Stormwater Management Design Brief

10249 Hunsden Sideroad,
Caledon, Ontario

Submitted to:
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Table of Contents

Tables

Appendices

1. Study Findings

1.1 Background

GEI Consultants Ltd. (GEI) was retained by Carringwood Homes (the "Owner"), to prepare a Stormwater management (SWM) Brief in support of an Erosion Hazard analysis being undertaken for an existing channel associated with the Nottawasaga Valley Conservation Authority (NVCA) regulated Beeton Creek tributaries traversing lands within the municipal address 10249 Hunsden Sideroad (subject site), in the Town of Caledon ("Town").

A Functional Servicing and Preliminary Stormwater Management Report dated June 2022 was prepared by C.F. Crozier & Associates Inc. ("Crozier") to support the proposed estate residential development located in the subject site.

The SWM Brief is prepared to support the Erosion Hazard Analysis being undertaken by GEI. This brief will present the pre-development hydrologic and hydraulic results for the existing channel to aid in the erosion assessment.

The objectives of the brief are to provide the following:

- Calculate the Pre-development flows for the 1 in 2-year design storm event;
- Estimate Water Surface Elevation and Velocity in the channel during the 1 in 2-year design storm event; and
- Establish the Regulatory flows and generate the Regulatory floodlines;

1.2 Site Description

The 50.34acre (20.37 ha) subject site is bounded by Hunsden Road to the northwest, and agricultural lands to the northeast, southeast and southwest. The site's legal description is as follows: Part of Lots 25 and 26, Concession 9, Town of Caledon, Regional Municipality of Peel.

The site property limits, and background aerial imagery of the site location is illustrated in **Figure DAP-1** included in **Appendix A**.

The site is currently an undeveloped area consisting of existing farmland, woodlot, and a small tributary of the Beeton Creek located at the north of the site. The portion of the site containing the tributary of the Beeton Creek is illustrated in **Figure DAP-1.**

The small portion of the subject site which comprises of the Beeton Creek is identified as part of the NVCA regulated area.

1.3 Existing Drainage Conditions

Existing drainage to the channel was delineated using the in purchasing the relevant digital elevation model (DEM) data files from First Base Solutions Inc (FBS). The various DEM files were combined to create an existing elevation surface modelled in Civil 3D (C3D). The existing drainage area, totaling approximately 135ha in size, was delineated based on contour data prepared from the C3D surface as illustrated in **Figure DAP-1**.

The site drainage area consists primarily of agricultural lands and woodlots with an elevation range of approximately 376m to 281.0 m. This drainage area was split up in three (3) sub-catchments based on the associated channel reaches. The existing drainage patterns, labelled as overland flow arrows, are illustrated on **Figure DAP-1** provided in **Appendix B** and characterized as follows:

- VO6 ID 301, 1.6ha in size, drains into an area identified as Tributary B-1 in the HEC-RAS model;
- VO6 ID 302, 37.6ha in size, is conveying to tributary, referred to as B-1-2 in the mentioned model; and
- VO6 ID 303, 95.7ha in size, is draining northwest towards tributary identified as BR 1-3 within the provided model. B-1-2 and B-1-3 converge into the tributary B-1 before discharging to the Beeton Creek.

The above drainage areas are denoted in accordance with Visual OTTHYMO 6.2 (VO6.2) hydrologic model parameterized and simulation results discussed in **Section 1.4 below**. A VO6.2 model schematic, comprising of three (3) NASHYD commands and two (2) ADDHYD commands, were prepared to represent the drainage pattern.

1.4 Pre-Development Hydrology Model

This section outlines the VO6.2 hydrologic modeling methodology and results required to model the single event flow data utilized in the HEC-RAS hydraulic model.

Based on the Soil Map of Peel County Ontario, the dominant soil type in the site area is Pontypool (Sandy Loam) which coincides with the Hydrologic Soil Group (HSG) of AB per MTO Manual (1993) chart H2-6A.

Since the existing site is comprised mainly of cultivated lands and woodlots with a minimal imperviousness, the VO6 NASHYD commands were used to represent the existing drainage characteristics. These NASHYDs were parametrized with a CN value of 51-60

based on the dominant Soil Type AB and land uses of Cultivated, Woods and Impervious areas. The CN values were based on Table 10.1 of the NVCA SWM guidelines (2013).

The VO6.2 model simulations used synthetic design storms based on single event hyetographs comprising of 24-hour duration 2-Year to 100-Year return periods with SCS (type II) distributions along with the Timmins storm. An initial abstraction (Ia) of 8-9 mm based on Table 10.2 of the NVCA SWM guidelines was applied to all single event-based storms simulations with antecedent II conditions. The time to peak (Tp) value of each area was calculated using the Airport Method assumed to be two thirds of the Time of Concentration (Tc). Note, the Airport Method relies on a runoff coefficient calculated based on Table 10.6 of the NVCA guidelines to reflect the overall sub-catchment's impervious value. The detail calculations are provided in **Appendix B**.

Table 1.1 below summarizes the pre-development modelling parameters used in the hydrologic analysis. Refer to **Appendix B** for the detailed pre-development input parameters.

Table 1.1:Pre-Development VO6 Model Input Parameters

Drainage ID / VO6.2 NASHYD ID	Area (ha)	Outlet Location	Tp(hrs)	CN II
301	1.62	B-1	0.27	51
302	37.60	B-1-2	0.89	58
303	95.73	B-132	0.98	60

Based on the VO6.2 model iterations, the Timmins storm flows were found to be regulatory flows. **Table 1.2** below summarizes the generated flow from the stimulated VO model for the Timmins storm and 24hr SCS (Type II) Storm. The 4hour Chicago flows are presented in Appendix B.

Table 1.2:Generated Flows from VO6 Model

Storm Event	NASHYD 301 Flow Rate (m^3/s)	NASHYD 302 Flow Rate (m^3/s) (Reach B-1-2)	NASHYD 303 Flow Rate (m^3/s) (Reach B-1-3)	Addhyd Outlet Flow Rate (m^3/s) Reach (B-1)
2 Year	0.013	0.171	0.437	0.611
100 Year	0.082	1.007	2.530	3.552
Regional (Timmins)	0.090	1.734	4.434	6.211

1.5 Pre-Development Hydraulic Model

An HECRAS model was prepared to establish the velocity, depth within the channel and establish the regulatory floodline based on the flows established in **Section 1.4** above.

The following **Section 1.5.1** details the geometry and hydraulic structures utilized to generate the required data.

1.5.1 HEC-RAS Model Creation

A HEC-RAS model was created to model the 3 reaches. A total of 58 cross-sections were created and their geometry was extracted using GEO-HECRAS software from the C3D surface to generate the HECRAS geometry file as listed in **Table 1.3**.

Table 1.3 Cross-Sections

Reach B-1	Reach B-1-2	Reach B-1-3
1223.86	1678.47	2705.05
1187.03	1662.83	2685.1
1155.57	1629.55	2660.6
1139.95	1605.37	2641.54
1125.93	1590.57	2627.01
1111.56	1566.38	2600.89
1089.35	1546.72	2580.17
1065.75	1523.98	2556.54
1045.46	1501.74	2532.76
1023.2	1472.59	2507.04
1000	1450.63	2481.14
	1424.99	2453.95
	1404.1	2420.9
	1371.7	2394.86
	1349.62	2367.12
	1324.36	2341.77
	1299.53	2314.2
	1283.23	2278.77
	1258.11	2252.8
		2226.83
		2198.94
		2172.15
		2145.07
		2110.06
		2087.01
		2060.99

Reach B-1	Reach B-1-2	Reach B-1-3
		2040.2
		2020.11
		2000

Based on the survey completed by J.D. Barnes Limited dated April 4, 2022, a road crossing along Hunsden Road, which conveys the flows from the channel on the subject site to the Beeton Creek was identified. This crossing was coded into the new model based on the information in **Table 1.4**.

Table 1.4 Culvert Crossing Information

Hunsden Road Culvert Data	
Property	**Value**
Diameter	1000 mm
Material	Corrugated Steel Pipe
Length	18.5 m
HEC-RAS Station XS ID	1125.93
Upstream Invert	283.75 m
Downstream Invert	283.77 m
Entrance Loss Coefficient	0.5
Exit Loss Coefficient	1
Manning's n Coefficient	0.024

1.5.2 HEC-RAS Parameters

For the hydraulic model, key hydraulic modeling parameters were coded in as described below:

Geometric Conditions
As mentioned, the cross-section geometry was based on acquired DEM data and applied to the model using Geo-HECRAS. Cross sections were coded from left to right, looking downstream.

Loss Coefficients
A Manning's 'n' value of 0.035 was used within the channel, and a value of 0.050 was used along the left of bank and right of bank stations.

Contraction and Expansion
Contraction and expansion coefficients of 0.1 and 0.3, respectively, were used for most cross sections, where appropriate. These values are used for gradual transitions. A standard four cross section series were coded in for the existing crossings, where the

three upstream ones used contraction and expansion coefficients of 0.3 and 0.5 respectively to add hydraulic losses to sharper transitions such as at known crossings.

Ineffective Flow Areas

Ineffective flow areas were used to indicate the blocked flow of normal water, which forced the flood flow width to narrow towards the culvert openings and created areas on the upstream side and downstream side of the crossings where water will pond. Ineffective flow areas were coded in for the sections upstream and downstream of the Hunsden Road crossing. For the upstream section, the ineffective flow areas were placed at the height of the road deck and a distance away from both outer edges of the culvert equal to how far the end of the culvert is from the upstream section. The ineffective flow areas for the downstream section were coded in similarly but only reaching halfway between the culvert obvert and the road deck.

1.5.3 Flow Conditions and Boundary Condition Sensitivity Analysis

Boundary conditions for reaches B-1-2 and B-1-3 were based on the downstream connection at Junction DS02. This Junction also served as the upstream boundary condition for Reach B-1. The downstream boundary condition for Reach B-1 was set using the Normal Depth option which requires the energy slope. This was approximated with the downstream channel bed slope which was found to be 2%.

A sensitivity analysis was also completed to confirm that this value does not significantly impact the results of the upstream sections near the site. Results proving this are provided in **Table 1.5**.

Table 1.5 Crossing Contraction and Expansion Coefficients

HEC-RAS XS ID	2-yr Water Surface Elevation		
	S = 0.01	S = 0.02	S = 0.05
1223.86	285.38	285.38	285.38
1187.03	285.19	285.19	285.19
1155.57	285.19	285.19	285.19
1139.95	285.11	285.11	285.11
1125.93	Culvert		
1111.56	284.04	284.04	284.04
1089.35	283.35	283.35	283.35
1065.75	282.88	282.88	282.88
1045.46	282.38	282.38	282.38
1023.2	281.38	281.39	281.40
1000	280.84	280.83	280.82

The results showed that only the two most downstream sections showed variation due to the different boundary conditions applied. Therefore, it can be concluded that this model is not sensitive to the downstream boundary condition of Reach B-1 and the value will not impact results near the site.

1.5.4 HEC-RAS Model Results and Analysis

The new model for Beeton Creek was run using flows based on the hydrology model results presented in **Table 1.2** and a using a normal water level downstream boundary condition of a 2% slope. A summary of the water surface elevation results for the 1 in 2-year design storm event are provided below. The detailed HEC-RAS outputs for all scenarios are provided in **Appendix C**, and a digital HEC-RAS model will be provided for review.

Table 1.6: 2-yr Water Surface Elevations

Reach B-1 Cross-Section ID	2-yr WSEL (m)	Reach B-1-2 Cross-Section ID	2-yr WSEL (m)	Reach B-1-3 Cross-Section ID	2-yr WSEL (m)
1223.86	285.38	1678.47	296.05	2705.05	299.57
1187.03	285.19	1662.83	295.54	2685.1	298.58
1155.57	285.19	1629.55	294.85	2660.6	298.08
1139.95	285.11	1605.37	294.13	2641.54	297.48
1125.93	Culvert	1590.57	294.04	2627.01	297.38
1111.56	284.04	1566.38	293.89	2600.89	296.83
1089.35	283.35	1546.72	293.78	2580.17	296.64
1065.75	282.88	1523.98	293.04	2556.54	296.40
1045.46	282.38	1501.74	292.31	2532.76	295.98
1023.2	281.39	1472.59	291.59	2507.04	295.84
1000	280.83	1450.63	291.29	2481.14	295.58
		1424.99	290.28	2453.95	295.10
		1404.1	289.57	2420.9	293.82
		1371.7	289.05	2394.86	292.89
		1349.62	288.54	2367.12	292.54
		1324.36	287.78	2341.77	292.17
		1299.53	286.58	2314.2	292.07
		1283.23	286.28	2278.77	290.82
		1258.11	285.82	2252.8	290.42
				2226.83	290.31
				2198.94	289.83
				2172.15	289.56
				2145.07	289.27
				2110.06	288.53

Reach B-1 Cross-Section ID	2-yr WSEL (m)	Reach B-1-2 Cross-Section ID	2-yr WSEL (m)	Reach B-1-3 Cross-Section ID	2-yr WSEL (m)
				2087.01	288.02
				2060.99	286.87
				2040.2	286.62
				2020.11	286.34
				2000	285.86

The average velocity for each reach is summarized below in **Table 1.7**.

Table 1.7: Average Channel Velocity

Channel Velocity (m/s)		
Reach B-1	**Reach B-1-2**	**Reach B-1-3**
0.74	0.50	0.59

In addition to the above, the generated regulatory floodplain limits were plotted and are illustrated in **Figure FP-1**.

2. Conclusions and Results

The following brief has been prepared to aid in the Erosion assessment being undertaken for the existing channel within the subject area.

A hydrology model using VO6 was prepared to generate the 2 year and regulatory flows traversing through the channel reaches. The generated flows were utilized to calculate the depth and velocity within the existing channel using HEC-RAS. The HEC-RAS hydraulic model was prepared based on the cross-sections extracted from C3D surface elevation model. Further, the existing culvert structure across the Hunsden Road was modelled in HEC-RAS.

The computed results to satisfy the three objectives of the memo are summarized in Tables 1.2, 1.6 and 1-7 presented above and demonstrated in the attached Figure FP-1.

Appendix A

FIGURES (DAP-1 & FP-1)

LEGEND:

- DRAINAGE AREA TO Reach B-1
- DRAINAGE AREA TO Reach B-1-2
- DRAINAGE AREA TO Reach B-1-3
- PROPERTY LINE
- DRAINAGE FLOW TO Reach B-1
- DRAINAGE FLOW TO Reach B-1-2
- DRAINAGE FLOW TO Reach B-1-3
- WATERCOURSE

100 / 0.74ha — STORM DRAINAGE AREA VO ID / DRAINAGE AREA IN HECTARES

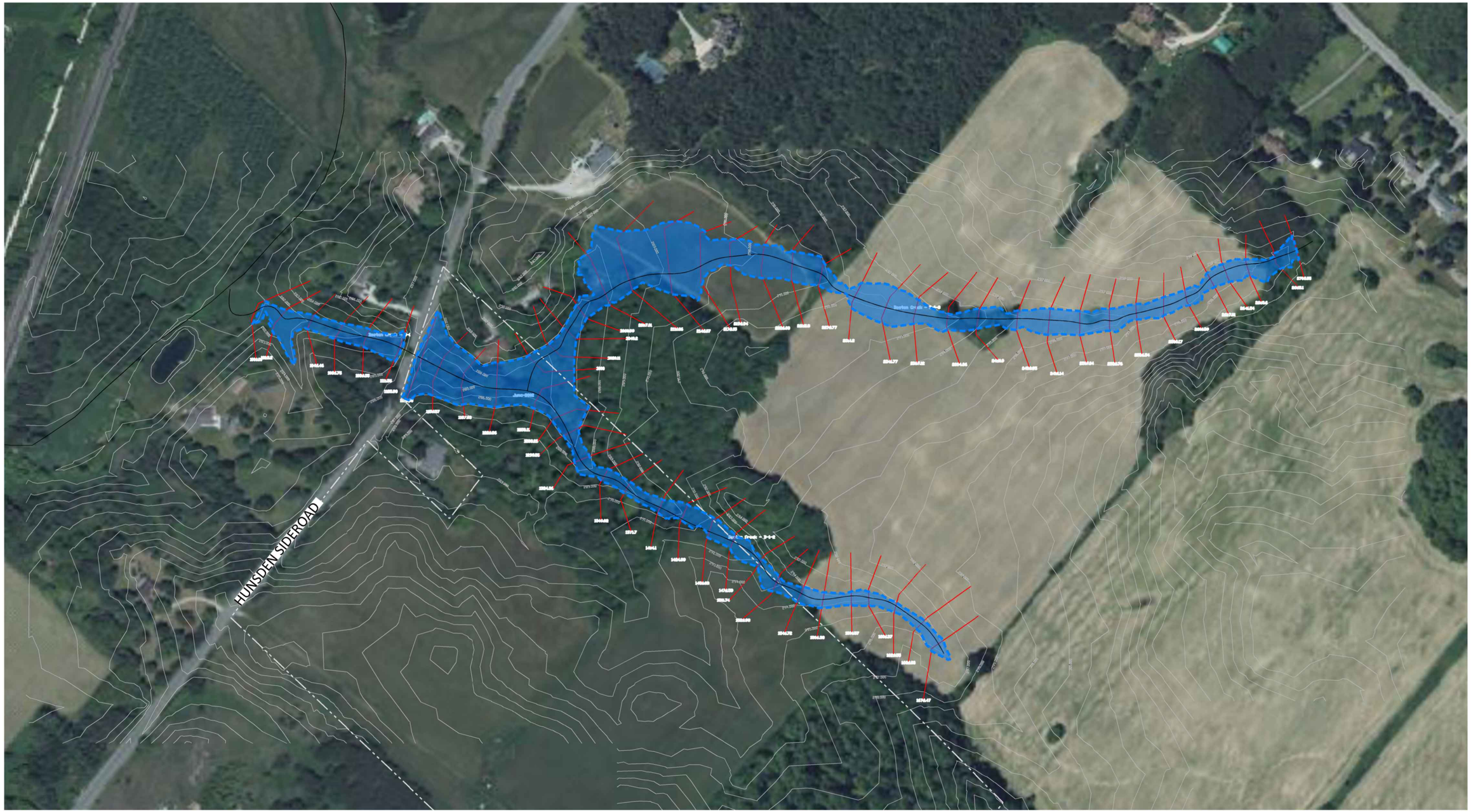
10249 Hundsden Sideroad
Caledon, Ontario

Carringwood Homes

GEI Consultants

EXISTING
DRAINAGE AREA MAP

Project 2101948 | NOV 2022 | FIG DAP-1



LEGEND

PROPERTY LINE
RIVER CENTERLINE
HEC-RAS CROSS-SECTIONS
SITE AREA
FLOOD AREA

10249 Hunsden Sideroad
Caledon, Ontario

Carringwood Homes

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FLOODPLAIN MAP
ORIGINAL MODEL

Project 2101948 | NOV 2022 | FIG FP-1

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Appendix B

SWM - Hydrologic Calculations

GEI Consultants

Pre-Development Drainage Parameters

Project Name:	10249 Hunsden Sideroad
Project No.:	2101948
Prepared By:	Yash Gollamudi
Date:	Nov-22

A301 -- NASHYD		
Area	ha	1.62
Land Use	Mainly Woodlot (90% =1.46ha) and existing residential (10% = 0.16ha)	
C	Cummulative Runoff coefficient	0.16
DT		5 min
CN	Cummulative Curve Number as per HSG AB for woodlot and existing residential	51
Ia (mm)	Cummulative Initial Abstraction for woodlot (10mm) and existing residential (2mm)	9
Storm Index	Default Value	1
N	Default Value	3.0
Tp (hrs)	Calculated using Airport Method fort Tc; Tp = 2/3 of Tc	0.27

Note: * Based on the Soil Map of Peel County , the dominant soil type in the site area is Pontypool (Sandy Loam). The Hydrologic Soil Group (HSG) is AB, as per MTO Design Chart H2-6A. The CN number was determined as 51 based on the Table 10.1 of the NVCA Guidelines (2013)

L (m)	90.0
Highest Point (m)	285.5
Lowest Point (m)	284.0
Slope (%)	1.667
Tc (min)	24.54
Tp (hrs)	0.27

(b) Airport Formula

$$T_c = \frac{3.26 * (1.1 - C) * L^{0.5}}{S_w^{0.33}}$$

where:

T_c = Time of concentration, min
L = Watershed length, m
S_w = Watershed slope, %
A = Watershed area, ha

A302 -- NASHYD		
Area	ha	37.60
Land Use	Approximately 16.8ha woodlot and 20.8ha cropland	
C	Cummulative Runoff coefficient	0.16
DT		5 min
CN	Cummulative CN number	58
Ia	Cummulative Initial Abstraction for woodlot (10mm) and cultivated(7mm)	8
Storm Index	Default Value	1
N	Default Value	3.0
Tp	Calculated using Airport Method fort Tc; Tp = 2/3 of Tc	0.89

Note: * * Based on the Soil Map of Peel County , the dominant soil type in the site area is Pontypool (Sandy Loam). The Hydrologic Soil Group (HSG) is AB, as per MTO Design Chart H2-6A. The CN number was determined based on the Table 10.1 of the NVCA Guidelines (2013)

L (m)	1704.0
Slope (%)	3.884
Tc (min)	81.06
Tp (hrs)	0.89

(b) Airport Formula

$$T_c = \frac{3.26 * (1.1 - C) * L^{0.5}}{S_w^{0.33}}$$

where:

T_c = Time of concentration, min
L = Watershed length, m
S_w = Watershed slope, %
A = Watershed area, ha

A303-- NASHYD		
Area	ha	95.73
Land Use	Woodlot (46.96ha), Agricultural Land (40.97ha), Roads and Existing Residential (7.8ha)	
C	Runoff coefficient	0.21
DT		5 min
CN	Cummulative CN number	60
Ia	Cummulative Initial Abstraction for woodlot (10mm), impervious areas (2mm) and cultivated(7mm)	8
Storm Index	Default Value	1
N	Default Value	3.0
Tp	Calculated using Airport Method fort Tc; Tp = 2/3 of Tc	0.98

Note: *

L (m)	1883.0
Slope (%)	2.899
Tc (min)	88.94
Tp (hrs)	0.98

(b) Airport Formula

$$T_c = \frac{3.26 * (1.1 - C) * L^{0.5}}{S_w^{0.33}}$$

where:

T_c = Time of concentration, min
L = Watershed length, m
S_w = Watershed slope, %
A = Watershed area, ha

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Equivalent Slope Calculations

Project Name:	10249 Hunsden Sideroad
Project No.:	2101948
Prepared By:	Yash Gollamudi
Date:	Nov-22

Catchment	Number of Divisions of Equal Length	Equal Lengths (m)	Upstream Elevation (mAMSL)	Downstream Elevation (mAMSL)	Difference in Elevation (mAMSL)	Slope (m/m)	Slope to the power of 0.5 (m/m)	Watershed Slope, Sw (%)
A302	1	340.8	365.5	333	##########	0.095	3.2	3.9
	2	340.8	333	314.75	##########	0.054	4.3	
	3	340.8	314.75	303.75	11	0.032	5.6	
	4	340.8	303.75	294	##########	0.029	5.9	
	5	340.8	294	285.5	8.5	0.025	6.3	
A303	1	376.6	360	324	36	0.096	3.2	2.9
	2	376.6	324	308	16	0.042	4.9	
	3	376.6	308	300.5	7.5	0.020	7.1	
	4	376.6	300.5	293.5	7	0.019	7.3	
	5	376.6	293.5	285.5	8	0.021	6.9	

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Pre-Development Flows

Project Name:	10249 Hunsden Sideroad
Project No.:	2101948
Prepared By:	Yash Gollamudi
Date:	Nov-22

	301	
Return Period	4-hour Chicago (m^3/s)	24-hour SCS (m^3/s)
2-year	0.009	0.013
100-year	0.092	0.082
Regional	0.090	

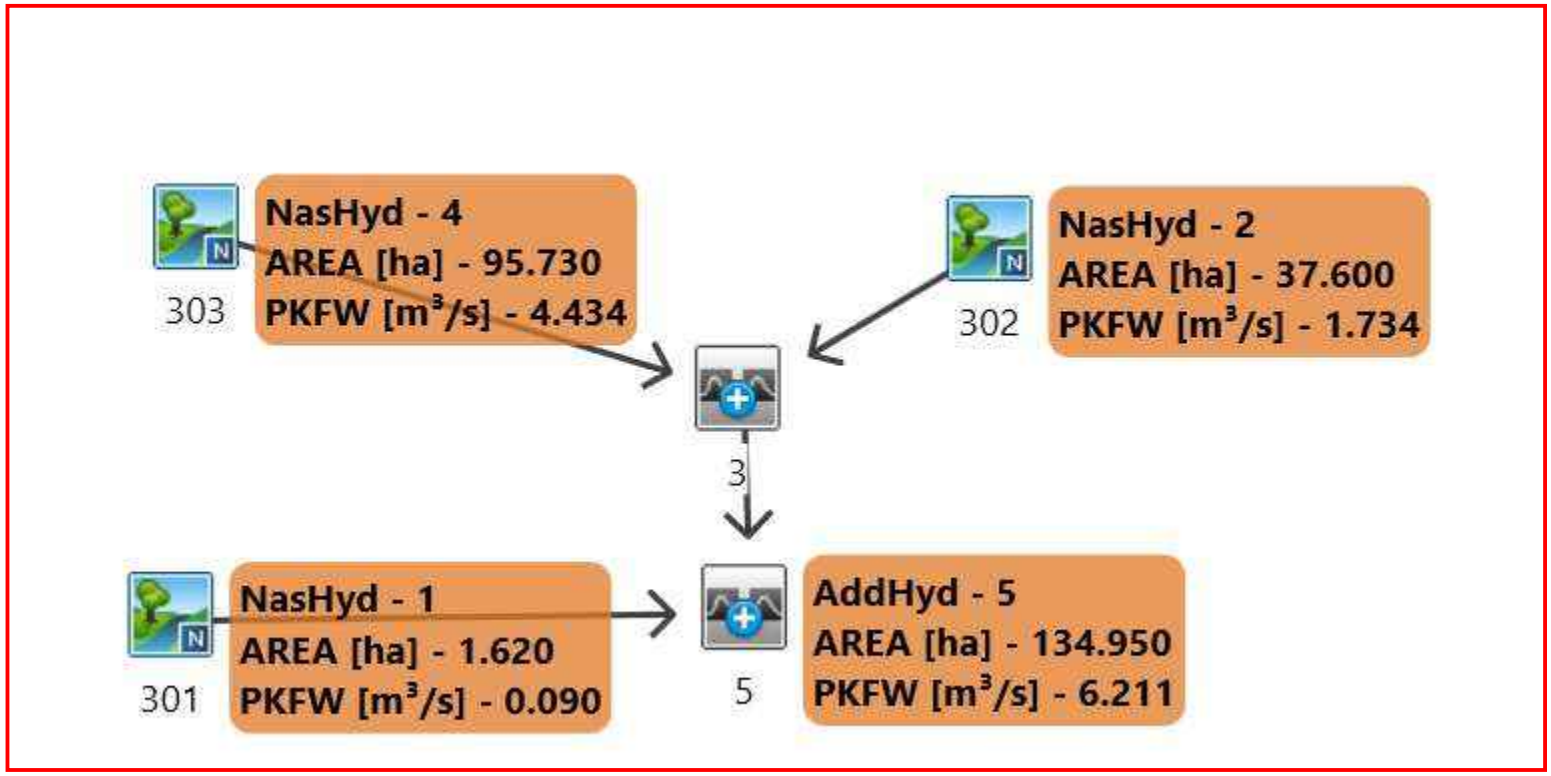
	302	**Reach B-1-2**
Return Period	4-hour Chicago (m^3/s)	24-hour SCS (m^3/s)
2-year	0.144	0.171
100-year	1.229	1.007
Regional	1.734	

	303	**Reach B-1-3**
Return Period	4-hour Chicago (m^3/s)	24-hour SCS (m^3/s)
2-year	0.368	0.437
100-year	3.079	2.530
Regional	4.434	

	301+302+303	**Reach B-1**
Return Period	4-hour Chicago (m^3/s)	24-hour SCS (m^3/s)
2-year	0.515	0.611
100-year	4.327	3.552
Regional	6.211	

File No. 2101948
10249 Hunsden Sideroad
Town of Caledon
2 & 100-Year 24 Hour SCS Storms, 4-hour Chicago Design Storms
Regional Storm
Pre-Development Model Output
November 2022

