Dry Run Flood Study

Venice Crossing - Phase 2

PREPARED: February 25, 2019

REVISED: June 6, 2019

REVISED: July 10, 2019

REVISED: January 14, 2020

REVISED: March 20, 2020

STORM WATER MANAGEMENT

Dry Run Flood Study

Table of Contents

February 25, 2019

Rev: June 6, 2019

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Attached Exhibits:

Drainage Map (24x36, 1000 Scale)
100 Year Storm Flood Limits - Existing Conditions (30x42, 100 Scale)
100 Year Storm Flood Limits with aerial photo - Existing Conditions (30x42, 100 Scale)

100 Year Storm Flood Limits - Proposed Conditions (30x42, 100 Scale)
100 Year Storm Flood Limits with aerial photo - Proposed Conditions (30x42, 100 Scale)

SUMMARY OF DATA

Rev: 3/20/2020

Method of Hydrograph Development: TR-55

Software: Hydraflow 2007, Version 9.20, HEC-RAS Version 4.1.0

HEC-RAS study of Dry Run Creek located in Ross Township, Butler County, Ohio. Study begins at the north property line of the Brown Farm and continues approximately 2910 linear feet downstream to the south property line. Proposed conditions include:
-Proposed Venice Crossing Section Two
-Proposed box beam bridge crossing at river station 0.255 (Venice Crossing Drive)
-Grading for future development on the west side of Dryn Run Creek near the south property line of Brown Farm

Drainage Area Descriptions	W (Acres)	CN	Tc (Hours)	Tt (Hours)
Area Tributary to Main Channel	3535.00	73.0	1.27	0.00
Area Tributary to Channel Entering Property from West	102.00	78.0	0.50	0.00

Frequency	Area Tributary to Main Channel	Channel Entering Property from West
(yr)	(cfs)	(cfs)
100	5144	335

100 Year Water Surface Elevations

(See HECRAS Output)

Cross Section	Water Surface Elevation, Existing	Water Surface Elevation, Proposed	Difference
(River Station)	(ft)	(ft)	(ft)
0.551	574.16	573.56	-0.60
0.513	573.39	572.72	-0.67
0.486	572.93	571.95	-0.98
0.445	572.83	571.46	-1.37
0.419	570.40	571.17	0.77
0.396	570.16	571.08	0.92
0.361	569.40	570.42	1.02
0.319	567.46	569.17	1.71
0.261	566.54	567.69	1.15
0.255	Bridge	Bridge	-
0.206	566.26	566.07	-0.19
0.170	565.48	565.48	0.00
0.138	564.05	563.82	-0.23
0.104	562.60	562.38	-0.22
0.066	561.70	561.49	-0.21
0.035	561.10	560.92	-0.18
0.000	560.43	560.26	-0.17

100 Year Channel Velocities

(See HECRAS Output)

Cross Section	Channel Velocity, Existing	Channel Velocity, Proposed	Diff.
(River Station)	(ft/s)	(ft/s)	(ft/s)
0.551	9.52	10.52	1.00
0.513	8.88	9.39	0.51
0.486	9.79	10.95	1.16
0.445	6.86	8.14	1.28
0.419	15.83	8.12	-7.71
0.396	11.93	6.33	-5.60
0.361	10.51	7.92	-2.59
0.319	13.45	10.73	-2.72
0.261	10.16	10.51	0.35
0.255	Bridge	Bridge	-
0.206	6.89	7.02	0.13
0.170	8.43	7.97	-0.46
0.138	12.50	12.75	0.25
0.104	14.11	14.15	0.04
0.066	12.67	12.92	0.25
0.035	10.72	10.72	0.00
0.000	12.01	11.89	-0.12

Average Velocity Change = -0.89 ft/s

25-Yr Summary

(at Bridge Section Only)

Discharge (cfs) =	3,531
Velocity (ft/s) =	8.38
W.S. Elev. =	565.84

Row Labels	Sum of Area_AC	Curve Number	CN* Area
1 - Offsite Area Main Channel			
A Soils			
101	4.80	39	187.0601
110	13.46	49	659.6396
111	30.41	49	1490.121
112	4.68	49	229.2313
500	1.09	46	50.08028
501	7.43	57	423.2865
502	0.85	46	38.96103
510	1.60	61	97.84
511	1.62	46	74.61691
512	7.44	46	342.4587
B Soils			
101	82.94	61	5059.334
102	2.79	61	170.1236
110	463.01	69	31947.92
111	919.73	69	63461.38
112	89.67	69	6187.421
121	17.54	60	1052.226
199	6.06	69	417.7951
416	9.00	74	665.9437
499	2.01	74	148.6266
500	10.33	65	671.566
501	42.06	72	3028.329
502	15.48	65	1006.295
510	125.05	75	9378.906
511	299.90	65	19493.53
512	89.15	65	5794.833
513	12.25	65	796.2263
599	10.42	65	677.5552
610	0.73	70	51.36156
620	0.87	70	60.55763
680	1.69	70	118.1894
(blank)	7.86	98	769.83
B/D Soils			
110	3.13	69	215.8458
111	2.04	69	140.7496
511	1.94	65	125.7766
C Soils			
101	9.29	74	687.0954
110	9.64	79	761.4592
111	101.62	79	8027.719
112	3.47	79	274.3449
121	15.34	73	1120.034
500	0.83	77	63.58273
501	7.52	81	609.3788

510	14.63	83	1214.643			
511	18.25	77	1405.444			
512	0.48	77	37.05768			
599	0.87	77	67.30724			
D Soils						
101	17.48	80	1398.438			
102	0.21	80	16.74667			
110	172.77	84	14512.51			
111	440.11	84	36969.14			
112	45.62	84	3831.777			
121	22.77	79	1798.699			
199	5.79	84	485.9842			
416	9.74	86	837.335			
500	5.93	82	485.9801			
501	70.50	86	6063.106			
510	107.77	87	9375.567			
511	104.11	82	8537.314			
512	29.45	82	2415.116			
513	11.95	82	979.8014			
599	0.70	82	57.21199			
680	0.46	82	37.61731			
(blank)	5.84	98	572.2214			
(blank)						
110	2.33	98	228.0498	Total	Total	
111	7.32	98	716.9313	Offsite	Offsite	
416	2.42	98	237.4092	Acreage	CN * A	CN =
501	0.29	98	28.82483	3,534.91	258927.4	73.2
511	0.41	98	39.96126			
2 - Onsite Area Channel From West						
B Soils						
111	10.94	69	755.0287			
500	2.10	65	136.3798			
510	54.12	75	4059.301			
C Soils						
111	3.07	79	242.901			
500	0.57	77	44.11896			
510	3.20	83	265.2798	Total	Total	
D Soils				Onsite	Onsite	
500	1.26	82	103.1064	Acreage	CN * A	CN =
510	26.97	87	2346.765	102.24	7952.881	77.8

www.butlercountyauditor.org

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130 High Street
Hamilton, Ohio 45011

Land Use Codes

LUC	Class - Description
100	A - AGRICULTURAL VACANT LAND
101	A - CASH GRAIN OR GENERAL FARM
102	A - LIVESTOCK FARMS EXCEPT DAIRY&POULTRY
103	A - DAIRY FARMS
104	A - POULTRY FARMS
105	A - FRUIT AND NUT FARMS
106	A - VEGETABLE FARMS
107	A - TOBACCO FARMS
108	A - NURSERIES
109	A - GREENHOUSES, VEGETABLES & FLORACULT.
110	A - AGRICULTURAL VACANT LAND
111	A - CASH GRAIN OR GENERAL FARM
112	A - LIVESTOCK FARM OTHER THAN DRY&POLRY
113	A - DAIRY FARMS
114	A - POULTRY FARMS
115	A - FRUIT AND NUT FARMS
116	A - VEGETABLE TABLES
117	A - TOBACCO FARMS
120	A - TIMBER OR FOREST LANDS
121	A - TIMBER
190	A - OTHER AGRICULTURAL USE
199	A - OTHER AGRICULTURAL USE
210	M - COAL LANDS, SURFACE AND RIGHTS
220	M - COAL RIGHTS, WORKING INTEREST
230	M - COAL RIGHTS, SEPARATE ROYALTY INT.
240	O - OIL AND GAS RIGHTS, WORKING INTEREST
245	G - OIL AND GAS RIGHTS, WORKING INTEREST
250	O - OIL&GAS RIGHTS,SEPARATE ROYALTY INT.
255	G - OIL AND GAS RIGHTS, SEPARATE ROYALTY
260	M - OTHER MINERALS
300	I - INDUSTRIAL, VACANT LAND
310	I - FOOD&DRINK PROCESS PLANTS AND STORAE
320	I - FOUNDERIES&HEAVY MANUFACT PLANTS
330	I - MANUFACTURING & ASSEMBLY MEDIUM
340	I - MANUFACTURING & ASSEMBLY LIGHT
350	I - INDUSTRIAL WAREHOUSES LIGHT
360	I - INDUSTRIAL TRUCK TERMINALS
370	I - SMALL SHOPS (MACHINE,TOOL & DIE ETC)
380	I - MINES AND QUARRIES
390	I - GRAIN ELEVATORS
399	I - OTHER INDUSTRIAL STRUCTURES
400	C - COMMERCIAL VACANT LAND
401	C - APARTMENTS 4-19 RENTAL UNITS
402	C - APARTMENTS 20-39 RENTAL UNITS
403	C - APARTMENTS 40 OR MORE RENTAL UNITS
410	C - MOTELS AND TOURIST CABINS
411	C - MOTELS
412	C - NURSING HOMES & PRIVATE HOSPITALS
415	C - TRAILER OR MOBILE HOME PARK
416	C - COMMERCIAL CAMPGROUNDS
419	C - OTHER COMMERCIAL HOUSING
420	C - SMALL (UNDER 10,000SF) DETACH RETAI
421	C - SUPERMARKETS
422	C - DISCOUNT STORES & JR. DEPT STORES
424	C - FULL LINE DEPARTMENT STORES

425	C - NEIGHBORHOOD SHOPPING CENTER
426	C - COMMUNITY SHOPPING CENTER
427	C - REGIONAL SHOPPING CENTER
429	C - OTHER RETAIL STRUCTURES
430	C - RESTURANT, CAFETERIA, AND/OR BAR
435	C - DRIVE-IN REST/FOOD SERVICE FACILITY
439	C - OTHER FOOD SERVICE STRUCTURE
440	C - DRY CLEANING PLANTS & LAUNDRIES
441	C - FUNERAL HOMES
442	C - MEDICAL CLINICS AND OFFICES
444	C - FULL SERVICE BANKS
445	C - SAVINGS AND LOAN
447	C - OFFICE BUILDING 1-2 STORIES
448	C - OFFICE BULD 3 OR MORE STORIES WALKUP
449	C - OFFICE BULD 3 OR MORE STORIES ELEVAT
450	C - CONDOMINIUM OFFICE UNITS
452	C - AUTOMOTIVE SERVICE STATION
453	C - CAR WASHES
454	C - AUTO CAR SALES AND SERVICES
455	C - COMMERCIAL GARAGES
456	C - PARKING GARAGE STRUCTURE & LOTS
460	C - THEATERS
461	C - DRIVE-IN THEATERS
462	C - GOLF DRIV RANGE & MINI GOLF COURSES
463	C - GOLF COURSES
464	C - BOWLING ALLEYS
465	C - LODGE HALLS AND AMUSEMENT PARKS
480	C - COMMERCIAL WAREHOUSES
481	C - MINI WAREHOUSE
482	C - COMMERCIAL TRUCK TERMINALS
489	C - PUBLIC UTILITY
490	C - MARINE SERVICE FACILITIES
496	C - MARINE (SMALL BOAT)
499	C - OTHER COMMERCIAL STRUCTURES
500	R - RESIDENTIAL, VACANT LAND, LOT
501	R - RESIDENTIAL, 0-9.999 AC
502	R - RESIDENTIAL, 10-19.999 AC
503	R - RESIDENTIAL, 20-29.999 AC
504	R - RESIDENTIAL, 30-39.999 AC
505	R - RESIDENTIAL, 40+ ACRES
510	R - SINGLE FAMILY DWELLING, PLATTED LOT
511	R - SINGLE FAMILY, O-9.999 AC
512	R - SINGLE FAMILY, 10-19.999 AC
513	R - SINGLE FAMILY, 20-29.999 AC
514	R - SINGLE FAMILY, 30-39.999 AC
515	R - SINGLE FAMILY, 40+ AC
520	R - TWO FAMILY DWELLING, PLATTED LOT
521	R - TWO FAMILY, 0-9.999 AC
522	R - TWO FAMILY, 10-19.999 AC
523	R - TWO FAMILY, 20-29.999 AC
524	R - TWO FAMILY, 30-39.999 AC
525	R - TWO FAMILY, 40+ AC
530	R - THREE FAMILY DWELLING, PLATTED LOT
531	R - THREE FAMILY, 0-9.999 AC
532	R - THREE FAMILY, 10-19.999 AC
533	R - THREE FAMILY, 20-29.999 AC
534	R - THREE FAMILY, 30-39.999 AC
535	R - THREE FAMILY, 40+ AC
550	R - CONDOMINIUM
560	R - HTRL/MOBILE HOME ON REAL ESTATE
569	R - HTRL PERS PROP (HMSTD)
599	R - OTHER RESIDENTIAL
600	E - EXEMPT PROPERTY OWNED BY USA
610	E - EXEMPT PROPERTY OWNED BY STATE OF OH
615	E - EXEMPT FORFEITED LAND
620	E - EXEMPT PROPERTY OWNED BY COUNTIES
625	E - SUSPENSION LIST
630	E - EXEMPT PROPERTY OWNED BY TOWNSHIP
640	E - EXEMPT PROPERTY OWNED BY MUNICIPALS
645	E - EXEMPT PROP OWN/ACQUIRE BY MET AUTH
650	E - EXEMPT PROPERTY OWNED BY BD OF EDUC.
660	E - EXEMPT PROPERTY OWNED PARK DIST.PUB

670	E - EXEMPT PROP OWNED COL-ACAD-PRI SCHOO
680	E - CHARIT EXEMT HOSP HOMS AGED ETC,PRIV
685	E - CHURCHES ETC PUBLIC WORSHIP PRIVE
690	E - GRAVEYARDS MONUMENTS, CEMETERIES
699	E - REGIONAL WATER DISTRICT
700	E - COMM URBAN REDEVL CORP TAX ABATEMENT
705	E - SOLAR EXEMPTIONS
710	E - COMM REINVEST AREA TAX ABATEMENT
720	E - MUNICIPAL IMPROVE TAX ABATEMENT
730	E - MUNICIPAL URBAN REDEVELOP TAX ABATET
740	E - OTHER TAX ABATEMENT
741	E - SPECIAL ASSESSMENT - TIF
800	A - AGRI LAND&IMPRO OWN PUBLIC UTI RAIL
810	M - MINE LAND&IMPRO OWN PUBLIC UTI RAIL
820	I - INDU LAND&IMPRO OWN PUBLIC UTI RAIL
830	C - COMM LD&IMPRO OWN BY PUB UTI TH RAIL
840	U - RAILROAD REAL PROP USED IN OPERATION
850	U - RAILROAD REAL PROP NOT USED OPERATOS
860	U - RAIL PER PROP USED OPER RAIL PER PRO
870	U - RAIL PER PROP NOT USED IN OPERATIONS
880	U - PUB UTIL PER PROP OTHER THAN RRS
890	U - SPECIAL ASSESSMENTS RAILROAD

149 rows selected.

Sketch Description Codes

Code	DESCRIB
10	FRAME
11	OPEN FRAME PORCH
12	ENCL FRAME PORCH
13	FRAME GARAGE
14	FRAME UTILITY BUILDING
15	FRAME BAY
16	FRAME OVERHANG
17	FRAME HALF-STORY
18	ATTIC-UNFINISHED
19	ATTIC-FINISHED
20	MASONRY
21	OPEN MASONRY PORCH
22	ENCL MASONRY PORCH
23	MASONRY GARAGE
24	MASONRY UTILITY BUILDING
25	MASONRY BAY
26	MASONRY OVERHANG
27	MASONRY HALF-STORY
28	PART-ATTIC-FINISHED
30	OPEN CARPORT
31	WOOD DECKS
32	CANOPY
33	CONC/BRICK PATIO
34	FGST/TILE PATIO
35	MAS STOOP/TERRACE
36	ATTACH GREENHOUSE
50	UNF BASEMENT
51	FIN BSMT REC
52	FIN BSMT LA
53	SUB BSMT
99	MISC BLDG TOTAL

31 rows selected.

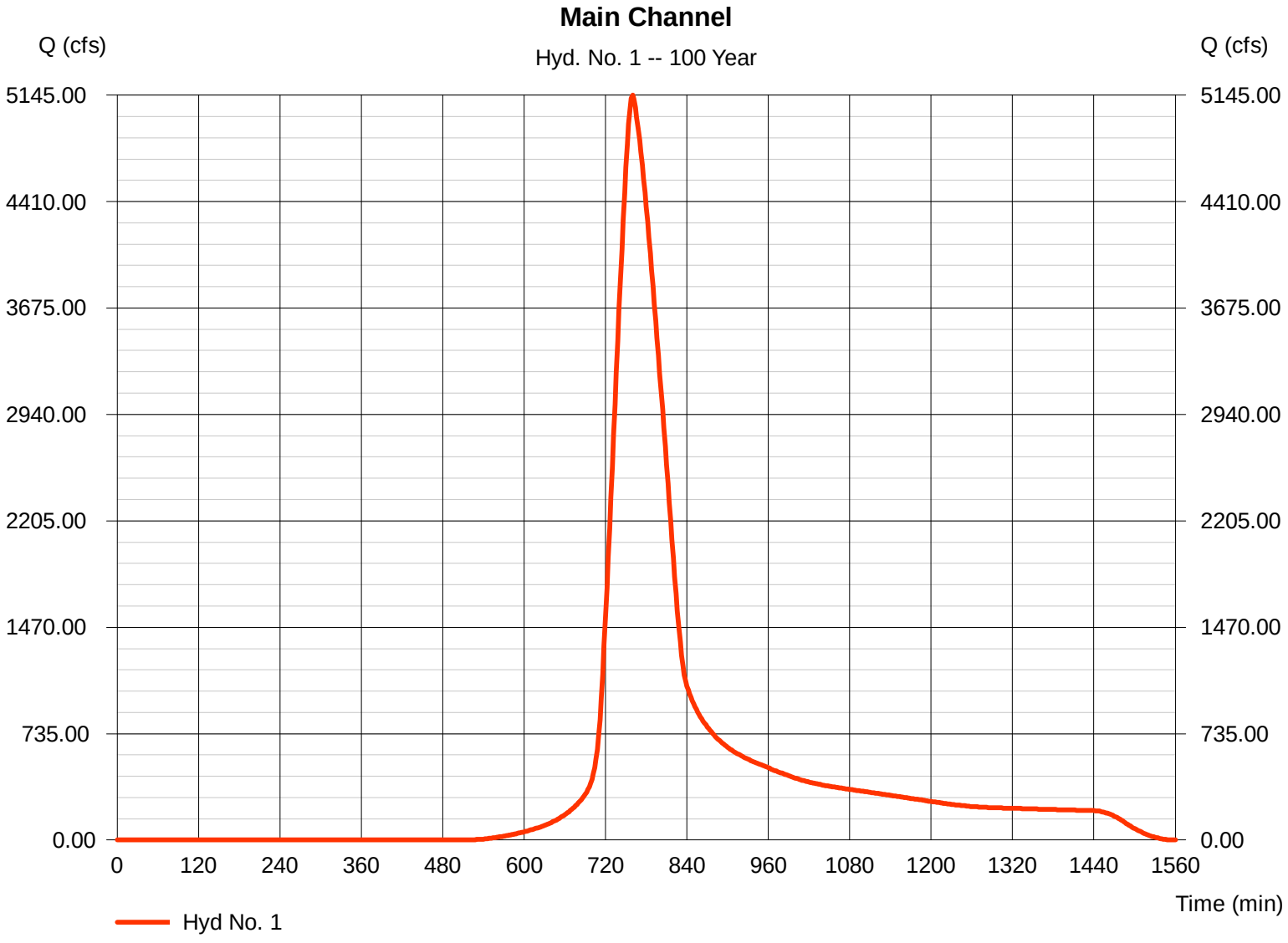
Hydrograph Report

Hydraflow Hydrographs by Intelisolve v9.2 — Monday, Jan 20, 2014

Hyd. No. 1

Main Channel

Hydrograph type	=	SCS Runoff	Peak discharge	=	5143.98 cfs
Storm frequency	=	100 yrs	Time to peak	=	760 min
Time interval	=	2 min	Hyd. volume	=	39,841,530 cuft
Drainage area	=	3535.000 ac	Curve number	=	73
Basin Slope	=	0.6 %	Hydraulic length	=	22000 ft
Tc method	=	TR55	Time of conc. (Tc)	=	76.10 min
Total precip.	=	6.04 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484



TR55 Tc Worksheet

Hyd. No. 1

Main Channel

Description	A	B	C	Totals
Sheet Flow				
Manning's n-value	= 0.240	0.011	0.011	
Flow length (ft)	= 100.0	0.0	0.0	
Two-year 24-hr precip. (in)	= 2.90	0.00	0.00	
Land slope (%)	= 1.00	0.00	0.00	
Travel Time (min)	**= 19.78 +**	**0.00 +**	**0.00 =**	**19.78**
Shallow Concentrated Flow				
Flow length (ft)	= 150.00	0.00	0.00	
Watercourse slope (%)	= 1.00	0.00	0.00	
Surface description	= Unpaved	Paved	Paved	
Average velocity (ft/s)	= 1.61	0.00	0.00	
Travel Time (min)	**= 1.55 +**	**0.00 +**	**0.00 =**	**1.55**
Channel Flow				
X sectional flow area (sqft)	= 200.00	0.00	0.00	
Wetted perimeter (ft)	= 58.00	0.00	0.00	
Channel slope (%)	= 0.60	0.00	0.00	
Manning's n-value	= 0.040	0.015	0.015	
Velocity (ft/s)	= 6.61	0.00	0.00	
Flow length (ft)	= 21750.0	0.0	0.0	
Travel Time (min)	**= 54.82 +**	**0.00 +**	**0.00 =**	**54.82**

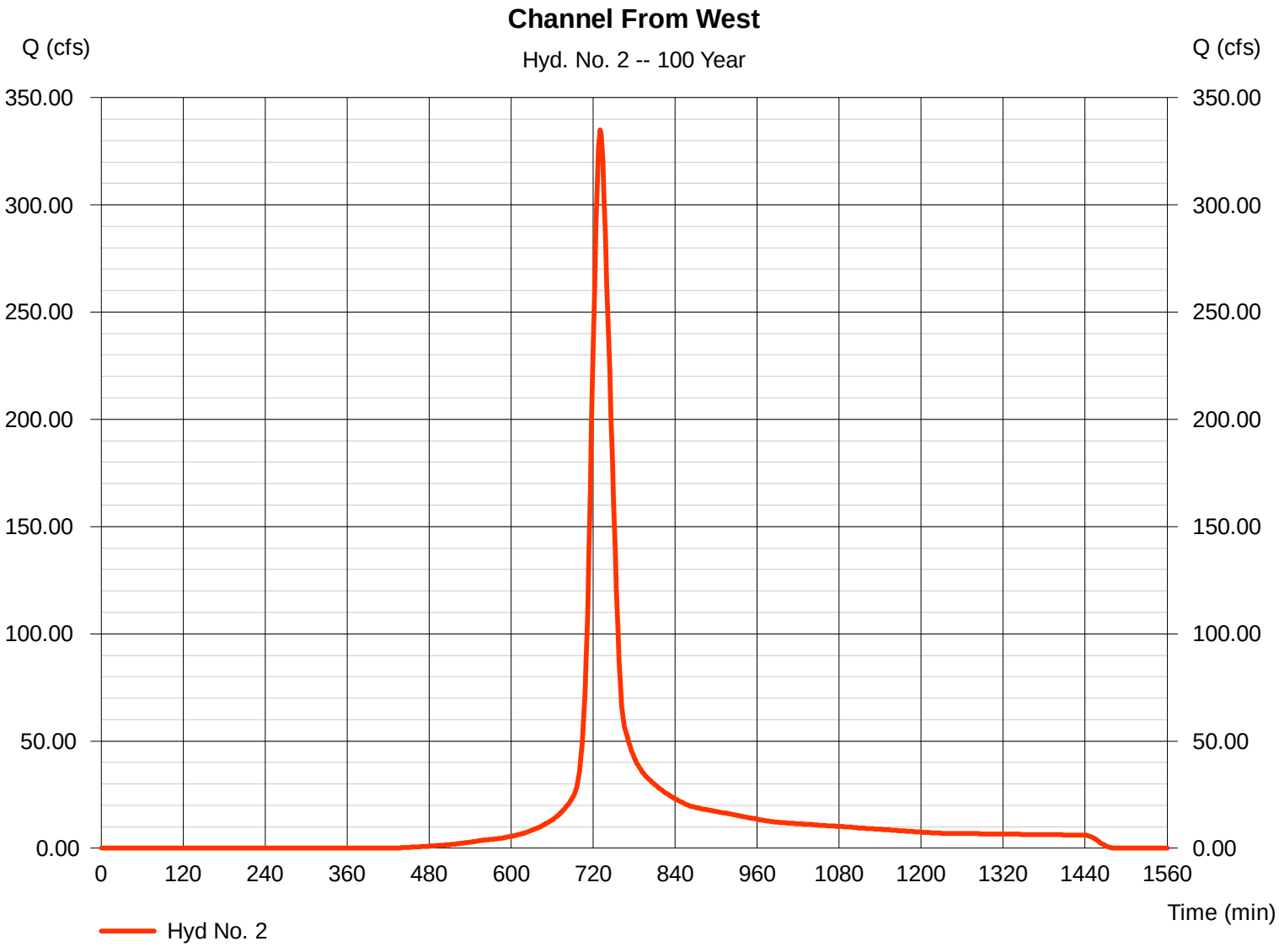
Total Travel Time, Tc ..... 76.10 min

Hydrograph Report

Hyd. No. 2

Channel From West

Hydrograph type	=	SCS Runoff	Peak discharge	=	334.90 cfs
Storm frequency	=	100 yrs	Time to peak	=	730 min
Time interval	=	2 min	Hyd. volume	=	1,338,219 cuft
Drainage area	=	102.000 ac	Curve number	=	78
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	USER	Time of conc. (Tc)	=	30.00 min
Total precip.	=	6.04 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484



Hydraflow Rainfall Report

Return Period (Yrs)	Intensity-Duration-Frequency Equation Coefficients (FHA)			
	B	D	E	(N/A)
1	80.0000	14.0000	1.0000	--------
2	106.0000	17.0000	1.0000	--------
3	118.0000	18.0000	1.0000	--------
5	131.0000	19.0000	1.0000	--------
10	170.0000	23.0000	1.0000	--------
25	230.0000	30.0000	1.0000	--------
50	250.0000	27.0000	1.0000	--------
100	300.0000	31.0000	1.0000	--------

File name: Butlerco.IDF

Intensity = B / (Tc + D)^E

Return Period (Yrs)	Intensity Values (in/hr)											
	5 min	10	15	20	25	30	35	40	45	50	55	60
1	4.21	3.33	2.76	2.35	2.05	1.82	1.63	1.48	1.36	1.25	1.16	1.08
2	4.82	3.93	3.31	2.86	2.52	2.26	2.04	1.86	1.71	1.58	1.47	1.38
3	5.13	4.21	3.58	3.11	2.74	2.46	2.23	2.03	1.87	1.74	1.62	1.51
5	5.46	4.52	3.85	3.36	2.98	2.67	2.43	2.22	2.05	1.90	1.77	1.66
10	6.07	5.15	4.47	3.95	3.54	3.21	2.93	2.70	2.50	2.33	2.18	2.05
25	6.57	5.75	5.11	4.60	4.18	3.83	3.54	3.29	3.07	2.88	2.71	2.56
50	7.81	6.76	5.95	5.32	4.81	4.39	4.03	3.73	3.47	3.25	3.05	2.87
100	8.33	7.32	6.52	5.88	5.36	4.92	4.55	4.23	3.95	3.70	3.49	3.30

Tc = time in minutes. Values may exceed 60.

Precip. file name: Butler.pcp

Storm Distribution	Rainfall Precipitation Table (in)							
	1-yr	2-yr	3-yr	5-yr	10-yr	25-yr	50-yr	100-yr
SCS 24-hour	2.33	2.86	0.00	3.49	3.99	4.70	5.32	6.04
SCS 6-Hr	0.00	1.80	0.00	0.00	2.60	0.00	0.00	4.00
Huff-1st	0.00	1.55	0.00	2.75	4.00	5.38	6.50	8.00
Huff-2nd	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-3rd	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-4th	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-Indy	0.00	1.55	0.00	2.75	4.00	5.38	6.50	8.00
Custom	0.00	1.75	0.00	2.80	3.90	5.25	6.00	7.10

HEC-RAS Version 4.1.0 Jan 2010
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: Dry Run Flood Study
Project File : DryRun.prj
Run Date and Time: 6/5/2019 3:38:47 PM

Project in English units

Project Description:
Existing and Proposed Condtions for Dry Run Creek through Venice Crossing
Subdivision.
Located in Butler County Ohio.
Study updated 2-25-2019 with
most recent bridge construction plans.
Study performed by Bayer Becker.

PLAN DATA
Plan Title: Dry Run - Existing Conditions
Plan File : j:\2013\13M074-000\CV\Design Calcs\Flood Study\Venice Crossing Phase 2 Report Rev 190606\HECRAS System Files\DryRun.p01
Geometry Title: Dry Run Flood Study Ex Conditions
Geometry File : j:\2013\13M074-000\CV\Design Calcs\Flood Study\Venice Crossing Phase 2 Report Rev 190606\HECRAS System Files\DryRun.g03
Flow Title : 100 Year Flow
Flow File : j:\2013\13M074-000\CV\Design Calcs\Flood Study\Venice Crossing Phase 2 Report Rev 190606\HECRAS System Files\DryRun.f01

Plan Summary Information:
Number of: Cross Sections = 17 Multiple Openings = 0
Culverts = 0 Inline Structures = 0
Bridges = 0 Lateral Structures = 0

Computational Information
Water surface calculation tolerance = 0.01
Critical depth calculation tolerance = 0.01
Maximum number of iterations = 20
Maximum difference tolerance = 0.3
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: 100 Year Flow
Flow File : j:\2013\13M074-000\CV\Design Calcs\Flood Study\Venice Crossing Phase 2 Report Rev 190606\HECRAS System Files\DryRun.f01

Flow Data (cfs)

River	Reach	RS	100 Yr	50 Yr	25 Yr	10 Yr	5 Yr
Dry Run	Flood Study Site	0.551	5144	4139	3304	2393	1793
Dry Run	Flood Study Site	0.445	5479	4415	3531	2565	1928

Boundary Conditions

River	Reach	Profile	Upstream	Downstream
Dry Run	Flood Study Site	100 Yr		Normal S = 0.0046
Dry Run	Flood Study Site	50 Yr		Normal S = 0.0046

GEOMETRY DATA
Geometry Title: Dry Run Flood Study Ex Conditions
Geometry File : j:\2013\13M074-000\CV\Design Calcs\Flood Study\Venice Crossing Phase 2 Report Rev 190606\HECRAS System Files\DryRun.g03

CROSS SECTION
RIVER: Dry Run
REACH: Flood Study Site   RS: 0.551

INPUT
Description:
Station Elevation Data   num=   144

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	585.46	1.12	585.56	2.81	585.69	11.43	586.46	15.37	586.85
18.97	587.18	24.76	587.69	25.23	587.72	30.39	587.98	33.24	588.04
35.52	588.03	38.3	587.93	41.72	587.72	42.02	587.69	45.54	587.25
47.44	587.03	51.31	586.52	57.83	585.69	59.59	585.46	64.41	584.84
70.37	584.07	73.34	583.69	80.61	582.75	85.43	582.13	87.18	581.9
88.82	581.69	95.69	580.82	102.21	580.01	104.82	579.69	111.43	578.89
115.56	578.56	121.32	578.14	123.64	577.92	127.57	577.69	129.23	577.68
134.23	577.65	139.52	577.64	148.08	577.62	156.49	577.61	156.73	577.61
157.11	577.61	157.7	577.61	158.8	577.62	159.23	577.62	159.44	577.62
159.53	577.62	159.59	577.62	160.53	577.62	161.49	577.61	165.84	577.59
171.31	577.56	176.62	577.54	181.14	577.53	186.29	577.52	191.38	577.51
192.44	577.51	193.27	577.5	198.6	577.48	200.53	577.48	205.25	577.45
206.4	577.44	206.74	577.44	206.84	577.44	210.59	577.44	214.67	577.42
216.43	577.39	217.8	577.37	220.18	577.34	222.9	577.3	224.35	577.28
230.25	577.23	231.26	577.22	238.74	577.15	247.55	577.07	253.23	577
258.42	576.95	264.79	576.88	270.51	576.82	273.77	576.79	280.58	576.74
283.69	576.73	286.41	576.73	289.13	576.72	292.8	576.73	296.47	576.73
301.56	576.73	306.64	576.72	309.89	576.72	313.1	576.72	314.49	576.71
319.38	576.69	323.07	576.68	324.52	576.68	326.38	576.68	328.51	576.69
330.1	576.71	331.04	576.73	331.57	576.76	361.07	576.5	407.7	576.05
421.91	568.36	432.04	566.32	447.03	565.47	453.6	563.25	460.82	562.41
473.14	563.48	486.83	566.96	505.79	568.72	525.55	568.11	532.64	569.61
560.61	571.95	582.72	573.43	602.77	574.98	612.18	577.18	620.03	583.63
629.38	590.61	633.09	591.92	646.06	594.34	667.06	596.26	691.84	598.05
716.03	599.69	718.13	599.69	722.44	599.69	726.85	599.69	730.74	599.69
736.69	599.69	738.28	599.69	742.54	599.69	745.26	599.69	748.03	599.69
750.97	599.69	756.4	599.69	758.72	599.69	762.03	599.69	766.22	599.69
770.01	599.69	773.46	599.69	775.57	599.69	819.25	600.03	907.28	601.38
911.47	601.44	913.73	601.48	917.51	601.53	922.54	601.46		

Manning's n Values   num=   3

Sta	n Val	Sta	n Val	Sta	n Val
0	.06	453.6	.04	473.14	.06

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
453.6	473.14	210.99	224.07	236.88	.1	.3

CROSS SECTION OUTPUT Profile #100 Yr

			Left OB	Channel	Right OB
E.G. Elev (ft)	574.87	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.71	Wt. n-Val.	0.060	0.040	0.060
W.S. Elev (ft)	574.16	Reach Len. (ft)	210.99	224.07	236.88
Crit W.S. (ft)		Flow Area (sq ft)	288.53	220.01	524.04
E.G. Slope (ft/ft)	0.002621	Area (sq ft)	288.53	220.01	524.04
Q Total (cfs)	5144.00	Flow (cfs)	1272.59	2095.28	1776.13
Top Width (ft)	181.00	Top Width (ft)	42.41	19.54	119.05
Vel Total (ft/s)	4.98	Avg. Vel. (ft/s)	4.41	9.52	3.39
Max Chl Dpth (ft)	11.75	Hydr. Depth (ft)	6.80	11.26	4.40
Conv. Total (cfs)	100472.0	Conv. (cfs)	24856.1	40924.8	34691.1
Length Wtd. (ft)	223.40	Wetted Per. (ft)	44.47	19.64	119.91
Min Ch El (ft)	562.41	Shear (lb/sq ft)	1.06	1.83	0.72
Alpha	1.84	Stream Power (lb/ft s)	922.54	0.00	0.00
Frctn Loss (ft)	0.55	Cum Volume (acre-ft)	18.80	26.14	11.53
C & E Loss (ft)	0.02	Cum SA (acres)	5.09	2.47	3.29

CROSS SECTION
RIVER: Dry Run
REACH: Flood Study Site   RS: 0.513

INPUT
Description:
Station Elevation Data num= 91

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	575.98	21.78	575.7	26.49	575.7	28.06	575.7	50.38	575.71
81.17	575.69	85.42	575.69	88.6	575.51	89.62	575.47	90.94	575.41
97.94	575.06	103.55	574.83	110.61	574.48	114.11	574.33	126.32	573.69
126.75	573.62	127.35	573.54	129.93	573.17	135.43	572.4	142.81	573.14
157.9	573.16	164.58	572.04	171.95	570.27	188.77	569.66	202.28	567.85
214.9	567.24	233.77	566.21	242.31	562.58	249.06	561.96	274.94	562
279.12	564.08	289.21	569.16	292.51	574.99	297.77	577.85	318.6	590.34
339.99	592.6	382.39	593.55	388.04	593.49	388.44	593.52	388.62	593.54
394.97	593.47	395.21	593.5	401.28	593.44	406.96	593.38	412.28	593.33
417.76	593.3	425.88	593.3	434.04	593.31	442.26	593.31	448.76	593.4
453.82	593.53	458.42	593.67	458.98	593.69	459.43	593.73	461.84	593.98
464.87	594.23	467.37	594.53	479.2	595.47	480.31	595.56	481.94	595.69
490.82	596.31	493.29	596.48	496.33	596.65	501.54	597	505.93	597.15
507.41	597.23	508.28	597.27	509.37	597.3	514.21	597.37	515.54	597.43
523.48	597.44	524.27	597.48	529.6	597.46	533.11	597.48	536.5	597.55
540.39	597.69	545.71	597.8	546.14	597.8	550.96	597.9	555.29	597.99
556.44	597.97	557.37	597.97	557.82	597.96	567.94	597.94	637.71	599.63
638.96	599.62	639.14	599.62	641.04	599.69	642.9	599.69	645.11	599.69
650.01	599.69								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.06	242.31	.04	279.12	.06

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
242.31	279.12	162	178.88	194.96	.1	.3

CROSS SECTION OUTPUT Profile #100 Yr

E.G. Elev (ft)	574.30	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.91	Wt. n-Val.	0.060	0.040	0.060
W.S. Elev (ft)	573.39	Reach Len. (ft)	162.00	178.88	194.96
Crit W.S. (ft)		Flow Area (sq ft)	430.04	413.62	73.38
E.G. Slope (ft/ft)	0.002312	Area (sq ft)	430.04	413.62	73.38
Q Total (cfs)	5144.00	Flow (cfs)	1232.10	3672.28	239.62
Top Width (ft)	163.21	Top Width (ft)	113.92	36.81	12.48
Vel Total (ft/s)	5.61	Avg. Vel. (ft/s)	2.87	8.88	3.27
Max Chl Dpth (ft)	11.43	Hydr. Depth (ft)	3.78	11.24	5.88
Conv. Total (cfs)	106975.9	Conv. (cfs)	25623.0	76369.6	4983.3
Length Wtd. (ft)	174.52	Wetted Per. (ft)	115.24	37.33	16.16
Min Ch El (ft)	561.96	Shear (lb/sq ft)	0.54	1.60	0.66
Alpha	1.87	Stream Power (lb/ft s)	650.01	0.00	0.00
Frctn Loss (ft)	0.48	Cum Volume (acre-ft)	17.06	24.51	9.90
C & E Loss (ft)	0.01	Cum SA (acres)	4.72	2.32	2.94

CROSS SECTION
RIVER: Dry Run
REACH: Flood Study Site RS: 0.486
INPUT
Description: Increased Channel n to avoid inverse WS slope
Station Elevation Data num= 48

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	576.14	37.52	575.71	39.5	575.7	53.88	575.7	55	575.7
59.78	575.7	61.88	575.7	63.33	575.7	68.14	575.7	70.39	575.7
82.57	575.7	86.17	575.7	88	575.7	92.43	575.7	96.67	575.7
101.95	575.7	102.32	575.7	106.95	575.7	109.14	575.7	112.2	575.7
115.25	575.69	118.87	575.69	124.93	575.69	126.31	575.33	132.13	573.84
132.86	573.69	158.21	572.48	159.02	572.57	178.93	572.46	190.94	569.46
205.43	567.12	218.47	567.1	231.32	567.73	262.91	566.8	273.86	567.98
282.38	562.27	285.79	560.9	295.76	561.17	306.12	561.85	339.11	582
345	585.42	357.28	591.33	366.8	596.65	368.17	596.8	370.03	596.81
374.01	596.83	377.65	597.05	378.1	597.07				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.06	282.38	.045	306.12	.06

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
282.38	306.12	216	225	233.94	.1	.3

CROSS SECTION OUTPUT Profile #100 Yr

E.G. Elev (ft)	573.81	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.88	Wt. n-Val.	0.060	0.045	0.060
W.S. Elev (ft)	572.93	Reach Len. (ft)	216.00	225.00	233.94
Crit W.S. (ft)		Flow Area (sq ft)	553.88	275.48	100.42
E.G. Slope (ft/ft)	0.003398	Area (sq ft)	553.88	275.48	100.42
Q Total (cfs)	5144.00	Flow (cfs)	2040.02	2695.76	408.22
Top Width (ft)	175.38	Top Width (ft)	133.50	23.74	18.13
Vel Total (ft/s)	5.53	Avg. Vel. (ft/s)	3.68	9.79	4.07
Max Chl Dpth (ft)	12.03	Hydr. Depth (ft)	4.15	11.60	5.54
Conv. Total (cfs)	88250.1	Conv. (cfs)	34998.4	46248.3	7003.4
Length Wtd. (ft)	220.96	Wetted Per. (ft)	135.90	24.03	21.25
Min Ch El (ft)	560.90	Shear (lb/sq ft)	0.86	2.43	1.00
Alpha	1.86	Stream Power (lb/ft s)	378.10	0.00	0.00
Frctn Loss (ft)	0.43	Cum Volume (acre-ft)	15.23	23.09	9.51
C & E Loss (ft)	0.15	Cum SA (acres)	4.26	2.20	2.87

CROSS SECTION
RIVER: Dry Run
REACH: Flood Study Site   RS: 0.445
INPUT
Description:
Station Elevation Data   num=   73

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	576.6	4.35	576.6	7.7	576.61	10.98	576.62	32.16	576.4
64.55	576.06	65.67	576.04	69.74	575.98	85.4	575.83	86.1	575.82
99.73	575.69	114.71	574.13	116.85	573.91	117.32	573.88	117.57	573.86
117.8	573.86	118.05	573.86	118.4	573.86	119.35	573.88	120.61	573.69
122.23	573.69	134.37	573.68	144.55	573.67	144.74	573.67	145.07	573.67
155.36	573.68	159.68	573.68	166.74	573.69	177.37	573.69	201.64	573.69
202.19	573.48	203.56	572.97	229.97	566.78	238.26	564.16	255.87	566.04
263.78	565.32	287.87	565.72	302.86	566.79	315.52	565.96	322.94	564.11
327.26	564.55	341.4	564.61	351.6	562.17	365.15	560.57	373.71	560.02
376.42	560.6	379.57	562.74	385.98	576.21	388.35	576.15	401.2	575.9
422.54	576.22	452.83	577.05	457.3	577.14	459.56	577.18	466.73	577.33
468.25	577.35	476.29	577.52	484.75	577.69	486.6	577.72	486.79	577.73
497.14	577.92	505.62	578.08	507.72	578.14	510.67	578.23	523.39	578.52
532.01	578.81	536.42	578.92	551.69	579.46	553	579.49	558.42	579.69
566.47	579.87	567.5	579.87	572.04	579.97				

