J·R ENGINEERING

To: **El Paso County Engineering Division**

From: **Mike Bramlett, PE**

Date: **November 25, 2020**

Subject: Sand Creek Center Tributary Channel Improvements

JR is working with Bristlecone Ecology to address 404 permitting requirements and will address cd and report comments once corps permit has been applied for and initial corps response received.
There are no wetlands in the reach but the reach is considered waters of the Us.
Initial Corps direction is to apply for a Nationwide permit. MB 3-17-21

The purpose of this letter is to provide design information for the existing conditions of the Sand Creek Center Tributary Drainageway, located east of the Solace Apartments site. This letter will also discuss the proposed improvements for the channel, design methodology, and the modeling results. For further information on the previous evaluation of the channel in its existing conditions and conceptual design, see the *Sand Creek – Center Tributary Channel Analyses Report for Solace Apartments* by JR Engineering. For further information concerning drainage for the Solace Apartments Site, see the *Final Drainage Report for Solace Apartments*, by JR Engineering.

Project General Discussion

The Sand Creek Center Tributary Channel is located in Section 7, Township 14 South, Range 65 West of the 6th Principal Meridian in El Paso County, Colorado. The site is part of the Solace Apartments project and is located on the eastern edge of the project. As part of the proposed improvements for the Solace Apartments Project, this reach of the Sand Creek Center Tributary will also be improved. The sections upstream and downstream of the site have already undergone improvements, and the channel in its current state shows extensive flooding in a 100 year event. In addition to improvements to the Sand Creek Center Tributary Channel, the channels secondary drainageway located to the west of the channel in Paonia Street will also be improved with an overflow channel that will direct flow present in the secondary drainageway into the main channel and avoid further flooding of the Paonia Street extension into the Solace Apartments site.

Please state where this convergence occurs.

Channel Flows

Evaluation of the flows present in the Sand Creek Center Tributary and its secondary drainageway were discussed in detail in the *Sand Creek – Center Tributary Channel Analysis for Solace Apartment*s by JR Engineering. Since the initial analysis of the channel took place, JR Engineering was able to acquire the modeling data used by FEMA for determination of flood plain modeling shown in FEMA FIRM 08041C0752G. JR Engineering assumes FEMA's flows to be accurate, and thus utilized these as the basis for our model. The main channel contains 820 cfs of flow and the secondary channel contains 217 cfs. The flow in the main channel then jumps up to 1,037 cfs at the convergence of the secondary drainageway. Downstream an existing channel coming from nearby Valley Road (east) converges with the main channel, we then utilized FEMA's 1,100 cfs to model the remaining portion of the channel.

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Colorado Springs, CO 80907
303-740-9393 • Fax: 303-721-9019
www.jrengineering.com

Existing Channel Conditions

In its existing conditions the Sand Creek Center Tributary Channel along the Solace site consists of a natural channel overgrown with trees and bushes along the sides of the channel with the bottom being relatively clean and free of obstacles. The 1,350 LF reach of the Sand Creek Center Tributary Channel located incorporated with the Solace site is undeveloped, as compared to the majority of channels in the basin which have had some improvement. Downstream and upstream sections of the Sand Creek Center Tributary Channel are concrete lined. The secondary Drainageway located in Paonia Street flows south from Omaha Blvd to the Solace Apartments site where flow splits between an existing concrete channel running east to the main Sand Creek Center Tributary Channel, and a swale flowing south where it eventually rejoins the main channel at the Galley Road crossing. It is anticipated that the concrete channel will divert 42 cfs from the 217cfs present in the secondary drainageway, with 175 cfs flowing south down the existing swale. There is also an existing channel coming from Valley Road to the east. This channel intersects the main channel approximate halfway between the north and south limits of the site, adding 63 cfs to the main channel, as discussed in the Channel Flows section above. In its existing conditions, the Sand Creek Center Tributary Channel FEMA firm panel 08041C0752G, depicts 100 year flooding extending into the adjacent properties to the east and onto Paonia Street improvements to the west. The existing channel currently overtops the Galley Road crossing; primarily due to the capacity of the culverts at the crossing rather than the channel's current conditions.

Proposed Channel Improvements

As determined by the Sand Creek Drainage Basin Planning Study (DBPS) & and JR Engineering Sand Creek – Center Tributary Channel Analysis for Solace Apartments, this section of the Sand Creek Center Tributary will require improvements to ensure adequate capacity in the channel and protection against erosive velocities. In order to be consistent with improvements already made in the surrounding area and to align with the recommendations made by the DBPS, JR Engineering is proposing concrete lining of the channel along the Solace site, along with widening of the existing channel and modification to the channel alignment in this area. JR Engineering is also proposing the addition of a USBR Type III Stilling Basin and 10 foot sloped concrete drop in the channel, in order to force a hydraulic jump in the channel and reduce velocities present in the channel while still matching existing grades for the majority of channel alignment. The design methodology of the sloped drop and USBR Type III Stilling Basin are based on the design procedure for Stilling Basins presented in the Federal Highway Administrations Hydraulic Engineering Circular No. 14, Chapter 8. Calculation for stilling basin and accessories sizing can be found in the Appendix of this letter. The proposed channel section shall be a trapezoidal channel section with a 10' bottom width, with a minimum channel depth of 6.5' and side slopes varying from 3:1 to 2:1 along the channel's alignment. The channel shall be lined with concrete for a depth of 4.5' to protect the channel from the erosive velocities present in the channel, with an average depth of flow in a 100 year event for the proposed channel being approximately 3' this will provide a freeboard of 1'-1.5' from the top of the concrete lining to the 100 year water surface. The concrete section shall typically be a 6" thick concrete apron for the channel, with sections of the section of channel located within the sloped drop and stilling basin being a 12" thick concrete apron. In accordance with the DBPS the channel shall be designed with a stable slope of 1% for the majority of the channel. For further details please see the Channel Improvement Plans included in the Appendix of this letter. In order to reduce the velocities present in the

State what the criteria indicates is needed for freeboard (refer to DCMV1_Section 10.5.5)and whether the provided freeboard meets the criteria.

channel and avoid excessively steep slopes for extended portions of the channel's alignment, a 100' long sloped drop structure, with a total vertical drop of 10', will be placed at the upstream end of the channel. At the base of the drop will be a USBR Type III Stilling Basin that will include chute blocks, baffle blocks and a sill wall to decrease the velocity of the water coming down the sloped drop and force a hydraulic jump. This basin will also include a low flow channel through the sill wall located at the end of the stilling basin to allow water movement through the structure at lower flows and prevent ponding of water in the stilling basin. Further details of the sloped drop and stilling basin can be found in the channel improvement plans shown in the Appendix.

Please discuss how the overflow along the existing Paonia street will be diverted to the this overflow channel. Additionally, Please indicate the bypass flow that will enter the two inlets. Does the roadway have the capacity for this bypass flow? Please address.

Paonia Street Secondary Drainageway Improvements

Part of the Sand Creek Center Tributary Improvements also includes the addition of a diversion channel that will direct flows present in the Paonia Street Secondary Drainageway into the main channel. This diversion will be known as the Overflow Channel for the remainder of this letter. The Overflow Channel shall be a concrete and riprapped lined channel with varying widths and depths that will convey the flows present in Paonia Street into the main channel. The diversion channel shall be concrete from the edge of Paonia to the right-of-way, after which it will become a riprap trapezoidal channel section with a typical bottom width of 20' and a depth of 2'-3'. The channel will run east from Paonia until it intersects with the proposed Sand Creek Center Tributary Channel alignment, where it will outfall just upstream of the proposed sloped drop in the channel. Just south of the diversion channel opening along Paonia Street will be two 15'type R inlets, that will be used to capture nuisance flows in the curb & gutter and also any flow that may bypass the diversion channel. These inlets will directly outfall into the main channel and will not be detained by any of the onsite detention ponds. For further detail on the diversion channel please see the channel improvement plans, and for detail on the type R inlets see the exert of the Solace Construction Drawings, both shown in the Appendix of this letter.

Modeling Results

The proposed conditions of the channel and its second Drainageway were modeled using GeoHecRas to determine the extents of the 100 year floodplain for the site. Flow rates from the model were used based on those discussed in the Channel Flows section and Existing Conditions section of this letter. The model was run with downstream boundary conditions for each reach using critical depths, and the entirety of the model was ran using steady flow conditions. The model was contains four separate reaches, with the main reach modeling the proposed alignment and conditions for the Sand Creek Center Tributary Channel. The other reaches modeling the Paonia Street Overflow Channel, the existing concrete overflow channel at Paonia and an existing channel that runs east to west from Valley Street and intersects the Sand Creek Center Tributary Channel, each reach intersection were modeled using the energy equation. The model used manning's values (n) of 0.013 for the concrete lining, 0.033 for the riprap of the overflow channel, and 0.03 for the any location outside of the concrete or riprap extents as they were determined to be most similar to a grassed area with some weeds. The results of the GeoHecRas model show that the proposed improvements to the channel substantially reduce the extents of the flood plain in the channel and contain the 100 year flood plain within the concrete extents of the channel. The results also show a maximum velocity in the channel of 10.32 ft/s in a 100 year event, showing that the concrete lining of the channel will provide sufficient protection from erosive velocities present in the channel. The GeoHecRas model for the proposed conditions also shows overtopping of the channel crossing at Galley Road, which is consistent with the flood data presented by the FEMA FIRM 08041C0752G. Flooding of

the roadway is due to the insufficient capacity of the culvert crossing in this area, with the current configuration of three 48" CMP culverts only providing 365 cfs of capacity of the 1,100 cfs flow at the crossing. Flooding of the Galley Road Crossing could be alleviated by upsizing of the culvert(s), these improvements will be necessary when the County deems the historic overtopping of Galley Road to be above acceptable tolerance. *The channel improvements did not results in any change to existing overtopping of Galley Road as this is due to insufficient capacity of the culverts at this crossing, which will ultimately be addressed at a later date.* Further details on the model results can be found in the Appendix.

Summary

The analysis of the proposed improvements of the Sand Creek Center Tributary Drainageway and its secondary drainageway located in Paonia Street show significant reduction of the flood plain extents, with it now being contained within the channel extents and no longer extensively flooding properties adjacent the proposed Solace Apartment Site. The proposed diversion channel also redirects flow that would otherwise flood the proposed extension of Paonia Street back into the channel, thus alleviating the risk of the roadway flooding in a 100 year event.

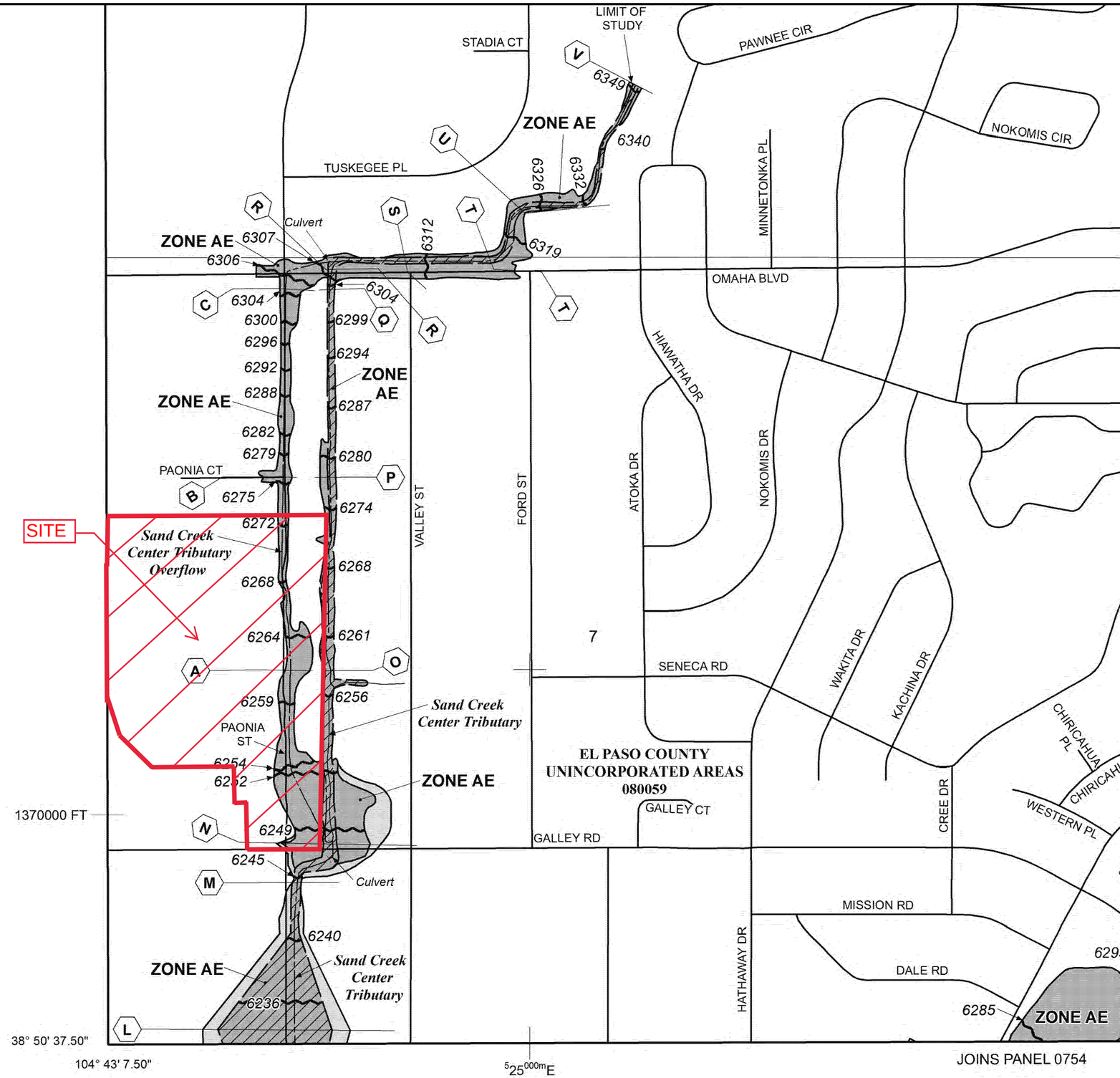
Please contact me should you have any questions or concerns regarding this letter at 303-267-6240.

Sincerely,
JR ENGINEERING, LLC

Mike Bramlett

Mike Bramlett, PE
JR Engineering

This will be discussed with my manager and/or the County Engineer as to whether any improvements to this crossing are required.



MAP SCALE 1" = 500'

0 500 1000 FEET

NFIP

PANEL 0752G

NATIONAL FLOOD INSURANCE PROGRAM

FIRM

FLOOD INSURANCE RATE MAP

EL PASO COUNTY, COLORADO

AND INCORPORATED AREAS

PANEL 752 OF 1300

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
COLORADO SPRINGS, CITY OF	080060	0752	G
EL PASO COUNTY	080059	0752	G

Notice to User: The **Map Number** shown below should be used when placing map orders; the **Community Number** shown above should be used on insurance applications for the subject community.

MAP NUMBER
08041C0752G

MAP REVISED
DECEMBER 7, 2018

Federal Emergency Management Agency

This is an official copy of a portion of the above referenced flood map. It was extracted using F-MIT On-Line. This map does not reflect changes or amendments which may have been made subsequent to the date on the title block. For the latest product information about National Flood Insurance Program flood maps check the FEMA Flood Map Store at www.msc.fema.gov

USBR Type III Drop and Stilling Basin

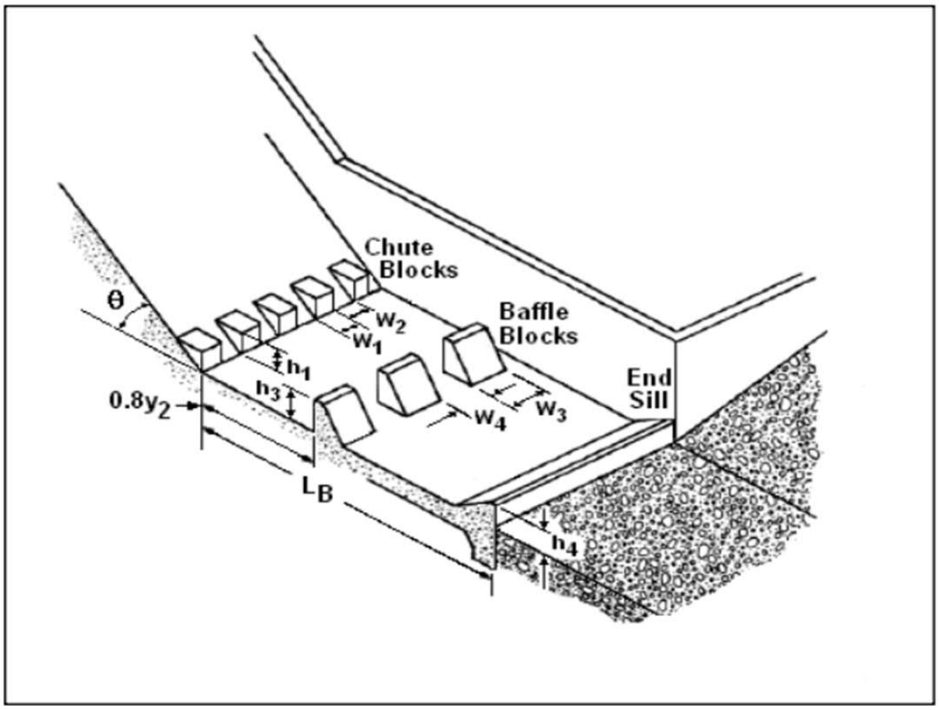
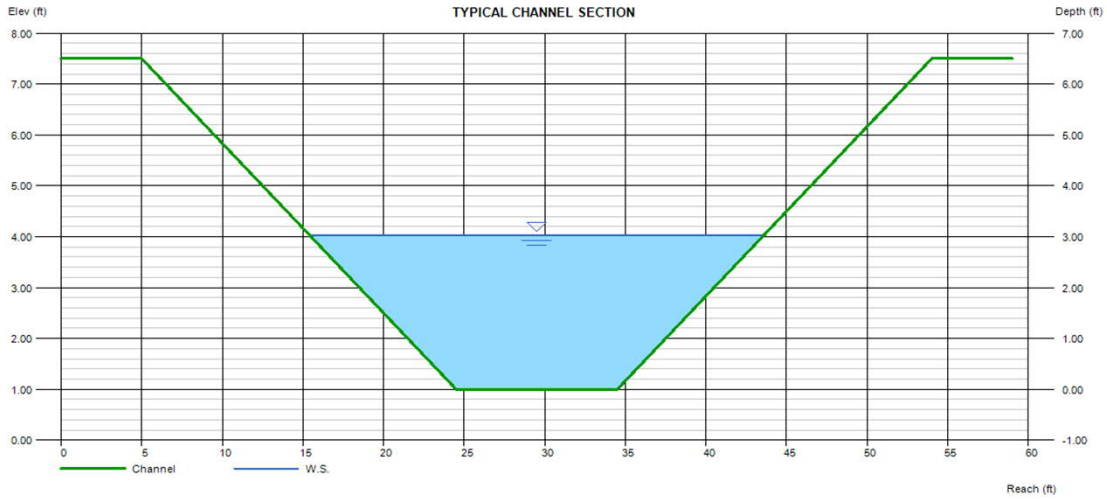


Figure 8.3. USBR Type III Stilling Basin

Design of Energy Dissipators for Culverts and Channels

Upstream Channel Parameters		
Channel Flow (Q)	1037	cfs
Channel Bottom Width	10	ft
Sill Slopes (Z:1)	1	
Channel Total Depth	6.5	ft
Channel Depth (y1)	3.02	ft
Drop Crest Width	35	ft
Upstream Slope	1.00%	



USBR Type III Drop and Stilling Basin (cont…)

FHWA Critieria Checks

Unit Discharge Over Crest	29.63	cfs/ft	Limit=200 cfs/ft
Transition Slope (St)	10.00%	> as Θ	5.71 °
Veloctity Entering Basin(V)	41.04	ft/s	Limit=60 ft/s
Channel Depth Entering Basin (d)	1.68	ft	
Transition Legnth (St)	120	ft	
Basin Width (Wb)	10	ft	

Basin Parameter Calculations

Froude Number entering Basin: $\frac{V}{(gd)^{1/2}}$ = 5.579879

Determine Lb/Y2 value from FHWA Table 8.2

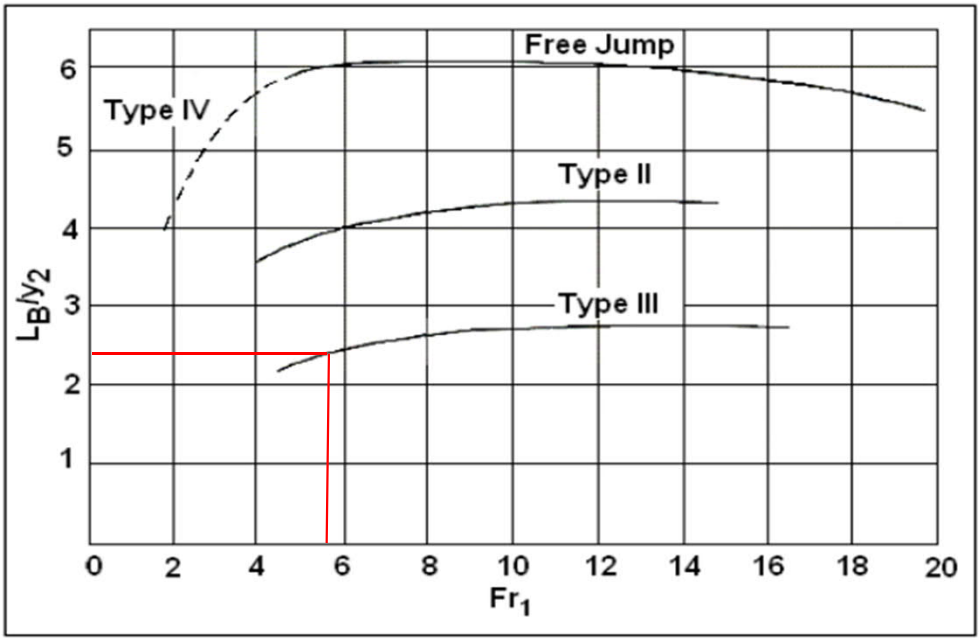


Figure 8.2. Length of Hydraulic Jump on a Horizontal Floor

Lb/Y2: 2.5 Conservative Approximation

Calculate Y2

Y2: $\frac{C * y0}{2}(\sqrt{1+8Fr}-1$ = 12.4437 ft

Length of Basin (Lb): 31.1092536 ft

Length of Basin Floor to Sill Top (Lt): $\frac{L_T(S_T - S_o) - L_b * S_o}{S_s + S_o}$ = 10.59486 ft

The details only indicate 2 chute blocks. Please revise the details and/or calcs accordingly.

USBR Type III Drop and Stilling Basin (cont…)

Basin Element Sizing

Determine Number of Chute Blocks (Nc):	$\frac{W_b}{2y_1}$	=	2.98 →3
Chute Block Width and Spacing (W1 & W2):	$\frac{W_b}{2N_c}$	=	3.333333
Baffle Block Height(h3):	$y_1(0.168 * Fr + 0.58)$		2.549265 ft
Number of Baffle Blocks (Nb)	$\frac{W_b}{1.5h_3}$	=	2.615133 →3
Baffle Width and Spacing (W3&W4)	$\frac{W_b}{2N_b}$	=	3.333333
End Sill Height (h4)	$y_1(0.0536 * Fr + 1.04)$		2.249657 ft
0.8*Y2	9.95496114 ft		

the spacing on the detail indicates 1.33'. Revise accordingly.

Only 2 baffle blocks are indicated on the detail. Revise accordingly.

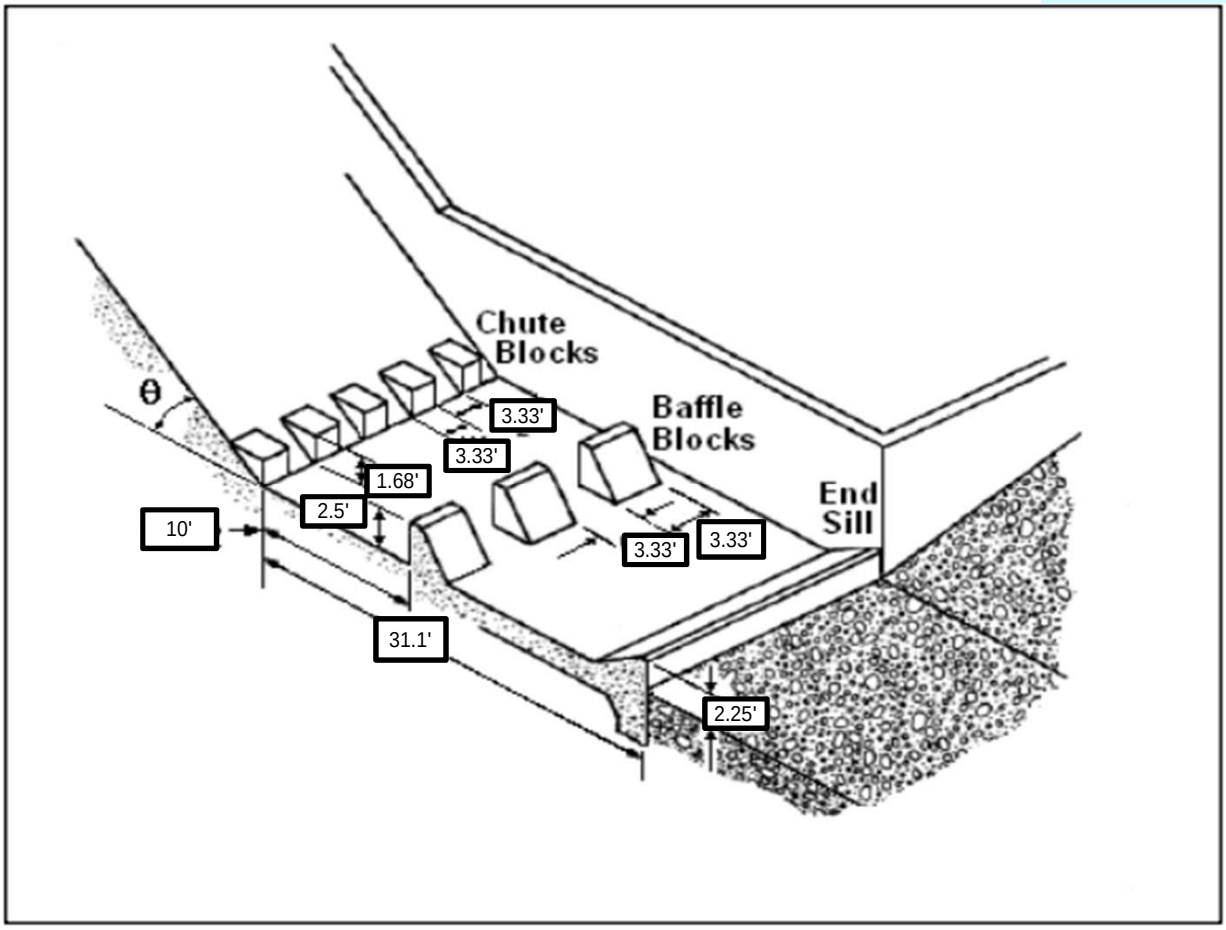
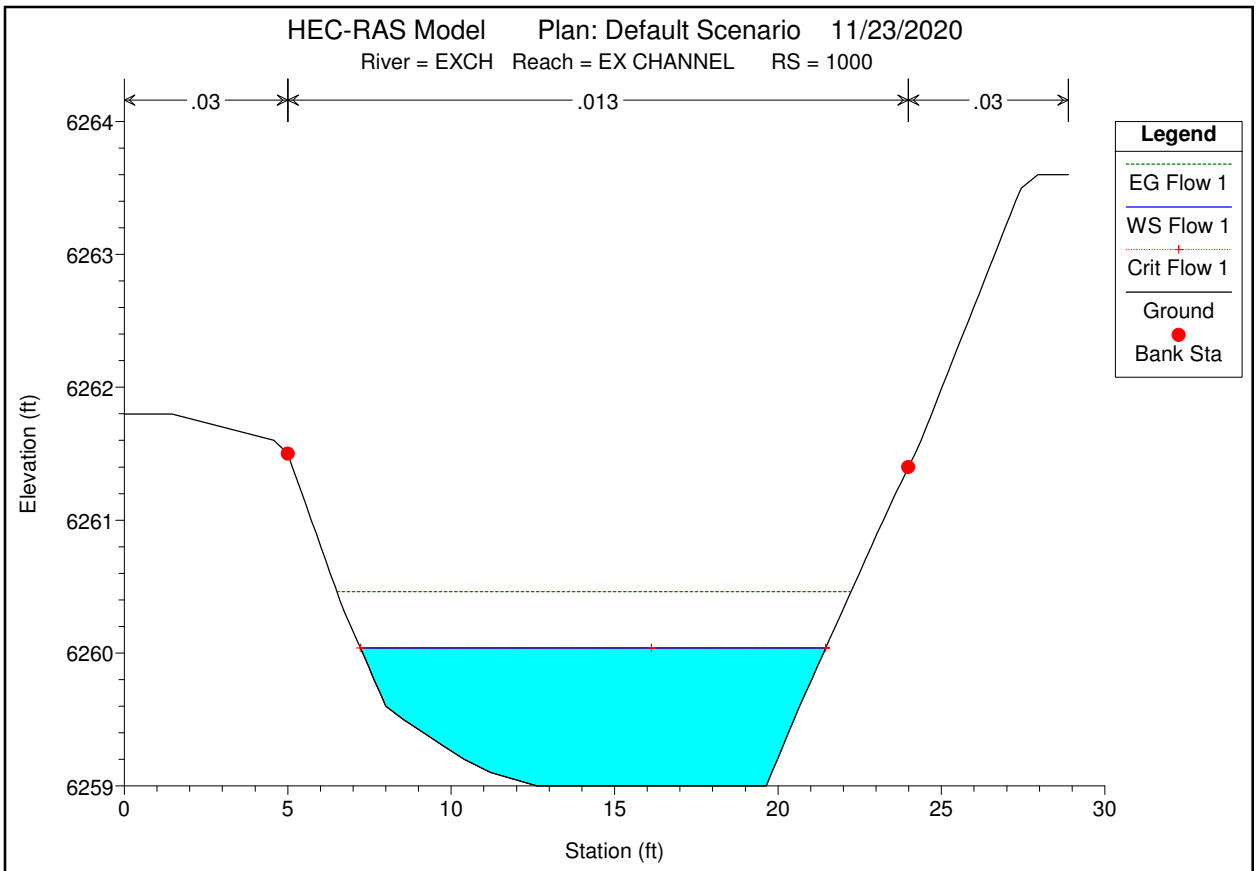
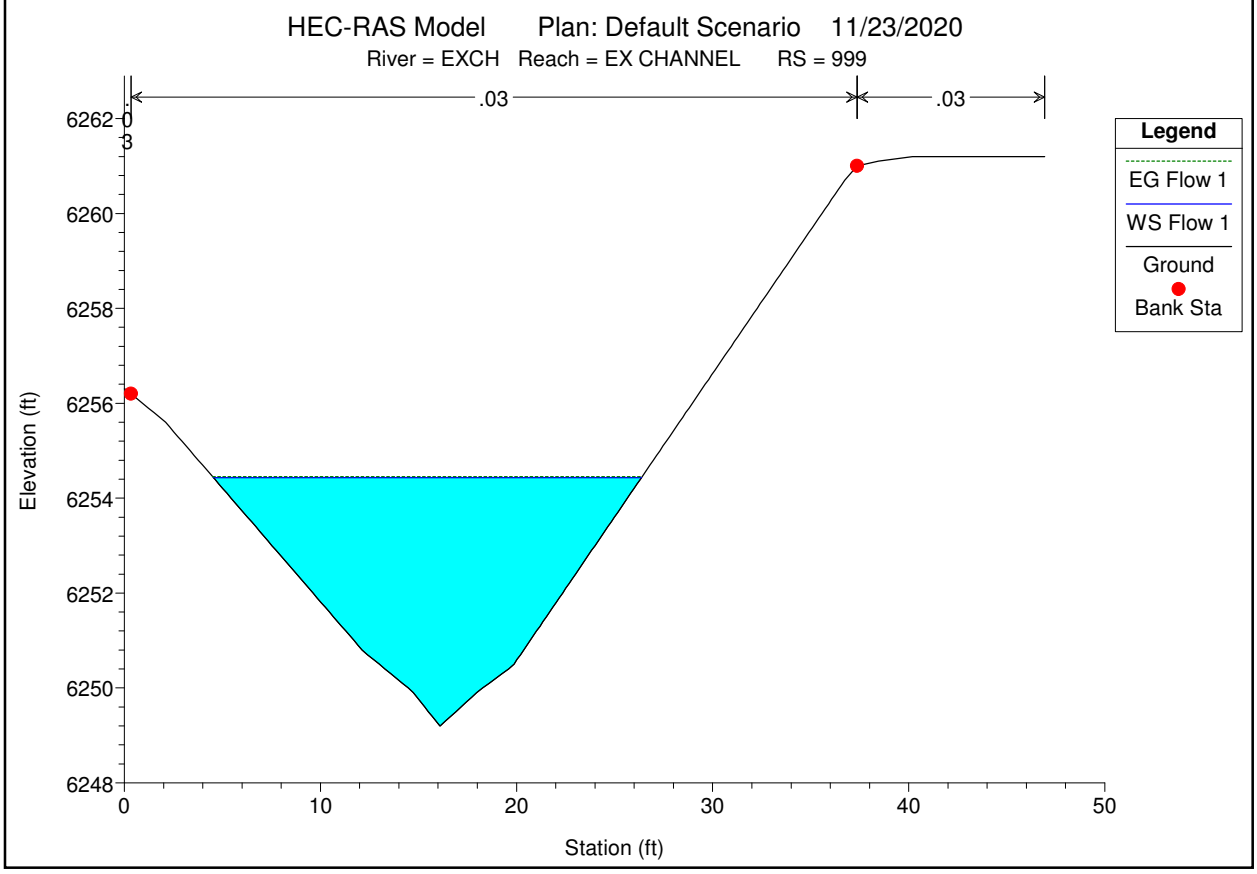
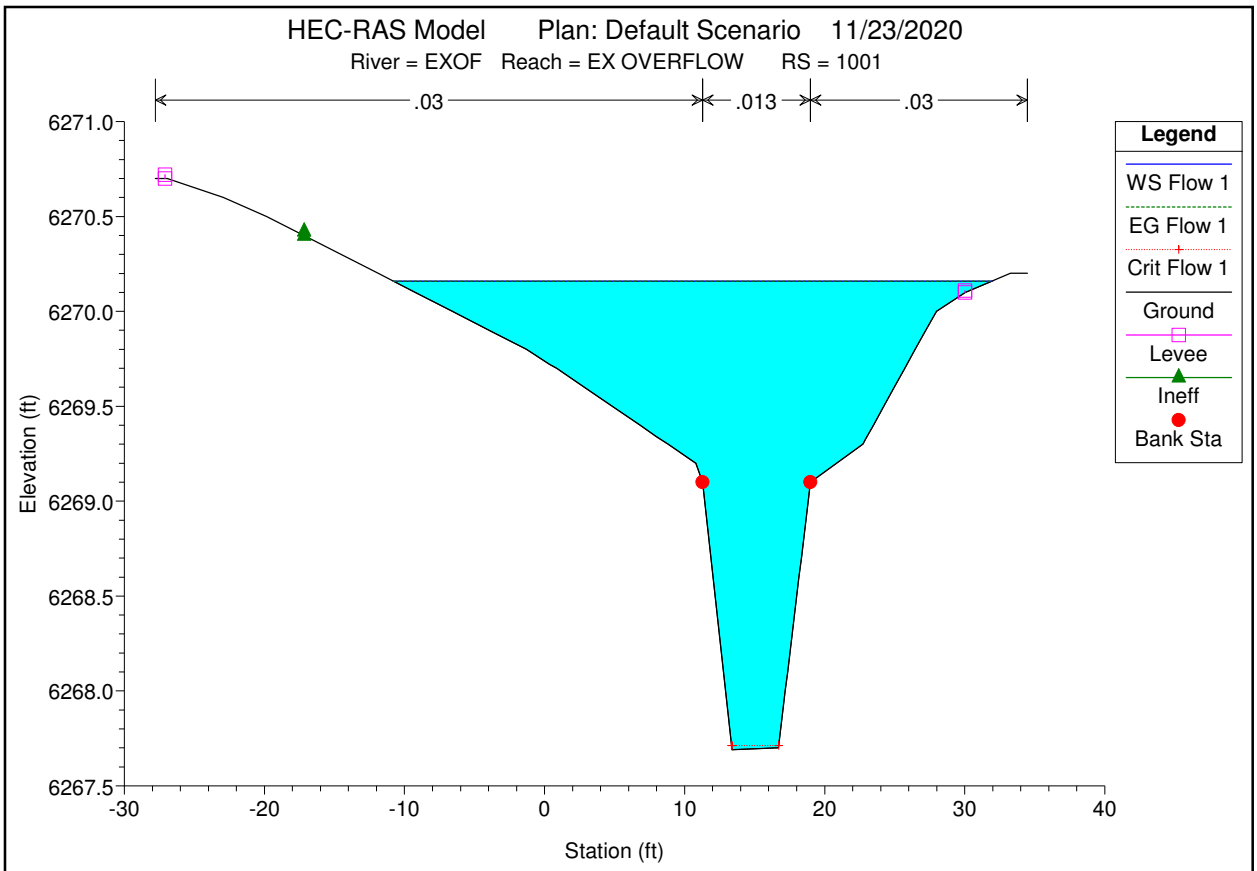


Figure 8.3. USBR Type III Stilling Basin

Please overlay the stationing used on the CD's to easily cross reference the stationing on the plans to these HEC-RAS sections.