VO6 Model Schematic



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                0.25    1.12 |  6.33    1.83 | 12.42   14.62 | 18.50    1.83
                0.33    1.12 |  6.42    1.83 | 12.50   14.62 | 18.58    1.83
                0.42    1.12 |  6.50    1.83 | 12.58   14.62 | 18.67    1.83
                0.50    1.12 |  6.58    1.83 | 12.67    7.51 | 18.75    1.83
                0.58    1.12 |  6.67    1.83 | 12.75    7.51 | 18.83    1.83
                0.67    1.12 |  6.75    1.83 | 12.83    7.51 | 18.92    1.83
                0.75    1.12 |  6.83    1.83 | 12.92    7.51 | 19.00    1.83
                0.83    1.12 |  6.92    1.83 | 13.00    7.51 | 19.08    1.83
                0.92    1.12 |  7.00    1.83 | 13.08    7.51 | 19.17    1.83
                1.00    1.12 |  7.08    1.83 | 13.17    5.48 | 19.25    1.83
                1.08    1.12 |  7.17    2.23 | 13.25    5.48 | 19.33    1.83
                1.17    1.12 |  7.25    2.23 | 13.33    5.48 | 19.42    1.83
                1.25    1.12 |  7.33    2.23 | 13.42    5.48 | 19.50    1.83
                1.33    1.12 |  7.42    2.23 | 13.50    5.48 | 19.58    1.83
                1.42    1.12 |  7.50    2.23 | 13.58    5.48 | 19.67    1.83
                1.50    1.12 |  7.58    2.23 | 13.67    4.27 | 19.75    1.83
                1.58    1.12 |  7.67    2.23 | 13.75    4.27 | 19.83    1.83
                1.67    1.12 |  7.75    2.23 | 13.83    4.27 | 19.92    1.83
                1.75    1.12 |  7.83    2.23 | 13.92    4.27 | 20.00    1.83
                1.83    1.12 |  7.92    2.23 | 14.00    4.27 | 20.08    1.83
                1.92    1.12 |  8.00    2.23 | 14.08    4.27 | 20.17    1.22
                2.00    1.12 |  8.08    2.23 | 14.17    3.05 | 20.25    1.22
                2.08    1.12 |  8.17    2.64 | 14.25    3.05 | 20.33    1.22
                2.17    1.32 |  8.25    2.64 | 14.33    3.05 | 20.42    1.22
                2.25    1.32 |  8.33    2.64 | 14.42    3.05 | 20.50    1.22
                2.33    1.32 |  8.42    2.64 | 14.50    3.05 | 20.58    1.22
                2.42    1.32 |  8.50    2.64 | 14.58    3.05 | 20.67    1.22
                2.50    1.32 |  8.58    2.64 | 14.67    3.05 | 20.75    1.22
                2.58    1.32 |  8.67    2.84 | 14.75    3.05 | 20.83    1.22
                2.67    1.32 |  8.75    2.84 | 14.83    3.05 | 20.92    1.22
                2.75    1.32 |  8.83    2.84 | 14.92    3.05 | 21.00    1.22
                2.83    1.32 |  8.92    2.84 | 15.00    3.05 | 21.08    1.22
                2.92    1.32 |  9.00    2.84 | 15.08    3.05 | 21.17    1.22
                3.00    1.32 |  9.08    2.84 | 15.17    3.05 | 21.25    1.22
                3.08    1.32 |  9.17    3.25 | 15.25    3.05 | 21.33    1.22
                3.17    1.32 |  9.25    3.25 | 15.33    3.05 | 21.42    1.22
                3.25    1.32 |  9.33    3.25 | 15.42    3.05 | 21.50    1.22
                3.33    1.32 |  9.42    3.25 | 15.50    3.05 | 21.58    1.22
                3.42    1.32 |  9.50    3.25 | 15.58    3.05 | 21.67    1.22
                3.50    1.32 |  9.58    3.25 | 15.67    3.05 | 21.75    1.22
                3.58    1.32 |  9.67    3.66 | 15.75    3.05 | 21.83    1.22
                3.67    1.32 |  9.75    3.66 | 15.83    3.05 | 21.92    1.22
                3.75    1.32 |  9.83    3.66 | 15.92    3.05 | 22.00    1.22
                3.83    1.32 |  9.92    3.66 | 16.00    3.05 | 22.08    1.22
                3.92    1.32 | 10.00    3.66 | 16.08    3.05 | 22.17    1.22
                4.00    1.32 | 10.08    3.66 | 16.17    1.83 | 22.25    1.22
                4.08    1.32 | 10.17    4.67 | 16.25    1.83 | 22.33    1.22
                4.17    1.62 | 10.25    4.67 | 16.33    1.83 | 22.42    1.22
                4.25    1.62 | 10.33    4.67 | 16.42    1.83 | 22.50    1.22
                4.33    1.62 | 10.42    4.67 | 16.50    1.83 | 22.58    1.22
                4.42    1.62 | 10.50    4.67 | 16.58    1.83 | 22.67    1.22
                4.50    1.62 | 10.58    4.67 | 16.67    1.83 | 22.75    1.22
                4.58    1.62 | 10.67    6.30 | 16.75    1.83 | 22.83    1.22
                4.67    1.62 | 10.75    6.30 | 16.83    1.83 | 22.92    1.22
                4.75    1.62 | 10.83    6.30 | 16.92    1.83 | 23.00    1.22
                4.83    1.62 | 10.92    6.30 | 17.00    1.83 | 23.08    1.22
                4.92    1.62 | 11.00    6.30 | 17.08    1.83 | 23.17    1.22
                5.00    1.62 | 11.08    6.30 | 17.17    1.83 | 23.25    1.22
                5.08    1.62 | 11.17    9.75 | 17.25    1.83 | 23.33    1.22
                5.17    1.62 | 11.25    9.75 | 17.33    1.83 | 23.42    1.22
                5.25    1.62 | 11.33    9.75 | 17.42    1.83 | 23.50    1.22
                5.33    1.62 | 11.42    9.75 | 17.50    1.83 | 23.58    1.22
                5.42    1.62 | 11.50    9.75 | 17.58    1.83 | 23.67    1.22
                5.50    1.62 | 11.58    9.75 | 17.67    1.83 | 23.75    1.22
                5.58    1.62 | 11.67   30.06 | 17.75    1.83 | 23.83    1.22
                5.67    1.62 | 11.75   30.06 | 17.83    1.83 | 23.92    1.22
                5.75    1.62 | 11.83   30.06 | 17.92    1.83 | 24.00    1.22
                5.83    1.62 | 11.92  124.30 | 18.00    1.83 | 24.08    1.22
                5.92    1.62 | 12.00  124.30 | 18.08    1.83 |
                6.00    1.62 | 12.08  124.30 | 18.17    1.83 |
                6.08    1.62 | 12.17   14.62 | 18.25    1.83 |

--------------------------------------------------------------------------------

--------------------
| CALIB            |
| NASHYD   (  0301)|   Area     (ha)=   1.62   Curve Number    (CN)= 51.0
|ID= 1 DT= 5.0 min |   Ia       (mm)=   9.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.27

     Unit Hyd Qpeak  (cms)=   0.229

     PEAK FLOW       (cms)=   0.082 (i)
     TIME TO PEAK    (hrs)=  12.250
     RUNOFF VOLUME    (mm)=  25.433
     TOTAL RAINFALL   (mm)= 101.550
     RUNOFF COEFFICIENT   =   0.250

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0302)|   Area     (ha)=  37.60   Curve Number    (CN)= 58.0
|ID= 1 DT= 5.0 min |   Ia       (mm)=   8.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.89

     Unit Hyd Qpeak  (cms)=   1.614
```

```
     PEAK FLOW       (cms)=   1.007 (i)
     TIME TO PEAK    (hrs)=  12.917
     RUNOFF VOLUME    (mm)=  31.539
     TOTAL RAINFALL   (mm)= 101.550
     RUNOFF COEFFICIENT   =   0.311

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
-------------------
| CALIB             |
| NASHYD   (  0303)|   Area     (ha)=  95.73   Curve Number    (CN)= 60.0
|ID= 1 DT= 5.0 min |   Ia       (mm)=   8.00   # of Linear Res.(N)= 3.00
-------------------   U.H. Tp(hrs)=   0.98

     Unit Hyd Qpeak  (cms)=   3.731

     PEAK FLOW       (cms)=   2.530 (i)
     TIME TO PEAK    (hrs)=  13.083
     RUNOFF VOLUME    (mm)=  33.291
     TOTAL RAINFALL   (mm)= 101.550
     RUNOFF COEFFICIENT   =   0.328

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------

-------------------
| ADD HYD  (  0003)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
-------------------            (ha)     (cms)    (hrs)     (mm)
       ID1= 1 (  0302):    37.60   1.007    12.92    31.54
     + ID2= 2 (  0303):    95.73   2.530    13.08    33.29
       ================================================
       ID = 3 (  0003):   133.33   3.532    13.00    32.80

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

-------------------
| ADD HYD  (  0005)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
-------------------            (ha)     (cms)    (hrs)     (mm)
       ID1= 1 (  0003):   133.33   3.532    13.00    32.80
     + ID2= 2 (  0301):     1.62   0.082    12.25    25.43
       ================================================
       ID = 3 (  0005):   134.95   3.552    13.00    32.71

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
================================================================================
======

       V    V   I    SSSSS  U   U    A    L              (v 6.2.2003)
       V    V   I    SS     U   U   A A   L
        V  V    I     SS    U   U  AAAAA  L
        V  V    I      SS   U   U  A   A  L
         VV     I    SSSSS  UUUUU  A   A  LLLLL

        OOO   TTTTT  TTTTT  H   H  Y   Y  M   M   OOO    TM
       O   O    T      T    H   H   Y Y   MM MM  O   O
       O   O    T      T    H   H    Y    M   M  O   O
        OOO     T      T    H   H    Y    M   M   OOO
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                  *****  D E T A I L E D   O U T P U T *****


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  Output  filename: C:\Users\ygollamudi\AppData\Local\Civica\VH5\11695a72-db91-4c23-8400-
bfb46676b66f\fee39999-8b61-4506-a061-66a73ae89d0e\s

  Summary filename: C:\Users\ygollamudi\AppData\Local\Civica\VH5\11695a72-db91-4c23-8400-
bfb46676b66f\fee39999-8b61-4506-a061-66a73ae89d0e\s


DATE: 11/10/2022                          TIME: 04:41:44

USER:


COMMENTS: _____

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  ************************************************
  ** SIMULATION : 100yr 4hr 10min Chicago       **
  ************************************************

--------------------
| CHICAGO STORM    |    IDF curve parameters: A=4688.000
| Ptotal= 89.87 mm |                          B=  17.000
--------------------                          C=   0.962
                        used in:   INTENSITY =  A / (t + B)^C

                        Duration of storm  =  4.00 hrs
                        Storm time step    = 10.00 min
                        Time to peak ratio =  0.33

                TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
                 hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
                0.17    2.89 |  1.17   62.12 |  2.17   12.48 |  3.17    3.91
                0.33    3.67 |  1.33  196.54 |  2.33    9.60 |  3.33    3.44
                0.50    4.88 |  1.50   83.09 |  2.50    7.66 |  3.50    3.05
                0.67    6.96 |  1.67   41.25 |  2.67    6.29 |  3.67    2.73
                0.83   11.02 |  1.83   25.07 |  2.83    5.28 |  3.83    2.47
                1.00   21.03 |  2.00   17.06 |  3.00    4.51 |  4.00    2.24


--------------------------------------------------------------------------------
-------------------
| CALIB             |
| NASHYD   (  0301)|   Area     (ha)=   1.62   Curve Number    (CN)= 51.0
|ID= 1 DT= 5.0 min |   Ia       (mm)=   9.00   # of Linear Res.(N)= 3.00
-------------------   U.H. Tp(hrs)=   0.27

        NOTE:  RAINFALL WAS TRANSFORMED TO   5.0 MIN. TIME STEP.


                          ---- TRANSFORMED HYETOGRAPH ----
                TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
                 hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
               0.083    2.89 | 1.083   62.12 | 2.083   12.48 |  3.08    3.91
               0.167    2.89 | 1.167   62.12 | 2.167   12.48 |  3.17    3.91
               0.250    3.67 | 1.250  196.54 | 2.250    9.60 |  3.25    3.44
               0.333    3.67 | 1.333  196.54 | 2.333    9.60 |  3.33    3.44
               0.417    4.88 | 1.417   83.09 | 2.417    7.66 |  3.42    3.05
               0.500    4.88 | 1.500   83.09 | 2.500    7.66 |  3.50    3.05
               0.583    6.96 | 1.583   41.25 | 2.583    6.29 |  3.58    2.73
               0.667    6.96 | 1.667   41.25 | 2.667    6.29 |  3.67    2.73
               0.750   11.02 | 1.750   25.07 | 2.750    5.28 |  3.75    2.47
               0.833   11.02 | 1.833   25.07 | 2.833    5.28 |  3.83    2.47
               0.917   21.03 | 1.917   17.06 | 2.917    4.51 |  3.92    2.24
               1.000   21.03 | 2.000   17.06 | 3.000    4.51 |  4.00    2.24

    Unit Hyd Qpeak  (cms)=   0.229

    PEAK FLOW       (cms)=   0.092 (i)
    TIME TO PEAK    (hrs)=   1.667
    RUNOFF VOLUME    (mm)=  20.116
    TOTAL RAINFALL   (mm)=  89.870
    RUNOFF COEFFICIENT   =   0.224

    (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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GEI Consultants

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--------------------
| CALIB            |
| NASHYD   (  0302)|   Area     (ha)=  37.60   Curve Number    (CN)= 58.0
|ID= 1 DT= 5.0 min |   Ia       (mm)=   8.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.89

        NOTE:  RAINFALL WAS TRANSFORMED TO   5.0 MIN. TIME STEP.

                        ---- TRANSFORMED HYETOGRAPH ----
   TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
    hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
  0.083    2.89 | 1.083   62.12 | 2.083   12.48 |  3.08    3.91
  0.167    2.89 | 1.167   62.12 | 2.167   12.48 |  3.17    3.91
  0.250    3.67 | 1.250  196.54 | 2.250    9.60 |  3.25    3.44
  0.333    3.67 | 1.333  196.54 | 2.333    9.60 |  3.33    3.44
  0.417    4.88 | 1.417   83.09 | 2.417    7.66 |  3.42    3.05
  0.500    4.88 | 1.500   83.09 | 2.500    7.66 |  3.50    3.05
  0.583    6.96 | 1.583   41.25 | 2.583    6.29 |  3.58    2.73
  0.667    6.96 | 1.667   41.25 | 2.667    6.29 |  3.67    2.73
  0.750   11.02 | 1.750   25.07 | 2.750    5.28 |  3.75    2.47
  0.833   11.02 | 1.833   25.07 | 2.833    5.28 |  3.83    2.47
  0.917   21.03 | 1.917   17.06 | 2.917    4.51 |  3.92    2.24
  1.000   21.03 | 2.000   17.06 | 3.000    4.51 |  4.00    2.24

    Unit Hyd Qpeak  (cms)=   1.614

    PEAK FLOW       (cms)=   1.229 (i)
    TIME TO PEAK    (hrs)=   2.417
    RUNOFF VOLUME    (mm)=  25.217
    TOTAL RAINFALL   (mm)=  89.870
    RUNOFF COEFFICIENT   =   0.281

    (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
```

```
--------------------
| CALIB            |
| NASHYD   (  0303)|   Area     (ha)=  95.73   Curve Number    (CN)= 60.0
|ID= 1 DT= 5.0 min |   Ia       (mm)=   8.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.98

        NOTE:  RAINFALL WAS TRANSFORMED TO   5.0 MIN. TIME STEP.

                        ---- TRANSFORMED HYETOGRAPH ----
   TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
    hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
  0.083    2.89 | 1.083   62.12 | 2.083   12.48 |  3.08    3.91
  0.167    2.89 | 1.167   62.12 | 2.167   12.48 |  3.17    3.91
  0.250    3.67 | 1.250  196.54 | 2.250    9.60 |  3.25    3.44
  0.333    3.67 | 1.333  196.54 | 2.333    9.60 |  3.33    3.44
  0.417    4.88 | 1.417   83.09 | 2.417    7.66 |  3.42    3.05
  0.500    4.88 | 1.500   83.09 | 2.500    7.66 |  3.50    3.05
  0.583    6.96 | 1.583   41.25 | 2.583    6.29 |  3.58    2.73
  0.667    6.96 | 1.667   41.25 | 2.667    6.29 |  3.67    2.73
  0.750   11.02 | 1.750   25.07 | 2.750    5.28 |  3.75    2.47
  0.833   11.02 | 1.833   25.07 | 2.833    5.28 |  3.83    2.47
  0.917   21.03 | 1.917   17.06 | 2.917    4.51 |  3.92    2.24
  1.000   21.03 | 2.000   17.06 | 3.000    4.51 |  4.00    2.24

    Unit Hyd Qpeak  (cms)=   3.731

    PEAK FLOW       (cms)=   3.079 (i)
    TIME TO PEAK    (hrs)=   2.500
    RUNOFF VOLUME    (mm)=  26.682
    TOTAL RAINFALL   (mm)=  89.870
    RUNOFF COEFFICIENT   =   0.297

    (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
```

```
--------------------
| ADD HYD  (  0003)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)     (cms)    (hrs)      (mm)
       ID1= 1 (  0302):    37.60    1.229     2.42     25.22
     + ID2= 2 (  0303):    95.73    3.079     2.50     26.68
       ================================================
       ID = 3 (  0003):   133.33    4.303     2.50     26.27

    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
```

```
--------------------
| ADD HYD  (  0005)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)     (cms)    (hrs)      (mm)
       ID1= 1 (  0003):   133.33    4.303     2.50     26.27
     + ID2= 2 (  0301):     1.62    0.092     1.67     20.12
       ================================================
       ID = 3 (  0005):   134.95    4.327     2.50     26.19

    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
```

```
      V    V   I    SSSSS  U   U    A    L              (v 6.2.2003)
      V    V   I    SS     U   U   A A   L
       V  V    I     SS    U   U  AAAAA  L
       V  V    I      SS   U   U  A   A  L
        VV     I    SSSSS  UUUUU  A   A  LLLLL

       OOO   TTTTT  TTTTT  H   H  Y   Y  M   M   OOO    TM
      O   O    T      T    H   H   Y Y   MM MM  O   O
      O   O    T      T    H   H    Y    M   M  O   O
       OOO     T      T    H   H    Y    M   M   OOO
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                  *****  D E T A I L E D   O U T P U T *****

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DATE: 11/10/2022                          TIME: 04:41:44

USER:


COMMENTS: _____
```

```
  ************************************************
  ** SIMULATION : 2yr 24hr 5min SCS             **
  ************************************************