Manning's n Values   num=   3

Sta	n Val	Sta	n Val	Sta	n Val
0	.06	351.6	.04	379.57	.06

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
351.6	379.57	156	156.94	159.06	.1	.3

CROSS SECTION OUTPUT Profile #100 Yr

E.G. Elev (ft)	573.23	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.39	Wt. n-Val.	0.060	0.040	0.060
W.S. Elev (ft)	572.83	Reach Len. (ft)	156.00	156.94	159.06
Crit W.S. (ft)		Flow Area (sq ft)	995.85	331.70	24.23
E.G. Slope (ft/ft)	0.001312	Area (sq ft)	995.85	331.70	24.23
Q Total (cfs)	5479.00	Flow (cfs)	3166.04	2276.55	36.42
Top Width (ft)	180.22	Top Width (ft)	147.45	27.97	4.80
Vel Total (ft/s)	4.05	Avg. Vel. (ft/s)	3.18	6.86	1.50
Max Chl Dpth (ft)	12.81	Hydr. Depth (ft)	6.75	11.86	5.05
Conv. Total (cfs)	151239.4	Conv. (cfs)	87393.6	62840.7	1005.2
Length Wtd. (ft)	156.62	Wetted Per. (ft)	149.29	28.80	11.18
Min Ch El (ft)	560.02	Shear (lb/sq ft)	0.55	0.94	0.18
Alpha	1.55	Stream Power (lb/ft s)	572.04	0.00	0.00
Frctn Loss (ft)	0.39	Cum Volume (acre-ft)	11.39	21.52	9.18
C & E Loss (ft)	0.19	Cum SA (acres)	3.56	2.07	2.81

CROSS SECTION
RIVER: Dry Run
REACH: Flood Study Site   RS: 0.419

INPUT
Description:
Station Elevation Data   num=   74

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	577.31	21.95	577	29.42	576.86	51.25	576.54	59.46	576.42
64.5	576.35	71.58	576.26	76.89	576.19	79.63	576.15	82	576.12

87.45	575.98	90.82	575.92	100.46	575.69	109.28	575.42	114.85	575.29
120.04	575.19	127.64	575.06	133.09	574.97	137.84	574.89	144.23	574.77
145.48	574.75	150.79	574.66	157.29	574.59	161.99	574.51	162.95	574.51
168.19	574.49	171.18	574.46	176.39	574.39	186.09	574.25	197.8	574.07
212.1	573.86	235.4	572.73	252.86	565.83	275.42	562.26	282.15	563.62
288.56	563.56	295.35	559.83	299.9	557.68	303.07	557.34	306.56	557.65
309.44	558.36	324.41	568.53	335.27	568.87	350.1	569.22	357.71	572.54
364.6	574.66	376.41	574.76	384.37	574.85	390.49	577.02	393.38	577.02
397.5	574.64	403.52	573.86	407.28	574.71	409.32	574.73	410.07	574.73
410.67	574.73	411.18	574.72	411.87	574.68	412.85	574.59	415.9	574.39
417.2	574.34	419.55	574.29	421.87	574.27	424.71	574.27	428.17	574.28
433.82	574.32	435.67	574.33	441.94	574.38	445.6	574.4	449.56	574.43
451.47	574.46	453.97	574.49	457.09	574.55	457.66	574.56		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.06	295.35	.04	309.44	.06

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
295.35	309.44	170.6	134	77.06	.1	.3

CROSS SECTION OUTPUT Profile #100 Yr

E.G. Elev (ft)	572.65	Element	Left OB	Channel	Right OB
Vel Head (ft)	2.24	Wt. n-Val.	0.060	0.040	0.060
W.S. Elev (ft)	570.40	Reach Len. (ft)	170.60	134.00	77.06
Crit W.S. (ft)	568.53	Flow Area (sq ft)	322.83	174.60	144.33
E.G. Slope (ft/ft)	0.006693	Area (sq ft)	322.83	174.60	144.33
Q Total (cfs)	5479.00	Flow (cfs)	2095.42	2763.61	619.98
Top Width (ft)	111.52	Top Width (ft)	54.06	14.09	43.37
Vel Total (ft/s)	8.54	Avg. Vel. (ft/s)	6.49	15.83	4.30
Max Chl Dpth (ft)	13.06	Hydr. Depth (ft)	5.97	12.39	3.33
Conv. Total (cfs)	66969.5	Conv. (cfs)	25612.2	33779.4	7578.0
Length Wtd. (ft)	137.84	Wetted Per. (ft)	56.30	14.69	46.75
Min Ch El (ft)	557.34	Shear (lb/sq ft)	2.40	4.97	1.29
Alpha	1.98	Stream Power (lb/ft s)	457.66	0.00	0.00
Frctn Loss (ft)	0.75	Cum Volume (acre-ft)	9.03	20.61	8.87
C & E Loss (ft)	0.22	Cum SA (acres)	3.20	1.99	2.72

CROSS SECTION
RIVER: Dry Run
REACH: Flood Study Site RS: 0.396
INPUT
Description:
Station Elevation Data num= 89

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	595.69	3.42	595.69	5.84	595.69	8.61	595.69	13.71	595.69
16.97	595.69	21.03	595.69	25.98	595.69	26.36	595.53	26.96	595.46
27.94	595.31	37.04	593.69	39.12	593.15	39.97	593.13	41.2	593.03
48.94	592.04	50.31	591.83	51.5	591.69	57.06	590.96	67.54	590.02
68.82	589.88	71.03	589.69	81.2	589.07	96.47	587.69	103.29	587.08
105.5	586.87	116.25	585.69	117.27	585.55	118.38	585.45	126.15	584.71
133.88	584.04	136.67	583.69	136.83	583.67	144.25	582.9	155.32	581.75
155.97	581.69	168.23	580.79	172.98	580.46	184.52	579.74	184.57	579.74
184.7	579.72	184.77	579.72	185.04	579.71	185.35	579.69	191.31	579.44
192.85	579.39	193.73	579.35	199.93	579.09	203.35	578.92	208.35	578.69
215.81	578.3	218.47	578.18	227.77	577.69	230.33	577.56	231.9	577.48
244.25	576.86	255.37	576.3	259.8	576.07	262.1	575.96	267.58	575.69
273.99	575.38	276.92	575.23	286.5	574.75	295.64	574.25	298.78	574.1
302.21	574.07	323.28	574.07	339.21	571.28	358.73	567.89	380.84	563.78
399.58	559.9	403.18	559.32	406.75	559.45	416.93	559.58	426.78	560.21
431.2	561.68	440.42	562.8	449.69	569.34	454.89	572.54	461.11	573.07
465.42	573.67	475.32	573.65	499.03	573.49	507.9	573.75	522.85	573.26
544.07	573.62	548.37	573.69	580.18	574.27	589.85	574.48		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.06	399.58	.04	426.78	.06

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
399.58	426.78	219.03	204.96	130.53	.1	.3

Ineffective Flow num= 1

Sta L	Sta R	Elev	Permanent
0	207.8	579.19	F

CROSS SECTION OUTPUT Profile #100 Yr

E.G. Elev (ft)	571.68	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.52	Wt. n-Val.	0.060	0.040	0.060
W.S. Elev (ft)	570.16	Reach Len. (ft)	219.03	204.96	130.53
Crit W.S. (ft)	568.03	Flow Area (sq ft)	266.25	285.86	152.16
E.G. Slope (ft/ft)	0.004493	Area (sq ft)	266.25	285.86	152.16
Q Total (cfs)	5479.00	Flow (cfs)	1266.70	3409.44	802.86
Top Width (ft)	105.35	Top Width (ft)	53.91	27.20	24.24
Vel Total (ft/s)	7.78	Avg. Vel. (ft/s)	4.76	11.93	5.28
Max Chl Dpth (ft)	10.84	Hydr. Depth (ft)	4.94	10.51	6.28
Conv. Total (cfs)	81737.0	Conv. (cfs)	18896.9	50862.9	11977.3
Length Wtd. (ft)	195.96	Wetted Per. (ft)	54.88	27.27	26.85
Min Ch El (ft)	559.32	Shear (lb/sq ft)	1.36	2.94	1.59
Alpha	1.62	Stream Power (lb/ft s)	589.85	0.00	0.00
Frctn Loss (ft)	0.85	Cum Volume (acre-ft)	7.88	19.90	8.61
C & E Loss (ft)	0.04	Cum SA (acres)	2.99	1.93	2.66

CROSS SECTION
RIVER: Dry Run
REACH: Flood Study Site RS: 0.361
INPUT
Description:
Station Elevation Data num= 172

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	579.42	6.48	579.4	10.41	579.3	12.3	579.26	16.2	579.28
18.46	579.23	25.16	579.26	26.61	579.22	27.41	579.19	33.1	579.2
34.69	579.16	39.78	579.15	42.6	579.08	47.44	579.05	50.91	578.96
55.75	578.91	60.19	578.79	66.18	578.63	70.68	578.55	78.57	578.33
81.05	578.27	91.65	577.98	92.82	577.95	101.82	577.69	111.12	577.41
113.65	577.38	125.65	577.07	129.58	577.04	138.93	576.82	144.36	576.78
151.99	576.73	160.21	576.57	166.25	576.45	170.88	576.36	174.55	576.29
177.35	576.25	179.12	576.22	182.18	576.18	185.78	576.12	188.98	576.07
192.97	576.02	197.15	575.96	198.29	575.94	208.41	575.87	214.51	575.84
214.87	575.84	215.37	575.84	217.99	575.85	219.01	575.85	219.87	575.85
220.52	575.85	221.24	575.86	222.14	575.86	222.77	575.86	230.21	575.84
237.8	575.82	238.43	575.83	246.09	575.8	254.13	575.78	254.44	575.78
262.61	575.75	262.83	575.75	268.88	575.74	275.05	575.72	275.27	575.72
280.64	575.7	280.7	575.7	286.08	575.69	288.2	575.69	292.97	575.63
293.32	575.62	300.12	575.52	308.72	575.48	309.48	575.47	317.96	575.42
319	575.42	319.75	575.42	327.68	575.35	328.61	575.36	336.16	575.3
337.85	575.32	345.22	575.27	347.07	575.29	348.06	575.29	355.42	575.24
357.06	575.22	362.4	575.18	364.92	575.14	370.03	575.11	372.99	575.06
377.7	574.99	381.33	574.93	385.69	574.87	389.56	574.82	393.92	574.74
397.43	574.7	402.55	574.61	405.67	574.57	410.01	574.5	413.53	574.46
418.23	574.39	421.25	574.36	426.29	574.28	428.82	574.25	436.08	574.14
438.02	574.12	446.02	573.99	447.65	573.96	456.79	573.77	457.11	573.76
460.81	573.69	466.85	573.57	467.31	573.57	472.47	573.52	477.39	573.48
478.2	573.46	485.92	573.43	486.89	573.42	494.39	573.38	495.89	573.35
501.27	573.33	503.11	573.29	508.31	573.27	509.76	573.22	513.12	573.12
515.15	573.05	519.04	572.84	523.14	572.71	526.63	572.52	532.37	572.35
534.73	572.24	538.84	572.16	540.29	571.8	566.05	571.37	592.12	570.91
616.19	571.12	629.57	570.93	636.32	570.76	644.01	569.08	649.15	568.35
654.3	563.05	658.94	561.19	663.75	558.96	666.03	558.42	676.3	558.99
683.58	559.85	688.91	561.86	697.09	561.34	706.71	559.75	714.8	562.44
722.76	563.6	728.26	564.1	735.4	567.66	745.41	571.9	759.26	572.67
772.07	572.56	775.15	572.52	799.32	572.61	823.67	573.63	828.36	573.69
829.18	573.71	829.25	573.71	829.34	573.71	835.75	573.89	836.5	573.9
842.37	574.05	845.27	574.06	852.82	574.25	855.06	574.26	861.6	574.41
866.83	574.53	867.45	574.53						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.06	663.75	.04	706.71	.06

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
663.75	706.71	237.09	240	241.89	.1	.3

Ineffective Flow num= 1

Sta L	Sta R	Elev	Permanent
0	395.71	575.32	T

CROSS SECTION OUTPUT Profile #100 Yr

E.G. Elev (ft)	570.79	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.40	Wt. n-Val.	0.060	0.040	0.060
W.S. Elev (ft)	569.40	Reach Len. (ft)	237.09	240.00	241.89

Crit W.S. (ft)		Flow Area (sq ft)	101.40	401.35	177.14
E.G. Slope (ft/ft)	0.004152	Area (sq ft)	101.40	401.35	177.14
Q Total (cfs)	5479.00	Flow (cfs)	418.57	4219.59	840.85
Top Width (ft)	96.95	Top Width (ft)	21.20	42.96	32.79
Vel Total (ft/s)	8.06	Avg. Vel. (ft/s)	4.13	10.51	4.75
Max Chl Dpth (ft)	10.98	Hydr. Depth (ft)	4.78	9.34	5.40
Conv. Total (cfs)	85029.5	Conv. (cfs)	6495.9	65484.4	13049.2
Length Wtd. (ft)	239.80	Wetted Per. (ft)	24.37	43.60	34.53
Min Ch El (ft)	558.42	Shear (lb/sq ft)	1.08	2.39	1.33
Alpha	1.38	Stream Power (lb/ft s)	867.45	0.00	0.00
Frctn Loss (ft)	1.17	Cum Volume (acre-ft)	6.95	18.29	8.11
C & E Loss (ft)	0.07	Cum SA (acres)	2.80	1.76	2.57

CROSS SECTION
RIVER: Dry Run
REACH: Flood Study Site RS: 0.319
INPUT
Description:
Station Elevation Data num= 194

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	578.65	2.77	578.72	7.27	578.88	9.96	578.92	15.53	579.13
17.37	579.14	19.12	579.12	25.04	579.43	26	579.4	28.2	579.38
29.74	579.31	32.2	579.17	33.86	579.07	36.8	578.83	39.65	578.67
44.79	578.33	47.43	578.12	54.6	577.69	54.82	577.68	54.9	577.67
61.49	577.13	64.78	576.78	68.2	576.43	74.46	575.69	75.44	575.52
79.37	574.84	84.24	574	86.04	573.69	96.83	572.05	99.32	571.69
107.35	570.83	113.3	570.39	117.3	570.04	122.79	569.69	125.19	569.55
132.98	569.1	136.22	568.94	141.47	568.64	147.23	568.36	150.06	568.2
158.21	567.82	160.71	567.69	167.87	567.69	169.81	567.69	173.57	567.69
176.53	567.69	181.32	567.69	185.63	567.69	190.22	567.69	191.24	567.69
196.85	567.9	199.52	567.96	204.81	568.1	214.04	568.4	239.11	569.01
267.29	569.69	273.57	569.8	283.8	569.96	284.5	569.97	293.44	570.1
301.05	570.22	304.35	570.24	311.44	570.34	317.22	570.43	320.79	570.44
324.49	570.45	327.99	570.52	332.1	570.53	335.5	570.59	340.16	570.66
344.33	570.72	348.63	570.73	352.79	570.77	357.3	570.78	361.9	570.79
367.11	570.8	368.69	570.8	371.16	570.83	376.91	570.96	384.09	571.12
393.32	571.33	394.86	571.34	401.26	571.49	402.11	571.5	409.03	571.67
409.22	571.67	410	571.69	419.91	572.02	426.1	572.2	429.81	572.29
433.33	572.36	436.32	572.39	439.55	572.4	445	572.38	449.63	572.36
451.77	572.42	455.05	572.51	457.74	572.51	461.68	572.62	464.66	572.71
469.54	572.81	472.87	572.91	476.57	572.99	483.69	573.16	486.13	573.21
494.55	573.42	495.8	573.45	501.07	573.57	501.61	573.58	506.21	573.69
507.4	573.7	516.29	573.79	521.93	573.82	529.21	574	538.96	574.78
565.93	574.7	596.86	574.56	618.34	576.14	628.56	576.68	635.76	579.89
642.34	574.79	647.6	571.69	656.01	566.69	660.85	565.95	673.47	565.5
678.29	563.27	683.93	563.66	692.52	560.93	698.01	559.83	707.72	557.26
713.35	556.61	723.01	556.99	728.37	557.51	732.38	557.25	735.24	556.87
740.91	561.05	747.25	563.93	756.26	571.27	761.11	576.78	765.16	580.38
770.74	580.01	777.91	580.06	780.75	579.77	792.66	579.66	801.18	579.79
825.71	579.56	850.09	580.34	864.78	580.46	894.73	580.72	914.38	580.89
922.47	580.93	929.75	580.97	929.91	580.96	931.31	580.96	934.39	580.98
938.35	581.01	942.58	581.04	946.99	581.08	951.48	581.13	954.39	581.16
959.61	581.22	974.34	581.37	992.31	581.55	993.15	581.56	1005.48	581.69
1015.94	581.99	1019.02	582.06	1033.03	582.45	1040.58	582.62	1049.69	582.86
1061.05	583.1	1066.01	583.23	1068.02	583.27	1079.78	583.53	1080.51	583.55
1087.19	583.69	1093.45	583.87	1100.46	584.01	1110.5	584.21	1111.65	584.24
1113.64	584.29	1121.85	584.46	1124.43	584.53	1130.8	584.67	1136.92	584.81
1141.74	584.92	1146.94	585.03	1153.14	585.16	1156.23	585.22	1164.02	585.37
1165.8	585.41	1166.8	585.43	1174.78	585.58	1175.04	585.59		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.06	707.72	.04	735.24	.06

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
707.72	735.24	306.16	307.08	310.08	.1	.3

Ineffective Flow num= 1

Sta L	Sta R	Elev	Permanent
0	635	585	F

CROSS SECTION OUTPUT Profile #100 Yr

E.G. Elev (ft)	569.56	Element	Left OB	Channel	Right OB
Vel Head (ft)	2.09	Wt. n-Val.	0.060	0.040	0.060
W.S. Elev (ft)	567.46	Reach Len. (ft)	306.16	307.08	310.08
Crit W.S. (ft)	566.44	Flow Area (sq ft)	235.25	287.22	87.41

E.G. Slope (ft/ft)	0.005774	Area (sq ft)	235.25	287.22	87.41
Q Total (cfs)	5479.00	Flow (cfs)	1171.30	3862.09	445.61
Top Width (ft)	96.88	Top Width (ft)	53.01	27.52	16.35
Vel Total (ft/s)	8.98	Avg. Vel. (ft/s)	4.98	13.45	5.10
Max Chl Dpth (ft)	10.85	Hydr. Depth (ft)	4.44	10.44	5.35
Conv. Total (cfs)	72106.2	Conv. (cfs)	15414.8	50826.9	5864.5
Length Wtd. (ft)	307.20	Wetted Per. (ft)	54.66	27.62	19.60
Min Ch El (ft)	556.61	Shear (lb/sq ft)	1.55	3.75	1.61
Alpha	1.67	Stream Power (lb/ft s)	1175.04	0.00	0.00
Frctn Loss (ft)	1.41	Cum Volume (acre-ft)	6.03	16.39	7.38
C & E Loss (ft)	0.21	Cum SA (acres)	2.60	1.57	2.44

CROSS SECTION
RIVER: Dry Run
REACH: Flood Study Site RS: 0.261
INPUT
Description:
Station Elevation Data num= 150

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	573.69	.9	573.69	19.53	573.68	25.51	573.68	27.18	573.68
31.93	573.68	35.06	573.68	37.74	573.68	43.27	573.69	45.48	573.69
50.81	573.69	55.09	573.69	58.52	573.69	64.78	573.69	68.4	573.69
70.3	573.67	82.69	573.49	88.05	573.53	93.61	573.56	101.29	573.6
106.51	573.61	106.74	573.61	107.27	573.62	107.7	573.62	108.22	573.63
108.4	573.63	108.56	573.63	108.84	573.63	109.17	573.63	109.58	573.62
109.66	573.62	109.79	573.62	110.03	573.62	110.37	573.61	111.05	573.61
116.09	573.6	116.85	573.6	121.48	573.58	121.98	573.57	122.46	573.57
128.19	573.53	129.57	573.52	137.11	573.46	138.62	573.45	138.82	573.44
148.55	573.35	149.21	573.35	150.25	573.34	155.87	573.28	157.2	573.27
157.54	573.27	160.91	573.31	163.09	573.31	165.84	573.26	170.31	573.18
173.46	573.13	177.36	573.06	182.3	572.98	188.78	572.87	197.61	572.72
199.54	572.7	204.71	572.63	208.07	572.57	211.14	572.46	225.52	572.31
225.57	572.31	225.64	572.31	248.25	572.69	255.29	572.78	272.12	573.09
282.49	562.98	286.74	558.97	287.48	558.62	289.39	558.05	293.4	556.82
305.05	556.98	308.72	556.94	310.67	556.93	323.24	557.07	329.01	557.23
329.99	557.26	330.09	557.26	330.59	557.3	333.12	557.39	333.3	557.47
333.6	557.54	336.09	557.54	337.04	557.54	337.99	557.23	338.7	557.08
339.39	556.83	339.7	556.77	340.91	557.03	341.34	557.12	343.89	560.43
345.35	562.04	352.19	562.16	357.08	562.16	362.3	562.17	363.84	562.22
365.41	562.81	366.33	563.14	368.18	563.95	379.39	568.33	388.3	572.73
388.53	572.83	388.78	572.95	395.34	572.73	407.06	572.37	414.6	572.48
431.33	572.69	431.47	572.69	431.73	572.7	431.83	572.7	433.04	572.71
438.51	572.75	476.08	573.03	480.08	573.06	481.47	573.08	486.41	573.17
487.02	573.18	490.23	573.23	492.23	573.27	500.68	573.39	502	573.41
511.29	573.55	512.08	573.56	520.88	573.67	521.01	573.67	522.94	573.69
530.22	573.8	539.26	573.92	540.08	573.93	548.34	574.04	549.57	574.06
557.33	574.16	559.58	574.2	566.66	574.29	569.53	574.34	575.91	574.42
579.42	574.49	585.25	574.58	589.45	574.66	594.42	574.73	599.33	574.84
605.08	574.95	608.06	575.01	610.64	575.05	616.98	575.18	618.59	575.21

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.06	293.4	.04	341.34	.06

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
293.4	341.34	114.33	114.33	.1	.3

CROSS SECTION OUTPUT Profile #100 Yr

E.G. Elev (ft)	567.93	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.39	Wt. n-Val.	0.060	0.040	0.060
W.S. Elev (ft)	566.54	Reach Len. (ft)	114.33	114.33	114.33
Crit W.S. (ft)		Flow Area (sq ft)	88.10	454.37	132.67
E.G. Slope (ft/ft)	0.003752	Area (sq ft)	88.10	454.37	132.67
Q Total (cfs)	5479.00	Flow (cfs)	385.93	4618.55	474.52
Top Width (ft)	95.98	Top Width (ft)	14.56	47.94	33.47
Vel Total (ft/s)	8.12	Avg. Vel. (ft/s)	4.38	10.16	3.58
Max Chl Dpth (ft)	9.77	Hydr. Depth (ft)	6.05	9.48	3.96
Conv. Total (cfs)	89449.2	Conv. (cfs)	6300.6	75401.6	7747.0
Length Wtd. (ft)	114.33	Wetted Per. (ft)	17.95	48.12	36.64
Min Ch El (ft)	556.77	Shear (lb/sq ft)	1.15	2.21	0.85
Alpha	1.36	Stream Power (lb/ft s)	618.59	0.00	0.00
Frctn Loss (ft)	0.42	Cum Volume (acre-ft)	4.90	13.77	6.60
C & E Loss (ft)	0.06	Cum SA (acres)	2.36	1.30	2.26

CROSS SECTION
RIVER: Dry Run
REACH: Flood Study Site RS: 0.239
INPUT
Description: Increased Channel n to avoid inverse WS slope
Station Elevation Data num= 259

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	571.48	6.92	571.5	65.87	571.03	66.58	571.06	68.25	571.01
73.02	570.9	74.61	570.86	75.45	570.88	77.13	570.84	80.19	570.78
82.01	570.75	83.4	570.75	87.78	570.72	92.19	570.69	94.77	570.69
99.01	570.66	101.65	570.66	103.35	570.65	107.3	570.64	111.26	570.64
115.24	570.64	116.8	570.62	120.86	570.62	126.36	570.61	131.94	570.6
134.4	570.57	138.99	570.56	143.65	570.55	147.24	570.54	150.91	570.52
157.05	570.5	163.13	570.46	169.38	570.41	176.02	570.35	183.35	570.28
193.35	570.16	207.95	569.98	217.96	569.85	229.66	569.69	229.74	569.69
264.95	568.74	277.56	568.4	302.85	567.69	307.75	567.5	314.25	567.25
336.7	566.39	355.86	565.69	360.2	565.69	361.91	565.69	366.1	565.69
373.95	565.69	376.24	565.69	380.6	565.69	383.56	565.69	389.44	565.69
393.1	565.69	401.27	565.69	402.63	565.69	403.2	565.69	403.29	565.69
408.35	565.95	410.52	566.07	417.47	566.49	425.27	566.93	430.21	567.23
438.32	567.69	441.19	567.86	456.02	568.7	465.82	569.26	468.7	569.43
473.57	569.69	481.69	570	482.98	570.03	491.97	570.35	494.56	570.39
498.06	570.47	501.89	570.57	508.2	570.77	514.79	570.95	518.93	571.08
527.26	571.29	529.46	571.35	530.7	571.38	538.55	571.57	538.98	571.58
543.35	571.69	546.4	571.72	554.4	571.79	561.8	571.86	566.99	571.92
571.76	571.99	575.94	572.06	579.8	572.12	589.06	572.07	598.98	572.01
599.02	571.92	600.11	571.86	602.3	571.81	605.93	571.76	612.17	571.69
612.51	571.69	622.95	571.57	624.33	571.55	633.22	571.45	634.02	571.44
645.28	571.31	648.15	571.28	655.99	571.19	659.96	571.15	664.51	571.1
669.19	571.05	674.02	570.95	676.27	570.92	682.86	570.97	685.44	570.97
690.58	570.91	695.67	570.96	698.97	570.84	713.1	570.95	719.41	571.19
724.55	571.04	737.88	570.82	739.58	570.75	741.47	570.76	743.7	569.72
750.62	566.17	753.35	564.62	755.1	564.26	756.52	563.97	760.56	562.88
764.98	558.47	766.1	557.44	767.63	556.95	768.14	556.42	768.29	556.27
770.48	554.02	772.33	553.05	773.66	552.3	774.14	552.06	774.94	552.28
777.53	552.84	779.15	553.3	779.94	553.22	781.09	554.66	781.39	555.12
782.37	554.99	786.3	555.49	790.01	556.26	793.44	556.75	800.23	556.53
806.24	556.71	809.2	556.85	811.46	556.29	813.46	555.75	816.16	555.71
817.78	555.66	820.16	555.88	821.23	556	822.34	557.69	824.2	561.47
827.82	562.44	830.68	562.93	841.43	567.8	847.04	569.88	848.52	570.63
850.92	570.57	860.3	570.33	863.96	570.2	872.59	570.11	880.72	569.95
884.76	569.9	894.78	569.72	899.58	569.65	904.1	569.63	910.86	569.62
918.67	569.6	918.81	569.61	924.48	569.61	930.12	569.61	936.79	569.61
943.45	569.6	949.52	569.61	955.61	569.61	960.37	569.62	965.15	569.62
969.8	569.69	971.65	569.69	971.74	569.69	974.68	569.69	975.26	569.69
976.77	569.69	977.85	569.69	978.71	569.69	979.08	569.69	980.49	569.72
983.18	569.8	984.86	569.88	986.74	569.96	992.16	569.86	995.76	569.82
1000.55	569.81	1005.43	569.81	1006	569.81	1011.7	569.84	1013.1	569.84
1019.29	569.89	1020.8	569.9	1029.5	569.98	1031.92	569.99	1037.71	570.05
1039.22	570.06	1044.82	570.12	1046.61	570.12	1053.97	570.21	1055.78	570.21
1062.65	570.28	1064.73	570.29	1070.93	570.36	1073.51	570.36	1079.36	570.42
1082.19	570.43	1087.71	570.48	1090.49	570.49	1095.91	570.54	1098.88	570.54
1104.01	570.59	1107.15	570.59	1112.01	570.64	1116.66	570.63	1121.34	570.68
1124.11	570.7	1126.77	570.72	1130.46	570.74	1133.93	570.75	1136.87	570.76
1139.91	570.76	1143.28	570.75	1147.62	570.74	1150.49	570.72	1153.44	570.71
1157.65	570.69	1162.58	570.68	1166.87	570.66	1171.1	570.64	1175.79	570.64
1180.09	570.61	1184.27	570.61	1188.66	570.58	1192.71	570.58	1196.77	570.58
1198.91	570.59	1202.4	570.6	1205.55	570.59	1209.03	570.6	1212.18	570.58
1216.87	570.56	1219.21	570.53	1222.69	570.49	1225.74	570.46		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.06	773.66	.045	821.23	.06

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
773.66 821.23 180 178.04 175.96 .1 .3

Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
0	700	580	F
860	1225.74	580	F

CROSS SECTION OUTPUT Profile #100 Yr

E.G. Elev (ft)	567.45	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.18	Wt. n-Val.	0.060	0.045	0.060
W.S. Elev (ft)	566.27	Reach Len. (ft)	180.00	178.04	175.96

Crit W.S. (ft)	562.39	Flow Area (sq ft)	140.53	504.88	61.14
E.G. Slope (ft/ft)	0.003530	Area (sq ft)	176.01	504.88	61.14
Q Total (cfs)	5479.00	Flow (cfs)	608.18	4687.31	183.51
Top Width (ft)	161.60	Top Width (ft)	97.20	47.57	16.83
Vel Total (ft/s)	7.75	Avg. Vel. (ft/s)	4.33	9.28	3.00
Max Chl Dpth (ft)	14.21	Hydr. Depth (ft)	6.05	10.61	3.63
Conv. Total (cfs)	92213.1	Conv. (cfs)	10235.8	78888.8	3088.5
Length Wtd. (ft)	178.09	Wetted Per. (ft)	27.86	49.05	20.98
Min Ch El (ft)	552.06	Shear (lb/sq ft)	1.11	2.27	0.64
Alpha	1.27	Stream Power (lb/ft s)	1225.74	0.00	0.00
Frctn Loss (ft)	0.39	Cum Volume (acre-ft)	4.55	12.52	6.34
C & E Loss (ft)	0.16	Cum SA (acres)	2.21	1.18	2.19

CROSS SECTION
RIVER: Dry Run
REACH: Flood Study Site RS: 0.206
INPUT
Description:
Station Elevation Data num= 237

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	571.69	2.7	571.69	8.31	571.69	12.44	571.69	15.84	571.69
20.15	571.69	26.55	571.69	29.85	571.69	47.66	571.69	49.06	571.69
54.88	571.69	56.16	571.69	62.04	571.69	82.76	571.69	87.5	571.69
91.95	571.69	94.06	571.65	94.32	571.65	103.9	571.46	105.75	571.42
114.59	571.25	118.39	571.17	127.98	570.97	134.39	570.83	141.93	570.67
151.25	570.47	156.5	570.36	169.75	570.06	186.67	569.69	189.05	569.62
202.67	569.27	205.27	569.21	214.14	568.99	220.39	568.86	226.34	568.76
231.35	568.68	237.07	568.57	241.22	568.5	248.01	568.37	251.24	568.32
259.15	568.16	261.1	568.13	269.9	567.95	271	567.93	280.32	567.72
281.44	567.69	294.7	566.92	305.48	566.22	310.08	565.92	313.69	565.69
325.04	565.69	327.4	565.69	330.87	565.69	338.49	565.68	344.73	565.68
351.76	565.68	353.31	565.68	359.08	565.68	361.6	565.68	367.27	565.68
370.77	565.68	376.29	565.69	379.49	565.69	383.24	565.69	389.17	565.69
390.11	565.69	391.44	565.69	401.48	565.69	401.88	565.69	402.42	565.69
410.23	565.69	413.48	565.75	414.22	565.77	424.7	565.99	426.47	566.04
433.48	566.22	435.75	566.29	441.66	566.44	444.81	566.53	449.63	566.65
454.42	566.79	460.44	566.94	463.95	567.03	469.78	567.14	472.3	567.2
478.07	567.27	479.93	567.32	488.43	567.37	489.85	567.4	497.51	567.45
498.56	567.48	499.14	567.48	500.24	567.49	507.85	567.53	512.93	567.58
513.43	567.58	518.55	567.64	522.62	567.69	525.79	567.76	526.19	567.77
533.26	567.94	534.66	567.97	541.59	568.16	544.23	568.23	550.26	568.39
555.72	568.54	559.55	568.63	585.74	568.82	610.02	569	635.08	569.46
640.57	569.61	643.13	564.36	649.1	558.63	654.92	555.21	658	553.82
660.24	553.48	674.56	553.86	678.95	554.15	682.62	555.32	685.72	556.22
691.7	556.45	698.09	557.3	702.59	557.6	710.71	557.07	722.04	556.86
728.61	559.04	739.61	560.15	747.81	565.26	753.27	570.15	758.24	570.29
775.05	569.6	799.63	568.96	826.66	568.78	827.28	568.77	829.35	568.76
831.59	568.76	833.73	568.75	836.34	568.75	839.51	568.75	843.31	568.76
846.05	568.76	848.83	568.77	852.15	568.77	855.51	568.78	858.63	568.79
861.8	568.8	864.3	568.81	866.85	568.82	870.02	568.88	873.54	568.94
879.19	568.93	882	568.93	885.24	568.93	888.29	568.94	891.66	568.96
895.09	568.98	899.86	569.02	903.02	569.04	906.32	569.07	910.9	569.12
915.79	569.17	920.69	569.22	925.95	569.27	931.59	569.33	937.92	569.39
944.78	569.46	952.23	569.54	960.35	569.62	965.93	569.68	967.55	569.69
971.97	569.74	980.28	569.82	987.8	569.88	993.97	569.91	1000.14	569.94
1006.78	569.96	1015.01	569.97	1020.27	569.97	1025.53	569.97	1032.78	569.96
1034.13	569.97	1041.38	569.96	1048.24	569.95	1049.54	569.96	1056.39	569.95
1057.58	569.96	1064.43	569.95	1066.87	569.97	1068.71	569.98	1073.84	569.99
1075.06	570	1080.15	570	1087.47	570	1090.97	569.98	1096.05	569.95
1101.32	569.92	1103.1	569.94	1110.29	569.92	1112.56	569.95	1120.69	569.95
1121.94	569.96	1127.67	569.97	1129.05	569.99	1134.71	569.99	1136.25	570.01
1142.58	570.03	1144.34	570.06	1150.52	570.08	1152.54	570.1	1158.57	570.13
1164.35	570.16	1166.75	570.2	1171.66	570.23	1174.6	570.28	1179.32	570.31
1182.78	570.36	1186.68	570.4	1190.35	570.44	1194.48	570.5	1197.75	570.54
1202.65	570.61	1205.71	570.65	1211.48	570.74	1214.55	570.78	1221.37	570.88
1229.56	571	1240.09	571.17	1248.35	571.29	1258.03	571.43	1259.46	571.45
1270.12	571.6	1270.61	571.61	1270.91	571.61	1276.44	571.69	1281.63	571.8
1282.32	571.81	1290.8	571.99						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.06	658	.04	722.04	.06

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
658	722.04	212.94	210 208.95	.1	.3

Ineffective Flow num= 1

Sta L	Sta R	Elev	Permanent
0	626.05	570.21	F

CROSS SECTION OUTPUT Profile #100 Yr

E.G. Elev (ft)	566.90	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.65	Wt. n-Val.	0.060	0.040	0.060
W.S. Elev (ft)	566.26	Reach Len. (ft)	212.94	210.00	208.95
Crit W.S. (ft)	561.49	Flow Area (sq ft)	119.79	673.62	157.50
E.G. Slope (ft/ft)	0.001505	Area (sq ft)	184.66	673.62	157.50
Q Total (cfs)	5479.00	Flow (cfs)	373.25	4639.58	466.17
Top Width (ft)	236.42	Top Width (ft)	145.50	64.04	26.88
Vel Total (ft/s)	5.76	Avg. Vel. (ft/s)	3.12	6.89	2.96
Max Chl Dpth (ft)	12.78	Hydr. Depth (ft)	7.58	10.52	5.86
Conv. Total (cfs)	141222.2	Conv. (cfs)	9620.5	119586.0	12015.7
Length Wtd. (ft)	210.13	Wetted Per. (ft)	20.51	64.48	29.13
Min Ch El (ft)	553.48	Shear (lb/sq ft)	0.55	0.98	0.51
Alpha	1.25	Stream Power (lb/ft s)	1290.80	0.00	0.00
Frctn Loss (ft)	0.36	Cum Volume (acre-ft)	3.81	10.11	5.90
C & E Loss (ft)	0.04	Cum SA (acres)	1.71	0.95	2.10

CROSS SECTION
RIVER: Dry Run
REACH: Flood Study Site   RS: 0.170
INPUT
Description:
Station Elevation Data   num=   290

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	571.69	.43	571.69	1.36	571.69	6.39	571.69	10.52	571.69
11.61	571.69	16.76	571.69	19.61	571.69	24.53	571.69	26.29	571.69
35.4	571.69	44.07	571.68	56.07	571.68	66.13	571.68	68.41	571.68
72.53	571.68	74.87	571.68	78.74	571.68	81.84	571.68	84.61	571.68
88.61	571.68	91.44	571.68	95.17	571.68	99.79	571.68	103.26	571.68
105.01	571.68	108.26	571.68	111.67	571.68	156.76	571.68	191.71	571.67
242.06	571.68	242.92	571.68	246.59	571.68	247.38	571.68	283.6	571.28
284.26	571.35	285.69	571.41	287.86	571.46	291.11	571.5	295.52	571.52
300.61	571.54	301.23	571.53	305.79	571.53	306.47	571.52	311.04	571.51
312.66	571.49	313.77	571.48	314.58	571.46	318.27	571.4	323.18	571.37
324.88	571.34	326.67	571.32	332.4	571.26	335.08	571.22	341.78	571.13
345.16	571.1	349.05	571.05	358.57	570.91	363.6	570.85	368.1	570.8
377.71	570.66	382.16	570.6	387.44	570.54	396.64	570.43	400.39	570.38
405.77	570.32	408.9	570.28	412.75	570.24	416.47	570.21	416.94	570.2
425.18	570.1	427.94	570.08	436.85	569.97	437.26	569.96	439.07	569.95
448.7	569.83	448.99	569.82	449.94	569.81	450.36	569.81	459.46	569.69
461.36	569.65	461.67	569.64	473.81	569.37	476.11	569.32	485.88	569.12
490.37	569.02	498.41	568.84	505.16	568.69	510.99	568.57	520.79	568.34
524.66	568.25	537.68	567.93	538.62	567.91	539.35	567.9	547.13	567.69
549.9	567.59	550.72	567.56	560.66	567.22	564.82	567.1	572.77	566.84
576.61	566.71	579.91	566.62	584.9	566.52	589.78	566.4	593.46	566.32
598.94	566.19	601.43	566.13	606.36	566.02	612.07	565.89	612.31	565.91
621.47	565.7	621.66	565.7	622.24	565.69	631.55	565.6	653.07	564.88
676.77	564.4	702.36	564	706.44	564.1	718.76	563.93	724.84	562.19
729.45	562.02	741.4	555.99	744.42	555.54	747.45	554.49	752.35	555.14
760.57	555.01	771.96	553.87	780.2	552.2	784.9	551.49	787.62	550.99
792.67	552.82	795.89	560.96	799.61	561.98	804.83	563.73	813.07	566.56
816.21	566.96	824.84	566.65	831.81	566.65	857.31	567.04	883.57	567.2
885.32	567.82	885.74	567.82	894.84	567.81	903.98	567.81	912.77	567.79
913.03	567.79	921.93	567.77	922.04	567.77	922.19	567.77	922.27	567.77
922.58	567.76	928.51	567.76	928.69	567.76	934.65	567.75	934.9	567.75
942.38	567.76	942.85	567.76	943.7	567.74	943.99	567.74	944.15	567.73
944.35	567.73	944.43	567.73	944.59	567.72	944.67	567.72	944.7	567.72
944.77	567.72	944.82	567.72	944.89	567.72	944.95	567.72	945.02	567.72
945.11	567.72	945.22	567.72	945.37	567.72	945.57	567.72	945.75	567.72
945.9	567.72	945.99	567.73	946.1	567.73	946.27	567.73	946.36	567.73
946.46	567.73	946.55	567.73	946.66	567.73	946.76	567.73	946.92	567.73
947.12	567.73	947.43	567.74	948.96	567.75	949.38	567.76	959.55	567.79
968.69	567.82	969.28	567.82	978.22	567.86	988.27	567.9	989.15	567.91
998.89	567.94	1008.21	567.98	1009.23	567.99	1017.77	568.03	1019	568.03
1027.26	568.07	1035.17	568.11	1036.81	568.11	1044.48	568.15	1051.83	568.18
1054.24	568.19	1055.83	568.19	1060	568.22	1061.7	568.22	1065.81	568.25
1068.28	568.25	1072.35	568.29	1074.97	568.29	1080.99	568.33	1083.65	568.34
1089.46	568.38	1092.31	568.38	1097.92	568.42	1130.01	568.48	1159.99	568.5
1164.56	568.48	1167.64	568.48	1172.19	568.49	1176.65	568.47	1181.3	568.45
1184.46	568.45	1188.81	568.43	1193.36	568.4	1198.11	568.37	1204.93	568.33
1206.44	568.33	1210.7	568.32	1213.34	568.32	1216.23	568.33	1220.28	568.34
1222.57	568.35	1226.31	568.34	1228.59	568.35	1233.19	568.37	1237.42	568.4

1239.29	568.41	1242.35	568.4	1244.25	568.42	1247.94	568.45	1250.04	568.47
1253.31	568.48	1265.97	568.63	1271.2	568.69	1274.55	568.71	1280.38	568.78
1283.39	568.81	1288.09	568.86	1293.26	568.92	1297.01	568.95	1304.43	569.03
1308.55	569.08	1316.61	569.16	1318.78	569.19	1327.13	569.27	1328.87	569.29
1337.92	569.38	1348.08	569.49	1356.13	569.59	1363.21	569.69	1364	569.71
1364.25	569.72	1379.14	570.2	1384.58	570.38	1399.12	570.86	1409.34	571.2
1424.54	571.69	1431.51	571.93	1434.32	572.02	1448.86	572.5	1458.49	572.81
1469.08	573.17	1474.52	573.35	1484.66	573.69	1485.99	573.72	1486.29	573.73
1498.78	574.02	1503.52	574.08	1513.61	574.31	1518.01	574.36	1523.19	574.42
1530.43	574.51	1541.26	574.72	1547.26	574.84	1551.96	574.93	1554.24	574.97

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.06	741.4	.04	792.67	.06

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
741.4	792.67	169.96	165.04	160.96	.1	.3

