.33	128.13	161.46	129.33	161.55	
129.95	161.7	130.91	162.04	132.3	162.72	133.69	162.78	135.28	163.11	
136.46	163.24	137.26	163.29	137.85	163.41	139.24	163.47	140.63	163.43	
141.23	163.49	142.02	163.47	143.88	163.53	144.8	163.52	147.17	163.56	
147.58	163.52	148.97	163.25	150.36	163.04	151.75	163	153.12	162.73	
154.52	162.78	155.1	162.88	157.08	163.07	158.69	162.96	159.07	162.99	
161.05	163	161.47	162.91	163.03	162.33	164.25	161.74	165.64	160.84	
167.1	160.16	168.42	159.81	170.96	158.74	171.19	158.74	172.58	158.35	
172.94	158.3	175.36	158.22	176.75	157.98	178.14	158.03	178.89	157.87	
179.53	157.8	180.87	157.92	182.58	157.83	182.69	157.82	184.47	157.8	
186.25	157.87	188.03	157.9	189.99	157.88	191.81	157.79	193.64	157.74	
195.46	157.78	196.35	157.85	196.94	157.9	197.29	157.89	198.72	157.73	
199.11	157.75	200.93	158.12	202.76	158.18	204.58	157.95	206.4	157.79	
207.62	157.58	208.23	157.55	209.4	157.61	211.18	157.53	213.7	157.36	
214.74	157.33	216.52	157.19	218.3	157.1	220.08	157.13	220.99	157.01	
221.86	156.83	223.64	156.64	224.64	156.63	227.2	156.38	228.29	156.18	
228.98	156.19	230.11	156.07	231.93	155.29	232.55	155.2	233.76	155.12	
236.11	154.65	237.4	154.56	239.23	154.39	241.05	153.85	242.88	153.67	
244.7	153.14	245.01	153.02	246.52	152.59	248.35	152.44	248.57	152.3	
250.17	151.7	250.35	151.71	252.13	151.28	253.82	150.69	255.64	150.02	
257.46	149.76	259.25	148.86	261.11	148.51	262.94	148.41	266.37	147.96	
268.15	147.69	269.93	147.48	270.23	147.42	271.71	147.54	275.28	147.46	
277.06	147.44	277.52	147.4	278.84	147.42	280.62	147.19	281.17	147.21	
282.4	147.13	284.18	147.19	284.82	147.15	285.96	147.27	286.64	147.21	
287.74	146.96	288.47	147.02	289.52	147.19	290.29	147.38	290.59	146.99	

Belair Road.rep

291.61	147	309.58	147.26	311.37	147.15	311.72	147.11	313.29	147.12
319.98	147.13	320.3	147	322.54	146.06	322.69	146	323.78	145.54
324.66	145	324.85	144.88	326.29	144	326.79	143.71	327.93	143
328.89	142.44	329.57	142	340.18	141.56	349.07	141.18	351.69	141
353.08	140.97	353.13	141	353.3	141.12	354.56	142	355.15	142.4
355.99	143	356.62	143.42	357.43	144	358.19	144.53	358.83	145
359.6	145.46	360.37	146	361.07	146.48	361.81	147	362.51	147.51
363.16	148	363.94	148.49	364.7	149	365.37	149.49	366.07	150
366.86	150.51	367.58	151	368.33	151.52	369.01	152	369.66	152.48
370.36	153	371.06	153.49	371.8	154	372.62	154.52	373.32	155
373.96	155.44	374.72	156	375.03	156.32	375.68	156.73	376.07	157
376.65	157.56	377.18	157.79	379.12	158	379.29	158.02	380.56	158.11
381.33	158.17	381.73	158.19	388.5	158.52	388.51	158.52	391.87	158.81
392.55	158.87	393.82	159	395.68	159.19	403.56	160	406.68	160.31
410.33	160.33	422.8	160.41	426.16	160.54	434.58	160.8	436.25	160.85
436.99	160.89	438.92	161	448.15	161.49	461.01	162	461.6	162.03
461.95	162.03	462.95	162.11	465.7	162.28	474.26	162.72	478.25	162.91
479.75	163	483.16	163.19	493.47	163.86	493.86	163.89	494.3	163.93
495	164	495.93	164.09	505.32	165	508.41	165.3	510.94	165.42
512.65	165.5	515.93	165.65	523.72	166	534.81	166.59	535.85	166.61
537.09	166.63	538.6	166.66	538.74	166.66	540.63	166.74	541.66	166.79
546.47	167	547.83	167.06	554.15	167.37	567.68	167.95	568.32	167.99
568.43	168	571.16	168.2	582.34	169	589.17	169.55	590.9	169.64
597.94	170	599.44	170.08						

Manning's n Values

num=

5

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
-39.71	.013	196.35	.08	319.98	.035	361.81	.08	388.51	.03

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
319.98 361.81 107.02 107.92 97.7 .1 .3

Ineffective Flow	num=	2
Sta L Sta R Elev	Permanent	
-39.71 132.3 163	T	
381.33 599.44 163	T	

CROSS SECTION

RIVER: Whitemarsh Run

REACH: 1

RS: 17.22

INPUT

Description:

Station Elevation Data		num= 350							
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
31.53	168.12	32.69	168.38	33.22	168.43	34.92	168.49	36.34	168.4
36.61	168.33	38.17	168.33	39.95	168.38	41.69	168.46	43.38	168.36
43.66	168.38	45.08	168.27	45.49	168.21	47.32	168.2	48.47	168.04
50.16	167.5	51.85	167.11	52.8	166.66	53.55	166.41	54.63	166.13
55.24	166	56.46	166.03	58.29	165.35	58.63	165.32	60.12	165.01
62.01	164.55	63.71	164.62	65.61	163.97	67.1	163.32	67.43	163.24
69.26	162.96	70.48	162.89	71.09	162.75	72.92	162.27	73.87	162.05
74.75	162.05	76.58	161.56	77.26	161.46	80.24	160.9	82.06	160.73
82.34	160.68	83.89	160.65	85.72	160.4	87.55	160.07	89.11	159.71
91.21	159.39	93.04	159.22	94.87	159.11	95.89	159.1	96.7	159.03
97.58	158.7	98.52	158.17	99.27	157.82	100.97	157.63	104.35	156.88
106.05	156.11	107.67	155.98	109.44	155.49	111.33	154.76	113.16	154.27
114.52	154.23	114.98	154.25	116.81	154.22	117.9	154.16	118.64	154.19
119.6	154.14	120.47	154.21	121.29	154.51	122.3	154.98	122.98	155.18
124.13	155.18	125.96	155.41	127.79	155.95	128.07	156.05	129.76	156.78
131.44	157.08	133.15	157.55	133.27	157.56	134.84	157.99	135.1	158.02
136.53	157.94	136.93	157.95	138.76	157.76	139.92	157.73	141.61	157.79
142.42	157.79	144.25	157.84	145	157.84	146.7	157.72	147.9	157.75
148.23	157.72	148.39	157.71	149.73	157.29	150.08	157.21	151.56	157.17
153.47	157.21	156.86	157.37	157.05	157.4	158.55	157.46	160.24	157.27
161.94	157.32	162.54	157.31	163.63	157.35	164.36	157.34	165.33	157.26
166.19	157.29	167.02	157.36	168.02	157.39	169.85	157.34	170.41	157.3
172.1	157.33	173.51	157.14	175.3	157.09	175.49	157.09	177.17	156.88

Belair Road.rep

179	156.96	180.57	157.53	180.82	157.57	182.26	157.51	182.65	157.54
184.48	157.37	185.65	157.44	186.31	157.41	188.14	157.45	189.04	157.38
189.97	157.25	190.73	157.1	192.42	156.81	193.63	156.53	194.12	156.36
195.46	155.6	197.28	154.84	197.5	154.72	200.94	153.73	202.59	152.82
202.77	152.75	204.28	151.94	204.6	151.69	205.97	150.96	206.43	150.86
207.67	150.47	208.26	150.21	209.36	149.63	210.09	149.34	211.05	149.13
211.92	148.87	212.75	148.66	213.74	148.37	215.57	147.68	216.13	147.49
217.83	147.09	219.23	146.82	219.52	146.79	221.22	146.47	222.89	146.33
224.72	145.99	226.55	145.83	227.99	145.73	228.38	145.74	230.2	145.69
231.38	145.83	233.07	145.75	233.86	145.79	235.69	145.64	236.46	145.61
237.52	145.64	238.15	145.71	239.35	145.69	239.85	145.53	241.18	145.38
241.54	145.42	243.01	145.36	243.23	145.39	244.93	145.3	248.49	144.98
250.01	144.87	250.32	144.82	251.7	144.76	252.15	144.77	253.39	144.69
253.98	144.74	255.09	144.72	255.81	144.62	256.78	144.64	258.48	144.48
259.47	144.46	260.17	144.37	261.3	144.1	261.86	144.04	263.12	143.48
263.56	143.34	264.95	143.02	266.94	142.38	268.61	142.94	270.44	143.35
272.27	142.98	274.1	143.03	275.41	143.43	275.93	143.48	277.1	143.75
277.76	143.84	278.8	143.91	279.58	144	280.49	143.88	282.19	143.91
283.88	143.82	285.07	143.7	285.57	143.47	286.9	143.15	288.67	142.14
288.73	142.11	290.56	141.18	290.65	141.16	292.35	140.42	294.04	140.66
294.22	140.64	296.29	140.64	296.84	140.63	301.65	140.62	303.52	140.72
308.15	140.67	311.01	140.64	314.75	140.63	316.62	140.65	318.5	140.6
320.37	140.41	322.24	140.81	323.14	141.04	324.66	141.39	325.98	141.63
326.18	141.64	329.22	142.22	329.72	142.16	330.74	142.59	331.59	142.9
332.26	143.35	333.47	144.44	333.78	144.65	335.3	145.78	336.81	146.96
337.21	147.1	338.33	148.56	339.08	148.46	339.85	148.43	340.95	149.89
341.37	150.08	342.82	151.05	344.41	152.38	345.93	152.59	346.57	152.63
347.45	152.94	348.44	153.63	348.97	153.56	350.49	153.99	351.27	154.3
352.18	154.61	352.72	150.58	353.58	151	355.39	151.88	355.49	151.93
355.64	152	355.73	152.04	357.71	153	357.88	153.08	359.78	154
360.23	154.22	360.61	154.4	361.85	155	362.85	155.49	363.29	155.7
363.91	156	364.26	156.17	365.98	157	367.6	157.78	368.04	158
368.49	158.22	370.11	159	371.3	159.58	372.17	160	372.93	160.37
374.16	161	374.33	161.04	374.85	161.29	381.09	161.62	382.62	161.68
390.01	162	402.35	162.51	406.46	162.66	416.48	163	418.5	163.1
420.67	163.23	430.8	164	447.34	164.73	447.4	164.73	452.28	164.97
452.59	165	452.88	165	453.11	165.01	453.76	165.01	455.93	165.13
463.34	165.55	466.97	165.74	468.82	165.85	469.43	165.89	469.44	165.97
469.57	166.87	469.6	167	475.97	167.26	476.72	167.23	477.56	167.2
477.82	167.2	480.49	167.22	480.75	167.01	480.8	167.01	480.87	167
481.71	167	488.63	167.06	489.43	166.39	491.66	166.19	493.51	166.11
493.68	166.11	495.39	166.16	499.29	166.36	513.5	167	515.21	167.07
515.55	167.09	516.03	167.11	525.4	167.44	527.53	167.52	530.37	167.64
535.87	168	542.84	168.45	551.46	169	554.66	169.22	561.26	169.63
564.22	169.74	569.66	170	574.57	170.27	579.02	170.05	579.16	170.04
581.7	170	592.11	169.81	594.24	169.88	597.36	169.93	599.97	170
600.5	170	600.99	170.02	601.55	170.06	609.6	170.56	610.54	170.62

Manning's n Values

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
31.53	.08	148.23	.013	175.3	.08	286.9	.035	332.26	.08
390.01	.03	455.93	.045						

Bank Sta:	Left	Right	Lengths:	Left	Channel	Right	Coeff	Contr.	Expan.
	286.9	332.26		84.87	72.33	64.28		.1	.3
Ineffective Flow			num=	2					
Sta L	Sta R	Elev	Permanent						
31.53	134.84	163	T						
352.18	610.54	163	T						

CROSS SECTION

RIVER: Whitemarsh Run

REACH: 1 RS: 17.20

INPUT

Description: FEMA Effective Cross Section R

Station Elevation Data num= 448

Belair Road.rep									
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	168.08	1.73	168.24	2.14	168.36	4.01	168.2	4.77	168.22
7.75	167.87	9.62	167.96	11.49	167.87	12.37	167.99	15.23	168.1
17.1	167.95	18.45	167.65	20.84	167.85	24.31	167.66	27.58	167.66
30.62	167.61	33.94	167.51	38.22	167.55	39.55	167.62	41.26	167.4
43.3	167.24	45.17	167.43	48.91	167.12	50.78	167.06	52.65	166.91
54.94	167.08	56.39	166.92	57.98	167.1	60.13	167.21	60.21	167.2
62.22	167.04	64.83	167	67.45	167.12	68.76	166.94	72.68	166.91
73.52	166.86	75.3	167.05	76.61	166.94	77.91	167.07	79.22	166.77
81.84	166.73	83.15	166.53	85.76	166.68	88.38	166.28	90.99	166.12
93.59	166.16	94.92	166.02	96.22	165.54	98.08	165.5	98.84	165.57
100.32	165.19	101.46	165.35	104.07	164.87	105.38	164.82	106.69	164.99
107.99	164.43	109.25	164.62	111.48	164.52	114.53	164.09	115.69	164.12
117.15	163.96	118.18	164.05	119.77	163.93	121.07	164.04	122.65	163.98
124.88	164.01	126.31	163.88	131.58	163.84	132.84	163.74	134.15	163.8
135.46	163.57	139.38	163.28	140.52	163.52	142	163.31	143.31	163.3
144.98	162.99	145.92	162.93	147.25	163.04	148.54	162.62	151.68	162.33
153.92	162.24	155.08	162.06	156.39	161.99	157.69	162.14	159	161.82
161.62	161.64	162.93	161.49	165.54	161.55	168.16	161.4	169.35	161.15
171.78	161.23	173.39	161.1	176	161.04	177.31	160.94	179.93	161.08
181.24	161.03	182.54	160.81	183.85	161.07	185.13	160.98	187.42	160.96
189.65	161.02	191.88	160.54	194.6	160.19	195.62	160.16	196.35	159.82
196.96	159.81	198.24	159.78	200.81	159.16	202.16	159.01	203.05	159.08
204.78	158.49	206.09	158.87	207.51	158.48	208.7	158.02	209.75	157.96
211.32	158.1	215.24	158.06	217.86	157.89	219.16	158.03	220.91	157.92
223.01	158.06	225.7	158	227.01	157.88	229.32	158.08	230.94	158.15
232.24	158.07	233.55	158.15	234.86	157.93	236.55	158.08	238.78	158.18
242.71	157.38	244.01	157.4	245.48	157.06	249.25	156.89	249.95	156.77
251.41	156.88	253.17	156.86	254.57	156.67	257.09	156.43	258.4	156.12
260.88	156.08	262.33	155.93	263.63	155.6	264.94	155.61	266.25	155.33
268.86	155.49	270.35	154.86	271.48	155	272.79	154.83	274.1	154.8
275.4	154.43	276.75	154.62	278.02	154.55	278.98	154.14	279.82	154.27
281.21	154.99	282.98	155.39	284.56	155.2	285.87	154.46	287.91	154.79
288.48	154.98	291.1	155.31	292.38	154.73	293.71	155.3	294.61	155.05
296.85	155.55	297.64	155.43	298.76	155.56	300.25	155.5	301.56	155.65
302.87	155.4	305.78	155.28	308.01	154.88	310.72	154.76	313.33	154.85
315.95	154.59	317.7	154.55	320.85	155.06	322.49	155.2	323.64	155.53
325.1	155.26	325.88	155.39	327.72	155.46	329.03	155.86	330.32	155.97
331.64	155.71	335.57	155.27	338.18	155.13	339.79	154.77	343.41	154.65
345.98	154.06	348.65	153.74	351.26	153.33	352.57	153.31	353.88	153.07
355.57	152.98	357.14	152.72	358.73	152.55	360.42	152.6	363.03	151.92
364.34	152.03	365.65	151.64	366.96	151.54	368.2	151.17	370.88	151.03
372.19	151.15	373.5	150.97	375.01	151.15	376.11	151.08	378.73	151.21
379.48	151.09	382.65	150.87	387.88	150.61	389.19	150.69	390.29	150.57
391.81	150.54	393.11	150.42	395.73	150.45	397.34	150.28	398.34	150.32
400.96	150.16	404.04	150.37	406.07	150.45	408.81	150.45	410.12	150.68
411.42	150.66	414.04	151.15	415.35	151.77	416.66	151.99	417.96	152.37
419.67	152.1	420.58	152.19	421.91	152.86	423.19	152.81	424.14	152.98
427.12	153.9	428.43	154.47	429.73	154.46	431.04	154.88	432.35	155.55
433.07	155.69	434.48	155.55	435.31	155.71	436.27	156.47	437.54	157.27
439.77	157.63	441.51	158.01	442.81	158.72	444.24	158.46	445.43	159.21
448.71	160.06	449.35	160.03	450.26	160.23	451.75	160.34	451.97	160.36
454.58	160.27	458.51	160.28	461.12	160.16	462.11	160.01	464.34	159.5
466.57	159.37	468.81	159.5	471.59	159.56	474.2	159.36	475.51	159.52
479.97	159.35	483.36	159.26	484.67	159.28	485.97	159.11	487.21	159.15
488.59	159.2	491.3	159.07	493.37	159.08	495.13	158.97	496.44	159.11
497.84	159.41	499.05	159.44	501.67	159.37	502.31	159.47	503.92	159.47
505.59	158.94	508.21	158.3	509.01	158.24	510.24	157.86	510.82	157.57
512.13	157.18	513.39	156.64	514.75	155.72	516.55	155.19	517.94	154.61
518.67	154.17	520.17	153.57	521.29	153.34	522.4	152.58	523.9	151.86
525.21	151.61	526.52	150.9	527.83	149.88	529.1	149	530.44	149.1
531.75	148.6	533.57	148.04	535.49	146.19	536.98	144.2	538.04	142.9
539.6	142.16	540.27	142.23	541.8	142.12	543.52	141.84	546.14	141.96
547.44	141.79	549.2	141.71	550.06	141.81	551.44	141.76	552.68	141.24
553.67	141.21	554.42	141.54	555.9	142.42	556.6	142.51	559.21	143.5
560.74	143.63	561.83	143.49	563.89	143.36	565.75	143.32	567.05	142.41
568.37	142.43	569.68	142.16	570.99	142.2	572.29	142.41	573.6	142.31
576.52	142.54	577.52	142.53	578.83	142.67	580.14	143.07	581.45	142.87
584.06	143.56	585.99	143.64	587.99	143.83	590.6	143.76	591.64	143.58

Belair Road.rep									
593.87	142.89	594.53	142.56	596.1	142.03	597.14	141.83	598.61	140.78
599.76	140.44	601.07	139.87	602.14	139.6	602.37	139.54	605.04	139.53
608.32	139.67	615.92	139.99	632.46	140.7	634.07	140.55	636.3	140.78
637.69	141.69	638.53	141.8	640.3	141.66	641.61	141.91	643	141.49
644.23	142.24	645.96	142.01	646.84	142.25	648.15	142.4	649.7	143.1
650.77	142.96	653.38	142.77	656.4	142.86	657.31	143	658.58	143.02
661.23	143.29	662.54	143.27	663.1	143.38	664.9	144.05	665.33	144.13
668.05	144.26	669.08	144.41	670.38	144.94	671.69	144.98	673	145.64
674.37	146.7	675.62	146.73	676.5	147.33	677.52	147.68	678.23	148.07
678.73	148.14	679.54	148.65	680.68	148.9	680.97	149.11	682.16	150.56
683.84	151.39	684.77	151.95	686.99	152.81	688.69	153.85	689.9	154.26
692.13	155.45	692.62	155.86	693.93	156.54	694.37	156.97	696.46	158.23
697.85	158.4	700.47	159.77	701.77	160.03	703.08	160.13	704.39	160.63
708.31	161.48	710.93	161.65	712.23	161.56	714.47	161.83	715.73	161.78
716.16	161.76	720.08	161.92	721.39	162.19	722.7	162.05	723.4	162.09
725.32	161.98	728.02	162	729.37	162.02	735.29	162.32	746.74	162.9
747.15	162.92	748.89	163	754.68	163.28	757.37	163.39	765.62	163.75
768.87	163.87	771.37	164	783.05	164.48	795.78	165	796.67	165.03
802.18	165.28	816.2	166	826.1	166.44	838.36	167	838.8	167.01
839.51	167.01	840.38	167.01	841.74	167.05	847.61	167.11	848.28	167.16
862.17	168	869.14	168.57	870.5	168.64	875.76	169	882.63	169.69
886.18	170	887.5	170.12	894.16	170.59				

Manning's n Values									
Sta	n Val	Sta	num=	Sta	n Val	Sta	n Val	Sta	n Val
0	.03	196.96	.08	451.75	.013	487.21	.08	597.14	.035
637.69	.08	715.73	.03						

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	597.14	637.69		36.99	38.09		.1	.3
Ineffective Flow	num=		2					
Sta L	Sta R	Elev	Permanent					
0	529.1	160.96	T					
678.23	894.16	165.7	T					

CROSS SECTION

RIVER: Whitemarsh Run
 REACH: 1 RS: 17.13

INPUT									
Description:									
Station Elevation Data									
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	165.02	1.71	165	2.68	164.89	3.99	164.56	5.3	164.55
6.61	164.24	7.78	164.16	10.55	164.17	13.17	163.88	14.56	163.88
17.1	163.78	19.72	163.76	21.07	163.89	22.34	163.92	24.19	164.12
24.96	164.13	26.28	164.35	27.59	164.14	28.9	164.22	29.93	164.35
31.52	164.08	32.14	164.07	34.35	164.24	38.07	164.34	39.38	163.97
40.69	164	42	164.12	43.31	163.79	44.63	164.03	45.43	163.41
45.46	163.38	45.94	162.89	46.68	162.99	47.25	163.18	48.56	163.21
49.85	163.05	51.18	163	52.07	162.86	54.28	163.1	56.5	163.08
57.73	162.83	59.04	163.01	60.35	162.85	61.67	163.03	62.98	162.99
64.29	163.47	65.35	163.31	66.91	163.5	68.22	163.45	69.78	163.78
70.84	163.66	72	163.63	74.21	163.73	74.77	163.6	76.08	162.96
77.39	163.34	78.8	163.3	80.02	163.15	80.85	163.43	81.33	163.36
82.01	163.5	83.07	163.41	83.95	163.24	85.28	163.86	86.57	163.35
87.88	163.13	88.43	163.11	90.5	163.19	91.93	162.79	93.12	162.66
96.35	163.28	97.05	163.3	98.07	163.58	98.57	163.59	99.68	163.28
100.78	163.22	102.3	162.89	104.92	162.73	106.23	162.79	107.54	162.76
108.85	162.96	112.78	162.88	115.4	162.67	116.28	162.56	117.34	162.53
118.03	162.6	120.55	162.71	121.96	162.57	123.27	162.38	125.14	162.42
128.51	161.97	129.82	161.93	132.44	161.6	133.75	161.36	135.07	161.21
136.38	160.82	137.69	160.81	138.43	160.66	139.83	160.55	140.31	160.45
141.62	160.5	142.86	160.45	145.07	159.69	145.55	159.71	146.86	159.56
148.17	159.31	149.46	159.21	150.79	158.72	152.1	158.69	153.42	158.16
153.93	158.11	156.04	158.08	157.35	157.81	159.1	157.2	159.97	156.84
162.31	156.28	163.9	156.1	165	155.54	166.52	155.48	167.83	155.13

Belair Road.rep									
169.14	155.16	170.45	154.72	171.64	154.63	174.39	154.23	176.07	153.88
178.28	153.75	182.25	153.64	183.56	153.52	184.93	153.57	186.18	153.8
187.49	153.77	188.81	153.93	190.12	154.16	191.43	154	192.74	154.44
194.05	154.63	195.36	154.98	197.98	155.24	199.29	155.82	200.6	155.68
201.91	156.32	203.22	156.56	204.07	156.81	204.53	156.83	205.84	157.25
207.07	157.03	208.47	157.55	209.28	157.7	209.78	157.91	211.09	158.26
212.4	158.76	213.7	159.09	215.02	159.24	216.33	159.88	218.95	160.26
220.36	160.62	221.57	160.58	225.51	160.78	226.82	160.89	228.13	160.8
229.21	160.83	230.57	160.73	230.75	160.72	232.06	160.84	233.37	160.88
234.68	160.7	235.86	160.8	237.3	160.64	240.28	160.01	241.23	159.92
244.71	159.89	246.48	159.84	247.79	159.88	249.04	160	251.36	159.9
254.34	159.94	255.78	159.84	258	159.89	259.58	159.78	262.43	159.73
263.52	159.74	264.83	159.63	266.14	159.69	267.04	159.62	268.76	159.48
271.52	159.56	273.5	159.67	276.62	159.96	277.94	160.03	279.24	159.88
280.56	159.64	281.87	159.69	283.18	159.54	285.8	159.38	288.42	158.95
290.79	157.99	293.66	157.19	294.97	156.18	296.28	155.64	297.86	154.51
300.07	153.54	301.53	152.51	302.84	151.76	304.15	151.42	304.5	151.18
305.46	150.77	306.71	149.85	308.08	149.45	309.39	148.75	311.14	148.26
312.01	148.13	313.28	148.04	314.63	147.22	316.49	146.41	317.78	146.09
318.57	146.01	319.7	145.7	321.19	145.48	322.5	145.36	323.81	145.41
325.12	145.27	326.43	144.84	327.74	144.86	328.86	144.72	331.67	144.63
332.55	144.7	333.28	144.66	334.3	144.42	335.76	144.35	336.92	144.19
339.54	144.07	342.14	143.64	343.47	143.73	344.78	143.68	346.09	143.39
347.4	143.63	348.61	143.32	350.02	143.09	351.82	142.95	353.96	143.04
355.43	142.91	356.58	143	359.2	142.82	360.51	142.81	363.13	142.53
365.75	142.13	369.68	141.66	370.93	141.33	372.31	141.26	374.93	141.03
377.59	140.9	386.32	140.49	391.15	140.26	397.5	139.96	398.52	139.92
399.71	139.99	401.14	140.18	402.45	139.98	404.14	140.4	405.07	140.98
406.43	140.94	407.7	142.15	408.57	142.56	409.01	143.06	409.64	143.19
410.78	143.72	411.63	144	413	144.26	414.25	143.74	415.21	143.86
416.87	143.79	417.43	143.6	419.28	143.49	420.8	143.84	421.86	143.66
423.42	142.94	424.07	142.82	426.05	142.96	427.36	143.22	428.5	143.27
429.98	143.57	431.29	143.73	432.12	143.74	432.93	143.85	433.91	144.14
435.34	144.11	436.53	144.41	437.36	144.42	438.55	144.59	440.46	145.12
441.76	145.65	444.4	145.76	445.71	146.04	447.02	145.79	448.33	145.92
449.64	145.88	450.64	146.27	451.4	146.3	452.86	145.8	453.57	145.63
454.61	145.55	456.19	145.52	457.28	145.22	458.81	145.51	460.12	145.17
461.44	144.26	462.75	144.68	463.93	144.27	465.37	144.33	466.68	144.65
467.46	143.52	467.99	143.12	468.36	143.07	469.3	143.92	470.67	143.26
471.92	143.87	472.78	144.1	473.23	144.48	473.88	143.92	474.54	143.8
475	143.84	477.09	144.71	478.47	145.13	479.79	145.86	480.3	145.97
481.1	145.94	481.64	146.36	482.41	146.6	483.52	147.58	483.86	147.79
485.03	147.77	486.34	149	487.65	149.75	488.28	149.97	488.96	150.58
489.94	150.6	491.58	151.06	492.71	151.69	494.2	153.65	494.93	154.13
495.51	154.19	496.36	154.77	496.82	154.93	497.14	155.39	498.14	155.82
499.36	156.76	499.58	156.85	500.76	156.64	501.57	157.34	503.38	157.72
504.69	158.3	505.25	158.36	506	158.44	507.31	159.14	508.21	159.75
508.62	159.93	509.21	159.92	509.93	159.77	512.43	160.04	513.86	160.01
515.18	160.36	515.64	160.15	516.49	159.98	517.8	160.03	519.11	159.53
519.29	159.76	520.42	160.35	521.5	159.87	522.06	160.43	523.04	161.75
523.71	162.19	524.35	162.4	526.97	162.85	528.49	163.2	530.9	163.15
531.7	163.17	534.79	163.47	536.15	163.35	537	163.56	537.46	163.57
539.21	163.42	541.39	163.55	543.91	163.74	548.99	164	557.4	164.6
563.03	165	564.28	165.11	564.33	165.11	569.47	165.41	574.5	165.65
581.22	166	588.54	166.41	590.01	166.51	598.97	167	607.97	167.49
612.72	167.77	616.87	168	617.77	168.05	618.13	168.07	637.79	169
639.5	169.08	639.98	169.11	655.57	169.77	659.89	169.96	660.42	170
660.49	170.01	661.22	170.11	661.25	170.11	663.75	170.47	663.94	170.5
667.36	171	669.41	171.29	674.36	172	679.19	172.69	681.37	173
682.82	173.21	683.46	173.3	688.82	174	692.78	174.5	696.67	174.95
697.12	175	702.65	175.62	705.67	175.66	706.14	175.67	707.4	175.8
710.39	176	720.97	176.76	725.33	176.99	725.51	177	731.56	177.4
735.04	177.26	735.83	177.29	736.61	177.34	739.56	177.71		

Manning's n Values		num= 7							
Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
0	.03	45.46	.08	230.57	.013	267.04	.08	360.51	.035
409.01	.08	505.25	.03						

Bank Sta: Left	Right	Lengths: Left	Channel	Belair Road.rep		
360.51	409.01	21.67	21.88	Right	Coeff	Contr.
				21.95	.3	.5
Ineffective Flow	num=	2				
Sta L	Sta R	Elev	Permanent			
0	342.14	160.96	T			
441.76	739.56	165.7	T			

CROSS SECTION

RIVER: Whitmarsh Run
 REACH: 1 RS: 17.09

INPUT

Description:

Station	Elevation	Data	num=	462					
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	168.26	.62	168.1	2.29	167.96	3.89	167.91	6.08	167.97
8.27	167.72	9.82	167.85	12.45	167.68	14.85	167.75	16.39	167.48
17.7	167.35	21.65	167.03	22.96	167.06	24.27	166.86	25.82	166.7
28.01	166.63	29.53	166.53	30.85	166.32	32.16	166.2	33.47	166.3
36.1	166.21	38.36	165.97	41.36	165.48	42.67	165.67	43.99	165.42
45.3	165.27	47.93	165.35	49.25	165.22	49.95	165.24	51.48	165.14
53.19	165.1	54.33	165	55.82	165.09	57.13	165	59.76	165.03
60.91	165.21	62.39	165.02	63.7	164.99	66.33	165.1	67.87	165.04
70.27	165.03	71.88	164.9	72.9	164.95	74.43	164.93	75.53	165.02
78.46	164.83	79.47	164.83	80.99	164.74	82.1	164.8	83.42	164.71
84.73	164.78	86.04	164.7	88.67	164.8	89.99	165.14	91.62	165.12
91.9	165.08	92.62	164.96	95.24	164.93	96	164.74	96.56	164.71
97.87	164.4	99.19	164.39	101.82	164.52	103.13	164.62	103.95	164.48
104.78	164.47	105.76	164.64	107.23	164.76	108.39	164.76	109.7	164.65
111.02	164.87	112.33	164.6	113.79	164.45	114.96	164.41	116.27	164.21
117.59	164.2	118.9	164.09	120.34	163.9	121.53	163.9	124.52	163.6
125.47	163.46	128.1	163.33	129.41	163.22	130.18	163.08	132.04	162.99
133.46	162.84	134.67	162.65	135.99	162.78	137.67	162.71	138.61	162.53
139.87	162.56	142.56	162.38	144.25	162.42	145.19	162.3	146.45	161.89
148.64	161.43	149.13	161.39	150.83	160.85	153.03	160.37	154.39	160.14
155.7	159.78	157.01	159.61	158.33	159.14	159.61	158.88	160.96	158.51
162.27	158.28	163.99	157.67	166.25	157.13	167.53	157.02	168.84	156.69
170.16	156.53	171.47	156.47	172.77	156.18	175.41	156.12	176.73	156.22
178.04	156.75	179.36	156.93	180.67	156.74	181.99	156.67	183.73	156.93
185.93	157.12	188.12	157.55	191.18	157.92	192.49	158.19	193.81	158.18
196.89	158.37	197.76	158.61	199.05	158.57	201.28	158.96	201.7	158.93
203.47	159.12	204.33	159.42	205.61	159.45	206.96	159.94	208.27	160.12
209.58	160.44	210.9	160.85	212.21	160.8	214.84	161.03	217.47	161.02
220.1	161.19	221.41	161.22	222.73	161.16	224.04	161.18	227.98	161.03
228.12	161.03	229.3	161.02	230.61	160.9	233.24	160.28	234.18	160.18
235.87	160.24	237.18	160.11	239.81	160.26	241.13	160.22	242.95	160.26
243.76	160.22	245.07	160.04	246.38	160.15	249.01	160.21	250.33	160.16
251.72	160.22	254.27	160.24	256.9	160.21	258.08	160.09	260.84	160.13
262.15	160.06	263.47	160.09	264.78	159.89	266.1	160.01	270.04	160.03
271.46	159.93	272.67	159.97	273.03	160.08	273.98	160.36	275.85	160.71
277.93	161.01	280.23	160.6	281.87	160.45	283.18	160.42	284.5	160.48
285.81	160.36	287.59	159.89	288.44	159.74	289.75	159.31	291.2	158.4
292.38	157.83	293.39	157.18	294.15	156.78	295.01	156.59	295.59	156.21
296.33	156.03	297.43	155.61	298.95	154.87	299.97	154.47	300.71	154.03
302.17	152.94	303.99	151.93	305.53	151.48	307.27	150.88	308.15	150.49
309.47	150.15	310.94	149.88	312.1	149.19	313.13	148.46	313.83	148.39
314.72	148.53	315.33	148.37	316.04	148.32	317.52	147.96	319.71	147.79
321.3	147.29	321.91	147.16	323.92	147.03	326.55	146.68	327.87	146.38
329.18	146.47	330.68	146.03	331.81	145.91	333.5	145.85	334.44	145.7
335.75	145.79	337.26	145.7	338.38	145.3	339.7	145.49	340.06	145.48
342.32	145.68	343.84	145.91	346.27	145.9	348.9	145.69	350.21	145.32
351.52	145.35	352.61	144.87	354.15	144.87	354.8	144.79	356.46	144.42
358.1	144.45	359.74	144.16	361.38	143.47	362.04	143.05	363.58	142.76
364.67	142.46	367.3	142.38	368.61	142.46	370.16	142.34	371.24	141.96
372.35	141.86	372.38	141.85	373.87	141.35	375.18	141.73	376.74	141.82
377.81	141.54	379.12	141.28	386.03	140.77	399.09	139.81	400.09	139.79
402.37	139.74	403.06	139.7	404.09	139.93	405.65	139.76	406.72	140.16

Belair Road.rep

407.44	140.54	408.04	141.93	408.93	142.61	409.35	143.24	409.63	143.22
410.67	143.69	412.21	143.94	413.29	144.4	414.61	144.34	415.49	143.89
416.21	143.71	417.24	143.6	418.55	143.96	418.84	143.95	419.86	143.97
420.66	144.04	421.16	144.21	421.83	144.13	422.46	144.23	422.93	144.16
424.89	144.86	426.37	145.57	427.68	144.98	429.74	145.82	430.28	145.99
431.59	145.88	432.89	146.41	434.28	146.67	435.5	146.61	438.1	146.67
439.41	146.86	440.19	147.15	442.01	147.53	443.36	147.48	444.62	147.79
445.92	148.25	447.22	148.59	447.9	148.56	448.53	148.68	449.83	149.41
452.44	149.74	454.71	149.71	455.04	149.64	456.98	149.51	457.65	149.34
459.25	149.34	460.26	149.5	461.52	150.29	462.86	150.78	463.79	151.37
465.47	152.56	466.06	152.81	466.77	153.26	468.08	153.88	468.33	153.92
470.6	155.22	470.8	155.24	471.99	155.78	473.29	156.52	475.14	157.05
477.2	158.24	478.5	158.55	481.11	160.05	481.95	160.32	482.41	160.63
483.71	160.77	485.02	161.38	486.48	161.79	489.16	162.13	490.23	161.78
491.02	161.91	491.53	161.73	492.84	161.64	494.14	161.48	495.56	162.11
496.75	162.35	498.05	162.85	499.35	163.01	500.1	163.2	500.66	163.22
502.37	163.05	504.46	163.06	505.87	163.31	509.18	163.45	509.78	163.53
511.08	163.49	512.39	163.66	513.69	164.03	514.99	163.92	517.6	164.39
518.9	164.52	520.53	164.54	521.51	164.83	522.8	164.8	524.11	165.19
525.42	165.22	526.29	165.16	527.34	165.09	528.02	165.2	528.95	165.17
530.63	165.58	531.88	165.43	533.24	165.34	534.15	165.13	535.84	165.26
537.15	165.27	538.45	165.2	538.69	165.27	541.19	165.5	542.36	165.37
543.23	164.82	544.97	164.22	547.31	164.12	548.88	164.1	550.04	163.66
550.37	163.69	551.48	164.38	552.78	163.96	553.43	164.03	554.58	164.47
555.63	164.58	556.44	164.64	557.21	164.59	559.27	164.71	559.9	164.78
562.66	165	563.4	165.11	564.29	165.3	565.69	165.43	566.79	165.66
569.34	165.85	570.37	166	573.72	166.37	579.86	166.06	580.5	166.03
583.25	166.28	587.27	166.62	593.22	166.97	594.23	166.97	595.08	167
596.42	167.08	607.92	167.8	611.17	168	613.84	168.03	613.96	168.03
614.46	168.03	623.69	168.64	627.57	169	627.67	169.01	628.11	169.01
628.35	169.01	631.08	169.07	633.35	169.09	635.09	169.09	639.95	169.6
641.22	169.86	641.9	170	642.13	170.05	645.86	170.37	649.04	170.64
653.86	171	665.32	171.86	665.65	171.87	666.59	172	670.54	172.5
674.15	173	677.28	173.38	681.81	174	687.22	174.64	687.26	174.65
691.1	175	692.25	175.1	695.32	175.43	700.6	176	708.35	176.84
709.48	176.95	709.59	176.97	709.82	176.99	710.16	177	710.4	177.05
711.15	177.11	711.82	177.16	712.41	177.2	712.94	177.24	713.42	177.28
713.86	177.31	714.26	177.34	714.63	177.36	714.98	177.38	715.3	177.41
715.6	177.42	715.88	177.44	716.34	177.48	724.57	178	724.68	178.01
732.64	178.55	733.77	178.66	738.75	179	739.07	179.02	739.11	179.03
739.14	179.03	740.26	179.12						

Manning's n Values		num= 7							
Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
0	.03	91.9	.08	228.12	.013	273.03	.08	359.74	.035
409.35	.08	526.29	.03						

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	359.74	409.35		139.9	136.02		.3	.5
Ineffective Flow			num=	2				
Sta L	Sta R	Elev	Permanent					
0	356.46	160.96	T					
429.74	740.26	165.7	T					

CULVERT

RIVER: Whitmarsh Run
 REACH: 1 RS: 16.98

INPUT

Description:
 Distance from Upstream XS = 30
 Deck/Roadway Width = 94
 Weir Coefficient = 2.6
 Upstream Deck/Roadway Coordinates

num= 16							
Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord	Sta	Hi Cord
0	175.5		25.5	173		141.7	166

178.2	164	201.8	163		Belair Road.rep
318.87	160.96	318.87	163.63	0	228 162
416.13	165.7	0 497.13	170.13		356.54 163.9
522.83	168	550	169		497.13 167.46
742	180.5				692.93 178.68

Upstream Bridge Cross Section Data

Station Elevation Data		num= 462							
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	168.26	.62	168.1	2.29	167.96	3.89	167.91	6.08	167.97
8.27	167.72	9.82	167.85	12.45	167.68	14.85	167.75	16.39	167.48
17.7	167.35	21.65	167.03	22.96	167.06	24.27	166.86	25.82	166.7
28.01	166.63	29.53	166.53	30.85	166.32	32.16	166.2	33.47	166.3
36.1	166.21	38.36	165.97	41.36	165.48	42.67	165.67	43.99	165.42
45.3	165.27	47.93	165.35	49.25	165.22	49.95	165.24	51.48	165.14
53.19	165.1	54.33	165	55.82	165.09	57.13	165	59.76	165.03
60.91	165.21	62.39	165.02	63.7	164.99	66.33	165.1	67.87	165.04
70.27	165.03	71.88	164.9	72.9	164.95	74.43	164.93	75.53	165.02
78.46	164.83	79.47	164.83	80.99	164.74	82.1	164.8	83.42	164.71
84.73	164.78	86.04	164.7	88.67	164.8	89.99	165.14	91.62	165.12
91.9	165.08	92.62	164.96	95.24	164.93	96	164.74	96.56	164.71
97.87	164.4	99.19	164.39	101.82	164.52	103.13	164.62	103.95	164.48
104.78	164.47	105.76	164.64	107.23	164.76	108.39	164.76	109.7	164.65
111.02	164.87	112.33	164.6	113.79	164.45	114.96	164.41	116.27	164.21
117.59	164.2	118.9	164.09	120.34	163.9	121.53	163.9	124.52	163.6
125.47	163.46	128.1	163.33	129.41	163.22	130.18	163.08	132.04	162.99
133.46	162.84	134.67	162.65	135.99	162.78	137.67	162.71	138.61	162.53
139.87	162.56	142.56	162.38	144.25	162.42	145.19	162.3	146.45	161.89
148.64	161.43	149.13	161.39	150.83	160.85	153.03	160.37	154.39	160.14
155.7	159.78	157.01	159.61	158.33	159.14	159.61	158.88	160.96	158.51
162.27	158.28	163.99	157.67	166.25	157.13	167.53	157.02	168.84	156.69
170.16	156.53	171.47	156.47	172.77	156.18	175.41	156.12	176.73	156.22
178.04	156.75	179.36	156.93	180.67	156.74	181.99	156.67	183.73	156.93
185.93	157.12	188.12	157.55	191.18	157.92	192.49	158.19	193.81	158.18
196.89	158.37	197.76	158.61	199.05	158.57	201.28	158.96	201.7	158.93
203.47	159.12	204.33	159.42	205.61	159.45	206.96	159.94	208.27	160.12
209.58	160.44	210.9	160.85	212.21	160.8	214.84	161.03	217.47	161.02
220.1	161.19	221.41	161.22	222.73	161.16	224.04	161.18	227.98	161.03
228.12	161.03	229.3	161.02	230.61	160.9	233.24	160.28	234.18	160.18
235.87	160.24	237.18	160.11	239.81	160.26	241.13	160.22	242.95	160.26
243.76	160.22	245.07	160.04	246.38	160.15	249.01	160.21	250.33	160.16
251.72	160.22	254.27	160.24	256.9	160.21	258.08	160.09	260.84	160.13
262.15	160.06	263.47	160.09	264.78	159.89	266.1	160.01	270.04	160.03
271.46	159.93	272.67	159.97	273.03	160.08	273.98	160.36	275.85	160.71
277.93	161.01	280.23	160.6	281.87	160.45	283.18	160.42	284.5	160.48
285.81	160.36	287.59	159.89	288.44	159.74	289.75	159.31	291.2	158.4
292.38	157.83	293.39	157.18	294.15	156.78	295.01	156.59	295.59	156.21
296.33	156.03	297.43	155.61	298.95	154.87	299.97	154.47	300.71	154.03
302.17	152.94	303.99	151.93	305.53	151.48	307.27	150.88	308.15	150.49
309.47	150.15	310.94	149.88	312.1	149.19	313.13	148.46	313.83	148.39
314.72	148.53	315.33	148.37	316.04	148.32	317.52	147.96	319.71	147.79
321.3	147.29	321.91	147.16	323.92	147.03	326.55	146.68	327.87	146.38
329.18	146.47	330.68	146.03	331.81	145.91	333.5	145.85	334.44	145.7
335.75	145.79	337.26	145.7	338.38	145.3	339.7	145.49	340.06	145.48
342.32	145.68	343.84	145.91	346.27	145.9	348.9	145.69	350.21	145.32
351.52	145.35	352.61	144.87	354.15	144.87	354.8	144.79	356.46	144.42
358.1	144.45	359.74	144.16	361.38	143.47	362.04	143.05	363.58	142.76
364.67	142.46	367.3	142.38	368.61	142.46	370.16	142.34	371.24	141.96
372.35	141.86	372.38	141.85	373.87	141.35	375.18	141.73	376.74	141.82
377.81	141.54	379.12	141.28	386.03	140.77	399.09	139.81	400.09	139.79
402.37	139.74	403.06	139.7	404.09	139.93	405.65	139.76	406.72	140.16
407.44	140.54	408.04	141.93	408.93	142.61	409.35	143.24	409.63	143.22
410.67	143.69	412.21	143.94	413.29	144.4	414.61	144.34	415.49	143.89
416.21	143.71	417.24	143.6	418.55	143.96	418.84	143.95	419.86	143.97
420.66	144.04	421.16	144.21	421.83	144.13	422.46	144.23	422.93	144.16
424.89	144.86	426.37	145.57	427.68	144.98	429.74	145.82	430.28	145.99
431.59	145.88	432.89	146.41	434.28	146.67	435.5	146.61	438.1	146.67
439.41	146.86	440.19	147.15	442.01	147.53	443.36	147.48	444.62	147.79
445.92	148.25	447.22	148.59	447.9	148.56	448.53	148.68	449.83	149.41

Belair Road.rep

452.44	149.74	454.71	149.71	455.04	149.64	456.98	149.51	457.65	149.34
459.25	149.34	460.26	149.5	461.52	150.29	462.86	150.78	463.79	151.37
465.47	152.56	466.06	152.81	466.77	153.26	468.08	153.88	468.33	153.92
470.6	155.22	470.8	155.24	471.99	155.78	473.29	156.52	475.14	157.05
477.2	158.24	478.5	158.55	481.11	160.05	481.95	160.32	482.41	160.63
483.71	160.77	485.02	161.38	486.48	161.79	489.16	162.13	490.23	161.78
491.02	161.91	491.53	161.73	492.84	161.64	494.14	161.48	495.56	162.11
496.75	162.35	498.05	162.85	499.35	163.01	500.1	163.2	500.66	163.22
502.37	163.05	504.46	163.06	505.87	163.31	509.18	163.45	509.78	163.53
511.08	163.49	512.39	163.66	513.69	164.03	514.99	163.92	517.6	164.39
518.9	164.52	520.53	164.54	521.51	164.83	522.8	164.8	524.11	165.19
525.42	165.22	526.29	165.16	527.34	165.09	528.02	165.2	528.95	165.17
530.63	165.58	531.88	165.43	533.24	165.34	534.15	165.13	535.84	165.26
537.15	165.27	538.45	165.2	538.69	165.27	541.19	165.5	542.36	165.37
543.23	164.82	544.97	164.22	547.31	164.12	548.88	164.1	550.04	163.66
550.37	163.69	551.48	164.38	552.78	163.96	553.43	164.03	554.58	164.47
555.63	164.58	556.44	164.64	557.21	164.59	559.27	164.71	559.9	164.78
562.66	165	563.4	165.11	564.29	165.3	565.69	165.43	566.79	165.66
569.34	165.85	570.37	166	573.72	166.37	579.86	166.06	580.5	166.03
583.25	166.28	587.27	166.62	593.22	166.97	594.23	166.97	595.08	167
596.42	167.08	607.92	167.8	611.17	168	613.84	168.03	613.96	168.03
614.46	168.03	623.69	168.64	627.57	169	627.67	169.01	628.11	169.01
628.35	169.01	631.08	169.07	633.35	169.09	635.09	169.09	639.95	169.6
641.22	169.86	641.9	170	642.13	170.05	645.86	170.37	649.04	170.64
653.86	171	665.32	171.86	665.65	171.87	666.59	172	670.54	172.5
674.15	173	677.28	173.38	681.81	174	687.22	174.64	687.26	174.65
691.1	175	692.25	175.1	695.32	175.43	700.6	176	708.35	176.84
709.48	176.95	709.59	176.97	709.82	176.99	710.16	177	710.4	177.05
711.15	177.11	711.82	177.16	712.41	177.2	712.94	177.24	713.42	177.28
713.86	177.31	714.26	177.34	714.63	177.36	714.98	177.38	715.3	177.41
715.6	177.42	715.88	177.44	716.34	177.48	724.57	178	724.68	178.01
732.64	178.55	733.77	178.66	738.75	179	739.07	179.02	739.11	179.03
739.14	179.03	740.26	179.12						

Manning's n	Values	num=	7						
Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
0	.03	91.9	.08	228.12	.013	273.03	.08	359.74	.035
409.35	.08	526.29	.03						

Bank Sta:	Left	Right	Coeff	Contr.	Expan.
359.74	409.35		.3	.5	

Ineffective Flow	num=	2
Sta L	Sta R	Elev
0	356.46	160.96
429.74	740.26	165.7

Downstream	Deck/Roadway	Coordinates
num=	13	
Sta	Hi Cord	Lo Cord
-116.2	173	0
51.8	163	78
168.87	163.63	206.54
347.13	170.13	347.13
398.83	169	

Downstream Bridge	Cross Section Data
Station Elevation	Data
Sta	Elev
-74.16	169.33
-65.6	168.95
-59.08	169.08
-52.56	168.16
-44.74	165.83
-39.51	164.56
-32.99	164.71
-22.17	164.17
-15.4	163.74
-9.5	162.7
-5.59	161.75

						Belair Road.rep			
- .37	159.51	.4	159.22	.94	158.72	1.54	158.46	2.24	157.76
3.55	156.96	4.85	156.56	6.06	155.74	7.46	154.84	8.32	154.98
8.77	154.93	9.38	154.64	10.07	154.14	11.37	153.48	12.84	153.05
13.98	152.62	15.1	152.37	17.36	152.11	17.9	152.02	19.62	152.04
20.51	151.91	21.88	152.05	23.11	151.68	24.8	151.49	25.72	151.27
26.4	151.31	27.03	151.21	27.88	151.18	29.64	150.88	30.94	150.82
32.24	150.67	34.05	150.66	34.85	150.6	37.46	150.14	38.77	149.96
40.21	149.96	41.37	149.87	42.22	149.68	43.98	149.44	44.49	149.43
45.29	149.28	46.38	149.2	46.75	149.12	47.9	149.04	49.01	149.06
50.5	148.97	51.81	149.08	53.11	148.84	53.53	148.82	54.42	148.63
55.63	148.62	57.03	148.4	58.05	148.02	58.71	147.84	59.63	147.68
60.94	147.81	62.24	147.71	63.55	147.85	64.83	147.71	66.16	147.64
68.76	147.44	70.07	147.42	71.37	147.14	72.68	147.13	73.87	147.04
75.29	146.87	76.13	146.93	76.59	146.87	77.89	146.53	80.65	146.7
81.81	146.63	82.91	146.45	84.42	146.43	85.72	146.31	87.02	146.42
88.33	146.13	89.69	145.98	90.94	145.57	92.63	145.3	93.55	145.28
94.85	145.33	96.48	145.1	97.46	145.01	100.07	145.28	101	145.2
102.68	144.8	103.98	144.77	105.52	144.69	107.78	144.84	109.2	144.72
110.5	144.41	111.81	144.5	113.11	144.54	114.56	144.35	115.72	144.48
117.02	144.34	118.33	144.38	119.08	144.3	120.94	144.28	122.24	144.22
123.6	144.09	124.85	144.15	127.46	143.93	129.64	143.83	132.64	143.8
133.98	143.83	134.9	143.76	135.8	143.82	137.89	144.03	139.42	143.81
140.5	143.78	141.69	143.64	143.95	144.29	145.05	144.26	147.02	144
148.33	143.99	149.63	144.25	151.22	144.5	153.54	144.42	154.85	144.18
156.15	144.45	157.39	144.88	158.76	144.81	160.07	144.86	161.37	144.6
162.68	144.5	163.98	144.68	165.28	144.38	166.55	144.33	168.81	144.18
170.5	144.11	173.33	143.85	175.59	143.9	177.85	143.87	178.33	143.91
179.63	143.8	180.94	143.77	182.24	143.82	183.54	143.6	184.63	143.51
186.15	143.56	187.46	143.55	188.76	143.64	190.07	143.57	191.42	143.09
192.67	142.3	193.98	141.66	195.28	140.08	195.94	139.79	196.59	139.6
197.48	139.09	198.2	138.48	199.2	137.73	200.56	137.13	201.8	136.67
202.72	136.18	204.41	136	205.72	136.08	207.24	136.1	208.33	136.07
209.81	136.11	211.76	136.22	213.54	136.27	217.46	136.3	218.54	136.28
221.37	136.29	223.06	136.34	236.26	136.36	239.8	136.37	256.91	136.39
257.9	136.38	260.51	136.17	261.41	136.33	263.13	136.46	263.66	136.65
264.43	136.77	265.74	136.89	265.92	136.83	268.17	136.71	268.59	136.76
269.65	137.22	270.42	137.35	272.26	137.86	274.87	138.9	276.18	139
277.18	138.85	277.91	139.02	278.79	139.34	279.43	139.4	280.09	139.65
281.01	140.32	281.68	140.7	282.71	141.05	283.93	141.05	284.12	141.17
285.32	142.51	286.19	142.62	287.22	142.65	288.44	142.76	289.23	142.91
290.69	142.95	291.84	143.07	292.94	143.35	294.45	143.23	295.2	143.24
297.45	143.11	299.64	143.22	300.98	143.36	302.29	143.36	303.59	143.56
304.9	143.69	306.46	143.71	307.51	143.89	308.71	143.96	310.12	144.14
310.96	144.3	312.06	144.33	313.21	144.53	314.03	144.78	315.47	144.76
316.64	144.64	317.72	144.81	319.97	145.24	321.37	145.43	322.22	145.5
323.17	145.5	324.47	145.72	327.58	145.93	328.98	146.16	330.68	146.11
331.23	146.17	332.31	146.45	333.61	146.58	334.92	146.3	336.22	146.21
337.53	146.34	338.83	146.39	340.27	146.73	341.44	146.94	342.97	147.32
344.85	147.98	345.34	148.24	347.14	148.42	347.94	148.44	349.24	148.58
349.42	148.65	350.54	148.73	351.71	150.22	352.02	150.48	353.15	150.51
354	151.21	357.05	151.73	358.05	152.22	359.65	152.91	361.07	153.31
363.15	154.51	364.09	155.02	364.86	155.59	365.44	155.77	366.16	156.22
367.1	156.63	367.73	157.05	368.76	158.03	370.02	158.69	371.36	159.54
372.31	159.98	373.14	160.15	373.97	160.41	375.27	161.09	376.57	161.44
377.87	162.57	379.17	164.07	380.47	165	381.46	165.26	382.19	165.19
383.07	165.31	383.75	165.48	384.38	165.95	385.68	167.34	388.32	167.97
389.58	168.66	392.18	169.06	393.48	168.97	394.16	169.13	394.78	169.28
397.27	169.22	399.77	169.36	402.59	169.77	403.89	169.92	406.5	170.04
407.8	169.81	408.92	170.13	411.7	170.27	413	170.44	414.3	170.46
416.91	170.61	419.51	170.67	422.11	170.58	424.42	170.86	426.01	170.92
427.43	171.03	428.62	171.18	429.51	171.06	430.45	171.1	432.52	171.31
433.82	171.55	435.12	171.46	438.67	171.7	439.5	171.71	441.63	171.83
443.24	172.03	445.53	172.02	447.82	172.07	450.74	172.27	452.04	172.22
453.34	172.47	455.94	172.62	457.24	172.63	459.26	172.73	459.84	172.71
461.15	172.8	463.84	173.04	466.35	173.2	467.65	173.23	468.95	173.41
469.66	173.35	470.7	173.36	472.68	173.5	475.28	173.64	476.76	173.67
478.06	173.77	480.66	173.91	484.43	174.19	487.17	174.34	488.47	174.27
489.77	174.26	494.98	174.35	496.28	174.44	497.58	174.45	498.88	174.52
501.48	174.61	504.09	174.65	505.39	174.64	506.69	174.71	508.88	174.72

Belair Road.rep

510.59	174.8	511.89	174.97	513.19	174.93	514.5	174.83	515.8	174.89
517.1	175.02	521	174.96	523.96	175.07	527.91	175	530	175.11
534.01	175.22	536.03	175.21	537.92	175.24	539.35	175.23	541.82	175.3
543.12	175.24	546.21	175.4	548.33	175.41	549.63	175.57	552.23	175.81
553.08	175.76	554.13	175.79	554.83	175.91	557.66	176.2	558.74	176.19
560.16	176.3	561.34	176.47	562.23	176.48	563.94	176.73	565.24	176.8
566.54	176.99	567.84	176.96	569.15	177.02	570.45	177.26	572.23	177.44
574.35	177.56	575.96	177.69	576.95	177.83	578.25	177.9	580.54	178.16
582.83	178.45	584.76	178.74	586.06	178.76	588.66	179.13	591.98	179.44
595.17	179.81	596.47	179.93	597.77	180.16	598.84	180.18	600.37	180.32
601.68	180.37	602.98	180.61	604.28	180.75	608	180.96	609.48	181.1
612.09	181.25	612.57	181.21	614.69	181.29	617.15	181.6	618.59	181.55
621.19	181.62	622.5	181.76	625.1	181.83	626.52	181.84	629.54	181.95
630.3	182.04	632.9	182.14	634.21	182.23	636.81	182.3	639.41	182.41
640.71	182.32	641.61	182.32	643.31	182.42	644.61	182.38	645.92	182.42
646.9	182.53	648.52	182.59	649.82	182.49	651.47	182.47	652.42	182.55
653.76	182.57	655.03	182.64	656.33	182.77	657.63	182.62	658.93	182.7
661.53	182.67	662.83	182.79	664.13	182.73	665.2	182.73	667.35	182.79

Manning's n Values num= 4

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
-74.16	.05	197.48	.035	274.87	.05	394.16	.015

Bank Sta: Left Right Coeff Contr. Expan.
 197.48 274.87 .3 .5

Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
0	205.72	160.5	F
268.59	665.2	160.5	F

Upstream Embankment side slope = 3 horiz. to 1.0 vertical
 Downstream Embankment side slope = 3 horiz. to 1.0 vertical
 Maximum allowable submergence for weir flow = .98
 Elevation at which weir flow begins =
 Energy head used in spillway design =
 Spillway height used in design =
 Weir crest shape = Broad Crested

Number of Culverts = 1

Culvert Name	Shape	Rise	Span
Culvert #1	Circular	9	

FHWA Chart # 2 - Corrugated Metal Pipe Culvert
 FHWA Scale # 2 - Mitered to conform to slope
 Solution Criteria = Highest U.S. EG

Culvert Upstrm Dist	Length	Top n	Bottom n	Depth Blocked	Entrance Loss Coef	Exit Loss Coef
30	94	.024	.024	0	.7	1

Number of Barrels = 3
 Upstream Elevation = 139.8
 Centerline Stations
 Sta. Sta. Sta.
 380 392 404
 Downstream Elevation = 138.2
 Centerline Stations
 Sta. Sta. Sta.
 230 242 254

CROSS SECTION

RIVER: Whitemarsh Run
 REACH: 1 RS: 16.86

INPUT

Description:

Station Elevation Data		num= 490	
Sta	Elev	Sta	Elev
-74.16	169.33	-73.43	169.34
-65.6	168.95	-64.3	168.96