--------------------
|    READ STORM    |    Filename: C:\Users\ygollamudi\AppD
|                  |              ata\Local\Temp\
|                  |              8b40cebd-4423-41f9-a925-911f4ea0751e\c8ddd733
| Ptotal= 43.76 mm |   Comments: 2yr 24hr 5min SCS
--------------------
                TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
                 hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
                0.08    0.00 |  6.17    0.79 | 12.25    6.30 | 18.33    0.79
                0.17    0.48 |  6.25    0.79 | 12.33    6.30 | 18.42    0.79
                0.25    0.48 |  6.33    0.79 | 12.42    6.30 | 18.50    0.79
                0.33    0.48 |  6.42    0.79 | 12.50    6.30 | 18.58    0.79
```

0.42	0.48	6.50	0.79	12.58	6.30	18.67	0.79
0.50	0.48	6.58	0.79	12.67	3.24	18.75	0.79
0.58	0.48	6.67	0.79	12.75	3.24	18.83	0.79
0.67	0.48	6.75	0.79	12.83	3.24	18.92	0.79
0.75	0.48	6.83	0.79	12.92	3.24	19.00	0.79
0.83	0.48	6.92	0.79	13.00	3.24	19.08	0.79
0.92	0.48	7.00	0.79	13.08	3.24	19.17	0.79
1.00	0.48	7.08	0.79	13.17	2.36	19.25	0.79
1.08	0.48	7.17	0.96	13.25	2.36	19.33	0.79
1.17	0.48	7.25	0.96	13.33	2.36	19.42	0.79
1.25	0.48	7.33	0.96	13.42	2.36	19.50	0.79
1.33	0.48	7.42	0.96	13.50	2.36	19.58	0.79
1.42	0.48	7.50	0.96	13.58	2.36	19.67	0.79
1.50	0.48	7.58	0.96	13.67	1.84	19.75	0.79
1.58	0.48	7.67	0.96	13.75	1.84	19.83	0.79
1.67	0.48	7.75	0.96	13.83	1.84	19.92	0.79
1.75	0.48	7.83	0.96	13.92	1.84	20.00	0.79
1.83	0.48	7.92	0.96	14.00	1.84	20.08	0.79
1.92	0.48	8.00	0.96	14.08	1.84	20.17	0.53
2.00	0.48	8.08	0.96	14.17	1.31	20.25	0.53
2.08	0.48	8.17	1.14	14.25	1.31	20.33	0.53
2.17	0.57	8.25	1.14	14.33	1.31	20.42	0.53
2.25	0.57	8.33	1.14	14.42	1.31	20.50	0.53
2.33	0.57	8.42	1.14	14.50	1.31	20.58	0.53
2.42	0.57	8.50	1.14	14.58	1.31	20.67	0.53
2.50	0.57	8.58	1.14	14.67	1.31	20.75	0.53
2.58	0.57	8.67	1.23	14.75	1.31	20.83	0.53
2.67	0.57	8.75	1.23	14.83	1.31	20.92	0.53
2.75	0.57	8.83	1.23	14.92	1.31	21.00	0.53
2.83	0.57	8.92	1.23	15.00	1.31	21.08	0.53
2.92	0.57	9.00	1.23	15.08	1.31	21.17	0.53
3.00	0.57	9.08	1.23	15.17	1.31	21.25	0.53
3.08	0.57	9.17	1.40	15.25	1.31	21.33	0.53
3.17	0.57	9.25	1.40	15.33	1.31	21.42	0.53
3.25	0.57	9.33	1.40	15.42	1.31	21.50	0.53
3.33	0.57	9.42	1.40	15.50	1.31	21.58	0.53
3.42	0.57	9.50	1.40	15.58	1.31	21.67	0.53
3.50	0.57	9.58	1.40	15.67	1.31	21.75	0.53
3.58	0.57	9.67	1.58	15.75	1.31	21.83	0.53
3.67	0.57	9.75	1.58	15.83	1.31	21.92	0.53
3.75	0.57	9.83	1.58	15.92	1.31	22.00	0.53
3.83	0.57	9.92	1.58	16.00	1.31	22.08	0.53
3.92	0.57	10.00	1.58	16.08	1.31	22.17	0.53
4.00	0.57	10.08	1.58	16.17	0.79	22.25	0.53
4.08	0.57	10.17	2.01	16.25	0.79	22.33	0.53
4.17	0.70	10.25	2.01	16.33	0.79	22.42	0.53
4.25	0.70	10.33	2.01	16.42	0.79	22.50	0.53
4.33	0.70	10.42	2.01	16.50	0.79	22.58	0.53
4.42	0.70	10.50	2.01	16.58	0.79	22.67	0.53
4.50	0.70	10.58	2.01	16.67	0.79	22.75	0.53
4.58	0.70	10.67	2.71	16.75	0.79	22.83	0.53
4.67	0.70	10.75	2.71	16.83	0.79	22.92	0.53
4.75	0.70	10.83	2.71	16.92	0.79	23.00	0.53
4.83	0.70	10.92	2.71	17.00	0.79	23.08	0.53
4.92	0.70	11.00	2.71	17.08	0.79	23.17	0.53
5.00	0.70	11.08	2.71	17.17	0.79	23.25	0.53
5.08	0.70	11.17	4.20	17.25	0.79	23.33	0.53
5.17	0.70	11.25	4.20	17.33	0.79	23.42	0.53
5.25	0.70	11.33	4.20	17.42	0.79	23.50	0.53
5.33	0.70	11.42	4.20	17.50	0.79	23.58	0.53
5.42	0.70	11.50	4.20	17.58	0.79	23.67	0.53
5.50	0.70	11.58	4.20	17.67	0.79	23.75	0.53
5.58	0.70	11.67	12.95	17.75	0.79	23.83	0.53
5.67	0.70	11.75	12.95	17.83	0.79	23.92	0.53
5.75	0.70	11.83	12.95	17.92	0.79	24.00	0.53
5.83	0.70	11.92	53.56	18.00	0.79	24.08	0.53
5.92	0.70	12.00	53.56	18.08	0.79		
6.00	0.70	12.08	53.56	18.17	0.79		
6.08	0.70	12.17	6.30	18.25	0.79		

CALIB					
NASHYD (0301)	Area	(ha)=	1.62	Curve Number	(CN)= 51.0
ID= 1 DT= 5.0 min	Ia	(mm)=	9.00	# of Linear Res.	(N)= 3.00
	U.H. Tp(hrs)=		0.27		

Unit Hyd Qpeak (cms)= 0.229

PEAK FLOW (cms)= 0.013 (i)
TIME TO PEAK (hrs)= 12.250
RUNOFF VOLUME (mm)= 4.331
TOTAL RAINFALL (mm)= 43.760
RUNOFF COEFFICIENT = 0.099

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB					
NASHYD (0302)	Area	(ha)=	37.60	Curve Number	(CN)= 58.0
ID= 1 DT= 5.0 min	Ia	(mm)=	8.00	# of Linear Res.	(N)= 3.00
	U.H. Tp(hrs)=		0.89		

Unit Hyd Qpeak (cms)= 1.614

PEAK FLOW (cms)= 0.171 (i)
TIME TO PEAK (hrs)= 13.000
RUNOFF VOLUME (mm)= 5.821
TOTAL RAINFALL (mm)= 43.760
RUNOFF COEFFICIENT = 0.133

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB					
NASHYD (0303)	Area	(ha)=	95.73	Curve Number	(CN)= 60.0
ID= 1 DT= 5.0 min	Ia	(mm)=	8.00	# of Linear Res.	(N)= 3.00
	U.H. Tp(hrs)=		0.98		

Unit Hyd Qpeak (cms)= 3.731

PEAK FLOW (cms)= 0.437 (i)
TIME TO PEAK (hrs)= 13.167
RUNOFF VOLUME (mm)= 6.235
TOTAL RAINFALL (mm)= 43.760
RUNOFF COEFFICIENT = 0.142

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

ADD HYD (0003)
1 + 2 = 3

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0302):	37.60	0.171	13.00	5.82
+ ID2= 2 (0303):	95.73	0.437	13.17	6.24
ID = 3 (0003):	133.33	0.607	13.08	6.12

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0005)
1 + 2 = 3

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0003):	133.33	0.607	13.08	6.12
+ ID2= 2 (0301):	1.62	0.013	12.25	4.33
ID = 3 (0005):	134.95	0.611	13.08	6.10

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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V   V   I   SSSSS  U   U   A   L              (v 6.2.2003)
V   V   I   SS     U   U   A A   L
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GEI Consultants

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       V  V    I     SS    U   U  AAAAA  L
       V  V    I      SS   U   U  A   A  L
        VV     I    SSSSS  UUUUU  A   A  LLLLL

       OOO   TTTTT  TTTTT  H   H  Y   Y  M   M   OOO    TM
      O   O    T      T    H   H   Y Y   MM MM  O   O
      O   O    T      T    H   H    Y    M   M  O   O
       OOO     T      T    H   H    Y    M   M   OOO
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***** D E T A I L E D O U T P U T *****

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DATE: 11/10/2022 TIME: 04:41:44

USER:

COMMENTS: _____

****
** SIMULATION : 2yr 4hr 10min Chicago **
****

| CHICAGO STORM | Ptotal= 34.22 mm |

IDF curve parameters: A=1070.000
B= 7.850
C= 0.876
used in: INTENSITY = A / (t + B)^C

Duration of storm = 4.00 hrs
Storm time step = 10.00 min
Time to peak ratio = 0.33

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.17	1.53	1.17	19.60	2.17	4.48	3.17	1.89
0.33	1.81	1.33	85.72	2.33	3.65	3.33	1.73
0.50	2.22	1.50	26.59	2.50	3.08	3.50	1.59
0.67	2.87	1.67	12.64	2.67	2.66	3.67	1.47
0.83	4.06	1.83	7.99	2.83	2.34	3.83	1.37
1.00	6.86	2.00	5.76	3.00	2.10	4.00	1.29

CALIB	NASHYD (0301)	ID= 1 DT= 5.0 min

Area (ha)= 1.62 Curve Number (CN)= 51.0
Ia (mm)= 9.00 # of Linear Res.(N)= 3.00
U.H. Tp(hrs)= 0.27

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	1.53	1.083	19.60	2.083	4.48	3.08	1.89
0.167	1.53	1.167	19.60	2.167	4.48	3.17	1.89
0.250	1.81	1.250	85.72	2.250	3.65	3.25	1.73
0.333	1.81	1.333	85.72	2.333	3.65	3.33	1.73
0.417	2.22	1.417	26.59	2.417	3.08	3.42	1.59
0.500	2.22	1.500	26.59	2.500	3.08	3.50	1.59
0.583	2.87	1.583	12.64	2.583	2.66	3.58	1.47
0.667	2.87	1.667	12.64	2.667	2.66	3.67	1.47
0.750	4.06	1.750	7.99	2.750	2.34	3.75	1.37
0.833	4.06	1.833	7.99	2.833	2.34	3.83	1.37
0.917	6.86	1.917	5.76	2.917	2.10	3.92	1.29
1.000	6.86	2.000	5.76	3.000	2.10	4.00	1.29

Unit Hyd Qpeak (cms)= 0.229

PEAK FLOW (cms)= 0.009 (i)
TIME TO PEAK (hrs)= 1.667
RUNOFF VOLUME (mm)= 2.360
TOTAL RAINFALL (mm)= 34.218
RUNOFF COEFFICIENT = 0.069

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB	NASHYD (0302)	ID= 1 DT= 5.0 min

Area (ha)= 37.60 Curve Number (CN)= 58.0
Ia (mm)= 8.00 # of Linear Res.(N)= 3.00
U.H. Tp(hrs)= 0.89

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	1.53	1.083	19.60	2.083	4.48	3.08	1.89
0.167	1.53	1.167	19.60	2.167	4.48	3.17	1.89
0.250	1.81	1.250	85.72	2.250	3.65	3.25	1.73
