FLOODPLAIN STUDY - DANIELS RUN

MATHY PARK

CITY OF FAIRFAX, VIRGINIA

INTRODUCTION

THE PURPOSE OF THIS STUDY IS TO ESTABLISH EXISTING 100-YEAR FLOODPLAIN LIMITS AND CONFIRM THE PROPOSED DEVELOPMENT WILL NOT RESULT IN AN IMPACT TO THE FLOODPLAIN LOCATION ON ADJACENT PROPERTIES. THE PROJECT IS LOCATED IN THE CITY OF FAIRFAX BETWEEN MAIN STREET AND SAGER AVENUE. THE PROJECT CONSISTS OF A 19 UNIT TOWNHOUSE DEVELOPMENT WITH PRIVATE STREETS AND STORMWATER FACILITIES. FILL WILL BE PLACED WITHIN THE EXISTING FLOODPLAIN AS PART OF THE DEVELOPMENT.

HYDRAULICS

THE FEMA MODEL FOR CASE NUMBER04-03-A027P, DATED 7/20/2006, WAS PROVIDED AND USED TO ESTABLISH THE EXISTING LIMITS OF THE FLOODPLAIN WITHIN THIS STUDY. THIS FEMA MODEL WAS RUN ON HEC-RAS VERSION 5.07 TO CREATE THE DUPLICATE EFFECTIVE MODEL. THE CORRECTED EFFECTIVE MODEL WAS THEN CREATED UTILIZING FIELD RUN TOPOGRAPHY FOR THE 3 SECTIONS RUNNING ACROSS THE SITE AND DATA FROM THE DUPLICATE EFFECTIVE MODEL WAS USED TO POPULATE THE ADDITIONAL CROSS SECTIONS IN THE MODEL. THE CORRECTED EFFECTIVE MODEL VARIES FROM THE DUPLICATE EFFECTIVE IN THAT IT MODELS AN EXISTING CULVERT UNDER SAGER AVENUE THAT WAS NOT PREVIOUSLY MODELED IN THE DUPLICATE EFFECTIVE MODEL. THE PROPOSED CONDITION WAS CREATED BY REVISING CROSS SECTIONS 20 AND 21 TO SHOW THE PROPOSED CONDITION OF THE SITE. FOR ALL THREE MODELS THE USACE HEC-RAS VERSION 5.07 WAS USED TO RUN AND EDIT THE EXISTING AND PROPOSED MODELS.

THE MAIN CHANNEL MANNING'S N-VALUES THAT WERE USED IN THE MODEL WERE DETERMINED FROM THE EXISTING FEMA HEC-RAS MODEL AND UTILIZED FOR BOTH EXISTING AND PROPOSED CONDITIONS.

RESULTS

THE PROPOSED IMPROVEMENTS TO THE SITE HAVE BEEN SHOWN TO NOT IMPACT THE FLOODPLAIN LIMITS ONSITE OR ON ADJACENT PROPERTIES. THE HEC-RAS DATA FOR ALL THREE MODELS HAS BEEN PROVIDED TO SHOW HOW THE PROPOSED DEVELOPMENT EFFECTS THE FLOODPLAIN.

FLOODPLAIN DATA TABLE

IMPERVIOUS AREA IN THE FLOODPLAIN
EXISTING: 0 SF
PROPOSED: 0 SF

AREA OF FLOODPLAIN VEGETATION DISTURBED: 12,150 SF (0.28 AC)

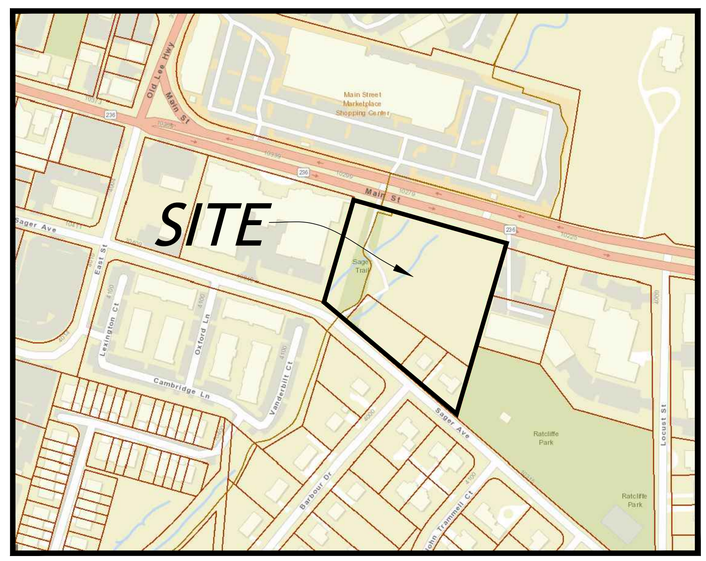
AREA OF FLOODPLAIN LAND GRADED: 12,150 SF (0.28 AC)

MAX. DEPTH OF CUT/FILL ON FLOODPLAIN LAND: 10' (FILL)

PRE AND POST VELOCITIES UPSTREAM, DOWNSTREAM AND ON-SITE: PLAN PROPOSES NO CHANGES TO THE EXISTING STREAM/CHANNEL VELOCITY

BASE ELEVATION AT LOWEST LEVEL: 401.65 (FLOODPLAIN ELEVATION = 395)

MARKET VALUE OF EXISTING STRUCTURES: $840,000
APPROX. MARKET VALUE OF PROPOSED IMPROVEMENTS: TBD



VA. STATE GRID NORTH

N

VICINITY MAP

SCALE : 1"=200'

APPLICANT

MS-SAGER, LLC
C/O MADISON HOMES, INC.
1950 OLD GALLOWS ROAD
SUITE 200
TYSONS, VA 22182
CONTACT: ANDREW ROSENBERGER
PHONE (703) 506-9292x15

OWNERS

ALI JAVAD
10251 MAIN STREET AND 10324 SAGER AVE
FAIRFAX, VA 22030

BRIAN GLENN POWELL
10320 SAGER AVE
FAIRFAX, VA 22030

JOHN R. AND TIFFANY R. VALENZUELA
10318 SAGER AVE
FAIRFAX, VA 22030

Sheet List Table

Sheet Number	Sheet Title
01	COVER
02	SITE OVERVIEW
03	EXISTING CONDITIONS
04	PROPOSED FLOODPLAIN
05	PROPOSED DRAINAGE AREAS
06	CROSS SECTIONS
07	DUPLICATE EFFECTIVE HEC-RAS
08	DUPLICATE EFFECTIVE HEC-RAS
09	DUPLICATE EFFECTIVE HEC-RAS
10	CORRECTED EFFECTIVE HEC-RAS
11	CORRECTED EFFECTIVE HEC-RAS
12	CORRECTED EFFECTIVE HEC-RAS
13	CORRECTED EFFECTIVE HEC-RAS
14	PROPOSED HEC-RAS
15	PROPOSED HEC-RAS
16	PROPOSED HEC-RAS
17	PROPOSED HEC-RAS

NOTES

1. NO USE SHALL BE MADE OF, NOR SHALL ANY IMPROVEMENT BE MADE IN THE FLOODPLAIN WITHOUT SPECIFIC AUTHORIZATION FROM THE CITY OF FAIRFAX.
2. ALL CONSTRUCTION SHALL CONFORM TO THE CURRENT CITY OF FAIRFAX AND VIRGINIA DEPARTMENT OF TRASPORTATION STANDARDS AND SPECIFICATION.
3. THE ENGINEER OF RECORD CERTIFIES THAT, TO THE BEST OF HIS KNOWLEDGE AND BELIEF, ALL APPLICABLE FEDERAL, STATE, AND LOCAL LAWS RELATIVE TO THE PROTECTION OF THE ENVIRONMENTAL, HISTORICAL, OR ARCHAEOLOGICAL FEATURES HAVE BEEN OR WILL BE MET.
4. CITY OF FAIRFAX 2-FOOT CONTOURS AND J2 ENGINEERING SURVEY DATA DATED FEBRUARY, 2018 WERE USED FOR TOPOGRAPHIC INFORMATION. BOTH OF THESE SOURCES USE THE NAVD 88 VERTICAL DATUM.
5. BOUNDARY INFORMATION SHOWN HEREON WAS TAKEN FROM AN ALTA/ACSM SURVEY BY J2 ENGINEERS DATED FEBRUARY, 2018. ALL BEARINGS AND NORTH MERIDIAN ARE REFERENCED TO THE NORTH AMERICAN DATUM OF 1983 (NAD 83) VIRGINIA STATE PLANE (NORTH ZONE) PER THE ALTA.
6. THERE ARE NO PROFFERED OR SPECIAL EXCEPTION CONDITIONS RELATED TO THIS APPLICATION.

FLOODPLAIN AREA TABULATION

PROPERTY OWNER	ADDRESS	EXISTING FLOODPLAIN AREA (SQ. FT.)
ALI JAVAD; BRIAN GLENN POWELL; JOHN R. AND TIFFANY R. VALENZUELA	10320 SAGER AVENUE FAIRFAX, VA; 10251 MAIN STREET FAIRFAX, VA; 10318 SAGER AVENUE FAIRFAX, VA	89,343

J2 Engineers, Inc.
4080 Lafayette Center Drive
Suite 330
Chantilly, Va. 20151

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COMMONWEALTH OF VIRGINIA
ROBERT W. BROWN
Lic. No. 037041
01/31/20
PROFESSIONAL ENGINEER

PLAN# MH11901
DATE: JULY 12, 2019
CONTOUR INT.= 2'
SCALE: AS NOTED

PLAN DATE
07/31/19
12/13/19
01/31/20

COVER
FLOODPLAIN STUDY
MATHY PARK
DANIELS RUN
CITY OF FAIRFAX, VIRGINIA

No.	DATE	DESCRIPTION

REVISIONS

SHEET
01
OF
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J2 Engineers - X:\DRAWINGS\ACTIVE\Mathy Park - Madison Homes\Floodplain Study\MH1901 - COVER.dwg [COVER] January 31, 2020 - 4:17pm awells

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VA STATE GRID NAD 83 NORTH

GRAPHIC SCALE
0 25 50 100
(IN FEET)
1 INCH = 50 FEET

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SITE OVERVIEW
FLOODPLAIN STUDY
MATHY PARK
DANIELS RUN
CITY OF FAIRFAX, VIRGINIA

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SHEET
02
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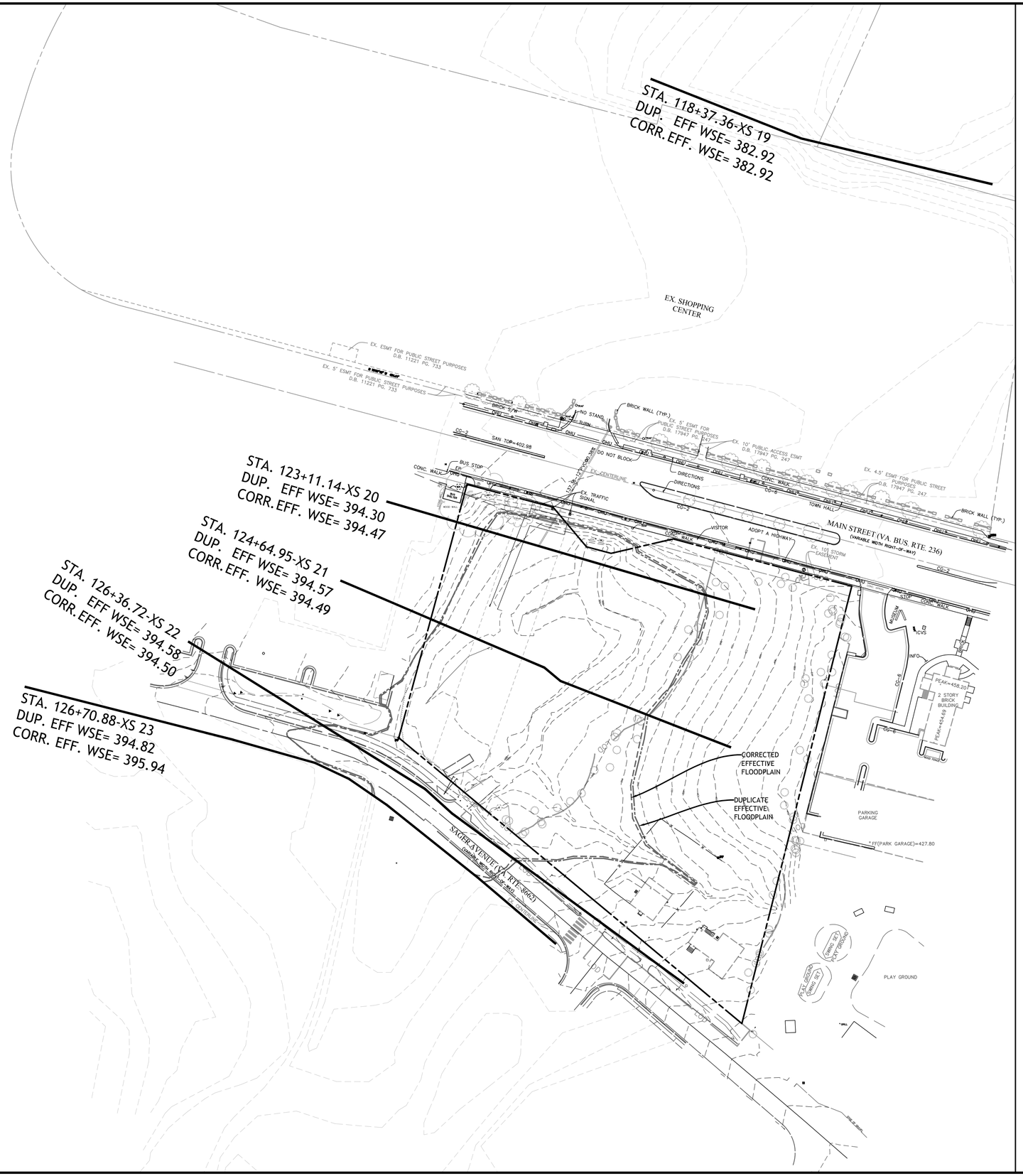
17



LEGEND

DUPLICATE EFFECTIVE FLOODPLAIN

CORRECTED EFFECTIVE FLOODPLAIN

VA. STATE GRID NAD 83 NORTH

N

GRAPHIC SCALE

0 25 50 100

(IN FEET)
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PLAN# MH11901
DATE: JULY 12, 2019
CONTOUR INT.= 2'
SCALE: 1"=60'

PLAN DATE
07/31/19
12/13/19
01/31/20

EXISTING CONDITIONS

FLOODPLAIN STUDY
MATHY PARK

DANIELS RUN

CITY OF FAIRFAX, VIRGINIA

REVISIONS

No.	DATE	DESCRIPTION

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03
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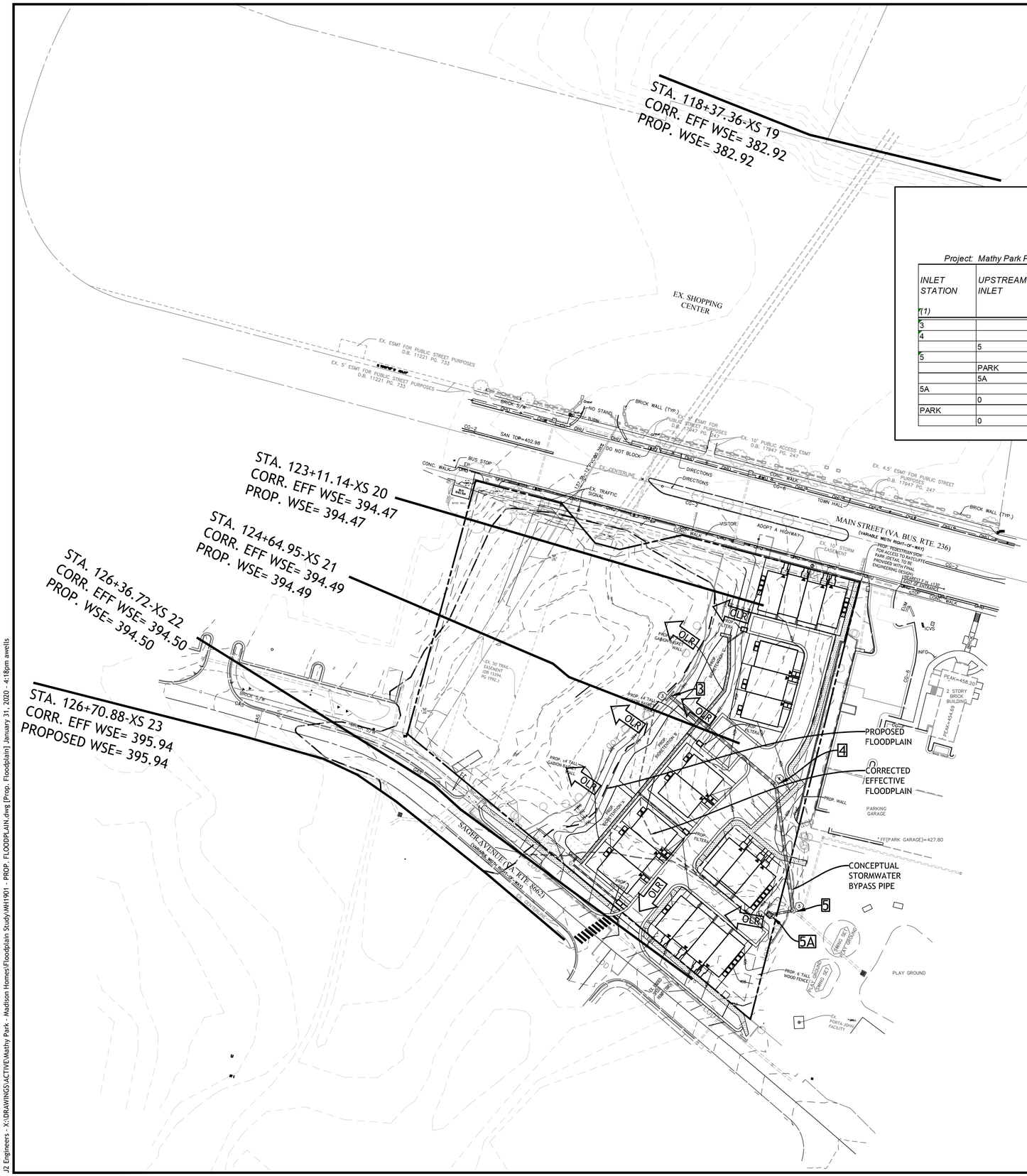

100-YEAR PIPE/HGL COMPUTATIONS FOR STORMWATER BYPASS PIPE FROM RATCLIFFE PARK

STORM SEWER DESIGN COMPUTATIONS

Project: Mathy Park Preliminary Storm Comps

From Point	To Point	Drainage Area	C Factor	C x A Increment	C x A Cumm.	Inlet Time Min.	Rain Fall In/Hr	Runoff Q C.F.S.	Invert Elev. Upper End	Invert Elev. Lower End	Length FT.	Slope %	Dia. IN.	Capacity Q C.F.S.	VEL. F.P.S.	Flow Time MIN.
*****																
PARK	5	10.40	0.55		8.28	17.50	6.00	49.66	398.00	397.70	10.48	2.81%	24	38.02	12.10	0.01
5A	5	0.12	0.6875	0.08	0.08	5.00	9.75	0.80	398.00	397.70	23.58	1.25%	24	25.36	3.68	0.11
5	4	0.00	0	0.00	8.36	17.50	6.00	50.18	396.70	395.46	124.60	1.00%	36	66.88	10.38	0.20
4	3	0.00	0	0.00	8.36	17.50	6.00	50.18	395.36	394.00	135.83	1.00%	36	66.88	10.38	0.22

NOTE: C-FACTORS TO INLETS HAVE BEEN MULTIPLIED BY 1.25 FOR THE 100-YEAR CORRECTION FACTOR.

HYDRAULIC GRADE LINE COMPUTATIONS

Project: Mathy Park Preliminary Storm Comps

INLET STATION (1)	UPSTREAM INLET	Outlet Water Surface Elev. (2)	Do in (3)	Qo cfs (4)	Lo ft (5)	Sfo % (6)	Hf ft (7)	JUNCTION LOSS Vo (8)	Ho (9)	Qi (10)	Vi (11)	QiVi (12)	2 Vi /2g (13)	Hi (14)	Angle (15)	Hd (16)	Ht (17)	1.3 Ht (18)	0.5 Ht (19)	FINAL H (20)	Inlet Water Surface Elev. (21)	RIM/ THROAT ELEV (21)
3																			Starting Elevation		396.40	
4		396.40	36.00	50.18	135.83	0.56	0.76	10.38	0.42					0.27		0.33	1.02	0.00	0.51	1.28	397.68	405.75
	5		36.00							50.18	7.10	356.16	0.78		45.00							
5		397.86	36.00	50.18	124.60	0.56	0.70	10.38	0.42					1.36		1.65	3.43	0.00	1.71	2.41	400.27	404.00
	PARK		24.00							49.66	15.81	784.99	3.88	1.36	45.00	1.65						
	5A		24.00							0.80	0.26	0.21	0.00	0.00	65.00	0.00						
5A		400.27	24.00	0.80	23.58	0.00	0.00	3.68	0.05					0.00		0.00	0.05	0.07	0.00	0.07	400.34	401.50
	0									0.80	0.00	0.00	0.00		0.00							
PARK		400.27	24.00	49.66	10.48	4.79	0.50	12.10	0.57					0.00		0.00	0.57	0.00	0.00	1.07	401.34	408.00
	0									49.66	0.00	0.00	0.00		0.00							

NOTE: STARTING W.S.E. OF 396.40 BASED ON 80% PIPE FULL CONDITION WHICH EXCEEDS THE 100-YEAR BASE FLOOD ELEVATION OF 394.49, THEREBY PROVIDING A CONSERVATIVE DESIGN APPROACH.

100-YEAR OVERLAND RELIEF NARRATIVE

1. 100-YEAR STORM WILL SPILL OVER WESTERN EDGE OF BIORETENTION AND OUTFALL DIRECTLY INTO THE FLOODPLAIN

2. OVERLAND RELIEF FROM THE NORTHERN PORTION OF THE PROPOSED DEVELOPMENT WILL OVERTOP THE CURB OF THE NORTHERN MOST ALLEY AND EMERGENCY ACCESS TURN-AROUND AND FLOW DIRECTLY INTO THE FLOODPLAIN AS SHOWN ON THIS SHEET. THE REMAINDER OF THE SITE WILL DRAIN TO THE SAGER AVENUE RIGHT-OF-WAY, WHERE IT WILL CONTINUE WEST UNTIL OUTFALLING TO THE FLOODPLAIN.

3. SURFACE RUNOFF FROM THE PARK WILL BE DIRECTED TO A LOW POINT AND YARD INLET FOR COLLECTION. OVERLAND RELIEF FROM THIS INLET WILL SPILL INTO THE SOUTHERN ALLEY AND STAY WITHIN THE PROPOSED PRIVATE ROADWAY BEFORE ENTERING THE SAGER AVENUE RIGHT-OF-WAY.

LEGEND

- CORRECTED EFFECTIVE FLOODPLAIN
- PROPOSED FLOODPLAIN
- OLR — DENOTES PATH OF OVERLAND RELIEF
- 3 — PROPOSED STORM STRUCTURE

VA. STATE GRID NAD 83 N NORTH

GRAPHIC SCALE

0 25 50 100

(IN FEET)
1 INCH = 50 FEET

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PLAN# WH11901
DATE: JULY 12, 2019
CONTOUR INT.= 2'
SCALE: 1"=50'

PLAN DATE
07/31/19
12/13/19
01/31/20

PROPOSED FLOODPLAIN
FLOODPLAIN STUDY
MATHY PARK
DANIELS RUN
CITY OF FAIRFAX, VIRGINIA

REVISIONS

No.	DATE	DESCRIPTION

SHEET
04
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17

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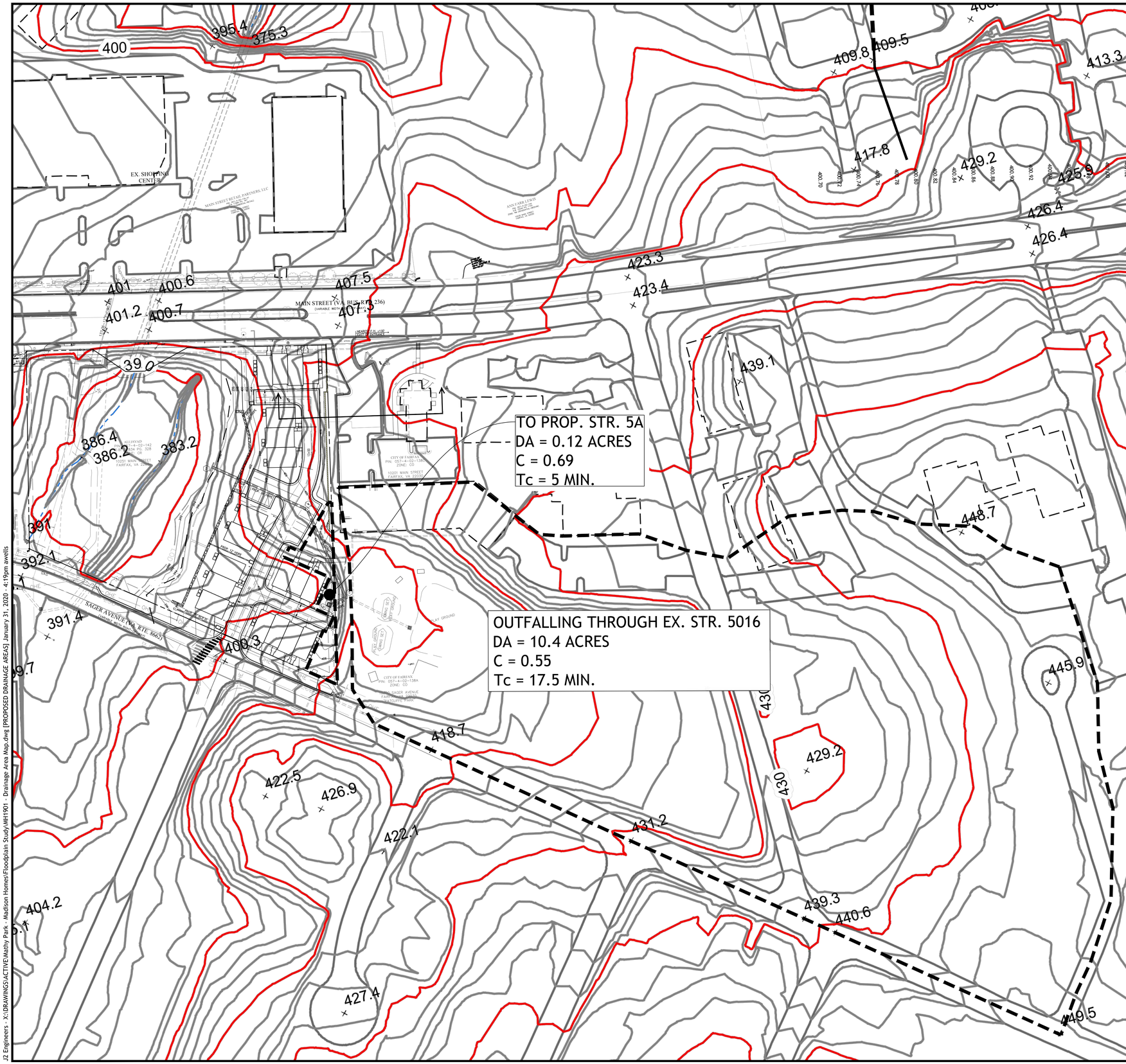
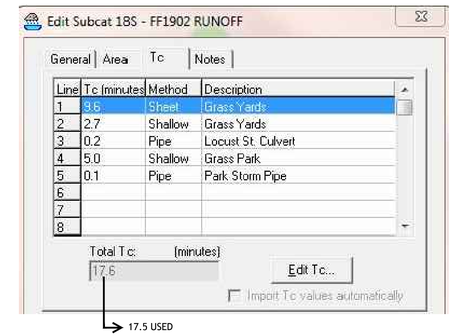


LEGEND

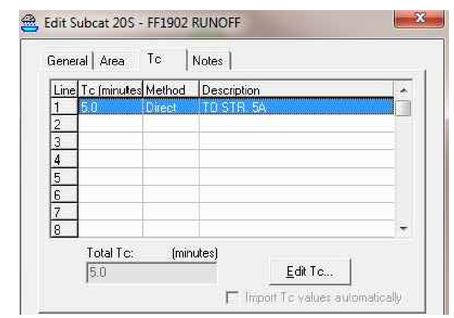
DRAINAGE AREA

TIME OF CONCENTRATION CALCULATIONS

THRU STR. 5016:



TO STR. 5A:



VA STATE GRID NORTH

N

GRAPHIC SCALE

0 30 60 120

(IN FEET)
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PROPOSED DRAINAGE AREAS
FLOODPLAIN STUDY
MATHY PARK
DANIELS RUN
CITY OF FAIRFAX, VIRGINIA

