Dewberry

Proposed Floodplain Study

Magruder Pointe

Werrlein WSSC LLC.

Proposed 100-year floodplain delineation for the Northwest Branch Anacostia River in association with the Magruder Pointe site.

July 2018

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.: 29517
Expiration Date: December 31, 2019

SUBMITTED BY:

Dewberry Engineers Inc.
4601 Forbes Boulevard, Ste. 300
Lanham, Maryland 20706
301.731.5551

SUBMITTED FOR:

Werrlein WSSC LLC
522 Defense Highway
Annapolis, MD 21401
443-510-1274

TABLE OF CONTENTS

PRINCE GEORGE'S COUNTY GOVERNMENT

Department of Permitting, Inspections and Enforcement
(301) 883-5710

100-YEAR FLOODPLAIN REVIEW CHECKLIST*

This checklist serves as a guide for the consultant in the preparation and for the County the review of an existing or proposed 100-year floodplain study if prepared by a consultant. Any questions regarding items contained herein should be referred to the Prince George's County DPIE for clarification. Applicable page number or section in the Stormwater Design Manual or County Code for specific criteria are included for reference.

NOTE: PLANS SUBMITTED WITHOUT A COMPLETED CHECKLIST MAY BE RETURNED WITHOUT REVIEW

Site/Project Name: Magruder Pointe Date: 7/25/18

Consultant: Dewberry Engineers Inc. Applicant: Werrlein WSSC LLC

Phone Number: 301-364-1858 Phone Number: 443-510-1274

Email Address: bturton@dewberry.com Email Address: karl@werrleinproperties.com

Concept Plan No.: 10823-2018-0 Site Development Plan No.: _____

PermitNo.: FPS 201827

Consultant: Please complete the checklist below by indicating the following:
C or ✓ = Complete or checked; X = Not Applicable; O = Outstanding, need to address
Please place the appropriate symbol in the CONSULT column.

Item #	Design Checklist Item	Reference	CONSULT	DPIE
A	**GENERAL REQUIREMENTS FOR PRIVATE CONSULTANT**			
A-1	Subject to approval by DPIE and shall conform to other Department requirements.	4-6	✓	
A-2	Floodplain studies must be prepared by a Registered Professional Engineer licensed to practice engineering in Maryland; sealed, signed and dated	4-7	✓	
A-3	The floodplain study will be prepared in the design plan datum.		✓	
A-4	No freeboard is required for a study prepared by a consultant.	4-9	✗	
A-5	Based on actual existing channel geometry obtained from either field survey or 2 foot aerial topography. MNCP&PC topography is not acceptable.	4-7	✓	
A-6	Existing uses in the floodplain may be flood proofed, but not otherwise expanded, provided this does not raise the flood elevation.	32.205	✗	

Item #	Design Checklist Item	Reference	CONSULT	DPIE
A-7	Areas outside the property limits, which are affected by any water surface rise resulting from the development, must be acquired by applicant or reserved by acquisition of suitable floodplain easements.	4-7	✗	
A-8	New residential development is not permitted within the designated floodplain areas, based on the proposed channel conditions.	4-9	✓	
A-9	Must indicate whether any portion of the site lies within the danger reach of any existing or planned upstream dams. Where the project site overlaps a danger reach, the danger reach must be delineated on the floodplain plan, and all new structures must be located outside the danger reach.	4-8	✗	
B	**FLOODPLAIN STUDY REPORT**			
B-1	Brief description of existing site conditions, including location and vicinity maps. Indicate the availability of existing studies (FEMA, SHA, County, etc.). Discuss proposed improvements	4-9	✓	
B-2	Source of the hydraulic model cross-section information. (Field survey, aerial topography, etc.). Note vertical datum.	4-10	✓	
B-3	Discuss methodology for determining the starting water surface elevation.	4-10	✓	
B-4	Ranges of Manning's "n" values for channel and overbanks, any assumptions used and a statement on how "n" values were determined.	4-10	✓	
B-5	Discuss any environmental impacts due to the proposed floodplain impacts, and any other pertinent information which will aid reviewers in expediting the review process (computer disks, correspondence, intra/inter-agency agreements, etc.)	4-10	✓	
B-6	Provide a Summary of Elevations table for existing and proposed conditions at each cross section.	4-10	✓	
B-7	Explanation of all assumptions made in computations. Provide reference for the computational procedures and equations taken from manuals, books, etc.	4-10	✓	
B-8	Watershed Schematic for TR-20.	4-13	✗	
B-9	If channel modifications are proposed, include a copy of design plans and computations for cut-fill balance.	4-10	✓	
B-10	Include all existing and proposed channel conditions cross sections and profiles.	4-10	✓	
C	**HYDROLOGY (IF APPLICABLE)**			
C-1	Drainage area map with existing and proposed topography identifying each sub-watershed and flow path used for Tc calculation with segments labeled for both existing and proposed channel conditions. Note vertical datum used.	4-10	✗	
C-2	Soils with sub-watershed boundaries and ultimate land-use boundaries shown on drainage area map.	4-12	✗	
C-3	The ratio of the largest drainage area to the smallest drainage area shall not exceed 5:1 without permission from the Department.	4-12	✗	
C-4	Final drainage areas generated by TR-20 must reflect actual watershed drainage areas.		✗	
C-5	The 24-hour rainfall amount for the 100-year storm event in Prince George's County is 7.4 inches. Use rainfall distribution Table II and Antecedent Moisture Condition II.	4-13	✗	