0.333	1.81	1.333	85.72	2.333	3.65	3.33	1.73
0.417	2.22	1.417	26.59	2.417	3.08	3.42	1.59
0.500	2.22	1.500	26.59	2.500	3.08	3.50	1.59
0.583	2.87	1.583	12.64	2.583	2.66	3.58	1.47
0.667	2.87	1.667	12.64	2.667	2.66	3.67	1.47
0.750	4.06	1.750	7.99	2.750	2.34	3.75	1.37
0.833	4.06	1.833	7.99	2.833	2.34	3.83	1.37
0.917	6.86	1.917	5.76	2.917	2.10	3.92	1.29
1.000	6.86	2.000	5.76	3.000	2.10	4.00	1.29

Unit Hyd Qpeak (cms)= 1.614

PEAK FLOW (cms)= 0.144 (i)
TIME TO PEAK (hrs)= 2.500
RUNOFF VOLUME (mm)= 3.271
TOTAL RAINFALL (mm)= 34.218
RUNOFF COEFFICIENT = 0.096

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB	NASHYD (0303)	ID= 1 DT= 5.0 min

Area (ha)= 95.73 Curve Number (CN)= 60.0
Ia (mm)= 8.00 # of Linear Res.(N)= 3.00
U.H. Tp(hrs)= 0.98

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	1.53	1.083	19.60	2.083	4.48	3.08	1.89
0.167	1.53	1.167	19.60	2.167	4.48	3.17	1.89
0.250	1.81	1.250	85.72	2.250	3.65	3.25	1.73
0.333	1.81	1.333	85.72	2.333	3.65	3.33	1.73
0.417	2.22	1.417	26.59	2.417	3.08	3.42	1.59
0.500	2.22	1.500	26.59	2.500	3.08	3.50	1.59
0.583	2.87	1.583	12.64	2.583	2.66	3.58	1.47
0.667	2.87	1.667	12.64	2.667	2.66	3.67	1.47
0.750	4.06	1.750	7.99	2.750	2.34	3.75	1.37

0.833	4.06	1.833	7.99	2.833	2.34	3.83	1.37
0.917	6.86	1.917	5.76	2.917	2.10	3.92	1.29
1.000	6.86	2.000	5.76	3.000	2.10	4.00	1.29

Unit Hyd Qpeak (cms)= 3.731

PEAK FLOW (cms)= 0.368 (i)
TIME TO PEAK (hrs)= 2.667
RUNOFF VOLUME (mm)= 3.515
TOTAL RAINFALL (mm)= 34.218
RUNOFF COEFFICIENT = 0.103

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

ADD HYD (0003)		AREA	QPEAK	TPEAK	R.V.
1 + 2 = 3		(ha)	(cms)	(hrs)	(mm)
ID1= 1 (0302):		37.60	0.144	2.50	3.27
+ ID2= 2 (0303):		95.73	0.368	2.67	3.52
ID = 3 (0003):		133.33	0.512	2.58	3.45

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0005)		AREA	QPEAK	TPEAK	R.V.
1 + 2 = 3		(ha)	(cms)	(hrs)	(mm)
ID1= 1 (0003):		133.33	0.512	2.58	3.45
+ ID2= 2 (0301):		1.62	0.009	1.67	2.36
ID = 3 (0005):		134.95	0.515	2.58	3.43

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

V V I SSSSS U U A L (v 6.2.2003)
V V I SS U U A A L
V V I SS U U AAAAA L
V V I SS U U A A L
VV I SSSSS UUUUU A A LLLLL

OOO TTTTT TTTTT H H Y Y M M OOO TM
O O T T H H Y Y MM MM O O
O O T T H H Y M M O O
OOO T T H H Y M M OOO

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***** D E T A I L E D O U T P U T *****

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DATE: 11/10/2022 TIME: 04:41:44

USER:

COMMENTS: _____

** SIMULATION : Timmins **

READ STORM	Filename: C:\Users\ygollamudi\AppData\Local\Temp\8b40cebd-4423-41f9-a925-911f4ea0751e\f1f0f343
Ptotal=193.00 mm	Comments: Timmins

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.25	0.00	3.50	3.00	6.75	43.00	10.00	13.00
0.50	15.00	3.75	3.00	7.00	43.00	10.25	13.00
0.75	15.00	4.00	3.00	7.25	43.00	10.50	13.00
1.00	15.00	4.25	3.00	7.50	20.00	10.75	13.00
1.25	15.00	4.50	5.00	7.75	20.00	11.00	13.00
1.50	20.00	4.75	5.00	8.00	20.00	11.25	13.00
1.75	20.00	5.00	5.00	8.25	20.00	11.50	8.00
2.00	20.00	5.25	5.00	8.50	23.00	11.75	8.00
2.25	20.00	5.50	20.00	8.75	23.00	12.00	8.00
2.50	10.00	5.75	20.00	9.00	23.00	12.25	8.00
2.75	10.00	6.00	20.00	9.25	23.00		
3.00	10.00	6.25	20.00	9.50	13.00		
3.25	10.00	6.50	43.00	9.75	13.00		

CALIB					
NASHYD (0301)	ID= 1 DT= 5.0 min	Area (ha)= 1.62	Curve Number (CN)= 51.0	Ia (mm)= 9.00	# of Linear Res.(N)= 3.00
		U.H. Tp(hrs)= 0.27			

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	0.00	3.167	10.00	6.250	20.00	9.33	13.00
0.167	0.00	3.250	10.00	6.333	43.00	9.42	13.00
0.250	0.00	3.333	3.00	6.417	43.00	9.50	13.00
0.333	15.00	3.417	3.00	6.500	43.00	9.58	13.00
0.417	15.00	3.500	3.00	6.583	43.00	9.67	13.00
0.500	15.00	3.583	3.00	6.667	43.00	9.75	13.00
0.583	15.00	3.667	3.00	6.750	43.00	9.83	13.00
0.667	15.00	3.750	3.00	6.833	43.00	9.92	13.00
0.750	15.00	3.833	3.00	6.917	43.00	10.00	13.00
0.833	15.00	3.917	3.00	7.000	43.00	10.08	13.00
0.917	15.00	4.000	3.00	7.083	43.00	10.17	13.00
1.000	15.00	4.083	3.00	7.167	43.00	10.25	13.00
1.083	15.00	4.167	3.00	7.250	43.00	10.33	13.00
1.167	15.00	4.250	3.00	7.333	20.00	10.42	13.00
1.250	15.00	4.333	5.00	7.417	20.00	10.50	13.00
1.333	20.00	4.417	5.00	7.500	20.00	10.58	13.00
1.417	20.00	4.500	5.00	7.583	20.00	10.67	13.00
1.500	20.00	4.583	5.00	7.667	20.00	10.75	13.00
1.583	20.00	4.667	5.00	7.750	20.00	10.83	13.00
1.667	20.00	4.750	5.00	7.833	20.00	10.92	13.00
1.750	20.00	4.833	5.00	7.917	20.00	11.00	13.00
1.833	20.00	4.917	5.00	8.000	20.00	11.08	13.00
1.917	20.00	5.000	5.00	8.083	20.00	11.17	13.00
2.000	20.00	5.083	5.00	8.167	20.00	11.25	13.00
2.083	20.00	5.167	5.00	8.250	20.00	11.33	8.00
2.167	20.00	5.250	5.00	8.333	23.00	11.42	8.00
2.250	20.00	5.333	20.00	8.417	23.00	11.50	8.00
2.333	10.00	5.417	20.00	8.500	23.00	11.58	8.00
2.417	10.00	5.500	20.00	8.583	23.00	11.67	8.00
2.500	10.00	5.583	20.00	8.667	23.00	11.75	8.00
2.583	10.00	5.667	20.00	8.750	23.00	11.83	8.00
2.667	10.00	5.750	20.00	8.833	23.00	11.92	8.00
2.750	10.00	5.833	20.00	8.917	23.00	12.00	8.00

2.833	10.00	5.917	20.00	9.000	23.00	12.08	8.00
2.917	10.00	6.000	20.00	9.083	23.00	12.17	8.00
3.000	10.00	6.083	20.00	9.167	23.00	12.25	8.00
3.083	10.00	6.167	20.00	9.250	23.00		

Unit Hyd Qpeak (cms)= 0.229

PEAK FLOW (cms)= 0.090 (i)
TIME TO PEAK (hrs)= 7.250
RUNOFF VOLUME (mm)= 79.049
TOTAL RAINFALL (mm)= 193.000
RUNOFF COEFFICIENT = 0.410

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB			
NASHYD (0302)	Area (ha)= 37.60	Curve Number (CN)= 58.0	
ID= 1 DT= 5.0 min	Ia (mm)= 8.00	# of Linear Res.(N)= 3.00	
	U.H. Tp(hrs)= 0.89		

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	0.00	3.167	10.00	6.250	20.00	9.33	13.00
0.167	0.00	3.250	10.00	6.333	43.00	9.42	13.00
0.250	0.00	3.333	3.00	6.417	43.00	9.50	13.00
0.333	15.00	3.417	3.00	6.500	43.00	9.58	13.00
0.417	15.00	3.500	3.00	6.583	43.00	9.67	13.00
0.500	15.00	3.583	3.00	6.667	43.00	9.75	13.00
0.583	15.00	3.667	3.00	6.750	43.00	9.83	13.00
0.667	15.00	3.750	3.00	6.833	43.00	9.92	13.00
0.750	15.00	3.833	3.00	6.917	43.00	10.00	13.00
0.833	15.00	3.917	3.00	7.000	43.00	10.08	13.00
0.917	15.00	4.000	3.00	7.083	43.00	10.17	13.00
1.000	15.00	4.083	3.00	7.167	43.00	10.25	13.00
1.083	15.00	4.167	3.00	7.250	43.00	10.33	13.00
1.167	15.00	4.250	3.00	7.333	20.00	10.42	13.00
1.250	15.00	4.333	5.00	7.417	20.00	10.50	13.00
1.333	20.00	4.417	5.00	7.500	20.00	10.58	13.00
1.417	20.00	4.500	5.00	7.583	20.00	10.67	13.00
1.500	20.00	4.583	5.00	7.667	20.00	10.75	13.00
1.583	20.00	4.667	5.00	7.750	20.00	10.83	13.00
1.667	20.00	4.750	5.00	7.833	20.00	10.92	13.00
1.750	20.00	4.833	5.00	7.917	20.00	11.00	13.00
1.833	20.00	4.917	5.00	8.000	20.00	11.08	13.00
1.917	20.00	5.000	5.00	8.083	20.00	11.17	13.00
2.000	20.00	5.083	5.00	8.167	20.00	11.25	13.00
2.083	20.00	5.167	5.00	8.250	20.00	11.33	8.00
2.167	20.00	5.250	5.00	8.333	23.00	11.42	8.00
2.250	20.00	5.333	20.00	8.417	23.00	11.50	8.00
2.333	10.00	5.417	20.00	8.500	23.00	11.58	8.00
2.417	10.00	5.500	20.00	8.583	23.00	11.67	8.00
2.500	10.00	5.583	20.00	8.667	23.00	11.75	8.00
2.583	10.00	5.667	20.00	8.750	23.00	11.83	8.00
2.667	10.00	5.750	20.00	8.833	23.00	11.92	8.00
2.750	10.00	5.833	20.00	8.917	23.00	12.00	8.00
2.833	10.00	5.917	20.00	9.000	23.00	12.08	8.00
2.917	10.00	6.000	20.00	9.083	23.00	12.17	8.00
3.000	10.00	6.083	20.00	9.167	23.00	12.25	8.00
3.083	10.00	6.167	20.00	9.250	23.00		

Unit Hyd Qpeak (cms)= 1.614

PEAK FLOW (cms)= 1.734 (i)
TIME TO PEAK (hrs)= 7.917
RUNOFF VOLUME (mm)= 92.767
TOTAL RAINFALL (mm)= 193.000
RUNOFF COEFFICIENT = 0.481

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB			
NASHYD (0303)	Area (ha)= 95.73	Curve Number (CN)= 60.0	
ID= 1 DT= 5.0 min	Ia (mm)= 8.00	# of Linear Res.(N)= 3.00	
	U.H. Tp(hrs)= 0.98		

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	0.00	3.167	10.00	6.250	20.00	9.33	13.00
0.167	0.00	3.250	10.00	6.333	43.00	9.42	13.00
0.250	0.00	3.333	3.00	6.417	43.00	9.50	13.00
0.333	15.00	3.417	3.00	6.500	43.00	9.58	13.00