No.	DATE	DESCRIPTION

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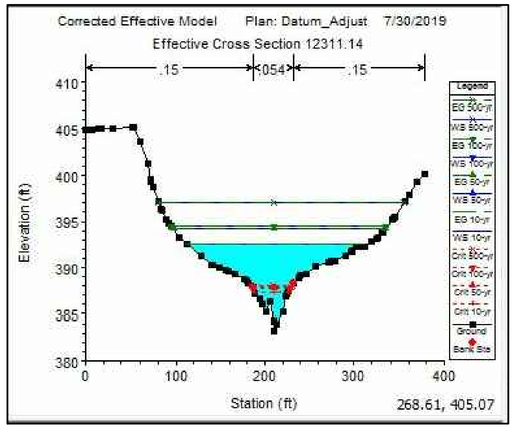
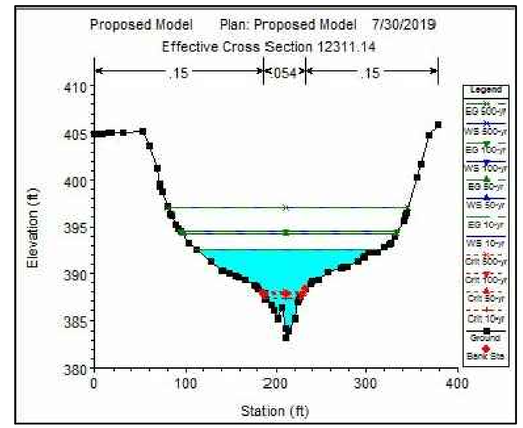
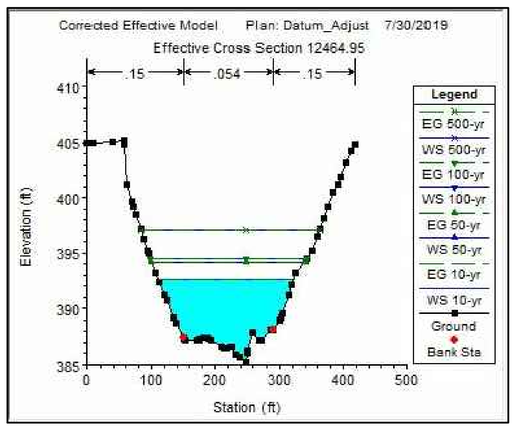
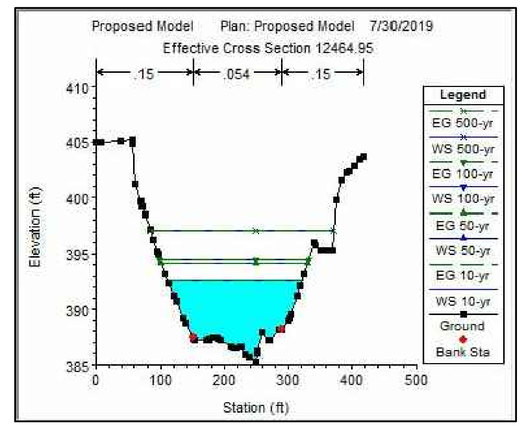
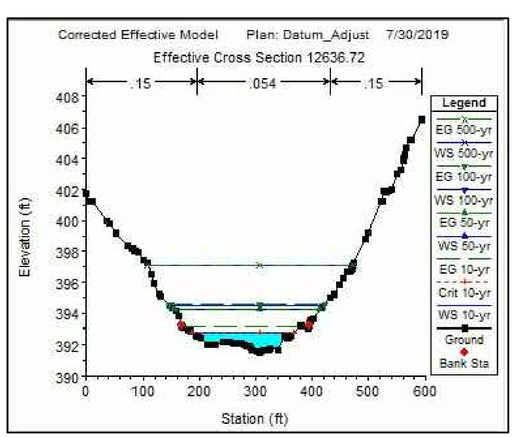
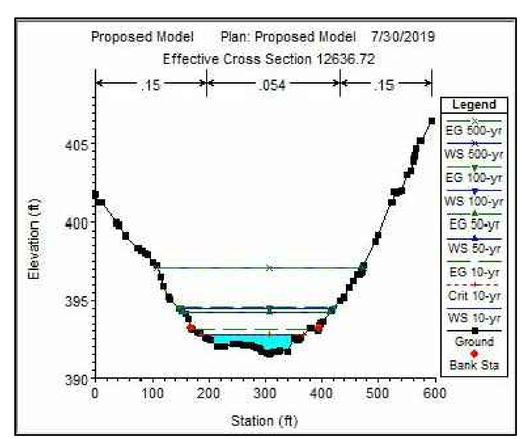
	CORRECTED EFFECTIVE CROSS SECTIONS	PROPOSED CROSS SECTIONS
CROSS SECTION 20		
CROSS SECTION 21		
CROSS SECTION 22		

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PLAN# MH11901
DATE: JULY 12, 2019
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SCALE: AS NOTED

PLAN DATE
07/31/19
12/13/19
01/31/20

CROSS SECTIONS
FLOODPLAIN STUDY
MATHY PARK
DANIELS RUN
CITY OF FAIRFAX, VIRGINIA

REVISIONS

No.	DATE	DESCRIPTION

SHEET
06
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HEC-RAS HEC-RAS 5.0.7 MARCH 2019
U.S. ARMY CORPS OF ENGINEERS
HYDROLOGIC ENGINEERING CENTER
609 SECOND STREET
DAVIS, CALIFORNIA

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PROJECT DATA
PROJECT TITLE: DUPLICATE EFFECTIVE MODEL
PROJECT FILE : DUPLICATEEFFECTIVE.PRJ
RUN DATE AND TIME: 7/30/2019 11:57:33 AM

PROJECT IN ENGLISH UNITS

PROJECT DESCRIPTION:
& R

PLAN DATA

PLAN TITLE: DATUM_ADJUST
PLAN FILE : X:\DRAWINGS\ACTIVE\MATHY PARK - MADISON HOMES\FLOODPLAIN STUDY\FINAL FLOODPLAIN MODELS\DUPLICATE EFFECTIVE MODEL\DUPLICATEEFFECTIVE.P03

GEOMETRY TITLE: SURVEYED XS NGVD 29
GEOMETRY FILE : X:\DRAWINGS\ACTIVE\MATHY PARK - MADISON HOMES\FLOODPLAIN STUDY\FINAL FLOODPLAIN MODELS\DUPLICATE EFFECTIVE MODEL\DUPLICATEEFFECTIVE.G03

FLOW TITLE : HMS DISCHARGES
FLOW FILE : X:\DRAWINGS\ACTIVE\MATHY PARK - MADISON HOMES\FLOODPLAIN STUDY\FINAL FLOODPLAIN MODELS\DUPLICATE EFFECTIVE MODEL\DUPLICATEEFFECTIVE.F02

PLAN SUMMARY INFORMATION:
NUMBER OF: CROSS SECTIONS = 29 MULTIPLE OPENINGS = 0
CULVERTS = 3 INLINE STRUCTURES = 1
BRIDGES = 1 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 = 0.3
FLOW TOLERANCE FACTOR = 0.001

COMPUTATION OPTIONS
CRITICAL DEPTH COMPUTED ONLY WHERE NECESSARY
CONVEYANCE CALCULATION METHOD: AT BREAKS IN N VALUES ONLY
FRICTION SLOPE METHOD: AVERAGE CONVEYANCE
COMPUTATIONAL FLOW REGIME: SUBCRITICAL FLOW

FLOW DATA

FLOW TITLE: HMS DISCHARGES
FLOW FILE : X:\DRAWINGS\ACTIVE\MATHY PARK - MADISON HOMES\FLOODPLAIN STUDY\FINAL FLOODPLAIN MODELS\DUPLICATE EFFECTIVE MODEL\DUPLICATEEFFECTIVE.F02

FLOW DATA (CFS)

RIVER	REACH	RS	10-YR	50-YR	100-YR	500-YR
DANIELS RUN	1	23	310	560	705	1000
DANIELS RUN	1	22	590	870	985	1280
DANIELS RUN	1	20	530	690	715	785
DANIELS RUN	1	19	530	700	750	830
DANIELS RUN	1	13.2	865	1400	1560	2020

BOUNDARY CONDITIONS

RIVER	REACH	PROFILE	UPSTREAM	DOWNSTREAM
DANIELS RUN	1	10-YR		KNOWN WS = 358.94
DANIELS RUN	1	50-YR		KNOWN WS = 359.58
DANIELS RUN	1	100-YR		KNOWN WS = 359.73
DANIELS RUN	1	500-YR		KNOWN WS = 360.09

CHANGES IN WS AND EG

RIVER	REACH	RS	PROFILE	TYPE	VALUE
DANIELS RUN	1	4	500-YR	KNOWN WS	372.59
DANIELS RUN	1	4	100-YR	KNOWN WS	372.01
DANIELS RUN	1	4	50-YR	KNOWN WS	371.79
DANIELS RUN	1	4	10-YR	KNOWN WS	370.97

GEOMETRY DATA

GEOMETRY TITLE: SURVEYED XS NGVD 29
GEOMETRY FILE : X:\DRAWINGS\ACTIVE\MATHY PARK - MADISON HOMES\FLOODPLAIN STUDY\FINAL FLOODPLAIN MODELS\DUPLICATE EFFECTIVE MODEL\DUPLICATEEFFECTIVE.G03

CROSS SECTION

RIVER: DANIELS RUN
REACH: 1 RS: 23

INPUT
DESCRIPTION: EFFECTIVE CROSS SECTION 12670.88
STATION ELEVATION DATA NUM= 28
STA ELEV STA ELEV STA ELEV STA ELEV STA ELEV
-207 404 -77 398 0 395.49 1.28 395.46 10.17 395.32
18.68 395.12 27.3 394.98 36.07 394.76 43.22 394.63 110 394.06
154.801 393.61 197.254 393.94 245.9 394.2 255.44 394.39 273.09 394.86
278.8 395.02 281.34 395.1 291.23 395.31 299.51 395.56 309.66 396.13
318.17 396.38 328.05 396.94 336.77 397.2 343.22 397.46 352.86 398
359.52 398.67 371.05 399.32 376.84 399.61

MANNING'S N VALUES NUM= 4
STA N VAL STA N VAL STA N VAL STA N VAL
-207 .015 0 .015 110 .015 245.9 .015

BANK STA: LEFT RIGHT LENGTHS: LEFT CHANNEL RIGHT COEFF CONTR. EXPAN.
110 245.9 35.4 34.16 33.72 .1 .3
INEFFECTIVE FLOW NUM= 1
STA L STA R ELEV PERMANENT
-207 102.96 399.96 F

CROSS SECTION

RIVER: DANIELS RUN
REACH: 1 RS: 22

INPUT
DESCRIPTION: EFFECTIVE CROSS SECTION 12636.72
STATION ELEVATION DATA NUM= 64
STA ELEV STA ELEV STA ELEV STA ELEV STA ELEV
0 402.17 16.95 399.83 23.21 398.93 32.39 398.37 41.55 397.94
52.89 397.13 55.93 396.75 66.82 395.93 77.69 395.49 91.11 394.38
105.55 393.39 128.88 393.11 145.54 393.6 187.55 392.27 189.16 392.27
191.44 392.2 193.29 392.17 214.22 392.2 239.14 392.2 252.83 392.12
269.85 392.21 271.42 392.18 272.21 392.17 275.46 391.05 277.15 389.77
278.94 387.87 280.72 386.6 288.16 386.11 296.19 386.28 298.27 386.71
300.65 388.11 303.92 390.16 305.35 391.62 306.03 391.81 306.27 391.87
306.47 391.91 314.96 393.52 320.69 393.66 327.2 393.46 345.86 393.87
359 393.62 363.68 393.66 375.48 393.77 395.37 394.44 398.2 394.77
413.83 393.76 432.35 395.66 444.92 397.9 450.2 398.73 460.73 399.77
479.56 400.51 490.01 401.21 509.15 402.49 516.39 403.02 517.78 403.53
525.16 406.11 531.29 406.39 550.95 406.93 562.46 407.24 563 407.26
563.28 407.27 563.54 407.28 572.85 407.6 586.08 408.03

MANNING'S N VALUES NUM= 7
STA N VAL STA N VAL STA N VAL STA N VAL STA N VAL
0 .15 275.46 .054 305.35 .15 479.56 10 490.01 .15
550.95 10 572.85 .15

BANK STA: LEFT RIGHT LENGTHS: LEFT CHANNEL RIGHT COEFF CONTR. EXPAN.
275.46 305.35 157.4 171.77 172.46 .1 .3
INEFFECTIVE FLOW NUM= 1
STA L STA R ELEV PERMANENT
0 143.94 399.92 F
BLOCKED OBSTRUCTIONS NUM= 1
STA L STA R ELEV
551.48 571.7 409.7

CROSS SECTION

RIVER: DANIELS RUN
REACH: 1 RS: 21

INPUT
DESCRIPTION: EFFECTIVE CROSS SECTION 12464.95
STATION ELEVATION DATA NUM= 34
STA ELEV STA ELEV STA ELEV STA ELEV STA ELEV
0 407.42 58 399.61 81.47 394.51 98.23 390.63 112.58 388.16
118.72 387.95 147.1 387.53 172.94 387.9 188.12 388.54 215.61 388.69
215.91 388.69 218.86 388.74 220.26 388.1 222.68 385.23 225.93 385.07
238.48 385.25 242.07 387.04 242.07 387.06 244.84 388.78 250.8 389.65
253.55 389.37 253.86 389.34 259.28 390.32 285.23 392.7 300.17 394.28
312.27 395.97 320.57 396.85 331.3 399.07 364.74 405.14 392.01 406.86
394.15 406.94 396.02 407.11 400.93 407.88 413.62 409.57

MANNING'S N VALUES NUM= 3
STA N VAL STA N VAL STA N VAL
0 .15 218.86 .054 244.84 .15

BANK STA: LEFT RIGHT LENGTHS: LEFT CHANNEL RIGHT COEFF CONTR. EXPAN.
218.86 244.84 108.63 153.82 133.47 .3 .5

CROSS SECTION

RIVER: DANIELS RUN
REACH: 1 RS: 20

INPUT
DESCRIPTION: EFFECTIVE CROSS SECTION 12311.14
STATION ELEVATION DATA NUM= 36
STA ELEV STA ELEV STA ELEV STA ELEV STA ELEV
0 404.76 9.71 403.27 26.77 401.31 32.46 400.53 40.26 399.7
56.7 395.63 58.73 395.45 63.58 394.89 84.87 394.24 108.49 392.84
134.01 390.68 146.45 390.14 155.99 388.19 158.49 385.88 160.68 384.3
164.33 383.84 177.47 384.05 178.93 384.5 181.85 385.83 183.68 387.67
190.32 388.6 204.4 391.6 210.93 392.22 215.92 392.34 242.53 393.62
245.62 393.94 246.03 393.95 254.97 393.98 275.67 394.45 284.04 395.48
290.13 395.97 313 398.75 329.46 398.58 336.46 399.86 357.74 404.58
373.18 406.39

MANNING'S N VALUES NUM= 3
STA N VAL STA N VAL STA N VAL
0 .15 155.99 .054 183.68 .15

BANK STA: LEFT RIGHT LENGTHS: LEFT CHANNEL RIGHT COEFF CONTR. EXPAN.
155.99 183.68 475.23 473.78 470.71 .3 .5
INEFFECTIVE FLOW NUM= 2
STA L STA R ELEV PERMANENT
0 158 401.37 F
178 373.18 401.37 F

CULVERT

RIVER: DANIELS RUN
REACH: 1 RS: 19.5

INPUT
DESCRIPTION: ROUTE 236
DISTANCE FROM UPSTREAM XS = 25
DECK/ROADWAY WIDTH = 420
WEIR COEFFICIENT = 2.9
UPSTREAM DECK/ROADWAY COORDINATES
NUM= 53
STA HI CORD LO CORD STA HI CORD LO CORD STA HI CORD LO CORD
0 406.94 375 8.33 406.61 375 9 406.57 375
28.14 405.77 375 28.77 405.76 375 33.92 405.49 375
42.71 405.13 375 45.71 405.01 375 53.2 404.74 375
62.08 404.37 375 65.12 404.25 375 72.49 403.99 375
81.47 403.61 375 83.7 403.52 375 84.56 403.48 375
91.76 403.23 375 100.79 403.14 375 108.67 402.86 375
117.25 402.77 375 126.85 402.69 375 157.7 401.44 375
160.47 401.4 375 162.48 401.38 375 163.25 401.37 375
188.42 401.45 375 195.81 401.42 375 196.99 401.53 375
199.95 401.56 375 213.89 401.69 375 215.66 401.7 375
233.69 401.88 375 234.94 401.9 375 253.35 402.08 375
254.28 402.09 375 255.21 402.1 375 273.67 402.27 375
274.25 402.28 375 290.46 402.78 375 291.28 402.79 375
297.43 402.98 375 307.29 403.27 375 322.89 403.76 375
324.07 403.81 375 339.48 404.27 375 340.87 404.33 375
356.08 404.81 375 357.67 404.87 375 373.73 405.56 375
374.67 405.6 375 391.45 406.32 375 391.65 406.32 375
402.52 406.97 375 406.32 407.11 375

UPSTREAM BRIDGE CROSS SECTION DATA
STATION ELEVATION DATA NUM= 36
STA ELEV STA ELEV STA ELEV STA ELEV STA ELEV
0 404.76 9.71 403.27 26.77 401.31 32.46 400.53 40.26 399.7
56.7 395.63 58.73 395.45 63.58 394.89 84.87 394.24 108.49 392.84
134.01 390.68 146.45 390.14 155.99 388.19 158.49 385.88 160.68 384.3
164.33 383.84 177.47 384.05 178.93 384.5 181.85 385.83 183.68 387.67
190.32 388.6 204.4 391.6 210.93 392.22 215.92 392.34 242.53 393.62
245.62 393.94 246.03 393.95 254.97 393.98 275.67 394.45 284.04 395.48
290.13 395.97 313 398.75 329.46 398.58 336.46 399.86 357.74 404.58
373.18 406.39

MANNING'S N VALUES NUM= 3
STA N VAL STA N VAL STA N VAL
0 .15 155.99 .054 183.68 .15

BANK STA: LEFT RIGHT LENGTHS: LEFT CHANNEL RIGHT COEFF CONTR. EXPAN.
155.99 183.68 .3 .5
INEFFECTIVE FLOW NUM= 2
STA L STA R ELEV PERMANENT
0 158 401.37 F
178 373.18 401.37 F

DOWNSTREAM DECK/ROADWAY COORDINATES
NUM= 9
STA HI CORD LO CORD STA HI CORD LO CORD STA HI CORD LO CORD
0 402.52 375 26.7 401.44 375 29.47 401.4 375
31.48 401.38 375 32.25 401.37 375 57.42 401.45 375
64.81 401.42 375 65.99 401.53 375 68.94 401.56 375

DOWNSTREAM BRIDGE CROSS SECTION DATA
STATION ELEVATION DATA NUM= 14
STA ELEV STA ELEV STA ELEV STA ELEV STA ELEV
0 384.72 22.51 381.82 26.79 379.86 28.62 379 31.5 379.17
33.74 378.38 37.27 376.66 41.78 376.18 48.29 376.68 51.96 377.16
54.8 379.66 56.49 380.08 62.8 384.97 68.94 387.82

MANNING'S N VALUES NUM= 3
STA N VAL STA N VAL STA N VAL
0 .12 33.74 .072 54.8 .12

BANK STA: LEFT RIGHT COEFF CONTR. EXPAN.
33.74 54.8 .3 .5
INEFFECTIVE FLOW NUM= 2
STA L STA R ELEV PERMANENT
0 33 386 F
53 68.94 386 F

UPSTREAM EMBANKMENT SIDE SLOPE = 2 HORIZ. TO 1.0 VERTICAL
DOWNSTREAM EMBANKMENT SIDE SLOPE = 2 HORIZ. TO 1.0 VERTICAL
MAXIMUM ALLOWABLE SUBMERGENCE FOR WEIR FLOW = .95
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
RT 236 BOX 5 5
FHWA CHART # 9 - FLARED WINGWALLS AND INLET TOP EDGE BEVEL
FHWA SCALE # 2 - WINGWALL FLARED 18 TO 33.7 DEG.; INLET TOP EDGE BEVEL=0.083D
SOLUTION CRITERIA = HIGHEST U.S. EG
CULVERT UPSTRM DIST LENGTH TOP N BOTTOM N DEPTH BLOCKED ENTRANCE LOSS COEF EXIT LOSS COEF
5 460 .015 .015 0 .4 1
NUMBER OF BARRELS = 2
UPSTREAM ELEVATION = 384.34
CENTERLINE STATIONS
STA. STA.
165.4 171
DOWNSTREAM ELEVATION = 377.16
CENTERLINE STATIONS
STA. STA.
40 45.5

CROSS SECTION

RIVER: DANIELS RUN
REACH: 1 RS: 19

INPUT
DESCRIPTION: JUST DOWNSTREAM OF ROUTE 236
STATION ELEVATION DATA NUM= 14
STA ELEV STA ELEV STA ELEV STA ELEV STA ELEV
0 384.72 22.51 381.82 26.79 379.86 28.62 379 31.5 379.17
33.74 378.38 37.27 376.66 41.78 376.18 48.29 376.68 51.96 377.16
54.8 379.66 56.49 380.08 62.8 384.97 68.94 387.82

MANNING'S N VALUES NUM= 3
STA N VAL STA N VAL STA N VAL
0 .12 33.74 .072 54.8 .12

BANK STA: LEFT RIGHT LENGTHS: LEFT CHANNEL RIGHT COEFF CONTR. EXPAN.
33.74 54.8 247 247 247 .3 .5
INEFFECTIVE FLOW NUM= 2
STA L STA R ELEV PERMANENT
0 33 386 F
53 68.94 386 F

CROSS SECTION

RIVER: DANIELS RUN
REACH: 1 RS: 18

INPUT
DESCRIPTION:
STATION ELEVATION DATA NUM= 12
STA ELEV STA ELEV STA ELEV STA ELEV STA ELEV
0 382.71 9.17 382.46 16.62 380.29 48.15 379.62 76.04 379.5
96.68 379.55 110.86 378.06 117.31 374.6 123.07 373.72 125 374.83
127.99 376.82 141.03 383.74

MANNING'S N VALUES NUM= 4
STA N VAL STA N VAL STA N VAL STA N VAL
0 .013 9.17 .12 110.86 .072 127.99 .12

BANK STA: LEFT RIGHT LENGTHS: LEFT CHANNEL RIGHT COEFF CONTR. EXPAN.
110.86 127.99 120 120 120 .1 .3

CROSS SECTION

RIVER: DANIELS RUN
REACH: 1 RS: 17

INPUT
DESCRIPTION:
STATION ELEVATION DATA NUM= 13
STA ELEV STA ELEV STA ELEV STA ELEV STA ELEV
0 380.75 50 379.14 81.2 378.57 87.49 378.13 103.63 376.28
111.02 376 112.84 373.73 117.32 371.98 121.87 373.68 125.67 376.4
128.07 376.66 139.42 383.3 143.74 384.18

MANNING'S N VALUES NUM= 3
STA N VAL STA N VAL STA N VAL
0 .12 111.02 .072 125.67 .12

BANK STA: LEFT RIGHT LENGTHS: LEFT CHANNEL RIGHT COEFF CONTR. EXPAN.
111.02 125.67 89 89 89 .1 .3

CROSS SECTION

RIVER: DANIELS RUN
REACH: 1 RS: 16

INPUT
DESCRIPTION:
STATION ELEVATION DATA NUM= 16
STA ELEV STA ELEV STA ELEV STA ELEV STA ELEV
0 380.75 11.4 379.19 21.5 378.59 28.74 378.42 99.11 377.87
111.59 377.83 117.68 377.2 120.46 376.79 125.71 375.11 131.82 373.06
134.97 371.95 137 372.41 139.61 374.65 150.81 377.34 163.98 379.85
171.24 380.48

MANNING'S N VALUES NUM= 4
STA N VAL STA N VAL STA N VAL STA N VAL
0 .03 28.74 .12 125.71 .072 139.61 .12

BANK STA: LEFT RIGHT LENGTHS: LEFT CHANNEL RIGHT COEFF CONTR. EXPAN.
125.71 139.61 96 96 96 .1 .3

CROSS SECTION

RIVER: DANIELS RUN
REACH: 1 RS: 15

INPUT
DESCRIPTION:
STATION ELEVATION DATA NUM= 17
STA ELEV STA ELEV STA ELEV STA ELEV STA ELEV
0 380.47 10.01 378.99 28.58 377.91 31.66 377.87 40.68 377.84
64.14 377.19 93.56 377.14 111.95 376.93 124.36 375.64 130.42 374.28
134.43 372.72 137.74 372.5 139.37 373.02 143.64 374.74 155.33 377.03
174.29 378.67 182.63 379.42

MANNING'S N VALUES NUM= 4
STA N VAL STA N VAL STA N VAL STA N VAL
0 .03 40.68 .12 130.42 .072 143.64 .12

BANK STA: LEFT RIGHT LENGTHS: LEFT CHANNEL RIGHT COEFF CONTR. EXPAN.
130.42 143.64 246 246 246 .1 .3

CROSS SECTION

RIVER: DANIELS RUN
REACH: 1 RS: 14

INPUT
DESCRIPTION:
STATION ELEVATION DATA NUM= 18
STA ELEV STA ELEV STA ELEV STA ELEV STA ELEV
0 380.78 28.7 376.98 52.78 376.44 75.01 376.6 98.31 375.77
110.29 374.73 119.25 373.02 120.07 371.01 126.02 368.49 131.16 371.17
134.37 373.28 142 375.05 153.22 375.09 158.47 375.48 189.04 375.7
219.99 375.75 250.86 376.26 287.27 379.79

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COMMONWEALTH OF VIRGINIA
ROBERT W. BROWN
Lic. No. 037041
01/31/20
PROFESSIONAL ENGINEER

PLAN# MH11901
DATE: JULY 12, 2019
CONTOUR INT.= 2'
SCALE: AS NOTED

PLAN DATE
07/31/19
12/13/19
01/31/20

DUPLICATE EFFECTIVE HEC-RAS
FLOODPLAIN STUDY
MATHY PARK
DANIELS RUN
CITY OF FAIRFAX, VIRGINIA

No.	DATE	DESCRIPTION

REVISIONS

SHEET
07
OF
17

J2 Engineers - X:\DRAWINGS\ACTIVE\Mathy Park - Madison Homes\Floodplain Study\MH11901 - HEC-RAS.dwg [DUPLICATE EFFECTIVE] January 31, 2020 - 4:19pm awells

MANNING'S N VALUES NUM= 4
STA N VAL STA N VAL STA N VAL STA N VAL
0 .03 75.01 .12 119.25 .072 134.37 .12

BANK STA: LEFT RIGHT LENGTHS: LEFT CHANNEL RIGHT COEFF CONTR. EXPAN.
119.25 134.37 16 50 74 .1 .3

CROSS SECTION

RIVER: DANIELS RUN
REACH: 1 RS: 13.3

INPUT
DESCRIPTION:
STATION ELEVATION DATA NUM= 21
STA ELEV STA ELEV STA ELEV STA ELEV STA ELEV
0 381.39 39.33 376.4 47.64 376.51 63.54 376.43 100.46 375.83
102.57 375.7 109.32 372.97 111.01 371.56 115.17 370.75 121.39 368.75
188.42 368.75 196.04 370.75 199 371.41 203.25 372.23 208.75 374.29
213 375.07 213.53 375.17 231.93 375.88 245.41 376 250.51 376.28
283.11 381.25

MANNING'S N VALUES NUM= 5
STA N VAL STA N VAL STA N VAL STA N VAL STA N VAL
0 .03 63.54 .12 109.32 .06 203.25 .12 231.93 .03

BANK STA: LEFT RIGHT LENGTHS: LEFT CHANNEL RIGHT COEFF CONTR. EXPAN.
109.32 203.25 15 15 15 .3 .5

CROSS SECTION

RIVER: DANIELS RUN
REACH: 1 RS: 13.2

INPUT
DESCRIPTION:
STATION ELEVATION DATA NUM= 23
STA ELEV STA ELEV STA ELEV STA ELEV STA ELEV
0 379.35 21.69 377.05 36.38 376.4 44.71 376.45 63.91 376.42
73.22 376.62 76.82 375.9 88.89 375.76 98.08 375.62 107.05 372.62
108.4 371.51 110.47 370.75 116.97 368.75 164.53 368.75 172.36 370.75
178 371.37 185.99 372.26 195.16 374.59 200.41 374.91 206.44 374.92
218.88 375.18 248.48 376.35 269.62 382.16

MANNING'S N VALUES NUM= 5
STA N VAL STA N VAL STA N VAL STA N VAL STA N VAL
0 .03 44.71 .12 107.05 .06 185.99 .12 218.88 .03

BANK STA: LEFT RIGHT LENGTHS: LEFT CHANNEL RIGHT COEFF CONTR. EXPAN.
107.05 185.99 26 26 26 .3 .5

INLINE STRUCTURE

RIVER: DANIELS RUN
REACH: 1 RS: 13.1

INPUT
DESCRIPTION:
DISTANCE FROM UPSTREAM XS = 22
DECK/ROADWAY WIDTH = 1
WEIR COEFFICIENT = 2.6
WEIR EMBANKMENT COORDINATES NUM = 16
STA ELEV STA ELEV STA ELEV STA ELEV STA ELEV
98.08 373 114.01 373 127.01 373 127.02 371.5 134.34 371.5
134.35 373 136.36 373 136.37 371.5 143.7 371.5 143.71 373
145.71 373 145.72 371.5 153.05 371.5 153.06 373 174.04 373
195.16 373

UPSTREAM EMBANKMENT SIDE SLOPE = 0 HORIZ. TO 1.0 VERTICAL
DOWNSTREAM EMBANKMENT SIDE SLOPE = 0 HORIZ. TO 1.0 VERTICAL
MAXIMUM ALLOWABLE SUBMERGENCE FOR WEIR FLOW = .95
ELEVATION AT WHICH WEIR FLOW BEGINS =
WEIR CREST SHAPE = BROAD CRESTED