Item #	Design Checklist Item	Reference	CONSULT	DPIE
C-6	Runoff Curve Numbers should be computed based on ultimate land use taken from the most recent zoning map/sectional map amendment or utilizing the proposed development plan for on-site area and the soil types based on the Prince George's County Soil Survey or boring longs. (Making the assumption that the land will remain undeveloped is unacceptable.)	4-11	✗	
C-7	Time of Concentration shall be used following the procedures outlined in Chapter 3 of the June, 1986 edition of "TR-55 Computations". Manning's "n" factor for sheet flow should reflect ultimate land use condition (for existing and proposed channel conditions). P100=7.4 inches should be used in the equation to determine sheet flow travel time. The sheet flow length should not be more than 100 feet.	4-11	✗	
C-8	Shallow concentrated flow shall be used until the existence of a channel.	4-11	✗	
C-9	Rating tables for channel routing shall be generated from reliable hydraulic analysis such as HEC-2/HEC-RAS modeling. (Identify sections used).	4-12	✗	
C-10	Provide computations for stage-discharge and discharge-area relationships for the channel routing rating tables. The most recent and updated topographic information should be used to determine stage-storage relationship. M-NCPPC's 2-ft. topographic map is the minimum required. If field run or other aerial 2-ft. topographic maps are available, they should be used. Rating tables must be adjusted to reflect proposed channel conditions.	4-12	✗	
C-11	Stage discharge computations for reservoir control structures must (where applicable) take into account submergence of weirs, slots, and orifices due to tailwater conditions. Computations can be generated by using HEC-2, HEC-RAS, HY-8 or FHWA HDS No. 5.	4-12	✗	
C-12	Rating Tables for Reservoir Routing must reflect the proposed channel conditions	4-13	✗	
C-13	Input data used in TR-20 run must be consistent with the computations.	4-14	✗	
C-14	Proposed stormwater ponds for the development which significantly impact the 100-year discharge should be included in proposed channel condition hydrology and hydraulics. The existing and proposed channel condition models should be as consistent as possible so that 100-year discharge can be compared at study points. Should the proposed channel conditions discharge be greater than existing channel condition discharge, the floodplain study must be extended downstream of the site to determine the increase in the 100-year floodplain elevations.	4-13	✗	
C-15	The flood elevation calculated from the TR-20 run and the predicted flood elevation energy grade line from the hydraulic model must be within 0.25 foot.	4-17	✗	
D	**HYDRAULICS ~~HEC-2~~ HEC-RAS**			
D-1	Cross sections should be generated from field survey or two-foot aerial topography. Cross sections may not be obtained from M-NCPPC's 5 foot topography are unacceptable. Vertical datum to match plan datum.	4-14	✓	

Item #	Design Checklist Item	Reference	CONSULT	DPIE
D-2	Provide detailed bridge or culvert information including: bridge geometry such as opening, material, length, invert elevations, etc.; back-up calculations for bridge or culvert parameters, road profile, and inlet control vs. outlet control computation.	4-18	✗	
D-3	Manning's "n" values should reflect actual field conditions. The composite or equivalent coefficient of roughness of any cross section should not be averaged for the wetted perimeter of the cross section. Refer to HEC-2 User's Manual, ?? or FHWA HDS No. 5 for computation of composite Manning's "n" values.	4-15	✓	
D-4	All stations used in control input must be reflected in the data points for a cross section.	4-15	✓	
D-5	Proper expansion and contraction coefficients should be used. Adjust the value of loss coefficients at abrupt transitions in the channel reach.	4-15	✗ NOT MODIFIED	
D-6	Starting Water Surface Elevation should be used from a downstream study, if available. If not available, use other accepted County procedures.	4-14	✓	
D-7	When channel modifications are proposed, a hydraulics analysis must be prepared for both existing and proposed channel conditions. The analysis shall extend upstream until the WSEL converges. Offsite areas must be be acquired or a floodplain easement provided.	4-15	✓	
D-8	The HEC-2 assumes outlet control flow condition. Inlet control flow condition should be checked using the Bureau of Public Roads charts. If inlet control governs, an accurate water surface elevation should be input into the model using an X5 card.	4-16	✗ HEC-RAS	
D-9	Consider backwater conditions, local obstructions and where required by ther Department the partial or complete failure of any enclosed drainage system. Consideration must be given to the overflow path to ensure that no structure will flood in the event of system failure.		✓	
D-10	Top widths at upstream and downstream face of bridge must be reasonably encroached. For pressure or low flow conditions, top widths should be the same as the bridge opening. For weir flow, top width should not be limited to the bridge opening, and velocity head should not exceed 0.5 feet at upstream face of bridge without appropriate justification.	4-16	✗ NOT MODIFIED	
D-11	The normal bridge routine should be used to model low flow or completely submerged conditions, while the special bridge routine should be used to model pressure flow or pressure plus weir flow conditions. (Note, GR & BT stations must match in low flow condition).	4-16	HEC-RAS ✗ NOT MODIFIED	
D-12	Headwater elevation at bridges/culverts can be determined using the HEC-2 or HEC-RAS bridge routines, HY-8, or other computer programs that calculate headwater or by hand computations. Due to their flexibility in handling different flow regimes, we encourage the use of the HEC-2 or HEC-RAS bridge routines.	4-15	HEC-RAS ✗ NOT MODIFIED	

Item #	Design Checklist Item	Reference	CONSULT	DPIE
D-13	More detailed evaluation is required to verify adequacy of critical depth at bridge cross sections. For low flow or pressure flow conditions, modeling should reflect proper expansion of flow downstream of bridge and contraction of flow upstream of bridge (page IV-15, HEC-2 manual). When the Special Bridge Method is used, no critical depth is acceptable at the upstream face of the bridge/culvert.	4-18	HEC-RAS ✗ NOT MODIFIED	
D-14	Critical Depth occurs when the program cannot balance water surface elevation, critical depth is assumed for the cross section and a message to that effect is printed by the program. The consultant must verify the adequacy of all critical depth messages per the manual guidelines.	4-17	HEC-RAS ✗ NOT MODIFIED	
D-15	For supercritical flow condition, due to large velocity head, the 100- year floodplain delineation should reflect the hydraulic model energy grade elevations.	4-16	HEC-RAS ✗ NOT MODIFIED	
D-16	Floodplain maps indicating location of HEC-2 cross sections, flood elevations (existing and proposed) at each cross-section, floodplain boundary (existing and proposed), proposed changes of the stream, houses, etc.	4-16	✓	
D-17	Divided flow messages should be analyzed to insure that this is indeed the flow situation.All notes and remarks in the HEC-2 output should be reviewed.	4-17	HEC-RAS ✗ NOT MODIFIED	
E	**MISCELLANEOUS**			
E-1	For all proposed fill, either permanent or temporary within the existing 100-year floodplain, cannot result in an increase in offsite water surface elevations.		✓	
E-3	An equal amount of compensatory floodplain storage is required to counter-balance proposed floodplain fill except for road crossings (Subsection 32 Division 4). A detailed site plan and computations showing a balance of cut-and-fill, the impact must minimize disturbance of the floodplain, and respect environmental features.		✓	
E-4	Floodplain fill for embankments of road crossings or stormwater management facilities may be acceptable without requiring compensatory storage. The embankments, in this case, must be crossing the main stream for which the 100-year floodplain is being determined.		✗	
E-5	A detailed hydraulic analysis utilizing HEC-2/HEC-RAS is required in order to determine the impacts of the proposed fill.		✓	
E-6	If the proposed floodplain fill is located within the FEMA Detailed Study Floodplain limits, then a FEMA map revision process will be required.	4-6	○	
E-7	Computer disk consisting of computer miodel input files for the project (if necessary).	4-16	✓	