0.417	15.00	3.500	3.00	6.583	43.00	9.67	13.00
0.500	15.00	3.583	3.00	6.667	43.00	9.75	13.00
0.583	15.00	3.667	3.00	6.750	43.00	9.83	13.00
0.667	15.00	3.750	3.00	6.833	43.00	9.92	13.00
0.750	15.00	3.833	3.00	6.917	43.00	10.00	13.00
0.833	15.00	3.917	3.00	7.000	43.00	10.08	13.00
0.917	15.00	4.000	3.00	7.083	43.00	10.17	13.00
1.000	15.00	4.083	3.00	7.167	43.00	10.25	13.00
1.083	15.00	4.167	3.00	7.250	43.00	10.33	13.00
1.167	15.00	4.250	3.00	7.333	20.00	10.42	13.00
1.250	15.00	4.333	5.00	7.417	20.00	10.50	13.00
1.333	20.00	4.417	5.00	7.500	20.00	10.58	13.00
1.417	20.00	4.500	5.00	7.583	20.00	10.67	13.00
1.500	20.00	4.583	5.00	7.667	20.00	10.75	13.00
1.583	20.00	4.667	5.00	7.750	20.00	10.83	13.00
1.667	20.00	4.750	5.00	7.833	20.00	10.92	13.00
1.750	20.00	4.833	5.00	7.917	20.00	11.00	13.00
1.833	20.00	4.917	5.00	8.000	20.00	11.08	13.00
1.917	20.00	5.000	5.00	8.083	20.00	11.17	13.00
2.000	20.00	5.083	5.00	8.167	20.00	11.25	13.00
2.083	20.00	5.167	5.00	8.250	20.00	11.33	8.00
2.167	20.00	5.250	5.00	8.333	23.00	11.42	8.00
2.250	20.00	5.333	20.00	8.417	23.00	11.50	8.00
2.333	10.00	5.417	20.00	8.500	23.00	11.58	8.00
2.417	10.00	5.500	20.00	8.583	23.00	11.67	8.00
2.500	10.00	5.583	20.00	8.667	23.00	11.75	8.00
2.583	10.00	5.667	20.00	8.750	23.00	11.83	8.00
2.667	10.00	5.750	20.00	8.833	23.00	11.92	8.00
2.750	10.00	5.833	20.00	8.917	23.00	12.00	8.00
2.833	10.00	5.917	20.00	9.000	23.00	12.08	8.00
2.917	10.00	6.000	20.00	9.083	23.00	12.17	8.00
3.000	10.00	6.083	20.00	9.167	23.00	12.25	8.00
3.083	10.00	6.167	20.00	9.250	23.00		

Unit Hyd Qpeak (cms)= 3.731

PEAK FLOW (cms)= 4.434 (i)
TIME TO PEAK (hrs)= 8.083
RUNOFF VOLUME (mm)= 96.589
TOTAL RAINFALL (mm)= 193.000
RUNOFF COEFFICIENT = 0.500

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

ADD HYD (0003)				
1 + 2 = 3	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0302):	37.60	1.734	7.92	92.77
+ ID2= 2 (0303):	95.73	4.434	8.08	96.59
ID = 3 (0003):	133.33	6.160	8.00	95.51

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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```
| ADD HYD  (  0005)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
------------------           (ha)     (cms)    (hrs)      (mm)
        ID1= 1 (  0003):   133.33   6.160     8.00     95.51
      + ID2= 2 (  0301):     1.62   0.090     7.25     79.05
        ==================================================
        ID = 3 (  0005):   134.95   6.211     8.00     95.31

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
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 FINISH
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Appendix C

HEC-RAS Results

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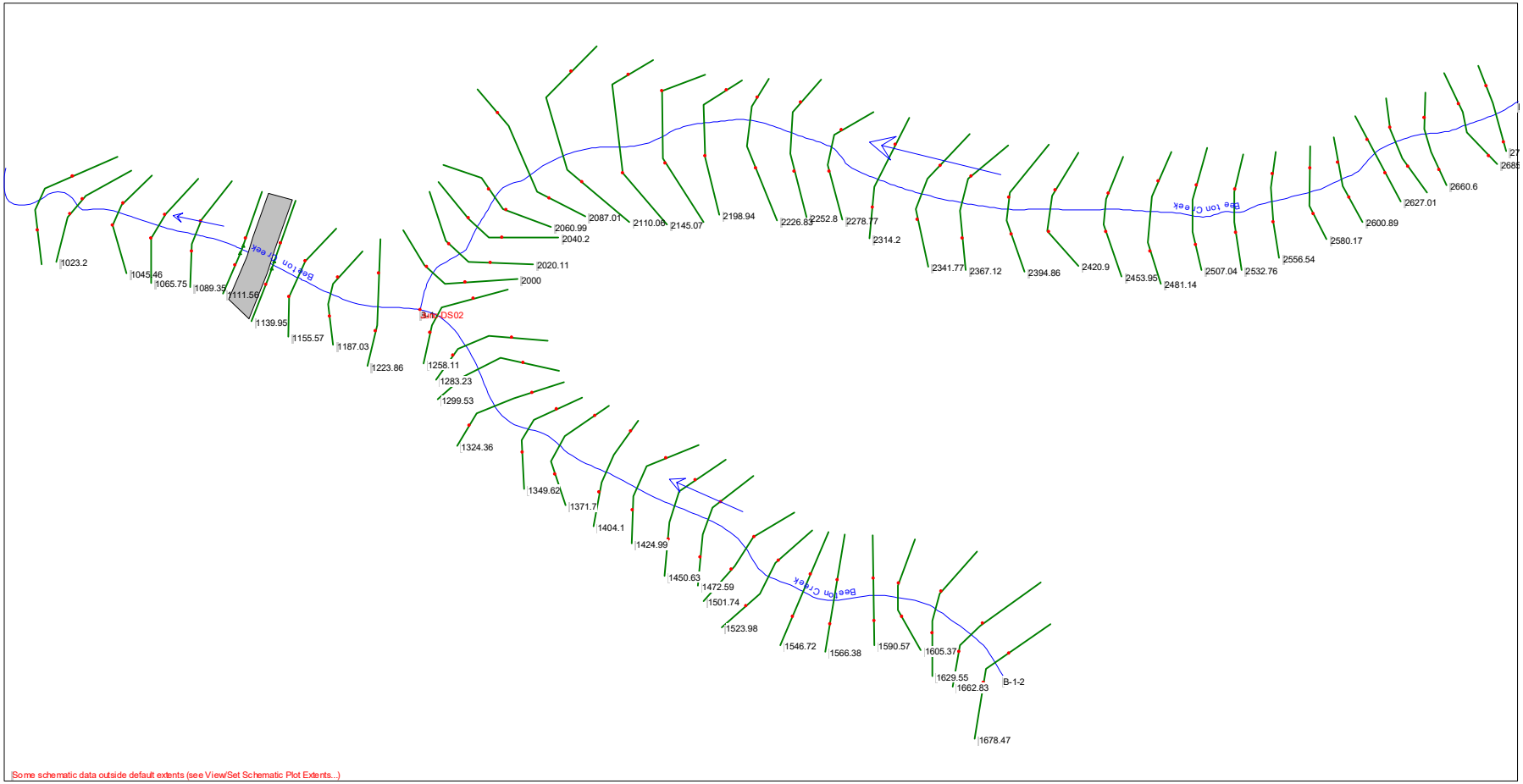
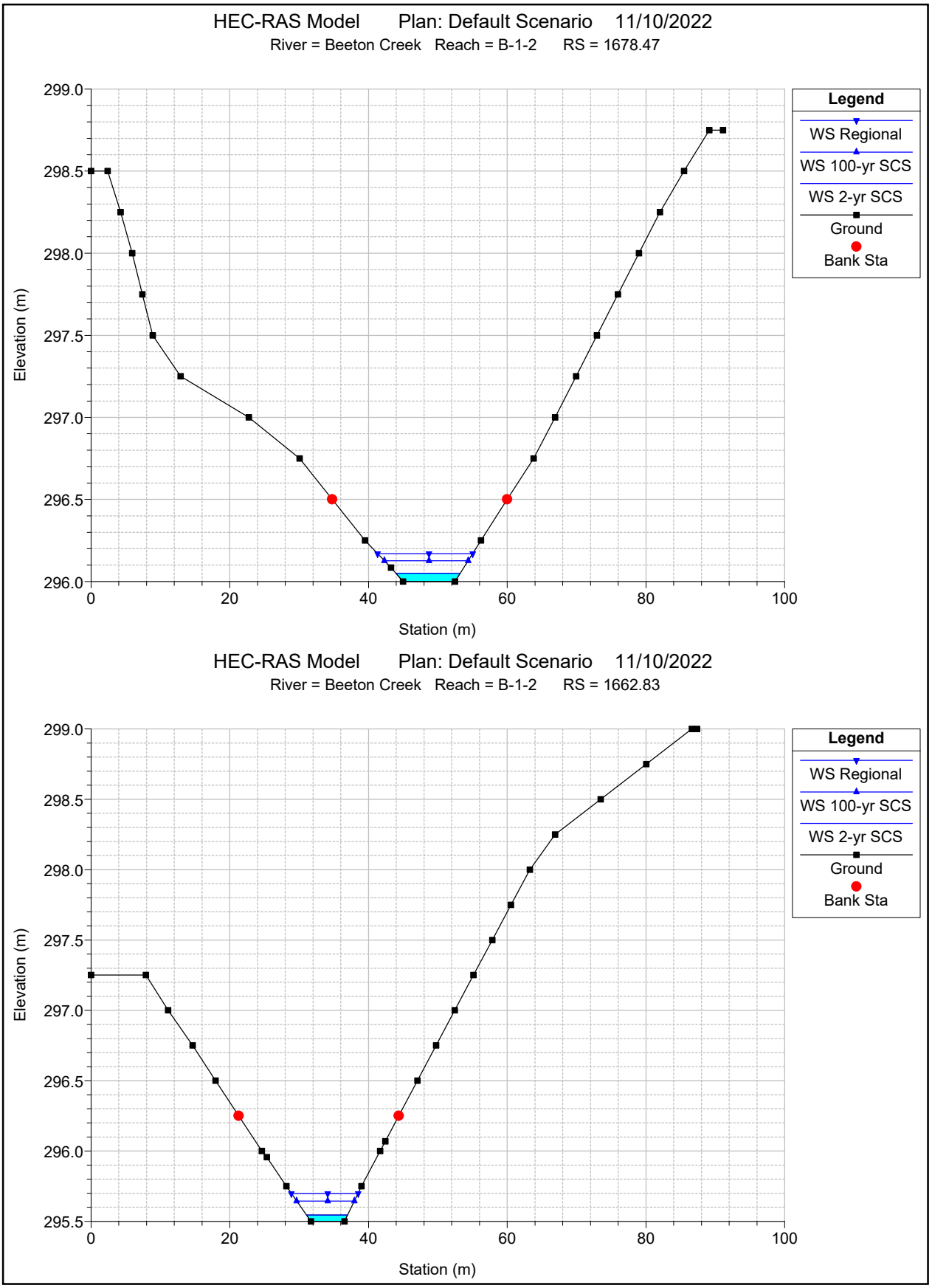
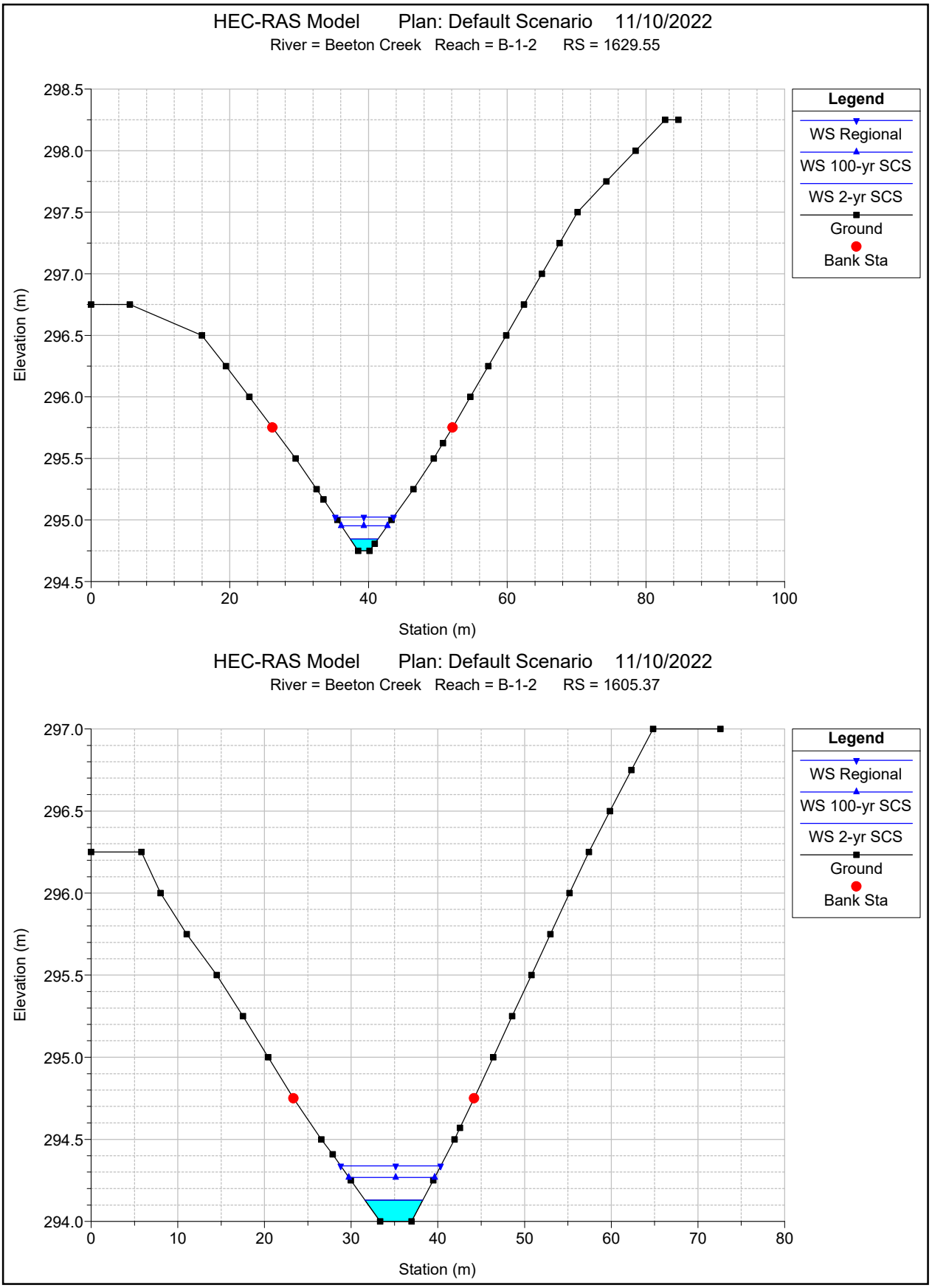
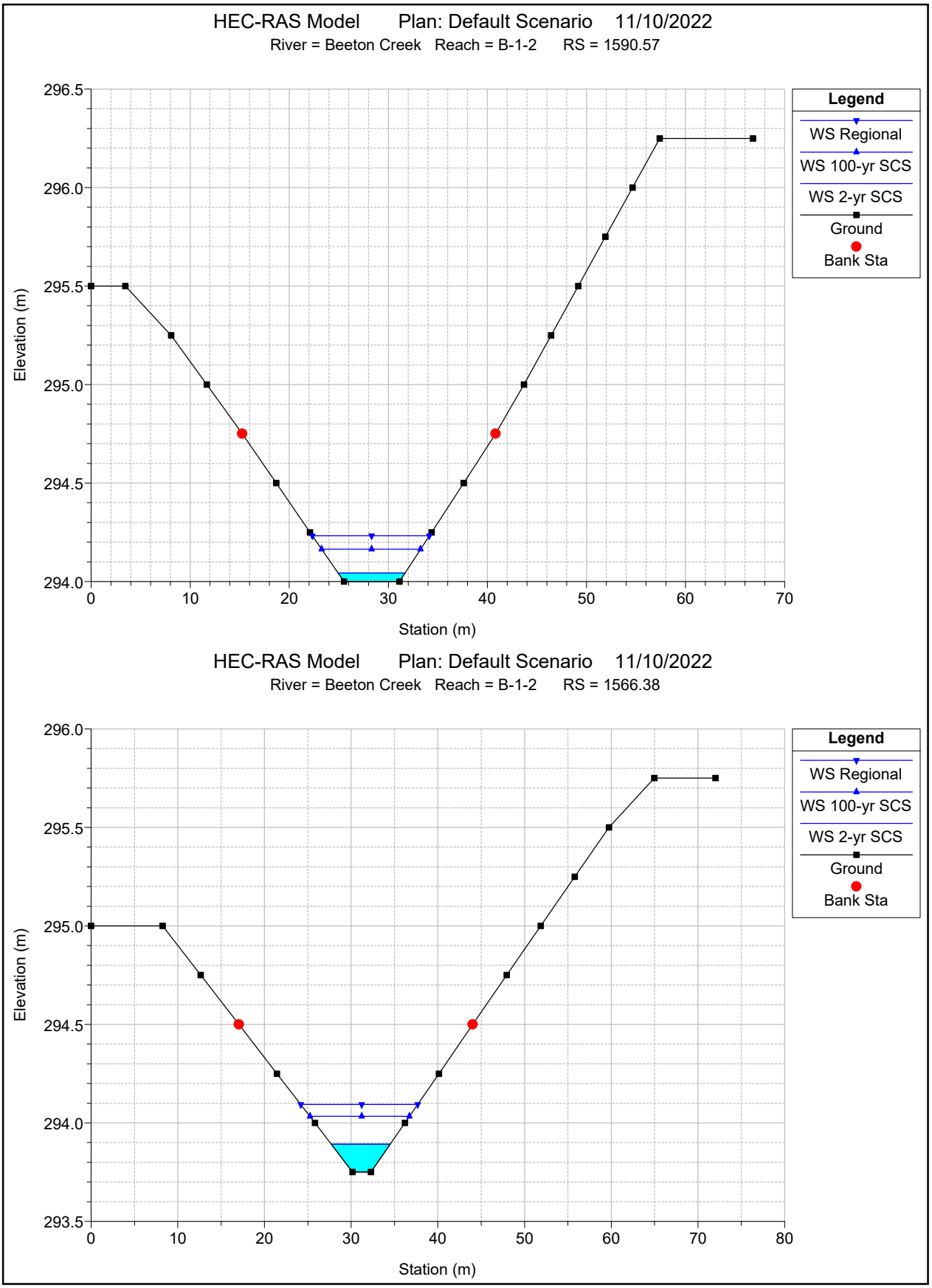
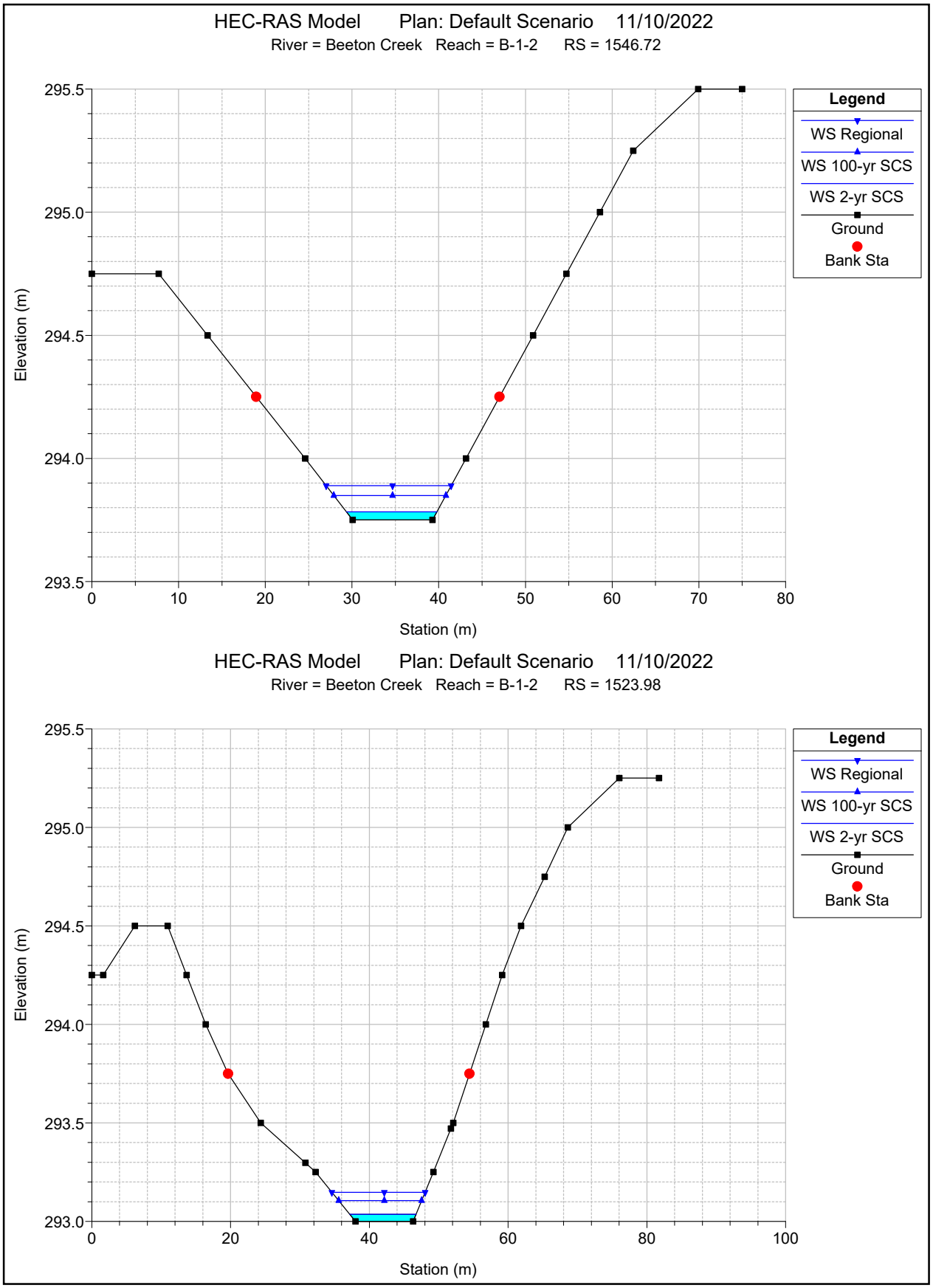
Existing Conditions Schematic – Beeton Creek **November 2022**

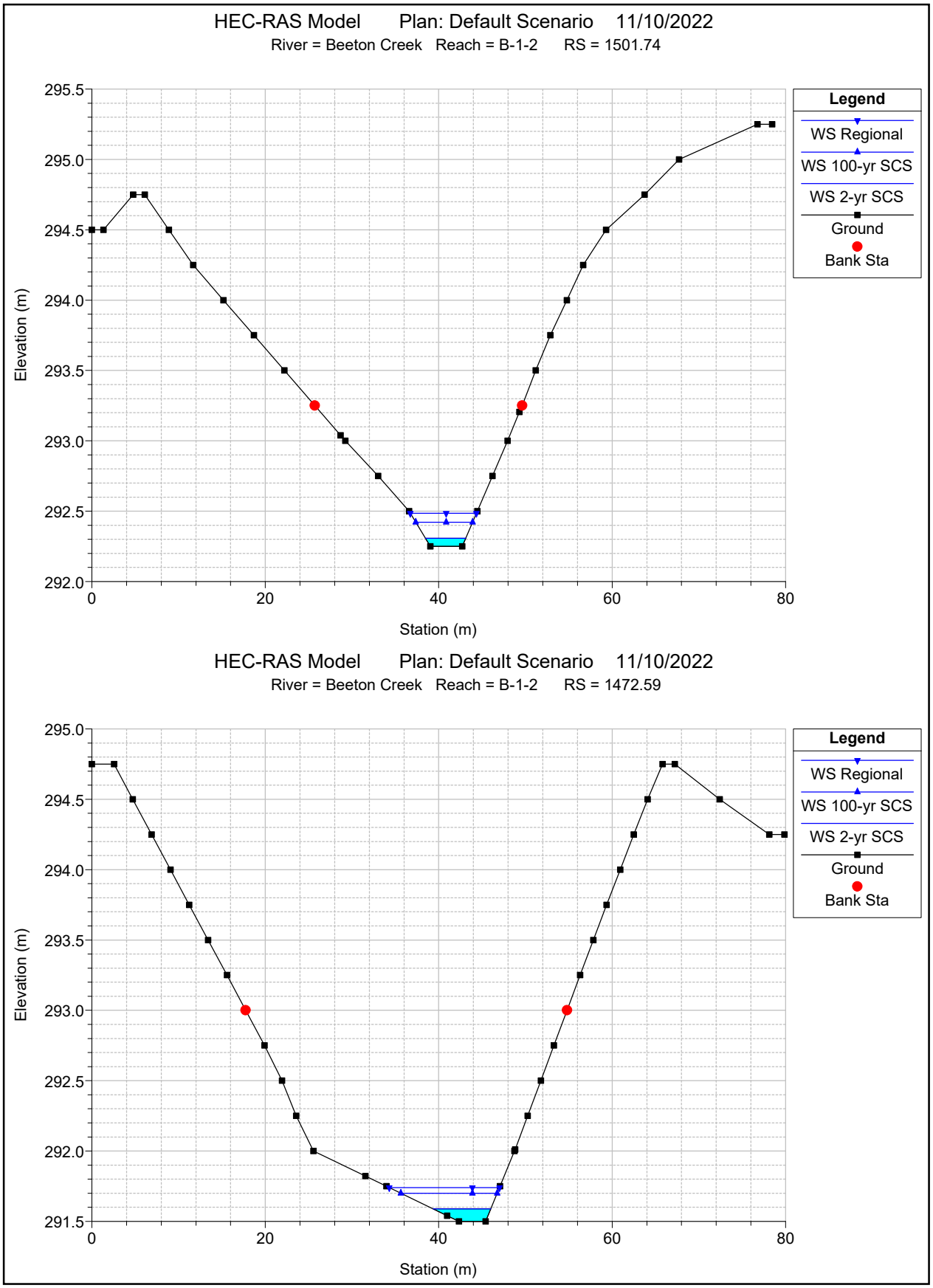


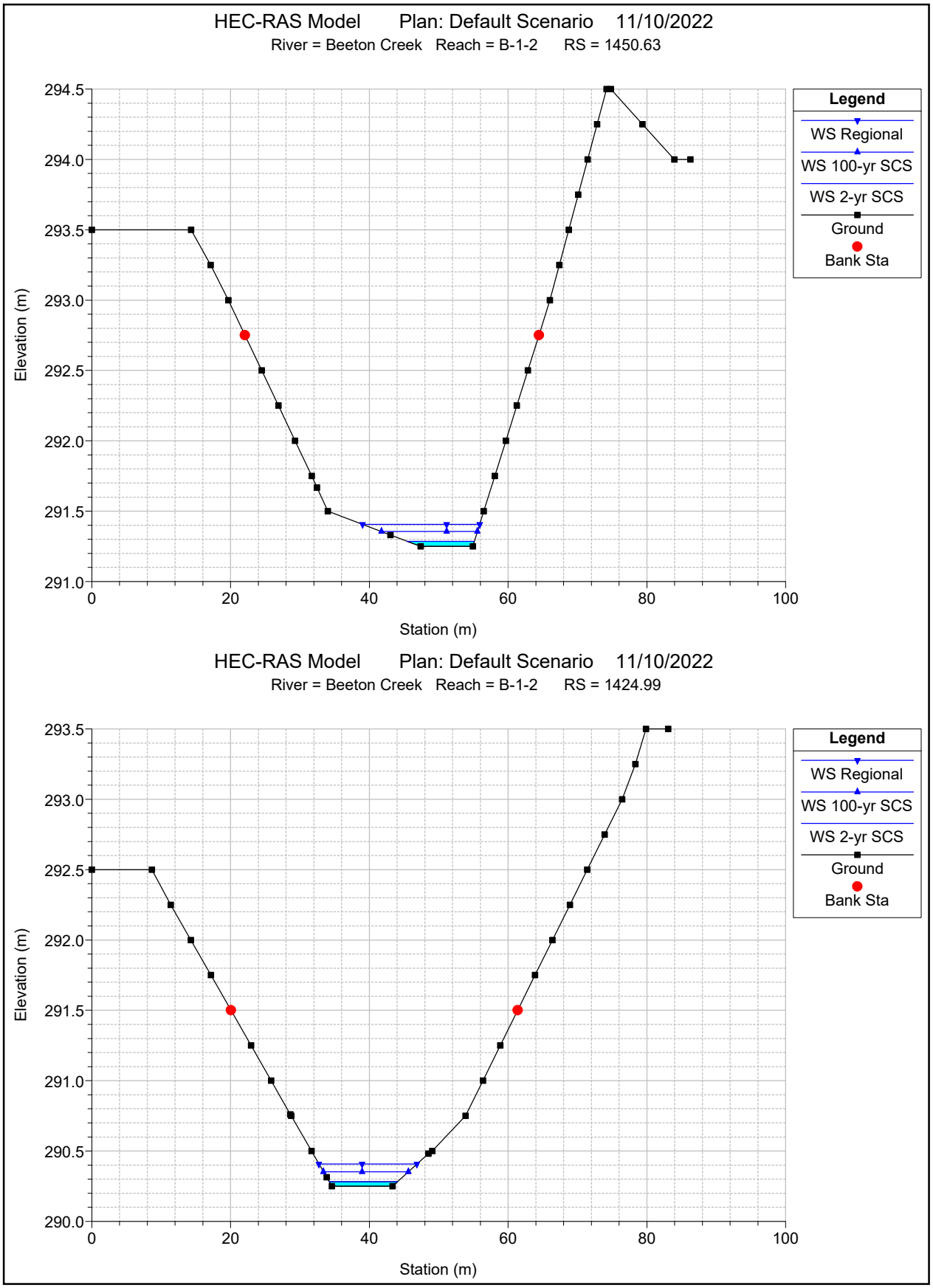

HEC-RAS Model Plan: Default Scenario 11/10/2022
River = Beeton Creek Reach = B-1-2 RS = 1678.47
Legend
WS Regional
WS 100-yr SCS
WS 2-yr SCS
Ground
Bank Sta
Elevation (m)
Station (m)
HEC-RAS Model Plan: Default Scenario 11/10/2022
River = Beeton Creek Reach = B-1-2 RS = 1662.83
Legend
WS Regional
WS 100-yr SCS
WS 2-yr SCS
Ground
Bank Sta
Elevation (m)
Station (m)

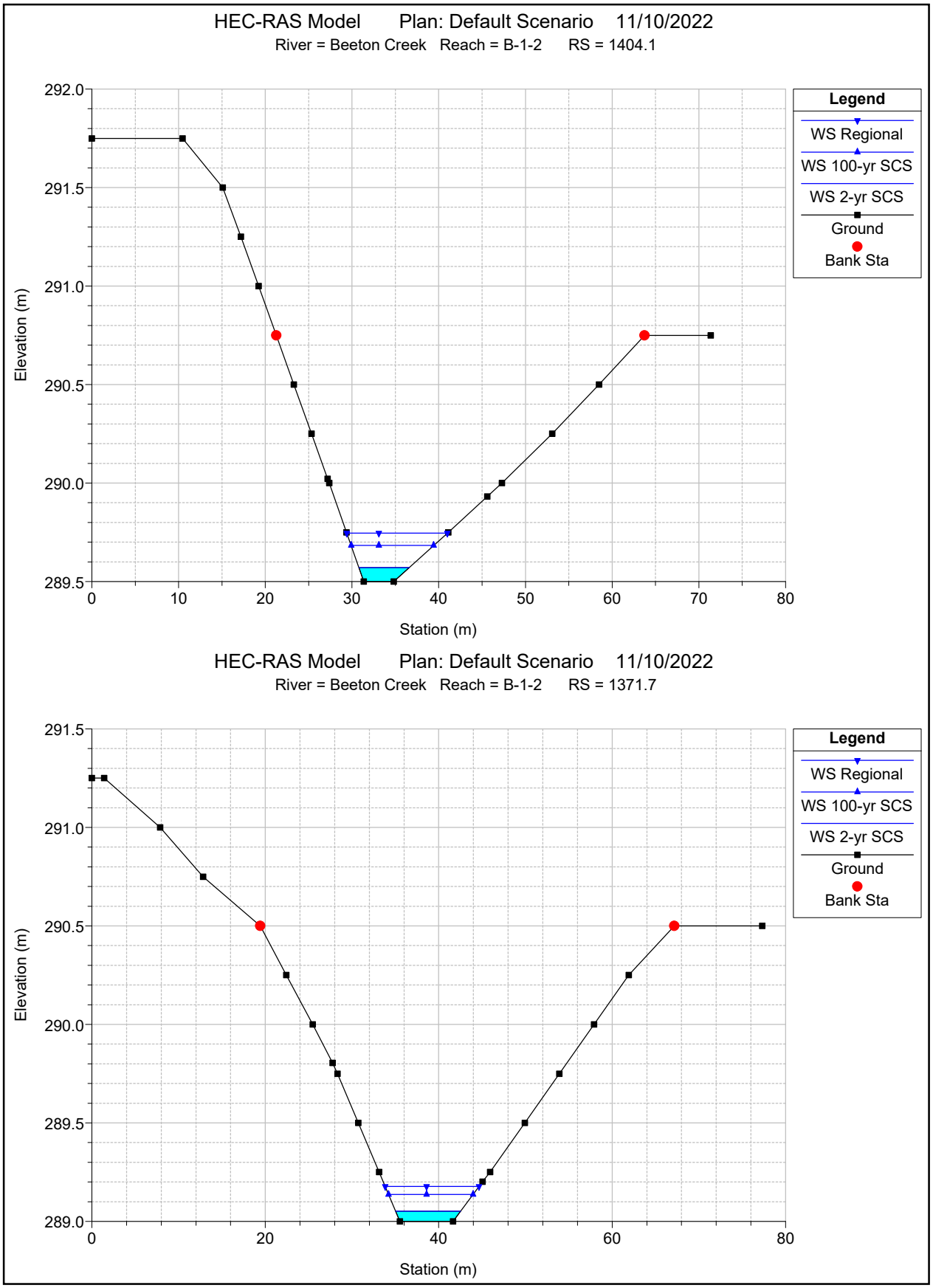

HEC-RAS Model Plan: Default Scenario 11/10/2022
River = Beeton Creek Reach = B-1-2 RS = 1629.55
Elevation (m)
Station (m)
Legend
WS Regional
WS 100-yr SCS
WS 2-yr SCS
Ground
Bank Sta
HEC-RAS Model Plan: Default Scenario 11/10/2022
River = Beeton Creek Reach = B-1-2 RS = 1605.37
Elevation (m)
Station (m)
Legend
WS Regional
WS 100-yr SCS
WS 2-yr SCS
Ground
Bank Sta

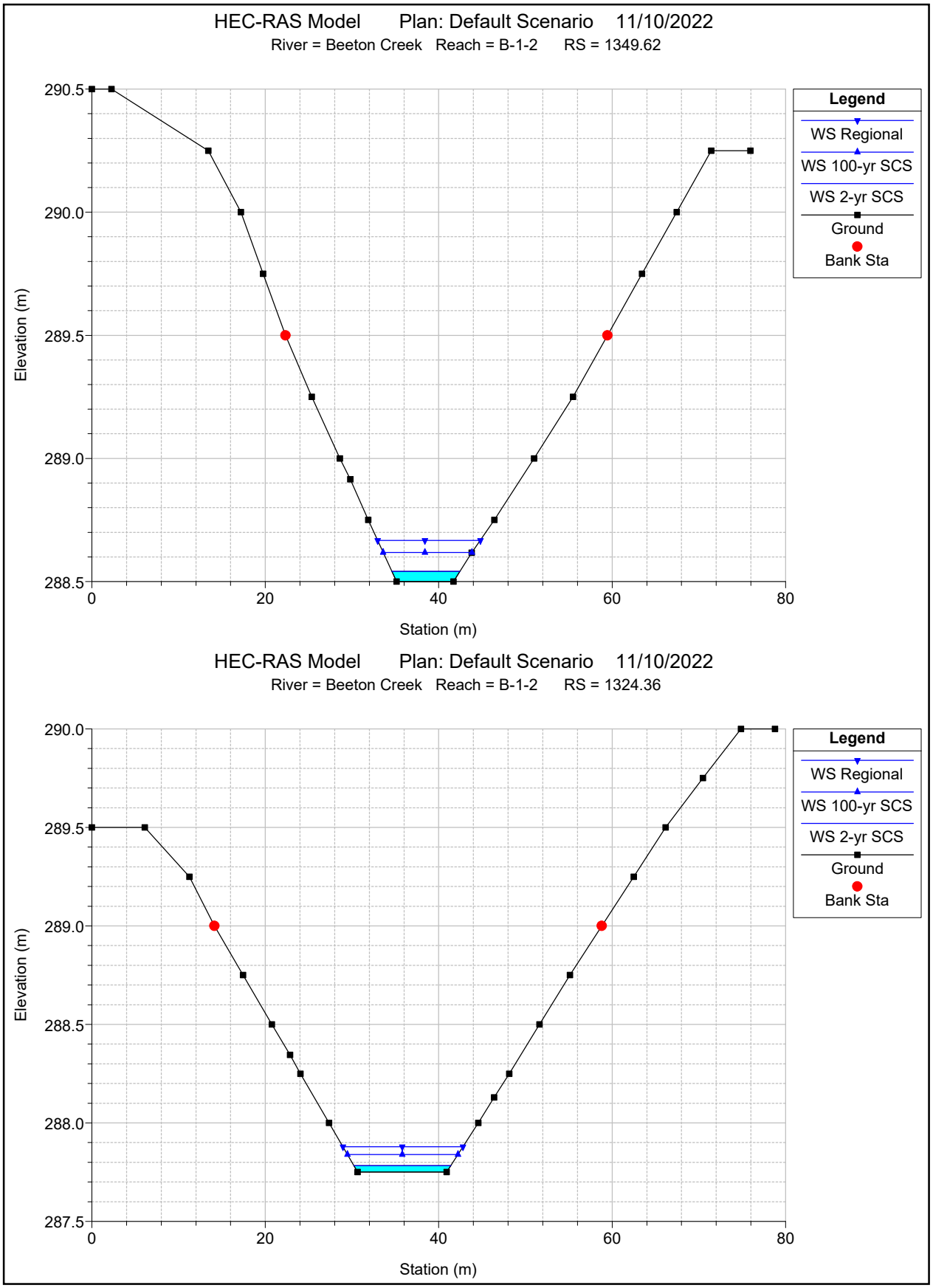

HEC-RAS Model Plan: Default Scenario 11/10/2022
River = Beeton Creek Reach = B-1-2 RS = 1590.57
Legend
WS Regional
WS 100-yr SCS
WS 2-yr SCS
Ground
Bank Sta
Elevation (m)
Station (m)
HEC-RAS Model Plan: Default Scenario 11/10/2022
River = Beeton Creek Reach = B-1-2 RS = 1566.38
Legend
WS Regional
WS 100-yr SCS
WS 2-yr SCS
Ground
Bank Sta
Elevation (m)
Station (m)

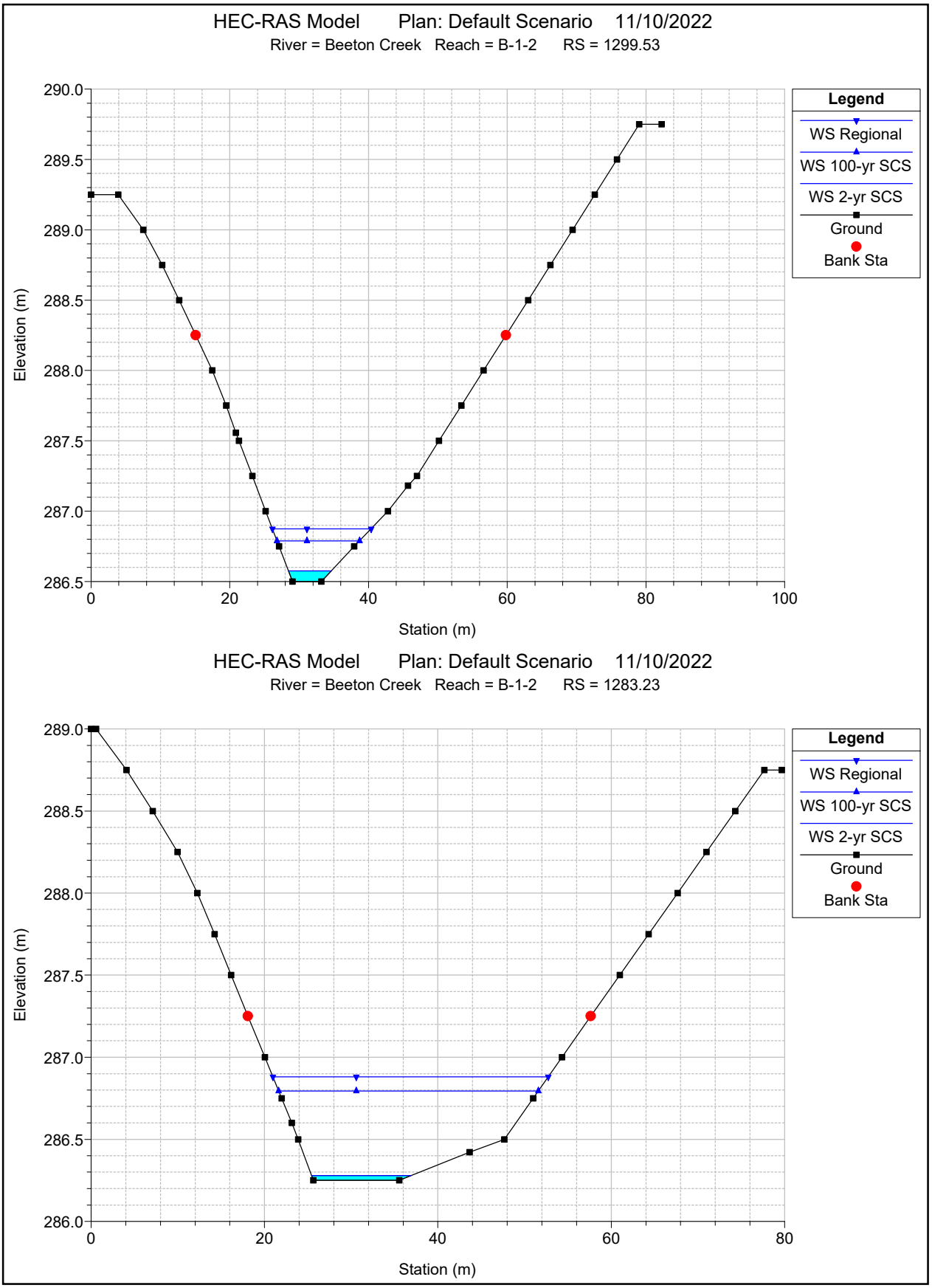

HEC-RAS Model Plan: Default Scenario 11/10/2022
River = Beeton Creek Reach = B-1-2 RS = 1546.72
Legend
WS Regional
WS 100-yr SCS
WS 2-yr SCS
Ground
Bank Sta
Elevation (m)
Station (m)
HEC-RAS Model Plan: Default Scenario 11/10/2022
River = Beeton Creek Reach = B-1-2 RS = 1523.98
Legend
WS Regional
WS 100-yr SCS
WS 2-yr SCS
Ground
Bank Sta
Elevation (m)
Station (m)

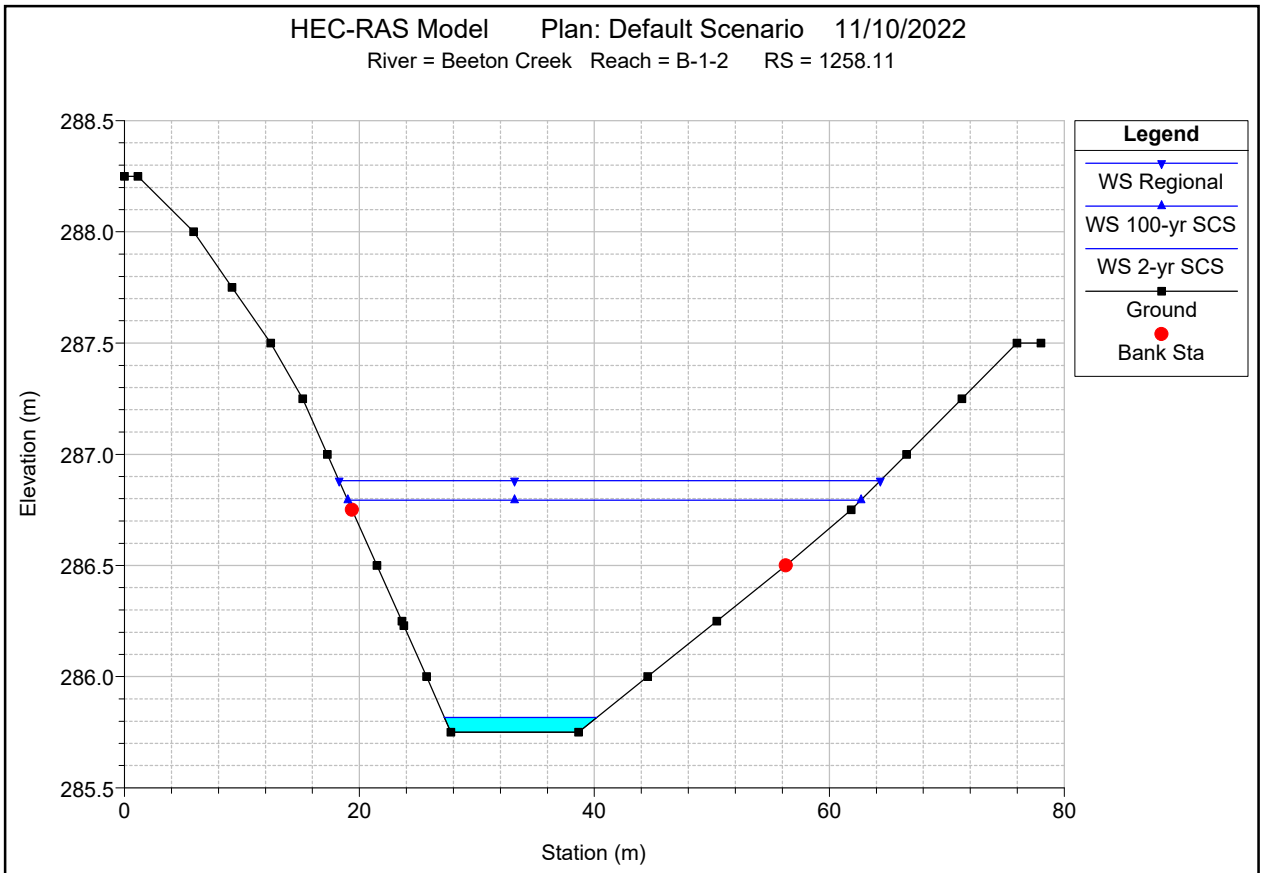

HEC-RAS Model Plan: Default Scenario 11/10/2022
River = Beeton Creek Reach = B-1-2 RS = 1501.74
Elevation (m)
Station (m)
Legend
WS Regional
WS 100-yr SCS
WS 2-yr SCS
Ground
Bank Sta
HEC-RAS Model Plan: Default Scenario 11/10/2022
River = Beeton Creek Reach = B-1-2 RS = 1472.59
Elevation (m)
Station (m)
Legend
WS Regional
WS 100-yr SCS
WS 2-yr SCS
Ground
Bank Sta


HEC-RAS Model Plan: Default Scenario 11/10/2022
River = Beeton Creek Reach = B-1-2 RS = 1450.63
Elevation (m)
294.5
294.0
293.5
293.0
292.5
292.0
291.5
291.0
0
20
40
60
80
100
Station (m)
Legend
WS Regional
WS 100-yr SCS
WS 2-yr SCS
Ground
Bank Sta
HEC-RAS Model Plan: Default Scenario 11/10/2022
River = Beeton Creek Reach = B-1-2 RS = 1424.99
Elevation (m)
293.5
293.0
292.5
292.0
291.5
291.0
290.5
290.0
0
20
40
60
80
100
Station (m)
Legend
WS Regional
WS 100-yr SCS
WS 2-yr SCS
Ground
Bank Sta


HEC-RAS Model Plan: Default Scenario 11/10/2022
River = Beeton Creek Reach = B-1-2 RS = 1404.1
Legend
WS Regional
WS 100-yr SCS
WS 2-yr SCS
Ground
Bank Sta
Elevation (m)
Station (m)
292.0
291.5
291.0
290.5
290.0
289.5
0
10
20
30
40
50
60
70
80
HEC-RAS Model Plan: Default Scenario 11/10/2022
River = Beeton Creek Reach = B-1-2 RS = 1371.7
Legend
WS Regional
WS 100-yr SCS
WS 2-yr SCS
Ground
Bank Sta
Elevation (m)
Station (m)
291.5
291.0
290.5
290.0
289.5
289.0
0
20
40
60
80


HEC-RAS Model Plan: Default Scenario 11/10/2022
River = Beeton Creek Reach = B-1-2 RS = 1349.62
Elevation (m)
290.5
290.0
289.5
289.0
288.5
0
20
40
60
80
Station (m)
Legend
WS Regional
WS 100-yr SCS
WS 2-yr SCS
Ground
Bank Sta
HEC-RAS Model Plan: Default Scenario 11/10/2022
River = Beeton Creek Reach = B-1-2 RS = 1324.36
Elevation (m)
290.0
289.5
289.0
288.5
288.0
287.5
0
20
40
60
80
Station (m)
Legend
WS Regional
WS 100-yr SCS
WS 2-yr SCS
Ground
Bank Sta


HEC-RAS Model Plan: Default Scenario 11/10/2022
River = Beeton Creek Reach = B-1-2 RS = 1299.53
Elevation (m)
290.0
289.5
289.0
288.5
288.0
287.5
287.0
286.5
0
20
40
60
80
100
Station (m)
Legend
WS Regional
WS 100-yr SCS
WS 2-yr SCS
Ground
Bank Sta
HEC-RAS Model Plan: Default Scenario 11/10/2022
River = Beeton Creek Reach = B-1-2 RS = 1283.23
Elevation (m)
289.0
288.5
288.0
287.5
287.0
286.5
286.0
0
20
40
60
80
Station (m)
Legend
WS Regional
WS 100-yr SCS
WS 2-yr SCS
Ground
Bank Sta


HEC-RAS Model Plan: Default Scenario 11/10/2022
River = Beeton Creek Reach = B-1-2 RS = 1258.11
Legend
WS Regional
WS 100-yr SCS
WS 2-yr SCS
Ground
Bank Sta
Elevation (m)
Station (m)
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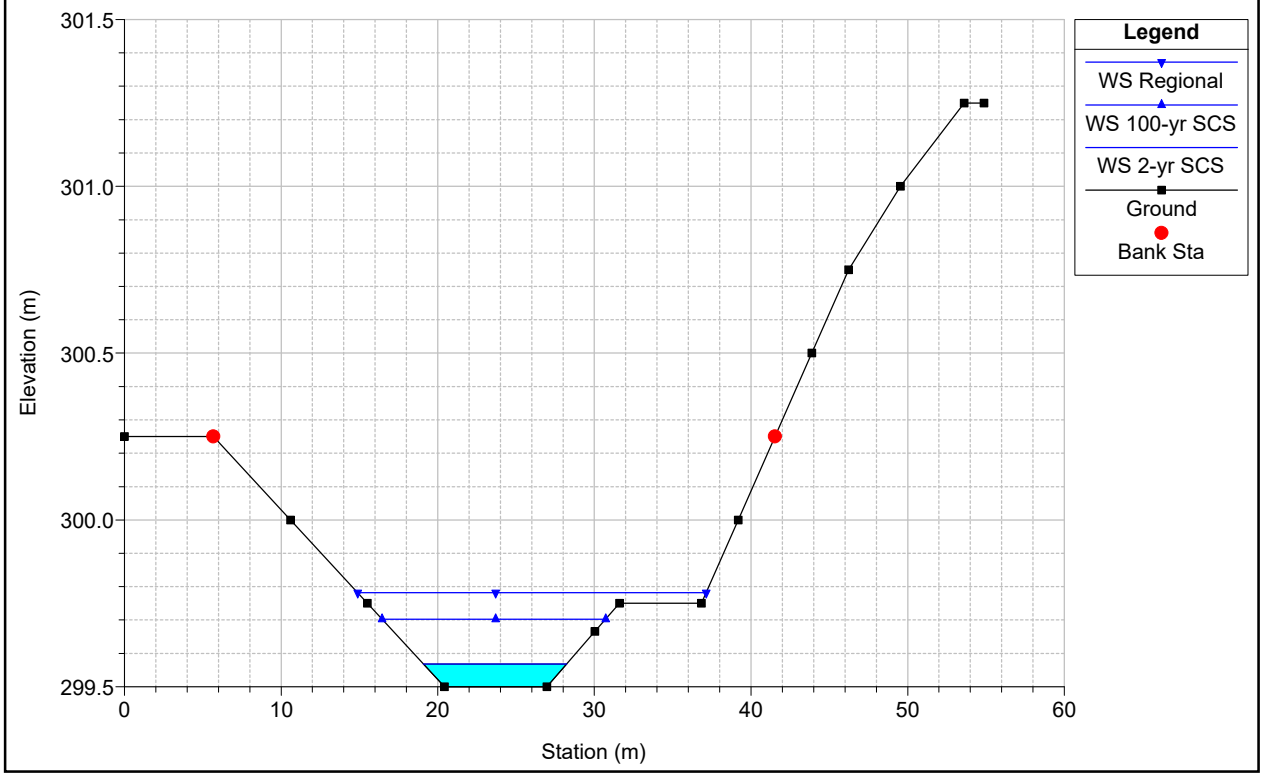
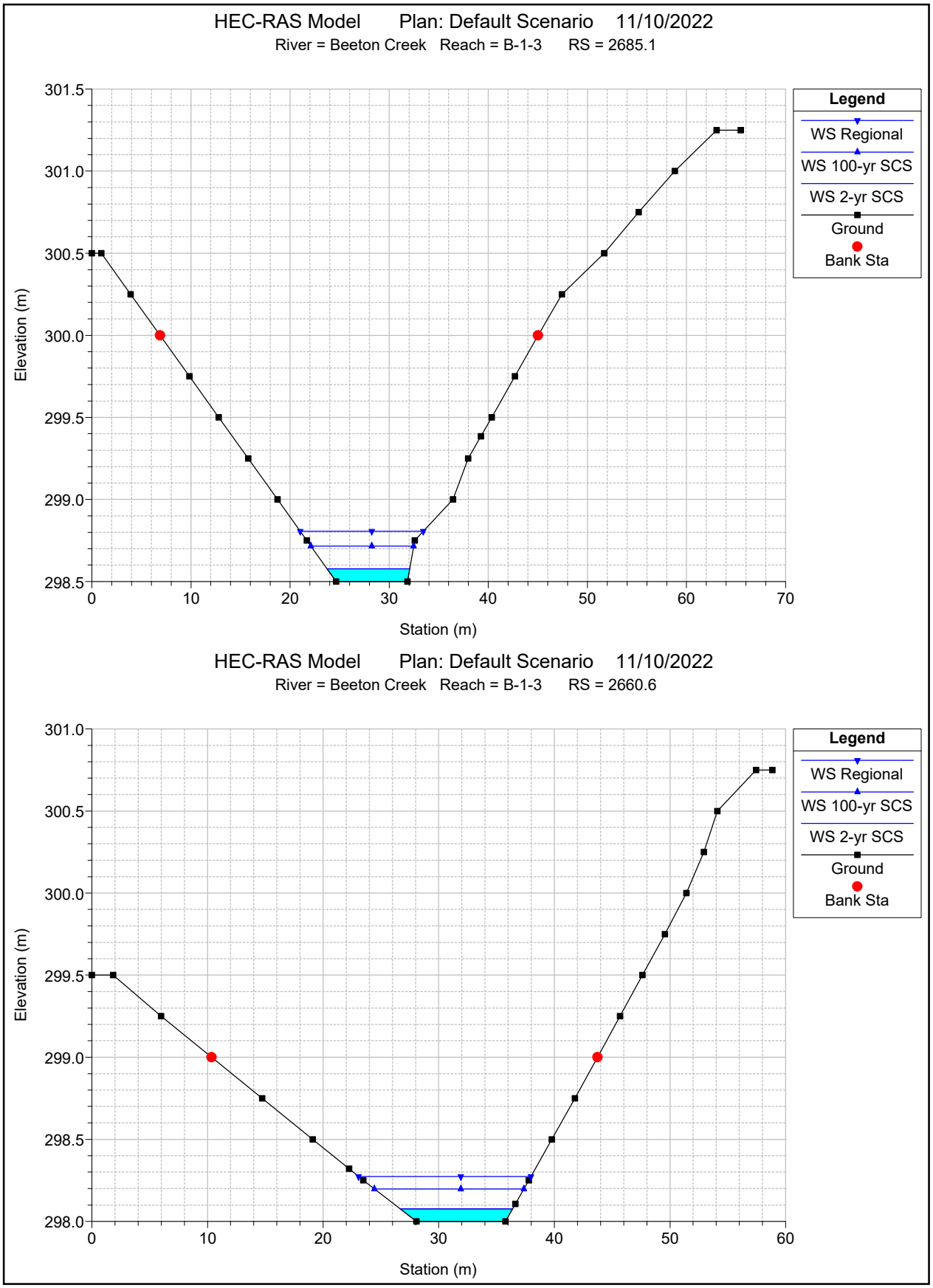
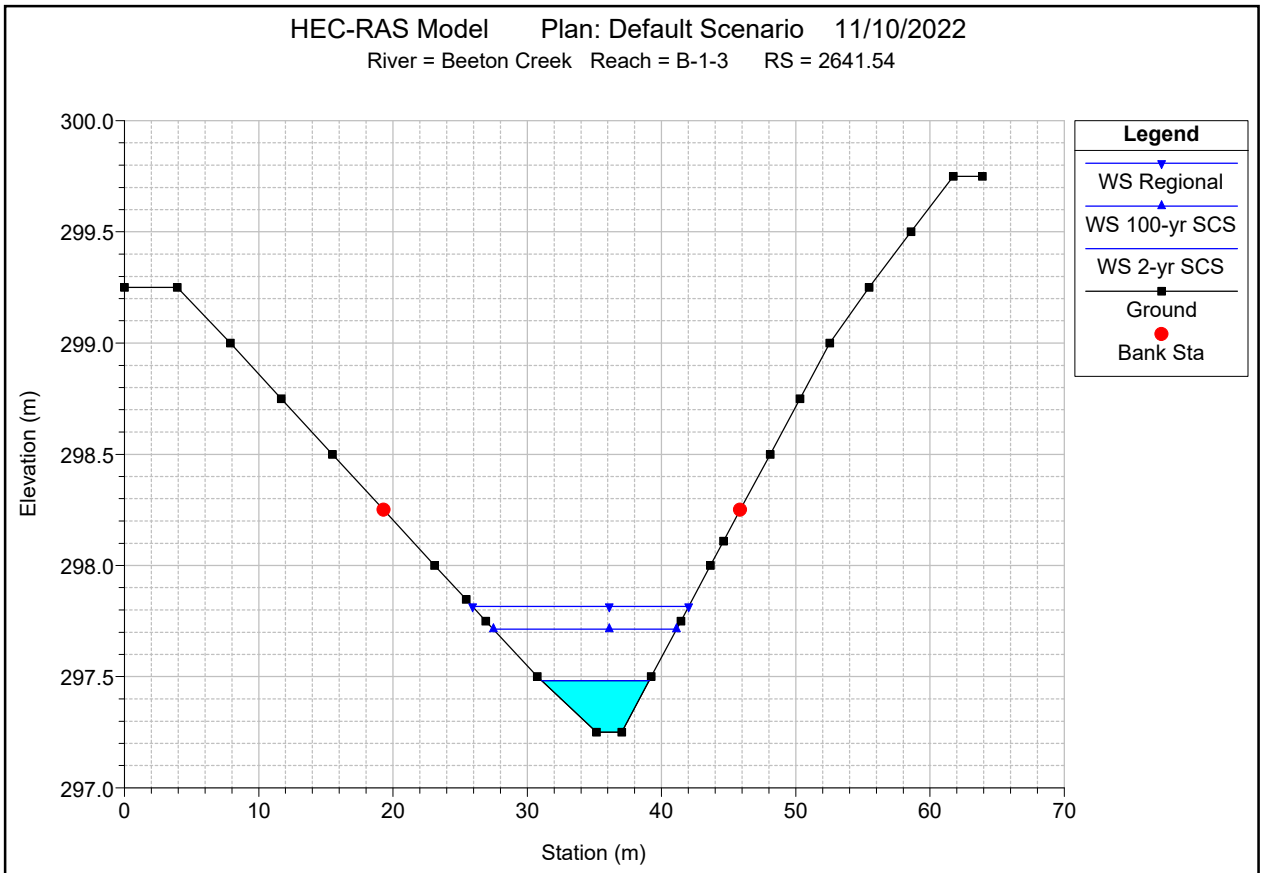
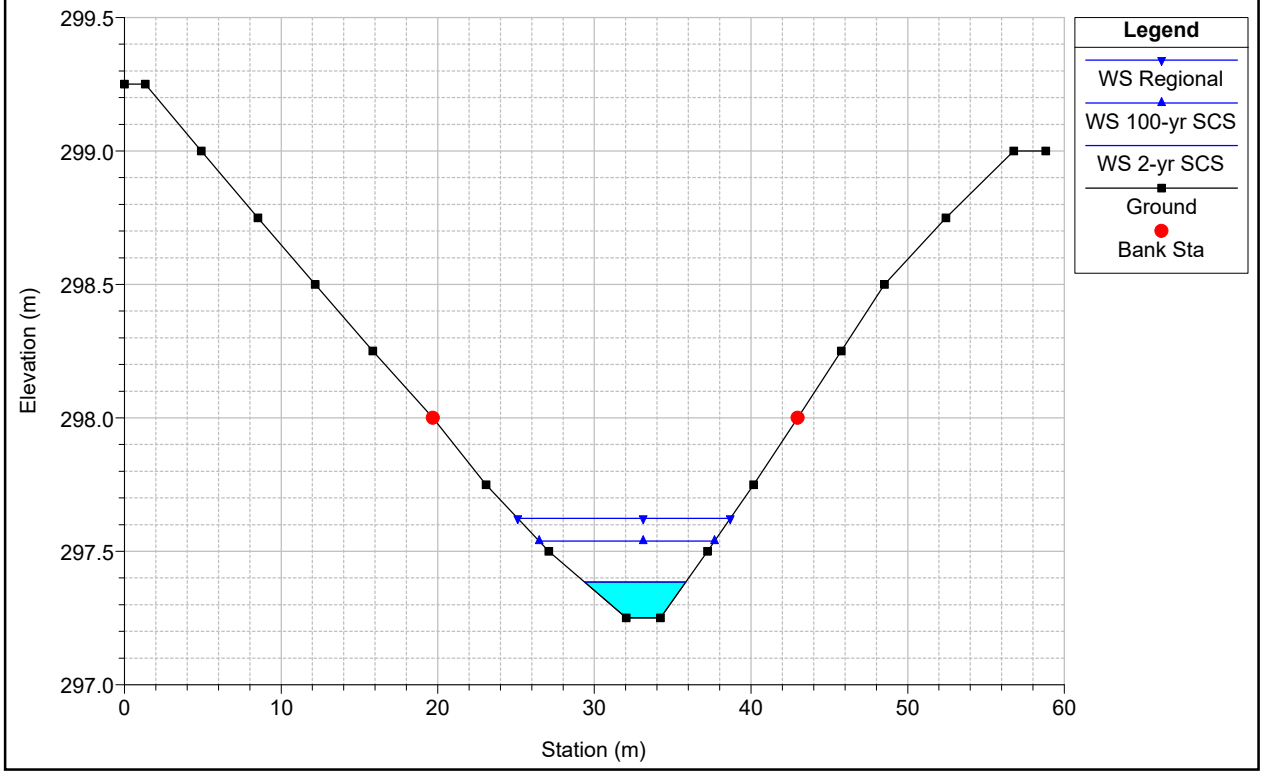
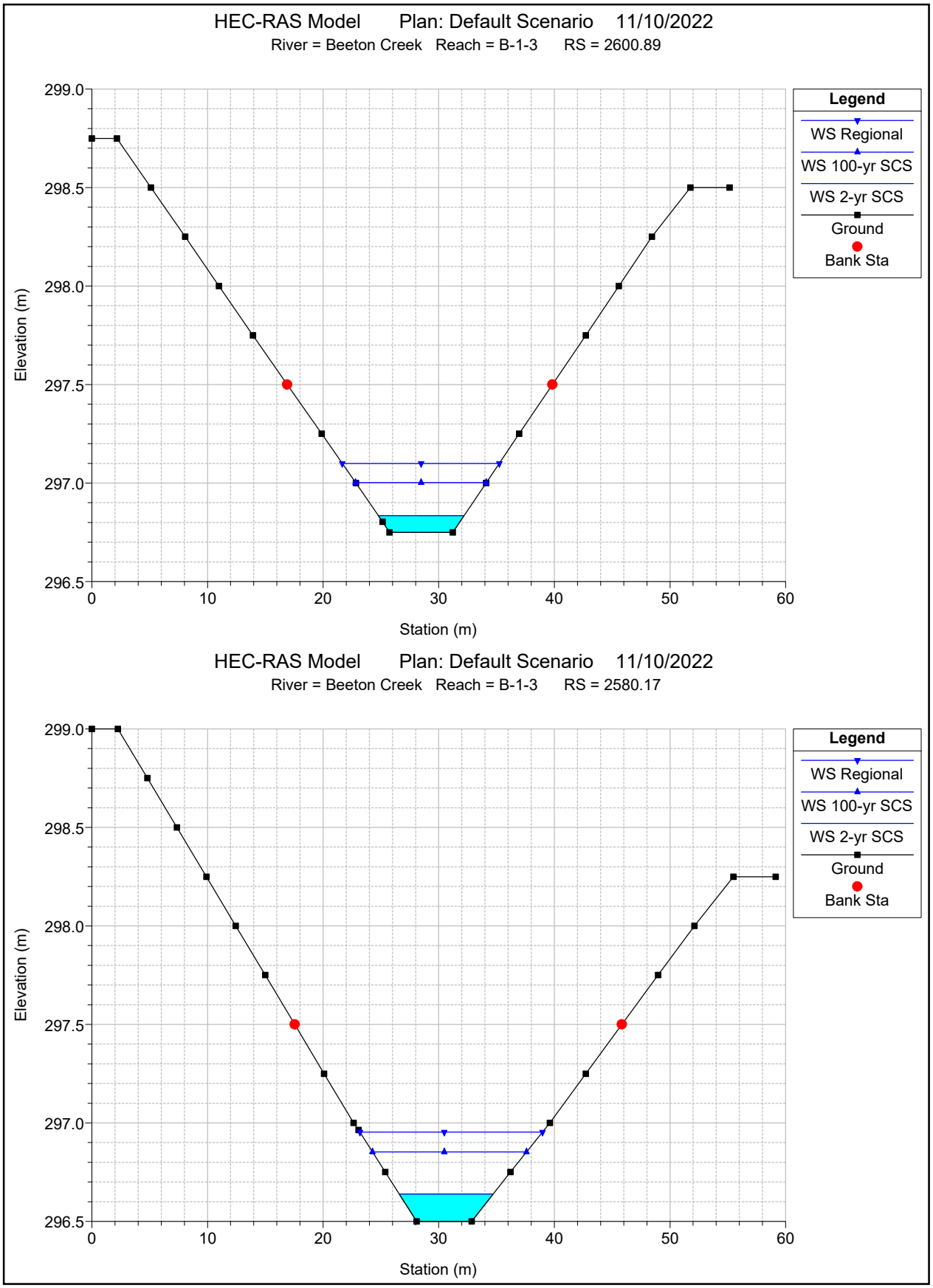
288.0
287.5
287.0
286.5
286.0
285.5
0
20
40
60
80

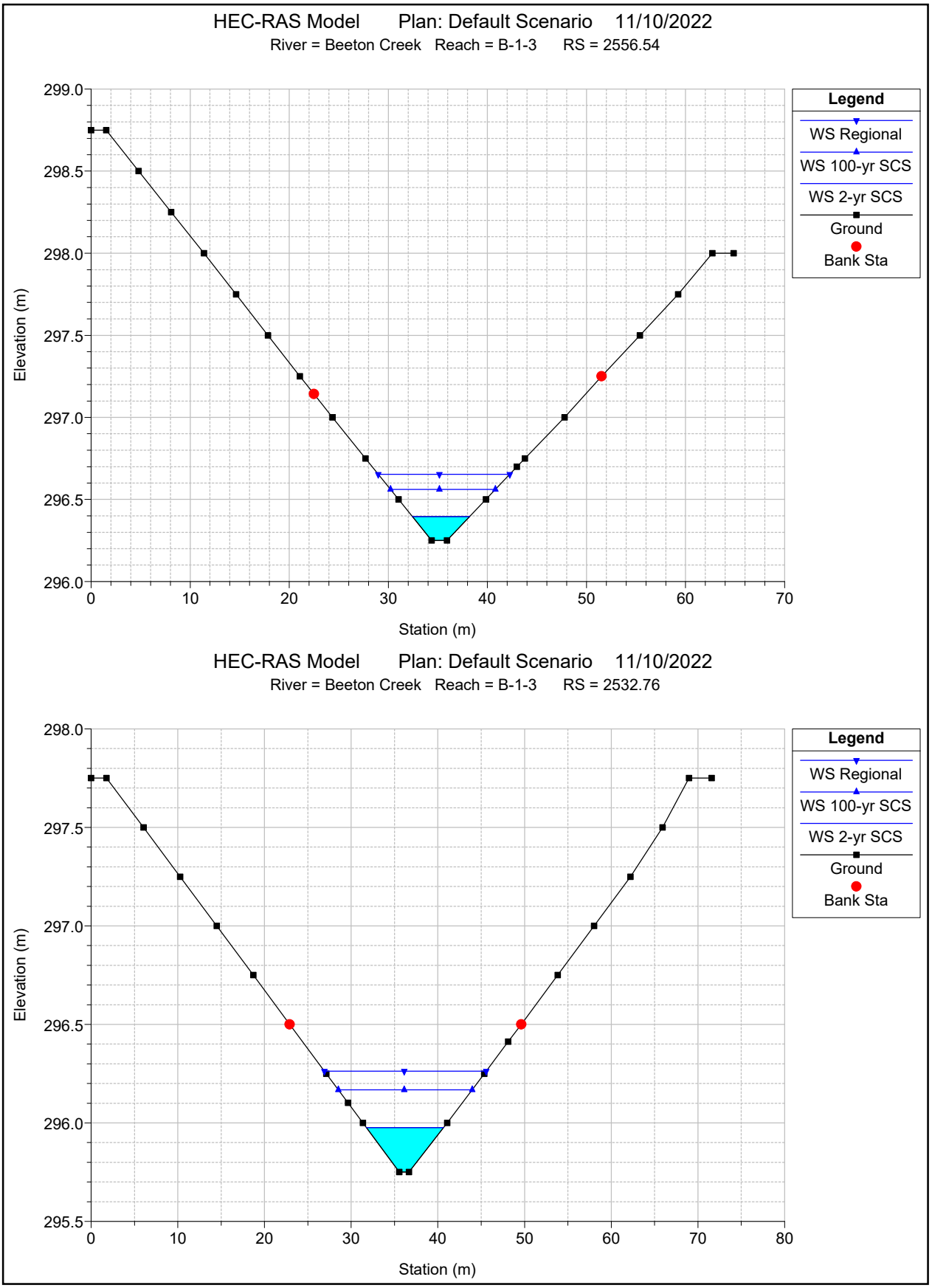

HEC-RAS Model Plan: Default Scenario 11/10/2022
River = Beeton Creek Reach = B-1-3 RS = 2705.05
Legend
WS Regional
WS 100-yr SCS
WS 2-yr SCS
Ground
Bank Sta
Elevation (m)
Station (m)
301.5
301.0
300.5
300.0
299.5
0
10
20
30
40
50
60

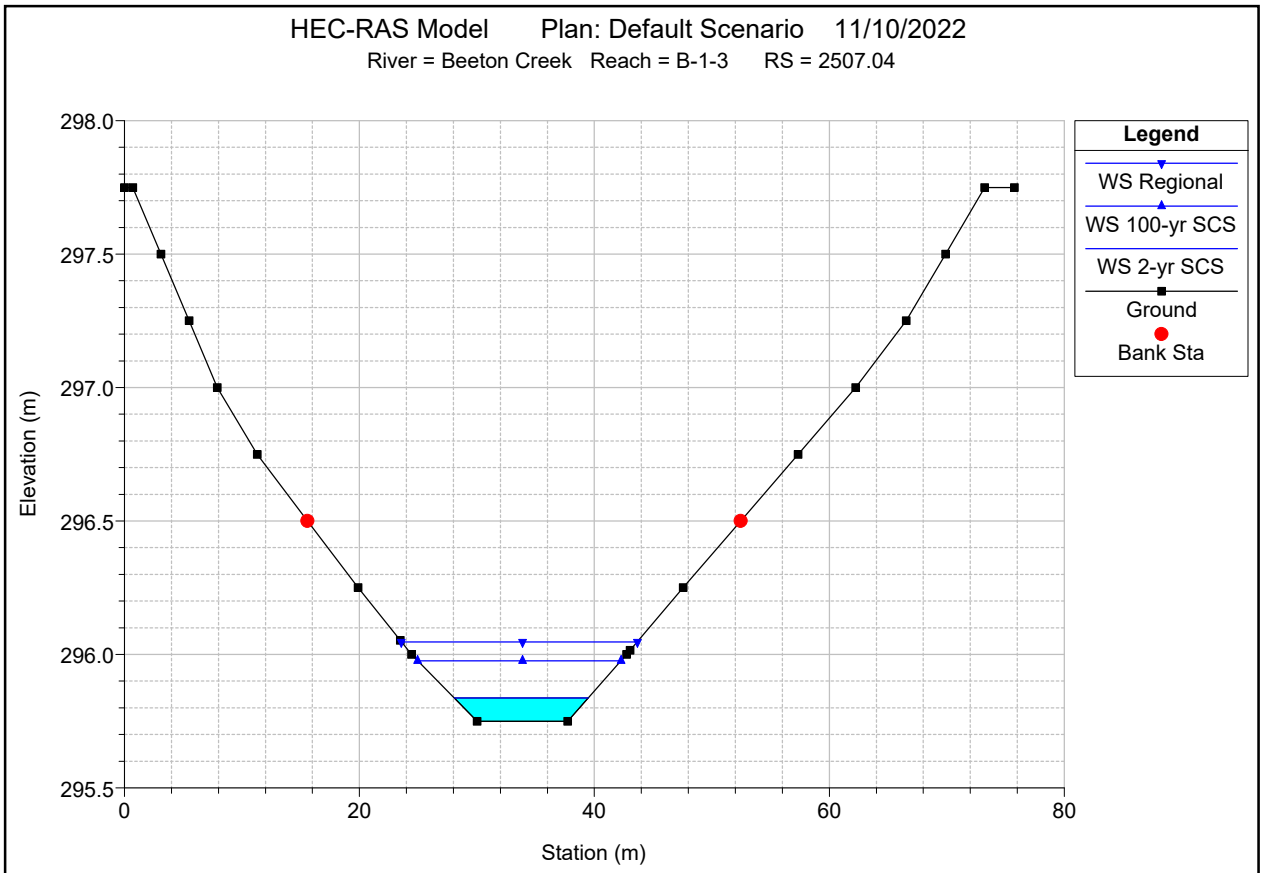

HEC-RAS Model Plan: Default Scenario 11/10/2022