CROSS SECTION

RIVER: DANIELS RUN
REACH: 1 RS: 13

INPUT
DESCRIPTION:
STATION ELEVATION DATA NUM= 24
STA ELEV STA ELEV STA ELEV STA ELEV STA ELEV
0 380.48 22.64 376.62 41.26 375.96 51.44 376.13 61.72 376.13
69.53 376.27 72.97 375.3 84.2 375.13 91.64 374.03 95.48 372.24
99.97 369.62 107.36 368.37 117.77 368.79 129.2 369.28 131.35 370.74
135.03 371.95 146.75 373.76 161.81 374.4 179.65 374.68 182.3 375.01
191.46 374.81 220.19 375.44 239.45 375.93 260.31 382.18

MANNING'S N VALUES NUM= 5
STA N VAL STA N VAL STA N VAL STA N VAL STA N VAL
0 .03 51.44 .12 95.48 .06 135.03 .12 182.3 .03

BANK STA: LEFT RIGHT LENGTHS: LEFT CHANNEL RIGHT COEFF CONTR. EXPAN.
95.48 135.03 56 48 18 .3 .5

CROSS SECTION

RIVER: DANIELS RUN
REACH: 1 RS: 12.7

INPUT
DESCRIPTION:
STATION ELEVATION DATA NUM= 20
STA ELEV STA ELEV STA ELEV STA ELEV STA ELEV
0 380.22 20.77 376.65 43.44 375.89 52.47 375.82 56.46 375.25
66.08 373.67 70 369.86 74.48 368.13 80.32 369.44 81.74 370.92
91.15 372.89 105.35 374.32 112.63 374.43 139.52 374.31 147.44 375.1
155.41 375.08 160.23 374.71 181.56 375.47 206.77 376.23 228.37 382.38

MANNING'S N VALUES NUM= 5
STA N VAL STA N VAL STA N VAL STA N VAL STA N VAL
0 .03 52.47 .12 66.08 .06 91.15 .12 147.44 .03

BANK STA: LEFT RIGHT LENGTHS: LEFT CHANNEL RIGHT COEFF CONTR. EXPAN.
66.08 105.35 48 48 48 .3 .5

CROSS SECTION

RIVER: DANIELS RUN
REACH: 1 RS: 12.5

INPUT
DESCRIPTION:
STATION ELEVATION DATA NUM= 19
STA ELEV STA ELEV STA ELEV STA ELEV STA ELEV
0 380 21 376.43 58.84 375.36 68.14 375.26 77.54 374.75
110.94 372.75 116.83 370.75 119 367.9 127 367.9 128.92 370.75
132.76 372.75 135.06 373.45 143.95 374.31 151.87 375.1 159.84 375.08
164.66 374.71 185.99 375.47 211.2 376.23 232.8 382.38

MANNING'S N VALUES NUM= 5
STA N VAL STA N VAL STA N VAL STA N VAL STA N VAL
0 .03 68.14 .12 116.83 .06 128.92 .12 151.87 .03

BANK STA: LEFT RIGHT LENGTHS: LEFT CHANNEL RIGHT COEFF CONTR. EXPAN.
116.83 128.92 20 20 20 .3 .5

BRIDGE

RIVER: DANIELS RUN
REACH: 1 RS: 12.45

INPUT
DESCRIPTION: FOOTBRIDGE
DISTANCE FROM UPSTREAM XS = 5.5
DECK/ROADWAY WIDTH = 8.3
WEIR COEFFICIENT = 2.6
UPSTREAM DECK/ROADWAY COORDINATES
NUM= 6
STA HI CORD LO CORD STA HI CORD LO CORD STA HI CORD LO CORD
0 374.75 95.24 374.75 95.25 378.25 373.25
150.75 378.35 373.35 150.76 374.85 200 374.85

UPSTREAM BRIDGE CROSS SECTION DATA
STATION ELEVATION DATA NUM= 19
STA ELEV STA ELEV STA ELEV STA ELEV STA ELEV
0 380 21 376.43 58.84 375.36 68.14 375.26 77.54 374.75
110.94 372.75 116.83 370.75 119 367.9 127 367.9 128.92 370.75
132.76 372.75 135.06 373.45 143.95 374.31 151.87 375.1 159.84 375.08
164.66 374.71 185.99 375.47 211.2 376.23 232.8 382.38

MANNING'S N VALUES NUM= 5
STA N VAL STA N VAL STA N VAL STA N VAL STA N VAL
0 .03 68.14 .12 116.83 .06 128.92 .12 151.87 .03

BANK STA: LEFT RIGHT COEFF CONTR. EXPAN.
116.83 128.92 .3 .5

DOWNSTREAM DECK/ROADWAY COORDINATES
NUM= 6
STA HI CORD LO CORD STA HI CORD LO CORD STA HI CORD LO CORD
0 374.6 122.24 374.6 122.25 378.1 373.1
177.75 378.21 373.21 177.76 374.71 200 374.71

STATION ELEVATION DATA NUM= 17
STA ELEV STA ELEV STA ELEV STA ELEV STA ELEV
0 379.85 20 376.28 66.89 375.13 76.5 375.03 92.64 374.69
101.86 374.6 141.94 372.75 146.03 370.75 147 367.81 153 367.81
153.98 370.75 157.24 372.75 163.04 374.15 167.86 374.71 189.19 375.47
214.4 376.23 236 382.38

MANNING'S N VALUES NUM= 5
STA N VAL STA N VAL STA N VAL STA N VAL STA N VAL
0 .03 101.86 .12 146.03 .06 153.98 .12 167.86 .03

BANK STA: LEFT RIGHT COEFF CONTR. EXPAN.
146.03 153.98 .3 .5

UPSTREAM EMBANKMENT SIDE SLOPE = 0 HORIZ. TO 1.0 VERTICAL
DOWNSTREAM EMBANKMENT SIDE SLOPE = 0 HORIZ. TO 1.0 VERTICAL
MAXIMUM ALLOWABLE SUBMERGENCE FOR WEIR FLOW = .95
ELEVATION AT WHICH WEIR FLOW BEGINS =
ENERGY HEAD USED IN SPILLWAY DESIGN =
SPILLWAY HEIGHT USED IN DESIGN =
WEIR CREST SHAPE = BROAD CRESTED

NUMBER OF BRIDGE COEFFICIENT SETS = 1

LOW FLOW METHODS AND DATA
ENERGY
SELECTED LOW FLOW METHODS = HIGHEST ENERGY ANSWER

HIGH FLOW METHOD
ENERGY ONLY

ADDITIONAL BRIDGE PARAMETERS
ADD FRICTION COMPONENT TO MOMENTUM
DO NOT ADD WEIGHT COMPONENT TO MOMENTUM
CLASS B FLOW CRITICAL DEPTH COMPUTATIONS USE CRITICAL DEPTH
INSIDE THE BRIDGE AT THE UPSTREAM END
CRITERIA TO CHECK FOR PRESSURE FLOW = UPSTREAM ENERGY GRADE LINE

CROSS SECTION

RIVER: DANIELS RUN
REACH: 1 RS: 12.4

INPUT
DESCRIPTION:
STATION ELEVATION DATA NUM= 17
STA ELEV STA ELEV STA ELEV STA ELEV STA ELEV
0 379.85 20 376.28 66.89 375.13 76.5 375.03 92.64 374.69
101.86 374.6 141.94 372.75 146.03 370.75 147 367.81 153 367.81
153.98 370.75 157.24 372.75 163.04 374.15 167.86 374.71 189.19 375.47
214.4 376.23 236 382.38

MANNING'S N VALUES NUM= 5
STA N VAL STA N VAL STA N VAL STA N VAL STA N VAL
0 .03 101.86 .12 146.03 .06 153.98 .12 167.86 .03

BANK STA: LEFT RIGHT LENGTHS: LEFT CHANNEL RIGHT COEFF CONTR. EXPAN.
146.03 153.98 135 135 135 .3 .5

CROSS SECTION

RIVER: DANIELS RUN
REACH: 1 RS: 12

INPUT
DESCRIPTION:
STATION ELEVATION DATA NUM= 17
STA ELEV STA ELEV STA ELEV STA ELEV STA ELEV
0 379.29 16.08 374.76 23.05 374.49 27.62 373.77 34.52 374.22
43.01 374.06 56.81 373.34 65.24 371.45 69.7 368.3 78.45 367.16
88.42 368.33 95.64 371.36 110.73 372.25 122.67 373.75 145.71 374.43
174.78 375.58 186.62 378.45

MANNING'S N VALUES NUM= 5
STA N VAL STA N VAL STA N VAL STA N VAL STA N VAL
0 .03 43.01 .12 69.7 .06 88.42 .12 174.78 .03

BANK STA: LEFT RIGHT LENGTHS: LEFT CHANNEL RIGHT COEFF CONTR. EXPAN.
65.24 95.64 158 158 158 .1 .3

CROSS SECTION

RIVER: DANIELS RUN
REACH: 1 RS: 11

INPUT
DESCRIPTION:
STATION ELEVATION DATA NUM= 16
STA ELEV STA ELEV STA ELEV STA ELEV STA ELEV
0 377.78 7.49 375.08 13.68 373.61 15.86 373.4 24 373.11
33.81 372.26 47.18 369.29 51.11 366.94 57.33 365.23 63.2 369.61
69.86 372.21 96.04 373.27 125.33 374.89 147.07 373.52 166.53 375.12
178.84 377.96

MANNING'S N VALUES NUM= 5
STA N VAL STA N VAL STA N VAL STA N VAL STA N VAL
0 .03 24 .12 47.18 .06 63.2 .12 166.53 .03

BANK STA: LEFT RIGHT LENGTHS: LEFT CHANNEL RIGHT COEFF CONTR. EXPAN.
47.18 63.2 153 153 153 .1 .3

CROSS SECTION

RIVER: DANIELS RUN
REACH: 1 RS: 10

INPUT
DESCRIPTION:
STATION ELEVATION DATA NUM= 14
STA ELEV STA ELEV STA ELEV STA ELEV STA ELEV
0 376.04 27.85 374.2 39.74 373.88 42.94 373.48 57.9 369.4
67.94 367.52 73.11 365.11 77.31 364.82 82.98 365.24 85.58 367.78
96.31 370.5 116.77 370.87 161.2 372.33 200.89 375.05

MANNING'S N VALUES NUM= 5
STA N VAL STA N VAL STA N VAL STA N VAL STA N VAL
0 .12 27.85 .03 42.94 .12 67.94 .06 85.58 .12

BANK STA: LEFT RIGHT LENGTHS: LEFT CHANNEL RIGHT COEFF CONTR. EXPAN.
67.94 85.58 156 156 156 .1 .3

CROSS SECTION

RIVER: DANIELS RUN
REACH: 1 RS: 9

INPUT
DESCRIPTION:
STATION ELEVATION DATA NUM= 17
STA ELEV STA ELEV STA ELEV STA ELEV STA ELEV
0 378.9 12.78 375.9 20.33 373.89 22.62 373.77 31.06 373.51
49.33 372.44 92.55 370.04 102.87 368.38 104.9 367.63 107.05 363.88
112.81 363.35 115.74 363.99 121.92 365.96 138.74 365.25 174.3 370.44
213.99 373.37 224.33 374.75

MANNING'S N VALUES NUM= 5
STA N VAL STA N VAL STA N VAL STA N VAL STA N VAL
0 .12 12.78 .03 49.33 .12 104.9 .06 121.92 .12

BANK STA: LEFT RIGHT LENGTHS: LEFT CHANNEL RIGHT COEFF CONTR. EXPAN.
104.9 121.92 156 156 156 .1 .3

CROSS SECTION

RIVER: DANIELS RUN
REACH: 1 RS: 8

INPUT
DESCRIPTION:
STATION ELEVATION DATA NUM= 15
STA ELEV STA ELEV STA ELEV STA ELEV STA ELEV
0 376.28 5.54 376.04 16.57 371.51 24.81 371.25 34.4 371
64.86 368.93 86.74 366.77 94.05 362.91 98.09 362.65 101.73 363.42
105.27 364.45 111.93 364.79 133.47 369.25 164.03 371.47 190.7 374.27

MANNING'S N VALUES NUM= 5
STA N VAL STA N VAL STA N VAL STA N VAL STA N VAL
0 .03 34.4 .12 86.74 .06 105.27 .12 164.03 .03

BANK STA: LEFT RIGHT LENGTHS: LEFT CHANNEL RIGHT COEFF CONTR. EXPAN.
86.74 105.27 122 122 122 .3 .5

CROSS SECTION

RIVER: DANIELS RUN
REACH: 1 RS: 7

INPUT
DESCRIPTION:
STATION ELEVATION DATA NUM= 18
STA ELEV STA ELEV STA ELEV STA ELEV STA ELEV
0 374.01 9.68 374.47 21.09 374.9 29.97 375.11 31.29 375.11
39.22 375.22 41.86 375.46 42.58 366.9 55.63 365.77 65.99 364.48
71.26 362.31 82.03 361.26 96.99 362.23 110.94 362.16 128.22 361.4
138.89 362.04 152.49 366.64 178.13 375.02

MANNING'S N VALUES NUM= 6
STA N VAL STA N VAL STA N VAL STA N VAL STA N VAL
0 .03 29.97 .013 39.22 .03 42.58 .08 71.26 .06
138.89 .08

BANK STA: LEFT RIGHT LENGTHS: LEFT CHANNEL RIGHT COEFF CONTR. EXPAN.
71.26 138.89 75 75 75 .3 .5
INEFFECTIVE FLOW NUM= 2
STA L STA R ELEV PERMANENT
0 57.78 374.01 F
151.91 178.13 381.48 F

CULVERT

RIVER: DANIELS RUN
REACH: 1 RS: 6.5

INPUT
DESCRIPTION: FARRCROFT DRIVE
DISTANCE FROM UPSTREAM XS = 9
DECK/ROADWAY WIDTH = 63
WEIR COEFFICIENT = 2.6
UPSTREAM DECK/ROADWAY COORDINATES
NUM= 4
STA HI CORD LO CORD STA HI CORD LO CORD STA HI CORD LO CORD
41.86 375.46 97 378.76 153 381.53
205 384.11

UPSTREAM BRIDGE CROSS SECTION DATA
STATION ELEVATION DATA NUM= 18
STA ELEV STA ELEV STA ELEV STA ELEV STA ELEV
0 374.01 9.68 374.47 21.09 374.9 29.97 375.11 31.29 375.11
39.22 375.22 41.86 375.46 42.58 366.9 55.63 365.77 65.99 364.48
71.26 362.31 82.03 361.26 96.99 362.23 110.94 362.16 128.22 361.4
138.89 362.04 152.49 366.64 178.13 375.02

MANNING'S N VALUES NUM= 6
STA N VAL STA N VAL STA N VAL STA N VAL STA N VAL
0 .03 29.97 .013 39.22 .03 42.58 .08 71.26 .06
138.89 .08

BANK STA: LEFT RIGHT COEFF CONTR. EXPAN.
71.26 138.89 .3 .5
INEFFECTIVE FLOW NUM= 2
STA L STA R ELEV PERMANENT
0 57.78 374.01 F
151.91 178.13 381.48 F

DOWNSTREAM DECK/ROADWAY COORDINATES
NUM= 4
STA HI CORD LO CORD STA HI CORD LO CORD STA HI CORD LO CORD
44.26 375.18 103 378.08 164 381.14
230 384.49

DOWNSTREAM BRIDGE CROSS SECTION DATA
STATION ELEVATION DATA NUM= 15
STA ELEV STA ELEV STA ELEV STA ELEV STA ELEV
0 373.35 15.55 374.16 31.73 374.51 39.25 374.84 44.26 375.18
44.49 364.06 52.51 363.43 64.66 362.12 67.16 361.15 124.12 361.15
158.71 362.36 180.24 363.17 196.75 365.21 198.19 373.17 209.65 376.35

MANNING'S N VALUES NUM= 9
STA N VAL STA N VAL STA N VAL STA N VAL STA N VAL
0 .03 31.73 .013 39.25 .03 44.26 .013 44.49 .03
64.66 .06 158.71 .03 196.75 .013 198.19 .03

BANK STA: LEFT RIGHT COEFF CONTR. EXPAN.
44.49 196.75 .3 .5
INEFFECTIVE FLOW NUM= 2
STA L STA R ELEV PERMANENT
0 67.53 373.35 F
147.66 209.65 380.32 F

UPSTREAM EMBANKMENT SIDE SLOPE = 0 HORIZ. TO 1.0 VERTICAL
DOWNSTREAM EMBANKMENT SIDE SLOPE = 0 HORIZ. TO 1.0 VERTICAL
MAXIMUM ALLOWABLE SUBMERGENCE FOR WEIR FLOW = .95
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 = 3

CULVERT NAME SHAPE RISE SPAN
CULVERT #1 CONSPAN ARCH 11 24
FHWA CHART # 60- SPAN/RISE RATIO APPROXIMATE 2:1
FHWA SCALE # 1 - 0 DEGREE WING WALL ANGLE
SOLUTION CRITERIA = HIGHEST U.S. EG
CULVERT UPSTRM DIST LENGTH TOP N BOTTOM N DEPTH BLOCKED ENTRANCE LOSS COEF EXIT LOSS COEF
9 63 .013 .035 0 .5 1
UPSTREAM ELEVATION = 361.17

J2 Engineers, Inc.
4080 Lafayette Center Drive
Suite 330
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703.361.1550 (office)
703.956.6845 (fax)
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COMMONWEALTH OF VIRGINIA
Robert Brown
ROBERT W. BROWN
Lic. No. 037041
01/31/20
PROFESSIONAL ENGINEER

PLAN# MH11901
DATE: JULY 12, 2019
CONTOUR INT.= 2'
SCALE: AS NOTED

PLAN DATE
07/31/19
12/13/19
01/31/20

No.	DATE	DESCRIPTION

REVISIONS

DUPLICATE EFFECTIVE HEC-RAS
FLOODPLAIN STUDY
MATHY PARK
DANIELS RUN
CITY OF FAIRFAX, VIRGINIA

SHEET
08
OF
17

J2 Engineers - X:\DRAWINGS\ACTIVE\Mathy Park - Madison Homes\Floodplain Study\MH1901 - HEC-RAS.dwg [DUPLICATE EFFECTIVE-2] January 31, 2020 - 4:19pm awells

CENTERLINE STATION = 78.78
DOWNSTREAM ELEVATION = 361.15
CENTERLINE STATION = 81.03

CULVERT NAME SHAPE RISE SPAN
CULVERT #2 CONSPAN ARCH 11 24
FHWA CHART # 60- SPAN/RISE RATIO APPROXIMATE 2:1
FHWA SCALE # 1 - 0 DEGREE WING WALL ANGLE
SOLUTION CRITERIA = HIGHEST U.S. EG
CULVERT UPSTRM DIST LENGTH TOP N BOTTOM N DEPTH BLOCKED ENTRANCE LOSS COEF EXIT LOSS COEF
9 63 .013 .035 0 .5 1
UPSTREAM ELEVATION = 361.19
CENTERLINE STATION = 105.3
DOWNSTREAM ELEVATION = 361.17
CENTERLINE STATION = 107.55

CULVERT NAME SHAPE RISE SPAN
CULVERT #3 CONSPAN ARCH 11 24
FHWA CHART # 60- SPAN/RISE RATIO APPROXIMATE 2:1
FHWA SCALE # 1 - 0 DEGREE WING WALL ANGLE
SOLUTION CRITERIA = HIGHEST U.S. EG
CULVERT UPSTRM DIST LENGTH TOP N BOTTOM N DEPTH BLOCKED ENTRANCE LOSS COEF EXIT LOSS COEF
9 63 .013 .035 0 .5 1
UPSTREAM ELEVATION = 361.25
CENTERLINE STATION = 131.91
DOWNSTREAM ELEVATION = 361.16
CENTERLINE STATION = 134.16

CROSS SECTION

RIVER: DANIELS RUN
REACH: 1 RS: 6

INPUT
DESCRIPTION:
STATION ELEVATION DATA NUM= 15
STA ELEV STA ELEV STA ELEV STA ELEV STA ELEV
0 373.35 15.55 374.16 31.73 374.51 39.25 374.84 44.26 375.18
44.49 364.06 52.51 363.43 64.66 362.12 67.16 361.15 124.12 361.15
158.71 362.36 180.24 363.17 196.75 365.21 198.19 373.17 209.65 376.35

MANNING'S N VALUES NUM= 9
STA N VAL STA N VAL STA N VAL STA N VAL STA N VAL
0 .03 31.73 .013 39.25 .03 44.26 .013 44.49 .03
64.66 .06 158.71 .03 196.75 .013 198.19 .03

BANK STA: LEFT RIGHT LENGTHS: LEFT CHANNEL RIGHT COEFF CONTR. EXPAN.
44.49 196.75 91 88 84 .3 .5
INEFFECTIVE FLOW NUM= 2
STA L STA R ELEV PERMANENT
0 67.53 373.35 F
147.66 209.65 380.32 F

CROSS SECTION

RIVER: DANIELS RUN
REACH: 1 RS: 5

INPUT
DESCRIPTION:
STATION ELEVATION DATA NUM= 18
STA ELEV STA ELEV STA ELEV STA ELEV STA ELEV
0 373.76 3.17 373.11 11.32 372.9 19.53 370.08 27.71 367.48
41.94 362.21 57.13 360.75 61.13 358.75 65.13 356.75 69.13 354.75
152.41 354.75 156.41 356.75 160.41 358.75 164.41 360.75 176.7 362.1
185.94 364.89 186.81 373.11 196.06 376

MANNING'S N VALUES NUM= 7
STA N VAL STA N VAL STA N VAL STA N VAL STA N VAL
0 .03 3.17 .013 11.32 .03 41.94 .06 176.7 .03
185.94 .013 186.81 .03

BANK STA: LEFT RIGHT LENGTHS: LEFT CHANNEL RIGHT COEFF CONTR. EXPAN.
41.94 176.7 162 138 110 .3 .5

CROSS SECTION

RIVER: DANIELS RUN
REACH: 1 RS: 4

INPUT
DESCRIPTION:
STATION ELEVATION DATA NUM= 16
STA ELEV STA ELEV STA ELEV STA ELEV STA ELEV
0 376.68 8.86 376.51 32.94 369.65 56.12 362.12 68.71 360.75
74.34 358.75 80.96 356.75 89.71 354.75 205.9 354.75 210.76 356.75
215.15 358.75 219.38 360.75 228.71 361.98 242.61 364.81 243.49 373.17
248.69 374.28

MANNING'S N VALUES NUM= 6
STA N VAL STA N VAL STA N VAL STA N VAL STA N VAL
0 .013 8.86 .03 56.12 .06 228.71 .03 242.61 .013
243.49 .03

BANK STA: LEFT RIGHT LENGTHS: LEFT CHANNEL RIGHT COEFF CONTR. EXPAN.
56.12 228.71 120 120 120 .3 .5

CULVERT

RIVER: DANIELS RUN
REACH: 1 RS: 3.5

INPUT
DESCRIPTION: FARRCROFT POND PRINCIPAL SPILLWAY
DISTANCE FROM UPSTREAM XS = 45
DECK/ROADWAY WIDTH = 50
WEIR COEFFICIENT = 2.6
UPSTREAM DECK/ROADWAY COORDINATES
NUM= 5
STA HI CORD LO CORD STA HI CORD LO CORD STA HI CORD LO CORD
8.86 376.51 56 373 220 373
230 374 250 376

UPSTREAM BRIDGE CROSS SECTION DATA
STATION ELEVATION DATA NUM= 16
STA ELEV STA ELEV STA ELEV STA ELEV STA ELEV
0 376.68 8.86 376.51 32.94 369.65 56.12 362.12 68.71 360.75
74.34 358.75 80.96 356.75 89.71 354.75 205.9 354.75 210.76 356.75
215.15 358.75 219.38 360.75 228.71 361.98 242.61 364.81 243.49 373.17
248.69 374.28

MANNING'S N VALUES NUM= 6
STA N VAL STA N VAL STA N VAL STA N VAL STA N VAL
0 .013 8.86 .03 56.12 .06 228.71 .03 242.61 .013
243.49 .03

BANK STA: LEFT RIGHT COEFF CONTR. EXPAN.
56.12 228.71 .3 .5

DOWNSTREAM DECK/ROADWAY COORDINATES
NUM= 3
STA HI CORD LO CORD STA HI CORD LO CORD STA HI CORD LO CORD
0 373 91 373 109.57 374

DOWNSTREAM BRIDGE CROSS SECTION DATA
STATION ELEVATION DATA NUM= 14
STA ELEV STA ELEV STA ELEV STA ELEV STA ELEV
0 368.75 3.77 366.47 14.35 357.56 18.63 357.08 24.06 357.09
34.52 356.25 52.71 357.25 59.13 360.76 62.26 363.91 65.22 364.57
82.29 372.57 86.41 372.68 94.22 372.72 109.57 372.93

MANNING'S N VALUES NUM= 6
STA N VAL STA N VAL STA N VAL STA N VAL STA N VAL
0 .15 14.35 .06 52.71 .08 82.29 .03 86.41 .013
94.22 .03

BANK STA: LEFT RIGHT COEFF CONTR. EXPAN.
14.35 52.71 .3 .5
INEFFECTIVE FLOW NUM= 2
STA L STA R ELEV PERMANENT
0 8.27 373 F
52.27 109.57 373 F

UPSTREAM EMBANKMENT SIDE SLOPE = 0 HORIZ. TO 1.0 VERTICAL
DOWNSTREAM EMBANKMENT SIDE SLOPE = 0 HORIZ. TO 1.0 VERTICAL
MAXIMUM ALLOWABLE SUBMERGENCE FOR WEIR FLOW = .95
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 BOX 8 9
FHWA CHART # 8 - FLARED WINGWALLS
FHWA SCALE # 1 - WINGWALL FLARED 30 TO 75 DEG.
SOLUTION CRITERIA = HIGHEST U.S. EG
CULVERT UPSTRM DIST LENGTH TOP N BOTTOM N DEPTH BLOCKED ENTRANCE LOSS COEF EXIT LOSS COEF
44 52 .013 .013 0 .4 1
NUMBER OF BARRELS = 2
UPSTREAM ELEVATION = 357.8
CENTERLINE STATIONS
STA. STA.
140 150
DOWNSTREAM ELEVATION = 357.5
CENTERLINE STATIONS
STA. STA.
21.5 31.5

CROSS SECTION

RIVER: DANIELS RUN
REACH: 1 RS: 3

INPUT
DESCRIPTION:
STATION ELEVATION DATA NUM= 14
STA ELEV STA ELEV STA ELEV STA ELEV STA ELEV
0 368.75 3.77 366.47 14.35 357.56 18.63 357.08 24.06 357.09
34.52 356.25 52.71 357.25 59.13 360.76 62.26 363.91 65.22 364.57
82.29 372.57 86.41 372.68 94.22 372.72 109.57 372.93

MANNING'S N VALUES NUM= 6
STA N VAL STA N VAL STA N VAL STA N VAL STA N VAL
0 .15 14.35 .06 52.71 .08 82.29 .03 86.41 .013
94.22 .03

BANK STA: LEFT RIGHT COEFF CONTR. EXPAN.
14.35 52.71 154 154 154 .3 .5
INEFFECTIVE FLOW NUM= 2
STA L STA R ELEV PERMANENT
0 8.27 373 F
52.27 109.57 373 F

CROSS SECTION

RIVER: DANIELS RUN
REACH: 1 RS: 2

INPUT
DESCRIPTION:
STATION ELEVATION DATA NUM= 17
STA ELEV STA ELEV STA ELEV STA ELEV STA ELEV
0 366.75 3.59 364.96 6.96 362.5 26.57 362.33 43.69 362.22
54.49 362.01 57.85 356.3 67.85 355.81 70.46 356.28 74.99 361.8
90.98 362.14 106.13 363.05 126.7 364.25 131.86 366.47 134.39 366.75
142.58 366.85 148.23 367.88

MANNING'S N VALUES NUM= 6
STA N VAL STA N VAL STA N VAL STA N VAL STA N VAL
0 .15 54.49 .06 74.99 .15 131.86 .03 134.39 .013
142.58 .03

BANK STA: LEFT RIGHT LENGTHS: LEFT CHANNEL RIGHT COEFF CONTR. EXPAN.
54.49 74.99 196 196 196 .1 .3

CROSS SECTION

RIVER: DANIELS RUN
REACH: 1 RS: 1

INPUT
DESCRIPTION:
STATION ELEVATION DATA NUM= 11
STA ELEV STA ELEV STA ELEV STA ELEV STA ELEV
0 364.08 43.37 361.49 72.19 359.98 77.28 354.36 83.86 353.25
90.79 354.26 95.29 358.63 100.45 360.01 149.81 360.65 186.56 362.65
194.77 363.26

MANNING'S N VALUES NUM= 4
STA N VAL STA N VAL STA N VAL STA N VAL
0 .03 43.37 .08 72.19 .06 100.45 .15

BANK STA: LEFT RIGHT LENGTHS: LEFT CHANNEL RIGHT COEFF CONTR. EXPAN.
72.19 100.45 256.85 260.24 259.46 .1 .3

CROSS SECTION

RIVER: DANIELS RUN
REACH: 1 RS: 0

INPUT
DESCRIPTION: EFFECTIVE CROSS SECTION 8879.358
STATION ELEVATION DATA NUM= 34
STA ELEV STA ELEV STA ELEV STA ELEV STA ELEV
0 374.08 25.98 373.55 78.53 362.65 84.23 361.53 98.6 361.24
156.95 360.02 199.54 358.96 212.03 358.71 228.24 358.06 258.96 356.86
260.88 356.79 262.99 356.7 269 356.554 269.97 356.53 270.73 352.75
278.77 353.16 282.55 353.23 283.26 354.41 283.45 356.64 291.79 357.07
292.76 357.1 314.07 358.01 356.64 359.792 385.49 361 390.06 361.12
404.38 361.17 435.29 361.35 448.48 361.78 459.01 362.98 469.11 365.25
475.94 367.31 481.81 368.96 495.08 371.9 506.78 373.65