* For the latest available design checklists, scan the barcode below:

VICINITY MAP
SCALE: 1" = 2000'

PRINCE GEORGE'S COUNTY
ROAD ATLAS
MAP 5409 GRID H8, F8

Project Narrative

INTRODUCTION

Magruder Pointe is a proposed 72-lot residential development adjacent to the Northwest Branch Anacostia River. The Northwest Branch Anacostia River has an existing detailed FEMA study, with base flood elevations reported, per the currently effective Flood Insurance Study, dated September 16, 2016, due to the more detailed analysis available. In June 2018 (Floodplain Study Number 201827), the county approved the use of the currently effective FEMA study, with a modified starting water surface elevation, as the regulatory floodplain study for the Northwest Branch Anacostia River, as it affects the Magruder pointe site.

The purpose of this study is to revise the approved existing conditions floodplain to include the proposed grading for the Magruder Pointe site. As part of the redevelopment of the site, fill will be incorporated in order to have each structure above the regulatory and delineated floodplain elevation. In addition, a compensatory storage area will be established in order to provide the necessary storage to maintain the existing floodplain water surface elevation. A floodplain waiver request has been submitted.

METHODOLOGY

HYDROLOGY

The FEMA discharges were not revised for this proposed floodplain study.

HYDRAULICS

The FEMA HEC-RAS hydraulic model was used as the base model for this proposed floodplain study. According to this floodplain modeling, Cross Section 0.63 traverses the Magruder Pointe site. The existing geometry for Cross Section 0.63 was revised to represent the proposed geometry associated with the redevelopment. The proposed geometry includes revised grading for residential lots, alleyways, and open space areas. In addition, the proposed compensatory storage area has been added to Cross Section 0.63's proposed geometry, with updated Manning's n coefficients.

Since the area to be redeveloped is located within the ineffective flow area of Cross Section 0.63, the proposed grading did not have any impact to the approved existing FPS 201827 delineated water surface elevations, 25.63. See Table 1 for tabulation of existing and proposed conditions water surface elevation.

FILES

Project Name: MAGRUDER POINT FPS
File Name: MAGRUDERPOINTEFPS.prj

"FEMA Effective" Plan:
Plan: MAGRUDERPOINTEFPS.p01
Geometry: MAGRUDERPOINTEFPS.g01
Steady Flow: MAGRUDERPOINTEFPS.f01

"Modified FEMA" Plan:
Plan: MAGRUDERPOINTEFPS.p02
Geometry: MAGRUDERPOINTEFPS.g01
Steady Flow: MAGRUDERPOINTEFPS.f02

"Proposed Conditions" Plan:
Plan: MAGRUDERPOINTEFPS.p05
Geometry: MAGRUDERPOINTEFPS.g05
Steady Flow: MAGRUDERPOINTEFPS.f02

MAPPING

The proposed conditions floodplain was mapped according to the proposed topographic data. As can be seen from the proposed conditions floodplain mapping, the residential units will be outside the proposed floodplain and a 25-foot floodplain buffer.

CONCLUSION

The purpose of this floodplain study was to update the county floodplain study to the proposed conditions associated with the Magruder Pointe site, while maintaining the existing water surface elevations for the Northwest Branch Anacostia River.

CROSS SECTION 0.71	EXISTING BFE		EXISTING BFE PLUS FREEBOARD		PROPOSED BFE		PROPOSED BFE PLUS FREEBOARD	
DATUM	NGVD29	NAVD88	NGVD29	NAVD88	NGVD29	NAVD88	NGVD29	NAVD88
COUNTY WATERSHED STUDY	27.65	26.87	28.65	27.87	27.65	26.87	28.65	27.87
FEMA STUDY	24.76	23.98	25.76	24.98	24.76	23.98	25.76	24.98
MODIFIED FEMA STUDY (FPS 201827)	24.76	23.98	25.76	24.98	24.76	23.98	25.76	24.98

CROSS SECTION 0.63	EXISTING BFE		EXISTING BFE PLUS FREEBOARD		PROPOSED BFE		PROPOSED BFE PLUS FREEBOARD	
DATUM	NGVD29	NAVD88	NGVD29	NAVD88	NGVD29	NAVD88	NGVD29	NAVD88
COUNTY WATERSHED STUDY	27.61	26.83	28.61	27.83	27.61	26.83	28.61	27.83
FEMA STUDY	24.63	23.85	25.63	24.85	24.63	23.85	25.63	24.85
MODIFIED FEMA STUDY (FPS 201827)	24.63	23.85	25.63	24.85	24.63	23.85	25.63	24.85

CROSS SECTION 0.53	EXISTING BFE		EXISTING BFE PLUS FREEBOARD		PROPOSED BFE		PROPOSED BFE PLUS FREEBOARD	
DATUM	NGVD29	NAVD88	NGVD29	NAVD88	NGVD29	NAVD88	NGVD29	NAVD88
COUNTY WATERSHED STUDY	27.43	26.65	28.43	27.65	27.43	26.65	28.43	27.65
FEMA STUDY	24.27	23.49	25.27	24.49	24.27	23.49	25.27	24.49
MODIFIED FEMA STUDY (FPS 201827)	24.27	23.49	25.27	24.49	24.27	23.49	25.27	24.49

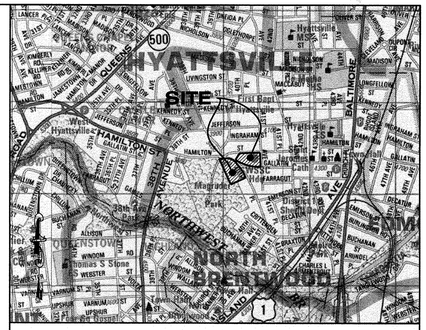
Table 1: Existing and Proposed Floodplain Water Surface Elevations