						Belair	Road.rep		
-59.08	169.08	-58.29	168.95	-56.03	168.75	-55.17	168.64	-53.99	168.39
-52.56	168.16	-51.25	167.82	-49.26	167.36	-47.8	166.97	-46.03	166.26
-44.74	165.83	-43.42	165.66	-42.48	165.34	-40.81	164.95	-40.23	164.67
-39.51	164.56	-38.53	164.59	-37.97	164.67	-35.43	164.78	-34.29	164.78
-32.99	164.71	-31.2	164.87	-28.94	164.72	-26.16	164.57	-25.16	164.54
-22.17	164.17	-21.24	164.13	-19.98	164.17	-18.63	164.11	-17.33	163.81
-15.4	163.74	-14.72	163.62	-13.42	163.11	-13.14	163.06	-10.88	163.03
-9.5	162.7	-8.2	162.6	-7.61	162.43	-6.89	162.07	-6.37	162.01
-5.59	161.75	-4.52	161.67	-4.11	161.53	-2.98	160.82	-1.67	159.88
-3.37	159.51	.4	159.22	.94	158.72	1.54	158.46	2.24	157.76
3.55	156.96	4.85	156.56	6.06	155.74	7.46	154.84	8.32	154.98
8.77	154.93	9.38	154.64	10.07	154.14	11.37	153.48	12.84	153.05
13.98	152.62	15.1	152.37	17.36	152.11	17.9	152.02	19.62	152.04
20.51	151.91	21.88	152.05	23.11	151.68	24.8	151.49	25.72	151.27
26.4	151.31	27.03	151.21	27.88	151.18	29.64	150.88	30.94	150.82
32.24	150.67	34.05	150.66	34.85	150.6	37.46	150.14	38.77	149.96
40.21	149.96	41.37	149.87	42.22	149.68	43.98	149.44	44.49	149.43
45.29	149.28	46.38	149.2	46.75	149.12	47.9	149.04	49.01	149.06
50.5	148.97	51.81	149.08	53.11	148.84	53.53	148.82	54.42	148.63
55.63	148.62	57.03	148.4	58.05	148.02	58.71	147.84	59.63	147.68
60.94	147.81	62.24	147.71	63.55	147.85	64.83	147.71	66.16	147.64
68.76	147.44	70.07	147.42	71.37	147.14	72.68	147.13	73.87	147.04
75.29	146.87	76.13	146.93	76.59	146.87	77.89	146.53	80.65	146.7
81.81	146.63	82.91	146.45	84.42	146.43	85.72	146.31	87.02	146.42
88.33	146.13	89.69	145.98	90.94	145.57	92.63	145.3	93.55	145.28
94.85	145.33	96.48	145.1	97.46	145.01	100.07	145.28	101	145.2
102.68	144.8	103.98	144.77	105.52	144.69	107.78	144.84	109.2	144.72
110.5	144.41	111.81	144.5	113.11	144.54	114.56	144.35	115.72	144.48
117.02	144.34	118.33	144.38	119.08	144.3	120.94	144.28	122.24	144.22
123.6	144.09	124.85	144.15	127.46	143.93	129.64	143.83	132.64	143.8
133.98	143.83	134.9	143.76	135.8	143.82	137.89	144.03	139.42	143.81
140.5	143.78	141.69	143.64	143.95	144.29	145.05	144.26	147.02	144
148.33	143.99	149.63	144.25	151.22	144.5	153.54	144.42	154.85	144.18
156.15	144.45	157.39	144.88	158.76	144.81	160.07	144.86	161.37	144.6
162.68	144.5	163.98	144.68	165.28	144.38	166.55	144.33	168.81	144.18
170.5	144.11	173.33	143.85	175.59	143.9	177.85	143.87	178.33	143.91
179.63	143.8	180.94	143.77	182.24	143.82	183.54	143.6	184.63	143.51
186.15	143.56	187.46	143.55	188.76	143.64	190.07	143.57	191.42	143.09
192.67	142.3	193.98	141.66	195.28	140.08	195.94	139.79	196.59	139.6
197.48	139.09	198.2	138.48	199.2	137.73	200.56	137.13	201.8	136.67
202.72	136.18	204.41	136	205.72	136.08	207.24	136.1	208.33	136.07
209.81	136.11	211.76	136.22	213.54	136.27	217.46	136.3	218.54	136.28
221.37	136.29	223.06	136.34	236.26	136.36	239.8	136.37	256.91	136.39
257.9	136.38	260.51	136.17	261.41	136.33	263.13	136.46	263.66	136.65
264.43	136.77	265.74	136.89	265.92	136.83	268.17	136.71	268.59	136.76
269.65	137.22	270.42	137.35	272.26	137.86	274.87	138.9	276.18	139
277.18	138.85	277.91	139.02	278.79	139.34	279.43	139.4	280.09	139.65
281.01	140.32	281.68	140.7	282.71	141.05	283.93	141.05	284.12	141.17
285.32	142.51	286.19	142.62	287.22	142.65	288.44	142.76	289.23	142.91
290.69	142.95	291.84	143.07	292.94	143.35	294.45	143.23	295.2	143.24
297.45	143.11	299.64	143.22	300.98	143.36	302.29	143.36	303.59	143.56
304.9	143.69	306.46	143.71	307.51	143.89	308.71	143.96	310.12	144.14
310.96	144.3	312.06	144.33	313.21	144.53	314.03	144.78	315.47	144.76
316.64	144.64	317.72	144.81	319.97	145.24	321.37	145.43	322.22	145.5
323.17	145.5	324.47	145.72	327.58	145.93	328.98	146.16	330.68	146.11
331.23	146.17	332.31	146.45	333.61	146.58	334.92	146.3	336.22	146.21
337.53	146.34	338.83	146.39	340.27	146.73	341.44	146.94	342.97	147.32
344.85	147.98	345.34	148.24	347.14	148.42	347.94	148.44	349.24	148.58
349.42	148.65	350.54	148.73	351.71	150.22	352.02	150.48	353.15	150.51
354	151.21	357.05	151.73	358.05	152.22	359.65	152.91	361.07	153.31
363.15	154.51	364.09	155.02	364.86	155.59	365.44	155.77	366.16	156.22
367.1	156.63	367.73	157.05	368.76	158.03	370.02	158.69	371.36	159.54
372.31	159.98	373.14	160.15	373.97	160.41	375.27	161.09	376.57	161.44
377.87	162.57	379.17	164.07	380.47	165	381.46	165.26	382.19	165.19
383.07	165.31	383.75	165.48	384.38	165.95	385.68	167.34	388.32	167.97
389.58	168.66	392.18	169.06	393.48	168.97	394.16	169.13	394.78	169.28
397.27	169.22	399.77	169.36	402.59	169.77	403.89	169.92	406.5	170.04
407.8	169.81	408.92	170.13	411.7	170.27	413	170.44	414.3	170.46
416.91	170.61	419.51	170.67	422.11	170.58	424.42	170.86	426.01	170.92

Belair Road.rep									
427.43	171.03	428.62	171.18	429.51	171.06	430.45	171.1	432.52	171.31
433.82	171.55	435.12	171.46	438.67	171.7	439.5	171.71	441.63	171.83
443.24	172.03	445.53	172.02	447.82	172.07	450.74	172.27	452.04	172.22
453.34	172.47	455.94	172.62	457.24	172.63	459.26	172.73	459.84	172.71
461.15	172.8	463.84	173.04	466.35	173.2	467.65	173.23	468.95	173.41
469.66	173.35	470.7	173.36	472.68	173.5	475.28	173.64	476.76	173.67
478.06	173.77	480.66	173.91	484.43	174.19	487.17	174.34	488.47	174.27
489.77	174.26	494.98	174.35	496.28	174.44	497.58	174.45	498.88	174.52
501.48	174.61	504.09	174.65	505.39	174.64	506.69	174.71	508.88	174.72
510.59	174.8	511.89	174.97	513.19	174.93	514.5	174.83	515.8	174.89
517.1	175.02	521	174.96	523.96	175.07	527.91	175	530	175.11
534.01	175.22	536.03	175.21	537.92	175.24	539.35	175.23	541.82	175.3
543.12	175.24	546.21	175.4	548.33	175.41	549.63	175.57	552.23	175.81
553.08	175.76	554.13	175.79	554.83	175.91	557.66	176.2	558.74	176.19
560.16	176.3	561.34	176.47	562.23	176.48	563.94	176.73	565.24	176.8
566.54	176.99	567.84	176.96	569.15	177.02	570.45	177.26	572.23	177.44
574.35	177.56	575.96	177.69	576.95	177.83	578.25	177.9	580.54	178.16
582.83	178.45	584.76	178.74	586.06	178.76	588.66	179.13	591.98	179.44
595.17	179.81	596.47	179.93	597.77	180.16	598.84	180.18	600.37	180.32
601.68	180.37	602.98	180.61	604.28	180.75	608	180.96	609.48	181.1
612.09	181.25	612.57	181.21	614.69	181.29	617.15	181.6	618.59	181.55
621.19	181.62	622.5	181.76	625.1	181.83	626.52	181.84	629.54	181.95
630.3	182.04	632.9	182.14	634.21	182.23	636.81	182.3	639.41	182.41
640.71	182.32	641.61	182.32	643.31	182.42	644.61	182.38	645.92	182.42
646.9	182.53	648.52	182.59	649.82	182.49	651.47	182.47	652.42	182.55
653.76	182.57	655.03	182.64	656.33	182.77	657.63	182.62	658.93	182.7
661.53	182.67	662.83	182.79	664.13	182.73	665.2	182.73	667.35	182.79

Manning's n Values		num= 4							
Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
-74.16	.05	197.48	.035	274.87	.05	394.16	.015		
Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff	Contr.	Expan.		
197.48	274.87	40.7	36.32	32.18	.3	.5			
Ineffective Flow	num= 2								
Sta L	Sta R	Elev	Permanent						
0	205.72	160.5	F						
268.59	665.2	160.5	F						

CROSS SECTION

RIVER: Whitemarsh Run
 REACH: 1 RS: 16.80

INPUT									
Description: FEMA Effective Cross Section Q									
Station Elevation Data		num= 493							
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	146.87	.54	146.77	1.52	146.66	2.37	146.48	3.31	146.42
5.39	146.51	6.68	146.35	7.98	146.24	8.83	145.97	9.65	145.86
10.56	145.89	12.08	145.8	13.14	145.87	14.36	145.73	15.73	145.68
17.02	145.38	19.35	145.33	22.19	145.13	22.65	145.18	24.21	145.11
24.77	145.01	26.06	144.94	26.63	144.83	27.35	144.75	28.64	144.75
29.06	144.81	31.49	144.83	32.52	144.81	33.7	144.6	35.1	144.3
36.34	143.95	36.46	143.95	37.69	144.36	38.76	144.42	40.27	144.23
41.19	144.17	42.85	143.92	43.62	143.86	44.15	143.93	45.44	143.87
46.04	143.71	46.73	143.6	48.02	143.75	48.47	143.73	49.31	143.78
50.28	143.56	50.9	143.56	51.9	143.8	53.04	143.62	54.48	143.68
55.75	143.23	57.06	143.56	58.36	143.57	58.56	143.54	60.6	143.51
62.23	143.57	63.03	143.5	64.82	143.56	66.11	143.4	67.4	143.45
67.88	143.41	68.69	143.44	69.62	143.23	70.3	143.16	71.27	143.24
72.38	143.68	72.73	143.74	73.86	143.33	76.44	143.2	77.91	143.15
79.03	143.07	81.61	142.93	82.44	143.05	83.43	142.97	84.19	142.87
84.86	142.99	85.48	143.02	86.19	142.89	86.78	142.67	87.29	142.62
88.96	142.6	89.36	142.64	90.65	142.61	92.14	142.71	93.24	142.72
94.57	142.77	97.11	142.42	98.4	142.63	99.42	142.61	100.99	142.52
103.57	142.51	105.53	142.54	107.45	142.59	108.3	142.57	109.12	142.62
110.03	142.63	111.55	142.52	113.82	142.5	115.2	142.42	116.59	142.49

117.78	142.41	119.35	142.26	121.25	142.33	122.11	142.4	122.95	142.43
123.68	142.61	124.24	142.67	124.88	142.83	125.53	142.84	126.11	142.73
126.82	142.52	128.53	142.33	129.41	142.26	130.4	142.32	130.96	142.28
131.99	142.03	133.39	141.24	134.57	140.48	135.93	140.18	138.24	139.49
139.74	139.49	140.66	139.44	141.03	139.38	141.45	139.47	142.33	139.57
143.09	139.41	143.62	139.35	144.91	138.8	145.52	138.73	146.2	138.74
147.49	138.26	147.94	138.19	148.33	138.04	148.78	137.87	150.08	136.6
151.37	136.14	152.8	136.09	153.95	136.15	155.22	136.05	156.54	136
158.03	135.9	160.07	135.99	161.7	136.11	162.5	136.11	162.99	136.16
163.56	136.14	165.58	136.19	180.48	136.32	191.41	136.42	195.29	136.45
196.47	136.48	197.87	136.63	199.17	136.63	200.46	136.67	201.75	136.66
202.86	136.78	203.04	136.8	204.33	136.73	205.62	136.72	208.21	136
209.5	136.91	211.02	136.92	212.08	136.85	213.29	136.95	214.67	136.89
216.05	137.07	217.25	137.29	218.82	137.52	219.83	137.71	221.13	138.15
222.42	138.24	223.16	138.61	223.71	139.04	225.58	139.68	226.29	139.78
227.1	139.96	227.59	139.97	228.01	140.14	228.88	140.34	230.17	140.74
231.46	140.67	234.04	140.7	235.39	140.64	236.63	140.71	238.16	140.53
239.21	140.48	240.14	140.57	240.92	140.82	241.8	141.19	243.09	141.34
244.38	141.39	244.99	141.45	245.67	141.45	248.25	141.6	249.55	141.7
250.84	141.76	251.97	141.94	253.42	141.99	254.71	142.1	256.01	141.97
257.3	142.16	258.59	142.14	259.88	142.25	261.17	142.45	261.97	142.63
262.46	142.67	263.76	142.57	264.4	142.55	265.79	142.67	266.34	142.79
267.63	142.85	268.92	142.84	270.22	142.96	271.87	142.96	272.95	142.85
274.33	142.94	275.7	142.95	276.19	143.01	277.07	143.22	278.44	143.42
279.49	143.43	279.82	143.54	281.19	143.82	282.56	143.86	284.85	144.28
285.52	144.37	286.68	144.38	287.53	144.69	288.05	144.97	289.54	145.52
290.8	145.85	292.17	145.88	293.56	146.47	294.91	146.47	295.57	146.52
296.29	146.66	297.58	146.44	299.03	146.48	300.4	146.65	301.6	146.93
302.16	147.21	303.15	147.59	303.61	147.92	304.52	148.3	305.62	148.65
305.89	148.63	306.48	149.03	307.27	149.51	307.63	149.58	308.64	150.01
310.01	150.69	311.39	150.98	311.65	151.14	312.76	152.52	313.66	153.14
314.13	153.01	315.14	153.66	315.67	153.96	317.68	154.37	318.25	154.81
319.69	155.74	320.99	155.99	321.7	156.36	322.37	156.57	323.71	158.02
323.79	158.08	325.11	158.55	326.48	160.55	327.86	160.78	328.12	161
329.23	162.18	329.74	162.36	330.6	162.5	331.75	163.23	331.97	163.45
333.35	164.52	333.76	164.91	334.72	166	336.09	166.03	337.46	166.42
337.78	166.56	339							

Belair Road.rep									
570.97	182.32	572.17	182.19	573.54	182.32	574.99	182.3	576.29	182.33
577.66	182.28	581.02	182.45	583.15	182.46	584.53	182.56	585.9	182.57
587.05	182.66	588.64	182.62	590.02	182.64	591.07	182.7	592.76	182.74
594.13	182.71	595.09	182.76	597.1	182.79	599.11	182.76	602.37	182.85
603.74	182.91	605.11	183	606.49	182.91	607.86	182.9	609.38	182.97
611.17	182.99	611.98	182.97	614.72	183.03	616.09	183.03	617.47	183.12
618.84	183.17	620.21	183.15	621.58	183.25	623.23	183.29	625.24	183.4
625.7	183.38	628.45	183.42	629.82	183.47	632.56	183.53	637.3	183.58
702.57	183.89	703.94	183.8	705.65	183.73	707.66	183.57	708.06	183.56
709.43	183.66	710.8	183.21	711.9	183.16				

Manning's n Values		num=		4	
Sta	n Val	Sta	n Val	Sta	n Val
0	.05	146.2	.035	223.71	.05
				354.58	.015

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	146.2	223.71		0	0		.1	.3
Ineffective Flow		num=	2					
Sta L	Sta R	Elev	Permanent					
0	83.43	160.5	F					
244.38	711.9	160.5	F					

SUMMARY OF MANNING'S N VALUES

River:Whitemarsh Run

Reach	River Sta.	n1	n2	n3	n4	n5	n6	n7
1	17.59	.013	.08	.035	.08			
1	17.52	.013	.08	.035	.08			
1	17.41	.013	.08	.035	.08			
1	17.39	.013	.08	.035	.08	.03		
1	17.37	.013	.08	.035	.08	.03		
1	17.35	.013	.08	.035	.08	.03		
1	17.33	.013	.08	.035	.08	.03		
1	17.29	.013	.08	.035	.08	.03		
1	17.27	.013	.08	.035	.08	.03		
1	17.25	.013	.08	.035	.08	.03		
1	17.22	.08	.013	.08	.035	.08	.03	.045
1	17.20	.03	.08	.013	.08	.035	.08	.03
1	17.13	.03	.08	.013	.08	.035	.08	.03
1	17.09	.03	.08	.013	.08	.035	.08	.03
1	16.98	Culvert						
1	16.86	.05	.035	.05	.015			
1	16.80	.05	.035	.05	.015			

SUMMARY OF REACH LENGTHS

River: Whitemarsh Run

Reach	River Sta.	Left	Channel	Right
1	17.59	324.06	285.46	241.07
1	17.52	503.81	443.88	439.17
1	17.41	78.82	87.09	85.54
1	17.39	37.31	60.85	73.16
1	17.37	49.75	65.61	71.57
1	17.35	56.25	69.36	74.19
1	17.33	165.95	146.59	127.68
1	17.29	78.52	69.25	65.48
1	17.27	77.71	84.1	87.23
1	17.25	107.02	107.92	97.7
1	17.22	84.87	72.33	64.28
1	17.20	36.99	38.09	41.26

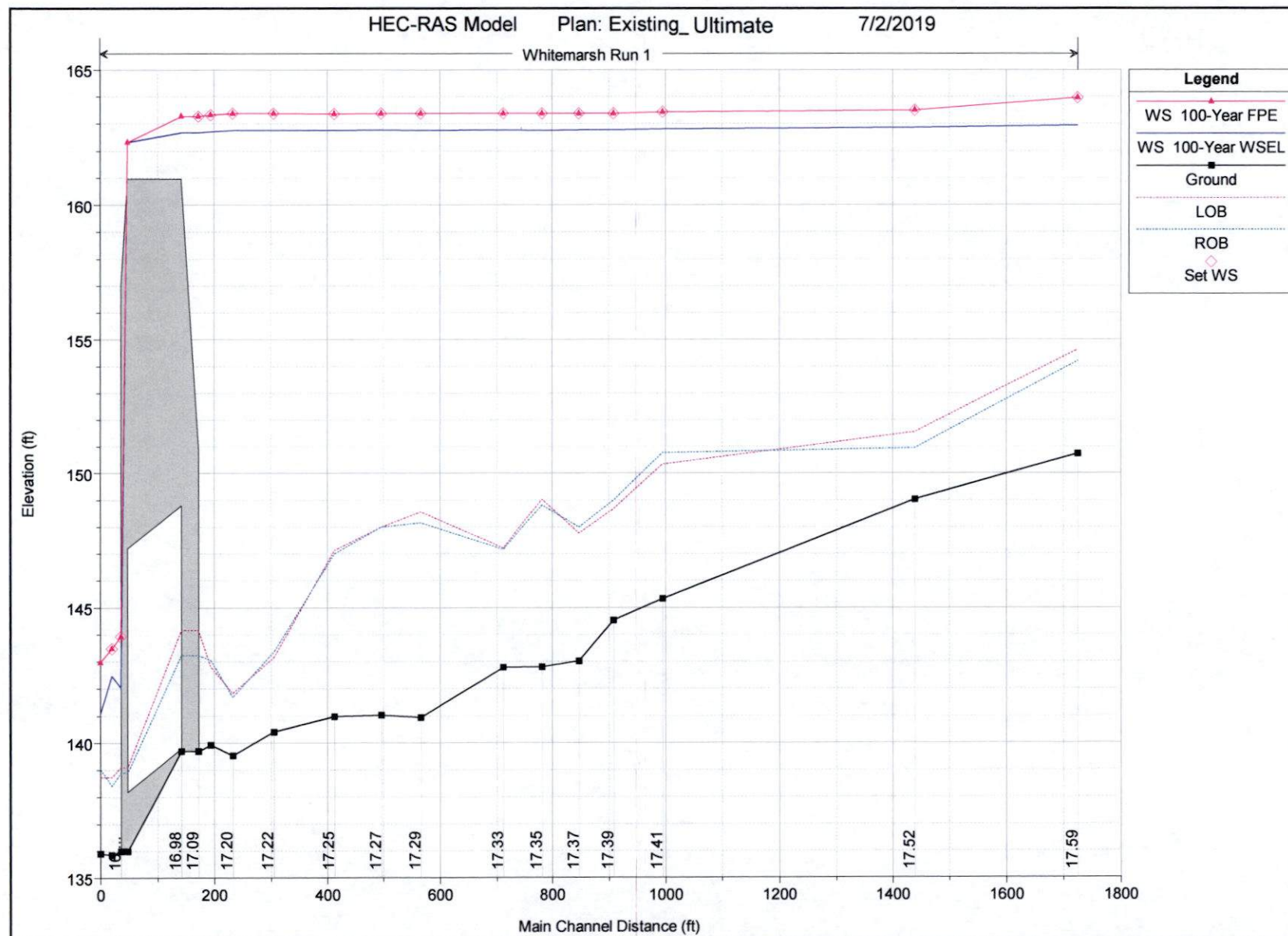
			Belair Road.rep	
1	17.13	21.67	21.88	21.95
1	17.09	139.9	136.02	133.64
1	16.98	Culvert		
1	16.86	40.7	36.32	32.18
1	16.80	0	0	0

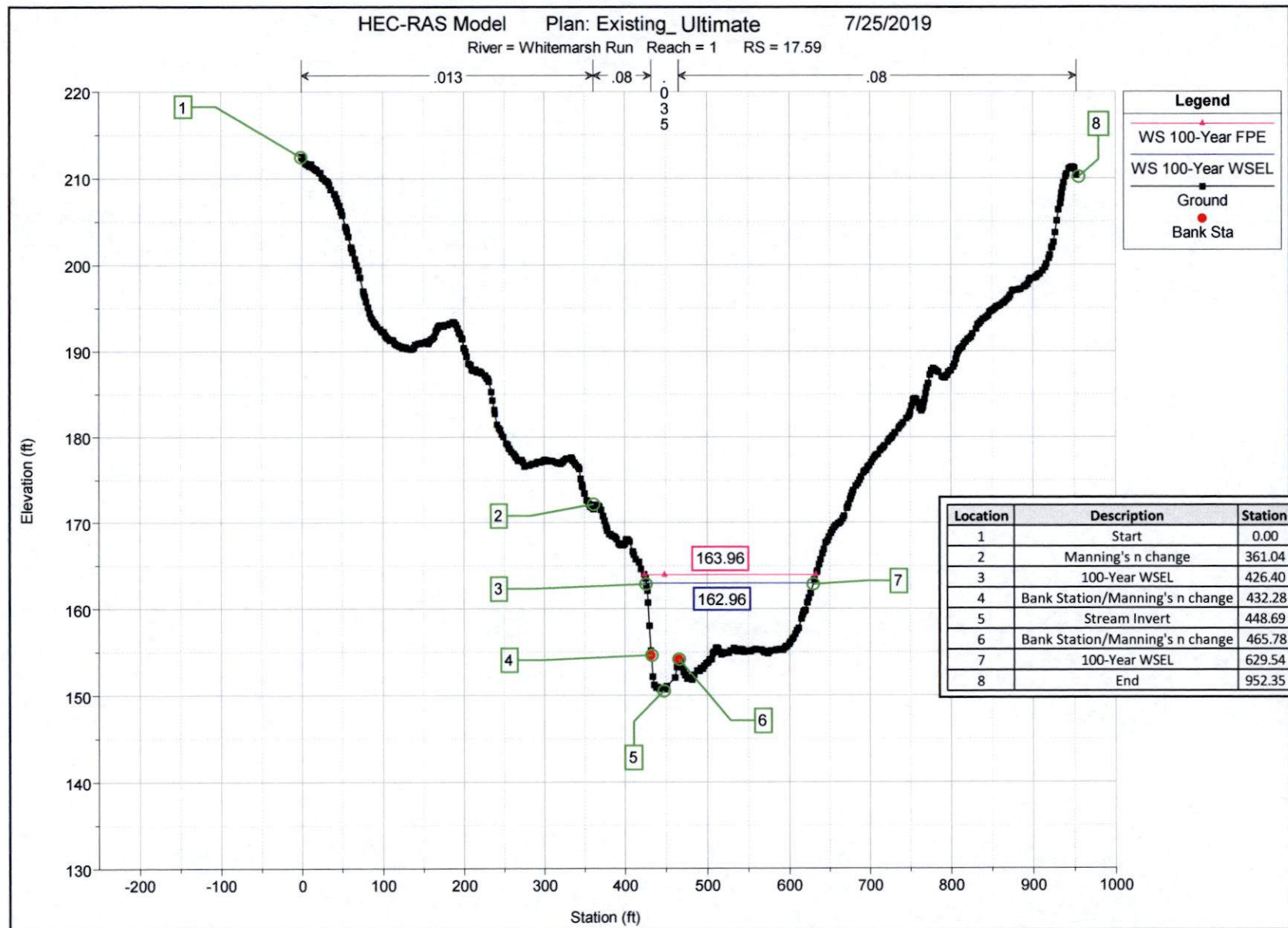
SUMMARY OF CONTRACTION AND EXPANSION COEFFICIENTS
River: Whitemarsh Run

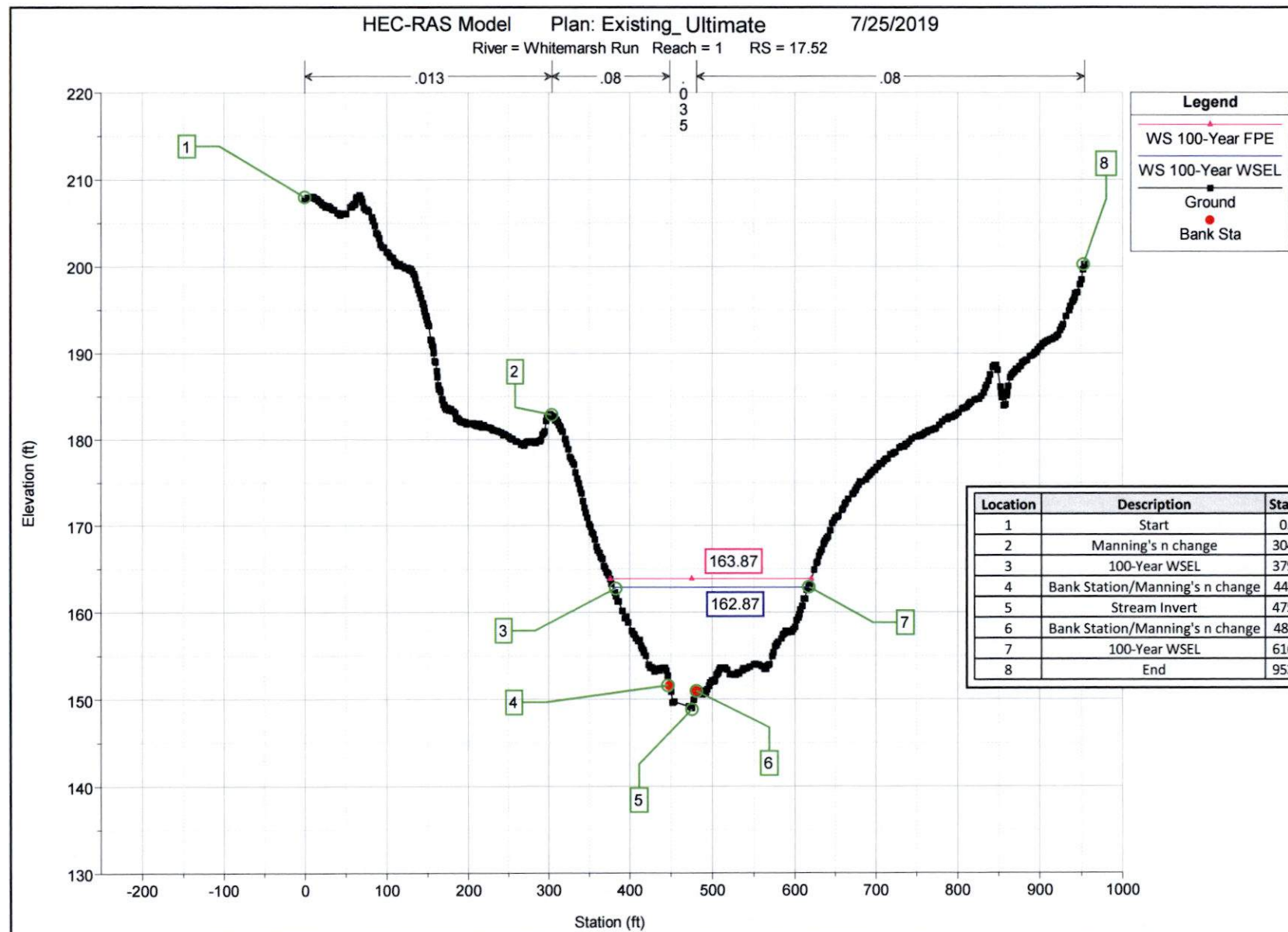
Reach	River Sta.	Contr.	Expan.
1	17.59	.1	.3
1	17.52	.1	.3
1	17.41	.1	.3
1	17.39	.1	.3
1	17.37	.1	.3
1	17.35	.1	.3
1	17.33	.1	.3
1	17.29	.1	.3
1	17.27	.1	.3
1	17.25	.1	.3
1	17.22	.1	.3
1	17.20	.1	.3
1	17.13	.3	.5
1	17.09	.3	.5
1	16.98	Culvert	
1	16.86	.3	.5
1	16.80	.1	.3

HEC-RAS Print Existing ULT River: Wetmarsh Run Reach: 1 Profile: 100-Year WSEL

Reach	River Sta	Profile	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
1	17.59	100-Year WSEL	3940.00	150.73	162.88	157.50	163.15	0.000543	4.81	1656.36	203.14	0.25
1	17.52	100-Year WSEL	3940.00	149.09	162.87	156.12	163.03	0.000333	4.37	1972.29	237.53	0.21
1	17.41	100-Year WSEL	3940.00	145.33	162.82	152.16	162.92	0.000726	2.94	1956.41	265.08	0.13
1	17.39	100-Year WSEL	3940.00	144.53	162.77	151.66	162.91	0.001688	3.64	2321.02	285.12	0.15
1	17.37	100-Year WSEL	3940.00	143.02	162.77	151.69	162.89	0.001680	3.53	2556.34	325.99	0.15
1	17.35	100-Year WSEL	3940.00	142.80	162.77	151.14	162.88	0.000148	3.40	2543.73	342.79	0.14
1	17.33	100-Year WSEL	3940.00	142.79	162.77	151.29	162.88	0.000131	3.27	2505.80	355.44	0.13
1	17.29	100-Year WSEL	3940.00	140.94	162.76	149.43	162.85	0.000039	2.73	2402.00	506.24	0.11
1	17.27	100-Year WSEL	3940.00	141.02	162.77	148.71	162.84	0.000067	2.42	2837.75	382.37	0.10
1	17.25	100-Year WSEL	3940.00	140.97	162.76	149.51	162.83	0.000063	2.71	2562.80	421.56	0.11
1	17.22	100-Year WSEL	3940.00	140.41	162.77	147.07	162.81	0.000047	2.23	3076.73	338.58	0.08
1	17.20	100-Year WSEL	3940.00	139.53	162.76	145.83	162.81	0.000048	2.31	3685.74	595.93	0.09
1	17.13	100-Year WSEL	3940.00	139.82	162.71	145.51	162.80	0.000072	2.76	2406.69	412.09	0.10
1	17.09	100-Year WSEL	3940.00	138.70	162.67	145.93	162.79	0.000093	3.07	1857.03	359.88	0.12
1	16.99	Cutbank										
1	16.86	100-Year WSEL	3940.00	136.00	141.32	141.32	143.80	0.010483	12.63	311.92	89.99	1.00
1	16.80	100-Year WSEL	3940.00	135.90	141.05	141.05	142.97	0.009794	11.21	373.09	107.80	0.94

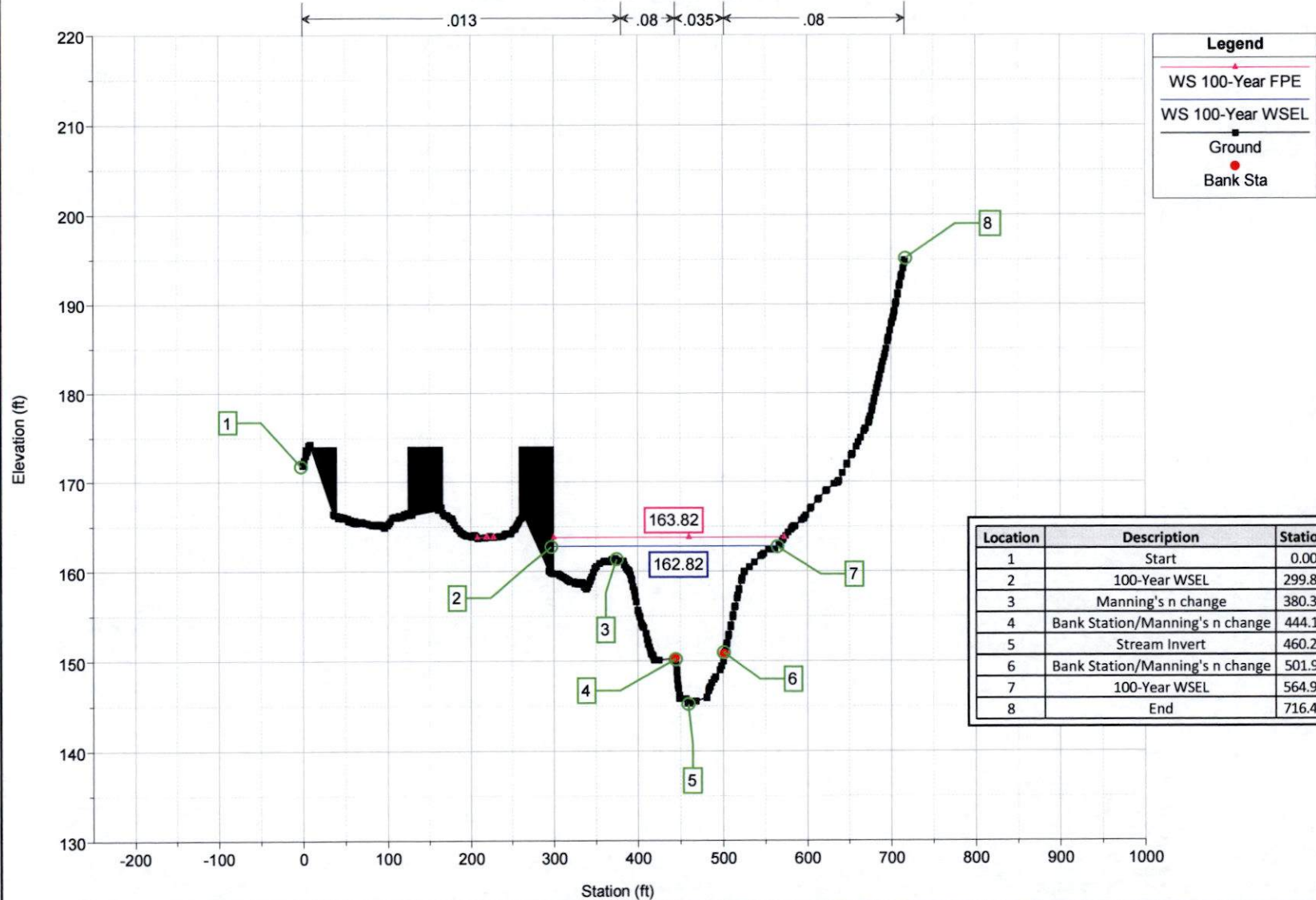






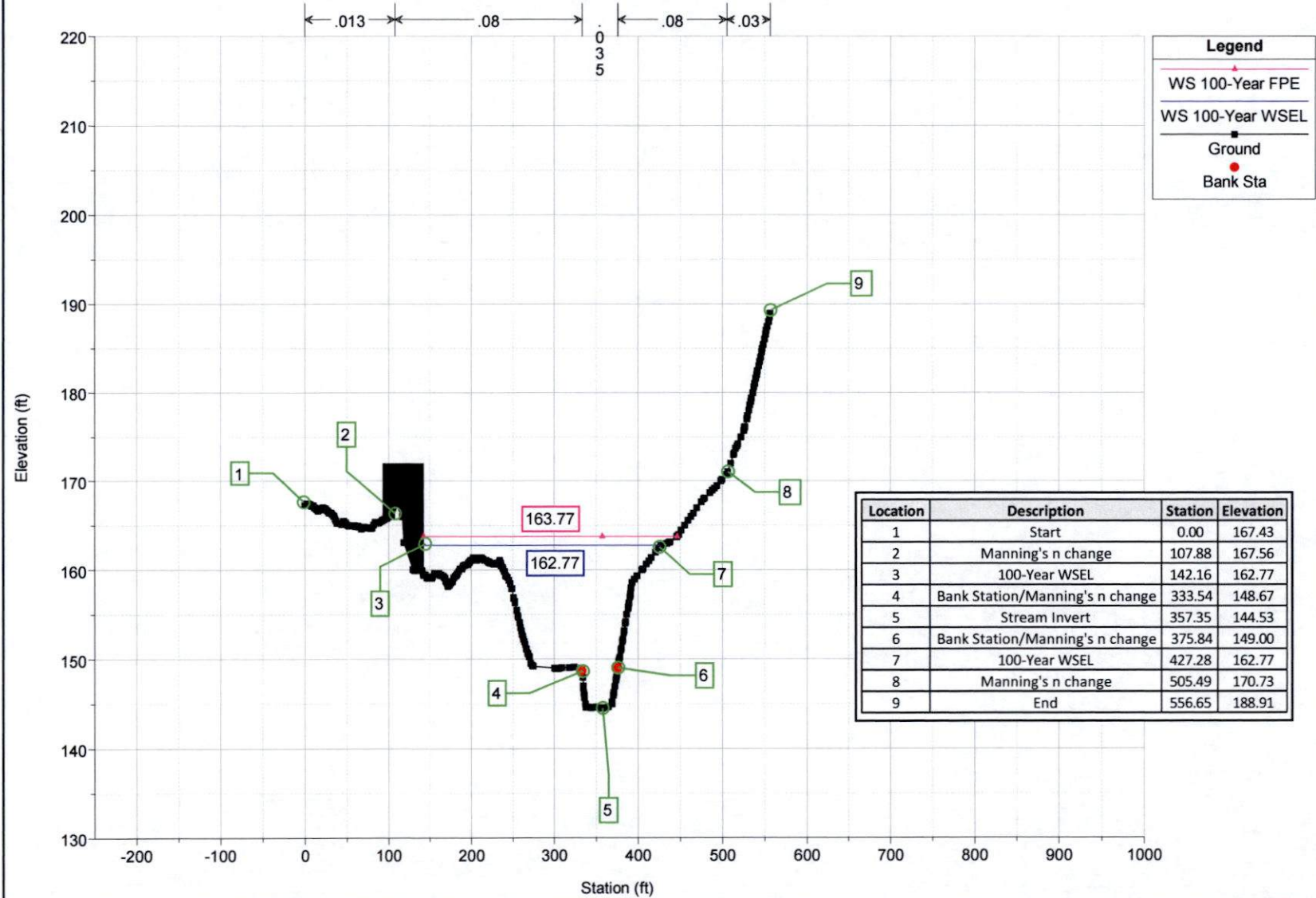
HEC-RAS Model Plan: Existing_Ultimate 7/25/2019

River = Whitmarsh Run Reach = 1 RS = 17.41



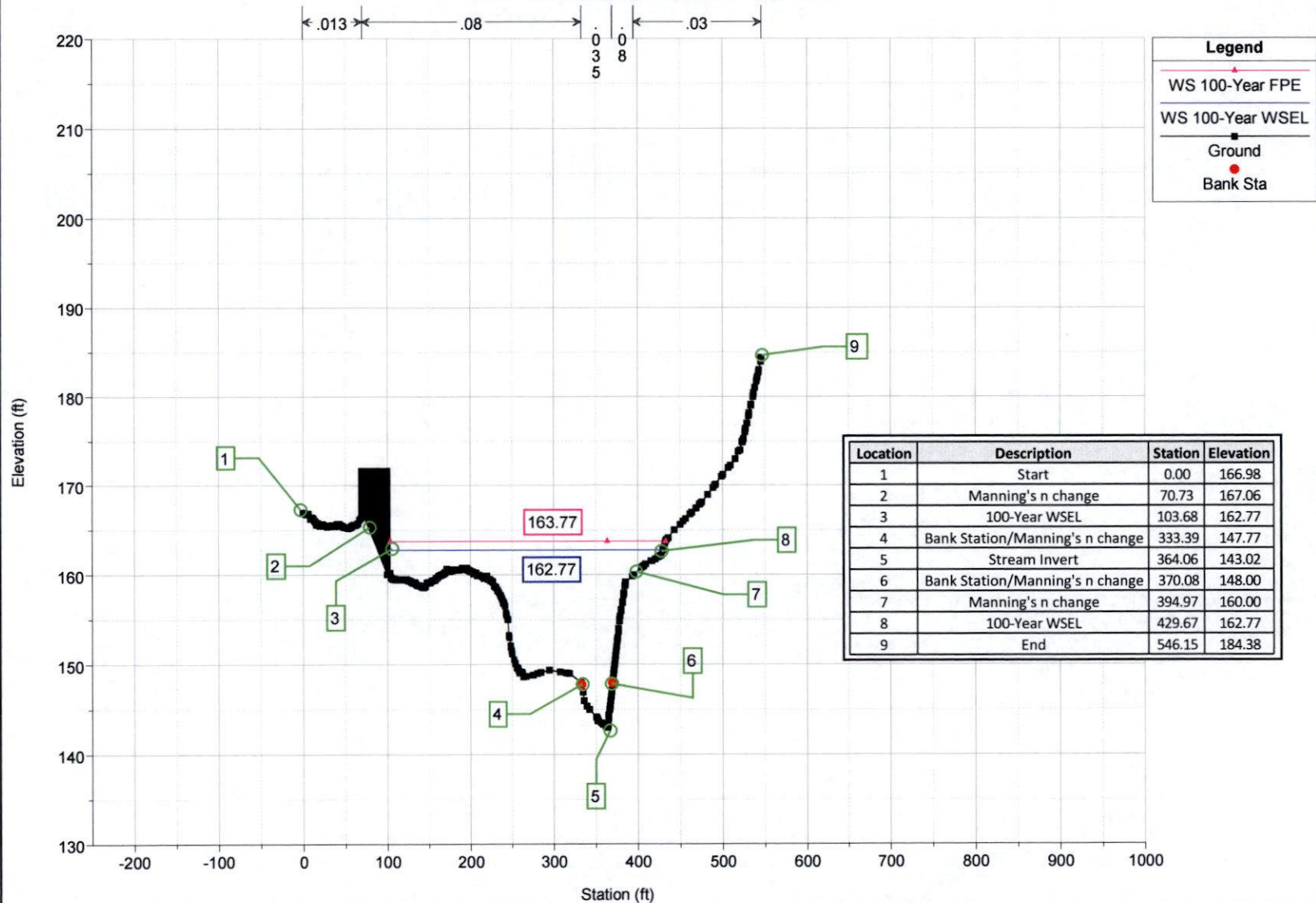
HEC-RAS Model Plan: Existing_Ultimate 7/25/2019

River = Whitemarsh Run Reach = 1 RS = 17.39



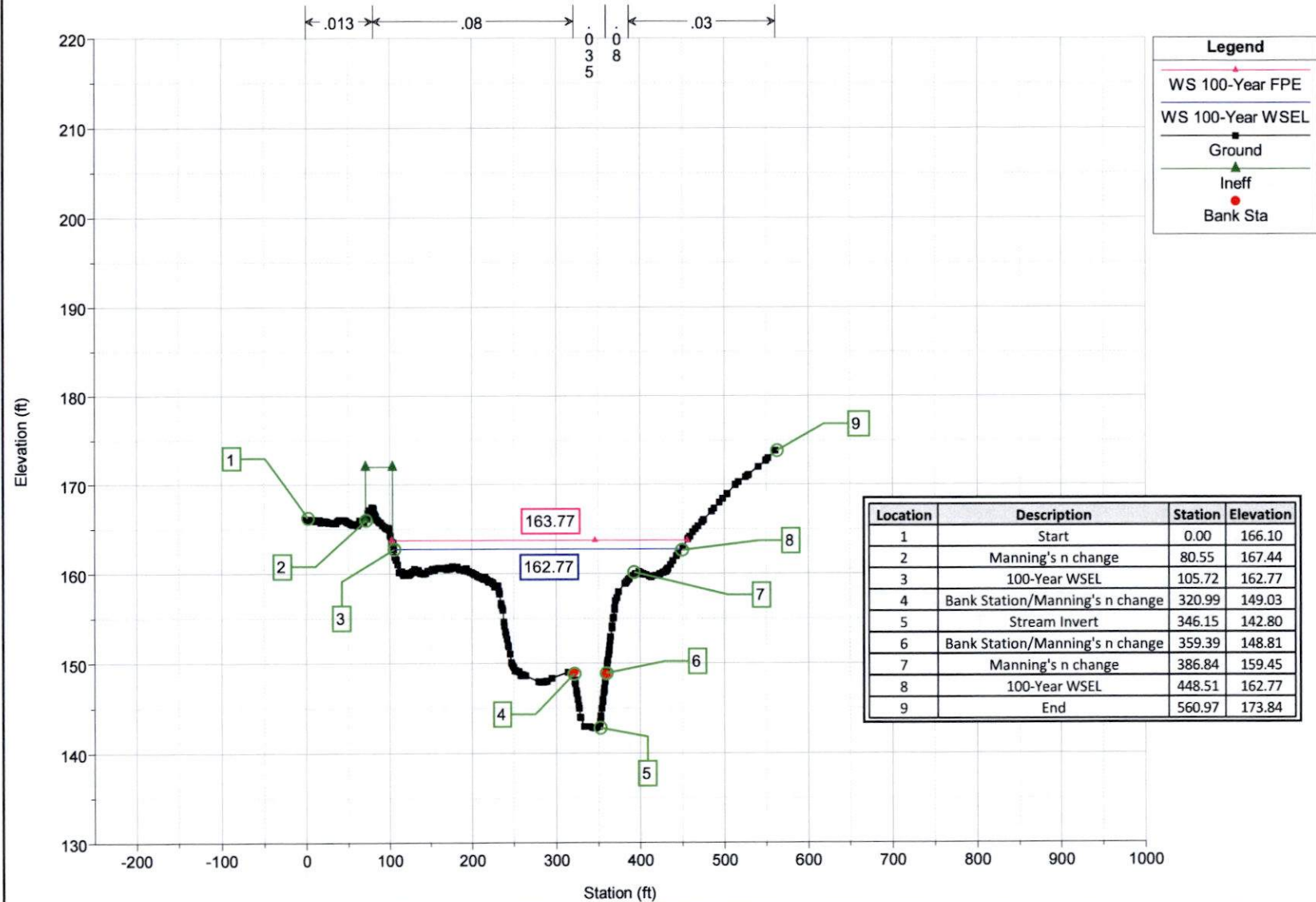
HEC-RAS Model Plan: Existing_Ultimate 7/25/2019

River = Whitemarsh Run Reach = 1 RS = 17.37



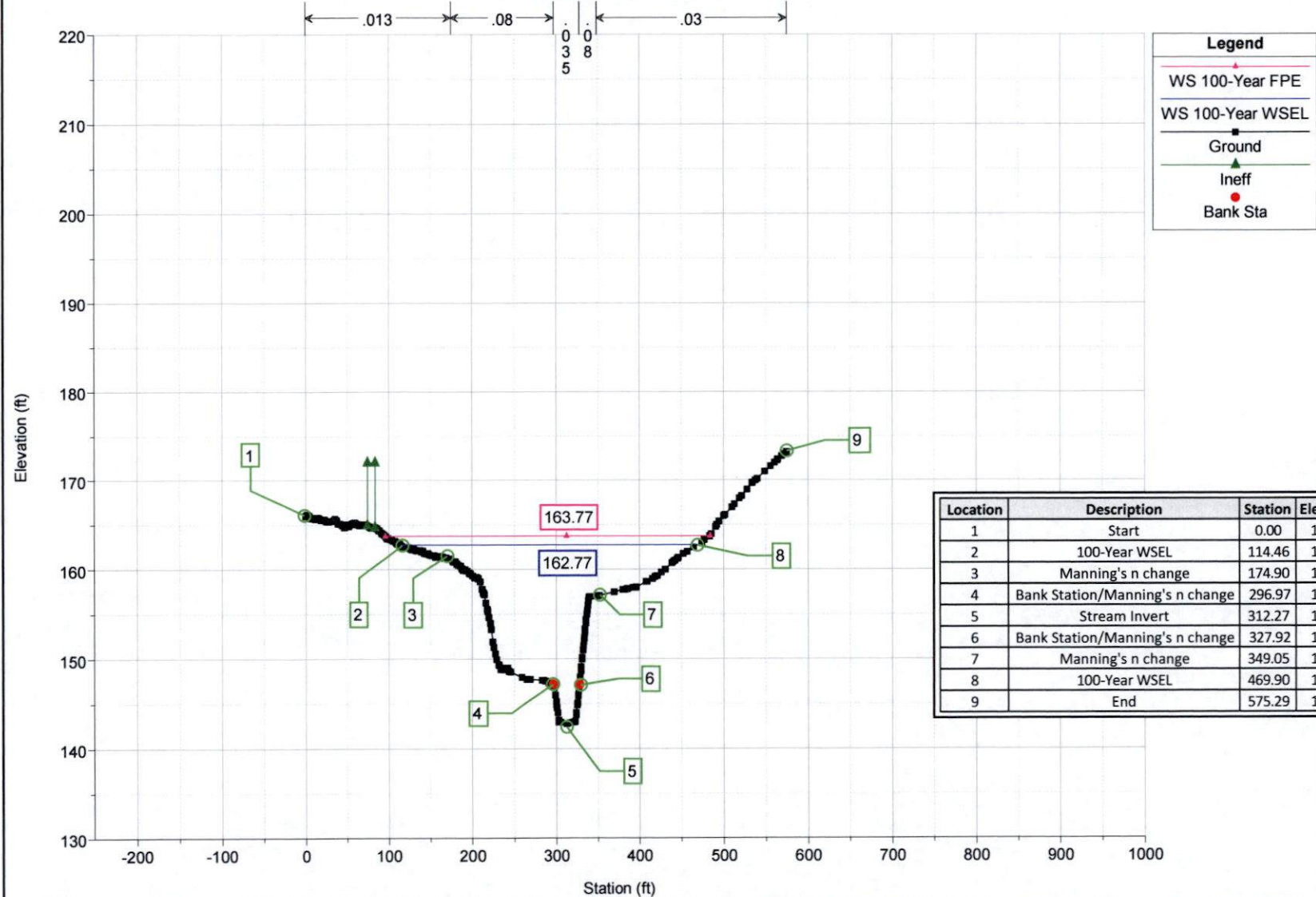
HEC-RAS Model Plan: Existing_Ultimate 7/25/2019

River = Whitmarsh Run Reach = 1 RS = 17.35



HEC-RAS Model Plan: Existing_Ultimate 7/25/2019

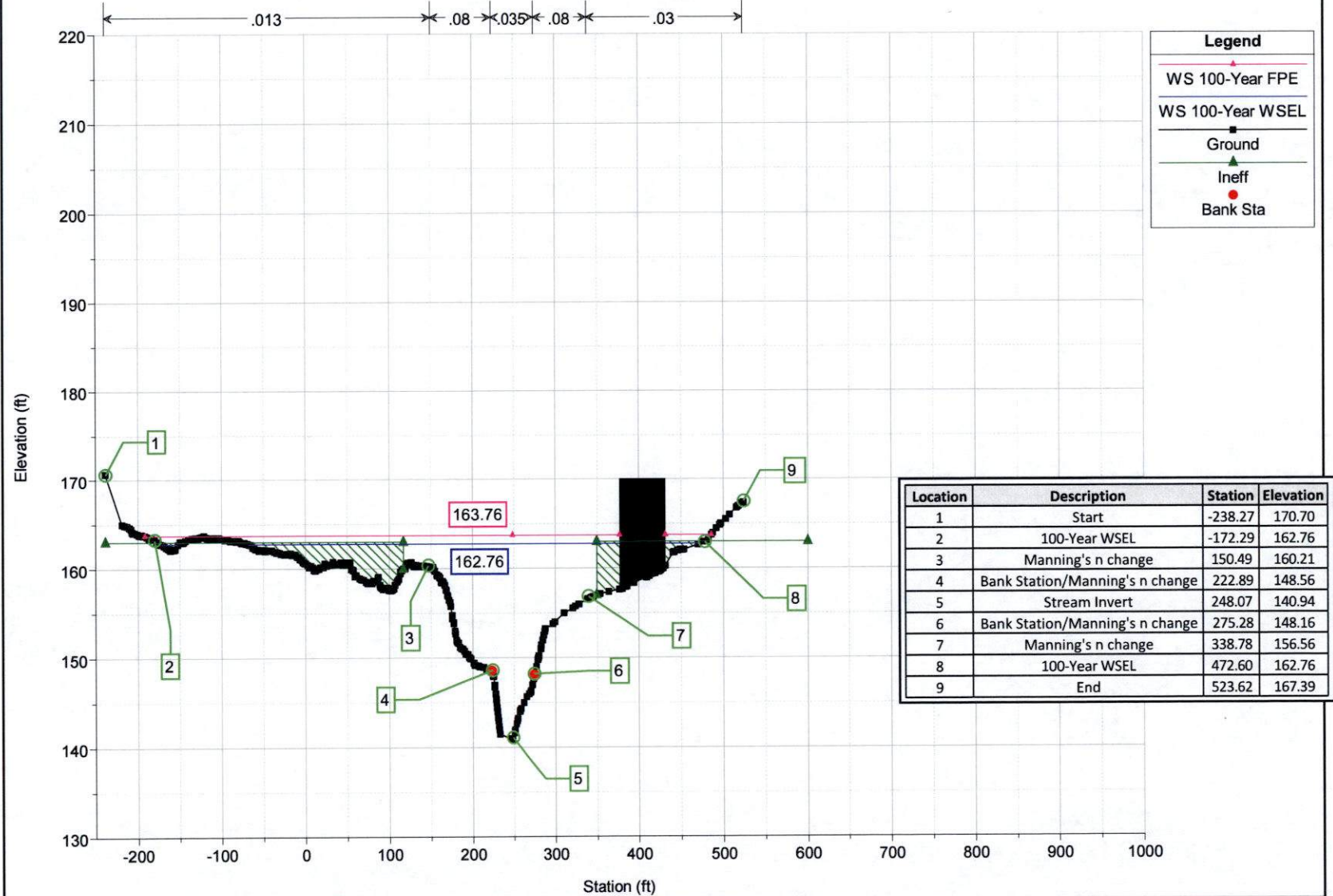
River = Whitmarsh Run Reach = 1 RS = 17.33



HEC-RAS Model Plan: Existing_Ultimate

7/25/2019

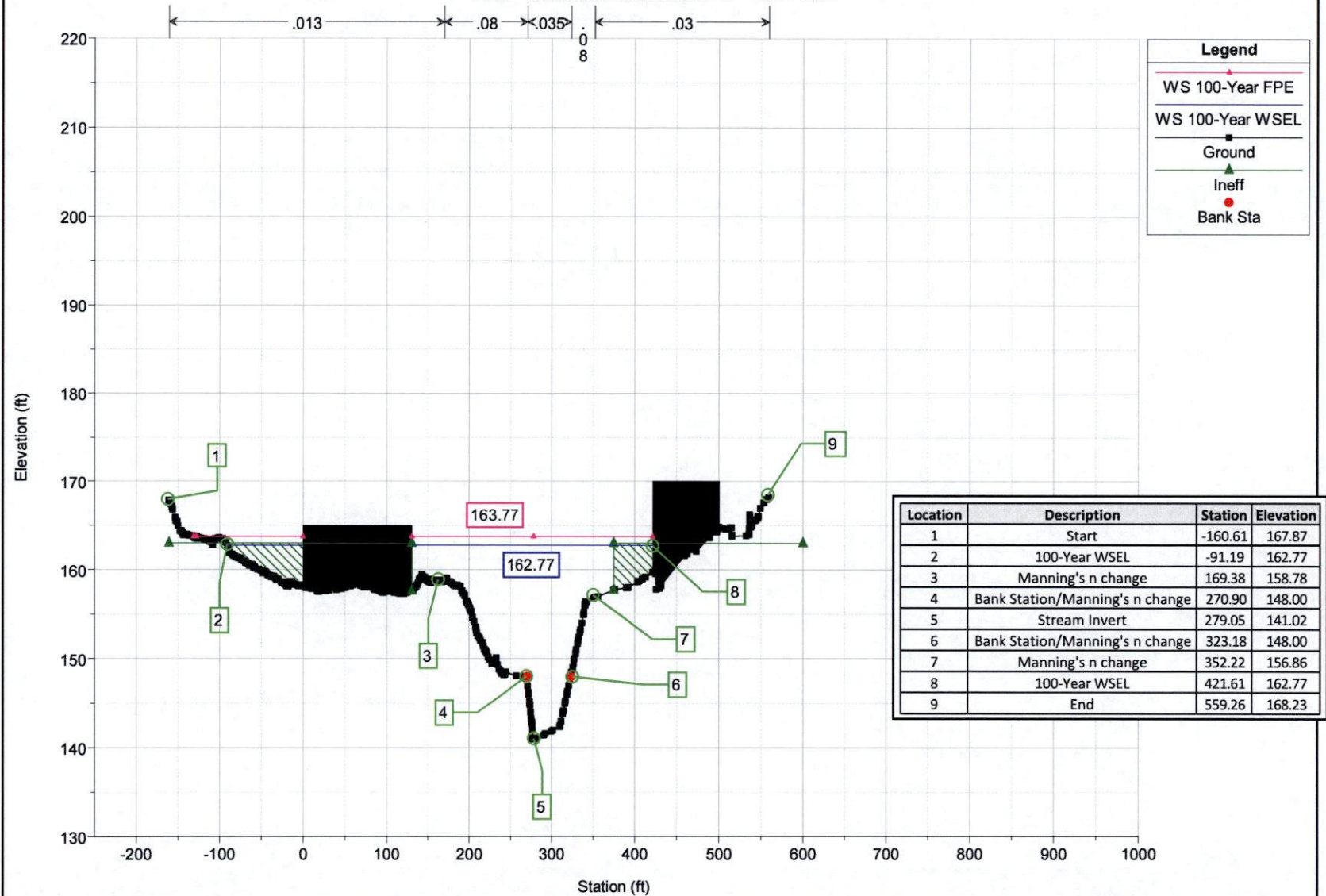
River = Whitmarsh Run Reach = 1 RS = 17.29