MANNING'S N VALUES NUM= 6
STA N VAL STA N VAL STA N VAL STA N VAL STA N VAL
0 .03 258.96 .15 269.97 .06 283.45 .15 314.07 .03
390.06 .15

BANK STA: LEFT RIGHT LENGTHS: LEFT CHANNEL RIGHT COEFF CONTR. EXPAN.
269.97 283.45 0 0 0 .1 .3

SUMMARY OF MANNING'S N VALUES

RIVER:DANIELS RUN

REACH	RIVER STA.	N1	N2	N3	N4	N5	N6	N7	N8	N9
1	23	.015	.015	.015	.015					
1	22	.15	.054	.15	10	.15	10	.15		
1	21	.15	.054	.15						
1	20	.15	.054	.15						
1	19.5	CULVERT								
1	19	.12	.072	.12						
1	18	.013	.12	.072	.12					
1	17	.12	.072	.12						
1	16	.03	.12	.072	.12					
1	15	.03	.12	.072	.12					
1	14	.03	.12	.072	.12					
1	13.3	.03	.12	.06	.12	.03				
1	13.2	.03	.12	.06	.12	.03				
1	13.1	INL STRUCT								
1	13	.03	.12	.06	.12	.03				
1	12.7	.03	.12	.06	.12	.03				
1	12.5	.03	.12	.06	.12	.03				
1	12.45	BRIDGE								
1	12.4	.03	.12	.06	.12	.03				
1	12	.03	.12	.06	.12	.03				
1	11	.03	.12	.06	.12	.03				
1	10	.12	.03	.12	.06	.12				
1	9	.12	.03	.12	.06	.12				
1	8	.03	.12	.06	.12	.03				
1	7	.03	.013	.03	.08	.06	.08			
1	6.5	CULVERT								
1	6	.03	.013	.03	.013	.03	.06	.03	.013	.03
1	5	.03	.013	.03	.06	.03	.013	.03		
1	4	.013	.03	.06	.03	.013	.03			
1	3.5	CULVERT								
1	3	.15	.06	.08	.03	.013	.03			
1	2	.15	.06	.15	.03	.013	.03			
1	1	.03	.08	.06	.15					
1	0	.03	.15	.06	.15	.03	.15			

SUMMARY OF REACH LENGTHS

RIVER: DANIELS RUN

REACH	RIVER STA.	LEFT	CHANNEL	RIGHT
1	23	35.4	34.16	33.72
1	22	157.4	171.77	172.46
1	21	108.63	153.82	133.47
1	20	475.23	473.78	470.71
1	19.5	CULVERT		
1	19	247	247	247
1	18	120	120	120
1	17	89	89	89
1	16	96	96	96
1	15	246	246	246
1	14	16	50	74
1	13.3	15	15	15
1	13.2	26	26	26
1	13.1	INL STRUCT		
1	13	56	48	18
1	12.7	48	48	48
1	12.5	20	20	20
1	12.45	BRIDGE		
1	12.4	135	135	135
1	12	158	158	158
1	11	153	153	153
1	10	156	156	156
1	9	156	156	156
1	8	122	122	122
1	7	75	75	75
1	6.5	CULVERT		
1	6	91	88	84
1	5	162	138	110
1	4	120	120	120
1	3.5	CULVERT		
1	3	154	154	154
1	2	196	196	196
1	1	256.85	260.24	259.46
1	0	0	0	0

SUMMARY OF CONTRACTION AND EXPANSION COEFFICIENTS

RIVER: DANIELS RUN

REACH	RIVER STA.	CONTR.	EXPAN.
1	23	.1	.3
1	22	.1	.3
1	21	.3	.5
1	20	.3	.5
1	19.5	CULVERT	
1	19	.3	.5
1	18	.1	.3
1	17	.1	.3
1	16	.1	.3
1	15	.1	.3
1	14	.1	.3
1	13.3	.3	.5
1	13.2	.3	.5
1	13.1	INL STRUCT	
1	13	.3	.5
1	12.7	.3	.5
1	12.5	.3	.5
1	12.45	BRIDGE	
1	12.4	.3	.5
1	12	.1	.3
1	11	.1	.3
1	10	.1	.3
1	9	.1	.3
1	8	.3	.5
1	7	.3	.5
1	6.5	CULVERT	
1	6	.3	.5
1	5	.3	.5
1	4	.3	.5
1	3.5	CULVERT	
1	3	.3	.5
1	2	.1	.3
1	1	.1	.3
1	0	.1	.3

J2 Engineers, Inc.
4080 Lafayette Center Drive
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Chantilly, Va. 20151

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COMMONWEALTH OF VIRGINIA
Robert Brown
ROBERT W. BROWN
Lic. No. 037041
01/31/20
PROFESSIONAL ENGINEER

PLAN# MHI1901
DATE: JULY 12, 2019
CONTOUR INT.= 2'
SCALE: AS NOTED

PLAN DATE
07/31/19
12/13/19
01/31/20

DUPLICATE EFFECTIVE HEC-RAS
FLOODPLAIN STUDY
MATHY PARK
DANIELS RUN
CITY OF FAIRFAX, VIRGINIA

No.	DATE	DESCRIPTION

REVISIONS

SHEET
09
OF
17

J2 Engineers - X:\DRAWINGS\ACTIVE\Mathy Park - Madison Homes\Floodplain Study\MH1901 - HEC-RAS.dwg [DUPLICATE EFFECTIVE-3] January 31, 2020 - 4:19pm awells