Appendix A:
Proposed Conditions Floodplain Mapping

MAGRUDER POINTE

PROPOSED 100 YEAR FLOODPLAIN DELINEATION PLAN

NAD83/91 NAD83/91 DATUM



VICINITY MAP
SCALE: 1" = 2000'

Vicinity Map © ADC - Kappa Map Group LLC/GIS Integrated Solutions LLC 2014

PRINCE GEORGE'S COUNTY
ROAD ATLAS
MAP 5409 GRID H8, F8

LEGEND

- EXISTING MAJOR CONTOUR (210)
- EXISTING MINOR CONTOUR
- EXISTING BOUNDARY
- EXISTING ADJACENT PROPERTY
- EXISTING FLOOD PLAIN (FP)
- EXISTING STREAM
- EXISTING WETLAND (WL)
- PROPOSED MAJOR CONTOUR (210)
- PROPOSED MINOR CONTOUR (212)
- PROPOSED FLOOD PLAIN (FP)
- PROPOSED ROAD RIGHT-OF-WAY
- PROPOSED PROPERTY LINE
- PROPOSED ROAD CENTERLINE
- PROPOSED EDGE OF PAVEMENT/CURB & GUTTER
- PROPOSED BUILDING
- PROPOSED STORM DRAIN
- X.XX — X-SEC
- XX.XX — ELEV. (NGVD29)

NOTE: SOURCE OF EXISTING ON-SITE TOPOGRAPHY: FIELD TOPOGRAPHY BY DEWBERRY ENGINEERS INC. IN FEBRUARY 2018.

CROSS SECTION 0.71	EXISTING BFE		EXISTING BFE PLUS FREEBOARD		PROPOSED BFE		PROPOSED BFE PLUS FREEBOARD	
DATUM	NGVD29	NAVD88	NGVD29	NAVD88	NGVD29	NAVD88	NGVD29	NAVD88
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CROSS SECTION 0.63	EXISTING BFE		EXISTING BFE PLUS FREEBOARD		PROPOSED BFE		PROPOSED BFE PLUS FREEBOARD	
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NOTE
FOR LOCATION OF UTILITIES CALL
8-1-1 OR 1-800-257-7777
OR LOG ON TO
www.call811.com
http://www.missutility.net
48 HOURS IN ADVANCE OF ANY WORK IN THIS VICINITY
INFORMATION CONCERNING UNDERGROUND UTILITIES WAS OBTAINED FROM AVAILABLE RECORDS BUT THE CONTRACTOR MUST DETERMINE THE EXACT LOCATION AND ELEVATION OF THE MAINS BY DIGGING TEST PITS BY HAND AT ALL UTILITY CROSSINGS WELL IN ADVANCE OF THE START OF EXCAVATION.

DRAWN BY	NAG
APPROVED BY	SKF
CHECKED BY	BHT
DATE	JULY 2018

APPLICANT
WERRLEIN WSSC LLC
522 DEFENSE HIGHWAY
ANNAPOLIS, MD 21401

CONTACT
JONATHAN WERRLEIN
443-510-1274
Jonathan@werrleinproperties.com

16TH ELECTION DISTRICT
PRINCE GEORGE'S ROAD ATLAS:
MAP 50 - GRID B1
WSSC GRID 206NE03

SCALE(S)
0' 100' 200'
1"=100'
Unless otherwise noted

NO.	DESCRIPTION	DATE	BY
	REVISIONS		

SEAL
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.: 29517,
EXPIRATION DATE: DECEMBER 31, 2019.

STATE OF MARYLAND · SHARON K. FREEMAN · No. 29517 · PROFESSIONAL ENGINEER · 7-24-18

MAGRUDER POINTE
PRINCE GEORGE'S COUNTY
MARYLAND
PROPOSED FLOODPLAIN

COVER SHEET

Dewberry®
Dewberry Engineers Inc.
4601 Forbes Boulevard, Suite 300
Lanham, MD 20706
301.731.5551
301.731.0188 fax