HEC-RAS Model Plan: Default Scenario 11/23/2020
River = EXCH Reach = EX CHANNEL RS = 1000
.03
.013
.03
Legend
EG Flow 1
WS Flow 1
Crit Flow 1
Ground
Bank Sta
Elevation (ft)
6264
6263
6262
6261
6260
6259
0
5
10
15
20
25
30
Station (ft)


HEC-RAS Model Plan: Default Scenario 11/23/2020
River = EXCH Reach = EX CHANNEL RS = 999
.03
.03
Legend
EG Flow 1
WS Flow 1
Ground
Bank Sta
Elevation (ft)
6262
6260
6258
6256
6254
6252
6250
6248
0
10
20
30
40
50
Station (ft)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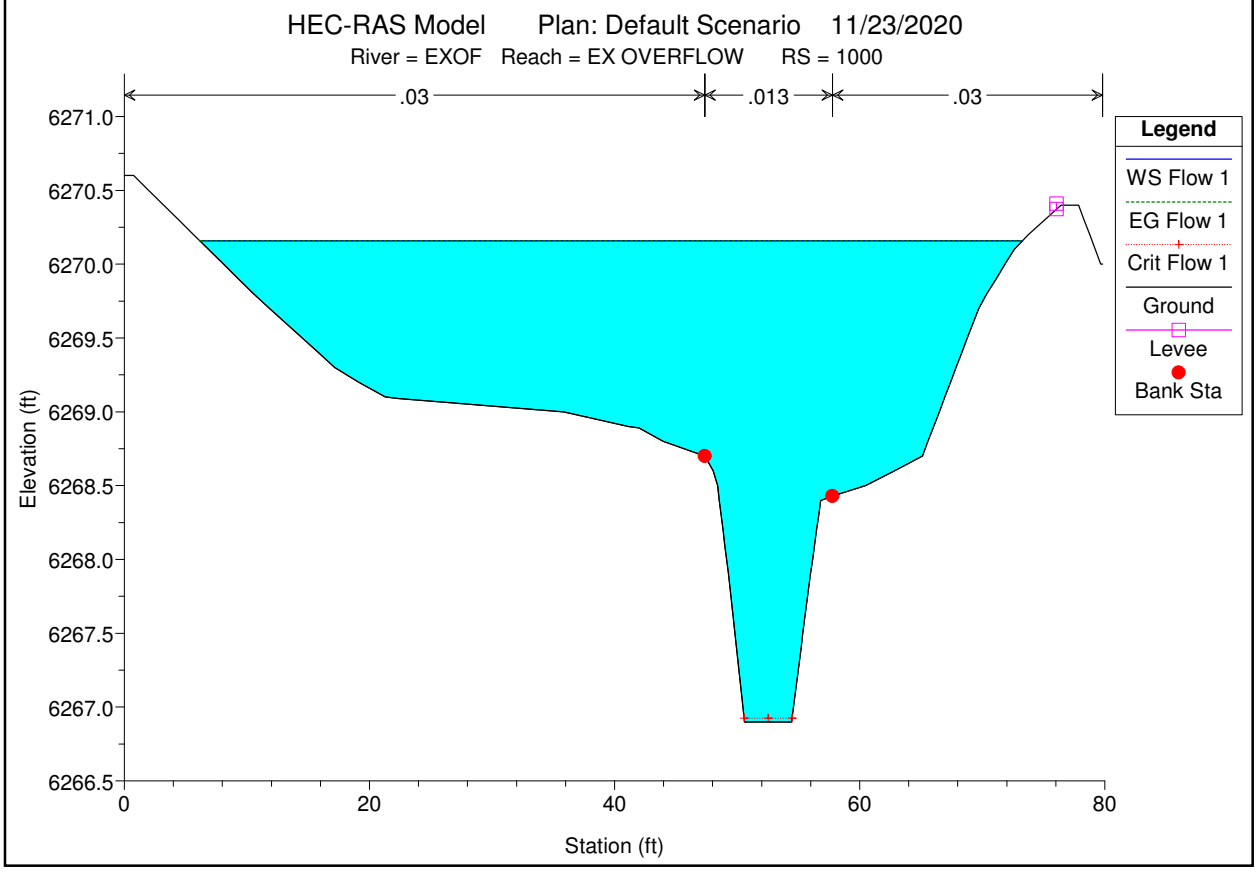
River = EXOF Reach = EX OVERFLOW RS = 1001
.03
.013
.03
Elevation (ft)
Station (ft)
Legend
WS Flow 1
EG Flow 1
Crit Flow 1
Ground
Levee
Ineff
Bank Sta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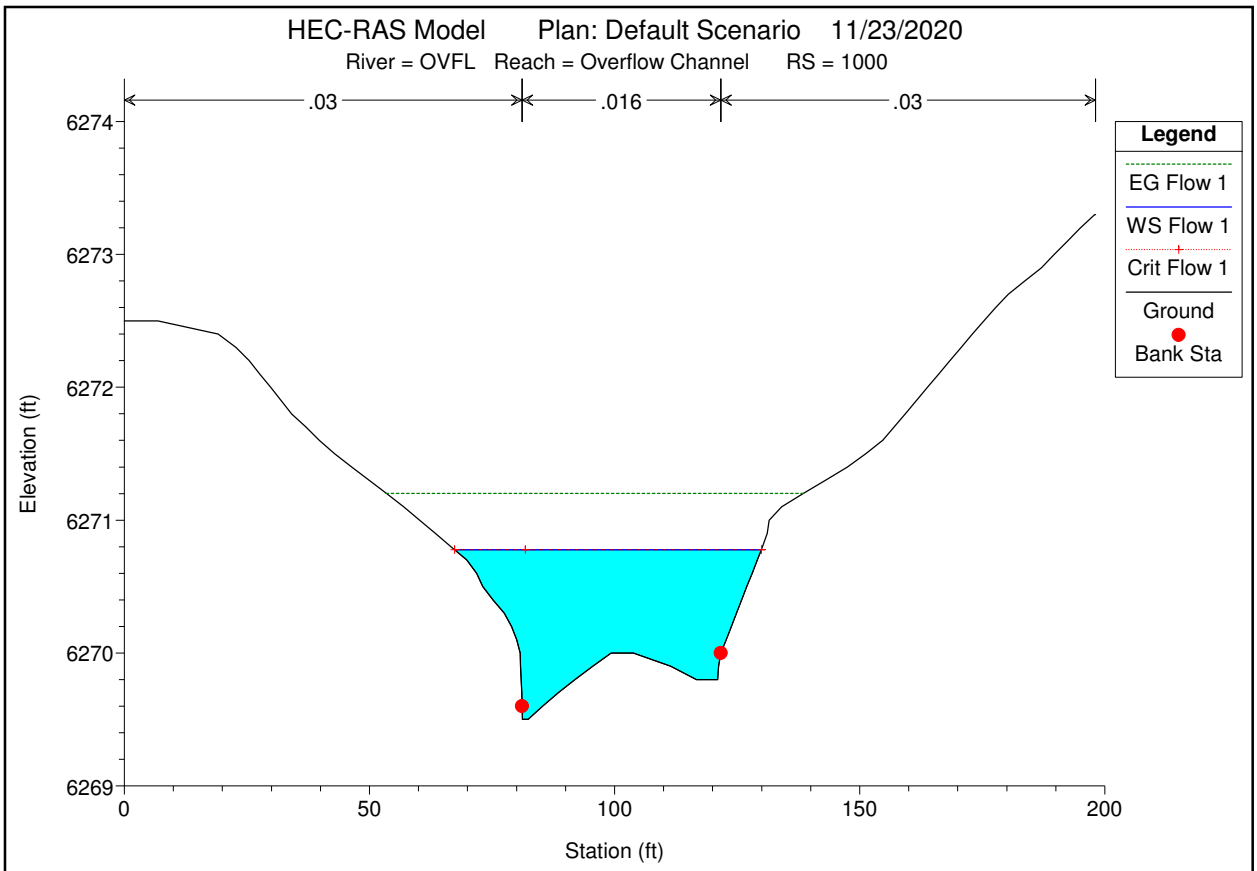
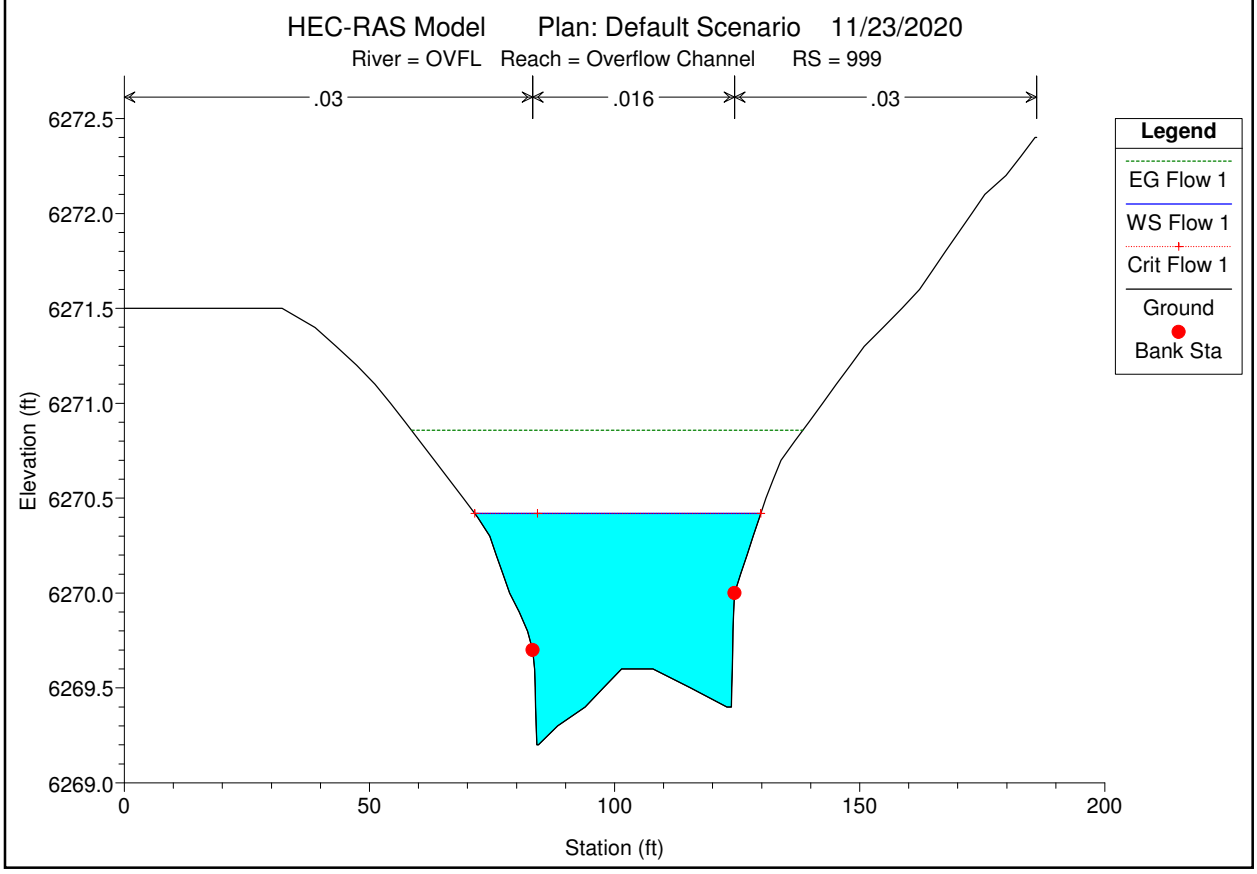
.03
.013
.03
Elevation (ft)
Station (ft)
Legend
WS Flow 1
EG Flow 1
Crit Flow 1
Ground
Levee
Bank Sta


HEC-RAS Model Plan: Default Scenario 11/23/2020
River = OVFL Reach = Overflow Channel RS = 1000
.03
.016
.03
Legend
EG Flow 1
WS Flow 1
Crit Flow 1
Ground
Bank Sta
Elevation (ft)
6274
6273
6272
6271
6270
6269
0
50
100
150
200
Station (ft)


HEC-RAS Model Plan: Default Scenario 11/23/2020
River = OVFL Reach = Overflow Channel RS = 999
.03
.016
.03
Legend
EG Flow 1
WS Flow 1
Crit Flow 1
Ground
Bank Sta
Elevation (ft)
6272.5
6272.0
6271.5
6271.0
6270.5
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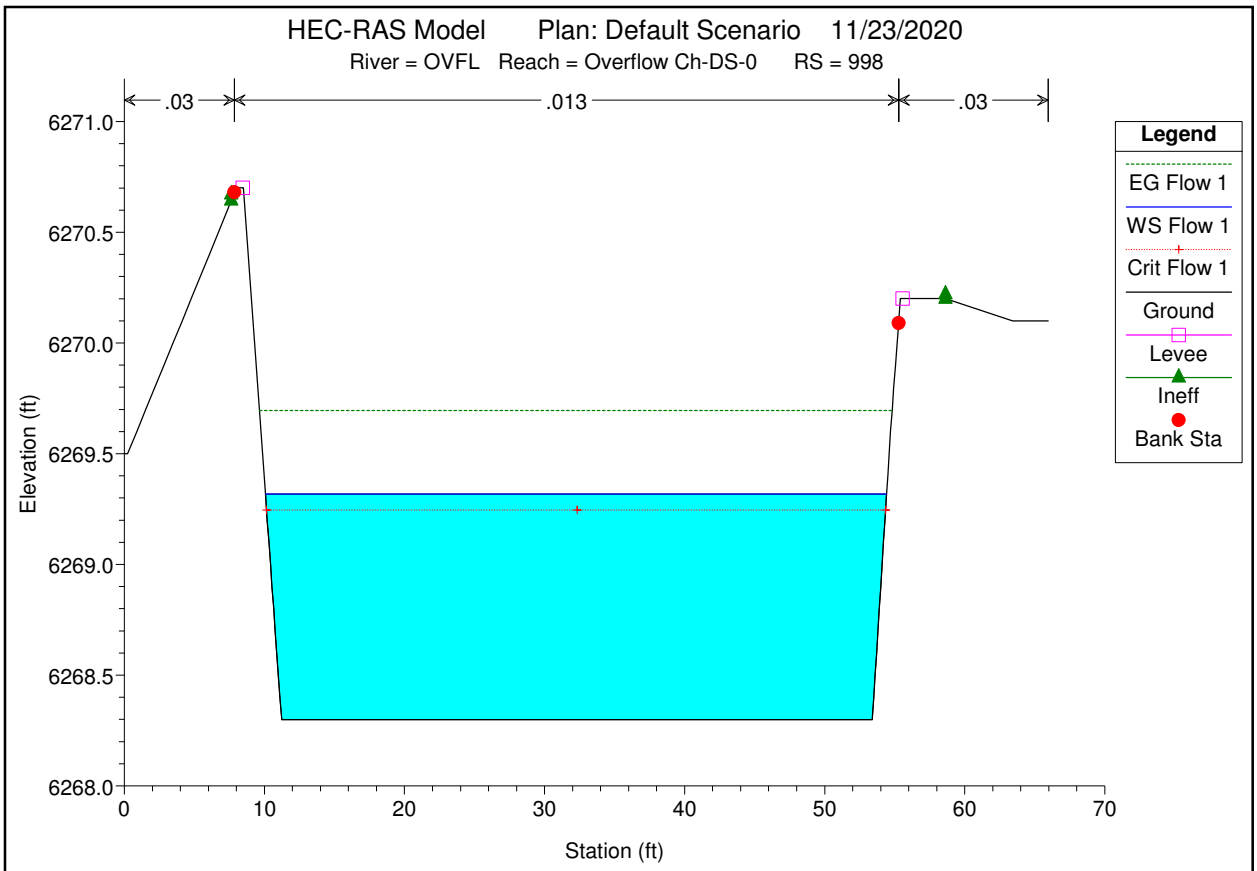
6269.5
6269.0
0
50
100
150
200
Station (ft)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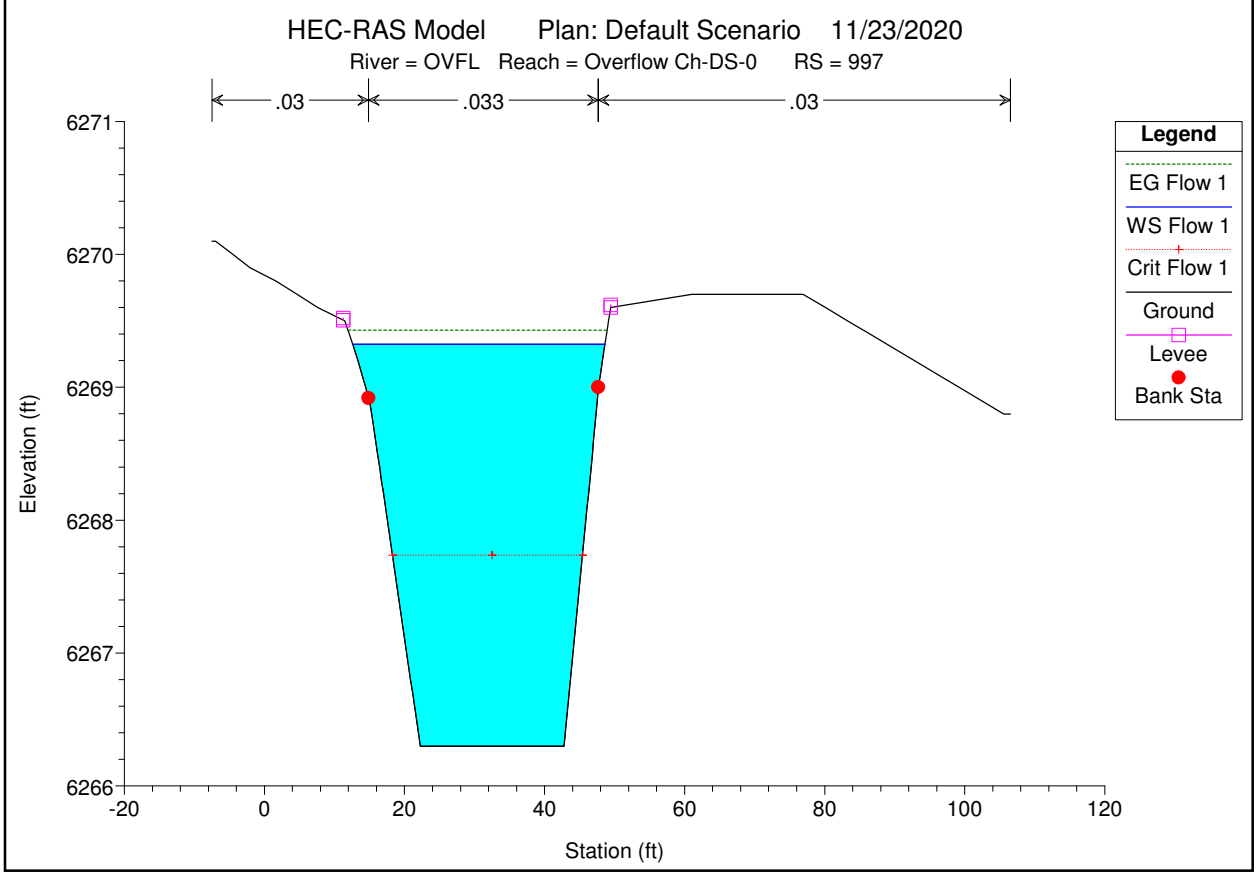
River = OVFL Reach = Overflow Ch-DS-0 RS = 998
.03
.013
.03
Elevation (ft)
Station (ft)
Legend
EG Flow 1
WS Flow 1
Crit Flow 1
Ground
Levee
Ineff
Bank Sta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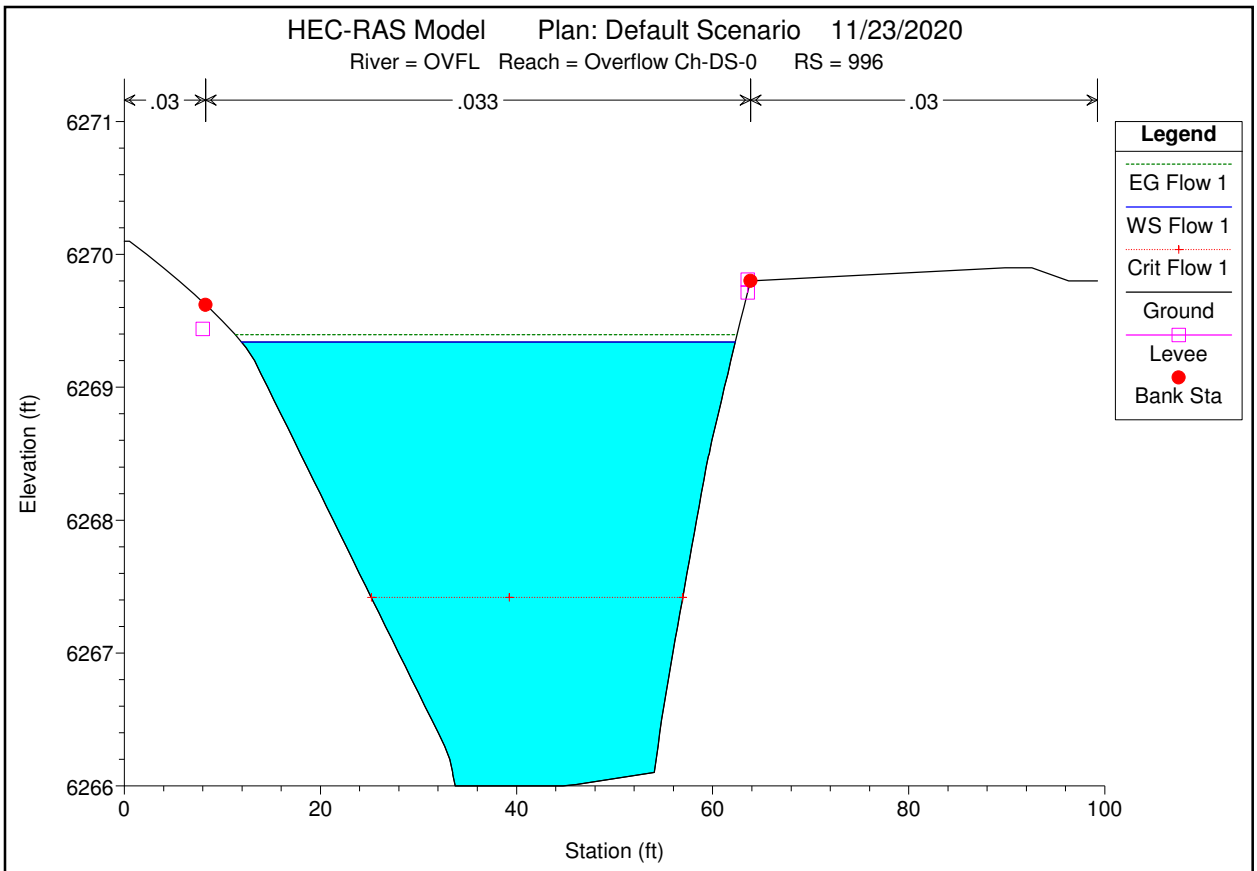
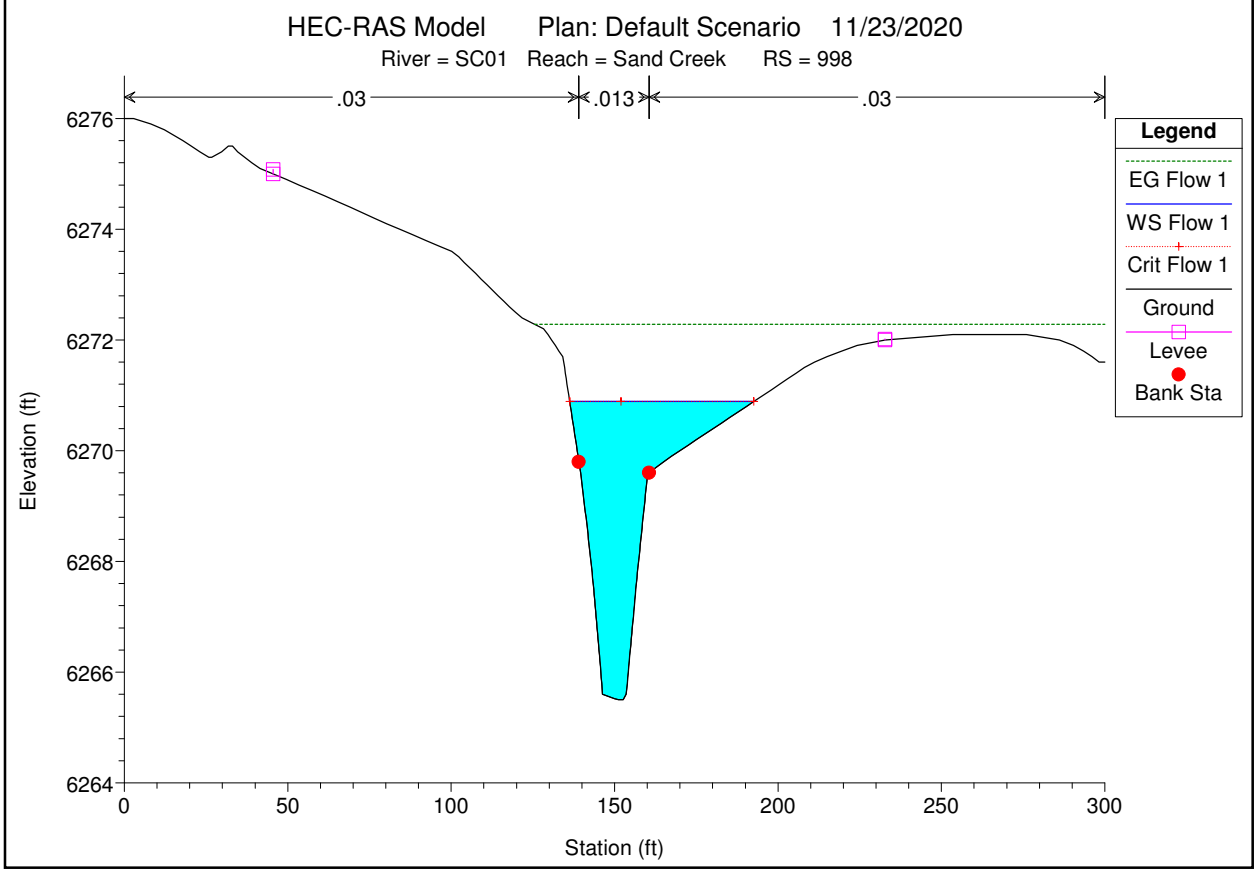
.03
.033
.03
Elevation (ft)
Station (ft)
Legend
EG Flow 1
WS Flow 1
Crit Flow 1
Ground
Levee
Bank Sta


HEC-RAS Model Plan: Default Scenario 11/23/2020
River = OVFL Reach = Overflow Ch-DS-0 RS = 996
.03
.033
.03
Legend
EG Flow 1
WS Flow 1
Crit Flow 1
Ground
Levee
Bank Sta
Elevation (ft)
6271
6270
6269
6268
6267
6266
0
20
40
60
80
100
Station (ft)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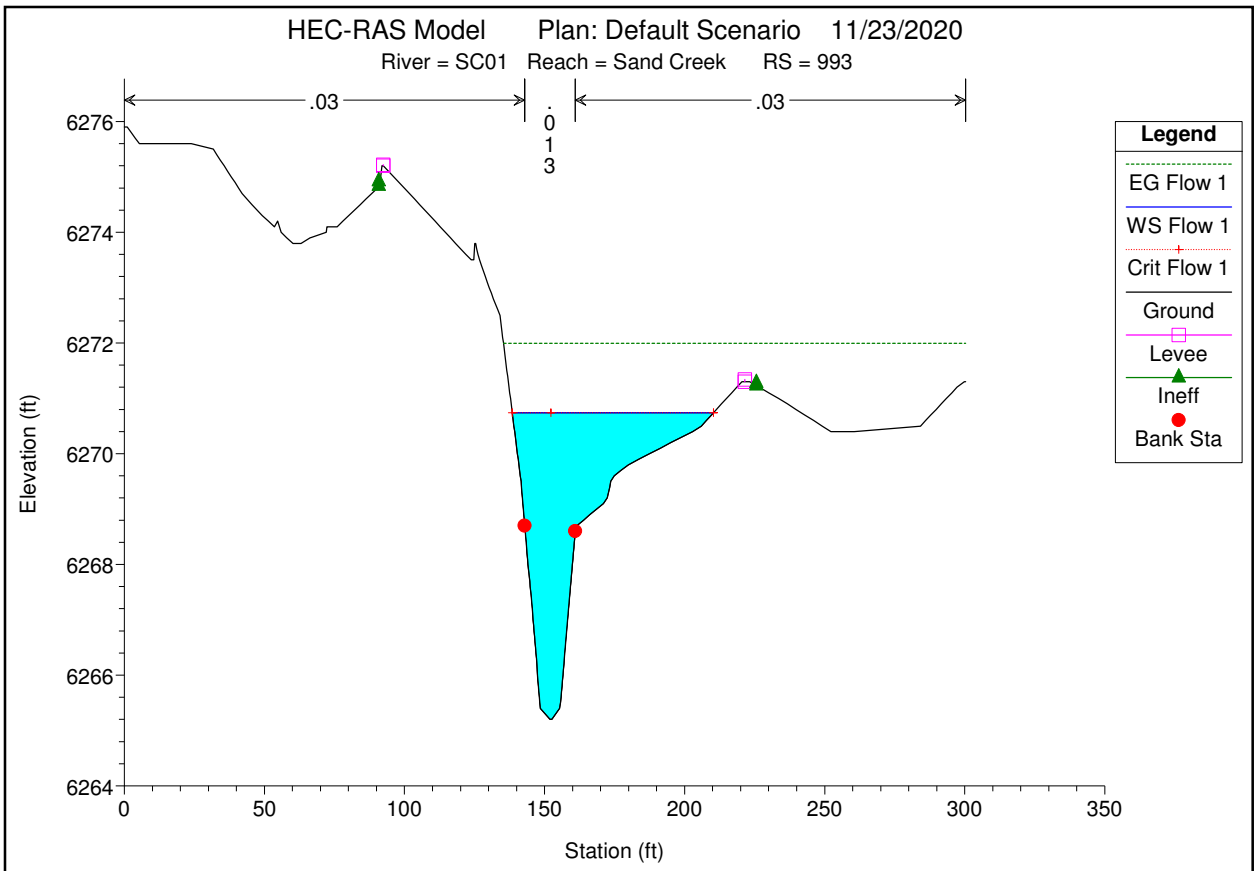
.03
.013
.03
Legend
EG Flow 1
WS Flow 1
Crit Flow 1
Ground
Levee
Bank Sta
Elevation (ft)
6276
6274
6272
6270
6268
6266
6264
0
50
100
150
200
250
300
Station (ft)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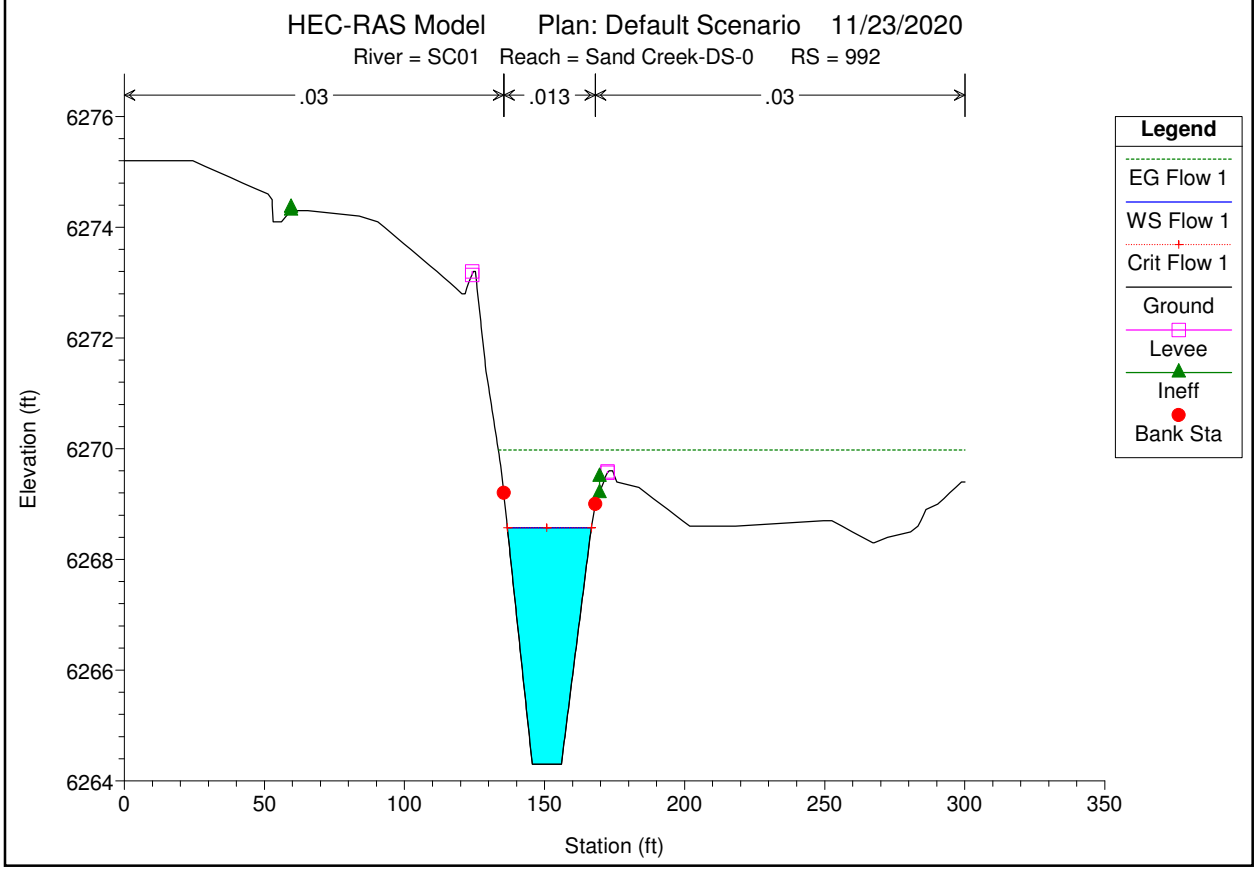
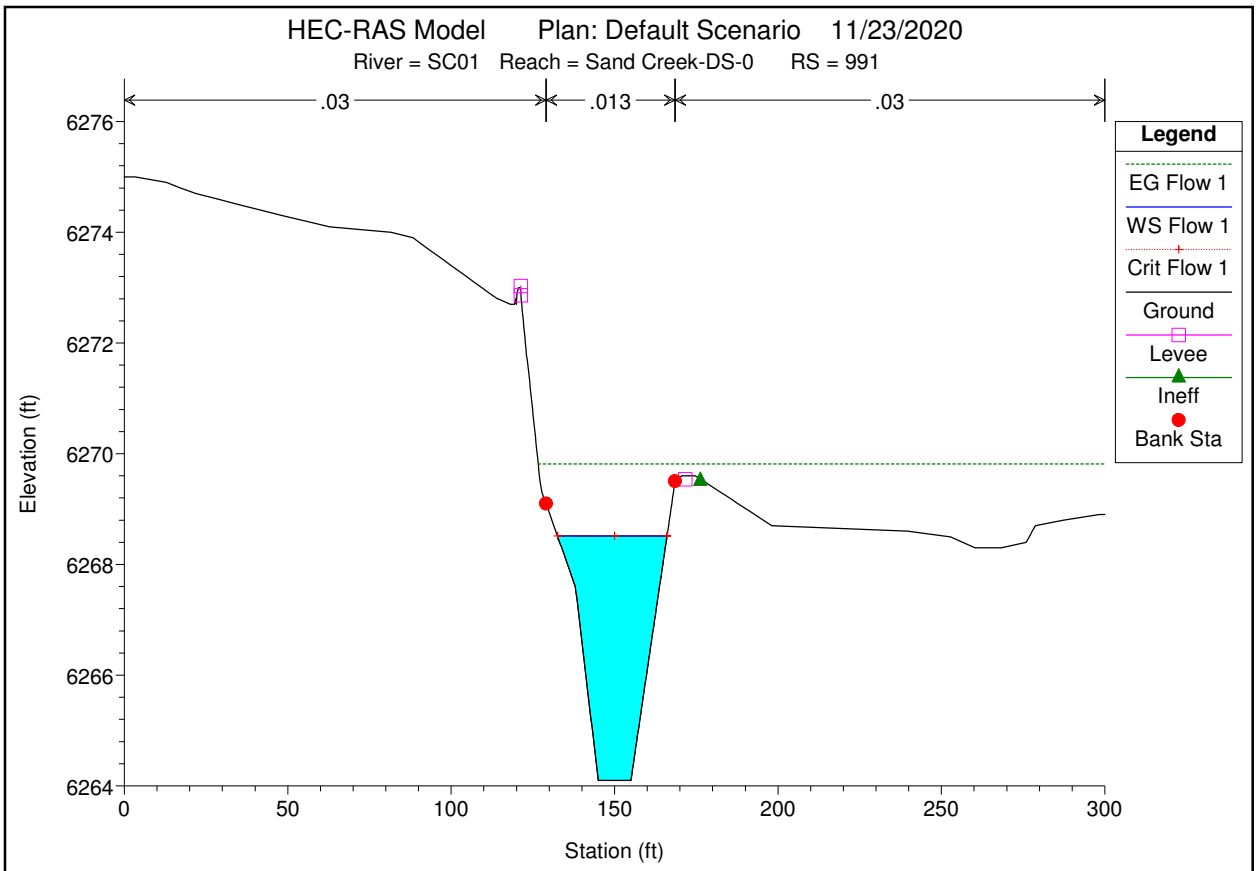
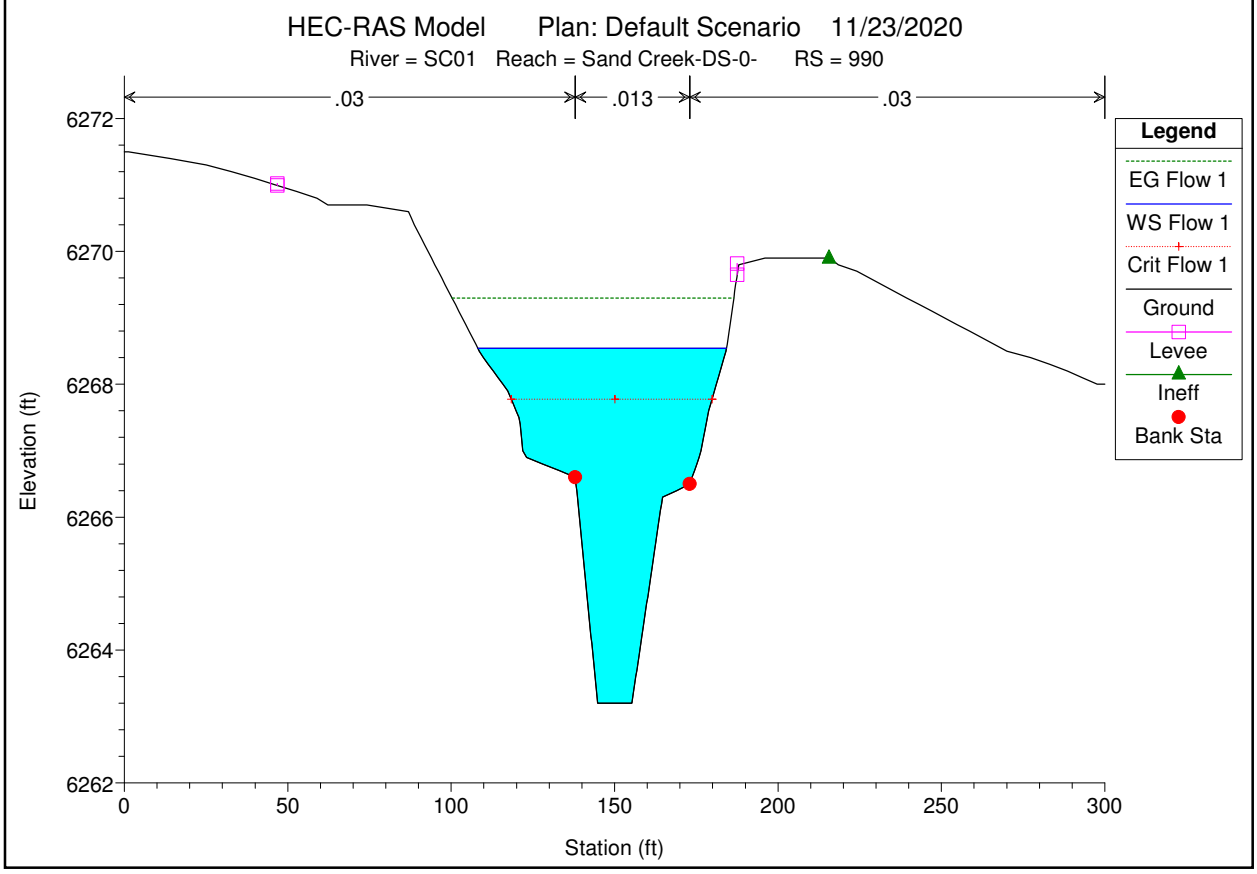
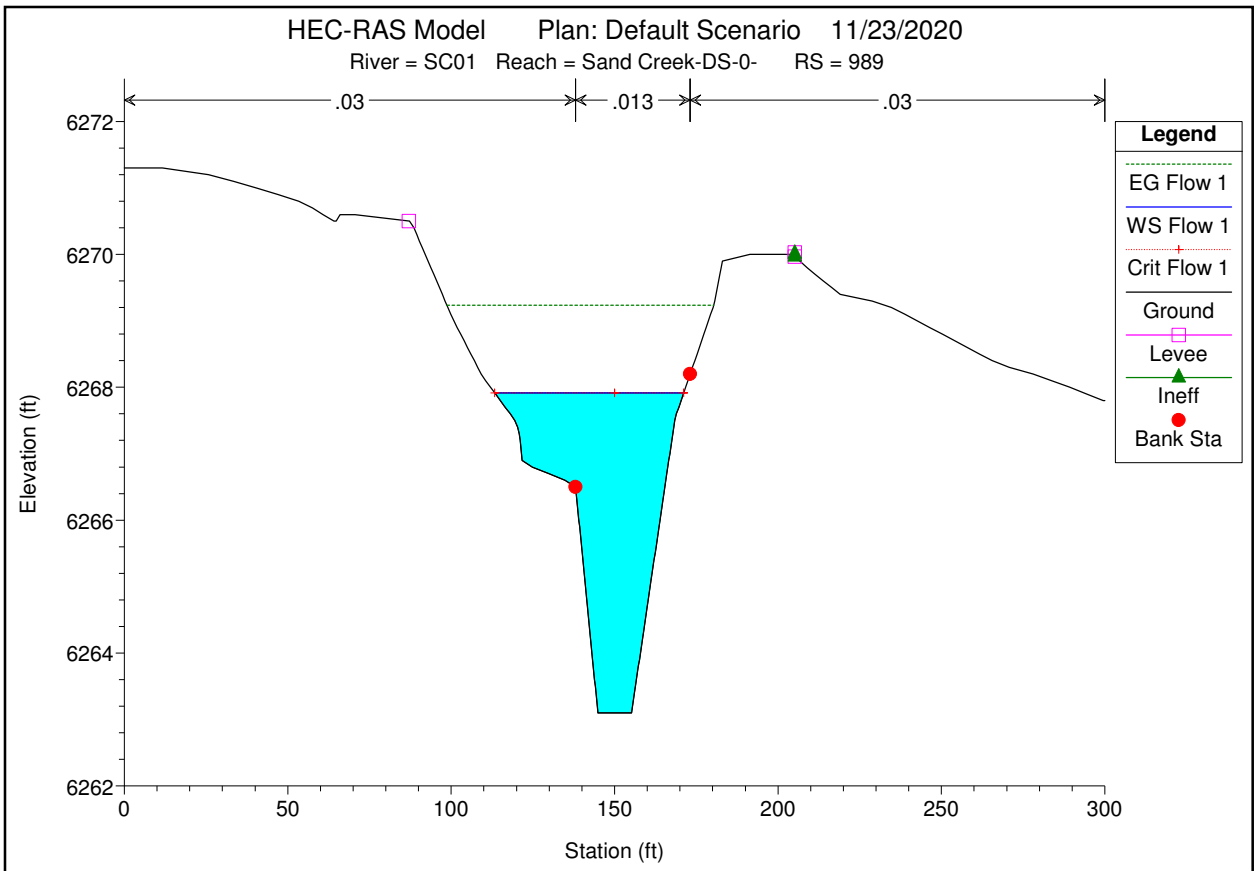
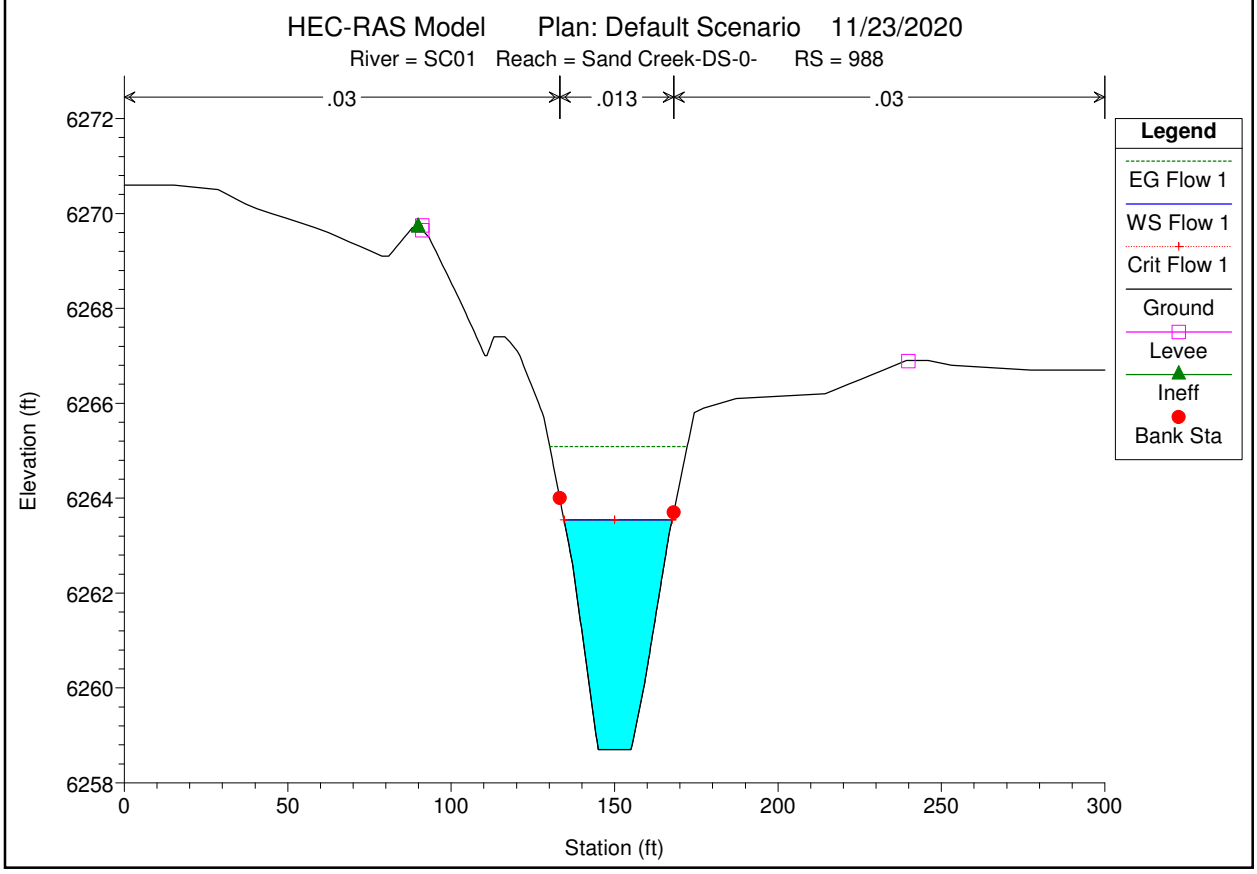
River = SC01 Reach = Sand Creek RS = 993
.03
.013
.03
Elevation (ft)
Station (ft)
Legend
EG Flow 1
WS Flow 1
Crit Flow 1
Ground
Levee
Ineff
Bank Sta