HEC-RAS HEC-RAS 5.0.7 MARCH 2019
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
XXXXXXX 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 XXXXXX  XXXX     X  X  X   X XXXXX
```

PROJECT DATA
PROJECT TITLE: CORRECTED EFFECTIVE MODEL
PROJECT FILE : COREFFECTIVEMODEL.PRJ
RUN DATE AND TIME: 7/30/2019 2:37:03 PM

PROJECT IN ENGLISH UNITS

PROJECT DESCRIPTION:
CORRECTED EFFECTIVE MODEL

PLAN DATA

PLAN TITLE: DATUM_ADJUST
PLAN FILE : X:\DRAWINGS\ACTIVE\MATHY PARK - MADISON HOMES\FLOODPLAIN STUDY\FINAL FLOODPLAIN MODELS\CORRECTED EFFECTIVE MODEL\COREFFECTIVEMODEL.P03

GEOMETRY TITLE: SURVEYED XS NGVD 29
GEOMETRY FILE : X:\DRAWINGS\ACTIVE\MATHY PARK - MADISON HOMES\FLOODPLAIN STUDY\FINAL FLOODPLAIN MODELS\CORRECTED EFFECTIVE MODEL\COREFFECTIVEMODEL.G03

FLOW TITLE : HMS DISCHARGES
FLOW FILE : X:\DRAWINGS\ACTIVE\MATHY PARK - MADISON HOMES\FLOODPLAIN STUDY\FINAL FLOODPLAIN MODELS\CORRECTED EFFECTIVE MODEL\COREFFECTIVEMODEL.F02

PLAN SUMMARY INFORMATION:
NUMBER OF: CROSS SECTIONS = 29 MULTIPLE OPENINGS = 0
CULVERTS = 4 INLINE STRUCTURES = 1
BRIDGES = 1 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 = 0.3
FLOW TOLERANCE FACTOR = 0.001

COMPUTATION OPTIONS
CRITICAL DEPTH COMPUTED ONLY WHERE NECESSARY
CONVEYANCE CALCULATION METHOD: AT BREAKS IN N VALUES ONLY
FRICTION SLOPE METHOD: AVERAGE CONVEYANCE
COMPUTATIONAL FLOW REGIME: SUBCRITICAL FLOW

FLOW DATA

FLOW TITLE: HMS DISCHARGES
FLOW FILE : X:\DRAWINGS\ACTIVE\MATHY PARK - MADISON HOMES\FLOODPLAIN STUDY\FINAL FLOODPLAIN MODELS\CORRECTED EFFECTIVE MODEL\COREFFECTIVEMODEL.F02

FLOW DATA (CFS)

RIVER	REACH	RS	10-YR	50-YR	100-YR	500-YR
DANIELS RUN	1	23	310	560	705	1000
DANIELS RUN	1	22	590	870	985	1280
DANIELS RUN	1	20	530	690	715	785
DANIELS RUN	1	19	530	700	750	830
DANIELS RUN	1	13.2	865	1400	1560	2020

BOUNDARY CONDITIONS

RIVER	REACH	PROFILE	UPSTREAM	DOWNSTREAM
DANIELS RUN	1	10-YR		KNOWN WS = 358.94
DANIELS RUN	1	50-YR		KNOWN WS = 359.58
DANIELS RUN	1	100-YR		KNOWN WS = 359.73
DANIELS RUN	1	500-YR		KNOWN WS = 360.09

CHANGES IN WS AND EG

RIVER	REACH	RS	PROFILE	TYPE	VALUE
DANIELS RUN	1	4	500-YR	KNOWN WS	372.59
DANIELS RUN	1	4	100-YR	KNOWN WS	372.01
DANIELS RUN	1	4	50-YR	KNOWN WS	371.79
DANIELS RUN	1	4	10-YR	KNOWN WS	370.97

GEOMETRY DATA

GEOMETRY TITLE: SURVEYED XS NGVD 29
GEOMETRY FILE : X:\DRAWINGS\ACTIVE\MATHY PARK - MADISON HOMES\FLOODPLAIN STUDY\FINAL FLOODPLAIN MODELS\CORRECTED EFFECTIVE MODEL\COREFFECTIVEMODEL.G03

CROSS SECTION

RIVER: DANIELS RUN
REACH: 1 RS: 23

INPUT
DESCRIPTION: EFFECTIVE CROSS SECTION 12670.88
STATION ELEVATION DATA NUM= 69

STA	ELEV	STA	ELEV	STA	ELEV	STA	ELEV	STA	ELEV
0	401.68	3.25	401.53	14.45	401.23	34.27	400.1	48.01	399.62
51.78	399.47	53.01	399.47	53.59	399.52	75.06	399.23	76.82	399.19
102.98	399.05	104.38	399	108.65	398.91	132.02	398.73	141.65	398.51
144.29	398.49	159.61	398.48	173.17	398.22	187.1	398.21	207.41	397.7
213.99	397.69	220.63	397.23	226.22	396.72	228.33	396.6	230.84	396.85
237.42	397.23	241.67	397.36	242.37	397.27	257.55	397.36	265.18	397.4
265.84	397.42	267.53	397.33	282.06	397.38	287.36	397.23	289.23	396.39
291.79	395.23	297.09	393.4	297.35	393.29	297.48	393.23	310.91	392.08
313.47	391.87	324.29	391.85	330.3	391.85	344.34	391.33	359.62	391.34
371.84	391.34	381.25	391.69	392.12	392.15	393.81	392.18	403.69	392.81
408.51	393	411.83	393.23	420.84	394.05	426.41	394.19	430.74	394.31
437.69	395.23	441.23	395.53	459.18	395.83	464.51	396.48	467.8	396.58
471.21	396.68	489.43	396.94	490.12	397.2	490.67	396.98	510.15	397.23
514.13	397.28	515.08	397.31	524.19	397.63	525.62	397.75		

MANNING'S N VALUES NUM= 3

STA	N VAL	STA	N VAL	STA	N VAL
0	.15	257.55	.054	467.8	.15

BANK STA: LEFT RIGHT LENGTHS: LEFT CHANNEL RIGHT COEFF CONTR. EXPAN.
297.09 420.84 35.4 34.16 33.72 .1 .3
INEFFECTIVE FLOW NUM= 1

STA L	STA R	ELEV	PERMANENT
0	102.96	399.19	F

CULVERT

RIVER: DANIELS RUN
REACH: 1 RS: 22.5

INPUT
DESCRIPTION: SAGER AVENUE CULVERT
DISTANCE FROM UPSTREAM XS = 1
DECK/ROADWAY WIDTH = 30
WEIR COEFFICIENT = 2.8
UPSTREAM DECK/ROADWAY COORDINATES
NUM= 5

STA	HI CORD	LO CORD	STA	HI CORD	LO CORD	STA	HI CORD	LO CORD
100	392.74		200	391.23		300	394.27	
400	399.5		500	406.87				

UPSTREAM BRIDGE CROSS SECTION DATA
STATION ELEVATION DATA NUM= 69

STA	ELEV	STA	ELEV	STA	ELEV	STA	ELEV	STA	ELEV
0	401.68	3.25	401.53	14.45	401.23	34.27	400.1	48.01	399.62
51.78	399.47	53.01	399.47	53.59	399.52	75.06	399.23	76.82	399.19
102.98	399.05	104.38	399	108.65	398.91	132.02	398.73	141.65	398.51
144.29	398.49	159.61	398.48	173.17	398.22	187.1	398.21	207.41	397.7
213.99	397.69	220.63	397.23	226.22	396.72	228.33	396.6	230.84	396.85
237.42	397.23	241.67	397.36	242.37	397.27	257.55	397.36	265.18	397.4
265.84	397.42	267.53	397.33	282.06	397.38	287.36	397.23	289.23	396.39
291.79	395.23	297.09	393.4	297.35	393.29	297.48	393.23	310.91	392.08
313.47	391.87	324.29	391.85	330.3	391.85	344.34	391.33	359.62	391.34
371.84	391.34	381.25	391.69	392.12	392.15	393.81	392.18	403.69	392.81
408.51	393	411.83	393.23	420.84	394.05	426.41	394.19	430.74	394.31
437.69	395.23	441.23	395.53	459.18	395.83	464.51	396.48	467.8	396.58
471.21	396.68	489.43	396.94	490.12	397.2	490.67	396.98	510.15	397.23
514.13	397.28	515.08	397.31	524.19	397.63	525.62	397.75		

MANNING'S N VALUES NUM= 3

STA	N VAL	STA	N VAL	STA	N VAL
0	.15	257.55	.054	467.8	.15

BANK STA: LEFT RIGHT COEFF CONTR. EXPAN.
297.09 420.84 .1 .3

STA L	STA R	ELEV	PERMANENT
0	102.96	399.19	F

DOWNSTREAM DECK/ROADWAY COORDINATES
NUM= 5

STA	HI CORD	LO CORD	STA	HI CORD	LO CORD	STA	HI CORD	LO CORD
101.53	392.31		204.93	391.23		304.93	394.16	
404.94	400.15		504.94	407.73				

DOWNSTREAM BRIDGE CROSS SECTION DATA
STATION ELEVATION DATA NUM= 122

STA	ELEV	STA	ELEV	STA	ELEV	STA	ELEV	STA	ELEV
0	401.75	7.41	401.23	12.24	401.23	37.5	399.95	40.7	399.81
52.39	399.23	53.22	399.16	74.68	398.37	81.97	398.18	85.01	398.06
90.25	397.91	99.92	397.46	100.52	397.42	106.46	397.23	113.53	396.48
119.55	395.93	127.5	395.23	131.26	395.08	146.97	394.52	147.39	394.47
149.19	394.44	151.31	394.32	157	394.11	162.27	393.82	163.21	393.82
167.04	393.23	170.5	393.11	178.23	392.95	182.7	392.86	192.64	392.61
195.71	392.57	198.19	392.54	202.52	392.49	214.95	392	225.93	392.06
228.38	392.04	241.93	392.18	243.66	392.21	243.74	392.2	247.58	392.23
249.01	392.22	253.92	392.19	260.12	392.14	261.97	392.14	272.92	392.11
274.58	392.12	274.66	392.12	279.21	392.02	283.55	391.96	287.41	391.96
289.57	391.89	291.26	391.85	293.75	391.73	301.27	391.58	306.74	391.61
307.52	391.56	308.23	391.62	309.68	391.63	310.31	391.63	314.49	391.7
318.29	391.7	321.63	391.65	322.36	391.65	325.89	391.8	340.04	391.71
350.58	392.52	356.83	392.47	357.89	392.48	360.5	392.53	363.03	392.64
363.21	392.65	380.16	393.21	380.29	393.21	380.34	393.22	380.86	393.23
381.2	393.23	392.07	393.07	394.2	393.23	396.44	393.417	396.83	393.45
398.53	393.58	401.41	393.62	415.34	394.28	418.92	394.37	432.93	394.95
438.63	395.18	439.44	395.23	449.45	395.84	455.08	396.24	463.15	396.66
465.94	396.71	467.29	396.71	469.35	396.77	470.07	396.87	471.08	396.86
472.17	397.06	475.36	397.23	496.16	398.78	500.78	399.23	522.74	401.2
522.81	401.21	522.93	401.21	523.04	401.23	523.11	401.25	523.13	401.25
528.09	401.9	529.68	401.8	531.19	401.85	532.57	401.91	533.93	401.94
538.48	402	539.45	401.98	549.89	402.99	555.69	403.23	560.06	403.9
560.45	404.02	561.95	404.21	562.57	404.27	565.54	404.72	573.03	405.23
575.1	405.23	593.06	406.5						

MANNING'S N VALUES NUM= 3

STA	N VAL	STA	N VAL	STA	N VAL
0	.15	195.71	.054	432.93	.15

BANK STA: LEFT RIGHT COEFF CONTR. EXPAN.
167.04 394.2 .1 .3

UPSTREAM EMBANKMENT SIDE SLOPE = 19.6 HORIZ. TO 1.0 VERTICAL
DOWNSTREAM EMBANKMENT SIDE SLOPE = 0 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 BOX 6 6
FHWA CHART # 8 - FLARED WINGWALLS
FHWA SCALE # 1 - WINGWALL FLARED 30 TO 75 DEG.
SOLUTION CRITERIA = HIGHEST U.S. EG

CULVERT UPSTRM DIST	LENGTH	TOP N	BOTTOM N	DEPTH BLOCKED	ENTRANCE LOSS COEF	EXIT LOSS COEF
6.2	27	.03	.03	0	.024	1

NUMBER OF BARRELS = 2
UPSTREAM ELEVATION = 385.22
CENTERLINE STATIONS
STA. STA.
191.57 201
DOWNSTREAM ELEVATION = 384.51
CENTERLINE STATIONS
STA. STA.
207.8 216

CROSS SECTION

RIVER: DANIELS RUN
REACH: 1 RS: 22

INPUT
DESCRIPTION: EFFECTIVE CROSS SECTION 12636.72
STATION ELEVATION DATA NUM= 122

STA	ELEV	STA	ELEV	STA	ELEV	STA	ELEV	STA	ELEV
0	401.75	7.41	401.23	12.24	401.23	37.5	399.95	40.7	399.81
52.39	399.23	53.22	399.16	74.68	398.37	81.97	398.18	85.01	398.06
90.25	397.91	99.92	397.46	100.52	397.42	106.46	397.23	113.53	396.48
119.55	395.93	127.5	395.23	131.26	395.08	146.97	394.52	147.39	394.47
149.19	394.44	151.31	394.32	157	394.11	162.27	393.82	163.21	393.82
167.04	393.23	170.5	393.11	178.23	392.95	182.7	392.86	192.64	392.61
195.71	392.57	198.19	392.54	202.52	392.49	214.95	392	225.93	392.06
228.38	392.04	241.93	392.18	243.66	392.21	243.74	392.2	247.58	392.23
249.01	392.22	253.92	392.19	260.12	392.14	261.97	392.14	272.92	392.11
274.58	392.12	274.66	392.12	279.21	392.02	283.55	391.96	287.41	391.96
289.57	391.89	291.26	391.85	293.75	391.73	301.27	391.58	306.74	391.61
307.52	391.56	308.23	391.62	309.68	391.63	310.31	391.63	314.49	391.7
318.29	391.7	321.63	391.65	322.36	391.65	325.89	391.8	340.04	391.71
350.58	392.52	356.83	392.47	357.89	392.48	360.5	392.53	363.03	392.64
363.21	392.65	380.16	393.21	380.29	393.21	380.34	393.22	380.86	393.23
381.2	393.23	392.07	393.07	394.2	393.23	396.44	393.417	396.83	393.45
398.53	393.58	401.41	393.62	415.34	394.28	418.92	394.37	432.93	394.95
438.63	395.18	439.44	395.23	449.45	395.84	455.08	396.24	463.15	396.66
465.94	396.71	467.29	396.71	469.35	396.77	470.07	396.87	471.08	396.86
472.17	397.06	475.36	397.23	496.16	398.78	500.78	399.23	522.74	401.2
522.81	401.21	522.93	401.21	523.04	401.23	523.11	401.25	523.13	401.25
528.09	401.9	529.68	401.8	531.19	401.85	532.57	401.91	533.93	401.94
538.48	402	539.45	401.98	549.89	402.99	555.69	403.23	560.06	403.9
560.45	404.02	561.95	404.21	562.57	404.27	565.54	404.72	573.03	405.23
575.1	405.23	593.06	406.5						

MANNING'S N VALUES NUM= 3

STA	N VAL	STA	N VAL	STA	N VAL
0	.15	195.71	.054	432.93	.15

BANK STA: LEFT RIGHT LENGTHS: LEFT CHANNEL RIGHT COEFF CONTR. EXPAN.
167.04 394.2 157.4 171.77 172.46 .1 .3

CROSS SECTION

RIVER: DANIELS RUN
REACH: 1 RS: 21

INPUT
DESCRIPTION: EFFECTIVE CROSS SECTION 12464.95
STATION ELEVATION DATA NUM= 77

STA	ELEV	STA	ELEV	STA	ELEV	STA	ELEV	STA	ELEV
0	404.95	5.07	404.92	5.72	404.91	5.97	404.91	8.86	404.93
37.94	405.11	56.2	405.23	56.64	404.84	60.62	401.23	68.64	399.7
71.69	399.23	75.5	398.53	82.72	397.23	87.88	396.31	94.36	395.23
96.14	394.94	106.85	393.23	113.18	392.35	121.01	391.23	124.22	390.74
134.88	389.23	138.61	388.76	150.01	387.49	151.47	387.4	153.15	387.23
172.26	387.23	175.12	387.28	175.79	387.29	176.01	387.3	180.63	387.43
181.29	387.45	181.46	387.46	181.97	387.48	182.02	387.48	184.88	387.46
187.99	387.42	190.39	387.36	194.8	387.23	210.7	386.68	214.62	386.54
215.11	386.54	216.31	386.55	218.18	386.55	223.85	386.63	226.31	386.64
233.29	385.96	238.42	385.69	248.42	385.23	250.3	386.1	251.75	386.31
259.19	387.99	259.39	387.94	268.53	387.26	269.98	387.2	271.42	387.23
286.42	388.15	289.02	388.17	289.7	388.2	300.67	389.03	303.01	389.23
304.76	389.55	314.28	391.23	319.34	392.21	325.39	393.23	340.38	394.25
343.21	394.54	350.01	395.23	358.26	396.48	363.38	397.23	368.47	398.14
375.9	399.23	384.14	400.44	390.98	401.23	395.86	401.93	404.75	403.23
412.78	404.21	418.55	404.88						

MANNING'S N VALUES NUM= 3

STA	N VAL	STA	N VAL	STA	N VAL
0	.15	150.01	.054	289.02	.15

BANK STA: LEFT RIGHT LENGTHS: LEFT CHANNEL RIGHT COEFF CONTR. EXPAN.
150.01 289.02 108.63 153.82 133.47 .1 .3

CROSS SECTION

RIVER: DANIELS RUN
REACH: 1 RS: 20

INPUT
DESCRIPTION: EFFECTIVE CROSS SECTION 12311.14
STATION ELEVATION DATA NUM= 75

STA	ELEV	STA	ELEV	STA	ELEV	STA	ELEV	STA	ELEV
0	404.92	7.11	404.95	14.63	405	18.09	405	31.2	405.09
51.95	405.23	59.14	403.72	68.27	401.23	71.2	399.53	72.03	399.23
73.75	398.71	79.96	397.23	83.5	396.4	84.83	396.14	88.61	395.23
91.7	394.81	94.6	394.55	103.72	393.23	112.61	392.51	127.94	391.23
139.72	390.34	141.09	390.24	148.31	390.04	155.74	389.65	158.53	389.56
165.78	389.23	176.48	388.72	179.94	388.54	181.67	388.37	186.38	387.82
188.4	387.23	194.56	386.59	197.22	386.04	201.67	385.23	201.79	385.23
201.97	385.22	202.1	385.22	205.18	386.27	209.55	384.19	210.39	383.23
213.69	383.93	220.78	385.23	224.03	386.89	224.66	387.23	226.57	387.48
232.82	388.35	238.16	388.89	240.11	389.22	246.65	389.23	256.62	390.2
270.82	390.53	273.22	390.63	274.31	390.67	278.83	390.74	290.04	391.23
290.77	391.28	295.84	391.64	297.2	391.69	298.07	391.77	302.47	392.22
308.4	392.22	312.08	392.28	319.87	392.8	320.23	392.83	325.59	393.11
325.95	393.15	326.51	393.23	331.55	393.87	342.08	395.23	343.71	395.42
344.71	395.53	355.94	397.23	360.53	397.92	369.81	399.23	377.62	400.2

MANNING'S N VALUES NUM= 3

STA	N VAL	STA	N VAL	STA	N VAL
0	.15	186.38	.054	232.82	.15

BANK STA: LEFT RIGHT LENGTHS: LEFT CHANNEL RIGHT COEFF CONTR. EXPAN.
186.38 232.82 475.23 473.78 470.71 .1 .3

CULVERT

RIVER: DANIELS RUN
REACH: 1 RS: 19.5

INPUT
DESCRIPTION: ROUTE 236
DISTANCE FROM UPSTREAM XS = 25
DECK/ROADWAY WIDTH = 420
WEIR COEFFICIENT = 2.9
UPSTREAM DECK/ROADWAY COORDINATES
NUM= 53

STA	HI CORD	LO CORD	STA	HI CORD	LO CORD	STA	HI CORD	LO CORD
0	407.65	375.71	8.33	407.32	375.71	9	407.28	375.71
28.14	406.48	375.71	28.77	406.47	375.71	33.92	406.2	375.71
42.71	405.84	375.71	45.71	405.72	375.71	53.2	405.45	375.71
62.08	405.08	375.71	65.12	404.96	375.71	72.49	404.7	375.71
81.47	404.32	375.71	83.7	404.23	375.71	84.56	404.19	375.71
91.76	403.94	375.71	100.79	403.85	375.71	108.67	403.57	375.71
117.25	403.48	375.71	126.85	403.4	375.71	157.7	402.15	375.71
160.47	402.11	375.71	162.48	402.09	375.71	163.25	402.08	375.71
188.42	402.16	375.71	195.81	402.13	375.71	196.99	402.24	375.71
199.95	402.27	375.71	213.89	402.4	375.71	215.66	402.41	375.71
233.69	402.59	375.71	234.94	402.61	375.71	253.35	402.79	375.71
254.28	402.8	375.71	255.21	402.81	375.71	273.67	402.98	375.71
274.25	402.99	375.71	290.46	403.49	375.71	291.28	403.5	375.71
297.43	403.69	375.71	307.29	403.98	375.71	322.89	404.47	375.71
324.07	404.52	375.71	339.48	404.98	375.71	340.87	405.04	375.71
356.08	405.52	375.71	357.67	405.58	375.71	373.73	406.27	375.71
374.67	406.31	375.71	391.45	407.03	375.71	391.65	407.03	375.71
402.52	407.68	375.71	406.32	407.82	375.71			

UPSTREAM BRIDGE CROSS SECTION DATA
STATION ELEVATION DATA NUM= 75

STA	ELEV	STA	ELEV	STA	ELEV	STA	ELEV	STA	ELEV
0	404.92	7.11	404.95	14.63	405	18.09	405	31.2	405.09
51.95	405.23	59.14	403.72	68.27	401.23	71.2	399.53	72.03	399.23
73.75	398.71	79.96	397.23	83.5	396.4	84.83	396.14	88.61	395.23
91.7	394.81	94.6	394.55	103.72	393.23	112.61	392.51	127.94	391.23
139.72	390.34	141.09	390.24	148.31	390.04	155.74	389.65	158.53	389.56
165.78	389.23	176.48	388.72	179.94	388.54	181.67	388.37	186.38	387.82
188.4	387.23	194.56	386.59	197.22	386.04	201.67	385.23	201.79	385.23
201.97	385.22	202.1	385.22	205.18	386.27	209.55	384.19	210.39	383.23
213.69	383.93	220.78	385.23	224.03	386.89	224.66	387.23	226.57	387.48
232.82	388.35	238.16	388.89	240.11	389.22	246.65	389.23	256.62	390.2
270.82	390.53	273.22	390.63	274.31	390.67	278.83	390.74	290.04	391.23
290.77	391.28	295.84	391.64	297.2	391.69	298.07	391.77	302.47	392.22
308.4	392.22	312.08	392.28	319.87	392.8	320.23	392.83	325.59	393.11
325.95	393.15	326.51	393.23	331.55	393.87	342.08	395.23	343.71	395.42
344.71	395.53	355.94	397.23	360.53	397.92	369.81	399.23	377.62	400.2

MANNING'S N VALUES NUM= 3

STA	N VAL	STA	N VAL	STA	N VAL
0	.15	186.38	.054	232.82	.15

BANK STA: LEFT RIGHT COEFF CONTR. EXPAN.
186.38 232.82 .1 .3

DOWNSTREAM DECK/ROADWAY COORDINATES
NUM= 9

STA	HI CORD	LO CORD	STA	HI CORD	LO CORD	STA	HI CORD	LO CORD
0	403.23	375.71	26.7	402.15	375.71	29.47	402.11	375.71
31.48	402.09	375.71	32.25	402.08	375.71	57.42	402.16	375.71
64.81	402.13	375.71	65.99	402.24	375.71	68.94	402.27	375.71

DOWNSTREAM BRIDGE CROSS SECTION DATA
STATION ELEVATION DATA NUM= 14

STA	ELEV	STA	ELEV	STA	ELEV	STA	ELEV	STA	ELEV
0	384.72	22.51	381.82	26.79	379.86	28.62	379	31.5	379.17
33.74	378.38	37.27	376.66	41.78	376.18	48.29	376.68	51.96	377.16
54.8	379.66	56.49	380.08	62.8	384.97	68.94	387.82		

MANNING'S N VALUES NUM= 3

STA	N VAL	STA	N VAL	STA	N VAL
0	.12	33.74	.072	54.8	.12

BANK STA: LEFT RIGHT COEFF CONTR. EXPAN.
33.74 54.8 .3 .5
INEFFECTIVE FLOW NUM= 2

STA L	STA R	ELEV	PERMANENT
0	33	386	F
53	68.94	386	F

UPSTREAM EMBANKMENT SIDE SLOPE = 2 HORIZ. TO 1.0 VERTICAL
DOWNSTREAM EMBANKMENT SIDE SLOPE = 2 HORIZ. TO 1.0 VERTICAL
MAXIMUM ALLOWABLE SUBMERGENCE FOR WEIR FLOW = .95
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

J2 Engineers, Inc.
4080 Lafayette Center Drive
Suite 330
Chantilly, Va. 20151

703.361.1550 (office)
703.956.6845 (fax)
www.j2engineers.com

COMMONWEALTH OF VIRGINIA
ROBERT W. BROWN
Lic. No. 037041
01/31/20
PROFESSIONAL ENGINEER

PLAN# MH1901
DATE: JULY 12, 2019
CONTOUR INT. = 2'
SCALE: AS NOTED

PLAN DATE
07/31/19
12/13/19
01/31/20

CORRECTED EFFECTIVE HEC-RAS
FLOODPLAIN STUDY
MATHY PARK
DANIELS RUN
CITY OF FAIRFAX, VIRGINIA

REVISIONS
No. DATE DESCRIPTION

SHEET
10
OF
17

CULVERT NAME SHAPE RISE SPAN
RT 236 BOX 5 5
FHWA CHART # 9 - FLARED WINGWALLS AND INLET TOP EDGE BEVEL
FHWA SCALE # 2 - WINGWALL FLARED 18 TO 33.7 DEG.; INLET TOP EDGE BEVEL=0.083D
SOLUTION CRITERIA = HIGHEST U.S. EG
CULVERT UPSTRM DIST LENGTH TOP N BOTTOM N DEPTH BLOCKED ENTRANCE LOSS COEF EXIT LOSS COEF
5 460 .015 .015 0 .4 1
NUMBER OF BARRELS = 2
UPSTREAM ELEVATION = 385.05
CENTERLINE STATIONS
STA. STA.
165.4 171
DOWNSTREAM ELEVATION = 377.87
CENTERLINE STATIONS
STA. STA.
40 45.5

CROSS SECTION

RIVER: DANIELS RUN
REACH: 1 RS: 19

INPUT
DESCRIPTION: JUST DOWNSTREAM OF ROUTE 236
STATION ELEVATION DATA NUM= 14
STA ELEV STA ELEV STA ELEV STA ELEV STA ELEV
0 384.72 22.51 381.82 26.79 379.86 28.62 379 31.5 379.17
33.74 378.38 37.27 376.66 41.78 376.18 48.29 376.68 51.96 377.16
54.8 379.66 56.49 380.08 62.8 384.97 68.94 387.82

MANNING'S N VALUES NUM= 3
STA N VAL STA N VAL STA N VAL
0 .12 33.74 .072 54.8 .12

BANK STA: LEFT RIGHT LENGTHS: LEFT CHANNEL RIGHT COEFF CONTR. EXPAN.
33.74 54.8 247 247 247 .3 .5
INEFFECTIVE FLOW NUM= 2
STA L STA R ELEV PERMANENT
0 33 386 F
53 68.94 386 F

CROSS SECTION

RIVER: DANIELS RUN
REACH: 1 RS: 18

INPUT
DESCRIPTION:
STATION ELEVATION DATA NUM= 12
STA ELEV STA ELEV STA ELEV STA ELEV STA ELEV
0 382.71 9.17 382.46 16.62 380.29 48.15 379.62 76.04 379.5
96.68 379.55 110.86 378.06 117.31 374.6 123.07 373.72 125 374.83
127.99 376.82 141.03 383.74

MANNING'S N VALUES NUM= 4
STA N VAL STA N VAL STA N VAL STA N VAL
0 .013 9.17 .12 110.86 .072 127.99 .12

BANK STA: LEFT RIGHT LENGTHS: LEFT CHANNEL RIGHT COEFF CONTR. EXPAN.
110.86 127.99 120 120 120 .1 .3

CROSS SECTION

RIVER: DANIELS RUN
REACH: 1 RS: 17

INPUT
DESCRIPTION:
STATION ELEVATION DATA NUM= 13
STA ELEV STA ELEV STA ELEV STA ELEV STA ELEV
0 380.75 50 379.14 81.2 378.57 87.49 378.13 103.63 376.28
111.02 376 112.84 373.73 117.32 371.98 121.87 373.68 125.67 376.4
128.07 376.66 139.42 383.3 143.74 384.18

MANNING'S N VALUES NUM= 3
STA N VAL STA N VAL STA N VAL
0 .12 111.02 .072 125.67 .12

BANK STA: LEFT RIGHT LENGTHS: LEFT CHANNEL RIGHT COEFF CONTR. EXPAN.
111.02 125.67 89 89 89 .1 .3

CROSS SECTION

RIVER: DANIELS RUN
REACH: 1 RS: 16

INPUT
DESCRIPTION:
STATION ELEVATION DATA NUM= 16
STA ELEV STA ELEV STA ELEV STA ELEV STA ELEV
0 380.75 11.4 379.19 21.5 378.59 28.74 378.42 99.11 377.87
111.59 377.83 117.68 377.2 120.46 376.79 125.71 375.11 131.82 373.06
134.97 371.95 137 372.41 139.61 374.65 150.81 377.34 163.98 379.85
171.24 380.48

MANNING'S N VALUES NUM= 4
STA N VAL STA N VAL STA N VAL STA N VAL
0 .03 28.74 .12 125.71 .072 139.61 .12

BANK STA: LEFT RIGHT LENGTHS: LEFT CHANNEL RIGHT COEFF CONTR. EXPAN.
125.71 139.61 96 96 96 .1 .3

CROSS SECTION

RIVER: DANIELS RUN
REACH: 1 RS: 15

INPUT
DESCRIPTION:
STATION ELEVATION DATA NUM= 17
STA ELEV STA ELEV STA ELEV STA ELEV STA ELEV
0 380.47 10.01 378.99 28.58 377.91 31.66 377.87 40.68 377.84
64.14 377.19 93.56 377.14 111.95 376.93 124.36 375.64 130.42 374.28
134.43 372.72 137.74 372.5 139.37 373.02 143.64 374.74 155.33 377.03
174.29 378.67 182.63 379.42

MANNING'S N VALUES NUM= 4
STA N VAL STA N VAL STA N VAL STA N VAL
0 .03 40.68 .12 130.42 .072 143.64 .12

BANK STA: LEFT RIGHT LENGTHS: LEFT CHANNEL RIGHT COEFF CONTR. EXPAN.
130.42 143.64 246 246 246 .1 .3

CROSS SECTION

RIVER: DANIELS RUN
REACH: 1 RS: 14

INPUT
DESCRIPTION:
STATION ELEVATION DATA NUM= 18
STA ELEV STA ELEV STA ELEV STA ELEV STA ELEV
0 380.78 28.7 376.98 52.78 376.44 75.01 376.6 98.31 375.77
110.29 374.73 119.25 373.02 120.07 371.01 126.02 368.49 131.16 371.17
134.37 373.28 142 375.05 153.22 375.09 158.47 375.48 189.04 375.7
219.99 375.75 250.86 376.26 287.27 379.79

MANNING'S N VALUES NUM= 4
STA N VAL STA N VAL STA N VAL STA N VAL
0 .03 75.01 .12 119.25 .072 134.37 .12

BANK STA: LEFT RIGHT LENGTHS: LEFT CHANNEL RIGHT COEFF CONTR. EXPAN.
119.25 134.37 16 50 74 .1 .3

CROSS SECTION

RIVER: DANIELS RUN
REACH: 1 RS: 13.3

INPUT
DESCRIPTION:
STATION ELEVATION DATA NUM= 21
STA ELEV STA ELEV STA ELEV STA ELEV STA ELEV
0 381.39 39.33 376.4 47.64 376.51 63.54 376.43 100.46 375.83
102.57 375.7 109.32 372.97 111.01 371.56 115.17 370.75 121.39 368.75
188.42 368.75 196.04 370.75 199 371.41 203.25 372.23 208.75 374.29
213 375.07 213.53 375.17 231.93 375.88 245.41 376 250.51 376.28
283.11 381.25

MANNING'S N VALUES NUM= 5
STA N VAL STA N VAL STA N VAL STA N VAL STA N VAL
0 .03 63.54 .12 109.32 .06 203.25 .12 231.93 .03

BANK STA: LEFT RIGHT LENGTHS: LEFT CHANNEL RIGHT COEFF CONTR. EXPAN.
109.32 203.25 15 15 15 .3 .5

CROSS SECTION

RIVER: DANIELS RUN
REACH: 1 RS: 13.2

INPUT
DESCRIPTION:
STATION ELEVATION DATA NUM= 23
STA ELEV STA ELEV STA ELEV STA ELEV STA ELEV
0 379.35 21.69 377.05 36.38 376.4 44.71 376.45 63.91 376.42
[illegible]
108.4 371.51 110.47 370.75 116.97 368.75 164.53 368.75 172.36 370.75
178 371.37 185.99 372.26 195.16 374.59 200.41 374.91 206.44 374.92
218.88 375.18 248.48 376.35 269.62 382.16

MANNING'S N VALUES NUM= 5
STA N VAL STA N VAL STA N VAL STA N VAL STA N VAL
0 .03 44.71 .12 107.05 .06 185.99 .12 218.88 .03

BANK STA: LEFT RIGHT LENGTHS: LEFT CHANNEL RIGHT COEFF CONTR. EXPAN.
107.05 185.99 26 26 26 .3 .5

INLINE STRUCTURE

RIVER: DANIELS RUN
REACH: 1 RS: 13.1

INPUT
DESCRIPTION:
DISTANCE FROM UPSTREAM XS = 22
DECK/ROADWAY WIDTH = 1
WEIR COEFFICIENT = 2.6
WEIR EMBANKMENT COORDINATES NUM = 16