PROJECT NO. 50099455

1

SHEET NO. 1 of 2

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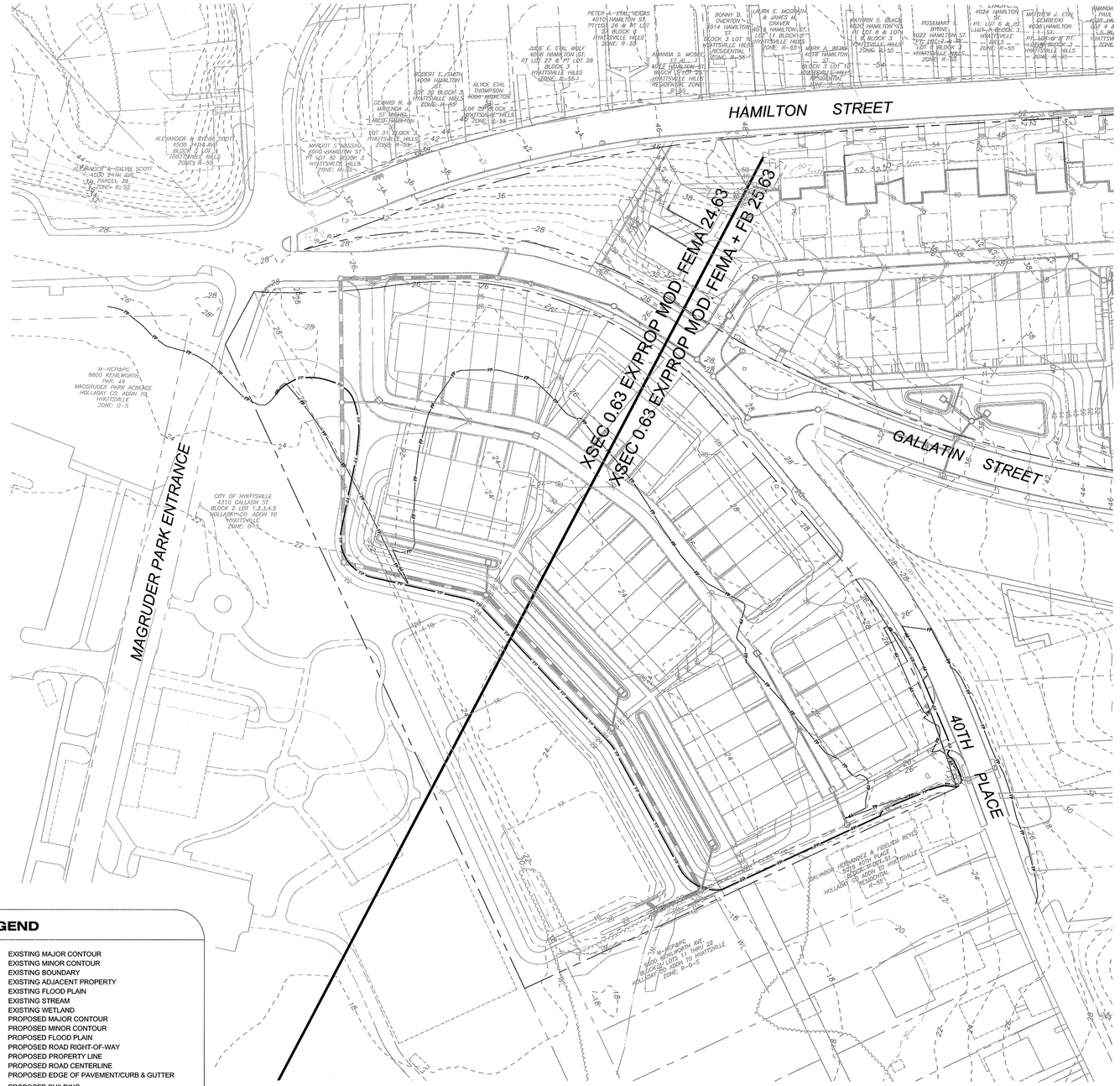

LEGEND

- EXISTING MAJOR CONTOUR (210)
- EXISTING MINOR CONTOUR
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MODIFIED FEMA STUDY (FPS 201827)	24.63	23.85	25.63	24.85	24.63	23.85	25.63	24.85

NOTE: SOURCE OF EXISTING ON-SITE TOPOGRAPHY: FIELD TOPOGRAPHY BY DEWBERRY ENGINEERS INC. IN FEBRUARY 2018.

MAGRUDER POINTE

PRINCE GEORGE'S COUNTY
MARYLAND

PROPOSED FLOODPLAIN

SITE PLAN

NOTE
FOR LOCATION OF UTILITIES CALL
8-1-1 OR 1-800-257-7777
OR LOG ON TO
www.call811.com
http://www.missutility.net
48 HOURS IN ADVANCE OF ANY WORK IN THIS VICINITY
INFORMATION CONCERNING UNDERGROUND UTILITIES WAS OBTAINED FROM AVAILABLE RECORDS BUT THE CONTRACTOR MUST DETERMINE THE EXACT LOCATION AND ELEVATION OF THE MAINS BY DIGGING TEST PITS BY HAND AT ALL UTILITY CROSSINGS WELL IN ADVANCE OF THE START OF EXCAVATION.

DRAWN BY	NAG
APPROVED BY	SKF
CHECKED BY	BHT
DATE	JULY 2018

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522 DEFENSE HIGHWAY
ANNAPOLIS, MD 21401

CONTACT
JONATHAN WERRLEIN
443-510-1274
Jonathan@werrleinproperties.com

16TH ELECTION DISTRICT
PRINCE GEORGE'S ROAD ATLAS:
MAP 50 - GRID B1
WSSC GRID 206NE03

SCALE(S)
0' 50' 100'
1"=50'
Unless otherwise noted

NO.	DESCRIPTION	DATE	BY
	REVISIONS		

SEAL
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.: 29517, EXPIRATION DATE: DECEMBER 31, 2019

STATE OF MARYLAND — KAREN K. FREELAND — 29517 — PROFESSIONAL ENGINEER — 7/24/19

Dewberry®
Dewberry Engineers Inc.
4601 Forbes Boulevard, Suite 300
Lanham, MD 20706
301.731.5551
301.731.0188 fax

PROJECT NO. 50099455

2

SHEET NO. 2 of 2

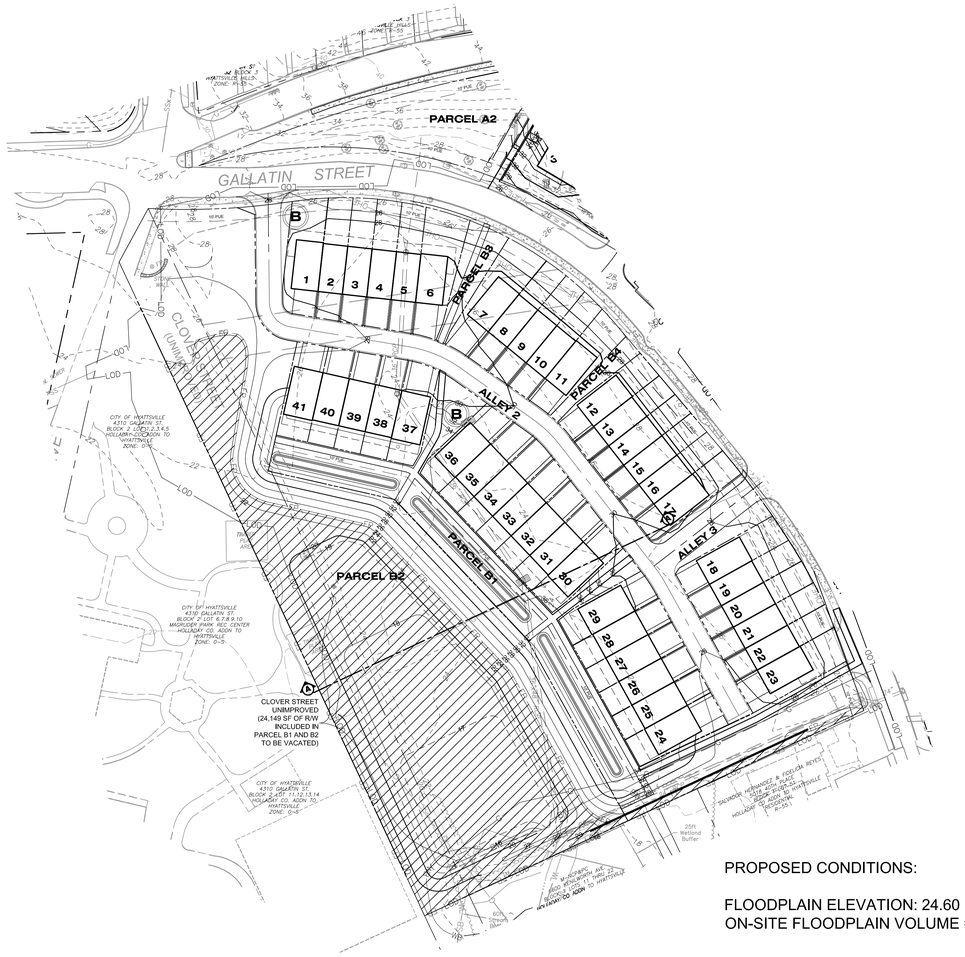
Q:\50099455\CAD\Civil\DPIE\Floodplain\FPS-94455-02-PROPOSED FP SITE PLAN.dwg