HEC-RAS Model Plan: Existing_Ultimate

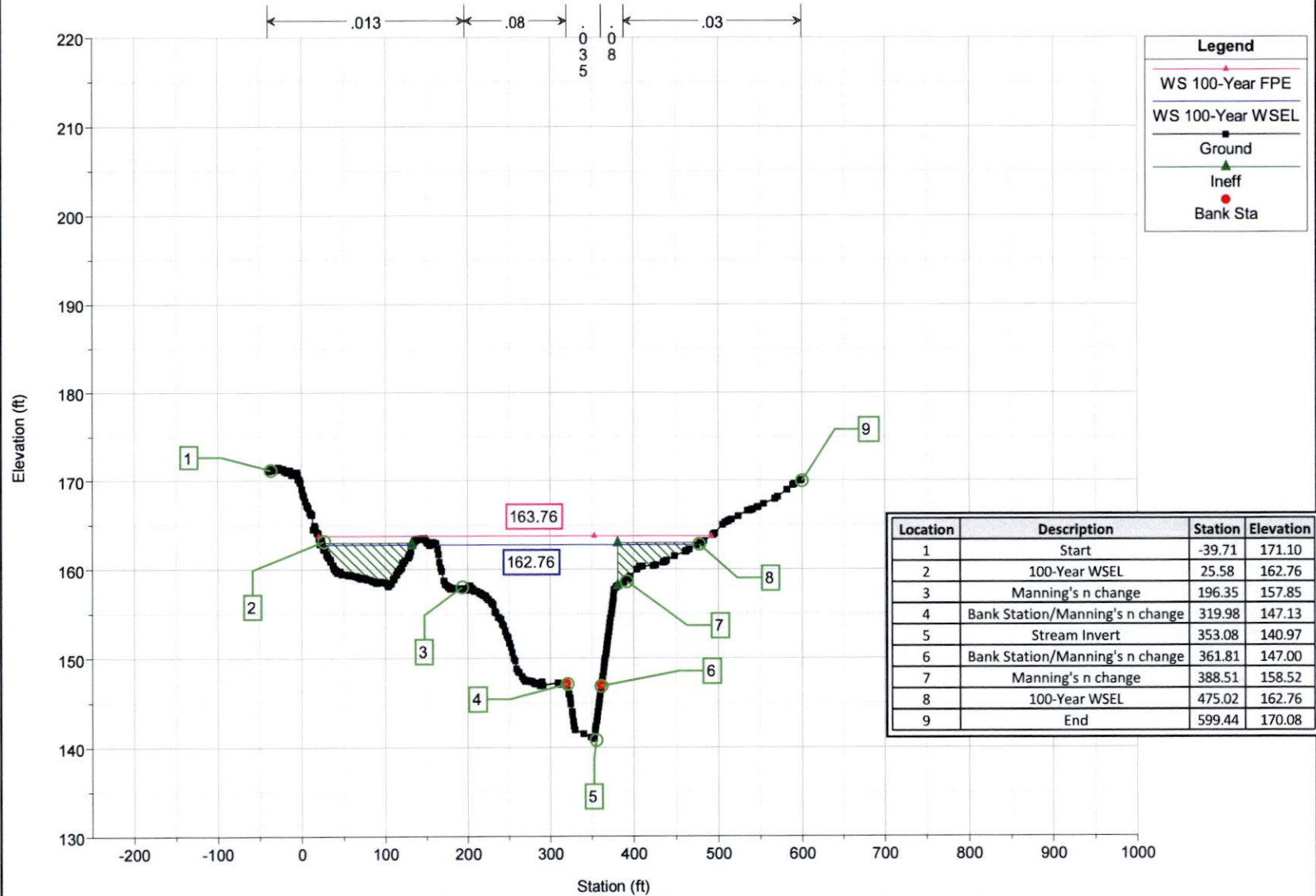
7/25/2019

River = Whitemarsh Run Reach = 1 RS = 17.27



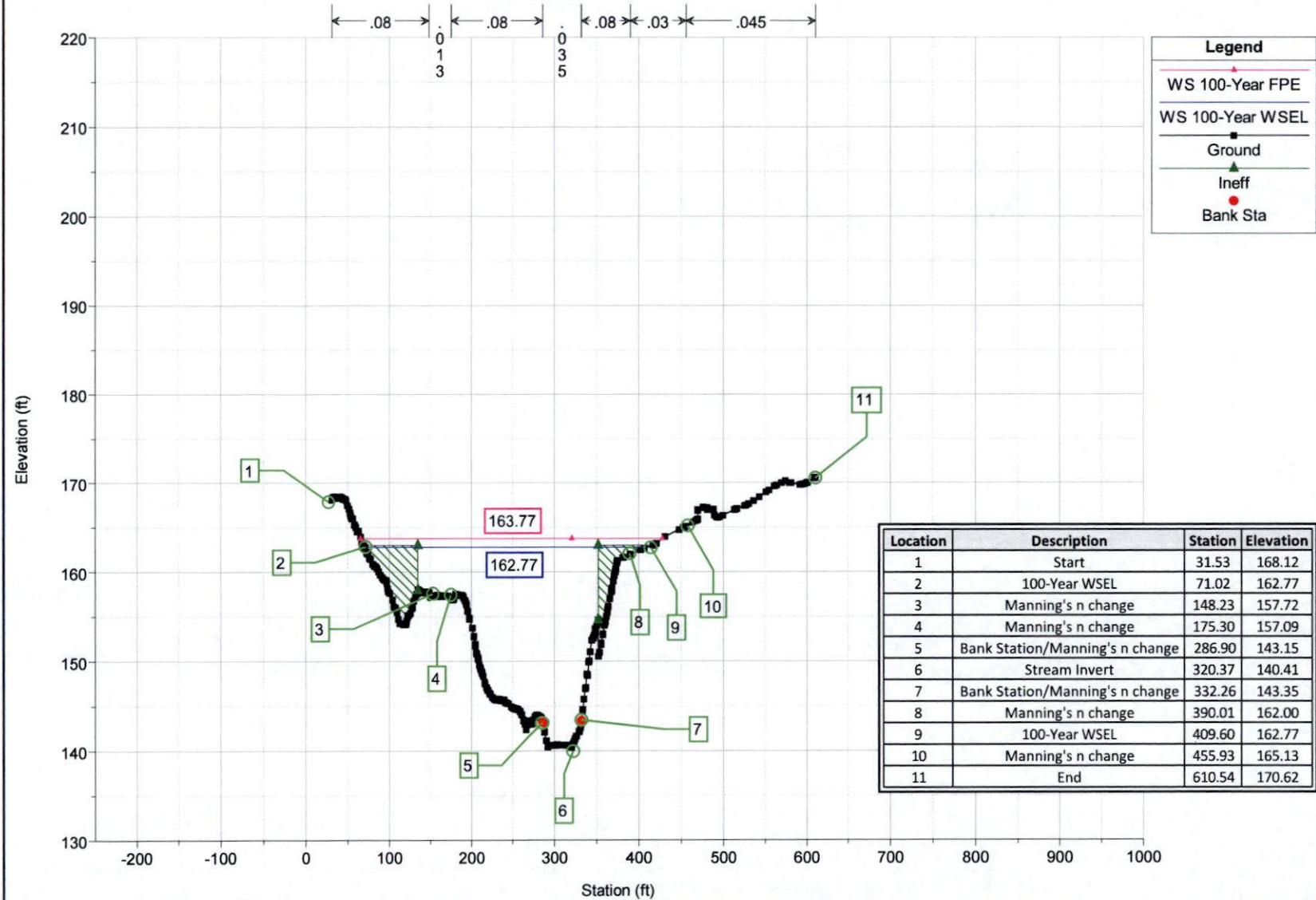
HEC-RAS Model Plan: Existing_Ultimate 7/25/2019

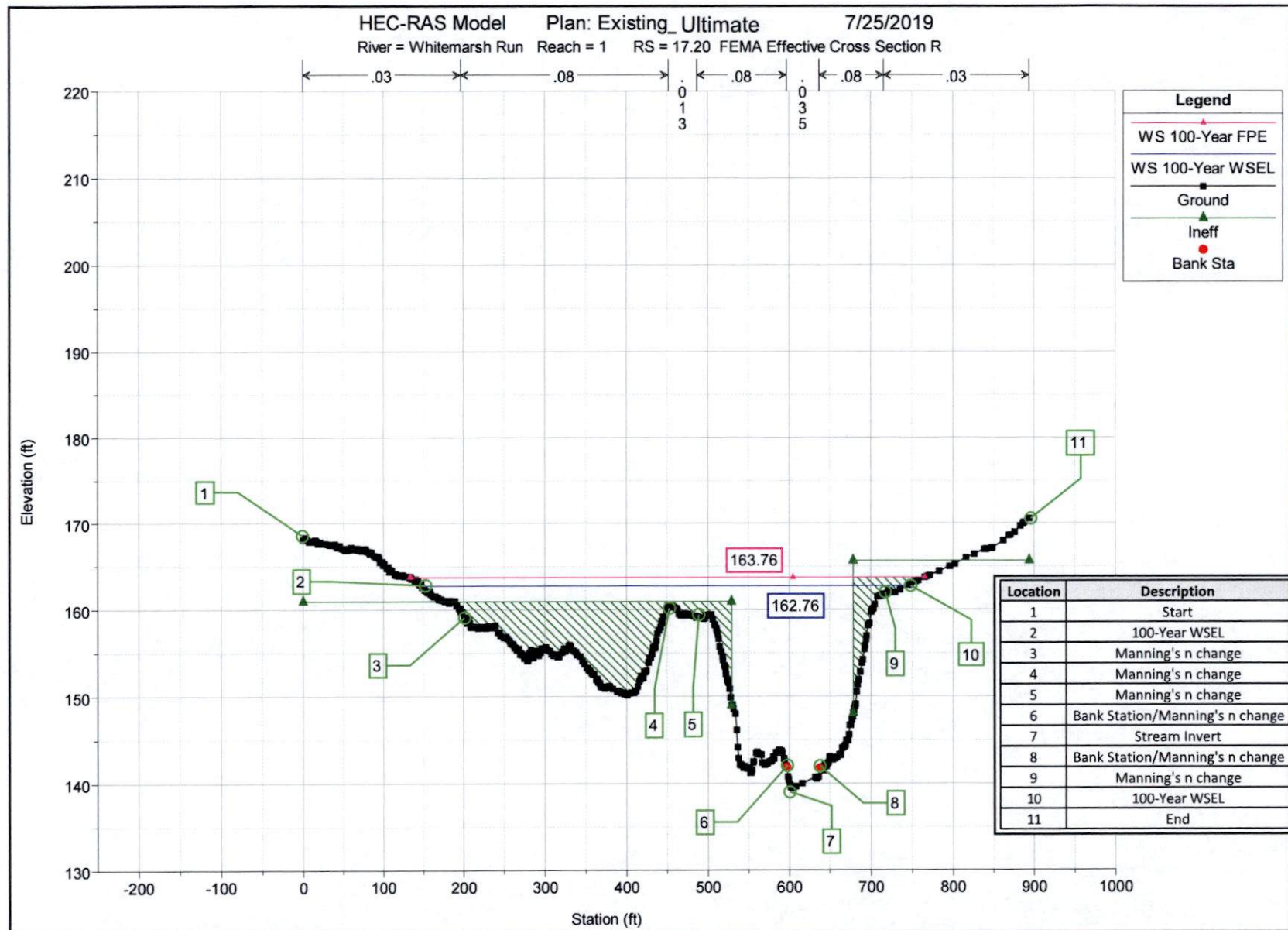
River = Whitmarsh Run Reach = 1 RS = 17.25



HEC-RAS Model Plan: Existing_Ultimate 7/25/2019

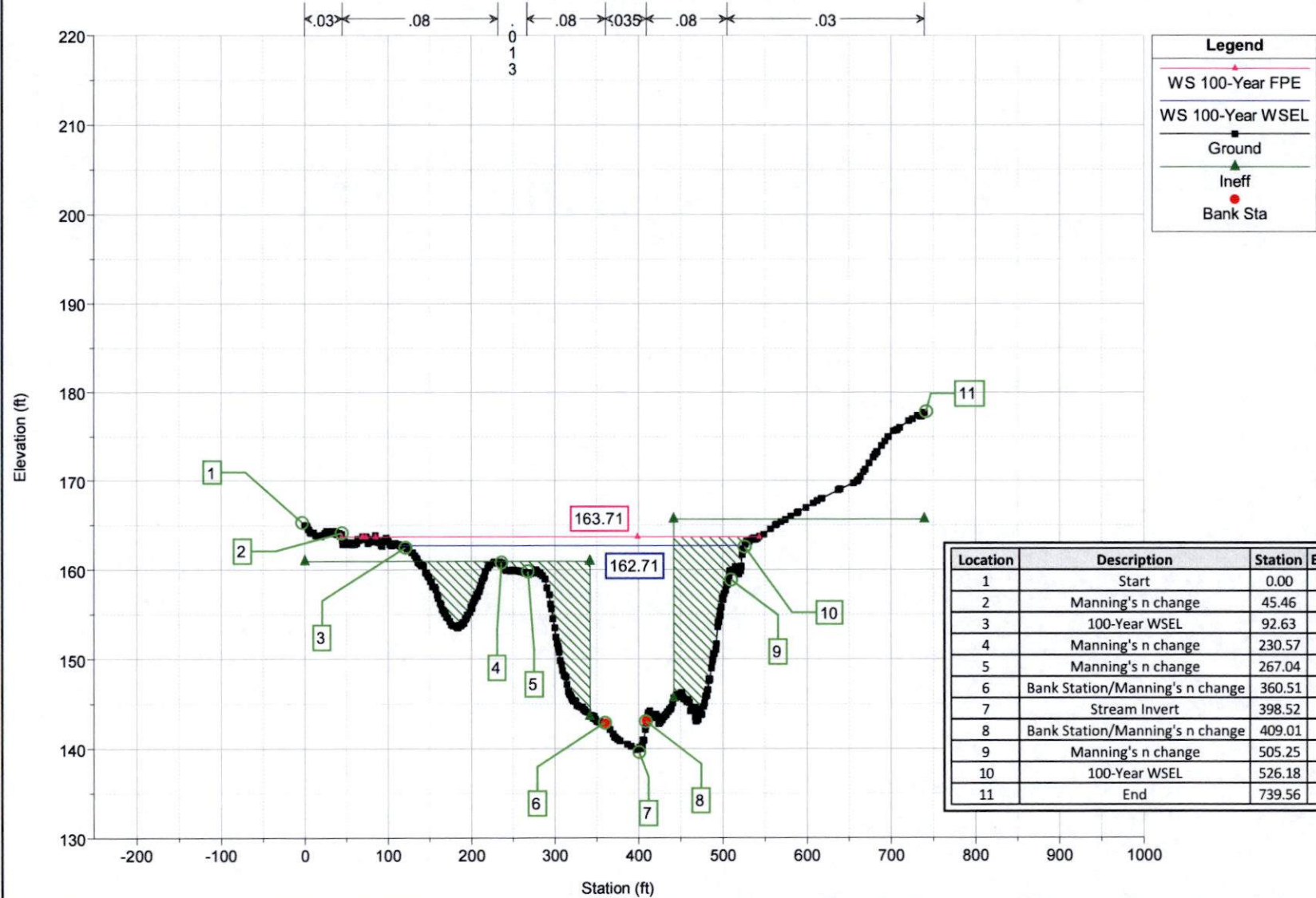
River = Whitmarsh Run Reach = 1 RS = 17.22





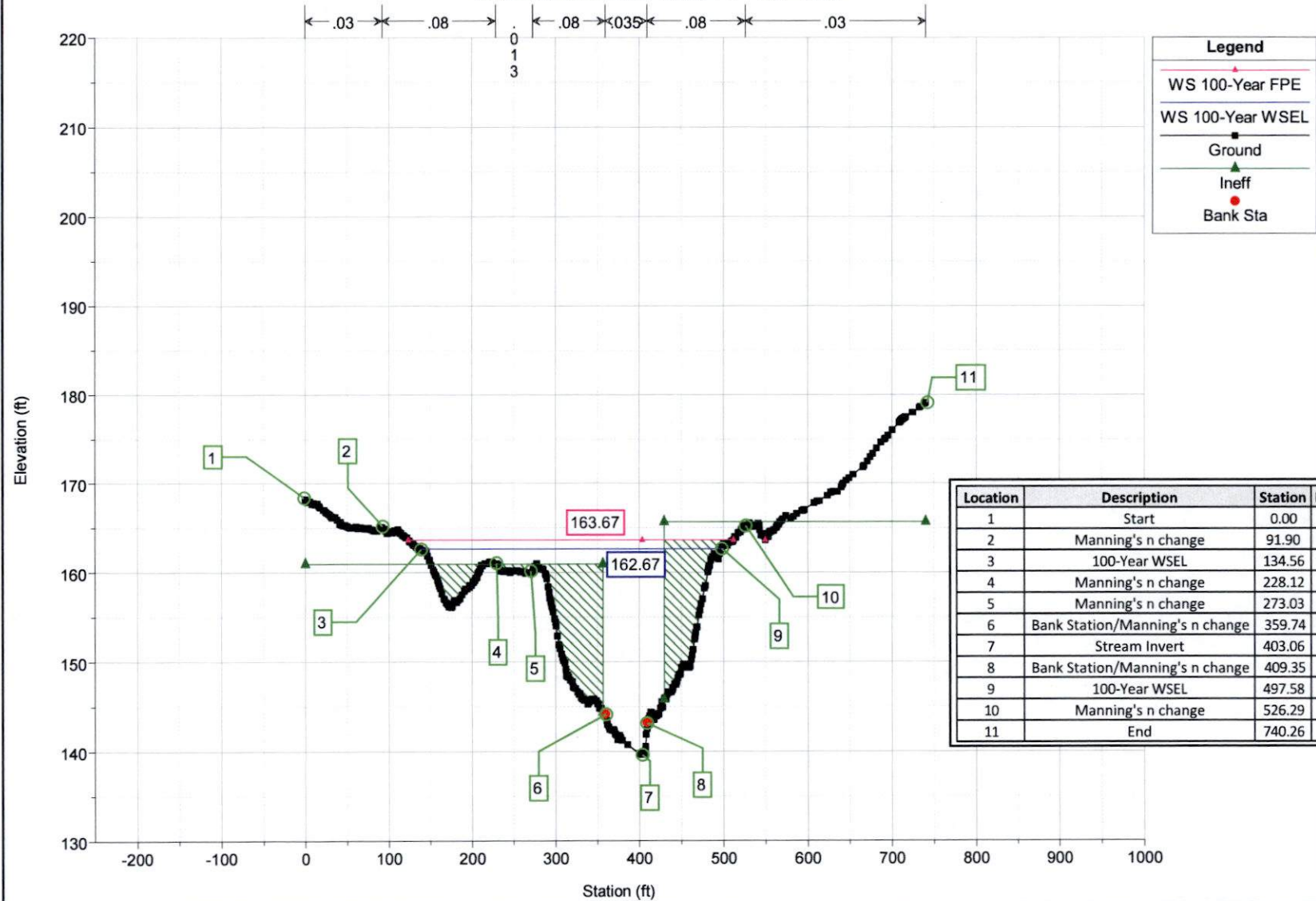
HEC-RAS Model Plan: Existing_Ultimate 7/25/2019

River = Whitmarsh Run Reach = 1 RS = 17.13



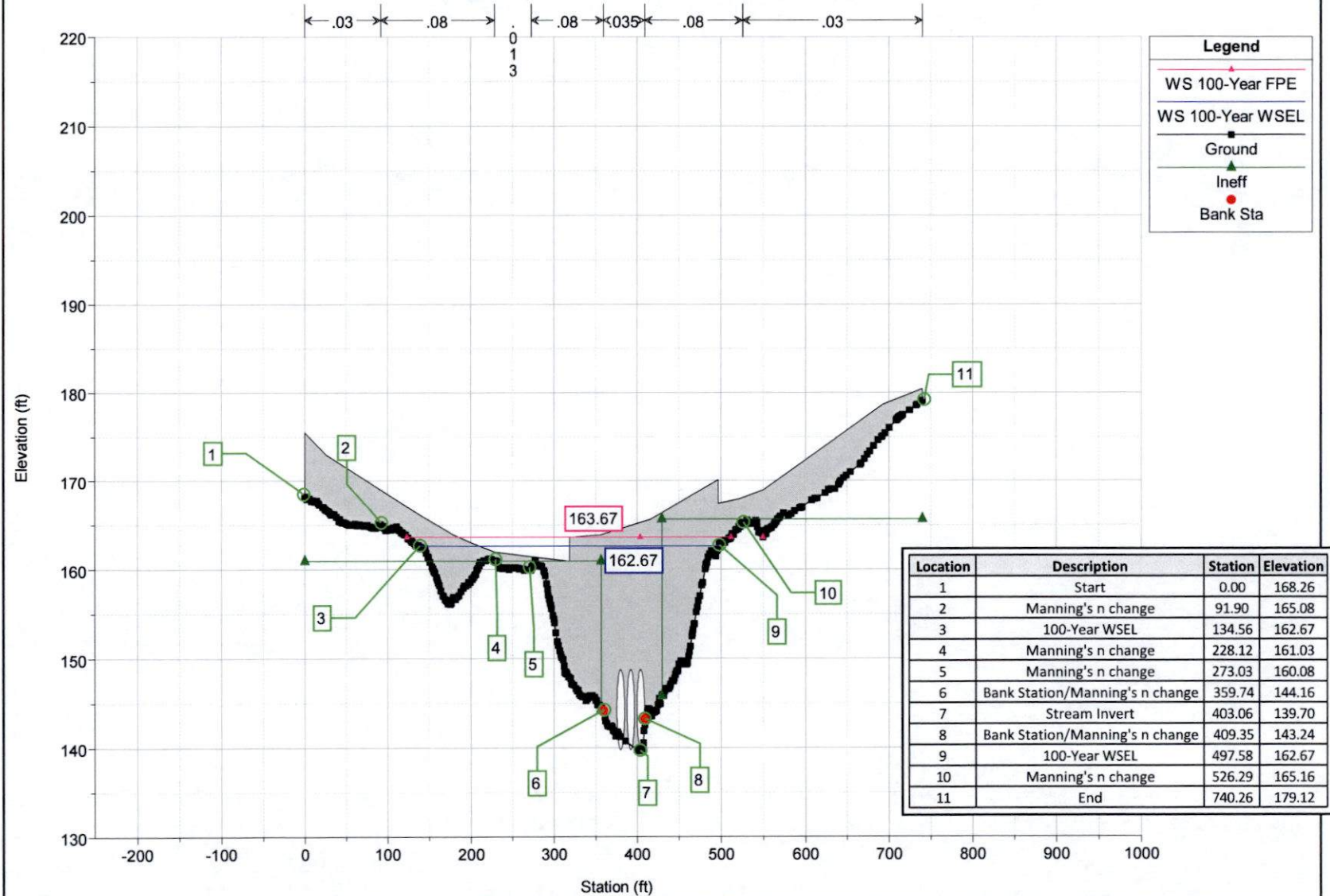
HEC-RAS Model Plan: Existing_Ultimate 7/25/2019

River = Whitmarsh Run Reach = 1 RS = 17.09



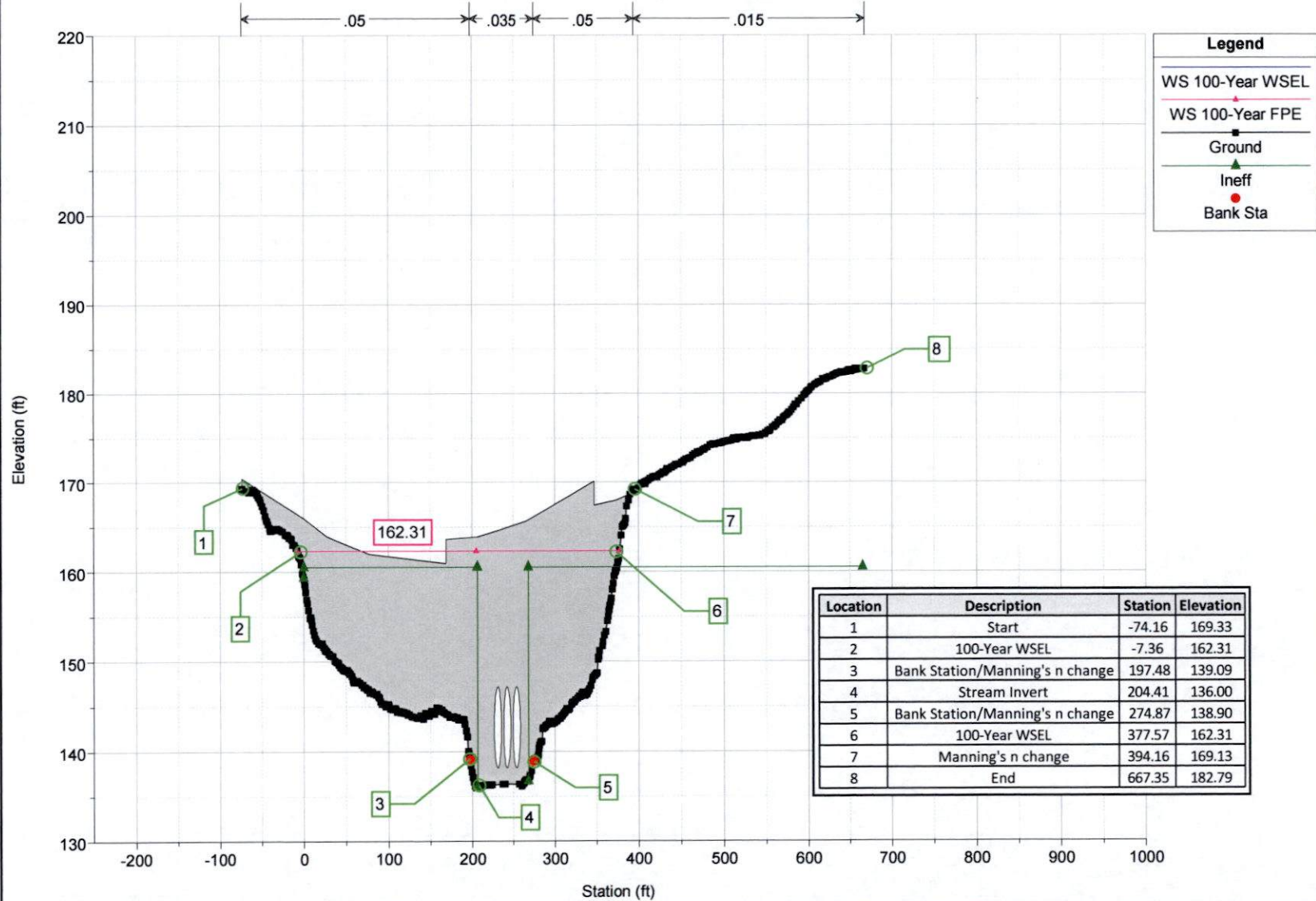
HEC-RAS Model Plan: Existing_Ultimate 7/25/2019

River = Whitemarsh Run Reach = 1 RS = 16.98 Culv



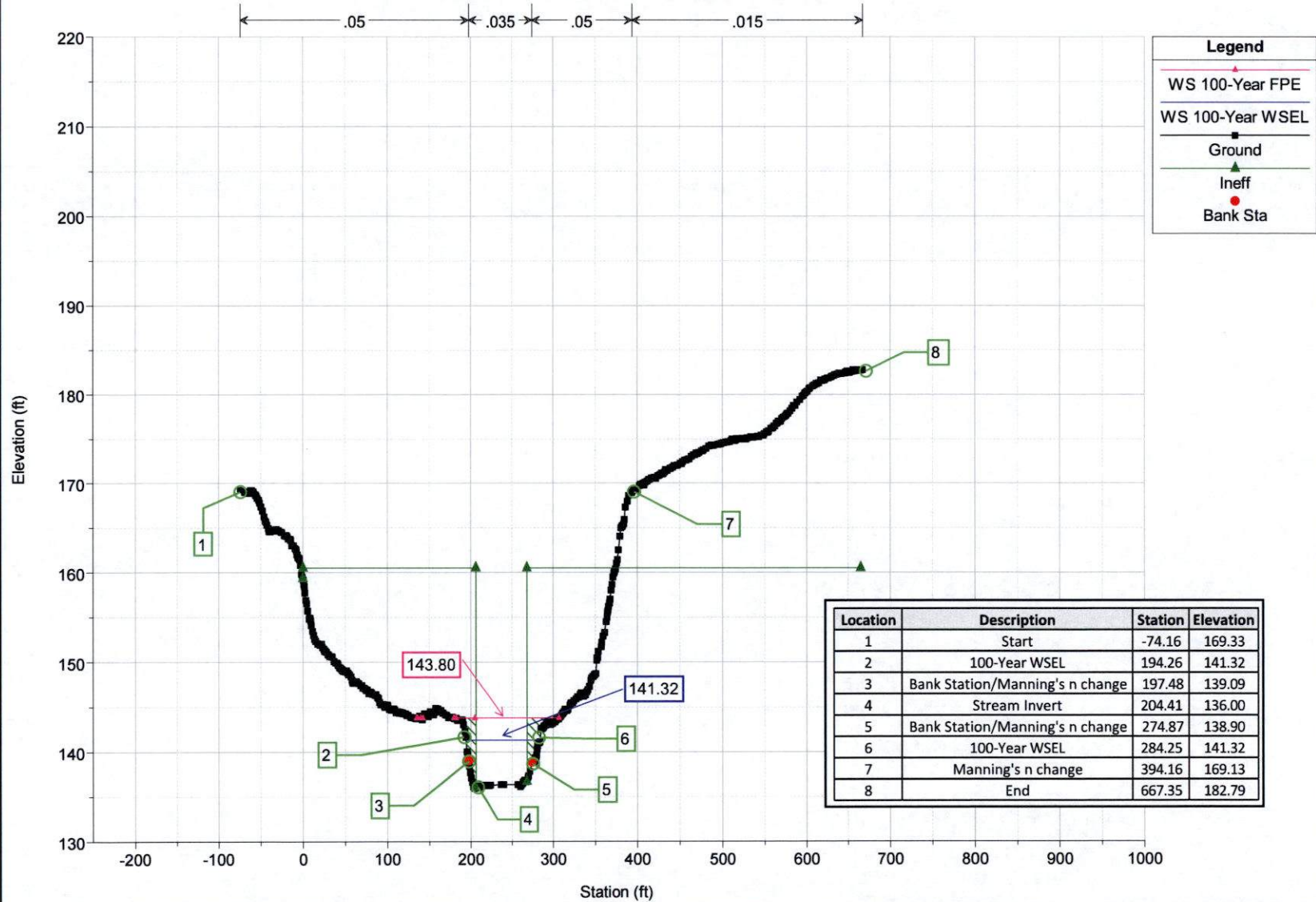
HEC-RAS Model Plan: Existing_Ultimate 10/11/2019

River = Whitmarsh Run Reach = 1 RS = 16.98 Culv



HEC-RAS Model Plan: Existing_Ultimate 10/14/2019

River = Whitmarsh Run Reach = 1 RS = 16.86



Kimley»Horn

October 28, 2019

Mr. Terry W. Curtis
Baltimore County Department of Public Works
111 West Chesapeake Avenue
Towson, Maryland 21204

RE: *Comment Response for Beyond Self Storage Flood Plain Study – 8228 Belair Road*

Dear Mr. Curtis:

This letter addresses the comments received September 30, 2019 for the project described above. Our responses to the comments are as follows:

Comment 1: Provide a minimum of three grid ticks based on the Maryland Coordinate System on all plans.

Response: The plan sheets have been updated to include a minimum of three grid ticks.

Comment 2: The Department of Public Works Baltimore County Design Manual page 7-48, states that the flood plain studies must be based on ultimate conditions. It appears that the engineer used ultimate conditions but labeled the report "fully developed". If this is the case the engineer should add a sentence to the introduction explaining ultimate conditions was used or change all "fully developed" references to "ultimate".

Response: The report was updated to change all "fully developed" references to "ultimate".

Comment 3: We prefer to have the HEC-RAS files georeferenced.

Response: The reach and cross sections in the HEC-RAS models provided are georeferenced based on the NAD83 horizontal datum. The effective model received from FEMA was prepared using HEC-2 which does not support georeferencing.

Comment 4: Provide full detailed HEC-RAS input and output data within the report.

Response: Detailed HEC-RAS report input and output data has been added to the HEC-RAS output attachments (C.1, C.2, D.1 and D.2).

Comment 5: Extend the ground lines for cross section 16.98 because the water surface elevation calculated is greater than the highest elevation defining the ground line, and this will give erroneous results.

Response: Cross section 16.98 has been extended to contain the water surface elevation.

Comment 6: The engineer must explain all warnings, errors and notes in the report generated by HEC-RAS. They may be acceptable, but they must be explained as to why they are acceptable. A brief explanation of a common warning or error could be used.

Response: *Check-RAS output is included in Appendix C (Attachment C.7). All warnings, errors and notes have been explained. Cross section 16.83 was removed to address one of the errors. Results upstream of Belair Road are unchanged as a result.*

Comment 7: Please provide certified (sealed, signed and dated) surveyed data or certified as-built drawings for all the existing bridges and culverts that were modeled in the submitted hydraulic analysis. The plans should include the dimensions of the structures and all elevations necessary for verification of the hydraulic modeling. Please ensure the plans include approach and exit channel details and limits, the low chord and high chord bridge elevations or culvert invert elevations, as appropriate, and please ensure that the vertical datum is referenced on each plan.

Response: *Certified as-built drawings were requested for Belair Road from Maryland State Highway Administration (SHA), however, SHA was unable to provide the certified as-builts. Therefore, certified field run topography and surveyed data is being completed at this time to address this comment and will be provided as soon as available. It is not anticipated that the certified field run topography and surveyed data will differ from the current existing model or alter the results of this study.*

Comment 8: Evaluate the condition and geometry of the existing bridges and culverts for comparison with the HEC-RAS input data. Photographs of the structures, upstream and downstream may be helpful. Please give a professional opinion of the hydraulic and structural condition of these existing structures. See our suitable outfall policy found in Appendix A of the *Baltimore County Bureau of Development Plans Review Policy Manual* dated February 27, 2002, states for a minimum of 1000 feet downstream.

Response: *Additional photographs of the structure, upstream and downstream, have been provided along with photographs of the channel 1000 feet downstream of the structure. The photographs are included in Appendix C (Attachment C.6). The runoff from the subject property outfalls into Whitemarsh Run. The subject property is located upstream of the Belair Road culvert crossing. The existing Belair Road structure appears to be operating as designed from a hydraulic perspective. There are no other drainage structures downstream of Belair Road within 1,000 feet. Conditions in Whitemarsh Run, which is considered the outfall for the subject property, are controlled by peak flows from the contributing watershed which is approximately 1,500 acres. The peak flows from the watershed and the subject property do not occur at the same time. Whitemarsh Run was considered a suitable outfall and negative impacts to downstream conditions are not anticipated as a result of the proposed development based on this analysis.*

Comment 9: The proposed development is being built in an existing riverine flood plain. According to the Baltimore County Building Code, Baltimore County Council Bill 40-12 effective

July 1, 2012, Part 125, no new buildings shall be constructed in any riverine flood plain. A waiver to the proper flood plain ordinances will be required.

Response: The proposed grading, which extends into existing riverine floodplain as defined by the County, will remove the site and building from the floodplain. A waiver to the zoning code will be requested.

Comment 10: Baltimore County, MD, County Code Section 32-4-414 and 32-8-304, including all of Title 8, also prohibits new buildings within a flood plain. A waiver to proper flood plain ordinances will be required.

Response: See the response to Comment 9 above.

Comment 11: If a Conditional Letter of Map Amendment or Revision (CLOMA or CLOMR) to the Federal Emergency Management Administration (FEMA) at the developer's expense. Upon completion of the development the engineer must submit a Letter of Map Amendment or Revision (LOMA or LOMR) to FEMA at the developer's expense. Failure to do so could result in forfeit of public works and/or utility agreement funds. A waiver to Baltimore County Code Section 32-4-414 and 32-8 will not be supported by the Department of Public Works until we have a copy of the CLOMR approval.

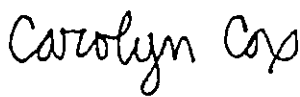
Response: There is no grading or fill proposed within the FEMA effective 100-year floodplain and there are no increases in 100-year water surface elevations as a result of the proposed improvements. A CLOMR/LOMR is not proposed or required with this project. Dave Guignet at MDE was contacted by phone regarding this comment. During the phone call, Mr. Guignet agreed that the project would not require a CLOMR or a LOMR by definition, as the proposed development does not encroach on the effective mapped 100-year floodplain. Mr. Guignet agreed to provide confirmation via email for reference, we emailed Mr. Guignet and will forward his confirmation once received, for reference. Our email to Mr. Guignet has been included in the resubmission for reference.

Comment 12: If a Joint Permit Application with the Army Corps of Engineers and the Maryland Department of the Environment. A copy of the application and a response letter from the Maryland Department of the Environment must be submitted to this office before approval of study. All other governmental permits and waivers must be filed and are the responsibility of the engineer. This must be done before our office can accept the report for filing and copies of documents must be added to the report.

Response: The Joint Permit Application approval has been added to Appendix E – Digital Files. The Authorization Number is 201960883/19-NT-0154.

If you have any additional questions, please do not hesitate to contact me at (972) 770-1399 or Carolyn.Cox@kimley-horn.com and Robert.Haase@Kimley-Horn.com.

Sincerely,



Carolyn F. Cox, P.E., CFM



Robert L. Haase III, P.E.

Attachments (*Attachment updated from original submittal):

- Report*
- Appendix A
 - Floodplain Checklists
- Appendix B
 - MD Rte. 43 Drainage Area Map
 - NRCS Soil Type Map
- Appendix C
 - Pre-Project HEC-RAS Output_County*
 - Post-Project HEC-RAS Output_County*
 - Base Map*
 - Fully Developed Floodplain Workmap*
 - Floodplain Profile*
 - Structure and Channel Photos*
 - Check-RAS*
- Appendix D
 - Pre-Project HEC-RAS Output_FEMA*
 - Post-Project HEC-RAS Output_FEMA*
 - FEMA Floodplain Workmap*
 - Effective FEMA FIRM Panel
 - Annotated FEMA FIRM Panel
 - FEMA FIS Floodway Data Whitemarsh Run
 - FEMA FIS Profile Whitemarsh Run
- Appendix E
 - HEC-RAS v.5.0.3 Model*
 - HEC-2 Effective Hydraulic Input/Output
 - Belair Road Record Drawings*
 - Maryland Rte. 43 Whitemarsh Run Hydrologic Report
 - Joint Permit Application Approval*

**STATE OF MARYLAND
DEPARTMENT OF THE ENVIRONMENT
WATER AND SCIENCE ADMINISTRATION
AUTHORIZATION TO PROCEED**

AUTHORIZATION NUMBER: **201960883/19-NT-0154**

EFFECTIVE DATE: July 17, 2019

EXPIRATION DATE: July 17, 2024



AUTHORIZED PERSON: Northpoint Development, LLC
4825 NW 41st Street, Suite 500
Riverside, Missouri 64150
Attn: Johnny Sweeny

IN ACCORDANCE WITH ENVIRONMENT ARTICLE §5-503(a) AND §5-906(b), ANNOTATED CODE OF MARYLAND (2007 REPLACEMENT VOLUME), COMAR 26.17.04 AND 26.23.01, AND 26.08.02 AND THE ATTACHED CONDITIONS OF AUTHORIZATIONS, Northpoint Development, LLC ("AUTHORIZED PERSON"), IS HEREBY AUTHORIZED BY THE WATER AND SCIENCE ADMINISTRATION ("ADMINISTRATION") TO CONDUCT A REGULATED ACTIVITY IN A NONTIDAL WETLAND, BUFFER, OR EXPANDED BUFFER, AND/OR TO CHANGE THE COURSE, CURRENT OR CROSS-SECTION OF WATERS OF THE STATE, IN ACCORDANCE WITH THE ATTACHED PLANS APPROVED BY THE ADMINISTRATION ON July 17, 2019 ("APPROVED PLAN") AND PREPARED BY Geo-Technology Associates, Inc. AND INCORPORATED HEREIN, AS DESCRIBED BELOW:

The project involves the construction of a mini-warehouse self-storage facility and associated infrastructure on the property. The project includes the installation of a storm drain outfall within the 100-year nontidal floodplain of White Marsh Run. The project will permanently impact 75 square feet and temporarily impact 6,405 square feet of 100-year nontidal floodplain. The project is located on 8228 Belair Road, Nottingham in Baltimore County.

MD Grid Coordinates 190478 x 442796

Denise M. Keehner
Program Manager
Wetlands and Waterways Program

Attachments: Conditions of Authorization
Approved Plans

cc: WSA Compliance Division w/ file
Mr. Maxwell D Potember, Geo-Technology Associates, inc.

PETITIONER' S

EXHIBIT NO. 6

THE FOLLOWING CONDITIONS OF AUTHORIZATION APPLY TO ALL ACTIVITIES AUTHORIZED BY
AUTHORIZATION NUMBER 19-NT-0154/201960883

Page 2 of 3

1. **Validity:** Authorization is valid only for use by Authorized Person. Authorization may be transferred only with prior written approval of the Administration. In the event of transfer, transferee agrees to comply with all terms and conditions of Authorization.
2. **Initiation of Work, Modifications and Extension of Term:** Authorized Person shall initiate authorized activities with two (2) years of the Effective Date of this Authorization or the Authorization shall expire. Authorized Person may submit written requests to the Administration for (a) extension of the period for initiation of work, (b) modification of Authorization, including the Approved Plan, or, (c) not later than 45 days prior to Expiration Date, an extension of the term. Requests for modification shall be in accordance with applicable regulations and shall state reasons for changes, and shall indicate the impacts on nontidal wetlands, streams, and the floodplain, as applicable. The Administration may grant a request at its sole discretion.
3. **Responsibility and Compliance:** Authorized Person is fully responsible for all work performed and activities authorized by this Authorization shall be performed in compliance with this Authorization and Approved Plan. Authorized Person agrees that a copy of the Authorization and Approved Plan shall be kept at the construction site and provided to its employees, agents and contractors. A person (including Authorized Person, its employees, agents or contractors) who violates or fails to comply with the terms and conditions of this Authorization, Approved Plan or an administrative order may be subject to penalties in accordance with §5-514 and §5-911, Department of the Environment Article, Annotated Code of Maryland (2007 Replacement Volume).
4. **Failure to Comply:** If Authorized Person, its employees, agents or contractors fail to comply with this Authorization or Approved Plan, the Administration may, in its discretion, issue an administrative order requiring Authorized Person, its employees, agents and contractors to cease and desist any activities which violate this Authorization, or the Administration may take any other enforcement action available to it by law, including filing civil or criminal charges.
5. **Suspension or Revocation:** Authorization may be suspended or revoked by the Administration, after notice of opportunity for a hearing, if Authorized Person: (a) submits false or inaccurate information in Permit application or subsequently required submittals; (b) deviates from the Approved Plan, specifications, terms and conditions; (c) violates, or is about to violate terms and conditions of this Authorization; (d) violates, or is about to violate, any regulation promulgated pursuant to Title 5, Department of the Environment Article, Annotated Code of Maryland as amended; (e) fails to allow authorized representatives of the Administration to enter the site of authorized activities at any reasonable time to conduct inspections and evaluations; (f) fails to comply with the requirements of an administrative action or order issued by the Administration; or (g) does not have vested rights under this Authorization and new information, changes in site conditions, or amended regulatory requirements necessitate revocation or suspension.
6. **Other Approvals:** Authorization does not authorize any injury to private property, any invasion of rights, or any infringement of federal, State or local laws or regulations, nor does it obviate the need to obtain required authorizations or approvals from other State, federal or local agencies as required by law.
7. **Site Access:** Authorized Person shall allow authorized representatives of the Administration access to the site of authorized activities during normal business hours to conduct inspections and evaluations necessary to assure compliance with this Authorization. Authorized Person shall provide necessary assistance to effectively and safely conduct such inspections and evaluations.
8. **Inspection Notification:** Authorized Person shall notify the Administration's Compliance Program at least five (5) days before starting authorized activities and five (5) days after completion. For Allegany, Garrett, and Washington counties, Authorized Person shall call 301-689-1480. For Carroll, Frederick, Howard, Montgomery, and Prince George's counties, Authorized Person shall call 301-665-2850. For Baltimore City, Anne Arundel, Baltimore, Calvert, Charles, and St. Mary's, Authorized Person shall call 410-537-3510. For Caroline, Cecil, Dorchester, Harford, Kent, Queen Anne's, Somerset, Talbot, Wicomico and Worcester, Authorized Person shall call 410-901-4020. If Authorization is for a project that is part of a mining site, please contact the Land and Materials Administration's Mining Program at 410-537-3557 at least five (5) days before starting authorized activities and five (5) days after completion.
9. **Sediment Control:** Authorized Person shall obtain approval from the Baltimore Soil Conservation District for a grading and sediment control plan specifying soil erosion control measures. The approved grading and sediment control plan shall be included in the Approved Plan, and shall be available at the construction site.

THE FOLLOWING CONDITIONS OF AUTHORIZATION APPLY TO ALL ACTIVITIES AUTHORIZED BY
AUTHORIZATION NUMBER 19-NT-0154/201960883

Page 3 of 3

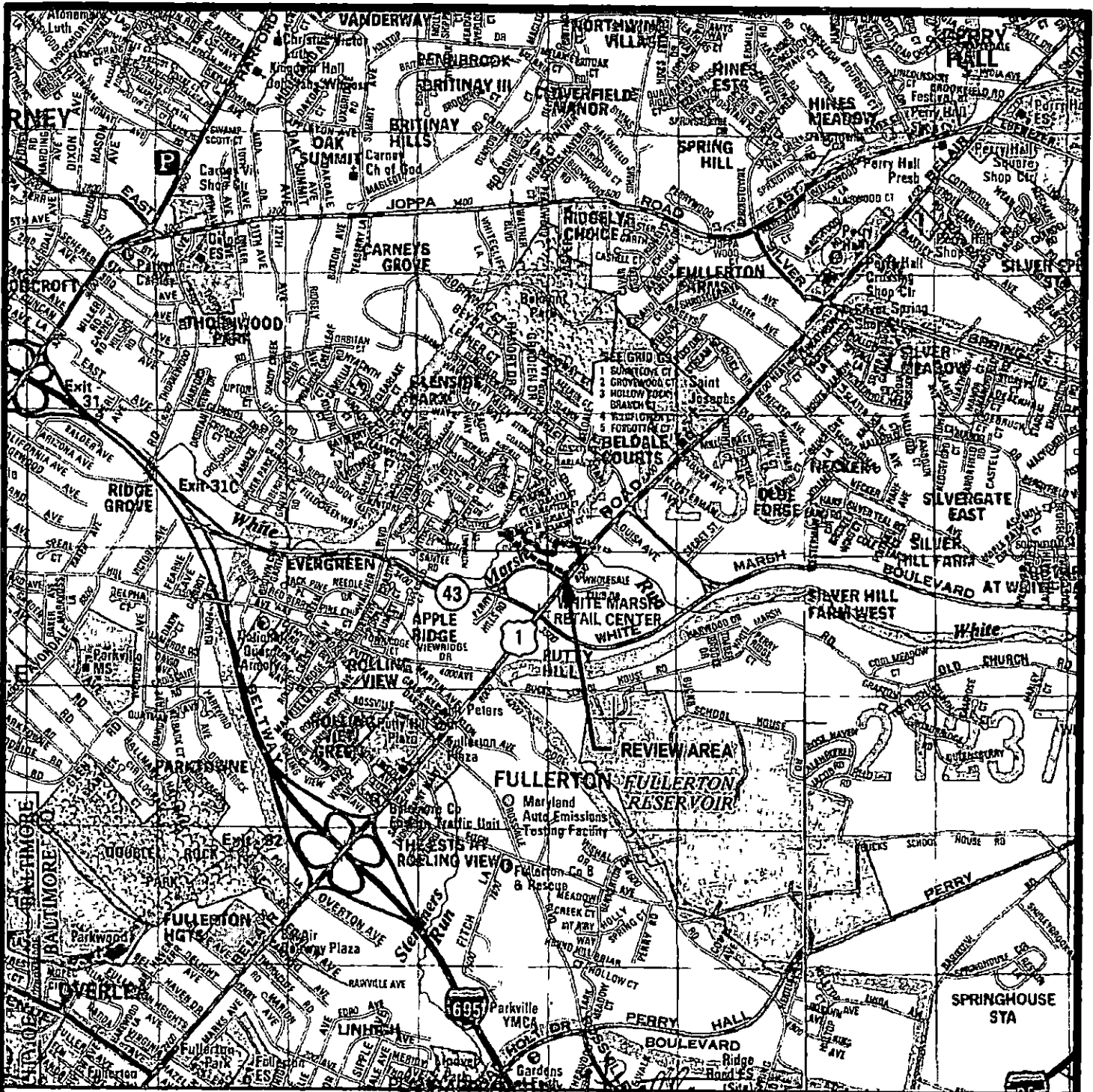
10. **Best Management Practices During Construction:** Authorized Person, its employees, agents and contractors shall conduct authorized activities in a manner consistent with the Best Management Practices specified by the Administration.
11. **Disposal of Excess:** Unless otherwise shown on the Approved Plan, all excess fill, spoil material, debris, and construction material shall be disposed of outside of nontidal wetlands, nontidal wetlands buffers, and the 100-year floodplain, and in a location and manner which does not adversely impact surface or subsurface water flow into or out of nontidal wetlands.
12. **Temporary Staging Areas:** Temporary construction trailers or structures, staging areas and stockpiles shall not be located within nontidal wetlands, nontidal wetlands buffers, or the 100-year floodplain unless specifically included on the Approved Plan.
13. **Temporary Stream Access Crossings:** Temporary stream access crossings shall not be constructed or utilized unless shown on the Approved Plan. If temporary stream access crossings are determined necessary prior to initiation of work or at any time during construction, Authorized Person, its employees, agents or contractors shall submit a written request to the Administration and secure the necessary permits or approvals for such crossings before installation of the crossings. Temporary stream access crossings shall be removed and the disturbance stabilized prior to completion of authorized activity or within one (1) year of installation.
14. **Discharge:** Runoff or accumulated water containing sediment or other suspended materials shall not be discharged into waters of the State unless treated by an approved sediment control device or structure.
15. **Instream Construction Prohibition:**
 - ☒ No instream construction is to occur under this Authorization;
 - ☐ To protect important aquatic species, motor driven construction equipment shall not be allowed within stream channels unless on authorized ford crossings. Activities within stream channels are prohibited as determined by the classification of the stream (COMAR 26.08.02.08): Whitemarsh Run is a Use IV waterway; in-stream work may not be conducted from March 1 through May 31 inclusive, of any year.
16. **Instream Blasting:** Authorized Person shall obtain prior written approval from the Administration before blasting or using explosives in the stream channel.
17. **Minimum Disturbance:** Any disturbance of stream banks, channel bottom, wetlands, and wetlands buffer authorized by this Authorization or Approved Plan shall be the minimum necessary to conduct permitted activities. All disturbed areas shall be stabilized vegetatively no later than seven (7) days after construction is completed or in accordance with the approved grading or sediment and erosion control plan.
18. **Restoration of Construction Site:** Authorized Person shall restore the construction site upon completion of authorized activities. Undercutting, meandering or degradation of the stream banks or channel bottom, any deposition of sediment or other materials, and any alteration of wetland vegetation, soils, or hydrology, resulting directly or indirectly from construction or authorized activities, shall be corrected by Authorized Person as directed by the Administration.

FEDERALLY MANDATED STATE AUTHORIZATIONS

In accordance with the requirements of Section 401 of the Federal Clean Water Act, Water Quality Certification is hereby issued for any discharges to Waters of the U.S. authorized herein, subject to the conditions of this Authorization. In addition, as applicable, this Authorization constitutes the State's concurrence with the Applicant's certification that the activities authorized herein are consistent with the Maryland Coastal Zone Management Program, as required by Section 307 of the Coastal Zone Management Act of 1972, as amended. Activities in the following counties are not subject to the Maryland Coastal Zone Management requirement: Allegany, Carroll, Frederick, Garrett, Howard, Montgomery, and Washington.

U.S. ARMY CORPS OF ENGINEERS AUTHORIZATION

The U.S. Army Corps of Engineers does not regulate the 100-year floodplain. So, no corps authorization is required.



SOURCE: ADC, THE MAP PEOPLE. PERMITTED USE NUMBER 20146238.

DATE: 7/17/19
 WATER AND SCIENCE ADMINISTRATION
 WATERWAY CONSTRUCTION DIVISION
 MARYLAND DEPARTMENT OF THE ENVIRONMENT NORTH



0 2,000
 Approximate Scale
 1 inch = 2,000 feet



GEO-TECHNOLOGY ASSOCIATES, INC.
 GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS

3445-A BOX HILL CORPORATE CENTER DRIVE
 ABINGDON, MARYLAND 21009
 410-515-9448
 FAX: 410-515-4895
 WWW.GTAENG.COM

©GEO-TECHNOLOGY ASSOCIATES, INC.

SITE LOCATION MAP

8228 BELAIR ROAD

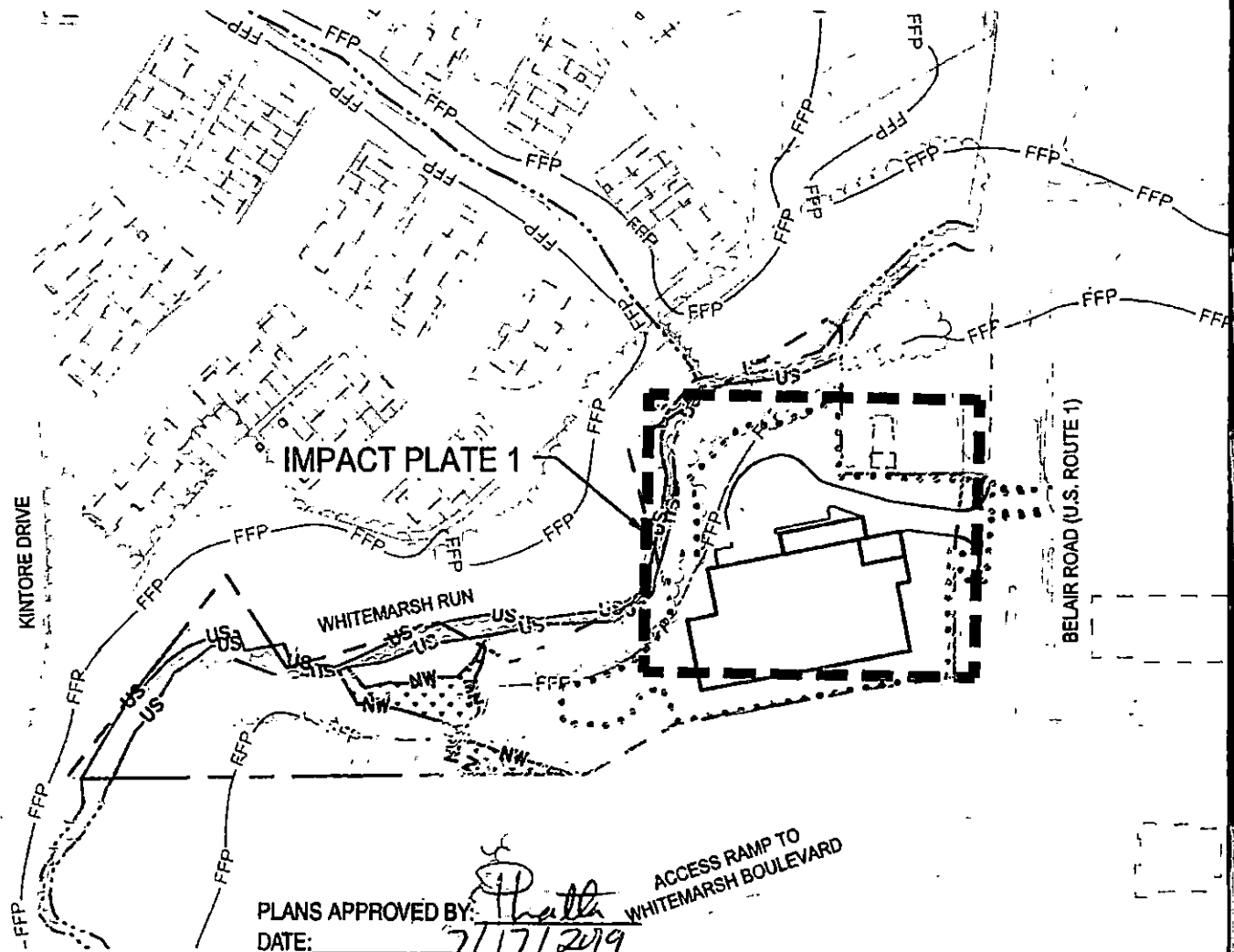
BALTIMORE COUNTY, MARYLAND

JOB NO.	31181132	SCALE:	1" = 2000'	DATE:	JULY 24, 2018	DRAWN BY:	MDP	REVIEW BY:	TAS	FIGURE:	1
---------	----------	--------	------------	-------	---------------	-----------	-----	------------	-----	---------	---

LEGEND

SUBJECT PROPERTY
EX. PROPERTY LINE
EX. EASEMENT
EX. PAVING
EX. FORESTED AREAS
EX. BUILDING

US EX. PERENNIAL STREAM
NW EX. NONTIDAL WETLAND
NW
FFP EX. FEMA 100-YEAR FLOODPLAIN
PR. BUILDING
..... LIMIT OF DISTURBANCE



PLANS APPROVED BY: *Thath*
DATE: 7/17/2019
WATER AND SCIENCE ADMINISTRATION
WATERWAY CONSTRUCTION DIVISION
MARYLAND DEPARTMENT OF THE ENVIRONMENT

ACCESS RAMP TO
WHITEMARSH BOULEVARD

0 100 200
APPROXIMATE SCALE
1 INCH = 200 FEET



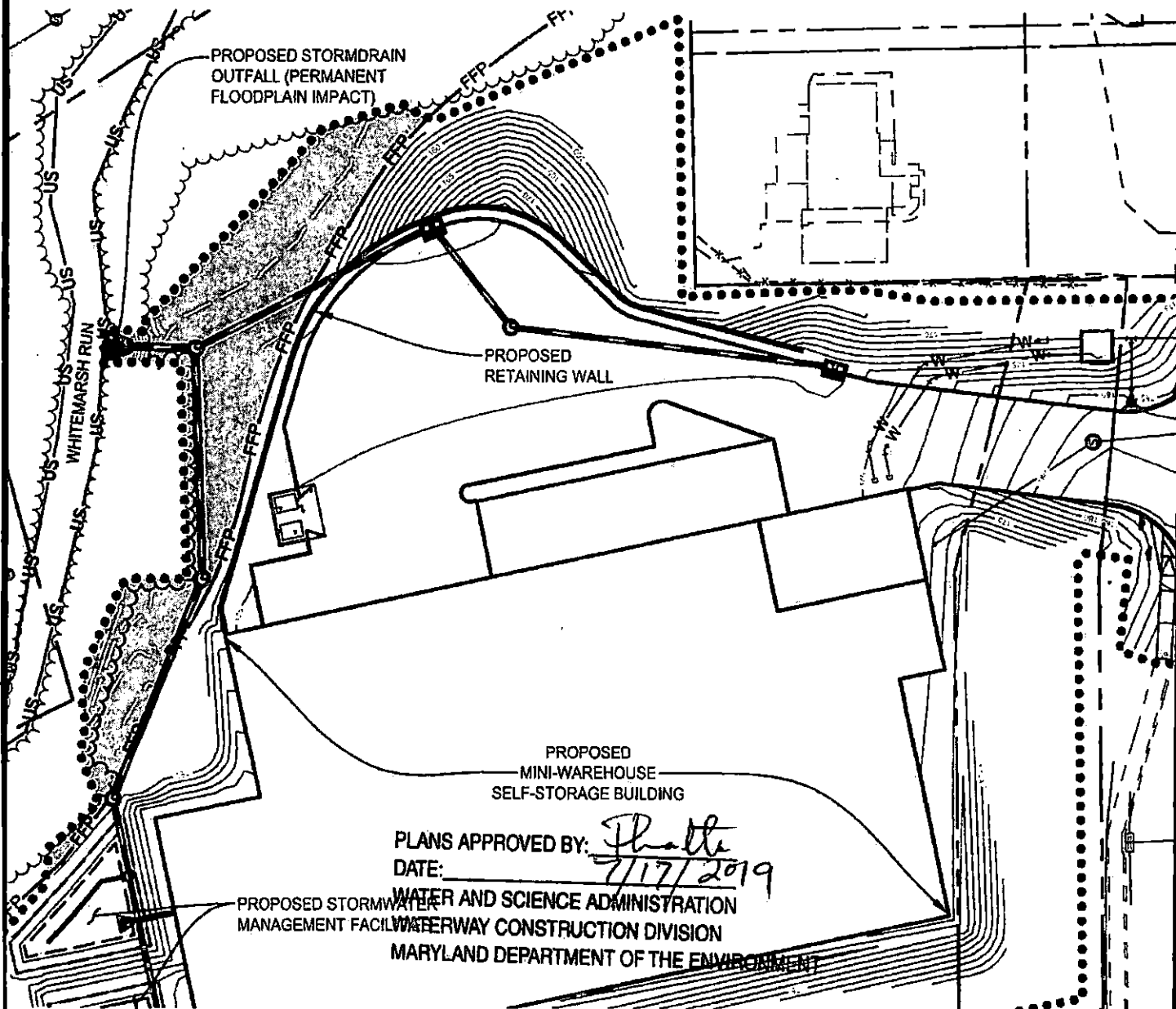
GEO-TECHNOLOGY ASSOCIATES, INC.
GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS
3445-A BOX HILL CORPORATE CENTER DRIVE
ABINGDON, MARYLAND 21009
410-515-9448
FAX: 410-515-4895
WWW.GTAENG.COM
© GEO-TECHNOLOGY ASSOCIATES, INC.

**WETLAND/WATERWAY KEY SHEET
BEYOND SELF-STORAGE -
WHITEMARSH
8228 BELAIR ROAD
BALTIMORE COUNTY, MARYLAND**

JOB NO.	31181132	SCALE:	1" = 200'	DATE:	APRIL 19, 2019	DRAWN BY:	MDP	REVIEW BY:	TAS	FIGURE:	1
---------	----------	--------	-----------	-------	----------------	-----------	-----	------------	-----	---------	---

LEGEND

---	EX. PROPERTY LINE	---	FFP	---	EX. 100-YEAR FEMA FLOODPLAIN
---	EX. EASEMENT	---	US	---	EX. PERENNIAL STREAM
---	EX. CONTOURS	---	---	---	PR. BUILDING
---	EX. PAVING	---	---	---	PR. CONTOURS
---	EX. FORESTED AREAS	---	---	---	PR. CURB
---	EX. BUILDING	---	---	---	PR. LIMIT OF DISTURBANCE



PROPOSED IMPACTS

	TEMPORARY 100-YEAR FLOODPLAIN IMPACTS: 6,405 FT ² (0.15 ACRES)
	PERMANENT 100-YEAR FLOODPLAIN IMPACTS (STORMDRAIN OUTFALL AND MANHOLES): 75 FT ² (0.002 ACRES)

0 25 50
APPROXIMATE SCALE
1 INCH = 50 FEET



GEO-TECHNOLOGY ASSOCIATES, INC.

GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS

3445-A BOX HILL CORPORATE CENTER DRIVE
ABINGDON, MARYLAND 21009
410-515-9446
FAX: 410-515-4895
WWW.GTAENG.COM

© GEO-TECHNOLOGY ASSOCIATES, INC.