STA ELEV STA ELEV STA ELEV STA ELEV STA ELEV
98.08 373 114.01 373 127.01 373 127.02 371.5 134.34 371.5
134.35 373 136.36 373 136.37 371.5 143.7 371.5 143.71 373
145.71 373 145.72 371.5 153.05 371.5 153.06 373 174.04 373
195.16 373

UPSTREAM EMBANKMENT SIDE SLOPE = 0 HORIZ. TO 1.0 VERTICAL
DOWNSTREAM EMBANKMENT SIDE SLOPE = 0 HORIZ. TO 1.0 VERTICAL
MAXIMUM ALLOWABLE SUBMERGENCE FOR WEIR FLOW = .95
ELEVATION AT WHICH WEIR FLOW BEGINS =
WEIR CREST SHAPE = BROAD CRESTED

CROSS SECTION

RIVER: DANIELS RUN
REACH: 1 RS: 13

INPUT
DESCRIPTION:
STATION ELEVATION DATA NUM= 24
STA ELEV STA ELEV STA ELEV STA ELEV STA ELEV
0 380.48 22.64 376.62 41.26 375.96 51.44 376.13 61.72 376.13
69.53 376.27 72.97 375.3 84.2 375.13 91.64 374.03 95.48 372.24
99.97 369.62 107.36 368.37 117.77 368.79 129.2 369.28 131.35 370.74
135.03 371.95 146.75 373.76 161.81 374.4 179.65 374.68 182.3 375.01
191.46 374.81 220.19 375.44 239.45 375.93 260.31 382.18

MANNING'S N VALUES NUM= 5
STA N VAL STA N VAL STA N VAL STA N VAL STA N VAL
0 .03 51.44 .12 95.48 .06 135.03 .12 182.3 .03

BANK STA: LEFT RIGHT LENGTHS: LEFT CHANNEL RIGHT COEFF CONTR. EXPAN.
95.48 135.03 56 48 18 .3 .5

CROSS SECTION

RIVER: DANIELS RUN
REACH: 1 RS: 12.7

INPUT
DESCRIPTION:
STATION ELEVATION DATA NUM= 20
STA ELEV STA ELEV STA ELEV STA ELEV STA ELEV
0 380.22 20.77 376.65 43.44 375.89 52.47 375.82 56.46 375.25
66.08 373.67 70 369.86 74.48 368.13 80.32 369.44 81.74 370.92
91.15 372.89 105.35 374.32 112.63 374.43 139.52 374.31 147.44 375.1
155.41 375.08 160.23 374.71 181.56 375.47 206.77 376.23 228.37 382.38

MANNING'S N VALUES NUM= 5
STA N VAL STA N VAL STA N VAL STA N VAL STA N VAL
0 .03 52.47 .12 66.08 .06 91.15 .12 147.44 .03

BANK STA: LEFT RIGHT LENGTHS: LEFT CHANNEL RIGHT COEFF CONTR. EXPAN.
66.08 105.35 48 48 48 .3 .5

CROSS SECTION

RIVER: DANIELS RUN
REACH: 1 RS: 12.5

INPUT
DESCRIPTION:
STATION ELEVATION DATA NUM= 19
STA ELEV STA ELEV STA ELEV STA ELEV STA ELEV
0 380 21 376.43 58.84 375.36 68.14 375.26 77.54 374.75
110.94 372.75 116.83 370.75 119 367.9 127 367.9 128.92 370.75
132.76 372.75 135.06 373.45 143.95 374.31 151.87 375.1 159.84 375.08
164.66 374.71 185.99 375.47 211.2 376.23 232.8 382.38

MANNING'S N VALUES NUM= 5
STA N VAL STA N VAL STA N VAL STA N VAL STA N VAL
0 .03 68.14 .12 116.83 .06 128.92 .12 151.87 .03

BANK STA: LEFT RIGHT LENGTHS: LEFT CHANNEL RIGHT COEFF CONTR. EXPAN.
116.83 128.92 20 20 20 .3 .5

BRIDGE

RIVER: DANIELS RUN
REACH: 1 RS: 12.45

INPUT
DESCRIPTION: FOOTBRIDGE
DISTANCE FROM UPSTREAM XS = 5.5
DECK/ROADWAY WIDTH = 8.3
WEIR COEFFICIENT = 2.6
UPSTREAM DECK/ROADWAY COORDINATES
NUM= 6
STA HI CORD LO CORD STA HI CORD LO CORD STA HI CORD LO CORD
0 374.75 95.24 374.75 95.25 378.25 373.25
150.75 378.35 373.35 150.76 374.85 200 374.85

UPSTREAM BRIDGE CROSS SECTION DATA
STATION ELEVATION DATA NUM= 19
STA ELEV STA ELEV STA ELEV STA ELEV STA ELEV
0 380 21 376.43 58.84 375.36 68.14 375.26 77.54 374.75
110.94 372.75 116.83 370.75 119 367.9 127 367.9 128.92 370.75
132.76 372.75 135.06 373.45 143.95 374.31 151.87 375.1 159.84 375.08
164.66 374.71 185.99 375.47 211.2 376.23 232.8 382.38

MANNING'S N VALUES NUM= 5
STA N VAL STA N VAL STA N VAL STA N VAL STA N VAL
0 .03 68.14 .12 116.83 .06 128.92 .12 151.87 .03

BANK STA: LEFT RIGHT COEFF CONTR. EXPAN.
116.83 128.92 .3 .5

DOWNSTREAM DECK/ROADWAY COORDINATES
NUM= 6
STA HI CORD LO CORD STA HI CORD LO CORD STA HI CORD LO CORD
0 374.6 122.24 374.6 122.25 378.1 373.1
177.75 378.21 373.21 177.76 374.71 200 374.71

DOWNSTREAM BRIDGE CROSS SECTION DATA
STATION ELEVATION DATA NUM= 17
STA ELEV STA ELEV STA ELEV STA ELEV STA ELEV
0 379.85 20 376.28 66.89 375.13 76.5 375.03 92.64 374.69
101.86 374.6 141.94 372.75 146.03 370.75 147 367.81 153 367.81
153.98 370.75 157.24 372.75 163.04 374.15 167.86 374.71 189.19 375.47
214.4 376.23 236 382.38

MANNING'S N VALUES NUM= 5
STA N VAL STA N VAL STA N VAL STA N VAL STA N VAL
0 .03 101.86 .12 146.03 .06 153.98 .12 167.86 .03

BANK STA: LEFT RIGHT COEFF CONTR. EXPAN.
146.03 153.98 .3 .5

UPSTREAM EMBANKMENT SIDE SLOPE = 0 HORIZ. TO 1.0 VERTICAL
DOWNSTREAM EMBANKMENT SIDE SLOPE = 0 HORIZ. TO 1.0 VERTICAL
MAXIMUM ALLOWABLE SUBMERGENCE FOR WEIR FLOW = .95
ELEVATION AT WHICH WEIR FLOW BEGINS =
ENERGY HEAD USED IN SPILLWAY DESIGN =
SPILLWAY HEIGHT USED IN DESIGN =
WEIR CREST SHAPE = BROAD CRESTED

NUMBER OF BRIDGE COEFFICIENT SETS = 1

LOW FLOW METHODS AND DATA
ENERGY
SELECTED LOW FLOW METHODS = HIGHEST ENERGY ANSWER

HIGH FLOW METHOD
ENERGY ONLY

ADDITIONAL BRIDGE PARAMETERS
ADD FRICTION COMPONENT TO MOMENTUM
DO NOT ADD WEIGHT COMPONENT TO MOMENTUM
CLASS B FLOW CRITICAL DEPTH COMPUTATIONS USE CRITICAL DEPTH
INSIDE THE BRIDGE AT THE UPSTREAM END
CRITERIA TO CHECK FOR PRESSURE FLOW = UPSTREAM ENERGY GRADE LINE

CROSS SECTION

RIVER: DANIELS RUN
REACH: 1 RS: 12.4

INPUT
DESCRIPTION:
STATION ELEVATION DATA NUM= 17
STA ELEV STA ELEV STA ELEV STA ELEV STA ELEV
0 379.85 20 376.28 66.89 375.13 76.5 375.03 92.64 374.69
101.86 374.6 141.94 372.75 146.03 370.75 147 367.81 153 367.81
153.98 370.75 157.24 372.75 163.04 374.15 167.86 374.71 189.19 375.47
214.4 376.23 236 382.38

MANNING'S N VALUES NUM= 5
STA N VAL STA N VAL STA N VAL STA N VAL STA N VAL
0 .03 101.86 .12 146.03 .06 153.98 .12 167.86 .03

BANK STA: LEFT RIGHT LENGTHS: LEFT CHANNEL RIGHT COEFF CONTR. EXPAN.
146.03 153.98 135 135 135 .3 .5

CROSS SECTION

RIVER: DANIELS RUN
REACH: 1 RS: 12

INPUT
DESCRIPTION:
STATION ELEVATION DATA NUM= 17
STA ELEV STA ELEV STA ELEV STA ELEV STA ELEV
0 379.29 16.08 374.76 23.05 374.49 27.62 373.77 34.52 374.22
43.01 374.06 56.81 373.34 65.24 371.45 69.7 368.3 78.45 367.16
88.42 368.33 95.64 371.36 110.73 372.25 122.67 373.75 145.71 374.43
174.78 375.58 186.62 378.45

MANNING'S N VALUES NUM= 5
STA N VAL STA N VAL STA N VAL STA N VAL STA N VAL
0 .03 43.01 .12 69.7 .06 88.42 .12 174.78 .03

BANK STA: LEFT RIGHT LENGTHS: LEFT CHANNEL RIGHT COEFF CONTR. EXPAN.
65.24 95.64 158 158 158 .1 .3

CROSS SECTION

RIVER: DANIELS RUN
REACH: 1 RS: 11

INPUT
DESCRIPTION:
STATION ELEVATION DATA NUM= 16
STA ELEV STA ELEV STA ELEV STA ELEV STA ELEV
0 377.78 7.49 375.08 13.68 373.61 15.86 373.4 24 373.11
33.81 372.26 47.18 369.29 51.11 366.94 57.33 365.23 63.2 369.61
69.86 372.21 96.04 373.27 125.33 374.89 147.07 373.52 166.53 375.12
178.84 377.96

MANNING'S N VALUES NUM= 5
STA N VAL STA N VAL STA N VAL STA N VAL STA N VAL
0 .03 24 .12 47.18 .06 63.2 .12 166.53 .03

BANK STA: LEFT RIGHT LENGTHS: LEFT CHANNEL RIGHT COEFF CONTR. EXPAN.
47.18 63.2 153 153 153 .1 .3

CROSS SECTION

RIVER: DANIELS RUN
REACH: 1 RS: 10

INPUT
DESCRIPTION:
STATION ELEVATION DATA NUM= 14
STA ELEV STA ELEV STA ELEV STA ELEV STA ELEV
0 376.04 27.85 374.2 39.74 373.88 42.94 373.48 57.9 369.4
67.94 367.52 73.11 365.11 77.31 364.82 82.98 365.24 85.58 367.78
96.31 370.5 116.77 370.87 161.2 372.33 200.89 375.05

MANNING'S N VALUES NUM= 5
STA N VAL STA N VAL STA N VAL STA N VAL STA N VAL
0 .12 27.85 .03 42.94 .12 67.94 .06 85.58 .12

BANK STA: LEFT RIGHT LENGTHS: LEFT CHANNEL RIGHT COEFF CONTR. EXPAN.
67.94 85.58 156 156 156 .1 .3

CROSS SECTION

RIVER: DANIELS RUN
REACH: 1 RS: 9

INPUT
DESCRIPTION:

J2 Engineers, Inc.
4080 Lafayette Center Drive
Suite 330
Chantilly, Va. 20151

703.361.1550 (office)
703.956.6845 (fax)
www.j2engineers.com

COMMONWEALTH OF VIRGINIA
ROBERT W. BROWN
Lic. No. 037041
01/31/20
PROFESSIONAL ENGINEER

PLAN# MH11901
DATE: JULY 12, 2019
CONTOUR INT.= 2'
SCALE: AS NOTED

PLAN DATE
07/31/19
12/13/19
01/31/20

CORRECTED EFFECTIVE HEC-RAS
FLOODPLAIN STUDY
MATHY PARK
DANIELS RUN
CITY OF FAIRFAX, VIRGINIA

No.	DATE	DESCRIPTION

REVISIONS

SHEET
11
OF
17

STATION ELEVATION DATA NUM= 17
STA ELEV STA ELEV STA ELEV STA ELEV STA ELEV
0 378.9 12.78 375.9 20.33 373.89 22.62 373.77 31.06 373.51
49.33 372.44 92.55 370.04 102.87 368.38 104.9 367.63 107.05 363.88
112.81 363.35 115.74 363.99 121.92 365.96 138.74 365.25 174.3 370.44
213.99 373.37 224.33 374.75

MANNING'S N VALUES NUM= 5
STA N VAL STA N VAL STA N VAL STA N VAL STA N VAL
0 .12 12.78 .03 49.33 .12 104.9 .06 121.92 .12

BANK STA: LEFT RIGHT LENGTHS: LEFT CHANNEL RIGHT COEFF CONTR. EXPAN.
104.9 121.92 156 156 156 .1 .3

CROSS SECTION

RIVER: DANIELS RUN
REACH: 1 RS: 8

INPUT
DESCRIPTION:
STATION ELEVATION DATA NUM= 15
STA ELEV STA ELEV STA ELEV STA ELEV STA ELEV
0 376.28 5.54 376.04 16.57 371.51 24.81 371.25 34.4 371
64.86 368.93 86.74 366.77 94.05 362.91 98.09 362.65 101.73 363.42
105.27 364.45 111.93 364.79 133.47 369.25 164.03 371.47 190.7 374.27

MANNING'S N VALUES NUM= 5
STA N VAL STA N VAL STA N VAL STA N VAL STA N VAL
0 .03 34.4 .12 86.74 .06 105.27 .12 164.03 .03

BANK STA: LEFT RIGHT LENGTHS: LEFT CHANNEL RIGHT COEFF CONTR. EXPAN.
86.74 105.27 122 122 122 .3 .5

CROSS SECTION

RIVER: DANIELS RUN
REACH: 1 RS: 7

INPUT
DESCRIPTION:
STATION ELEVATION DATA NUM= 18
STA ELEV STA ELEV STA ELEV STA ELEV STA ELEV
0 374.01 9.68 374.47 21.09 374.9 29.97 375.11 31.29 375.11
39.22 375.22 41.86 375.46 42.58 366.9 55.63 365.77 65.99 364.48
71.26 362.31 82.03 361.26 96.99 362.23 110.94 362.16 128.22 361.4
138.89 362.04 152.49 366.64 178.13 375.02

MANNING'S N VALUES NUM= 6
STA N VAL STA N VAL STA N VAL STA N VAL STA N VAL
0 .03 29.97 .013 39.22 .03 42.58 .08 71.26 .06
138.89 .08

BANK STA: LEFT RIGHT LENGTHS: LEFT CHANNEL RIGHT COEFF CONTR. EXPAN.
71.26 138.89 75 75 75 .3 .5
INEFFECTIVE FLOW NUM= 2
STA L STA R ELEV PERMANENT
0 57.78 374.01 F
151.91 178.13 381.48 F

CULVERT

RIVER: DANIELS RUN
REACH: 1 RS: 6.5

INPUT
DESCRIPTION: FARRCROFT DRIVE
DISTANCE FROM UPSTREAM XS = 9
DECK/ROADWAY WIDTH = 63
WEIR COEFFICIENT = 2.6
UPSTREAM DECK/ROADWAY COORDINATES
NUM= 4
STA HI CORD LO CORD STA HI CORD LO CORD STA HI CORD LO CORD
41.86 375.46 97 378.76 153 381.53
205 384.11

UPSTREAM BRIDGE CROSS SECTION DATA
STATION ELEVATION DATA NUM= 18
STA ELEV STA ELEV STA ELEV STA ELEV STA ELEV
0 374.01 9.68 374.47 21.09 374.9 29.97 375.11 31.29 375.11
39.22 375.22 41.86 375.46 42.58 366.9 55.63 365.77 65.99 364.48
71.26 362.31 82.03 361.26 96.99 362.23 110.94 362.16 128.22 361.4
138.89 362.04 152.49 366.64 178.13 375.02

MANNING'S N VALUES NUM= 6
STA N VAL STA N VAL STA N VAL STA N VAL STA N VAL
0 .03 29.97 .013 39.22 .03 42.58 .08 71.26 .06
138.89 .08

BANK STA: LEFT RIGHT COEFF CONTR. EXPAN.
71.26 138.89 .3 .5
INEFFECTIVE FLOW NUM= 2
STA L STA R ELEV PERMANENT
0 57.78 374.01 F
151.91 178.13 381.48 F

DOWNSTREAM DECK/ROADWAY COORDINATES
NUM= 4
STA HI CORD LO CORD STA HI CORD LO CORD STA HI CORD LO CORD
44.26 375.18 103 378.08 164 381.14
230 384.49

DOWNSTREAM BRIDGE CROSS SECTION DATA
STATION ELEVATION DATA NUM= 15
STA ELEV STA ELEV STA ELEV STA ELEV STA ELEV
0 373.35 15.55 374.16 31.73 374.51 39.25 374.84 44.26 375.18
44.49 364.06 52.51 363.43 64.66 362.12 67.16 361.15 124.12 361.15
158.71 362.36 180.24 363.17 196.75 365.21 198.19 373.17 209.65 376.35

MANNING'S N VALUES NUM= 9
STA N VAL STA N VAL STA N VAL STA N VAL STA N VAL
0 .03 31.73 .013 39.25 .03 44.26 .013 44.49 .03
64.66 .06 158.71 .03 196.75 .013 198.19 .03

BANK STA: LEFT RIGHT COEFF CONTR. EXPAN.
44.49 196.75 .3 .5
INEFFECTIVE FLOW NUM= 2
STA L STA R ELEV PERMANENT
0 67.53 373.35 F
147.66 209.65 380.32 F

UPSTREAM EMBANKMENT SIDE SLOPE = 0 HORIZ. TO 1.0 VERTICAL
DOWNSTREAM EMBANKMENT SIDE SLOPE = 0 HORIZ. TO 1.0 VERTICAL
MAXIMUM ALLOWABLE SUBMERGENCE FOR WEIR FLOW = .95
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 = 3

CULVERT NAME SHAPE RISE SPAN
CULVERT #1 CONSPAN ARCH 11 24
FHWA CHART # 60- SPAN/RISE RATIO APPROXIMATE 2:1
FHWA SCALE # 1 - 0 DEGREE WING WALL ANGLE
SOLUTION CRITERIA = HIGHEST U.S. EG
CULVERT UPSTRM DIST LENGTH TOP N BOTTOM N DEPTH BLOCKED ENTRANCE LOSS COEF EXIT LOSS COEF
9 63 .013 .035 0 .5 1
UPSTREAM ELEVATION = 361.17
CENTERLINE STATION = 78.78
DOWNSTREAM ELEVATION = 361.15
CENTERLINE STATION = 81.03

CULVERT NAME SHAPE RISE SPAN
CULVERT #2 CONSPAN ARCH 11 24
FHWA CHART # 60- SPAN/RISE RATIO APPROXIMATE 2:1
FHWA SCALE # 1 - 0 DEGREE WING WALL ANGLE
SOLUTION CRITERIA = HIGHEST U.S. EG
CULVERT UPSTRM DIST LENGTH TOP N BOTTOM N DEPTH BLOCKED ENTRANCE LOSS COEF EXIT LOSS COEF
9 63 .013 .035 0 .5 1
UPSTREAM ELEVATION = 361.19
CENTERLINE STATION = 105.3
DOWNSTREAM ELEVATION = 361.17
CENTERLINE STATION = 107.55

CULVERT NAME SHAPE RISE SPAN
CULVERT #3 CONSPAN ARCH 11 24
FHWA CHART # 60- SPAN/RISE RATIO APPROXIMATE 2:1
FHWA SCALE # 1 - 0 DEGREE WING WALL ANGLE
SOLUTION CRITERIA = HIGHEST U.S. EG
CULVERT UPSTRM DIST LENGTH TOP N BOTTOM N DEPTH BLOCKED ENTRANCE LOSS COEF EXIT LOSS COEF
9 63 .013 .035 0 .5 1
UPSTREAM ELEVATION = 361.25
CENTERLINE STATION = 131.91
DOWNSTREAM ELEVATION = 361.16
CENTERLINE STATION = 134.16

CROSS SECTION

RIVER: DANIELS RUN
REACH: 1 RS: 6

INPUT
DESCRIPTION:
STATION ELEVATION DATA NUM= 15
STA ELEV STA ELEV STA ELEV STA ELEV STA ELEV
0 373.35 15.55 374.16 31.73 374.51 39.25 374.84 44.26 375.18
44.49 364.06 52.51 363.43 64.66 362.12 67.16 361.15 124.12 361.15
158.71 362.36 180.24 363.17 196.75 365.21 198.19 373.17 209.65 376.35

MANNING'S N VALUES NUM= 9
STA N VAL STA N VAL STA N VAL STA N VAL STA N VAL
0 .03 31.73 .013 39.25 .03 44.26 .013 44.49 .03
64.66 .06 158.71 .03 196.75 .013 198.19 .03

BANK STA: LEFT RIGHT LENGTHS: LEFT CHANNEL RIGHT COEFF CONTR. EXPAN.
44.49 196.75 91 88 84 .3 .5
INEFFECTIVE FLOW NUM= 2
STA L STA R ELEV PERMANENT
0 67.53 373.35 F
147.66 209.65 380.32 F

CROSS SECTION

RIVER: DANIELS RUN
REACH: 1 RS: 5

INPUT
DESCRIPTION:
STATION ELEVATION DATA NUM= 18
STA ELEV STA ELEV STA ELEV STA ELEV STA ELEV
0 373.76 3.17 373.11 11.32 372.9 19.53 370.08 27.71 367.48
41.94 362.21 57.13 360.75 61.13 358.75 65.13 356.75 69.13 354.75
152.41 354.75 156.41 356.75 160.41 358.75 164.41 360.75 176.7 362.1
185.94 364.89 186.81 373.11 196.06 376

MANNING'S N VALUES NUM= 7
STA N VAL STA N VAL STA N VAL STA N VAL STA N VAL
0 .03 3.17 .013 11.32 .03 41.94 .06 176.7 .03
185.94 .013 186.81 .03

BANK STA: LEFT RIGHT LENGTHS: LEFT CHANNEL RIGHT COEFF CONTR. EXPAN.
41.94 176.7 162 138 110 .3 .5

CROSS SECTION

RIVER: DANIELS RUN
REACH: 1 RS: 4

INPUT
DESCRIPTION:
STATION ELEVATION DATA NUM= 16
STA ELEV STA ELEV STA ELEV STA ELEV STA ELEV
0 376.68 8.86 376.51 32.94 369.65 56.12 362.12 68.71 360.75
74.34 358.75 80.96 356.75 89.71 354.75 205.9 354.75 210.76 356.75
215.15 358.75 219.38 360.75 228.71 361.98 242.61 364.81 243.49 373.17
248.69 374.28

MANNING'S N VALUES NUM= 6
STA N VAL STA N VAL STA N VAL STA N VAL STA N VAL
0 .013 8.86 .03 56.12 .06 228.71 .03 242.61 .013
243.49 .03

BANK STA: LEFT RIGHT LENGTHS: LEFT CHANNEL RIGHT COEFF CONTR. EXPAN.
56.12 228.71 120 120 120 .3 .5

CULVERT

RIVER: DANIELS RUN
REACH: 1 RS: 3.5

INPUT
DESCRIPTION: FARRCROFT POND PRINCIPAL SPILLWAY
DISTANCE FROM UPSTREAM XS = 45
DECK/ROADWAY WIDTH = 50
WEIR COEFFICIENT = 2.6
UPSTREAM DECK/ROADWAY COORDINATES
NUM= 5
STA HI CORD LO CORD STA HI CORD LO CORD STA HI CORD LO CORD
8.86 376.51 56 373 220 373
230 374 250 376

UPSTREAM BRIDGE CROSS SECTION DATA
STATION ELEVATION DATA NUM= 16
STA ELEV STA ELEV STA ELEV STA ELEV STA ELEV
0 376.68 8.86 376.51 32.94 369.65 56.12 362.12 68.71 360.75
74.34 358.75 80.96 356.75 89.71 354.75 205.9 354.75 210.76 356.75
215.15 358.75 219.38 360.75 228.71 361.98 242.61 364.81 243.49 373.17
248.69 374.28

MANNING'S N VALUES NUM= 6
STA N VAL STA N VAL STA N VAL STA N VAL STA N VAL
0 .013 8.86 .03 56.12 .06 228.71 .03 242.61 .013
243.49 .03

BANK STA: LEFT RIGHT COEFF CONTR. EXPAN.
56.12 228.71 .3 .5

DOWNSTREAM DECK/ROADWAY COORDINATES
NUM= 3
STA HI CORD LO CORD STA HI CORD LO CORD STA HI CORD LO CORD
0 373 91 373 109.57 374

DOWNSTREAM BRIDGE CROSS SECTION DATA
STATION ELEVATION DATA NUM= 14
STA ELEV STA ELEV STA ELEV STA ELEV STA ELEV
0 368.75 3.77 366.47 14.35 357.56 18.63 357.08 24.06 357.09
34.52 356.25 52.71 357.25 59.13 360.76 62.26 363.91 65.22 364.57
82.29 372.57 86.41 372.68 94.22 372.72 109.57 372.93

MANNING'S N VALUES NUM= 6
STA N VAL STA N VAL STA N VAL STA N VAL STA N VAL
0 .15 14.35 .06 52.71 .08 82.29 .03 86.41 .013
94.22 .03

BANK STA: LEFT RIGHT COEFF CONTR. EXPAN.
14.35 52.71 .3 .5
INEFFECTIVE FLOW NUM= 2
STA L STA R ELEV PERMANENT
0 8.27 373 F
52.27 109.57 373 F

UPSTREAM EMBANKMENT SIDE SLOPE = 0 HORIZ. TO 1.0 VERTICAL
DOWNSTREAM EMBANKMENT SIDE SLOPE = 0 HORIZ. TO 1.0 VERTICAL
MAXIMUM ALLOWABLE SUBMERGENCE FOR WEIR FLOW = .95
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 BOX 8 9
FHWA CHART # 8 - FLARED WINGWALLS
FHWA SCALE # 1 - WINGWALL FLARED 30 TO 75 DEG.
SOLUTION CRITERIA = HIGHEST U.S. EG
CULVERT UPSTRM DIST LENGTH TOP N BOTTOM N DEPTH BLOCKED ENTRANCE LOSS COEF EXIT LOSS COEF
44 52 .013 .013 0 .4 1
NUMBER OF BARRELS = 2
UPSTREAM ELEVATION = 357.8
CENTERLINE STATIONS
STA. STA.
140 150
DOWNSTREAM ELEVATION = 357.5
CENTERLINE STATIONS
STA. STA.
21.5 31.5

CROSS SECTION

RIVER: DANIELS RUN
REACH: 1 RS: 3

INPUT
DESCRIPTION:
STATION ELEVATION DATA NUM= 14
STA ELEV STA ELEV STA ELEV STA ELEV STA ELEV
0 368.75 3.77 366.47 14.35 357.56 18.63 357.08 24.06 357.09
34.52 356.25 52.71 357.25 59.13 360.76 62.26 363.91 65.22 364.57
82.29 372.57 86.41 372.68 94.22 372.72 109.57 372.93

MANNING'S N VALUES NUM= 6
STA N VAL STA N VAL STA N VAL STA N VAL STA N VAL
0 .15 14.35 .06 52.71 .08 82.29 .03 86.41 .013
94.22 .03

BANK STA: LEFT RIGHT LENGTHS: LEFT CHANNEL RIGHT COEFF CONTR. EXPAN.
14.35 52.71 154 154 154 .3 .5
INEFFECTIVE FLOW NUM= 2
STA L STA R ELEV PERMANENT
0 8.27 373 F
52.27 109.57 373 F

CROSS SECTION

RIVER: DANIELS RUN
REACH: 1 RS: 2

INPUT
DESCRIPTION:
STATION ELEVATION DATA NUM= 17
STA ELEV STA ELEV STA ELEV STA ELEV STA ELEV
0 366.75 3.59 364.96 6.96 362.5 26.57 362.33 43.69 362.22
54.49 362.01 57.85 356.3 67.85 355.81 70.46 356.28 74.99 361.8
90.98 362.14 106.13 363.05 126.7 364.25 131.86 366.47 134.39 366.75
142.58 366.85 148.23 367.88

MANNING'S N VALUES NUM= 6
STA N VAL STA N VAL STA N VAL STA N VAL STA N VAL
0 .15 54.49 .06 74.99 .15 131.86 .03 134.39 .013
142.58 .03

BANK STA: LEFT RIGHT LENGTHS: LEFT CHANNEL RIGHT COEFF CONTR. EXPAN.
54.49 74.99 196 196 196 .1 .3

CROSS SECTION

RIVER: DANIELS RUN
REACH: 1 RS: 1

INPUT
DESCRIPTION:
STATION ELEVATION DATA NUM= 11
STA ELEV STA ELEV STA ELEV STA ELEV STA ELEV
0 364.08 43.37 361.49 72.19 359.98 77.28 354.36 83.86 353.25
90.79 354.26 95.29 358.63 100.45 360.01 149.81 360.65 186.56 362.65
194.77 363.26

MANNING'S N VALUES NUM= 4
STA N VAL STA N VAL STA N VAL STA N VAL
0 .03 43.37 .08 72.19 .06 100.45 .15

BANK STA: LEFT RIGHT LENGTHS: LEFT CHANNEL RIGHT COEFF CONTR. EXPAN.
72.19 100.45 256.85 260.24 259.46 .1 .3

CROSS SECTION

RIVER: DANIELS RUN
REACH: 1 RS: 0

INPUT
DESCRIPTION: EFFECTIVE CROSS SECTION 8879.358
STATION ELEVATION DATA NUM= 34
STA ELEV STA ELEV STA ELEV STA ELEV STA ELEV
0 374.08 25.98 373.55 78.53 362.65 84.23 361.53 98.6 361.24
156.95 360.02 199.54 358.96 212.03 358.71 228.24 358.06 258.96 356.86
260.88 356.79 262.99 356.7 269 356.554 269.97 356.53 270.73 352.75
278.77 353.16 282.55 353.23 283.26 354.41 283.45 356.64 291.79 357.07
292.76 357.1 314.07 358.01 356.64 359.792 385.49 361 390.06 361.12
404.38 361.17 435.29 361.35 448.48 361.78 459.01 362.98 469.11 365.25
475.94 367.31 481.81 368.96 495.08 371.9 506.78 373.65

MANNING'S N VALUES NUM= 6
STA N VAL STA N VAL STA N VAL STA N VAL STA N VAL
0 .03 258.96 .15 269.97 .06 283.45 .15 314.07 .03
390.06 .15

BANK STA: LEFT RIGHT LENGTHS: LEFT CHANNEL RIGHT COEFF CONTR. EXPAN.
269.97 283.45 0 0 0 .1 .3

SUMMARY OF MANNING'S N VALUES

RIVER:DANIELS RUN

REACH	RIVER STA.	N1	N2	N3	N4	N5	N6	N7	N8	N9
1	23	.15	.054	.15						
1	22.5	CULVERT								
1	22	.15	.054	.15						
1	21	.15	.054	.15						
1	20	.15	.054	.15						
1	19.5	CULVERT								
1	19	.12	.072	.12						
1	18	.013	.12	.072	.12					
1	17	.12	.072	.12						
1	16	.03	.12	.072	.12					
1	15	.03	.12	.072	.12					
1	14	.03	.12	.072	.12					
1	13.3	.03	.12	.06	.12	.03				
1	13.2	.03	.12	.06	.12	.03				
1	13.1	INL STRUCT								
1	13	.03	.12	.06	.12	.03				
1	12.7	.03	.12	.06	.12	.03				
1	12.5	.03	.12	.06	.12	.03				
1	12.45	BRIDGE								
1	12.4	.03	.12	.06	.12	.03				
1	12	.03	.12	.06	.12	.03				
1	11	.03	.12	.06	.12	.03				
1	10	.12	.03	.12	.06	.12				
1	9	.12	.03	.12	.06	.12				
1	8	.03	.12	.06	.12	.03				
1	7	.03	.013	.03	.08	.06	.08			
1	6.5	CULVERT								
1	6	.03	.013	.03	.013	.03	.06	.03	.013	.03
1	5	.03	.013	.03	.06	.03	.013	.03		

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COMMONWEALTH OF VIRGINIA
ROBERT W. BROWN
Lic. No. 037041
01/31/20
PROFESSIONAL ENGINEER

PLAN# MH1901
DATE: JULY 12, 2019
CONTOUR INT.= 2'
SCALE: AS NOTED

PLAN DATE
07/31/19
12/13/19
01/31/20

CORRECTED EFFECTIVE HEC-RAS
FLOODPLAIN STUDY
MATHY PARK
DANIELS RUN
CITY OF FAIRFAX, VIRGINIA

REVISIONS
No. DATE DESCRIPTION

J2 Engineers - X:\DRAWINGS\ACTIVE\Mathy Park - Madison Homes\Floodplain Study\MH1901 - HEC-RAS.dwg [CORRECTED EFFECTIVE-3] January 31, 2020 - 4:19pm awells

1	4	.013	.03	.06	.03	.013	.03	
1	3.5	CULVERT						
1	3	.15	.06	.08	.03	.013	.03	
1	2	.15	.06	.15	.03	.013	.03	
1	1	.03	.08	.06	.15			
1	0	.03	.15	.06	.15	.03	.15	

SUMMARY OF REACH LENGTHS

RIVER: DANIELS RUN

REACH	RIVER STA.	LEFT	CHANNEL	RIGHT
1	23	35.4	34.16	33.72
1	22.5	CULVERT		
1	22	157.4	171.77	172.46
1	21	108.63	153.82	133.47
1	20	475.23	473.78	470.71
1	19.5	CULVERT		
1	19	247	247	247
1	18	120	120	120
1	17	89	89	89
1	16	96	96	96
1	15	246	246	246
1	14	16	50	74
1	13.3	15	15	15
1	13.2	26	26	26
1	13.1	INL STRUCT		
1	13	56	48	18
1	12.7	48	48	48
1	12.5	20	20	20
1	12.45	BRIDGE		
1	12.4	135	135	135
1	12	158	158	158
1	11	153	153	153
1	10	156	156	156
1	9	156	156	156
1	8	122	122	122
1	7	75	75	75
1	6.5	CULVERT		
1	6	91	88	84
1	5	162	138	110
1	4	120	120	120
1	3.5	CULVERT		
1	3	154	154	154
1	2	196	196	196
1	1	256.85	260.24	259.46
1	0	0	0	0

SUMMARY OF CONTRACTION AND EXPANSION COEFFICIENTS

RIVER: DANIELS RUN

REACH	RIVER STA.	CONTR.	EXPAN.
1	23	.1	.3
1	22.5	CULVERT	
1	22	.1	.3
1	21	.1	.3
1	20	.1	.3
1	19.5	CULVERT	
1	19	.3	.5
1	18	.1	.3
1	17	.1	.3
1	16	.1	.3
1	15	.1	.3
1	14	.1	.3
1	13.3	.3	.5
1	13.2	.3	.5
1	13.1	INL STRUCT	
1	13	.3	.5
1	12.7	.3	.5
1	12.5	.3	.5
1	12.45	BRIDGE	
1	12.4	.3	.5
1	12	.1	.3
1	11	.1	.3
1	10	.1	.3
1	9	.1	.3
1	8	.3	.5
1	7	.3	.5
1	6.5	CULVERT	
1	6	.3	.5
1	5	.3	.5
1	4	.3	.5
1	3.5	CULVERT	
1	3	.3	.5
1	2	.1	.3
1	1	.1	.3
1	0	.1	.3

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COMMONWEALTH OF VIRGINIA
ROBERT W. BROWN
Lic. No. 037041
01/31/20
PROFESSIONAL ENGINEER

PLAN# MH11901
DATE: JULY 12, 2019
CONTOUR INT.= 2'
SCALE: AS NOTED

PLAN DATE
07/31/19
12/13/19
01/31/20

CORRECTED EFFECTIVE HEC-RAS
FLOODPLAIN STUDY