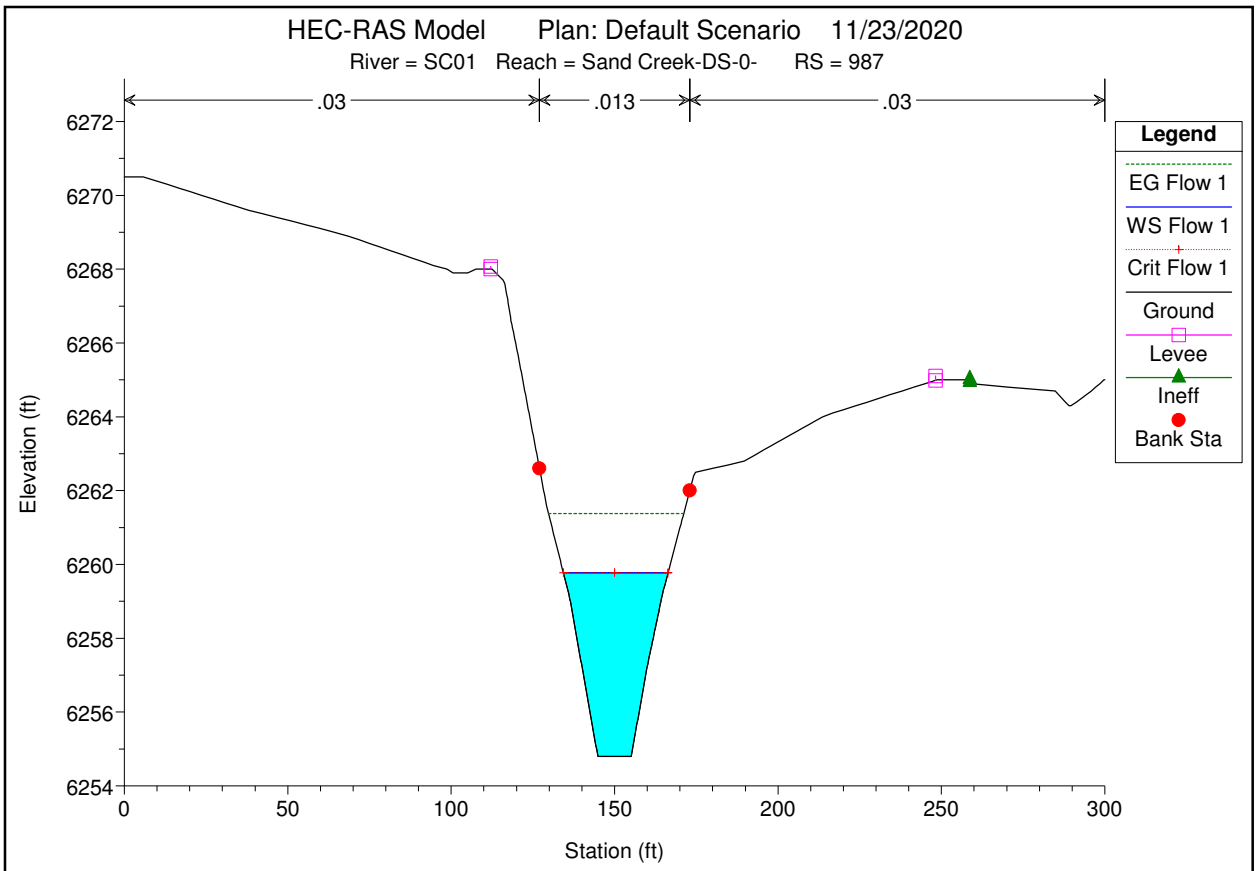

HEC-RAS Model Plan: Default Scenario 11/23/2020
River = SC01 Reach = Sand Creek-DS-0 RS = 992
.03
.013
.03
Elevation (ft)
Station (ft)
Legend
EG Flow 1
WS Flow 1
Crit Flow 1
Ground
Levee
Ineff
Bank Sta

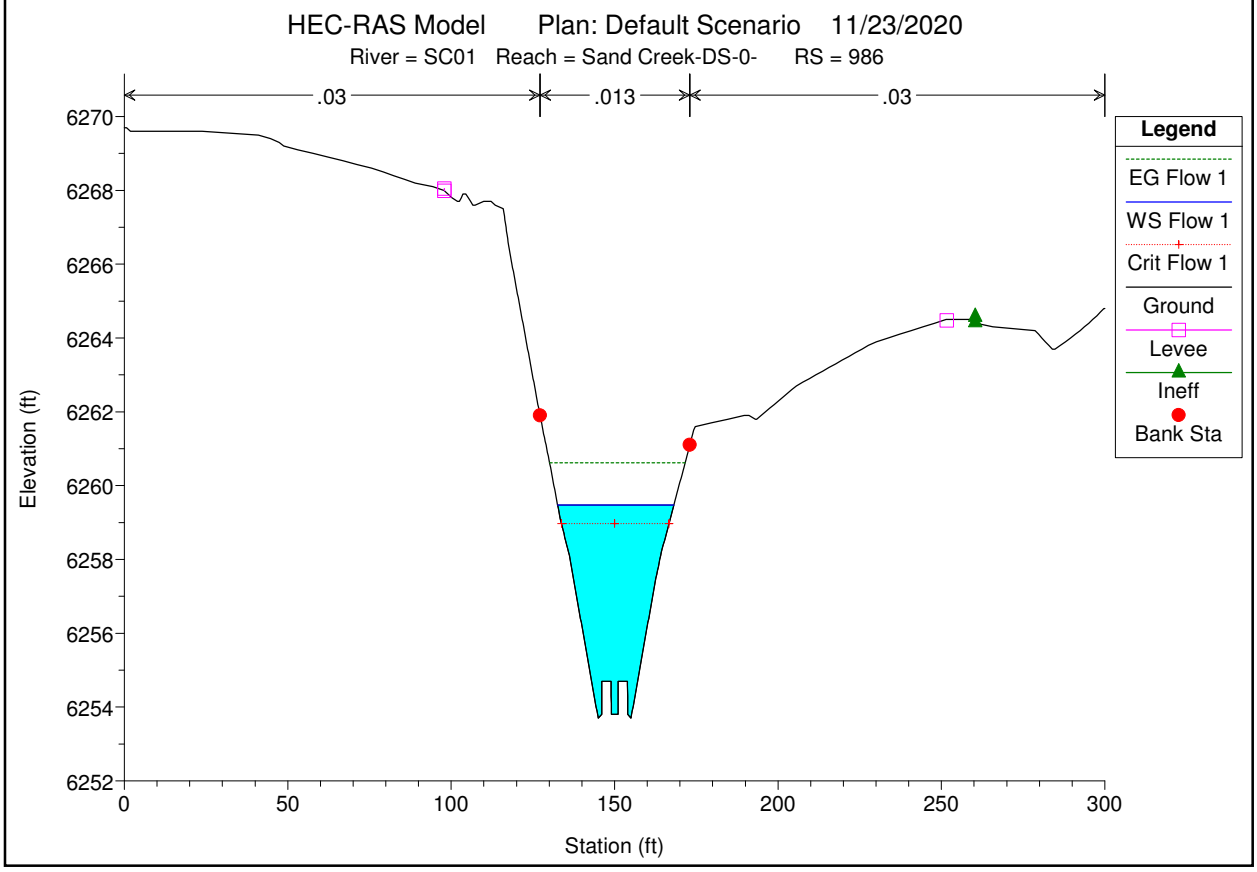

HEC-RAS Model Plan: Default Scenario 11/23/2020
River = SC01 Reach = Sand Creek-DS-0 RS = 991
.03
.013
.03
Legend
EG Flow 1
WS Flow 1
Crit Flow 1
Ground
Levee
Ineff
Bank Sta
Elevation (ft)
6276
6274
6272
6270
6268
6266
6264
0
50
100
150
200
250
300
Station (ft)

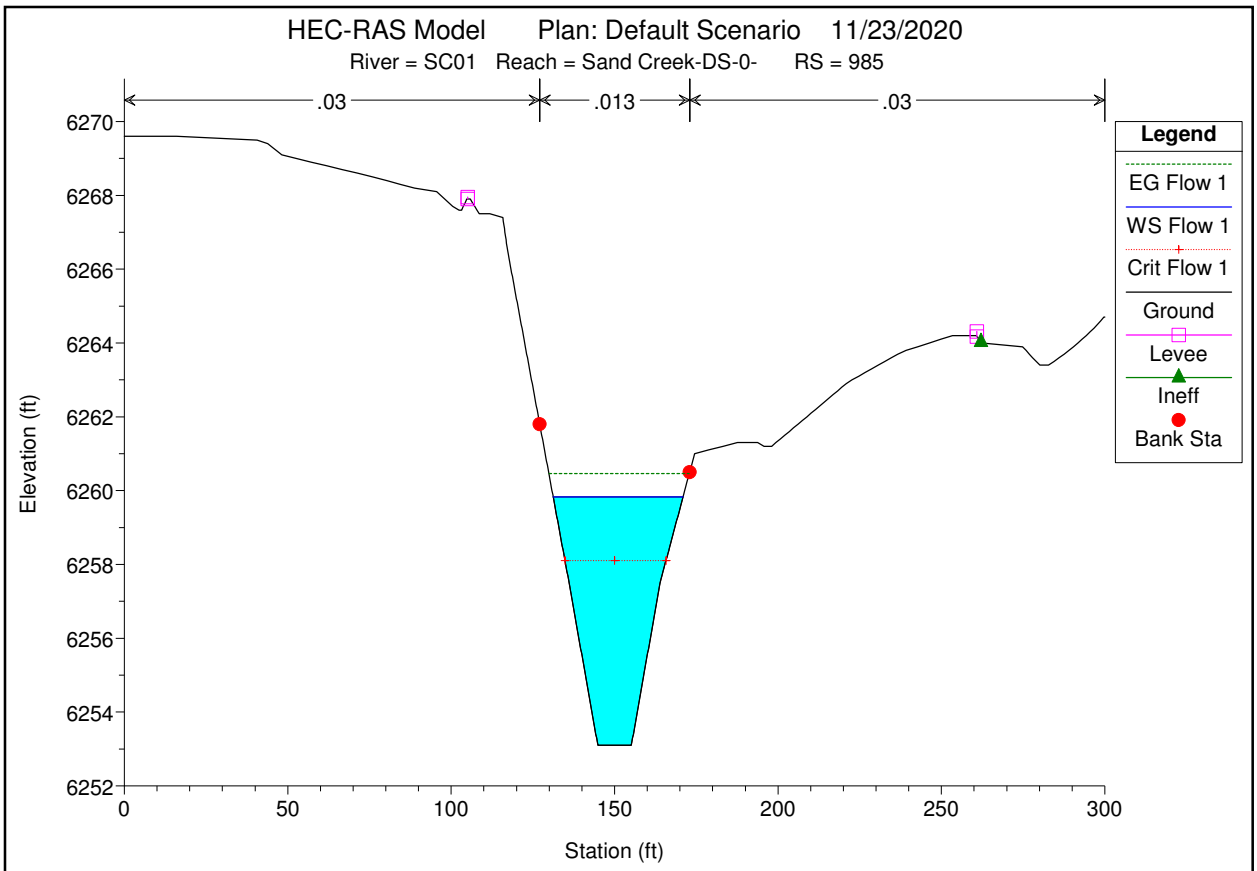

HEC-RAS Model Plan: Default Scenario 11/23/2020
River = SC01 Reach = Sand Creek-DS-0- RS = 990
.03
.013
.03
Legend
EG Flow 1
WS Flow 1
Crit Flow 1
Ground
Levee
Ineff
Bank Sta
Elevation (ft)
6272
6270
6268
6266
6264
6262
0
50
100
150
200
250
300
Station (ft)

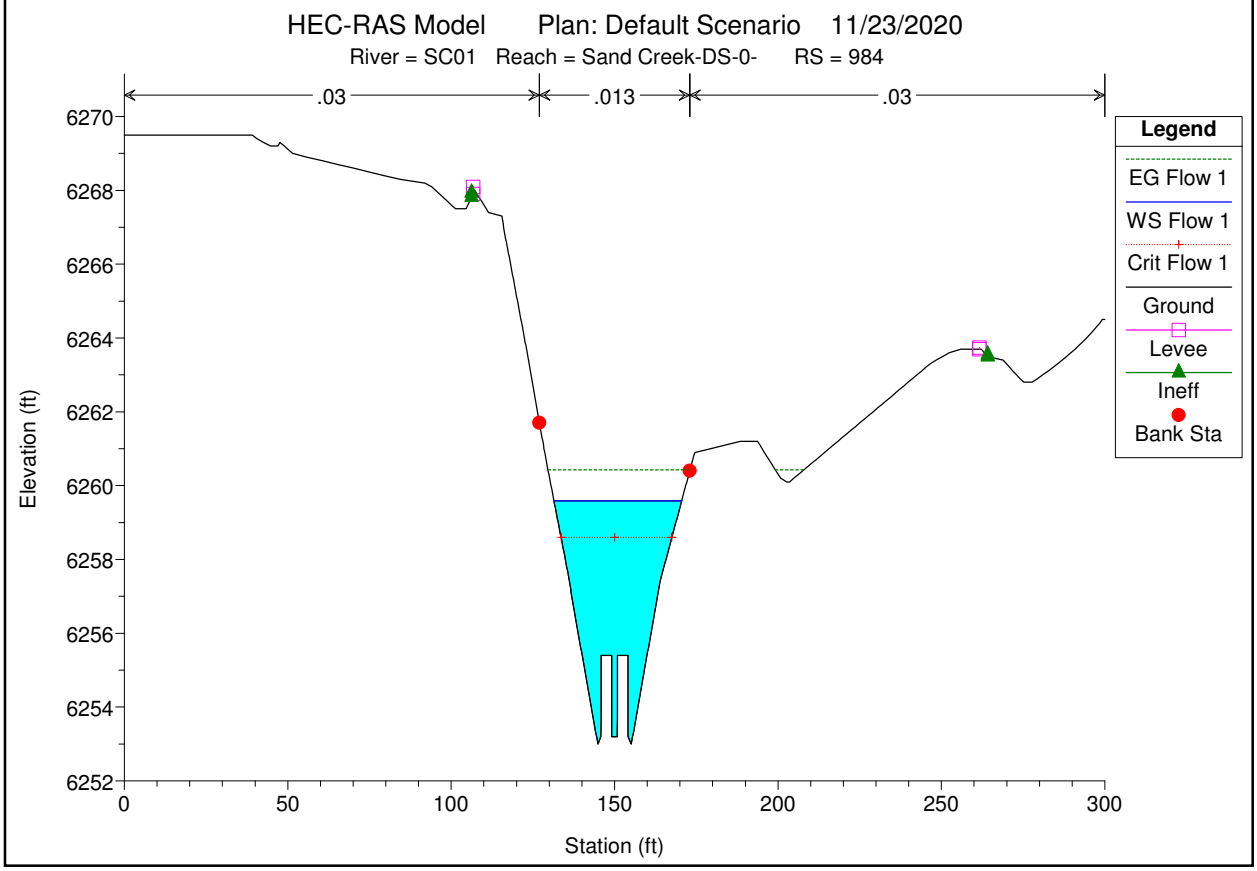

HEC-RAS Model Plan: Default Scenario 11/23/2020
River = SC01 Reach = Sand Creek-DS-0- RS = 989
.03
.013
.03
Legend
EG Flow 1
WS Flow 1
Crit Flow 1
Ground
Levee
Ineff
Bank Sta
Elevation (ft)
6272
6270
6268
6266
6264
6262
0
50
100
150
200
250
300
Station (ft)

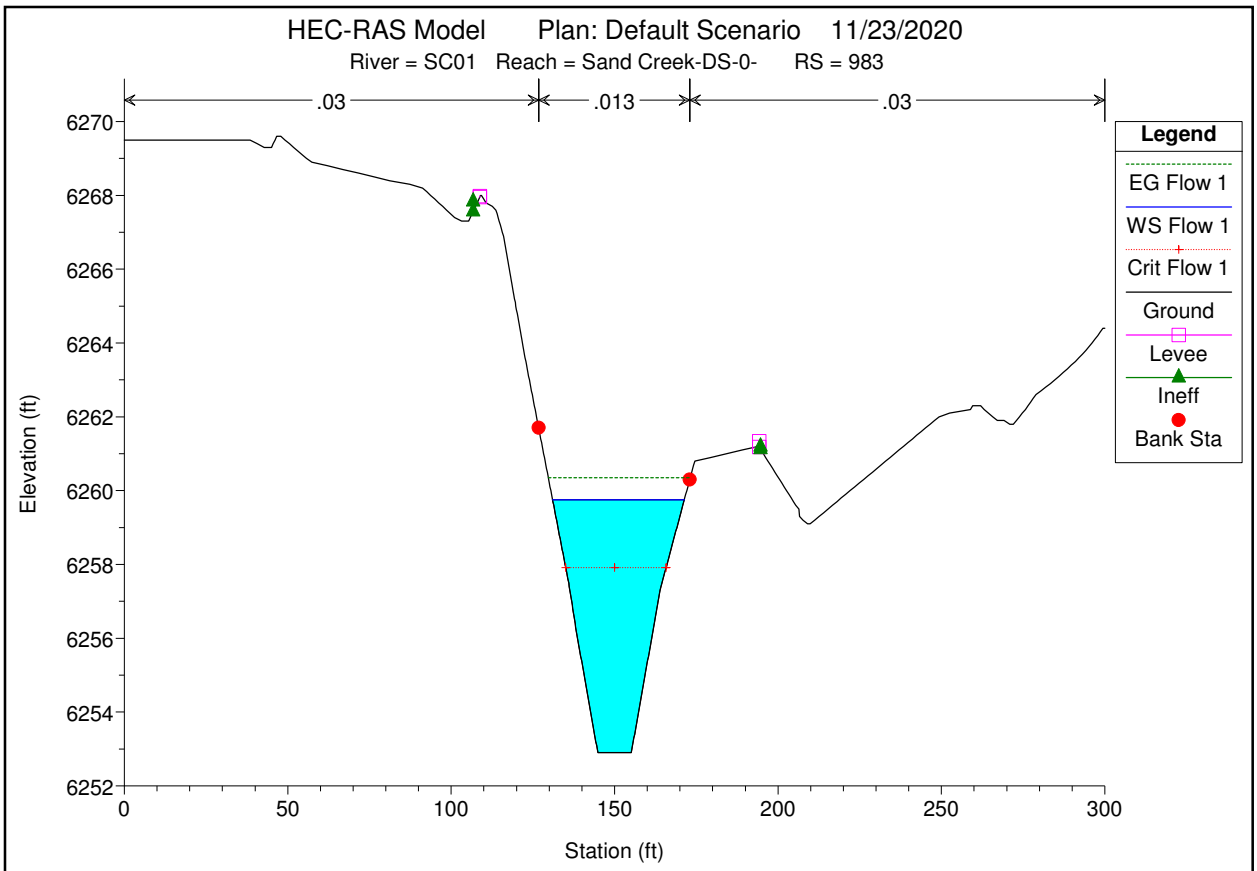

HEC-RAS Model Plan: Default Scenario 11/23/2020
River = SC01 Reach = Sand Creek-DS-0- RS = 988
.03
.013
.03
Legend
EG Flow 1
WS Flow 1
Crit Flow 1
Ground
Levee
Ineff
Bank Sta
Elevation (ft)
6272
6270
6268
6266
6264
6262
6260
6258
0
50
100
150
200
250
300
Station (ft)

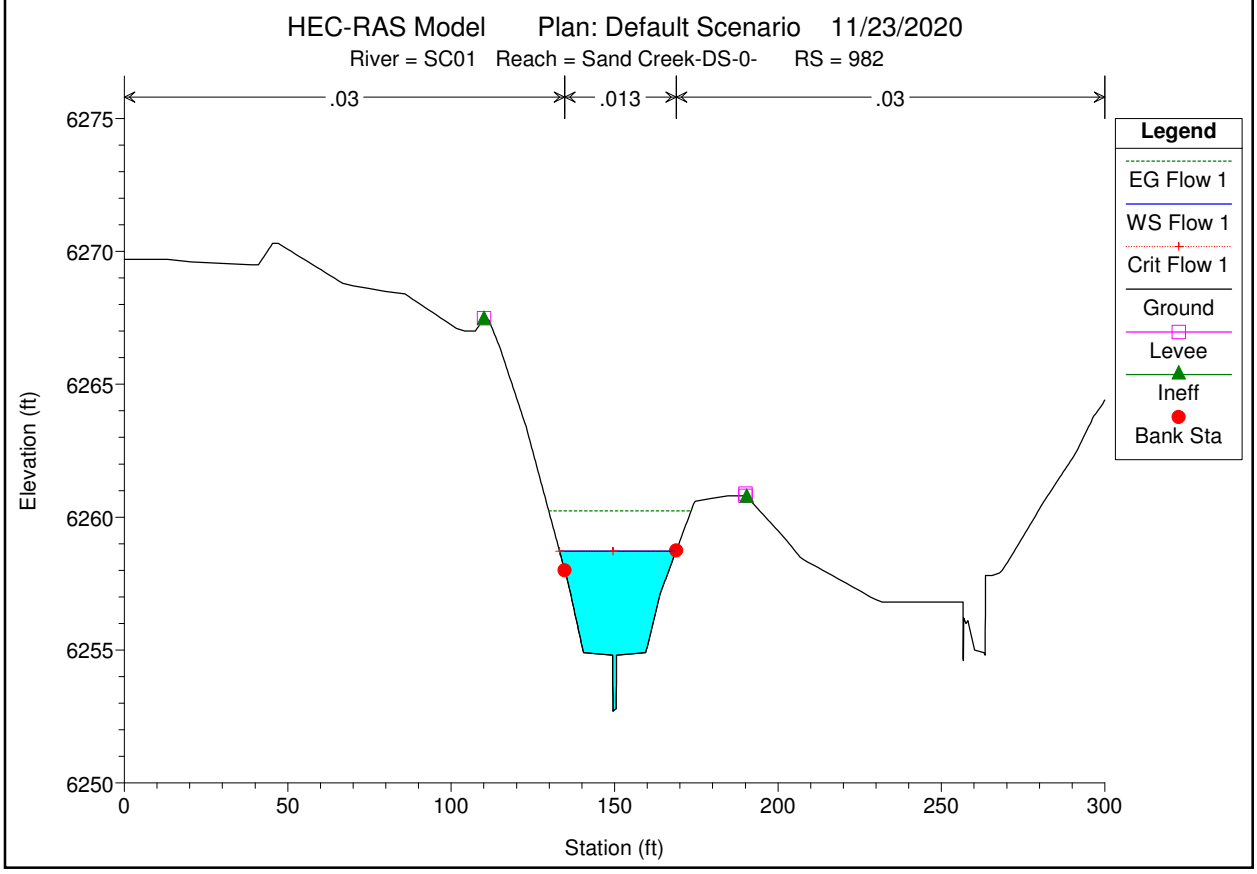

HEC-RAS Model Plan: Default Scenario 11/23/2020
River = SC01 Reach = Sand Creek-DS-0- RS = 987
.03
.013
.03
Legend
EG Flow 1
WS Flow 1
Crit Flow 1
Ground
Levee
Ineff
Bank Sta
Elevation (ft)
Station (ft)

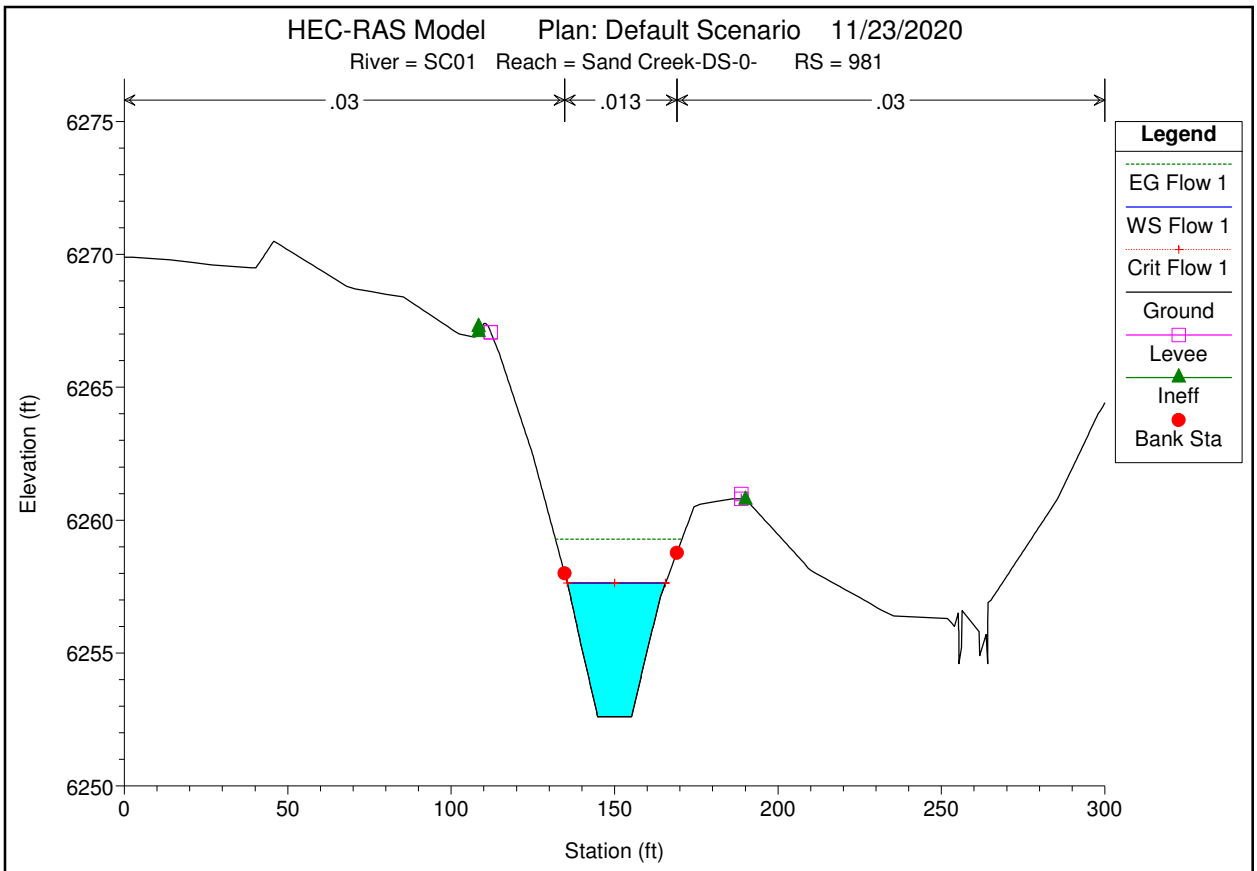

HEC-RAS Model Plan: Default Scenario 11/23/2020
River = SC01 Reach = Sand Creek-DS-0- RS = 986
.03
.013
.03
Legend
EG Flow 1
WS Flow 1
Crit Flow 1
Ground
Levee
Ineff
Bank Sta
Elevation (ft)
Station (ft)

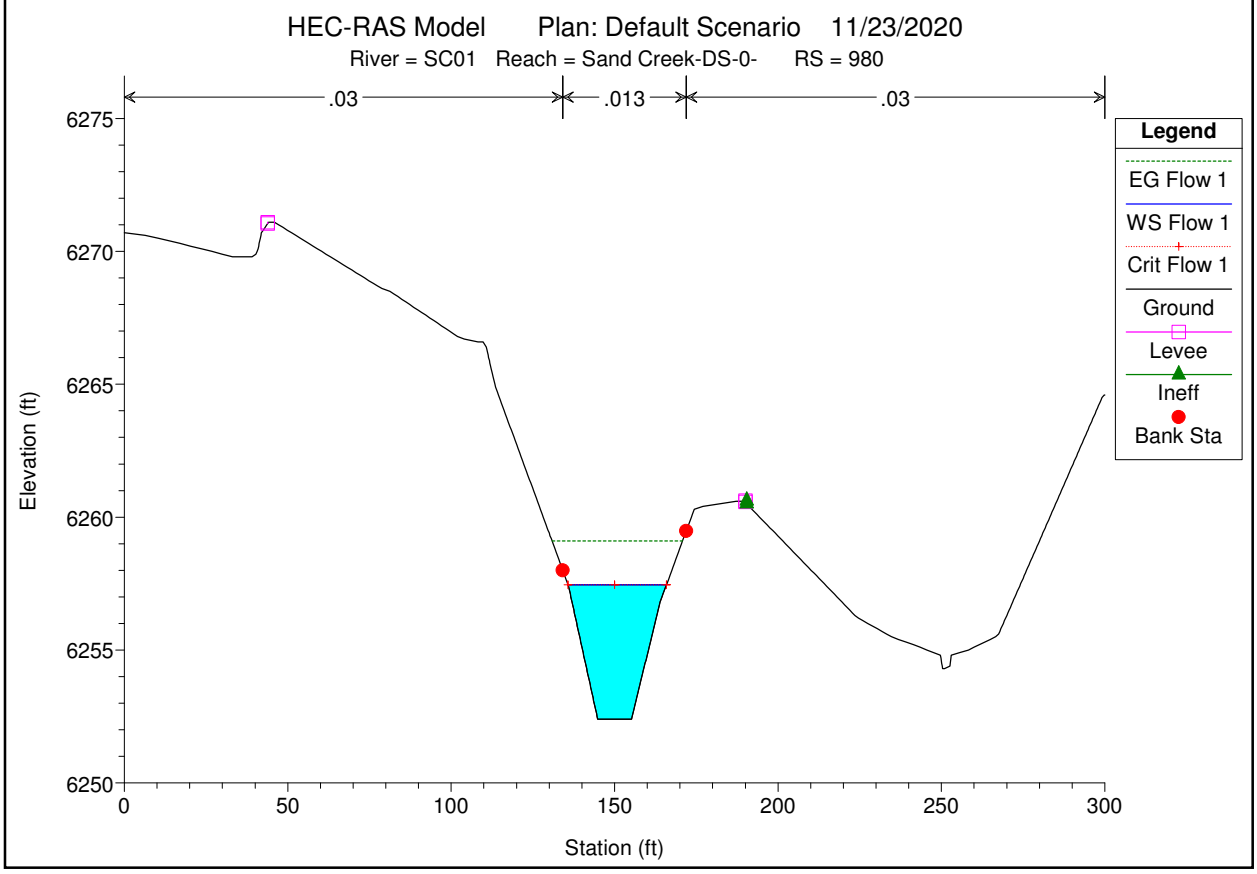

HEC-RAS Model Plan: Default Scenario 11/23/2020
River = SC01 Reach = Sand Creek-DS-0- RS = 985
.03
.013
.03
Elevation (ft)
Station (ft)
Legend
EG Flow 1
WS Flow 1
Crit Flow 1
Ground
Levee
Ineff
Bank Sta