WETLAND/WATERWAY IMPACT PLATE
BEYOND SELF-STORAGE -
WHITEMARSH
8228 BELAIR ROAD
BALTIMORE COUNTY, MARYLAND

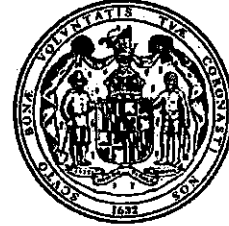
JOB NO. 31181132 SCALE: 1" = 50' DATE: APRIL 19, 2019 DRAWN BY: MDP REVIEW BY: TAS FIGURE: 2

STATE OF MARYLAND
DEPARTMENT OF THE ENVIRONMENT
WATER AND SCIENCE ADMINISTRATION
AUTHORIZATION TO PROCEED

AUTHORIZATION NUMBER: **201960883/19-NT-0154**

EFFECTIVE DATE: July 17, 2019

EXPIRATION DATE: July 17, 2024



AUTHORIZED PERSON: Northpoint Development, LLC
4825 NW 41st Street, Suite 500
Riverside, Missouri 64150
Attn:Johnny Sweeny

IN ACCORDANCE WITH ENVIRONMENT ARTICLE §5-503(a) AND §5-906(b), ANNOTATED CODE OF MARYLAND (2007 REPLACEMENT VOLUME), COMAR 26.17.04 AND 26.23.01, AND 26.08.02 AND THE ATTACHED CONDITIONS OF AUTHORIZATIONS, Northpoint Development, LLC ("AUTHORIZED PERSON"), IS HEREBY AUTHORIZED BY THE WATER AND SCIENCE ADMINISTRATION ("ADMINISTRATION") TO CONDUCT A REGULATED ACTIVITY IN A NONTIDAL WETLAND, BUFFER, OR EXPANDED BUFFER, AND/OR TO CHANGE THE COURSE, CURRENT OR CROSS-SECTION OF WATERS OF THE STATE, IN ACCORDANCE WITH THE ATTACHED PLANS APPROVED BY THE ADMINISTRATION ON July 17, 2019 ("APPROVED PLAN") AND PREPARED BY Geo-Technology Associates, Inc. AND INCORPORATED HEREIN, AS DESCRIBED BELOW:

The project involves the construction of a mini-warehouse self-storage facility and associated infrastructure on the property. The project includes the installation of a storm drain outfall within the 100-year nontidal floodplain of White Marsh Run. The project will permanently impact 75 square feet and temporarily impact 6,405 square feet of 100-year nontidal floodplain. The project is located on 8228 Belair Road, Nottingham in Baltimore County.

MD Grid Coordinates 190478 x 442796

Denise M. Keehner
Program Manager
Wetlands and Waterways Program

Attachments: Conditions of Authorization
Approved Plans

cc: WSA Compliance Division w/ file
Mr. Maxwell D Potember, Geo-Technology Associates, inc.

THE FOLLOWING CONDITIONS OF AUTHORIZATION APPLY TO ALL ACTIVITIES AUTHORIZED BY
AUTHORIZATION NUMBER 19-NT-0154/201960883

Page 2 of 3

1. **Validity:** Authorization is valid only for use by Authorized Person. Authorization may be transferred only with prior written approval of the Administration. In the event of transfer, transferee agrees to comply with all terms and conditions of Authorization.
2. **Initiation of Work, Modifications and Extension of Term:** Authorized Person shall initiate authorized activities with two (2) years of the Effective Date of this Authorization or the Authorization shall expire. Authorized Person may submit written requests to the Administration for (a) extension of the period for initiation of work, (b) modification of Authorization, including the Approved Plan, or, (c) not later than 45 days prior to Expiration Date, an extension of the term. Requests for modification shall be in accordance with applicable regulations and shall state reasons for changes, and shall indicate the impacts on nontidal wetlands, streams, and the floodplain, as applicable. The Administration may grant a request at its sole discretion.
3. **Responsibility and Compliance:** Authorized Person is fully responsible for all work performed and activities authorized by this Authorization shall be performed in compliance with this Authorization and Approved Plan. Authorized Person agrees that a copy of the Authorization and Approved Plan shall be kept at the construction site and provided to its employees, agents and contractors. A person (including Authorized Person, its employees, agents or contractors) who violates or fails to comply with the terms and conditions of this Authorization, Approved Plan or an administrative order may be subject to penalties in accordance with §5-514 and §5-911, Department of the Environment Article, Annotated Code of Maryland (2007 Replacement Volume).
4. **Failure to Comply:** If Authorized Person, its employees, agents or contractors fail to comply with this Authorization or Approved Plan, the Administration may, in its discretion, issue an administrative order requiring Authorized Person, its employees, agents and contractors to cease and desist any activities which violate this Authorization, or the Administration may take any other enforcement action available to it by law, including filing civil or criminal charges.
5. **Suspension or Revocation:** Authorization may be suspended or revoked by the Administration, after notice of opportunity for a hearing, if Authorized Person: (a) submits false or inaccurate information in Permit application or subsequently required submittals; (b) deviates from the Approved Plan, specifications, terms and conditions; (c) violates, or is about to violate terms and conditions of this Authorization; (d) violates, or is about to violate, any regulation promulgated pursuant to Title 5, Department of the Environment Article, Annotated Code of Maryland as amended; (e) fails to allow authorized representatives of the Administration to enter the site of authorized activities at any reasonable time to conduct inspections and evaluations; (f) fails to comply with the requirements of an administrative action or order issued by the Administration; or (g) does not have vested rights under this Authorization and new information, changes in site conditions, or amended regulatory requirements necessitate revocation or suspension.
6. **Other Approvals:** Authorization does not authorize any injury to private property, any invasion of rights, or any infringement of federal, State or local laws or regulations, nor does it obviate the need to obtain required authorizations or approvals from other State, federal or local agencies as required by law.
7. **Site Access:** Authorized Person shall allow authorized representatives of the Administration access to the site of authorized activities during normal business hours to conduct inspections and evaluations necessary to assure compliance with this Authorization. Authorized Person shall provide necessary assistance to effectively and safely conduct such inspections and evaluations.
8. **Inspection Notification:** Authorized Person shall notify the Administration's Compliance Program at least five (5) days before starting authorized activities and five (5) days after completion. For Allegany, Garrett, and Washington counties, Authorized Person shall call 301-689-1480. For Carroll, Frederick, Howard, Montgomery, and Prince George's counties, Authorized Person shall call 301-665-2850. For Baltimore City, Anne Arundel, Baltimore, Calvert, Charles, and St. Mary's, Authorized Person shall call 410-537-3510. For Caroline, Cecil, Dorchester, Harford, Kent, Queen Anne's, Somerset, Talbot, Wicomico and Worcester, Authorized Person shall call 410-901-4020. If Authorization is for a project that is part of a mining site, please contact the Land and Materials Administration's Mining Program at 410-537-3557 at least five (5) days before starting authorized activities and five (5) days after completion.
9. **Sediment Control:** Authorized Person shall obtain approval from the Baltimore Soil Conservation District for a grading and sediment control plan specifying soil erosion control measures. The approved grading and sediment control plan shall be included in the Approved Plan, and shall be available at the construction site.

THE FOLLOWING CONDITIONS OF AUTHORIZATION APPLY TO ALL ACTIVITIES AUTHORIZED BY
AUTHORIZATION NUMBER 19-NT-0154/201960883

Page 3 of 3

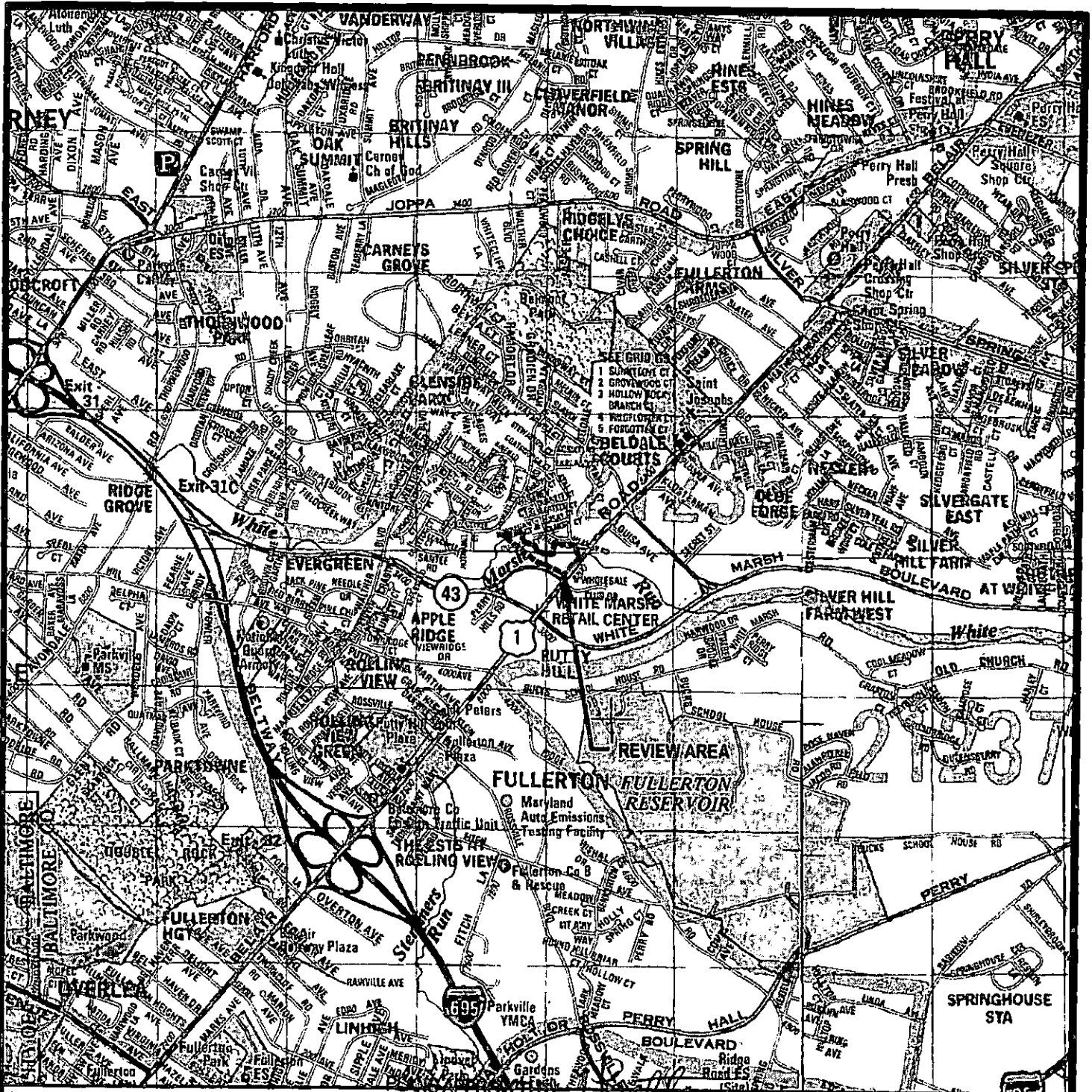
10. **Best Management Practices During Construction:** Authorized Person, its employees, agents and contractors shall conduct authorized activities in a manner consistent with the Best Management Practices specified by the Administration.
11. **Disposal of Excess:** Unless otherwise shown on the Approved Plan, all excess fill, spoil material, debris, and construction material shall be disposed of outside of nontidal wetlands, nontidal wetlands buffers, and the 100-year floodplain, and in a location and manner which does not adversely impact surface or subsurface water flow into or out of nontidal wetlands.
12. **Temporary Staging Areas:** Temporary construction trailers or structures, staging areas and stockpiles shall not be located within nontidal wetlands, nontidal wetlands buffers, or the 100-year floodplain unless specifically included on the Approved Plan.
13. **Temporary Stream Access Crossings:** Temporary stream access crossings shall not be constructed or utilized unless shown on the Approved Plan. If temporary stream access crossings are determined necessary prior to initiation of work or at any time during construction, Authorized Person, its employees, agents or contractors shall submit a written request to the Administration and secure the necessary permits or approvals for such crossings before installation of the crossings. Temporary stream access crossings shall be removed and the disturbance stabilized prior to completion of authorized activity or within one (1) year of installation.
14. **Discharge:** Runoff or accumulated water containing sediment or other suspended materials shall not be discharged into waters of the State unless treated by an approved sediment control device or structure.
15. **Instream Construction Prohibition:**
 - ☒ No instream construction is to occur under this Authorization;
 - ☐ To protect important aquatic species, motor driven construction equipment shall not be allowed within stream channels unless on authorized ford crossings. Activities within stream channels are prohibited as determined by the classification of the stream (COMAR 26.08.02.08): Whitemarsh Run is a Use IV waterway; in-stream work may not be conducted from March 1 through May 31 inclusive, of any year.
16. **Instream Blasting:** Authorized Person shall obtain prior written approval from the Administration before blasting or using explosives in the stream channel.
17. **Minimum Disturbance:** Any disturbance of stream banks, channel bottom, wetlands, and wetlands buffer authorized by this Authorization or Approved Plan shall be the minimum necessary to conduct permitted activities. All disturbed areas shall be stabilized vegetatively no later than seven (7) days after construction is completed or in accordance with the approved grading or sediment and erosion control plan.
18. **Restoration of Construction Site:** Authorized Person shall restore the construction site upon completion of authorized activities. Undercutting, meandering or degradation of the stream banks or channel bottom, any deposition of sediment or other materials, and any alteration of wetland vegetation, soils, or hydrology, resulting directly or indirectly from construction or authorized activities, shall be corrected by Authorized Person as directed by the Administration.

FEDERALLY MANDATED STATE AUTHORIZATIONS

In accordance with the requirements of Section 401 of the Federal Clean Water Act, Water Quality Certification is hereby issued for any discharges to Waters of the U.S. authorized herein, subject to the conditions of this Authorization. In addition, as applicable, this Authorization constitutes the State's concurrence with the Applicant's certification that the activities authorized herein are consistent with the Maryland Coastal Zone Management Program, as required by Section 307 of the Coastal Zone Management Act of 1972, as amended. Activities in the following counties are not subject to the Maryland Coastal Zone Management requirement: Allegany, Carroll, Frederick, Garrett, Howard, Montgomery, and Washington.

U.S. ARMY CORPS OF ENGINEERS AUTHORIZATION

The U.S. Army Corps of Engineers does not regulate the 100-year floodplain. So, no corps authorization is required.



SOURCE: ADC, THE MAP PEOPLE. PERMITTED USE NUMBER 20116238.

DATE: 7/17/19
 WATER AND SCIENCE ADMINISTRATION
 WATERWAY CONSTRUCTION DIVISION
 MARYLAND DEPARTMENT OF THE ENVIRONMENT



0 2,000
 Approximate Scale
 1 inch = 2,000 feet



GEO-TECHNOLOGY ASSOCIATES, INC.
 GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS

3445-A BOX HILL CORPORATE CENTER DRIVE
 ABINGDON, MARYLAND 21009
 410-515-9448
 FAX: 410-515-4895
 WWW.GTAENG.COM

© GEO-TECHNOLOGY ASSOCIATES, INC.

SITE LOCATION MAP

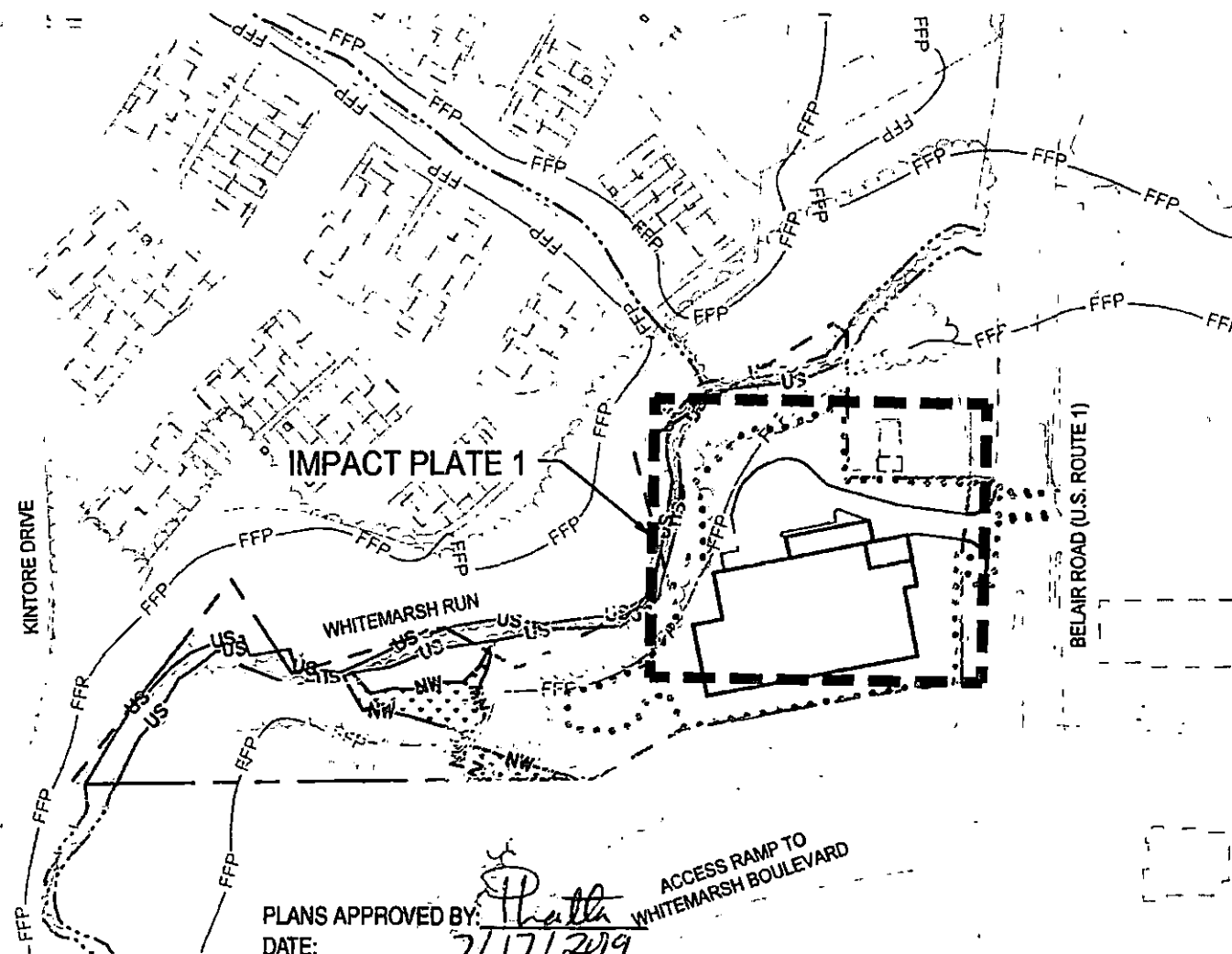
8228 BELAIR ROAD

BALTIMORE COUNTY, MARYLAND

JOB NO.	31181132	SCALE:	1" = 2000'	DATE:	JULY 24, 2018	DRAWN BY:	MDP	REVIEW BY:	TAS	FIGURE:	1
---------	----------	--------	------------	-------	---------------	-----------	-----	------------	-----	---------	---

LEGEND

---	SUBJECT PROPERTY	---	US	---	EX. PERENNIAL STREAM
- - -	EX. PROPERTY LINE	[Dotted Box]	NW	[Dotted Box]	EX. NONTIDAL WETLAND
- - -	EX. EASEMENT	[Dotted Box]	NW	[Dotted Box]	EX. FEMA 100-YEAR FLOODPLAIN
- - -	EX. PAVING	---	FFP	---	PR. BUILDING
- - -	EX. FORESTED AREAS	---		---	LIMIT OF DISTURBANCE
- - -	EX. BUILDING	---		---	



PLANS APPROVED BY: *[Signature]*
 DATE: 7/17/2019
 WATER AND SCIENCE ADMINISTRATION
 WATERWAY CONSTRUCTION DIVISION
 MARYLAND DEPARTMENT OF THE ENVIRONMENT

0 100 200
 APPROXIMATE SCALE
 1 INCH = 200 FEET



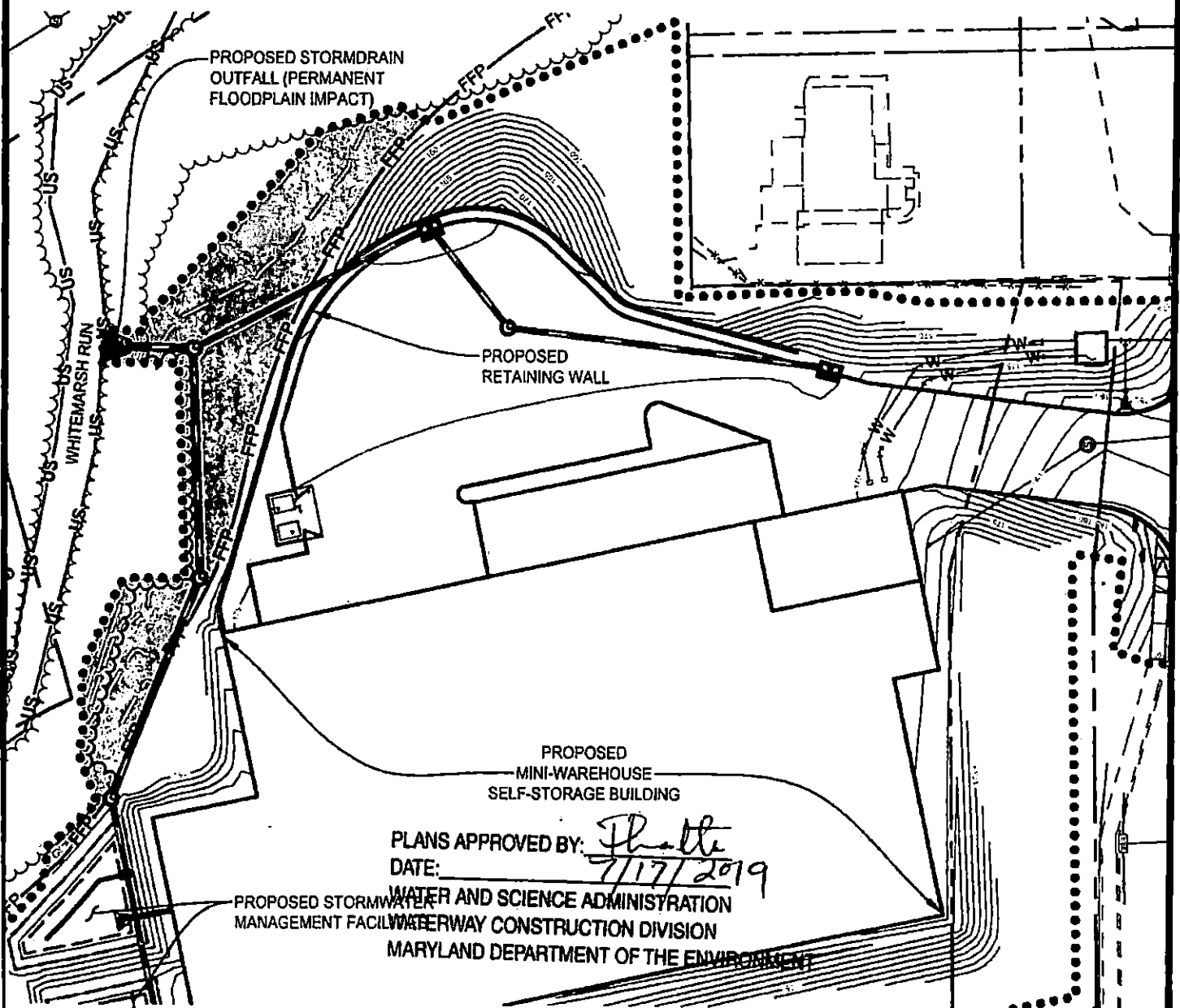
GEO-TECHNOLOGY ASSOCIATES, INC.
 GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS
 3445-A BOX HILL CORPORATE CENTER DRIVE
 ABINGDON, MARYLAND 21009
 410-515-9446
 FAX: 410-515-4895
 WWW.GTAENG.COM
 © GEO-TECHNOLOGY ASSOCIATES, INC.

WETLAND/WATERWAY KEY SHEET
BEYOND SELF-STORAGE -
WHITEMARSH
8228 BELAIR ROAD
 BALTIMORE COUNTY, MARYLAND

JOB NO. 31181132 SCALE: 1" = 200' DATE: APRIL 18, 2019 DRAWN BY: MDP REVIEW BY: TAS FIGURE: 1

LEGEND

EX. PROPERTY LINE	FFP	EX. 100-YEAR FEMA FLOODPLAIN
EX. EASEMENT	US	EX. PERENNIAL STREAM
EX. CONTOURS	PR. BUILDING	
EX. PAVING	PR. CONTOURS	
EX. FORESTED AREAS	PR. CURB	
EX. BUILDING	PR. LIMIT OF DISTURBANCE	



PROPOSED IMPACTS

- TEMPORARY 100-YEAR FLOODPLAIN IMPACTS:
6,405 FT² (0.15 ACRES)
- PERMANENT 100-YEAR FLOODPLAIN IMPACTS (STORMDRAIN
OUTFALL AND MANHOLES): 75 FT² (0.002 ACRES)

0 25 50
APPROXIMATE SCALE
1 INCH = 50 FEET



GEO-TECHNOLOGY ASSOCIATES, INC.
GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS
3445-A BOX HILL CORPORATE CENTER DRIVE
ABINGDON, MARYLAND 21009
410-515-9448
FAX: 410-515-4895
WWW.GTAENG.COM
© GEO-TECHNOLOGY ASSOCIATES, INC.

**WETLAND/WATERWAY IMPACT PLATE
BEYOND SELF-STORAGE -
WHITEMARSH
8228 BELAIR ROAD
BALTIMORE COUNTY, MARYLAND**

JOB NO. 31181132 SCALE: 1" = 50' DATE: APRIL 19, 2019 DRAWN BY: MDP REVIEW BY: TAS FIGURE: 2



JOHN A. OLSZEWSKI, JR.
County Executive

August 30, 2019

PETITIONER'S

EXHIBIT NO. 8

DAVID V. LYKENS, Director
Department of Environmental Protection
and Sustainability

Mr. Maxwell Potember
Geo-Technology Associates, Inc.
3445-A Box Hill Corporate Center Dr.
Abingdon MD 21009

Re: Beyond Self Storage, 8228 Belair Rd. 21236
Offsite Forest Planting, Forest Buffer Mitigation, or Wetland Mitigation Area

Dear Mr. Potember:

A request to utilize an offsite Forest Planting, Forest Buffer Mitigation, or Wetland Mitigation Area to meet ☐ Forest Conservation, ☒ Forest Buffer, ☐ Chesapeake Bay Critical Area Law was received by this Department on August 13, 2019. This request proposes to meet planting or mitigation requirement for this project by purchasing 20,757 square feet of ☐ forest planting, ☒ forest buffer mitigation, ☐ wetland mitigation credit in an offsite area previously approved by this Department.

We have reviewed this request, and acknowledge that in this case, greater resource protection will be achieved through the use of offsite planting/mitigation opportunities rather than through onsite planting/mitigation, or that onsite priority planting or mitigation options have been exhausted. Therefore, your request is hereby approved, in accordance with provisions of the ☐ Forest Conservation Law ☒ Law for the Protection of Water Quality, Streams, Wetlands and Floodplains ☐ Chesapeake Bay Critical Area Law.

It is the development project applicant's responsibility to contact the owner/owner's designated representative to make the arrangements for the purchase of credits. Please follow the instructions below. Proof of payment must be received by this Department prior to the approval of the grading plan or minor subdivision plan, whichever is applicable. Please be advised, the developer is responsible for posting a Forest Conservation, Forest Buffer Mitigation, or Critical Area Management security with the Department via an Environmental Agreement. Please be further advised that the developer may also be responsible for preparation and implementation of a Forest Conservation Plan, depending on the choice of Forest Planting, Forest Buffer Mitigation or Wetland Mitigation Area.

Available offsite Forest Planting, Forest Buffer Mitigation or Wetland Mitigation Areas from which you may choose, and contacts for these sites, are listed below or on the next page:

<u>Forest Planting</u>	<u>Contact Person(s)</u>	<u>Phone No.</u>
Southern Four Property	John Canoles	410-832-2480
Hillside Road Property	Rachel Ort	410-420-2600

Mr. Maxwell Potember
Beyond Self Storage, 8228 Belair Rd. 21236
Forest Buffer Mitigation Bank Use Request
August 30, 2019
Page 2

<u>Forest Buffer Mitigation</u>	<u>Contact Person(s)</u>	<u>Phone No.</u>
Bee Tree Run	Rachel Ortt	410-420-2600
Southern Four Property	John Canoles	410-832-2480
Fourth Mine Farm	Rachel Ortt	410-420-2600

<u>Critical Area Buffer or Forest Mitigation</u>	<u>Contact Person(s)</u>	<u>Phone No.</u>
Southern Four Property	John Canoles	410-832-2480

<u>Wetland Mitigation</u>	<u>Contact Person(s)</u>	<u>Phone No.</u>
---------------------------	--------------------------	------------------

No banks currently available

The choice of which Forest Planting, Forest Buffer, Mitigation or Wetland Mitigation Area to use is up to the development project applicant. Additionally, negotiations regarding the price to be paid to utilize an offsite area are between the development project applicant and the offsite area property owner or his designated representative, and do not involve the County. Please be advised, a person or applicant may not purchase Forest Retention Bank credits to meet Forest Buffer mitigation requirements; or Chesapeake Bay Critical Area forest, wetland, or buffer mitigation requirements.

Once the development project applicant has decided on which Forest Planting, Forest Buffer Mitigation, or Wetland Mitigation Area to use and has paid the owner or his designated representative, please have the owner/owner's designated representative sign the statement below verifying receipt of payment. Please also have the development project applicant sign the letter, acknowledging that he/she has paid the owner/owner's designated representative. The entire, original signed letter must then be returned to Environmental Impact Review of this Department to obtain final Forest Conservation, Forest Buffer, or Chesapeake Bay Critical Area approval for the development project.

Please be advised that paying money to the offsite owner/owner's designated representative does not convey any rights upon the development project applicant to utilize the offsite property. This includes, but is not limited to, a right of access to the property. Please be further advised that failure to return the signed letter in a timely fashion may result in delays in processing of future development plans for the subject project.

If you have any questions, please contact me at 410-887-3980.

Sincerely,



Paul A. Dennis, Environmental Impact Review

Property Owner _____ Date _____ OR Owner's Designated Representative _____ Date _____

Development Project Applicant	Date	Development Project Applicant	Date



JOHN A. OLSZEWSKI, JR.
County Executive

August 27, 2019

DAVID V. LYKENS, *Director*
Department of Environmental Protection
and Sustainability

Mr. Maxwell Potember
Geo-Technology Associates, Inc.
3445-A Box Hill Corporate Center Dr.
Abingdon MD 21009

Re: Beyond Self Storage, 8228 Belair Road, 21236
Forest Buffer Variance
Tracking No. 05-19-2998

Dear Mr. Potember:

The Department of Environmental Protection and Sustainability (EPS) has completed a review of the variance request submitted for the referenced project pursuant to Baltimore County Code Article 33, Title 3, Protection of Water Quality, Streams, Wetlands and Floodplains. This redevelopment proposes impacts to 30,642 square feet of the forest buffer for the construction of a self-storage facility and the required infrastructure. Impacts include areas of existing buildings, asphalt, gravel, lawn areas, and areas of individual trees on maintained lawn. 16,844 square feet of the impacts are within areas of existing impervious surfaces, and the development results in a reduction of impervious surface area in the forest buffer. With the exception of a suitable stormwater management outfall on the bank of White Marsh Run, there are no stream or wetland impacts proposed. The applicant proposes planting non-forested buffer areas on the project site, and purchasing credits in an approved forest buffer mitigation bank to mitigate these impacts. The buffers are associated with White Marsh Run (Use IV waters).

It is agreed that the most viable alternatives for location of the buildings, access and parking areas, stormwater management facilities, and related infrastructure for this commercial development are the preferred alternatives. When considering site constraints, the layout minimizes impacts to resources and will improve water quality management with forest buffer planting and stormwater management. By providing the mitigation for the forest buffer impacts, and utilizing adequate sediment controls, the proposal can be managed to minimize water quality impacts.

This Department has reviewed the variance request and has determined that a practical difficulty and unreasonable hardship does exist. It is acknowledged that the potential for impacts to water quality and aquatic resources as a result of this proposal can be minimized by performing mitigative measures. Based on this review, the proposed forest buffer impacts for the redevelopment of this property meets the requirements of Baltimore County Code Section 33-3-106 and Section 33-3-112 (c) (2). The approvals are subject to the following conditions to minimize water quality impacts:

Mr. Maxwell Potember
Beyond Self Storage, 8228 Belair Road, 21236
Forest Buffer Variance
Tracking No. 05-19-2998
August 27, 2019
Page 2

1. In accordance with Section 33-3-112 (c) (2) of the Baltimore County Code, the project shall be located, designed, constructed, and maintained to provide maximum erosion protection, to have the least adverse effects on wildlife, aquatic life, and their habitats, and to maintain hydrologic processes and water quality. Following any disturbance, the impacted area shall be restored.

2. The following note must appear on all plans submitted for this project:

“On August 27, 2019, a variance was granted by the Baltimore County Department of Environmental Protection and Sustainability (EPS) pursuant to Baltimore County Code Article 33, Title 3 Protection of Water Quality, Streams, Wetlands and Floodplains to allow impacts to the forest buffer for redevelopment of this commercial property. Conditions, including on-site forest buffer planting, were placed on this variance to reduce water quality impacts.”

3. The proposed on-site planting of 26,729 square feet of forest buffer, and the purchase of 20,757 square feet of forest buffer mitigation in an approved forest buffer mitigation bank are acceptable for the mitigation. If an off-site forest buffer mitigation bank is unavailable, alternative mitigation options must be presented for review. Details of all mitigation and other forest buffer requirements for this project must be presented in a Forest Buffer Protection Plan (FBPP). The FBPP must be approved and a security provided with the Environmental Agreement for the project.
4. The forest buffer easements shall be permanently posted with “Forest Buffer - Do Not Disturb” signs as outlined in the FBPP required for this project.
5. The forest buffer easements, forest conservation easements, and forest buffer and forest conservation easements must be recorded in Baltimore County Land Records with the appropriate declarations of protective covenants, conditions, and restrictions.
6. The grading and sediment control plans must be reviewed and approved by this office.
7. All conditions of the variance must be completed to the satisfaction of this Department prior to any permit approvals for this project, unless otherwise stated above or in the FBPP.
8. Any required state/federal approvals for stream, wetland, and floodplain impacts must be received by this office prior to grading permit approval.

It is the intent of this Department to approve this variance subject to the above conditions. Any changes to site layout or plan information may require approval of an amended variance request.

Mr. Maxwell Potember
Beyond Self Storage, 8228 Belair Road, White Marsh
Forest Buffer Variance
Tracking No. 05-19-2998
August 27, 2019
Page 3

Please have the property owners and contract purchaser sign the statement at the end of this letter, and return the signed original of this letter to this Department within 21 calendar days. Failure to return a signed copy may render this approval null and void, or may result in delays in the processing of plans for this project.

If you have any questions regarding this correspondence, please contact Paul Dennis at (410) 887-3980.

Sincerely yours,



David V. Lykens
Director

DVL: pad

S:\EPS\EIR\paul\FB\BeyondSelfStorage\bcslaird8228fbv2019-08.doc

I/We agree to the above conditions to bring this property into compliance with Baltimore County Code Article 33. Environmental Protection And Sustainability, Title 3. Protection of Water Quality, Streams, Wetlands, and Floodplains:

Property Owner	Printed Name	Date
Developer/Contract Purchaser	Printed Name	Date



JOHN A. OLSZEWSKI, JR.
County Executive

DAVID V. LYKENS, Director
Department of Environmental Protection
and Sustainability

August 27, 2019

Mr. Maxwell Potember
Geo-Technology Associates, Inc.
3445-A Box Hill Corporate Center Dr.
Abingdon MD 21009

Re: Beyond Self Storage, 8228 Belair Road, 21236
Forest Conservation Variance
Tracking # 05-19-2997

Dear Mr. Potember:

A request for a variance from the Baltimore County Forest Conservation Law for the referenced property was received by the Department of Environmental Protection and Sustainability (EPS) on August 13, 2019. The request proposes to remove a *Quercus rubra* (48-inch diameter at breast height), a *Q. alba* (31-inch diameter at breast height), and a *Fagus grandifolia* (34-inch diameter at breast height) in order to redevelop the commercial property for a self-storage facility. Six specimen trees are being retained within protective easements on the property that are adjacent to White Marsh Run and associated wetlands and floodplains. The specimen trees proposed for removal are located outside of forest in currently maintained portions of the site.

The Director of EPS may grant a special variance to the Forest Conservation Law in accordance with criteria outlined in Section 33-6-116 of the Baltimore County Code. There are six (6) criteria listed in Subsection 33-6-116(d) and (e) that shall be used to evaluate the variance request. One of the three criteria under Subsection 33-6-116 (d) must be met, and all three of the criteria under Subsection 33-6-116 (e) must be met, in order to approve the variance.

The first criterion (Subsection 33-6-116 (d)(1) of the Code) requires that the petitioner show that the land in question cannot yield a reasonable return if the requirement from which the special variance is requested is imposed and will deprive the petitioner of all beneficial use of his property. The applicant proposes to redevelop the existing commercial property for use as a self-storage facility and the associated infrastructure. Due to site constraints and the infrastructure requirements, this redevelopment for this use could not be constructed as proposed without removal of the 3 specimen trees. However, other types of viable commercial uses have existed on the site without impacts to these trees. Therefore, the petitioner would not be deprived of all beneficial use of the property, and this criterion is not met.

The second criterion (Subsection 33-6-116 (d) (2) of the Code) requires that the petitioner show that his/her plight is due to unique circumstances and not the general conditions in the neighborhood. This variance request is due to the specimen tree locations on the referenced property in relation to the proposed redevelopment of the site for a self-storage facility and the

Mr. Maxwell Potember
Beyond Self Storage, 8228 Belair Road, 21236
Forest Conservation Variance
Tracking # 05-19-2997
August 27, 2019
Page 2

required infrastructure for such a use. The redevelopment proposed is based on these unique conditions of the property, and not from general conditions of the neighborhood. Therefore, this criterion is met.

The third criterion (Subsection 33-6-116 (d) (3) of the Code) requires that the petitioner show that the special variance requested will not alter the essential character of the neighborhood. The property is an existing commercial use site with surrounding commercial uses. Therefore, the proposed commercial redevelopment of the site would be compatible with the neighborhood, and this criterion is met.

The fourth criterion (Subsection 33-6-116 (e) (1) of the Code) requires that the granting of the special variance will not adversely affect water quality. Development of the site must comply with all forest buffer requirements to protect White Marsh Run and the associated wetlands and floodplain. Also, forest conservation requirements must be met, including specimen tree mitigation. In addition, stormwater management must be provided in accordance with current County regulations. Based on this, water quality impacts can be minimized by providing forest buffer and forest conservation mitigation, and stormwater management. Therefore, this criterion is met.

The fifth criterion (Subsection 33-6-116 (e) (2) of the Code) requires that the special variance request does not arise from a condition or circumstance, which is the result of actions taken by the petitioner. This request is based on the specimen tree locations relative to the proposed development requirements. Also, there has been no work conducted on the property that would have required this request. Therefore, this criterion is met.

The sixth criterion (Subsection 33-6-116 (e)(3) of the Code) requires that the Director of EPS find that the special variance, as granted, would be consistent with the spirit and intent of Article 33 of the Baltimore County Code. The development must meet all forest conservation requirements outlined in this Code, including mitigation for specimen trees approved for removal. Therefore, this criterion is met.

Based upon our review, this Department finds that the required variance criteria have been met. Therefore, the requested variance is hereby approved, in accordance with Section 33-6-116 of the Baltimore County Code, with the following conditions:

1. Mitigation for the removal of the 3 specimen trees in fair to good condition requires additional reforestation, or payment of a fee-in-lieu to the Baltimore County Forest Conservation Fund pursuant to the requirements of the forest conservation law. The final forest conservation plan (FCP) for this project must be submitted and approved by EPS prior to issuance of any permits. The approved forest conservation worksheet, and all required notes, including information concerning the protection of the specimen tree to be retained must be included in this plan.

Mr. Max Potember
Beyond Self Storage, 8228 Belair Road, 21236
Forest Conservation Variance
Tracking # 05-19-2997
August 27, 2019
Page 3

2. On all project plans, label specimen trees as "retain" or "remove" and add the following note:

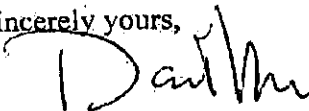
A forest conservation special variance was granted by Baltimore County Department of Environmental Protection and Sustainability on August 27, 2019 to allow for the removal of 3 specimen trees on this project site. Mitigation was provided by meeting all forest conservation requirements as outlined on the forest conservation plan for the project. If any specimen tree shown on the plan "to remain" is proposed to be removed, special variance approval or written authorization must first be obtained from the Department of Environmental Protection & Sustainability.

It is the intent of this Department to approve this variance subject to the above conditions. Any changes to site layout may require submittal of revised plans and an amended variance request.

Please have the property owner sign the statement at the end of this letter and return a signed copy of this letter to this Department within 21 calendar days. Failure to return a signed copy may render this approval null and void, or may result in delays in the processing of plans for this project.

If you have any questions regarding this correspondence, please contact Paul Dennis at (410) 887-3980.

Sincerely yours,



David V. Lykens
Director

DVL/pad

c: Marian Honecny MDDNR

I/we agree to the above conditions to bring my/our property into compliance with Baltimore County Forest Conservation Law.

Property Owner(s)

Date

Printed Name(s)

S:\EPS\DIR\pau\FCV\belair\8228fv2019-08.doc



VARIANCE REQUEST & ALTERNATIVES ANALYSIS
(Regulations for the Protection of Water Quality, Streams, Wetlands, and Floodplains)

BEYOND SELF-STORAGE – WHITEMARSH
AT 8228 BELAIR ROAD
Baltimore County, Maryland

April 23, 2019,
revised July 5, 2019

Prepared for:

KIMLEY-HORN AND ASSOCIATES, INC.
1801 Porter Street, Suite 401
Baltimore, Maryland 21230

Attn: Mr. Bobby Haase

Prepared by:

GEO-TECHNOLOGY ASSOCIATES, INC.
Geotechnical and Environmental Consultants
3445-A Box Hill Corporate Center Drive
Abingdon, Maryland 21009
Phone: (410) 515-9446
Fax: (410) 515-4895
www.gtaeng.com

GTA Project No: 31181132

Part A. Applicant information**Applicant/Developer:**

Name(s): Mr. Johnny Sweeney
Company: Northpoint Development, LLC Phone#: (816) 281-2901
Street 4825 NW 41st Street, Suite 500
City: Riverside State: MO Zip Code: 64150

Property owner(s):

Name(s): Mr. Mark J. McQuade
Company: Phone#: (410) 440-5658
Street 8228 Belair Road
City: Baltimore State: MD Zip Code: 21236

Engineer/representative:

Name(s): Mr. Bobby Haase
Company: Kimley-Horn and Associates, Inc. Phone#: (443) 743-3465
Street 1801 Porter Street, Suite 401
City: Baltimore State: MD Zip Code: 21230

Principal contact:

Name(s): Mr. Maxwell D. Potember
Company: Geo-Technology Associates, Inc. Phone#: (410) 515-9446
Street 3445-A Box Hill Corporate Center Drive
City: Abingdon State: MD Zip Code: 21009

Part B. Property Information

Property address/location: 8228 Belair Road, Nottingham, Maryland 21236

Tax account number(s): 14-1418000625

Subdivision name: N/A

Tax Map: 71

Parcel number(s): 501

Acreage/Lot size: 5.42± acres

Deeds: 06420/00073

Part C. Indicate the specific section(s) of the Code from which you are requesting a variance:
Article 33 Section 3-112(b)(2) *Management Requirements for Forest Buffers (Prohibited practices)*.

The Applicant requests a variance from the Section of the Baltimore County Code referenced above for impacts to portions of the forest buffer to:

- Construct a self-storage building, parking areas, and a retaining wall; and
- forego the recordation of a forest buffer easement over portions of the calculated the forest buffer on the subject property.

Article 33 Section 3-112(c)(2) *Management Requirements for Forest Buffers (Prohibited practices)*.

In accordance with the section of the Baltimore County Code referenced above, the Applicant submits this Alternatives Analysis for impacts to the forest buffer that result from the construction of stormwater management facilities, underground stormdrain utilities, and a stormdrain outfall.

Indicate the reason why you are applying for a variance. Please check only one item.

- ☒ practical difficulty or hardship
- ☐ public improvement project
- ☐ repair/maintenance of public improvement
- ☐ practical had stream/forest buffer applied in conformance with Water Quality Management Policy or Executive Order

Part D. Indication of Practical Difficulty or Unreasonable Hardship

Indicate practical difficulty or unreasonable hardship if this is the reason you applied for a variance.

The subject property's location, parcel configuration, and existing site conditions result in a situation where strict compliance with the requirements of the forest buffer regulations constrains the development without commensurate benefits to the site's natural resources. The project is located in the Nottingham area of Baltimore County, Maryland. The subject property consists of approximately 5.42 acres and consists primarily of existing developed land.

The subject property contains a tractor repair shop, a residence, several storage sheds and storage containers, a storage garage, maintained lawn areas, gravel/paved driveways and parking areas, and wooded land. The western portion of the subject property contains a maintained Baltimore Gas & Electric Company (BGE) right-of-way. The subject property is bound to the north by Whitmarsh Run and to the southeast by Belair Road.

Based on a review of available aerial imagery, the subject property was developed around 1956, prior to Baltimore County's Regulations for the Protection of Water Quality, Streams, Wetlands, and Floodplains (Forest Buffer Regulations). Between 1956 and 1981, additional development occurred within close vicinity to Whitemarsh Run, within the forest buffer. During GTA's field evaluation in August 2018, GTA observed several storage sheds and storage containers, a storage garage, gravel/paved driveways and parking areas, and portions of tractor repair shop within the forest buffer. Based on GTA's field observations, it does not appear that stormwater is currently managed within the subject property and surficial drainage is conveyed into Whitemarsh Run without treatment. The proposed development would bring the stormwater management on the subject property to the current standard and reduce water quality degradation.

The subject property is located along Belair Road and is proposed to be redeveloped with a mini-warehouse self-storage facility. In addition to the construction of the facility, site improvements will include the construction of driveway/parking areas, retention wall, stormwater management facilities, and other associated infrastructure. The proposed use of the project would be consistent with the surrounding land uses along Belair Road, which consists primarily of commercial developments. The construction of the project would help promote Baltimore County's growth as a major corporate economic development area.

The 8228 Belair Road property is unique in terms of its parcel configuration, limited road frontage/site accessibility, challenging topography, existing utility and road rights-of-way, challenging topography, and natural resources.

One of the practical difficulties that this project has faced is the parcel size and parcel configuration, as well as the site's limited frontage on Belair Road. The parcel's irregular shape has resulted in limiting the developable area to the southern and eastern portions of the site. Also, the site can only be accessed from Belair Road, which borders the southeastern portion of the property. In general, the developable area on the subject property is limited to already-developed areas on the eastern portion of the site.

The site is bound to the north by Whitemarsh Run with steep slopes along the northeastern portions of the site along Whitemarsh Run. According to the Federal Emergency Management Agency (FEMA) Flood Insurance Rate Map (FIRM) 20400100270F, the 100-year floodplain extends into the subject property. Approximately 2.23 acres of the subject property is located within the 100-year floodplain, which accounts for approximately 41% of the subject property. A Steep Slopes and Erodible Soils Analysis (SSESA) was prepared and approved by the Baltimore County Department of Environmental Protection and Sustainability (EPS) on January 28, 2019. The approved forest buffer extends into the majority of the subject property. Approximately 3.33 acres of the subject property is located within the forest buffer, which accounts for approximately 61% of the subject property. These regulated resources, including the forest buffer, limit the developable area of the subject property significantly.

The majority of the forest within the subject property is located within the 100-year floodplain, or within existing rights-of-ways, and cannot be used for forest conservation retention. Furthermore,

due to the limited availability of space on-site to satisfy Forest Conservation afforestation requirements, the Applicant will propose to satisfy Forest Conservation requirements on-site to the maximum extent practicable, or through the payment of fee-in-lieu or the purchase of forest bank credits from a Baltimore County EPS-approved Forest Conservation bank. No relief from Forest Conservation requirements are sought on the development of the property.

The aforementioned combination of practical difficulties created difficult circumstances for the development of the property for its intended use. By themselves, it could be argued that these constraints pose an undue hardship on the development, yet, multiple redesign efforts were undertaken to accommodate the property constraints and to limit impacts to environmental features, while achieving the purpose of the project. Moreover, the greatest practical difficulty at the development site lies in the strict enforcement of the forest buffer regulations, which would prevent the construction of necessary infrastructure required to develop the site for commercial use. Alternatively, if the variance is granted, the result would be improved water quality through best stormwater management practices, and with protection of more environmentally sensitive areas elsewhere in the County that need protection. Without relief from strict application of the Baltimore County Code's Article 33 Section 3-112(b)(2) *Management Requirements for Forest Buffers (Prohibited practices)*, the practical difficulties faced by the development of the subject property for its intended use would constitute an undue hardship for an applicant who must create a commercial development project that satisfies the County's requirements for development, while protecting natural resources and water quality within the Bird River watershed and providing protection to more environmentally sensitive areas elsewhere.

Part E. Project Description

Briefly describe the proposed project or activity.

The Beyond Self-Storage – Whitmarsh at 8228 Belair Road project is a proposed commercial development project consisting of the construction of an approximate 150,000+ square-foot Mini-Warehouse self-storage facility and associated infrastructure. The project is located on a tract of land predominately zoned BR (Business Roadside) with areas of DR-1 and DR-16 (Density Residential) located along Belair Road, in the Nottingham area of Baltimore County, Maryland. The project site encompasses approximately 5.42 acres and consists primarily of existing developed land. The site is bound to the north by Whitmarsh Run; steep slopes exist along the northeastern portions of the subject bordering Whitmarsh Run. The proposed development includes the a Mini-Warehouse self-storage building, egress and ingress road originating from Belair Road, a parking area along the proposed Mini-Warehouse, a retaining wall along the egress and ingress road, two stormwater management (SWM) Environmental Site Design (ESD) facilities and an associated stormwater outfall, and associated utilities and infrastructure. The implementation of the ESD stormwater management facilities will provide an opportunity for improvement of stormwater quantity and quality management where none presently exists. Some of the site improvements are located within the approved forest buffer.

Part F. Existing Resources

Briefly describe the existing resources (e.g., streams, wetlands, floodplains, steep slopes/erodible soils, vegetation) present within the Forest buffer, and the condition/quality of these resources.

The subject property consists of approximately 5.42 acres and is identified on Baltimore County Tax Map 72 as Parcel 501. The subject property is developed with a tractor repair shop, a residence, storage sheds and storage containers, a storage garage, gravel/paved driveways and parking areas. 2014 Aerial Imagery is included as Appendix B. The western portion of the subject property contains a maintained BGE right-of-way. The subject property is bound to the north by Whitemarsh Run. GTA performed a wetland delineation of the subject property in August 2018; in addition to Whitemarsh Run along the northern property boundary, a nontidal wetland was delineated on the western portion of the subject property. The subject property drains towards Whitemarsh Run, which is a tributary to the Bird River. In the vicinity of the subject property tributaries are classified in the Code of Maryland Regulations (COMAR) 26.08.02.08 as designated use "Class IV: Recreational Trout Waters." According to FEMA FIRM 20400100270F, the 100-year floodplain extends into the subject property.

GTA performed a Forest Stand Delineation (FSD) of the subject property in August 2018. GTA observed two forest stands within the subject property. In general, these stands were dominated by invasive understory and herbaceous vegetation. Both stands were assigned a "good" forest structure and contained areas of Priority 1 and Priority 2 retention areas. Nine specimen trees are located within the subject property; three specimen trees were observed outside of the forest in the subject property. The FSD was approved by the Baltimore County EPS on January 28, 2019.

A SSES was approved by the Baltimore County EPS on January 28, 2019. The approved forest buffer extends into the majority of the subject property. Approximately 3.33 acres of the subject property is located within the forest buffer, which accounts for approximately 61% of the subject property. On the subject property, areas within the forest buffer consist of woods, lawn, parking lot, portions of the tractor repair shop, and several storage structures. Approximately 0.85 acres of the buffer on the subject property is paved or occupied by buildings/structures. Additionally, approximately 0.41 acres of the forest buffer is located within the existing maintained BGE right-of-way.

As depicted on the *Forested Stream Buffer Exhibit*, prepared by Kimley-Horn and Associates, Inc., included as Appendix C, the subject property currently contains approximately 14,391 square feet of impervious surface within 100-foot stream buffer; existing buildings located within the subject property are located approximately 17 feet from the stream, and existing paved areas of the subject property are located within approximately 51 feet of the stream.

Part G. Proposed Forest Buffer Impacts

Briefly describe the proposed Forest Buffer impacts (e.g., type/acreages of wetlands to be filled, forest to be cleared, width of buffer to be impacted, etc.). Include a description of the Forest Buffer that would remain, if these impacts are allowed to occur.

Since much of the forest buffer is within previously-developed portions of the subject property, impacts to existing forest is relatively minor. Construction of the project will disturb areas of existing asphalt/gravel driveway and parking areas, lawn areas, individual trees over maintained lawn within the buffer to construct the development. Minor forest impacts are proposed for the construction of stormdrain utilities and a stormdrain outfall along Whitemarsh Run. Because the stormdrain outfalls to Whitemarsh Run, forest buffer must be impacted for its construction.

Proposed impacts to the forest buffer are depicted on the *Forest Conservation and Forest Buffer Protection Plan*, included as Appendix A. In total, the project proposes approximately 30,642 square feet (0.70 acres) of impacts to the forest buffer. Approximately 13,798 square feet (0.31 acres) of the proposed impacts to the forest buffer are located within areas of existing developed and/or impervious areas. The project proposes approximately 16,844 square feet (0.39 acres) of impacts to areas of the forest buffer that do not currently contain impervious surfaces. Approximately 150 square feet (<0.01 acres) of existing forest within the forest buffer is proposed to be impacted for the construction of a stormdrain outfall.

The Applicant proposes to provide forest buffer mitigation at a rate of 1:1 for proposed forest buffer impacts to existing impervious areas and forest buffer mitigation at a rate of 2:1 for proposed forest buffer impacts to existing non-impervious areas. Based on the proposed impacts to the forest buffer, the Applicant is required to provide approximately 47,486 square feet of forest buffer mitigation. The table below provides a summary of the proposed impacts to the forest buffer and required forest buffer mitigation:

Proposed Forest Buffer Impact	Area	Mitigation Ratio	Forest Buffer Mitigation Required
Impervious Areas	13,798± square feet	1:1	13,798± square feet
Non-Impervious Areas	16,844± square feet	2:1	33,688± square feet
Total Forest Buffer Mitigation Required			47,486± square feet

The Applicant proposes to provide approximately 26,729 square feet of forest buffer mitigation on-site. The Applicant proposes to plant approximately 19,824 square feet (0.45 acres) of existing unforested areas of the forest buffer. These forest buffer plantings will be located within a proposed forest buffer easement. The Applicant also proposes to place approximately 6,905 square feet (0.16 acres) of required Baltimore County Landscape Plantings into the proposed forest buffer easement. GTA understands that the required landscape plantings will consist of

native tree and shrub species. Following development of the subject property, approximately 2.23 acres of the 5.42-acre subject property will be protected in Forest Buffer and Forest Conservation Easements.

The remaining forest buffer mitigation requirement (approximately 20,757 square feet) is proposed to be satisfied through purchase of credits from an EPS-Approved, off-site forest buffer mitigation bank.

Part H. Minimization of Impacts

Briefly describe how the proposed project or activity will minimize impacts to water quality, streams, wetlands, and floodplains, both during construction and over the long term. Include a description of any proposed mitigative measures.

Impacts to the forest buffer have been minimized by limiting disturbance within the buffer to that which is needed to construct the proposed improvements. Additionally, to minimize impacts to water quality, the project will be constructed in accordance with grading, sediment, and erosion control plans reviewed and approved by Baltimore County. Furthermore, no impacts to streams, wetlands, or wetland buffers are proposed by this project. Impacts to the on-site forest resources are minimal; a small area of forest clearing is required for the construction of a stormwater management outfall. Part J below includes an Alternatives Analysis describing the design considerations that were made to minimize impacts to the forest buffer.

Portions of the subject property, including areas within the forest buffer, have been previously developed. The proposed development would remove areas of existing impervious surfaces within the forest buffer on the subject property. As depicted on the *Forested Stream Buffer Exhibit*, prepared by Kimley-Horn and Associates, Inc., included as Appendix C, the construction of the project will reduce the total impervious surfaces within the 100-foot stream buffer by approximately 6,158 square feet. Additionally, with the proposed development of the subject property, on-site buildings will be located approximately 39 feet further away from the stream than the current structures on-site and paved areas will be located 7 feet further away from the site than current on-site paved areas.

Additionally, stormwater does not appear to be currently managed within the subject property and surficial drainage is conveyed into Whitemarsh Run without treatment. The proposed development would bring the stormwater management on the subject property to the current standard and reduce water quality degradation.

Part I. Supplemental Information

Indicate any supplemental information included with the application.

- ☐ functional assessment of:
- ☒ alternatives analysis for proposed impacts to the forest buffer from SWM, road, storm drain (see **Part J**).
- ☐ a conceptual mitigation plan for proposed impacts to:
- ☐ wetland data sheets:
- ☐ copies of pertinent state and Federal permits:
- ☒ other (explain)

Appendix A: Forest Conservation and Forest Buffer Protection Plan

Appendix B: 2014 Aerial Imagery

Appendix C: Forested Stream Buffer Exhibit

Part J. Additional Information (Alternatives Analysis)

Use this space to explain answers to any of the questions on this form in greater detail, or to provide other information about the site or project pertinent to this variance request. Attach additional sheets if necessary.

Introduction:

During the conceptual design of the proposed project, the project's engineer reviewed several alternate site configurations to achieve the goals of the project. Four alternatives for the project are summarized in the section below and were not chosen because they did not allow the Applicant to achieve the goals of the project and the alternative site layouts would cause increased impacts to the forest buffer and regulated environmental resources.

Alternatives:**Alternative 1 – No Action Alternative (No Development)**

Approximately 3.33 acres of the subject property is located within the forest buffer, which accounts for approximately 61% of the subject property. Additionally, approximately 0.73 acres of the subject property (approximately 13% of the subject property) is located within the an existing BGE right-of-way. Approximately 0.41 acres of calculated forest buffer is within the BGE right-of-way. Therefore, approximately 1.72 acres of the subject property is located outside of the forest buffer and BGE right-of-way. This 1.72-acre "developable area" would not be sufficient to develop the subject property for commercial use, so this option is considered not feasible.

Furthermore, portions of the subject property, including areas within the forest buffer, have been previously developed. The proposed development would remove approximately 6,158 square feet of existing impervious surfaces within the forest buffer on the subject property. Additionally, stormwater does not appear to be currently managed within the subject property and surficial drainage is conveyed into Whitemarsh Run without treatment. The proposed development would bring the stormwater management on the subject property to the current standard and reduce water quality degradation.

Alternative 2 – No Retaining Wall

The proposed project includes the construction of a retaining wall on the northern portion of the development. This retaining wall reduces the extent of grading required to develop the subject property. Without the proposed retaining wall, in order to create a flat developable area, additional grading would be required; this additional grading would likely further encroach into the 100-year floodplain and the forest buffer within the subject property. Additional grading would also require more forest clearing to develop the subject property.

Alternative 3 – Additional Stormwater Management Facilities and Outfalls

During the preparation of the conceptual plans for the project, two stormwater management facilities and two stormdrain outfalls were proposed as part of the project. Currently stormwater is proposed to be managed on-site with two ESD facilities and conveyed through one stormwater outfall to Whitemarsh Run. An additional stormwater management facility would have impacted additional areas of the forest buffer and an additional stormwater outfall would have required additional forest clearing within the forest buffer.

Alternative 4 – Additional Parking and Wrap-Around Roadway

During the preparation of the conceptual plans for the project, the proposed Mini-Warehouse self-storage building was proposed further towards the interior of the subject property and further into the forest buffer. This conceptual layout also included a proposed roadway that wrapped-around the periphery of the Mini-Warehouse self-storage building. The construction of the Wrap-Around Roadway would require a larger retaining wall. Generally, this alternative would have proposed more impervious surface within the subject property and the development of the project would have had greater impacts on the forest buffer.

Conclusion:

The majority of the Alternatives described above would result in additional forest clearing, additional impacts to the forest buffer, and additional areas of impervious surface within and immediately surrounding the forest buffer. Based on the information and Alternatives described above, the current project minimizes impacts to the forest buffer to the maximum extent practicable, while still achieving the goals of the project.

I/We do solemnly declare and affirm under the penalties of perjury that the contents of this application are true and correct to the best of my/our knowledge, and that the application contains names and address of all persons having legal or equitable interest in the property.