MATHY PARK
DANIELS RUN
CITY OF FAIRFAX, VIRGINIA

REVISIONS

No.	DATE	DESCRIPTION

SHEET
13
OF
17

J2 Engineers - X:\DRAWINGS\ACTIVE\Mathy Park - Madison Homes\Floodplain Study\MH11901 - HEC-RAS.dwg [CORRECTED EFFECTIVE-4] January 31, 2020 - 4:19pm awells

HEC-RAS HEC-RAS 5.0.7 MARCH 2019

U.S. ARMY CORPS OF ENGINEERS
HYDROLOGIC ENGINEERING CENTER
609 SECOND STREET
DAVIS, CALIFORNIA

X X XXXXXX XXXX XXXX XX XXXX
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X X XXXXXX XXXX X X X X XXXXX

PROJECT DATA
PROJECT TITLE: PROPOSED MODEL
PROJECT FILE : PROPOSEDMODEL.PRJ
RUN DATE AND TIME: 7/30/2019 2:41:09 PM

PROJECT IN ENGLISH UNITS

PROJECT DESCRIPTION:
PROPOSED MODEL

PLAN DATA

PLAN TITLE: PROPOSED MODEL
PLAN FILE : X:\DRAWINGS\ACTIVE\MATHY PARK - MADISON HOMES\FLOODPLAIN STUDY\FINAL FLOODPLAIN MODELS\PROPOSED MODEL\PROPOSEDMODEL.P02

GEOMETRY TITLE: PROP XS NGVD 29
GEOMETRY FILE : X:\DRAWINGS\ACTIVE\MATHY PARK - MADISON HOMES\FLOODPLAIN STUDY\FINAL FLOODPLAIN MODELS\PROPOSED MODEL\PROPOSEDMODEL.G02

FLOW TITLE : HMS DISCHARGES
FLOW FILE : X:\DRAWINGS\ACTIVE\MATHY PARK - MADISON HOMES\FLOODPLAIN STUDY\FINAL FLOODPLAIN MODELS\PROPOSED MODEL\PROPOSEDMODEL.F02

PLAN SUMMARY INFORMATION:
NUMBER OF: CROSS SECTIONS = 29 MULTIPLE OPENINGS = 0
CULVERTS = 4 INLINE STRUCTURES = 1
BRIDGES = 1 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 = 0.3
FLOW TOLERANCE FACTOR = 0.001

COMPUTATION OPTIONS
CRITICAL DEPTH COMPUTED ONLY WHERE NECESSARY
CONVEYANCE CALCULATION METHOD: AT BREAKS IN N VALUES ONLY
FRICTION SLOPE METHOD: AVERAGE CONVEYANCE
COMPUTATIONAL FLOW REGIME: SUBCRITICAL FLOW

FLOW DATA

FLOW TITLE: HMS DISCHARGES
FLOW FILE : X:\DRAWINGS\ACTIVE\MATHY PARK - MADISON HOMES\FLOODPLAIN STUDY\FINAL FLOODPLAIN MODELS\PROPOSED MODEL\PROPOSEDMODEL.F02

FLOW DATA (CFS)

RIVER	REACH	RS	10-YR	50-YR	100-YR	500-YR
DANIELS RUN	1	23	310	560	705	1000
DANIELS RUN	1	22	590	870	985	1280
DANIELS RUN	1	20	530	690	715	785
DANIELS RUN	1	19	530	700	750	830
DANIELS RUN	1	13.2	865	1400	1560	2020

BOUNDARY CONDITIONS

RIVER	REACH	PROFILE	UPSTREAM	DOWNSTREAM
DANIELS RUN	1	10-YR		KNOWN WS = 358.94
DANIELS RUN	1	50-YR		KNOWN WS = 359.58
DANIELS RUN	1	100-YR		KNOWN WS = 359.73
DANIELS RUN	1	500-YR		KNOWN WS = 360.09

CHANGES IN WS AND EG

RIVER	REACH	RS	PROFILE	TYPE	VALUE
DANIELS RUN	1	4	500-YR	KNOWN WS	372.59
DANIELS RUN	1	4	100-YR	KNOWN WS	372.01
DANIELS RUN	1	4	50-YR	KNOWN WS	371.79
DANIELS RUN	1	4	10-YR	KNOWN WS	370.97

GEOMETRY DATA

GEOMETRY TITLE: PROP XS NGVD 29
GEOMETRY FILE : X:\DRAWINGS\ACTIVE\MATHY PARK - MADISON HOMES\FLOODPLAIN STUDY\FINAL FLOODPLAIN MODELS\PROPOSED MODEL\PROPOSEDMODEL.G02

CROSS SECTION

RIVER: DANIELS RUN
REACH: 1 RS: 23

INPUT
DESCRIPTION: EFFECTIVE CROSS SECTION 12670.88
STATION ELEVATION DATA NUM= 69
STA ELEV STA ELEV STA ELEV STA ELEV STA ELEV
0 401.68 3.25 401.53 14.45 401.23 34.27 400.1 48.01 399.62
51.78 399.47 53.01 399.47 53.59 399.52 75.06 399.23 76.82 399.19
102.98 399.05 104.38 399 108.65 398.91 132.02 398.73 141.65 398.51
144.29 398.49 159.61 398.48 173.17 398.22 187.1 398.21 207.41 397.7
213.99 397.69 220.63 397.23 226.22 396.72 228.33 396.6 230.84 396.85
237.42 397.23 241.67 397.36 242.37 397.27 257.55 397.36 265.18 397.4
265.84 397.42 267.53 397.33 282.06 397.38 287.36 397.23 289.23 396.39
291.79 395.23 297.09 393.4 297.35 393.29 297.48 393.23 310.91 392.08
313.47 391.87 324.29 391.85 330.3 391.85 344.34 391.33 359.62 391.34
371.84 391.34 381.25 391.69 392.12 392.15 393.81 392.18 403.69 392.81
408.51 393 411.83 393.23 420.84 394.05 426.41 394.19 430.74 394.31
437.69 395.23 441.23 395.53 459.18 395.83 464.51 396.48 467.8 396.58
471.21 396.68 489.43 396.94 490.12 397.2 490.67 396.98 510.15 397.23
514.13 397.28 515.08 397.31 524.19 397.63 525.62 397.75

MANNING'S N VALUES NUM= 3
STA N VAL STA N VAL STA N VAL
0 .15 257.55 .054 467.8 .15

BANK STA: LEFT RIGHT LENGTHS: LEFT CHANNEL RIGHT COEFF CONTR. EXPAN.
297.09 420.84 35.4 34.16 33.72 .1 .3
INEFFECTIVE FLOW NUM= 1
STA L STA R ELEV PERMANENT
0 102.96 399.19 F

CULVERT

RIVER: DANIELS RUN
REACH: 1 RS: 22.5

INPUT
DESCRIPTION: SAGER AVENUE CULVERT
DISTANCE FROM UPSTREAM XS = 1
DECK/ROADWAY WIDTH = 30
WEIR COEFFICIENT = 2.8
UPSTREAM DECK/ROADWAY COORDINATES
NUM= 5
STA HI CORD LO CORD STA HI CORD LO CORD STA HI CORD LO CORD
100 392.74 200 391.23 300 394.27
400 399.5 500 406.87

UPSTREAM BRIDGE CROSS SECTION DATA
STATION ELEVATION DATA NUM= 69
STA ELEV STA ELEV STA ELEV STA ELEV STA ELEV
0 401.68 3.25 401.53 14.45 401.23 34.27 400.1 48.01 399.62
51.78 399.47 53.01 399.47 53.59 399.52 75.06 399.23 76.82 399.19
102.98 399.05 104.38 399 108.65 398.91 132.02 398.73 141.65 398.51
144.29 398.49 159.61 398.48 173.17 398.22 187.1 398.21 207.41 397.7
213.99 397.69 220.63 397.23 226.22 396.72 228.33 396.6 230.84 396.85
237.42 397.23 241.67 397.36 242.37 397.27 257.55 397.36 265.18 397.4
265.84 397.42 267.53 397.33 282.06 397.38 287.36 397.23 289.23 396.39
291.79 395.23 297.09 393.4 297.35 393.29 297.48 393.23 310.91 392.08
313.47 391.87 324.29 391.85 330.3 391.85 344.34 391.33 359.62 391.34
371.84 391.34 381.25 391.69 392.12 392.15 393.81 392.18 403.69 392.81
408.51 393 411.83 393.23 420.84 394.05 426.41 394.19 430.74 394.31
437.69 395.23 441.23 395.53 459.18 395.83 464.51 396.48 467.8 396.58
471.21 396.68 489.43 396.94 490.12 397.2 490.67 396.98 510.15 397.23
514.13 397.28 515.08 397.31 524.19 397.63 525.62 397.75

MANNING'S N VALUES NUM= 3
STA N VAL STA N VAL STA N VAL
0 .15 257.55 .054 467.8 .15

BANK STA: LEFT RIGHT LENGTHS: LEFT CHANNEL RIGHT COEFF CONTR. EXPAN.
297.09 420.84 35.4 34.16 33.72 .1 .3
INEFFECTIVE FLOW NUM= 1
STA L STA R ELEV PERMANENT
0 102.96 399.19 F

DOWNSTREAM DECK/ROADWAY COORDINATES
NUM= 5
STA HI CORD LO CORD STA HI CORD LO CORD STA HI CORD LO CORD
101.53 392.31 204.93 391.23 304.93 394.16
404.94 400.15 504.94 407.73

DOWNSTREAM BRIDGE CROSS SECTION DATA
STATION ELEVATION DATA NUM= 122
STA ELEV STA ELEV STA ELEV STA ELEV STA ELEV
0 401.75 7.41 401.23 12.24 401.23 37.5 399.95 40.7 399.81
52.39 399.23 53.22 399.16 74.68 398.37 81.97 398.18 85.01 398.06
90.25 397.91 99.92 397.46 100.52 397.42 106.46 397.23 113.53 396.48
119.55 395.93 127.5 395.23 131.26 395.08 146.97 394.52 147.39 394.47
149.19 394.44 151.31 394.32 157 394.11 162.27 393.82 163.21 393.82
167.04 393.23 170.5 393.11 178.23 392.95 182.7 392.86 192.64 392.61
195.71 392.57 198.19 392.54 202.52 392.49 214.95 392 225.93 392.06
228.38 392.04 241.93 392.18 243.66 392.21 243.74 392.2 247.58 392.23
249.01 392.22 253.92 392.19 260.12 392.14 261.97 392.14 272.92 392.11
274.58 392.12 274.66 392.12 279.21 392.02 283.55 391.96 287.41 391.96
289.57 391.89 291.26 391.85 293.75 391.73 301.27 391.58 306.74 391.61
307.52 391.56 308.23 391.62 309.68 391.63 310.31 391.63 314.49 391.7
318.29 391.7 321.63 391.65 322.36 391.65 325.89 391.8 340.04 391.71
350.58 392.52 356.83 392.47 357.89 392.48 360.5 392.53 363.03 392.64
363.21 392.65 380.16 393.21 380.29 393.21 380.34 393.22 380.86 393.23
381.2 393.23 392.07 393.07 394.2 393.23 396.44 393.417 396.83 393.45
398.53 393.58 401.41 393.62 415.34 394.28 418.92 394.37 432.93 394.95
438.63 395.18 439.44 395.23 449.45 395.84 455.08 396.24 463.15 396.66
465.94 396.71 467.29 396.71 469.35 396.77 470.07 396.87 471.08 396.86
472.17 397.06 475.36 397.23 496.16 398.78 500.78 399.23 522.74 401.2
522.81 401.21 522.93 401.21 523.04 401.23 523.11 401.25 523.13 401.25
528.09 401.9 529.68 401.8 531.19 401.85 532.57 401.91 533.93 401.94
538.48 402 539.45 401.98 549.89 402.99 555.69 403.23 560.06 403.9
560.45 404.02 561.95 404.21 562.57 404.27 565.54 404.72 573.03 405.23
575.1 405.23 593.06 406.5

MANNING'S N VALUES NUM= 3
STA N VAL STA N VAL STA N VAL
0 .15 195.71 .054 432.93 .15

BANK STA: LEFT RIGHT COEFF CONTR. EXPAN.
167.04 394.2 .1 .3

UPSTREAM EMBANKMENT SIDE SLOPE = 19.6 HORIZ. TO 1.0 VERTICAL
DOWNSTREAM EMBANKMENT SIDE SLOPE = 0 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 BOX 6 6
FHWA CHART # 8 - FLARED WINGWALLS
FHWA SCALE # 1 - WINGWALL FLARED 30 TO 75 DEG.
SOLUTION CRITERIA = HIGHEST U.S. EG
CULVERT UPSTRM DIST LENGTH TOP N BOTTOM N DEPTH BLOCKED ENTRANCE LOSS COEF EXIT LOSS COEF
6.2 27 .03 .03 0 .024 1
NUMBER OF BARRELS = 2
UPSTREAM ELEVATION = 385.22
CENTERLINE STATIONS
STA. STA.
191.57 201
DOWNSTREAM ELEVATION = 384.51
CENTERLINE STATIONS
STA. STA.
207.8 216

CROSS SECTION

RIVER: DANIELS RUN
REACH: 1 RS: 22

INPUT
DESCRIPTION: EFFECTIVE CROSS SECTION 12636.72
STATION ELEVATION DATA NUM= 122
STA ELEV STA ELEV STA ELEV STA ELEV STA ELEV
0 401.75 7.41 401.23 12.24 401.23 37.5 399.95 40.7 399.81
52.39 399.23 53.22 399.16 74.68 398.37 81.97 398.18 85.01 398.06
90.25 397.91 99.92 397.46 100.52 397.42 106.46 397.23 113.53 396.48
119.55 395.93 127.5 395.23 131.26 395.08 146.97 394.52 147.39 394.47
149.19 394.44 151.31 394.32 157 394.11 162.27 393.82 163.21 393.82
167.04 393.23 170.5 393.11 178.23 392.95 182.7 392.86 192.64 392.61
195.71 392.57 198.19 392.54 202.52 392.49 214.95 392 225.93 392.06
228.38 392.04 241.93 392.18 243.66 392.21 243.74 392.2 247.58 392.23
249.01 392.22 253.92 392.19 260.12 392.14 261.97 392.14 272.92 392.11
274.58 392.12 274.66 392.12 279.21 392.02 283.55 391.96 287.41 391.96
289.57 391.89 291.26 391.85 293.75 391.73 301.27 391.58 306.74 391.61
307.52 391.56 308.23 391.62 309.68 391.63 310.31 391.63 314.49 391.7
318.29 391.7 321.63 391.65 322.36 391.65 325.89 391.8 340.04 391.71
350.58 392.52 356.83 392.47 357.89 392.48 360.5 392.53 363.03 392.64
363.21 392.65 380.16 393.21 380.29 393.21 380.34 393.22 380.86 393.23
381.2 393.23 392.07 393.07 394.2 393.23 396.44 393.417 396.83 393.45
398.53 393.58 401.41 393.62 415.34 394.28 418.92 394.37 432.93 394.95
438.63 395.18 439.44 395.23 449.45 395.84 455.08 396.24 463.15 396.66
465.94 396.71 467.29 396.71 469.35 396.77 470.07 396.87 471.08 396.86
472.17 397.06 475.36 397.23 496.16 398.78 500.78 399.23 522.74 401.2
522.81 401.21 522.93 401.21 523.04 401.23 523.11 401.25 523.13 401.25
528.09 401.9 529.68 401.8 531.19 401.85 532.57 401.91 533.93 401.94
538.48 402 539.45 401.98 549.89 402.99 555.69 403.23 560.06 403.9
560.45 404.02 561.95 404.21 562.57 404.27 565.54 404.72 573.03 405.23
575.1 405.23 593.06 406.5

MANNING'S N VALUES NUM= 3
STA N VAL STA N VAL STA N VAL
0 .15 195.71 .054 432.93 .15

BANK STA: LEFT RIGHT LENGTHS: LEFT CHANNEL RIGHT COEFF CONTR. EXPAN.
167.04 394.2 157.4 171.77 172.46 .1 .3

CROSS SECTION

RIVER: DANIELS RUN
REACH: 1 RS: 21

INPUT
DESCRIPTION: EFFECTIVE CROSS SECTION 12464.95
STATION ELEVATION DATA NUM= 77
STA ELEV STA ELEV STA ELEV STA ELEV STA ELEV
0 404.95 5.07 404.92 5.72 404.91 5.97 404.91 8.86 404.93
37.94 405.11 56.2 405.23 56.64 404.84 60.62 401.23 68.64 399.7
71.69 399.23 75.5 398.53 82.72 397.23 87.88 396.31 94.36 395.23
96.14 394.94 106.85 393.23 113.18 392.35 121.01 391.23 124.22 390.74
134.88 389.23 138.61 388.76 150.01 387.49 151.47 387.4 153.15 387.23
172.26 387.23 175.12 387.28 175.79 387.29 176.01 387.3 180.63 387.43
181.29 387.45 181.46 387.46 181.97 387.48 182.02 387.48 184.88 387.46
187.99 387.42 190.39 387.36 194.8 387.23 210.7 386.68 214.62 386.54
215.11 386.54 216.31 386.55 218.18 386.55 223.85 386.63 226.31 386.64
233.29 385.96 238.42 385.69 248.42 385.23 250.3 386.1 251.75 386.31
259.19 387.99 259.39 387.94 268.53 387.26 269.98 387.2 271.42 387.23
286.42 388.15 289.02 388.17 289.7 388.2 300.67 389.03 303.01 389.23
304.76 389.55 314.28 391.23 319.34 392.21 325.39 393.23 340.38 396.03
343.21 395.79 350.01 395.29 358.26 395.29 363.38 395.29 368.47 395.29
375.9 399.79 384.14 401.56 390.98 402.29 395.86 402.32 404.75 402.84
412.78 403.4 418.55 403.72

MANNING'S N VALUES NUM= 3
STA N VAL STA N VAL STA N VAL
0 .15 150.01 .054 289.02 .15

BANK STA: LEFT RIGHT LENGTHS: LEFT CHANNEL RIGHT COEFF CONTR. EXPAN.
150.01 289.02 108.63 153.82 133.47 .1 .3

CROSS SECTION

RIVER: DANIELS RUN
REACH: 1 RS: 20

INPUT
DESCRIPTION: EFFECTIVE CROSS SECTION 12311.14
STATION ELEVATION DATA NUM= 75
STA ELEV STA ELEV STA ELEV STA ELEV STA ELEV
0 404.92 7.11 404.95 14.63 405 18.09 405 31.2 405.09
51.95 405.23 59.14 403.72 68.27 401.23 71.2 399.53 72.03 399.23
73.75 398.71 79.96 397.23 83.5 396.4 84.83 396.14 88.61 395.23
91.7 394.81 94.6 394.55 103.72 393.23 112.61 392.51 127.94 391.23
139.72 390.34 141.09 390.24 148.31 390.04 155.74 389.65 158.53 389.56
165.78 389.23 176.48 388.72 179.94 388.54 181.67 388.37 186.38 387.82
188.4 387.23 194.56 386.59 197.22 386.04 201.67 385.23 201.79 385.23
201.97 385.22 202.1 385.22 205.18 386.27 209.55 384.19 210.39 383.23
213.69 383.93 220.78 385.23 224.03 386.89 224.66 387.23 226.57 387.48
232.82 388.35 238.16 388.89 240.11 389.22 246.65 389.23 256.62 390.2
270.82 390.53 273.22 390.63 274.31 390.67 278.83 390.74 290.04 391.23
290.77 391.28 295.84 391.64 297.2 391.69 298.07 391.77 302.47 392.22
308.4 392.22 312.08 392.28 319.87 392.8 320.23 392.83 325.59 393.11
325.95 393.15 326.51 393.23 331.55 394.01 342.08 395.62 343.71 396.19
344.71 396.51 355.94 400.22 360.53 401.73 369.81 404.79 377.62 405.97

MANNING'S N VALUES NUM= 3
STA N VAL STA N VAL STA N VAL
0 .15 186.38 .054 232.82 .15

BANK STA: LEFT RIGHT LENGTHS: LEFT CHANNEL RIGHT COEFF CONTR. EXPAN.
186.38 232.82 475.23 473.78 470.71 .1 .3

CULVERT

RIVER: DANIELS RUN
REACH: 1 RS: 19.5

INPUT
DESCRIPTION: ROUTE 236
DISTANCE FROM UPSTREAM XS = 25
DECK/ROADWAY WIDTH = 420
WEIR COEFFICIENT = 2.9
UPSTREAM DECK/ROADWAY COORDINATES
NUM= 53
STA HI CORD LO CORD STA HI CORD LO CORD STA HI CORD LO CORD
0 407.65 375.71 8.33 407.32 375.71 9 407.28 375.71
28.14 406.48 375.71 28.77 406.47 375.71 33.92 406.2 375.71
42.71 405.84 375.71 45.71 405.72 375.71 53.2 405.45 375.71
62.08 405.08 375.71 65.12 404.96 375.71 72.49 404.7 375.71
81.47 404.32 375.71 83.7 404.23 375.71 84.56 404.19 375.71
91.76 403.94 375.71 100.79 403.85 375.71 108.67 403.57 375.71
117.25 403.48 375.71 126.85 403.4 375.71 157.7 402.15 375.71
160.47 402.11 375.71 162.48 402.09 375.71 163.25 402.08 375.71
188.42 402.16 375.71 195.81 402.13 375.71 196.99 402.24 375.71
199.95 402.27 375.71 213.89 402.4 375.71 215.66 402.41 375.71
233.69 402.59 375.71 234.94 402.61 375.71 253.35 402.79 375.71
254.28 402.8 375.71 255.21 402.81 375.71 273.67 402.98 375.71
274.25 402.99 375.71 290.46 403.49 375.71 291.28 403.5 375.71
297.43 403.69 375.71 307.29 403.98 375.71 322.89 404.47 375.71
324.07 404.52 375.71 339.48 404.98 375.71 340.87 405.04 375.71
356.08 405.52 375.71 357.67 405.58 375.71 373.73 406.27 375.71
374.67 406.31 375.71 391.45 407.03 375.71 391.65 407.03 375.71
402.52 407.68 375.71 406.32 407.82 375.71

UPSTREAM BRIDGE CROSS SECTION DATA
STATION ELEVATION DATA NUM= 75
STA ELEV STA ELEV STA ELEV STA ELEV STA ELEV
0 404.92 7.11 404.95 14.63 405 18.09 405 31.2 405.09
51.95 405.23 59.14 403.72 68.27 401.23 71.2 399.53 72.03 399.23
73.75 398.71 79.96 397.23 83.5 396.4 84.83 396.14 88.61 395.23
91.7 394.81 94.6 394.55 103.72 393.23 112.61 392.51 127.94 391.23
139.72 390.34 141.09 390.24 148.31 390.04 155.74 389.65 158.53 389.56
165.78 389.23 176.48 388.72 179.94 388.54 181.67 388.37 186.38 387.82
188.4 387.23 194.56 386.59 197.22 386.04 201.67 385.23 201.79 385.23
201.97 385.22 202.1 385.22 205.18 386.27 209.55 384.19 210.39 383.23
213.69 383.93 220.78 385.23 224.03 386.89 224.66 387.23 226.57 387.48
232.82 388.35 238.16 388.89 240.11 389.22 246.65 389.23 256.62 390.2
270.82 390.53 273.22 390.63 274.31 390.67 278.83 390.74 290.04 391.23
290.77 391.28 295.84 391.64 297.2 391.69 298.07 391.77 302.47 392.22
308.4 392.22 312.08 392.28 319.87 392.8 320.23 392.83 325.59 393.11
325.95 393.15 326.51 393.23 331.55 394.01 342.08 395.62 343.71 396.19
344.71 396.51 355.94 400.22 360.53 401.73 369.81 404.79 377.62 405.97

MANNING'S N VALUES NUM= 3
STA N VAL STA N VAL STA N VAL
0 .15 186.38 .054 232.82 .15

BANK STA: LEFT RIGHT COEFF CONTR. EXPAN.
186.38 232.82 .1 .3

DOWNSTREAM DECK/ROADWAY COORDINATES
NUM= 9
STA HI CORD LO CORD STA HI CORD LO CORD STA HI CORD LO CORD
0 403.23 375.71 26.7 402.15 375.71 29.47 402.11 375.71
31.48 402.09 375.71 32.25 402.08 375.71 57.42 402.16 375.71
64.81 402.13 375.71 65.99 402.24 375.71 68.94 402.27 375.71

DOWNSTREAM BRIDGE CROSS SECTION DATA
STATION ELEVATION DATA NUM= 14
STA ELEV STA ELEV STA ELEV STA ELEV STA ELEV
0 384.72 22.51 381.82 26.79 379.86 28.62 379 31.5 379.17
33.74 378.38 37.27 376.66 41.78 376.18 48.29 376.68 51.96 377.16
54.8 379.66 56.49 380.08 62.8 384.97 68.94 387.82

MANNING'S N VALUES NUM= 3
STA N VAL STA N VAL STA N VAL
0 .12 33.74 .072 54.8 .12

BANK STA: LEFT RIGHT COEFF CONTR. EXPAN.
33.74 54.8 .3 .5
INEFFECTIVE FLOW NUM= 2
STA L STA R ELEV PERMANENT
0 33 386 F
53 68.94 386 F

UPSTREAM EMBANKMENT SIDE SLOPE = 2 HORIZ. TO 1.0 VERTICAL
DOWNSTREAM EMBANKMENT SIDE SLOPE = 2 HORIZ. TO 1.0 VERTICAL
MAXIMUM ALLOWABLE SUBMERGENCE FOR WEIR FLOW = .95
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

J2 Engineers, Inc.
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COMMONWEALTH OF VIRGINIA
ROBERT W. BROWN
Lic. No. 037041
01/31/20
PROFESSIONAL ENGINEER

PLAN# MH11901
DATE: JULY 12, 2019
CONTOUR INT.= 2'
SCALE: AS NOTED

PLAN DATE
07/31/19
12/13/19
01/31/20

PROPOSED HEC-RAS
FLOODPLAIN STUDY
MATHY PARK
DANIELS RUN
CITY OF FAIRFAX, VIRGINIA

No.	DATE	DESCRIPTION

REVISIONS

SHEET
14
OF
17

J2 Engineers - X:\DRAWINGS\ACTIVE\Mathy Park - Madison Homes\Floodplain Study\MH11901 - HEC-RAS.dwg [PROPOSED] January 31, 2020 - 4:19pm awells

CULVERT NAME SHAPE RISE SPAN
RT 236 BOX 5 5
FHWA CHART # 9 - FLARED WINGWALLS AND INLET TOP EDGE BEVEL
FHWA SCALE # 2 - WINGWALL FLARED 18 TO 33.7 DEG.; INLET TOP EDGE BEVEL=0.083D
SOLUTION CRITERIA = HIGHEST U.S. EG
CULVERT UPSTRM DIST LENGTH TOP N BOTTOM N DEPTH BLOCKED ENTRANCE LOSS COEF EXIT LOSS COEF
5 460 .015 .015 0 .4 1
NUMBER OF BARRELS = 2
UPSTREAM ELEVATION = 385.05
CENTERLINE STATIONS
STA. STA.
165.4 171
DOWNSTREAM ELEVATION = 377.87
CENTERLINE STATIONS
STA. STA.
40 45.5

CROSS SECTION

RIVER: DANIELS RUN
REACH: 1 RS: 19

INPUT
DESCRIPTION: JUST DOWNSTREAM OF ROUTE 236
STATION ELEVATION DATA NUM= 14
STA ELEV STA ELEV STA ELEV STA ELEV STA ELEV
0 384.72 22.51 381.82 26.79 379.86 28.62 379 31.5 379.17
33.74 378.38 37.27 376.66 41.78 376.18 48.29 376.68 51.96 377.16
54.8 379.66 56.49 380.08 62.8 384.97 68.94 387.82

MANNING'S N VALUES NUM= 3
STA N VAL STA N VAL STA N VAL
0 .12 33.74 .072 54.8 .12

BANK STA: LEFT RIGHT LENGTHS: LEFT CHANNEL RIGHT COEFF CONTR. EXPAN.
33.74 54.8 247 247 247 .3 .5
INEFFECTIVE FLOW NUM= 2
STA L STA R ELEV PERMANENT
0 33 386 F
53 68.94 386 F

CROSS SECTION

RIVER: DANIELS RUN
REACH: 1 RS: 18

INPUT
DESCRIPTION:
STATION ELEVATION DATA NUM= 12
STA ELEV STA ELEV STA ELEV STA ELEV STA ELEV
0 382.71 9.17 382.46 16.62 380.29 48.15 379.62 76.04 379.5
96.68 379.55 110.86 378.06 117.31 374.6 123.07 373.72 125 374.83
127.99 376.82 141.03 383.74

MANNING'S N VALUES NUM= 4
STA N VAL STA N VAL STA N VAL STA N VAL
0 .013 9.17 .12 110.86 .072 127.99 .12

BANK STA: LEFT RIGHT LENGTHS: LEFT CHANNEL RIGHT COEFF CONTR. EXPAN.
110.86 127.99 120 120 120 .1 .3

CROSS SECTION

RIVER: DANIELS RUN
REACH: 1 RS: 17

INPUT
DESCRIPTION:
STATION ELEVATION DATA NUM= 13
STA ELEV STA ELEV STA ELEV STA ELEV STA ELEV
0 380.75 50 379.14 81.2 378.57 87.49 378.13 103.63 376.28
111.02 376 112.84 373.73 117.32 371.98 121.87 373.68 125.67 376.4
128.07 376.66 139.42 383.3 143.74 384.18

MANNING'S N VALUES NUM= 3
STA N VAL STA N VAL STA N VAL
0 .12 111.02 .072 125.67 .12

BANK STA: LEFT RIGHT LENGTHS: LEFT CHANNEL RIGHT COEFF CONTR. EXPAN.
111.02 125.67 89 89 89 .1 .3

CROSS SECTION

RIVER: DANIELS RUN
REACH: 1 RS: 16

INPUT
DESCRIPTION:

STATION ELEVATION DATA NUM= 16
STA ELEV STA ELEV STA ELEV STA ELEV STA ELEV
0 380.75 11.4 379.19 21.5 378.59 28.74 378.42 99.11 377.87
111.59 377.83 117.68 377.2 120.46 376.79 125.71 375.11 131.82 373.06
134.97 371.95 137 372.41 139.61 374.65 150.81 377.34 163.98 379.85
171.24 380.48

MANNING'S N VALUES NUM= 4
STA N VAL STA N VAL STA N VAL STA N VAL
0 .03 28.74 .12 125.71 .072 139.61 .12

BANK STA: LEFT RIGHT LENGTHS: LEFT CHANNEL RIGHT COEFF CONTR. EXPAN.
125.71 139.61 96 96 96 .1 .3

CROSS SECTION

RIVER: DANIELS RUN
REACH: 1 RS: 15

INPUT
DESCRIPTION:
STATION ELEVATION DATA NUM= 17
STA ELEV STA ELEV STA ELEV STA ELEV STA ELEV
0 380.47 10.01 378.99 28.58 377.91 31.66 377.87 40.68 377.84
64.14 377.19 93.56 377.14 111.95 376.93 124.36 375.64 130.42 374.28
134.43 372.72 137.74 372.5 139.37 373.02 143.64 374.74 155.33 377.03
174.29 378.67 182.63 379.42

MANNING'S N VALUES NUM= 4
STA N VAL STA N VAL STA N VAL STA N VAL
0 .03 40.68 .12 130.42 .072 143.64 .12

BANK STA: LEFT RIGHT LENGTHS: LEFT CHANNEL RIGHT COEFF CONTR. EXPAN.
130.42 143.64 246 246 246 .1 .3

CROSS SECTION

RIVER: DANIELS RUN
REACH: 1 RS: 14

INPUT
DESCRIPTION:
STATION ELEVATION DATA NUM= 18
STA ELEV STA ELEV STA ELEV STA ELEV STA ELEV
0 380.78 28.7 376.98 52.78 376.44 75.01 376.6 98.31 375.77
110.29 374.73 119.25 373.02 120.07 371.01 126.02 368.49 131.16 371.17
134.37 373.28 142 375.05 153.22 375.09 158.47 375.48 189.04 375.7
219.99 375.75 250.86 376.26 287.27 379.79

MANNING'S N VALUES NUM= 4
STA N VAL STA N VAL STA N VAL STA N VAL
0 .03 75.01 .12 119.25 .072 134.37 .12

BANK STA: LEFT RIGHT LENGTHS: LEFT CHANNEL RIGHT COEFF CONTR. EXPAN.
119.25 134.37 16 50 74 .1 .3

CROSS SECTION

RIVER: DANIELS RUN
REACH: 1 RS: 13.3

INPUT
DESCRIPTION:
STATION ELEVATION DATA NUM= 21
STA ELEV STA ELEV STA ELEV STA ELEV STA ELEV
0 381.39 39.33 376.4 47.64 376.51 63.54 376.43 100.46 375.83
102.57 375.7 109.32 372.97 111.01 371.56 115.17 370.75 121.39 368.75
188.42 368.75 196.04 370.75 199 371.41 203.25 372.23 208.75 374.29
213 375.07 213.53 375.17 231.93 375.88 245.41 376 250.51 376.28
283.11 381.25

MANNING'S N VALUES NUM= 5
STA N VAL STA N VAL STA N VAL STA N VAL STA N VAL
0 .03 63.54 .12 109.32 .06 203.25 .12 231.93 .03

BANK STA: LEFT RIGHT LENGTHS: LEFT CHANNEL RIGHT COEFF CONTR. EXPAN.
109.32 203.25 15 15 15 .3 .5

CROSS SECTION

RIVER: DANIELS RUN
REACH: 1 RS: 13.2

INPUT
DESCRIPTION:
STATION ELEVATION DATA NUM= 23
STA ELEV STA ELEV STA ELEV STA ELEV STA ELEV
0 379.35 21.69 377.05 36.38 376.4 44.71 376.45 63.91 376.42
[illegible]

108.4 371.51 110.47 370.75 116.97 368.75 164.53 368.75 172.36 370.75
178 371.37 185.99 372.26 195.16 374.59 200.41 374.91 206.44 374.92
218.88 375.18 248.48 376.35 269.62 382.16

MANNING'S N VALUES NUM= 5
STA N VAL STA N VAL STA N VAL STA N VAL STA N VAL
0 .03 44.71 .12 107.05 .06 185.99 .12 218.88 .03