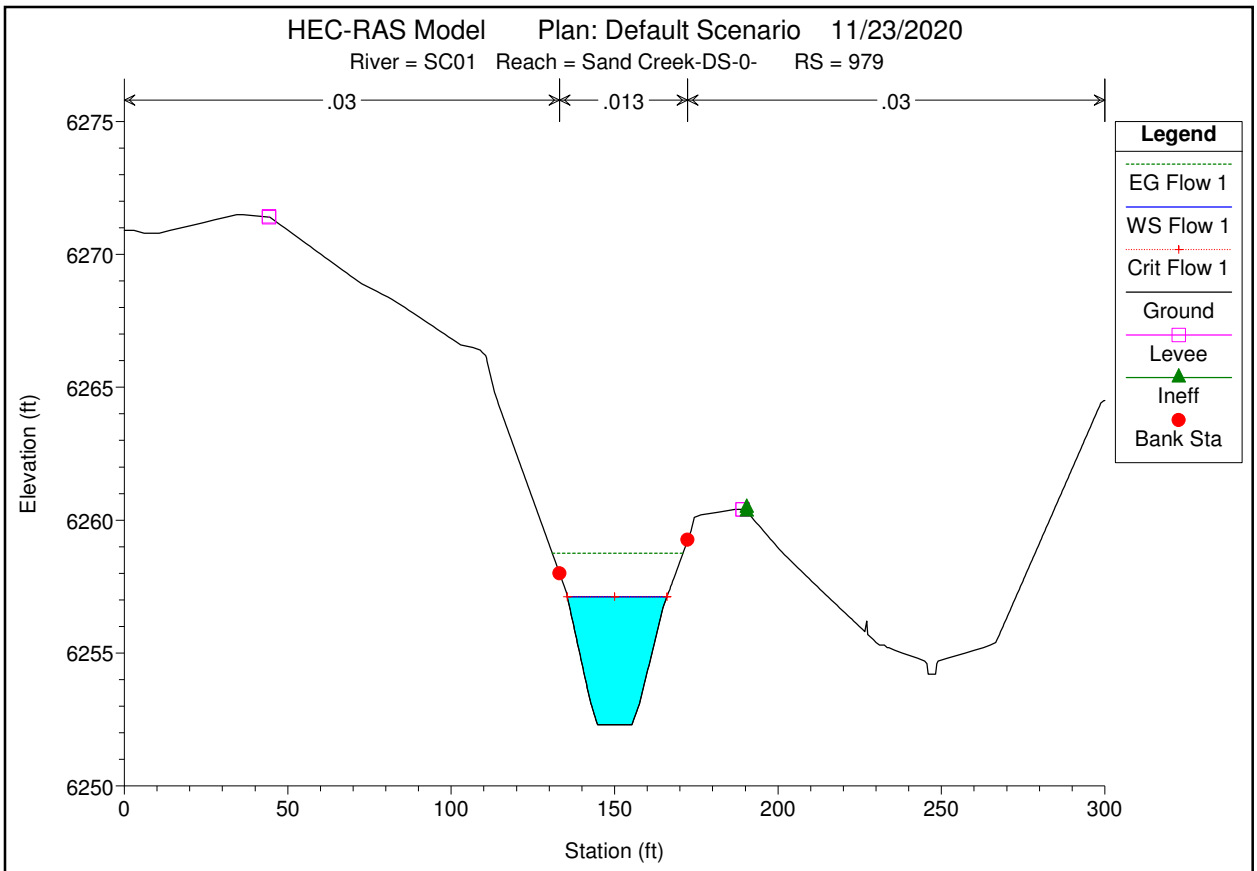

HEC-RAS Model Plan: Default Scenario 11/23/2020
River = SC01 Reach = Sand Creek-DS-0- RS = 984
.03
.013
.03
Elevation (ft)
Station (ft)
Legend
EG Flow 1
WS Flow 1
Crit Flow 1
Ground
Levee
Ineff
Bank Sta

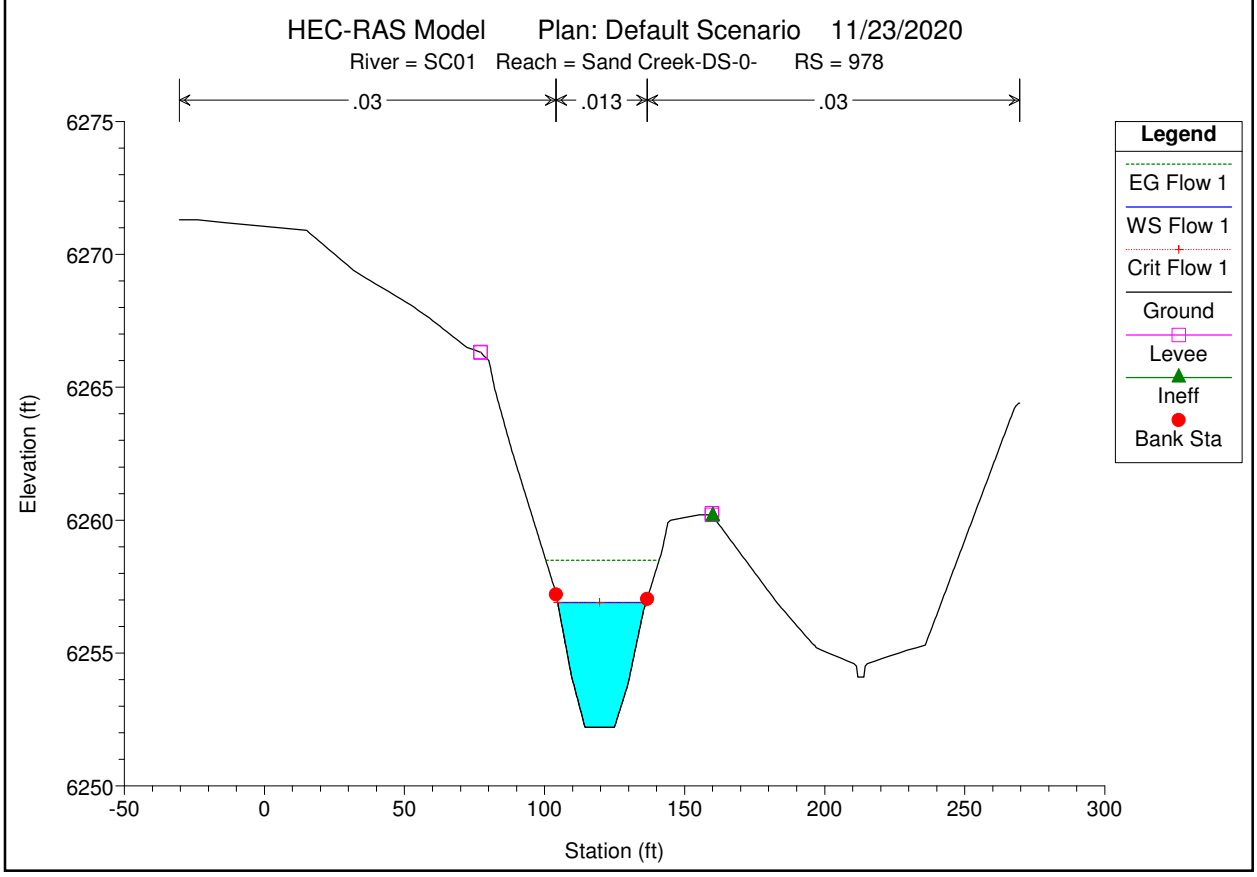

HEC-RAS Model Plan: Default Scenario 11/23/2020
River = SC01 Reach = Sand Creek-DS-0- RS = 983
.03
.013
.03
Legend
EG Flow 1
WS Flow 1
Crit Flow 1
Ground
Levee
Ineff
Bank Sta
Elevation (ft)
Station (ft)

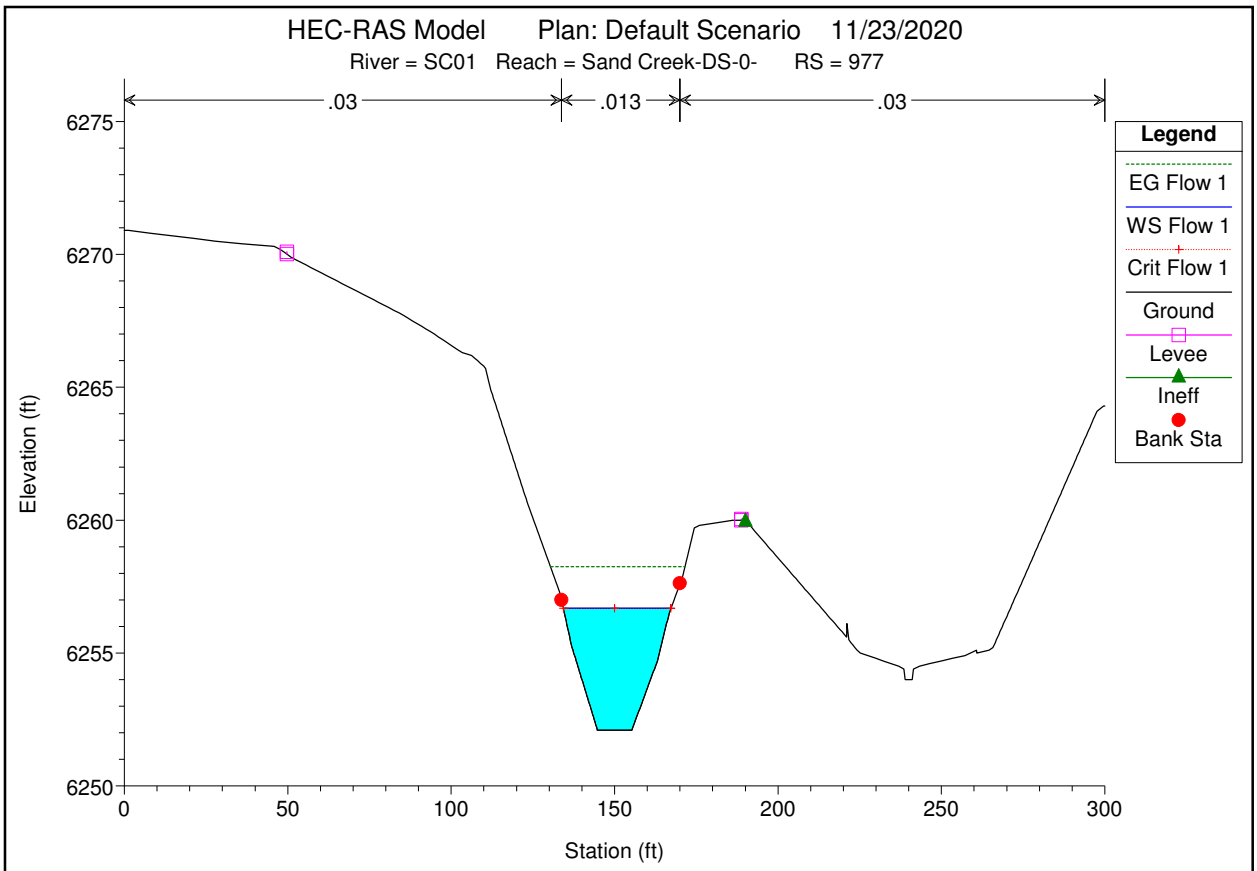

HEC-RAS Model Plan: Default Scenario 11/23/2020
River = SC01 Reach = Sand Creek-DS-0- RS = 982
.03
.013
.03
Legend
EG Flow 1
WS Flow 1
Crit Flow 1
Ground
Levee
Ineff
Bank Sta
Elevation (ft)
Station (ft)

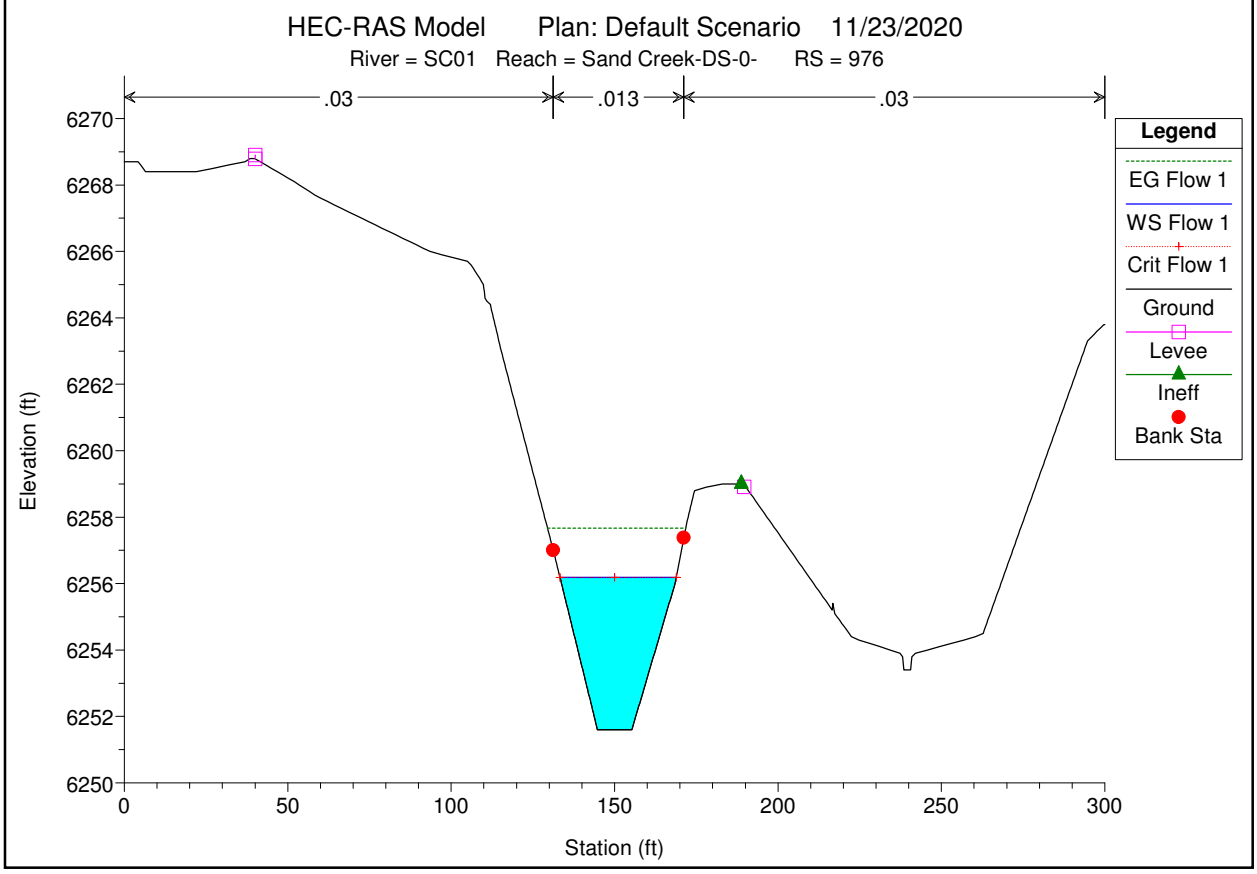

HEC-RAS Model Plan: Default Scenario 11/23/2020
River = SC01 Reach = Sand Creek-DS-0- RS = 981
.03
.013
.03
Legend
EG Flow 1
WS Flow 1
Crit Flow 1
Ground
Levee
Ineff
Bank Sta
Elevation (ft)
6275
6270
6265
6260
6255
6250
0
50
100
150
200
250
300
Station (ft)

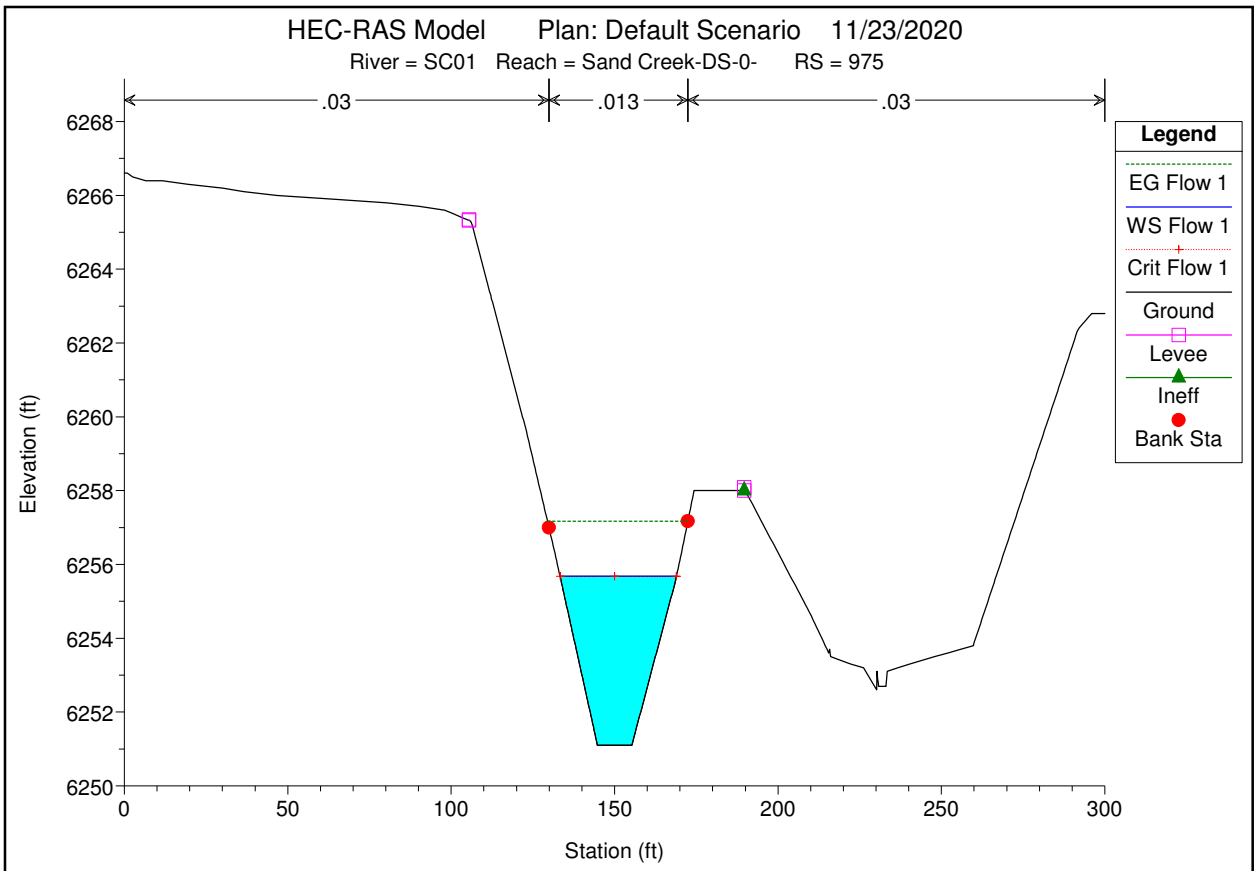

HEC-RAS Model Plan: Default Scenario 11/23/2020
River = SC01 Reach = Sand Creek-DS-0- RS = 980
.03
.013
.03
Legend
EG Flow 1
WS Flow 1
Crit Flow 1
Ground
Levee
Ineff
Bank Sta
Elevation (ft)
6275
6270
6265
6260
6255
6250
0
50
100
150
200
250
300
Station (ft)

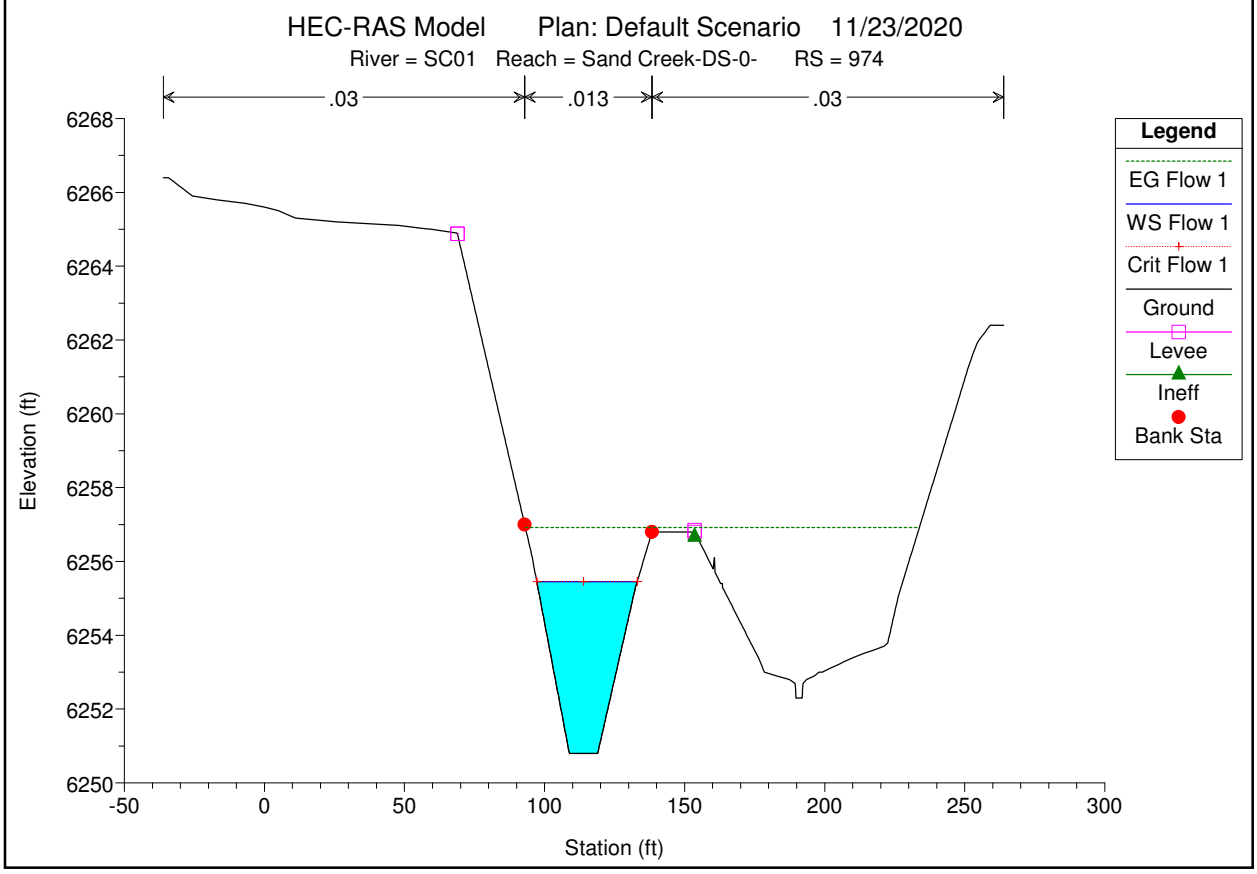

HEC-RAS Model Plan: Default Scenario 11/23/2020
River = SC01 Reach = Sand Creek-DS-0- RS = 979
.03
.013
.03
Legend
EG Flow 1
WS Flow 1
Crit Flow 1
Ground
Levee
Ineff
Bank Sta
Elevation (ft)
6275
6270
6265
6260
6255
6250
0
50
100
150
200
250
300
Station (ft)

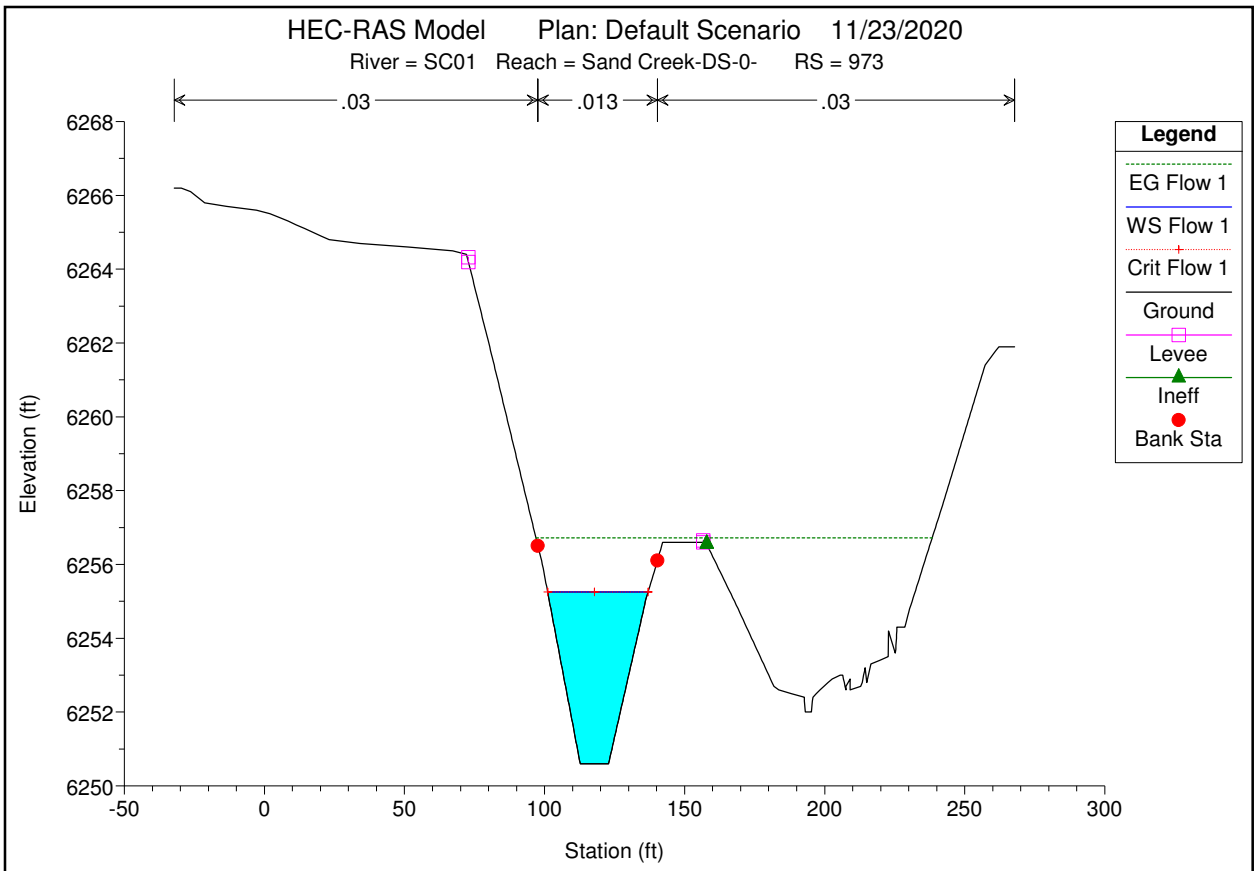

HEC-RAS Model Plan: Default Scenario 11/23/2020
River = SC01 Reach = Sand Creek-DS-0- RS = 978
.03
.013
.03
Legend
EG Flow 1
WS Flow 1
Crit Flow 1
Ground
Levee
Ineff
Bank Sta
Elevation (ft)
6275
6270
6265
6260
6255
6250
-50
0
50
100
150
200
250
300
Station (ft)

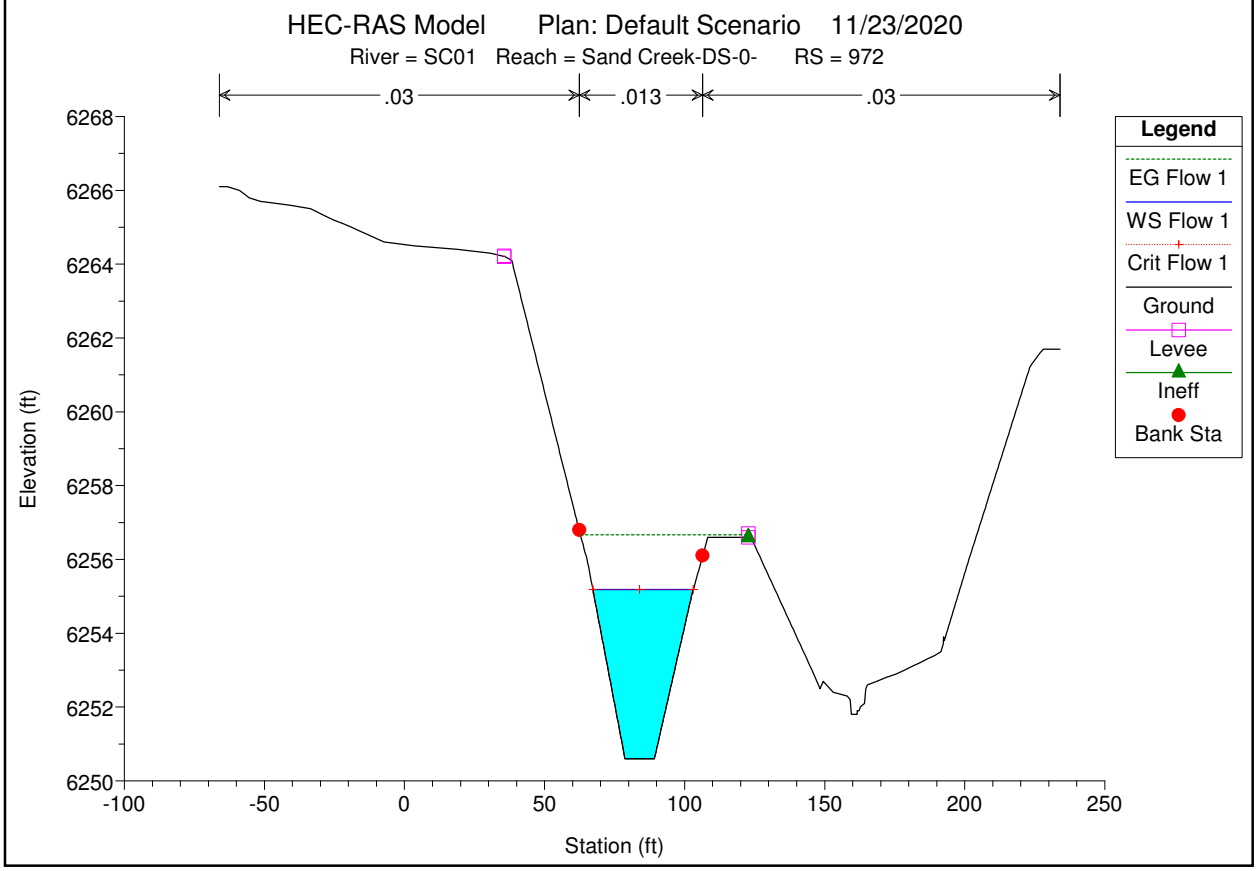

HEC-RAS Model Plan: Default Scenario 11/23/2020
River = SC01 Reach = Sand Creek-DS-0- RS = 977
.03
.013
.03
Legend
EG Flow 1
WS Flow 1
Crit Flow 1
Ground
Levee
Ineff
Bank Sta
Elevation (ft)
6275
6270
6265
6260
6255
6250
0
50
100
150
200
250
300
Station (ft)

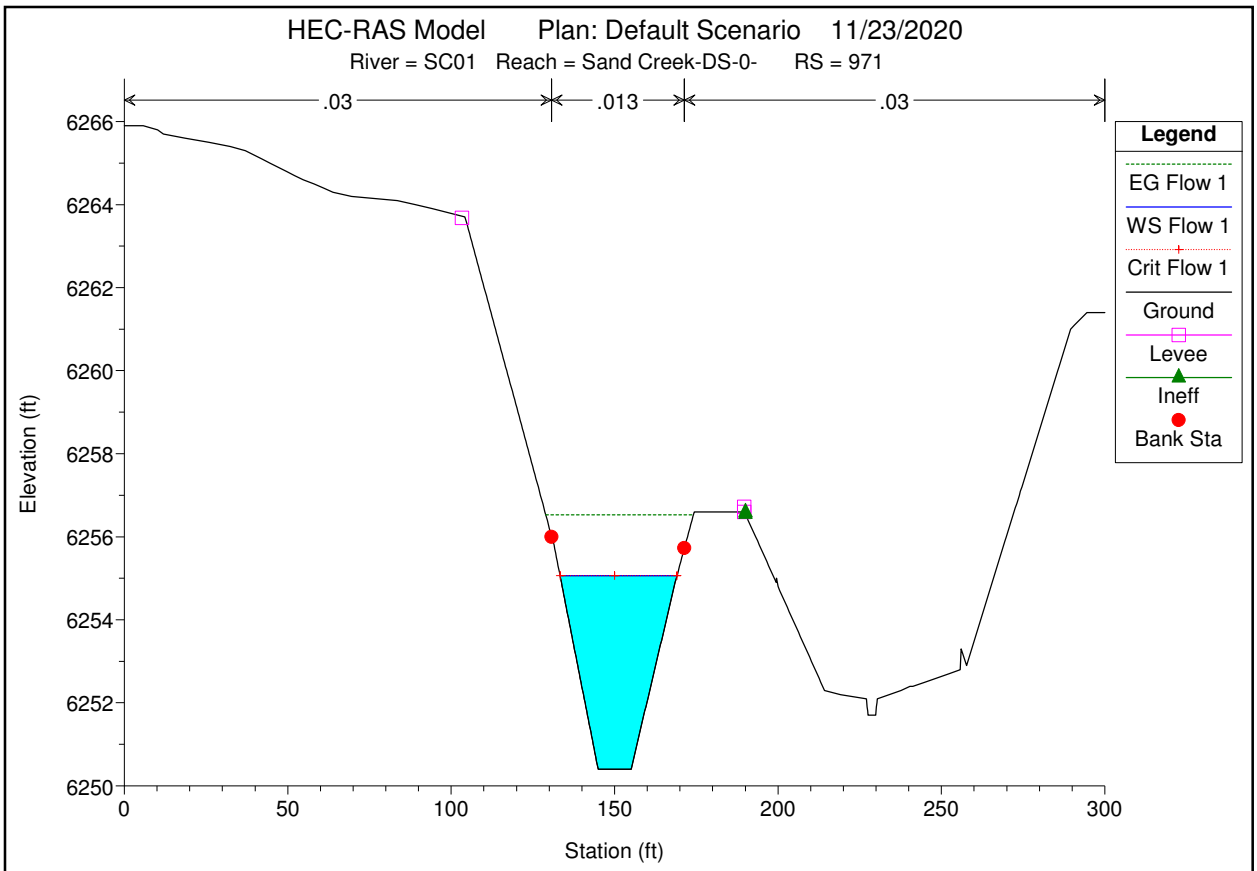

HEC-RAS Model Plan: Default Scenario 11/23/2020
River = SC01 Reach = Sand Creek-DS-0- RS = 976
.03
.013
.03
Legend
EG Flow 1
WS Flow 1
Crit Flow 1
Ground
Levee
Ineff
Bank Sta
Elevation (ft)
6270
6268
6266
6264
6262
6260
6258
6256
6254
6252
6250
0
50
100
150
200
250
300
Station (ft)

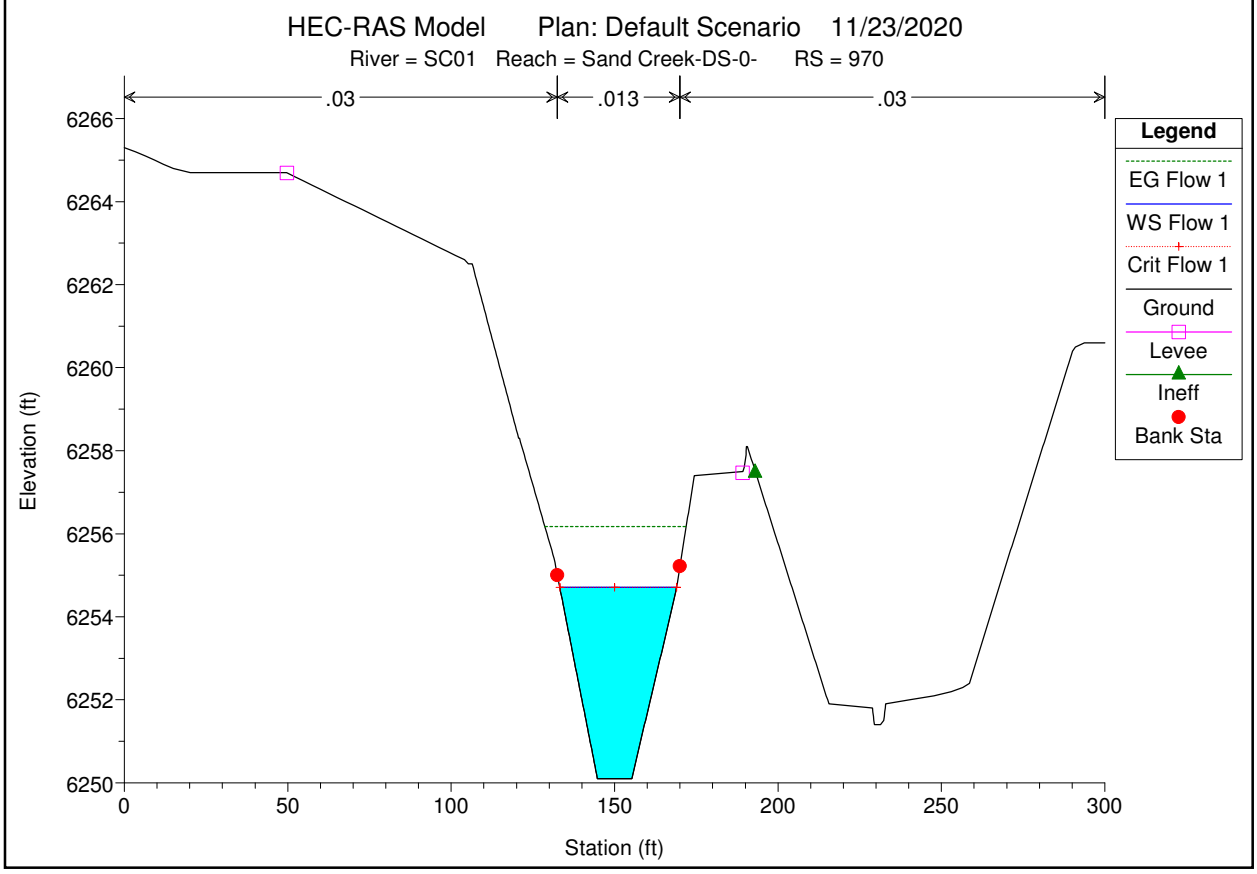

HEC-RAS Model Plan: Default Scenario 11/23/2020
River = SC01 Reach = Sand Creek-DS-0- RS = 975
.03
.013
.03
Legend
EG Flow 1
WS Flow 1
Crit Flow 1
Ground
Levee
Ineff
Bank Sta
Elevation (ft)
6268
6266
6264
6262
6260
6258
6256
6254
6252
6250
0
50
100
150
200
250
300
Station (ft)