CROSS SECTION OUTPUT Profile #100 Yr

E.G. Elev (ft)	566.50	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.02	Wt. n-Val.	0.060	0.040	0.060
W.S. Elev (ft)	565.48	Reach Len. (ft)	169.96	165.04	160.96
Crit W.S. (ft)		Flow Area (sq ft)	189.63	598.53	60.75
E.G. Slope (ft/ft)	0.001992	Area (sq ft)	189.63	598.53	60.75
Q Total (cfs)	5479.00	Flow (cfs)	305.07	5047.49	126.44
Top Width (ft)	174.81	Top Width (ft)	106.28	51.27	17.26
Vel Total (ft/s)	6.45	Avg. Vel. (ft/s)	1.61	8.43	2.08
Max Chl Dpth (ft)	14.49	Hydr. Depth (ft)	1.78	11.67	3.52
Conv. Total (cfs)	122770.0	Conv. (cfs)	6835.8	113101.0	2833.2
Length Wtd. (ft)	164.86	Wetted Per. (ft)	107.98	52.17	23.51
Min Ch El (ft)	550.99	Shear (lb/sq ft)	0.22	1.43	0.32
Alpha	1.58	Stream Power (lb/ft s)	1554.24	0.00	0.00
Frctn Loss (ft)	0.46	Cum Volume (acre-ft)	2.89	7.04	5.38
C & E Loss (ft)	0.09	Cum SA (acres)	1.09	0.67	2.00

CROSS SECTION
RIVER: Dry Run
REACH: Flood Study Site RS: 0.138
INPUT
Description:
Station Elevation Data num= 136

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	570.39	8.97	570.24	9.32	570.24	10.29	570.16	11.21	570.09
16.79	569.75	20.32	569.67	27.52	570.06	35.6	570.98	42.93	571.37
46.93	571.51	52.07	571.64	53.83	571.69	54.65	571.69	58.33	571.69
61.52	571.69	85.22	571.69	88.09	571.69	90.86	571.69	103.53	571.69
106.78	571.69	117.18	571.69	122	571.69	132.76	571.69	135.98	571.69
143.06	571.32	162.57	570.62	174.84	567.43	186.84	565.76	222.25	563.65
248.25	563.78	251.61	563.53	258.45	554.95	263.84	551.66	282.96	552.68
289.81	552.9	292.64	552.56	302.6	556.55	314.71	557.29	326.04	561.08
330.54	561.21	335	562.36	339.35	562.78	341.17	563.22	348.89	563.24
356.56	563.45	377.7	564.04	403.35	564.62	434.33	565.69	450.33	565.88
465.41	566.06	477.74	566.21	483.63	566.26	494.78	566.35	500.78	566.4
506.37	566.44	513.32	566.49	519.72	566.54	525.64	566.58	530.94	566.63
536.44	566.67	542.75	566.71	546.68	566.73	552.36	566.77	556.05	566.8
562.16	566.84	567.29	566.87	573.79	566.93	578.41	566.95	585.3	567.01
589.39	567.03	592.13	567.05	597.41	567.09	599.91	567.1	605.38	567.15
607.13	567.16	614.14	567.2	615.73	567.21	618.21	567.23	623.65	567.26
630.08	567.31	635.34	567.32	636.73	567.33	642.16	567.34	643.65	567.35
649.52	567.35	653.51	567.39	654.65	567.4	659.02	567.44	659.95	567.44
660.2	567.44	660.68	567.44	661.67	567.44	664.69	567.43	666.56	567.43
675.03	567.42	675.55	567.42	681.14	567.4	686.64	567.39	693.77	567.37
700.74	567.35	706.58	567.33	712.29	567.32	717.88	567.3	722.88	567.28
727.77	567.26	732.55	567.25	739.07	567.22	743.22	567.22	746.99	567.22
751.19	567.23	755.97	567.24	760.45	567.26	766.73	567.29	770.81	567.32
775.02	567.34	780.5	567.38	786.22	567.42	793.74	567.47	801.74	567.53
811.28	567.61	821.63	567.69	822.02	567.69	837.8	567.98	850.12	568.21
855.78	568.32	866.2	568.52	874	568.67	881.19	568.8	887.09	568.91
896.46	569.07	900.65	569.15	903.9	569.21	915.43	569.39	919.19	569.46
925.91	569.54								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.06	263.84	.04	292.64	.06

```
Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        263.84  292.64           176.04  176.04  176.04             .1       .3

CROSS SECTION OUTPUT  Profile #100 Yr

  E.G. Elev (ft)            565.95    Element                 Left OB    Channel   Right OB
  Vel Head (ft)               1.90    Wt. n-Val.               0.060      0.040     0.060
  W.S. Elev (ft)            564.05    Reach Len. (ft)         176.04     176.04    176.04
  Crit W.S. (ft)            561.04    Flow Area (sq ft)       101.99     336.19    285.39
  E.G. Slope (ft/ft)      0.004286    Area (sq ft)            101.99     336.19    285.39
  Q Total (cfs)             5479.00   Flow (cfs)              254.83    4202.33   1021.83
  Top Width (ft)             162.35   Top Width (ft)           48.23      28.80     85.32
  Vel Total (ft/s)             7.57   Avg. Vel. (ft/s)          2.50      12.50      3.58
  Max Chl Dpth (ft)           12.39   Hydr. Depth (ft)          2.11      11.67      3.35
  Conv. Total (cfs)         83691.5   Conv. (cfs)             3892.6    64190.5   15608.5
  Length Wtd. (ft)           176.04   Wetted Per. (ft)          53.31      28.85     86.96
  Min Ch El (ft)             551.66   Shear (lb/sq ft)           0.51       3.12      0.88
  Alpha                        2.14   Stream Power (lb/ft s)   925.91       0.00      0.00
  Frctn Loss (ft)              1.00   Cum Volume (acre-ft)       2.32       5.27      4.74
  C & E Loss (ft)              0.04   Cum SA (acres)             0.79       0.52      1.81

CROSS SECTION
RIVER: Dry Run
REACH: Flood Study Site   RS: 0.104

INPUT
Description: Increased Channel n to avoid default to critical depth
Station Elevation Data    num=     181
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0  570.33    5.69  570.46    8.47   570.5      15  570.65   18.34   570.7
   23.14  570.78   27.04  570.85    32.6  570.98   43.65  571.27   59.39  571.69
   60.92  571.69   66.73  571.69   67.05  571.69   71.76  571.69   76.33  571.69
   97.03  571.69  100.76  571.69  105.85  571.69   106.9  571.69  112.31  571.69
  113.84  571.69  134.38  571.69  137.31  571.69  140.59  571.69  154.88  571.69
  160.31  571.69  163.64  571.69   168.3  571.69  175.38  571.69  179.46  571.69
  184.11  571.69  191.17  571.54  193.21  571.49  197.39  571.39  217.35  570.93
  250.21  570.18  256.29  570.04  266.58   569.8  275.72  570.24  295.09  564.06
  304.01  563.51  329.92  562.89  358.36  562.38   381.1  559.58  392.66  558.79
  402.54  552.58  412.23  551.93  420.05  551.17  428.94  552.93  434.47  554.83
  443.03  557.35  453.22  560.06  461.15  561.02  469.89  561.09  486.79  560.93
  505.09  562.38  522.07  563.47  546.98  563.21  554.99  562.95   561.2  562.83
  586.47  562.96  612.07  563.76  613.69  563.86  616.88  563.97  620.08  564.06
  624.45  564.14  630.85  564.26  634.62  564.39  640.13   564.5  643.98  564.64
  648.54  564.79  653.66  564.98  659.05  565.21  666.78  565.54  667.64  565.58
   670.1  565.69   680.3  565.61  681.63  565.58  685.38  565.51  686.34  565.49
  690.39  565.42  691.65  565.08  692.78  565.16  697.31  565.26  704.38  565.42
  706.14  565.38  711.53  565.28  715.99  565.19  717.12  565.11  718.52  565.49
  719.98  565.55  720.33  565.56  720.86  565.57  721.38  565.57  724.32  565.61
  724.75  565.62  727.74  565.65  728.24  565.66  728.72  565.66  731.43   565.7
  731.86   565.7  733.03  565.71  735.79  565.74  736.19  565.74  738.77  565.77
  741.26  565.79  741.53  565.79  743.89  565.82   744.1  565.82  744.29  565.82
  746.48  565.84  746.97  565.84  748.87  565.87  749.04  565.87   751.3   565.9
  751.52   565.9  751.74  565.91  753.83  565.93  755.74  565.96     756  565.96
  757.78  565.98  758.05  565.98  758.32  565.99  759.97     566  760.24  566.01
  761.79  566.02  762.05  566.03  763.51  566.04  764.91  566.05  769.57  566.66
  773.94  566.71  777.95  566.75   781.7  566.78  782.67  566.78  784.59  566.78
  788.43  566.78  792.18  566.78  795.94  566.78  799.69  566.78  803.05  566.78
   806.4  566.79  811.89  566.79  813.65   566.8  817.34   566.8  821.04   566.8
   825.9   566.8  830.76  566.79   834.9  566.79  839.02  566.79  843.12  566.78
  846.84  566.78  850.54  566.78   854.2  566.77  859.28  566.77  862.57  566.77
  865.59  566.78     869  566.79  872.93  566.81  876.66  566.83  881.99  566.86
  885.51  566.89  889.19  566.92  894.04  566.96  899.21     567  906.14  567.05
  913.72  567.12  923.02   567.2  933.44  567.29  941.35  567.36  950.02  567.44
  959.78  567.53   970.6  567.63  977.08  567.69  988.13  567.92  991.96     568
 1013.29  568.43 1025.86  568.69 1040.12  568.95 1048.63  569.13  1053.9  569.23
 1069.83  569.49

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .06  402.54    .045  428.94     .06

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        402.54  428.94           211.05   204.9  202.11             .1       .3
Ineffective Flow     num=       1
   Sta L   Sta R    Elev  Permanent
  522.07 1069.83  568.72       F
```

CROSS SECTION OUTPUT Profile #100 Yr

E.G. Elev (ft)	564.91	Element	Left OB	Channel	Right OB
Vel Head (ft)	2.31	Wt. n-Val.	0.060	0.045	0.060
W.S. Elev (ft)	562.60	Reach Len. (ft)	211.05	204.90	202.11
Crit W.S. (ft)	562.38	Flow Area (sq ft)	145.76	280.34	217.70
E.G. Slope (ft/ft)	0.007919	Area (sq ft)	145.76	280.34	217.70
Q Total (cfs)	5479.00	Flow (cfs)	592.33	3956.72	929.94
Top Width (ft)	162.14	Top Width (ft)	56.22	26.40	79.51
Vel Total (ft/s)	8.51	Avg. Vel. (ft/s)	4.06	14.11	4.27
Max Chl Dpth (ft)	11.43	Hydr. Depth (ft)	2.59	10.62	2.74
Conv. Total (cfs)	61568.0	Conv. (cfs)	6656.1	44462.0	10449.9
Length Wtd. (ft)	204.88	Wetted Per. (ft)	58.21	26.63	80.67
Min Ch El (ft)	551.17	Shear (lb/sq ft)	1.24	5.20	1.33
Alpha	2.05	Stream Power (lb/ft s)	1069.83	0.00	0.00
Frctn Loss (ft)	1.28	Cum Volume (acre-ft)	1.82	4.02	3.72
C & E Loss (ft)	0.17	Cum SA (acres)	0.58	0.41	1.48

CROSS SECTION
RIVER: Dry Run
REACH: Flood Study Site RS: 0.066
INPUT
Description:
Station Elevation Data num= 104

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	571.69	14.1	571.69	42.04	571.69	80.26	571.69	81.99	571.69
82.68	571.68	84.9	571.69	85.06	571.69	85.17	571.69	116.59	571.69
118.59	571.69	137.13	571.69	139.21	571.69	143.7	571.69	148.57	571.69
152.44	571.69	157.95	571.69	160.19	571.69	164.74	571.69	167.26	571.69
171.47	571.69	173.96	571.69	205.92	570.87	248.35	569.69	281.39	569.11
299.53	568.8	312.22	568.59	321.64	568.44	330.34	568.31	336.48	568.22
341.05	568.15	357.42	567.77	357.99	567.76	358.4	567.75	359.21	567.76
360.03	569.1	367.58	565.01	378.87	558.71	387.6	556.62	394.11	551.02
407.29	551.11	421.82	551.62	431.17	556.48	443.28	556.27	454.62	558.03
462.71	558.47	469.15	559.69	487	560	505.42	559.18	525.93	559.5
536.07	562.67	540.42	562.73	545.09	562	551.8	562.42	558.7	561.95
567.82	562.18	576.35	561.49	600.96	561.14	627.05	561.23	653.16	561.66
679.69	561.93	703.01	562.98	733.63	564.19	736.95	563.99	738.28	563.99
745.48	564.21	749.72	564.23	751.09	564.25	753.41	564.29	758.35	564.39
765.27	564.53	775.73	564.74	781.3	564.89	798.07	565.22	802.59	565.34
821.62	565.69	822.76	565.7	822.92	565.7	846.89	565.93	849.93	565.97
854.11	566.02	860.22	566.1	871.36	566.23	887.54	566.43	914.38	566.74
987.27	567.67	988.99	567.69	990.14	567.69	995.46	567.69	998.67	567.73
1017.16	567.96	1031.84	568.13	1048.09	568.33	1056.38	568.45	1065.69	568.58
1078.78	568.75	1091.47	568.94	1114.66	569.3	1138.87	569.69	1159.47	571.17
1166.51	571.69	1187.67	573.34	1192.33	573.69	1193.09	573.73		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.06	394.11	.04	421.82	.06

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
394.11	421.82	162	162	.1	.3

Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
0	193.09		F
535.29	1193.09	573.15	F

CROSS SECTION OUTPUT Profile #100 Yr

E.G. Elev (ft)	563.46	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.76	Wt. n-Val.	0.060	0.040	0.060
W.S. Elev (ft)	561.70	Reach Len. (ft)	162.00	162.00	162.00
Crit W.S. (ft)	561.34	Flow Area (sq ft)	94.54	290.35	360.55
E.G. Slope (ft/ft)	0.005079	Area (sq ft)	94.54	290.35	390.50
Q Total (cfs)	5479.00	Flow (cfs)	419.69	3679.80	1379.51
Top Width (ft)	242.83	Top Width (ft)	20.60	27.71	194.52
Vel Total (ft/s)	7.35	Avg. Vel. (ft/s)	4.44	12.67	3.83
Max Chl Dpth (ft)	10.68	Hydr. Depth (ft)	4.59	10.48	3.24
Conv. Total (cfs)	76880.7	Conv. (cfs)	5889.0	51634.5	19357.1
Length Wtd. (ft)	162.00	Wetted Per. (ft)	23.70	27.72	112.96
Min Ch El (ft)	551.02	Shear (lb/sq ft)	1.26	3.32	1.01
Alpha	2.09	Stream Power (lb/ft s)	1193.09	0.00	0.00
Frctn Loss (ft)	0.78	Cum Volume (acre-ft)	1.24	2.68	2.31
C & E Loss (ft)	0.08	Cum SA (acres)	0.40	0.28	0.84

CROSS SECTION
RIVER: Dry Run
REACH: Flood Study Site RS: 0.035
INPUT
Description:
Station Elevation Data num= 135

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	569.72	3.92	569.85	6.26	569.96	9.02	570.1	11.38	570.21
12.79	570.24	14.94	570.25	17.88	570.26	23.21	570.27	28.51	570.27
33.78	570.28	36.54	570.26	37.89	570.25	38.91	570.25	40.52	570.28
42.28	570.31	45.65	570.38	48.71	570.45	50.82	570.47	51.89	570.47
52.01	570.5	54.25	570.5	56.5	570.49	61.12	570.33	62.07	570.31
65.79	570.25	92.4	569.79	98.91	569.69	102.93	569.49	110.38	569.12
115.29	568.88	117.5	568.82	119.15	568.81	120.5	568.83	121.7	568.88
123.41	568.99	127.82	569.3	133.38	569.69	135.69	569.69	136.61	569.69
147.34	569.69	150.03	569.69	152.14	569.7	162.15	569.7	175.67	569.69
179.62	569.69	182.03	569.63	186.85	569.89	208.5	569.34	218.83	565.66
228.09	564.58	242.88	563.49	255.25	556.2	264.12	554.03	276.04	551.98
289.38	551.25	303.83	551	310.15	555.27	315.53	555.95	326.38	557.75
346.48	558.45	367.5	558.7	393.57	562.88	401.28	563.68	419.37	563.51
434.87	562.76	443.5	562.78	467.28	563.08	470.22	562.59	473.89	562.65
479.47	562.72	483.56	562.79	488.3	562.85	494.32	562.95	499.42	563.05
502.92	563.1	508.76	563.25	518.35	563.57	519	563.58	522.13	563.69
532.43	563.77	533.57	563.78	548.32	563.9	549.77	563.92	563.32	564.03
565.31	564.05	575.32	564.13	584.35	564.21	592.54	564.28	595.86	564.3
602.09	564.35	607.86	564.4	614.8	564.46	621.91	564.5	628.52	564.54
633.4	564.57	636.27	564.59	639.25	564.61	643.6	564.63	648.18	564.66
652.95	564.68	657.96	564.71	663.12	564.73	668.5	564.75	671	564.76
673.93	564.78	678.72	564.81	684	564.86	689.73	564.91	696.7	564.97
704.45	565.04	718.16	565.18	730.28	565.3	740.13	565.41	751.43	565.54
762.42	565.68	762.79	565.69	763.1	565.7	763.15	565.7	771.16	565.92
772.8	565.95	779.79	566.16	782.68	566.2	787.8	566.36	791.49	566.4
796.9	566.57	799.8	566.59	804.89	566.75	807.55	566.75	809.28	566.73
809.88	566.7	831.47	566.77	856.8	566.88	870.46	567.01	885.88	567.14

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.06	264.12	.04	310.15	.06

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
264.12	310.15	183.12	183.12	183.12	.1	.3

CROSS SECTION OUTPUT Profile #100 Yr

			Left OB	Channel	Right OB
E.G. Elev (ft)	562.60	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.49	Wt. n-Val.	0.060	0.040	0.060
W.S. Elev (ft)	561.10	Reach Len. (ft)	183.12	183.12	183.12
Crit W.S. (ft)		Flow Area (sq ft)	73.48	417.55	207.07
E.G. Slope (ft/ft)	0.004592	Area (sq ft)	73.48	417.55	207.07
Q Total (cfs)	5479.00	Flow (cfs)	306.11	4474.78	698.11
Top Width (ft)	135.54	Top Width (ft)	17.19	46.03	72.33
Vel Total (ft/s)	7.85	Avg. Vel. (ft/s)	4.17	10.72	3.37
Max Chl Dpth (ft)	10.10	Hydr. Depth (ft)	4.28	9.07	2.86
Conv. Total (cfs)	80856.6	Conv. (cfs)	4517.5	66036.8	10302.4
Length Wtd. (ft)	183.12	Wetted Per. (ft)	18.78	47.53	72.72
Min Ch El (ft)	551.00	Shear (lb/sq ft)	1.12	2.52	0.82
Alpha	1.56	Stream Power (lb/ft s)	885.88	0.00	0.00
Frctn Loss (ft)	0.84	Cum Volume (acre-ft)	0.93	1.37	1.20
C & E Loss (ft)	0.07	Cum SA (acres)	0.33	0.14	0.34

CROSS SECTION
RIVER: Dry Run
REACH: Flood Study Site RS: 0.000
INPUT
Description:
Station Elevation Data num= 132

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	567.86	.16	567.86	3.93	567.84	8.97	567.81	9.15	567.81
9.4	567.81	10.81	567.81	11.02	567.81	11.11	567.81	11.21	567.81
11.4	567.81	11.66	567.82	12.81	567.83	13.17	567.83	13.33	567.83
13.52	567.83	13.73	567.84	13.92	567.85	14.18	567.85	14.43	567.86
14.64	567.87	14.93	567.9	15.04	567.9	15.21	567.91	15.93	567.91
16.26	567.92	16.9	567.92	17.14	567.92	17.96	567.95	18.08	567.95
18.4	567.97	20.12	568.1	24.57	568.04	30.97	568	31.28	568.02
35.66	568.03	40.22	568.05	40.93	568.07	45.35	568.09	52.43	568.06

54.95	567.97	57.12	567.83	58.67	567.69	66.29	567.04	69.39	566.63
77.45	565.69	83.72	564.9	90.54	563.69	96.06	562.41	99.15	561.69
118.31	561.2	122.27	561.12	135.69	560.79	144.1	560.59	151.72	560.44
157.2	560.34	167.59	560.17	168.9	560.14	170.54	560.11	182.79	559.92
184.19	559.89	193.75	559.74	196.61	559.69	199.99	558.84	201.77	558.66
206.4	558.1	207.64	557.87	209.03	557.69	212.02	557.6	212.98	557.58
215.43	557.12	241.12	557.68	261.93	557.12	276.75	554.72	285.02	552.46
289.97	550.2	298.33	549.72	307.42	549.8	312.14	550.87	315.4	553.48
323.92	556.82	330.66	556.6	338.42	557.07	358.97	556.46	378.75	556.17
396.81	556.92	407.74	562.86	422.76	563.21	447.9	563.35	472.66	563.53
486.03	563.55	492.67	563.69	512.78	563.96	515.27	564.01	542.11	564.38
543.75	564.41	552.58	564.56	569.43	564.8	569.8	564.81	574.6	564.89
588.04	565.09	594.68	565.2	595.11	565.2	611.25	565.48	651.7	565.74
663.92	566.24	693.84	567.56	696.09	567.66	696.26	567.67	696.72	567.69
697.89	567.69	780.59	567.69	785.41	567.69	788.31	567.69	790.12	567.69
818.1	567.68	828.62	567.67	839.64	567.66	845.55	567.66	857.64	567.65
863.45	567.66	867.45	567.66	884.33	567.67	912.39	567.68	917.13	567.68
929.47	567.66	933.29	567.69	951.53	568.32	960.69	568.66	972.06	569.07
987.72	569.69	993.37	570.11						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.06	289.97	.04	312.14	.06

Bank Sta: Left	Right	Coeff Contr.	Expan.
289.97	312.14	.1	.3

CROSS SECTION OUTPUT Profile #100 Yr

E.G. Elev (ft)	561.68	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.25	Wt. n-Val.	0.060	0.040	0.060
W.S. Elev (ft)	560.43	Reach Len. (ft)			
Crit W.S. (ft)	559.57	Flow Area (sq ft)	367.94	232.20	363.22
E.G. Slope (ft/ft)	0.004601	Area (sq ft)	367.94	232.20	363.22
Q Total (cfs)	5479.00	Flow (cfs)	1182.66	2789.75	1506.59
Top Width (ft)	251.09	Top Width (ft)	137.79	22.17	91.13
Vel Total (ft/s)	5.69	Avg. Vel. (ft/s)	3.21	12.01	4.15
Max Chl Dpth (ft)	10.71	Hydr. Depth (ft)	2.67	10.47	3.99
Conv. Total (cfs)	80772.7	Conv. (cfs)	17435.0	41127.2	22210.5
Length Wtd. (ft)		Wetted Per. (ft)	139.02	22.30	93.62
Min Ch El (ft)	549.72	Shear (lb/sq ft)	0.76	2.99	1.11
Alpha	2.49	Stream Power (lb/ft s)	993.37	0.00	0.00
Frctn Loss (ft)		Cum Volume (acre-ft)			
C & E Loss (ft)		Cum SA (acres)			

SUMMARY OF MANNING'S N VALUES

River:Dry Run

Reach	River Sta.	n1	n2	n3
Flood Study Site	0.551	.06	.04	.06
Flood Study Site	0.513	.06	.04	.06
Flood Study Site	0.486	.06	.045	.06
Flood Study Site	0.445	.06	.04	.06
Flood Study Site	0.419	.06	.04	.06
Flood Study Site	0.396	.06	.04	.06
Flood Study Site	0.361	.06	.04	.06
Flood Study Site	0.319	.06	.04	.06
Flood Study Site	0.261	.06	.04	.06
Flood Study Site	0.239	.06	.045	.06
Flood Study Site	0.206	.06	.04	.06
Flood Study Site	0.170	.06	.04	.06
Flood Study Site	0.138	.06	.04	.06
Flood Study Site	0.104	.06	.045	.06
Flood Study Site	0.066	.06	.04	.06
Flood Study Site	0.035	.06	.04	.06
Flood Study Site	0.000	.06	.04	.06

SUMMARY OF REACH LENGTHS

River: Dry Run

Reach	River Sta.	Left	Channel	Right
Flood Study Site	0.551	210.99	224.07	236.88
Flood Study Site	0.513	162	178.88	194.96
Flood Study Site	0.486	216	225	233.94
Flood Study Site	0.445	156	156.94	159.06
Flood Study Site	0.419	170.6	134	77.06
Flood Study Site	0.396	219.03	204.96	130.53

Flood Study Site	0.361	237.09	240	241.89
Flood Study Site	0.319	306.16	307.08	310.08
Flood Study Site	0.261	114.33	114.33	114.33
Flood Study Site	0.239	180	178.04	175.96
Flood Study Site	0.206	212.94	210	208.95
Flood Study Site	0.170	169.96	165.04	160.96
Flood Study Site	0.138	176.04	176.04	176.04
Flood Study Site	0.104	211.05	204.9	202.11
Flood Study Site	0.066	162	162	162
Flood Study Site	0.035	183.12	183.12	183.12
Flood Study Site	0.000			

SUMMARY OF CONTRACTION AND EXPANSION COEFFICIENTS

River: Dry Run

Reach	River Sta.	Contr.	Expan.
Flood Study Site	0.551	.1	.3
Flood Study Site	0.513	.1	.3
Flood Study Site	0.486	.1	.3
Flood Study Site	0.445	.1	.3
Flood Study Site	0.419	.1	.3
Flood Study Site	0.396	.1	.3
Flood Study Site	0.361	.1	.3
Flood Study Site	0.319	.1	.3
Flood Study Site	0.261	.1	.3
Flood Study Site	0.239	.1	.3
Flood Study Site	0.206	.1	.3
Flood Study Site	0.170	.1	.3
Flood Study Site	0.138	.1	.3
Flood Study Site	0.104	.1	.3
Flood Study Site	0.066	.1	.3
Flood Study Site	0.035	.1	.3
Flood Study Site	0.000	.1	.3

ERRORS WARNINGS AND NOTES

Errors Warnings and Notes for Plan : Existing

River: Dry Run Reach: Flood Study Site RS: 0.486 Profile: 100 Yr

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.

River: Dry Run Reach: Flood Study Site RS: 0.445 Profile: 100 Yr

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections. Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.

River: Dry Run Reach: Flood Study Site RS: 0.419 Profile: 100 Yr

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.

Warning: The parabolic search method failed to converge on critical depth. The program will try the cross section slice/secant method to find critical depth.

Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.

River: Dry Run Reach: Flood Study Site RS: 0.361 Profile: 100 Yr

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

River: Dry Run Reach: Flood Study Site RS: 0.319 Profile: 100 Yr

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.

River: Dry Run Reach: Flood Study Site RS: 0.239 Profile: 100 Yr

Warning: Divided flow computed for this cross-section.

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.

Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.

River: Dry Run Reach: Flood Study Site RS: 0.206 Profile: 100 Yr

Warning: Divided flow computed for this cross-section.

Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.

River: Dry Run Reach: Flood Study Site RS: 0.170 Profile: 100 Yr

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.

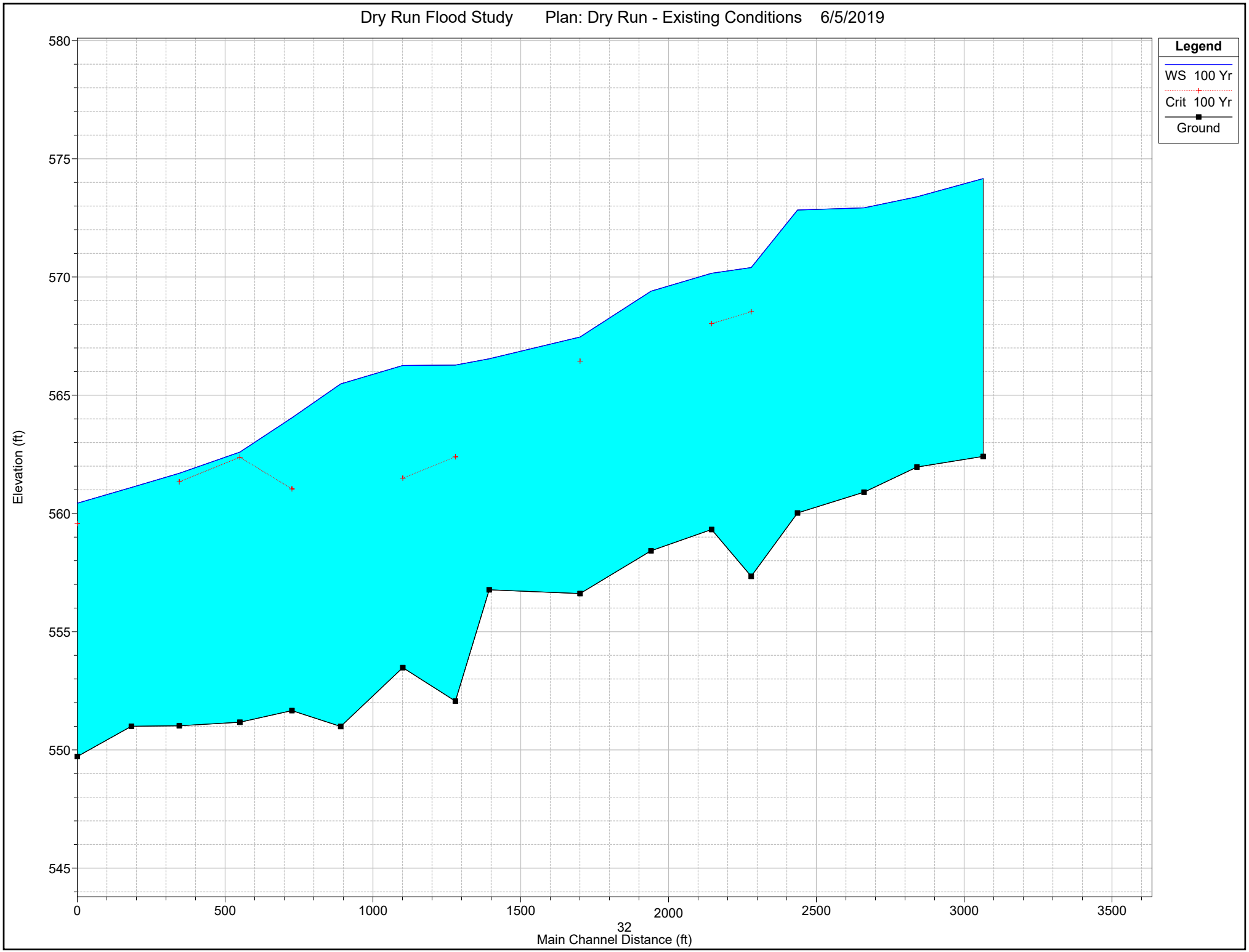
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.

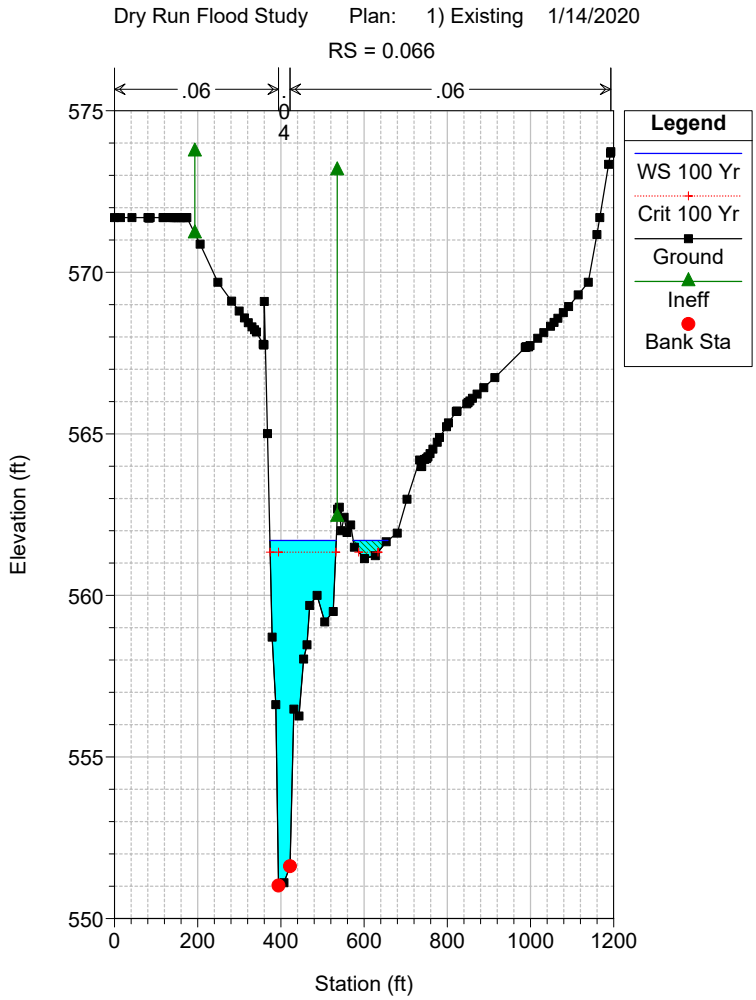
River: Dry Run Reach: Flood Study Site RS: 0.138 Profile: 100 Yr

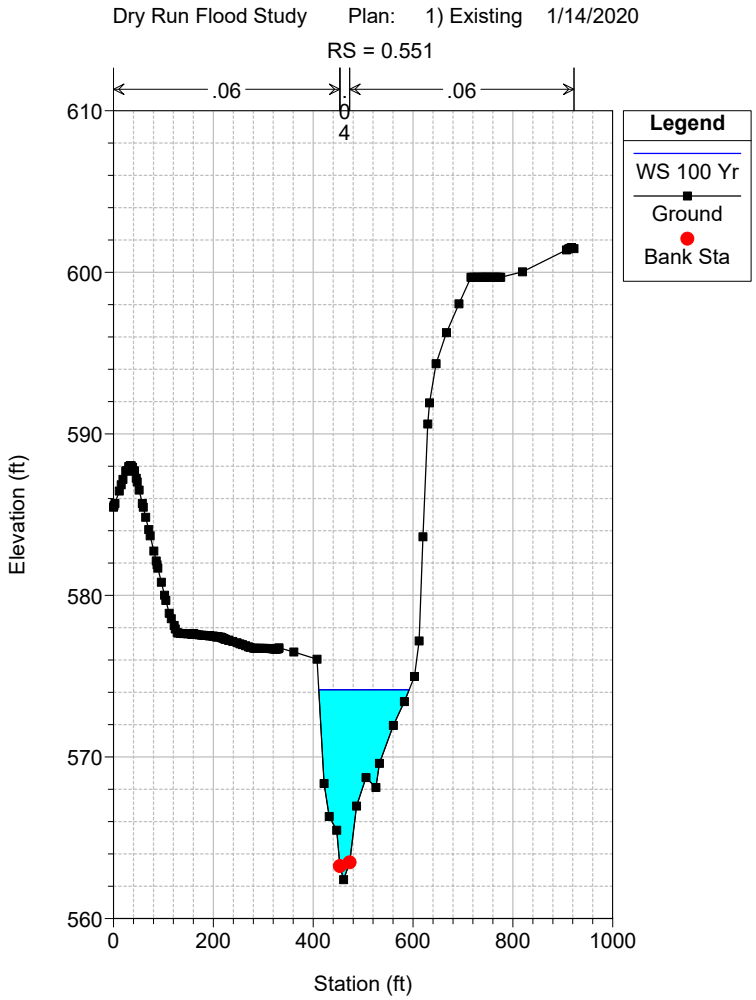
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: Dry Run Reach: Flood Study Site RS: 0.104 Profile: 100 Yr
Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
River: Dry Run Reach: Flood Study Site RS: 0.066 Profile: 100 Yr
   Warning: Divided flow computed for this cross-section.
   Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.

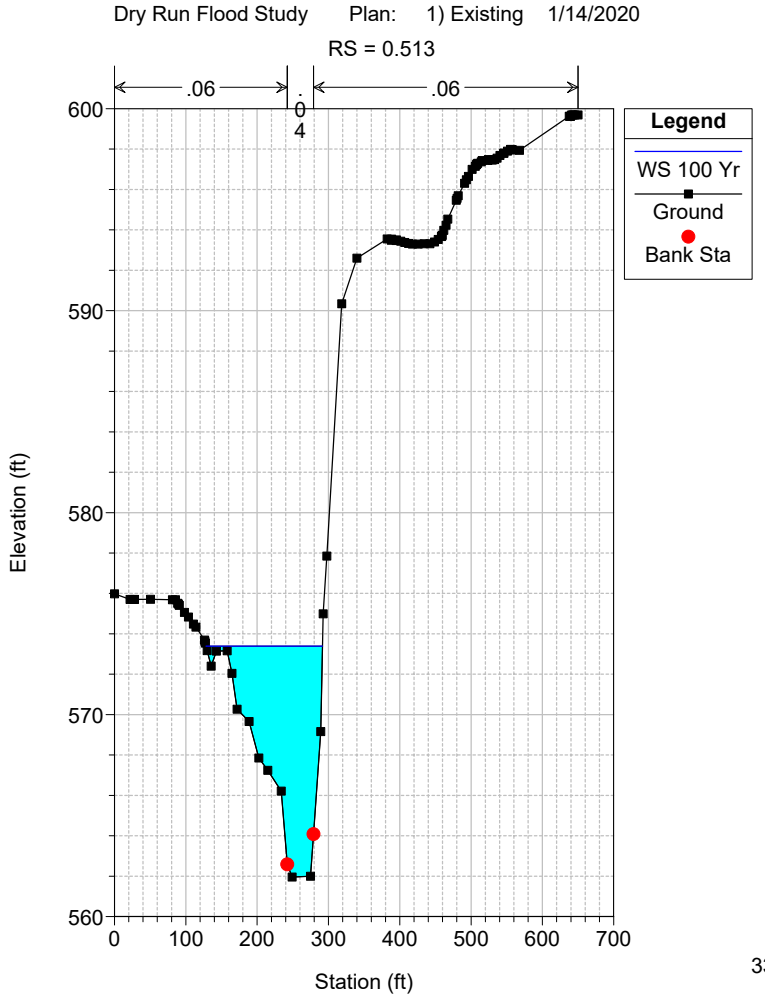
HEC-RAS Plan: Existing River: Dry Run Reach: Flood Study Site Profile: 100 Yr

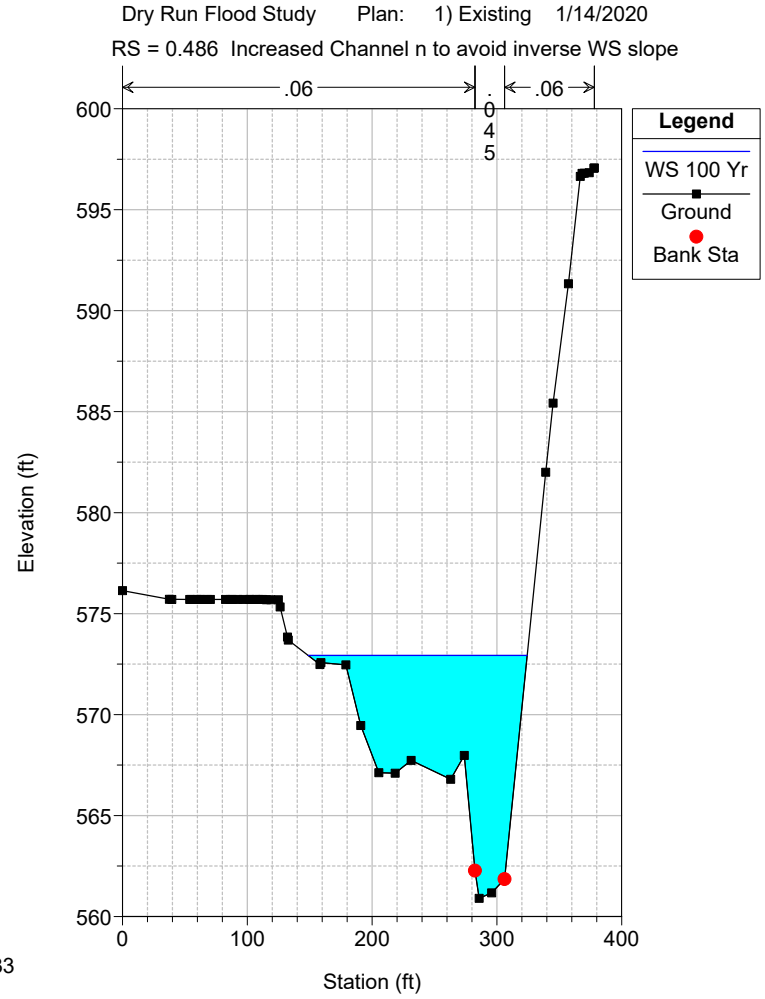
Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Flood Study Site	0.551	100 Yr	5144.00	562.41	574.16		574.87	0.002621	9.52	1032.58	181.00	0.50
Flood Study Site	0.513	100 Yr	5144.00	561.96	573.39		574.30	0.002312	8.88	917.04	163.21	0.47
Flood Study Site	0.486	100 Yr	5144.00	560.90	572.93		573.81	0.003398	9.79	929.78	175.38	0.51
Flood Study Site	0.445	100 Yr	5479.00	560.02	572.83		573.23	0.001312	6.86	1351.78	180.22	0.35
Flood Study Site	0.419	100 Yr	5479.00	557.34	570.40	568.53	572.65	0.006693	15.83	641.75	111.52	0.79
Flood Study Site	0.396	100 Yr	5479.00	559.32	570.16	568.03	571.68	0.004493	11.93	704.27	105.35	0.65
Flood Study Site	0.361	100 Yr	5479.00	558.42	569.40		570.79	0.004152	10.51	679.89	96.95	0.61
Flood Study Site	0.319	100 Yr	5479.00	556.61	567.46	566.44	569.56	0.005774	13.45	609.87	96.88	0.73
Flood Study Site	0.261	100 Yr	5479.00	556.77	566.54		567.93	0.003752	10.16	675.14	95.98	0.58
Flood Study Site	0.239	100 Yr	5479.00	552.06	566.27	562.39	567.45	0.003530	9.28	706.54	161.60	0.50
Flood Study Site	0.206	100 Yr	5479.00	553.48	566.26	561.49	566.90	0.001505	6.89	950.92	236.42	0.37
Flood Study Site	0.170	100 Yr	5479.00	550.99	565.48		566.50	0.001992	8.43	848.90	174.81	0.43
Flood Study Site	0.138	100 Yr	5479.00	551.66	564.05	561.04	565.95	0.004286	12.50	723.57	162.35	0.64
Flood Study Site	0.104	100 Yr	5479.00	551.17	562.60	562.38	564.91	0.007919	14.11	643.79	162.14	0.76
Flood Study Site	0.066	100 Yr	5479.00	551.02	561.70	561.34	563.46	0.005079	12.67	745.44	242.83	0.69
Flood Study Site	0.035	100 Yr	5479.00	551.00	561.10		562.60	0.004592	10.72	698.10	135.54	0.63
Flood Study Site	0.000	100 Yr	5479.00	549.72	560.43	559.57	561.68	0.004601	12.01	963.36	251.09	0.65