Property Owner Signature Date

Contract Purchaser Signature Date

Property Owner Printed Name Date

Contract Purchaser Printed Name Date

APPENDIX A

Forest Conservation and Forest Buffer Protection Plan

[illegible][illegible]

1. SUBJECT SITE DATA		ACRES (± 0.01)
CROSS SITE AREA		0.0
ACRES WITHIN ROAD RIGHT-OF-WAY		0.0
ACRES WITHIN AGGREGATE FLOODPLAIN		0.0
ACRES WITHIN AGGREGATE FLOODPLAIN PARCELS (if applicable)		0.0
ACRES IN TRANSPORTATION LAW EASEMENTS (if applicable)		0.0
NET TRACT AREA		0.0
LAND USE CATEGORY (see p.31 of Manual or Berkeley County Code, Section 14-4-01-01)		CM-10
POTENTIAL HIGH-POTENTIAL		0.0
2. ESTIMATED VALUES FOR CALCULATIONS		ACRES (± 0.01)
A. NET TRACT AREA		6.0
B. FUTURE CONSTRUCTION INCREASED (± 50% MAX)		0.0
C. EXISTING FUTURE INCREASED (± 50% MAX)		0.0
D. EXISTING PORTION OF NET TRACT AREA		0.0
E. EXISTING PORTION OF AGGREGATE FLOODPLAIN PARCELS IN TRANSPORTATION LAW EASEMENTS (if applicable)		0.0
F. PORTION TO BE GRADENED		0.0
G. PORTION TO BE REVEGETATED		0.0
H. AMOUNT OF AFForestation AND REFORESTATION TO SITE		0.0
ACRES (± 0.01)		0.0

THE PORTIONS OF THE SUBJECT PROPERTY THAT ARE WITHIN ONE OR MORE ARE LOCATED EXCLUSIVELY

6. BIOLOGICAL DATA	ACR1 (1 row)
SHOOT SITE AREA	4
AREA WITHIN 100 M FLOODPLAIN	4
APPROXIMATE AGROCLIMATIC ZONE OR PHYSIOGRAPHIC ZONE (see appendix)	4
AREA OF TRANSFORMATION LINE (see appendix 1) (sq km)	4
NET TRAPED AREA	4
LAND-USE CATEGORY (see 11.1.1 for list of categories for Baltimore County, China; Appendix 1A-100)	4
APPROXIMATE AREA OF PLANT	ACR1 (1 row)
7. PHYSICAL DATA FOR CALCULATION	4
A. NET TRAPED AREA	4
B. AREA OF TRANSFORMATION PERCENTAGE (B/A x 100)	4
C. APPLICATION OF LINEAR MODEL (C/A x 100)	4
D. CORRECTING FOR DIFFERENCES IN NET TRAPED AREA	4
E. BREAKING-FORWARD TIME (minutes of net trap area) (see appendix 1A-100)	4
F. BREAKING-FORWARD TIME (minutes of net trap area) (see appendix 1A-100)	4
G. FOREST TO BE CLEARED	4
H. FOREST TO BE RE-PLANTED	4
8. APPLICATION OF APPLICATION RATE AND RESIDUE RATIO TO SITE	ACR1 (1 row)
1. Alternative Only	

1. BASIC SITE DATA		ACRES (1/1000)
GARDEN SITE AREA		0.6
AREA WITHIN 100' BUFFER FLOODPLAIN		0.6
AREA WITHIN AGRICULTURAL VALUE DEPRESSIONATION PARCEL (21.49 acres)		0.6
AREA TRANSPORTATION LINE EXCEEDING 60' SEPARATION		0.6
NET PLANT AREA		0.2
LAND USE CATEGORY (see p. 21 of Manual or Supplemental Worksheet A-10)		CR 1
		RESTORATION AND REUSE
2. INFORMATION FOR CALCULATIONS		ACRES (1/1000)
A. NET PLANT AREA		0.2
B. FOREST CONCENTRATION PERCENTAGE		10%
C. FOREST TYPE		1
D. FOREST TYPE PERCENTAGE		100%
E. FOREST TYPE PERCENTAGE PER NET PLANT AREA		0.2
F. FOREST TYPE PERCENTAGE PER NET PLANT AREA		0.2
G. FOREST TYPE PERCENTAGE PER NET PLANT AREA		0.2
H. FOREST TYPE PERCENTAGE PER NET PLANT AREA		0.2
I. FOREST TYPE PERCENTAGE PER NET PLANT AREA		0.2
J. FOREST TYPE PERCENTAGE PER NET PLANT AREA		0.2
K. FOREST TYPE PERCENTAGE PER NET PLANT AREA		0.2
L. FOREST TYPE PERCENTAGE PER NET PLANT AREA		0.2
M. FOREST TYPE PERCENTAGE PER NET PLANT AREA		0.2
N. FOREST TYPE PERCENTAGE PER NET PLANT AREA		0.2
O. FOREST TYPE PERCENTAGE PER NET PLANT AREA		0.2
P. FOREST TYPE PERCENTAGE PER NET PLANT AREA		0.2
Q. FOREST TYPE PERCENTAGE PER NET PLANT AREA		0.2
R. FOREST TYPE PERCENTAGE PER NET PLANT AREA		0.2
S. FOREST TYPE PERCENTAGE PER NET PLANT AREA		0.2
T. FOREST TYPE PERCENTAGE PER NET PLANT AREA		0.2
U. FOREST TYPE PERCENTAGE PER NET PLANT AREA		0.2
V. FOREST TYPE PERCENTAGE PER NET PLANT AREA		0.2
W. FOREST TYPE PERCENTAGE PER NET PLANT AREA		0.2
X. FOREST TYPE PERCENTAGE PER NET PLANT AREA		0.2
Y. FOREST TYPE PERCENTAGE PER NET PLANT AREA		0.2
Z. FOREST TYPE PERCENTAGE PER NET PLANT AREA		0.2
AA. FOREST TYPE PERCENTAGE PER NET PLANT AREA		0.2
AB. FOREST TYPE PERCENTAGE PER NET PLANT AREA		0.2
AC. FOREST TYPE PERCENTAGE PER NET PLANT AREA		0.2
AD. FOREST TYPE PERCENTAGE PER NET PLANT AREA		0.2
AE. FOREST TYPE PERCENTAGE PER NET PLANT AREA		0.2
AF. FOREST TYPE PERCENTAGE PER NET PLANT AREA		0.2
AG. FOREST TYPE PERCENTAGE PER NET PLANT AREA		0.2
AH. FOREST TYPE PERCENTAGE PER NET PLANT AREA		0.2
AI. FOREST TYPE PERCENTAGE PER NET PLANT AREA		0.2
AJ. FOREST TYPE PERCENTAGE PER NET PLANT AREA		0.2
AK. FOREST TYPE PERCENTAGE PER NET PLANT AREA		0.2
AL. FOREST TYPE PERCENTAGE PER NET PLANT AREA		0.2
AM. FOREST TYPE PERCENTAGE PER NET PLANT AREA		0.2
AN. FOREST TYPE PERCENTAGE PER NET PLANT AREA		0.2
AO. FOREST TYPE PERCENTAGE PER NET PLANT AREA		0.2
AP. FOREST TYPE PERCENTAGE PER NET PLANT AREA		0.2
AQ. FOREST TYPE PERCENTAGE PER NET PLANT AREA		0.2
AR. FOREST TYPE PERCENTAGE PER NET PLANT AREA		0.2
AS. FOREST TYPE PERCENTAGE PER NET PLANT AREA		0.2
AT. FOREST TYPE PERCENTAGE PER NET PLANT AREA		0.2
AU. FOREST TYPE PERCENTAGE PER NET PLANT AREA		0.2
AV. FOREST TYPE PERCENTAGE PER NET PLANT AREA		0.2
AW. FOREST TYPE PERCENTAGE PER NET PLANT AREA		0.2
AX. FOREST TYPE PERCENTAGE PER NET PLANT AREA		0.2
AY. FOREST TYPE PERCENTAGE PER NET PLANT AREA		0.2
AZ. FOREST TYPE PERCENTAGE PER NET PLANT AREA		0.2
BA. FOREST TYPE PERCENTAGE PER NET PLANT AREA		0.2
BB. FOREST TYPE PERCENTAGE PER NET PLANT AREA		0.2
BC. FOREST TYPE PERCENTAGE PER NET PLANT AREA		0.2
BD. FOREST TYPE PERCENTAGE PER NET PLANT AREA		0.2
BE. FOREST TYPE PERCENTAGE PER NET PLANT AREA		0.2
BF. FOREST TYPE PERCENTAGE PER NET PLANT AREA		0.2
BG. FOREST TYPE PERCENTAGE PER NET PLANT AREA		0.2
BH. FOREST TYPE PERCENTAGE PER NET PLANT AREA		0.2
BI. FOREST TYPE PERCENTAGE PER NET PLANT AREA		0.2
BJ. FOREST TYPE PERCENTAGE PER NET PLANT AREA		0.2
BK. FOREST TYPE PERCENTAGE PER NET PLANT AREA		0.2
BL. FOREST TYPE PERCENTAGE PER NET PLANT AREA		0.2
BM. FOREST TYPE PERCENTAGE PER NET PLANT AREA		0.2
BN. FOREST TYPE PERCENTAGE PER NET PLANT AREA		0.2
BO. FOREST TYPE PERCENTAGE PER NET PLANT AREA		0.2
BP. FOREST TYPE PERCENTAGE PER NET PLANT AREA		0.2
BQ. FOREST TYPE PERCENTAGE PER NET PLANT AREA		0.2
BR. FOREST TYPE PERCENTAGE PER NET PLANT AREA		0.2
BS. FOREST TYPE PERCENTAGE PER NET PLANT AREA		0.2
BT. FOREST TYPE PERCENTAGE PER NET PLANT AREA		0.2
BU. FOREST TYPE PERCENTAGE PER NET PLANT AREA		0.2
BV. FOREST TYPE PERCENTAGE PER NET PLANT AREA		0.2
BW. FOREST TYPE PERCENTAGE PER NET PLANT AREA		0.2
BX. FOREST TYPE PERCENTAGE PER NET PLANT AREA		0.2
BY. FOREST TYPE PERCENTAGE PER NET PLANT AREA		0.2
BZ. FOREST TYPE PERCENTAGE PER NET PLANT AREA		0.2
CA. FOREST TYPE PERCENTAGE PER NET PLANT AREA		0.2
CB. FOREST TYPE PERCENTAGE PER NET PLANT AREA		0.2
CC. FOREST TYPE PERCENTAGE PER NET PLANT AREA		0.2
CD. FOREST TYPE PERCENTAGE PER NET PLANT AREA		0.2
CE. FOREST TYPE PERCENTAGE PER NET PLANT AREA		0.2
CF. FOREST TYPE PERCENTAGE PER NET PLANT AREA		0.2
CG. FOREST TYPE PERCENTAGE PER NET PLANT AREA		0.2
CH. FOREST TYPE PERCENTAGE PER NET PLANT AREA		0.2
CI. FOREST TYPE PERCENTAGE PER NET PLANT AREA		0.2
CJ. FOREST TYPE PERCENTAGE PER NET PLANT AREA		0.2
CK. FOREST TYPE PERCENTAGE PER NET PLANT AREA		0.2
CL. FOREST TYPE PERCENTAGE PER NET PLANT AREA		0.2
CM. FOREST TYPE PERCENTAGE PER NET PLANT AREA		0.2
CN. FOREST TYPE PERCENTAGE PER NET PLANT AREA		0.2
CO. FOREST TYPE PERCENTAGE PER NET PLANT AREA		0.2
CP. FOREST TYPE PERCENTAGE PER NET PLANT AREA		0.2
CQ. FOREST TYPE PERCENTAGE PER NET PLANT AREA		0.2
CR. FOREST TYPE PERCENTAGE PER NET PLANT AREA		0.2
CS. FOREST TYPE PERCENTAGE PER NET PLANT AREA		0.2
CT. FOREST TYPE PERCENTAGE PER NET PLANT AREA		0.2
CU. FOREST TYPE PERCENTAGE PER NET PLANT AREA		0.2

WILDLIFE	SCIENTIFIC NAME	COMMON NAME	SEX	CONDITION	COMMENT
BT-1	ACIN BACCHAMURU	SILVER MAMULE	41	FAIR	EXCHANGED WITH WILDS
BT-2	QUERDUS ALBA	WHITE OAR	21	GOOD	
BT-3	QUERDUS ALBA	NORTHERN RED OAR	30	GOOD	
BT-4	PLATARDUS OCCIDENTALIS	AMERICAN BYCANKORE	31	GOOD	
BT-5	PLATARDUS OCCIDENTALIS	AMERICAN BYCANKORE	31	GOOD	
BT-6	PLATARDUS OCCIDENTALIS	AMERICAN BYCANKORE	30	FAIR	
BT-7	ACIN BACCHAMURU	SILVER MAMULE	40	FAIR	EXCHANGED WITH WILDS
BT-8	QUERDUS ALBA	WHITE OAR	40	GOOD	
BT-9	ACIN BACCHAMURU	AMERICAN NEPHE	26	GOOD	

FOREST RETENTION REQUIRED:	0.1± AC
FOREST RETENTION PROVIDED:	0.1± AC
AFFORESTATION REQUIRED:	0.2± AC

THE 0.3-ACRE MITIGATION REQUIREMENT FOR FOREST CONSERVATION WILL BE SATISFIED BY PAYMENT OF A FEE-IN-LIEU OF FORESTLAND TO THE STATE OF ARIZONA FROM AN EDA-APPROVED, OFF-SITE FOREST MITIGATION BANK.

SPECIMEN TREE MITIGATION REQUIRED: 7,812.50 SQ. FT.
PER THE SPECIAL VARIANCE APPLICATION SUBMITTED CONCURRENTLY WITH THIS FCP, THE 7,812.50 SQUARE FEET OF MITIGATION REQUIRED FOR SPECIMEN TREE IMPACTS WILL BE SATISFIED BY PAYMENT OF A FEE-IN-LIEU OR PURCHASE OF CREDITS FROM AN EPA-APPROVED, OFF-SITE FOREST MITIGATION BANK.

PROPOSED FOREST BUFFER IMPACT	AREA	MITIGATION RATIO	MITIGATION REQUIRED
IMPERVIOUS AREAS	13,796± SQ. FT.	1:1	13,796± SQ. FT.
NON-IMPERVIOUS AREAS	18,844± SQ. FT.	2:1	37,688± SQ. FT.
TOTAL FOREST BUFFER MITIGATION REQUIRED			47,484± SQ. FT.

REMAINING FOREST BUFFER MITIGATION REQUIREMENT: 20,767± SQ. FT.
THE FOREST BUFFER MITIGATION PROVIDED ON-SITE INCLUDES FOREST BUFFER PLANTINGS TO BE PRESERVED IN THE FOREST BUFFER EASEMENT AND BALTIMORE COUNTY LANDSCAPE PLANTINGS TO BE PRESERVED IN THE FOREST BUFFER EASEMENT.

STANDARD FOREST BUFFER NOTE:

STANDARD NON-DISTURBANCE NOTE:
THERE SHALL BE NO CLEARING, GRADING, CONSTRUCTION OR DISTURBANCE OF VEGETATION IN THE FOREST BUFFER EXCEPT AS PERMITTED BY THE BALTIMORE COUNTY DEPARTMENT OF ENVIRONMENTAL PROTECTION AND SUSTAINABILITY.

ANY FOREST BUFFER EASEMENT AND/OR FOREST CONSERVATION EASEMENT SHOWN HEREON IS SUBJECT TO PROTECTIVE COVENANTS WHICH MAY BE FOUND IN THE LAND RECORDS OF BALTIMORE COUNTY AND WHICH RESTRICT DISTURBANCE AND USE OF THESE AREAS.



8-10-11 10:00-11:00 AM

MULTICOM COUNTY, MAINE AND

AUGUST 13, 1974 REVISED PROTECTED FOREST BUFFER LIMITATIONS AND FOREST BUFFER/POWERTY CONSIDERATIONS WITHIN FOR VOLUME COMMENTS PROVIDED BY MR. PAUL
 SCHMIDT OF THE FOREST SERVICE ON 10 MAY 74, 1014 AND 1015, 1016, 1017, 1018, 1019, 1020, 1021, 1022, 1023, 1024, 1025, 1026, 1027, 1028, 1029, 1030, 1031, 1032, 1033, 1034, 1035, 1036, 1037, 1038, 1039, 1040, 1041, 1042, 1043, 1044, 1045, 1046, 1047, 1048, 1049, 1050, 1051, 1052, 1053, 1054, 1055, 1056, 1057, 1058, 1059, 1060, 1061, 1062, 1063, 1064, 1065, 1066, 1067, 1068, 1069, 1070, 1071, 1072, 1073, 1074, 1075, 1076, 1077, 1078, 1079, 1080, 1081, 1082, 1083, 1084, 1085, 1086, 1087, 1088, 1089, 1090, 1091, 1092, 1093, 1094, 1095, 1096, 1097, 1098, 1099, 1100, 1101, 1102, 1103, 1104, 1105, 1106, 1107, 1108, 1109, 1110, 1111, 1112, 1113, 1114, 1115, 1116, 1117, 1118, 1119, 1120, 1121, 1122, 1123, 1124, 1125, 1126, 1127, 1128, 1129, 1130, 1131, 1132, 1133, 1134, 1135, 1136, 1137, 1138, 1139, 1140, 1141, 1142, 1143, 1144, 1145, 1146, 1147, 1148, 1149, 1150, 1151, 1152, 1153, 1154, 1155, 1156, 1157, 1158, 1159, 1160, 1161, 1162, 1163, 1164, 1165, 1166, 1167, 1168, 1169, 1170, 1171, 1172, 1173, 1174, 1175, 1176, 1177, 1178, 1179, 1180, 1181, 1182, 1183, 1184, 1185, 1186, 1187, 1188, 1189, 1190, 1191, 1192, 1193, 1194, 1195, 1196, 1197, 1198, 1199, 1200, 1201, 1202, 1203, 1204, 1205, 1206, 1207, 1208, 1209, 1210, 1211, 1212, 1213, 1214, 1215, 1216, 1217, 1218, 1219, 1220, 1221, 1222, 1223, 1224, 1225, 1226, 1227, 1228, 1229, 1230, 1231, 1232, 1233, 1234, 1235, 1236, 1237, 1238, 1239, 1240, 1241, 1242, 1243, 1244, 1245, 1246, 1247, 1248, 1249, 1250, 1251, 1252, 1253, 1254, 1255, 1256, 1257, 1258, 1259, 1260, 1261, 1262, 1263, 1264, 1265, 1266, 1267, 1268, 1269, 1270, 1271, 1272, 1273, 1274, 1275, 1276, 1277, 1278, 1279, 1280, 1281, 1282, 1283, 1284, 1285, 1286, 1287, 1288, 1289, 1290, 1291, 1292, 1293, 1294, 1295, 1296, 1297, 1298, 1299, 1300, 1301, 1302, 1303, 1304, 1305, 1306, 1307, 1308, 1309, 1310, 1311, 1312, 1313, 1314, 1315, 1316, 1317, 1318, 1319, 1320, 1321, 1322, 1323, 1324, 1325, 1326, 1327, 1328, 1329, 1330, 1331, 1332, 1333, 1334, 1335, 1336, 1337, 1338, 1339, 1340, 1341, 1342, 1343, 1344, 1345, 1346, 1347, 1348, 1349, 1350, 1351, 1352, 1353, 1354, 1355, 1356, 1357, 1358, 1359, 1360, 1361, 1362, 1363, 1364, 1365, 1366, 1367, 1368, 1369, 1370, 1371, 1372, 1373, 1374, 1375, 1376, 1377, 1378, 1379, 1380, 1381, 1382, 1383, 1384, 1385, 1386, 1387, 1388, 1389, 1390, 1391, 1392, 1393, 1394, 1395, 1396, 1397, 1398, 1399, 1400, 1401, 1402, 1403, 1404, 1405, 1406, 1407, 1408, 1409, 1410, 1411, 1412, 1413, 1414, 1415, 1416, 1417, 1418, 1419, 1420, 1421, 1422, 1423, 1424, 1425, 1426, 1427, 1428, 1429, 1430, 1431, 1432, 1433, 1434, 1435, 1436, 1437, 1438, 1439, 1440, 1441, 1442, 1443, 1444, 1445, 1446, 1447, 1448, 1449, 1450, 1451, 1452, 1453, 1454, 1455, 1456, 1457, 1458, 1459, 1460, 1461, 1462, 1463, 1464, 1465, 1466, 1467, 1468, 1469, 1470, 1471, 1472, 1473, 1474, 1475, 1476, 1477, 1478, 1479, 1480, 1481, 1482, 1483, 1484, 1485, 1486, 1487, 1488, 1489, 1490, 1491, 1492, 1493, 1494, 1495, 1496, 1497, 1498, 1499, 1500, 1501, 1502, 1503, 1504, 1505, 1506, 1507, 1508, 1509, 1510, 1511, 1512, 1513, 1514, 1515, 1516, 1517, 1518, 1519, 1520, 1521, 1522, 1523, 1524, 1525, 1526, 1527, 1528, 1529, 1530, 1531, 1532, 1533, 1534, 1535, 1536, 1537, 1538, 1539, 1540, 1541, 1542, 1543, 1544, 1545, 1546, 1547, 1548, 1549, 1550, 1551, 1552, 1553, 1554, 1555, 1556, 1557, 1558, 1559, 1560, 1561, 1562, 1563, 1564, 1565, 1566, 1567, 1568, 1569, 1570, 1571, 1572, 1573, 1574, 1575, 1576, 1577, 1578, 1579, 1580, 1581, 1582, 1583, 1584, 1585, 1586, 1587, 1588, 1589, 1590, 1591, 1592, 1593, 1594, 1595, 1596, 1597, 1598, 1599, 1600, 1601, 1602, 1603, 1604, 1605, 1606, 1607, 1608, 1609, 1610, 1611, 1612, 1613, 1614, 1615, 1616, 1617, 1618, 1619, 1620, 1621, 1622, 1623, 1624, 1625, 1626, 1627, 1628, 1629, 1630, 1631, 1632, 1633, 1634, 1635, 1636, 1637, 1638, 1639, 1640, 1641, 1642, 1643, 1644, 1645, 1646, 1647, 1648, 1649, 1650, 1651, 1652, 1653, 1654, 1655, 1656, 1657, 1658, 1659, 1660, 1661, 1662, 1663, 1664, 1665, 1666, 1667, 1668, 1669, 1670, 1671, 1672, 1673, 1674, 1675, 1676, 1677, 1678, 1679, 1680, 1681, 1682, 1683, 1684

Mark J. Potvin
MARK J. POTVIN
COMMISSIONER OF REVENUE, MINNESOTA
QUALIFIED PROFESSIONAL
FEE CODE 001 10.00.00

1. CLEARING OF FOREST AREAS SHOWN ON THIS PLAN WILL BE COMPLETED AS PART OF A MAJOR GRADED PUMP. SLAKE CHANGES HIGH-VISIBILITY FENCES (SEE DETAIL, THIS SECT) SHALL BE INSTALLED TO THE EDGE OF THE CRITICAL ROAD ROWS (SEE DETAIL, THIS SECT). THE LIMIT OF DISTURBANCE (LOD) IS ADJACENT TO THE FOREST BUFFER OR FOREST CONSERVATION AREA. ADJUSTMENTS TO THIS FENCE WILL BE PERMITTED ONLY FOR THE PLANT PLACEMENT OF LIGHT WEIGHT SOIL NAIL OR ROOT PILING (SEE DETAIL, THIS SECT) IMMEDIATELY PRIOR TO DOING THE WORK.

- [illegible]

JOISTS ARE VITAL TO THE FUNCTIONING OF ANY TRUCK. THEY PROVIDE STRUCTURAL SUPPORT AS WELL AS THE MECHANISM FOR LIGHTING AND WATER LIFTING FOR USE BY THE TRUCK. EXCEPTING A SECTION OF A TRUCK'S ROOF, ALL IS ESSENTIALLY BUILT IN A SIMILAR MANNER TO THE TRUCK CHASSIS.

[illegible]

WHEN DELIBERATE FORCE IS EXERCISED UPON A FIELD, ONE MUST CONSIDER NOT ONLY THE VISIBLE PORTION OF THE TREE (THE TRUNK AND CANOPY) BUT THE JUST BELOW GROUND PORTION AS WELL. ON ALL FOREST CONSERVATION OR REFORESTATION PROJECTS SHOULD BE WORKED WITH PERMANENT, NOT TEMPORARY, AND ALL SHOULD BE MONITORED BY THE LOCAL CITIZEN, NOT JUST ONCE AND NOT LATE BY THE COUNTRY OF THE CANOPIA.

THE TRUE SIZE OF THE CRACK. ROOT SIZE IS DETERMINED BY THE SPECIES AND THE AGE OF THE TREE AS WELL AS THE CONDITIONS OF THE SOIL, INCLUDING TEXTURE AND MOISTURE LEVELS. IT IS DIFFICULT TO GENERALIZE FOR ALL TREES BUT ALSO DIFFICULT TO FIELD-CLIMATE THE ROOT SYSTEMS OF ALL OF THE TREES IN CRACKS.

THESE ARE REMINDERS WHEN TO ESTIMATE THE SIZE OF THE CRITICAL AREA AND WITHOUT EXAMINING THE ROOTS IN THE FIELD. THE FOLLOWING CALCULATION IS SUGGESTED BY OTHER RESEARCHERS AND IS ACCORDING TO PRESENTED APPROXIMATIONS OF THE CRITICAL AREA.

For the choice of words among the five choices of two choices below,

1" DIA OF THE TUBE • 1" DIA OF THE
CIRCULAR HOOT JUNG

FOR SOIL AND SPERMATOPHYTES
1" LONG OF THE TREE + 1" BAGS OF THE
CUTTING, ROOTS, ETC.

1. FORECAST PROTECTION SERVICE ONLY.
2. PROTECT AREA SHALL BE SET UP PRIOR TO THE SERVICE PROCESS.
3. SUBSTANCES OF INTEREST/HAZARD SHALL BE IDENTIFIED AND PLACED PRIOR TO INSTALLING SERVICE.
4. BEST SERVICE SHOULD BE AVOIDED.
5. PROTECTIVE SIGNALS, IF APPLIED, SHOULD BE USED.
6. SERVICE SHOULD BE UNINTERRUPTED THROUGHOUT CONSTRUCTION.
7. FOR PROTECTIVE AREA LOCATIONS SEE FORECAST PROTECTOR PROCEDURES AND INCLUDE THE SHEET.

1. PERSONS (WHICH INCLUDES PERSONS AT 17 AND 18 YEARS) LIVES OF LIMITED SOLUBILITY
2. PERSONS AT 17 AND 18 YEARS SHOULD HAVE BEEN AND OTHER PARTS OF OTHER COLLEGE
3. IF IN PERSONS 17 AND 18 YEARS, THE PERSONS SHOULD BE 17 AND 18 YEARS

© 2006 The Authors
Journal compilation © 2006 Blackwell Publishing Ltd

12

PAULSON & LADDER CAN DO MUCH FOR YOU

1. REMOVING THE WOODEN BRACKET BY CUTTING AT "A".
2. REMOVING THE BRACKET AT "B" PRIOR TO THE BRIDGE

1000

Page 12 of 12

1. ONLY POINT AT SPECIFIED TIME.
 2. NO MORE THAN 2% OF CHARGE TO BE SPENT AT ONE TIME.

[illegible]

THREAT TO THE RESIDENCE OF ANY PERSON, SURVIVAL LIMITS OF ENVIRONMENTAL ELEMENTS IMMEDIATELY ADJACENT TO LOT, OR IN CONSIDERATION OF POSSIBLE FUTURE IMPACTS, SHALL BE CLEARLY MARKED IN THE FIELD WITH PERSIMMON, BROWN-PAINT WARNING TO FUTURE OCCUPANTS OF ENVIRONMENTAL LIMITS OF ANY PROPERTY BEING AND COUNTRY SCENE. FORTH PROTECTION FROM HAZARD, WE WILL BE AN "ADDITIONAL" POINT BEHIND EACH RESIDENCE. ADDITIONALLY, THE LOCATION OF THE FENCE AND THE OTHER ELEMENTS, SHALL BE MARKED ON THE FENCE MAPS.

The diagram illustrates the critical root zone of a tree. It shows a cross-section of the ground with the tree's trunk and roots. The trunk is labeled 'TREE PROTECTIVE FORCE'. The force varies with the trunk diameter, indicated by 'FORCE Varies 1 FOOT OF TRUNK DIA'. The critical root zone is defined by a '1 FOOT BACK OF LINE OF DISTURBANCE L' and a '1 FOOT SHOULDER DEPTH'. The '1 FOOT SHOULDER WIDTH' is also shown. The 'ROOT PLANNING TRACHE' is indicated by a horizontal line. The 'CRITICAL ROOT ZONE' is the area within the critical root zone that is most vulnerable to damage.

1. CONFIDENTIAL THIS IS NOT A PART OF THE (OFFICIAL) RECORD.
2. INFORMATION ON THIS CASE IS BEING FORWARDED FROM (NAME) (RATED) FROM (TO) (RATED) AS A (CLASSIFICATION OF) (TYPE) (CLASS) IN (COUNTRY).
3. THIS CASE IS BEING FORWARDED FROM (NAME) (RATED) TO (NAME) (RATED) AS A (CLASSIFICATION OF) (TYPE) (CLASS) IN (COUNTRY).
4. THIS CASE IS BEING FORWARDED FROM (NAME) (RATED) TO (NAME) (RATED) AS A (CLASSIFICATION OF) (TYPE) (CLASS) IN (COUNTRY).

Figure 1 consists of two schematic diagrams of dendritic trees. The left diagram is labeled 'Highly branched form' and shows a dense, bushy network of dendrites. The right diagram is labeled 'Polarized form' and shows a more organized structure with a clear apical dendritic field and a basal dendritic field. Both diagrams include a legend: solid line for 'DENDRITIC ARBOR', dashed line for 'PERIPHERAL RETICULAR EDGE', 'H' for 'HYPHAE', 'B' for 'BASE', and a shaded area for 'CLUSTERED AREA'.

- [illegible]

AS A RESULT OF THIS PROCESS:

STANDARD INFORMATION PROVIDED IN THIS REPORT IS UNCLASSIFIED EXCEPT WHERE SHOWN OTHERWISE. THIS REPORT DATES 11/12/2011.

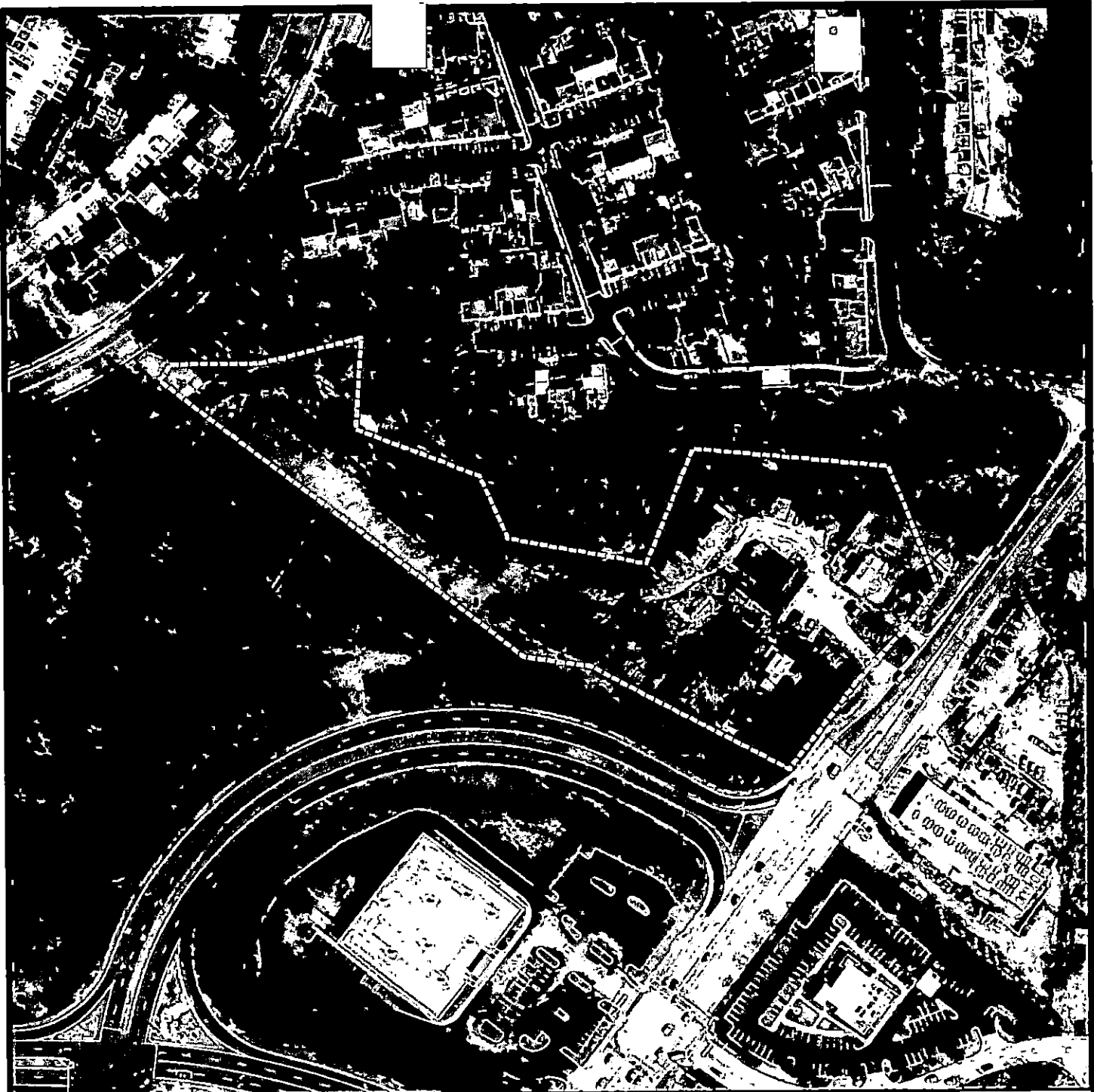
NOTES:

1. DO NOT FERTILIZE WITHIN 3 FEET OF TRUNK.
2. APPLY HERBICIDE TO ENTIRE CIRCULAR AREA.

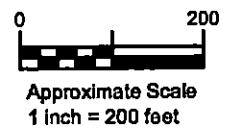
5. NO FERTILIZATION WITHIN 2 FEET OF TAILING.

[illegible]

APPENDIX B
2014 Aerial Imagery



SOURCE: 2014 BASE AERIAL IMAGERY PROVIDED BY MARYLAND IMAP.



GEO-TECHNOLOGY ASSOCIATES, INC.
GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS

3445-A BOX HILL CORPORATE CENTER DRIVE
ABINGDON, MARYLAND 21009
410-515-9448
FAX: 410-515-4895
WWW.GTAENG.COM

© GEO-TECHNOLOGY ASSOCIATES, INC.

2014 AERIAL IMAGERY

8228 BELAIR ROAD

BALTIMORE COUNTY, MARYLAND

JOB NO.	31181132	SCALE:	1" = 200'	DATE:	APRIL 15, 2019	DRAWN BY:	MDP	REVIEW BY:	TAS	APPENDIX:	B
---------	----------	--------	-----------	-------	----------------	-----------	-----	------------	-----	-----------	---

APPENDIX C
Forested Stream Buffer Exhibit



SPECIAL VARIANCE APPLICATION
(Baltimore County Forest Conservation Regulations)

BEYOND SELF-STORAGE – WHITEMARSH
AT 8228 BELAIR ROAD
Baltimore County, Maryland

April 23, 2019,
revised July 5, 2019

Prepared For:

KIMLEY-HORN AND ASSOCIATES, INC.
1801 Porter Street, Suite 401
Baltimore, Maryland 21230

Attn: Mr. Bobby Haase

Prepared By:

GEO-TECHNOLOGY ASSOCIATES, INC.
Geotechnical and Environmental Consultants
3445-A Box Hill Corporate Center Drive
Abingdon, Maryland 21009
Phone: (410) 515-9446
Fax: (410) 515-4895
www.gtaeng.com

GTA Job No.: 31181132

Part A. Applicant Information**Applicant/Developer:**

Name(s): Mr. Johnny Sweeney
Company: Northpoint Development, LLC Phone#: (816) 281-2901
Street 4825 NW 41st Street, Suite 500
City: Riverside State: MO Zip Code: 64150

Property owner(s):

Name(s): Mr. Mark J. McQuade
Company: Phone#: (410) 440-5658
Street 8228 Belair Road
City: Baltimore State: MD Zip Code: 21236

Contract purchaser(s): N/A

Name(s):
Company: Phone#:
Street
City: State: Zip Code:

Engineer/representative:

Name(s): Mr. Bobby Haase
Company: Kimley-Horn and Associates, Inc. Phone#: (443) 743-3465
Street 1801 Porter Street, Suite 401
City: Baltimore State: MD Zip Code: 21230

Principal contact:

Name(s): Mr. Maxwell D. Potember
Company: Geo-Technology Associates, Inc. Phone#: (410) 792-9446
Street 3445-A Box Hill Corporate Center Drive
City: Abingdon State: MD Zip Code: 21009

Part B. Property Information

Property address/location: 8228 Belair Road, Baltimore, Maryland 21236

Tax account number(s): 1418000625

Subdivision name: N/A

Tax Map: 71

Parcel number(s): 501

Acreage/Lot size: 5.42± acres

Deeds: 06420/00073

Water: Public

Sewer: Public

Part C. Special Variance Type.

Indicate the specific section(s) of the Code from which you are requesting a variance:

The applicant requests a variance from Section 33-6-111(b)(5)(i), *Afforestation and Retention*, which defines trees having a diameter at 4.5 feet above the ground of 30 inches or more as priority for retention, and requires that they be left in an undisturbed condition unless the applicant has demonstrated that reasonable efforts have been made to protect them, the plan cannot be reasonably altered, and the plan complies with all other applicable laws.

The applicant requests a variance from the *Natural Resources – No Net Loss of Forest Policy – Forest Conservation Act of 2009*, which requires that trees having a diameter at 4.5 feet above the ground and of 30 inches or more be left in an undisturbed condition unless the applicant qualifies for a variance to remove the tree.

In accordance with Section 33-6-116, *Special Variances*, the applicant requests a forest conservation Special Variance to remove trees having a diameter at 4.5 feet above the ground of 30 inches or more (specimen trees).

Part D. Project Description.

Briefly describe the proposed project or activity:

The Beyond Self-Storage – White Marsh at 8228 Belair Road project is a proposed commercial development project consisting of the construction of an approximate 150,000 square-foot mini-warehouse self-storage facility and associated infrastructure. The project is located on a tract of land predominately zoned BR (Business Roadside) with areas of DR-1 and DR-16 (Density Residential) located along Belair Road, in the Nottingham area of Baltimore County, Maryland. The project site encompasses approximately 5.42 acres and consists primarily of existing developed land. The site is

bound to the north by Whitemarsh Run; steep slopes exist along the northeastern portions of the subject bordering Whitemarsh Run. The proposed development includes the mini-warehouse self-storage building, ingress and egress road originating from Belair Road, a parking area for the proposed mini-warehouse, a retaining wall along the ingress and egress road, two stormwater management (SWM) environmental site design (ESD) facilities and an associated stormwater outfall, and associated utilities and infrastructure. The implementation of the ESD SWM facilities will provide an opportunity for improvement of stormwater quantity and quality management to a developed property where none presently exists.

Part E. Existing Resources.

Briefly describe the existing forest resources present onsite and the condition/quality of these resources:

The subject property consists of approximately 5.42 acres and is identified on Baltimore County Tax Map 72 as Parcel 501. The subject property is developed with a tractor repair shop, a residence, storage sheds, storage containers, a storage garage, gravel/paved driveways, and parking areas. The western portion of the subject property contains a maintained Baltimore Gas and Electric Company (BGE) right-of-way. The subject property is bound to the north by Whitemarsh Run. Geo-Technology Associates, Inc. (GTA) performed a wetland delineation of the subject property in August 2018. In addition to Whitemarsh Run along the northern property boundary, a nontidal wetland was delineated on the western portion of the subject property. The subject property drains towards Whitemarsh Run, which is a tributary to the Bird River. In the vicinity of the subject property tributaries are classified in the Code of Maryland Regulations (COMAR) 26.08.02.08 as designated use "Class IV: Recreational Trout Waters." According to the Federal Emergency Management Agency (FEMA) Flood Insurance Rate Map (FIRM) 20400100270F, the 100-year floodplain extends into the subject property.

GTA performed a Forest Stand Delineation (FSD) of the subject property in August 2018. GTA observed two forest stands within the subject property. In general, these stands were dominated by invasive understory and herbaceous vegetation. Both stands were assigned a "good" forest structure and contained areas of Priority 1 and Priority 2 retention areas. Nine specimen trees are located within the subject property. Three specimen trees were observed outside of the forest limits within the subject property. The FSD was approved by the Baltimore County Department of Environmental Protection and Sustainability (EPS) on January 28, 2019.

The three specimen trees that were observed outside of the forest are proposed to be removed or impacted by the development of the subject property. Specimen Tree (ST)-9 and ST-10 are proposed to be removed, and a portion of ST-2's critical root zone (CRZ) will be impacted by development. ST-2 was identified as a 31-inch diameter at breast height (DBH) *Quercus alba* in good condition; ST-9 was identified as a 48-inch DBH *Quercus rubra* in good condition; and ST-10 was identified as a 34-inch DBH *Fagus grandifolia* in good condition. These three specimen trees are located within areas of maintained lawn, surrounding the existing residence within the subject property. The table below describes the specimen trees proposed to be impacted by the development of the subject property:

Specimen Tree Table					
Number	Scientific Name	Common Name	DBH (inches)	Condition	CRZ Area (ft ²)
ST-2	<i>Quercus alba</i>	White oak	31	Good	6,793
ST-9	<i>Quercus rubra</i>	Northern red oak	48	Good	16,286
ST-10	<i>Fagus grandifolia</i>	American beech	34	Good	8,171

Part F. Indication of Unwarranted Hardship in Accordance with Section 14-415 (d) of the Code

Briefly describe how the land in question cannot yield a reasonable return if the requirement from which this special variance is requested is imposed and will deprive the applicant of all beneficial use of his property.

The subject property's location, parcel configuration, and existing site conditions result in a situation where strict compliance with the requirements of *Section 33-6-111(b)(5)(i), Afforestation and Retention* do not allow the Applicant to yield a reasonable return on the property. The project is located in the Nottingham area of Baltimore County, Maryland. The subject property encompasses of approximately 5.42 acres and consists primarily of existing developed land. The subject property contains a tractor repair shop, a residence, several storage sheds, and storage containers, a storage garage, maintained lawn areas, gravel/paved driveways and parking areas, and wooded land. The western portion of the subject property contains a maintained BGE right-of-way. The subject property is bound to the north by Whitemarsh Run. The 8228 Belair Road property is unique in terms of the design constraints created by its parcel configuration, limited road frontage/site accessibility, existing utility and road rights-of-way, challenging topography, and natural resources.

One of the practical difficulties that this project has faced is the parcel size and parcel configuration, as well as the site's limited frontage on Belair Road. The parcel's irregular shape has resulted in limiting the developable area to the southern and eastern portions of the site. Also, the site can only be accessed from Belair Road, which borders the southeastern portion of the property. In general, the developable area on the subject property is limited to already-developed areas on the eastern portion of the site. The existing specimen trees that are proposed to be impacted by the development of the subject property are located within this developable area. The other specimen trees within the subject property, which are not proposed to be impacted by the development of the subject property, are located within the approved forest buffer, within the FEMA FIRM 100-year floodplain, and within the on-site forest areas.

The majority of the forest within the subject property is located within the 100-year floodplain, or within existing rights-of-ways, and cannot be used for the development of the site. The aforementioned combination of practical difficulties created difficult circumstances for the development of the property for its intended use. By themselves, it could be argued that these constraints pose an undue hardship on the development, yet, multiple redesign efforts were

undertaken to accommodate the property constraints and to limit impacts to environmental features, while achieving the purpose of the project. Furthermore, the site could not likely be redeveloped without impacting the three specimen trees located in the developable portion of the site.

Briefly describe how the plight of the applicant is due to unique circumstances and not the general conditions in the neighborhood.

The petitioner's plight is due to circumstances associated with the location of the existing specimen trees to be removed and the fact that relocation of the limit of disturbance (LOD) to avoid the trees directly conflicts with the areas of the subject property that can be developed.

The plight of petitioner is unique and not due to the general conditions in the neighborhood because the existing configuration of the developed property is unique. It is unlikely that other properties within the surrounding vicinity contain a stream that extends along the entirety of the property boundary that projects a forest buffer into the majority of the subject property. Because the site was developed prior to Baltimore County's *Regulations for the Protection of Water Quality, Steams, Wetlands, and Floodplains*, the site was not designed to accommodate these regulations. The current property owner (the applicant) is now hindered by the configuration of the site.

Briefly describe how the special variance will not alter the essential character of the neighborhood.

The granting of a variance to remove the specimen trees within the existing developed portions of the subject property will not alter the essential character of the neighborhood because the proposed commercial development is located on a tract of land predominately zoned BR (Business Roadside) along Belair Road and will be consistent with surrounding land uses.

Part G. Other Special Variance Criteria Listed in Section 14-415(e) of the Code

Briefly describe how the proposed project or activity will not adversely affect water quality, both during construction and over the long term:

Two of the specimen trees that are proposed for removal (ST-9 and ST-10) are located completely outside of the forest buffer. A portion of ST-2's CRZ that will be impacted by the development of the subject property is located within the forest buffer. All three specimen trees are located within groups of individual trees growing over maintained lawn areas and not contiguous with tracts of forest. The three specimen tree are not located within the 100-year floodplain, nontidal wetlands and associated buffers, or within the immediate vicinity of streams or watercourses. Therefore, the removal of these trees should not adversely affect water quality. Additionally, during construction, water quality will be protected by sediment and erosion controls reviewed and approved by Baltimore County. Furthermore, the redevelopment of this property will provide an

immediate and long-term improvement to water quality by providing SWM on a developed property where none presently exists.

Briefly describe how the special variance does not arise from a condition or circumstance, which is the result of actions taken by the applicant:

This special variance request arises from the need to redevelop an existing, developed property where specimen trees are growing within the most developable portion of the property. This special variance does not arise from a condition or circumstance, which is the result of actions taken by the petitioner because the petitioner has not taken any actions on this property prior to requesting the variance. Furthermore, no actions by the applicant caused the specimen trees to be located in the area of the property least constrained by streams, buffers, and rights-of-way.

Briefly describe how the special variance, as granted, would be consistent with the spirit and intent of the Forest Conservation Law:

The spirit and intent of the forest conservation regulations includes protecting and preserving the County's most environmentally valuable and sensitive forest resources in the context of development that would otherwise eradicate them. Removal of these specimen trees would be consistent with the spirit and intent of the Forest Conservation Law given that other specimen trees within the development will be preserved within protective easements. Additionally, mitigation for specimen tree impacts will be satisfied through the purchase of credits from an EPS-approved forest conservation bank, or by the payment of a fee-in-lieu to provide forest conservation elsewhere in the County. Based on a mitigation ratio of 0.25 square-foot of mitigation per 1 square-foot of critical root zone per specimen tree removed, the proposed specimen tree impacts will result in a requirement of 7,812.50 square feet of mitigation.

Part H. Supplemental Information.

Indicate any supplemental information included with the application.

- ☒ Approved Forest Stand Delineation (Appendix A)
- ☒ Forest Conservation Plan (Appendix B)
- ☐ Forest Retention Investigative Report
- ☐ other (explain)

Part I. Additional Information.

Use this space to explain answers to any of the questions on this form in greater detail, or to provide other information about the site or project pertinent to this special variance request. Attach additional sheets if necessary.

Part J. Signatures.

All persons having legal or equitable interest in the property must sign below. Unsigned applications will be returned to the applicant as incomplete.

I/We do solemnly declare and affirm under the penalties of perjury that the contents of this application are true and correct to the best of my/our knowledge, and that the application contains names and address of all persons having legal or equitable interest in the property.

Property Owner Signature Date

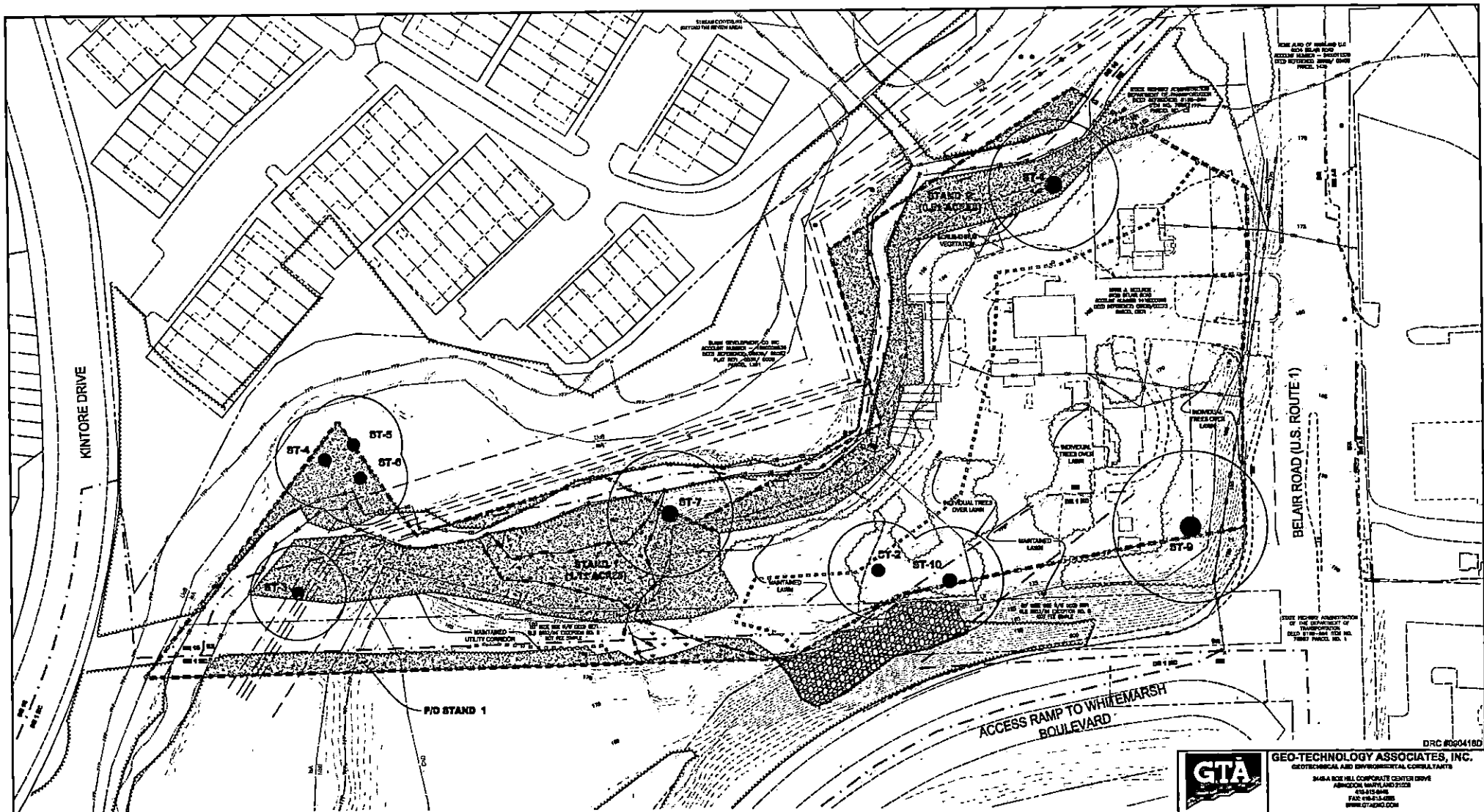
Contract Purchaser Signature Date

Property Owner Printed Name Date

Contract Purchaser Printed Name Date

Page left intentionally blank for formatting purposes.

APPENDIX A
APPROVED FOREST STAND
DELINEATION PLAN



LEGEND:

EX. 100-YEAR FLOODPLAIN EX. PROPERTY LINE EX. EASEMENT EX. ZONING BOUNDARY EX. INTERIOR BOUNDARY EX. INDEX CONTOUR EX. FLOODING EX. OVERHEAD UTILITY LINE EX. CULVERT EX. ROCK BOUNDARY EX. BUILDING EX. MEDICINAL, EDIBLE/AROMATIC, GROUP OF THREE + 10,000 SQUARE FEET EX. FORESTED AREAS	EX. CALCULATED FOREST BUFFER EX. FOREST STAND BOUNDARY EX. PERMANENT STREAM DELINEATED BY GTA EX. OFF-ROUTE STREAM COUNTY CDE EX. MONTANA WETLAND EX. BLOOMERS WETLAND EX. SPECIES TREES
--	---

SOILS CHART

SYMBOL ¹	NAME/DESCRIPTION ¹	HYDRO ²	HYDRO ³	PERCENTAGE OF MAPPING UNIT ⁴	POSITION IN LANDSCAPE ⁵
DIO	DRY ORGANELLY SANDY LOAM, 10 TO 15 PERCENT BLOOMERS	NO	-	-	FLOOD PLANE, CROWNEDWAYS
HA	BROWN SILT LOAM, OCCASIONALLY FLOODED	YES	POTENTIAL	10	-
MM	BROWN CHERRY LOAM, 15 TO 45 PERCENT BLOOMERS	NO	-	-	-
UM	MOISTURE, HIGHWAY, 8 TO 10 PERCENT BLOOMERS	NO	-	-	-
UP	URBAN LAND, 8 TO 10 PERCENT BLOOMERS	NO	-	-	-
UB	URBAN LAND-CONCRETE COMPLEX, 1 TO 1 PERCENT BLOOMERS	NO	-	-	-

1. LAYED OUT BY THE STATE OF MARYLAND, DEPARTMENT OF AGRICULTURE, DIVISION OF SOILS, 1998. 2. HYDROLOGICAL INFORMATION FROM THE STATE OF MARYLAND, DEPARTMENT OF AGRICULTURE, DIVISION OF SOILS, 1998. 3. HYDROLOGICAL INFORMATION FROM THE STATE OF MARYLAND, DEPARTMENT OF AGRICULTURE, DIVISION OF SOILS, 1998. 4. PERCENTAGE OF MAPPING UNIT. 5. POSITION IN LANDSCAPE.



Handwritten signature
DATE: 10/10/10

GEO-TECHNOLOGY ASSOCIATES, INC.
GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS
3400 BELAIR ROAD, SUITE 100
BALTIMORE, MARYLAND 21206
410-555-5555
FAX: 410-555-5556
WWW.GTA-INC.COM

FOREST STAND DELINEATION PLAN

8228 BELAIR ROAD

BALTIMORE COUNTY, MARYLAND

REVISIONS:

NO.	DATE	DESCRIPTION	BY	APP'D
1	10/10/10	FOREST STAND DELINEATION PLAN	GT	GT

JOB NO. 101010
SCALE 1" = 40'
CITY BALTIMORE, MD
OWNER GT
DESIGNER GT
REVIEWER GT
DATE 10/10/10

DRC #080418D

2 OF 2

APPENDIX B

**FOREST CONSERVATION AND FOREST
BUFFER PROTECTION PLAN**

FOREST CONSERVATION WORKSHEET

A. NET TRACT AREA
C. AFFORESTATION THRESHOLD (100% X 1)
D. EXISTING FOREST ON NET TRACT AREA
E. FOREST AREAS TO BE CLEARED

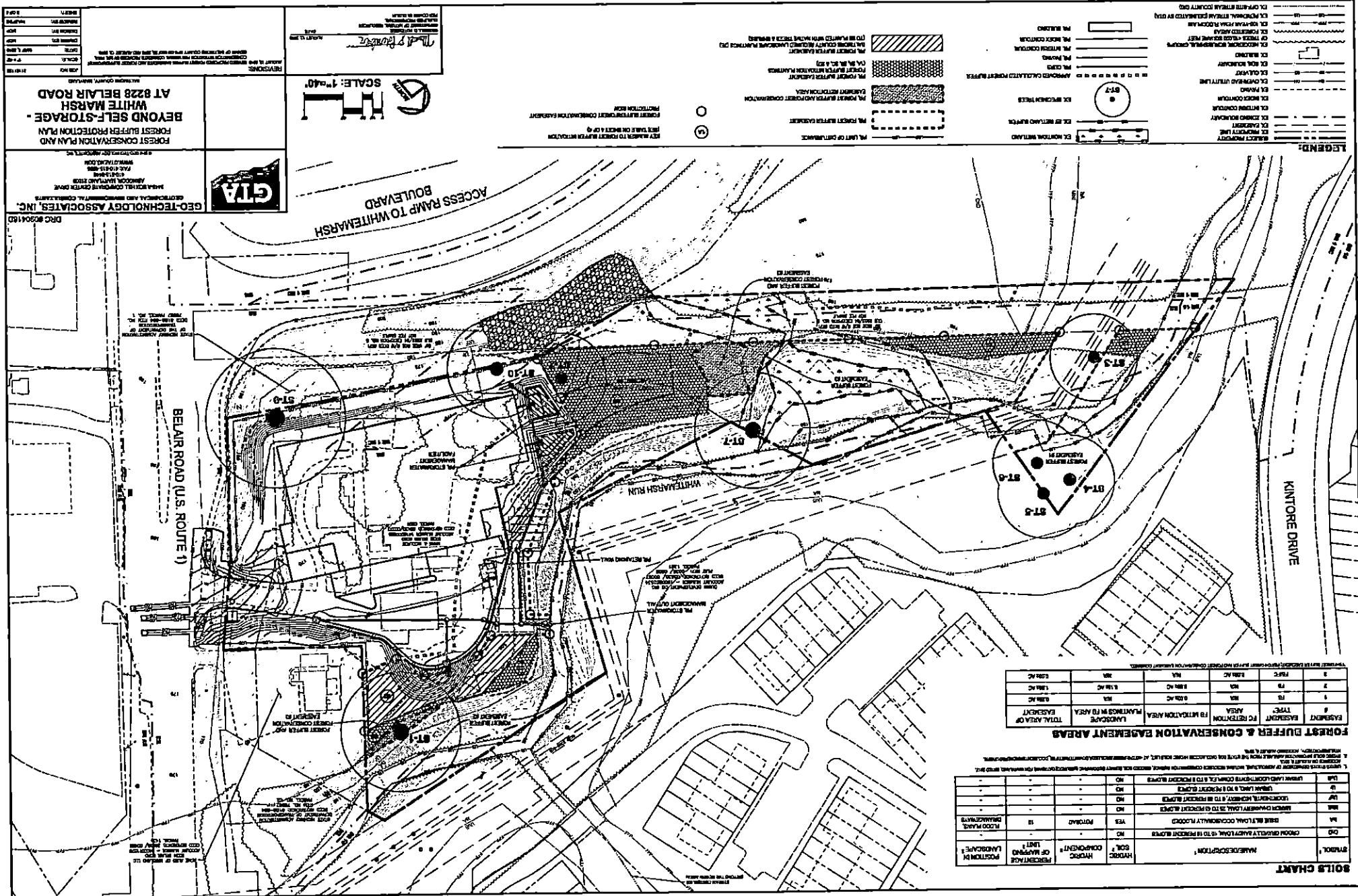
FOREST BUFFER MITIGATION PROVIDED ON SITE

AUGUST 12, 1968
 DATE

	FOR
--	-----

[illegible]

DRC #0904180



SOILS CHART

SYMBOL	PERCENTAGE POSITION IN LANDSCAPE	HYDROLOGIC COMPONENT	HYDROLOGIC POSITION IN LANDSCAPE
1	0-10%	NO	NO
2	10-25%	NO	NO
3	25-50%	NO	NO
4	50-75%	NO	NO
5	75-100%	NO	NO
6	0-10%	NO	NO
7	10-25%	NO	NO
8	25-50%	NO	NO
9	50-75%	NO	NO
10	75-100%	NO	NO
11	0-10%	NO	NO
12	10-25%	NO	NO
13	25-50%	NO	NO
14	50-75%	NO	NO
15	75-100%	NO	NO
16	0-10%	NO	NO
17	10-25%	NO	NO
18	25-50%	NO	NO
19	50-75%	NO	NO
20	75-100%	NO	NO

FOREST BUFFER & CONSERVATION EASEMENT AREAS

EASEMENT TYPE	PERCENTAGE POSITION IN LANDSCAPE	HYDROLOGIC COMPONENT	HYDROLOGIC POSITION IN LANDSCAPE
1	0-10%	NO	NO
2	10-25%	NO	NO
3	25-50%	NO	NO
4	50-75%	NO	NO
5	75-100%	NO	NO
6	0-10%	NO	NO
7	10-25%	NO	NO
8	25-50%	NO	NO
9	50-75%	NO	NO
10	75-100%	NO	NO
11	0-10%	NO	NO
12	10-25%	NO	NO
13	25-50%	NO	NO
14	50-75%	NO	NO
15	75-100%	NO	NO
16	0-10%	NO	NO
17	10-25%	NO	NO
18	25-50%	NO	NO
19	50-75%	NO	NO
20	75-100%	NO	NO

GIA

GEO-TECHNOLOGY ASSOCIATES, INC.

1000 WEST 10TH AVENUE, SUITE 100
DENVER, COLORADO 80202
TEL: 303.733.1100
FAX: 303.733.1101
WWW.GIA-INC.COM

FOREST BUFFER PROTECTION PLAN AND BEYOND SELF-STORAGE AT 8228 BELAIR ROAD

REVISIONS:

DATE: 10/1/00

BY: J. L. BROWN

FOR: BELAIR ROAD

PROJECT: FOREST BUFFER PROTECTION PLAN AND BEYOND SELF-STORAGE AT 8228 BELAIR ROAD

LEGEND

1. EXISTING EASEMENT

2. EXISTING EASEMENT

3. EXISTING EASEMENT

4. EXISTING EASEMENT

5. EXISTING EASEMENT

6. EXISTING EASEMENT

7. EXISTING EASEMENT

8. EXISTING EASEMENT

9. EXISTING EASEMENT

10. EXISTING EASEMENT

11. EXISTING EASEMENT

12. EXISTING EASEMENT

13. EXISTING EASEMENT

14. EXISTING EASEMENT

15. EXISTING EASEMENT

16. EXISTING EASEMENT

17. EXISTING EASEMENT

18. EXISTING EASEMENT

19. EXISTING EASEMENT

20. EXISTING EASEMENT

4. CLEARING OF FOREST AREAS SHOWN ON THIS PLAN WILL BE COMPLETED AS PART OF A SINGLE GRADING PLAN. BLAZE CORNERS SHOW VISIBILITY PENCE (SEE DETAIL, THIS SHEET) SHALL BE INSTALLED TO THE EDGE OF THE CRITICAL ROAD ZONE (CRZ) WITHIN THE LIMIT OF DISTURBANCE (LOD) IN ACCORDANCE TO THE FOREST BUFFER OR FOREST COMBINATION AREA. ADJUSTMENT 8 TO THIS PENCE WILL BE PERMITTED ONLY FOR THE FINAL PLACEMENT OF LINE SHEDD BOX, BOX OR ROCC PILLARS (SEE DETAIL, THIS SHEET) NEARLY NEARLY TO DOING THE WORK.