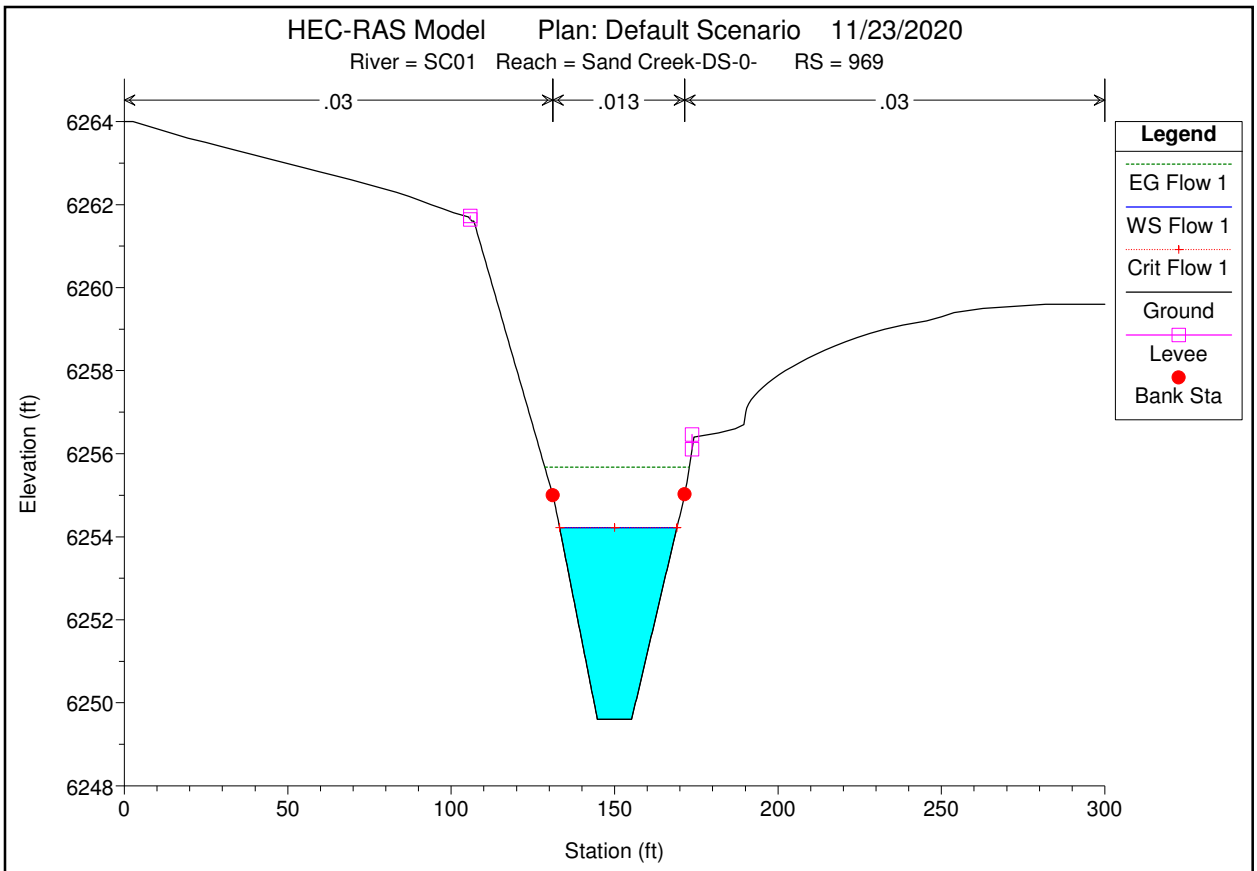

HEC-RAS Model Plan: Default Scenario 11/23/2020
River = SC01 Reach = Sand Creek-DS-0- RS = 974
.03
.013
.03
Legend
EG Flow 1
WS Flow 1
Crit Flow 1
Ground
Levee
Ineff
Bank Sta
Elevation (ft)
6268
6266
6264
6262
6260
6258
6256
6254
6252
6250
-50
0
50
100
150
200
250
300
Station (ft)

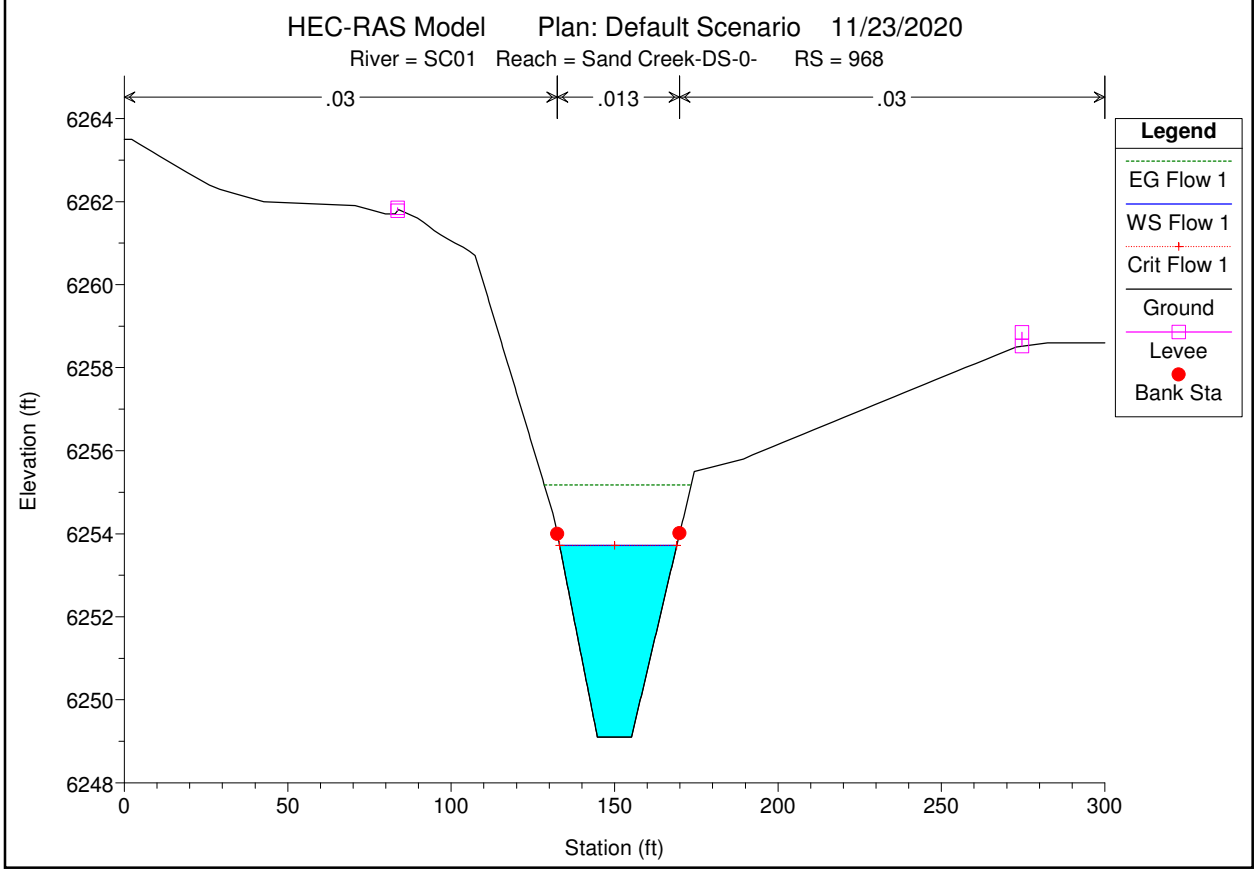

HEC-RAS Model Plan: Default Scenario 11/23/2020
River = SC01 Reach = Sand Creek-DS-0- RS = 973
.03
.013
.03
Legend
EG Flow 1
WS Flow 1
Crit Flow 1
Ground
Levee
Ineff
Bank Sta
Elevation (ft)
Station (ft)

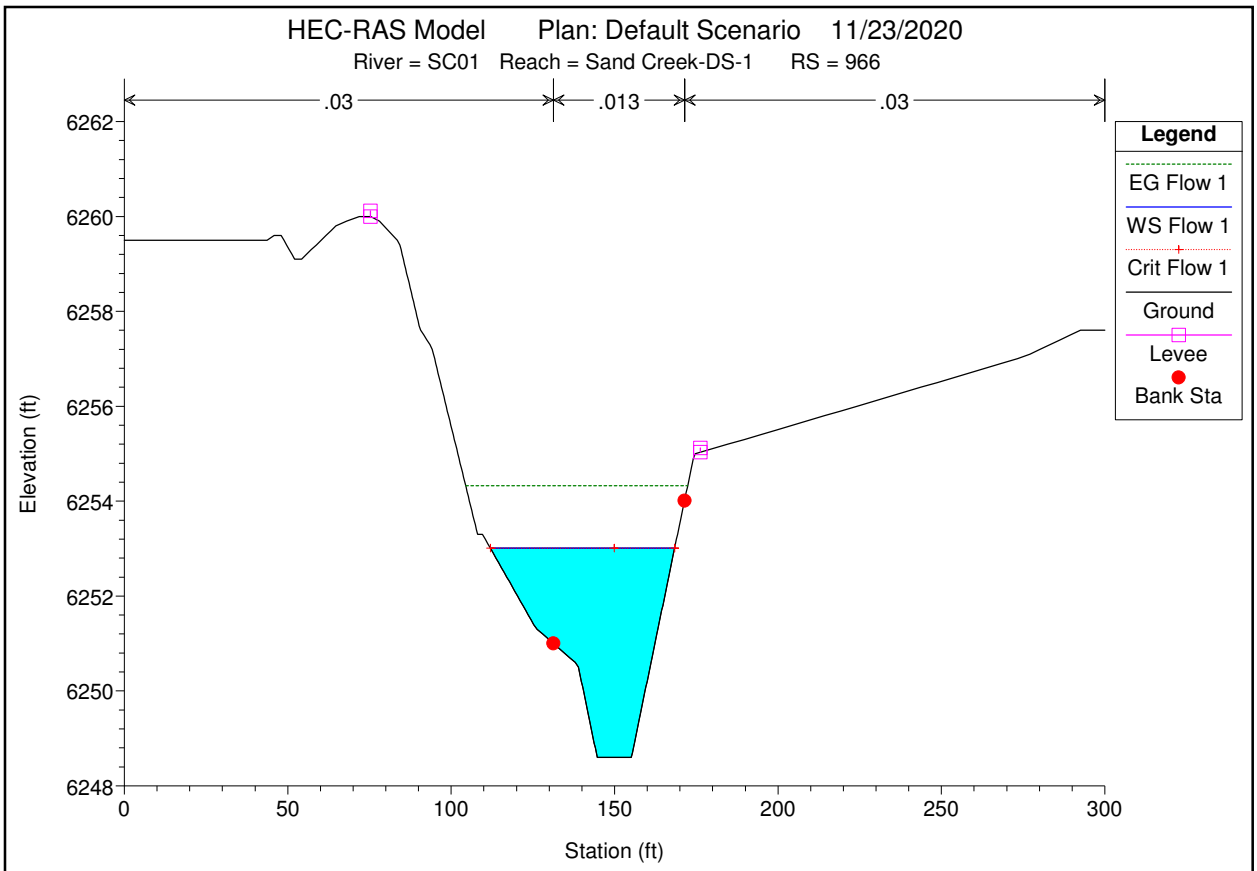

HEC-RAS Model Plan: Default Scenario 11/23/2020
River = SC01 Reach = Sand Creek-DS-0- RS = 972
.03
.013
.03
Legend
EG Flow 1
WS Flow 1
Crit Flow 1
Ground
Levee
Ineff
Bank Sta
Elevation (ft)
Station (ft)

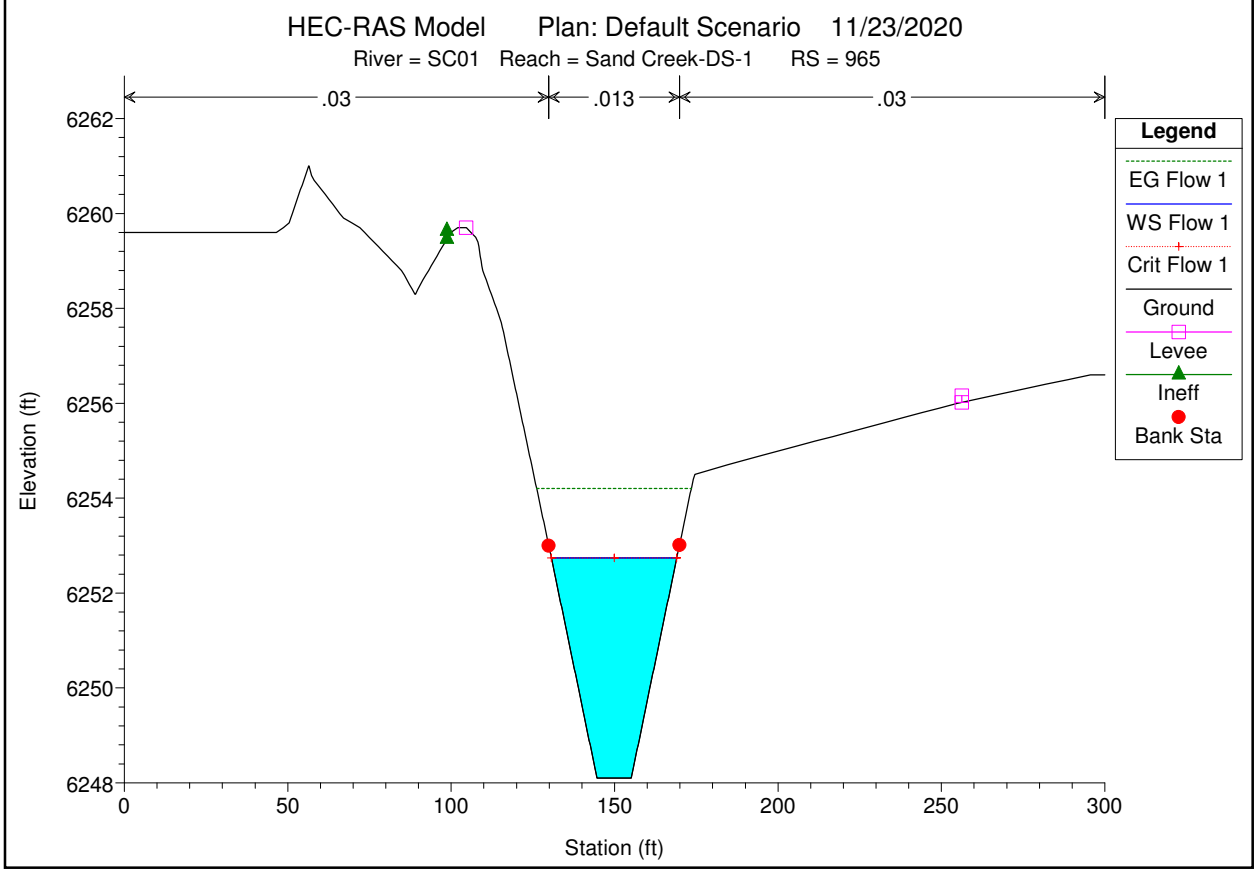

HEC-RAS Model Plan: Default Scenario 11/23/2020
River = SC01 Reach = Sand Creek-DS-0- RS = 971
.03
.013
.03
Legend
EG Flow 1
WS Flow 1
Crit Flow 1
Ground
Levee
Ineff
Bank Sta
Elevation (ft)
Station (ft)

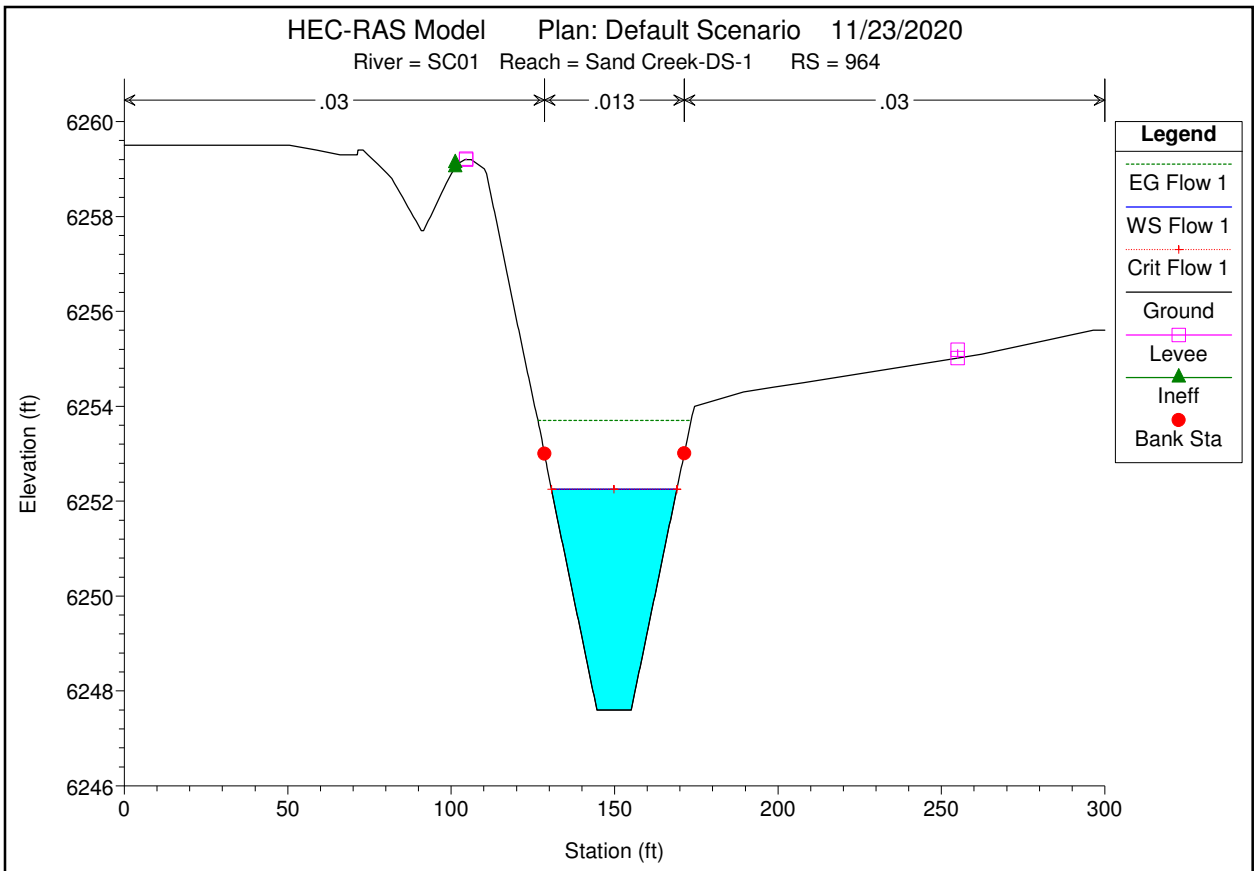

HEC-RAS Model Plan: Default Scenario 11/23/2020
River = SC01 Reach = Sand Creek-DS-0- RS = 970
.03
.013
.03
Legend
EG Flow 1
WS Flow 1
Crit Flow 1
Ground
Levee
Ineff
Bank Sta
Elevation (ft)
Station (ft)

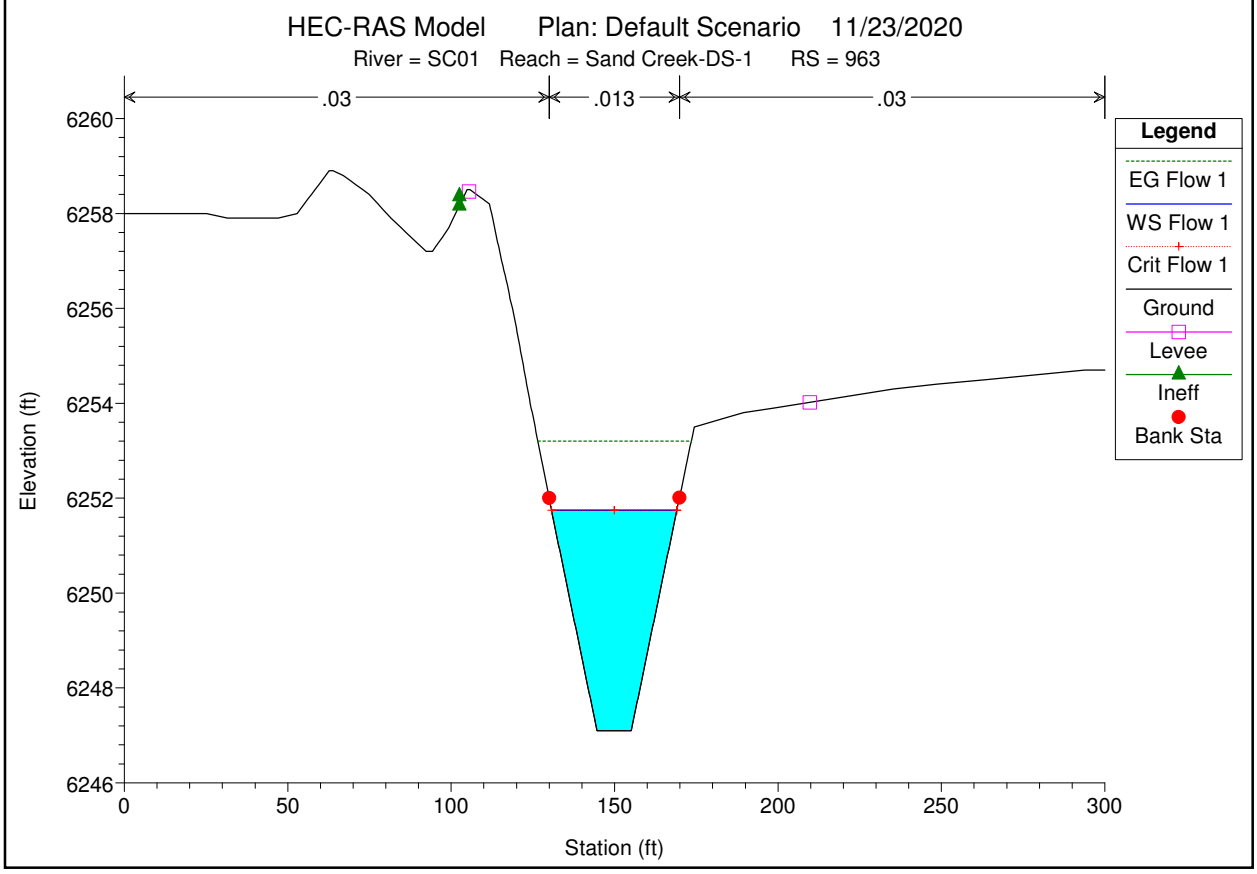

HEC-RAS Model Plan: Default Scenario 11/23/2020
River = SC01 Reach = Sand Creek-DS-0- RS = 969
.03
.013
.03
Legend
EG Flow 1
WS Flow 1
Crit Flow 1
Ground
Levee
Bank Sta
Elevation (ft)
6264
6262
6260
6258
6256
6254
6252
6250
6248
0
50
100
150
200
250
300
Station (ft)

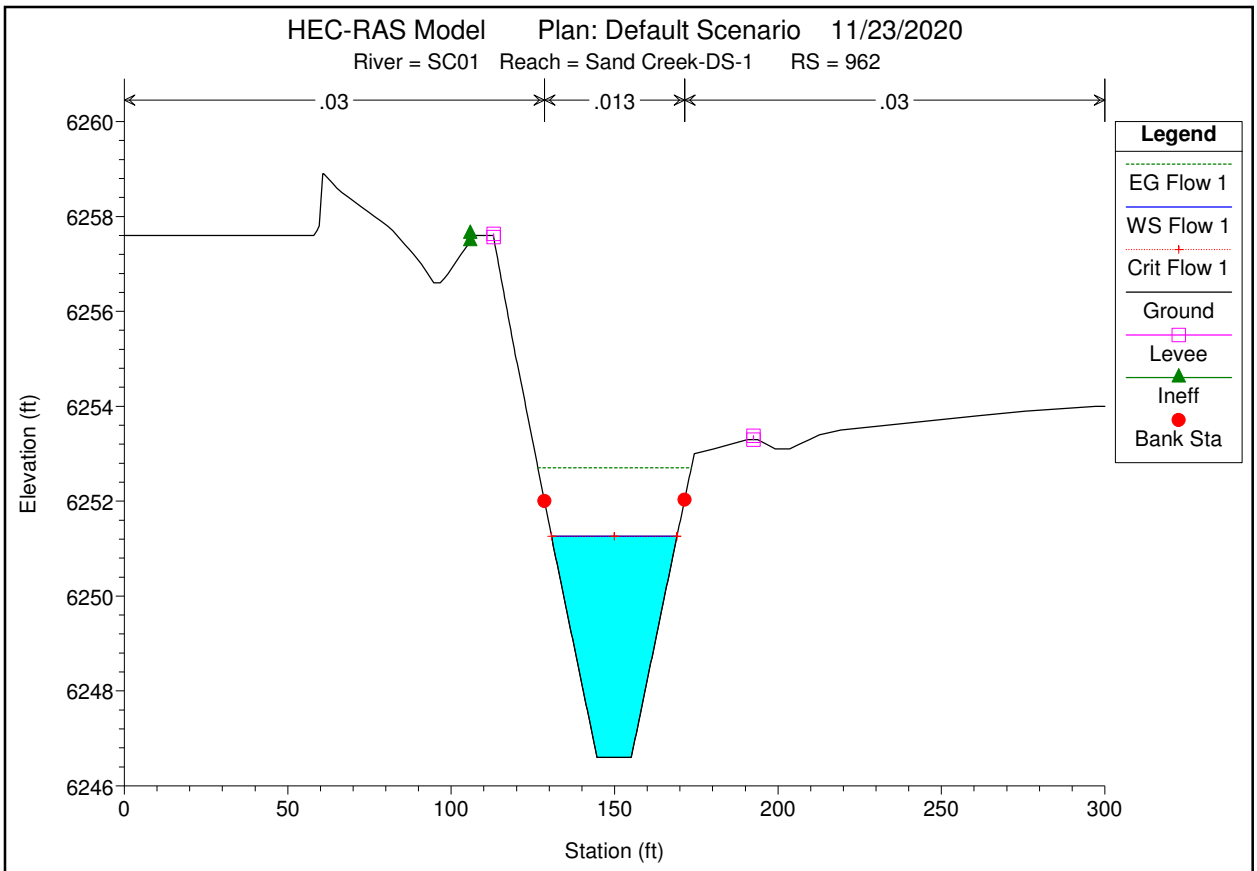

HEC-RAS Model Plan: Default Scenario 11/23/2020
River = SC01 Reach = Sand Creek-DS-0- RS = 968
.03
.013
.03
Legend
EG Flow 1
WS Flow 1
Crit Flow 1
Ground
Levee
Bank Sta
Elevation (ft)
6264
6262
6260
6258
6256
6254
6252
6250
6248
0
50
100
150
200
250
300
Station (ft)

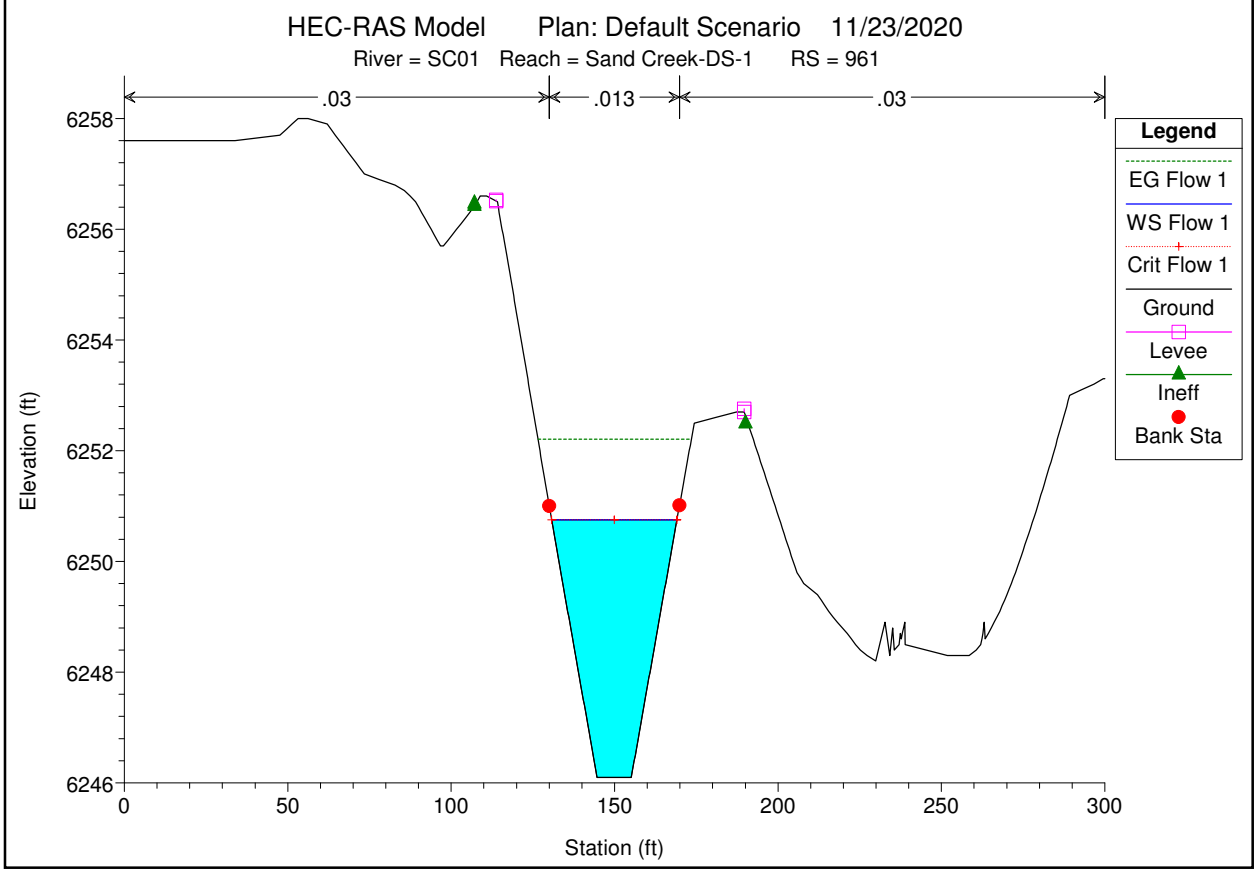

HEC-RAS Model Plan: Default Scenario 11/23/2020
River = SC01 Reach = Sand Creek-DS-1 RS = 966
.03
.013
.03
Legend
EG Flow 1
WS Flow 1
Crit Flow 1
Ground
Levee
Bank Sta
Elevation (ft)
6262
6260
6258
6256
6254
6252
6250
6248
0
50
100
150
200
250
300
Station (ft)

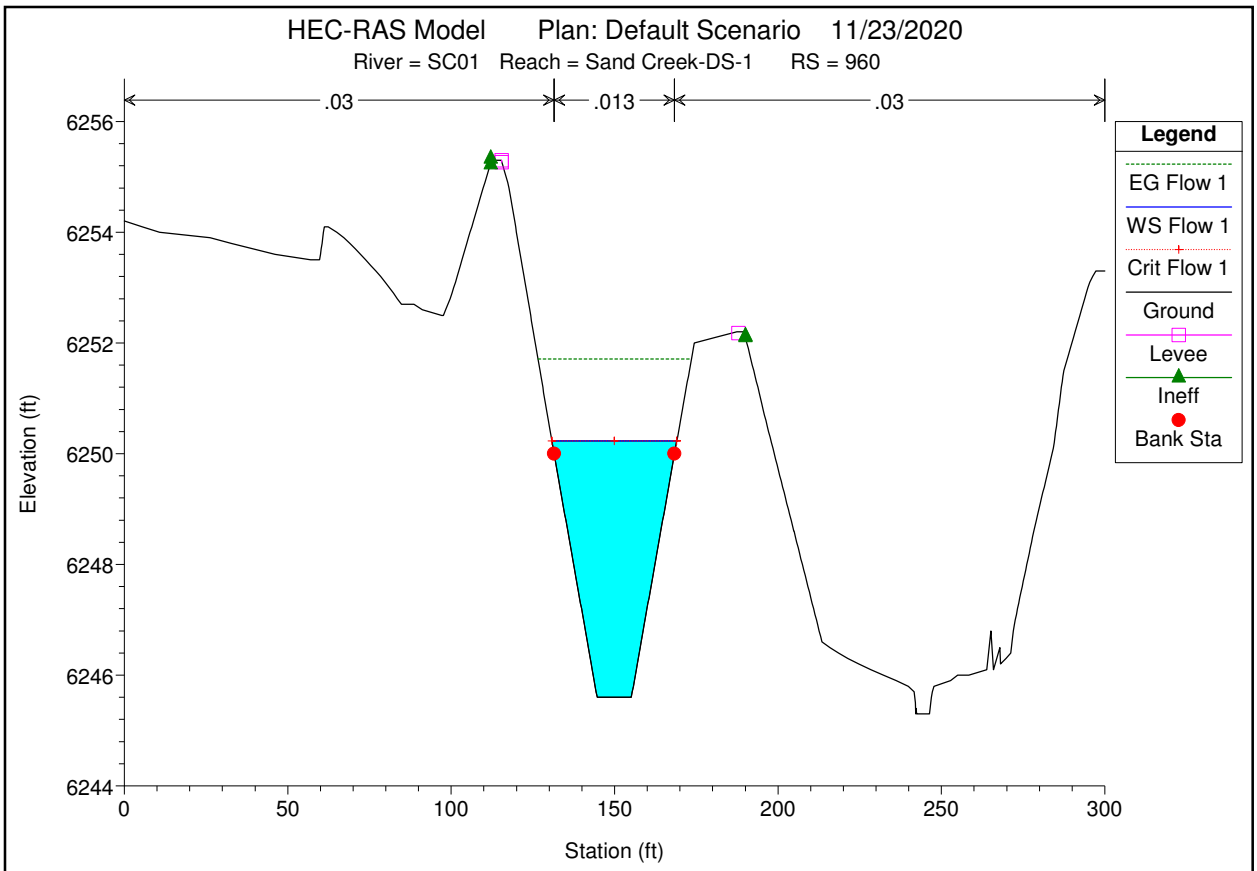

HEC-RAS Model Plan: Default Scenario 11/23/2020
River = SC01 Reach = Sand Creek-DS-1 RS = 965
.03
.013
.03
Legend
EG Flow 1
WS Flow 1
Crit Flow 1
Ground
Levee
Ineff
Bank Sta
Elevation (ft)
6262
6260
6258
6256
6254
6252
6250
6248
0
50
100
150
200
250
300
Station (ft)

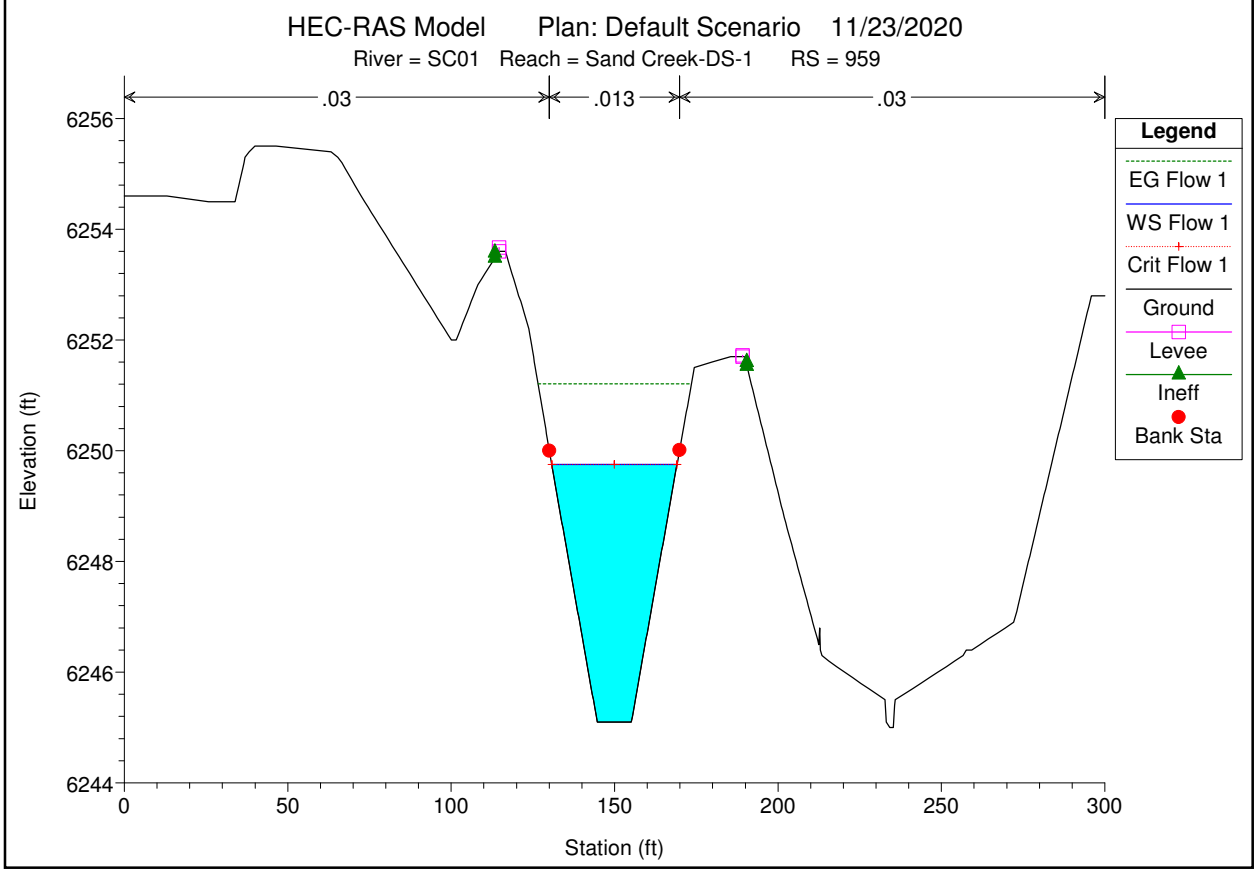

HEC-RAS Model Plan: Default Scenario 11/23/2020
River = SC01 Reach = Sand Creek-DS-1 RS = 964
.03
.013
.03
Legend
EG Flow 1
WS Flow 1
Crit Flow 1
Ground
Levee
Ineff
Bank Sta
Elevation (ft)
Station (ft)
6260
6258
6256
6254
6252
6250
6248
6246
0
50
100
150
200
250
300

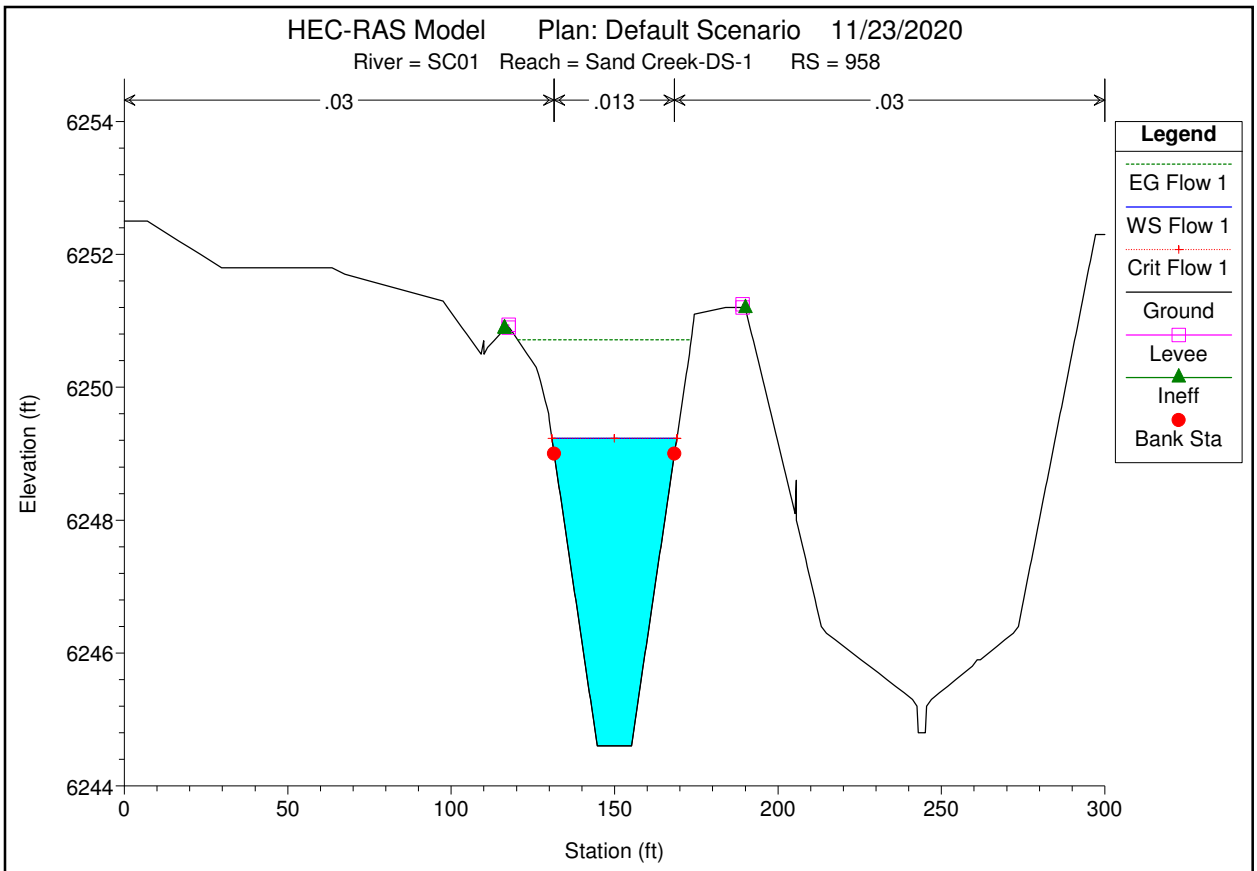

HEC-RAS Model Plan: Default Scenario 11/23/2020
River = SC01 Reach = Sand Creek-DS-1 RS = 963
.03
.013
.03
Legend
EG Flow 1
WS Flow 1
Crit Flow 1
Ground
Levee
Ineff
Bank Sta
Elevation (ft)
Station (ft)
6260
6258
6256
6254
6252
6250
6248
6246
0
50
100
150
200
250
300