Appendix B:
Compensatory Storage Exhibit

www.dewberry.com

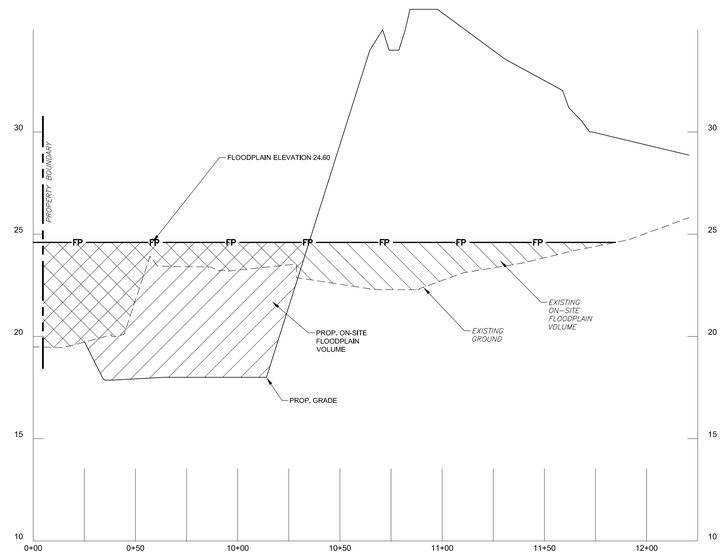
EXISTING CONDITIONS:

FLOODPLAIN ELEVATION: 24.60
ON-SITE FLOODPLAIN VOLUME = 7,597.21 CY



PROPOSED CONDITIONS:

FLOODPLAIN ELEVATION: 24.60
ON-SITE FLOODPLAIN VOLUME = 9,164.05 CY



A
1
CROSS SECTION A-A
SCALE: V=1"=3' H= 1"=30'

EXISTING CONDITIONS SURFACE FILEPATHS

Volumes by Triangulation (Prisms) Mon Jun 25 17:28:59 2018
Existing Surface: Q:\50099455\Tech\Civil\C-CARLSON\Roadnet\Ex-Survey-20180306.tin
Final Surface: Q:\50099455\Tech\Civil\C-CARLSON\Floodplain Compensation\20180625_Ex. FP Elevation 24.60.tin

PROPOSED CONDITIONS SURFACE FILEPATHS

Volumes by Triangulation (Prisms) Tue Jun 26 11:41:50 2018
Existing Surface: Q:\50099455\Tech\Civil\C-CARLSON\Floodplain Compensation\20180626_Proposed Surface 24.60.tin
Final Surface: Q:\50099455\Tech\Civil\C-CARLSON\Floodplain Compensation\20180626_Prop. FP Elevation 24.60.tin

NOTE
FOR LOCATION OF UTILITIES CALL
8-1-1 OR 1-800-257-7777
OR LOG ON TO
www.call811.com
http://www.missutility.net
48 HOURS IN ADVANCE OF ANY WORK
IN THIS VICINITY
INFORMATION CONCERNING UNDERGROUND UTILITIES WAS OBTAINED FROM AVAILABLE RECORDS BUT THE CONTRACTOR MUST DETERMINE THE EXACT LOCATION AND ELEVATION OF THE MAINS BY DIGGING TEST PITS BY HAND AT ALL UTILITY CROSSINGS WELL IN ADVANCE OF THE START OF EXCAVATION.

DRAWN BY	MCP
APPROVED BY	
CHECKED BY	SAR
DATE	JULY 10, 2018

OWNER/APPLICANT
WERRLEIN WSSC LLC
522 DEFENSE HIGHWAY
ANNAPOLIS, MD 21401

CONTACT
JONATHAN WERRLEIN
443-510-1274
Jonathan@werrleinproperties.com

16TH ELECTION DISTRICT
PRINCE GEORGE'S ROAD ATLAS:
MAP 50 - B1
WSSC GRID 206NE03

SCALE(S)
0' 50' 100'
1"=50'
Unless otherwise noted

NO.	DESCRIPTION	DATE	BY
	REVISIONS		

SEAL

KEY PLAN

MAGRUDER POINTE

PRINCE GEORGE'S COUNTY
MARYLAND

FLOODPLAIN COMPENSATION EXHIBIT

Dewberry
Dewberry Engineers Inc.
4601 Forbes Boulevard, Suite 300
Lanham, MD 20706
301.731.5551
301.731.0188 fax

PROJECT NO. 50099455

SHEET NO. __ of __

Appendix C:
HEC-RAS Summary Tables

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HEC-RAS Plan: MODIFIED FEMA River: NW Anacostia Reach: NW Profile: 100-Year Known W DATUM: NAVD88

Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
NW	0.92	100-Year Known W	21090.00	6.77	26.14	22.33	26.99	0.003352	8.46	3588.98	441.38	0.39
NW	0.86	100-Year Known W	21090.00	6.49	24.77	21.00	25.80	0.004695	9.12	3625.13	475.50	0.43
NW	0.85	100-Year Known W	21090.00	6.43	24.21	19.78	25.41	0.004882	9.81	3622.64	566.74	0.44
NW	0.84 38th Ave,		Bridge									
NW	0.83	100-Year Known W	21090.00	4.63	24.26	19.00	24.93	0.001074	7.85	4591.16	685.40	0.35
NW	0.81	100-Year Known W	21090.00	3.64	24.25	19.51	24.84	0.000960	7.50	4700.75	725.06	0.33
NW	0.76	100-Year Known W	21090.00	3.44	24.34	19.50	24.55	0.000440	5.41	8531.56	1078.50	0.23
NW	0.71	100-Year Known W	21090.00	3.24	23.98	19.22	24.39	0.000663	7.12	7104.21	1353.98	0.30
NW	0.63	100-Year Known W	21090.00	2.64	23.85	17.17	24.10	0.000367	5.43	8151.06	1879.60	0.23
NW	0.53	100-Year Known W	21090.00	3.04	23.49	16.88	23.88	0.000380	6.61	5467.74	1243.71	0.27
NW	0.45	100-Year Known W	21090.00	1.44	23.04	16.66	23.66	0.000583	8.01	4341.96	366.41	0.32
NW	0.38	100-Year Known W	21090.00	1.04	22.55	15.59	23.39	0.000729	8.65	3319.67	301.69	0.35
NW	0.31	100-Year Known W	21090.00	-0.06	22.06	15.48	23.08	0.001048	9.49	2899.72	800.24	0.38
NW	0.29	100-Year Known W	21090.00	0.82	21.50	15.22	22.89	0.001457	10.23	2429.57	194.79	0.43
NW	0.285	100-Year Known W	21090.00	1.66	20.97	15.40	22.82	0.000384	10.91	1932.35	130.40	0.50
NW	0.284	100-Year Known W	21090.00	1.64	20.46	15.12	22.77	0.000476	12.19	1730.37	109.20	0.54
NW	0.283	100-Year Known W	21090.00	1.63	20.13	15.12	22.73	0.000547	12.95	1628.38	101.60	0.57
NW	0.282	100-Year Known W	21090.00	1.60	18.30	16.42	22.57	0.001326	16.57	1272.48	94.70	0.80
NW	0.281	100-Year Known W	21090.00	1.61	18.36	15.61	22.53	0.000969	16.39	1286.39	85.10	0.74
NW	0.28	100-Year Known W	21090.00	1.61	18.11	15.70	22.51	0.001159	16.83	1252.78	84.00	0.77
NW	0.279	100-Year Known W	21090.00	1.61	17.98	15.69	22.49	0.001235	17.05	1236.65	83.00	0.78
NW	0.278	100-Year Known W	21090.00	1.59	16.06	15.84	22.31	0.001974	20.06	1051.09	80.00	0.98
NW	0.277	100-Year Known W	21090.00	1.55	15.83	15.83	22.30	0.002019	20.42	1032.96	79.80	1.00
NW	0.276	100-Year Known W	21090.00	1.53	16.31	15.74	22.25	0.001830	19.57	1077.63	79.60	0.94
NW	0.275	100-Year Known W	21090.00	1.18	17.36	15.16	22.21	0.001345	17.66	1193.97	77.60	0.79
NW	0.274	100-Year Known W	21090.00	1.16	17.27	15.20	22.21	0.001347	17.83	1182.60	77.40	0.80
NW	0.273	100-Year Known W	21090.00	1.14	17.42	15.10	22.20	0.001317	17.54	1202.42	77.40	0.78
NW	0.272	100-Year Known W	21090.00	0.79	17.68	14.67	22.18	0.001207	17.03	1238.69	75.20	0.74
NW	0.271	100-Year Known W	21090.00	0.77	17.65	14.69	22.18	0.001190	17.07	1235.73	75.20	0.74
NW	0.27	100-Year Known W	21090.00	0.75	17.70	14.62	22.17	0.001196	16.97	1243.06	75.00	0.73
NW	0.268	100-Year Known W	21090.00	0.06	16.28	14.61	22.13	0.001582	19.41	1086.82	67.00	0.85
NW	0.267 Rhode Island Ave		Bridge									
NW	0.24	100-Year Known W	21090.00	-1.70	16.24	14.32	21.91	0.001516	19.11	1103.36	67.00	0.83
NW	0.235	100-Year Known W	21090.00	-0.64	16.23	14.23	21.85	0.001496	19.03	1107.97	67.00	0.82
NW	0.23	100-Year Known W	21090.00	-0.37	16.20	14.18	21.80	0.001488	19.00	1110.17	67.00	0.82
NW	0.22 Railroad		Bridge									
NW	0.2	100-Year Known W	21090.00	-2.20	19.23	10.84	21.25	0.000364	11.42	1849.51	99.07	0.45
NW	0.16	100-Year Known W	21090.00	-1.16	20.41	13.30	20.66	0.000211	5.40	6924.52	1859.25	0.21
NW	0.15	100-Year Known W	21090.00	-1.19	20.36	13.62	20.64	0.000238	5.66	6730.52	1785.11	0.23
NW	0.145		Bridge									
NW	0.14	100-Year Known W	21090.00	-1.19	20.32	13.67	20.60	0.000243	5.70	6697.19	1776.53	0.23
NW	0.12	100-Year Known W	21090.00	-1.22	20.24	13.97	20.57	0.000283	6.03	6707.00	1666.67	0.24
NW	0.1	100-Year Known W	21090.00	-1.26	20.23	13.32	20.52	0.000223	5.65	6656.55	1593.40	0.22

HEC-RAS Plan: MODIFIED FEMA River: NW Anacostia Reach: NW Profile: 100-Year Known W (Continued)

Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
NW	0.07	100-Year Known W	21090.00	-1.36	20.07	13.24	20.47	0.000319	6.61	5736.39	1485.73	0.26
NW	0.05	100-Year Known W	21090.00	-1.46	20.04	12.55	20.42	0.000290	6.27	5436.34	1365.35	0.25

HEC-RAS Plan: PROP CONDITIONS River: NW Anacostia Reach: NW Profile: 100-Year Known W DATUM: NAVD88

Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
NW	0.92	100-Year Known W	21090.00	6.77	26.14	22.33	26.99	0.003352	8.46	3588.98	441.38	0.39
NW	0.86	100-Year Known W	21090.00	6.49	24.77	21.00	25.80	0.004695	9.12	3625.13	475.50	0.43
NW	0.85	100-Year Known W	21090.00	6.43	24.21	19.78	25.41	0.004882	9.81	3622.64	566.74	0.44
NW	0.84 38th Ave,		Bridge									
NW	0.83	100-Year Known W	21090.00	4.63	24.26	19.00	24.93	0.001074	7.85	4591.17	685.40	0.35
NW	0.81	100-Year Known W	21090.00	3.64	24.25	19.51	24.84	0.000960	7.50	4700.76	725.06	0.33
NW	0.76	100-Year Known W	21090.00	3.44	24.34	19.50	24.55	0.000440	5.41	8531.58	1078.50	0.23
NW	0.71	100-Year Known W	21090.00	3.24	23.98	19.22	24.39	0.000663	7.12	7104.23	1353.98	0.30
NW	0.63	100-Year Known W	21090.00	2.64	23.85	17.17	24.10	0.000367	5.43	8150.99	1719.66	0.23
NW	0.53	100-Year Known W	21090.00	3.04	23.49	16.88	23.88	0.000380	6.61	5467.74	1243.71	0.27
NW	0.45	100-Year Known W	21090.00	1.44	23.04	16.66	23.66	0.000583	8.01	4341.96	366.41	0.32
NW	0.38	100-Year Known W	21090.00	1.04	22.55	15.59	23.39	0.000729	8.65	3319.67	301.69	0.35
NW	0.31	100-Year Known W	21090.00	-0.06	22.06	15.48	23.08	0.001048	9.49	2899.72	800.24	0.38
NW	0.29	100-Year Known W	21090.00	0.82	21.50	15.22	22.89	0.001457	10.23	2429.57	194.79	0.43
NW	0.285	100-Year Known W	21090.00	1.66	20.97	15.40	22.82	0.000384	10.91	1932.35	130.40	0.50
NW	0.284	100-Year Known W	21090.00	1.64	20.46	15.12	22.77	0.000476	12.19	1730.37	109.20	0.54
NW	0.283	100-Year Known W	21090.00	1.63	20.13	15.12	22.73	0.000547	12.95	1628.38	101.60	0.57
NW	0.282	100-Year Known W	21090.00	1.60	18.30	16.42	22.57	0.001326	16.57	1272.48	94.70	0.80
NW	0.281	100-Year Known W	21090.00	1.61	18.36	15.61	22.53	0.000969	16.39	1286.39	85.10	0.74
NW	0.28	100-Year Known W	21090.00	1.61	18.11	15.70	22.51	0.001159	16.83	1252.78	84.00	0.77
NW	0.279	100-Year Known W	21090.00	1.61	17.98	15.69	22.49	0.001235	17.05	1236.65	83.00	0.78
NW	0.278	100-Year Known W	21090.00	1.59	16.06	15.84	22.31	0.001974	20.06	1051.09	80.00	0.98
NW	0.277	100-Year Known W	21090.00	1.55	15.83	15.83	22.30	0.002019	20.42	1032.96	79.80	1.00
NW	0.276	100-Year Known W	21090.00	1.53	16.31	15.74	22.25	0.001830	19.57	1077.63	79.60	0.94
NW	0.275	100-Year Known W	21090.00	1.18	17.36	15.16	22.21	0.001345	17.66	1193.97	77.60	0.79
NW	0.274	100-Year Known W	21090.00	1.16	17.27	15.20	22.21	0.001347	17.83	1182.60	77.40	0.80
NW	0.273	100-Year Known W	21090.00	1.14	17.42	15.10	22.20	0.001317	17.54	1202.42	77.40	0.78
NW	0.272	100-Year Known W	21090.00	0.79	17.68	14.67	22.18	0.001207	17.03	1238.69	75.20	0.74
NW	0.271	100-Year Known W	21090.00	0.77	17.65	14.69	22.18	0.001190	17.07	1235.73	75.20	0.74
NW	0.27	100-Year Known W	21090.00	0.75	17.70	14.62	22.17	0.001196	16.97	1243.06	75.00	0.73
NW	0.268	100-Year Known W	21090.00	0.06	16.28	14.61	22.13	0.001582	19.41	1086.82	67.00	0.85
NW	0.267 Rhode Island Ave		Bridge									
NW	0.24	100-Year Known W	21090.00	-1.70	16.24	14.32	21.91	0.001516	19.11	1103.36	67.00	0.83
NW	0.235	100-Year Known W	21090.00	-0.64	16.23	14.23	21.85	0.001496	19.03	1107.97	67.00	0.82
NW	0.23	100-Year Known W	21090.00	-0.37	16.20	14.18	21.80	0.001488	19.00	1110.17	67.00	0.82
NW	0.22 Railroad		Bridge									
NW	0.2	100-Year Known W	21090.00	-2.20	19.23	10 84	21.25	0.000364	11.42	1849.51	99.07	0.45
NW	0.16	100-Year Known W	21090.00	-1.16	20.41	13.30	20.66	0.000211	5.40	6924.52	1859.25	0.21
NW	0.15	100-Year Known W	21090.00	-1.19	20.36	13.62	20.64	0.000238	5.66	6730.52	1785.11	0.23
NW	0.145		Bridge									
NW	0.14	100-Year Known W	21090.00	-1.19	20.32	13.67	20.60	0.000243	5.70	6697.19	1776.53	0.23
NW	0.12	100-Year Known W	21090.00	-1.22	20.24	13.97	20.57	0.000283	6.03	6707.00	1666.67	0.24
NW	0.1	100-Year Known W	21090.00	-1.26	20.23	13.32	20.52	0.000223	5.65	6656.55	1593.40	0.22

HEC-RAS Plan: PROP CONDITIONS River: NW Anacostia Reach: NW Profile: 100-Year Known W (Continued)

Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
NW	0.07	100-Year Known W	21090.00	-1.36	20.07	13.24	20.47	0.000319	6.61	5736.39	1485.73	0.26
NW	0.05	100-Year Known W	21090.00	-1.46	20.04	12.55	20.42	0.000290	6.27	5436.34	1365.35	0.25