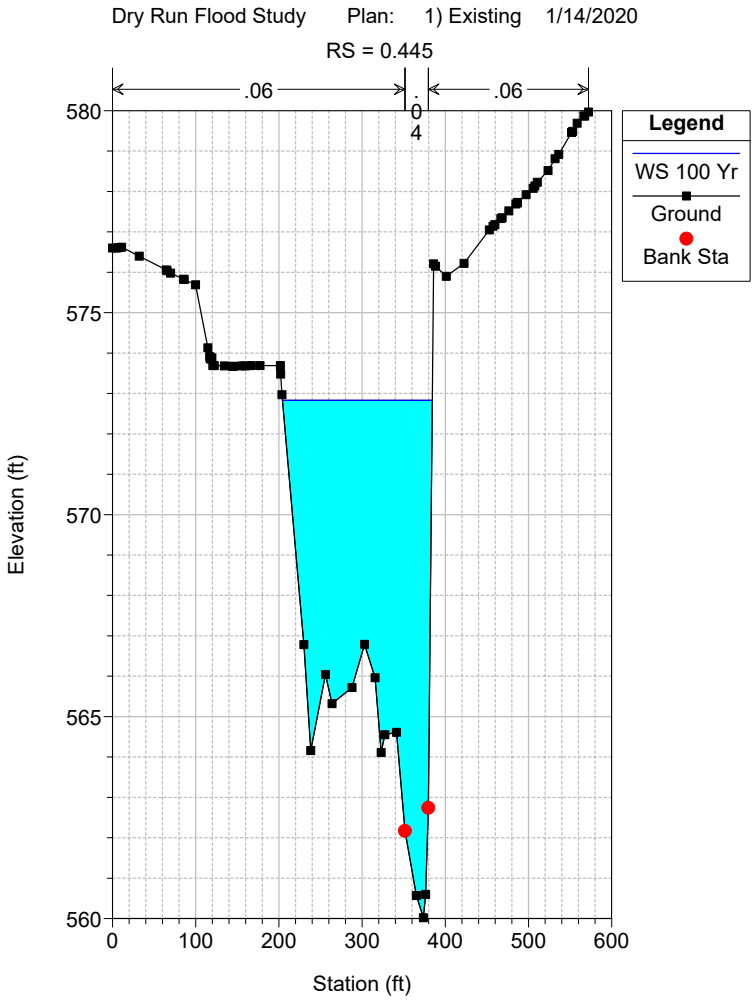

Dry Run Flood Study Plan: Dry Run - Existing Conditions 6/5/2019
Legend
WS 100 Yr
Crit 100 Yr
Ground
Elevation (ft)
580
575
570
565
560
555
550
545
0
500
1000
1500
2000
2500
3000
3500
Main Channel Distance (ft)
32
1 in Horiz. = 400 ft 1 in Vert. = 5 ft

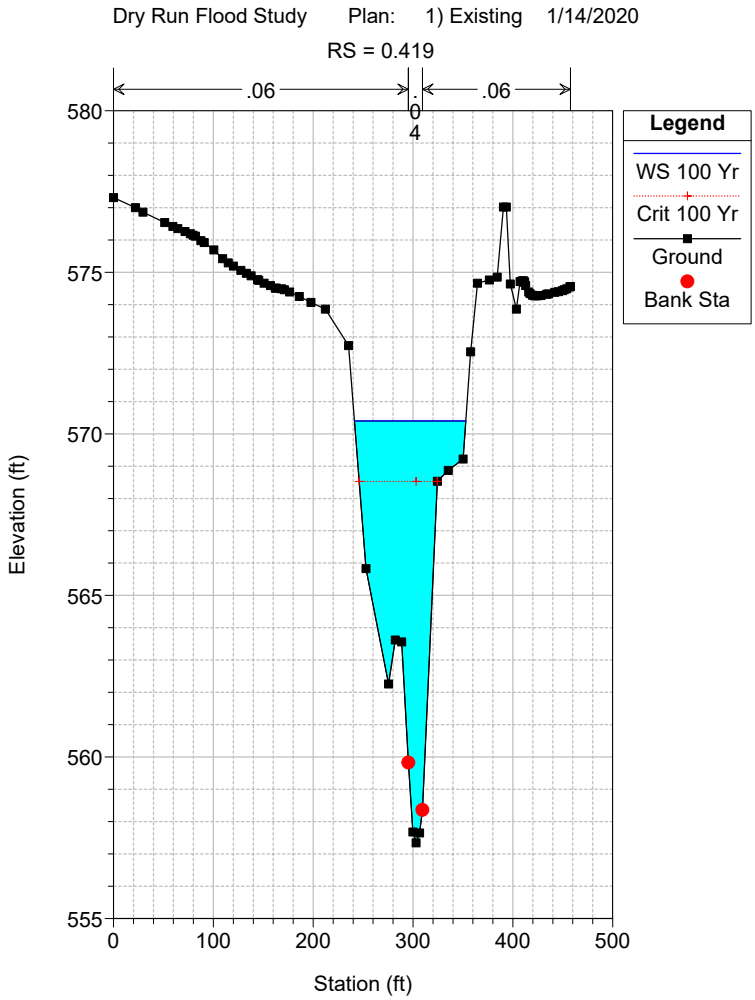

Dry Run Flood Study Plan: 1) Existing 1/14/2020
RS = 0.066
.06
.06
.04
Legend
WS 100 Yr
Crit 100 Yr
Ground
Ineff
Bank Sta
Elevation (ft)
Station (ft)

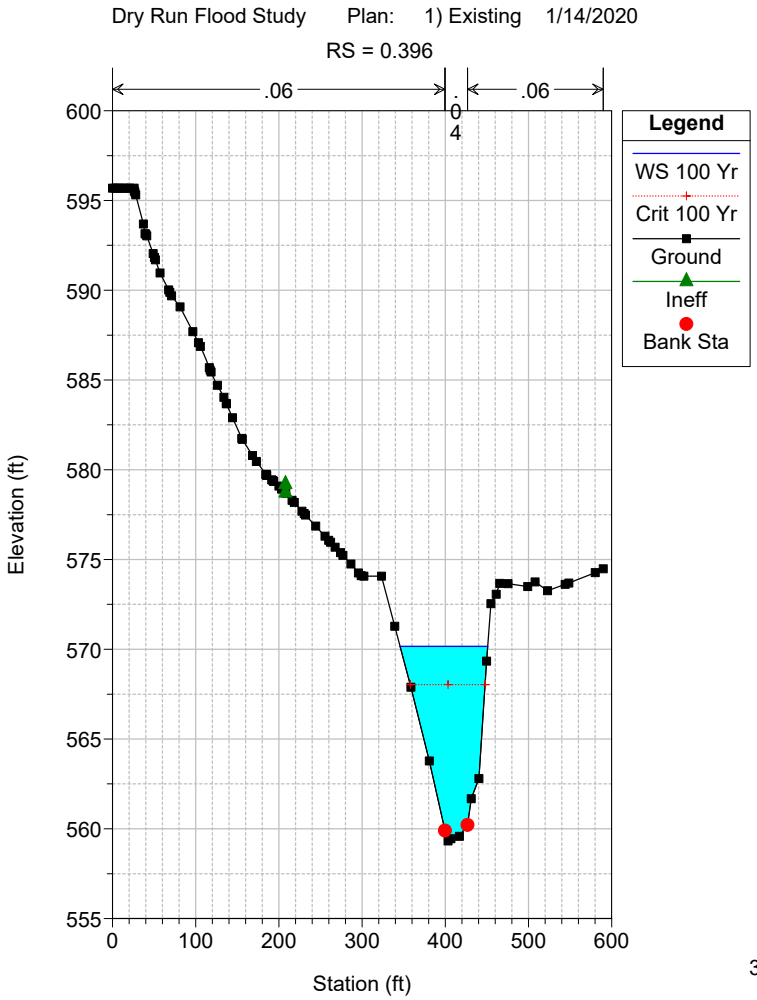

Dry Run Flood Study Plan: 1) Existing 1/14/2020
RS = 0.551
.06
.06
.04
Legend
WS 100 Yr
Ground
Bank Sta
Elevation (ft)
Station (ft)

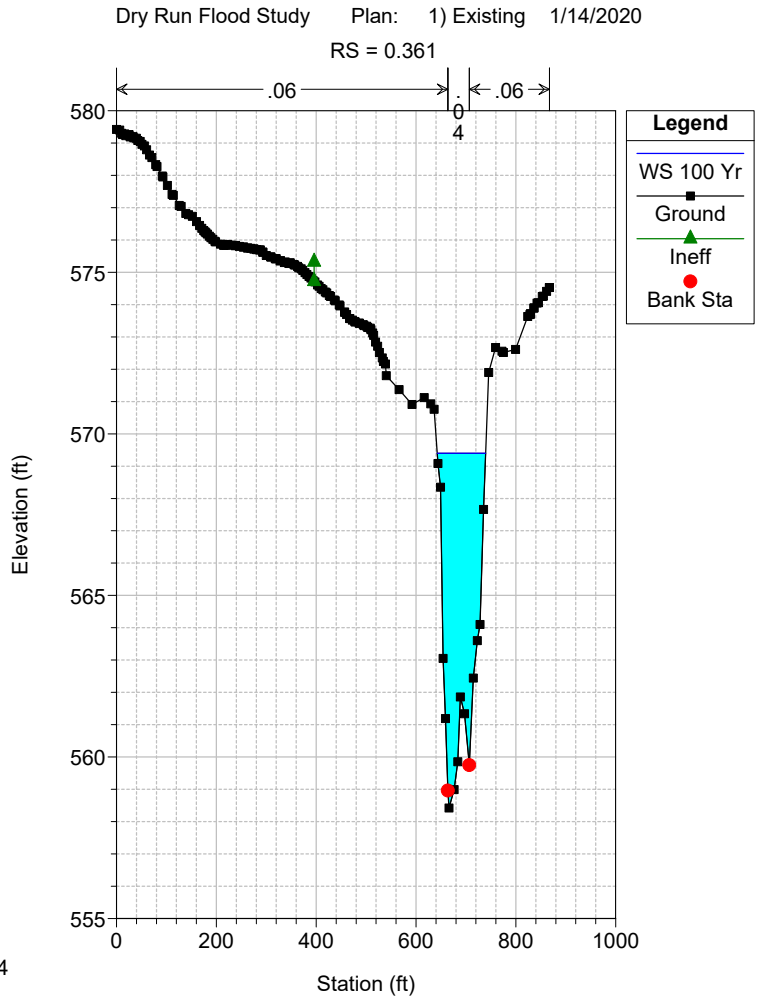

Dry Run Flood Study Plan: 1) Existing 1/14/2020
RS = 0.513
.06
.06
.04
Legend
WS 100 Yr
Ground
Bank Sta
Elevation (ft)
Station (ft)

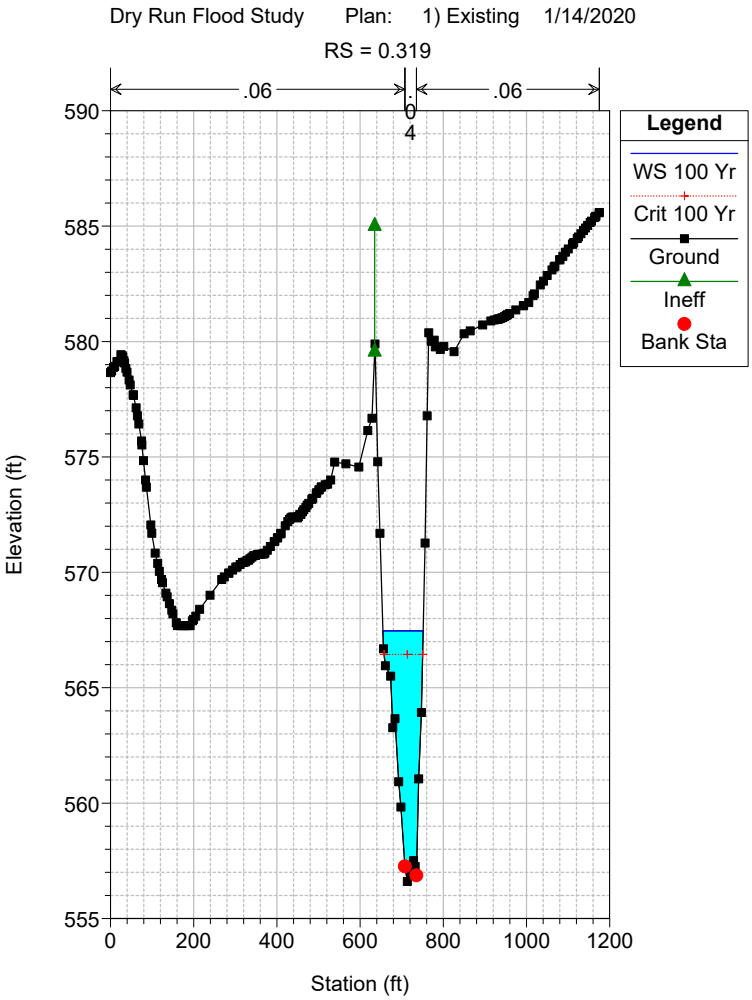

Dry Run Flood Study Plan: 1) Existing 1/14/2020
RS = 0.486 Increased Channel n to avoid inverse WS slope
.06
.06
.045
Legend
WS 100 Yr
Ground
Bank Sta
Elevation (ft)
Station (ft)


Dry Run Flood Study Plan: 1) Existing 1/14/2020
RS = 0.445
.06
.06
0.4
Legend
WS 100 Yr
Ground
Bank Sta
Elevation (ft)
Station (ft)


Dry Run Flood Study Plan: 1) Existing 1/14/2020
RS = 0.419
.06
.06
0.4
Legend
WS 100 Yr
Crit 100 Yr
Ground
Bank Sta
Elevation (ft)
Station (ft)


Dry Run Flood Study Plan: 1) Existing 1/14/2020
RS = 0.396
.06
.06
0.4
Legend
WS 100 Yr
Crit 100 Yr
Ground
Ineff
Bank Sta
Elevation (ft)
Station (ft)


Dry Run Flood Study Plan: 1) Existing 1/14/2020
RS = 0.361
.06
.06
0.4
Legend
WS 100 Yr
Ground
Ineff
Bank Sta
Elevation (ft)
Station (ft)


Dry Run Flood Study Plan: 1) Existing 1/14/2020
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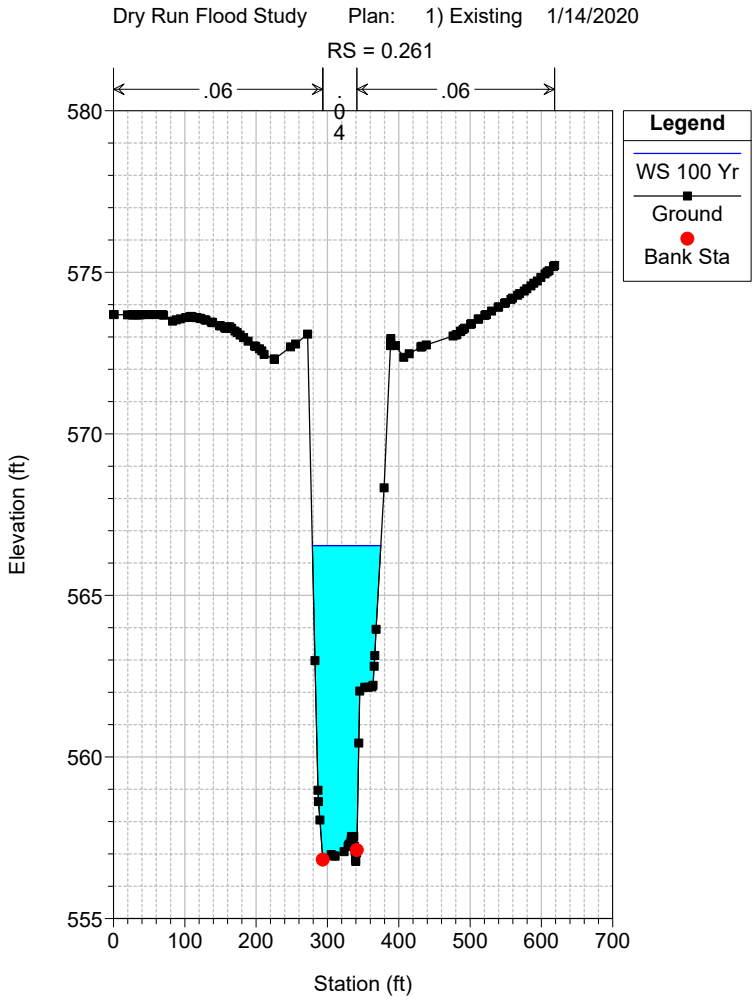
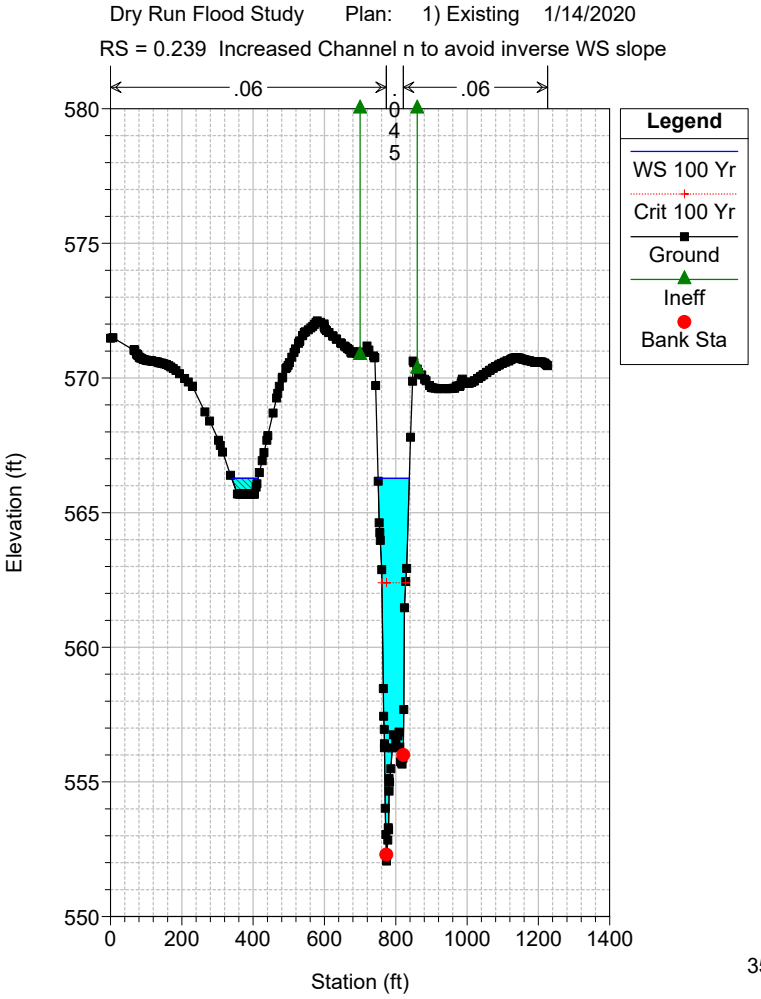
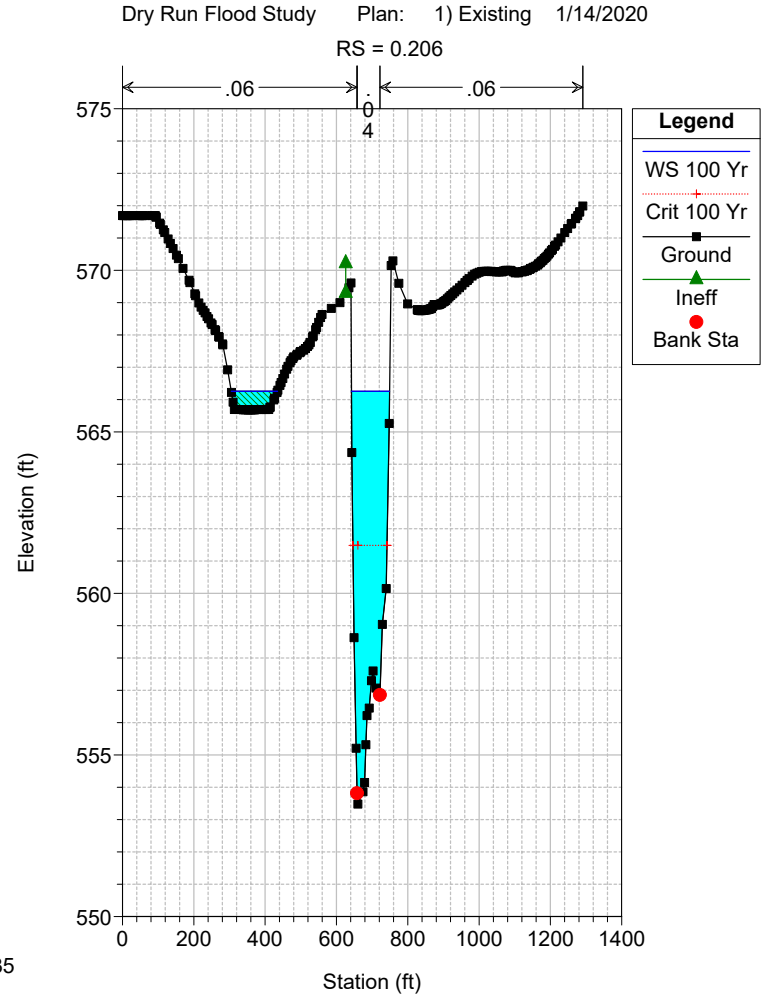
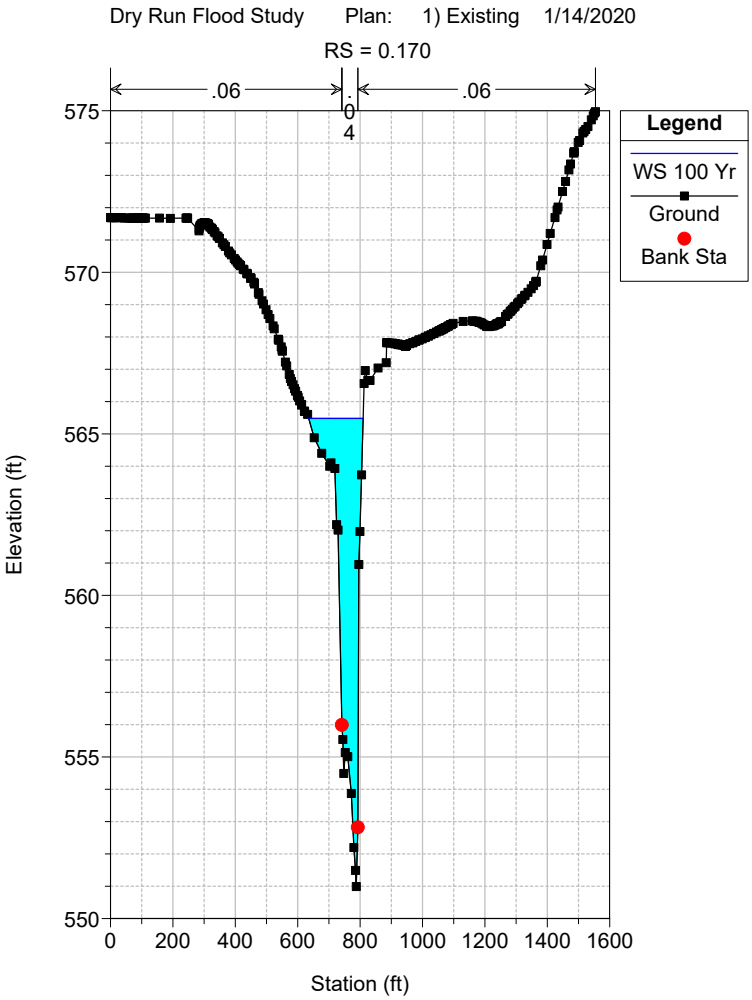
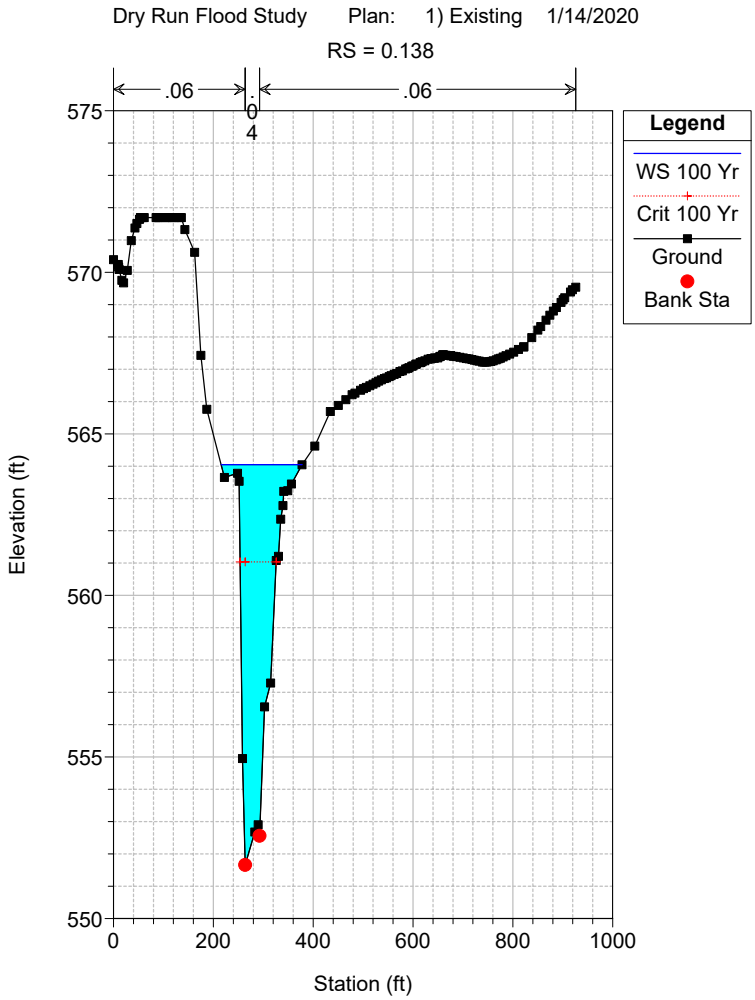
.06
.06
.04
Legend
WS 100 Yr
Crit 100 Yr
Ground
Ineff
Bank Sta
Elevation (ft)
Station (ft)


Dry Run Flood Study Plan: 1) Existing 1/14/2020
RS = 0.261
.06
.06
.04
Legend
WS 100 Yr
Ground
Bank Sta
Elevation (ft)
Station (ft)


Dry Run Flood Study Plan: 1) Existing 1/14/2020
RS = 0.239 Increased Channel n to avoid inverse WS slope
.06
.06
.045
Legend
WS 100 Yr
Crit 100 Yr
Ground
Ineff
Bank Sta
Elevation (ft)
Station (ft)


Dry Run Flood Study Plan: 1) Existing 1/14/2020
RS = 0.206
.06
.06
.04
Legend
WS 100 Yr
Crit 100 Yr
Ground
Ineff
Bank Sta
Elevation (ft)
Station (ft)


Dry Run Flood Study Plan: 1) Existing 1/14/2020
RS = 0.170
.06
.04
.06
Legend
WS 100 Yr
Ground
Bank Sta
Elevation (ft)
Station (ft)


Dry Run Flood Study Plan: 1) Existing 1/14/2020
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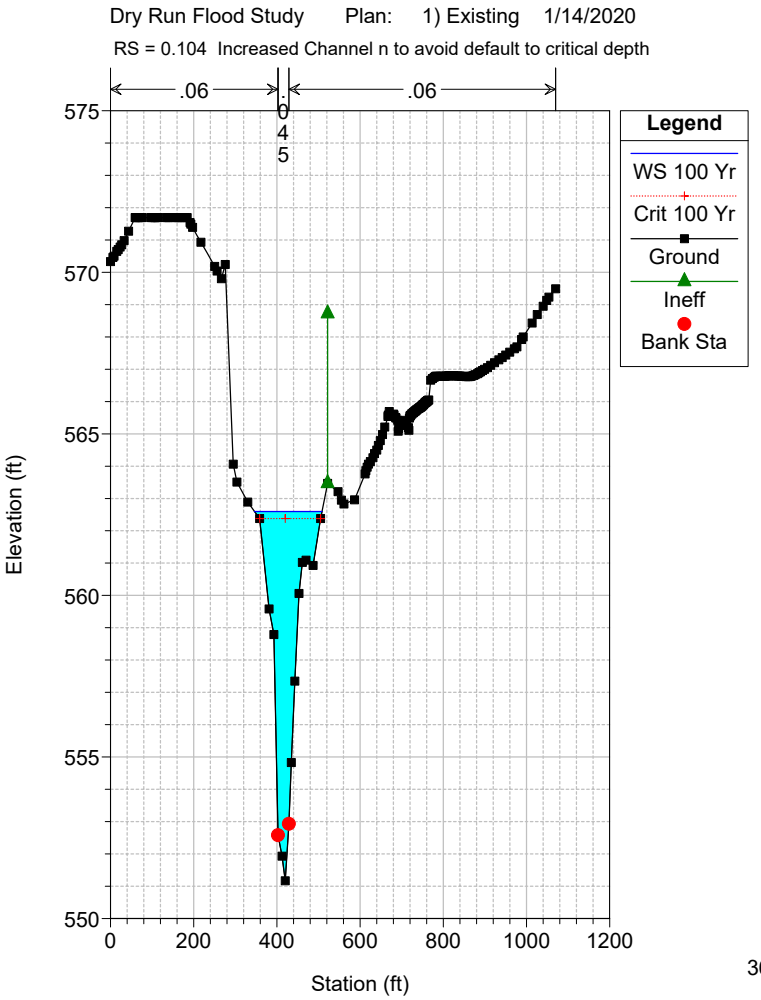
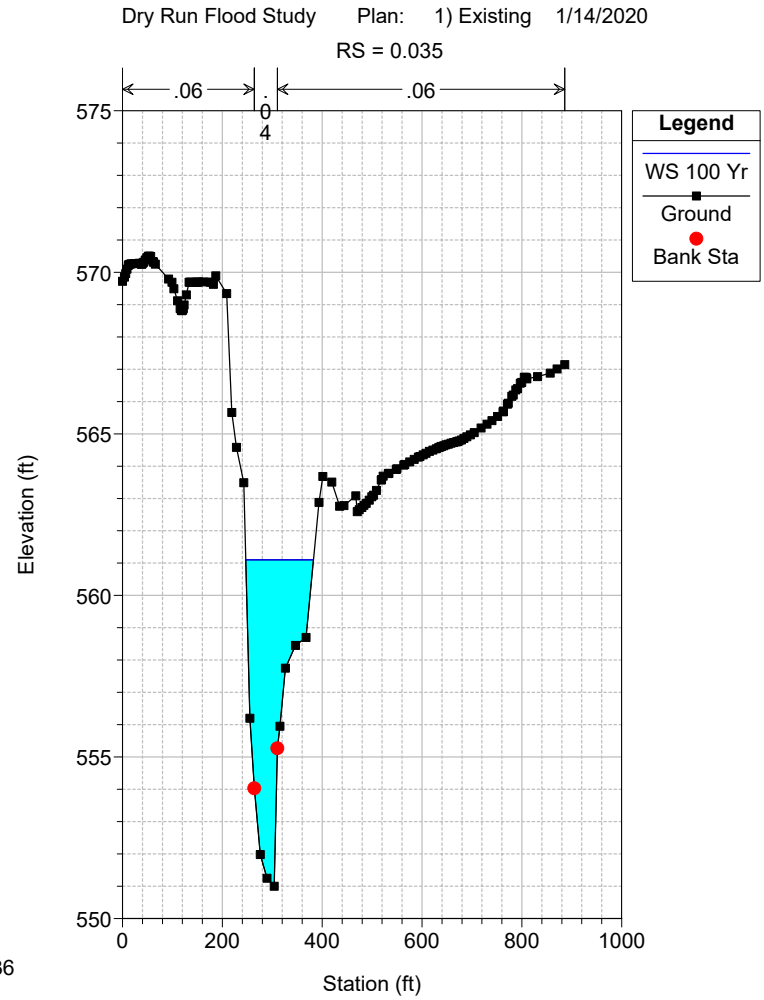
.04
.06
Legend
WS 100 Yr
Crit 100 Yr
Ground
Bank Sta
Elevation (ft)
Station (ft)


Dry Run Flood Study Plan: 1) Existing 1/14/2020
RS = 0.104 Increased Channel n to avoid default to critical depth
.06
.045
.06
Legend
WS 100 Yr
Crit 100 Yr
Ground
Ineff
Bank Sta
Elevation (ft)
Station (ft)


Dry Run Flood Study Plan: 1) Existing 1/14/2020
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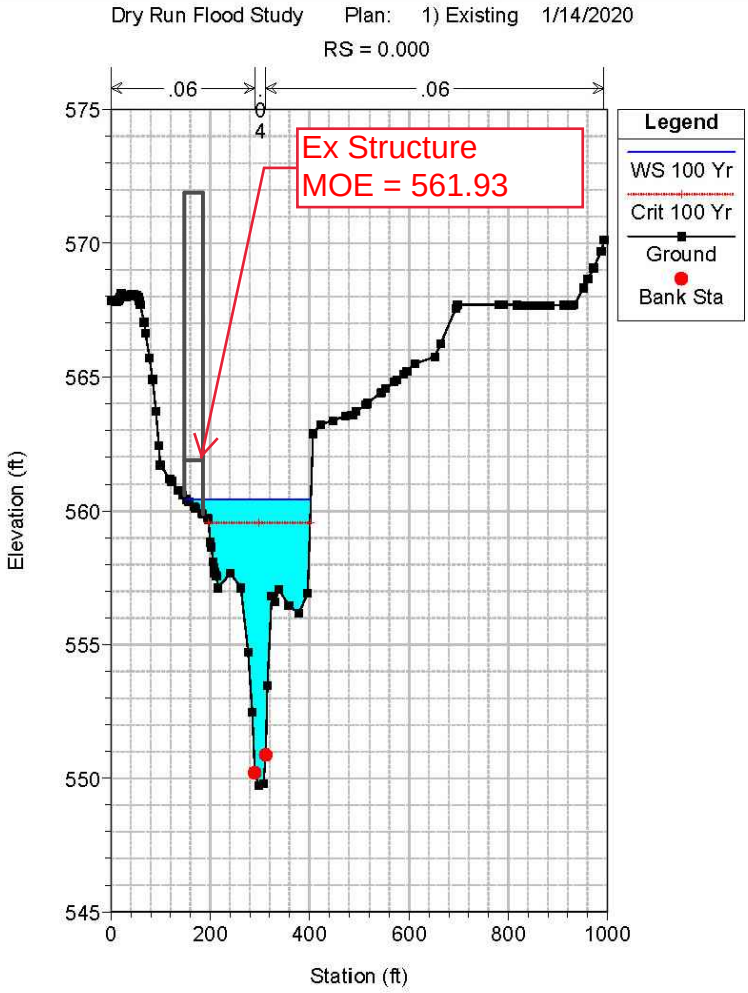
.06
.04
.06
Legend
WS 100 Yr
Ground
Bank Sta
Elevation (ft)
Station (ft)


Dry Run Flood Study Plan: 1) Existing 1/14/2020
RS = 0.000
.06
.06
0
4
Ex Structure
MOE = 561.93
Legend
WS 100 Yr
Crit 100 Yr
Ground
Bank Sta
Elevation (ft)
Station (ft)
575
570
565
560
555
550
545
0
200
400
600
800
1000

HEC-RAS Version 4.1.0 Jan 2010
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
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PROJECT DATA
Project Title: Dry Run Flood Study
Project File : DryRun.prj
Run Date and Time: 1/14/2020 2:31:30 PM

Project in English units

Project Description:
Existing and Proposed Condtions for Dry Run Creek through Venice
Crossing Subdivision.
Located in Butler County Ohio.
Study updated
1-14-2020 with most recent bridge construction plans.
Study performed by Bayer
Becker.

PLAN DATA

Plan Title: Dry Run - As-Built & PR Conditions
Plan File : J:\2013\13M074-000\CV\Design Calcs\Flood Study\Venice Crossing Phase 2 Report Rev 200114\HECRAS System Files\DryRun.p05

Geometry Title: Dry Run Flood Study - Proposed AB Comb
Geometry File : J:\2013\13M074-000\CV\Design Calcs\Flood Study\Venice Crossing Phase 2 Report Rev 200114\HECRAS System Files\DryRun.g05

Flow Title : 100 Year Flow
Flow File : J:\2013\13M074-000\CV\Design Calcs\Flood Study\Venice Crossing Phase 2 Report Rev 200114\HECRAS System Files\DryRun.f01

Plan Description:
As-Built Floodplain Compensation and Proposed Bridge Crossing

Plan Summary Information:
Number of: Cross Sections = 19 Multiple Openings = 0
Culverts = 0 Inline Structures = 0
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: 100 Year Flow
Flow File : J:\2013\13M074-000\CV\Design Calcs\Flood Study\Venice Crossing Phase 2 Report Rev 200114\HECRAS System Files\DryRun.f01

Flow Data (cfs)

River	Reach	RS	100 Yr	50 Yr	25 Yr	10 Yr	5 Yr	1.5 Yr Scour	500 Yr
Dry Run	Flood Study Site	0.551	5144	4139	3304	2393	1793	888	6335
Dry Run	Flood Study Site	0.445	5479	4415	3531	2565	1928	965	6738

Boundary Conditions

River	Reach	Profile	Upstream	Downstream
Dry Run	Flood Study Site	100 Yr	Normal S = 0.004	Normal S = 0.0046
Dry Run	Flood Study Site	50 Yr	Normal S = 0.004	Normal S = 0.0046
Dry Run	Flood Study Site	25 Yr	Normal S = 0.004	Normal S = 0.0046
Dry Run	Flood Study Site	10 Yr	Normal S = 0.004	Normal S = 0.0046
Dry Run	Flood Study Site	5 Yr	Normal S = 0.004	Normal S = 0.0046
Dry Run	Flood Study Site	1.5 Yr Scour	Normal S = 0.004	Normal S = 0.0046
Dry Run	Flood Study Site	500 Yr	Normal S = 0.004	Normal S = 0.0046

GEOMETRY DATA

Geometry Title: Dry Run Flood Study - Proposed AB Comb
Geometry File : J:\2013\13M074-000\CV\Design Calcs\Flood Study\Venice Crossing Phase 2 Report Rev 200114\HECRAS System Files\DryRun.g05

CROSS SECTION

RIVER: Dry Run
REACH: Flood Study Site RS: 0.551

INPUT
Description:
Station Elevation Data num= 144
  Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev
  0 585.46 1.12 585.56 2.81 585.69 11.43 586.46 15.37 586.85
 18.97 587.18 24.76 587.69 25.23 587.72 30.39 587.98 33.24 588.04
 35.52 588.03 38.3 587.93 41.72 587.72 42.02 587.69 45.54 587.25
 47.44 587.03 51.31 586.52 57.83 585.69 59.59 585.46 64.41 584.84
 70.37 584.07 73.34 583.69 80.61 582.75 85.43 582.13 87.18 581.9
 88.82 581.69 95.69 580.82 102.21 580.01 104.82 579.69 111.43 578.89
115.56 578.56 121.32 578.14 123.64 577.92 127.57 577.69 129.23 577.68
134.23 577.65 139.52 577.64 148.08 577.62 156.49 577.61 156.73 577.61
157.11 577.61 157.7 577.61 158.8 577.62 159.23 577.62 159.44 577.62
159.53 577.62 159.59 577.62 160.53 577.62 161.49 577.61 165.84 577.59
171.31 577.56 176.62 577.54 181.14 577.53 186.29 577.52 191.38 577.51
192.44 577.51 193.27 577.5 198.6 577.48 200.53 577.48 205.25 577.45
 206.4 577.44 206.74 577.44 206.84 577.44 210.59 577.44 214.67 577.42
216.43 577.39 217.8 577.37 220.18 577.34 222.9 577.3 224.35 577.28
230.25 577.23 231.26 577.22 238.74 577.15 247.55 577.07 253.23 577
258.42 576.95 264.79 576.88 270.51 576.82 273.77 576.79 280.58 576.74
283.69 576.73 286.41 576.73 289.13 576.72 292.8 576.73 296.47 576.73
301.56 576.73 306.64 576.72 309.89 576.72 313.1 576.72 314.49 576.71
319.38 576.69 323.07 576.68 324.52 576.68 326.38 576.68 328.51 576.69
 330.1 576.71 331.04 576.73 331.57 576.76 361.07 576.5 407.7 576.05
421.91 568.36 432.04 566.32 447.03 565.47 453.6 563.25 460.82 562.41
473.14 563.48 486.83 566.96 505.79 568.72 525.55 568.11 532.64 569.61
560.61 571.95 582.72 573.43 602.77 574.98 612.18 577.18 620.03 583.63
629.38 590.61 633.09 591.92 646.06 594.34 667.06 596.26 691.84 598.05
716.03 599.69 718.13 599.69 722.44 599.69 726.85 599.69 730.74 599.69
736.69 599.69 738.28 599.69 742.54 599.69 745.26 599.69 748.03 599.69
750.97 599.69 756.4 599.69 758.72 599.69 762.03 599.69 766.22 599.69
770.01 599.69 773.46 599.69 775.57 599.69 819.25 600.03 907.28 601.38
911.47 601.44 913.73 601.48 917.51 601.53 922.54 601.46

Manning's n Values num= 3
  Sta n Val Sta n Val Sta n Val
  0 .06 453.6 .04 473.14 .06

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
  453.6 473.14 210.99 224.07 236.88 .1 .3

CROSS SECTION

RIVER: Dry Run
REACH: Flood Study Site RS: 0.513

INPUT

Description:
Station Elevation Data num= 110

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	575.98	21.78	575.7	26.49	575.7	28.06	575.7	50.38	575.71
81.17	575.69	85.42	575.69	88.6	575.51	89.62	575.47	90.94	575.41
97.94	575.06	103.55	574.83	110.61	574.48	114.11	574.33	126.32	573.69
126.75	573.62	127.35	573.54	129.93	573.17	135.43	572.4	142.81	573.14
157.9	573.16	164.58	572.04	171.95	570.27	188.77	569.66	202.28	567.85
214.9	567.24	233.77	566.21	242.31	562.58	249.06	561.96	274.94	562
279.12	564.08	289.21	569.16	292.51	574.99	297.77	577.85	318.6	590.34
339.99	592.6	382.39	593.54	387.6	593.49	388	593.52	388.18	593.54
394.57	593.47	394.81	593.5	400.9	593.44	406.61	593.38	411.96	593.33
417.46	593.3	425.62	593.3	433.83	593.31	435.83	593.31	437.07	593.7
437.59	593.86	437.77	593.85	442.98	595.48	444.65	596	445.2	596.08
448.15	596.3	453.6	596.762	464.43	597.68	470.85	598	473.14	598.05
475.89	598.11	479.2	598.19	484.97	598.31	489.86	598.44	502.19	598.7
505.28	598.76	507.09	598.79	514.05	598.94	514.75	598.92	515.13	598.91
516.4	598.9	519.64	598.87	520.54	598.87	524.29	598.76	531.41	598.57
531.58	598.53	532.91	598.21	533.06	598.22	534.14	598.3	539.98	598.47
545.62	598.64	546.17	598.66	546.72	598.67	557.41	598.57	558.37	598.57
559.4	598.56	559.65	598.54	560.64	598.49	561.61	598.73	562.17	598.87
565.41	599.03	568.51	599.17	570.88	599.28	573.29	599.39	575.3	599.44
578.87	599.54	578.97	599.54	580	599.59	587.92	599.57	588.86	599.57
590.06	599.57	598.23	599.55	601.59	599.54	607.11	599.52	612.06	599.5
615.55	599.49	621.99	599.47	623.58	599.47	630.38	599.45	650.01	599.69

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.06	242.31	.04	279.12	.06

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

Left	Right	Left	Channel	Right	Coeff	Contr.	Expan.
242.31	279.12	162	178.88	194.96	.1	.3	