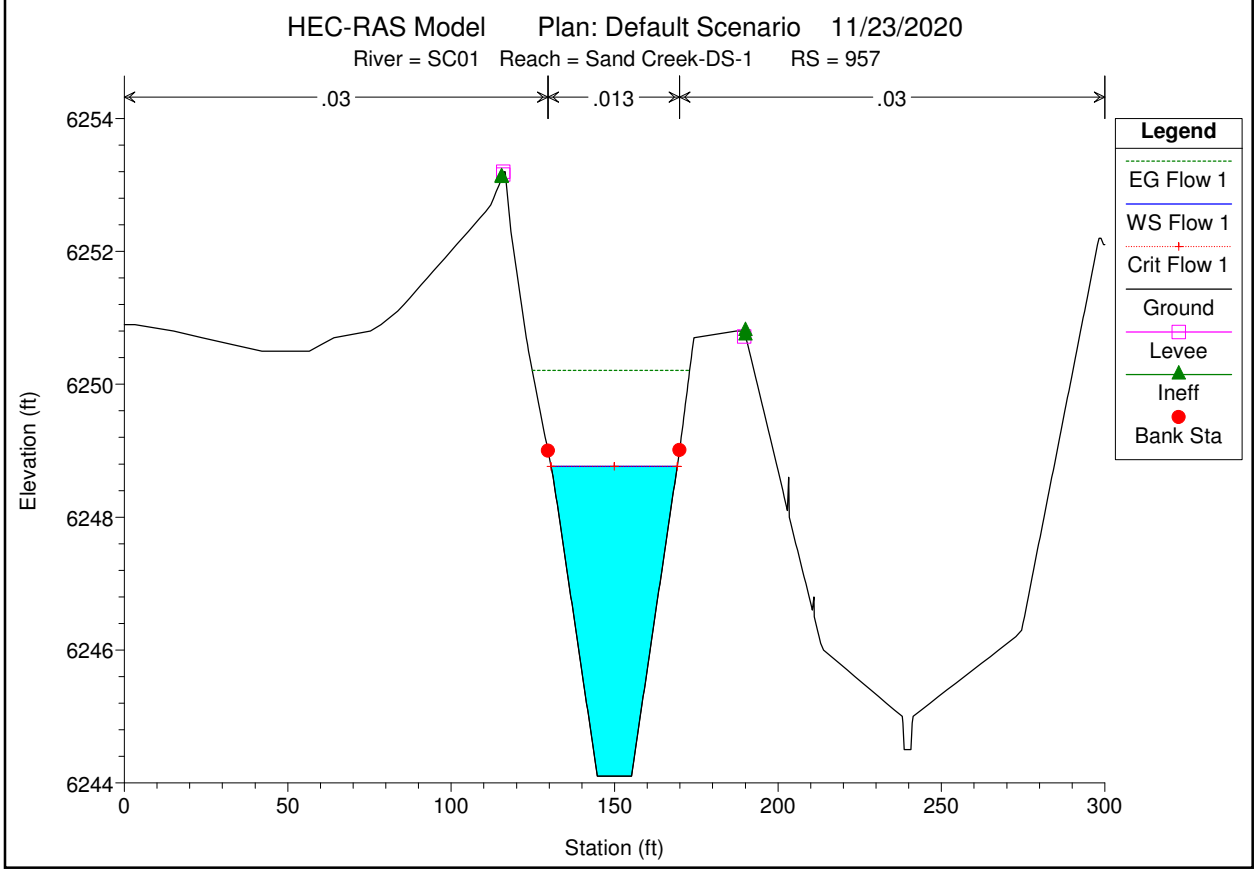

HEC-RAS Model Plan: Default Scenario 11/23/2020
River = SC01 Reach = Sand Creek-DS-1 RS = 962
.03
.013
.03
Legend
EG Flow 1
WS Flow 1
Crit Flow 1
Ground
Levee
Ineff
Bank Sta
Elevation (ft)
Station (ft)
6260
6258
6256
6254
6252
6250
6248
6246
0
50
100
150
200
250
300

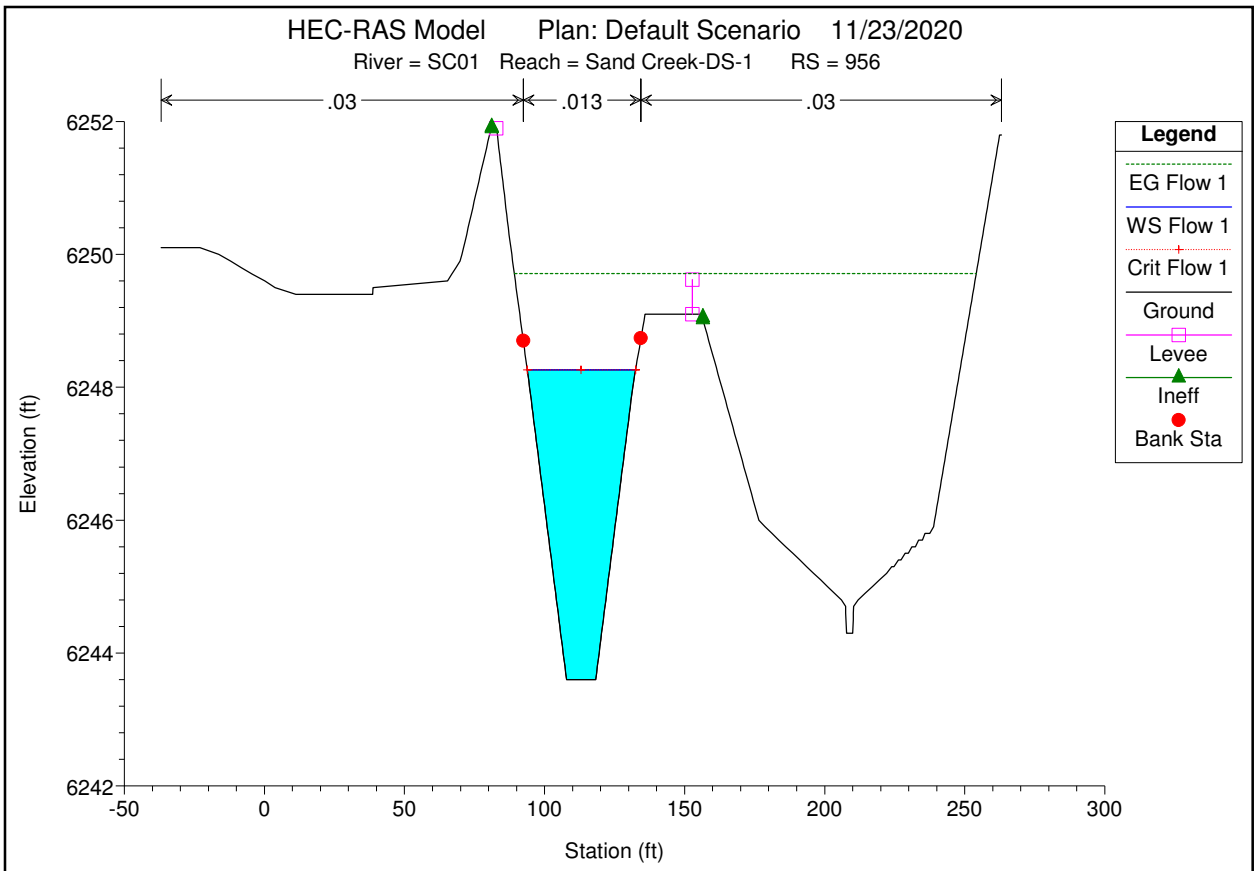

HEC-RAS Model Plan: Default Scenario 11/23/2020
River = SC01 Reach = Sand Creek-DS-1 RS = 961
.03
.013
.03
Legend
EG Flow 1
WS Flow 1
Crit Flow 1
Ground
Levee
Ineff
Bank Sta
Elevation (ft)
Station (ft)
6258
6256
6254
6252
6250
6248
6246
0
50
100
150
200
250
300

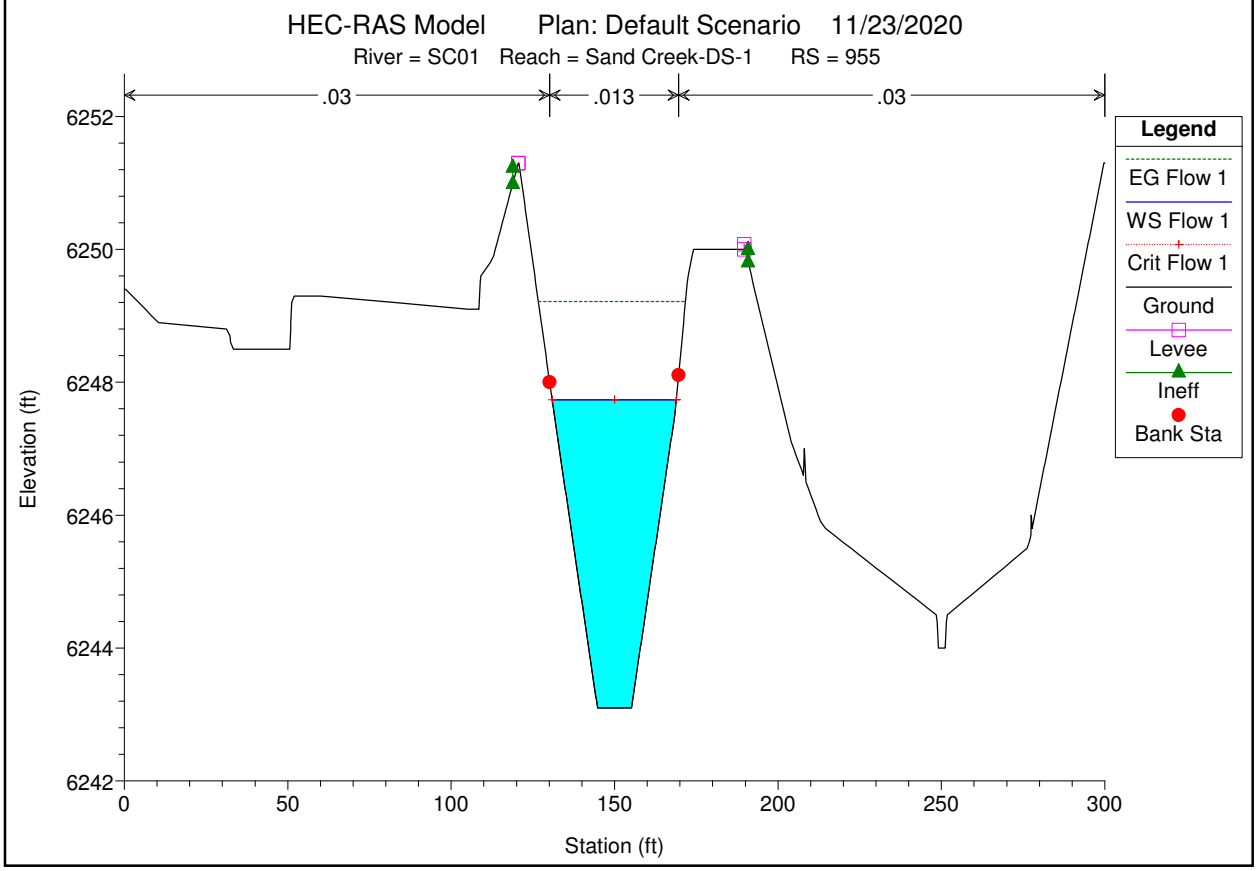

HEC-RAS Model Plan: Default Scenario 11/23/2020
River = SC01 Reach = Sand Creek-DS-1 RS = 960
.03
.013
.03
Legend
EG Flow 1
WS Flow 1
Crit Flow 1
Ground
Levee
Ineff
Bank Sta
Elevation (ft)
6256
6254
6252
6250
6248
6246
6244
0
50
100
150
200
250
300
Station (ft)

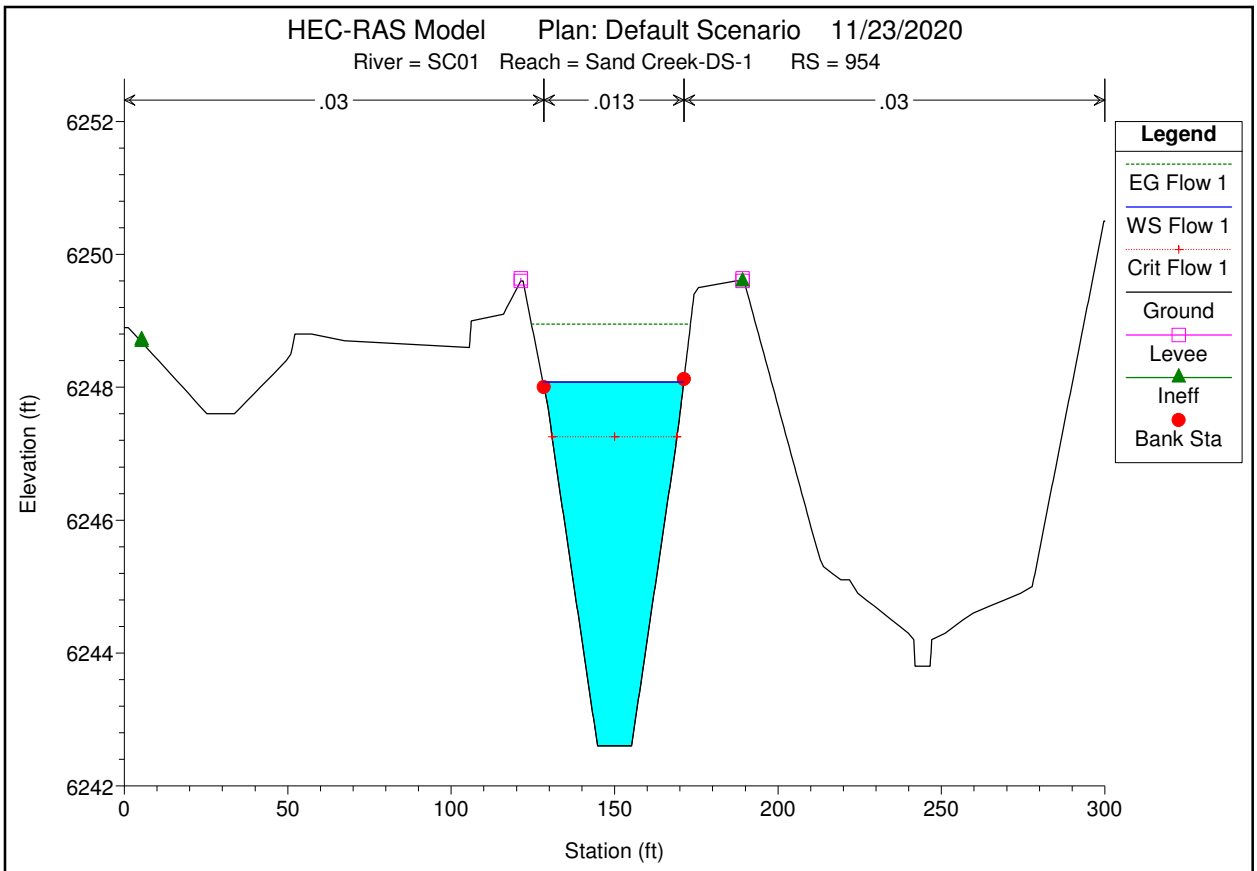

HEC-RAS Model Plan: Default Scenario 11/23/2020
River = SC01 Reach = Sand Creek-DS-1 RS = 959
.03
.013
.03
Legend
EG Flow 1
WS Flow 1
Crit Flow 1
Ground
Levee
Ineff
Bank Sta
Elevation (ft)
6256
6254
6252
6250
6248
6246
6244
0
50
100
150
200
250
300
Station (ft)

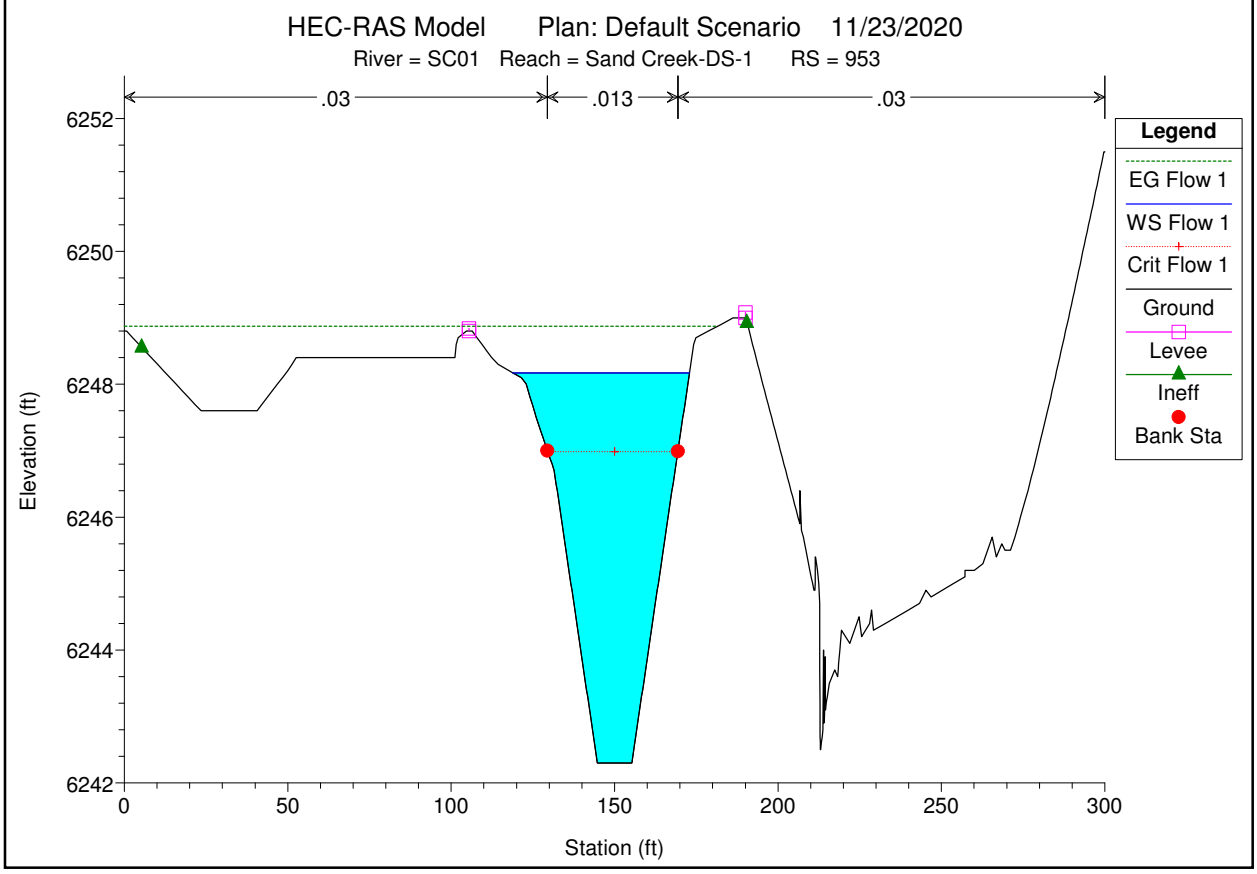

HEC-RAS Model Plan: Default Scenario 11/23/2020
River = SC01 Reach = Sand Creek-DS-1 RS = 958
.03
.013
.03
Legend
EG Flow 1
WS Flow 1
Crit Flow 1
Ground
Levee
Ineff
Bank Sta
Elevation (ft)
6254
6252
6250
6248
6246
6244
0
50
100
150
200
250
300
Station (ft)

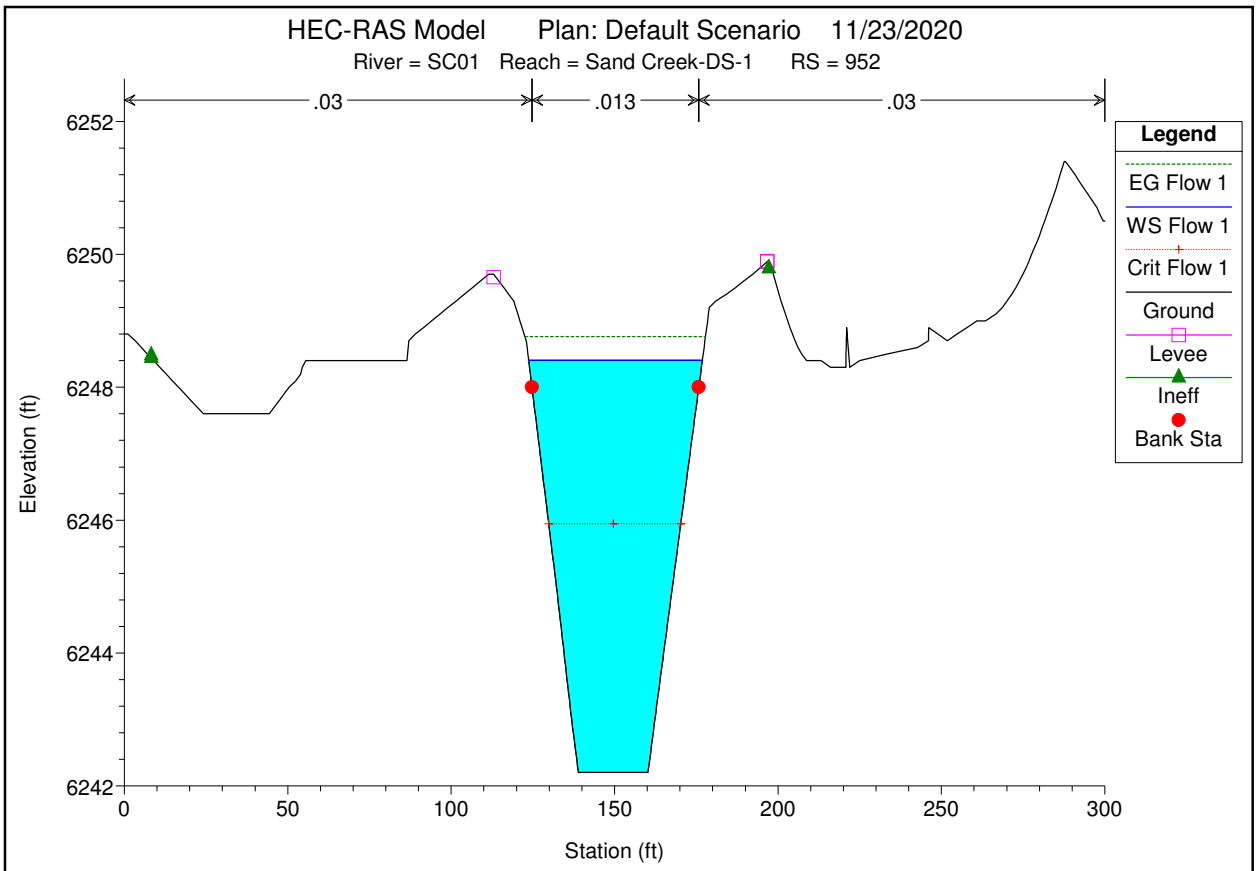

HEC-RAS Model Plan: Default Scenario 11/23/2020
River = SC01 Reach = Sand Creek-DS-1 RS = 957
.03
.013
.03
Legend
EG Flow 1
WS Flow 1
Crit Flow 1
Ground
Levee
Ineff
Bank Sta
Elevation (ft)
6254
6252
6250
6248
6246
6244
0
50
100
150
200
250
300
Station (ft)

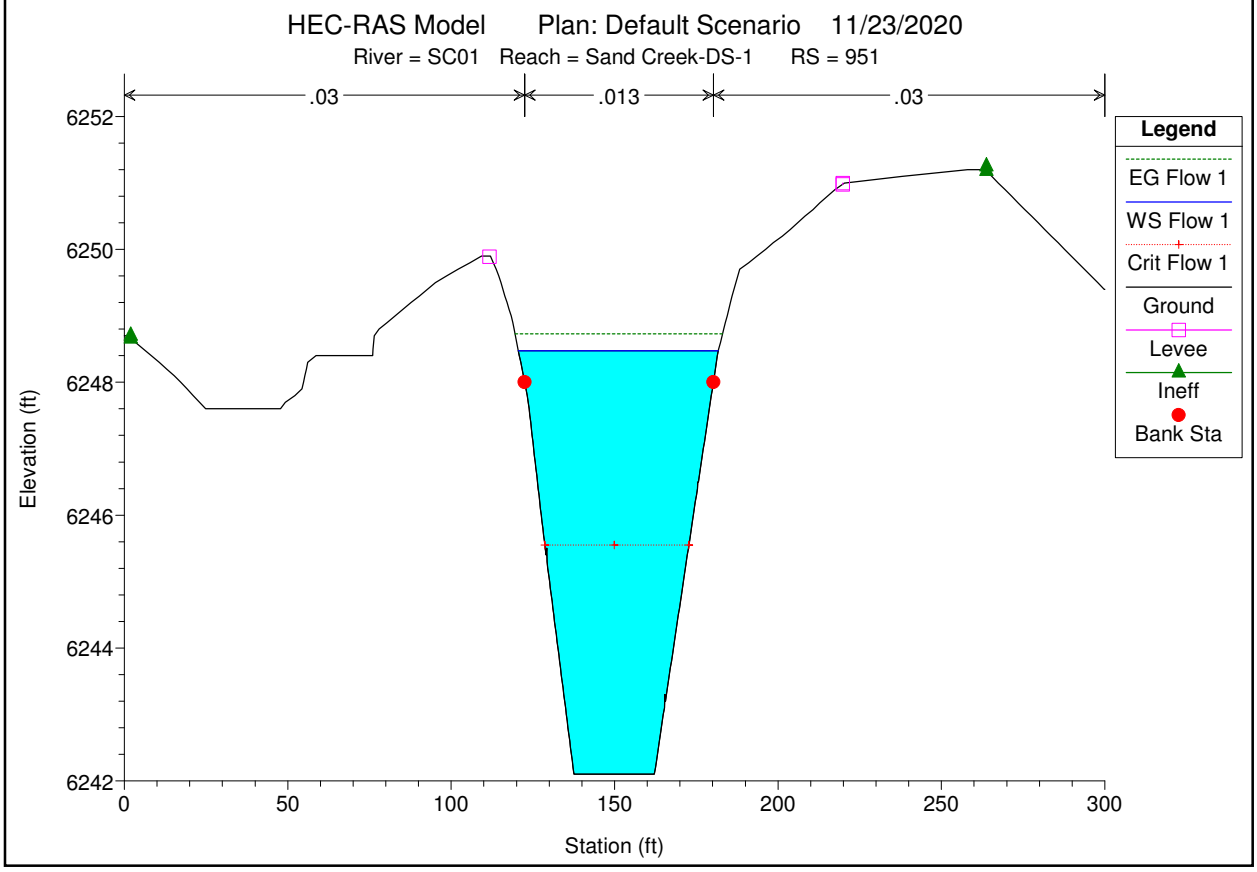

HEC-RAS Model Plan: Default Scenario 11/23/2020
River = SC01 Reach = Sand Creek-DS-1 RS = 956
.03
.013
.03
Elevation (ft)
Station (ft)
Legend
EG Flow 1
WS Flow 1
Crit Flow 1
Ground
Levee
Ineff
Bank Sta

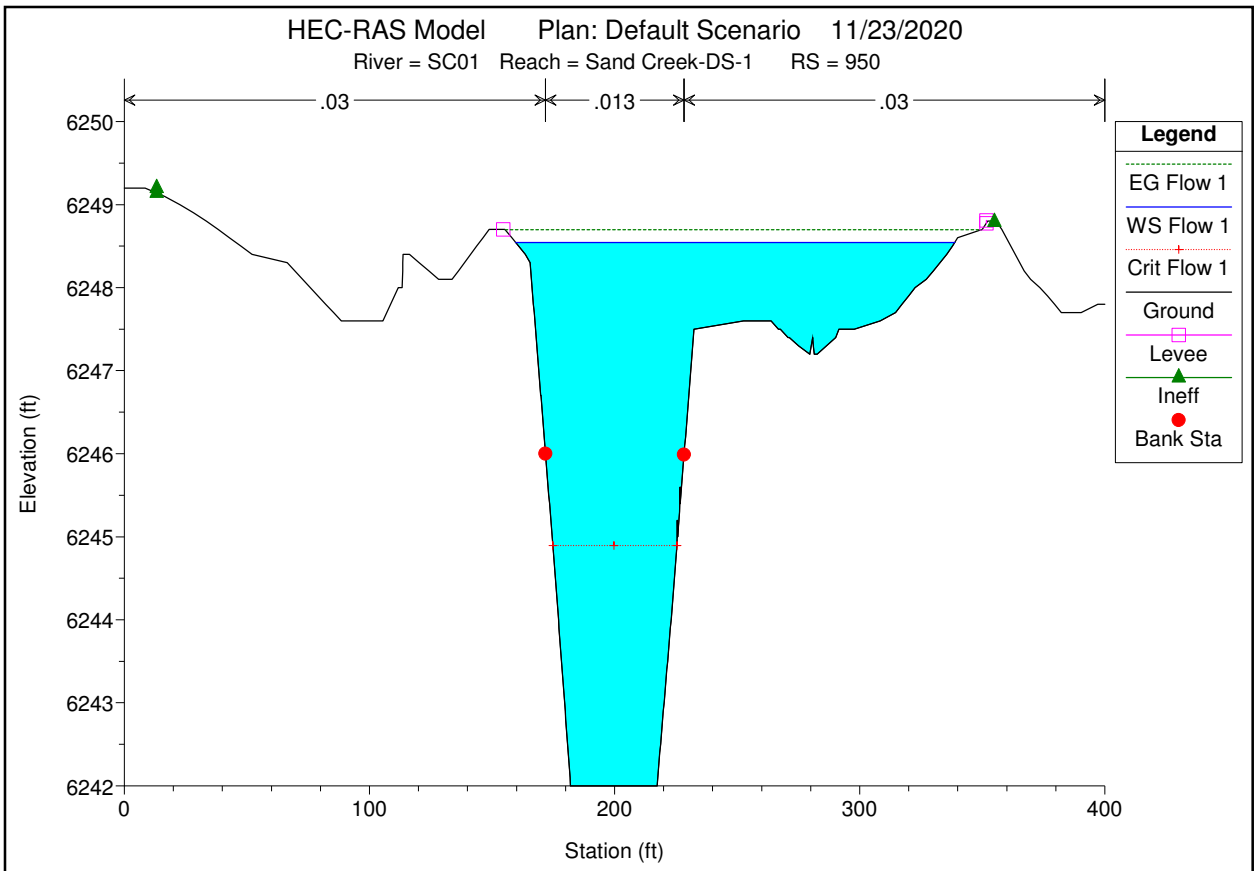

HEC-RAS Model Plan: Default Scenario 11/23/2020
River = SC01 Reach = Sand Creek-DS-1 RS = 955
.03
.013
.03
Elevation (ft)
Station (ft)
Legend
EG Flow 1
WS Flow 1
Crit Flow 1
Ground
Levee
Ineff
Bank Sta

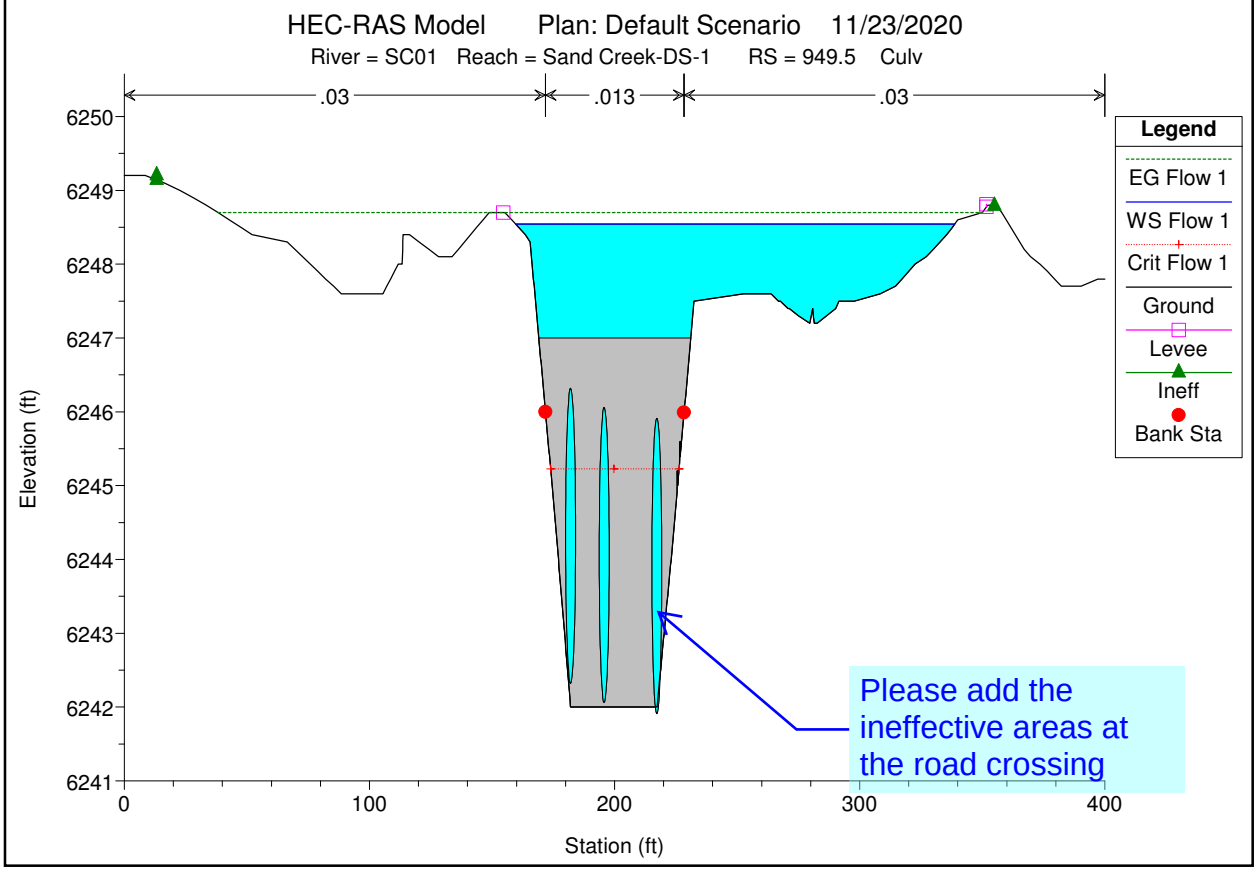

HEC-RAS Model Plan: Default Scenario 11/23/2020
River = SC01 Reach = Sand Creek-DS-1 RS = 954
.03
.013
.03
Legend
EG Flow 1
WS Flow 1
Crit Flow 1
Ground
Levee
Ineff
Bank Sta
Elevation (ft)
6252
6250
6248
6246
6244
6242
0
50
100
150
200
250
300
Station (ft)

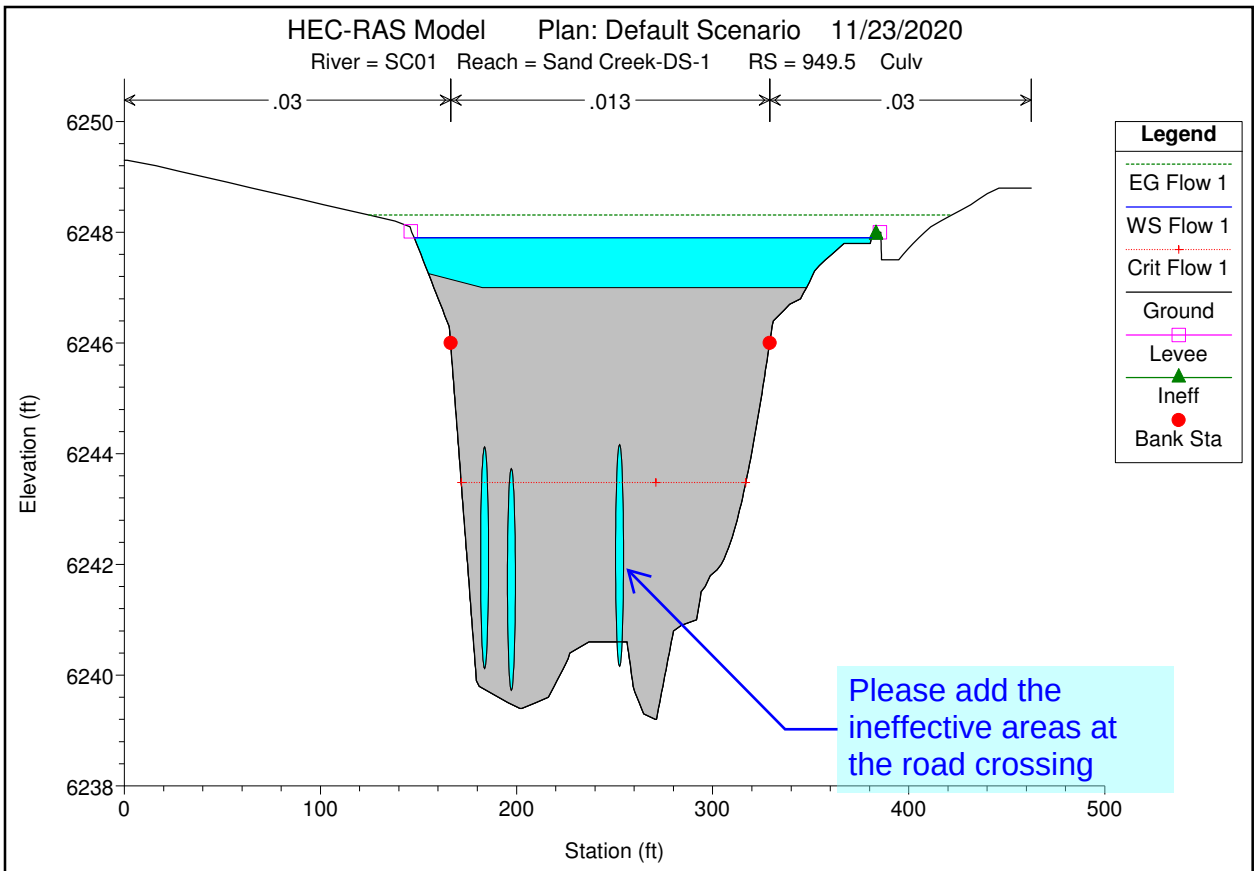

HEC-RAS Model Plan: Default Scenario 11/23/2020
River = SC01 Reach = Sand Creek-DS-1 RS = 953
.03
.013
.03
Legend
EG Flow 1
WS Flow 1
Crit Flow 1
Ground
Levee
Ineff
Bank Sta
Elevation (ft)
6252
6250
6248
6246
6244
6242
0
50
100
150
200
250
300
Station (ft)