- [illegible]

INSTEAD OF RELYING ON THE FLEXIBILITY OF AIRWHEELS, THEY PROVIDE STRUCTURAL SUPPORT AS WELL AS THE MAJOR MECHANISM FOR ROTATION AND ALIGNMENT. FOR ONE OF THE TOPS, EXPLODING A SECTION OF A SHOE'S BOOT, WE'VE IDENTIFIED WHAT IS A MICROCRACKS LEAD TO THE SHOE'S CANOE.

INSTEAD OF RELYING ON THE FLEXIBILITY OF AIRWHEELS, THEY PROVIDE STRUCTURAL SUPPORT AS WELL AS THE MAJOR MECHANISM FOR ROTATION AND ALIGNMENT. FOR ONE OF THE TOPS, EXPLODING A SECTION OF A SHOE'S BOOT, WE'VE IDENTIFIED WHAT IS A MICROCRACKS LEAD TO THE SHOE'S CANOE.

[illegible]

WHICH EXAMINATING POINTS EXTENSION LIVES IN THE FIELD, ONE MUST CONSIDER NOT ONLY THE VISIBLE PORTION, CONCEPT, OF THE TREE (THE TRUNK AND CANOPY) BUT THE JUST BELOW GROUND PORTION AS WELL. ON ALL FOREST COMPOSITION MAPS, IMAGINED SPACINGS TREES SHOULD BE NOTED WITH THEIR CRITICAL ROOT ZONES AND ALL SHOULD BE NOTED BY THE BOOKS OF THEIR CRITICAL ROOT ZONES AND NOT JUST BY THE EXTENT OF THEIR CANOPIES.

THE VALUE OF THE CRITICAL POINT INDEX IS DETERMINED BY THE SPECIES AND THE AGE OF THE TREE AS WELL AS THE CONDITION OF THE SOIL (INCLUDING TEXTURE AND HUMIDITY LEVELS). IT IS DIFFICULT TO CORRELATE FOR ALL TREES BUT IN GENERAL IT IS POSSIBLE TO DETERMINE THE GROWTH OF MOST OF ALL OF THE TREES IN QUESTION.

THESE ARE APPROXIMATE VALUES TO ESTIMATE THE SIZE OF THE CRYSTAL. ROCK JONES HAS FIRST EXAMINED THE SCOTTS IN THE FIELD. THE FOLLOWING CALCULATION IS SUGGESTED BUT OTHER METHODS MAY BE ACCEPTED IF BACKING TO

FOR THE RECORD OF LARGE AIRCRAFT, LIST THE OPERATOR OF TWO CHOCOLATE SYSTEMS

7. DATE OF THE CHECK - 7. NUMBER OF THE CHECK (SEE NOTE 10)

FIGURE 10-12. The form of the teeth - LP angles of the central incisors.



THE CHIEF, ROYAL, NOW IN THE AREA IN WHICH MOST OF THE CHIEF'S ROUTE LAY, INCLUDING THIS AREA, ALONG WITH THE THREE STAFF MEN, WOULD BE MAKING A FINAL STOP AT INTERSECTION AREA.

[illegible][illegible]

The diagram illustrates the various protective zones and distances around a tree. Key features labeled include:

- TREE PROTECTING FENCE**: A fence line surrounding the tree.
- FENCE WITHIN 10 FEET OF TRUNK LINE**: A specific fence line near the trunk.
- 1 FOOT THICK OF LIME OF DETERMINANCE LINE**: A line indicating the thickness of the lime of determination.
- 1 FOOT MINIMUM DEPTH**: The minimum depth of the protective zone.
- 12 INCHES MINIMUM**: A minimum distance or depth measurement.
- ROOT PROTECTING FENCE**: A fence line designed to protect the tree's roots.
- TRUNK PROTECTIVE FENCE**: A fence line specifically for protecting the tree trunk.

1. STANDARD WILL BE THE APPLICABLE ONE
2. CONSIDERATION OF STANDARD WILL BE THE APPLICABLE ONE
3. STANDARD WILL BE THE APPLICABLE ONE
4. STANDARD WILL BE THE APPLICABLE ONE
5. STANDARD WILL BE THE APPLICABLE ONE

[illegible]

Pecos River

..... PERMANENT RIVER
 - - - - PERMANENT RIVER (DRAINAGE)
 ——— PERMANENT RIVER (DRAINAGE)
 [Shaded] CLEARED AREA

Pecos River

..... PERMANENT RIVER
 - - - - PERMANENT RIVER (DRAINAGE)
 ——— PERMANENT RIVER (DRAINAGE)
 [Shaded] CLEARED AREA

- | TYPE # | STATUS | NOTES |
|--------|-----------|---|
| 1 | None | PRELIMINARY RECONSTRUCTION CODE (PAC) IMPROVING APPROXIMATELY 1/3 OF OFFICIAL ROAD AHEAD (CROSSING BROWNS) AND ALIGNED TO ACCOMMODATE |
| 2 | None/None | THIS RECONSTRUCTION IS THE SECOND OF FOUR IN A SEQUENCE OF IMPROVEMENTS DISCONNECTED WITH STATE DRAINAGE DUE TO CREEK, ADVANTAGE TO IMPROVE |
| 3 | None/None | PAVE OTHER TRAILS |
| 4 | None/None | STATE IS COMPLETELY AHEAD OF RECONSTRUCTION CODE |
| 5 | None | APPROXIMATELY 1/3 OF OFFICIAL TRAIL ROAD (CROSSING BROWNS) TO ACCOMMODATE |
| 6 | None/None | RECONSTRUCTION CODE REPAIR TRAIL ROAD |

AS A RESULT OF THIS PROCESSING
NO APPROVED DATA WILL BE RELEASED UNDER E.O. 13526

NOTES:

1. INSURE PORTLAND CEMENT SURFACE OF TRUNK.
2. APPLY PORTLAND CEMENT TO OTHER CRACKS, ROOT JOINTS.

1. NO FERTILIZER WITHIN 5 FEET OF TRUNK.
2. ADD 2 POUNDS PER 100 CUBIC FEET OF SOIL.

	GEO-TECHNOLOGY ASSOCIATES, INC. GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS 360-A RICHMILL CORPORATE CENTER DRIVE ARLINGTON, MARYLAND 21050 (301) 584-0000 FAX: (301) 584-0001 WWW.GTAONLINE.COM © 1997 BY GEOTECHNOLOGY ASSOCIATES, INC.
	FOREST CONSERVATION PLAN AND FOREST BUFFER PROTECTION PLAN BEYOND SELF-STORAGE - WHITE MARSH AT 8228 BELAIR ROAD BALTIMORE COUNTY, MARYLAND
REVISIONS: ALLUOT 10.01.01	FOR THE PROPOSED FOREST BUFFER, BOUNDARY, AND BUFFER SUPERVISORY CONNECTIONS BETWEEN THE VARIOUS CONSERVATION PROVED BY THIS PLAN OF THE FOREST CONSERVATION PLAN OF THE SELF-STORAGE, ETC.

BALTIMORE COUNTY, MARYLAND

INTEROFFICE CORRESPONDENCE

TO: Michael Millanoff, Director
Department of Permits, Approvals
FROM:  Vishnu Desai, Supervisor
Bureau of Development Plans Review

DATE: 01/21/2020

SUBJECT: Zoning Advisory Committee Meeting
For November 29, 2019
Item No. 2019-0526

The Bureau of Development Plans Review has reviewed the subject zoning items and we have the following comments.

If Special Hearing and Zoning Relief is granted, a Landscape Plan is required per the requirements of the Landscape Manual. A Lighting Plan is also required.

The project site as shown on the "Plan to Accompany Administrative Special Hearing" for Beyond Self-Storage dated November 21, 2019, shows that the proposed building, driveway, parking, grading, associated utilities, etc. are inside of the special flood hazard area (100-year Floodplain) as described by Baltimore County regulations.

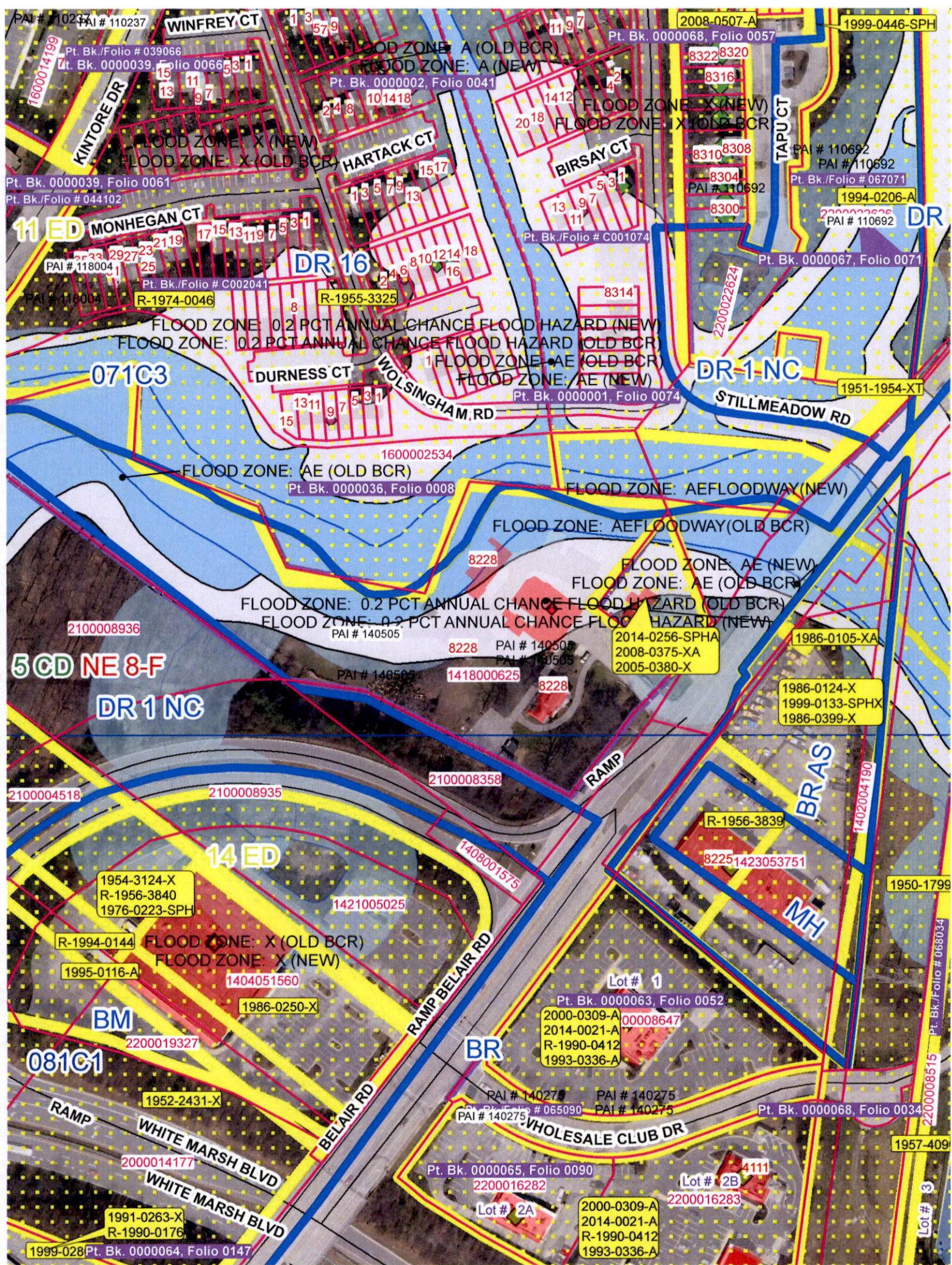
Baltimore County Code Sections 32-4-414, 32-8 and the 2015 Baltimore County Building Code Part 125 all state "no building in a riverine flood plain".

A Flood Study performed by Kimley Horn and Associates, Inc. dated October, 2019 signed and sealed by a Maryland Professional Engineer has been submitted to Baltimore County. On Page 10 of the report, the engineer states "*Although the proposed grading and improvements extend into the limits of ultimate condition Baltimore County floodplain, the proposed improvements do not cause increased in 100-year water surface elevations.*"

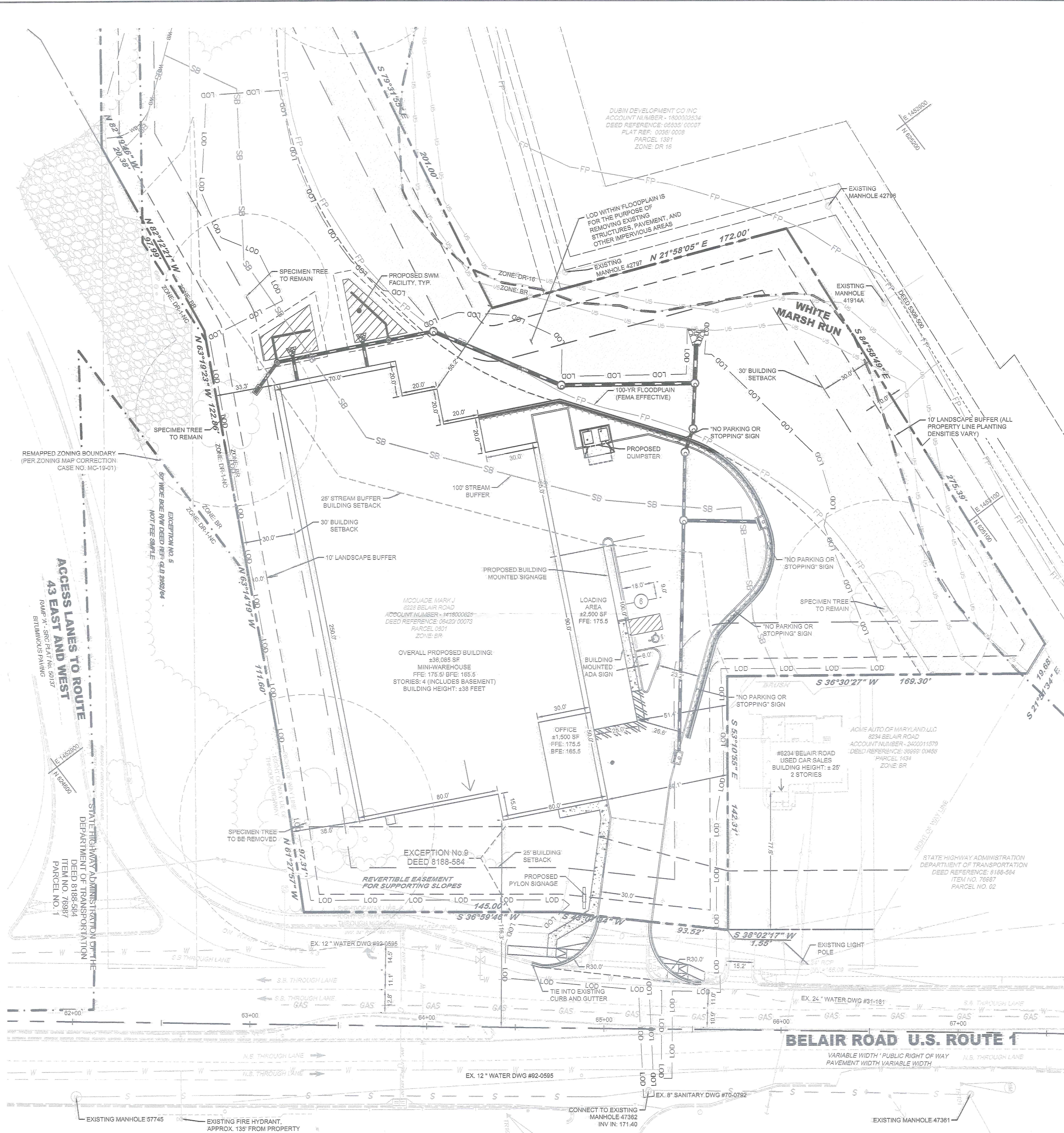
The Department of Public Works takes no exception for the approval of the waiver request.

* * * * *

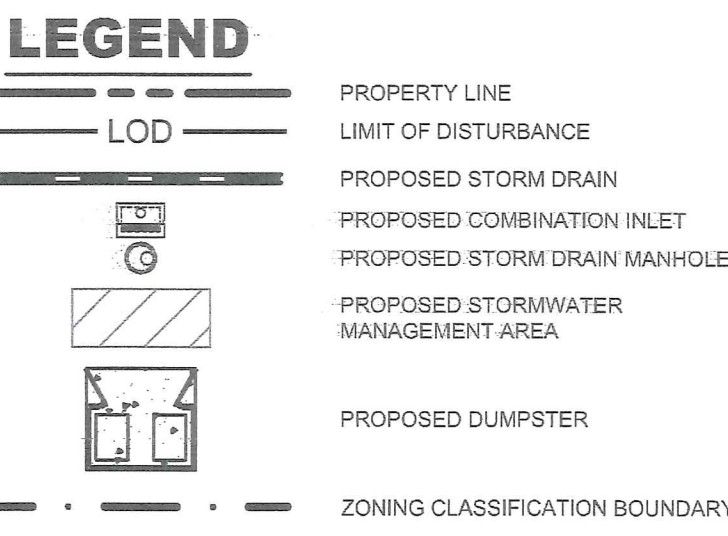
VKD: cen
cc: file







BULK REGULATIONS		
REGULATION	BR REQUIRED	PROVIDED
FRONT	25' FROM PROPERTY LINE, 50' STREET CENTERLINE, OR 50' PROPERTY ON DUAL HIGHWAY	51.7'
REAR	30' FROM PROPERTY LINE	55.2
SIDE	30' FROM PROPERTY LINE	38.5'
BUILDING HEIGHT (MAX.)	40'-0"	±38

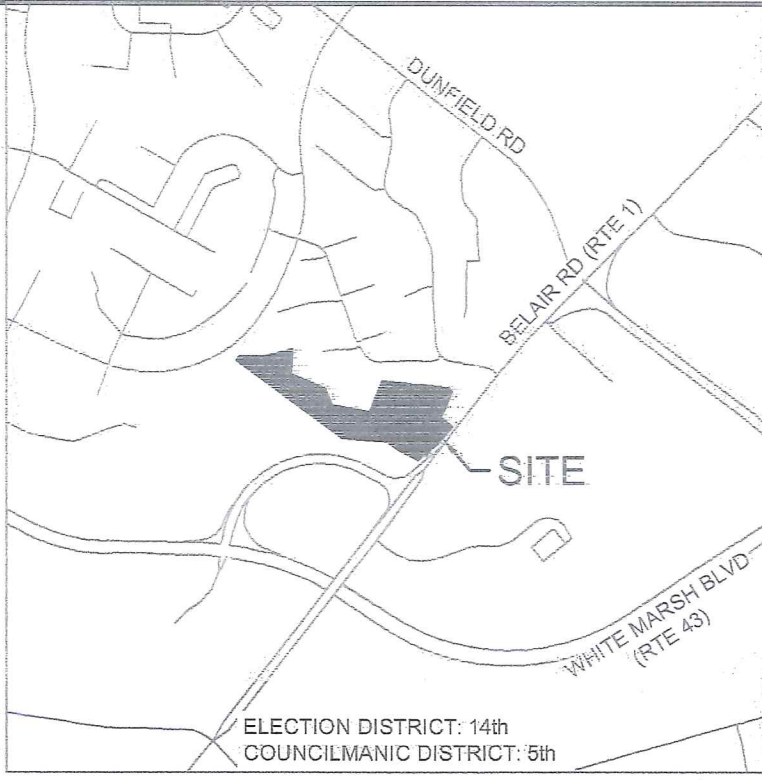


NOTES:

1. THERE SHALL BE NO CLEARING, GRADING, CONSTRUCTION OR DISTURBANCE OF VEGETATION IN THE FOREST BUFFER EASEMENT, FOREST CONSERVATION EASEMENT, OR FOREST BUFFER AND FOREST CONSERVATION EASEMENT EXCEPT AS DETERMINED BY THE BALTIMORE COUNTY DEPARTMENT OF ENVIRONMENTAL PROTECTION AND SUSTAINABILITY.
2. ANY FOREST BUFFER EASEMENT, FOREST CONSERVATION EASEMENT, OR FOREST BUFFER AND FOREST CONSERVATION EASEMENT SHOWN HEREON IS SUBJECT TO PROTECTIVE COVENANTS WHICH MAY BE FOUND IN THE LAND RECORDS OF BALTIMORE COUNTY AND WHICH RESTRICT DISTURBANCE AND USE OF THESE AREAS.

SITE DATA/ GENERAL NOTES:

- GROSS AND NET ACRES
 1.1. PARCEL 0501: ±5.218 ACRES
 1.2. GFA: 36085 SF*4 STORIES = 144340 SF (3.31 ACRES)
 1.3. EXISTING ZONING: FLOOR AREA RATIO = 3.31 ACRES/5.218 ACRES = 0.635
 1.4. AND DR 16 (DENSITY RESIDENTIAL 16 UNITS/ACRE) BR (BUSINESS ROADSIDE), DR1 NC (DENSITY RESIDENTIAL 1 UNIT/ACRE NEIGHBORHOOD COMMONS),
 1.5. EXISTING LAND USE: TRACTOR AND LAWN EQUIPMENT SUPPLY STORE
 1.6. PROPOSED USE: MINI-WAREHOUSE AND OUTDOOR STORAGE
 1.7. PARKING REQUIREMENTS: 3.3 PG.1000 SF OFFICE = 4 PS
 1.8. PARKING PROVIDED: 9 PS (8' X 16'); 5 STANDARD AND 1 ADA
 1.9. PROPERTY INFORMATION:
 1.9.1. TAX ACCOUNT #: 1418000625
 1.9.2. DEED REFERENCE: 642073
 1.9.3. ADJ MAP LOCATION: 4550G/44580K10
 1.9.4. TAX MAP: 0071
 1.9.5. PARCEL: 0501
 1.9.6. ZONING MAP: N.E. 8-F
 1.9.7. WATERSHED: BIRD RIVER
 1.9.8. SUB SEWERSHED: WHITE MARSH RUN
 1.9.9. BASIC SERVICES - WATER MAP: W-1 EXISTING SERVICE AREA, THE PROJECT IS NOT IN A WATER DEFICIENT AREA
 1.9.10. BASIC SERVICES - SEWER MAP: S-1 EXISTING SERVICE AREA, THE PROJECT IS NOT IN A SEWER DEFICIENT AREA
 1.9.11. BASIC SERVICES - TRANSPORTATION: PARKVILLE
 1.9.12. REGIONAL PLANNING DISTRICT: 4403
 1.9.13. CENSUS TRACT: 4403
 1.10. BUREAU OF TRAFFIC ENGINEERING AND TRANSPORTATION PLANNING HAS CONFIRMED THAT THE SUBJECT SITE IS NOT WITHIN A TRAFFIC DEFICIENT AREA.
 1.11. THIS PROJECT IS INSIDE OF THE URBAN RURAL DEMARCATION LINE.
 1.12. THIS SITE IS NOT LOCATED IN THE CHESAPEAKE BAY CRITICAL AREA.
 1.13. PROPERTY IS NOT UNDER ANY ACTIVE ZONING VIOLATIONS.
 1.14. THIS DEVELOPMENT WILL BE CONSTRUCTED IN ONE PHASE.
 1.15. THERE ARE NO SIGNIFICANT VIEWS PRESENT ON THIS SITE.
 1.16. THE DEVELOPER SHALL INVESTIGATE FOR AVAILABILITY OF ADEQUATE FIRM FLOW AT THE SITE.
 1.17. OFFSITE RIGHT LINE EASEMENTS ARE NOT ANTICIPATED FOR THIS PROJECT.
 1.18. AVERAGE DAILY TRIPS (ADTs): 41
 1.19. PER BALTIMORE REGION TRANSIT MAPS, THE PROPOSED DEVELOPMENT AREA AREA IS NOT SERVED BY MTA BUSES.
 1.20. SEE ZONING SUMMARY TABLE FOR ZONING INFORMATION.
 1.21. THIS DEVELOPMENT IS SUBJECT TO THE COMPREHENSIVE MANUAL OF DEVELOPMENT POLICIES (SECTION 504.2), AND THE COUNTY LANDSCAPE MANUAL (SECTION 409.8.A.1). THIS DEVELOPMENT WILL COMPLY AND BE CONSISTENT WITH ALL OF THE AFOREMENTIONED REGULATIONS, STANDARDS, GUIDELINES, AND POLICIES OR THE PROPER RELIEF WILL BE REQUESTED.
 1.22. THERE IS NO CONFORMANCE TO THE BALTIMORE COUNTY ZONING CODE, SECTIONS 450 OR APPROPRIATE RELIEF WILL BE REQUESTED.
 1.23. THERE ARE NO KNOWN BUILDINGS, PROPERTIES, OR SITES WITHIN OR ADJOINING THE PROPOSED DEVELOPMENT INCLUDED ON THE MARYLAND HISTORICAL TRUST INVENTORY (MHT), BALTIMORE COUNTY LANDMARKS LIST, THE NATIONAL REGISTER OF HISTORIC PLACES, OR THE MARYLAND ARCHEOLOGICAL SURVEY. THE PROJECT SITE IS NOT LOCATED WITHIN ANY BALTIMORE COUNTY OR NATIONAL HISTORIC DISTRICTS.
 1.24. THERE ARE NO PRIOR ZONING CASES FOR THIS PROPERTY.
 1.25. THE PRELIMINARY SHOW IS PRELIMINARY, FURTHER INVESTIGATION AND COORDINATION WITH THE MARYLAND STATE HIGHWAY ADMINISTRATION IS ON-GOING.
 1.26. A ZONING MAP AMENDMENT WAS SUBMITTED TO REMOVE THE DR-1-NC ZONING FROM THIS PROPERTY. THIS AMENDMENT WAS APPROVED AND PROCESSED BY BALTIMORE COUNTY UNDER CASE NUMBER MC-19-01.
 1.27. OPERATING HOURS: MONDAY THRU FRIDAY: 9AM-5PM SATURDAY: AND 10AM-4PM ON SUNDAY.
 1.28. STORAGE SPACE AND THE LOADING/UNLOADING DOORS ARE LOCKED AND KEY CARD ACTIVATED FOR TENANT USE ONLY AND ARE AVAILABLE FOR ENTRY 24/7.



VICINITY MAP

SCALE: 1" = 1000'

No.	REVISIONS	DATE	BY
1	1. Initial Design	10/10/2023	10/10/2023
2	2. Design Review	10/10/2023	10/10/2023
3	3. Design Approval	10/10/2023	10/10/2023
4	4. Design Change	10/10/2023	10/10/2023
5	5. Design Update	10/10/2023	10/10/2023
6	6. Design Final	10/10/2023	10/10/2023
7	7. Design Release	10/10/2023	10/10/2023
8	8. Design Archive	10/10/2023	10/10/2023
9	9. Design Backup	10/10/2023	10/10/2023
10	10. Design Restore	10/10/2023	10/10/2023

Kimley»»Horn

© 2019 KIMLEY-HORN AND ASSOCIATES, INC.
1801 PORTER ST., SUITE 401, BALTIMORE, MD 21230
PHONE: 443-743-3470
WWW.KIMLEY-HORN.COM



PROFESSIONAL CERTIFICATION: I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND.
 LICENSE NO. 44113
 EXPIRATION DATE 06/10/2021

DATE	11/21/2019
SCALE	AS SHOWN
DESIGNED BY	RLH
DRAWN BY	ECS

PLAN TO ACCOMPANY ADMINISTRATIVE SPECIAL HEARING

TAX MAP: 0071
GRID NO: 0023
PARCEL: 0501
ELECTION DISTRICT: 14th
COUNCILMANIC DISTRICT: 5th

PROJECT NAME:
**BEYOND
SELF-STORAGE
WHITE MARSH**



8228 BELAIR ROAD,
BALTIMORE, MD 21236

SHEET NUMBER:
1 OF 1

DRC #- 090418D
PAI #- 14-0505
LIMITED EXCEPTION #- 19003LN
MCS NAD 83(2011)/NAVD 88

OWNER:	APPLICANT:	CONSULTANT:
PROPERTY OWNER: PARCEL 0901 INCQUADE, MARK J 8228 BELMIRE RD BALTIMORE, MD 21238	DEVELOPER/ CONTRACT PURCHASER/ APPLICANT: NORTHPOINT DEVELOPMENT, LLC ATTN: JOHNNY WENIEY 4928 NW 41ST STREET SUITE 500 RIVERSIDE, MISSOURI 64150 TEL: (816) 281-2901 EMAIL: JSWENIEY@NORTHPOINTKC.COM	CIVIL ENGINEER: KIMLEY-HORN AND ASSOCIATES, INC. 1801 PORTER ST, SUITE 401 BALTIMORE, MD 21230 CALL: 443-743-3470 ATTN: NICHOLAS J LEFFNER, PE

CALL 48 HOURS
BEFORE YOU DIG

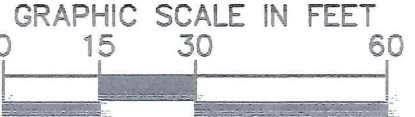
IT'S THE LAW!
DIAL 811

Know what's below.
Call before you dig

The logo for the 811 service, featuring the number 811 in a stylized font with a shovel icon integrated into the number 1.

PLAN TO ACCOMPANY ADMINISTRATIVE SPECIAL HEARING

SCALE: 1" = 30'



2019-0526-SPM

OWNER: APPLICANT: CONSULTANT:
PROPERTY OWNER: PARCEL 0591
APPLICANT: DEVELOPER CONTRACT PURCHASER APPLICANT
CONSULTANT: CIVIL ENGINEER
KIMLEY-HORN AND ASSOCIATES, INC.

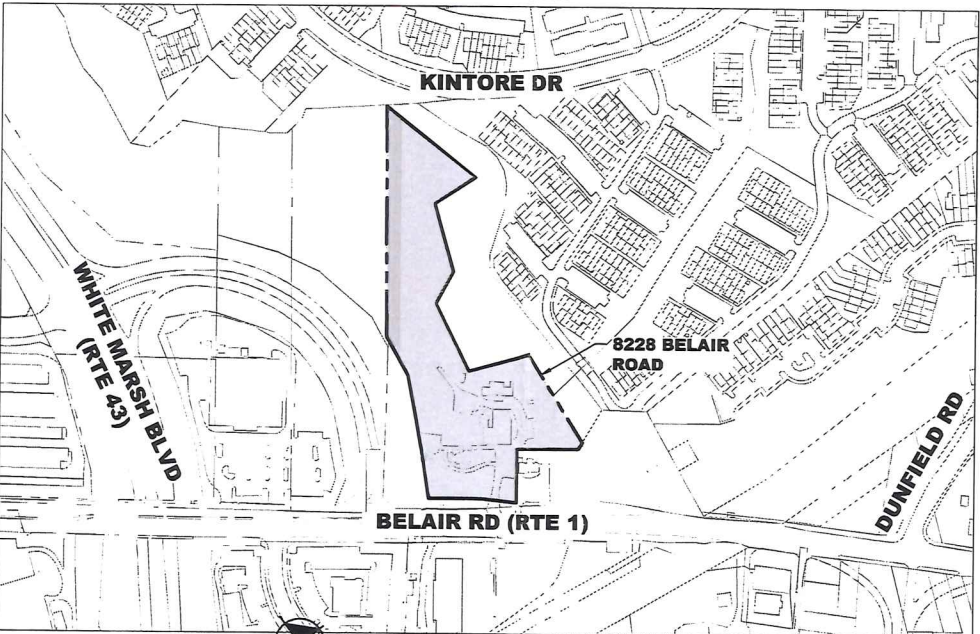
SITE DATA/ GENERAL NOTES:
1. GROSS AND NET ACREAGE
2. EXISTING ZONING
3. EXISTING LAND USE
4. PROPOSED USE
5. PROPERTY INFORMATION
6. DEED REFERENCE
7. ADD MAP LOCATION
8. TAX MAP
9. PARCEL
10. WATERSHED
11. SUB-SEWER/SEWER
12. BASIC SERVICES - WATER MAP
13. BASIC SERVICES - SEWER MAP
14. BASIC SERVICES - TRANSPORTATION
15. REGIONAL PLANNING DISTRICT
16. CENSUS TRACT
17. BUREAU OF TRAFFIC ENGINEERING AND TRANSPORTATION PLANNING HAS CONFIRMED THAT THE SUBJECT SITE IS NOT WITHIN A TRAFFIC DEFICIENT AREA.

FIRE PREVENTION NOTES:
1. THE PROPOSED BUILDING(S) SHALL BE DESIGNED AND CONSTRUCTED AS TO MEET THE APPLICABLE PROVISIONS OF THE BALTIMORE COUNTY FIRE PREVENTION CODE, COUNTY BILL NO. 3-17.
2. WHERE FIRE PROTECTION WATER SUPPLIES ARE REQUIRED TO BE PROVIDED SHALL BE INSTALLED AND MADE AVAILABLE FOR USE NOT LATER THAN THE TIME WHEN CONSTRUCTION OF ANY INDIVIDUAL BUILDING IS UNDER ROOF.
3. A CRUISER RUN ROAD ACCESS TO BUILDING AND REQUIRED WATER SUPPLIES SHALL BE AVAILABLE FOR THE USE BY EMERGENCY FIRE APPARATUS AND CAPABLE OF HANDLING EMERGENCY APPARATUS WEIGHING 70,000 LBS WHEN CONSTRUCTION OF ANY BUILDING IS UNDER ROOF.
4. A FIRE HYDRANT, IF REQUIRED, SHALL BE WITHIN 100 FEET OF THE FIRE DEPARTMENT CONNECTION (PDC). A DISTANCE OF 150 FEET IS PERMISSIBLE IF THE TOTAL DISTANCE IS DRIVABLE BY THE EMERGENCY APPARATUS.
5. ON-SITE FIRE HYDRANTS, IF REQUIRED, MUST BE A MINIMUM DISTANCE OF 40 FEET FROM THE BUILDING IN ACCORDANCE WITH THE BALTIMORE COUNTY FIRE PREVENTION CODE, COUNTY BILL NO. 3-17 SECTION 118.1.1 (1).

ENVIRONMENTAL NOTES:
1. BOUNDARY INFORMATION AND EXISTING TOPOGRAPHY BASED ON ALTA BOUNDARY AND TOPOGRAPHIC SURVEY COMPLETED BY MTL'S LAND SURVEYORS, LLC ON AUGUST 28, 2018, AND SUPPLEMENTED WITH BALTIMORE COUNTY GIS DATA.
2. A FOREST STAND DELINEATION HAS BEEN PREPARED BY GEOTECHNICAL ASSOCIATES, INC. (GTA) AND IS PENDING APPROVAL BY BALTIMORE COUNTY ENVIRONMENTAL IMPACT REVIEW (EIR) ON NOVEMBER 27, 2018.
3. A PRELIMINARY FOREST CONSERVATION PLAN IS BEING PREPARED BY GEO-TECHNOLOGY ASSOCIATES, INC. FOR APPROVAL BY THE BALTIMORE COUNTY DEPARTMENT OF ENVIRONMENTAL PROTECTION SERVICES.
4. WETLAND AND STREAM DELINEATION HAS BEEN COMPLETED BY GEO-TECHNOLOGY ASSOCIATES, INC. ON NOVEMBER 27, 2018. A NON-TOTAL WETLANDS INVESTIGATION WAS PERFORMED BY GTA ON NOVEMBER 27, 2018. A FULL WETLANDS STREAMS REPORT AND DELINEATION HAS BEEN PREPARED FOR REVIEW BY BALTIMORE COUNTY.
5. PER FEMA PANEL NUMBER 2800010202P, A PORTION OF THE SITE IS LOCATED IN A NON-TIDALLY INFLUENCED FLOODPLAIN. A VARIANCE TO CONSTRUCT WITHIN THE 100' FORESTED STREAM BUFFER AND 25' SETBACK MAY BE REQUIRED. THE PROPOSED IMPROVEMENTS REDUCE BOTH THE QUANTITY AND PROXIMITY OF IMPERVIOUS AREA TO THE EXISTING STREAM AND IMPROVE THE BUFFER.

CALL 48 HOURS BEFORE YOU DIG
IT'S THE LAW! DIAL 811
NAME PID STATUS DATE SET ADJUSTMENT NORTHING (NAD 83) EASTING (NAD 83) ELEVATION (NAD 88) DESCRIPTION
OS-181 NA ACTIVE 1/12/2009 12/12/2017 925929 611 201.65 BRASS DISK
AZ-181 NA ACTIVE 7/12/2004 12/12/2017 925929 644 164.1558 231.97 BRASS CAP

LIMITED EXEMPTION DEVELOPMENT PLAN
BEYOND SELF-STORAGE - WHITE MARSH
AT 8228 BELAIR ROAD



LOCATION MAP
SCALE: 1" = 200'

STATE HIGHWAY ADMINISTRATION:
1. A TRIP GENERATION STUDY WAS SUBMITTED TO MDOT SHA FOR REVIEW. NO ADDITIONAL TRAFFIC ANALYSIS IS REQUIRED BY MDOT SHA.
2. AN ACCESS PERMIT WILL BE REQUIRED FOR ALL CONSTRUCTION IN THE MDOT SHA RIGHT-OF-WAY ON BELAIR ROAD AND WILL BE TRACKED UNDER THE MDOT SHA TRACKING NUMBER: 18APR20XX.
3. AREAS BETWEEN THE SIGHT LINE AND CURB LINE MUST BE CLEARED, GRADED, AND KEPT FREE OF OBSTRUCTIONS.

ZONING CERTIFICATION:
THIS IS TO CERTIFY THAT THERE ARE NO KNOWN ZONING VIOLATIONS ON ANY PROPERTIES WITHIN BALTIMORE COUNTY OWNED OR CONTROLLED BY UNDERDESIGNED PROPERTY OWNERS(S) AND/OR DEVELOPER(S) OF THE DEVELOPMENT KNOWN AS BEYOND SELF-STORAGE - WHITE MARSH.
THE UNDERDESIGNED ACKNOWLEDGES THAT SHOULD ANY ZONING VIOLATIONS BE DISCOVERED DURING PROCESSING OF THIS DEVELOPMENT, THE PROVISION OF TITLE 22, BILL 18-80, MAY PREVENT THE COUNCIL FROM GRANTING APPROVALS AT ANY STAGE OF THE PROCESS.

DEVELOPMENT PLAN REVIEW AND REAL ESTATE COMPLIANCE:
1. LANDSCAPING SHALL COMPLY WITH THE BALTIMORE COUNTY LANDSCAPE MANUAL. A FINAL LANDSCAPE PLAN SHALL BE PREPARED/REVIEWED PRIOR TO BUILDING PERMIT APPLICATION IN ACCORDANCE WITH THE BALTIMORE COUNTY LANDSCAPE MANUAL.
2. A LIGHTING PLAN THAT CONFORMS WITH IESNA STANDARDS SHALL BE SUBMITTED IN CONJUNCTION WITH THE FINAL LANDSCAPE PLAN.
3. THIS PROJECT WILL BE SERVED BY PUBLIC WATER AND SEWER.
4. A RECORD PLAN WILL BE PROVIDED WITH THIS PROJECT.
5. WHERE APPLICABLE, RAMPS SHALL BE PROVIDED FOR PHYSICALLY HANDICAPPED PERSONS WITH DETECTABLE WARNING STRIPS, PER STANDARD DETAILS 193A AND R-308 AND SHA STD DET. 655.12 AND 655.19.

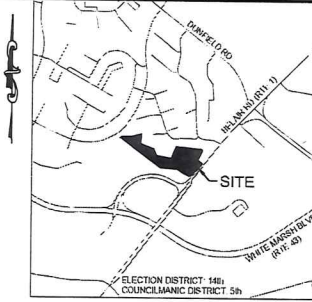
CERTIFICATE AS TO DELINQUENT ACCOUNTS:
THIS CERTIFICATION IS SUBMITTED IN CONNECTION WITH THE DEVELOPMENT KNOWN AS BEYOND SELF-STORAGE - WHITE MARSH AND IS GIVEN IN ACCORDANCE WITH THE PROVISIONS OF SECTION 22-55 (C) OF THE BALTIMORE COUNTY CODE, 1978 AS AMENDED.
I, Nicholas J. Leffner, Director of Project Accounting, CERTIFY UNDER OATH THAT THERE ARE NO DELINQUENT ACCOUNTS FOR ANY OTHER DEVELOPMENT WITH RESPECT TO ANY OF THE FOLLOWING: THE APPLICANT, A PERSON WITH FINANCIAL INTEREST IN THE PROPOSED DEVELOPMENT, OR A PERSON WHO SHALL PERFORM CONTRACTUAL SERVICES ON BEHALF OF THE PROPOSED DEVELOPMENT.

SLOPE PROTECTION NOTE:
THE DEVELOPMENT AS PROPOSED WILL INCLUDE PROTECTIVE MEASURES ADEQUATE TO PREVENT EROSION OR SLOUGHING OF ANY STEEP SLOPES AS DEFINED BY SECTION 34-4-101 OF THE BALTIMORE COUNTY CODE AND PROMOTE THE PRESERVATION OF THE NATURAL TOPOGRAPHIC FEATURES OF THE STEEP SLOPE. THIS WILL BE ACHIEVED BY PROVIDING EROSION AND SEDIMENT CONTROL MEASURES IN ACCORDANCE WITH THE REQUIREMENTS OF THE BALTIMORE COUNTY SOIL CONSERVATION DISTRICT AND THE CURRENT STATE OF MARYLAND AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL.

VARIANCE NOTES:
1. A FOREST CONSERVATION SPECIAL VARIANCE WAS GRANTED BY BALTIMORE COUNTY DEPARTMENT OF ENVIRONMENTAL PROTECTION AND SUSTAINABILITY ON AUGUST 27, 2019 TO ALLOW FOR THE REMOVAL OF SPECIFIC TREES ON THIS PROJECT SITE. ATTENTION WAS PROVIDED BY MEETING ALL FOREST CONSERVATION REQUIREMENTS OUTLINED ON THE FOREST CONSERVATION PLAN FOR THE PROJECT. IF ANY SPECIFIC TREE SHOWN ON THE PLAN TO BE RETAINED IS PROPOSED TO BE REMOVED, SPECIAL VARIANCE APPROVAL OR AUTHORIZATION MUST FIRST BE OBTAINED FROM THE DEPARTMENT OF ENVIRONMENTAL PROTECTION AND SUSTAINABILITY. ON AUGUST 27, 2019, A VARIANCE WAS GRANTED BY THE BALTIMORE COUNTY DEPARTMENT OF ENVIRONMENTAL PROTECTION AND SUSTAINABILITY PURSUANT TO BALTIMORE COUNTY CODE ARTICLE 33, TITLE 3 PROTECTION OF WATER QUALITY STREAMS, WETLANDS AND FLOODPLAINS TO ALLOW IMPACTS TO THE FOREST BUFFER FOR REDEVELOPMENT OF THIS COMMERCIAL PROPERTY. CONDITIONS, INCLUDING ON-SITE FOREST BUFFER PLANTING, WERE PLACED ON THIS VARIANCE TO REDUCE WATER QUALITY IMPACTS.

SUITABLE OUTFALL STATEMENT:
KIMLEY-HORN HAS EVALUATED THE LOCATION OF THE PROPOSED STORMWATER MANAGEMENT (SWM) OUTFALL FOR THE PROPOSED STORMWATER MANAGEMENT FACILITIES AND SITE DRAINAGE ON THE PROPERTY AT 8228 BELAIR ROAD. THIS OUTFALL LOCATION HAS BEEN FOUND TO BE SUITABLE FOR THE PROPOSED RELEASE RATE AT THIS POINT BASED ON RIP-RAP OUTFALL PROTECTION DESIGN AND COORDINATION WITH BALTIMORE COUNTY ON THE REQUIRED QUANTITY MANAGEMENT FOR THIS SITE. A SITE VISIT WAS COMPLETED TO DETERMINE THE LOCATION OF THE PROPOSED OUTFALL.
THE PROPOSED PROPERTY AT 8228 BELAIR ROAD DRAINS TO TWO SEPARATE STORMWATER MANAGEMENT FACILITIES THAT WILL PROVIDE WATER QUALITY, CHANNEL PROTECTION AND SUSTAINABILITY. THE FACILITIES ARE LOCATED TO THE WEST AND 15-AND 100-YEAR ARE NOT REQUIRED AS THE SITE IS IN DEVELOPMENT, AND 15-YEAR AND 100-YEAR ARE NOT REQUIRED AS THE SITE IS IN DEVELOPMENT, AND 15-YEAR AND 100-YEAR ARE NOT REQUIRED AS THE SITE IS IN DEVELOPMENT, AND 15-YEAR AND 100-YEAR ARE NOT REQUIRED AS THE SITE IS IN DEVELOPMENT.

ZONING SUMMARY table with columns: APPROXIMATE ACREAGE, ZONING, FRONT BUILDING SETBACK, SIDE BUILDING SETBACK, REAR SETBACK, LANDSCAPE BUFFER ADJ. STREETS, LANDSCAPE BUFFER ADJ. OTHER PROPERTIES, PARKING PROVIDED, MAX BUILDING HEIGHT, FAR REQUIREMENTS.



SOILS DATA table with columns: SYMBOL, SOIL SERIES, SLOPE, HYDRIC, K, HIGHLY ERODIBLE?, HYDROLOGIC CLASSIFICATION, WITHIN LOO?.

IT IS, THEREFORE, this 20th day of May, 2019, by the Board of Appeals of Baltimore County hereby
ORDERED that the Department of Planning reclassify the zoning of the portion of the property known as 8228 Belair Road in the Nottingham area of Baltimore County, Maryland, which is zoned D.R. 1-N.C. (Density Residential 1 - Neighborhood Commons) to B.R. (Business, Roadside) in accordance with the legislative intent of the County Council as reflected on County Exhibit 7; and it is further
ORDERED that the Department of Planning make the necessary changes in the official zoning maps as reflected on County Exhibit 7.

ORDER
IT IS, THEREFORE, this 20th day of May, 2019, by the Board of Appeals of Baltimore County hereby
ORDERED that the Department of Planning reclassify the zoning of the portion of the property known as 8228 Belair Road in the Nottingham area of Baltimore County, Maryland, which is zoned D.R. 1-N.C. (Density Residential 1 - Neighborhood Commons) to B.R. (Business, Roadside) in accordance with the legislative intent of the County Council as reflected on County Exhibit 7; and it is further
ORDERED that the Department of Planning make the necessary changes in the official zoning maps as reflected on County Exhibit 7.

Sheet List Table with columns: Sheet Number, Sheet Title.

BOARD OF APPEALS OF BALTIMORE COUNTY
Jason S. Garber, Chairman
Joseph L. Evans
Maureen E. Murphy

EXISTING BUILT CONDITIONS table with columns: EXISTING, NOT EXISTING, REMARKS.

COUNTY ADOPTED PLANS table with columns: EXISTING, NOT EXISTING, IN CONFORMANCE, PLAN, REMARKS.

TRACKING # - LIM-2019-00002
L.O.D. = 2.43 AC. OR 105,744 S.F.
DRC# - 090418D
PAI# - 14-0505N
LIMITED EXEMPTION # - 190030N

PROJECT NAME: BEYOND SELF-STORAGE WHITE MARSH
8228 BELAIR ROAD, BALTIMORE, MD 21238

Table with columns: NO., REVISIONS, DATE, BY.

Kimley-Horn
© 2019 KIMLEY-HORN AND ASSOCIATES, INC.
1801 PORTER ST., SUITE 401, BALTIMORE, MD 21230
PHONE: 443-743-3470
WWW.KIMLEY-HORN.COM

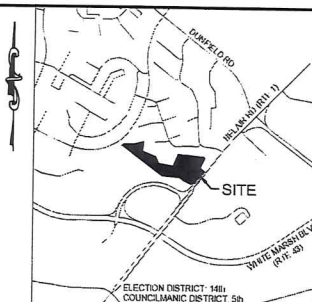
COVER SHEET

LIMITED EXEMPTION DEVELOPMENT PLAN

TAX MAP 0071
GRID NO. 0023
PARCEL 0591
ELECTION DISTRICT: 5th
COUNCILMANIC DISTRICT: 5th

PROJECT NAME: BEYOND SELF-STORAGE WHITE MARSH

8228 BELAIR ROAD, BALTIMORE, MD 21238

[illegible]

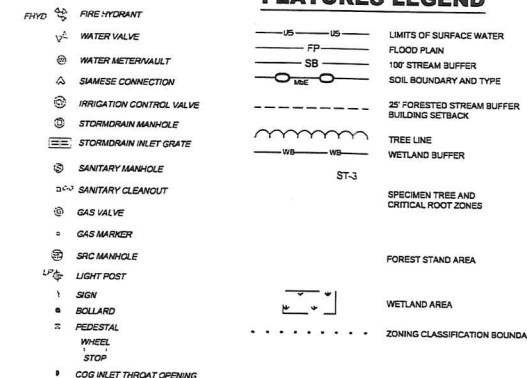
Kimley»Horn
© 2019 KIMLEY-HORN AND ASSOCIATES, INC.
1801 PORTER ST., SUITE 401, BALTIMORE, MD 21230
PHONE: 443-743-3470

© 2019 KIMLEY-HORN AND ASSOCIATES, INC.
1801 PORTER ST, SUITE 401, BALTIMORE, MD 21201
PHONE: 443-743-3470

VICINITY MAP
SCALE: 1" = 1000'

SCALE: 1" = 10'

ENVIRONMENTAL FEATURES | LEGEND



SOILS DATA						
SYMBOL	SOIL SERIES	SLOPE	HYDRIC	K	HIGHLY ERODIBLE?	HYDROLOGIC CLASSIFICATION
ChD	CROOM GRAVELLY SANDY LOAM	10-15%	NO	0.20	N	C
IsA	ISBUC GLT LOAM, OCCASIONALLY FLOODED	N/A	YES	0.37	N	B/D
MbE	MANOR CHANNERY LOAM	25-45%	NO	0.28	Y	B
UcF	UDORTHENTS, 1818 HWY	0-60%	NO	N/A	N/A	N/A
Ur	URBAN LAND	0-8%	NO	N/A	N/A	D
UaB	URBAN LAND UDORTHENTS COMPLEX	0-8%	NO	N/A	N/A	D/D

NATURAL RESOURCES INVENTORY								
FEDERAL REGULATED			STATE REGULATED			LOCAL REGULATED		
PRESENT?	FEATURE	LEGEND SYMBOL/COLOR	PRESENT?	FEATURE	LEGEND SYMBOL/COLOR	PRESENT?	FEATURE	LEGEND SYMBOL/COLOR
(Y/N)			(Y/N)			(Y/N)		
N	MAJOR WATERWAYS	N/A	N	WETLANDS OF SPECIAL STATE	N/A	N	HIGH ERODIBLE SOILS	
Y/N	FLOODPLAIN S	N/A	Y	WETLAND BUFFERS	REFER TO PLAN DP-2	N	ENHANCE STREAMS	
			Y	STREAM BUFFERS	REFER TO PLAN DP-2	Y	TOPOGRAPHIC SLOPES	REFER TO PLAN DP-2
			N	PERENNIAL STREAMS	N/A	N	SPRINGS	
			Y	FLOODPLAIN S	REFER TO PLAN DP-2	N	SEEPS	
			Y	FORESTS	REFER TO PLAN DP-2	N	INTERMITTENT STREAMS	
			Y	FOREST BUFFERS	REFER TO PLAN DP-2	Y	VEGETATIVE COVER	REFER TO PLAN DP-2
			N	CRITICAL AREAS	N/A	Y	SOILS	SEE SOILS TABLE
						N	BEDROCK/ GEOLOGY	N/A
						N	EXISTING DRAINAGE AREA	
						N	EXISTING SWM	

NOTES:

1. CONTRACTOR IS RESPONSIBLE FOR THE COST OF CAPING OR PLUGGING ANY EXISTING HOLE OR EXCAVATIONS NOT USED TO SEWAGE TO THE PROPOSED SITE.
2. THERE SHALL BE NO CLEARING, GRADING, OR CONSTRUCTION OR DISTURBANCE OF VEGETATION IN THE FOREST BUFFER EASEMENT, FOREST CONSERVATION EASEMENT, OR FOREST BUFFER AND FOREST CONSERVATION EASEMENT UNLESS PERMITTED BY THE BALTIMORE COUNTY DEPARTMENT OF ENVIRONMENTAL PROTECTION AND SUSTAINABILITY.
3. ANY FOREST BUFFER EASEMENT, FOREST CONSERVATION EASEMENT, OR FOREST BUFFER AND FOREST CONSERVATION EASEMENT SHOWN HEREON IS SUBJECT TO PROTECTIVE COVENANTS WHICH MAY BE DEPOSITED IN THE RECORDS OF BALTIMORE COUNTY AND WHICH RESTRICT DISTURBANCE AND USE OF THESE AREAS.

TRACKING # - LIM-2019-00002
L.O.D.= 2.43 AC. OR 105,744 S.F.
DRC# - 090418D
PAI# - 14-0505
LIMITED EXEMPTION # - 19003LN

PROJECT NAME:
**BEYOND
SELF-STORAGE
WHITE MARSH**



8228 BELAIR ROAD,
BALTIMORE, MD 21235

SHEET NUMBER
DP-2

TAX MAP	PARCEL	OWNER	DEED REFERENCE	TAX PIN	ZONING	CURRENT USE
	1391	QUBIN DEVELOPMENT CO INC	05638 0087	1060020254	DR 16	HOA/CO-DEVELOPER/RESIDENTIAL/FAMILY M
71	0000	STATE HIGHWAY ADMINISTRATION	09196 0564	2100300350	BRDR 1	COMMERCIAL
71	1404	ADME AUTO OF MARYLAND LLC	38560 0456	2400110750	BR	ROAD
81	0000	STATE HIGHWAY ADMINISTRATION	09527 0287	1100020675	BRDR 1	COMMERCIAL
01	0000	STATE HIGHWAY ADMINISTRATION	09527 0287	1100020676	DR 1	HOA/CO-DEVELOPER/RESIDENTIAL/FAMILY M
71	1328	BELMONT SOUTH COMMUNITY ASSOC INC	05560 0420	1700050100	DR 1	HOA/CO-DEVELOPER/RESIDENTIAL/FAMILY M
81	0467	SCHULTER, CHARLES F	16230 0016	1423053751	BR AS	COMMERCIAL
81	0449	NATIONAL RETAIL PROPERTIES LP	07149 0420	2200020567	BR	COMMERCIAL

AD-JOINING LANDOWNERS

EXISTING CONDITIONS AND SITE CONSTRAINTS MAP

SCALE: 1" = 30'



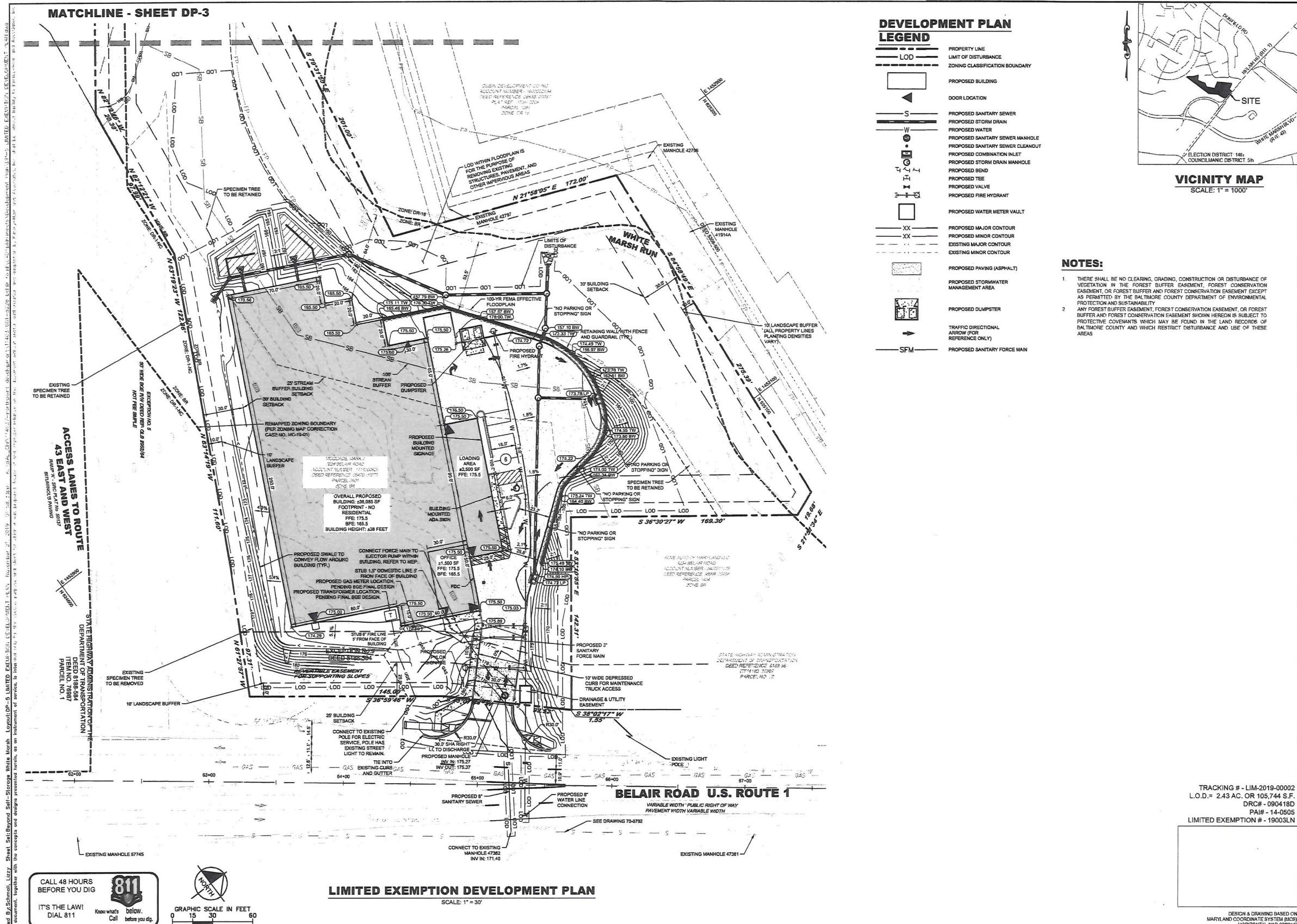
**CALL 48 HOURS
BEFORE YOU DIG**

**IT'S THE LAW!
DIAL 811**



811

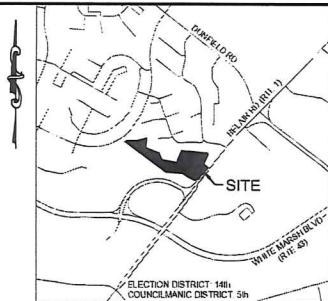
A graphic scale in miles, showing 0, 15, and 30 miles. Above the scale is a north arrow pointing towards the top-left, with the word "NORTH" written vertically inside the arrow's shaft.



- DEVELOPMENT PLAN LEGEND**
- PROPERTY LINE
 - LIMIT OF DISTURBANCE
 - ZONING CLASSIFICATION BOUNDARY
 - PROPOSED BUILDING
 - DOOR LOCATION
 - PROPOSED SANITARY SEWER
 - PROPOSED STORM DRAIN
 - PROPOSED WATER
 - PROPOSED SANITARY SEWER MANHOLE
 - PROPOSED SANITARY SEWER CLEANOUT
 - PROPOSED COMBINATION INLET
 - PROPOSED STORM DRAIN MANHOLE
 - PROPOSED RIND
 - PROPOSED TREE
 - PROPOSED VALVE
 - PROPOSED FIRE HYDRANT
 - PROPOSED WATER METER VAULT
 - PROPOSED MAJOR CONTOUR
 - PROPOSED MINOR CONTOUR
 - EXISTING MAJOR CONTOUR
 - EXISTING MINOR CONTOUR
 - PROPOSED PAVING (ASPHALT)
 - PROPOSED STORMWATER MANAGEMENT AREA
 - PROPOSED DUMPSTER
 - TRAFFIC DIRECTIONAL ARROW (FOR REFERENCE ONLY)
 - PROPOSED SANITARY FORCE MAIN

NOTES:

- THERE SHALL BE NO CLEARING, GRADING, CONSTRUCTION OR DISTURBANCE OF VEGETATION IN THE FOREST BUFFER EASEMENT, FOREST CONSERVATION EASEMENT, OR FOREST BUFFER EASEMENT EXCEPT AS PERMITTED BY THE BALTIMORE COUNTY DEPARTMENT OF ENVIRONMENTAL PROTECTION AND SUSTAINABILITY.
- ANY FOREST BUFFER EASEMENT, FOREST CONSERVATION EASEMENT, OR FOREST BUFFER AND FOREST CONSERVATION EASEMENT SHOWN HEREON IS SUBJECT TO PROTECTIVE COVENANTS WHICH MAY BE FOUND IN THE LAND RECORDS OF BALTIMORE COUNTY AND WHICH RESTRICT DISTURBANCE AND USE OF THESE AREAS.