CROSS SECTION

RIVER: Dry Run
REACH: Flood Study Site RS: 0.486

INPUT
Description: Increased Channel n to eliminate inverse WS slope
Station Elevation Data num= 50

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	576.14	37.52	575.71	39.5	575.7	53.88	575.7	55	575.7
59.78	575.7	61.88	575.7	63.33	575.7	68.14	575.7	70.39	575.7
82.57	575.7	86.17	575.7	88	575.7	92.43	575.7	96.67	575.7
101.95	575.7	102.32	575.7	106.95	575.7	109.14	575.7	112.2	575.7
115.25	575.69	118.87	575.69	124.93	575.69	126.31	575.33	132.13	573.84
132.86	573.69	158.22	572.48	159.02	572.44	178.93	572.46	190.94	569.46
205.43	567.12	218.47	567.1	231.32	567.73	242.31	567.4064	262.91	566.8
273.86	567.98	279.12	564.4548	282.38	562.27	285.79	560.9	295.76	561.17
306.12	561.85	339.11	582	345	585.42	357.28	591.33	366.8	596.67
368.02	596.8	369.9	596.81	373.94	596.83	377.65	597.05	378.1	597.07

Manning's n Values num= 3
Sta n Val Sta n Val Sta n Val
0 .06 282.38 .045 306.12 .06

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
282.38 306.12 216 225 233.94 .1 .3

CROSS SECTION

RIVER: Dry Run
REACH: Flood Study Site RS: 0.445

INPUT
Description:
Station Elevation Data num= 77
Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev
0 576.6 4.35 576.6 7.7 576.61 10.98 576.62 32.16 576.4
64.55 576.06 65.67 576.04 69.74 575.98 85.4 575.83 86.1 575.82
99.73 575.69 114.71 574.13 116.85 573.91 117.32 573.88 117.57 573.86
117.8 573.86 118.05 573.86 118.4 573.86 119.35 573.88 120.61 573.69
122.23 573.69 134.37 573.68 144.55 573.67 144.74 573.67 145.07 573.67
155.36 573.68 159.68 573.68 166.74 573.69 177.37 573.69 201.64 573.69
202.19 573.48 203.56 572.97 229.97 566.78 238.26 564.16 255.87 566.04
263.78 565.32 287.87 565.72 302.86 566.79 315.52 565.96 322.94 564.11
327.26 564.55 341.4 564.61 351.6 562.17 364.84 560.61 365.13 560.61
365.31 563 365.58 563.61 366 564 368.16 564.7 368.35 565.06
372.17 566 374.92 566.92 378.17 568 380.91 568.91 384.17 570
386.89 570.91 390.17 572 400.12 575.32 403.03 576.29 404.25 576.61
408.62 576.76 411.93 577.18 414.45 577.71 422.84 578.1 430.2 578.02
431.16 576.72 452.83 577.06 498.79 577.93 499.4 577.94 510.97 582.22
520.24 585.43 547.61 585.73 548.97 585.75 552.55 585.79 562.68 585.9
569.07 585.98 572.04 586.02

Manning's n Values num= 3
Sta n Val Sta n Val Sta n Val
0 .06 351.6 .04 378.17 .06

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
351.6 378.17 156 156.94 159.06 .1 .3

CROSS SECTION

RIVER: Dry Run
REACH: Flood Study Site RS: 0.419

INPUT
Description:
Station Elevation Data num= 63
Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev
0 577.31 21.95 577 29.42 576.86 51.25 576.54 59.46 576.42

64.5 576.35 71.58 576.26 76.89 576.19 79.63 576.15 82 576.12
87.45 575.98 90.82 575.92 100.46 575.69 109.28 575.42 114.85 575.29
120.04 575.19 127.64 575.06 133.09 574.97 137.84 574.89 144.23 574.77
145.48 574.75 150.79 574.66 157.29 574.59 161.99 574.51 162.95 574.51
168.19 574.49 171.18 574.46 176.39 574.39 186.09 574.25 197.8 574.07
212.1 573.86 235.4 572.73 252.86 565.83 275.42 562.26 282.15 563.62
288.56 563.56 295.35 559.83 299.9 557.68 303.07 557.34 306.56 557.65
308.17 559.93 310.4 560.23 310.61 560.25 313.58 560.64 315.09 561.37
320.59 563.06 323.71 563.14 343.95 563.75 347.09 563.86 347.72 563.86
351.16 563.88 375.86 563.99 383.13 564.07 395.23 564.52 406.42 567.9
413.22 569.72 429.09 574.05 431.56 574.71 434.1 574.76 443.69 574.79
447.18 574.85 448.21 574.47 457.66 574.57

Manning's n Values num= 3
Sta n Val Sta n Val Sta n Val
0 .06 295.35 .04 308.17 .06

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
295.35 308.17 170.6 134 77.06 .1 .3

CROSS SECTION

RIVER: Dry Run
REACH: Flood Study Site RS: 0.396

INPUT
Description:
Station Elevation Data num= 93
Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev
0 595.69 3.42 595.69 5.84 595.69 8.61 595.69 13.71 595.69
16.97 595.69 21.03 595.69 25.98 595.69 26.36 595.53 26.96 595.46
27.94 595.31 37.04 593.69 39.12 593.15 39.97 593.13 41.2 593.03
48.94 592.04 50.31 591.83 51.5 591.69 57.06 590.96 67.54 590.02
68.82 589.88 71.03 589.69 81.2 589.07 96.47 587.69 103.29 587.08
105.5 586.87 116.25 585.69 117.27 585.55 118.38 585.45 126.15 584.71
133.88 584.04 136.67 583.69 136.83 583.67 144.25 582.9 155.32 581.75
155.97 581.69 168.23 580.79 172.98 580.46 184.52 579.74 184.57 579.74
184.7 579.72 184.77 579.72 185.04 579.71 185.35 579.69 191.31 579.44
192.85 579.39 193.73 579.35 199.93 579.09 203.35 578.92 208.35 578.69
215.81 578.3 218.47 578.18 227.77 577.69 230.33 577.56 231.9 577.48
244.25 576.86 255.37 576.3 259.8 576.07 262.1 575.96 267.58 575.69
273.99 575.38 276.92 575.23 286.5 574.75 295.64 574.25 298.78 574.1
302.21 573.9 323.28 574.07 339.21 571.28 358.73 567.89 380.84 563.78
399.58 559.9 403.18 559.32 406.75 559.68 416.93 559.58 426.78 560.21
431.33 560.34 441.69 562.94 444.8 563.67 454.52 563.9 462.31 564.1
468.96 564.15 489.89 564.12 497.22 564.12 509.92 564.1 522.85 564.12
525.64 564.12 535.96 564.13 540.61 564.17 545.15 565.76 556.03 569.73
568.25 573.83 569.17 574.07 589.85 574.48

Manning's n Values num= 3
Sta n Val Sta n Val Sta n Val
0 .06 399.58 .04 426.78 .06

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
399.58 426.78 219.03 204.96 130.53 .1 .3
Ineffective Flow num= 1
Sta L Sta R Elev Permanent
0 324.42 F

CROSS SECTION

RIVER: Dry Run
REACH: Flood Study Site RS: 0.361

INPUT
Description:
Station Elevation Data num= 159
Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev
0 572.62 3.6 572.71 12.19 572.86 19.22 573.02 34.74 573.28
37.55 573.34 48.09 573.5 57.44 573.5 81.15 573.5 85.4 573.5
87.17 573.5 91.91 573.5 93.2 573.5 98.05 573.5 101.17 573.22
103.79 572.67 107.01 572.64 108.91 572.64 130.1 572.62 134.88 572.67
139.35 572.72 142.8 572.74 151.89 572.94 162.5 573.26 185.98 573.23
189.62 573.25 193.82 573.27 197.67 573.24 201.21 573.26 203.25 573.23
206.44 573.18 210.59 573.11 212.35 573.05 213.48 573.01 218.57 572.83
226.33 572.55 227.08 572.52 228.99 572.46 232 572.35 236.31 572.28
241.15 572.2 244.81 572.14 255.7 572.39 256.71 572.41 257.18 572.42
257.53 571.74 257.59 572.33 265.21 572.76 270.75 572.99 272.49 573.06
276.7 573.24 277.35 573.27 278.83 573.34 285.93 573.41 290.98 573.47
297.05 573.5 300.77 573.5 316.48 573.5 321.58 573.5 326.24 573.5
340.9 573.5 345.44 573.5 348.29 573.5 351.89 573.5 356.95 573.5
362.01 573.5 365.98 573.5 369.13 573.5 375.4 573.5 377.59 573.5
385.23 573.5 385.85 573.5 395.48 573.5 395.84 573.5 405.37 574.88
406.23 575 414.67 575 415.25 575 420.08 575 429.08 575
434.92 575 435.05 574.97 438.77 574 456.08 573.37 470.84 572.77
479.62 572.43 489.71 572 495.02 570.95 499.86 570 505.1 568.71
507.98 568 515.12 566.24 518.17 565.49 524.22 564 528.16 563.87
532.29 563.74 535.32 563.64 540.29 563.47 540.91 563.45 541.51 563.44
541.99 563.43 543.25 563.43 544.94 563.42 546.73 563.42 549.91 563.43
551.81 563.43 553.45 563.44 554.57 563.44 555.41 563.45 555.94 563.47
556.52 563.5 559.55 563.61 564.31 563.79 568.26 563.93 570.38 564
575.22 565.2 578.45 566 581.42 566.74 586.53 568 593.28 569.67
594.6 570 595.52 570.23 602.67 572 611.17 572.08 614.06 572.1
618.11 572 618.62 571.09 619.18 571.08 629.57 570.93 636.32 570.76
644.01 569.08 649.15 568.35 654.3 563.05 658.94 561.19 663.75 558.96
666.03 558.42 676.3 558.99 683.58 559.85 688.91 561.86 697.09 561.34
704.93 560.56 713.34 562.14 713.72 562.22 716.31 562.7 721.47 563.72
739.84 564.08 747.37 564.16 753.03 564.17 762.87 564.39 773.25 566.15
780.54 567.38 787.23 568.49 793.92 569.49 800.2 570.43 810.21 571.88
816.43 572.78 819.35 573.21 823.67 573.63 867.45 574.53

Manning's n Values num= 3
Sta n Val Sta n Val Sta n Val
0 .06 663.75 .04 704.93 .06

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
663.75 704.93 237.09 240 241.89 .1 .3
Ineffective Flow num= 1
Sta L Sta R Elev Permanent
0 612 580 T

CROSS SECTION

RIVER: Dry Run
REACH: Flood Study Site RS: 0.319

INPUT
Description:
Station Elevation Data num= 237
Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev
0 572.55 10.66 572.44 12.82 572.44 14.95 572.45 17.03 572.45
19.07 572.45 21.06 572.45 23 572.44 24.88 572.44 26.69 572.43
32.24 572.44 33.82 572.43 39.89 572.44 42.48 572.43 48.91 572.45
49.9 572.44 56.94 572.46 58.26 572.46 59.44 572.45 60.49 572.45
60.97 572.45 70.6 572.39 110.12 572.65 113.68 572.71 117.97 572.51
120.61 572.56 126.4 572.12 127.03 572.08 138.6 571.65 147.72 571.31
148.25 571.29 150.24 571.26 154.92 571.18 159.17 571.1 160.98 571.07
168.11 571.23 173.71 571.35 178.58 571.55 184.87 571.81 190.76 572.06
194.93 572.23 198.52 572.45 201.4 572.5 224.9 573.6 226.12 573.6
233.75 573.58 234.71 573.58 242.93 573.56 248.23 573.33 254.68 573.4
257.77 573.33 262.84 573.47 266.79 573.12 275.4 573.17 294.66 573.28
300.2 573.31 301.02 573.37 304.37 573.5 306.09 573.5 310.66 573.5
312.89 573.5 330.92 573.5 352.39 573.5 357.46 573.34 360.73 573.24
376.2 572.77 391.5 572.32 395.48 572.19 402.18 572 407.29 571.05
412.89 570 414.69 569.58 420.47 568.23 421.46 568 427.76 566.53
430.03 566 434.28 565.01 438.6 564 442.89 563 447.17 562
457.89 561.87 459.72 561.84 470.44 561.71 478.29 561.61 484.16 561.54
488.64 561.5 493.81 561.48 496.84 561.47 499.76 561.46 502.67 561.45
507.77 561.38 510.54 561.38 514.09 561.37 519.39 561.3 522.79 561.3
526.64 561.3 529.21 561.3 529.79 561.3 531.88 561.3 537.08 561.24
538.96 561.24 539.13 561.24 542.1 561.26 545.17 561.27 547.6 561.29
550.69 561.31 554.37 561.34 557.65 561.4 560.06 561.48 563.03 561.6
565.93 561.72 567.15 561.77 572.66 562 576.54 562.92 576.88 563
580.46 563.89 580.9 564 587.57 565.66 588.92 566 595.12 567.54
596.86 567.98 596.95 568 603.4 569.61 604.97 570 608.15 570.63
615.02 572 618.34 572.83 623.05 574 626.37 574.83 628.56 575.37
630.88 575.95 631.64 578.05 635.98 579.89 640.11 576.52 642.34 574.79
647.6 571.69 656.01 566.69 660.85 565.95 663.75565.8466 673.47 565.5
678.29 563.27 683.93 563.66 692.52 560.93 698.01 559.83 706.71557.5273
707.72 557.26 713.35 556.61 723.01 556.99 728.37 557.51 732.38 557.25
735.24 556.87 740.91 561.05 747.25 563.93 756.26 571.27 761.11 576.78
765.16 580.38 770.74 580.01 777.91 580.06 780.75 579.77 792.66 579.66
801.18 579.79 825.71 579.56 850.09 580.34 877.53 580.57 877.7 580.59
878.77 580.88 880.18 581.25 895.86 585 900.88 585.02 915.57 585.05
917.23 585.05 919.17 585.04 930.87 585.05 939.93 585.04 942.75 585.02
945.8 585 953.51 584.98 959.9 584.75 963.13 584.72 966.44 584.68

986.9 584.6 988.6 584.59 992.86 584.56 1005.04 584.49 1007.41 584.47
1013.99 584.43 1015.47 584.37 1019.96 584.25 1022.88 584.17 1028.3 583.95
1028.43 583.95 1033.51 583.74 1037.7 583.57 1039.74 583.16 1041.4 583.22
1047.06 583.23 1052.53 583.24 1055.44 583.24 1056.17 583.24 1058.48 583.24
1060.58 583.19 1061.77 583.15 1067.05 583.01 1070.96 582.9 1072.68 582.86
1072.8 582.86 1073.71 582.83 1074.26 582.82 1074.9 582.75 1075.47 582.74
1076.38 583.04 1076.6 583.04 1081.48 583.21 1085.48 583.21 1092.17 583.2
1096.3 583.19 1097.65 583.16 1103.99 583.02 1105.5 582.81 1106.33 582.85
1120.42 583.06 1134.5 583.11 1134.81 583.1 1135.48 583.07 1135.56 583.06
1135.7 583.11 1139.53 583.15 1146.6 583.24 1148.86 583.37 1152.73 583.54
1154.79 583.63 1157.28 583.73 1159.13 583.78 1162.03 583.85 1163.11 583.88
1164.28 583.93 1175.04 585.5

Manning's n Values num= 3
Sta n Val Sta n Val Sta n Val
0 .06 707.72 .04 735.24 .06

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
707.72 735.24 244.35 245.08 247.47 .1 .3
Ineffective Flow num= 1
Sta L Sta R Elev Permanent
0 635 585 F

CROSS SECTION

RIVER: Dry Run
REACH: Flood Study Site RS: .272710*

INPUT
Description:
Station Elevation Data num= 439
Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev
0 572.13 4.27 572.09 5.68 572.07 6.83 572.06 7.96 572.06
9.07 572.05 10.16 572.04 11.22 572.03 12.25 572.02 13.26 572.02
14.22 572.01 17.18 571.99 18.02 571.98 21.25 571.96 21.31 571.96
22.05 571.95 22.63 571.94 23.5 571.94 24.51 571.92 26.06 571.92
26.59 571.92 30.34 571.93 31.04 571.93 31.67 571.93 32.23 571.93
32.48 571.93 33.85 571.93 37.6 571.88 37.61 571.88 45.79 571.91
53.05 571.84 58.02 571.85 58.67 571.83 60.57 571.8 62.85 571.69
63.33 571.68 64.26 571.7 67.34 571.63 67.68 571.63 68.3 571.62
72.25 571.61 73.84 571.62 78.7 571.65 78.98 571.65 80.04 571.66
82.54 571.7 83.38 571.71 84.8 571.7 85.77 571.69 89.55 571.72
89.56 571.72 92.55 571.34 92.79 571.31 93.95 571.38 95.14 571.46
98.49 571.7 101.63 571.93 103.85 572.09 105.77 572.24 107.3 572.33
109.84 572.52 110.47 572.56 113.04 572.63 113.1 572.63 113.68 572.61
115.15 572.53 119.82 572.67 120.39 572.68 120.47 572.68 121.17 572.7
124.53 572.74 125.05 572.74 129.43 572.79 132.25 572.78 135.43 572.83
135.69 572.83 137.33 572.81 139.22 572.82 139.69 572.84 140.03 572.84
142.14 572.76 142.6 572.76 143.52 572.77 146.08 572.78 146.72 572.79
148.04 572.81 150.91 572.81 151.49 572.82 152.04 572.83 155.27 572.89
156.46 572.9 156.99 572.9 157.36 572.91 159.68 572.96 159.94 572.96
160.37 572.98 160.6 572.98 160.68 572.98 160.9 572.99 161.23 573

162.16 573.04 162.21 573.04 163.08 573.06 163.36 573.06 165.51 573.1
166.7 573.12 166.72 573.12 166.88 573.12 167.63 573.14 171 573.2
171.27 573.21 172.59 573.24 173.01 573.24 175.12 573.29 175.56 573.29
175.79 573.3 176.3 573.31 179.18 573.36 179.85 573.37 183.26 573.42
184.04 573.43 187.38 573.48 187.55 573.48 187.65 573.48 187.74 573.48
188.53 573.47 189.39 573.47 190.44 573.47 191.65 573.47 192.19 573.47
192.2 573.47 193.35 573.47 194.41 573.46 196.15 573.46 196.62 573.45
197.23 573.45 199.41 573.44 200.43 573.43 203.39 573.42 206.35 573.4
208.58 573.38 210.7 573.36 211.56 573.35 213.3 573.34 214.27 573.33
214.51 573.32 216.99 573.14 219.98 572.94 220.24 572.91 220.93 572.86
221.33 572.82 224.01 572.56 224.54 572.51 227.9 572.18 229.11 572.07
230.77 571.9 231.37 571.85 233.67 571.63 234.13 571.58 235.96 571.4
238.24 571.18 241.22 571.14 243.95 571.11 244.92 571.09 248.01 571.05
250.64 571.02 254.82 570.96 257.95 570.92 260.31 570.89 260.33 570.89
263.09 570.82 264.1 570.8 264.7 570.84 266.26 570.93 267.81 571.02
268.78 571.08 270.52 571.08 272 571.09 273.89 571.1 274.19 571.1
276.72 571.1 278.53 571.11 278.7 571.11 279.86 571.12 280.58 571.12
281.95 571.13 282.26 571.13 282.38 571.13 283.37 571.14 285.29 571.13
286.14 571.13 287.14 571.14 287.23 571.14 288.6 571.15 288.81 571.15
290.45 571.16 290.95 571.17 291.74 571.17 293.39 571.18 294.71 571.19
295.35 571.2 297.1 571.22 298.38 571.24 299.78 571.26 299.97 571.26
300.72 571.28 301.42 571.3 301.51 571.3 302.16 571.31 305.1 571.36
306.55 571.49 306.67 571.5 307.16 571.55 307.34 571.56 309.25 571.74
309.49 571.77 312.51 572.05 312.53 572.05 313.04 572.1 313.76 572.16
314.24 572.21 317.06 572.47 317.99 572.56 318.04 572.57 318.23 572.58
320.92 572.83 321.47 572.88 322.31 572.96 323.93 573.07 324 573.08
325.72 573.21 327.66 573.35 329.43 573.52 329.57 573.53 330.57 573.62
331.94 573.74 333.71 573.91 334.88 574.01 335.14 574.04 336.11 574.13
336.52 574.56 338.83 574.94 341.03 574.27 341.69 574.08 341.88 574.02
342.22 573.83 345.02 572.51 349.5 570.37 352.08 569.58 353.37 569.24
353.52 569.16 353.63 569.1 358.8 566.06 359.16 565.8 361.37 564.72
364.18 563.93 364.38 563.87 368.95 561.9 369.33 561.76 371.88 560.77
374.48 559.7 376.51 558.87 377.05 558.65 378.13 558.13 378.72 557.82
378.94 557.56 379 557.52 379.55 557.55 380.64 557.19 383.19 557.24
387.96 557.04 389.65 556.96 391.41 556.95 401.65 557.02 406.34 557.14
407.14 557.16 407.23 557.16 407.65 557.19 409.73 557.25 409.88 557.31
410.11 557.37 412.17 557.36 412.95 557.36 413.73 557.11 414.32 556.99
414.89 556.79 415.13 556.74 417.66 556.94 419.07 557.11 419.37 557.11
420.12 557.11 420.87 557.07 423.72 560.31 424.87 561.46 425.34 561.9
429.34 562.47 432.99 563.37 435.69 564 438.46 564.9 439.11 565.11
441.96 565.84 444.31 565.8 445.9 566.05 446.01 566.08 449.04 567.24
450.95 567.64 452.95 567.99 456.44 568.71 456.94 569.22 461.35 573.57
462.32 574.53 462.33 574.53 463.09 574.18 467.36 574.25 472.48 574.3
473.65 574.22 473.93 574.31 479.64 574.16 484.65 574.03 485.58 574.02
487.76 573.99 494.26 573.91 499.73 574.02 501.84 574.06 503.81 574.08
520.65 574.27 521.18 574.28 521.28 574.28 521.3 574.29 521.7 574.32
521.89 574.34 522.05 574.35 522.16 574.36 523.05 574.43 523.41 574.46
529.54 574.91 534.11 575.25 537.65 575.27 548 575.33 549.17 575.34
550.54 575.34 558.79 575.39 565.18 575.42 567.16 575.43 569.31 575.43
571.56 575.45 574.75 575.46 576.02 575.45 577.59 575.45 579.26 575.46
581.53 575.48 583.1 575.5 583.87 575.5 586.32 575.53 588.15 575.55
590.2 575.57 598.29 575.65 599.06 575.65 599.49 575.66 600.44 575.67
602.49 575.68 610.65 575.75 611.08 575.76 611.78 575.77 612.75 575.77

617.39 575.8 618.43 575.8 621.6 575.8 621.62 575.8 621.81 575.8
623.66 575.8 623.96 575.8 627.48 575.8 627.57 575.8 631.15 575.8
632.1 575.8 634.1 575.79 635.54 575.72 636.71 575.75 640.7 575.79
642.22 575.8 643.14 575.81 644.56 575.82 646.61 575.84 647.13 575.85
648.75 575.86 650.24 575.87 651.07 575.87 652.36 575.87 653.74 575.88
654.8 575.88 657.55 575.88 658.77 575.88 658.85 575.88 659.49 575.88
659.88 575.89 660.33 575.88 660.73 575.88 661.37 575.94 661.53 575.94
662.42 575.96 664.95 576.02 664.97 576.02 667.79 576.04 672.51 576.09
672.86 576.09 675.42 576.12 676.07 576.12 676.37 576.12 680.84 576.14
681.9 576.1 682.49 576.12 683.21 576.13 687.12 576.2 692.42 576.28
693.65 576.29 698.35 576.36 702.35 576.41 702.57 576.41 703.04 576.41
703.1 576.4 703.2 576.41 703.91 576.42 705.9 576.46 709.39 576.53
710.88 576.56 712.47 576.6 715.2 576.68 715.82 576.69 716.65 576.71
718.41 576.76 719.16 576.78 719.71 576.79 721.76 576.82 722.04 576.83
722.52 576.84 723.34 576.86 729.14 577.19 730.93 577.29

Manning's n Values num= 3
Sta n Val Sta n Val Sta n Val
0 .06 377.05 .04 420.87 .06

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
377.05 420.87 61.81 62 62.61 .3 .5

CROSS SECTION

RIVER: Dry Run
REACH: Flood Study Site RS: 0.261

INPUT
Description: Increased Channel n to eliminate inverse WS slope
Station Elevation Data num= 209
Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev
9 572.02 12.32 571.99 25.58 571.84 26.16 571.83 27.29 571.81
28.07 571.79 35.34 571.8 38.26 571.75 44.63 571.76 50.28 571.65
54.15 571.65 58.28 571.47 62.15 571.52 65.22 571.57 73.88 571.85
78.68 571.85 81.2 571.3 82.11 571.36 94.47 572.47 94.96 572.5
96.96 572.54 97.01 572.54 97.46 572.49 98.6 572.36 102.68 572.45
103.29 572.47 114.38 572.69 117.33 572.67 117.7 572.68 119.96 572.67
120.68 572.68 122.67 572.68 124.2 572.71 126.43 572.71 126.88 572.72
127.31 572.73 129.82 572.79 130.75 572.81 131.45 572.81 133.25 572.87
133.97 572.88 134.03 572.88 134.2 572.89 134.46 572.89 135.22 572.92
136.12 572.95 138.73 573.03 138.86 573.03 139.44 573.05 142.06 573.13
142.27 573.14 143.3 573.17 143.63 573.18 145.27 573.24 145.61 573.24
145.79 573.25 148.43 573.33 148.95 573.34 151.6 573.4 152.21 573.41
154.81 573.47 154.94 573.47 155.02 573.47 155.7 573.48 156.37 573.49
158.13 573.52 158.56 573.53 159.45 573.54 160.28 573.55 161.63 573.57
162 573.57 162.47 573.58 164.17 573.59 167.27 573.62 169.57 573.64
173.62 573.66 174.98 573.67 175.92 573.67 180.38 573.68 181.23 573.69
188.57 573.58 191.19 573.55 196.7 573.47 201.99 573.4 211.56 573.26
214.51 573.16 218.15 573.52 222.36 573.56 225.87 573.59 226.77 573.6
228.73 573.62 231 573.63 233.57 573.65 235.4 573.67 238.33 573.69
242.27 573.71 243 573.71 243.55 573.72 247.54 573.73 247.63 573.73

252.18 573.73 252.19 573.73 253.52 573.72 256.63 573.72 258.72 573.71
261.06 573.7 262.46 573.7 265.45 573.69 266.23 573.68 269.79 573.67
274.88 573.7 275.03 573.7 283.97 570.09 284.09 570 288.48 565.95
292.38 564 296.39 562 300.4 560 302.4 559.003 303.71 558.35
304.43 557.97 304.69 557.64 304.77 557.59 305.44 557.63 306.76 557.19
309.86 557.26 315.66 557.03 317.72 556.94 319.85 556.93 332.3 557.07
338 557.23 338.98 557.26 339.08 557.26 339.59 557.3 341.34 557.362
342.12 557.39 342.3 557.47 342.59 557.54 345.09 557.54 346.04 557.54
346.99 557.23 347.7 557.08 348.39 556.83 348.69 556.77 349.91 557.03
350.34 557.12 352.89 560.43 354.34 562.04 361.18 562.16 366.07 562.16
371.3 562.17 372.82 562.55 375.53 564 382.15 565.92 382.59 566.57
387.4 573.23 387.41 573.23 388.09 572.78 396.49 572.93 397.53 572.83
397.78 572.95 402.89 572.78 408.2 572.61 410.15 572.55 415.96 572.37
420.85 572.44 424.5 572.49 439.56 572.68 440.12 572.69 440.5 572.69
440.67 572.7 440.81 572.7 440.91 572.7 442.03 572.71 447.51 572.75
485.08 573.03 489.07 573.06 490.47 573.08 495.4 573.17 498.28 573.22
499.91 573.25 501.75 573.28 509.67 573.39 510.9 573.41 520.03 573.54
521.04 573.56 529.84 573.66 530.01 573.67 531.93 573.69 539.21 573.8
548.26 573.92 549.08 573.93 557.33 574.04 558.56 574.06 566.32 574.16
568.58 574.2 575.66 574.29 578.53 574.34 584.91 574.42 588.41 574.49
594.25 574.58 598.45 574.66 603.42 574.73 608.32 574.84 614.07 574.95
617.06 575.01 619.63 575.05 625.98 575.18 627.58 575.21

Manning's n Values num= 3
Sta n Val Sta n Val Sta n Val
9 .06 306.76 .04 350.34 .06

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
306.76 350.34 78.7 78.7 78.7 .3 .5
Ineffective Flow num= 2
Sta L Sta R Elev Permanent
9 263.04 F
354.34 627.58 F

BRIDGE

RIVER: Dry Run
REACH: Flood Study Site RS: 0.255

INPUT
Description:
Distance from Upstream XS = 19.46
Deck/Roadway Width = 36
Weir Coefficient = 2.6
Upstream Deck/Roadway Coordinates
num= 10
Sta Hi Cord Lo Cord Sta Hi Cord Lo Cord Sta Hi Cord Lo Cord
152.25 572 262.59 573.05 264.59 573.83
264.59 578.33 0 266.07 578.33 569.33 352.73 578.33 569.33
354.21 578.33 0 354.21 573.83 356.21 573.05
405.46 573.34

Upstream Bridge Cross Section Data
Station Elevation Data num= 21
Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev
81.25 570 120.25 570 152.25 572 258.25 571.42 266.07 566.83
295.32 557.08 323.48 557.08 352.73 566.83 354.31 568.26 417.08 576.96
426.08 577.51 431.08 577.42 446.08 577.75 470.08 578.61 495.08 579.1
548.4 580 596.81 580.52 652.04 582 705.91 582 833.17 582.95
875.08 583.1

Manning's n Values num= 3
Sta n Val Sta n Val Sta n Val
81.25 .07 295.32 .055 323.48 .07

Bank Sta: Left Right Coeff Contr. Expan.
295.32 323.48 .3 .5
Ineffective Flow num= 2
Sta L Sta R Elev Permanent
81.25 263.04 F
354.34 875.08 F

Downstream Deck/Roadway Coordinates
num= 12
Sta Hi Cord Lo Cord Sta Hi Cord Lo Cord Sta Hi Cord Lo Cord
100 573.05 264.44 572.73 264.44 575.36 0
265.92 575.36 569.33 352.58 575.36 569.33 354.06 575.36 0
354.06 572.73 356.06 573.05 405.31 573.34
420.83 573.45 455.31 573.18 650.76 570.09

Downstream Bridge Cross Section Data
Station Elevation Data num= 16
Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev
100 573.05 261.92 570 265.92 566.16 295.62 556.36 322.88 556.36
352.58 566.16 354.48 570.46 364.48 570.6 369.48 570.56 375.48 570.64
396.48 569.77 420.48 569.26 446.48 569.18 471.92 571.15 686.18 574.16
757.98 575.65

Manning's n Values num= 3
Sta n Val Sta n Val Sta n Val
100 .07 295.62 .055 322.88 .07

Bank Sta: Left Right Coeff Contr. Expan.
295.62 322.88 .3 .5

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

Number of Bridge Coefficient Sets = 1

Low Flow Methods and Data
Energy
Momentum Cd = 2
W.S. Pro Method

W.S.Pro Data
Left Embankment
El of the top of the embankment = 557.08
El of the toe of the abutment = 569.39
Right Embankment
El of the top of the embankment = 557.08
El of the toe of the abutment = 569.39
Abtument Type = 2 Vert. abutments and sloping embankments
Slope of abutments =
Top with of embankment = 80
Centroid station of bridge opening = 309.4
Wing Wall Type = No wing walls present
Width =
Angle =
Radius =
Guide Banks Type = No Guide Bank present
Length =
Offset =
Angle =
Optional Contraction and expansion coefficients
At approach Section
At Guide Bank
At upstream outside
At upstream inside (BU)
At downstream inside (BD)
Use Geometric mean as Friction Slope Method

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

BRIDGE OUTPUT Profile #100 Yr

			Inside BR US	Inside BR DS
E.G. US. (ft)	569.24	Element		
W.S. US. (ft)	567.69	E.G. Elev (ft)	569.06	568.40
Q Total (cfs)	5479.00	W.S. Elev (ft)	567.27	567.32
Q Bridge (cfs)	5479.00	Crit W.S. (ft)	565.60	564.98
Q Weir (cfs)		Max Chl Dpth (ft)	10.19	10.96
Weir Sta Lft (ft)		Vel Total (ft/s)	9.16	8.31
Weir Sta Rgt (ft)		Flow Area (sq ft)	598.12	658.96

Weir Submerg		Froude # Chl	0.59	0.44
Weir Max Depth (ft)		Specif Force (cu ft)	4270.79	4382.02
Min El Weir Flow (ft)	573.24	Hydr Depth (ft)	6.90	7.60
Min El Prs (ft)	569.33	W.P. Total (ft)	90.71	92.14
Delta EG (ft)	1.40	Conv. Total (cfs)	55695.4	63806.8
Delta WS (ft)	0.46	Top Width (ft)	86.67	86.67
BR Open Area (sq ft)	776.41	Frctn Loss (ft)	0.30	0.11
BR Open Vel (ft/s)	9.16	C & E Loss (ft)	0.36	0.02
Coef of Q	1.00	Shear Total (lb/sq ft)	3.98	3.29
Br Sel Method	WSPRO	Power Total (lb/ft s)	81.25	100.00

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.

This may indicate the need for additional cross sections.

BRIDGE OUTPUT Profile #50 Yr

E.G. US. (ft)	568.02	Element	Inside BR US	Inside BR DS
W.S. US. (ft)	566.78	E.G. Elev (ft)	567.78	567.12
Q Total (cfs)	4415.00	W.S. Elev (ft)	566.13	566.14
Q Bridge (cfs)	4415.00	Crit W.S. (ft)	564.64	564.01
Q Weir (cfs)		Max Chl Dpth (ft)	9.04	9.78
Weir Sta Lft (ft)		Vel Total (ft/s)	8.83	7.93
Weir Sta Rgt (ft)		Flow Area (sq ft)	500.14	556.62
Weir Submerg		Froude # Chl	0.70	0.61
Weir Max Depth (ft)		Specif Force (cu ft)	3251.30	3337.13
Min El Weir Flow (ft)	573.24	Hydr Depth (ft)	6.07	6.43
Min El Prs (ft)	569.33	W.P. Total (ft)	85.37	89.69
Delta EG (ft)	1.49	Conv. Total (cfs)	43629.2	50083.7
Delta WS (ft)	0.73	Top Width (ft)	82.43	86.55
BR Open Area (sq ft)	776.41	Frctn Loss (ft)	0.32	0.12
BR Open Vel (ft/s)	8.83	C & E Loss (ft)	0.34	0.03
Coef of Q	1.00	Shear Total (lb/sq ft)	3.75	3.01
Br Sel Method	WSPRO	Power Total (lb/ft s)	81.25	100.00

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.

This may indicate the need for additional cross sections.

BRIDGE OUTPUT Profile #25 Yr

E.G. US. (ft)	566.84	Element	Inside BR US	Inside BR DS
W.S. US. (ft)	565.84	E.G. Elev (ft)	566.58	565.95
Q Total (cfs)	3531.00	W.S. Elev (ft)	565.10	565.07
Q Bridge (cfs)	3531.00	Crit W.S. (ft)	563.74	563.10
Q Weir (cfs)		Max Chl Dpth (ft)	8.02	8.71
Weir Sta Lft (ft)		Vel Total (ft/s)	8.44	7.56
Weir Sta Rgt (ft)		Flow Area (sq ft)	418.55	467.10
Weir Submerg		Froude # Chl	0.69	0.61
Weir Max Depth (ft)		Specif Force (cu ft)	2453.83	2529.05
Min El Weir Flow (ft)	573.24	Hydr Depth (ft)	5.49	5.84

Min El Prs (ft)	569.33	W.P. Total (ft)	78.86	82.83
Delta EG (ft)	1.51	Conv. Total (cfs)	34401.2	39702.0
Delta WS (ft)	0.86	Top Width (ft)	76.26	80.03
BR Open Area (sq ft)	776.41	Frctn Loss (ft)	0.33	0.12
BR Open Vel (ft/s)	8.44	C & E Loss (ft)	0.30	0.03
Coef of Q	1.00	Shear Total (lb/sq ft)	3.49	2.78
Br Sel Method	WSPRO	Power Total (lb/ft s)	81.25	100.00

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.

BRIDGE OUTPUT Profile #10 Yr

E.G. US. (ft)	565.35	Element	Inside BR US	Inside BR DS
W.S. US. (ft)	564.61	E.G. Elev (ft)	565.10	564.52
Q Total (cfs)	2565.00	W.S. Elev (ft)	563.85	563.76
Q Bridge (cfs)	2565.00	Crit W.S. (ft)	562.62	561.97
Q Weir (cfs)		Max Chl Dpth (ft)	6.77	7.40
Weir Sta Lft (ft)		Vel Total (ft/s)	7.82	6.97
Weir Sta Rgt (ft)		Flow Area (sq ft)	327.97	367.81
Weir Submerg		Froude # Chl	0.68	0.59
Weir Max Depth (ft)		Specif Force (cu ft)	1645.52	1711.91
Min El Weir Flow (ft)	573.24	Hydr Depth (ft)	4.77	5.10
Min El Prs (ft)	569.33	W.P. Total (ft)	70.96	74.50
Delta EG (ft)	1.53	Conv. Total (cfs)	24767.9	28851.2
Delta WS (ft)	0.94	Top Width (ft)	68.77	72.12
BR Open Area (sq ft)	776.41	Frctn Loss (ft)	0.33	0.12
BR Open Vel (ft/s)	7.82	C & E Loss (ft)	0.25	0.03
Coef of Q	1.00	Shear Total (lb/sq ft)	3.09	2.44
Br Sel Method	WSPRO	Power Total (lb/ft s)	81.25	100.00

Warning: The flow regime calculated by the momentum equation shows class B flow. For the best solution, this profile should be
run as a mixed flow problem.
Warning: For the final momentum answer at the bridge, the upstream energy was computed lower than the energy inside of the
bridge deck. This is not physically possible. Please review your bridge data and results for reasonableness.

BRIDGE OUTPUT Profile #5 Yr

E.G. US. (ft)	564.23	Element	Inside BR US	Inside BR DS
W.S. US. (ft)	563.67	E.G. Elev (ft)	564.00	563.49
Q Total (cfs)	1928.00	W.S. Elev (ft)	562.98	562.87
Q Bridge (cfs)	1928.00	Crit W.S. (ft)	561.76	561.11
Q Weir (cfs)		Max Chl Dpth (ft)	5.90	6.51
Weir Sta Lft (ft)		Vel Total (ft/s)	7.12	6.30
Weir Sta Rgt (ft)		Flow Area (sq ft)	270.79	305.91
Weir Submerg		Froude # Chl	0.65	0.56
Weir Max Depth (ft)		Specif Force (cu ft)	1165.95	1233.77
Min El Weir Flow (ft)	573.24	Hydr Depth (ft)	4.26	4.59

Min El Prs (ft)	569.33	W.P. Total (ft)	65.50	68.81
Delta EG (ft)	1.52	Conv. Total (cfs)	19079.6	22502.4
Delta WS (ft)	0.89	Top Width (ft)	63.58	66.72
BR Open Area (sq ft)	776.41	Frctn Loss (ft)	0.31	0.12
BR Open Vel (ft/s)	7.12	C & E Loss (ft)	0.20	0.02
Coef of Q	1.00	Shear Total (lb/sq ft)	2.64	2.04
Br Sel Method	WSPRO	Power Total (lb/ft s)	81.25	100.00

Warning: The flow regime calculated by the momentum equation shows class B flow. For the best solution, this profile should be
run as a mixed flow problem.
Warning: For the final momentum answer at the bridge, the upstream energy was computed lower than the energy inside of the
bridge deck. This is not physically possible. Please review your bridge data and results for reasonableness.