River = Beeton Creek Reach = B-1-3 RS = 2685.1
Legend
WS Regional
WS 100-yr SCS
WS 2-yr SCS
Ground
Bank Sta
Elevation (m)
Station (m)
HEC-RAS Model Plan: Default Scenario 11/10/2022
River = Beeton Creek Reach = B-1-3 RS = 2660.6
Legend
WS Regional
WS 100-yr SCS
WS 2-yr SCS
Ground
Bank Sta
Elevation (m)
Station (m)

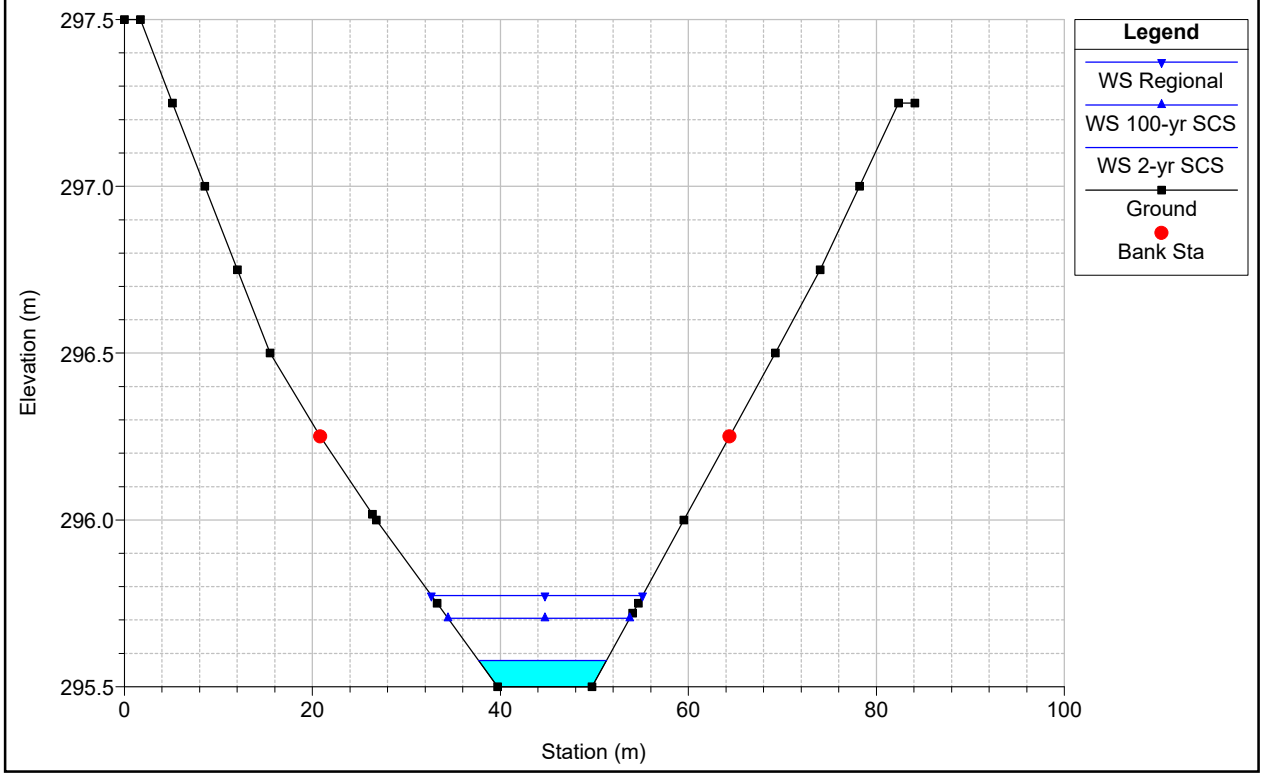

HEC-RAS Model Plan: Default Scenario 11/10/2022
River = Beeton Creek Reach = B-1-3 RS = 2641.54
Legend
WS Regional
WS 100-yr SCS
WS 2-yr SCS
Ground
Bank Sta
Elevation (m)
Station (m)
300.0
299.5
299.0
298.5
298.0
297.5
297.0
0
10
20
30
40
50
60
70

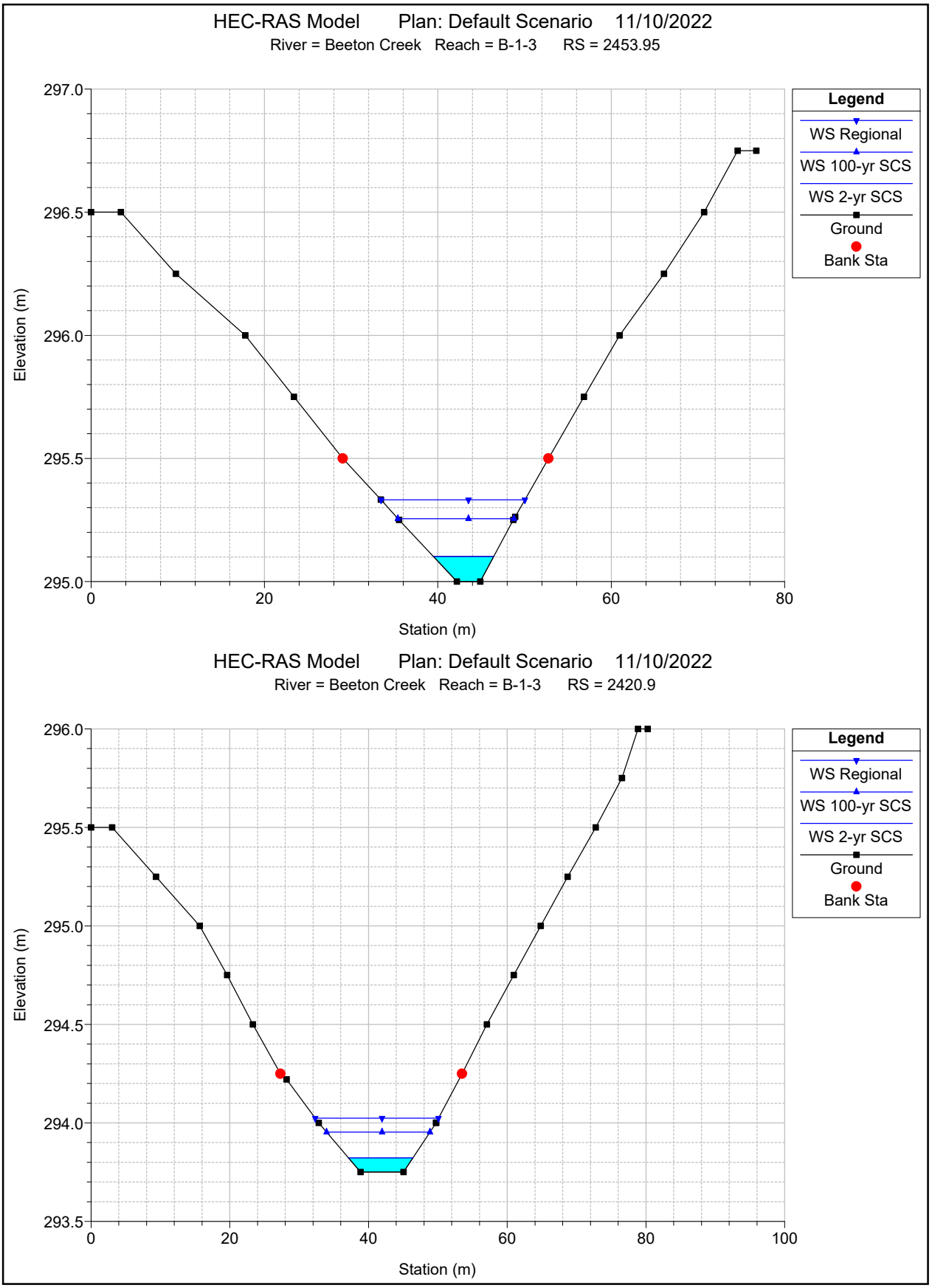

HEC-RAS Model Plan: Default Scenario 11/10/2022
River = Beeton Creek Reach = B-1-3 RS = 2627.01
Legend
WS Regional
WS 100-yr SCS
WS 2-yr SCS
Ground
Bank Sta
Elevation (m)
Station (m)
299.5
299.0
298.5
298.0
297.5
297.0
0
10
20
30
40
50
60

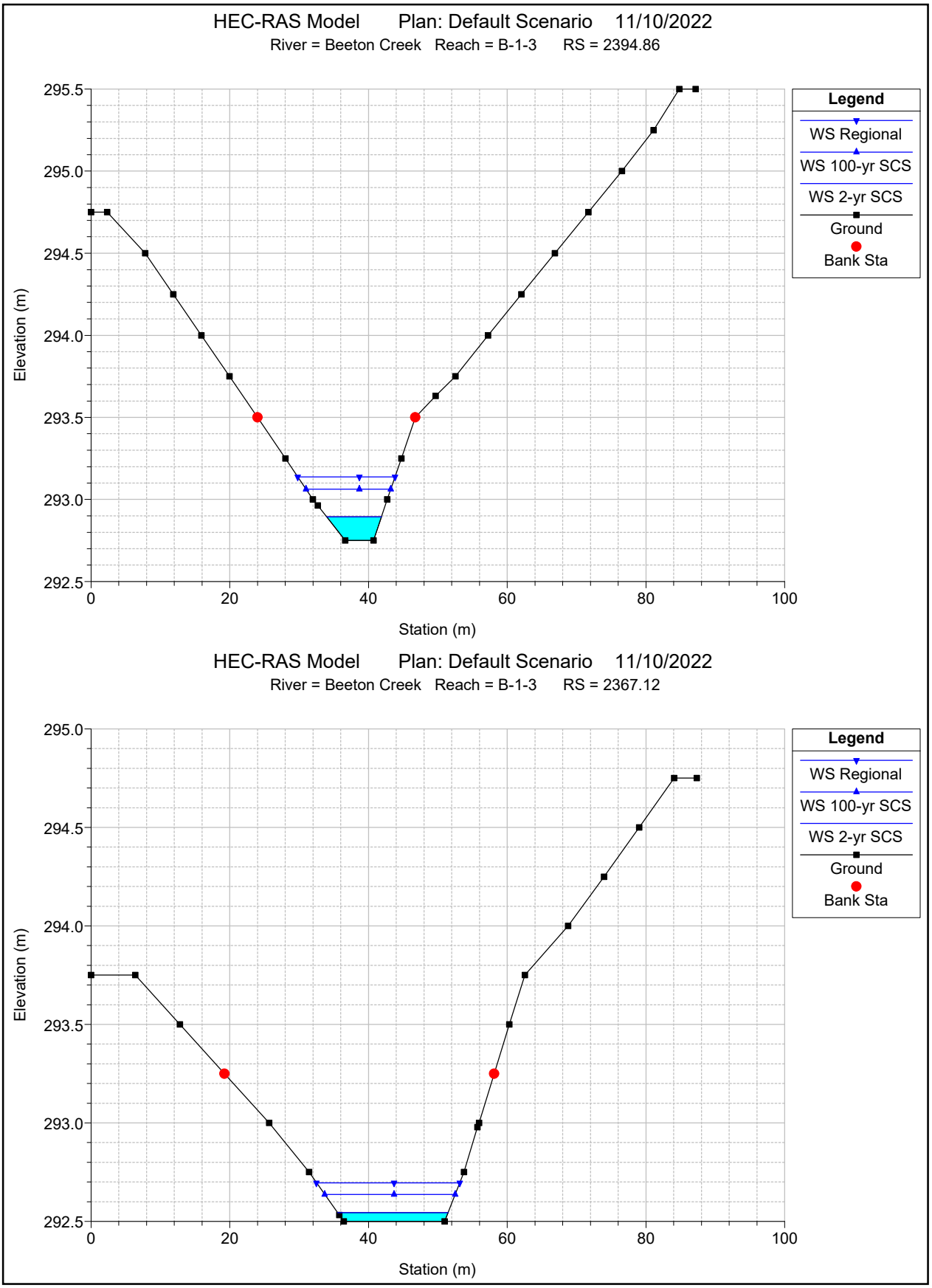

HEC-RAS Model Plan: Default Scenario 11/10/2022
River = Beeton Creek Reach = B-1-3 RS = 2600.89
Legend
WS Regional
WS 100-yr SCS
WS 2-yr SCS
Ground
Bank Sta
Elevation (m)
Station (m)
299.0
298.5
298.0
297.5
297.0
296.5
0
10
20
30
40
50
60
HEC-RAS Model Plan: Default Scenario 11/10/2022
River = Beeton Creek Reach = B-1-3 RS = 2580.17
Legend
WS Regional
WS 100-yr SCS
WS 2-yr SCS
Ground
Bank Sta
Elevation (m)
Station (m)

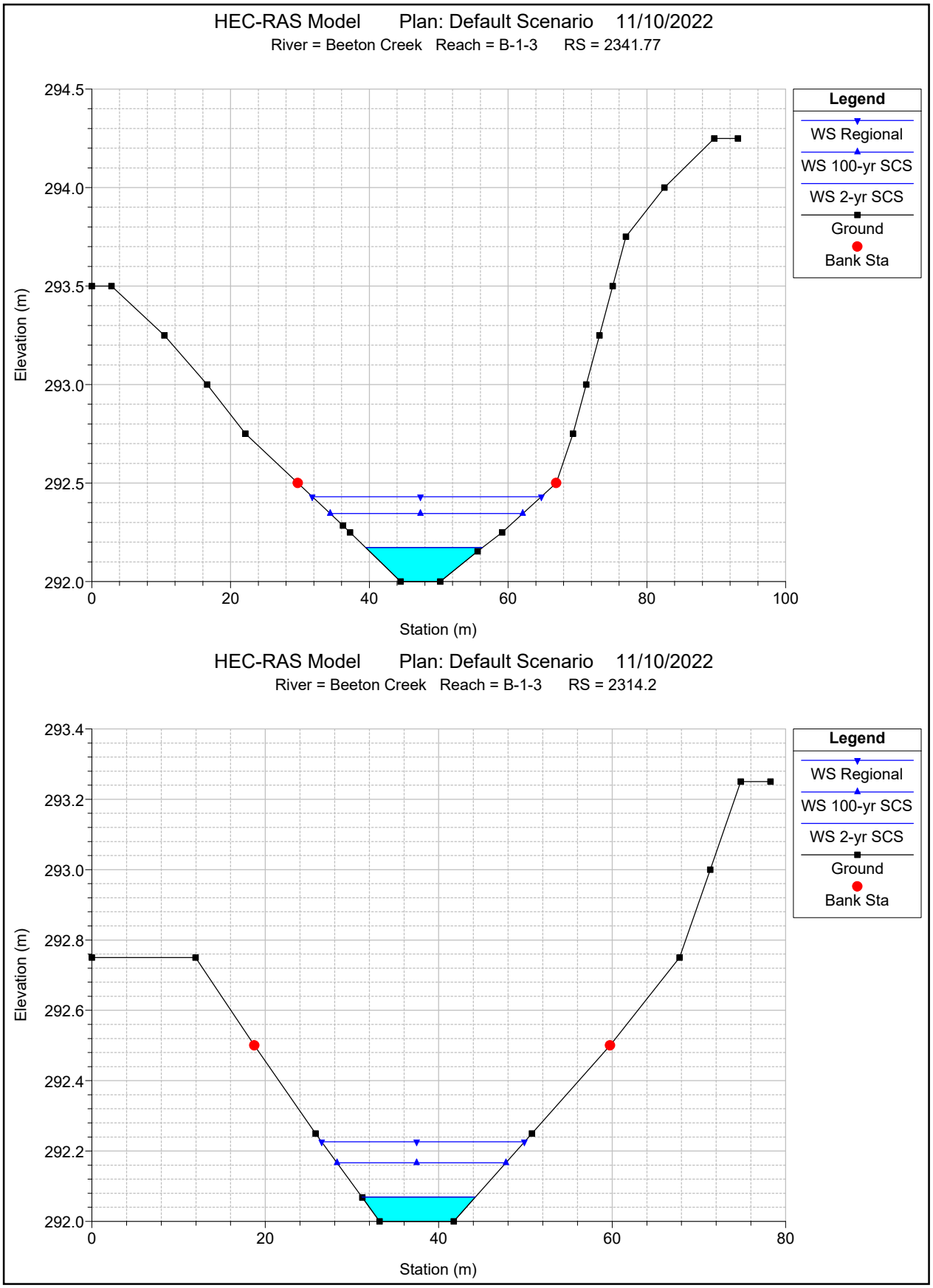

HEC-RAS Model Plan: Default Scenario 11/10/2022
River = Beeton Creek Reach = B-1-3 RS = 2556.54
Legend
WS Regional
WS 100-yr SCS
WS 2-yr SCS
Ground
Bank Sta
Elevation (m)
Station (m)
HEC-RAS Model Plan: Default Scenario 11/10/2022
River = Beeton Creek Reach = B-1-3 RS = 2532.76
Legend
WS Regional
WS 100-yr SCS
WS 2-yr SCS
Ground
Bank Sta
Elevation (m)
Station (m)

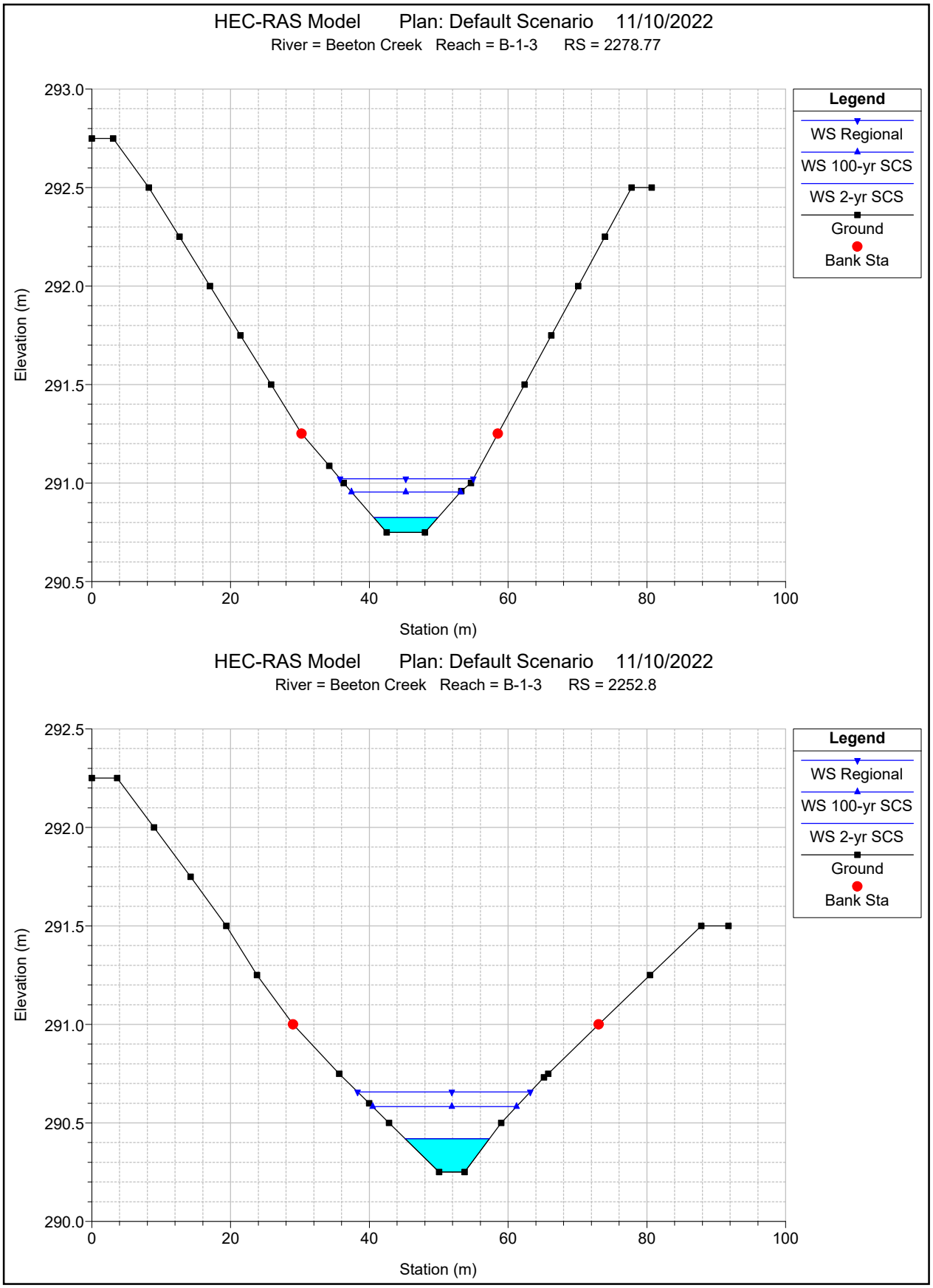

HEC-RAS Model Plan: Default Scenario 11/10/2022
River = Beeton Creek Reach = B-1-3 RS = 2507.04
Legend
WS Regional
WS 100-yr SCS
WS 2-yr SCS
Ground
Bank Sta
Elevation (m)
Station (m)
298.0
297.5
297.0
296.5
296.0
295.5
0
20
40
60
80

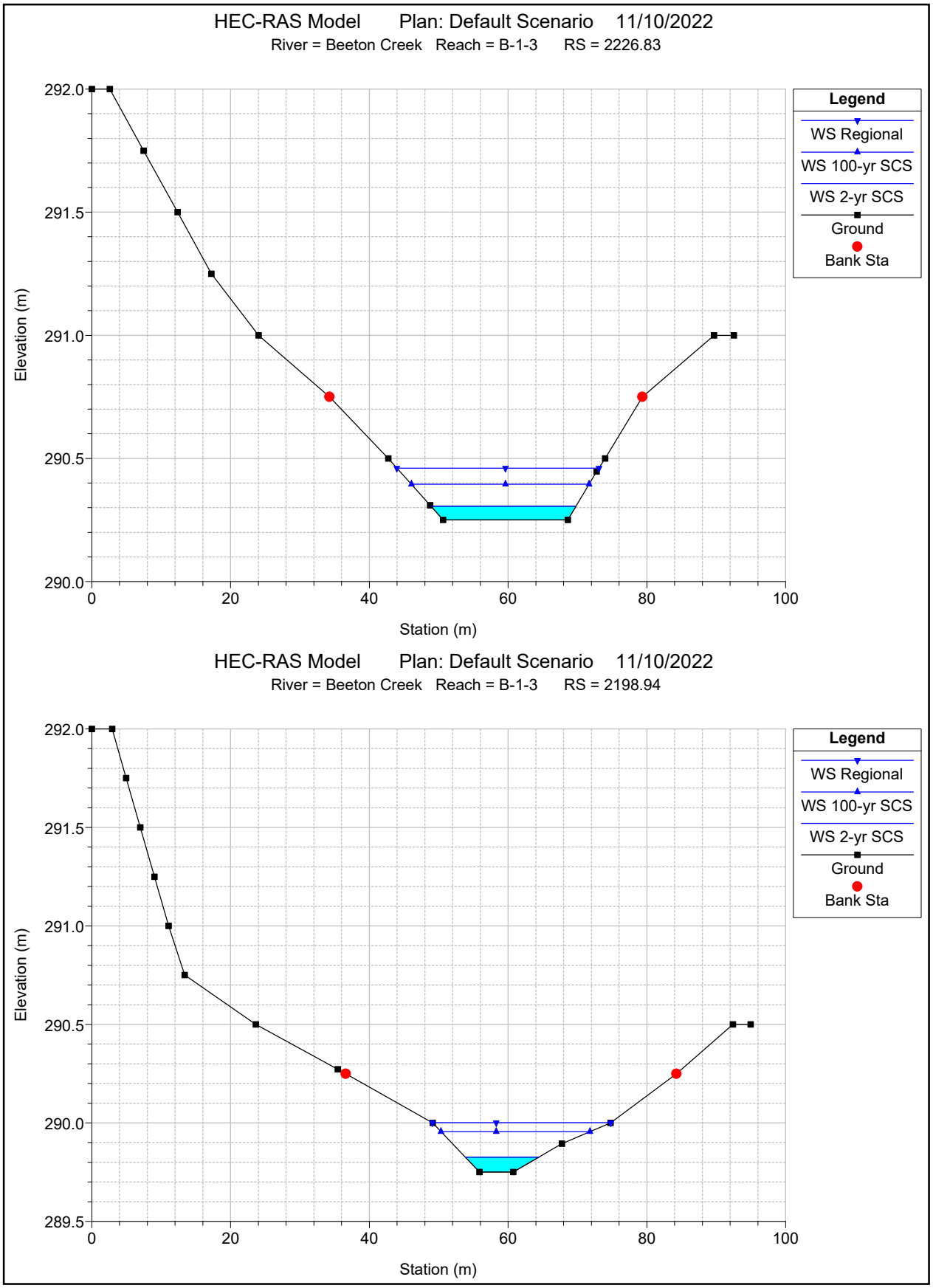

HEC-RAS Model Plan: Default Scenario 11/10/2022
River = Beeton Creek Reach = B-1-3 RS = 2481.14
Legend
WS Regional
WS 100-yr SCS
WS 2-yr SCS
Ground
Bank Sta
Elevation (m)
Station (m)
297.5
297.0
296.5
296.0
295.5
0
20
40
60
80
100

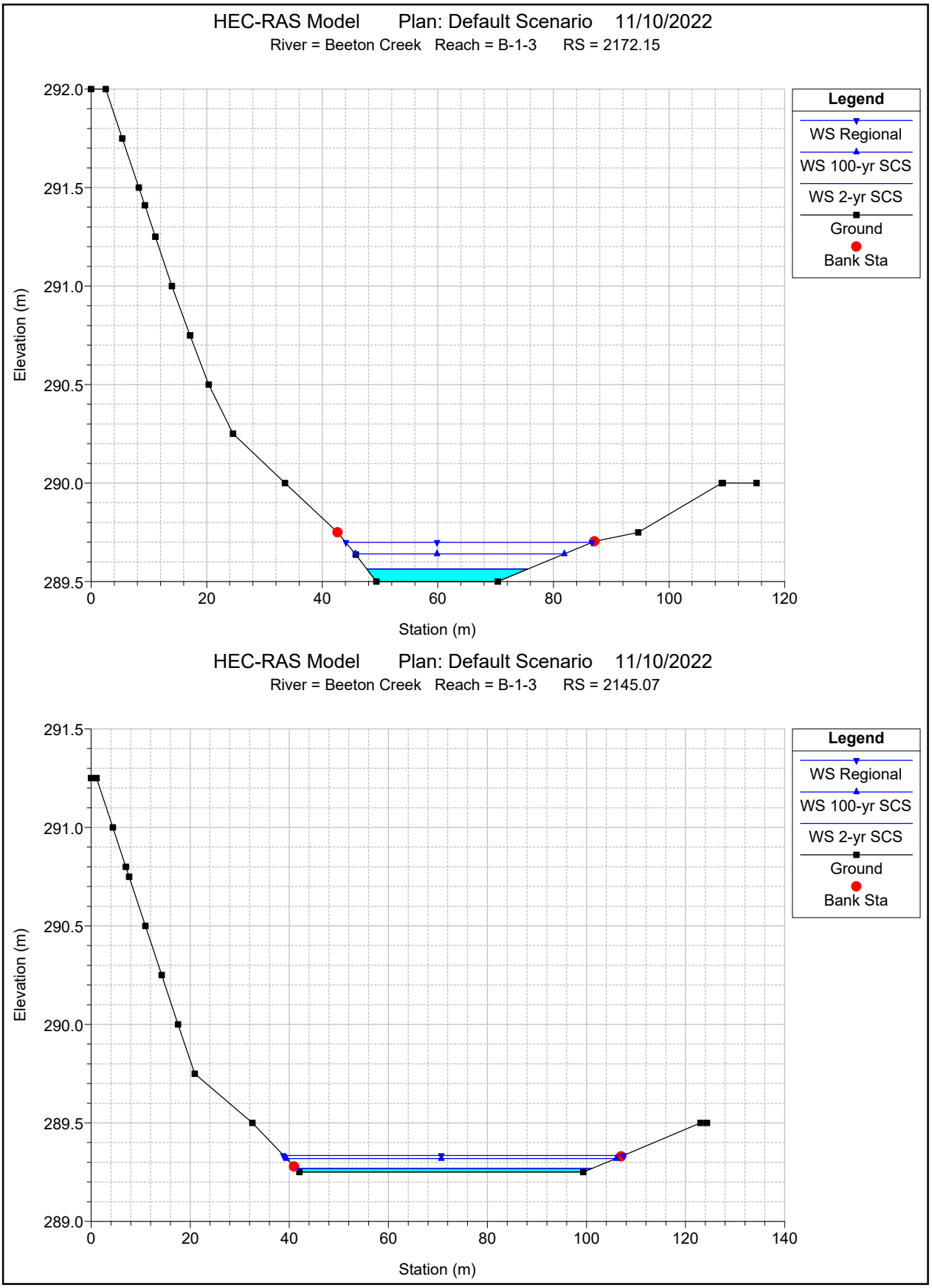

HEC-RAS Model Plan: Default Scenario 11/10/2022
River = Beeton Creek Reach = B-1-3 RS = 2453.95
Legend
WS Regional
WS 100-yr SCS
WS 2-yr SCS
Ground
Bank Sta
Elevation (m)
Station (m)
297.0
296.5
296.0
295.5
295.0
0
20
40
60
80
HEC-RAS Model Plan: Default Scenario 11/10/2022
River = Beeton Creek Reach = B-1-3 RS = 2420.9
Legend
WS Regional
WS 100-yr SCS
WS 2-yr SCS
Ground
Bank Sta
Elevation (m)
Station (m)
296.0
295.5
295.0
294.5
294.0
293.5
0
20
40
60
80
100

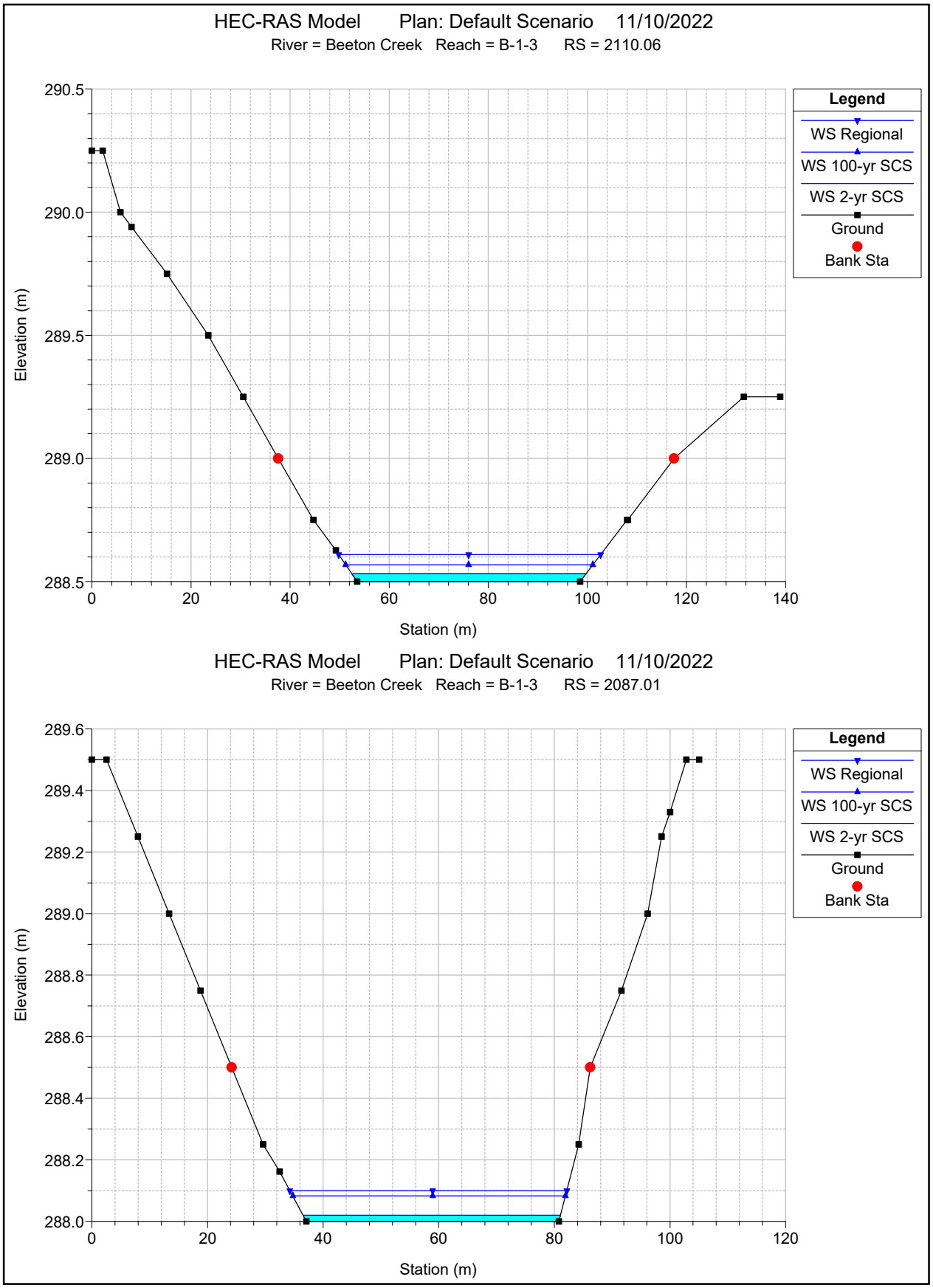

HEC-RAS Model Plan: Default Scenario 11/10/2022
River = Beeton Creek Reach = B-1-3 RS = 2394.86
Elevation (m)
Station (m)
Legend
WS Regional
WS 100-yr SCS
WS 2-yr SCS
Ground
Bank Sta
HEC-RAS Model Plan: Default Scenario 11/10/2022
River = Beeton Creek Reach = B-1-3 RS = 2367.12
Elevation (m)
Station (m)
Legend
WS Regional
WS 100-yr SCS
WS 2-yr SCS
Ground
Bank Sta

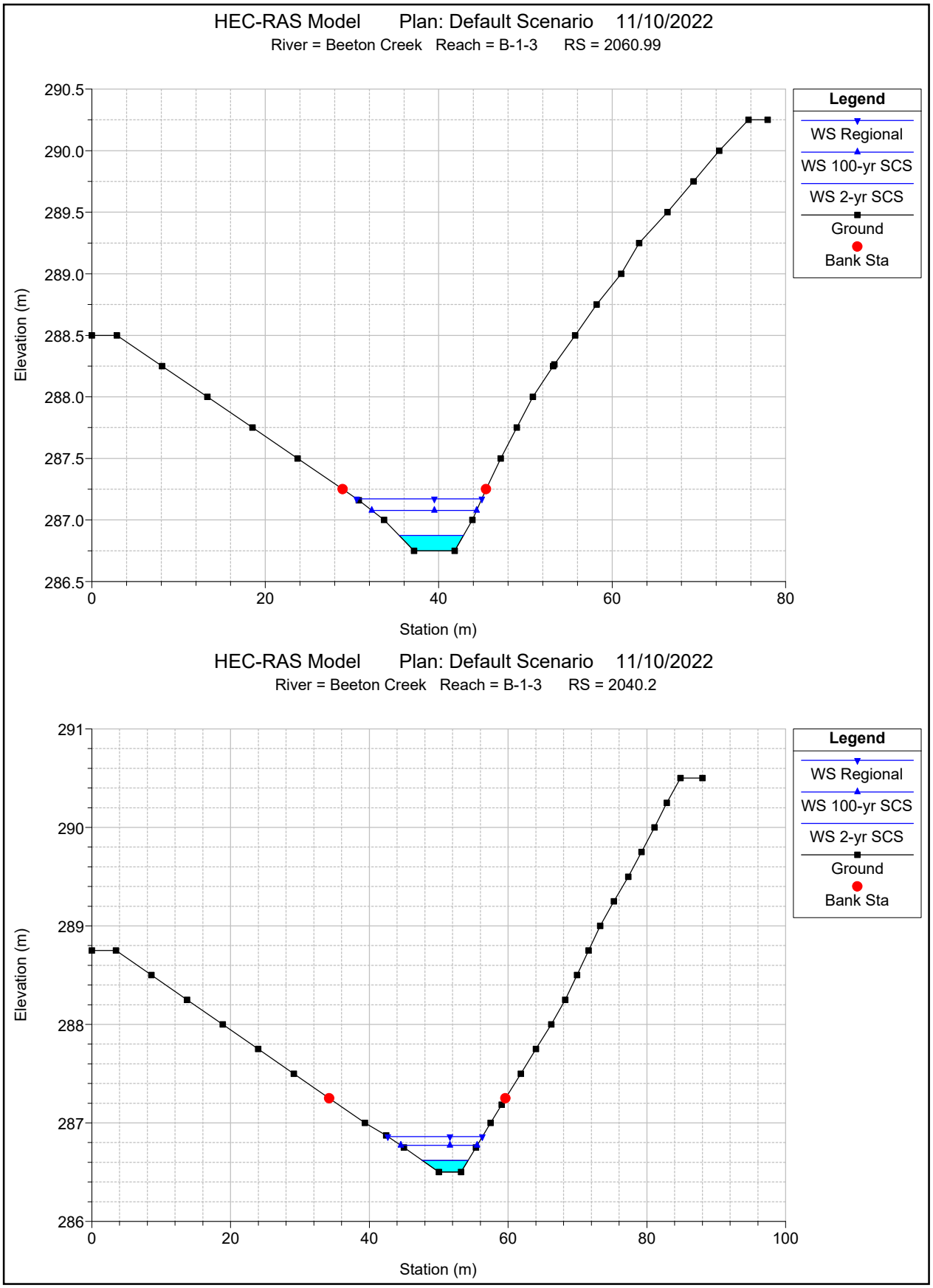

HEC-RAS Model Plan: Default Scenario 11/10/2022
River = Beeton Creek Reach = B-1-3 RS = 2341.77
Legend
WS Regional
WS 100-yr SCS
WS 2-yr SCS
Ground
Bank Sta
Elevation (m)
Station (m)
294.5
294.0
293.5
293.0
292.5
292.0
0
20
40
60
80
100
HEC-RAS Model Plan: Default Scenario 11/10/2022
River = Beeton Creek Reach = B-1-3 RS = 2314.2
Legend
WS Regional
WS 100-yr SCS
WS 2-yr SCS
Ground
Bank Sta
Elevation (m)
Station (m)
293.4
293.2
293.0
292.8
292.6
292.4
292.2
292.0
0
20
40
60
80

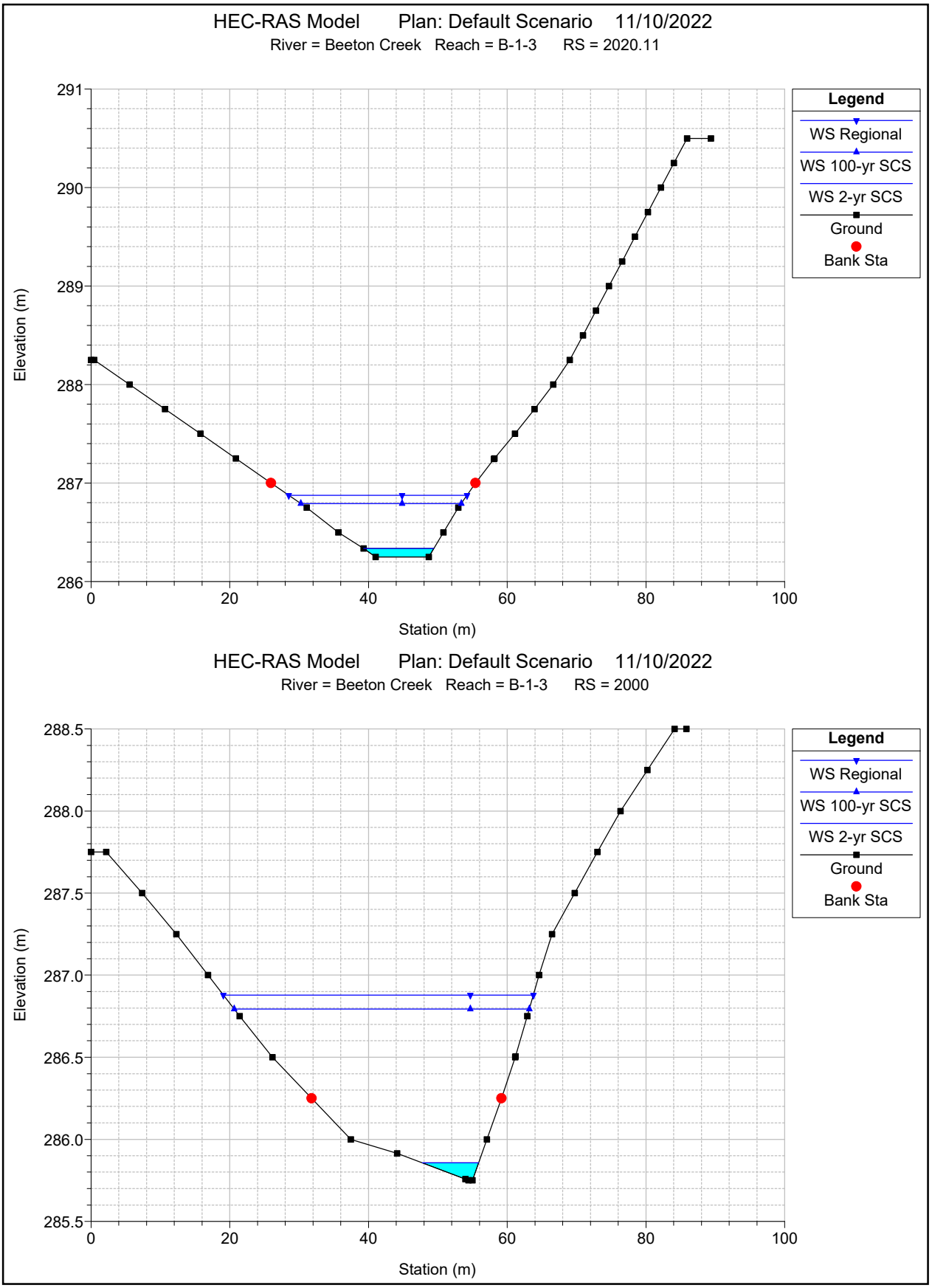

HEC-RAS Model Plan: Default Scenario 11/10/2022
River = Beeton Creek Reach = B-1-3 RS = 2278.77
Elevation (m)
Station (m)
293.0
292.5
292.0
291.5
291.0
290.5
0
20
40
60
80
100
Legend
WS Regional
WS 100-yr SCS
WS 2-yr SCS
Ground
Bank Sta
HEC-RAS Model Plan: Default Scenario 11/10/2022
River = Beeton Creek Reach = B-1-3 RS = 2252.8
Elevation (m)
Station (m)
292.5
292.0
291.5
291.0
290.5
290.0
0
20
40
60
80
100
Legend
WS Regional
WS 100-yr SCS
WS 2-yr SCS
Ground
Bank Sta

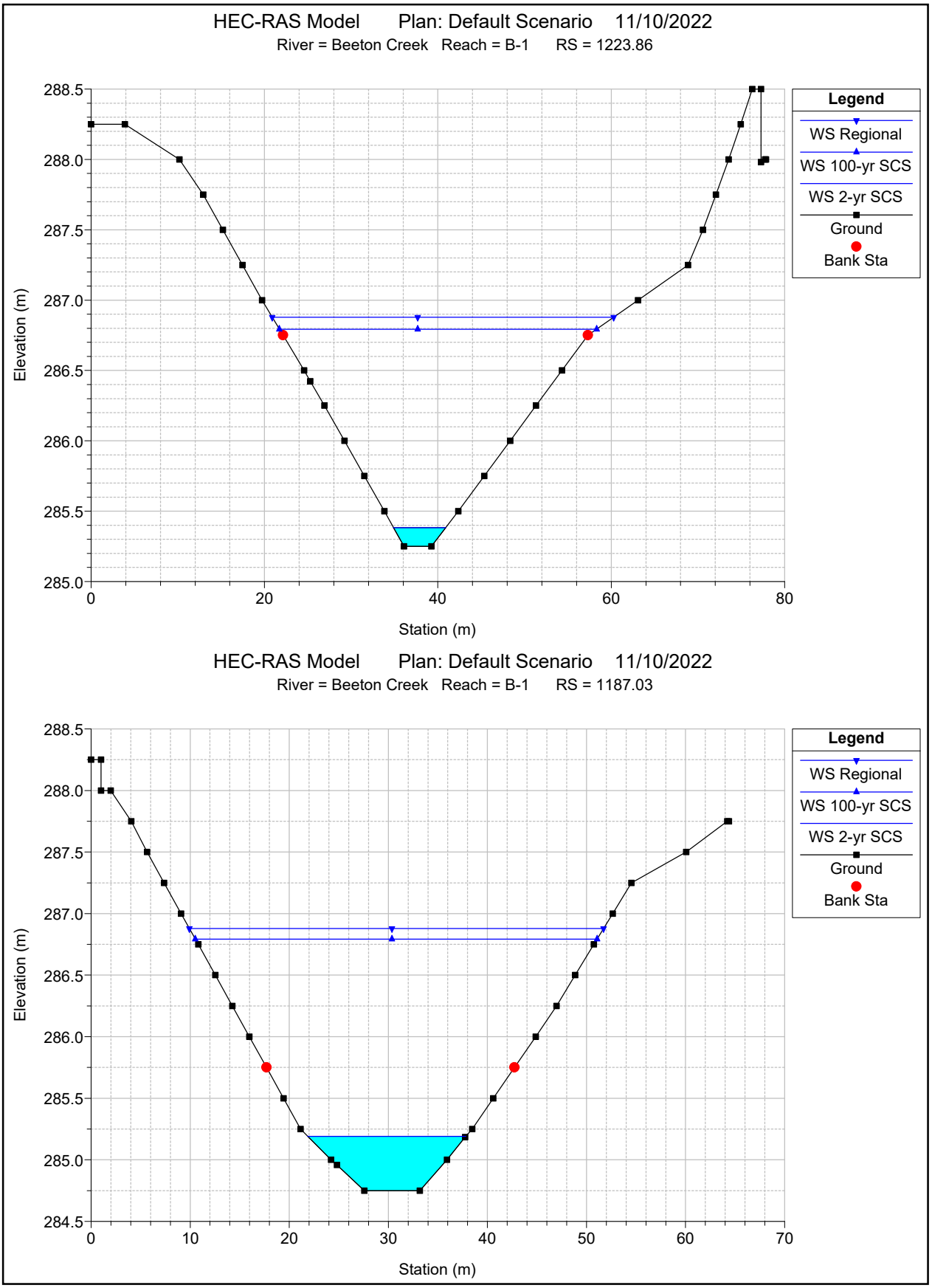

HEC-RAS Model Plan: Default Scenario 11/10/2022
River = Beeton Creek Reach = B-1-3 RS = 2226.83
Legend
WS Regional
WS 100-yr SCS
WS 2-yr SCS
Ground
Bank Sta
Elevation (m)
Station (m)
292.0
291.5
291.0
290.5
290.0
0
20
40
60
80
100
HEC-RAS Model Plan: Default Scenario 11/10/2022
River = Beeton Creek Reach = B-1-3 RS = 2198.94
Legend
WS Regional
WS 100-yr SCS
WS 2-yr SCS
Ground
Bank Sta
Elevation (m)
Station (m)
292.0
291.5
291.0
290.5
290.0
289.5
0
20
40
60
80
100

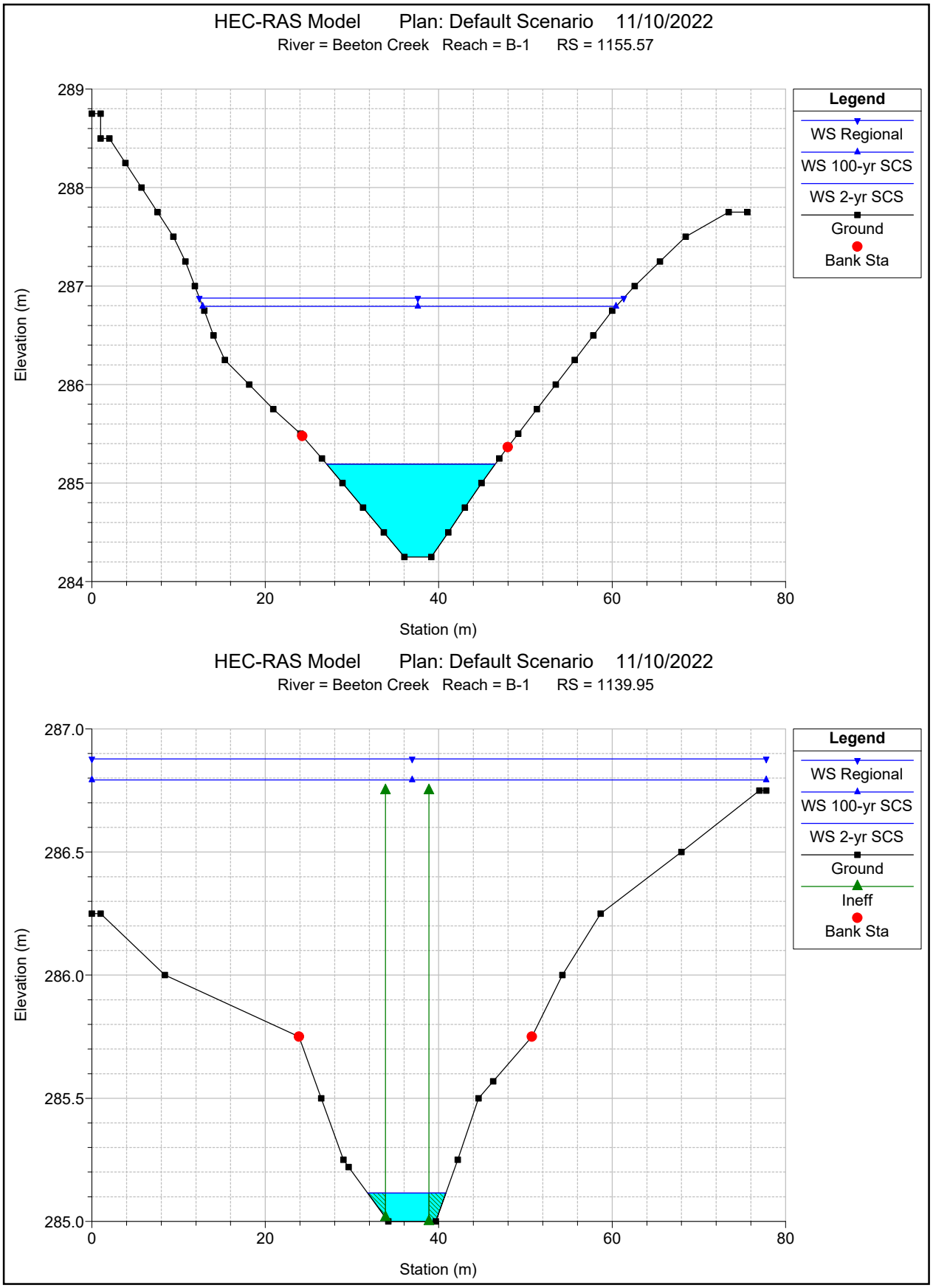

HEC-RAS Model Plan: Default Scenario 11/10/2022
River = Beeton Creek Reach = B-1-3 RS = 2172.15
Legend
WS Regional
WS 100-yr SCS
WS 2-yr SCS
Ground
Bank Sta
Elevation (m)
Station (m)
HEC-RAS Model Plan: Default Scenario 11/10/2022
River = Beeton Creek Reach = B-1-3 RS = 2145.07
Legend
WS Regional
WS 100-yr SCS
WS 2-yr SCS
Ground
Bank Sta
Elevation (m)
Station (m)

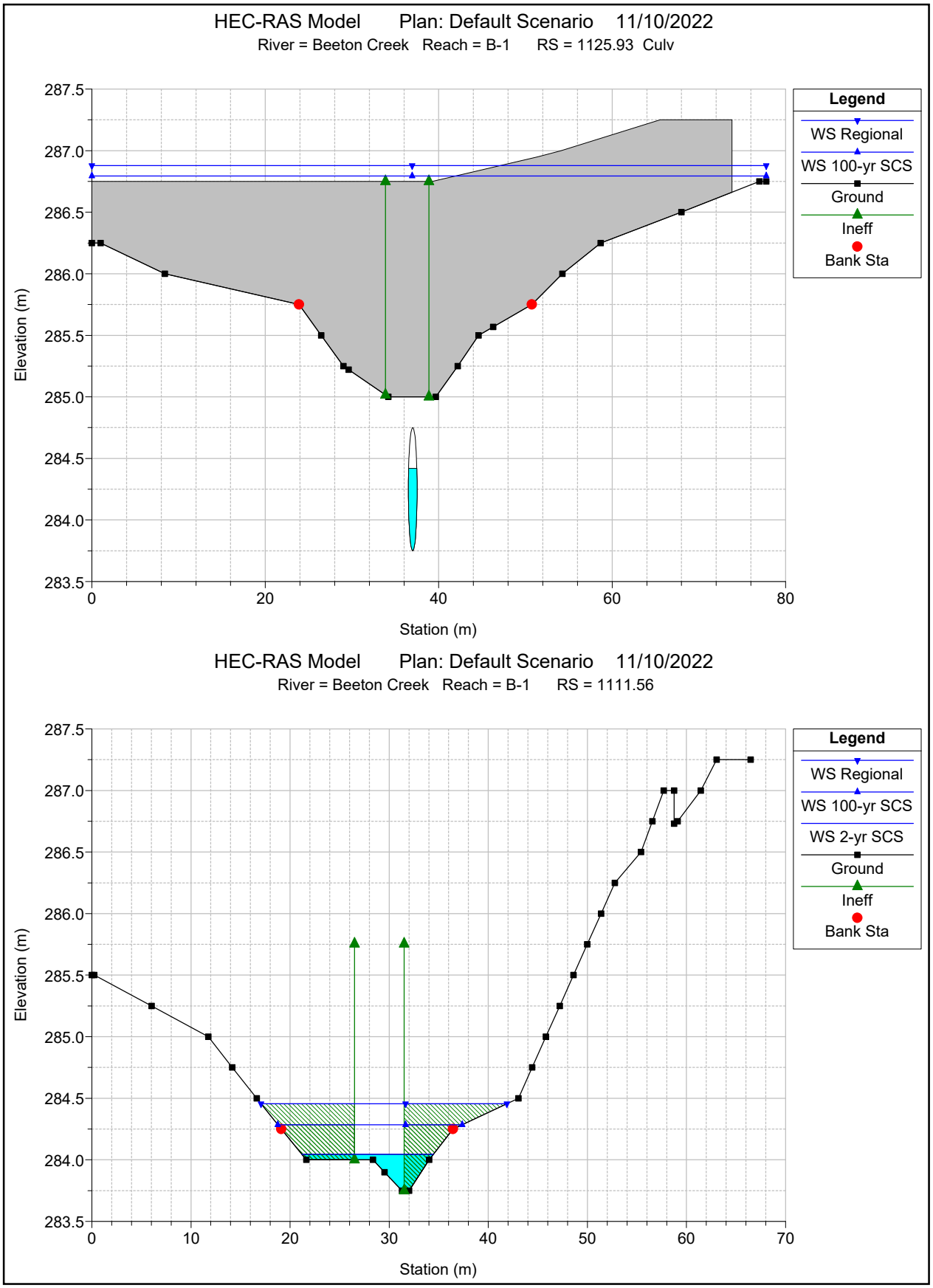

HEC-RAS Model Plan: Default Scenario 11/10/2022
River = Beeton Creek Reach = B-1-3 RS = 2110.06
Legend
WS Regional
WS 100-yr SCS
WS 2-yr SCS
Ground
Bank Sta
Elevation (m)
Station (m)
290.5
290.0
289.5
289.0
288.5
0
20
40
60
80
100
120
140
HEC-RAS Model Plan: Default Scenario 11/10/2022
River = Beeton Creek Reach = B-1-3 RS = 2087.01
Legend
WS Regional
WS 100-yr SCS
WS 2-yr SCS
Ground
Bank Sta
Elevation (m)
Station (m)
289.6
289.4
289.2
289.0
288.8
288.6
288.4
288.2
288.0
0
20
40
60
80
100
120

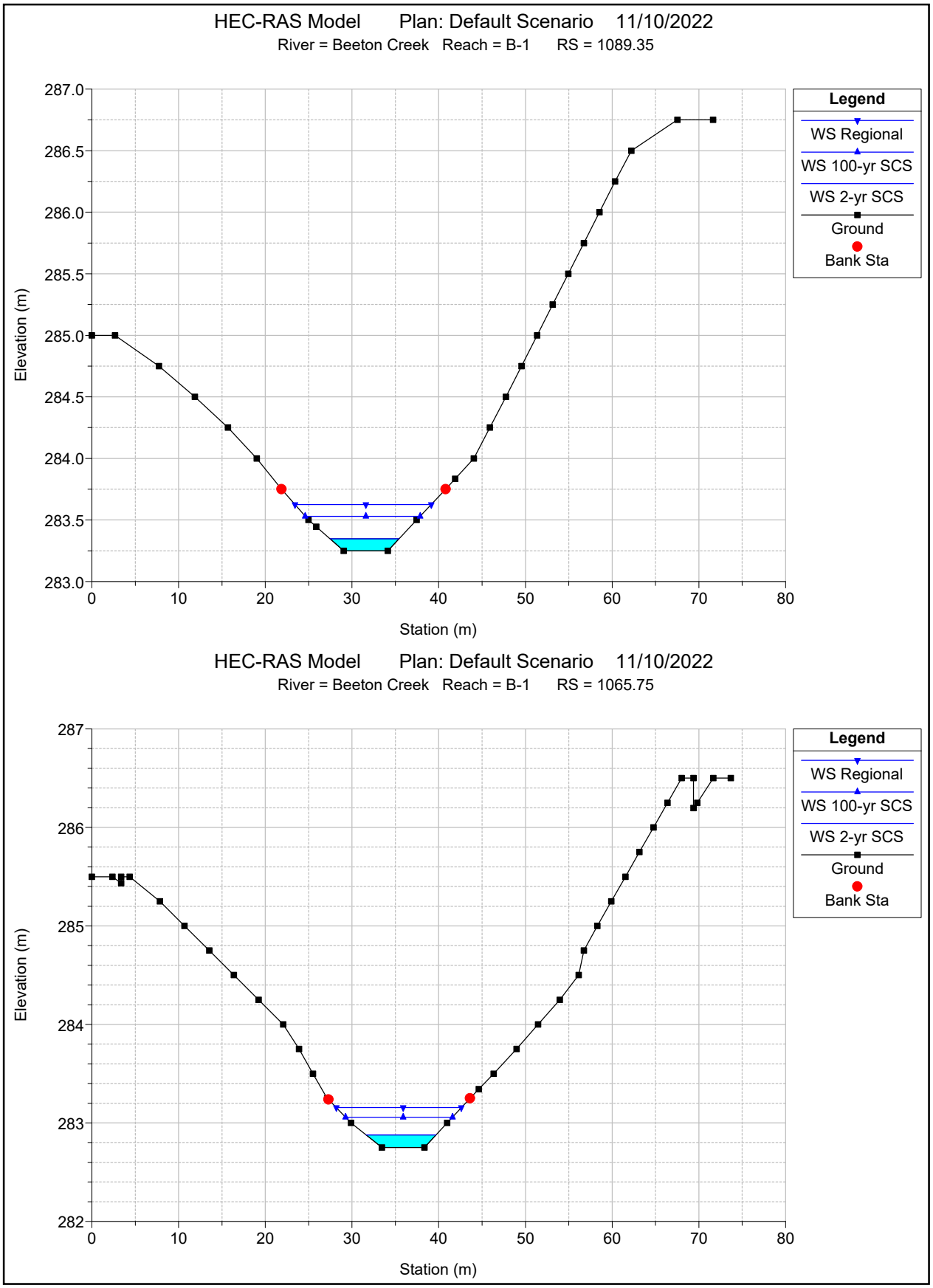

HEC-RAS Model Plan: Default Scenario 11/10/2022
River = Beeton Creek Reach = B-1-3 RS = 2060.99
Elevation (m)
Station (m)
Legend
WS Regional
WS 100-yr SCS
WS 2-yr SCS
Ground
Bank Sta
HEC-RAS Model Plan: Default Scenario 11/10/2022
River = Beeton Creek Reach = B-1-3 RS = 2040.2
Elevation (m)
Station (m)
Legend
WS Regional
WS 100-yr SCS
WS 2-yr SCS
Ground
Bank Sta

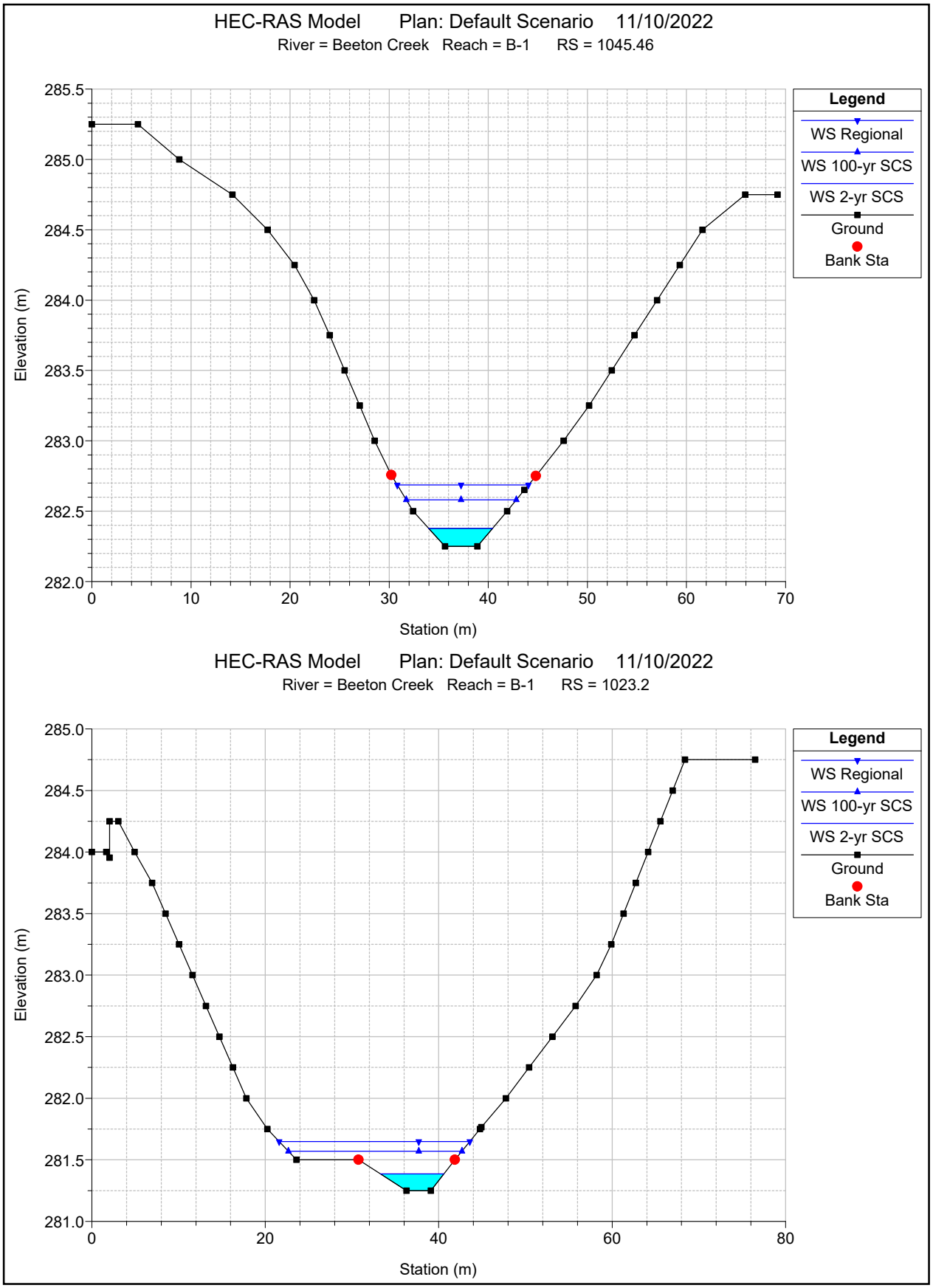

HEC-RAS Model Plan: Default Scenario 11/10/2022
River = Beeton Creek Reach = B-1-3 RS = 2020.11
Legend
WS Regional
WS 100-yr SCS
WS 2-yr SCS
Ground
Bank Sta
Elevation (m)
Station (m)
HEC-RAS Model Plan: Default Scenario 11/10/2022
River = Beeton Creek Reach = B-1-3 RS = 2000
Legend
WS Regional
WS 100-yr SCS
WS 2-yr SCS
Ground
Bank Sta
Elevation (m)
Station (m)


HEC-RAS Model Plan: Default Scenario 11/10/2022
River = Beeton Creek Reach = B-1 RS = 1223.86
Elevation (m)
Station (m)
Legend
WS Regional
WS 100-yr SCS
WS 2-yr SCS
Ground
Bank Sta
HEC-RAS Model Plan: Default Scenario 11/10/2022
River = Beeton Creek Reach = B-1 RS = 1187.03
Elevation (m)
Station (m)
Legend
WS Regional
WS 100-yr SCS
WS 2-yr SCS
Ground
Bank Sta


HEC-RAS Model Plan: Default Scenario 11/10/2022
River = Beeton Creek Reach = B-1 RS = 1155.57
Legend
WS Regional
WS 100-yr SCS
WS 2-yr SCS
Ground
Bank Sta
Elevation (m)
Station (m)
HEC-RAS Model Plan: Default Scenario 11/10/2022
River = Beeton Creek Reach = B-1 RS = 1139.95
Legend
WS Regional
WS 100-yr SCS
WS 2-yr SCS
Ground
Ineff
Bank Sta
Elevation (m)
Station (m)

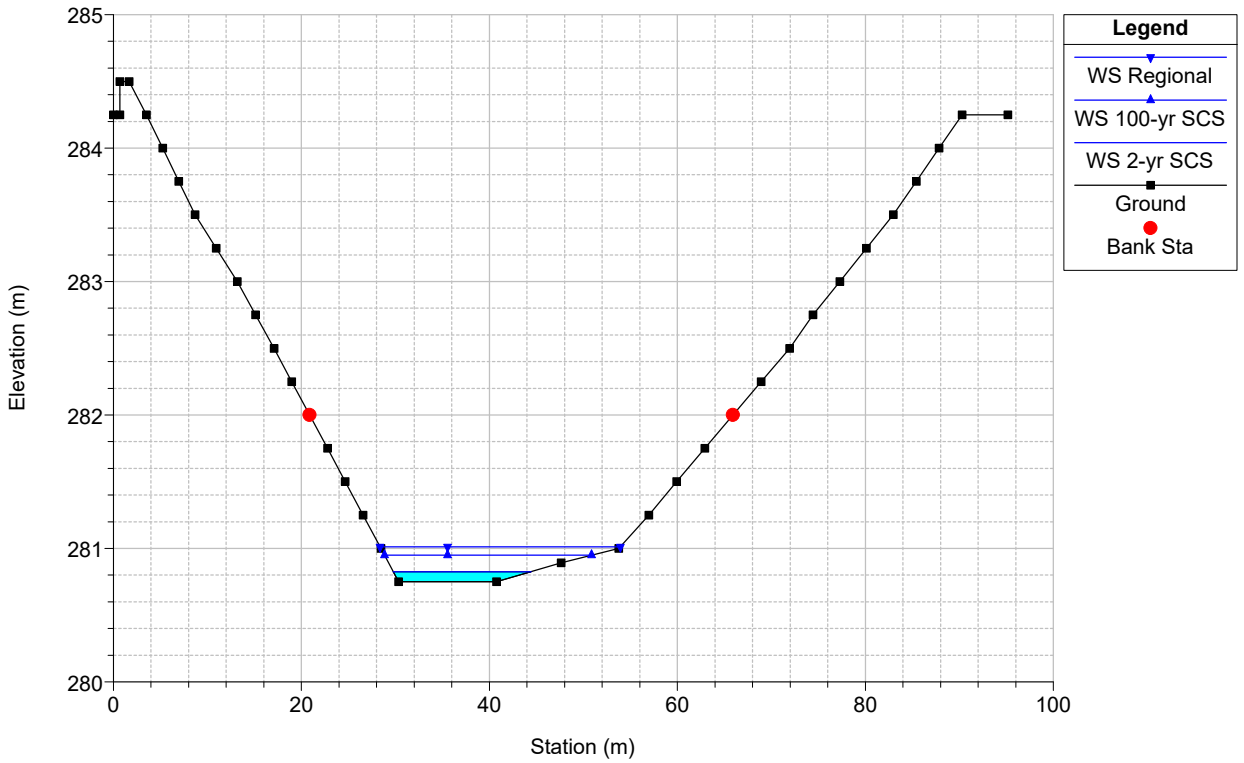

HEC-RAS Model Plan: Default Scenario 11/10/2022
River = Beeton Creek Reach = B-1 RS = 1125.93 Culv
Legend
WS Regional
WS 100-yr SCS
Ground
Ineff
Bank Sta
Elevation (m)
Station (m)
HEC-RAS Model Plan: Default Scenario 11/10/2022
River = Beeton Creek Reach = B-1 RS = 1111.56
Legend
WS Regional
WS 100-yr SCS
WS 2-yr SCS
Ground
Ineff
Bank Sta
Elevation (m)
Station (m)


HEC-RAS Model Plan: Default Scenario 11/10/2022
River = Beeton Creek Reach = B-1 RS = 1089.35
Elevation (m)
Station (m)
Legend
WS Regional
WS 100-yr SCS
WS 2-yr SCS