BANK STA: LEFT RIGHT LENGTHS: LEFT CHANNEL RIGHT COEFF CONTR. EXPAN.
107.05 185.99 26 26 26 .3 .5

INLINE STRUCTURE

RIVER: DANIELS RUN
REACH: 1 RS: 13.1

INPUT
DESCRIPTION:
DISTANCE FROM UPSTREAM XS = 22
DECK/ROADWAY WIDTH = 1
WEIR COEFFICIENT = 2.6
WEIR EMBANKMENT COORDINATES NUM = 16
STA ELEV STA ELEV STA ELEV STA ELEV STA ELEV
98.08 373 114.01 373 127.01 373 127.02 371.5 134.34 371.5
134.35 373 136.36 373 136.37 371.5 143.7 371.5 143.71 373
145.71 373 145.72 371.5 153.05 371.5 153.06 373 174.04 373
195.16 373

UPSTREAM EMBANKMENT SIDE SLOPE = 0 HORIZ. TO 1.0 VERTICAL
DOWNSTREAM EMBANKMENT SIDE SLOPE = 0 HORIZ. TO 1.0 VERTICAL
MAXIMUM ALLOWABLE SUBMERGENCE FOR WEIR FLOW = .95
ELEVATION AT WHICH WEIR FLOW BEGINS =
WEIR CREST SHAPE = BROAD CRESTED

CROSS SECTION

RIVER: DANIELS RUN
REACH: 1 RS: 13

INPUT
DESCRIPTION:
STATION ELEVATION DATA NUM= 24
STA ELEV STA ELEV STA ELEV STA ELEV STA ELEV
0 380.48 22.64 376.62 41.26 375.96 51.44 376.13 61.72 376.13
69.53 376.27 72.97 375.3 84.2 375.13 91.64 374.03 95.48 372.24
99.97 369.62 107.36 368.37 117.77 368.79 129.2 369.28 131.35 370.74
135.03 371.95 146.75 373.76 161.81 374.4 179.65 374.68 182.3 375.01
191.46 374.81 220.19 375.44 239.45 375.93 260.31 382.18

MANNING'S N VALUES NUM= 5
STA N VAL STA N VAL STA N VAL STA N VAL STA N VAL
0 .03 51.44 .12 95.48 .06 135.03 .12 182.3 .03

BANK STA: LEFT RIGHT LENGTHS: LEFT CHANNEL RIGHT COEFF CONTR. EXPAN.
95.48 135.03 56 48 18 .3 .5

CROSS SECTION

RIVER: DANIELS RUN
REACH: 1 RS: 12.7

INPUT
DESCRIPTION:
STATION ELEVATION DATA NUM= 20
STA ELEV STA ELEV STA ELEV STA ELEV STA ELEV
0 380.22 20.77 376.65 43.44 375.89 52.47 375.82 56.46 375.25
66.08 373.67 70 369.86 74.48 368.13 80.32 369.44 81.74 370.92
91.15 372.89 105.35 374.32 112.63 374.43 139.52 374.31 147.44 375.1
155.41 375.08 160.23 374.71 181.56 375.47 206.77 376.23 228.37 382.38

MANNING'S N VALUES NUM= 5
STA N VAL STA N VAL STA N VAL STA N VAL STA N VAL
0 .03 52.47 .12 66.08 .06 91.15 .12 147.44 .03

BANK STA: LEFT RIGHT LENGTHS: LEFT CHANNEL RIGHT COEFF CONTR. EXPAN.
66.08 105.35 48 48 48 .3 .5

CROSS SECTION

RIVER: DANIELS RUN
REACH: 1 RS: 12.5

INPUT
DESCRIPTION:
STATION ELEVATION DATA NUM= 19
STA ELEV STA ELEV STA ELEV STA ELEV STA ELEV
0 380 21 376.43 58.84 375.36 68.14 375.26 77.54 374.75

110.94 372.75 116.83 370.75 119 367.9 127 367.9 128.92 370.75
132.76 372.75 135.06 373.45 143.95 374.31 151.87 375.1 159.84 375.08
164.66 374.71 185.99 375.47 211.2 376.23 232.8 382.38

MANNING'S N VALUES NUM= 5
STA N VAL STA N VAL STA N VAL STA N VAL STA N VAL
0 .03 68.14 .12 116.83 .06 128.92 .12 151.87 .03

BANK STA: LEFT RIGHT LENGTHS: LEFT CHANNEL RIGHT COEFF CONTR. EXPAN.
116.83 128.92 20 20 20 .3 .5

BRIDGE

RIVER: DANIELS RUN
REACH: 1 RS: 12.45

INPUT
DESCRIPTION: FOOTBRIDGE
DISTANCE FROM UPSTREAM XS = 5.5
DECK/ROADWAY WIDTH = 8.3
WEIR COEFFICIENT = 2.6
UPSTREAM DECK/ROADWAY COORDINATES
NUM= 6
STA HI CORD LO CORD STA HI CORD LO CORD STA HI CORD LO CORD
0 374.75 95.24 374.75 95.25 378.25 373.25
150.75 378.35 373.35 150.76 374.85 200 374.85

UPSTREAM BRIDGE CROSS SECTION DATA
STATION ELEVATION DATA NUM= 19
STA ELEV STA ELEV STA ELEV STA ELEV STA ELEV
0 380 21 376.43 58.84 375.36 68.14 375.26 77.54 374.75
110.94 372.75 116.83 370.75 119 367.9 127 367.9 128.92 370.75
132.76 372.75 135.06 373.45 143.95 374.31 151.87 375.1 159.84 375.08
164.66 374.71 185.99 375.47 211.2 376.23 232.8 382.38

MANNING'S N VALUES NUM= 5
STA N VAL STA N VAL STA N VAL STA N VAL STA N VAL
0 .03 68.14 .12 116.83 .06 128.92 .12 151.87 .03

BANK STA: LEFT RIGHT COEFF CONTR. EXPAN.
116.83 128.92 .3 .5

DOWNSTREAM DECK/ROADWAY COORDINATES
NUM= 6
STA HI CORD LO CORD STA HI CORD LO CORD STA HI CORD LO CORD
0 374.6 122.24 374.6 122.25 378.1 373.1
177.75 378.21 373.21 177.76 374.71 200 374.71

DOWNSTREAM BRIDGE CROSS SECTION DATA
STATION ELEVATION DATA NUM= 17
STA ELEV STA ELEV STA ELEV STA ELEV STA ELEV
0 379.85 20 376.28 66.89 375.13 76.5 375.03 92.64 374.69
101.86 374.6 141.94 372.75 146.03 370.75 147 367.81 153 367.81
153.98 370.75 157.24 372.75 163.04 374.15 167.86 374.71 189.19 375.47
214.4 376.23 236 382.38

MANNING'S N VALUES NUM= 5
STA N VAL STA N VAL STA N VAL STA N VAL STA N VAL
0 .03 101.86 .12 146.03 .06 153.98 .12 167.86 .03

BANK STA: LEFT RIGHT COEFF CONTR. EXPAN.
146.03 153.98 .3 .5

UPSTREAM EMBANKMENT SIDE SLOPE = 0 HORIZ. TO 1.0 VERTICAL
DOWNSTREAM EMBANKMENT SIDE SLOPE = 0 HORIZ. TO 1.0 VERTICAL
MAXIMUM ALLOWABLE SUBMERGENCE FOR WEIR FLOW = .95
ELEVATION AT WHICH WEIR FLOW BEGINS =
ENERGY HEAD USED IN SPILLWAY DESIGN =
SPILLWAY HEIGHT USED IN DESIGN =
WEIR CREST SHAPE = BROAD CRESTED

NUMBER OF BRIDGE COEFFICIENT SETS = 1

LOW FLOW METHODS AND DATA
ENERGY
SELECTED LOW FLOW METHODS = HIGHEST ENERGY ANSWER

HIGH FLOW METHOD
ENERGY ONLY

ADDITIONAL BRIDGE PARAMETERS
ADD FRICTION COMPONENT TO MOMENTUM
DO NOT ADD WEIGHT COMPONENT TO MOMENTUM
CLASS B FLOW CRITICAL DEPTH COMPUTATIONS USE CRITICAL DEPTH
INSIDE THE BRIDGE AT THE UPSTREAM END
CRITERIA TO CHECK FOR PRESSURE FLOW = UPSTREAM ENERGY GRADE LINE

CROSS SECTION

RIVER: DANIELS RUN
REACH: 1 RS: 12.4

INPUT
DESCRIPTION:
STATION ELEVATION DATA NUM= 17
STA ELEV STA ELEV STA ELEV STA ELEV STA ELEV
0 379.85 20 376.28 66.89 375.13 76.5 375.03 92.64 374.69
101.86 374.6 141.94 372.75 146.03 370.75 147 367.81 153 367.81
153.98 370.75 157.24 372.75 163.04 374.15 167.86 374.71 189.19 375.47
214.4 376.23 236 382.38

MANNING'S N VALUES NUM= 5
STA N VAL STA N VAL STA N VAL STA N VAL STA N VAL
0 .03 101.86 .12 146.03 .06 153.98 .12 167.86 .03

BANK STA: LEFT RIGHT LENGTHS: LEFT CHANNEL RIGHT COEFF CONTR. EXPAN.
146.03 153.98 135 135 135 .3 .5

CROSS SECTION

RIVER: DANIELS RUN
REACH: 1 RS: 12

INPUT
DESCRIPTION:
STATION ELEVATION DATA NUM= 17
STA ELEV STA ELEV STA ELEV STA ELEV STA ELEV
0 379.29 16.08 374.76 23.05 374.49 27.62 373.77 34.52 374.22
43.01 374.06 56.81 373.34 65.24 371.45 69.7 368.3 78.45 367.16
88.42 368.33 95.64 371.36 110.73 372.25 122.67 373.75 145.71 374.43
174.78 375.58 186.62 378.45

MANNING'S N VALUES NUM= 5
STA N VAL STA N VAL STA N VAL STA N VAL STA N VAL
0 .03 43.01 .12 69.7 .06 88.42 .12 174.78 .03

BANK STA: LEFT RIGHT LENGTHS: LEFT CHANNEL RIGHT COEFF CONTR. EXPAN.
65.24 95.64 158 158 158 .1 .3

CROSS SECTION

RIVER: DANIELS RUN
REACH: 1 RS: 11

INPUT
DESCRIPTION:
STATION ELEVATION DATA NUM= 16
STA ELEV STA ELEV STA ELEV STA ELEV STA ELEV
0 377.78 7.49 375.08 13.68 373.61 15.86 373.4 24 373.11
33.81 372.26 47.18 369.29 51.11 366.94 57.33 365.23 63.2 369.61
69.86 372.21 96.04 373.27 125.33 374.89 147.07 373.52 166.53 375.12
178.84 377.96

MANNING'S N VALUES NUM= 5
STA N VAL STA N VAL STA N VAL STA N VAL STA N VAL
0 .03 24 .12 47.18 .06 63.2 .12 166.53 .03

BANK STA: LEFT RIGHT LENGTHS: LEFT CHANNEL RIGHT COEFF CONTR. EXPAN.
47.18 63.2 153 153 153 .1 .3

CROSS SECTION

RIVER: DANIELS RUN
REACH: 1 RS: 10

INPUT
DESCRIPTION:
STATION ELEVATION DATA NUM= 14
STA ELEV STA ELEV STA ELEV STA ELEV STA ELEV
0 376.04 27.85 374.2 39.74 373.88 42.94 373.48 57.9 369.4
67.94 367.52 73.11 365.11 77.31 364.82 82.98 365.24 85.58 367.78
96.31 370.5 116.77 370.87 161.2 372.33 200.89 375.05

MANNING'S N VALUES NUM= 5
STA N VAL STA N VAL STA N VAL STA N VAL STA N VAL
0 .12 27.85 .03 42.94 .12 67.94 .06 85.58 .12

BANK STA: LEFT RIGHT LENGTHS: LEFT CHANNEL RIGHT COEFF CONTR. EXPAN.
67.94 85.58 156 156 156 .1 .3

CROSS SECTION

RIVER: DANIELS RUN
REACH: 1 RS: 9

INPUT
DESCRIPTION:

J2 Engineers, Inc.
4080 Lafayette Center Drive
Suite 330
Chantilly, Va. 20151

703.361.1550 (office)
703.956.6845 (fax)
www.j2engineers.com

COMMONWEALTH OF VIRGINIA
ROBERT W. BROWN
Lic. No. 037041
01/31/20
PROFESSIONAL ENGINEER

PLAN# MH11901
DATE: JULY 12, 2019
CONTOUR INT.= 2'
SCALE: AS NOTED

PLAN DATE
07/31/19
12/13/19
01/31/20

PROPOSED HEC-RAS
FLOODPLAIN STUDY
MATHY PARK
DANIELS RUN
CITY OF FAIRFAX, VIRGINIA

No.	DATE	DESCRIPTION

REVISIONS

SHEET
15
OF
17

J2 Engineers - X:\DRAWINGS\ACTIVE\Mathy Park - Madison Homes\Floodplain Study\MH1901 - HEC-RAS.dwg [PROPOSED (2)] January 31, 2020 - 4:20pm awells

STATION ELEVATION DATA NUM= 17
STA ELEV STA ELEV STA ELEV STA ELEV STA ELEV
0 378.9 12.78 375.9 20.33 373.89 22.62 373.77 31.06 373.51
49.33 372.44 92.55 370.04 102.87 368.38 104.9 367.63 107.05 363.88
112.81 363.35 115.74 363.99 121.92 365.96 138.74 365.25 174.3 370.44
213.99 373.37 224.33 374.75

MANNING'S N VALUES NUM= 5
STA N VAL STA N VAL STA N VAL STA N VAL STA N VAL
0 .12 12.78 .03 49.33 .12 104.9 .06 121.92 .12

BANK STA: LEFT RIGHT LENGTHS: LEFT CHANNEL RIGHT COEFF CONTR. EXPAN.
104.9 121.92 156 156 156 .1 .3

CROSS SECTION

RIVER: DANIELS RUN
REACH: 1 RS: 8

INPUT
DESCRIPTION:
STATION ELEVATION DATA NUM= 15
STA ELEV STA ELEV STA ELEV STA ELEV STA ELEV
0 376.28 5.54 376.04 16.57 371.51 24.81 371.25 34.4 371
64.86 368.93 86.74 366.77 94.05 362.91 98.09 362.65 101.73 363.42
105.27 364.45 111.93 364.79 133.47 369.25 164.03 371.47 190.7 374.27

MANNING'S N VALUES NUM= 5
STA N VAL STA N VAL STA N VAL STA N VAL STA N VAL
0 .03 34.4 .12 86.74 .06 105.27 .12 164.03 .03

BANK STA: LEFT RIGHT LENGTHS: LEFT CHANNEL RIGHT COEFF CONTR. EXPAN.
86.74 105.27 122 122 122 .3 .5

CROSS SECTION

RIVER: DANIELS RUN
REACH: 1 RS: 7

INPUT
DESCRIPTION:
STATION ELEVATION DATA NUM= 18
STA ELEV STA ELEV STA ELEV STA ELEV STA ELEV
0 374.01 9.68 374.47 21.09 374.9 29.97 375.11 31.29 375.11
39.22 375.22 41.86 375.46 42.58 366.9 55.63 365.77 65.99 364.48
71.26 362.31 82.03 361.26 96.99 362.23 110.94 362.16 128.22 361.4
138.89 362.04 152.49 366.64 178.13 375.02

MANNING'S N VALUES NUM= 6
STA N VAL STA N VAL STA N VAL STA N VAL STA N VAL
0 .03 29.97 .013 39.22 .03 42.58 .08 71.26 .06
138.89 .08

BANK STA: LEFT RIGHT LENGTHS: LEFT CHANNEL RIGHT COEFF CONTR. EXPAN.
71.26 138.89 75 75 75 .3 .5
INEFFECTIVE FLOW NUM= 2
STA L STA R ELEV PERMANENT
0 57.78 374.01 F
151.91 178.13 381.48 F

CULVERT

RIVER: DANIELS RUN
REACH: 1 RS: 6.5

INPUT
DESCRIPTION: FARRCROFT DRIVE
DISTANCE FROM UPSTREAM XS = 9
DECK/ROADWAY WIDTH = 63
WEIR COEFFICIENT = 2.6
UPSTREAM DECK/ROADWAY COORDINATES
NUM= 4
STA HI CORD LO CORD STA HI CORD LO CORD STA HI CORD LO CORD
41.86 375.46 97 378.76 153 381.53
205 384.11

UPSTREAM BRIDGE CROSS SECTION DATA
STATION ELEVATION DATA NUM= 18
STA ELEV STA ELEV STA ELEV STA ELEV STA ELEV
0 374.01 9.68 374.47 21.09 374.9 29.97 375.11 31.29 375.11
39.22 375.22 41.86 375.46 42.58 366.9 55.63 365.77 65.99 364.48
71.26 362.31 82.03 361.26 96.99 362.23 110.94 362.16 128.22 361.4
138.89 362.04 152.49 366.64 178.13 375.02

MANNING'S N VALUES NUM= 6
STA N VAL STA N VAL STA N VAL STA N VAL STA N VAL
0 .03 29.97 .013 39.22 .03 42.58 .08 71.26 .06
138.89 .08

BANK STA: LEFT RIGHT COEFF CONTR. EXPAN.
71.26 138.89 .3 .5
INEFFECTIVE FLOW NUM= 2
STA L STA R ELEV PERMANENT
0 57.78 374.01 F
151.91 178.13 381.48 F

DOWNSTREAM DECK/ROADWAY COORDINATES
NUM= 4
STA HI CORD LO CORD STA HI CORD LO CORD STA HI CORD LO CORD
44.26 375.18 103 378.08 164 381.14
230 384.49

DOWNSTREAM BRIDGE CROSS SECTION DATA
STATION ELEVATION DATA NUM= 15
STA ELEV STA ELEV STA ELEV STA ELEV STA ELEV
0 373.35 15.55 374.16 31.73 374.51 39.25 374.84 44.26 375.18
44.49 364.06 52.51 363.43 64.66 362.12 67.16 361.15 124.12 361.15
158.71 362.36 180.24 363.17 196.75 365.21 198.19 373.17 209.65 376.35

MANNING'S N VALUES NUM= 9
STA N VAL STA N VAL STA N VAL STA N VAL STA N VAL
0 .03 31.73 .013 39.25 .03 44.26 .013 44.49 .03
64.66 .06 158.71 .03 196.75 .013 198.19 .03

BANK STA: LEFT RIGHT COEFF CONTR. EXPAN.
44.49 196.75 .3 .5
INEFFECTIVE FLOW NUM= 2
STA L STA R ELEV PERMANENT
0 67.53 373.35 F
147.66 209.65 380.32 F

UPSTREAM EMBANKMENT SIDE SLOPE = 0 HORIZ. TO 1.0 VERTICAL
DOWNSTREAM EMBANKMENT SIDE SLOPE = 0 HORIZ. TO 1.0 VERTICAL
MAXIMUM ALLOWABLE SUBMERGENCE FOR WEIR FLOW = .95
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 = 3

CULVERT NAME SHAPE RISE SPAN
CULVERT #1 CONSPAN ARCH 11 24
FHWA CHART # 60- SPAN/RISE RATIO APPROXIMATE 2:1
FHWA SCALE # 1 - 0 DEGREE WING WALL ANGLE
SOLUTION CRITERIA = HIGHEST U.S. EG
CULVERT UPSTRM DIST LENGTH TOP N BOTTOM N DEPTH BLOCKED ENTRANCE LOSS COEF EXIT LOSS COEF
9 63 .013 .035 0 .5 1
UPSTREAM ELEVATION = 361.17
CENTERLINE STATION = 78.78
DOWNSTREAM ELEVATION = 361.15
CENTERLINE STATION = 81.03

CULVERT NAME SHAPE RISE SPAN
CULVERT #2 CONSPAN ARCH 11 24
FHWA CHART # 60- SPAN/RISE RATIO APPROXIMATE 2:1
FHWA SCALE # 1 - 0 DEGREE WING WALL ANGLE
SOLUTION CRITERIA = HIGHEST U.S. EG
CULVERT UPSTRM DIST LENGTH TOP N BOTTOM N DEPTH BLOCKED ENTRANCE LOSS COEF EXIT LOSS COEF
9 63 .013 .035 0 .5 1
UPSTREAM ELEVATION = 361.19
CENTERLINE STATION = 105.3
DOWNSTREAM ELEVATION = 361.17
CENTERLINE STATION = 107.55

CULVERT NAME SHAPE RISE SPAN
CULVERT #3 CONSPAN ARCH 11 24
FHWA CHART # 60- SPAN/RISE RATIO APPROXIMATE 2:1
FHWA SCALE # 1 - 0 DEGREE WING WALL ANGLE
SOLUTION CRITERIA = HIGHEST U.S. EG
CULVERT UPSTRM DIST LENGTH TOP N BOTTOM N DEPTH BLOCKED ENTRANCE LOSS COEF EXIT LOSS COEF
9 63 .013 .035 0 .5 1
UPSTREAM ELEVATION = 361.25
CENTERLINE STATION = 131.91
DOWNSTREAM ELEVATION = 361.16
CENTERLINE STATION = 134.16

CROSS SECTION

RIVER: DANIELS RUN
REACH: 1 RS: 6

INPUT
DESCRIPTION:
STATION ELEVATION DATA NUM= 15
STA ELEV STA ELEV STA ELEV STA ELEV STA ELEV
0 373.35 15.55 374.16 31.73 374.51 39.25 374.84 44.26 375.18
44.49 364.06 52.51 363.43 64.66 362.12 67.16 361.15 124.12 361.15
158.71 362.36 180.24 363.17 196.75 365.21 198.19 373.17 209.65 376.35

MANNING'S N VALUES NUM= 9
STA N VAL STA N VAL STA N VAL STA N VAL STA N VAL
0 .03 31.73 .013 39.25 .03 44.26 .013 44.49 .03
64.66 .06 158.71 .03 196.75 .013 198.19 .03

BANK STA: LEFT RIGHT LENGTHS: LEFT CHANNEL RIGHT COEFF CONTR. EXPAN.
44.49 196.75 91 88 84 .3 .5
INEFFECTIVE FLOW NUM= 2
STA L STA R ELEV PERMANENT
0 67.53 373.35 F
147.66 209.65 380.32 F

CROSS SECTION

RIVER: DANIELS RUN
REACH: 1 RS: 5

INPUT
DESCRIPTION:
STATION ELEVATION DATA NUM= 18
STA ELEV STA ELEV STA ELEV STA ELEV STA ELEV
0 373.76 3.17 373.11 11.32 372.9 19.53 370.08 27.71 367.48
41.94 362.21 57.13 360.75 61.13 358.75 65.13 356.75 69.13 354.75
152.41 354.75 156.41 356.75 160.41 358.75 164.41 360.75 176.7 362.1
185.94 364.89 186.81 373.11 196.06 376

MANNING'S N VALUES NUM= 7
STA N VAL STA N VAL STA N VAL STA N VAL STA N VAL
0 .03 3.17 .013 11.32 .03 41.94 .06 176.7 .03
185.94 .013 186.81 .03

BANK STA: LEFT RIGHT LENGTHS: LEFT CHANNEL RIGHT COEFF CONTR. EXPAN.
41.94 176.7 162 138 110 .3 .5

CROSS SECTION

RIVER: DANIELS RUN
REACH: 1 RS: 4

INPUT
DESCRIPTION:
STATION ELEVATION DATA NUM= 16
STA ELEV STA ELEV STA ELEV STA ELEV STA ELEV
0 376.68 8.86 376.51 32.94 369.65 56.12 362.12 68.71 360.75
74.34 358.75 80.96 356.75 89.71 354.75 205.9 354.75 210.76 356.75
215.15 358.75 219.38 360.75 228.71 361.98 242.61 364.81 243.49 373.17
248.69 374.28

MANNING'S N VALUES NUM= 6
STA N VAL STA N VAL STA N VAL STA N VAL STA N VAL
0 .013 8.86 .03 56.12 .06 228.71 .03 242.61 .013
243.49 .03

BANK STA: LEFT RIGHT LENGTHS: LEFT CHANNEL RIGHT COEFF CONTR. EXPAN.
56.12 228.71 120 120 120 .3 .5

CULVERT

RIVER: DANIELS RUN
REACH: 1 RS: 3.5

INPUT
DESCRIPTION: FARRCROFT POND PRINCIPAL SPILLWAY
DISTANCE FROM UPSTREAM XS = 45
DECK/ROADWAY WIDTH = 50
WEIR COEFFICIENT = 2.6
UPSTREAM DECK/ROADWAY COORDINATES
NUM= 5
STA HI CORD LO CORD STA HI CORD LO CORD STA HI CORD LO CORD
8.86 376.51 56 373 220 373
230 374 250 376

UPSTREAM BRIDGE CROSS SECTION DATA
STATION ELEVATION DATA NUM= 16
STA ELEV STA ELEV STA ELEV STA ELEV STA ELEV
0 376.68 8.86 376.51 32.94 369.65 56.12 362.12 68.71 360.75
74.34 358.75 80.96 356.75 89.71 354.75 205.9 354.75 210.76 356.75
215.15 358.75 219.38 360.75 228.71 361.98 242.61 364.81 243.49 373.17
248.69 374.28

MANNING'S N VALUES NUM= 6
STA N VAL STA N VAL STA N VAL STA N VAL STA N VAL
0 .013 8.86 .03 56.12 .06 228.71 .03 242.61 .013
243.49 .03

BANK STA: LEFT RIGHT COEFF CONTR. EXPAN.
56.12 228.71 .3 .5

DOWNSTREAM DECK/ROADWAY COORDINATES
NUM= 3
STA HI CORD LO CORD STA HI CORD LO CORD STA HI CORD LO CORD
0 373 91 373 109.57 374

DOWNSTREAM BRIDGE CROSS SECTION DATA
STATION ELEVATION DATA NUM= 14
STA ELEV STA ELEV STA ELEV STA ELEV STA ELEV
0 368.75 3.77 366.47 14.35 357.56 18.63 357.08 24.06 357.09
34.52 356.25 52.71 357.25 59.13 360.76 62.26 363.91 65.22 364.57
82.29 372.57 86.41 372.68 94.22 372.72 109.57 372.93

MANNING'S N VALUES NUM= 6
STA N VAL STA N VAL STA N VAL STA N VAL STA N VAL
0 .15 14.35 .06 52.71 .08 82.29 .03 86.41 .013
94.22 .03

BANK STA: LEFT RIGHT COEFF CONTR. EXPAN.
14.35 52.71 .3 .5
INEFFECTIVE FLOW NUM= 2
STA L STA R ELEV PERMANENT
0 8.27 373 F
52.27 109.57 373 F

UPSTREAM EMBANKMENT SIDE SLOPE = 0 HORIZ. TO 1.0 VERTICAL
DOWNSTREAM EMBANKMENT SIDE SLOPE = 0 HORIZ. TO 1.0 VERTICAL
MAXIMUM ALLOWABLE SUBMERGENCE FOR WEIR FLOW = .95
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 BOX 8 9
FHWA CHART # 8 - FLARED WINGWALLS
FHWA SCALE # 1 - WINGWALL FLARED 30 TO 75 DEG.
SOLUTION CRITERIA = HIGHEST U.S. EG
CULVERT UPSTRM DIST LENGTH TOP N BOTTOM N DEPTH BLOCKED ENTRANCE LOSS COEF EXIT LOSS COEF
44 52 .013 .013 0 .4 1
NUMBER OF BARRELS = 2
UPSTREAM ELEVATION = 357.8
CENTERLINE STATIONS
STA. STA.
140 150
DOWNSTREAM ELEVATION = 357.5
CENTERLINE STATIONS
STA. STA.
21.5 31.5

CROSS SECTION

RIVER: DANIELS RUN
REACH: 1 RS: 3

INPUT
DESCRIPTION:
STATION ELEVATION DATA NUM= 14
STA ELEV STA ELEV STA ELEV STA ELEV STA ELEV
0 368.75 3.77 366.47 14.35 357.56 18.63 357.08 24.06 357.09
34.52 356.25 52.71 357.25 59.13 360.76 62.26 363.91 65.22 364.57
82.29 372.57 86.41 372.68 94.22 372.72 109.57 372.93

MANNING'S N VALUES NUM= 6
STA N VAL STA N VAL STA N VAL STA N VAL STA N VAL
0 .15 14.35 .06 52.71 .08 82.29 .03 86.41 .013
94.22 .03

BANK STA: LEFT RIGHT LENGTHS: LEFT CHANNEL RIGHT COEFF CONTR. EXPAN.
14.35 52.71 154 154 154 .3 .5
INEFFECTIVE FLOW NUM= 2
STA L STA R ELEV PERMANENT
0 8.27 373 F
52.27 109.57 373 F

CROSS SECTION

RIVER: DANIELS RUN
REACH: 1 RS: 2

INPUT
DESCRIPTION:
STATION ELEVATION DATA NUM= 17
STA ELEV STA ELEV STA ELEV STA ELEV STA ELEV
0 366.75 3.59 364.96 6.96 362.5 26.57 362.33 43.69 362.22
54.49 362.01 57.85 356.3 67.85 355.81 70.46 356.28 74.99 361.8
90.98 362.14 106.13 363.05 126.7 364.25 131.86 366.47 134.39 366.75
142.58 366.85 148.23 367.88

MANNING'S N VALUES NUM= 6
STA N VAL STA N VAL STA N VAL STA N VAL STA N VAL
0 .15 54.49 .06 74.99 .15 131.86 .03 134.39 .013
142.58 .03

BANK STA: LEFT RIGHT LENGTHS: LEFT CHANNEL RIGHT COEFF CONTR. EXPAN.
54.49 74.99 196 196 196 .1 .3

CROSS SECTION

RIVER: DANIELS RUN
REACH: 1 RS: 1

INPUT
DESCRIPTION:
STATION ELEVATION DATA NUM= 11
STA ELEV STA ELEV STA ELEV STA ELEV STA ELEV
0 364.08 43.37 361.49 72.19 359.98 77.28 354.36 83.86 353.25
90.79 354.26 95.29 358.63 100.45 360.01 149.81 360.65 186.56 362.65
194.77 363.26

MANNING'S N VALUES NUM= 4
STA N VAL STA N VAL STA N VAL STA N VAL
0 .03 43.37 .08 72.19 .06 100.45 .15

BANK STA: LEFT RIGHT LENGTHS: LEFT CHANNEL RIGHT COEFF CONTR. EXPAN.
72.19 100.45 256.85 260.24 259.46 .1 .3

CROSS SECTION

RIVER: DANIELS RUN
REACH: 1 RS: 0

INPUT
DESCRIPTION: EFFECTIVE CROSS SECTION 8879.358
STATION ELEVATION DATA NUM= 34
STA ELEV STA ELEV STA ELEV STA ELEV STA ELEV
0 374.08 25.98 373.55 78.53 362.65 84.23 361.53 98.6 361.24
156.95 360.02 199.54 358.96 212.03 358.71 228.24 358.06 258.96 356.86
260.88 356.79 262.99 356.7 269 356.554 269.97 356.53 270.73 352.75
278.77 353.16 282.55 353.23 283.26 354.41 283.45 356.64 291.79 357.07
292.76 357.1 314.07 358.01 356.64 359.792 385.49 361 390.06 361.12
404.38 361.17 435.29 361.35 448.48 361.78 459.01 362.98 469.11 365.25
475.94 367.31 481.81 368.96 495.08 371.9 506.78 373.65

MANNING'S N VALUES NUM= 6
STA N VAL STA N VAL STA N VAL STA N VAL STA N VAL
0 .03 258.96 .15 269.97 .06 283.45 .15 314.07 .03
390.06 .15

BANK STA: LEFT RIGHT LENGTHS: LEFT CHANNEL RIGHT COEFF CONTR. EXPAN.
269.97 283.45 0 0 0 .1 .3

SUMMARY OF MANNING'S N VALUES

RIVER:DANIELS RUN

REACH	RIVER STA.	N1	N2	N3	N4	N5	N6	N7	N8	N9
1	23	.15	.054	.15						
1	22.5	CULVERT								
1	22	.15	.054	.15						
1	21	.15	.054	.15						
1	20	.15	.054	.15						
1	19.5	CULVERT								
1	19	.12	.072	.12						
1	18	.013	.12	.072	.12					
1	17	.12	.072	.12						
1	16	.03	.12	.072	.12					
1	15	.03	.12	.072	.12					
1	14	.03	.12	.072	.12					
1	13.3	.03	.12	.06	.12	.03				
1	13.2	.03	.12	.06	.12	.03				
1	13.1	INL STRUCT								
1	13	.03	.12	.06	.12	.03				
1	12.7	.03	.12	.06	.12	.03				
1	12.5	.03	.12	.06	.12	.03				
1	12.45	BRIDGE								
1	12.4	.03	.12	.06	.12	.03				
1	12	.03	.12	.06	.12	.03				
1	11	.03	.12	.06	.12	.03				
1	10	.12	.03	.12	.06	.12				
1	9	.12	.03	.12	.06	.12				
1	8	.03	.12	.06	.12	.03				
1	7	.03	.013	.03	.08	.06	.08			
1	6.5	CULVERT								
1	6	.03	.013	.03	.013	.03	.06	.03	.013	.03
1	5	.03	.013	.03	.06	.03	.013	.03		

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COMMONWEALTH OF VIRGINIA
ROBERT W. BROWN
Lic. No. 037041
01/31/20
PROFESSIONAL ENGINEER

PLAN# MH11901
DATE: JULY 12, 2019
CONTOUR INT.= 2'
SCALE: AS NOTED

PLAN DATE
07/31/19
12/13/19
01/31/20

PROPOSED HEC-RAS
FLOODPLAIN STUDY
MATHY PARK
DANIELS RUN
CITY OF FAIRFAX, VIRGINIA

No.	DATE	DESCRIPTION

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	1		3.5	CULVERT				
1	3		.15	.06	.08	.03	.013	.03
1	2		.15	.06	.15	.03	.013	.03
	1	1		.03	.08	.06	.15	
1	0		.03	.15	.06	.15	.03	.15

SUMMARY OF REACH LENGTHS

RIVER: DANIELS RUN

REACH	RIVER STA.	LEFT	CHANNEL	RIGHT
1	23	35.4	34.16	33.72
1	22.5	CULVERT		
1	22	157.4	171.77	172.46
1	21	108.63	153.82	133.47
1	20	475.23	473.78	470.71
1	19.5	CULVERT		
1	19	247	247	247
1	18	120	120	120
1	17	89	89	89
1	16	96	96	96
1	15	246	246	246
1	14	16	50	74
1	13.3	15	15	15
1	13.2	26	26	26
1	13.1	INL STRUCT		
1	13	56	48	18
1	12.7	48	48	48
1	12.5	20	20	20
1	12.45	BRIDGE		
1	12.4	135	135	135
1	12	158	158	158
1	11	153	153	153
1	10	156	156	156
1	9	156	156	156
1	8	122	122	122
1	7	75	75	75
1	6.5	CULVERT		
1	6	91	88	84
1	5	162	138	110
1	4	120	120	120
1	3.5	CULVERT		
1	3	154	154	154
1	2	196	196	196
1	1	256.85	260.24	259.46
1	0	0	0	0

SUMMARY OF CONTRACTION AND EXPANSION COEFFICIENTS

RIVER: DANIELS RUN

REACH	RIVER STA.	CONTR.	EXPAN.
1	23	.1	.3
1	22.5	CULVERT	
1	22	.1	.3
1	21	.1	.3
1	20	.1	.3
1	19.5	CULVERT	
1	19	.3	.5
1	18	.1	.3
1	17	.1	.3
1	16	.1	.3
1	15	.1	.3
1	14	.1	.3
1	13.3	.3	.5
1	13.2	.3	.5
1	13.1	INL STRUCT	
1	13	.3	.5
1	12.7	.3	.5
1	12.5	.3	.5
1	12.45	BRIDGE	
1	12.4	.3	.5
1	12	.1	.3
1	11	.1	.3
1	10	.1	.3
1	9	.1	.3
1	8	.3	.5
1	7	.3	.5
1	6.5	CULVERT	
1	6	.3	.5
1	5	.3	.5
1	4	.3	.5
1	3.5	CULVERT	
1	3	.3	.5
1	1	.1	.3
1	0	.1	.3

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