BRIDGE OUTPUT Profile #1.5 Yr Scour

E.G. US. (ft)	562.19	Element	Inside BR US	Inside BR DS
W.S. US. (ft)	561.91	E.G. Elev (ft)	562.05	561.72
Q Total (cfs)	965.00	W.S. Elev (ft)	561.52	561.41
Q Bridge (cfs)	965.00	Crit W.S. (ft)	560.16	559.47
Q Weir (cfs)		Max Chl Dpth (ft)	4.44	5.05
Weir Sta Lft (ft)		Vel Total (ft/s)	5.24	4.49
Weir Sta Rgt (ft)		Flow Area (sq ft)	184.10	214.97
Weir Submerg		Froude # Chl	0.53	0.43
Weir Max Depth (ft)		Specif Force (cu ft)	535.41	612.30
Min El Weir Flow (ft)	573.24	Hydr Depth (ft)	3.36	3.71
Min El Prs (ft)	569.33	W.P. Total (ft)	56.23	59.49
Delta EG (ft)	1.40	Conv. Total (cfs)	11181.5	13888.1
Delta WS (ft)	0.58	Top Width (ft)	54.79	57.87
BR Open Area (sq ft)	776.41	Frctn Loss (ft)	0.22	0.08
BR Open Vel (ft/s)	5.24	C & E Loss (ft)	0.11	0.01
Coef of Q	1.00	Shear Total (lb/sq ft)	1.52	1.09
Br Sel Method	WSPRO	Power Total (lb/ft s)	81.25	100.00

BRIDGE OUTPUT Profile #500 Yr

E.G. US. (ft)	570.29	Element	Inside BR US	Inside BR DS
W.S. US. (ft)	568.17	E.G. Elev (ft)	570.04	569.49
Q Total (cfs)	6738.00	W.S. Elev (ft)	567.56	567.22
Q Bridge (cfs)	6738.00	Crit W.S. (ft)	566.62	566.00
Q Weir (cfs)		Max Chl Dpth (ft)	10.48	10.86
Weir Sta Lft (ft)		Vel Total (ft/s)	10.82	10.37
Weir Sta Rgt (ft)		Flow Area (sq ft)	622.83	649.86
Weir Submerg		Froude # Chl	0.69	0.65
Weir Max Depth (ft)		Specif Force (cu ft)	5230.81	5325.56
Min El Weir Flow (ft)	573.24	Hydr Depth (ft)	7.19	7.50
Min El Prs (ft)	569.33	W.P. Total (ft)	91.29	91.93
Delta EG (ft)	1.11	Conv. Total (cfs)	59032.3	62536.5
Delta WS (ft)	0.97	Top Width (ft)	86.67	86.67
BR Open Area (sq ft)	776.41	Frctn Loss (ft)	0.44	0.17

BR Open Vel (ft/s)	10.82	C & E Loss (ft)	0.10	0.15	
Coef of Q		Shear Total (lb/sq ft)	5.55	5.12	
Br Sel Method	Energy only	Power Total (lb/ft s)	81.25	100.00	

Note: Momentum answer is not valid if the water surface is above the low chord or if there is weir flow. The momentum
answer has been disregarded.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Dry Run
REACH: Flood Study Site RS: 0.239

INPUT
Description:
Station Elevation Data num= 122

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	573.34	2.1	573.38	3.57	573.44	4.45	573.46	6.36	573.47
7.07	573.49	8.06	573.52	8.7	573.53	9.19	573.54	9.62	573.54
10.21	573.55	10.99	573.55	11.34	573.56	11.87	573.54	12.26	573.49
45.11	572.9	62.46	572.64	65.23	572.65	68.09	572.67	72.01	572.68
74.66	572.69	76.14	571.96	79.42	571.92	103.6	573.5	129.66	572.82
134.42	572.72	135.08	572.54	137.37	572.53	142.37	572.48	147.85	572.42
149.69	572.41	155.58	572.35	161.43	572.29	163.35	572.28	169.58	572.22
176.38	572.15	178.37	572.13	183.58	572.08	186.19	572.06	189.11	572.04
191.16	572.01	194.68	571.99	196.49	571.96	197.27	571.96	204.92	571.791
209.51	571.69	214.87	571.57	265.2	571.25	270.49	568	290.72	558.06
295	557.46	340.07	557.54	342.66	558	357.9	565.46	362.36	571.31
369.53	570.91	375.14	570.67	394.69	570.23	398.8	570.18	401.49	570.3
410.19	570.73	410.93	570.75	414.95	570.74	418.49	570.73	420.28	570.73
423.51	570.72	426.33	570.71	426.51	570.67	429.3	570.61	430.91	570.59
432.64	570.58	433.91	570.58	436.46	570.58	441.21	570.62	443.68	570.65
447.61	570.65	451.5	570.68	454.38	570.69	458.49	570.73	461.24	570.73
466.69	570.79	469.92	570.8	475.81	570.86	478.79	570.87	485.18	570.94
487.79	570.95	490.31	570.96	497.08	571.04	498.93	571.05	503.23	571.09
504.94	571.1	509.41	571.14	511.73	571.16	517.08	571.2	522.69	571.24
524.04	571.25	531.89	571.3	540.28	571.36	541.14	571.37	541.73	571.38
542.18	571.4	542.45	571.41	542.76	571.43	543.63	571.41	544.2	571.41
544.95	571.41	545.69	571.41	553.94	571.46	554.65	571.47	563.24	571.52
572.33	571.57	572.74	571.58	580.19	571.64	587	571.69	587.98	571.7
588.04	571.7	595.99	571.79	596.49	571.79	604.17	571.87	604.99	571.88
612.35	571.95	616.67	572						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.06	290.72	.04	342.66	.06

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

290.72 342.66 101.52 103 106.44 .3 .5

CROSS SECTION

RIVER: Dry Run
REACH: Flood Study Site RS: .222721*

INPUT
Description:
Station Elevation Data num= 315
Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev
0 572.53 3.41 572.52 5.79 572.54 7.22 572.54 10.32 572.52
11.48 572.52 13.08 572.53 14.12 572.53 14.92 572.53 15.62 572.52
16.57 572.52 17.84 572.51 18.41 572.51 19.27 572.5 19.9 572.47
73.22 571.8 101.39 571.48 105.88 571.45 110.52 571.43 116.89 571.39
121.19 571.37 123.59 570.98 125.79 570.96 128.91 570.94 137.49 571.09
145.48 571.26 152.46 571.39 168.16 571.72 175.45 571.66 178.68 570.89
180.12 570.88 183.34 571.59 210.46 571.11 218.19 570.99 219.26 570.88
222.98 570.84 231.1 570.74 234.83 570.69 239.99 570.62 242.98 570.59
252.54 570.46 262.03 570.34 265.15 570.3 271.87 570.21 273.39 569.95
275.26 569.62 276.18 569.46 278.33 569.45 280.37 569.8 282.65 570.18
285.03 570.3 286.3 570.22 286.96 570.18 287.1 570.25 287.15 570.41
289.53 570.44 292.99 570.48 295.58 570.5 297.99 570.46 302.22 570.39
303.28 570.37 304.21 570.36 305.25 570.29 306.96 570.19 308.52 570.09
308.78 570.05 310.29 569.78 312.51 569.4 312.84 569.34 315 569.34
316.01 569.51 318.45 569.92 318.94 570 319.31 570.06 320.21 570.05
320.85 570.04 326.66 569.96 332.63 569.88 340.08 569.77 348.78 569.65
352.04 569.62 360.31 569.54 361.39 569.54 361.7 569.54 364.21 569.55
366.82 569.56 367.86 569.56 369.75 569.57 371.89 569.59 374.81 569.6
377.08 569.63 377.37 569.64 377.46 569.64 382.44 569.71 383.44 569.73
388.41 569.81 390.31 569.84 394.63 569.91 398.55 569.98 401.29 570.02
420.07 570.07 430.47 570.1 437.49 568.79 439.06 568.51 455.46 566.2
459.4 565.67 461.23 562.8 465.51 559.32 469.69 556.99 471.9 555.97
475.17 554.76 487.83 555.14 491.71 555.34 494.96 555.96 497.7 556.45
502.98 556.64 508.63 557.15 512.61 557.35 519.79 557.2 526.84 557.24
529.81 557.44 534.65 559.3 542.76 561.16 548.81 564.66 552.84 567.73
553.13 567.78 556.5 569.3 559.96 570.71 568.9 570.3 570.93 570.23
579.52 569.96 587.02 569.77 606.95 569.53 607.41 569.52 608.94 569.51
609.45 569.5 610.59 569.5 612.17 569.49 614.09 569.48 615.74 569.47
616.43 569.48 619.23 569.53 619.85 569.54 621.25 569.56 623.3 569.6
625.75 569.64 628.23 569.69 630.53 569.73 632.87 569.77 633.17 569.78
634.3 569.79 635.24 569.79 638.93 569.82 640.46 569.84 641.52 569.85
645.69 569.84 645.87 569.84 647.76 569.84 648.61 569.84 650.15 569.84
652.4 569.84 653.56 569.85 654.89 569.85 657.41 569.86 657.87 569.86
658.15 569.84 660.93 569.84 662.42 569.83 663.26 569.83 664.88 569.84
665.7 569.84 667.53 569.85 669.07 569.86 669.48 569.86 672.68 569.88
673.38 569.89 676.29 569.92 680.17 569.95 680.65 569.96 684.33 570
684.43 570 689 570.03 690.45 570.04 694.06 570.07 696.4 570.1
699.55 570.12 700.81 570.13 705.54 570.18 707.1 570.19 709.65 570.21
710.85 570.22 711.31 570.21 713.94 570.21 714.36 570.19 714.85 570.18
716.02 570.13 719.29 570 719.65 569.98 720.57 569.81 721.41 569.86
724.59 569.91 724.98 569.92 730.09 570.01 730.73 570.01 731.94 570

733.61 569.98 738.17 569.93 738.78 569.93 739.63 569.89 740.68 570.08
741.07 570.09 741.29 570.1 741.34 570.1 747.95 570.23 750.07 570.26
751.95 570.29 755.8 570.34 759.07 570.39 764.18 570.41 765.31 570.42
766.17 570.42 769 570.42 770.13 570.43 770.45 570.42 770.64 570.42
770.87 570.45 770.96 570.46 771.01 570.43 771.03 570.46 775.58 570.47
775.87 570.47 777 570.49 778.2 570.49 781.85 570.49 784.4 570.53
785.04 570.53 788.05 570.54 788.59 570.54 789.34 570.56 792.97 570.56
796.78 570.57 800.74 570.58 801.97 570.59 805.37 570.59 805.59 570.59
805.65 570.59 807.43 570.59 809.41 570.58 810.52 570.6 815.73 570.6
817.79 570.63 819.45 570.63 823.69 570.64 823.74 570.64 827.9 570.65
829.02 570.67 832.29 570.68 833.15 570.69 833.61 570.69 834.35 570.71
834.51 570.71 835.2 570.72 835.61 570.73 836.09 570.74 837.42 570.73
838.29 570.73 838.96 570.73 839.44 570.74 840.22 570.74 840.57 570.74
841.21 570.75 845.77 570.76 847.26 570.78 851.71 570.8 853.2 570.81
854.29 570.82 855.97 570.83 857.74 570.85 861.36 570.87 863.53 570.9
867.01 570.92 867.43 570.93 869.56 570.95 872.44 570.98 875.14 571
878.19 571.04 880.6 571.06 881.35 571.07 881.97 571.08 884.21 571.11
886.47 571.13 890.72 571.19 892.99 571.21 893.38 571.22 898.02 571.28
903.8 571.35 904.06 571.35 905.3 571.37 905.39 571.37 911.82 571.46
917.56 571.54 917.91 571.54 918.33 571.55 925.05 571.64 926.1 571.65
930.08 571.7 931.34 571.72 933.97 571.75 934.33 571.76 934.55 571.76
938.63 571.81 942.08 571.87 942.59 571.88 942.6 571.88 949.21 572

Manning's n Values num= 3
Sta n Val Sta n Val Sta n Val
0 .06 471.9 .04 529.81 .06

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
471.9 529.81 104.28 105.8 109.33 .3 .5

CROSS SECTION

RIVER: Dry Run
REACH: Flood Study Site RS: 0.206

INPUT
Description:
Station Elevation Data num= 199
Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev
0 571.69 175.4 569.94 191.71 569.89 202.86 569.89 212.59 569.88
244.64 569.89 249.14 568.39 251.15 568.39 255.65 569.88 327.44 568.88
379.09 568.13 381.21 567.6 385.1 566.63 388.1 566.63 390.94 567.34
394.12 568.13 397.44 568.4 400.13 568.16 400.32 568.3 400.4 568.63
408.54 568.8 412.15 568.87 422.89 568.64 424.18 568.62 425.63 568.49
430.19 568.11 430.55 568.02 435.75 566.72 436.21 566.61 439.22 566.61
444.04 567.81 445.23 568.11 447.38 568.08 455.48 568 490.88 567.63
502.4 567.51 503.91 567.5 504.35 567.5 507.85 567.53 511.48 567.57
512.93 567.58 515.57 567.61 518.55 567.64 522.62 567.69 525.79 567.76
526.19 567.77 526.32 567.78 533.26 567.94 534.66 567.97 541.59 568.16
544.23 568.23 550.26 568.39 555.72 568.54 559.55 568.63 585.74 568.82
610.02 569 635.08 569.46 640.57 569.61 643.13 564.36 649.1 558.63
654.92 555.21 658 553.82 660.24 553.48 674.56 553.86 678.95 554.15

682.62 555.32 685.72 556.22 691.7 556.45 698.09 557.3 702.59 557.6
710.71 557.07 722.04 556.86 728.61 559.04 739.61 560.15 747.81 565.26
753.27 570.15 758.24 570.29 775.05 569.6 799.63 568.96 826.66 568.78
827.28 568.77 829.35 568.76 831.59 568.76 833.73 568.75 836.34 568.75
839.51 568.75 843.31 568.76 846.05 568.76 848.83 568.77 852.15 568.77
855.51 568.78 858.63 568.79 861.8 568.8 865.02 568.81 870.02 568.88
873.54 568.94 879.19 568.93 882 568.93 885.24 568.93 888.29 568.94
891.66 568.96 895.09 568.98 899.86 569.02 903.02 569.04 906.32 569.07
910.9 569.12 915.79 569.17 920.69 569.22 925.95 569.27 931.59 569.33
937.92 569.39 944.78 569.46 952.23 569.54 960.35 569.62 965.93 569.68
967.55 569.69 971.74 569.66 972.31 569.62 972.98 569.58 974.56 569.48
979 569.2 979.49 569.14 980.73 568.81 981.88 568.9 986.71 569.01
993.65 569.16 994.51 569.15 996.16 569.12 1005.43 568.95 1006.58 568.87
1008 569.25 1008.53 569.27 1008.83 569.28 1008.9 569.28 1020.74 569.56
1032.95 569.78 1039.88 569.78 1041.4 569.78 1047.94 569.78 1048.38 569.77
1048.64 569.77 1048.95 569.83 1049.07 569.84 1049.13 569.78 1049.16 569.84
1055.73 569.84 1057.26 569.86 1063.83 569.85 1067.3 569.9 1072.24 569.9
1073.99 569.93 1078.91 569.93 1089.45 569.92 1091.12 569.94 1096.03 569.92
1096.11 569.92 1101.21 569.89 1102.72 569.92 1109.78 569.9 1112.57 569.95
1120.57 569.95 1120.64 569.95 1126.28 569.95 1127.8 569.98 1133.41 569.99
1135.03 570.02 1141.29 570.04 1142.99 570.06 1144.34 570.06 1150.52 570.08
1152.54 570.1 1158.57 570.13 1164.35 570.16 1166.75 570.2 1171.66 570.23
1174.6 570.28 1179.32 570.31 1182.78 570.36 1186.68 570.4 1190.35 570.44
1194.48 570.5 1197.75 570.54 1202.65 570.61 1205.71 570.65 1211.48 570.74
1214.55 570.78 1221.37 570.88 1229.56 571 1240.09 571.17 1248.35 571.29
1258.03 571.43 1259.46 571.45 1270.12 571.6 1270.61 571.61 1270.91 571.61
1276.44 571.69 1281.13 571.79 1281.81 571.81 1290.8 572

Manning's n Values num= 3
Sta n Val Sta n Val Sta n Val
0 .06 658 .04 722.04 .06

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
658 722.04 212.94 210 208.95 .1 .3

CROSS SECTION

RIVER: Dry Run
REACH: Flood Study Site RS: 0.170

INPUT
Description:
Station Elevation Data num= 321
Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev
0 571.69 .43 571.69 1.36 571.69 6.39 571.69 10.52 571.69
11.61 571.69 16.76 571.69 19.61 571.69 24.53 571.69 26.29 571.69
35.4 571.69 44.07 571.68 56.07 571.68 66.13 571.68 68.41 571.68
72.53 571.68 74.87 571.68 78.74 571.68 81.84 571.68 84.61 571.68
88.61 571.68 91.44 571.68 95.17 571.68 99.79 571.68 103.26 571.68
105.01 571.68 108.26 571.68 111.67 571.68 156.76 571.68 191.71 571.67
242.06 571.68 242.92 571.68 246.59 571.68 247.38 571.68 282.47 571.29
283.82 571.3 284.26 571.35 285.32 571.4 286.33 571.42 287.86 571.46

291.11 571.5 295.52 571.52 298.21 571.53 300.61 571.54 301.23 571.53
303.91 571.53 304.39 571.53 304.53 571.52 305.91 571.07 307.96 571.06
308.44 571.22 309.39 571.51 311.04 571.51 313.07 571.48 313.77 571.48
314.29 571.47 314.97 571.46 318.55 571.43 321.22 571.38 323.49 571.35
324.88 571.34 327.78 571.31 332.4 571.26 337.17 571.19 341.78 571.13
345.13 571.1 349.05 571.05 355.76 570.95 358.57 570.91 366.13 570.82
368.8 570.48 372.33 570.02 372.51 569.99 373.94 569.71 412.99 569.31
473.96 568.69 479.04 567.42 479.96 567.19 482.97 567.19 483.76 567.39
488.97 568.69 493.74 569.08 494.97 569.19 506.33 569.42 506.97 569.43
508.4 569.4 518.97 569.18 521.87 568.94 524.97 568.68 530.8 567.23
530.97 567.18 533.97 567.18 539.64 568.6 539.98 568.68 585.57 568.22
596.98 568.11 597.44 568.09 600.38 568 631.56 567.65 671.85 567.19
689.12 567 692.14 566 696.53 564.55 697.14 564.08 702.36 564
706.44 564.1 718.76 563.93 724.84 562.19 729.45 562.02 741.4 555.99
744.42 555.54 747.45 554.49 752.35 555.14 760.57 555.01 771.96 553.87
780.2 552.2 784.9 551.49 787.62 550.99 792.67 552.82 795.89 560.96
799.61 561.98 804.83 563.73 813.07 566.56 816.21 566.96 824.84 566.65
831.81 566.65 857.31 567.04 883.57 567.82 885.32 567.82 885.74 567.82
894.84 567.81 903.98 567.81 912.77 567.79 913.03 567.79 921.93 567.77
922.04 567.77 922.19 567.77 922.27 567.77 922.58 567.76 928.51 567.76
928.69 567.76 934.65 567.75 934.9 567.75 942.38 567.76 942.85 567.76
943.7 567.74 943.99 567.74 944.15 567.73 944.35 567.73 944.43 567.73
944.59 567.72 944.67 567.72 944.7 567.72 944.77 567.72 944.82 567.72
944.89 567.72 944.95 567.72 945.02 567.72 945.11 567.72 945.22 567.72
945.37 567.72 945.57 567.72 945.66 567.72 945.8 567.72 945.85 567.72
945.99 567.73 946.1 567.73 946.27 567.73 946.36 567.73 946.46 567.73
946.55 567.73 946.66 567.73 946.76 567.73 946.92 567.73 947.12 567.73
947.43 567.74 948.96 567.75 949.38 567.76 959.55 567.79 968.69 567.82
969.28 567.82 978.22 567.86 988.27 567.9 989.1 567.83 989.27 567.83
998.78 567.86 998.92 567.86 1007.89 567.89 1008 567.89 1008.22 567.88
1008.46 567.88 1008.73 567.87 1009.01 567.85 1009.33 567.85 1009.68 567.84
1010.08 567.83 1010.52 567.83 1017.76 567.85 1018.11 567.85 1018.2 567.85
1018.5 567.85 1018.57 567.85 1018.98 567.86 1019.2 567.87 1019.47 567.87
1020.1 567.87 1025.56 567.88 1025.72 567.88 1026.08 567.87 1026.83 567.85
1027.32 567.85 1027.78 567.82 1028.98 567.77 1030.52 567.72 1032.58 567.65
1033.26 567.63 1034.18 567.39 1035.31 567.47 1043.28 567.65 1046.05 567.71
1046.92 567.73 1054.85 567.57 1058.53 567.5 1059.66 567.42 1061.06 567.8
1061.92 567.84 1062.69 567.86 1062.83 567.86 1064.07 567.89 1065.2 567.92
1065.35 567.92 1066.38 567.94 1067.49 567.94 1067.68 567.95 1067.88 567.95
1069.06 567.97 1069.25 567.97 1070.33 567.99 1071.35 568 1071.52 568.01
1071.69 568.01 1072.64 568.02 1074.78 568.02 1075.87 568.04 1080.99 568.33
1083.65 568.34 1089.46 568.38 1092.31 568.38 1097.92 568.42 1130.01 568.48
1159.99 568.5 1164.56 568.48 1167.64 568.48 1172.19 568.49 1176.65 568.47
1181.3 568.45 1184.46 568.45 1188.81 568.43 1193.36 568.4 1198.11 568.37
1204.93 568.33 1206.44 568.33 1210.7 568.32 1213.34 568.32 1216.23 568.33
1220.28 568.34 1222.57 568.35 1226.31 568.34 1228.59 568.35 1233.19 568.37
1237.42 568.4 1239.29 568.41 1242.35 568.4 1244.25 568.42 1247.94 568.45
1250.04 568.47 1253.31 568.48 1265.97 568.63 1271.2 568.69 1274.55 568.71
1280.38 568.78 1283.39 568.81 1288.09 568.86 1293.26 568.92 1297.01 568.95
1304.43 569.03 1308.55 569.08 1316.61 569.16 1318.78 569.19 1327.13 569.27
1328.87 569.29 1337.92 569.38 1348.08 569.49 1356.13 569.59 1363.21 569.69
1364 569.71 1364.25 569.72 1379.14 570.2 1384.58 570.38 1399.12 570.86
1409.34 571.2 1424.54 571.69 1431.51 571.93 1434.32 572.02 1448.86 572.5

1458.49 572.81 1469.08 573.17 1474.52 573.35 1484.66 573.69 1485.99 573.72
1486.29 573.73 1498.78 574.02 1503.52 574.08 1513.61 574.31 1518.01 574.36
1523.19 574.42 1530.43 574.51 1541.26 574.72 1547.26 574.84 1551.96 574.93
1554.24 574.97

Manning's n Values num= 3
Sta n Val Sta n Val Sta n Val
0 .03 741.4 .04 792.67 .06

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
741.4 792.67 169.96 165.04 160.96 .1 .3

CROSS SECTION

RIVER: Dry Run
REACH: Flood Study Site RS: 0.138

INPUT
Description:
Station Elevation Data num= 196
Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev
0 570.39 8.97 570.24 9.32 570.24 10.29 570.16 11.21 570.09
16.79 569.75 20.32 569.67 27.52 570.06 35.6 570.98 42.93 571.37
46.93 571.51 52.07 571.64 53.83 571.69 54.65 571.69 58.33 571.69
61.52 571.69 85.22 571.69 88.09 571.69 90.86 571.69 103.53 571.69
106.78 571.69 117.18 571.69 122 571.69 132.76 571.69 135.98 571.69
143.06 571.32 162.57 570.62 174.84 567.43 186.84 565.76 222.25 563.65
248.25 563.78 251.61 563.53 258.45 554.95 263.84 551.66 282.96 552.68
289.81 552.9 292.64 552.56 302.6 556.55 314.71 557.29 326.04 561.08
330.54 561.21 335 562.36 339.35 562.78 341.17 563.22 348.89 563.24
356.56 563.45 360.49 563.76 377.85 564 381.99 565.03 385.85 566
404.35 566.06 418.47 566.11 428.13 566.14 435.15 566.16 506.73 566.46
508.78 566.5 511.2 566.54 511.69 566.72 514.52 566.75 517.95 566.79
522.19 566.84 527.53 566.89 534.46 566.97 538.69 567.02 539.69 566.97
542.29 566.92 544.69 566.87 549.11 566.69 554.7 566.46 556.08 566.08
557.2 566.16 565 566.33 568.71 566.41 571.93 566.34 580.21 566.17
581.33 566.09 582.71 566.47 583.22 566.49 591.46 566.84 592.72 566.89
597.32 566.99 597.72 567 598.72 567.04 603.1 567.13 608.9 566.92
613.38 566.96 613.65 566.96 613.91 566.97 615.36 566.99 616.67 567.01
616.86 567.01 617.04 567.01 618.19 567.03 622.56 567.06 622.71 567.06
623.83 567.07 624.89 567.08 624.98 567.08 625.06 567.08 626.01 567.09
626.19 567.1 627 567.11 627.08 567.11 627.15 567.11 628.08 567.12
628.17 567.12 628.99 567.14 629.73 567.15 629.83 567.15 634.64 567.17
635.34 567.18 635.45 567.18 636.09 567.18 636.2 567.19 636.3 567.19
636.89 567.19 642 567.2 642.59 567.21 642.68 567.21 642.78 567.21
643.32 567.21 643.41 567.21 648.99 567.21 649.55 567.21 649.63 567.21
650.16 567.22 650.68 567.22 650.74 567.22 651.28 567.22 651.32 567.22
651.78 567.23 651.89 567.23 652.33 567.23 652.87 567.24 652.92 567.24
653.38 567.24 653.8 567.25 653.86 567.25 654.26 567.25 654.32 567.25
654.38 567.25 654.76 567.25 654.82 567.25 655.17 567.26 655.23 567.26
655.57 567.26 655.89 567.26 656.98 567.42 659.02 567.44 659.95 567.44
660.2 567.44 660.68 567.44 661.67 567.44 664.69 567.43 666.56 567.43

675.03 567.42 675.55 567.42 681.14 567.4 686.64 567.39 693.77 567.37
700.74 567.35 706.58 567.33 712.29 567.32 717.88 567.3 722.88 567.28
727.77 567.26 732.55 567.25 739.07 567.22 743.22 567.22 746.99 567.22
751.19 567.23 755.97 567.24 760.45 567.26 766.73 567.29 770.81 567.32
775.02 567.34 780.5 567.38 786.22 567.42 793.74 567.47 801.74 567.53
811.28 567.61 821.63 567.69 822.02 567.69 837.8 567.98 850.12 568.21
855.78 568.32 866.2 568.52 874 568.67 881.19 568.8 887.09 568.91
896.46 569.07 900.65 569.15 903.9 569.21 915.43 569.39 919.19 569.46
925.91 569.54

Manning's n Values num= 4
Sta n Val Sta n Val Sta n Val Sta n Val
0 .06 263.84 .04 292.64 .06 377.85 .03

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
263.84 292.64 176.04 176.04 176.04 .1 .3

CROSS SECTION

RIVER: Dry Run
REACH: Flood Study Site RS: 0.104

INPUT
Description:
Station Elevation Data num= 143
Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev
0 570.33 5.69 570.46 8.47 570.5 15 570.65 18.34 570.7
23.14 570.78 27.04 570.85 32.6 570.98 43.65 571.27 59.39 571.69
60.92 571.69 66.73 571.69 67.05 571.69 71.76 571.69 76.33 571.69
97.03 571.69 100.76 571.69 105.85 571.69 106.9 571.69 112.31 571.69
113.84 571.69 134.38 571.69 137.31 571.69 140.59 571.69 154.88 571.69
160.31 571.69 163.64 571.69 168.3 571.69 175.38 571.69 179.46 571.69
184.11 571.69 191.17 571.54 193.21 571.49 197.39 571.39 217.35 570.93
250.21 570.18 256.29 570.04 266.58 569.8 275.72 570.24 295.09 564.06
304.01 563.51 329.92 562.89 358.36 562.38 381.1 559.58 392.66 558.79
402.54 552.58 412.23 551.93 420.05 551.17 428.94 552.93 434.47 554.83
443.03 557.35 453.22 560.06 461.15 561.02 469.93 561.09 486.82 560.93
505.09 562.38 509.79 562.43 516.09 564 520.09 565 524.1 566
565.67 565.97 588.94 565.98 631.93 565.96 672.99 565.99 674.13 565.99
675.12 565.95 679.41 565.87 680.16 565.86 686.86 565.59 690.25 565.45
691.65 565.08 692.78 565.16 697.31 565.26 704.38 565.42 706.14 565.38
711.53 565.28 715.99 565.19 717.12 565.11 718.52 565.49 721.36 565.61
728.62 565.92 731.54 565.99 733.67 566.03 734.68 566.08 745.41 566.31
752.97 566.47 761.77 566.02 761.79 566.02 762.05 566.03 763.51 566.04
764.91 566.05 769.57 566.66 773.94 566.71 777.95 566.75 781.7 566.78
782.67 566.78 784.59 566.78 788.43 566.78 792.18 566.78 795.94 566.78
799.69 566.78 803.05 566.78 806.4 566.79 811.89 566.79 813.65 566.8
817.34 566.8 821.04 566.8 825.9 566.8 830.76 566.79 834.9 566.79
839.02 566.79 843.12 566.78 846.84 566.78 850.54 566.78 854.2 566.77
859.28 566.77 862.57 566.77 865.59 566.78 869 566.79 872.93 566.81
876.66 566.83 881.99 566.86 885.51 566.89 889.19 566.92 894.04 566.96
899.21 567 906.14 567.05 913.72 567.12 923.02 567.2 933.44 567.29

941.35 567.36 950.02 567.44 959.78 567.53 970.6 567.63 977.08 567.69
988.13 567.92 991.96 568 1013.29 568.43 1025.86 568.69 1040.12 568.95
1048.63 569.13 1053.9 569.23 1069.83 569.49

Manning's n Values num= 4
Sta n Val Sta n Val Sta n Val Sta n Val
0 .06 402.54 .04 428.94 .06 461.15 .03

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
402.54 428.94 211.05 204.9 202.11 .1 .3

CROSS SECTION

RIVER: Dry Run
REACH: Flood Study Site RS: 0.066

INPUT
Description:
Station Elevation Data num= 168
Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev
0 571.69 14.1 571.69 42.04 571.69 80.26 571.69 81.99 571.69
82.68 571.68 84.9 571.69 85.06 571.69 85.17 571.69 116.59 571.69
118.59 571.69 137.13 571.69 139.21 571.69 143.7 571.69 148.57 571.69
152.44 571.69 157.95 571.69 160.19 571.69 164.74 571.69 167.26 571.69
171.47 571.69 173.96 571.69 205.92 570.87 248.35 569.69 281.39 569.11
299.53 568.8 312.22 568.59 321.64 568.44 330.34 568.31 336.48 568.22
341.05 568.15 357.42 567.77 357.99 567.76 358.4 567.75 359.21 567.76
360.03 567.78 367.58 565.01 378.87 558.71 387.6 556.62 394.11 551.02
407.29 551.11 421.82 551.62 431.17 556.48 443.28 556.27 454.62 558.03
462.71 558.47 469.15 559.69 487 560 502.45 560.03 503.88 560.01
505.13 560 505.3 560.03 509.13 561 510.64 561.38 513.15 562
515.03 562.47 517.17 563 519.41 563.56 521.19 564 523.78 564.65
525.21 565 530.52 565 534.96 565 537.91 565 543.85 565
544.54 565 547.53 565.01 550.73 565.02 554.17 565.03 557.91 565.03
562.02 565.03 563.66 565.03 570.97 565.03 578.32 565.03 580.57 565.05
588.28 565.05 590.17 565.06 615.77 564.97 616.84 564.96 624.34 564.96
625.43 564.94 626.76 564.93 631.81 564.93 633.3 564.9 635.19 564.87
640.36 564.87 644.53 564.8 645.58 564.78 650.29 564.76 653.79 564.69
658.81 564.59 661.85 564.57 668.02 564.44 672.28 564.35 673.28 564.31
675.77 564.25 678.28 564.2 683.18 564 688 563.8 688.28 563.78
689.66 563.41 690.78 563.49 697.09 563.62 702.28 563.73 703.75 563.74
704.79 563.78 708.92 563.88 710.29 563.91 713.67 563.99 714.06 564
715.92 563.98 718.86 564.05 719.46 564.06 721.07 564.1 722.81 564.14
724.25 564.16 724.74 564.17 732.93 564.28 742.34 564.41 742.65 564.48
744.32 564.56 748.34 564.63 749.96 564.64 759.29 564.73 764.59 564.81
765.57 564.84 765.65 564.84 774.18 564.97 780.68 565.15 784.02 565.22
796.66 565.38 798.84 565.42 799.08 565.43 801.06 565.49 801.32 565.5
801.66 565.51 801.83 565.51 821.62 565.69 822.76 565.7 822.92 565.7
846.89 565.93 849.93 565.97 854.11 566.02 860.22 566.1 871.36 566.23
871.77 566.74 897.27 567.36 950.24 568.65 951.61 568.67 991.18 569.38
993.89 569.43 1000.48 569.55 1003.89 569.61 1006.95 569.67 1015.11 569.82
1017.23 569.85 1021.85 569.94 1067.59 569.88 1075.23 569.86 1086.43 569.83

1097.42 569.79 1137.06 569.69 1138.87 569.69 1159.47 571.17 1166.51 571.69
1187.67 573.34 1192.33 573.69 1193.09 573.73

Manning's n Values num= 4
Sta n Val Sta n Val Sta n Val Sta n Val
0 .06 394.11 .04 421.82 .06 469.15 .03

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
394.11 421.82 162 162 162 .1 .3

CROSS SECTION

RIVER: Dry Run
REACH: Flood Study Site RS: 0.035

INPUT
Description:
Station Elevation Data num= 188
Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev
0 569.72 3.92 569.85 6.26 569.96 9.02 570.1 11.38 570.21
12.79 570.24 14.94 570.25 17.88 570.26 23.21 570.27 28.51 570.27
33.78 570.28 36.54 570.26 37.89 570.25 38.91 570.25 40.52 570.28
42.28 570.31 45.65 570.38 48.71 570.45 50.82 570.47 51.89 570.47
52.01 570.5 54.25 570.5 56.5 570.49 61.12 570.33 62.07 570.31
65.79 570.25 92.4 569.79 98.91 569.69 102.93 569.49 110.38 569.12
115.29 568.88 117.5 568.82 119.15 568.81 120.5 568.83 121.7 568.88
123.41 568.99 127.82 569.3 133.38 569.69 135.69 569.69 136.61 569.69
147.34 569.69 150.03 569.69 152.14 569.7 162.15 569.7 175.67 569.69
179.62 569.69 182.03 569.69 186.85 569.89 208.5 569.34 218.83 565.66
228.09 564.58 242.88 563.49 255.25 556.2 264.12 554.03 276.04 551.98
289.38 551.25 303.83 551 310.15 555.27 315.53 555.95 326.38 557.75
346.15 558.45 348.17 558.55 352.27 558.61 353.08 559 357.08 560
361.09 561 365.09 562 369.09 563 373.09 564 377.1 565
380.7 565 384.08 565 385.91 565 391.09 565 396.03 563.77
399.91 562.8 403.78 561.83 407.64 560.87 411.49 559.9 415.33 558.95
419.87 557.81 423 557.03 426.86 556.08 427.17 556 427.48 555.96
427.67 555.97 431.66 555.71 434.39 555.54 436.48 555.57 440.35 555.39
443.29 555.27 445.82 555.16 445.91 555.16 446.16 555.16 446.49 555.15
446.9 555.15 447.35 555.15 447.83 555.15 448.31 555.15 452.47 555.15
453.87 555.15 454.11 555.15 454.54 555.15 454.96 555.15 455.34 555.15
455.65 555.16 455.86 555.16 460.07 555.27 463.33 555.36 466.98 555.45
473.13 555.61 486.01 555.92 486.82 555.93 487.48 555.94 489.34 556
490.03 556.17 493.34 557 494.45 557.28 497.34 558 498.88 558.39
501.34 559 503.31 559.49 505.34 560 507.74 560.6 509.34 561
512.17 561.71 513.33 562 516.6 562.82 517.33 563 521.03 563.93
521.32 564 523.94 564.66 525.32 565 527.37 565 529.42 565
532.54 564.96 555.9 564.62 560.93 564.63 561.69 564.6 562.58 564.58
563.64 564.55 564.91 564.51 566.42 564.48 568.24 564.43 569.45 564.4
575.12 564.29 580.98 564.17 582.11 564.09 583.49 564.46 587.29 564.62
593.52 564.89 594.41 564.9 598.53 564.99 599.54 565.03 604.49 564.99
642.81 564.63 642.84 564.76 643.41 564.77 643.72 564.83 648.21 564.84
652.93 564.86 657.8 564.88 662.89 564.89 665.26 564.9 745.52 565.69

747.87 565.69 750.53 565.69 755.18 565.69 758.85 565.69 762.79 565.69
763.1 565.7 763.15 565.7 771.16 565.92 772.8 565.95 779.79 566.16
782.68 566.2 787.8 566.36 791.49 566.4 796.9 566.57 799.8 566.59
804.89 566.75 807.55 566.75 809.28 566.73 809.88 566.7 831.47 566.77
856.8 566.88 870.46 567.01 885.88 567.14

Manning's n Values num= 4
Sta n Val Sta n Val Sta n Val Sta n Val
0 .06 264.12 .04 310.15 .06 326.38 .03

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
264.12 310.15 183.12 183.12 183.12 .1 .3
Ineffective Flow num= 1
Sta L Sta R Elev Permanent
374.11 885.88 565 F

CROSS SECTION

RIVER: Dry Run
REACH: Flood Study Site RS: 0.000

INPUT
Description:
Station Elevation Data num= 224
Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev
0 567.86 .16 567.86 3.93 567.84 8.97 567.81 9.15 567.81
9.4 567.81 10.81 567.81 11.02 567.81 11.11 567.81 11.21 567.81
11.4 567.81 11.66 567.82 12.81 567.83 13.17 567.83 13.33 567.83
13.52 567.83 13.73 567.84 13.92 567.85 14.18 567.85 14.43 567.86
14.64 567.87 14.93 567.9 15.04 567.9 15.21 567.91 15.93 567.91
16.26 567.92 16.9 567.92 17.14 567.92 17.96 567.95 18.08 567.95
18.4 567.97 20.12 568.1 24.57 568.04 30.97 568 31.28 568.02
35.66 568.03 40.22 568.05 40.93 568.07 45.35 568.09 52.43 568.06
54.95 567.97 57.12 567.83 58.67 567.69 66.29 567.04 69.39 566.63
77.45 565.69 83.72 564.9 90.54 563.69 96.06 562.41 99.15 561.69
118.31 561.2 122.27 561.12 135.69 560.79 144.1 560.59 151.72 560.44
157.2 560.34 167.59 560.17 168.9 560.14 170.54 560.11 182.79 559.92
184.19 559.89 193.75 559.74 196.61 559.69 199.99 558.84 201.77 558.66
206.4 558.1 207.64 557.87 209.03 557.69 212.02 557.6 212.98 557.58
215.43 557.12 241.12 557.68 261.93 557.12 276.75 554.72 285.02 552.46
289.97 550.2 298.33 549.72 307.42 549.8 312.14 550.87 315.4 553.48
323.92 556.82 330.66 556.6 338.42 557.07 358.97 556.46 378.75 556.17
395.94 556.92 397.69 558.16 400.69 558.85 403.49 559.5 408.93 560.74
410.06 561 412.96 561.66 414.43 562 417.68 562.75 418.78 563
421.51 563.63 423.13 564 425.33 564.51 427.48 565 431.96 565
435.11 565 436.26 565 440.82 565 442.75 565 446.32 564.18
447.13 564 450.14 563.31 451.5 563 453.95 562.44 455.88 562
457.76 561.57 460.26 561 461.56 560.7 464.65 560 465.37 559.84
469.04 559 469.17 558.97 470.02 558.78 472.89 558.13 473.46 558
476.49 557.32 477.9 557 481.03 556.29 482.33 556 483.75 555.94
484.78 555.92 486.4 555.9 488.48 555.89 490.89 555.89 493.48 555.89
495.35 555.9 502.7 555.94 510.69 555.98 515.5 556 519.27 556.45

523.81 557 527.89 557.49 531.49 558 532.72 558.17 537.45 559
538.18 559.13 542.55 560 544.4 560.36 547.32 561 551.5 561.89
551.98 562 552.61 562.14 556.36 563 559.57 563.71 560.77 564
561.9 564.26 565.02 565 575.47 565.39 581.47 565.63 583.82 565.74
584.21 565.92 584.88 565.79 587.81 565.86 588.08 565.97 588.23 565.89
598.48 566.09 599.14 566.06 599.63 566.05 603.23 565.99 605.41 565.96
607.71 565.88 609.74 565.82 617.01 565.58 617.08 565.56 618.63 565.21
619.93 565.29 625.63 565.41 629.63 565.49 631.23 565.52 633.45 565.57
636.78 565.52 638.99 565.49 647.11 565.38 647.99 565.33 648.45 565.3
650.11 565.68 651.71 565.74 656.65 565.93 662.17 566.14 664.99 566.2
666.87 566.24 668.26 566.27 669.48 566.31 673.05 566.39 673.36 566.39
680.82 566.54 681.81 566.56 688.33 566.69 689.99 566.73 695.6 566.84
697.92 566.89 702.63 566.98 705.61 567.04 709.45 567.12 713.07 567.19
750.2 567.69 751.94 567.69 752.85 567.69 780.59 567.69 785.41 567.69
788.31 567.69 790.12 567.69 818.1 567.68 828.62 567.67 839.64 567.66
845.55 567.66 857.64 567.65 863.45 567.66 867.45 567.66 884.33 567.67
912.39 567.68 917.13 567.68 929.47 567.66 933.29 567.69 951.53 568.32
960.69 568.66 972.06 569.07 987.72 569.69 993.37 570.11

Manning's n Values num= 4

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
0	.06	289.97	.04	312.14	.06	378.75	.03

Bank Sta: Left Right Coeff Contr. Expan.
289.97 312.14 .1 .3

Ineffective Flow num= 1

Sta L	Sta R	Elev	Permanent
407.97	993.37	565	F

SUMMARY OF MANNING'S N VALUES

River:Dry Run

Reach	River Sta.	n1	n2	n3	n4
Flood Study Site	0.551	.06	.04	.06	
Flood Study Site	0.513	.06	.04	.06	
Flood Study Site	0.486	.06	.045	.06	
Flood Study Site	0.445	.06	.04	.06	
Flood Study Site	0.419	.06	.04	.06	
Flood Study Site	0.396	.06	.04	.06	
Flood Study Site	0.361	.06	.04	.06	
Flood Study Site	0.319	.06	.04	.06	
Flood Study Site	.272710*	.06	.04	.06	
Flood Study Site	0.261	.06	.04	.06	
Flood Study Site	0.255	Bridge			
Flood Study Site	0.239	.06	.04	.06	
Flood Study Site	.222721*	.06	.04	.06	
Flood Study Site	0.206	.06	.04	.06	
Flood Study Site	0.170	.03	.04	.06	
Flood Study Site	0.138	.06	.04	.06	.03

Flood Study Site	0.104	.06	.04	.06	.03
Flood Study Site	0.066	.06	.04	.06	.03
Flood Study Site	0.035	.06	.04	.06	.03
Flood Study Site	0.000	.06	.04	.06	.03

SUMMARY OF REACH LENGTHS

River: Dry Run

Reach	River Sta.	Left	Channel	Right
Flood Study Site	0.551	210.99	224.07	236.88
Flood Study Site	0.513	162	178.88	194.96
Flood Study Site	0.486	216	225	233.94
Flood Study Site	0.445	156	156.94	159.06
Flood Study Site	0.419	170.6	134	77.06
Flood Study Site	0.396	219.03	204.96	130.53
Flood Study Site	0.361	237.09	240	241.89
Flood Study Site	0.319	244.35	245.08	247.47
Flood Study Site	.272710*	61.81	62	62.61
Flood Study Site	0.261	78.7	78.7	78.7
Flood Study Site	0.255	Bridge		
Flood Study Site	0.239	101.52	103	106.44
Flood Study Site	.222721*	104.28	105.8	109.33
Flood Study Site	0.206	212.94	210	208.95
Flood Study Site	0.170	169.96	165.04	160.96
Flood Study Site	0.138	176.04	176.04	176.04
Flood Study Site	0.104	211.05	204.9	202.11
Flood Study Site	0.066	162	162	162
Flood Study Site	0.035	183.12	183.12	183.12
Flood Study Site	0.000			

SUMMARY OF CONTRACTION AND EXPANSION COEFFICIENTS
River: Dry Run

Reach	River Sta.	Contr.	Expan.
Flood Study Site	0.551	.1	.3
Flood Study Site	0.513	.1	.3
Flood Study Site	0.486	.1	.3
Flood Study Site	0.445	.1	.3
Flood Study Site	0.419	.1	.3
Flood Study Site	0.396	.1	.3
Flood Study Site	0.361	.1	.3
Flood Study Site	0.319	.1	.3
Flood Study Site	.272710*	.3	.5

Flood Study Site	0.261	.3	.5
Flood Study Site	0.255	Bridge	
Flood Study Site	0.239	.3	.5
Flood Study Site	.222721*	.3	.5
Flood Study Site	0.206	.1	.3
Flood Study Site	0.170	.1	.3
Flood Study Site	0.138	.1	.3
Flood Study Site	0.104	.1	.3
Flood Study Site	0.066	.1	.3
Flood Study Site	0.035	.1	.3
Flood Study Site	0.000	.1	.3

ERRORS WARNINGS AND NOTES

Errors Warnings and Notes for Plan : Dry Run - As

River: Dry Run Reach: Flood Study Site RS: 0.551 Profile: 5 Yr

Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.

This may indicate the need for additional cross sections.

River: Dry Run Reach: Flood Study Site RS: 0.551 Profile: 1.5 Yr Scour

Warning:Divided flow computed for this cross-section.

Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.

This may indicate the need for additional cross sections.

River: Dry Run Reach: Flood Study Site RS: 0.513 Profile: 100 Yr

Warning:Divided flow computed for this cross-section.

River: Dry Run Reach: Flood Study Site RS: 0.513 Profile: 50 Yr

Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.

This may indicate the need for additional cross sections.

River: Dry Run Reach: Flood Study Site RS: 0.513 Profile: 25 Yr

Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.

This may indicate the need for additional cross sections.

River: Dry Run Reach: Flood Study Site RS: 0.513 Profile: 10 Yr

Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.

This may indicate the need for additional cross sections.