VICINITY MAP
SCALE: 1" = 1000'

NO.	REVISIONS	DATE	BY

Kimley»Horn

© 2019 KIMLEY-HORN AND ASSOCIATES, INC.
1801 FORT LEE ROAD, BALTIMORE, MD 21220
PHONE: 443-743-3470
WWW.KIMLEY-HORN.COM

THIS PLAN IS PREPARED AND CERTIFIED AS BEING IN ACCORDANCE WITH THE PRELIMINARY DESIGN AND CONSTRUCTION SPECIFICATIONS FOR THE PROJECT.	KHA PROJECT 11/03/2019
PROFESSIONAL CERTIFICATION: I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR SUPERVISED BY ME OR AN AMPLY LICENSED PROFESSIONAL ENGINEER OR ARCHITECT IN THE STATE OF MARYLAND.	DATE 11/21/2019
DESIGNED BY JRH	SCALE AS SHOWN
DRAWN BY JRH	DESIGNED BY JRH
CHECKED BY RH/NL	EXP. DATE 12/31/2021

LIMITED EXEMPTION DEVELOPMENT PLAN

LIMITED EXEMPTION DEVELOPMENT PLAN

TAX MAP: 0071
GRID NO: 0025
PARCEL: 0591
ELECTION DISTRICT: 14th
COUNCILMANIC DISTRICT: 5th

PROJECT NAME:
BEYOND SELF-STORAGE WHITE MARSH

8228 BELAIR ROAD,
BALTIMORE, MD 21228

SHEET NUMBER
DP-5

CALL 48 HOURS BEFORE YOU DIG

IT'S THE LAW! DIAL 811

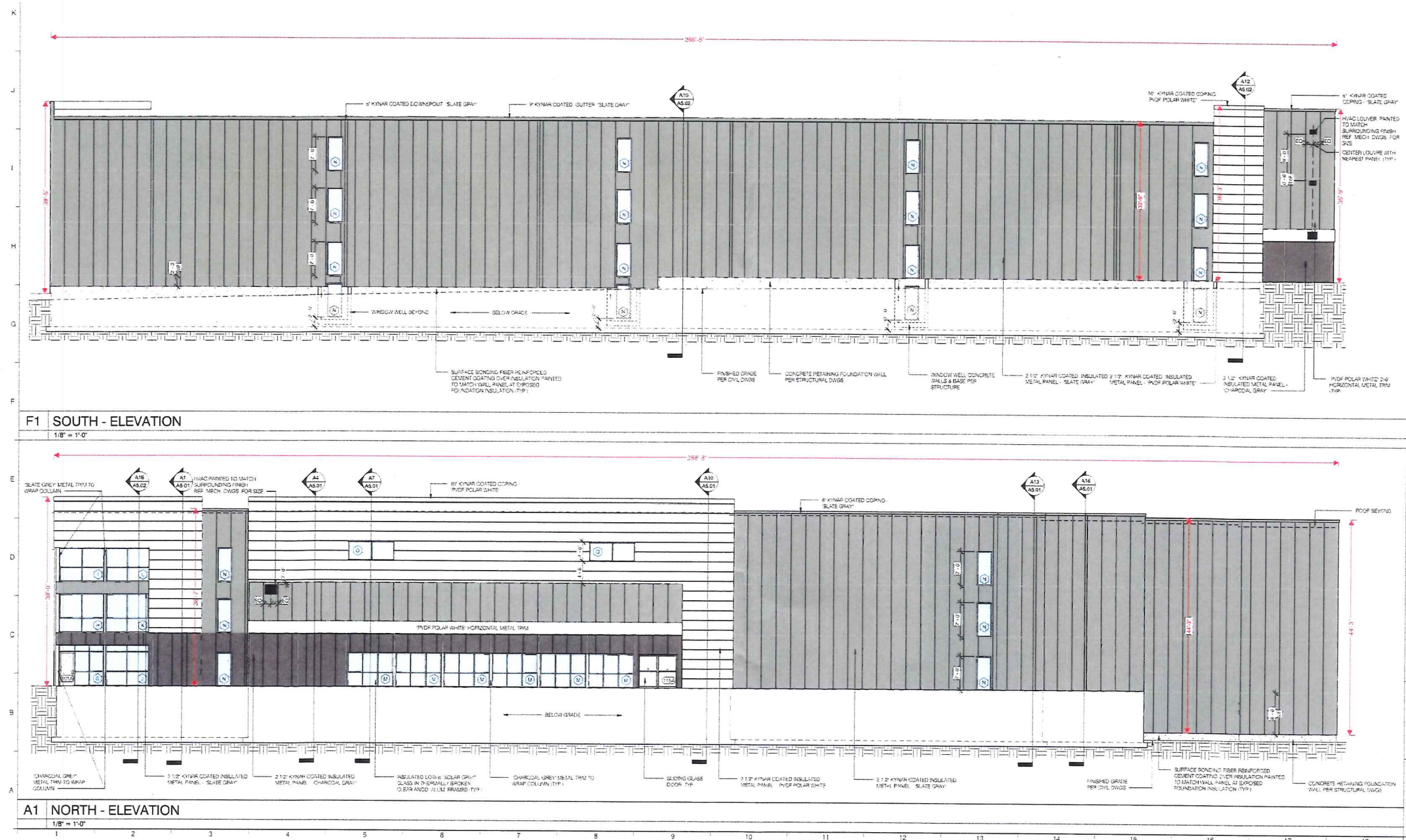
Know what's below. Call before you dig.

GRAPHIC SCALE IN FEET
0 15 30 60

LIMITED EXEMPTION DEVELOPMENT PLAN
SCALE: 1" = 30'

TRACKING # - LIM-2019-00002
L.O.D. = 2.43 AC. OR 105,744 S.F.
DRC# - 090418D
PAI# - 14-0505
LIMITED EXEMPTION # - 19003LN

DESIGN & DRAWING BASED ON
MARYLAND COORDINATE SYSTEM (MCS)
HORIZONTAL: NAD 83(2011)
VERTICAL: NAVD 83



Printed By: Schmoll, Lizzy
Sheet Set: Beyond Self-Storage White Marsh
Layout: BP-7 ARCHITECTURAL ELEVATIONS
November 21, 2019 01:58:35pm
K:\MAL_CIV\114037-norhtpoint_development\114037001-8228_bldg\CAD\plansheets\development\Plan0P-6 SITE PLAN DETAILS.dwg
This document, together with the concepts and designs presented herein, as an instrument of service, is intended only for the specific purpose and client for which it was prepared. Reuse of and improper reliance on this document without written authorization and adaptation by Kinley-Horn and Associates, Inc. shall be without liability to Kinley-Horn and Associates, Inc.

Kimley»»Horn
© 2019 KIMLEY-HORN AND ASSOCIATES, INC.
801 PORTER ST, SUITE 401, BALTIMORE, MD 21230
PHONE: 443-743-3470

THIS PLAN IS SEALED AND CERTIFIED
BEING IN ACCORDANCE WITH THE OR
APPROVAL

KHA PROJECT	DATE	SCALE	DESIGNED BY	DRAWN BY
114037001	11/21/2019	AS SHOWN	JHN	JHN

ARCHITECTURAL
ELEVATIONS

LIMITED EXEMPTION
DEVELOPMENT PL

TAX MAP: 0071
GRID NC: 0023
PARCEL: 0501
ELECTION DISTRICT: 14th
COUNCILMANIC DISTRICT: 5th

PROJECT NAME:
**BEYOND
SELF-STORAGE
WHITE MARSH**



8228 BELAIR ROAD,
BALTIMORE, MD 2123

SHEET NUMBER
DP-7

TRACKING # - LIM-2019-00002
L.O.D.= 2.43 AC. OR 105,744 S.F.
DRC# - 090418D
PAI# - 14-0505
LIMITED EXEMPTION # - 19003LN



DESIGN & DRAWING BASED ON
MARYLAND COORDINATE SYSTEM (MCS)
HORIZONTAL NAD 83(2011)
VERTICAL NAVD 88

[illegible]

Printed By: Smellie, Lizzy Sheet: SSI-Beyond SSSI-Storage White Marsh Logical: DP-a-ARCHITECTURAL ELEVATIONS Date: November 21, 2019 Time: 01:58:55pm K:\BAL_CDW\14037-northeast development\14037000-4828 balair_rise\CAD\plansheets\Development\Plan\DP-a SITE PLAN DETAILS.dwg
This document, together with the concepts and designs presented herein, is an instrument of service, is intended only for the specific purpose and client for which it was prepared. Reuse of and improper reliance on this document without written authorization and stipulation by Kinney-Hart and Associates, Inc. shall be without liability to Kinney-Hart and Associates, Inc.

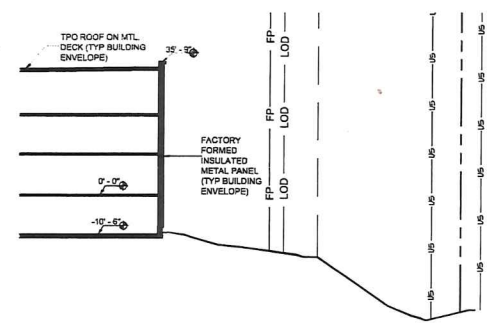
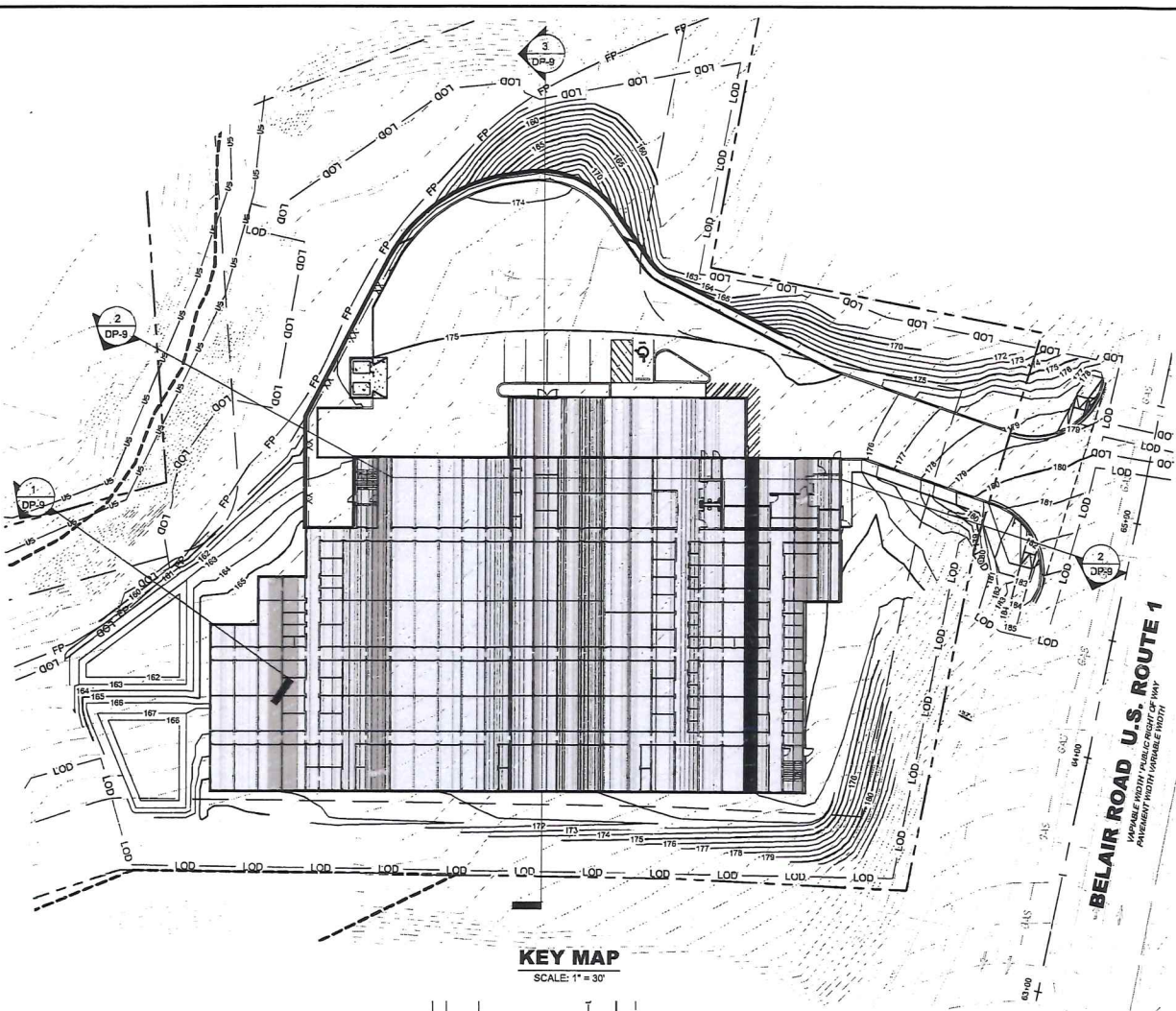


TRACKING # - LIM-2019-00002
L.O.D.= 2.43 AC. OR 105,744 S.F.
DRC# - 090418D
PAI# - 14-0505
LIMITED EXEMPTION # - 19003LN

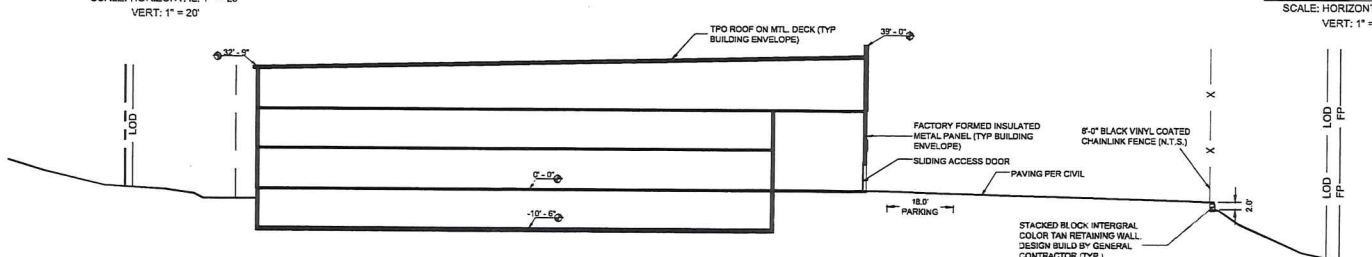
DESIGN & DRAWING BASED ON
MARYLAND COORDINATE SYSTEM (MCS)
HORIZONTAL NAD 83(2011)
VERTICAL NAVD 88

KHA PROJECT 114037001		DATE 11/2/2019		SCALE AS SHOWN		DESIGNED BY JHN		DRAWN BY JHN		CHECKED BY RH/NL		No.		REVISIONS		DATE		BY									
ARCHITECTURAL ELEVATIONS LIMITED EXEMPTION DEVELOPMENT PLAN TAX MAP: 9071 GRID NO: 0023 PARCEL: 8091 ELECTION DISTRICT: 14th COUNCILMANIC DISTRICT: 5th PROJECT NAME: BEYOND SELF-STORAGE WHITE MARSH  8228 BELAIR ROAD, BALTIMORE, MD 21236 SHEET NUMBER DP-8												Kimley»Horn © 2019 KIMLEY-HORN AND ASSOCIATES, INC. 1801 PORTER ST, SUITE 401, BALTIMORE, MD 21230 PHONE: 443-743-3470 WWW.KIMLEY-HORN.COM								THIS PLAN IS SEALED AND CERTIFIED AS BEING IN ACCORDANCE WITH THE DRC APPROVAL							

Plotted By: Schmitt, Lizzy. Sheet: Self-Storage White Marsh. Layout: DP-9 SITE CROSS SECTIONS. November 21, 2019. 01:59:12pm. K:\BAL_C\A\14037-north\self-storage\development\plan\DP-9 SITE CROSS SECTIONS.dwg. This document, together with the concepts and designs presented herein, as an instrument of service, is intended only for the specific purpose and client for which it was prepared. Reuse of and improper reliance on this document without written authorization and adaptation by Kimley-Horn and Associates, Inc. shall be without liability to Kimley-Horn and Associates, Inc.



SITE SECTION 1
SCALE: HORIZONTAL: 1" = 20'
VERT: 1" = 20'



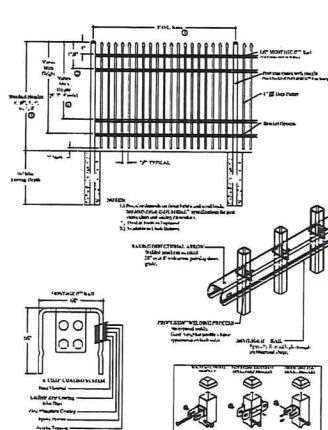
SITE SECTION 2
SCALE: HORIZONTAL: 1" = 20'
VERT: 1" = 20'



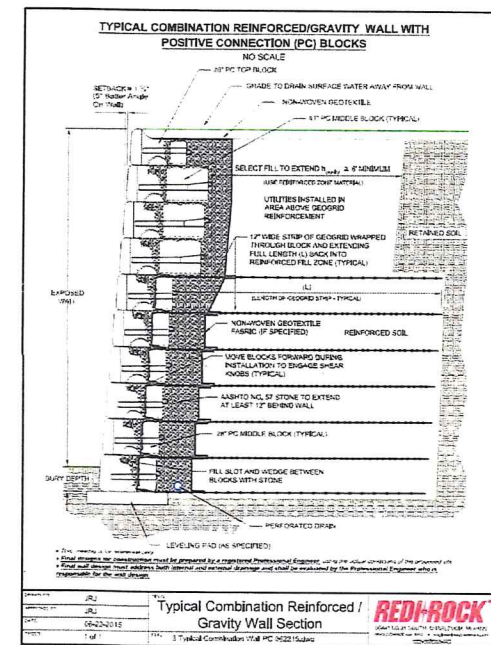
SITE SECTION 3
SCALE: HORIZONTAL: 1" = 20'
VERT: 1" = 20'



TYPICAL RETAINING WALL
COLOR AND FINISH
SCALE: N.T.S.



FENCE DETAIL
SCALE: N.T.S.

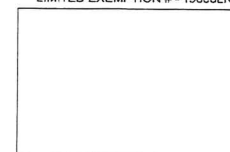


TYPICAL COMBINATION REINFORCED/GRAVITY WALL SECTION
SCALE: N.T.S. OR APPROVED EQUAL

- LEGEND**
- LOD LIMIT OF DISTURBANCE
 - FP PROPERTY LINE
 - US FLOODPLAIN LINE
 - US BUILDING SETBACK
 - X LIMIT OF STREAM
 - PROPOSED FENCE



TRACKING # - LIM-2019-00002
L.O.D. = 2.43 AC. OR 105,744 S.F.
DRG# - 090418D
PAIR# - 14-0505
LIMITED EXEMPTION # - 19003LN



REVISIONS		DATE	BY
No.			
Kimley»Horn			
© 2019 KIMLEY-HORN AND ASSOCIATES, INC. 1801 PORTER ST., SUITE 400 BALTIMORE, MD 21220 PHONE: 443-743-3470 WWW.KIMLEY-HORN.COM			
THIS PLAN IS SEaled AND CERTIFIED AS BEING IN ACCORDANCE WITH THE E&C APPROVAL			
KHA PROJECT	DATE	SCALE	DESIGNED BY
114037001	11/21/2019	AS SHOWN	JHN
			DRAWN BY
			JHN
			CHECKED BY
			RH/NL
SITE CROSS SECTIONS			
LIMITED EXEMPTION DEVELOPMENT PLAN			
TAXMAP 0071 GRID NO 0023 PARCEL 001 ELECTION DISTRICT 14B COUNCILMANIC DISTRICT 3H			
PROJECT NAME: BEYOND SELF-STORAGE WHITE MARSH			
8228 BELAIR ROAD, BALTIMORE, MD 21238			
SHEET NUMBER DP-9			

CALL 48 HOURS
BEFORE YOU DIG

IT'S THE LAW!
DIAL 811

Know what's
Call
below.
before you dig.



CALL 48 HOURS
BEFORE YOU DIG

IT'S THE LAW!
DIAL 811

Know what's
Call

 below.
before you dig.

0 15 30 60

SCHEMATIC LANDSCAPE PLAN
SCALE: 1" = 30'

SCALE: 1" = 30'

OWNER: **APPLICANT:**

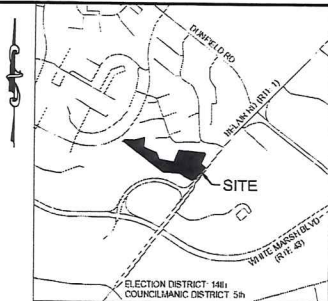
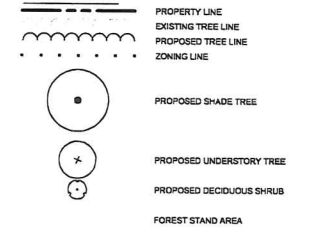
PROPERTY OWNER:
PARCEL 0501
MCQUADE, MARK J
8226 BELAIR RD
BALTIMORE, MD 21236

DEVELOPER/ CONTRACT PURCHASER:
NORTHPOINT DEVELOPMENT, LLC
ATTN: JOHNNY SWEENEY
4825 NW 41ST STREET
SUITE 500
RIVERSIDE, MISSOURI 64150
TEL: (816) 281-2501
EMAIL: JSWEENEY@NORTHPOINTKC.COM

CONSULTANT:

LANDSCAPE ARCHITECT:
KIMLEY-HORN AND ASSOCIATES, INC.
1801 PORTER ST, SUITE 401
BALTIMORE, MD 21230
TEL: 443-743-3470
ATTN: JON KRAFT, PLA

SCHEMATIC LANDSCAPE LEGEND



VICINITY MAP
SCALE: 1" = 1000'

BALTIMORE COUNTY PLANTING UNIT SUMMARY

PLANT TYPE	QUANTITY PROVIDED	PLANTING UNITS
MAJOR DECIDUOUS TREE (1 TREE = 1 P.U.)	38	38
MINOR DECIDUOUS TREE (2 TREES = 1 P.U.)	22	11
SHRUBS (5 SHRUBS = 1 P.U.)	85	17
TOTAL	145	66.0

ZONING SUMMARY

APPROXIMATE ACREAGE	5.215 AC	227,260 SQ. FT.
ZONING	CURRENT BR (BUSINESS ROADSIDE) PER BALTIMORE COUNTY ZONING MAP	
FRONT BUILDING SETBACK	25' FROM PROPERTY LINE, 30' FROM STREET CENTERLINE, OR FROM PROPERTY LINE ON DUAL HIGHWAY	
SIDE BUILDING SETBACK	30' FROM PROPERTY LINE	
REAR SETBACK	30' FROM PROPERTY LINE	
LANDSCAPE BUFFER ADJ. STREETS	10'	
LANDSCAPE BUFFER ADJ. OTHER PROPERTIES	10'	
PARKING REQUIRED	3.3 PPS/1000 SF OFFICE = 4 PPS	
PARKING PROVIDED	6 PPS (5x19) IS STANDARD 1 ADA	
MAX BUILDING HEIGHT	40'	
FAR REQUIREMENTS	2.0 MAXIMUM, 0.160 PROVIDED	

Schematic Landscape Plan Certification Form		
This Schematic Landscape Plan is sealed by a landscape architect and certified by my signature below as being in accordance with all county agency landscape architectural comments.		
Applicant Signature	11/21/2019 Date	JON KRAFT, PLA Print Name
1801 PORTER ST. SUITE 401, BALTIMORE, MD 21230		
Mailing Address (If not already on plan)		

LANDSCAPE REQUIREMENTS

KEY	CONDITION	ELEMENT	RATE	MEASUREMENT	UNITS	PLANTING UNITS (PU) REQUIRED	PLANTING UNITS (PU) PROVIDED
#1	A - STREET FRONTAGE	ADJACENT ROAD	1 PU/40 LF	241	LF	6.1	
#2	A - STREET FRONTAGE	ADJACENT ROAD	1 PU/40 LF	451	LF	11.3	
#3	A - STREET FRONTAGE	INTERIOR ROADWAY	1 PU/20 LF	166	LF	9.3	
#4	B - PARKING LOTS	PARKING LOT INTERIOR	1 PU/2 SPOTS	5	SPOTS	0.5	
#5	B - PARKING LOTS	PARKING ADJACENT TO COMMERCIAL	1 PU/20 LF	249	LF	12.5	
#6	H - DUMPSTERS	DUMPSITE SCREEN	1 PU/15 LF	37	LF	2.5	
#7	J - SLOPES AND RETAINING WALLS	RETAINING WALL	1 PU/15 LF	334	LF	22.3	
TOTAL						64.5	66

LIGHTING NOTES:

- 1 ALL LIGHTING IS TO BE BUILDING MOUNTED

SITE PLAN NOTES:

1. THIS SITE PLAN IS BASED ON SURVEY PROVIDED BY CHESTER/ENVIRO ENVIRONMENTAL MANAGEMENT ON MARCH 26, 2016
2. PROPERTY KNOWNS AS TAX PARCEL 0951 ON MAP 107.1
3. PROPERTY AREA = 5.718 AC OR 297,292.5 S.F. ACQUANT #41500625 TOTAL PROJECT AREA = 10.437 AC
4. PROPERTY IS ZONED BY BUSINESS DISTRICT
5. PROPERTY HAS BEEN ISSUED A TYPE-B &B DEVELOPMENT (DRG. NUMBER 0041610)
6. DISTRICT USE, TRACTION ALLOWED, AND SUPPLY Y-STORE
7. PROPOSED USE: MINI-WAREHOUSE (PERMITTED IN ZONE)
8. SITE PROPERTY OWNERS NAME AND ADDRESS
MCQUEEN, MARV J
1229 REAR RD
BALTIMORE, MD 21236
9. APPLICANT'S NAME AND ADDRESS
NORTHPOINT DEVELOPMENT
4625 HWY 415 E, SUITE 200
REVERDE, MO 64150
10. NO PREVIOUS ZONING VIOLATION HAS OCCURRED FOR THIS SITE
11. A PORTION OF THE SITE IS LOCATED INSIDE THE "100 YEAR FLOODPLAIN PER FEMA MAP NUMBER 2200240027F" AND OUTSIDE THE CRITICAL AREA
12. "WATERSHED" DRG. BINDER
13. "COASTAL HAZARD" DRG. BINDER
14. ELECTION DISTRICT 14
15. THIS SITE IS NOT A HISTORICAL PROPERTY. ACCORDING TO THE BALTIMORE COUNTY GIS
16. THERE ARE NO KNOWN WELLS ON SITE
17. THERE IS KNOWN KISTERS DRAINAGE ON SITE
18. APPROXIMATE LOTS OF DISTURBANCE: 155,744 S.F. = 2.428 AC
19. PERMANENT FENCING IS PROPOSED ALONG TOP OF RETAINING WALL
20. ALL LIGHT FIXTURES ARE MOUNTED ON THE PROPOSED BUILDING. REFER TO PHOTO METRIC PLAN FOR DETAILS

MINIMUM LANDSCAPE MAINTENANCE REQUIREMENTS

1. LAWN AREAS SHALL BE MOWED TO HEIGHT OF 2 TO 3 INCHES AND NOT ALLOWED TO REACH A HEIGHT OF INCHES BEFORE MOWING.
2. ALL CURBS AND WALKS SHALL BE EDGED AS NECESSARY.
3. ALL LAWN AREAS ADJACENT TO BUILDING FACIES OR STRUCTURES SHALL BE TRIMMED.
4. IN A SEASON RELEASE NITROGEN BALANCED FERTILIZER WITH A 4-0-16 RATIO SHALL BE APPLIED TO LAWN AREAS IN MARCH AND FERTILIZER WITH A 2-0-20 RATIO SHALL BE APPLIED TO LAWN AREAS IN SEPTEMBER AND FEBRUARY.
5. LIME SHALL BE APPLIED AT THE RATE DETERMINED BY A SOIL REPORT.
6. HERBICIDES ARE RECOMMENDED THAT LAWN AREAS BE TREATED IN WINTER, TO EARLY APRIL, WITH PRE-EMERGENT HERBICIDE (BETANER) OR EQUAL. APPLIED AT THE RATE OF ONE POUND PER ONE THOUSAND SQUARE FEET.
7. A POST-EMERGENT HERBICIDE (TRIFLORAL) OR EQUAL IS RECOMMENDED TO BE SPRAYED ON LAWN AREAS IN THE LATE SPRING OR THE EARLY FALL. FOLLOW THE MANUFACTURER'S DIRECTIONS FOR APPLICATION.
8. INSECTICIDES AND FUNGICIDES ARE RECOMMENDED FOR INSECT AND DISEASE CONTROL.
9. RESISTANT BARE AREAS OF LAWN AS NECESSARY, WINTER AERATION IS RECOMMENDED.
10. ALL TRUNK LITTER AND DEBRIS SHALL BE REMOVED FROM LAWN AREAS, PARKING LOTS, AND SHRUB BEDS AS NECESSARY.
11. MULCH ALL SHRUB AND GROUNDCOVER BEDS YEARLY WITH 3 INCHES OF BUCKWHEAT HAY OR EQUIV.
12. PERMIT SHRUBS AND TREES TO GROW AND ENLARGE TO THEIR DESIGN SIZE. CONSULT PROJECT LANDSCAPE ARCHITECT FOR DETAILS.
13. ALL WORK SHALL ACCORD WITH LANDSCAPE PRECIPITATION GUIDELINES FOR BALTIMORE-WASHINGTON METROPOLITAN AREAS.

NOTES:

1. ALL SINGULAR TREES SHALL HAVE A MULCH RING EXTENDING A MINIMUM OF 17" FROM THE TRUNK.
2. ALL PERVIOUS AREA TO BE STABILIZED WITH SOIL.
3. EXISTING AND PROPOSED CONTOURS ARE SHOWN AT 2' AND 10'.
4. PROPOSED 50' FACILITIES REQUIRE NO LANDSCAPE SCREENING AS THEY WILL BE PLANTED AND ARE NOT STATED OTHERWISE.
5. THERE SHALL BE NO CLEARING, GRADING, CONSTRUCTION OR DISTURBANCE OF VEGETATION IN THE FOREST BUFFER EASEMENT, FOREST CONSERVATION EASEMENT, 20' FOREST BUFFER AND FOREST CONSERVATION EASEMENT (EXCEPT AS PERMITTED BY THE BALTIMORE COUNTY DEPARTMENT OF ENVIRONMENTAL PROTECTION AND SUSTAINABILITY).
6. FOREST BUFFER EASEMENT, FOREST CONSERVATION EASEMENT, OR FOREST BUFFER AND FOREST CONSERVATION EASEMENT SHOWN HEREON IS SUBJECT TO PROTECTIVE COVENANTS WHICH MAY BE FOUND IN THE LAND RECORDS OF BALTIMORE COUNTY AND WHICH RESTRICT DISTURBANCE AND USE OF THESE AREAS.

TRACKING # - LIM-2019-00002
L.O.D.= 2.43 AC. OR 105,744 S.F.
DRC# - 090418D
PAI# - 14-0505
LIMITED EXEMPTION # - 19003LN

Kimley»»Horn
© 2019 KIMLEY-HORN AND ASSOCIATES, INC.
1801 PORTER ST, SUITE 401, BALTIMORE, MD 21230
PHONE: 443-743-3470
WWW.KIMLEY-HORN.COM

SCHEMATIC LANDSCAPE PLAN

LIMITED EXEMPTION
DEVELOPMENT PLAN

PROJECT NAME:
**BEYOND
SELF-STORAGE
WHITE MARSH**



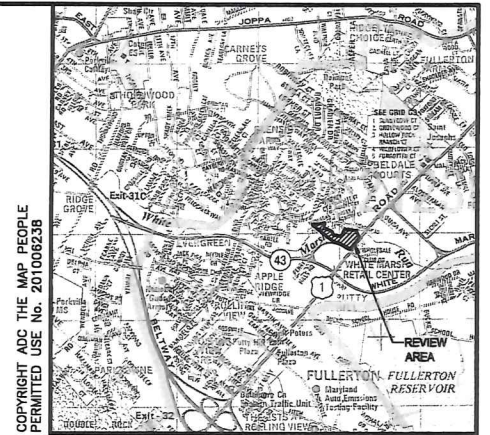
8228 BELAIR ROAD,
BALTIMORE, MD 21236

SHEET NUMBER
DP-10

PETITIONER'S

EXHIBIT NO. 7

FOREST CONSERVATION PLAN AND FOREST BUFFER PROTECTION PLAN BEYOND SELF-STORAGE - WHITE MARSH AT 8228 BELAIR ROAD OVERLEA, MARYLAND 21236

COPYRIGHT ADC THE MAP PEOPLE
PERMITTED USE No. 201006238

VICINITY MAP

SCALE: 1" = 2,000'

**GENERAL NOTES**

- PROPERTY OWNER(S): MR. MARK J. MCQUADE
8228 BELAIR ROAD
BALTIMORE, MARYLAND 21236
- APPLICANT/DEVELOPER: NORTHPOINT DEVELOPMENT, LLC
4825 NW 41ST STREET, SUITE 500
RIVERSIDE, MISSOURI 64150
ATTN: MR. JOHNNY SWEENEY
- ENGINEER: KIMLEY-HORN AND ASSOCIATES, INC.
1801 PORTER STREET, SUITE 401
BALTIMORE, MARYLAND 21230
ATTN: MR. BOBBY HAASE
- PLAN PREPARER: GEO-TECHNOLOGY ASSOCIATES, INC. (GTA)
3445-A BOX HILL CORPORATE CENTER DRIVE
ABINGDON, MARYLAND 21009
ATTN: MAXWELL D. POTEMBER
PHONE: 410-515-9446
EMAIL: MPOTEMBER@GTAENG.COM
- PROPERTY INFORMATION:
A. TAX ACCOUNT #: 14-1418000625
B. PARCELS: 501
C. TAX MAP: 71
D. COUNCILMANIC DISTRICT: 5
E. ELECTION DISTRICT: 14
F. EXISTING ZONING: BR (BUSINESS ROADSIDE); DR-1 & DR-16 (DENSITY RESIDENTIAL)
G. EXISTING LANDUSE: TRACTOR SUPPLY AND REPAIR (COMMERCIAL)
H. PROPOSED LANDUSE: MINI-WAREHOUSE (PERMITTED IN ZONE)
I. WATERSHED/SUBWATERSHED: BIRD RIVER/WHITEMARSH RUN
- REVIEW AREA ACREAGE: 5.42± ACRES
- THE TOPOGRAPHY AND EXISTING CONDITIONS SHOWN ON THIS PLAN WERE PROVIDED BY KIMLEY-HORN AND ASSOCIATES, INC. TOPOGRAPHY AND EXISTING CONDITIONS SHOWN BEYOND THE REVIEW AREA WERE SUPPLEMENTED WITH BALTIMORE COUNTY PHOTOGRAMMETRIC GEOGRAPHIC INFORMATION SYSTEM (GIS) TILES 071C3 AND 081C1.
- THE SUBJECT PROPERTY IS LOCATED WITHIN THE URBAN RURAL DEMARCATION LINE.
- A WETLAND DELINEATION OF THE SUBJECT PROPERTY WAS PERFORMED BY GTA IN AUGUST 2018. AS A RESULT, IT IS GTA'S PROFESSIONAL OPINION THAT THERE ARE JURISDICTIONAL "WATERS OF THE U.S.", INCLUDING WETLANDS, PRESENT WITHIN THE SUBJECT PROPERTY.
- THE REVIEW AREA DRAINS TOWARDS WHITEMARSH RUN. WHITEMARSH RUN IS A TRIBUTARY TO THE BIRD RIVER, WHICH CONTRIBUTES TO THE GUNPOWDER RIVER. IN THE VICINITY OF THE REVIEW AREA, WHITEMARSH RUN AND ITS TRIBUTARIES ARE CLASSIFIED IN THE CODE OF MARYLAND REGULATIONS (COMAR) 26.08.02.08 AS DESIGNATED USE "CLASS IV: RECREATIONAL TROUT WATERS."
- THE FLOODPLAIN SHOWN HEREON IS FROM FEDERAL EMERGENCY MANAGEMENT AGENCY (FEMA) FEDERAL INSURANCE RATE MAP (FIRM) NUMBER 20400100270F, EFFECTIVE SEPTEMBER 26, 2008.
- THE SUBJECT PROPERTY IS NOT WITHIN THE CHESAPEAKE BAY CRITICAL AREA.
- A FOREST STAND DELINEATION WAS PERFORMED BY GTA IN AUGUST 2018 AND WAS APPROVED BY THE BALTIMORE COUNTY DEPARTMENT OF ENVIRONMENTAL PROTECTION AND SUSTAINABILITY (EPS) ON JANUARY 28, 2019.
- ACCORDING TO MS. LORI BRYNE, ENVIRONMENTAL REVIEW COORDINATOR FOR THE MARYLAND DEPARTMENT OF NATURAL RESOURCES WILDLIFE AND HERITAGE SERVICE, IN A LETTER DATED AUGUST 13, 2018, "THE WILDLIFE AND HERITAGE SERVICE HAS DETERMINED THAT THERE ARE NO OFFICIAL STATE OR FEDERAL RECORDS FOR LISTED PLANT OR ANIMAL SPECIES WITHIN THE DELINEATED AREA AS SHOWN ON THE MAP PROVIDED. AS A RESULT, WE HAVE NO SPECIFIC CONCERNS REGARDING POTENTIAL IMPACTS OR RECOMMENDATIONS FOR PROTECTION MEASURES AT THIS TIME."
- ACCORDING TO THE UNITED STATES FISH AND WILD LIFE SERVICE (USFWS) INFORMATION FOR PLANNING AND CONSERVATION (IPAC) SYSTEM OFFICIAL SPECIES LIST, NO LISTED THREATENED, ENDANGERED, OR CANDIDATE SPECIES, OR CRITICAL HABITATS ARE LOCATED WITHIN THE SUBJECT PROPERTY. AN ONLINE CERTIFICATION LETTER, WHICH STATES THAT THE USFWS CERTIFIES THAT EXCEPT FOR OCCASIONAL TRANSIENT INDIVIDUALS, NO FEDERALLY PROPOSED OR LISTED ENDANGERED OR THREATENED SPECIES ARE KNOWN TO EXIST WITHIN THE PROJECT AREA, AND NO BIOLOGICAL ASSESSMENT OR FURTHER SECTION 7 CONSULTATION WITH THE USFWS IS REQUIRED, WAS SUBMITTED TO THE USFWS ON JULY 24, 2018.
- ACCORDING TO TERI RISING, BALTIMORE COUNTY HISTORIC PLANNER, IN AN ELECTRONIC MAIL RESPONSE DATED JULY 26, 2018 "THERE ARE NO LOCAL HISTORIC DESIGNATIONS INVOLVING THE PARCEL DIRECTLY OR INDIRECTLY." ACCORDING TO A RESPONSE FROM THE MARYLAND HISTORICAL TRUST (MHT), DATED MARCH 27, 2019, "THE MHT HAS DETERMINED THAT THERE ARE NO HISTORIC PROPERTY AFFECTED BY THIS UNDERTAKING."
- THE FOREST BUFFER LIMITS SHOWN ON THIS PLAN INCLUDE ADJUSTMENTS FOR STEEP SLOPES AND/OR ERODIBLE SOILS, AND WERE PREPARED BY GTA. THE FOREST BUFFER LIMITS WERE APPROVED BY BALTIMORE COUNTY EPS ON JANUARY 28, 2019.
- BALTIMORE COUNTY STANDARD FOREST BUFFER NOTES:
A. THERE SHALL BE NO CLEARING, GRADING, CONSTRUCTION OR DISTURBANCE OF VEGETATION IN THE FOREST BUFFER EASEMENT, FOREST CONSERVATION EASEMENT, OR FOREST BUFFER AND FOREST CONSERVATION EASEMENT EXCEPT AS PERMITTED BY THE BALTIMORE COUNTY DEPARTMENT OF ENVIRONMENTAL PROTECTION AND SUSTAINABILITY.
B. ANY FOREST BUFFER EASEMENT, FOREST CONSERVATION EASEMENT, OR FOREST BUFFER AND FOREST CONSERVATION EASEMENT SHOWN HEREON IS SUBJECT TO PROTECTIVE COVENANTS WHICH MAY BE FOUND IN THE LAND RECORDS OF BALTIMORE COUNTY AND WHICH RESTRICT DISTURBANCE AND USE OF THESE AREAS.
- THIS PLAN WAS PREPARED BY GTA FOR THE SOLE AND EXCLUSIVE USE OF KIMLEY-HORN AND ASSOCIATES, INC. ANY REPRODUCTION OF THIS PLAN BY ANY OTHER PERSON WITHOUT THE EXPRESSED WRITTEN PERMISSION OF GTA AND KIMLEY-HORN AND ASSOCIATES, INC. IS UNAUTHORIZED, AND SUCH USE IS AT THE SOLE RISK OF THE USER.

**FOREST CONSERVATION WORKSHEET
(HIGH DENSITY RESIDENTIAL):**

I. BASIC SITE DATA	ACRES (0.1 acre)
GROSS SITE AREA	0.6
AREA WITHIN 100 YEAR FLOODPLAIN	0.6
AREA WITHIN AGRICULTURAL USE OR PRESERVATION PARCEL (if applicable)	0.0
AREA IN TRANSMISSION LINE EASEMENTS (if applicable)	0.0
NET TRACT AREA	0.0
LAND USE CATEGORY (see p.31 of Manual or Baltimore County Code, Section 14-401B)	DR 16 RESIDENTIAL (HIGH-DENSITY)
II. INFORMATION FOR CALCULATIONS	ACRES (0.1 acre)
A. NET TRACT AREA	0.0
B. FOREST CONSERVATION THRESHOLD (20% X A)	0.0
C. AFFORESTATION THRESHOLD (15% X A)	0.0
D. EXISTING FOREST ON NET TRACT AREA	0.0
E. EXISTING FOREST ABOVE FOREST CONSERVATION THRESHOLD	0.0
F. BREAK-EVEN POINT (the amount of forest to be retained for no mitigation) ((E x 0.2) + B)	0.0
G. FOREST TO BE CLEARED	0.0
H. FOREST TO BE RETAINED	0.0
III. APPLICABILITY OF AFFORESTATION AND REFORESTATION TO SITE	ACRES (0.1 acre)
*THE PORTIONS OF THE SUBJECT PROPERTY THAT ARE WITHIN ZONE DR 16 ARE LOCATED ENTIRELY WITHIN THE FLOODPLAIN; THEREFORE, THE NET TRACT AREA IS 0.0.	

**FOREST CONSERVATION WORKSHEET
(MEDIUM DENSITY RESIDENTIAL):**

I. BASIC SITE DATA	ACRES (0.1 acre)
GROSS SITE AREA	0.5
AREA WITHIN 100 YEAR FLOODPLAIN	0.1
AREA WITHIN AGRICULTURAL USE OR PRESERVATION PARCEL (if applicable)	0.0
AREA IN TRANSMISSION LINE EASEMENTS (if applicable)	0.2
NET TRACT AREA	0.2
LAND USE CATEGORY (see p.31 of Manual or Baltimore County Code, Section 14-401B)	DR 1 NC RESIDENTIAL (MEDIUM-DENSITY)
II. INFORMATION FOR CALCULATIONS	ACRES (0.1 acre)
A. NET TRACT AREA	0.2
B. FOREST CONSERVATION THRESHOLD (25% X A)	0.0
C. AFFORESTATION THRESHOLD (20% X A)	0.0
D. EXISTING FOREST ON NET TRACT AREA	0.0
E. EXISTING FOREST ABOVE FOREST CONSERVATION THRESHOLD	0.0
F. BREAK-EVEN POINT (the amount of forest to be retained for no mitigation) ((E x 0.2) + B)	0.0
G. FOREST TO BE CLEARED	0.0
H. FOREST TO BE RETAINED	0.0
III. APPLICABILITY OF AFFORESTATION AND REFORESTATION TO SITE	ACRES (0.1 acre)
*WITHIN THE PORTIONS OF THE SUBJECT PROPERTY WITHIN ZONE DR 1 NC, THE CALCULATED FOREST CONSERVATION THRESHOLD AND CALCULATED AFFORESTATION THRESHOLD ARE BELOW 0.05 ACRES, AND THEREFORE, ROUNDED TO 0.0.	

SPECIMEN TREE LIST

NUMBER	SCIENTIFIC NAME	COMMON NAME	DBH	CONDITION	COMMENT
ST-1	ACER SACCHARINUM	SILVER MAPLE	41	FAIR	ENTANGLED WITH VINES
ST-2	QUERCUS ALBA	WHITE OAK	31	GOOD	
ST-3	QUERCUS RUBRA	NORTHERN RED OAK	30	GOOD	
ST-4	PLATANUS OCCIDENTALIS	AMERICAN SYCAMORE	31	GOOD	
ST-5	PLATANUS OCCIDENTALIS	AMERICAN SYCAMORE	31	GOOD	
ST-6	PLATANUS OCCIDENTALIS	AMERICAN SYCAMORE	30	GOOD	
ST-7	ACER SACCHARINUM	SILVER MAPLE	40	FAIR	ENTANGLED WITH VINES
ST-9	QUERCUS RUBRA	NORTHERN RED OAK	48	GOOD	
ST-10	FAGUS GRANDIFOLIA	AMERICAN BEECH	34	GOOD	

**FOREST CONSERVATION WORKSHEET
(COMMERCIAL/INDUSTRIAL):**

I. BASIC SITE DATA	ACRES (0.1 acre)
GROSS SITE AREA	4.2
AREA WITHIN 100 YEAR FLOODPLAIN	0.6
AREA WITHIN AGRICULTURAL USE OR PRESERVATION PARCEL (if applicable)	1.6
AREA IN TRANSMISSION LINE EASEMENTS (if applicable)	0.3
NET TRACT AREA	2.3
LAND USE CATEGORY (see p.31 of Manual or Baltimore County Code, Section 14-401B)	BR COMMERCIAL AND INDUSTRIAL
II. INFORMATION FOR CALCULATIONS	ACRES (0.1 acre)
A. NET TRACT AREA	2.3
B. FOREST CONSERVATION THRESHOLD (15% X A)	0.3
C. AFFORESTATION THRESHOLD (15% X A)	0.3
D. EXISTING FOREST ON NET TRACT AREA	0.1
E. EXISTING FOREST ABOVE FOREST CONSERVATION THRESHOLD	0.0
F. BREAK-EVEN POINT (the amount of forest to be retained for no mitigation) ((E x 0.2) + B)	0.3
G. FOREST TO BE CLEARED	0.0
H. FOREST TO BE RETAINED	0.1
III. APPLICABILITY OF AFFORESTATION AND REFORESTATION TO SITE	ACRES (0.1 acre)
1. Afforestation Only If existing forest areas are below the Afforestation Threshold (if D is less than C), and no forest clearing is proposed, afforestation requirements apply. GO TO SECTION IV	
IV. AFFORESTATION CALCULATIONS	ACRES (0.1 acre)
A. NET TRACT AREA	2.3
C. AFFORESTATION THRESHOLD (15% X A)	0.3
D. EXISTING FOREST ON NET TRACT AREA	0.1
G. FOREST AREAS TO BE CLEARED	0.0
H. FOREST AREAS TO BE RETAINED	0.1
Select the alternative that applies: 1. No clearing: If existing forest areas are below the Afforestation Threshold (if D is less than C), and no clearing is proposed, the following calculations apply: TOTAL AFFORESTATION REQUIRED C - D Afforestation must make the forest area equal to the minimum required by the Afforestation Threshold. 2. Clearing: If existing forest areas are below the Afforestation Threshold (if D is less than C) and clearing is proposed, the following calculations apply: AFFORESTATION FOR UNFORESTED AREAS BELOW AFFORESTATION THRESHOLD C - D REFORESTATION FOR CLEARING BELOW AFFORESTATION THRESHOLD G + 2 TOTAL PLANTING REQUIRED (C - D) + (G X 2)	0.2 N/A N/A

FOREST CONSERVATION TOTALS:

FOREST RETENTION REQUIRED:	0.1± AC
FOREST RETENTION PROVIDED:	0.1± AC
AFFORESTATION REQUIRED:	0.2± AC

THE 0.2-ACRE MITIGATION REQUIREMENT FOR FOREST CONSERVATION WILL BE SATISFIED BY PAYMENT OF A FEE-IN-LIEU OR PURCHASE OF CREDITS FROM AN EPS-APPROVED, OFF-SITE FOREST MITIGATION BANK.

SPECIMEN TREE IMPACTS - MITIGATION:

SPECIMEN TREE MITIGATION REQUIRED:	7,812.50 SQ. FT.
------------------------------------	------------------

PER THE SPECIAL VARIANCE APPLICATION SUBMITTED CONCURRENTLY WITH THIS FCP, THE 7,812.50 SQUARE FEET OF MITIGATION REQUIRED FOR SPECIMEN TREE IMPACTS WILL BE SATISFIED BY PAYMENT OF A FEE-IN-LIEU OR PURCHASE OF CREDITS FROM AN EPS-APPROVED, OFF-SITE FOREST MITIGATION BANK.

FOREST BUFFER MITIGATION TOTALS:

PROPOSED FOREST BUFFER IMPACT	AREA	MITIGATION RATIO	MITIGATION REQUIRED
IMPERVIOUS AREAS	13,798± SQ. FT.	1:1	13,798± SQ. FT.
NON-IMPERVIOUS AREAS	16,844± SQ. FT.	2:1	33,688± SQ. FT.
TOTAL FOREST BUFFER MITIGATION REQUIRED			47,486± SQ. FT.

FOREST BUFFER MITIGATION PROVIDED ONSITE:	26,729± SQ. FT.
REMAINING FOREST BUFFER MITIGATION REQUIREMENT:	20,757± SQ. FT.

THE FOREST BUFFER MITIGATION PROVIDED ONSITE INCLUDES FOREST BUFFER PLANTINGS TO BE PRESERVED IN THE FOREST BUFFER EASEMENT AND BALTIMORE COUNTY LANDSCAPE PLANTINGS TO BE PRESERVED IN THE FOREST BUFFER EASEMENT.

THE 20,757± SQ. FT. MITIGATION REQUIREMENT FOR FOREST CONSERVATION WILL BE SATISFIED BY PURCHASE OF CREDITS FROM AN EPS-APPROVED, OFF-SITE FOREST BUFFER MITIGATION BANK.

STANDARD FOREST BUFFER NOTE:**STANDARD NON-DISTURBANCE NOTE:**

THERE SHALL BE NO CLEARING, GRADING, CONSTRUCTION OR DISTURBANCE OF VEGETATION IN THE FOREST BUFFER EXCEPT AS PERMITTED BY THE BALTIMORE COUNTY DEPARTMENT OF ENVIRONMENTAL PROTECTION AND SUSTAINABILITY.

PROTECTIVE COVENANTS NOTE:

ANY FOREST BUFFER EASEMENT AND/OR FOREST CONSERVATION EASEMENT SHOWN HEREON IS SUBJECT TO PROTECTIVE COVENANTS WHICH MAY BE FOUND IN THE LAND RECORDS OF BALTIMORE COUNTY AND WHICH RESTRICT DISTURBANCE AND USE OF THESE AREAS.

DRC #090418D

**GEO-TECHNOLOGY ASSOCIATES, INC.**
GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS3445-A BOX HILL CORPORATE CENTER DRIVE
ABINGDON, MARYLAND 21009
410-515-9446
FAX: 410-515-4895
WWW.GTAENG.COM

© 2019 GEO-TECHNOLOGY ASSOCIATES, INC.

**FOREST CONSERVATION PLAN AND
FOREST BUFFER PROTECTION PLAN
BEYOND SELF-STORAGE -
WHITE MARSH
AT 8228 BELAIR ROAD**

BALTIMORE COUNTY, MARYLAND

Maxwell D. Potember
DEPARTMENT OF NATURAL RESOURCES
QUALIFIED PROFESSIONAL
PER COMAR 08.15.06.01

AUGUST 12, 2019
DATE

REVISIONS:
AUGUST 12, 2019 REVISED PROPOSED FOREST BUFFER EASEMENTS AND FOREST BUFFER/FOREST CONSERVATION MITIGATION PER VERBAL COMMENTS PROVIDED BY MR. PAUL DENNIS OF BALTIMORE COUNTY EPS ON MAY 23, 2019 AND AUGUST 12, 2019.

JOB NO:	31181132
SCALE:	N/A
DATE:	MAY 1, 2019
DRAWN BY:	MDP
DESIGN BY:	MDP
REVIEW BY:	MAJ/TAS
SHEET:	1 OF 4

SOILS CHART

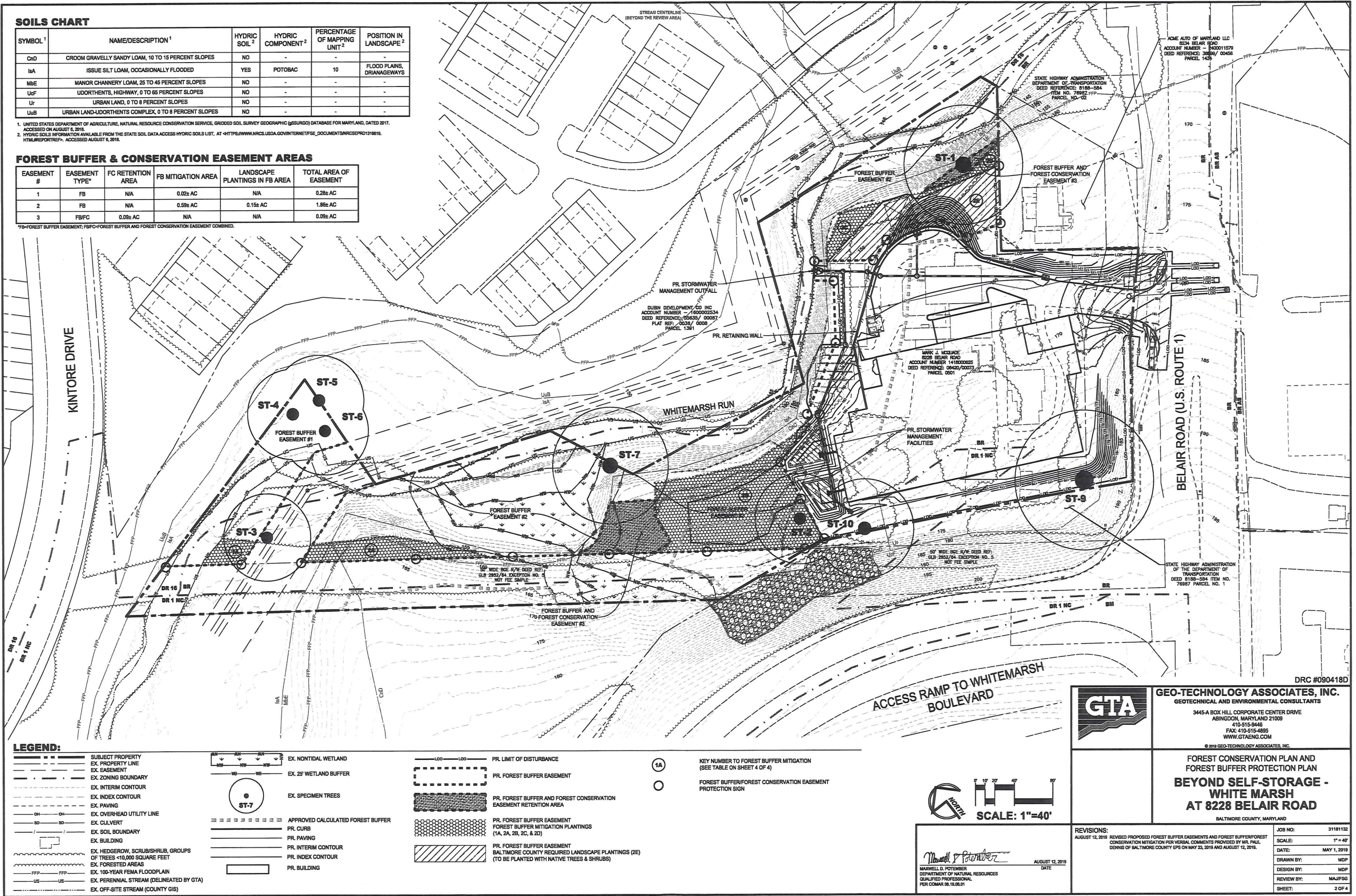
SYMBOL ¹	NAME/DESCRIPTION ¹	HYDRIC SOIL ²	HYDRIC COMPONENT ²	PERCENTAGE OF MAPPING UNIT ²	POSITION IN LANDSCAPE ²
Cnd	CROOM GRAVELLY SANDY LOAM, 10 TO 15 PERCENT SLOPES	NO	-	-	-
IsA	ISSUE SILT LOAM, OCCASIONALLY FLOODED	YES	POTOBAC	10	FLOOD PLAINS, DRAINAGEWAYS
MdE	MANOR CHANNERY LOAM, 25 TO 45 PERCENT SLOPES	NO	-	-	-
UcF	UDORTHERTS, HIGHWAY, 0 TO 65 PERCENT SLOPES	NO	-	-	-
Ur	URBAN LAND, 0 TO 8 PERCENT SLOPES	NO	-	-	-
UuB	URBAN LAND-UDORTHERTS COMPLEX, 0 TO 8 PERCENT SLOPES	NO	-	-	-

1. UNITED STATES DEPARTMENT OF AGRICULTURE, NATURAL RESOURCE CONSERVATION SERVICE, GRIDDED SOIL SURVEY GEOGRAPHIC (SSURGO) DATABASE FOR MARYLAND, DATED 2017, ACCESSED ON AUGUST 6, 2018.
2. HYDRIC SOILS INFORMATION AVAILABLE FROM THE STATE SOIL DATA ACCESS HYDRIC SOILS LIST, AT <HTPS://WWW.NRCS.USDA.GOV/INTERNET/FS_DOCUMENTS/NRCS/PRD1318618.HTML/REPORTREF>, ACCESSED AUGUST 6, 2018.

FOREST BUFFER & CONSERVATION EASEMENT AREAS

EASEMENT #	EASEMENT TYPE*	FC RETENTION AREA	FB MITIGATION AREA	LANDSCAPE PLANTINGS IN FB AREA	TOTAL AREA OF EASEMENT
1	FB	N/A	0.02± AC	N/A	0.28± AC
2	FB	N/A	0.59± AC	0.15± AC	1.86± AC
3	FB/FC	0.09± AC	N/A	N/A	0.09± AC

*FB-FOREST BUFFER EASEMENT; FB/FC-FOREST BUFFER AND FOREST CONSERVATION EASEMENT COMBINED.



LEGEND:

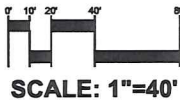
	SUBJECT PROPERTY		EX. NONTIDAL WETLAND		PR. LIMIT OF DISTURBANCE
	EX. PROPERTY LINE		EX. 25' WETLAND BUFFER		PR. FOREST BUFFER EASEMENT
	EX. EASEMENT		EX. SPECIMEN TREES		PR. FOREST BUFFER AND FOREST CONSERVATION EASEMENT RETENTION AREA
	EX. ZONING BOUNDARY				PR. FOREST BUFFER EASEMENT FOREST BUFFER MITIGATION PLANTINGS (1A, 2A, 2B, 2C, & 2D)
	EX. INTERIM CONTOUR				PR. FOREST BUFFER EASEMENT BALTIMORE COUNTY REQUIRED LANDSCAPE PLANTINGS (2E) (TO BE PLANTED WITH NATIVE TREES & SHRUBS)
	EX. INDEX CONTOUR				
	EX. PAVING				
	EX. OVERHEAD UTILITY LINE				
	EX. CULVERT				
	EX. SOIL BOUNDARY				
	EX. BUILDING				
	EX. HEDGEROW, SCRUB/SHRUB, GROUPS OF TREES <10,000 SQUARE FEET				
	EX. FORESTED AREAS				
	EX. 100-YEAR FEMA FLOODPLAIN				
	EX. PERENNIAL STREAM (DELINEATED BY GTA)				
	EX. OFF-SITE STREAM (COUNTY GIS)				

1A

KEY NUMBER TO FOREST BUFFER MITIGATION (SEE TABLE ON SHEET 4 OF 4)

O

FOREST BUFFER/FOREST CONSERVATION EASEMENT PROTECTION SIGN



MAXWELL D. POTEMER
DEPARTMENT OF NATURAL RESOURCES
QUALIFIED PROFESSIONAL
PER COMAR 08.18.08.01

AUGUST 12, 2019
DATE



GEO-TECHNOLOGY ASSOCIATES, INC.
GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS
3445-A BOX HILL CORPORATE CENTER DRIVE
ABINGDON, MARYLAND 21009
410-515-9446
FAX: 410-515-4895
WWW.GTAENG.COM
© 2019 GEO-TECHNOLOGY ASSOCIATES, INC.

FOREST CONSERVATION PLAN AND
FOREST BUFFER PROTECTION PLAN
**BEYOND SELF-STORAGE -
WHITE MARSH
AT 8228 BELAIR ROAD**
BALTIMORE COUNTY, MARYLAND

REVISIONS:
AUGUST 12, 2019 REVISED PROPOSED FOREST BUFFER EASEMENTS AND FOREST BUFFER/FOREST CONSERVATION MITIGATION PER VERBAL COMMENTS PROVIDED BY MR. PAUL DENNIS OF BALTIMORE COUNTY EPS ON MAY 23, 2019 AND AUGUST 12, 2019.