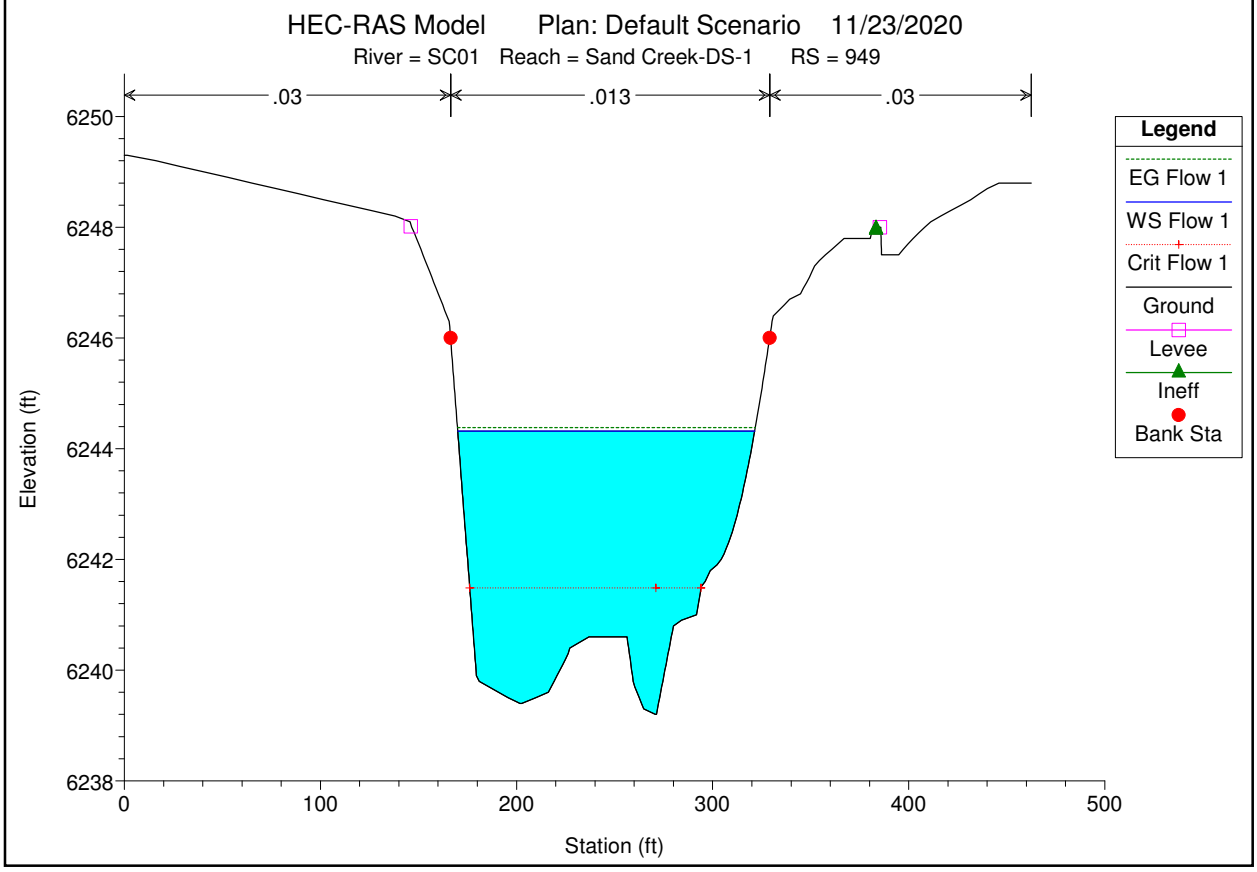

HEC-RAS Model Plan: Default Scenario 11/23/2020
River = SC01 Reach = Sand Creek-DS-1 RS = 952
.03
.013
.03
Elevation (ft)
Station (ft)
Legend
EG Flow 1
WS Flow 1
Crit Flow 1
Ground
Levee
Ineff
Bank Sta

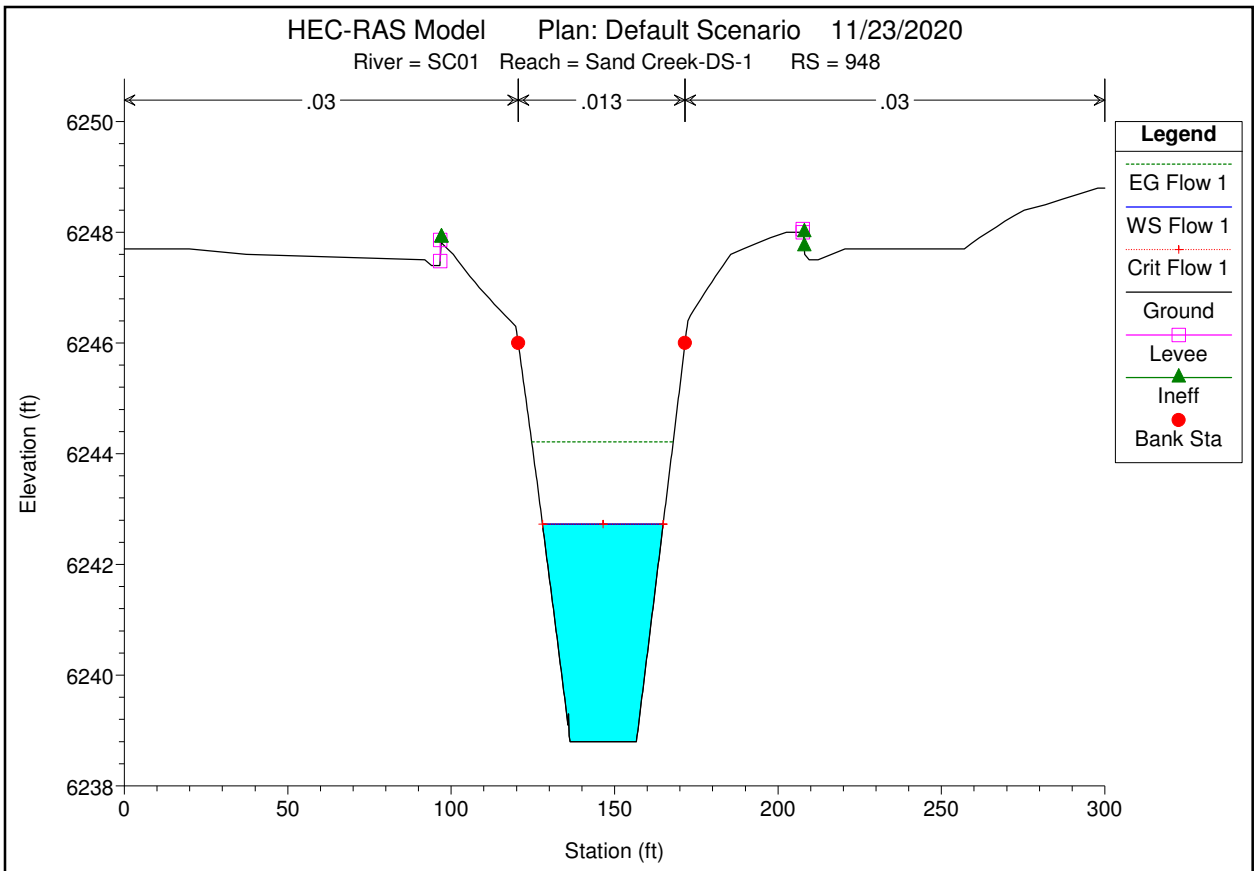

HEC-RAS Model Plan: Default Scenario 11/23/2020
River = SC01 Reach = Sand Creek-DS-1 RS = 951
.03
.013
.03
Elevation (ft)
Station (ft)
Legend
EG Flow 1
WS Flow 1
Crit Flow 1
Ground
Levee
Ineff
Bank Sta


HEC-RAS Model Plan: Default Scenario 11/23/2020
River = SC01 Reach = Sand Creek-DS-1 RS = 950
.03
.013
.03
Legend
EG Flow 1
WS Flow 1
Crit Flow 1
Ground
Levee
Ineff
Bank Sta
Elevation (ft)
6250
6249
6248
6247
6246
6245
6244
6243
6242
0
100
200
300
400
Station (ft)

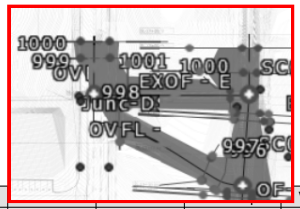

HEC-RAS Model Plan: Default Scenario 11/23/2020
River = SC01 Reach = Sand Creek-DS-1 RS = 949.5 Culv
.03
.013
.03
Legend
EG Flow 1
WS Flow 1
Crit Flow 1
Ground
Levee
Ineff
Bank Sta
Elevation (ft)
6250
6249
6248
6247
6246
6245
6244
6243
6242
6241
0
100
200
300
400
Station (ft)
Please add the ineffective areas at the road crossing


HEC-RAS Model Plan: Default Scenario 11/23/2020
River = SC01 Reach = Sand Creek-DS-1 RS = 949.5 Culv
.03
.013
.03
Legend
EG Flow 1
WS Flow 1
Crit Flow 1
Ground
Levee
Ineff
Bank Sta
Elevation (ft)
Station (ft)
Please add the ineffective areas at the road crossing


HEC-RAS Model Plan: Default Scenario 11/23/2020
River = SC01 Reach = Sand Creek-DS-1 RS = 949
.03
.013
.03
Legend
EG Flow 1
WS Flow 1
Crit Flow 1
Ground
Levee
Ineff
Bank Sta
Elevation (ft)
Station (ft)


HEC-RAS Model Plan: Default Scenario 11/23/2020
River = SC01 Reach = Sand Creek-DS-1 RS = 948
.03
.013
.03
Legend
EG Flow 1
WS Flow 1
Crit Flow 1
Ground
Levee
Ineff
Bank Sta
Elevation (ft)
6250
6248
6246
6244
6242
6240
6238
0
50
100
150
200
250
300
Station (ft)

please include the table summary for the overflow modeling



HEC-RAS Plan: Default Scenario Profile: Flow 1

Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev				Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Sand Creek	998	Flow 1	820.00	6265.50	6270.89	6270.89	6272.28	0.001362	9.64	103.80	56.32	0.87
Sand Creek	993	Flow 1	820.00	6265.20	6270.74	6270.74	6272.00	0.001080	9.43	128.24	71.77	0.79
Sand Creek-DS-0	992	Flow 1	820.02	6264.30	6268.57	6268.57	6269.98	0.001829	9.51	86.27	30.02	0.99
Sand Creek-DS-0	991	Flow 1	820.02	6264.10	6268.51	6268.51	6269.81	0.001850	9.15	89.57	33.50	0.99
Sand Creek-DS-0-	990	Flow 1	1037.00	6263.20	6268.54	6267.78	6269.30	0.000697	7.21	181.85	76.02	0.65
Sand Creek-DS-0-	989	Flow 1	1037.00	6263.10	6267.92	6267.92	6269.24	0.001524	9.40	128.51	57.84	0.93
Sand Creek-DS-0-	988	Flow 1	1037.00	6258.70	6263.54	6263.54	6265.09	0.001791	9.98	103.92	33.08	0.99
Sand Creek-DS-0-	987	Flow 1	1037.00	6254.80	6259.78	6259.78	6261.38	0.001842	10.16	102.05	32.04	1.00
Sand Creek-DS-0-	986	Flow 1	1037.00	6253.70	6259.48	6258.97	6260.62	0.001362	8.59	120.68	35.59	0.82
Sand Creek-DS-0-	985	Flow 1	1037.00	6253.10	6259.83	6258.11	6260.46	0.000526	6.39	162.41	39.72	0.56
Sand Creek-DS-0-	984	Flow 1	1037.00	6253.00	6259.59	6258.60	6260.43	0.001060	7.37	140.67	39.07	0.68
Sand Creek-DS-0-	983	Flow 1	1037.00	6252.90	6259.75	6257.91	6260.35	0.000491	6.22	166.73	40.29	0.54
Sand Creek-DS-0-	982	Flow 1	1037.00	6252.70	6258.72	6258.72	6260.24	0.002055	9.91	105.15	35.64	1.00
Sand Creek-DS-0-	981	Flow 1	1037.00	6252.60	6257.64	6257.64	6259.29	0.001815	10.32	100.46	30.11	1.00
Sand Creek-DS-0-	980	Flow 1	1037.00	6252.40	6257.46	6257.46	6259.10	0.001807	10.30	100.70	30.18	0.99
Sand Creek-DS-0-	979	Flow 1	1037.00	6252.30	6257.12	6257.12	6258.76	0.001808	10.28	100.87	30.54	1.00
Sand Creek-DS-0-	978	Flow 1	1037.00	6252.20	6256.90	6256.90	6258.49	0.001775	10.13	102.38	31.51	0.99
Sand Creek-DS-0-	977	Flow 1	1037.00	6252.10	6256.69	6256.69	6258.25	0.001800	10.03	103.44	32.94	1.00
Sand Creek-DS-0-	976	Flow 1	1037.00	6251.60	6256.19	6256.19	6257.67	0.001803	9.76	106.20	35.57	1.00
Sand Creek-DS-0-	975	Flow 1	1037.00	6251.10	6255.68	6255.68	6257.17	0.001823	9.79	105.88	35.61	1.00
Sand Creek-DS-0-	974	Flow 1	1037.00	6250.80	6255.45	6255.45	6256.92	0.001804	9.74	106.50	35.84	1.00
Sand Creek-DS-0-	973	Flow 1	1037.00	6250.60	6255.25	6255.25	6256.72	0.001805	9.74	106.46	35.84	1.00
Sand Creek-DS-0-	972	Flow 1	1037.00	6250.60	6255.19	6255.19	6256.67	0.001830	9.78	106.04	35.87	1.00
Sand Creek-DS-0-	971	Flow 1	1037.00	6250.40	6255.06	6255.06	6256.53	0.001787	9.71	106.75	35.79	0.99
Sand Creek-DS-0-	970	Flow 1	1037.00	6250.10	6254.71	6254.71	6256.17	0.001777	9.71	106.85	35.74	0.99
Sand Creek-DS-0-	969	Flow 1	1037.00	6249.60	6254.22	6254.22	6255.68	0.001780	9.69	106.96	35.89	0.99
Sand Creek-DS-0-	968	Flow 1	1037.00	6249.10	6253.72	6253.72	6255.18	0.001784	9.71	106.85	35.86	0.99
Sand Creek-DS-1	966	Flow 1	1100.00	6248.60	6253.01	6253.01	6254.32	0.001599	9.39	133.91	56.36	0.95
Sand Creek-DS-1	965	Flow 1	1100.00	6248.10	6252.74	6252.74	6254.20	0.001793	9.71	113.30	38.38	1.00
Sand Creek-DS-1	964	Flow 1	1100.00	6247.60	6252.25	6252.25	6253.70	0.001768	9.67	113.80	38.39	0.99
Sand Creek-DS-1	963	Flow 1	1100.00	6247.10	6251.75	6251.75	6253.21	0.001781	9.69	113.49	38.34	0.99
Sand Creek-DS-1	962	Flow 1	1100.00	6246.60	6251.26	6251.26	6252.71	0.001765	9.66	113.88	38.40	0.99
Sand Creek-DS-1	961	Flow 1	1100.00	6246.10	6250.75	6250.75	6252.21	0.001780	9.69	113.51	38.34	0.99
Sand Creek-DS-1	960	Flow 1	1100.00	6245.60	6250.23	6250.23	6251.71	0.001736	9.77	112.70	38.20	0.99
Sand Creek-DS-1	959	Flow 1	1100.00	6245.10	6249.75	6249.75	6251.21	0.001779	9.69	113.53	38.33	0.99
Sand Creek-DS-1	958	Flow 1	1100.00	6244.60	6249.23	6249.23	6250.71	0.001736	9.78	112.68	38.20	0.99
Sand Creek-DS-1	957	Flow 1	1100.00	6244.10	6248.77	6248.77	6250.21	0.001773	9.65	113.99	38.65	0.99
Sand Creek-DS-1	956	Flow 1	1100.00	6243.60	6248.26	6248.26	6249.71	0.001781	9.66	113.88	38.69	0.99
Sand Creek-DS-1	955	Flow 1	1100.00	6243.10	6247.74	6247.74	6249.22	0.001796	9.75	112.83	37.99	1.00
Sand Creek-DS-1	954	Flow 1	1100.00	6242.60	6248.08	6247.25	6248.95	0.000877	7.50	146.77	43.06	0.71
Sand Creek-DS-1	953	Flow 1	1100.00	6242.30	6248.17	6246.98	6248.87	0.000558	6.73	169.62	54.05	0.59
Sand Creek-DS-1	952	Flow 1	1100.00	6242.20	6248.41	6245.95	6248.76	0.000247	4.77	230.80	53.15	0.40
Sand Creek-DS-1	951	Flow 1	1100.00	6242.10	6248.47	6245.55	6248.73	0.000171	4.07	270.88	61.19	0.33
Sand Creek-DS-1	950	Flow 1	1100.00	6242.00	6248.54	6244.90	6248.70	0.000080	3.21	440.74	179.09	0.24
Sand Creek-DS-1	949.5		Culvert									
Sand Creek-DS-1	949	Flow 1	1100.00	6239.20	6244.32	6241.48	6244.38	0.000053	1.97	558.40	151.48	0.18
Sand Creek-DS-1	948	Flow 1	1100.00	6238.80	6242.73	6242.73	6244.22	0.001785	9.79	112.41	36.93	0.99

Provide the HECRAS Profile.

Please provide input/output data. Additionally we request that an electronic copy of the HEC modeling be provided. The electronic file may be sent via email.

SOLACE APARTMENTS - SAND CREEK CENTER TRIBUTARY

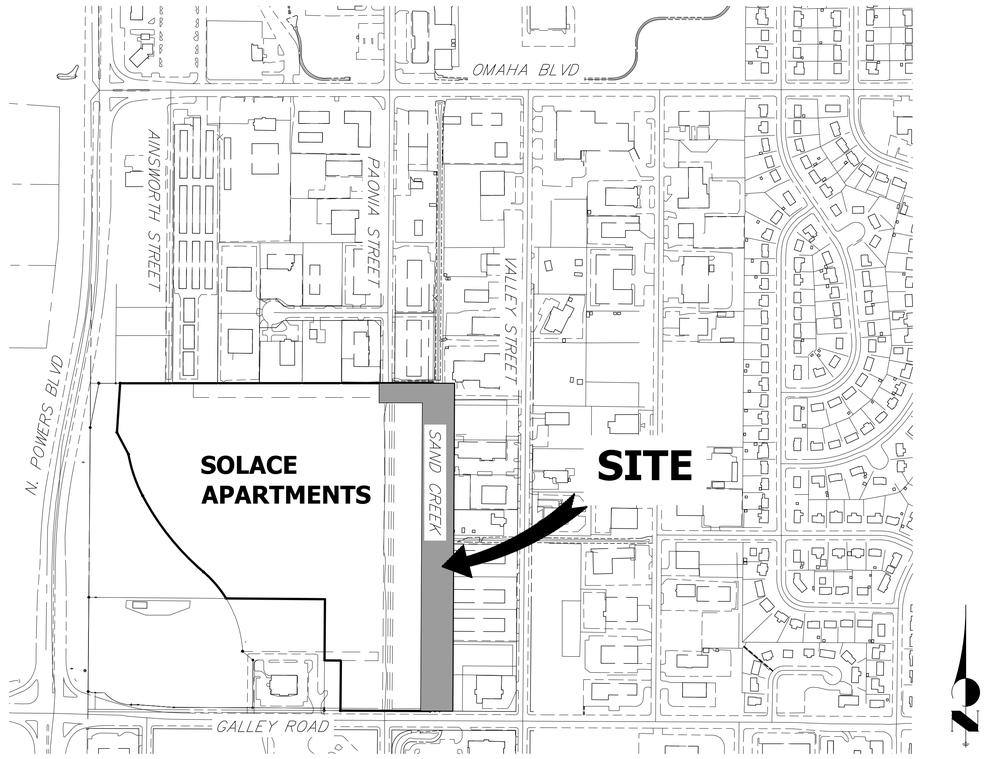
A PORTION OF SECTION 7, TOWNSHIP 14 SOUTH, RANGE 65 WEST OF THE 6TH P.M.

EL PASO COUNTY, COLORADO

CHANNEL IMPROVEMENTS

ABBREVIATIONS

AC	ACRE
AD	ALGEBRAIC DIFFERENCE
AH	AHEAD
ARCH	ARCHITECT
ASCE	AMERICAN SOCIETY OF CIVIL ENGINEERS
ASS'Y	ASSEMBLY
AVE	AVENUE
BB	BOX BASE
BK	BACK
BNDY	BOUNDARY
BOP	BOTTOM OF PIPE
BOV	BLOW OFF VALVE
BFV	BUTTERFLY VALVE
BLVD	BOULEVARD
BW	BOTTOM OF WALL
C&G	CURB & GUTTER
CATV	CABLE TELEVISION
CB	CATCH BASIN
CBC	CONCRETE BOX CULVERT
CDOT	COLORADO DEPARTMENT OF TRANSPORTATION
CDS	CUL-DE-SAC
CFS	CUBIC FEET PER SECOND
CL	CENTER LINE
CLOMR	CONDITIONAL LETTER OF MAP REVISION
CLR	CLEAR
CMP	CORRUGATED METAL PIPE
CO	CLEAN OUT
CONC	CONCRETE
CR	CIRCLE
CSP	CORRUGATED STEEL PIPE
CT	COURT
CTRB	CONCRETE THRUST REDUCER BLOCK
CY	CUBIC YARD
DBPS	DRAINAGE BASIN PLANNING STUDY
DE	DRAINAGE EASEMENT
DIA	DIAMETER
DIP	DUCTILE IRON PIPE
DR	DRIVE
DRC	DESIGN REVIEW COMMITTEE
DU	DWELLING UNITS
E	EAST
EA	EACH
EGL	ENERGY GRADE LINE
EL	ELEVATION
ELEC	ELECTRIC
EOA	EDGE OF ASPHALT
ESMT	EASEMENT
EST	ESTIMATE
EX	EXISTING
FDP	FINAL DEVELOPMENT PLAN
FDR	FINAL DRAINAGE REPORT
FES	FLARED END SECTION
FG	FINISHED GRADE
FH	FIRE HYDRANT
FL	FLOWLINE
FIL	FILING
FO	FIBER OPTIC CABLE
GB	GRADE BREAK
GE	GAS EASEMENT
GIS	GEOGRAPHIC INFORMATION SYSTEM
GL	GAS LINE
GPS	GLOBAL POSITIONING SYSTEM
GV	GATE VALVE
HC	HANDICAP
HDC	HIGH DEFLECTION COUPLING
HDPE	HIGH DENSITY POLYETHYLENE
HGL	HYDRAULIC GRADE LINE
HOA	HOME OWNERS ASSOCIATION
HP	HIGH POINT
I	INLET
IE	IRRIGATION EASEMENT
INT	INTERSECTION
INV	INVERT
IRR	IRRIGATION
KB	KICK (THRUST) BLOCK
LE	LANDSCAPE EASEMENT
LF	LINEAR FEET
LN	LANE
LOMR	LETTER OF MAP REVISION
LP	LOW POINT
LS	LUMP SUM
LT	LEFT
MAX	MAXIMUM
MDDP	MASTER DEVELOPMENT DRAINAGE PLAN
MH	MANHOLE
MIN	MINIMUM
N	NORTH
NRCP	NON-REINFORCED CONCRETE PIPE
ODP	OFFICIAL DEVELOPMENT PLAN
OHE	OVERHEAD ELECTRIC
OHU	OVERHEAD UTILITY
PC	POINT OF CURVATURE
PCC	POINT OF COMPOUND CURVATURE
PCR	POINT OF CURB RETURN
PDP	PRELIMINARY DEVELOPMENT PLAN
PE	PROFESSIONAL ENGINEER
PI	POINT OF INTERSECTION
PKWY	PARKWAY
PL	PROPERTY LINE
PR	PROPOSED
PRC	POINT OF REVERSE CURVATURE
PT	POINT OF TANGENCY
PV	PLUG VALVE
PVC	POLYVINYL CHLORIDE
R	RADIUS
RCP	REINFORCED CONCRETE PIPE
RD	ROAD
ROW	RIGHT OF WAY
RT	RIGHT
S	SOUTH
STE	STEEL
SAN	SANITARY SEWER
SF	SQUARE FEET
ST	STREET
STA	STATION
STM	STORM SEWER
SY	SQUARE YARD
SY-IN	SQUARE YARD INCH
TB	THRUST BLOCK
TBC	TOP BACK OF CURB
TBW	TOP BACK OF WALK
TEL	TELEPHONE
TOA	TOP OF ASPHALT
TOB	TOP OF BOX
TOC	TOP OF CURB OR CONCRETE
TOF	TOP OF FOUNDATION
TOP	TOP OF PIPE
TW	TOP OF WALL
TYP	TYPICAL
UDFCD	URBAN DRAINAGE AND FLOOD CONTROL DISTRICT
UE	UTILITY EASEMENT
U&DE	UTILITY & DRAINAGE EASEMENT
UGE	UNDERGROUND ELECTRIC
VCP	VITRIFIED CLAY PIPE
VPC	VERTICAL POINT OF CURVATURE
VPI	VERTICAL POINT OF INTERSECTION
VPT	VERTICAL POINT OF TANGENCY
VTC	VEHICLE TRACKING CONTROL
W	WEST
WL	WATER LINE
WM	WATER MAIN
WRD	WATER RESOURCES DEPARTMENT
WS	WATER SURFACE
WSE	WATER SURFACE ELEVATION
WTR	WATER
YR	YEAR



VICINITY MAP
SCALE: 1" = 300'

APPLICANT/OWNER

JACKSON DEARBORN PARTNERS
404 S. WELLS ST.
SUITE 400
CHICAGO, IL 60607
P~734.216.2577

CIVIL ENGINEER

JR ENGINEERING
5475 TECH CENTER DR
SUITE 235
COLORADO SPRINGS, CO 80919
CONTACT: MIKE BRAMLETT
C~719.659.7679

J·R ENGINEERING

PLANNER

N.E.S. INC.
619 N. CASCADE AVE
SUITE 200
COLORADO SPRINGS, CO 80903
CONTACT: TAMARA BAXTER
P~719.471.0073

GEOTECHNICAL ENGINEER

CTL THOMPSON, INC
5170 MARK DABLING BLVD
COLORADO SPRINGS, CO 80918
P~719.528.8300

CTL|THOMPSON INCORPORATED

SHEET INDEX

1	COVER SHEET
2	GENERAL NOTES
3	SITE AND DEMO PLAN
4–6	CHANNEL PLAN AND PROFILES
7	CHANNEL DETAILS
8	DROP STRUCTURES PLAN AND PROFILE
9	DROP STRUCTURE DETAIL SHEETS
10	PAONIA STREET OVERFLOW PLAN
TOTAL	10

BASIS OF BEARINGS

BENCHMARK

THE LOCATIONS OF EXISTING ABOVE GROUND AND UNDERGROUND UTILITIES ARE SHOWN IN AN APPROXIMATE WAY ONLY. THE CONTRACTOR SHALL DETERMINE THE EXACT LOCATION OF ALL EXISTING UTILITIES BEFORE COMMENCING WORK. THE CONTRACTOR SHALL BE FULLY RESPONSIBLE FOR ANY AND ALL DAMAGES WHICH MIGHT BE CAUSED BY HIS FAILURE TO EXACTLY LOCATE AND PRESERVE ANY AND ALL ABOVE GROUND AND UNDERGROUND UTILITIES.

811 Know what's below. Call before you dig.

OWNER/DEVELOPER STATEMENT

I, THE OWNER/DEVELOPER HAVE READ AND WILL COMPLY WITH ALL OF THE REQUIREMENTS SPECIFIED IN THESE DETAILED PLANS AND SPECIFICATIONS.

DANE OLMSTEAD DATE

JACKSON DEARBORN PARTNERS
404 S. WELLS ST. SUITE 400
CHICAGO, IL 60607

EL PASO COUNTY STATEMENT

COUNTY PLAN REVIEW IS PROVIDED ONLY FOR GENERAL CONFORMANCE WITH COUNTY DESIGN CRITERIA. THE COUNTY IS NOT RESPONSIBLE FOR THE ACCURACY AND ADEQUACY OF THE DESIGN, DIMENSIONS, AND/OR ELEVATIONS WHICH SHALL BE CONFIRMED AT THE JOB SITE. THE COUNTY THROUGH THE APPROVAL OF THIS DOCUMENT ASSUMES NO RESPONSIBILITY FOR COMPLETENESS AND/OR ACCURACY OF THIS DOCUMENT.

FILED IN ACCORDANCE WITH THE REQUIREMENTS OF THE EL PASO COUNTY LAND DEVELOPMENT CODE, DRAINAGE CRITERIA MANUAL, VOLUMES 1 AND 2, AND ENGINEERING CRITERIA MANUAL AS AMENDED.

IN ACCORDANCE WITH ECM SECTION 1.12, THESE CONSTRUCTION DOCUMENTS WILL BE VALID FOR CONSTRUCTION FOR A PERIOD OF 2 YEARS FROM THE DATE SIGNED BY THE EL PASO COUNTY ENGINEER. IF CONSTRUCTION HAS NOT STARTED WITHIN THOSE 2 YEARS, THE PLANS WILL NEED TO BE RESUBMITTED FOR APPROVAL, INCLUDING PAYMENT OF REVIEW FEES AT THE PLANNING AND COMMUNITY DEVELOPMENT DIRECTORS DISCRETION.

JENNIFER IRVINE, P.E. DATE

COUNTY ENGINEER/ECM ADMINISTRATOR

ENGINEER'S STATEMENT

STANDARD DETAILS SHOWN WERE REVIEWED ONLY AS TO THEIR APPLICATION ON THIS PROJECT

COLORADO REGISTERED MIKE A. BRAMLETT 32314 PROFESSIONAL ENGINEER

MIKE A. BRAMLETT, P.E. DATE
COLORADO P.E. 32314
FOR AND ON BEHALF OF JR ENGINEERING, LLC

UNTIL SUCH TIME AS THESE DRAWINGS ARE APPROVED BY THE APPROPRIATE REVIEWING AGENCIES, JR ENGINEERING APPROVES THEIR USE ONLY FOR THE PURPOSES DESIGNATED BY WRITTEN AUTHORIZATION.

PREPARED FOR
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Centennial 303-740-9393 • Colorado Springs 719-593-2593
Fort Collins 970-491-9888 • www.jrengineering.com

No.	REVISION	BY	DATE

H-SCALE	1"=300'
V-SCALE	N/A
DATE	11/16/20
DESIGNED BY	JBP
DRAWN BY	JBP
CHECKED BY	

SAND CREEK CENTER TRIBUTARY
COVER SHEET

SHEET 1 OF 10
JOB NO. 25174.00

LAYER LINETYPE LEGEND

	EXISTING	PROPOSED
MATCH LINE		
SECTION LINE		
BOUNDARY LINE		
PROPERTY LINE		
EASEMENT LINE		
RIGHT OF WAY		
CENTERLINE		
FENCE	×	×
GUARDRAIL		
CABLE TV	TV	TV
ELECTRIC	E	E
FIBER OPTIC	FO	FO
GAS MAIN	G	G
IRRIGATION MAIN	IRR	IRR
OVERHEAD UTILITY	OHU	OHU
SANITARY SEWER	S	
STORM DRAIN		
TELEPHONE	T	T
WATER MAIN	W	
SWALE/WATERWAY FLOWLINE		
DIVERSION DITCH		
TOP OF SLOPE		
TOE OF SLOPE		
100 YEAR FLOODPLAIN	100YR	100YR
5 YEAR HGL		
100 YEAR HGL		

UTILITIES LEGEND

	EXISTING	PROPOSED
STORM SEWER		
MANHOLE		
STORM INLET		
AREA INLET – SQUARE		
FLARED END SECTION		
RIPRAP		
SANITARY SEWER		
LINE MARKER	Mkr San	
SERVICE MARKER		
CLEAN-OUT		
MANHOLE W/ DIRECTIONAL FLOW ARROW		
WATER LINE		
LINE MARKER	Mkr W	
SERVICE MARKER		
FIRE HYDRANT		
MANHOLE		
BEND		
BLOW-OFF VALVE		
WELL	WELL	WELL
METER		
VALVE		
REDUCER		
CROSS		
PLUG W/ THRUST BLOCK		
TEE		
AIR & VACUUM VALVE ASSEMBLY		
GAS LINE		
MARKER	Mkr G	
SERVICE MARKER		
METER		
VALVE		
PLUG		
DRY UTILITIES		
CABLE TV MARKER	Mkr TV	
CABLE TELEVISION PEDESTAL	TV	
ELECTRIC MARKER	Mkr E	
ELECTRIC SERVICE MARKER		
ELECTRICAL PEDESTAL	E	
ELECTRICAL METER	E	
ELECTRICAL MANHOLE	E	
FIBER-OPTIC MARKER	Mkr FO	
IRRIGATION PEDESTAL	I	
TELEPHONE MARKER	Mkr T	
TELEPHONE PEDESTAL	T	
TELEPHONE MANHOLE	T	
UTILITY POLE		
GUY ANCHOR		
GUY POLE		

MONUMENTATION LEGEND

ALUMINUM CAP – FOUND	AC
BRASS CAP – FOUND	BC
BENCHMARK – FOUND	
CROSS – FOUND	
MONUMENT – SET	
MONUMENT – FOUND (DEFAULT)	
MONUMENT – FOUND (ALTERNATE 1)	
MONUMENT – FOUND (ALTERNATE 2)	
MONUMENT – FOUND (ALTERNATE 3)	
MONUMENT – FOUND (ALTERNATE 4)	
MONUMENT – FOUND (ALTERNATE 5)	
MONUMENT – FOUND (ALTERNATE 6)	
MONUMENT – FOUND (ALTERNATE 7)	
NAIL & WASHER – FOUND	NAIL & WASHER
PANEL – FOUND	
PK NAIL – FOUND	PK NAIL
ROW MONUMENT – FOUND	
ROW MARKER – FOUND	
SECTION CORNER – FOUND	
SECTION CORNER – SET	
QUARTER-SECTION CORNER – FOUND	
QUARTER-SECTION CORNER – SET	
SECTION CENTER – FOUND	
SECTION CENTER – FOUND	
CONTROL/TRAVERSE POINT – SET	

DRAINAGE REPORT PLANS

KEY

BASIN DESIGNATION (NO COEFFICIENT)	# / #.#
BASIN DESIGNATION (1 COEFFICIENT)	# / #.# / #
BASIN DESIGNATION (2 COEFFICIENTS)	# / #.# / # / #
ANALISYS POINT IDENTIFIER	#
BASIN DESIGNATION (HISTORIC)	# / #.#
BASIN DESIGNATION (DEVELOPED)	# / #.#
SUB-BASIN DESIGNATION (DEVELOPED)	# / #.#
DRAINAGE PIPE IDENTIFIER	##
DRAINAGE POINT IDENTIFIER (HEXAGONAL)	##
DRAINAGE POINT IDENTIFIER (TRIANGULAR)	?
SWMM DESIGNATION 1	#
SWMM DESIGNATION 2	#
SWMM DESIGNATION 3	#
SWMM DESIGNATION 4	?

LANDSCAPE LEGEND

	EXISTING	PROPOSED
TREE – CONIFEROUS		
TREE – DECIDUOUS		
SHRUB/BUSH		
SHRUBS AND BUSHES		
IRRIGATION BOX		
IRRIGATION SPRINKLER		
IRRIGATION VALVE		
BOLLARD		
FLAGPOLE	FP	

STANDARD NOTES FOR EL PASO COUNTY CONSTRUCTION PLANS

1. ALL DRAINAGE AND ROADWAY CONSTRUCTION SHALL MEET THE STANDARDS AND SPECIFICATIONS OF THE CITY OF COLORADO SPRINGS/EL PASO COUNTY DRAINAGE CRITERIA MANUAL, VOLUMES 1 AND 2, AND THE EL PASO COUNTY ENGINEERING CRITERIA MANUAL.

2. CONTRACTOR SHALL BE RESPONSIBLE FOR THE NOTIFICATION AND FIELD NOTIFICATION OF ALL EXISTING UTILITIES, WHETHER SHOWN ON THE PLANS OR NOT, BEFORE BEGINNING CONSTRUCTION. LOCATION OF EXISTING UTILITIES SHALL BE VERIFIED BY THE CONTRACTOR PRIOR TO CONSTRUCTION. CALL 811 TO CONTACT THE UTILITY NOTIFICATION CENTER OF COLORADO (UNCC).

3. CONTRACTOR SHALL KEEP A COPY OF THESE APPROVED PLANS, THE GRADING AND EROSION CONTROL PLAN, THE STORMWATER MANAGEMENT PLAN (SWMP), THE SOIL AND GEOTECHNICAL REPORT, AND THE APPROPRIATE DESIGN AND CONSTRUCTION STANDARDS AND SPECIFICATIONS AT THE JOB SITE AT ALL TIMES, INCLUDING THE FOLLOWING:
   - 3.1. EL PASO COUNTY ENGINEERING CRITERIA MANUAL (ECM)
   - 3.2. CITY OF COLORADO SPRINGS/ EL PASO COUNTY DRAINAGE CRITERIA MANUAL, VOLUMES 1 AND 2
   - 3.3. COLORADO DEPARTMENT OF TRANSPORTATION (CDOT) STANDARD SPECIFICATIONS AND BRIDGE CONSTRUCTION
   - 3.4. CDOT M&S STANDARDS

4. NOTWITHSTANDING ANYTHING DEPICTED IN THESE PLANS IN WORDS OR GRAPHIC REPRESENTATION, ALL DESIGN AND CONSTRUCTION RELATED TO ROADS, STORM DRAINAGE AND EROSION CONTROL SHALL CONFORM TO THE STANDARDS AND REQUIREMENTS OF THE MOST RECENT VERSIONS OF THE RELEVANT ADOPTED EL PASO COUNTY STANDARDS, INCLUDING THE LAND DEVELOPMENT CODE, THE EINGEERI9NG CRITERIA MANUAL, THE DRAINAGE CRITERIA MANUAL, AND THE DRAINAGE CRITERIA MANUAL VOLUME 2. ANY DEVIATIONS FROM REGULATIONS AND STANDARDS MUST BE REQUESTED, AND APPROVED, IN WRITING. ANY MODIFICATIONS NECESSARY TO MEET CRITERIA AFTER-THE-FACT WILL BE ENTIRELY THE DEVELOPER'S RESPONSIBILITY TO RECTIFY.