Ground
Bank Sta
HEC-RAS Model Plan: Default Scenario 11/10/2022
River = Beeton Creek Reach = B-1 RS = 1065.75
Elevation (m)
Station (m)
Legend
WS Regional
WS 100-yr SCS
WS 2-yr SCS
Ground
Bank Sta


HEC-RAS Model Plan: Default Scenario 11/10/2022
River = Beeton Creek Reach = B-1 RS = 1045.46
Elevation (m)
Station (m)
Legend
WS Regional
WS 100-yr SCS
WS 2-yr SCS
Ground
Bank Sta
HEC-RAS Model Plan: Default Scenario 11/10/2022
River = Beeton Creek Reach = B-1 RS = 1023.2
Elevation (m)
Station (m)
Legend
WS Regional
WS 100-yr SCS
WS 2-yr SCS
Ground
Bank Sta

HEC-RAS Model Plan: Default Scenario 11/10/2022

River = Beeton Creek Reach = B-1 RS = 1000.00



HEC-RAS Plan: Default Scenario

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
			(m3/s)	(m)	(m)	(m)	(m)	(m/m)	(m/s)	(m2)	(m)	
B-1-2	1678.47	2-yr SCS	0.17	296.00	296.05	296.03	296.06	0.013012	0.41	0.42	9.25	0.62
B-1-2	1678.47	100-yr SCS	1.01	296.00	296.13	296.11	296.16	0.016834	0.81	1.24	12.10	0.81
B-1-2	1678.47	Regional	1.73	296.00	296.17	296.15	296.22	0.017142	0.96	1.80	13.73	0.85
B-1-2	1662.83	2-yr SCS	0.17	295.50	295.54	295.54	295.57	0.044418	0.71	0.24	5.92	1.13
B-1-2	1662.83	100-yr SCS	1.01	295.50	295.65	295.64	295.70	0.024310	1.05	0.96	8.34	0.99
B-1-2	1662.83	Regional	1.73	295.50	295.70	295.70	295.77	0.022725	1.21	1.43	9.61	1.00
B-1-2	1629.55	2-yr SCS	0.17	294.75	294.85	294.85	294.87	0.017617	0.63	0.27	4.02	0.77
B-1-2	1629.55	100-yr SCS	1.01	294.75	294.95	294.95	295.03	0.027310	1.19	0.85	6.66	1.07
B-1-2	1629.55	Regional	1.73	294.75	295.02	295.02	295.10	0.021859	1.26	1.37	8.39	1.00
B-1-2	1605.37	2-yr SCS	0.17	294.00	294.13		294.13	0.001722	0.26	0.67	6.68	0.26
B-1-2	1605.37	100-yr SCS	1.01	294.00	294.27		294.28	0.003665	0.56	1.81	9.91	0.42
B-1-2	1605.37	Regional	1.73	294.00	294.34		294.36	0.004191	0.68	2.56	11.52	0.46
B-1-2	1590.57	2-yr SCS	0.17	294.00	294.04	294.04	294.06	0.036729	0.64	0.27	6.75	1.02
B-1-2	1590.57	100-yr SCS	1.01	294.00	294.16		294.20	0.011636	0.78	1.28	9.99	0.70
B-1-2	1590.57	Regional	1.73	294.00	294.23		294.27	0.009401	0.86	2.03	11.81	0.66
B-1-2	1566.38	2-yr SCS	0.17	293.75	293.89		293.90	0.002114	0.27	0.63	6.81	0.28
B-1-2	1566.38	100-yr SCS	1.01	293.75	294.03		294.05	0.003653	0.52	1.92	11.47	0.41
B-1-2	1566.38	Regional	1.73	293.75	294.09		294.12	0.004438	0.65	2.68	13.49	0.46
B-1-2	1546.72	2-yr SCS	0.17	293.75	293.78	293.78	293.80	0.035438	0.53	0.32	10.44	0.96
B-1-2	1546.72	100-yr SCS	1.01	293.75	293.85	293.85	293.89	0.027374	0.91	1.10	12.93	1.00
B-1-2	1546.72	Regional	1.73	293.75	293.89	293.89	293.95	0.024623	1.05	1.64	14.42	1.00
B-1-2	1523.98	2-yr SCS	0.17	293.00	293.04	293.03	293.05	0.030542	0.52	0.33	9.57	0.91
B-1-2	1523.98	100-yr SCS	1.01	293.00	293.11	293.11	293.15	0.027545	0.95	1.07	11.96	1.01
B-1-2	1523.98	Regional	1.73	293.00	293.15	293.15	293.21	0.024339	1.08	1.61	13.45	1.00
B-1-2	1501.74	2-yr SCS	0.17	292.25	292.31	292.31	292.33	0.034143	0.72	0.24	4.65	1.03
B-1-2	1501.74	100-yr SCS	1.01	292.25	292.42	292.42	292.49	0.023545	1.15	0.88	6.56	1.00
B-1-2	1501.74	Regional	1.73	292.25	292.48	292.48	292.57	0.021487	1.30	1.33	7.62	1.00
B-1-2	1472.59	2-yr SCS	0.17	291.50	291.59	291.56	291.60	0.007220	0.39	0.43	6.66	0.49
B-1-2	1472.59	100-yr SCS	1.01	291.50	291.70		291.73	0.009557	0.71	1.42	11.13	0.63
B-1-2	1472.59	Regional	1.73	291.50	291.74		291.78	0.013028	0.92	1.89	12.72	0.76
B-1-2	1450.63	2-yr SCS	0.17	291.25	291.29	291.28	291.30	0.036464	0.55	0.31	9.70	0.98
B-1-2	1450.63	100-yr SCS	1.01	291.25	291.36	291.36	291.40	0.027948	0.90	1.12	13.85	1.00
B-1-2	1450.63	Regional	1.73	291.25	291.41	291.41	291.45	0.018586	0.91	1.91	16.89	0.86
B-1-2	1424.99	2-yr SCS	0.17	290.25	290.28	290.28	290.30	0.042099	0.57	0.30	9.85	1.05
B-1-2	1424.99	100-yr SCS	1.01	290.25	290.35	290.35	290.40	0.027815	0.94	1.07	12.23	1.01
B-1-2	1424.99	Regional	1.73	290.25	290.41	290.41	290.45	0.017577	0.96	1.81	14.13	0.86
B-1-2	1404.1	2-yr SCS	0.17	289.50	289.57	289.56	289.58	0.015196	0.52	0.33	5.81	0.70
B-1-2	1404.1	100-yr SCS	1.01	289.50	289.68		289.72	0.014117	0.85	1.19	9.53	0.77
B-1-2	1404.1	Regional	1.73	289.50	289.75	289.71	289.79	0.012467	0.94	1.85	11.60	0.75
B-1-2	1371.7	2-yr SCS	0.17	289.00	289.05	289.04	289.06	0.017719	0.49	0.35	7.49	0.73
B-1-2	1371.7	100-yr SCS	1.01	289.00	289.14	289.13	289.18	0.019430	0.92	1.09	9.76	0.88
B-1-2	1371.7	Regional	1.73	289.00	289.18	289.18	289.25	0.022759	1.15	1.50	10.82	0.99
B-1-2	1349.62	2-yr SCS	0.17	288.50	288.54	288.54	288.56	0.031620	0.57	0.30	7.86	0.94
B-1-2	1349.62	100-yr SCS	1.01	288.50	288.62	288.62	288.67	0.028379	1.02	0.99	10.24	1.04
B-1-2	1349.62	Regional	1.73	288.50	288.67	288.67	288.73	0.023776	1.13	1.54	11.85	1.00
B-1-2	1324.36	2-yr SCS	0.17	287.75	287.78	287.78	287.80	0.028714	0.48	0.35	11.18	0.87
B-1-2	1324.36	100-yr SCS	1.01	287.75	287.84	287.84	287.89	0.034556	0.99	1.02	12.73	1.11
B-1-2	1324.36	Regional	1.73	287.75	287.88	287.88	287.94	0.028040	1.11	1.56	13.85	1.06
B-1-2	1299.53	2-yr SCS	0.17	286.50	286.58	286.55	286.59	0.009107	0.43	0.39	6.19	0.55
B-1-2	1299.53	100-yr SCS	1.01	286.50	286.79		286.80	0.002050	0.43	2.32	11.90	0.31
B-1-2	1299.53	Regional	1.73	286.50	286.87		286.89	0.002080	0.50	3.44	14.23	0.33
B-1-2	1283.23	2-yr SCS	0.17	286.25	286.28	286.28	286.29	0.046565	0.55	0.31	11.49	1.08
B-1-2	1283.23	100-yr SCS	1.01	286.25	286.79		286.79	0.000029	0.08	12.08	29.94	0.04
B-1-2	1283.23	Regional	1.73	286.25	286.88		286.88	0.000047	0.12	14.76	31.77	0.06
B-1-2	1258.11	2-yr SCS	0.17	285.75	285.82	285.77	285.82	0.002342	0.21	0.80	12.99	0.28
B-1-2	1258.11	100-yr SCS	1.01	285.75	286.79		286.79	0.000002	0.04	28.69	43.69	0.01
B-1-2	1258.11	Regional	1.73	285.75	286.88		286.88	0.000005	0.06	32.59	46.06	0.02
B-1-3	2705.05	2-yr SCS	0.44	299.50	299.57	299.57	299.60	0.035924	0.82	0.54	9.14	1.08
B-1-3	2705.05	100-yr SCS	2.53	299.50	299.70	299.70	299.78	0.022631	1.20	2.11	14.28	1.00
B-1-3	2705.05	Regional	4.43	299.50	299.78	299.78	299.86	0.022854	1.26	3.51	22.25	1.01

HEC-RAS Plan: Default Scenario (Continued)

Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(m3/s)	(m)	(m)	(m)	(m)	(m/m)	(m/s)	(m2)	(m)	
B-1-3	2685.1	2-yr SCS	0.44	298.50	298.58	298.58	298.60	0.022026	0.73	0.60	8.33	0.87
B-1-3	2685.1	100-yr SCS	2.53	298.50	298.72	298.72	298.81	0.021191	1.34	1.90	10.38	1.00
B-1-3	2685.1	Regional	4.43	298.50	298.81	298.81	298.92	0.019771	1.52	2.91	12.41	1.00
B-1-3	2660.6	2-yr SCS	0.44	298.00	298.08	298.08	298.10	0.019154	0.66	0.66	9.72	0.81
B-1-3	2660.6	100-yr SCS	2.53	298.00	298.20	298.20	298.28	0.022358	1.24	2.03	12.92	1.00
B-1-3	2660.6	Regional	4.43	298.00	298.27	298.27	298.38	0.020425	1.43	3.10	14.92	1.00
B-1-3	2641.54	2-yr SCS	0.44	297.25	297.48		297.49	0.002392	0.38	1.15	8.01	0.32
B-1-3	2641.54	100-yr SCS	2.53	297.25	297.71		297.74	0.003414	0.69	3.65	13.63	0.43
B-1-3	2641.54	Regional	4.43	297.25	297.82		297.85	0.004089	0.86	5.18	16.10	0.48
B-1-3	2627.01	2-yr SCS	0.44	297.25	297.38	297.37	297.41	0.017273	0.75	0.58	6.46	0.80
B-1-3	2627.01	100-yr SCS	2.53	297.25	297.54	297.54	297.62	0.021470	1.30	1.94	11.19	1.00
B-1-3	2627.01	Regional	4.43	297.25	297.62	297.62	297.73	0.019953	1.48	3.01	13.57	1.00
B-1-3	2600.89	2-yr SCS	0.44	296.75	296.83	296.83	296.87	0.025540	0.80	0.55	7.42	0.94
B-1-3	2600.89	100-yr SCS	2.53	296.75	297.00		297.08	0.016509	1.20	2.11	11.31	0.89
B-1-3	2600.89	Regional	4.43	296.75	297.10	297.07	297.19	0.014259	1.33	3.32	13.58	0.86
B-1-3	2580.17	2-yr SCS	0.44	296.50	296.64		296.65	0.005538	0.49	0.90	8.13	0.47
B-1-3	2580.17	100-yr SCS	2.53	296.50	296.85		296.88	0.005237	0.79	3.18	13.32	0.52
B-1-3	2580.17	Regional	4.43	296.50	296.95		297.00	0.005722	0.95	4.64	15.78	0.56
B-1-3	2556.54	2-yr SCS	0.44	296.25	296.40	296.40	296.43	0.020064	0.82	0.53	5.77	0.87
B-1-3	2556.54	100-yr SCS	2.53	296.25	296.56	296.56	296.65	0.022042	1.34	1.89	10.58	1.01
B-1-3	2556.54	Regional	4.43	296.25	296.65	296.65	296.77	0.019626	1.48	2.99	13.28	1.00
B-1-3	2532.76	2-yr SCS	0.44	295.75	295.98		295.98	0.002882	0.39	1.13	8.89	0.35