River: Dry Run Reach: Flood Study Site RS: 0.513 Profile: 5 Yr

Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.

This may indicate the need for additional cross sections.

River: Dry Run Reach: Flood Study Site RS: 0.513 Profile: 1.5 Yr Scour

Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.

This may indicate the need for additional cross sections.

River: Dry Run Reach: Flood Study Site RS: 0.486 Profile: 100 Yr

Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.

Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate
the need for additional cross sections.
River: Dry Run Reach: Flood Study Site RS: 0.486 Profile: 50 Yr
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate
the need for additional cross sections.
River: Dry Run Reach: Flood Study Site RS: 0.486 Profile: 25 Yr
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate
the need for additional cross sections.
River: Dry Run Reach: Flood Study Site RS: 0.486 Profile: 10 Yr
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate
the need for additional cross sections.
River: Dry Run Reach: Flood Study Site RS: 0.486 Profile: 5 Yr
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate
the need for additional cross sections.
River: Dry Run Reach: Flood Study Site RS: 0.486 Profile: 1.5 Yr Scour
Warning:Divided flow computed for this cross-section.
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate
the need for additional cross sections.
River: Dry Run Reach: Flood Study Site RS: 0.486 Profile: 500 Yr
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate
the need for additional cross sections.
River: Dry Run Reach: Flood Study Site RS: 0.445 Profile: 50 Yr
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.
River: Dry Run Reach: Flood Study Site RS: 0.445 Profile: 25 Yr
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.
River: Dry Run Reach: Flood Study Site RS: 0.445 Profile: 10 Yr
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.
River: Dry Run Reach: Flood Study Site RS: 0.445 Profile: 5 Yr

Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth
for the water surface and continued on with the calculations.
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate
the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated
water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
River: Dry Run Reach: Flood Study Site RS: 0.445 Profile: 1.5 Yr Scour
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth
for the water surface and continued on with the calculations.
Warning:Divided flow computed for this cross-section.
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate
the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated
water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
River: Dry Run Reach: Flood Study Site RS: 0.396 Profile: 1.5 Yr Scour
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.
River: Dry Run Reach: Flood Study Site RS: 0.361 Profile: 100 Yr
Warning:Divided flow computed for this cross-section.
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
River: Dry Run Reach: Flood Study Site RS: 0.361 Profile: 50 Yr
Warning:Divided flow computed for this cross-section.
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
River: Dry Run Reach: Flood Study Site RS: 0.361 Profile: 25 Yr
Warning:Divided flow computed for this cross-section.
River: Dry Run Reach: Flood Study Site RS: 0.361 Profile: 10 Yr
Warning:Divided flow computed for this cross-section.
River: Dry Run Reach: Flood Study Site RS: 0.361 Profile: 5 Yr
Warning:Divided flow computed for this cross-section.
River: Dry Run Reach: Flood Study Site RS: 0.361 Profile: 1.5 Yr Scour
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.
River: Dry Run Reach: Flood Study Site RS: 0.361 Profile: 500 Yr
Warning:Divided flow computed for this cross-section.

Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.

River: Dry Run Reach: Flood Study Site RS: 0.319 Profile: 100 Yr

Warning:Divided flow computed for this cross-section.

Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.

River: Dry Run Reach: Flood Study Site RS: 0.319 Profile: 50 Yr

Warning:Divided flow computed for this cross-section.

Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.

River: Dry Run Reach: Flood Study Site RS: 0.319 Profile: 25 Yr

Warning:Divided flow computed for this cross-section.

Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.

River: Dry Run Reach: Flood Study Site RS: 0.319 Profile: 10 Yr

Warning:Divided flow computed for this cross-section.

Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.

River: Dry Run Reach: Flood Study Site RS: 0.319 Profile: 5 Yr

Warning:Divided flow computed for this cross-section.

Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.

River: Dry Run Reach: Flood Study Site RS: 0.319 Profile: 1.5 Yr Scour

Warning:Divided flow computed for this cross-section.

Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.

River: Dry Run Reach: Flood Study Site RS: 0.319 Profile: 500 Yr

Warning:Divided flow computed for this cross-section.

Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.

River: Dry Run Reach: Flood Study Site RS: .272710* Profile: 100 Yr

Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.

River: Dry Run Reach: Flood Study Site RS: 0.261 Profile: 100 Yr

Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.

Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.

This may indicate the need for additional cross sections.

River: Dry Run Reach: Flood Study Site RS: 0.261 Profile: 50 Yr

Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.

Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.

This may indicate the need for additional cross sections.

River: Dry Run Reach: Flood Study Site RS: 0.261 Profile: 25 Yr

Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.

Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.

This may indicate the need for additional cross sections.

River: Dry Run Reach: Flood Study Site RS: 0.261 Profile: 10 Yr

Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.

Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.

This may indicate the need for additional cross sections.

River: Dry Run Reach: Flood Study Site RS: 0.261 Profile: 5 Yr

Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.

Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.
River: Dry Run Reach: Flood Study Site RS: 0.261 Profile: 1.5 Yr Scour
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.
River: Dry Run Reach: Flood Study Site RS: 0.261 Profile: 500 Yr
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.
River: Dry Run Reach: Flood Study Site RS: 0.255 Profile: 100 Yr Downstream
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.
River: Dry Run Reach: Flood Study Site RS: 0.255 Profile: 50 Yr Downstream
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.
River: Dry Run Reach: Flood Study Site RS: 0.255 Profile: 25 Yr Downstream
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.
River: Dry Run Reach: Flood Study Site RS: 0.255 Profile: 10 Yr
Warning:The flow regime calculated by the momentum equation shows class B flow. For the best solution, this profile should
be run as a mixed flow problem.
Warning:For the final momentum answer at the bridge, the upstream energy was computed lower than the energy inside of the
bridge deck. This is not physically possible. Please review your bridge data and results for reasonableness.
River: Dry Run Reach: Flood Study Site RS: 0.255 Profile: 5 Yr
Warning:The flow regime calculated by the momentum equation shows class B flow. For the best solution, this profile should
be run as a mixed flow problem.
Warning:For the final momentum answer at the bridge, the upstream energy was computed lower than the energy inside of the
bridge deck. This is not physically possible. Please review your bridge data and results for reasonableness.
River: Dry Run Reach: Flood Study Site RS: 0.255 Profile: 500 Yr
Note: Momentum answer is not valid if the water surface is above the low chord or if there is weir flow. The momentum
answer has been disregarded.
River: Dry Run Reach: Flood Study Site RS: 0.255 Profile: 500 Yr Downstream
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.
River: Dry Run Reach: Flood Study Site RS: 0.239 Profile: 500 Yr
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
River: Dry Run Reach: Flood Study Site RS: 0.206 Profile: 1.5 Yr Scour
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.
River: Dry Run Reach: Flood Study Site RS: 0.206 Profile: 500 Yr

Warning:Divided flow computed for this cross-section.
River: Dry Run Reach: Flood Study Site RS: 0.170 Profile: 100 Yr
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.
River: Dry Run Reach: Flood Study Site RS: 0.170 Profile: 500 Yr
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.
River: Dry Run Reach: Flood Study Site RS: 0.138 Profile: 100 Yr
Warning:The energy equation could not be balanced within the specified number of iterations. The program selected the water
surface that had the least amount of error between computed and assumed values.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate
the need for additional cross sections.
River: Dry Run Reach: Flood Study Site RS: 0.138 Profile: 50 Yr
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
River: Dry Run Reach: Flood Study Site RS: 0.138 Profile: 25 Yr
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.
River: Dry Run Reach: Flood Study Site RS: 0.138 Profile: 10 Yr
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
River: Dry Run Reach: Flood Study Site RS: 0.138 Profile: 500 Yr
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate
the need for additional cross sections.
River: Dry Run Reach: Flood Study Site RS: 0.104 Profile: 100 Yr
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate
the need for additional cross sections.
River: Dry Run Reach: Flood Study Site RS: 0.104 Profile: 50 Yr
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth
for the water surface and continued on with the calculations.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate
the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated
water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

River: Dry Run Reach: Flood Study Site RS: 0.104 Profile: 25 Yr
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate
the need for additional cross sections.
River: Dry Run Reach: Flood Study Site RS: 0.104 Profile: 500 Yr
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth
for the water surface and continued on with the calculations.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate
the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated
water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
River: Dry Run Reach: Flood Study Site RS: 0.066 Profile: 25 Yr
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
River: Dry Run Reach: Flood Study Site RS: 0.035 Profile: 100 Yr
Warning:Divided flow computed for this cross-section.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
River: Dry Run Reach: Flood Study Site RS: 0.035 Profile: 50 Yr
Warning:Divided flow computed for this cross-section.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
River: Dry Run Reach: Flood Study Site RS: 0.035 Profile: 25 Yr
Warning:Divided flow computed for this cross-section.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
River: Dry Run Reach: Flood Study Site RS: 0.035 Profile: 10 Yr
Warning:Divided flow computed for this cross-section.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
River: Dry Run Reach: Flood Study Site RS: 0.035 Profile: 5 Yr
Warning:Divided flow computed for this cross-section.
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
River: Dry Run Reach: Flood Study Site RS: 0.035 Profile: 1.5 Yr Scour
Warning:Divided flow computed for this cross-section.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
River: Dry Run Reach: Flood Study Site RS: 0.035 Profile: 500 Yr
Warning:Divided flow computed for this cross-section.
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate
the need for additional cross sections.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
River: Dry Run Reach: Flood Study Site RS: 0.000 Profile: 100 Yr
Warning:Divided flow computed for this cross-section.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
River: Dry Run Reach: Flood Study Site RS: 0.000 Profile: 50 Yr

Warning:Divided flow computed for this cross-section.

Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used. River: Dry Run Reach: Flood Study Site RS: 0.000 Profile: 25 Yr

Warning:Divided flow computed for this cross-section.

Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used. River: Dry Run Reach: Flood Study Site RS: 0.000 Profile: 10 Yr

Warning:Divided flow computed for this cross-section.

Warning:Slope too steep for slope area to converge during supercritical flow calculations (normal depth is below critical depth). Water surface set to critical depth.

Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used. River: Dry Run Reach: Flood Study Site RS: 0.000 Profile: 5 Yr

Warning:Divided flow computed for this cross-section.

Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used. River: Dry Run Reach: Flood Study Site RS: 0.000 Profile: 1.5 Yr Scour

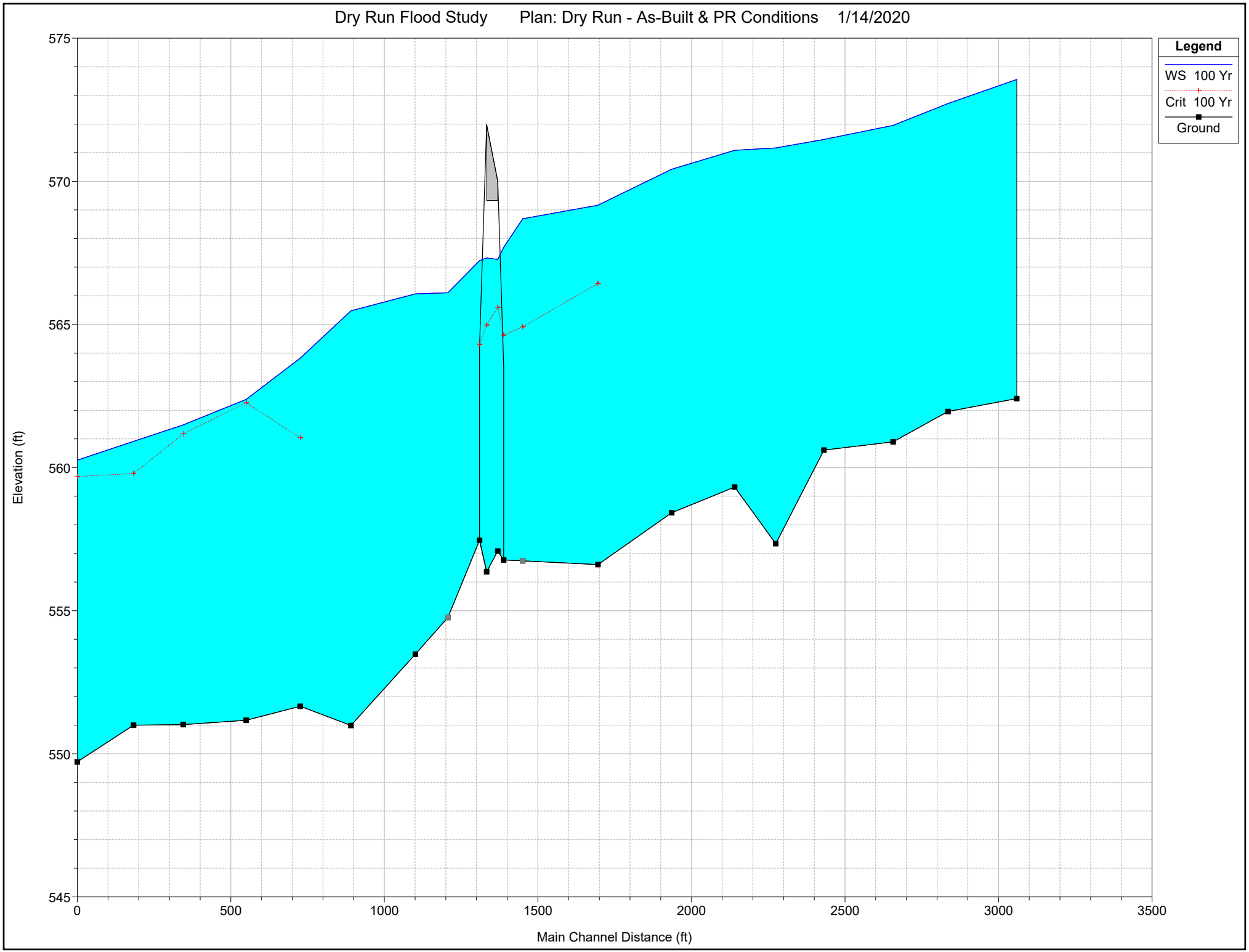
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used. River: Dry Run Reach: Flood Study Site RS: 0.000 Profile: 500 Yr

Warning:Divided flow computed for this cross-section.

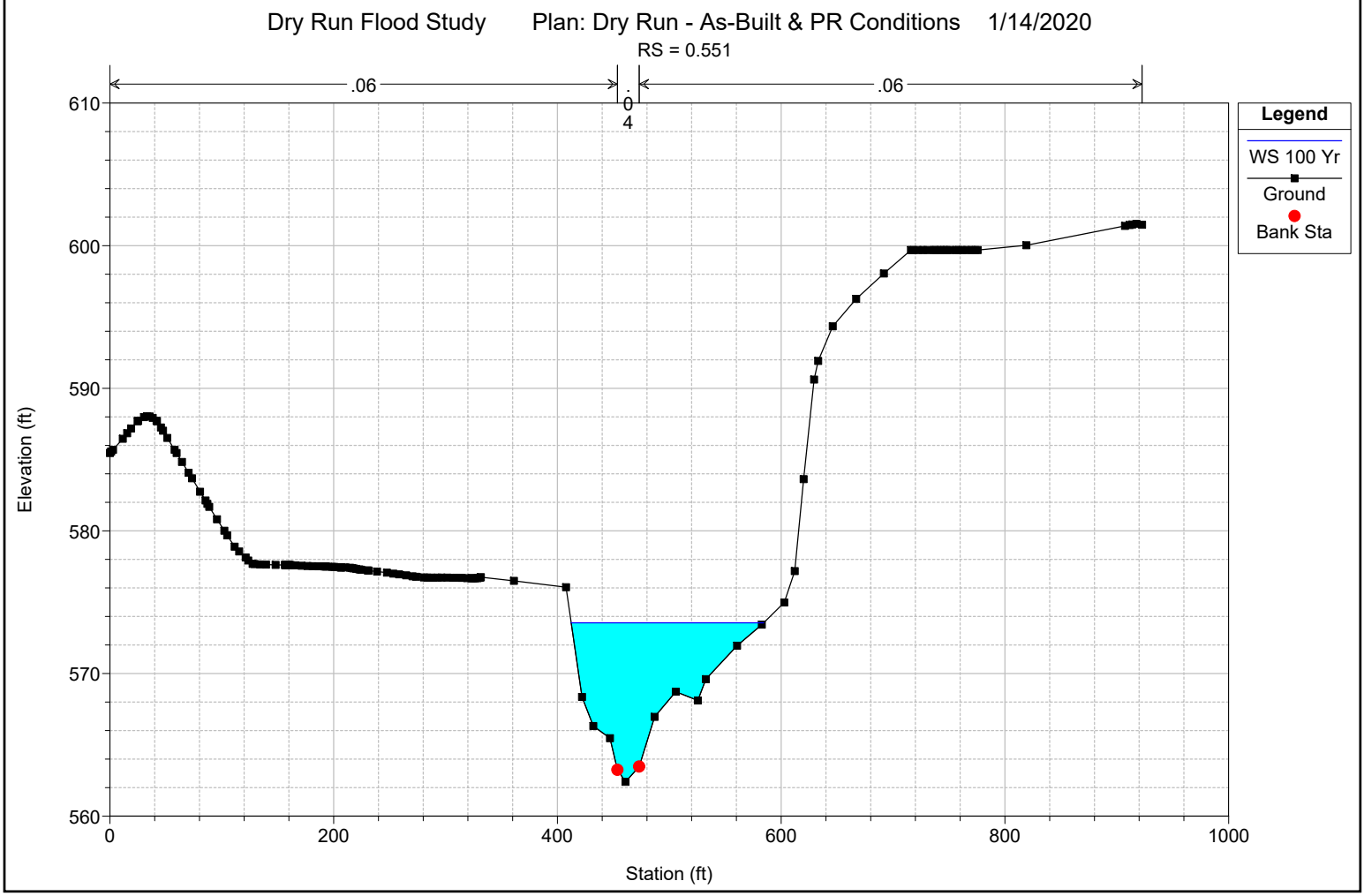
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.

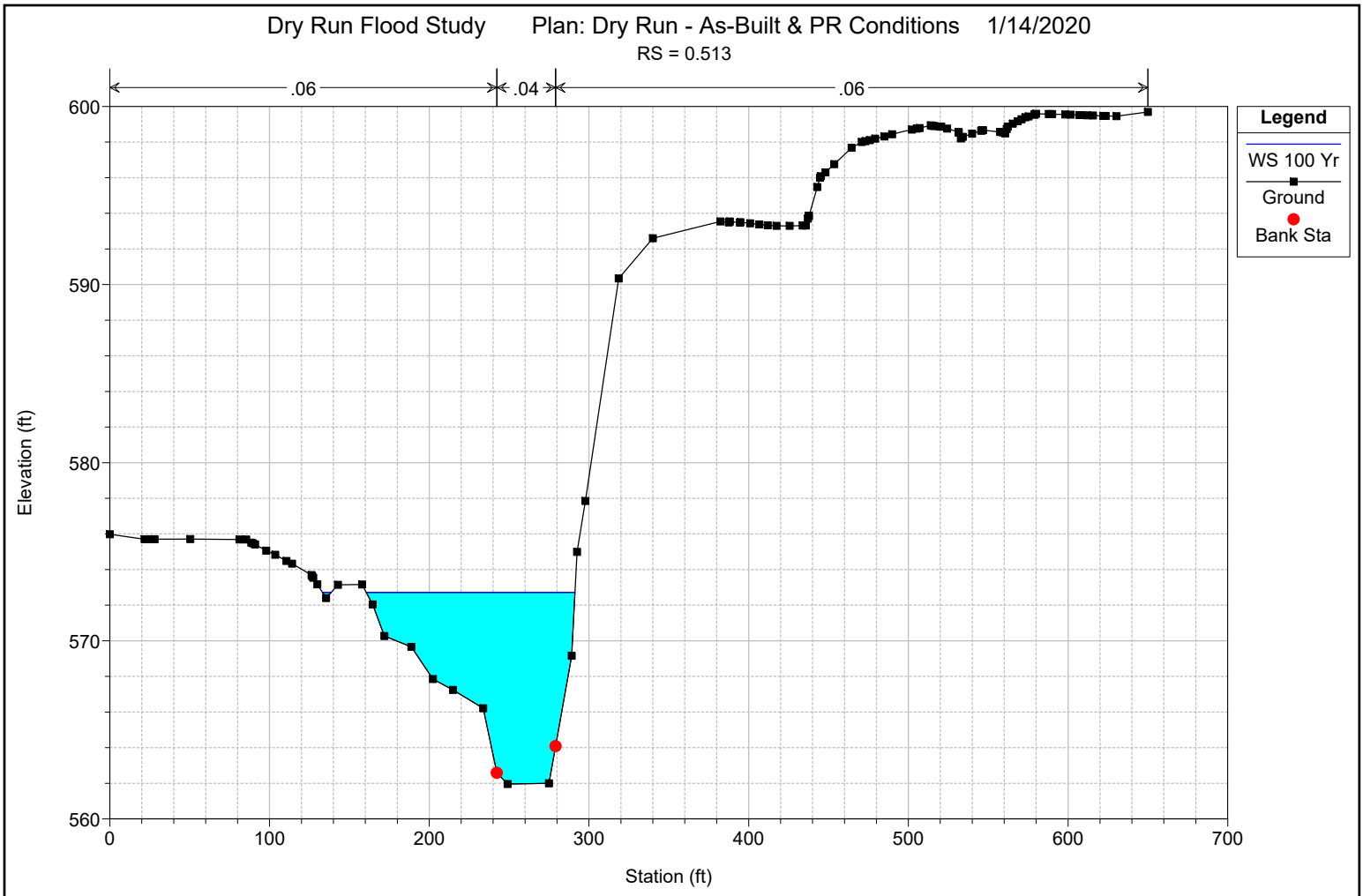
HEC-RAS Plan: Dry Run - As River: Dry Run Reach: Flood Study Site Profile: 100 Yr

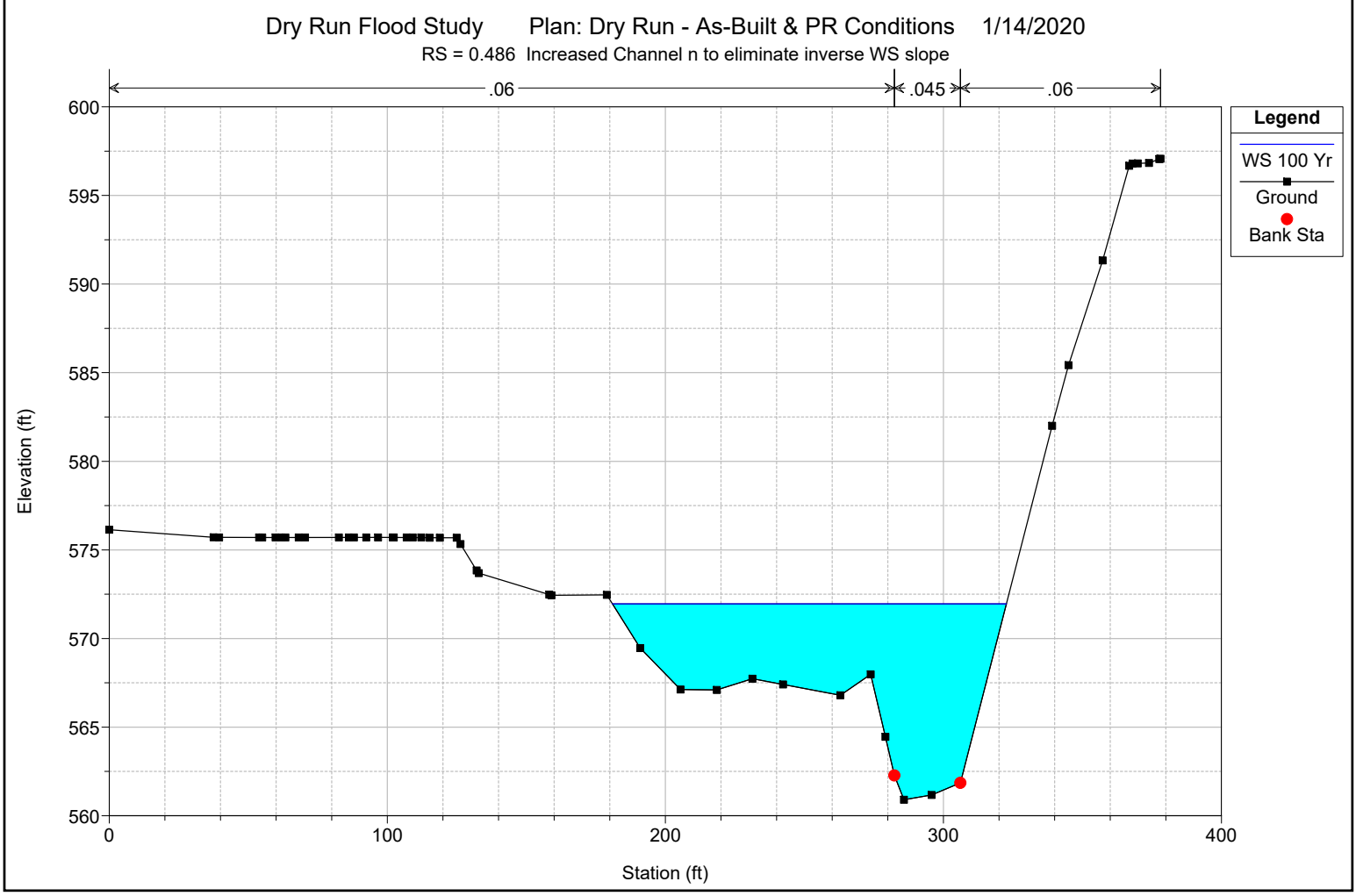
Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Flood Study Site	0.551	100 Yr	5144.00	562.41	573.56		574.45	0.003440	10.52	926.00	172.08	0.57
Flood Study Site	0.513	100 Yr	5144.00	561.96	572.72		573.74	0.002808	9.39	816.84	136.10	0.51
Flood Study Site	0.486	100 Yr	5144.00	560.90	571.95		573.10	0.004783	10.95	779.41	141.71	0.59
Flood Study Site	0.445	100 Yr	5479.00	560.61	571.46		572.01	0.003620	8.14	1025.69	178.56	0.51
Flood Study Site	0.419	100 Yr	5479.00	557.34	571.17		571.58	0.001833	8.12	1278.86	179.16	0.40
Flood Study Site	0.396	100 Yr	5479.00	559.32	571.08		571.39	0.001141	6.33	1536.75	219.70	0.33
Flood Study Site	0.361	100 Yr	5479.00	558.42	570.42		571.09	0.002061	7.92	1059.80	260.87	0.43
Flood Study Site	0.319	100 Yr	5479.00	556.61	569.17	566.43	570.43	0.003006	10.73	779.10	287.00	0.54
Flood Study Site	.272710*	100 Yr	5479.00	556.74	568.69	564.91	569.74	0.002232	8.90	775.91	102.01	0.46
Flood Study Site	0.261	100 Yr	5479.00	556.77	567.69	564.62	569.24	0.003477	10.51	608.95	96.81	0.57
Flood Study Site	0.255		Bridge									
Flood Study Site	0.239	100 Yr	5479.00	557.46	567.23	564.31	567.84	0.003249	9.62	674.35	87.20	0.54
Flood Study Site	.222721*	100 Yr	5479.00	554.76	566.11		567.13	0.002523	8.53	755.54	94.55	0.48
Flood Study Site	0.206	100 Yr	5479.00	553.48	566.07		566.74	0.001603	7.02	931.08	106.42	0.39
Flood Study Site	0.170	100 Yr	5479.00	550.99	565.48		566.37	0.001781	7.97	799.74	116.18	0.41
Flood Study Site	0.138	100 Yr	5479.00	551.66	563.82	561.04	565.81	0.004573	12.75	687.34	145.77	0.66
Flood Study Site	0.104	100 Yr	5479.00	551.17	562.38	562.27	564.69	0.006464	14.15	610.48	146.75	0.77
Flood Study Site	0.066	100 Yr	5479.00	551.02	561.49	561.18	563.35	0.005426	12.92	657.62	137.19	0.71
Flood Study Site	0.035	100 Yr	5479.00	551.00	560.92	559.79	562.42	0.004727	10.72	631.11	215.04	0.63
Flood Study Site	0.000	100 Yr	5479.00	549.72	560.26	559.69	561.48	0.004605	11.89	921.42	324.95	0.65

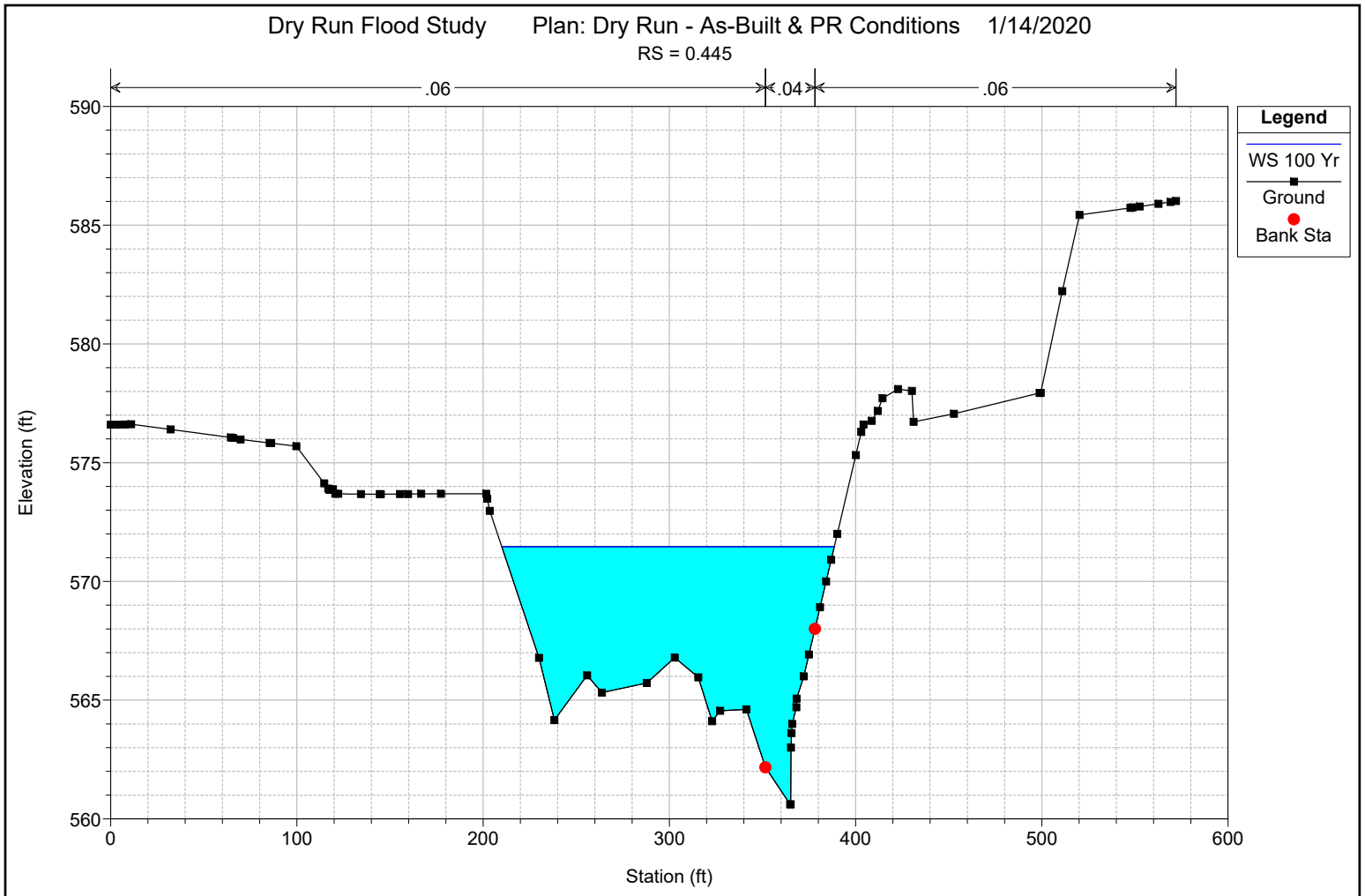

Dry Run Flood Study
Plan: Dry Run - As-Built & PR Conditions
1/14/2020
Legend
WS 100 Yr
Crit 100 Yr
Ground
Elevation (ft)
575
570
565
560
555
550
545
0
500
1000
1500
2000
2500
3000
3500
Main Channel Distance (ft)

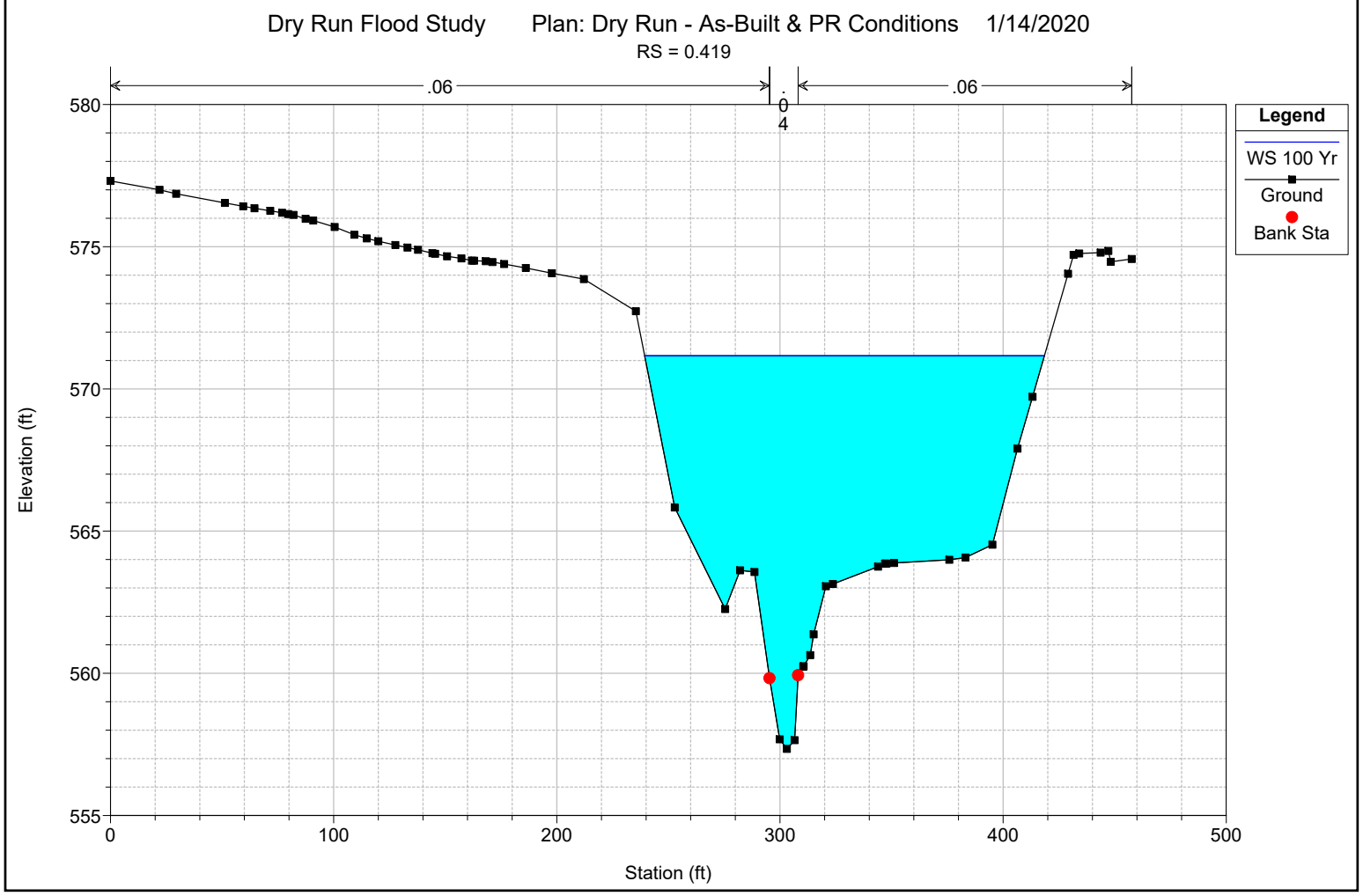
No Data for Plot

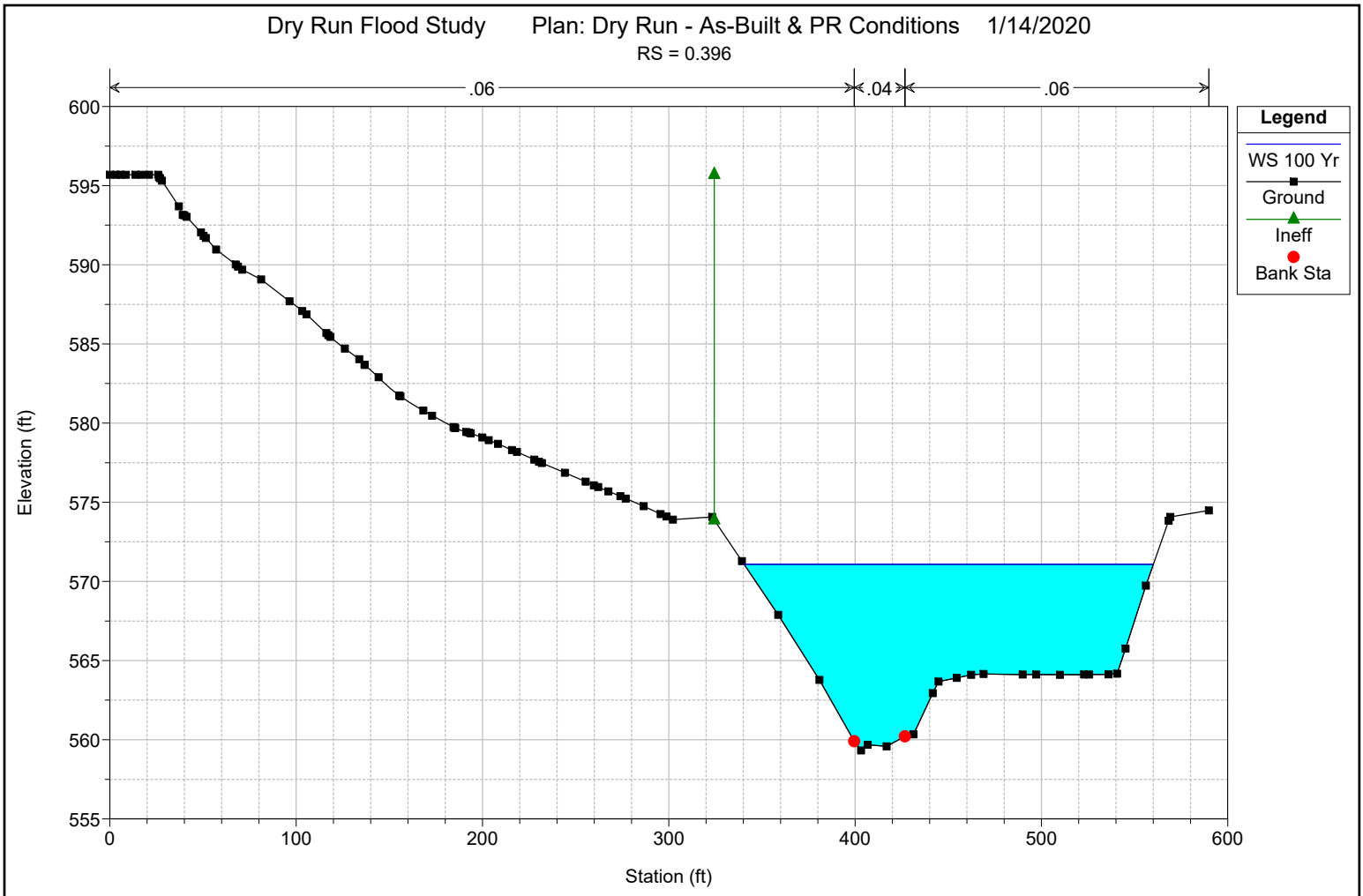


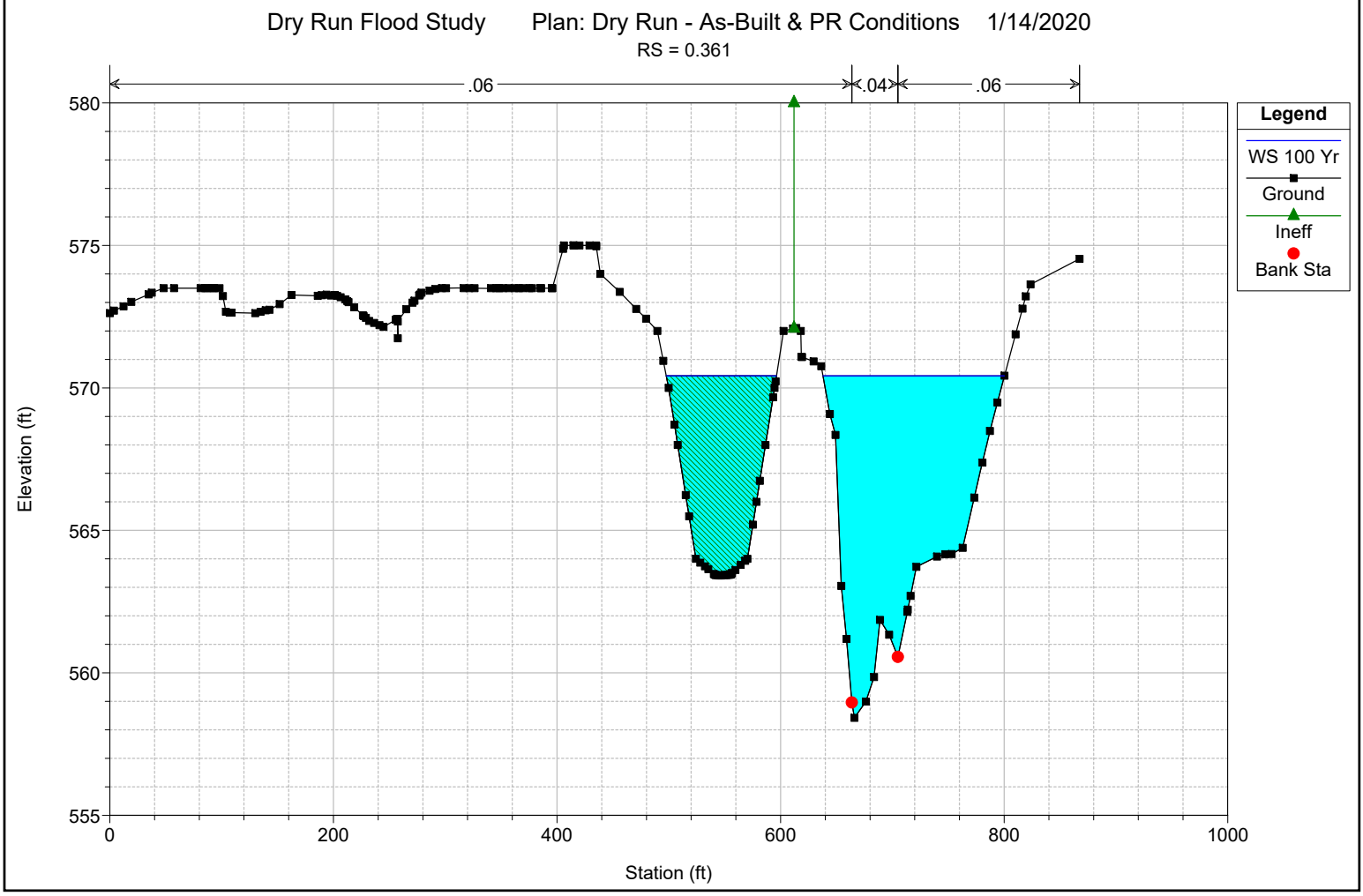

Dry Run Flood Study
Plan: Dry Run - As-Built & PR Conditions
1/14/2020
RS = 0.513
.06
.04
.06
Legend
WS 100 Yr
Ground
Bank Sta
Elevation (ft)
Station (ft)
600
590
580
570
560
0
100
200
300
400
500
600
700