JOB NO:	31181132
SCALE:	1" = 40'
DATE:	MAY 1, 2019
DRAWN BY:	MDP
DESIGN BY:	MDP
REVIEW BY:	MAJ/FSG
SHEET:	2 OF 4

FOREST PROTECTION PROCEDURES AND SEQUENCE:

1. CLEARING OF FOREST AREAS SHOWN ON THIS PLAN WILL BE COMPLETED AS PART OF A MASS GRADING PLAN. BLAZE ORANGE HIGH VISIBILITY FENCE (SEE DETAIL THIS SHEET) SHALL BE INSTALLED TO THE EDGE OF THE CRITICAL ROOT ZONE (CRZ), WHEREVER THE LIMIT OF DISTURBANCE (LOD) IS ADJACENT TO THE FOREST BUFFER OR FOREST CONSERVATION AREA. ADJUSTMENTS TO THIS FENCE WILL BE PERMITTED ONLY FOR THE FINAL PLACEMENT OF LIGHT WEIGHT SOIL MIX OR ROOT PRUNING (SEE DETAIL THIS SHEET) IMMEDIATELY PRIOR TO DOING THE WORK.
2. PRIOR TO INSTALLATION OF THE PERIMETER SEDIMENT CONTROL MEASURES, THE LIMIT OF CLEARING AS SHOWN ON THIS FCP SHALL BE FLAGGED AND SURVEYED. LIMITS OF ENVIRONMENTAL EASEMENTS IN AREAS OF POTENTIAL HUMAN IMPACTS, SHALL BE CLEARLY MARKED IN THE FIELD WITH PERMANENT, BELOW-GRADE MARKERS TO FACILITATE IDENTIFICATION OF EASEMENT LIMITS BY BOTH PROPERTY OWNERS AND COUNTY STAFF. FOREST PROTECTION SIGNS (SEE DETAIL THIS SHEET) SHALL BE INSTALLED AS "WITNESS" POSTS NEAR EACH REBAR LOCATION. FOREST PROTECTION SIGNS SHALL BE POSED AT THE LESSER OF, EVERY 100 FEET, OR AT EACH SIGNIFICANT CHANGE IN DIRECTION OF THE FOREST CONSERVATION/ FOREST BUFFER EASEMENT BOUNDARY AS SHOWN ON SHEET 2 OF THIS PLAN.
3. STOCKPILE AREAS, EMPLOYEE PARKING AND EQUIPMENT STAGING AREAS SHALL BE CONTAINED WITHIN THE LIMIT OF CLEARING AS SHOWN ON THIS FOREST CONSERVATION PLAN OR SEDIMENT & EROSION CONTROL PLAN.
4. TREES OVER 18" DBH REQUIRING EXCAVATION WITHIN THE CRITICAL ROOT ZONE SHALL HAVE ROOTS PRUNED (SEE DETAIL THIS SHEET) AND CROWN REDUCED (SEE DETAIL THIS SHEET) PROPORTIONAL TO THE PERCENTAGE OF ROOT SYSTEM REMOVED TO MAXIMUM OF 20%. A 2" PROTECTIVE MULCH LAYER SHALL BE SPREAD 5 FOOT BEYOND THE ROOT PRUNING LINE, IMMEDIATELY FOLLOWING REMOVAL OF PROTECTIVE FENCING AT THE END OF THE FINAL GRADING STABILIZATION.
5. SPRING AND FALL LOW NITROGEN FERTILIZERS (10-25-15) SHALL BE APPLIED BY MEANS OF LIQUID PRESSURE INJECTIONS (SEE DETAIL THIS SHEET) TO THE ROOT ZONE OF THE TREES OVER 18" DBH THAT WERE AFFECTED BY CONSTRUCTION WITHIN THE CRZ.
6. EACH GROUP OF TREES SHOULD ALSO BE MONITORED FOR DISEASE AND INSECT PROBLEMS DURING AND AFTER CONSTRUCTION, FOR A PERIOD OF TWO YEARS.
7. ERADICATE EXOTIC TREE AND SHRUB SPECIES IDENTIFIED AS "NOXIOUS WEEDS" IN ACCORDANCE WITH COMAR 26.23.01.02 F(5) BY CUTTING AND/OR SPRAYING WITH APPROVED HERBICIDE (I.E. GLYPHOSATE, (ROUNDUP, RODEO, OR EQUIVALENT)) BY A STATE-CERTIFIED PESTICIDE APPLICATOR, 2 APPLICATIONS PER YEAR FOR 2 YEARS MAY BE NECESSARY. REMOVAL SHALL BE LIMITED TO ONLY THOSE SPECIES DEFINED AS "NOXIOUS WEEDS."

THE CRITICAL ROOT ZONE

ROOTS ARE VITAL TO THE FUNCTIONING OF ANY TREE. THEY PROVIDE STRUCTURAL SUPPORT AS WELL AS THE MAJOR MECHANISM FOR NUTRIENT AND WATER UPTAKE FOR USE BY THE TREE. DESTROYING A SECTION OF A TREE'S ROOTS, WILL ULTIMATELY RESULT IN A PROPORTIONAL LOSS TO THE TREE'S CANOPY.

THE CRITICAL ROOT ZONE OF A TREE IS THE ZONE IN WHICH THE MAJORITY OF THE TREE'S ROOTS LAY. NINETY-FIVE PERCENT OF THE ROOTS OF MOST TREES WILL BE FOUND IN THE UPPER 15-18" OF THE SOIL. THE MAJORITY OF THE ROOTS THAT SUPPLY THE NUTRIENTS AND WATER TO THE TREE ARE FOUND JUST BELOW THE SOIL SURFACE. THE TOTAL AMOUNT OF A TREE'S ROOTS ARE GENERALLY PROPORTIONAL TO THE VOLUME OF THE TREE'S CANOPY. THEREFORE, IF THE ROOTS ONLY PENETRATE A THIN LAYER OF THE SOIL, THEN THE ROOTS MUST SPREAD FAR FROM THE TREE, BEYOND THE EXTENSION OF THE

WHEN DELINEATING FOREST RETENTION LINES IN THE FIELD, ONE MUST CONSIDER NOT ONLY THE VISIBLE PORTION CANOPY, OF THE TREE (THE TRUNK AND CANOPY) BUT THE JUST BELOW GROUND PORTION AS WELL. ON ALL FOREST CONSERVATION MAPS, ISOLATED SPECIMEN TREES SHOULD BE NOTED WITH THEIR CRITICAL ROOT ZONES AND ALL SHOULD BE NOTED BY THE EDGES OF THEIR CRITICAL ROOT ZONES AND NOT JUST BY THE EXTENT OF THEIR CANOPIES.

THE TRUE SIZE OF THE CRITICAL ROOT ZONE IS DETERMINED BY THE SPECIES AND THE SIZE OF THE TREE AS WELL AS THE CONDITIONS OF THE SOIL (INCLUDING TEXTURE AND MOISTURE LEVEL). IT IS DIFFICULT TO GENERALIZE FOR ALL TREES BUT ALSO DIFFICULT TO FIELD EXAMINE THE ROOT SYSTEMS OF ALL OF THE TREES IN QUESTION.

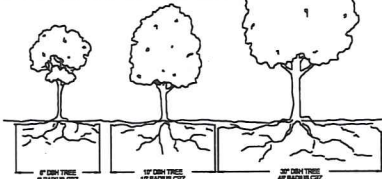
THERE ARE SEVERAL WAYS TO ESTIMATE THE SIZE OF THE CRITICAL ROOT ZONE WITHOUT EXAMINING THE ROOTS IN THE FIELD. THE FOLLOWING CALCULATION IS SUGGESTED BUT OTHER METHODS MAY BE ACCEPTED IF SHOWN TO PROTECT THE COMPLETE ROOT ZONE.

FOR THE EDGES OF LARGE AREAS, USE THE GREATER OF TWO CHOICES BELOW:

1" DBH OF THE TREE = 1" RADIUS OF THE CRITICAL ROOT ZONE OR 8 FT RADIUS CIRCLE AROUND THE TRUNK OF THE TREE

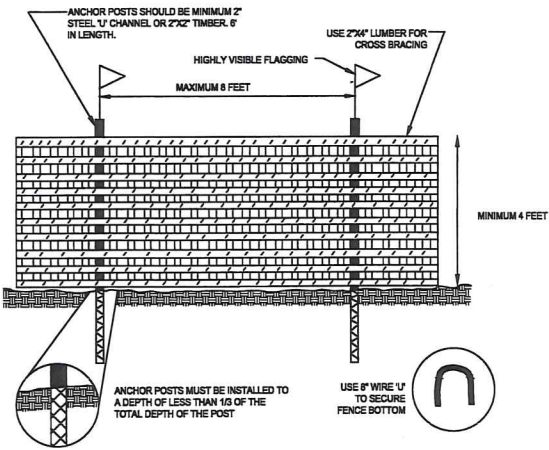
FOR ISOLATED SPECIMEN TREES:

1" DBH OF THE TREE = 1.5" RADIUS OF THE CRITICAL ROOT ZONE



THE CRITICAL ROOT ZONE IS THE AREA IN WHICH MOST OF THE TREE'S ROOTS LAY. RETAINING THIS AREA, ALONG WITH THE TREE ITSELF WILL HELP TO INSURE A HEALTHY RETENTION AREA.

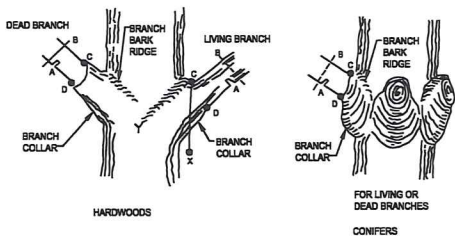
BLAZE ORANGE PLASTIC MESH



NOTES:

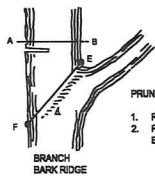
1. FOREST PROTECTION DEVICE ONLY.
2. RETENTION AREA WILL BE SET AS PART OF THE REVIEW PROCESS.
3. BOUNDARIES OF RETENTION AREA SHOULD BE STAKED AND FLAGGED PRIOR TO INSTALLING DEVICE.
4. ROOT DAMAGE SHOULD BE AVOIDED.
5. PROTECTIVE SIGNAGE MAY ALSO BE USED.
6. DEVICE SHOULD BE MAINTAINED THROUGHOUT CONSTRUCTION.
7. FOR PROPOSED FENCE LOCATION SEE "FOREST PROTECTION PROCEDURES AND SEQUENCE THIS SHEET."

CROWN REDUCTION



PRUNING A BRANCH

1. REMOVE BRANCH WEIGHT BY UNDERCUTTING AT "A" AND REMOVE LIMB BY CUTTING THROUGH AT "B".
2. REMOVE STUB AT "CD" (LINE BETWEEN BRANCH BARK RIDGE AND OUTER EDGE OF BRANCH COLLAR).
3. IF "D" IS DIFFICULT TO FIND ON HARDWOODS, DROP VERTICAL FROM "C" (LINE "CD"), ANGLE "XYC"=90°.



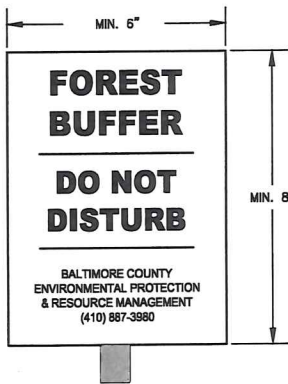
PRUNING A LEADER OR TO REDUCE SIZE

1. REMOVE TOP WEIGHT BY CUTTING AT "A/B".
2. REMOVE STUB AT "FE" PARALLEL TO THE BRANCH BARK RIDGE.

NOTES:

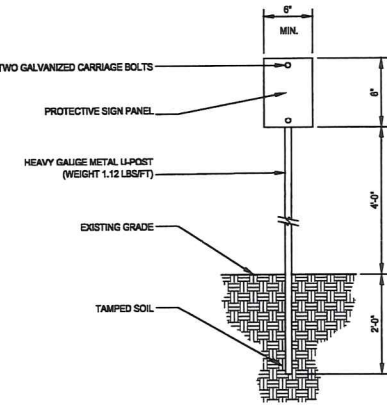
1. ONLY PRUNE AT SPECIFIED TIMES.
2. NO MORE THAN 30% OF CROWN TO BE REMOVED AT ONE TIME.

SIGNAGE



NOTE:

PERMANENT PROTECTIVE SIGNS SHALL BE PLACED THE LESSER OF, 100 FEET ON CENTER, OR AT EVERY SIGNIFICANT CHANGE IN DIRECTION OF THE FOREST CONSERVATION EASEMENT/FOREST BUFFER EASEMENT BOUNDARY AS SHOWN IN PLAN VIEW ON SHEET 2 OF 4.

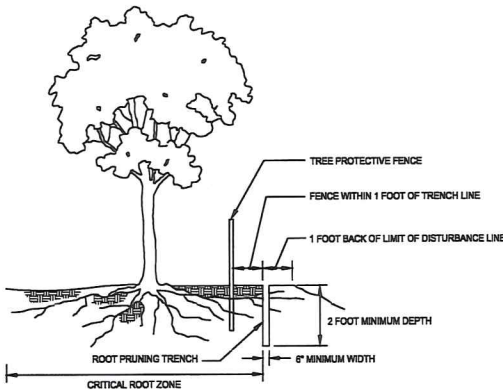


NOTE:

FOR PROTECTIVE SIGN SUPPLIERS CONTACT:
BALTIMORE COUNTY DEPARTMENT OF ENVIRONMENTAL PROTECTION AND SUSTAINABILITY (EPS)
100 WEST CHESAPEAKE AVENUE, SUITE 400
TOWSON, MARYLAND 21204
PHONE: (410) 867-3980

PRIOR TO THE ISSUANCE OF ANY PERMITS, SURVEYED LIMITS OF ENVIRONMENTAL EASEMENTS IMMEDIATELY ADJACENT TO LOTS, OR IN OTHER AREAS OF POTENTIAL HUMAN IMPACTS, SHALL BE CLEARLY MARKED IN THE FIELD WITH PERMANENT, BELOW-GRADE MARKERS TO FACILITATE IDENTIFICATION OF EASEMENT LIMITS BY BOTH PROPERTY OWNERS AND COUNTY STAFF. FOREST PROTECTION SIGNS SHALL BE INSTALLED AS "WITNESS" POSTS NEAR EACH REBAR LOCATION. ADDITIONALLY, THE LOCATIONS OF THE REBAR, AND THE OUTER EASEMENT LIMITS, SHOULD BE SHOWN ON THE FOREST BUFFER PROTECTION PLAN, AND SHALL BE SUBMITTED DIGITALLY TO EPS IN A FORMAT THAT COULD BE INCORPORATED INTO A GIS LAYER FOR FUTURE COUNTY USE.

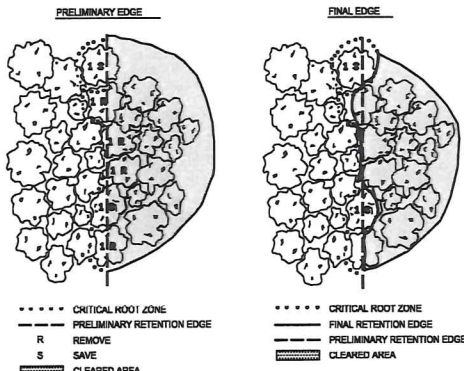
ROOT PRUNING



NOTES:

1. RETENTION AREAS WILL BE SET AS PART OF THE REVIEW PROCESS.
2. BOUNDARIES OF RETENTION AREAS SHOULD BE STAKED FLAGGED PRIOR TO TRENCHING.
3. EXACT LOCATION OF TRENCH SHOULD BE IDENTIFIED.
4. TRENCH SHOULD BE IMMEDIATELY BACKFILLED WITH SOIL REMOVED OR OTHER HIGH ORGANIC SOIL.
5. ROOTS SHOULD BE CLEANLY CUT USING VIBRATORY KNIFE OR OTHER ACCEPTABLE EQUIPMENT.

FIELD EDGE DETERMINATION

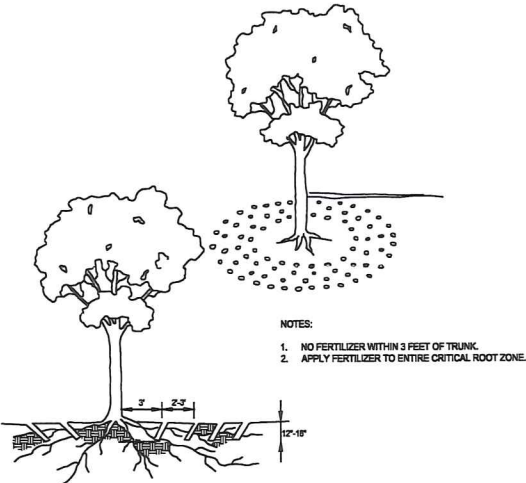


TREE #	STATUS	NOTES
1	SAVE	PRELIMINARY RETENTION EDGE (PRE) IMPACTING APPROXIMATELY 40% OF CRITICAL ROOT ZONE (CRZ). WORTH MOVING LINE SLIGHTLY TO ACCOMMODATE.
2	REMOVE	PRE IMPACT NEARING 60% OF CRZ SPECIES: TULIP POPLAR (CANNOT WITHSTAND DISTURBANCE WELL); TRUNK SHOWS SIGN OF DECAY; ADJUST LINE TO REMOVE.
3	REMOVE	PRE OVER TRUNK
4	REMOVE	TREE IS COMPLETELY WITHIN DISTURBANCE ZONE.
5	SAVE	APPROXIMATELY 40% IMPACT OF CRZ HEALTHY TREE. MOVE EDGE TO ACCOMMODATE.
6	REMOVE	RETENTION EDGE RUNS THROUGH TRUNK.

AS A RESULT OF THIS PROCESS:
NO ACRES LOST FROM BUILDABLE AREA TWO TREES SAVED

STAKING RETENTION EDGES IN THE FIELD REQUIRES TREE-BY-TREE DECISIONS. THE ABOVE EXAMPLE DEMONSTRATES THE USE OF THE CRITICAL ROOT ZONE, TREE HEALTH, AND TREE SPECIMENS IN LAYING OUT A FINAL, HEALTHY RETENTION LINE.

APPLICATION OF FERTILIZERS BY INJECTION



NOTES:

1. NO FERTILIZER WITHIN 3 FEET OF TRUNK.
2. APPLY FERTILIZER TO ENTIRE CRITICAL ROOT ZONE.



GEO-TECHNOLOGY ASSOCIATES, INC.
GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS

3445-A BOX HILL CORPORATE CENTER DRIVE
ABINGDON, MARYLAND 21009
410-515-9446
FAX: 410-515-4885
WWW.GTAENG.COM

© 2019 GEO-TECHNOLOGY ASSOCIATES, INC.

FOREST CONSERVATION PLAN AND
FOREST BUFFER PROTECTION PLAN
BEYOND SELF-STORAGE -
WHITE MARSH
AT 8228 BELAIR ROAD

BALTIMORE COUNTY, MARYLAND

REVISIONS:

AUGUST 12, 2019 REVISED PROPOSED FOREST BUFFER EASEMENTS AND FOREST BUFFER/FOREST CONSERVATION MITIGATION PER VERBAL COMMENTS PROVIDED BY MR. PAUL DENNIS OF BALTIMORE COUNTY EPS ON MAY 23, 2019 AND AUGUST 12, 2019.

Maxwell D. Potember
MAXWELL D. POTEMBER
DEPARTMENT OF NATURAL RESOURCES
QUALIFIED PROFESSIONAL
PER COMAR 08.19.06.01

AUGUST 12, 2019
DATE

JOB NO:	31181132
SCALE:	N/A
DATE:	MAY 1, 2019
DRAWN BY:	MDP
DESIGN BY:	MDP
REVIEW BY:	MAJ/SG
SHEET:	3 OF 4

FOREST BUFFER MITIGATION PLANTING - STANDARDS AND SPECIFICATIONS

1. PLANT MATERIAL SELECTION

A. ALL PLANT MATERIALS GREATER THAN 1" CALIPER SHALL MEET OR EXCEED THE REQUIREMENTS OF THE AMERICAN NURSERYMEN'S ASSOCIATION STANDARDS. ALL PLANTS SHALL BE TYPICAL OF THE SPECIES AND VARIETY, SHALL HAVE A NORMAL HABIT OF SRS GROWTH, AND SHALL BE FIRST QUALITY, SOUND, VIGOROUS, WELL-BRANCHED, AND WITH HEALTHY, WELL-FURNISHED ROOT SYSTEMS. THEY SHALL BE FREE OF DISEASE, INSECT PESTS, AND MECHANICAL INJURIES.

B. PLANTING STOCK LESS THAN 1" CALIPER SHOULD MEET THE FOLLOWING STANDARDS.

SEEDLINGS/WHIPS:
HARDWOODS - 1/4" TO 1/2" CALIPER WITH ROOTS NOT LESS THAN 8" LONG
CONIFERS - 1/4" TO 1/2" CALIPER WITH ROOTS NOT LESS THAN 8" LONG AND TOP HEIGHT OF 6" OR MORE
SHRUBS - 1/2" OR LARGER CALIPER WITH 8" ROOT SYSTEM

2. PLANTING SITE PREPARATION

A. UNDISTURBED SITES.

DISTURBANCE OF SOILS SHOULD BE LIMITED TO THE PLANTING FIELD FOR EACH PLANT. FOR PLANTINGS WHERE LARGE STOCK IS CHOSEN, THE PLANTING FIELD OF RADIUS OF 5 TIMES THE DIAMETER OF THE ROOT BALL IS RECOMMENDED.

IN AREAS OF STEEP SLOPES OR ERODIBLE SOILS, SOIL DISTURBANCE SHOULD BE LIMITED TO THE PLANTING FIELD WHOSE RADIUS IS EQUAL TO 2.5 X DIAMETER OF THE ROOT BALL.

B. DISTURBED AREAS.

SOILS SHOULD BE TREATED BY INCORPORATING NATURAL MULCH WITHIN THE TOP 12 INCHES, OR AMENDMENTS AS DETERMINED BY A SOILS ANALYSIS. NATURAL AMENDMENTS, SUCH AS ORGANIC MULCH OR LEAF MOLD COMPOST, ARE PREFERRED.

IF FILL MATERIAL IS USED AT THE PLANTING SITE, IT SHOULD BE CLEAN FILL WITH 12 INCHES OF NATIVE SOIL. STOCKPILING OF NATIVE TOPSOILS MUST BE DONE IN SUCH A WAY THAT THE HEIGHT OF THE PILE DOES NOT DAMAGE THE SEED BANK.

3. PLANTING PERIOD

DEPENDING ON THE SIZE STOCK BEING USED, THE ALLOWABLE PLANTING WINDOWS DIFFER.

4. PLANT MATERIAL STORAGE

IT IS RECOMMENDED THAT PLANTING OCCUR WITHIN 24 HOURS OF DELIVERY TO THE SITE. PLANT MATERIALS WHICH ARE LEFT UNPLANTED FOR MORE THAN 24 HOURS SHOULD BE PROTECTED FROM DIRECT SUN AND WEATHER AND KEPT MOIST. BARE ROOT STOCK, WHICH ARE UNPLANTED FOR MORE THAN 24 HOURS, SHOULD BE HELED IN NURSERY STOCK SHOULD NOT BE LEFT UNPLANTED FOR MORE THAN 2 WEEKS. ON-SITE OR LOCAL TRANSPLANTED MATERIALS SHOULD BE STORED IN TREE BANKS IF UNPLANTED FOR MORE THAN 24 HOURS.

5. ON-SITE INSPECTION

PRIOR TO PLANTING, PLANTING STOCK SHOULD BE INSPECTED. PLANTS NOT CONFORMING TO STANDARD NURSERYMAN SPECIFICATIONS FOR SIZE, FORM, VIGOR, ROOTS, TRUNK WOUNDS, INSECTS, AND DISEASE SHOULD BE REPLACED.

6. PLANTING SPECIFICATIONS

A. SEEDLINGS/WHIPS

PLANTING SMALL STOCK, SUCH AS SEEDLINGS AND WHIPS, AND BALLED AND BURLAPPED STOCK UP TO 2" CALIPER, CAN BE ACCOMPLISHED USING MANUAL METHODS OF PLANTING. SATISFACTORY EQUIPMENT INCLUDES SHOVELS, PLANTING OR DISSE BARS, AND MATTOCKS. FOR LARGER AREAS, PLANTING MACHINES MAY BE USED, BUT LINEAR, PLANTATION-TYPE PLANTINGS SHOULD BE AVOIDED.

EXTREME CARE SHOULD BE TAKEN TO INSURE RETAINED MOISTURE OF THE ROOTS. WHILE PLANTING SEEDLINGS AND WHIPS, A MOIST CARRYING CONTAINER SHOULD BE USED TO FURTHER PREVENT DESICCATION. FOR GREATER PROTECTION, SEEDLINGS MAY BE PLANTED WITH TREE SHELTERS.

AREAS PLANTED WITH SEEDLINGS OR WHIPS SHOULD BE MULCHED AFTER PLANTING.

B. CONTAINER-GROWN STOCK

SUCCESSFUL PLANTING OF CONTAINER-GROWN STOCK REQUIRES CAREFUL SITE PREPARATION AND INSPECTION OF THE PLANT MATERIAL ROOT SYSTEM. CAUTION IS RECOMMENDED WHEN SELECTING PLANTS GROWN IN A SOILS MEDIUM DIFFERENT FROM THAT OF THE PLANTING SITE. THE PLANT SHOULD BE REMOVED FROM THE CONTAINER AND THE ROOTS GENTLY LOOSENEED FROM THE SOILS. IF THE ROOTS ENCIRCLE THE ROOT BALL, SUBSTITUTION IS STRONGLY RECOMMENDED. A-SHAPED OR KINKED ROOT SYSTEMS SHOULD ALSO BE NOTED AND SUBSTITUTED IF NECESSARY. ROOTS MAY NOT BE TRIMMED ON-SITE DUE TO THE INCREASED CHANCES OF SOIL BORNE DISEASES.

THE PLANTING FIELD SHOULD BE PREPARED AS SPECIFIED. NATIVE STOCKPILED SOILS SHOULD BE USED TO BACKFILL PLANTING FIELD. RAWE SOILS EVENLY OVER THE PLANTING FIELD AND COVER WITH 2 TO 4 INCHES OF MULCH.

C. BALLED AND BURLAPPED TREES

TREE SPADES ARE USUALLY EMPLOYED TO PLANT LARGER TREE STOCK (BALLED AND BURLAPPED STOCK GREATER THAN 2" CALIPER). THIS TECHNIQUE IS PARTICULARLY USEFUL WHEN TRANSPLANTING ON-SITE OR WITH LOCAL PLANT MATERIALS. FOR TREES LARGER THAN 8" DIAMETER AT BREST HEIGHT (DBH), SPECIALIZED EQUIPMENT IS RECOMMENDED.

BALLED AND BURLAPPED TREES MUST BE HANDLED WITH CARE WHILE PLANTING. TREES SHOULD NOT BE PICKED UP BY THE TRUNK OR DROPPED, AS BOTH PRACTICES WILL TEND TO SEPARATE THE TRUNK FROM THE ROOT BALL. PRIOR TO PLANTING, ROOT BALLS SHOULD BE KEPT MOIST.

7. PLANTING METHODS

PLANTING FIELDS SHOULD BE CREATED. USE WATERING TO SETTLE SOIL. BACKFILLED AROUND TREES. STOCKPILED NATIVE TOPSOILS, IF AVAILABLE, SHOULD BE USED TO BACKFILL THE PLANTING FIELD. AMENDMENTS ARE NOT RECOMMENDED IN THE PLANTING FIELD, AS STUDIES HAVE SHOWN THAT ROOTS WILL BE ENCOURAGED TO STAY WITHIN THE AMENDED SOILS. SOILS SHOULD BE RAKED EVENLY OVER THE PLANTING FIELD AND COVERED WITH 2 TO 4 INCHES OF MULCH.

STAKING OF TREES IS NOT RECOMMENDED EXCEPT IN AREAS OF HIGH WINDS. STAKINGS MAY BE USED FOR TREES LARGER THAN 8 FEET IN HEIGHT. MOVEMENT IS NECESSARY TO STRENGTHEN THE TRUNK OF THE PLANTED TREE. IF STAKES ARE USED, THEY SHOULD BE REMOVED AFTER THE FIRST GROWING SEASON. WRAPPING IS ALSO NOT RECOMMENDED DUE TO THE INCREASED OPPORTUNITIES FOR INSECT INFESTATION AND DISEASE.

FOREST BUFFER AREAS PLANTING TABLE

FOREST BUFFER MITIGATION AREA	AREA (FT²)	AREA (ACRES)	REQUIRED # OF HARDWOOD WHIPS/ POTTED STOCK @ 350 PER ACRE
AREA 1A	1,054	0.02	7
AREA 2A	3,424	0.08	20
AREA 2B	13,318	0.30	105
AREA 2C	1,282	0.03	10
AREA 2D	786	0.02	7
TOTAL	19,824	0.45	149

8. POST CONSIDERATIONS

A. SOIL STABILIZATION

FOR AREAS OF LARGE-SCALE DISTURBANCE, SOILS MUST BE STABILIZED USING A NON-TURF-BUILDING GROUND COVER OR ENGINEERING FABRIC.

B. PROTECTION DEVICES

TO PREVENT DAMAGE OF PLANTED AREAS, ALL REFORESTATION AND AFFORESTATION SITES MUST BE POSTED WITH APPROPRIATE SIGNS AND FENCED. CONSTRUCTION EQUIPMENT SHALL BE PROHIBITED IN THESE AREAS.

C. WATERING

HOW OFTEN?

ANY WATERING PLAN SHOULD COMPENSATE FOR RECENT RAINFALL PATTERNS. TREES CAN DIE FROM TOO MUCH WATER, AS WELL AS TOO LITTLE. NEWLY PLANTED TREES MAY NEED WATER AS MUCH AS ONCE A WEEK FOR THE ENTIRE GROWING SEASON. THE NEXT TWO YEARS MAY REQUIRE WATERING ONLY A FEW TIMES A YEAR, EVERY MONTH DURING JULY AND AUGUST. AFTER THAT PERIOD, TREES SHOULD ONLY NEED WATER IN SEVERE DROUGHTS. BAKE ROOT TRANSPLANTS, AS OPPOSED TO BALLED AND BURLAP MATERIAL, IF THEY WERE SUFFICIENTLY WATERED DURING PLANTING, MAY NOT NEED WATER FOR ALMOST 2-4 WEEKS AFTER GROWTH BEGINS.

SOIL AND WATERING

SOIL TEXTURE INFLUENCES THE DOWNWARD FLOW OF WATER. SOILS WITH MORE CLAY TEND TO HOLD ON TO THE WATER MORE AND CAN BE WATERED LESS OFTEN. SOILS WITH MORE SAND DRAIN MORE QUICKLY AND NEED TO BE WATERED MORE OFTEN.

IF THE SOIL WAS WELL PREPARED BEFORE PLANTING, THEN THERE SHOULD NOT BE MANY DRAINAGE PROBLEMS. IF THERE IS RESTRICTED DOWNWARD FLOW OF WATER, THEN THE SOIL MAY HAVE BEEN COMPACTED DURING CONSTRUCTION AND NOT AERATED BEFORE PLANTING, OR THERE MAY BE A CLAY HARDPAN.

HOW TO WATER

THE BEST WAY TO WATER IS DEEPLY AND SLOWLY, USING A REGULAR HOSE, A SOAKER HOSE, OR DRIP IRRIGATION. ON LARGER TREES, START BY WATERING THE ROOT BALL THOROUGHLY AND THEN EXPAND THE WATERED AREA TO INCLUDE THE WHOLE ROOT ZONE AFTER THE TREE BECOMES MORE ESTABLISHED. MULCHING AROUND THE BASE OF NEWLY TRANSPLANTED TREES INSULATES ROOTS FROM DRYING TOO QUICKLY WHILE STILL PROVIDING AIR MOVEMENT TO THE ROOTS.

D. FERTILIZING

WHAT NUTRIENTS TO APPLY

TREES DEPEND ON THREE MAJOR NUTRIENTS: NITROGEN, PHOSPHORUS, AND POTASSIUM, AND A HOST OF OTHER MINOR ONES (OR MICRO), SUCH AS CALCIUM, MAGNESIUM, AND IRON. IN MOST SOILS, MOST OF THE MICRO ARE AVAILABLE IN ABUNDANCE. OF THE MAJOR NUTRIENTS, NITROGEN IS USUALLY THE LIMITED ONE. NOTHING SHOULD BE ADDED TO THE SOIL WITHOUT TESTING IT FIRST TO DETERMINE ITS NEEDS.

WHEN TO FERTILIZE

IN GENERAL, WHILE SOILS MAY BE DEFICIENT IN NITROGEN, IT IS NOT RECOMMENDED TO FERTILIZE A TREE WITHIN THE FIRST GROWING SEASON AFTER PLANTING. TOO MUCH NITROGEN MAY CAUSE A SPURT OF CANOPY GROWTH, WHICH THE ROOTS CANNOT SUPPORT. IT IS BEST TO WAIT UNTIL AFTER THE END OF THE FIRST GROWING SEASON, EITHER IN THE LATE FALL OR EARLY SPRING.

WHAT TYPE OF FERTILIZER

WHEN IT IS TIME TO FERTILIZE, ORGANIC FERTILIZERS ARE PREFERRED TO SYNTHETIC FERTILIZERS. BONE MEAL OR SEAWEED PRODUCTS ARE AVAILABLE COMMERCIALY. THEIR EFFECTIVENESS IS BASED ON THEIR ABILITY TO SUPPLY NUTRIENTS TO THE PLANT AS NEEDED WHILE MINIMIZING THE RISK OF EXCESS NUTRIENTS ENTERING THE FOREST SYSTEM AND THE WATER SUPPLY. SOME SYNTHETIC FERTILIZERS CAN MIMIC THIS SLOW ACTION AND MAY BE APPROPRIATE FOR USE.

E. CONTROL OF COMPETING VEGETATION

IN SOME CASES, UNWANTED VEGETATION GROWING NEAR NEWLY PLANTED TREES CAN TAKE OVER THE SITE. THE EXTENT TO WHICH THIS PROBLEM IS CONTROLLED DEPENDS ON THE ABILITY OF THE PLANTED MATERIAL TO WITHSTAND THE INTRUSION. SMALLER TREES NEED MORE CARE, ALTHOUGH SOME SEEDLINGS SURVIVE AMONG THE OVERGROWTH AND SHADE IT OUT WHEN THEY REACH A GREATER HEIGHT. AS A PREVENTIVE MEASURE, CONSIDER THE POTENTIAL FOR GROWTH OF INVASIVE SPECIES WHILE CHOOSING A REFORESTATION OR AFFORESTATION AREA. UNFORTUNATELY, GOOD SITES FOR REFORESTATION AND AFFORESTATION ARE GENERALLY GOOD SITES FOR UNWANTED VEGETATION AS WELL.

MULCH IS ONE OF THE BEST DETERRENTS TO WEEDS. SPREAD A 2-4" LAYER OF MULCH OVER THE ROOT AREA OF THE NEWLY PLANTED TREES AVOIDING DIRECT CONTACT WITH THE TRUNK, A PRIME SPOT FOR FUNGAL GROWTH. MULCH HELPS MAINTAIN THE SOIL MOISTURE LEVEL AND MAY PROVIDE A BUFFER FOR ANY EQUIPMENT, SUCH AS MOWERS, THAT MAY BE BROUGHT THROUGH THE AREA. MULCHING AND MANUAL CONTROL OF COMPETING VEGETATION IS MORE COMPATIBLE WITH THE LONG-TERM FOREST HEALTH THAN THE USE OF HERBICIDES.

F. PROTECTION: PESTS, DISEASES AND MECHANICAL INJURY

AN INTEGRATED PEST MANAGEMENT (IPM) PROGRAM IS ONE OF THE MOST EFFECTIVE AND SAFE APPROACHES FOR MAINTAINING A HEALTHY FOREST. THE BASICS OF IPM INCLUDE PROPER SPECIES SELECTION FOR THE SITE, GOOD PRUNING, MULCHING AND FERTILIZING PRACTICES, REGULAR MONITORING, AND PROPER TIMING OF NECESSARY SPRAYS. GOOD CULTURAL PRACTICES WILL MINIMIZE THE AMOUNT OF SPRAYING. PROFESSIONAL IPM PROGRAMS HAVE REDUCED PESTICIDE USE BY 90%. SOME ASPECTS OF A FULL IPM PROGRAM INCLUDE:

1. ELIMINATION OF SOME LOW VEGETATION BEFORE PLANTING. THIS WILL HELP CONTROL THE RODENT POPULATION, WHICH THRIVES IN BRUSHY ENVIRONMENTS.

2. USE OF TREE SHELTERS TO PROTECT THE TRUNKS OF SEEDLINGS OR WHIPS FROM ANIMAL DAMAGE. THE SHELTERS ACT AS MINI GREENHOUSES TO SPEED GROWTH. THESE TREES NEED MORE WATER THAN THOSE PLANTED WITHOUT TREE SHELTERS.

3. MULCHING AROUND THE TREES TO MINIMIZE INVASION BY EXOTIC PLANT SPECIES.

4. PRUNING DEAD AND DISEASED BRANCHES WITH A CLEAN CUT TO PREVENT SPREADING OF DISEASE.

SUNSCALD IS A PROBLEM, WHICH THIN, YOUNG TREES ENCOUNTER. TREE WRAP IS COMMONLY USED TO PROTECT THESE TREES FROM SUNSCALD, BUT IS NOT RECOMMENDED DUE TO THE INCREASE OPPORTUNITIES FOR INSECT INFESTATION AND DISEASE. AN ALTERNATIVE IS TO ALLOW SMALL, NONCOMPETITIVE BRANCHES, COMMONLY PRUNED, TO GROW ALONG THE SUNNY SIDE OF THE TRUNK TO HELP SHADE THE TRUNK.

NEWLY PLANTED TREES USUALLY DO NOT HAVE THE STRUCTURAL ROOTS TO SUPPORT THEM DURING HIGH WINDS. STAKES AND GUY WIRES, APPROPRIATE ONLY IN LOCATIONS WITH HIGH WINDS, SHOULD BE USED, BUT MUST BE REMOVED AFTER ONE GROWING SEASON OR THEY MAY CAUSE DAMAGE TO THE TREE AS IT GROWS.

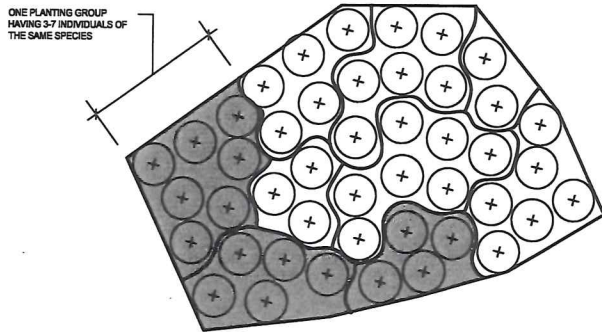
SCHEDULE FOR FOREST BUFFER MITIGATION PLANTING

			FOREST BUFFER MITIGATION AREAS						
			1A	2A	2B	2C	2D	TOTALS	
			PLANT QUANTITIES FOR EACH MITIGATION AREA						
TREE SPECIES	BOTANICAL NAME (COMMON NAME)	PLANT QUANTITIES OF EACH SPECIES	ACER NEGUNDO (BOX ELDER)	2	6	5	3	-	16
			ACER RUBRUM (RED MAPLE)	-	4	5	2	-	11
			ACER SACCHARINUM (SILVER MAPLE)	2	6	-	3	2	13
			FAGUS GRANDIFOLIA (AMERICAN BEECH)	1	2	-	2	-	5
			LIRIODENDRON TULIPIFERA (TULIPTREE)	-	-	25	-	-	25
			NYSSA SYLVATICA (BLACKGUM)	2	2	-	-	-	4
			PRUNUS SEROTINA (BLACK CHERRY)	-	-	20	-	2	22
			QUERCUS ALBA (WHITE OAK)	-	-	25	-	2	27
			QUERCUS RUBRA (NORTHERN RED OAK)	-	-	25	-	1	26
			TOTAL	7	20	105	10	7	149

NOTES:
SIZE: ALL TREE SHALL BE HARDWOOD WHIPS.
ROOT: ALL TREES SHALL BE FROM POTTED STOCK.
SPACING: ALL TREES SHALL BE PLANTED AT AN AVERAGE OF 11" ON CENTER.

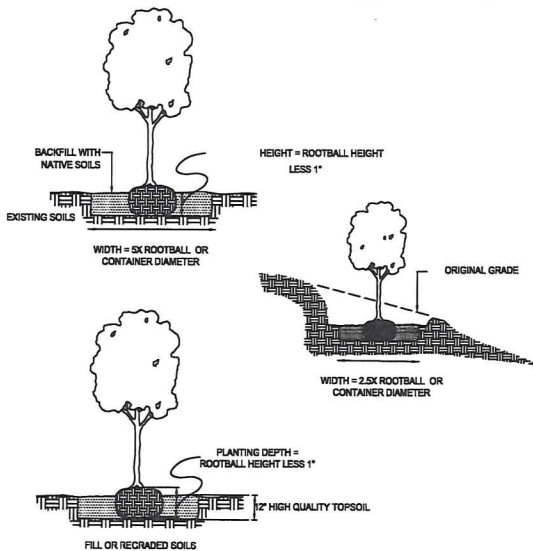
FOREST BUFFER MITIGATION AREA 2E WILL BE PLANTED WITH NATIVE TREES AND SHRUBS AS BALTIMORE COUNTY REQUIRED LANDSCAPE PLANTINGS AND PRESERVED WITHIN THE PROPOSED FOREST BUFFER EASEMENT.

TYPICAL PLANTING LAYOUT

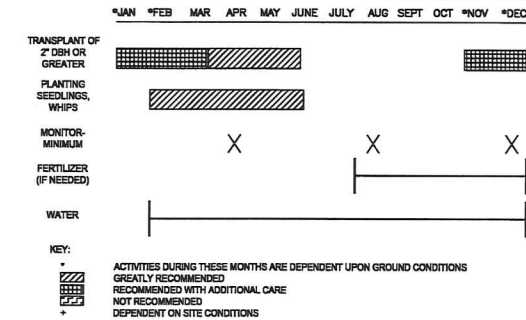


THE SPACING OF TREES SHALL VARY TO AVOID THE APPEARANCE OF A GRID. TREES SHALL BE PLANTED IN ACCORDANCE WITH THE AVERAGE SPACING SHOWN IN THE PLANTING SCHEDULE. THE PLANTING ROWS SHALL NOT BE STRAIGHT, BUT SHALL BE STAGGERED SLIGHTLY TO REDUCE THE VISUAL PERCEPTION OF THE ROWS. THE TREES SHALL BE PLANTED IN GROUPS HAVING 3-7 INDIVIDUALS OF THE SAME SPECIES. PLANT TREE GROUPS A MINIMUM OF TWO ROWS WIDE. GROUPS OF EACH SPECIES IN THE PLANTING SCHEDULE SHALL BE MIXED RANDOMLY AND EQUALLY. (THESE GROUPING SPECIFICATIONS MAY BE ALTERED AND DIRECTED IN THE FIELD BY THE ENVIRONMENTAL CONSULTANT.)

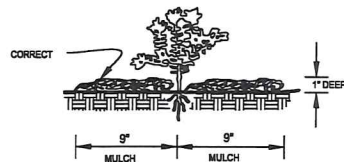
PLANTING CONTAINER GROWN AND B&B STOCK



TREE PLANTING AND MAINTENANCE CALENDAR



SEEDLING AND WHIP PLANTING SPECIFICATION



MULCHING NEWLY PLANTED SEEDLINGS IS SUGGESTED AS IT HELPS THE SOIL RETAIN MOISTURE AND IT PROTECTS THE SEEDLING FROM COMPACTION AND STEM INJURY.

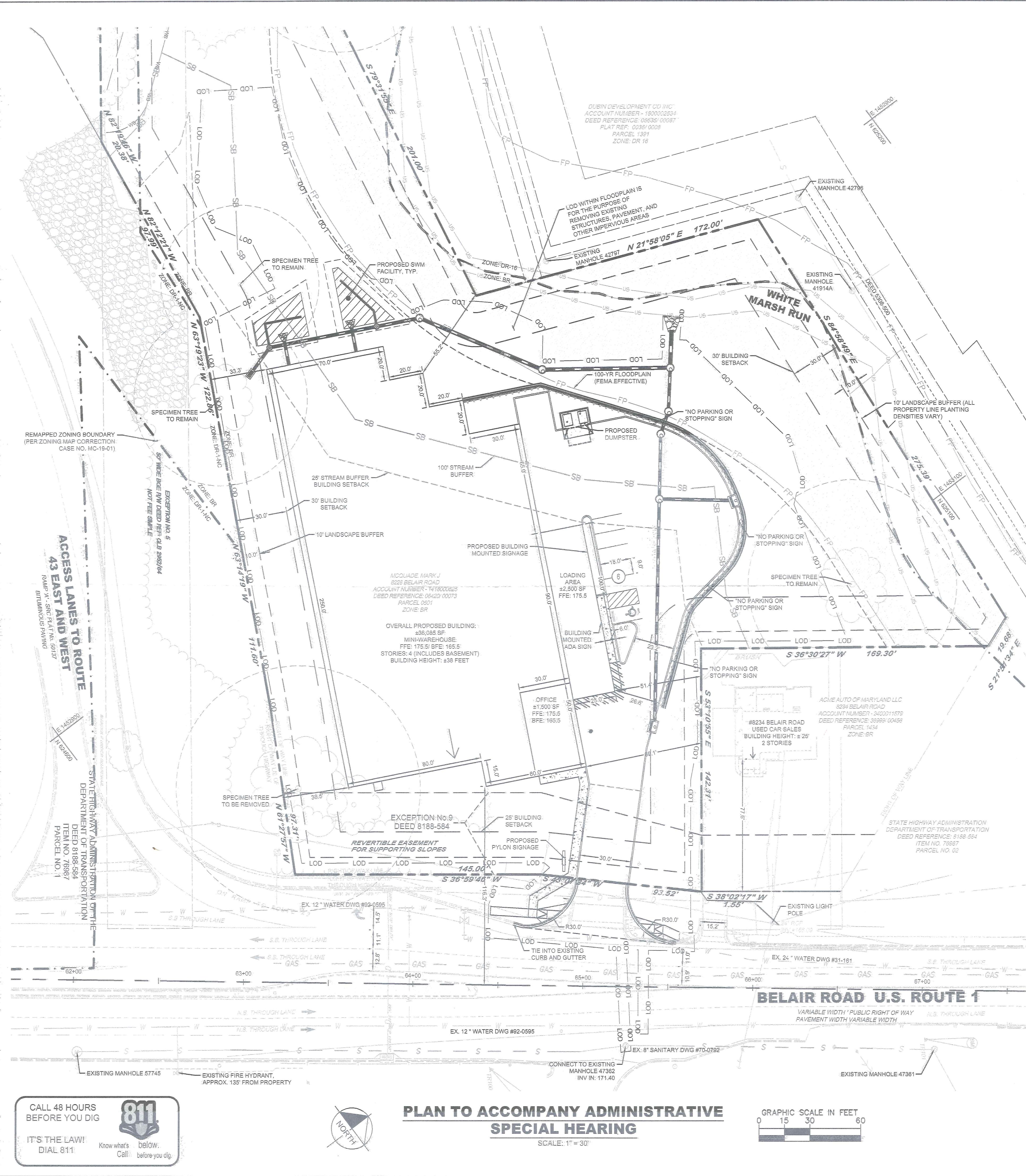
Maxwell D. Pottember
MAXWELL D. POTTEMBER
DEPARTMENT OF NATURAL RESOURCES
QUALIFIED PROFESSIONAL
PER COMAR 08.18.08.01
AUGUST 12, 2019
DATE

GEO-TECHNOLOGY ASSOCIATES, INC.
GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS
3445-A BOX HILL CORPORATE CENTER DRIVE
ABINGDON, MARYLAND 21009
410-515-9446
FAX: 410-515-4805
WWW.GTAENG.COM
© 2019 GEO-TECHNOLOGY ASSOCIATES, INC.

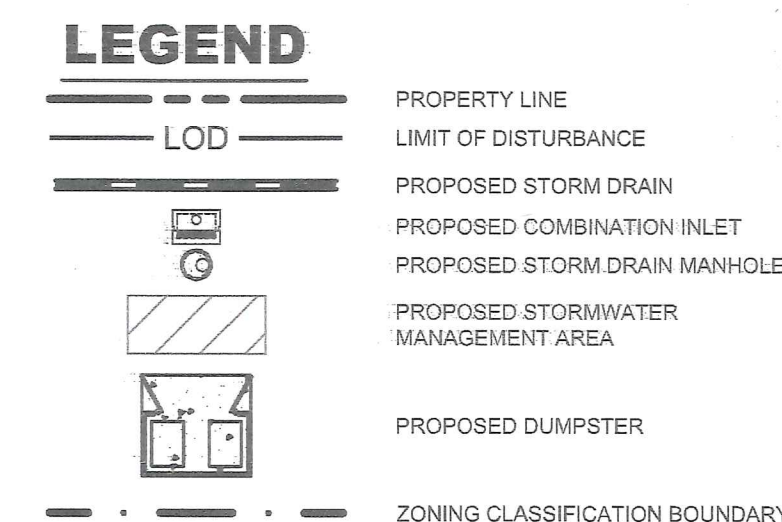
FOREST CONSERVATION PLAN AND
FOREST BUFFER PROTECTION PLAN
**BEYOND SELF-STORAGE -
WHITE MARSH
AT 8228 BELAIR ROAD**
BALTIMORE COUNTY, MARYLAND

REVISIONS:
AUGUST 12, 2019 REVISED PROPOSED FOREST BUFFER EASEMENTS AND FOREST BUFFER/FOREST
CONSERVATION MITIGATION PER VERBAL COMMENTS PROVIDED BY MR. PAUL
DENNIS OF BALTIMORE COUNTY EPS ON MAY 23, 2019 AND AUGUST 12, 2019.

JOB NO:	31181132
SCALE:	N/A
DATE:	MAY 1, 2019
DRAWN BY:	MDP
DESIGN BY:	MDP
REVIEW BY:	MAJ/FSG
SHEET:	4 OF 4



BULK REGULATIONS		
REGULATION	BR REQUIRED	PROVIDED
FRONT	25' FROM PROPERTY LINE, 50' STREET CENTERLINE, OR 50' PROPERTY ON DUAL HIGHWAY	51.7'
REAR	30' FROM PROPERTY LINE	55.2
SIDE	30' FROM PROPERTY LINE	36.5'
BUILDING HEIGHT (MAX.)	40'-0"	±38

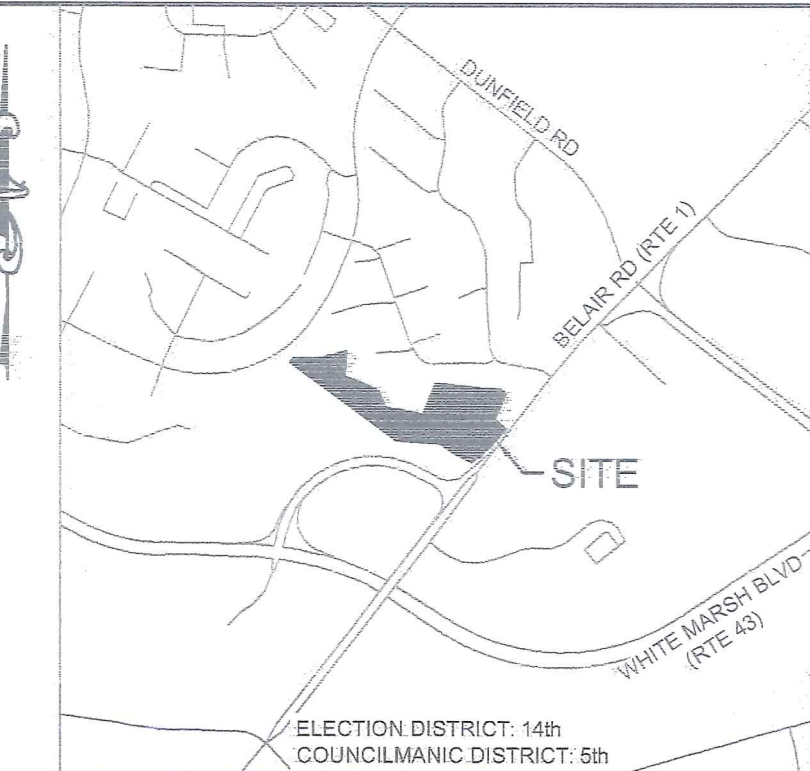


NOTES:

1. THERE SHALL BE NO CLEARING, GRADING, CONSTRUCTION OR DISTURBANCE OF VEGETATION IN THE FOREST BUFFER EASEMENT, FOREST CONSERVATION EASEMENT, OR FOREST BUFFER AND FOREST CONSERVATION EASEMENT EXCEPT AS PERMITTED BY THE BALTIMORE COUNTY DEPARTMENT OF ENVIRONMENTAL PROTECTION AND SUSTAINABILITY.
2. ANY FOREST BUFFER EASEMENT, FOREST CONSERVATION EASEMENT, OR FOREST BUFFER AND FOREST CONSERVATION EASEMENT SHOWN HEREON IS SUBJECT TO PROTECTIVE COVENANTS WHICH MAY BE FOUND IN THE LAND RECORDS OF BALTIMORE COUNTY AND WHICH RESTRICT DISTURBANCE AND USE OF THESE AREAS.

SITE DATA/ GENERAL NOTES:

- | | | |
|-------|---|---|
| 1. | GROSS AND NET ACREAGE | |
| 1.1. | PARCEL 0501: | ±5.218 ACRES |
| 1.2. | GFA: | 36085 SF/4 STORIES = 14430 SF (3.31 ACRES) |
| 2. | EXISTING ZONING: | FLOOR AREA RATIO = 3.31 ACRES/5.218 ACRES = 0.635 |
| 3. | EXISTING LAND USE: | BR (BUSINESS ROADSIDE), DR1 NC (DENSITY RESTRICTED 1 UNIT/ACRE NEIGHBORHOOD COMMONS), |
| 4. | PROPOSED USE: | TRACTOR AND LAWN EQUIPMENT SUPPLY STORE |
| 5. | PARKING REQUIREMENTS: | MINI-WAREHOUSE AND OUTDOOR STORAGE |
| 6. | PARKING PROVIDED: | 3.31 PS/1000 SF OFFICE = 4 PS |
| 7. | PROPERTY INFORMATION: | 6 PS (9' X 18'); 5 STANDARD AND 1 ADA |
| 7.1. | TAX ACCOUNT #: | 1418000625 |
| 7.2. | DEED REFERENCE: | 64207/3 |
| 7.3. | ADC MAP LOCATION: | 4550K9/4580K10 |
| 7.4. | TAX MAP: | 0071 |
| 7.5. | PARCEL: | 0501 |
| 7.6. | ZONING MAP: | N.E. 8-F |
| 7.7. | WATERSHED: | BIRD RIVER |
| 7.8. | SUB SEVERED: | WHITEPRAIRIE RUN |
| 7.9. | BASIC SERVICES - WATER MAP: | W-1 EXISTING SERVICE AREA, THE PROJECT IS NOT IN A WATER DEFICIENT AREA. |
| 7.10. | BASIC SERVICES - SEWER MAP: | S-1 EXISTING SERVICE AREA, THE PROJECT IS NOT IN A SEWER DEFICIENT AREA. |
| 7.11. | BASIC SERVICES - TRANSPORTATION: | N/A |
| 7.12. | REGIONAL PLANNING DISTRICT: | PARKVILLE |
| 7.13. | CENSUS TRACT: | 4403 |
| 8. | BUREAU OF TRAFFIC ENGINEERING AND TRANSPORTATION PLANNING HAS CONFIRMED THAT THE SUBJECT SITE IS <u>NOT</u> WITHIN A TRAFFIC DEFICIENT AREA. | |
| 9. | THIS PROJECT IS INSIDE OF THE URBAN RURAL DEMARCATION LINE. | |
| 10. | THIS SITE IS <u>NOT</u> LOCATED IN THE CHESAPEAKE BAY CRITICAL AREA. | |
| 11. | PROPERTY IS NOT UNDER ANY ACTIVE ZONING VIOLATIONS. | |
| 12. | THIS DEVELOPMENT WILL BE CONSTRUCTED IN ONE PHASE. | |
| 13. | THERE ARE NO SIGNIFICANT VIEWS PRESENT ON THIS SITE. | |
| 14. | THE DEVELOPER SHALL INVESTIGATE FOR AVAILABILITY OF ADEQUATE FIRE FLOW AT THE SITE. | |
| 15. | OFFSITE SIGHT LINE BASEMENTS ARE NOT ANTICIPATED FOR THIS PROJECT. | |
| 16. | VERAGE DAILY TRIPS (ADTs): 41 | |
| 17. | PER BALTIMORE REGION TRANSPORT MAPS, THE PROPOSED DEVELOPMENT AREA AREA IS NOT SERVED BY MTA BUSES. | |
| 18. | SEE ZONING SUMMARY TABLE FOR ZONING INFORMATION. | |
| 19. | THIS DEVELOPMENT IS SUBJECT TO THE COMPREHENSIVE ZONING MANUAL OF DEVELOPMENT POLICIES (SECTION 604.2), AND THE COUNTY LANDSCAPE MANUAL (SECTION 409.8.A.1). THIS DEVELOPMENT WILL COMPLY AND BE CONSISTENT WITH ALL OF THE AFOREMENTIONED REGULATIONS, STANDARDS, GUIDELINES, AND POLICIES OR THE PROPER RELIEF WILL BE REQUESTED. | |
| 20. | ALL SIGNS WILL CONFORM TO THE BALTIMORE COUNTY ZONING CODE, SECTIONS 450 OR APPROPRIATE RELIEF WILL BE REQUESTED. | |
| 21. | THE THERE ARE NO KNOWN BUILDINGS, PROPERTIES, OR SITES WITHIN OR ADJOINING THE PROPOSED DEVELOPMENT INCLUDED ON THE MARYLAND HISTORICAL TRUST INVENTORY (HMT), BALTIMORE COUNTY LANDMARKS LIST, THE NATIONAL REGISTER OF HISTORIC PLACES, OR THE MARYLAND ARCHEOLOGICAL SURVEY. THE PROJECT SITE IS NOT LOCATED WITHIN ANY BALTIMORE COUNTY OR NATIONAL HISTORIC DISTRICTS. | |
| 22. | THERE ARE NO PRIOR ZONING CASES FOR THIS PROPERTY. | |
| 23. | SITE ACCESS SHOWS IS PRELIMINARY, FURTHER INVESTIGATION AND COORDINATION WITH THE MARYLAND STATE HIGHWAY ADMINISTRATION IS ONGOING. | |
| 24. | A ZONING MAP AMENDMENT WAS SUBMITTED TO REMOVE THE DR-1-NC ZONING FROM THIS PROPERTY. THIS AMENDMENT WAS APPROVED AND PROCESSED BY BALTIMORE COUNTY UNDER CASE NUMBER MC-19-01. | |
| 25. | THE OFFICE HOURS OF OPERATION ARE 9AM-6PM MONDAY THRU FRIDAY, 9AM-5PM SATURDAY, AND 10AM-4PM ON SUNDAY. | |
| 26. | STORAGE SPACE AND THE LOADING/UNLOADING DOORS ARE LOCKED AND KEY CARD ACTIVATED FOR TENANT USE ONLY AND ARE AVAILABLE TO ALL TENANTS. | |



VICINITY MAP
SCALE: 1" = 1000'

Kimley»Horn

© 2019 KIMLEY-HORN AND ASSOCIATES, INC.
801 PORTER ST., SUITE 401, BALTIMORE, MD 21230
PHONE: 443-743-3470
WWW.KIMLEY-HORN.COM



PROFESSIONAL CERTIFICATION: I HEREBY
CERTIFY THAT THESE DOCUMENTS WERE
PREPARED OR APPROVED BY ME, AND I
AM A DULY LICENSED PROFESSIONAL
ENGINEER UNDER THE LAWS OF THE STATE
OF MARYLAND.
LICENSE NO. 44113
EXPIRATION DATE 06/10/2021

KHA PROJECT	DATE	SCALE	AS SHOWN	DESIGNED BY	RLH	DRAWN BY	ECS
114037001	11/21/2019						

PLAN TO ACCOMPANY ADMINISTRATIVE SPECIAL HEARING

TAX MAP: 0071
GRID NO: 0023
PARCEL: 0501
ELECTION DISTRICT: 14th
COUNCILMANIC DISTRICT: 5th

PROJECT NAME:

BEYOND SELF-STORAGE WHITE MARSH



8228 BELAIR ROAD,
BALTIMORE, MD 2123

SHEET NUMBER
1 OF 1

DRC #-090418D
PAI #-14-0505
LIMITED EXCEPTION #-19003LN
MCS NAD 83(2011)NAVD 88

OWNER:	APPLICANT:
PROPERTY OWNER: PARCEL 0501 MCQUADE, MARK J 8228 BELAIR RD BALTIMORE, MD 21236	DEVELOPER/ CONTRACT PURCHASER/ APPLICANT NORTHPOINT DEVELOPMENT, LLC ATTN: JOHNNY SWEENEY 4825 NW 41ST STREET SUITE 500 RIVERSIDE, MISSOURI 64150 TEL: (816) 281-2901 EMAIL: JSWEENEY@NORTHPOINTKC.COM

CONSULTANT:

CIVIL ENGINEER:
KIMLEY-HORN AND ASSOCIATES, INC.
1801 PORTER ST, SUITE 401
BALTIMORE, MD 21230
TEL: 443-743-3470
ATTN: NICHOLAS J. LEFFNER, PE