B-1-3	2532.76	100-yr SCS	2.53	295.75	296.17		296.20	0.004766	0.73	3.47	15.44	0.49
B-1-3	2532.76	Regional	4.43	295.75	296.26		296.30	0.005276	0.87	5.09	18.66	0.53
B-1-3	2507.04	2-yr SCS	0.44	295.75	295.84		295.85	0.010980	0.52	0.83	11.41	0.62
B-1-3	2507.04	100-yr SCS	2.53	295.75	295.98		296.02	0.010971	0.89	2.83	17.30	0.71
B-1-3	2507.04	Regional	4.43	295.75	296.05		296.11	0.011353	1.07	4.16	20.08	0.75
B-1-3	2481.14	2-yr SCS	0.44	295.50	295.58	295.55	295.59	0.009794	0.47	0.93	13.60	0.58
B-1-3	2481.14	100-yr SCS	2.53	295.50	295.70		295.74	0.010340	0.84	3.01	19.34	0.68
B-1-3	2481.14	Regional	4.43	295.50	295.77		295.82	0.010665	1.00	4.43	22.45	0.72
B-1-3	2453.95	2-yr SCS	0.44	295.00	295.10	295.10	295.14	0.033589	0.89	0.49	6.96	1.07
B-1-3	2453.95	100-yr SCS	2.53	295.00	295.26	295.26	295.33	0.022512	1.23	2.06	13.40	1.00
B-1-3	2453.95	Regional	4.43	295.00	295.33	295.33	295.43	0.021048	1.38	3.20	16.58	1.01
B-1-3	2420.9	2-yr SCS	0.44	293.75	293.82	293.82	293.85	0.031279	0.78	0.56	9.30	1.01
B-1-3	2420.9	100-yr SCS	2.53	293.75	293.95	293.95	294.02	0.022833	1.18	2.14	14.90	1.00
B-1-3	2420.9	Regional	4.43	293.75	294.02	294.02	294.12	0.020944	1.34	3.30	17.78	1.00
B-1-3	2394.86	2-yr SCS	0.44	292.75	292.89	292.84	292.91	0.006042	0.51	0.86	7.88	0.49
B-1-3	2394.86	100-yr SCS	2.53	292.75	293.06	293.01	293.11	0.009573	0.99	2.57	12.24	0.69
B-1-3	2394.86	Regional	4.43	292.75	293.14	293.09	293.22	0.012000	1.25	3.55	14.02	0.79
B-1-3	2367.12	2-yr SCS	0.44	292.50	292.54	292.54	292.57	0.036362	0.66	0.67	15.93	1.02
B-1-3	2367.12	100-yr SCS	2.53	292.50	292.64	292.64	292.70	0.025508	1.11	2.27	18.81	1.02
B-1-3	2367.12	Regional	4.43	292.50	292.70	292.70	292.78	0.022118	1.29	3.45	20.66	1.01
B-1-3	2341.77	2-yr SCS	0.44	292.00	292.17		292.17	0.001112	0.23	1.94	16.81	0.21
B-1-3	2341.77	100-yr SCS	2.53	292.00	292.35		292.35	0.001873	0.44	5.81	27.75	0.30
B-1-3	2341.77	Regional	4.43	292.00	292.43		292.45	0.002106	0.53	8.41	33.01	0.33
B-1-3	2314.2	2-yr SCS	0.44	292.00	292.07	292.07	292.09	0.018869	0.58	0.75	13.07	0.78
B-1-3	2314.2	100-yr SCS	2.53	292.00	292.17	292.17	292.23	0.024246	1.08	2.34	19.48	1.00
B-1-3	2314.2	Regional	4.43	292.00	292.23	292.23	292.30	0.022272	1.23	3.61	23.39	1.00
B-1-3	2278.77	2-yr SCS	0.44	290.75	290.82	290.82	290.86	0.032682	0.79	0.55	9.25	1.03
B-1-3	2278.77	100-yr SCS	2.53	290.75	290.96	290.96	291.02	0.023078	1.16	2.18	15.73	1.00
B-1-3	2278.77	Regional	4.43	290.75	291.02	291.02	291.11	0.021894	1.32	3.36	19.22	1.01
B-1-3	2252.8	2-yr SCS	0.44	290.25	290.42		290.42	0.002469	0.33	1.34	12.14	0.31
B-1-3	2252.8	100-yr SCS	2.53	290.25	290.58		290.60	0.004398	0.63	4.00	20.72	0.46
B-1-3	2252.8	Regional	4.43	290.25	290.66		290.69	0.005252	0.78	5.71	24.89	0.52
B-1-3	2226.83	2-yr SCS	0.44	290.25	290.31		290.31	0.010128	0.40	1.09	20.90	0.56
B-1-3	2226.83	100-yr SCS	2.53	290.25	290.40		290.43	0.012766	0.80	3.16	25.62	0.73
B-1-3	2226.83	Regional	4.43	290.25	290.46		290.50	0.010382	0.89	4.96	29.12	0.69
B-1-3	2198.94	2-yr SCS	0.44	289.75	289.83	289.83	289.85	0.031268	0.74	0.59	10.64	1.00
B-1-3	2198.94	100-yr SCS	2.53	289.75	289.96	289.94	290.00	0.018768	0.96	2.62	21.45	0.88

HEC-RAS Plan: Default Scenario (Continued)

Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(m3/s)	(m)	(m)	(m)	(m)	(m/m)	(m/s)	(m2)	(m)	
B-1-3	2198.94	Regional	4.43	289.75	290.00	290.00	290.07	0.023133	1.19	3.71	25.74	1.00
B-1-3	2172.15	2-yr SCS	0.44	289.50	289.56	289.54	289.57	0.004665	0.28	1.54	27.83	0.38
B-1-3	2172.15	100-yr SCS	2.53	289.50	289.64		289.66	0.009080	0.63	4.02	36.19	0.60
B-1-3	2172.15	Regional	4.43	289.50	289.70		289.72	0.007734	0.70	6.31	42.58	0.58
B-1-3	2145.07	2-yr SCS	0.44	289.25	289.27	289.27	289.28	0.040764	0.40	1.09	59.77	0.95
B-1-3	2145.07	100-yr SCS	2.53	289.25	289.32		289.34	0.016173	0.59	4.30	66.60	0.74
B-1-3	2145.07	Regional	4.43	289.25	289.34	289.33	289.37	0.024657	0.83	5.36	68.69	0.94
B-1-3	2110.06	2-yr SCS	0.44	288.50	288.53		288.54	0.011425	0.30	1.46	47.29	0.55
B-1-3	2110.06	100-yr SCS	2.53	288.50	288.57	288.57	288.60	0.028811	0.78	3.23	49.90	0.98
B-1-3	2110.06	Regional	4.43	288.50	288.61	288.60	288.64	0.017756	0.83	5.36	52.86	0.83
B-1-3	2087.01	2-yr SCS	0.44	288.00	288.02	288.02	288.03	0.056085	0.50	0.88	44.53	1.12
B-1-3	2087.01	100-yr SCS	2.53	288.00	288.08	288.08	288.11	0.016291	0.67	3.75	47.16	0.76
B-1-3	2087.01	Regional	4.43	288.00	288.10	288.10	288.15	0.026214	0.97	4.58	47.90	1.00
B-1-3	2060.99	2-yr SCS	0.44	286.75	286.87		286.89	0.008767	0.58	0.75	7.43	0.58
B-1-3	2060.99	100-yr SCS	2.53	286.75	287.08		287.12	0.007674	0.93	2.73	12.11	0.62
B-1-3	2060.99	Regional	4.43	286.75	287.17		287.24	0.008555	1.12	3.97	14.43	0.68
B-1-3	2040.2	2-yr SCS	0.44	286.50	286.62		286.65	0.017349	0.75	0.59	6.63	0.80
B-1-3	2040.2	100-yr SCS	2.53	286.50	286.77	286.77	286.86	0.021824	1.32	1.92	11.00	1.01
B-1-3	2040.2	Regional	4.43	286.50	286.86	286.86	286.97	0.019766	1.47	3.02	13.62	1.00
B-1-3	2020.11	2-yr SCS	0.44	286.25	286.34	286.32	286.35	0.012920	0.58	0.76	10.10	0.67
B-1-3	2020.11	100-yr SCS	2.53	286.25	286.79		286.80	0.000431	0.30	8.40	23.15	0.16
B-1-3	2020.11	Regional	4.43	286.25	286.88		286.88	0.000734	0.42	10.45	25.70	0.21
B-1-3	2000	2-yr SCS	0.44	285.75	285.86	285.86	285.90	0.049707	0.94	0.46	8.12	1.26
B-1-3	2000	100-yr SCS	2.53	285.75	286.79		286.79	0.000016	0.10	27.48	42.55	0.04
B-1-3	2000	Regional	4.43	285.75	286.88		286.88	0.000035	0.16	31.21	44.70	0.05
B-1	1223.86	2-yr SCS	0.61	285.25	285.38	285.38	285.43	0.025719	1.00	0.61	6.03	1.00
B-1	1223.86	100-yr SCS	3.55	285.25	286.79		286.79	0.000021	0.12	30.25	36.59	0.04
B-1	1223.86	Regional	6.21	285.25	286.88		286.88	0.000046	0.19	33.49	39.39	0.06
B-1	1187.03	2-yr SCS	0.61	284.75	285.19		285.19	0.000099	0.13	4.80	15.95	0.07
B-1	1187.03	100-yr SCS	3.55	284.75	286.79		286.79	0.000004	0.08	50.73	40.56	0.02
B-1	1187.03	Regional	6.21	284.75	286.88		286.88	0.000010	0.13	54.25	41.80	0.03
B-1	1155.57	2-yr SCS	0.61	284.25	285.19		285.19	0.000009	0.06	10.57	19.42	0.03
B-1	1155.57	100-yr SCS	3.55	284.25	286.79		286.79	0.000002	0.07	65.98	47.67	0.01
B-1	1155.57	Regional	6.21	284.25	286.88		286.88	0.000005	0.11	70.11	48.93	0.02
B-1	1139.95	2-yr SCS	0.61	285.00	285.11	285.11	285.17	0.025085	1.07	0.57	9.02	1.01
B-1	1139.95	100-yr SCS	3.55	285.00	286.79	285.38	286.79	0.000003	0.07	71.21	77.77	0.02
B-1	1139.95	Regional	6.21	285.00	286.88	285.54	286.88	0.000008	0.11	77.85	77.77	0.03
B-1	1125.93		Culvert									
B-1	1111.56	2-yr SCS	0.61	283.75	284.04	284.03	284.09	0.017306	0.95	0.64	13.28	0.85
B-1	1111.56	100-yr SCS	3.55	283.75	284.29	284.29	284.47	0.017223	1.93	1.84	18.62	1.01
B-1	1111.56	Regional	6.21	283.75	284.46	284.46	284.73	0.014845	2.30	2.70	24.81	1.00
B-1	1089.35	2-yr SCS	0.61	283.25	283.35	283.35	283.39	0.033061	0.96	0.63	7.95	1.09
B-1	1089.35	100-yr SCS	3.55	283.25	283.53	283.53	283.63	0.020639	1.38	2.58	13.25	1.00
B-1	1089.35	Regional	6.21	283.25	283.63	283.63	283.75	0.018997	1.57	3.96	15.72	1.00
B-1	1065.75	2-yr SCS	0.61	282.75	282.88		282.91	0.013845	0.74	0.83	8.06	0.73
B-1	1065.75	100-yr SCS	3.55	282.75	283.06	283.04	283.15	0.016561	1.33	2.68	12.33	0.91
B-1	1065.75	Regional	6.21	282.75	283.16	283.14	283.28	0.016720	1.56	3.97	14.41	0.95
B-1	1045.46	2-yr SCS	0.61	282.25	282.38	282.38	282.43	0.026463	0.98	0.62	6.47	1.00
B-1	1045.46	100-yr SCS	3.55	282.25	282.58	282.58	282.69	0.020000	1.46	2.43	11.10	1.00
B-1	1045.46	Regional	6.21	282.25	282.69	282.69	282.83	0.018703	1.67	3.72	13.24	1.01
B-1	1023.2	2-yr SCS	0.61	281.25	281.39	281.38	281.43	0.022834	0.89	0.69	7.31	0.93
B-1	1023.2	100-yr SCS	3.55	281.25	281.57	281.57	281.65	0.015351	1.32	3.09	20.02	0.88
B-1	1023.2	Regional	6.21	281.25	281.65	281.65	281.76	0.015107	1.59	4.72	21.96	0.92
B-1	1000.00	2-yr SCS	0.61	280.75	280.83	280.82	280.85	0.020005	0.65	0.94	14.65	0.82
B-1	1000.00	100-yr SCS	3.55	280.75	280.95	280.94	281.01	0.020010	1.11	3.19	22.03	0.93
B-1	1000.00	Regional	6.21	280.75	281.01	281.01	281.10	0.020007	1.31	4.73	25.57	0.97