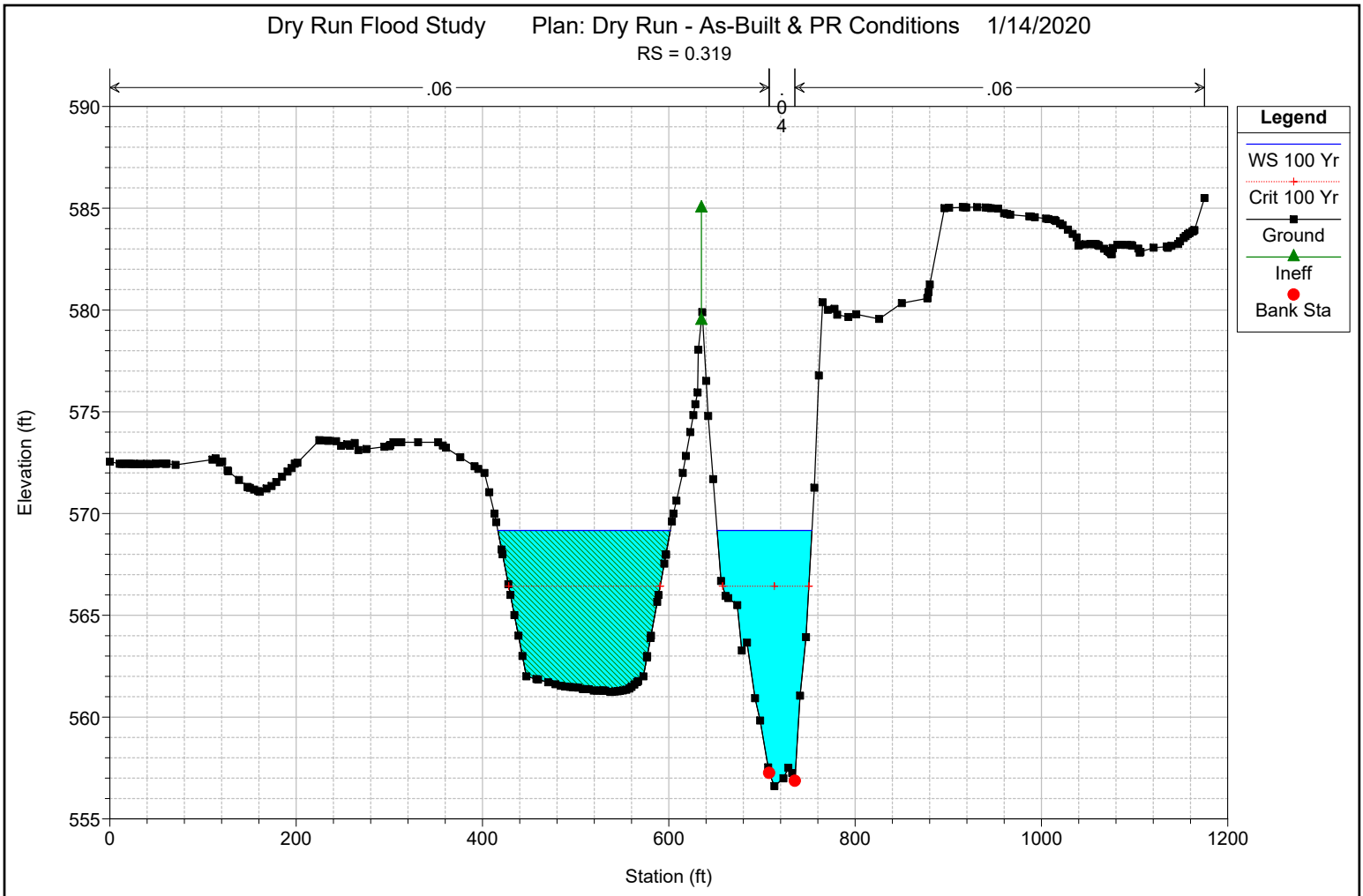

Dry Run Flood Study
Plan: Dry Run - As-Built & PR Conditions
1/14/2020
RS = 0.486
Increased Channel n to eliminate inverse WS slope
.06
.045
.06
Legend
WS 100 Yr
Ground
Bank Sta
Elevation (ft)
Station (ft)
600
595
590
585
580
575
570
565
560
0
100
200
300
400

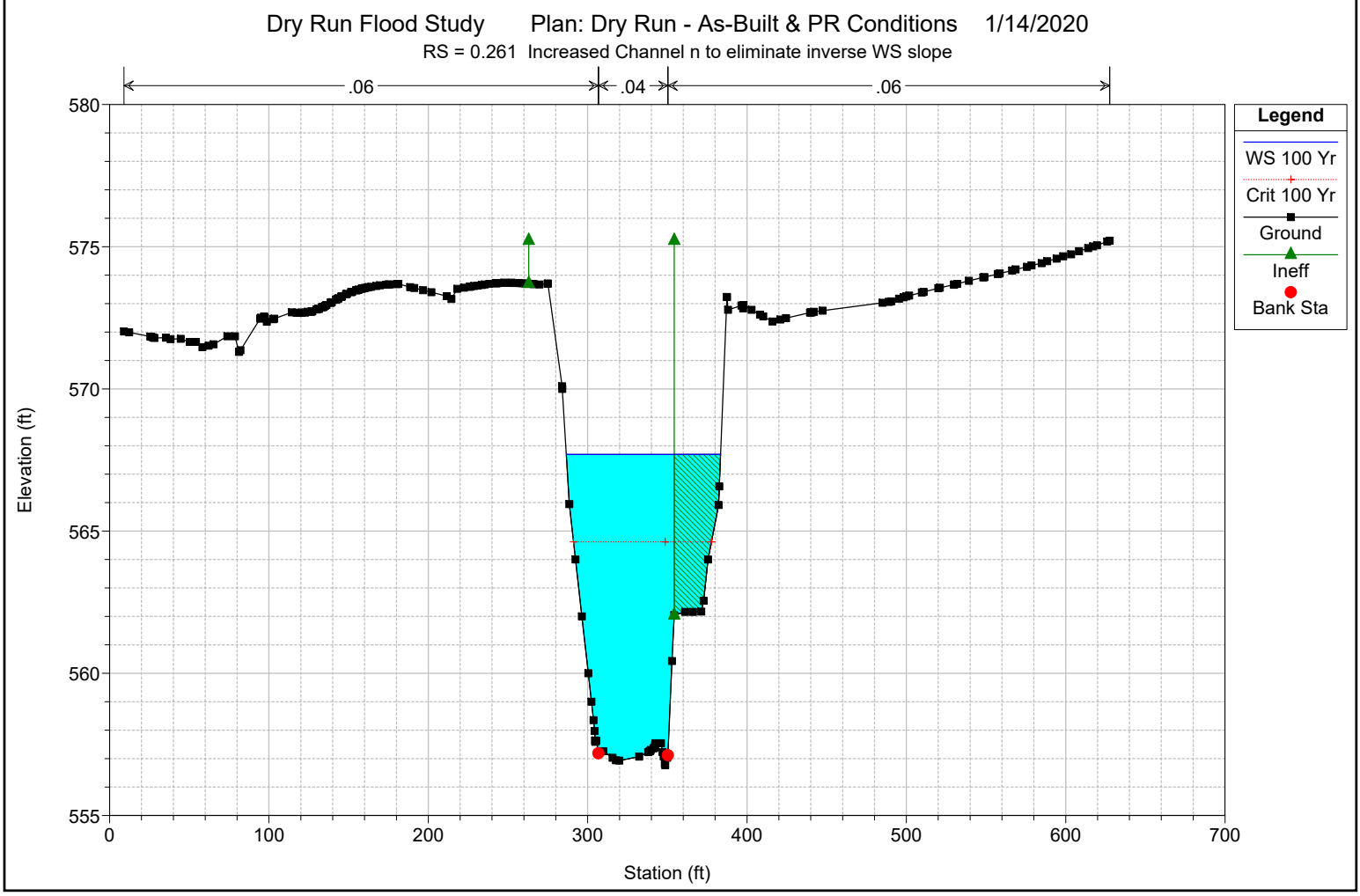

Dry Run Flood Study
Plan: Dry Run - As-Built & PR Conditions
1/14/2020
RS = 0.445
.06
.04
.06
Legend
WS 100 Yr
Ground
Bank Sta
Elevation (ft)
Station (ft)
590
585
580
575
570
565
560
0
100
200
300
400
500
600

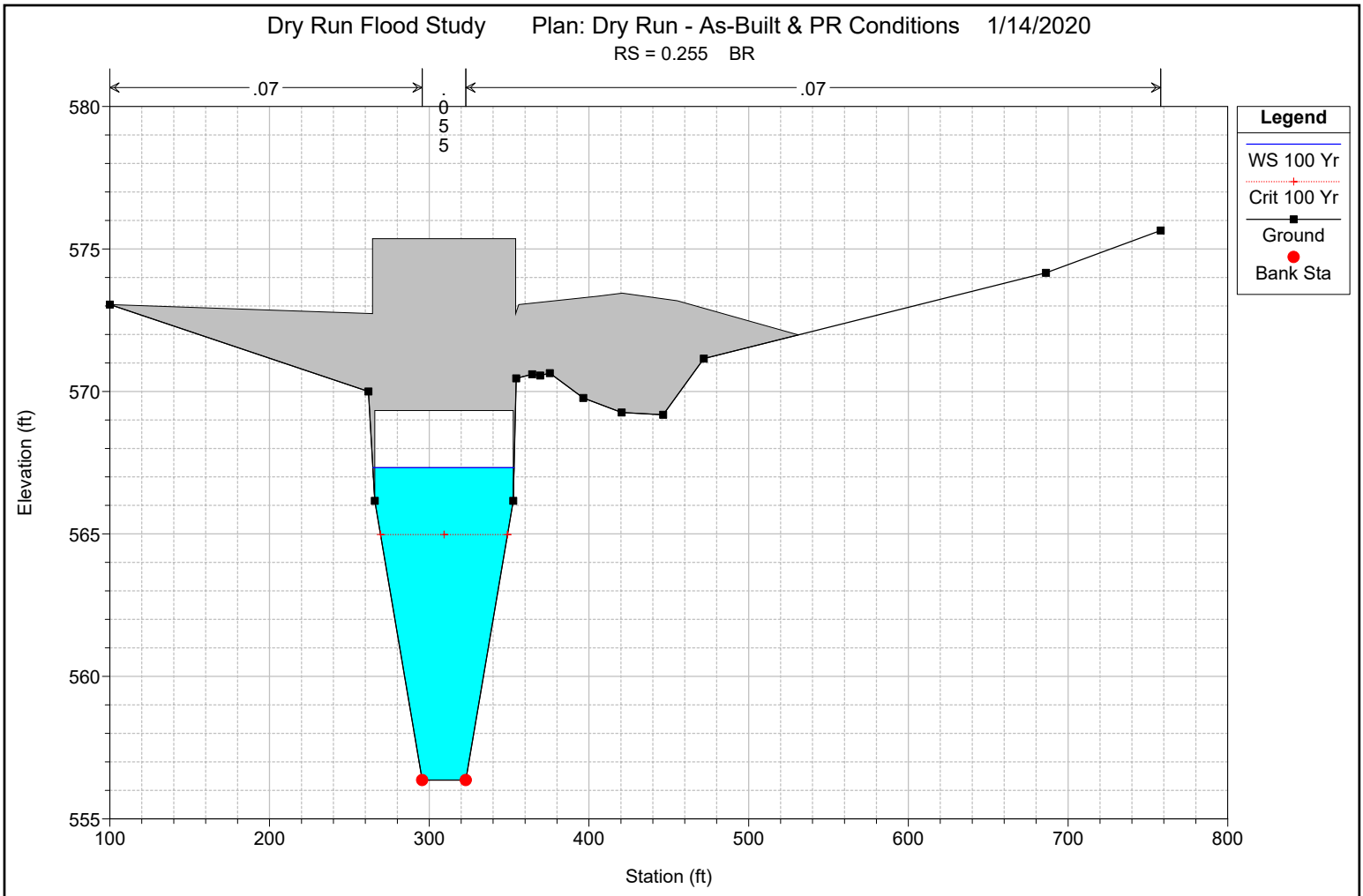

Dry Run Flood Study
Plan: Dry Run - As-Built & PR Conditions
1/14/2020
RS = 0.419
.06
.04
.06
Legend
WS 100 Yr
Ground
Bank Sta
Elevation (ft)
Station (ft)
580
575
570
565
560
555
0
100
200
300
400
500

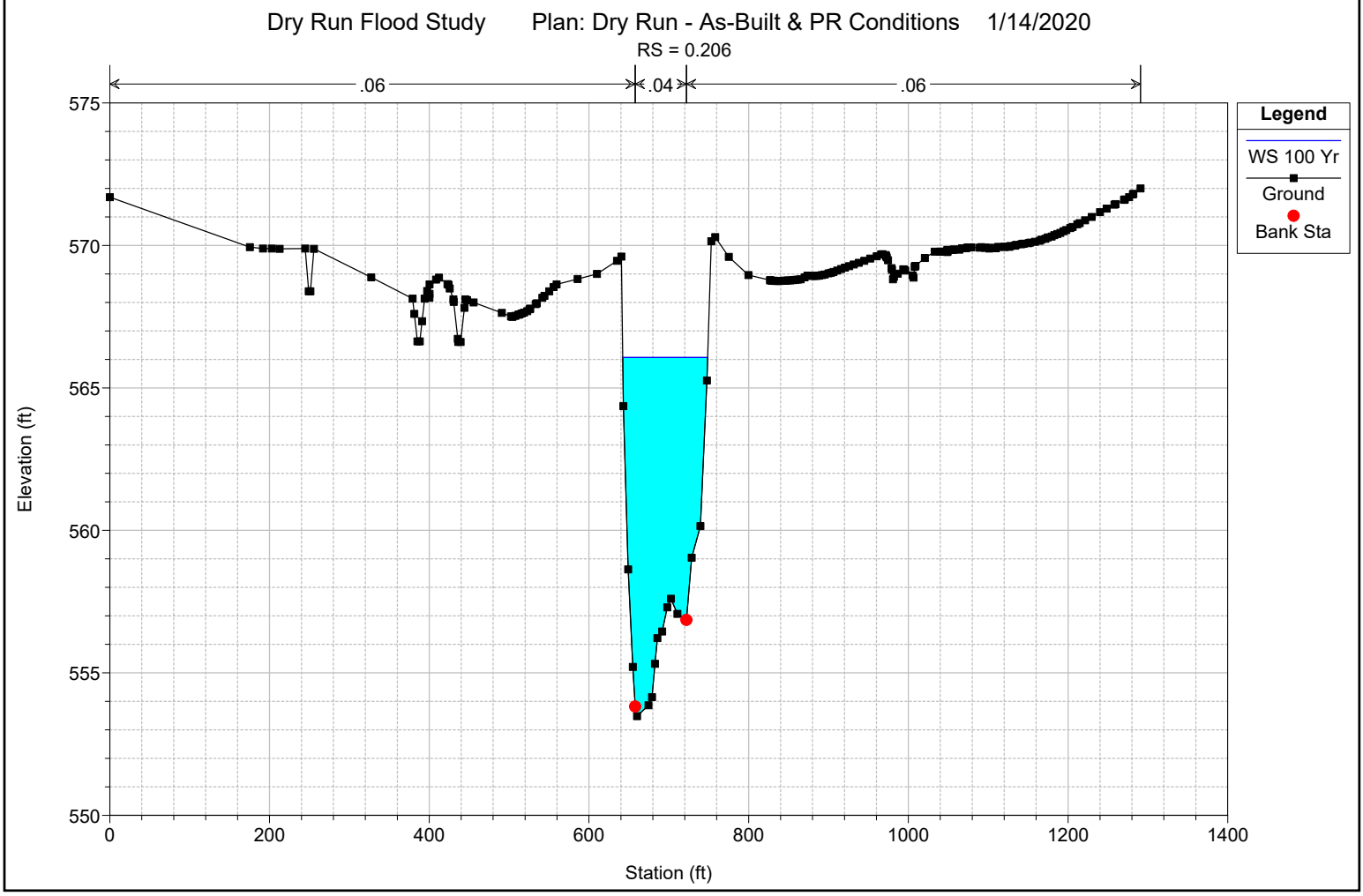

Dry Run Flood Study
Plan: Dry Run - As-Built & PR Conditions
1/14/2020
RS = 0.396
.06
.04
.06
Legend
WS 100 Yr
Ground
Ineff
Bank Sta
Elevation (ft)
Station (ft)
600
595
590
585
580
575
570
565
560
555
0
100
200
300
400
500
600

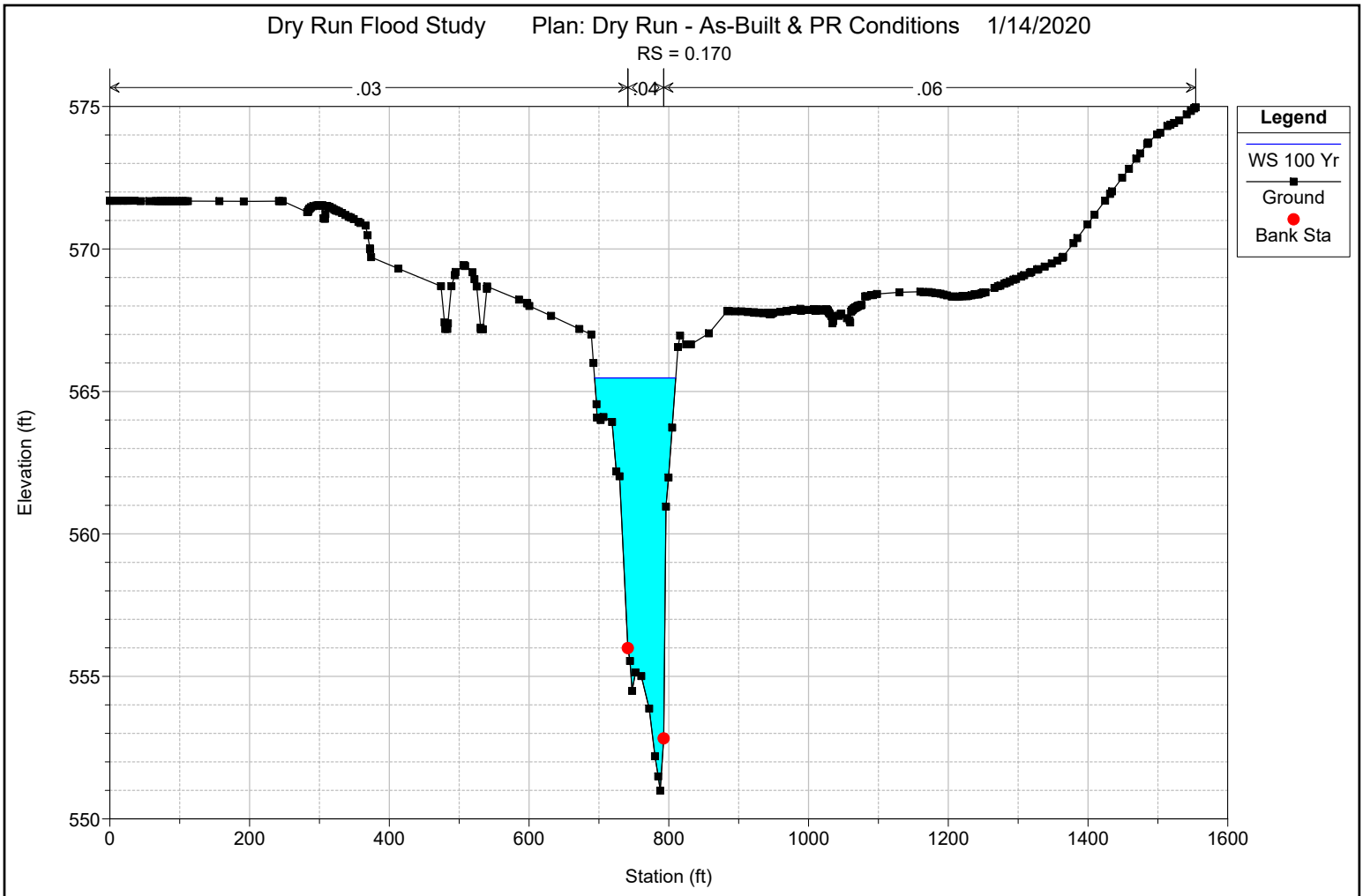

Dry Run Flood Study
Plan: Dry Run - As-Built & PR Conditions
1/14/2020
RS = 0.361
.06
.04
.06
Legend
WS 100 Yr
Ground
Ineff
Bank Sta
Elevation (ft)
Station (ft)
580
575
570
565
560
555
0
200
400
600
800
1000

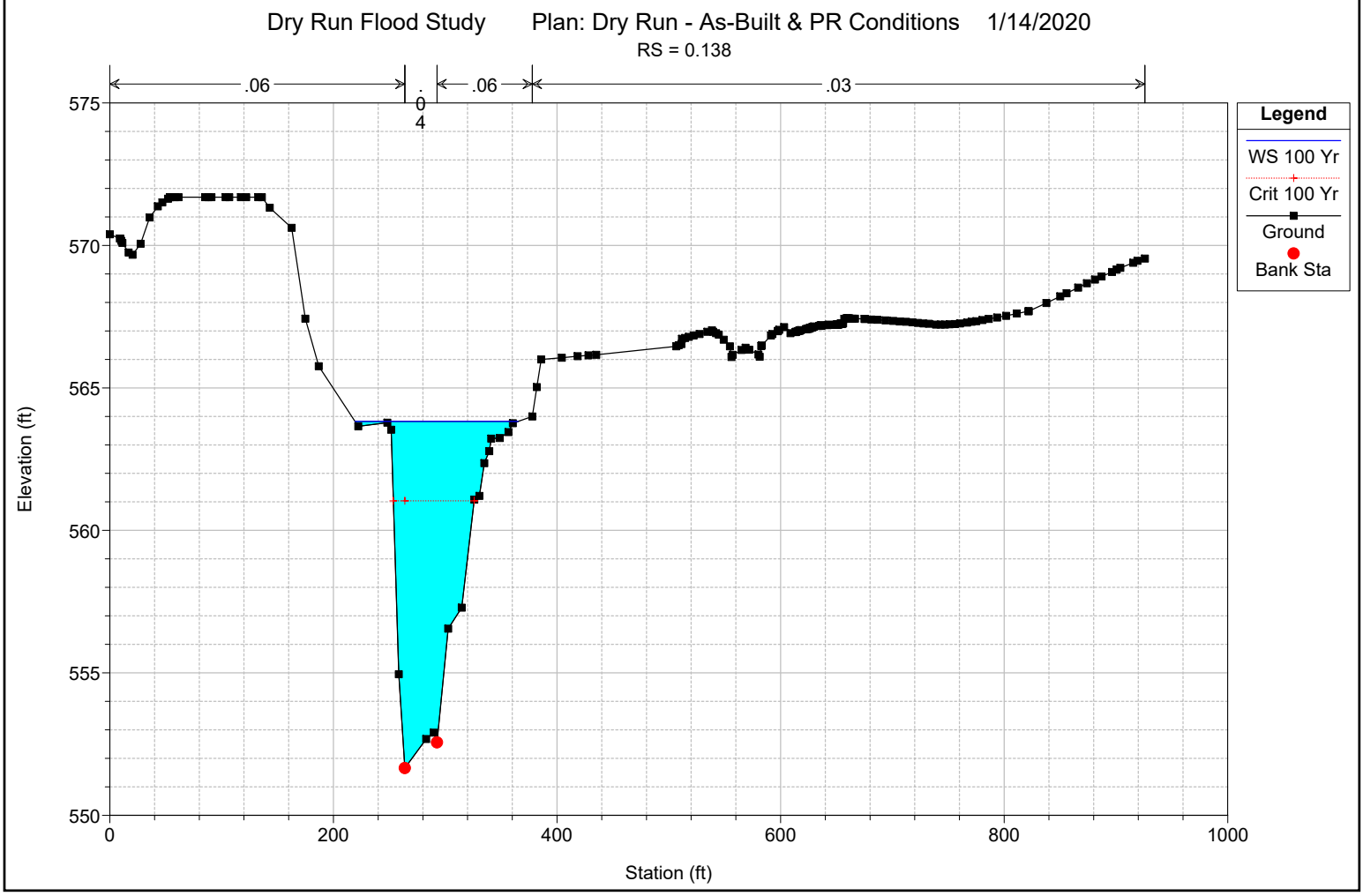

Dry Run Flood Study
Plan: Dry Run - As-Built & PR Conditions
1/14/2020
RS = 0.319
.06
.04
.06
Legend
WS 100 Yr
Crit 100 Yr
Ground
Ineff
Bank Sta
Elevation (ft)
Station (ft)
590
585
580
575
570
565
560
555
0
200
400
600
800
1000
1200

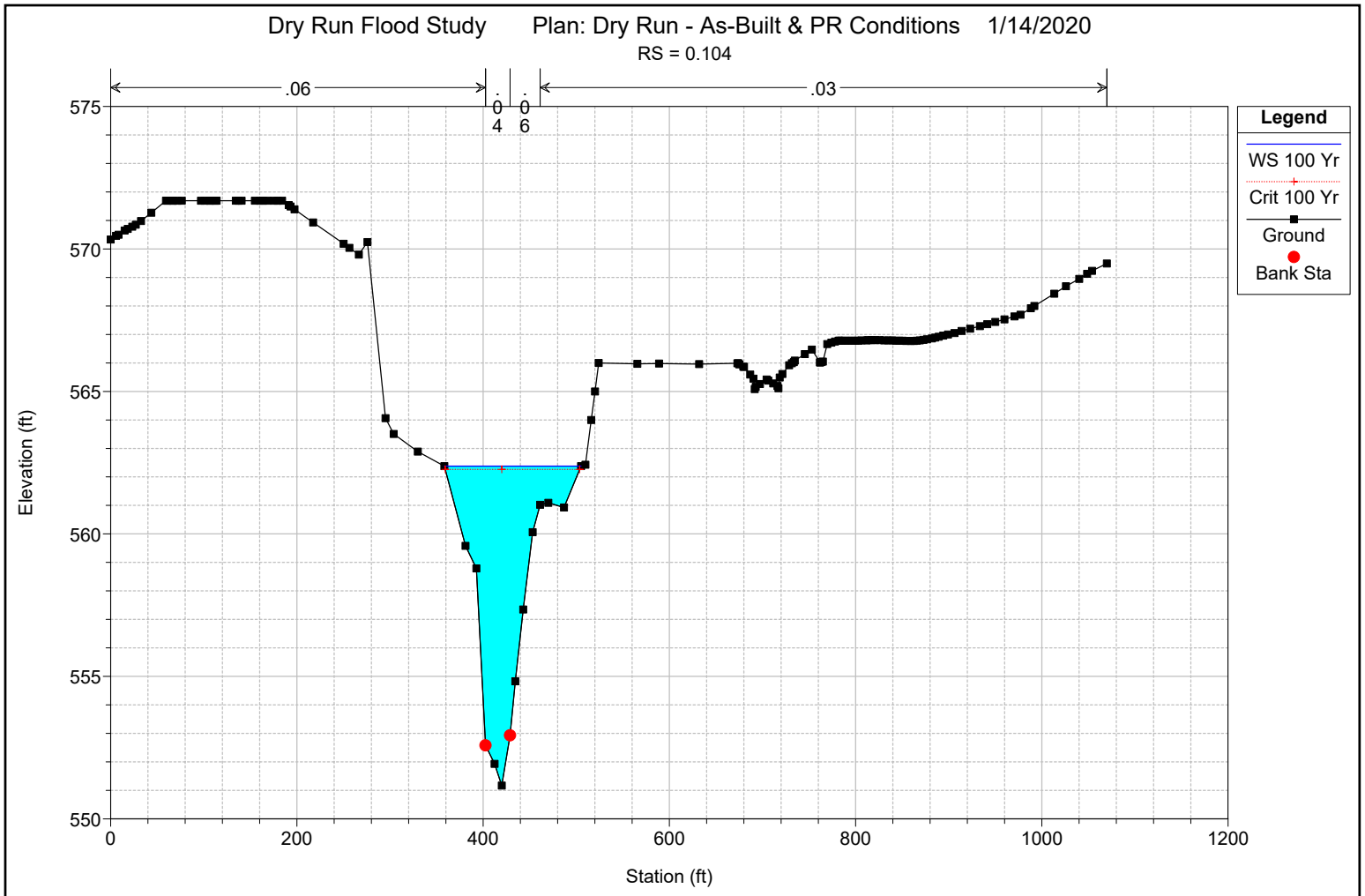

Dry Run Flood Study
Plan: Dry Run - As-Built & PR Conditions
1/14/2020
RS = 0.261 Increased Channel n to eliminate inverse WS slope
.06
.04
.06
Legend
WS 100 Yr
Crit 100 Yr
Ground
Ineff
Bank Sta
Elevation (ft)
Station (ft)
580
575
570
565
560
555
0
100
200
300
400
500
600
700

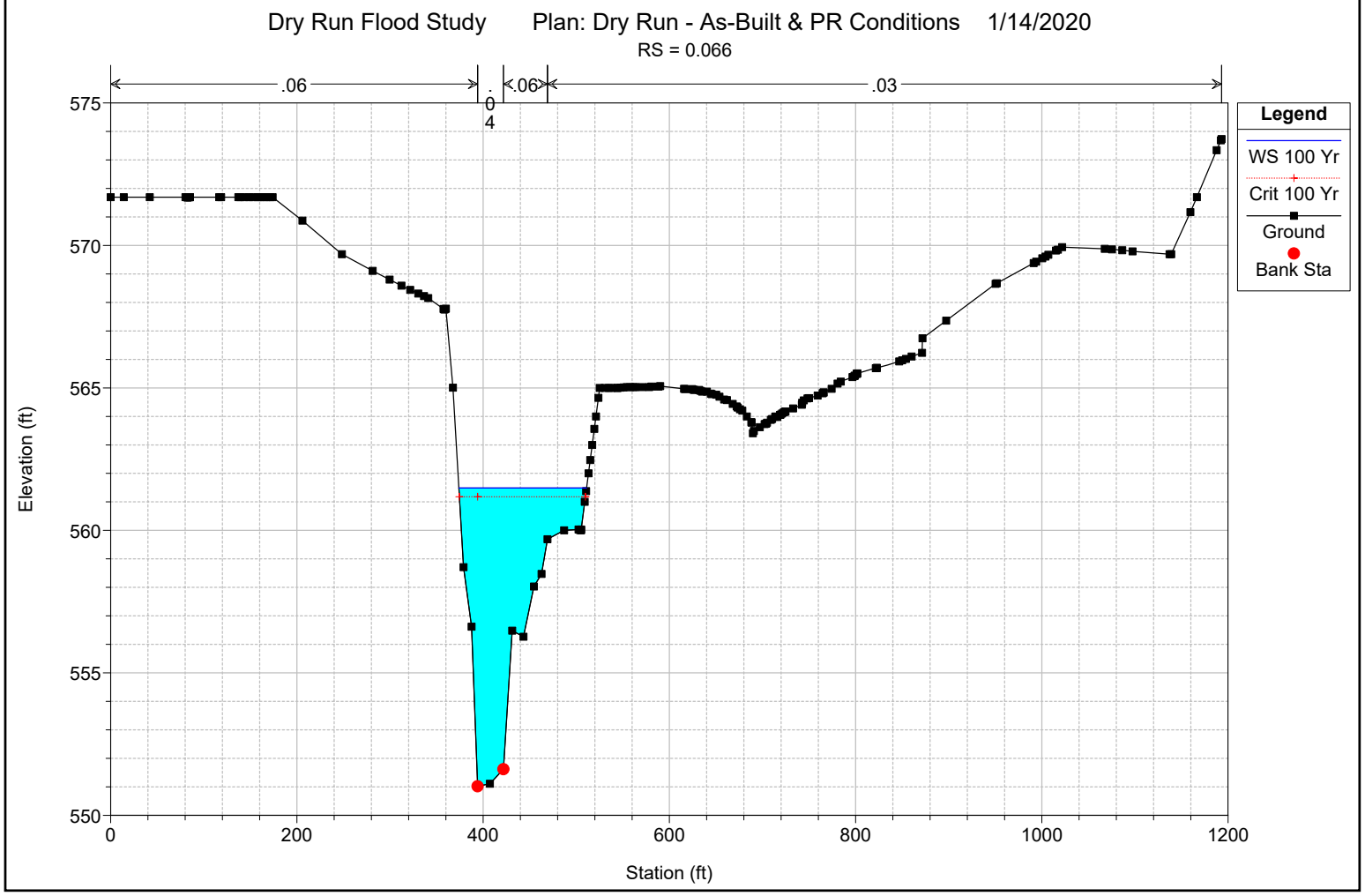

Dry Run Flood Study
Plan: Dry Run - As-Built & PR Conditions
1/14/2020
RS = 0.255 BR
.07
.055
.07
Legend
WS 100 Yr
Crit 100 Yr
Ground
Bank Sta
Elevation (ft)
Station (ft)

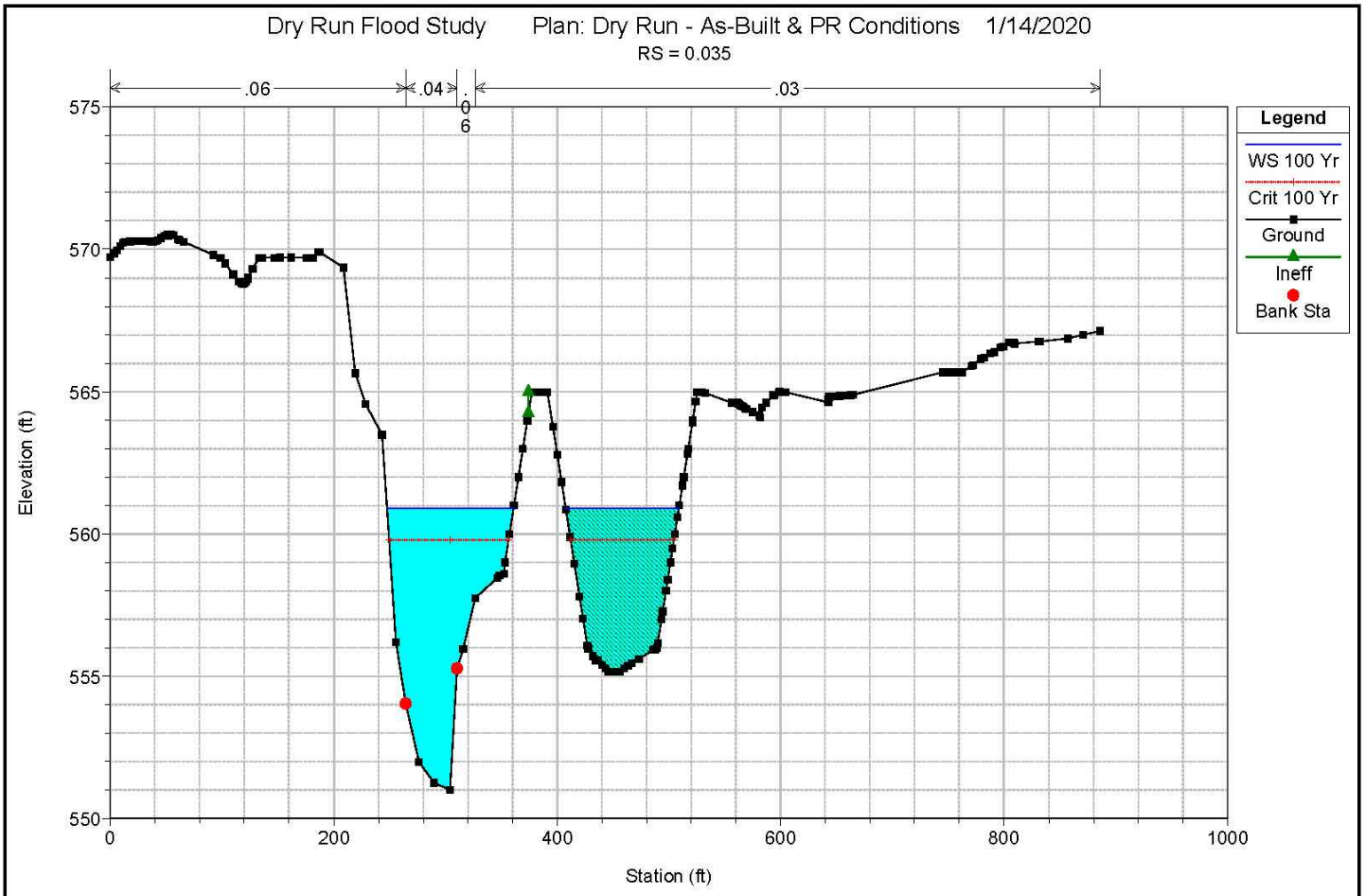

Dry Run Flood Study
Plan: Dry Run - As-Built & PR Conditions
1/14/2020
RS = 0.206
.06
.04
.06
Legend
WS 100 Yr
Ground
Bank Sta
Elevation (ft)
Station (ft)

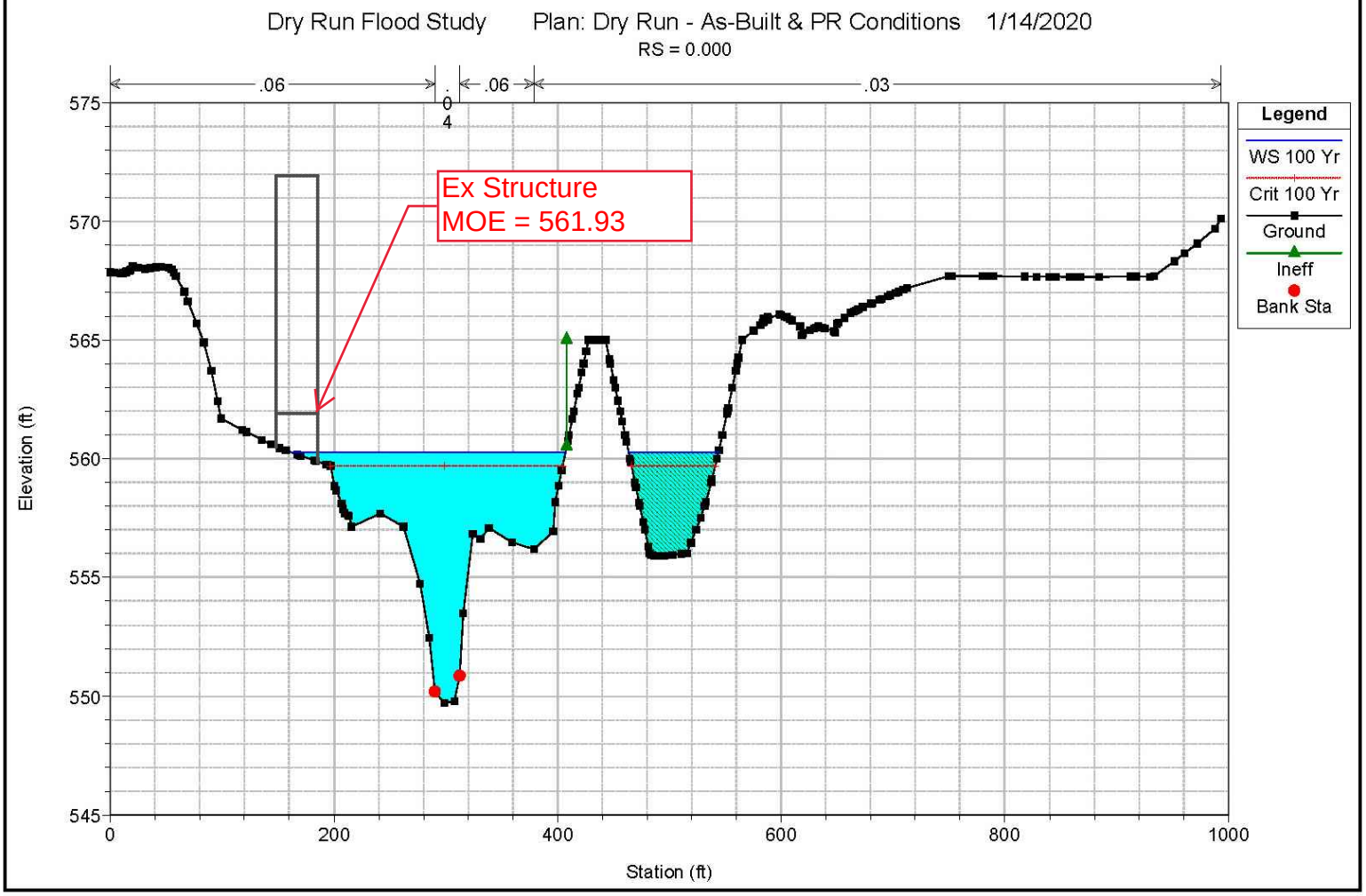

Dry Run Flood Study
Plan: Dry Run - As-Built & PR Conditions
1/14/2020
RS = 0.170
.03
.04
.06
Legend
WS 100 Yr
Ground
Bank Sta
Elevation (ft)
Station (ft)
575
570
565
560
555
550
0
200
400
600
800
1000
1200
1400
1600


Dry Run Flood Study
Plan: Dry Run - As-Built & PR Conditions
1/14/2020
RS = 0.138
.06
.04
.06
.03
Legend
WS 100 Yr
Crit 100 Yr
Ground
Bank Sta
Elevation (ft)
Station (ft)
575
570
565
560
555
550
0
200
400
600
800
1000


Dry Run Flood Study
Plan: Dry Run - As-Built & PR Conditions
1/14/2020
RS = 0.104
.06
.04
.06
.03
Legend
WS 100 Yr
Crit 100 Yr
Ground
Bank Sta
Elevation (ft)
Station (ft)
575
570
565
560
555
550
0
200
400
600
800
1000
1200


Dry Run Flood Study
Plan: Dry Run - As-Built & PR Conditions
1/14/2020
RS = 0.066
.06
.04
.06
.03
Legend
WS 100 Yr
Crit 100 Yr
Ground
Bank Sta
Elevation (ft)
Station (ft)
575
570
565
560
555
550
0
200
400
600
800
1000
1200


Dry Run Flood Study
Plan: Dry Run - As-Built & PR Conditions
1/14/2020
RS = 0.035
.06
.04
.03
.06
Legend
WS 100 Yr
Crit 100 Yr
Ground
Ineff
Bank Sta
Elevation (ft)
Station (ft)
575
570
565
560
555
550
0
200
400
600
800
1000


Dry Run Flood Study
Plan: Dry Run - As-Built & PR Conditions
1/14/2020
RS = 0.000
.06
.06
.03
Ex Structure
MOE = 561.93
Legend
WS 100 Yr
Crit 100 Yr
Ground
Ineff
Bank Sta
Elevation (ft)
Station (ft)
575
570
565
560
555
550
545
0
200
400
600
800
1000