5. IT IS THE DESIGN ENGINEER'S RESPONSIBILITY TO ACCURATELY SHOW EXISTING CONDITIONS, BOTH ONSITE AND OFFSITE, ON THE CONSTRUCTION PLANS. ANY MODIFICATIONS NECESSARY DUE TO CONFLICTS, OMISSIONS, OR CHANGED CONDITIONS WILL BE ENTIRELY THE DEVELOPER'S RESPONSIBILITY TO RECTIFY.

6. CONTRACTOR SHALL SCHEDULE A PRE-CONSTRUCTION MEETING WITH EL PASO COUNTY PLANNING AND COMMUNITY DEVELOPMENT INSPECTIONS, PRIOR TO STARTING CONSTRUCTION.

7. IT IS THE CONTRACTOR'S RESPONSIBILITY TO UNDERSTAND THE REQUIREMENTS OF ALL JURISDICTIONAL AGENCIES TO OBTAIN ALL REQUIRED PERMITS, INCLUDING BUT NOT LIMITED TO EL PASO COUNTY EROSION AND STORMWATER QUALITY CONTROL PERMIT (ESQCP), REGIONAL BUILDING FLOODPLAIN DEVELOPMENT PERMIT, U.S. ARMY CORPS OF ENGINEERS-ISSUED 401 AND/OR 404 PERMITS, AND COUNTY AND STATE FUGITIVE DUST PERMITS.

8. CONTRACTOR SHALL NOT DEVIATE FROM THE PLANS WITHOUT FIRST OBTAINING WRITTEN APPROVAL FROM THE DESIGN ENGINEER AND PCD. CONTRACTOR SHALL NOTIFY THE DESIGN ENGINEER IMMEDIATELY UPON DISCOVERY OF ANY ERRORS OR INCONSISTENCIES.

9. ALL STORM DRAIN PIPE SHALL BE CLASS III RCP UNLESS OTHERWISE NOTED AND APPROVED BY PLANNING AND COMMUNITY DEVELOPMENT.

10. CONTRACTOR SHALL COORDINATE GEOTECHNICAL TESTING PER ECM STANDARDS. PAVEMENT DESIGN SHALL BE APPROVED BY EL PASO COUNTY PCD PRIOR TO PLACEMENT OF CURB AND GUTTER AND PAVEMENT.

11. ALL CONSTRUCTION TRAFFIC MUST ENTER/EXIT THE SITE AT APPROVED CONSTRUCTION ACCESS POINTS.

12. SIGHT VISIBILITY TRIANGLES ARE IDENTIFIED IN THE PLANS SHALL BE PROVIDED AT ALL INTERSECTIONS. OBSTRUCTIONS GREATER THAN 18 INCHES ABOVE FLOWLINE ARE NOT ALLOWED IN SIGHT TRIANGLES.

13. SIGNING AND STRIPING SHALL COMPLY WITH EL PASO COUNTY DEPARTMENT OF PUBLIC WORKS AND MUTCD CRITERIA.

14. CONTRACTOR SHALL OBTAIN ANY PERMITS REQUIRED BY EL PASO COUNTY DEPARTMENT OF PUBLIC WORKS, INCLUDING WORK WITHIN THE RIGHT-OF-WAY AND SPECIAL TRANSPORT PERMITS.

15. THE LIMITS OF CONSTRUCTION SHALL REMAIN WITHIN THE PROPERTY LINE UNLESS OTHERWISE NOTED. THE OWENER/DEVELOPER SHALL OBTAIN WRITTEN PERMISSION AND EASEMENTS, WHERE REQUIRED, FROM ADJOINING PROPERTY OWNER(S) PRIOR TO ANY OFF-SITE DISTURBANCE, GRADING, OR CONSTRUCTION.

Know what's **below.**
Call before you dig.

ENGINEER'S STATEMENT

STANDARD DETAILS SHOWN WERE REVIEWED ONLY AS TO THEIR APPLICATION ON THIS PROJECT

COLORADO REGISTERED PROFESSIONAL ENGINEER MIKE A. BRAMLETT 32314

MIKE A. BRAMLETT, P.E. DATE
COLORADO P.E. 32314
FOR AND ON BEHALF OF JR ENGINEERING, LLC

UNTIL SUCH TIME AS THESE DRAWINGS ARE APPROVED BY THE APPROPRIATE REVIEWING AGENCIES, JR ENGINEERING APPROVES THEIR USE ONLY FOR THE PURPOSES DESIGNATED BY WRITTEN AUTHORIZATION.

PREPARED FOR
JACKSON DEARBORN PARTNERS
404 S. WELLS ST.
SUITE 400
CHICAGO, ILL 60607
OFFICE PHONE
(734) 216-2577

J·R ENGINEERING
A Westrian Company
Centennial 303-740-9393 • Colorado Springs 719-593-2593
Fort Collins 970-491-9888 • www.jrengineering.com

No.	REVISION	BY	DATE

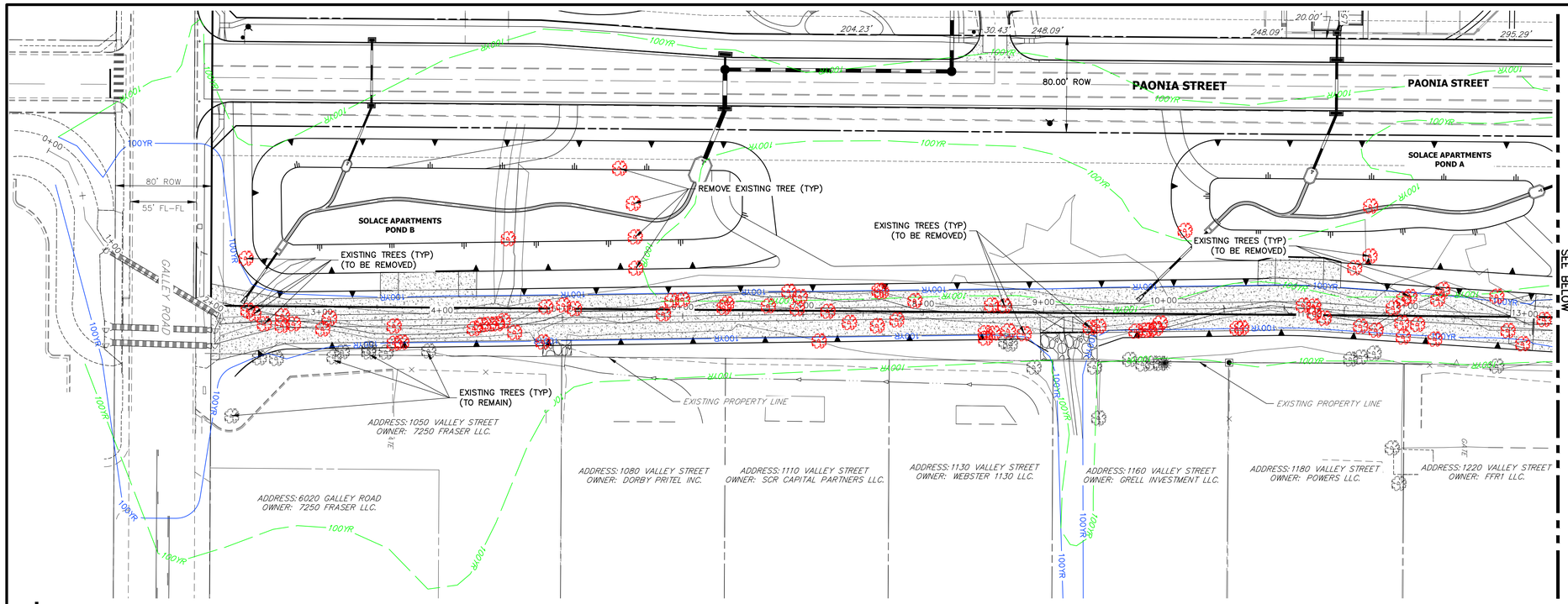
H-SCALE	N/A
V-SCALE	N/A
DATE	11/16/20
DESIGNED BY	JRM
DRAWN BY	JRM
CHECKED BY	

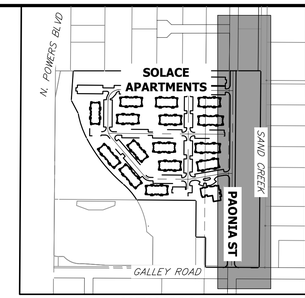
SAND CREEK CENTER TRIBUTARY

GENERAL NOTES

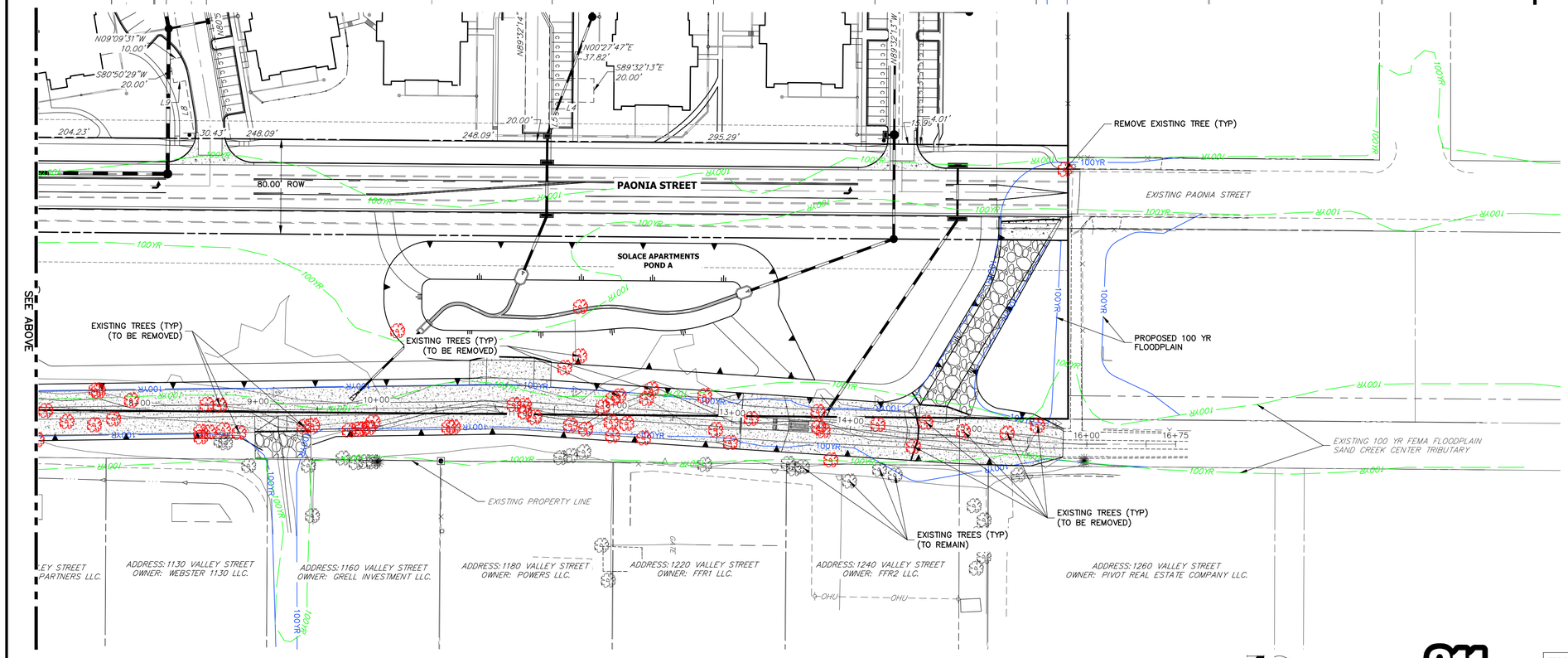
SHEET 2 OF 10

JOB NO. 25174.00





KEY MAP
SCALE 1"=500'



50 25 0 50 100
ORIGINAL SCALE: 1" = 50'

811 Know what's **below.** **Call** before you dig.

ENGINEER'S STATEMENT

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MIKE A. BRAMLETT, P.E.
COLORADO P.E. 32314
FOR AND ON BEHALF OF JR ENGINEERING, LLC

COLORADO REGISTERED PROFESSIONAL ENGINEER MIKE A. BRAMLETT 32314

DATE

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No.	REVISION	BY	DATE

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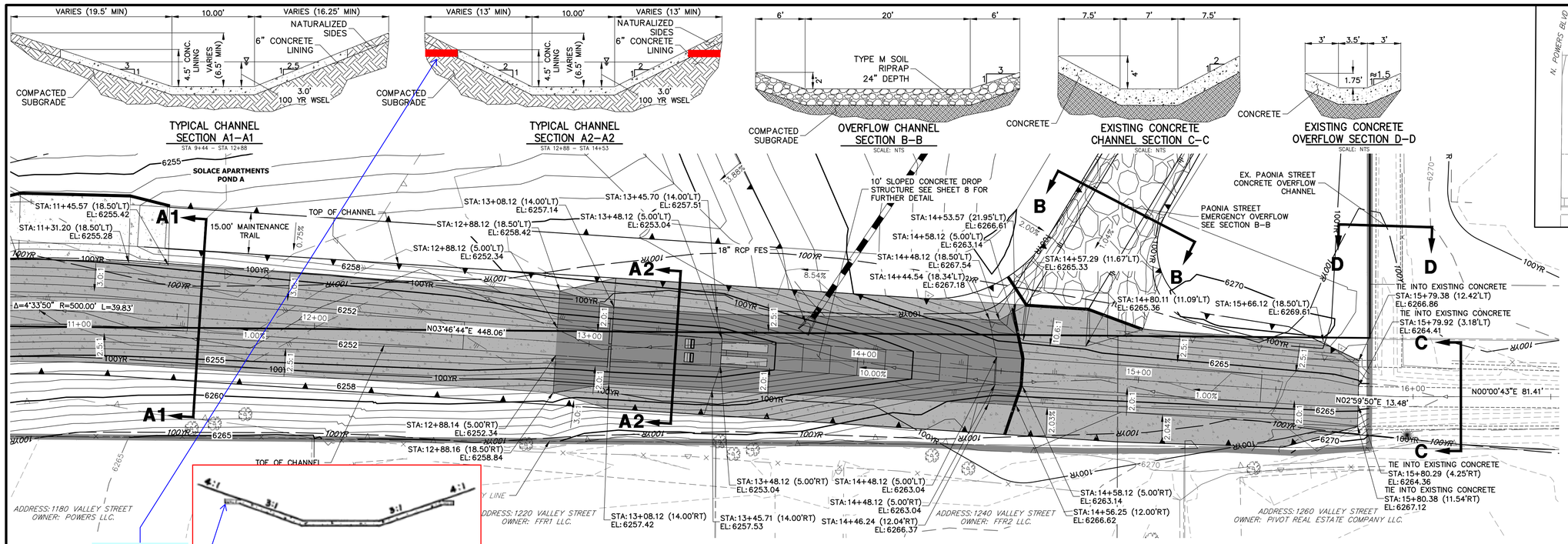
DRAWN BY	JBP
CHECKED BY	

SAND CREEK CENTER TRIBUTARY

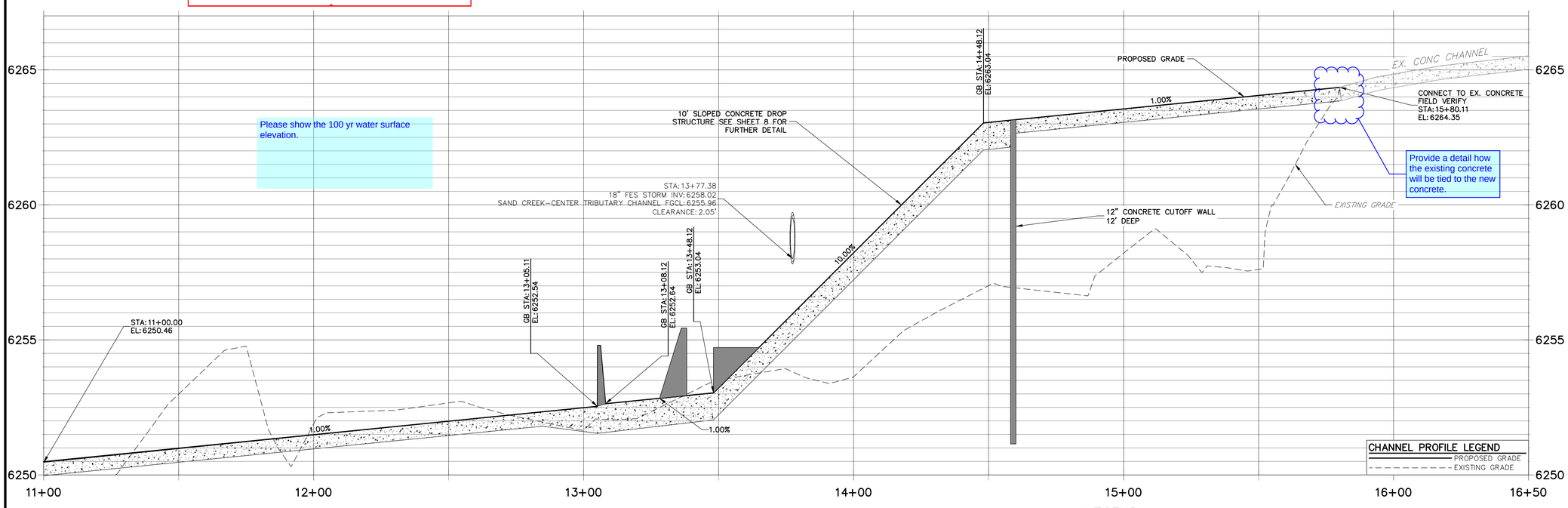
SITE AND DEMO PLAN

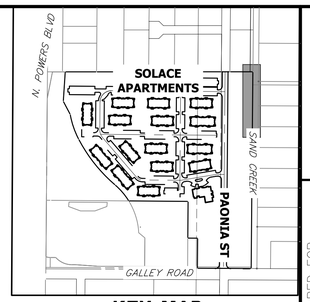
SHEET 3 OF 10

JOB NO. 25174.00



SAND CREEK-CENTER TRIBUTARY CHANNEL PROFILE (4)
STA 11+00.00 TO 16+50.00





KEY MAP
SCALE 1"=500'

LEGEND

PROPOSED MAJOR CONTOURS	6100
EXISTING MAJOR CONTOUR	6100
LIMITS OF GRADING	
6" THICK CONCRETE CHANNEL LINING	
12" THICK CONCRETE CHANNEL LINING	

20 10 0 20 40

HORIZONTAL
ORIGINAL SCALE: 1" = 20'
VERTICAL
ORIGINAL SCALE: 1" = 2'

ENGINEER'S STATEMENT

STANDARD DETAILS SHOWN WERE REVIEWED ONLY AS TO THEIR APPLICATION ON THIS PROJECT

MIKE A. BRAMLETT, P.E.
COLORADO P.E. 32314
FOR AND ON BEHALF OF JR ENGINEERING, LLC

DATE

COLORADO REGISTERED MIKE A. BRAMLETT 32314 PROFESSIONAL ENGINEER

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V-SCALE	1"=2'
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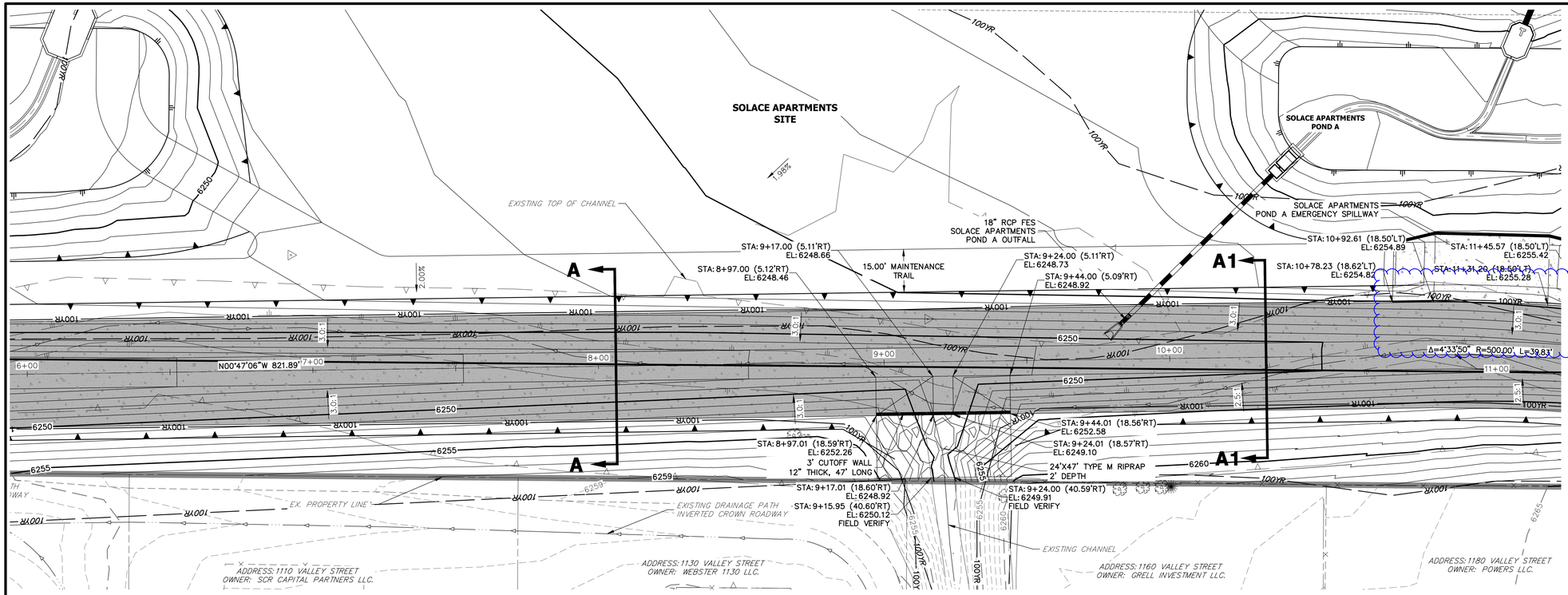
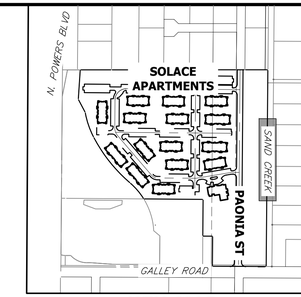
DRAWN BY	JBP
CHECKED BY	

SAND CREEK CENTER TRIBUTARY
CHANNEL PLAN AND PROFILES

SHEET 4 OF 10

JOB NO. 25174.00

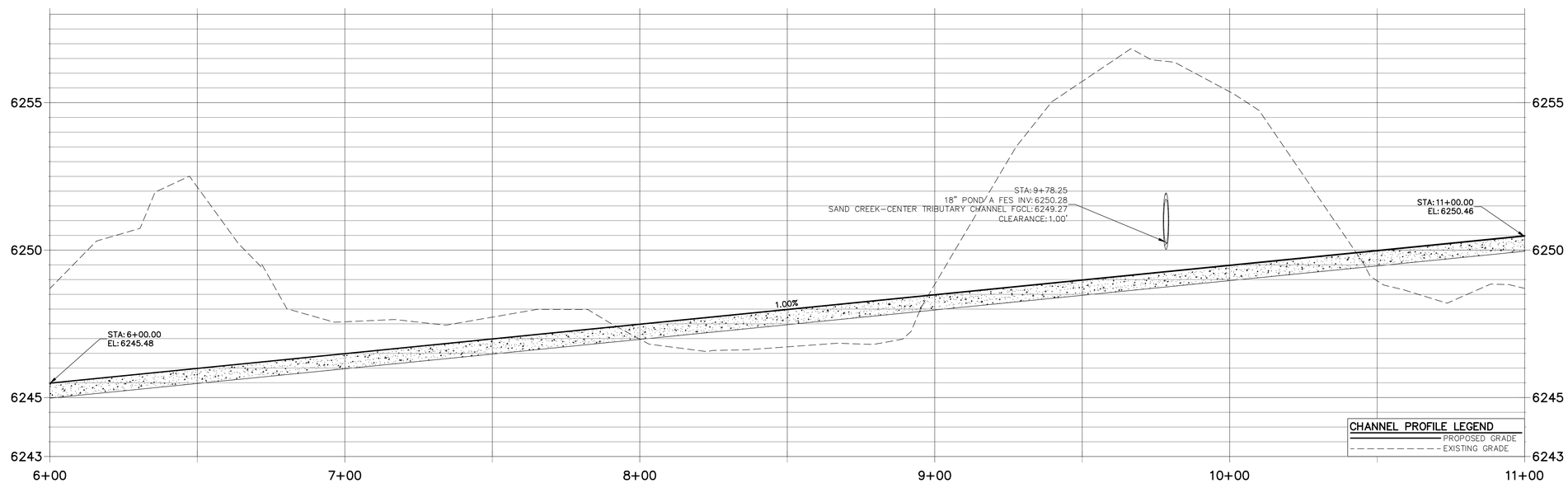


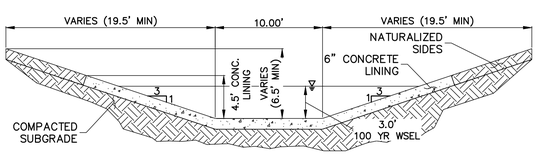


KEY MAP
SCALE 1"=500'

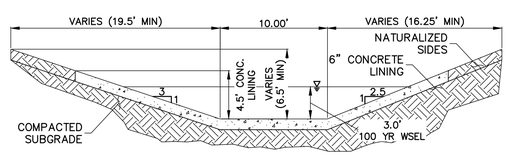
Will the concrete spillway extend to the concrete lining. Please indicate on the plans what will happen at this interface.

SAND CREEK-CENTER TRIBUTARY CHANNEL PROFILE (3)
STA 6+00.00 TO 11+00.00





TYPICAL CHANNEL SECTION A–A
STA 5+50 – STA 9+44



TYPICAL CHANNEL SECTION A1–A1
STA 9+44 – STA 12+88

20 10 0 20 40
HORIZONTAL ORIGINAL SCALE: 1" = 20'
VERTICAL ORIGINAL SCALE: 1" = 2'

LEGEND
PROPOSED MAJOR CONTOURS 6100
EXISTING MAJOR CONTOUR 6100
LIMITS OF GRADING
6" THICK CONCRETE CHANNEL LINING
12" THICK CONCRETE CHANNEL LINING

Know what's below. Call before you dig.

ENGINEER'S STATEMENT
STANDARD DETAILS SHOWN WERE REVIEWED ONLY AS TO THEIR APPLICATION ON THIS PROJECT

MIKE A. BRAMLETT, P.E.
COLORADO P.E. 32314
FOR AND ON BEHALF OF JR ENGINEERING, LLC

DATE

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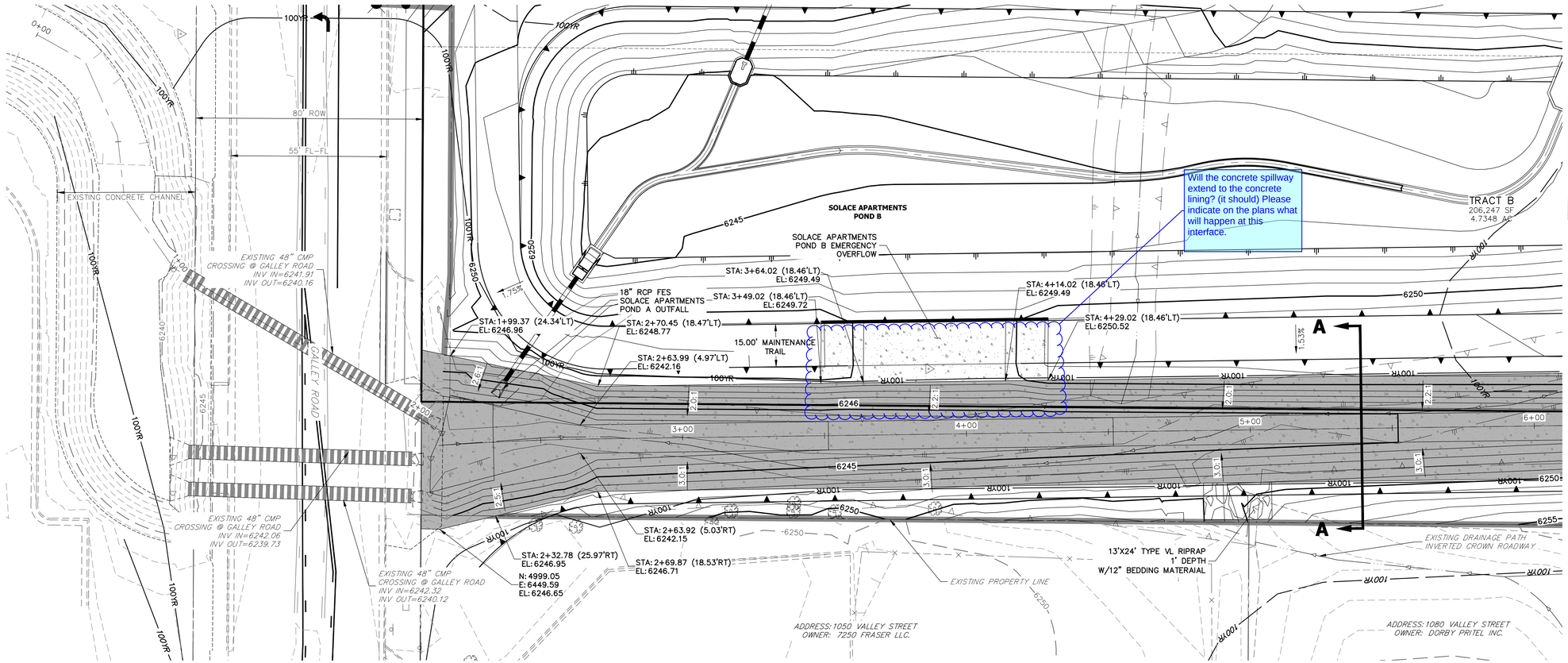
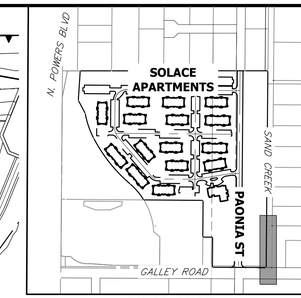
DESIGNED BY	JBP
DRAWN BY	JBP
CHECKED BY	

SAND CREEK CENTER TRIBUTARY
CHANNEL PLAN AND PROFILES

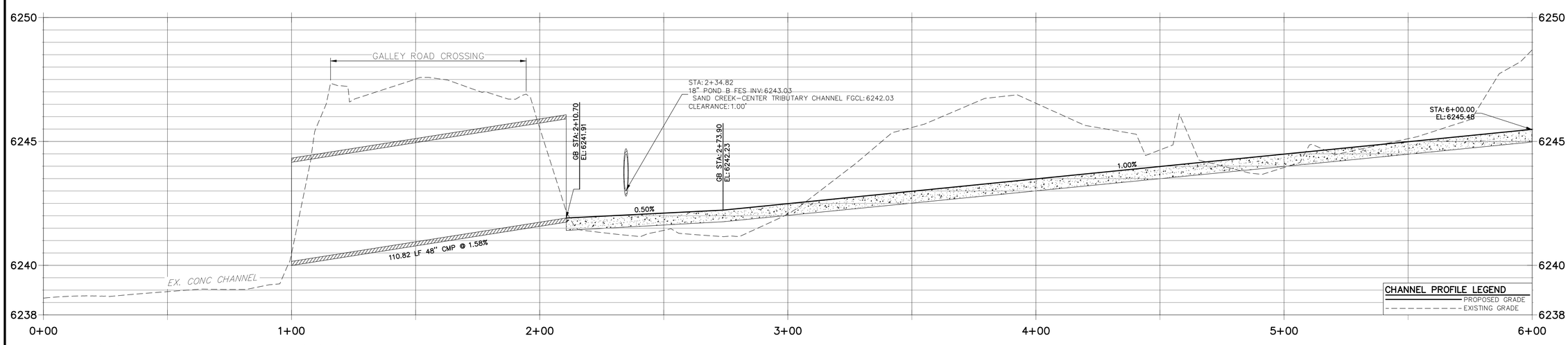
SHEET 5 OF 10
JOB NO. 25174.00

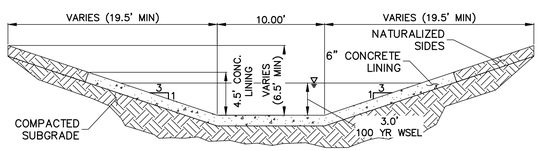




KEY MAP
SCALE 1"=500'

SAND CREEK-CENTER TRIBUTARY CHANNEL PROFILE
STA 0+00.00 TO 6+00.00





TYPICAL CHANNEL SECTION A–A
STA 5+50 – STA 9+44

LEGEND

- PROPOSED MAJOR CONTOURS (6100)
- EXISTING MAJOR CONTOUR (6100)
- LIMITS OF GRADING
- 6" THICK CONCRETE CHANNEL LINING
- 12" THICK CONCRETE CHANNEL LINING

20 10 0 20 40
HORIZONTAL ORIGINAL SCALE: 1" = 20'
VERTICAL ORIGINAL SCALE: 1" = 2'

811 Know what's below. Call before you dig.

ENGINEER'S STATEMENT
STANDARD DETAILS SHOWN WERE REVIEWED ONLY AS TO THEIR APPLICATION ON THIS PROJECT

MIKE A. BRAMLETT, P.E.
COLORADO P.E. 32314
FOR AND ON BEHALF OF JR ENGINEERING, LLC

COLORADO LICENSED PROFESSIONAL ENGINEER MIKE A. BRAMLETT 32314

DATE

UNTIL SUCH TIME AS THESE DRAWINGS ARE APPROVED BY THE APPROPRIATE REVIEWING AGENCIES, JR ENGINEERING APPROVES THEIR USE ONLY FOR THE PURPOSES DESIGNATED BY WRITTEN AUTHORIZATION.

PREPARED FOR
JACKSON DEARBORN PARTNERS
404 S. WELLS ST.
SUITE 400
CHICAGO, ILL 60607
OFFICE PHONE
(734) 216-2577

J·R ENGINEERING
A Westrian Company
Centennial 303-740-9393 • Colorado Springs 719-593-2593
Fort Collins 970-491-9888 • www.jrengineering.com

No.	REVISION	BY	DATE

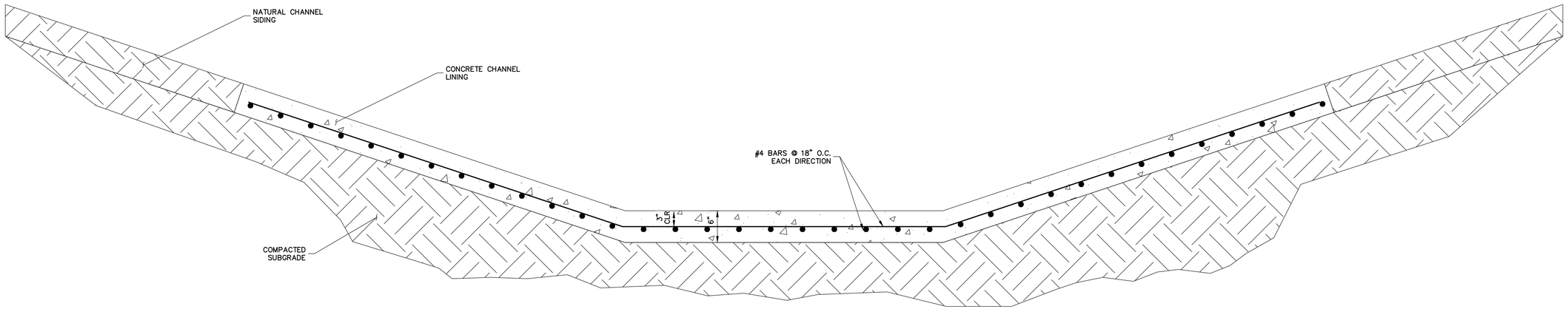
H-SCALE	1" = 20'
V-SCALE	1" = 2'
DATE	11/16/20
DESIGNED BY	JBP
DRAWN BY	JBP
CHECKED BY	

SAND CREEK CENTER TRIBUTARY

CHANNEL PLAN AND PROFILES

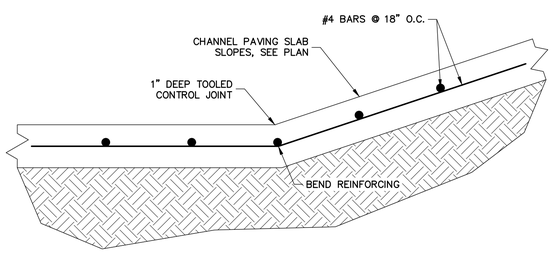
SHEET 6 OF 10

JOB NO. 25174.00



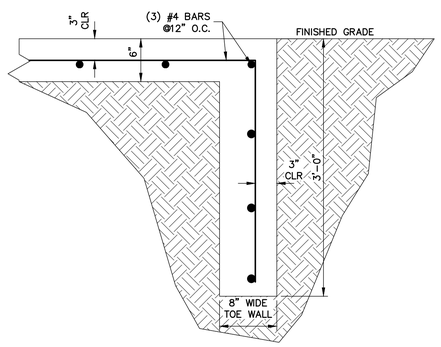
TYPICAL CONCRETE CHANNEL SECTION

SCALE: N.T.S.



SLOPE CHANGE AT CHANNEL PAVING SLAB

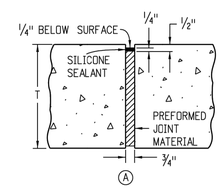
SCALE: N.T.S.



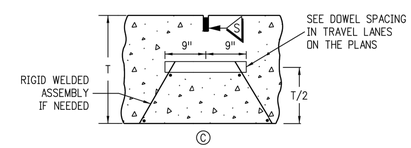
CUTOFF/APRON TOE WALL @ TIE INTO EXISTING

SCALE: N.T.S.

Please show where this occurs on the profile/plans

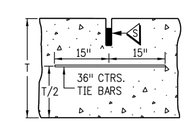


EXPANSION JOINT



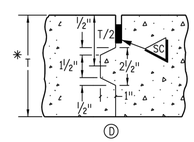
DOWELED TRANSVERSE CONSTRUCTION OR CONTRACTION JOINT

(TRANSVERSE WEAKENED PLANE JOINT)



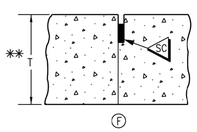
LONGITUDINAL CONTRACTION JOINT

(LONGITUDINAL WEAKENED PLANE JOINT)



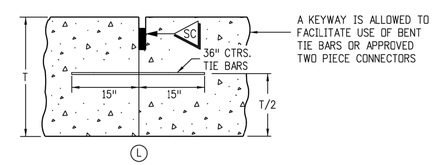
LONGITUDINAL CONSTRUCTION JOINT

* USE ONLY IF T ≥ 8 IN.
FORM ONLY FEMALE KEYWAY

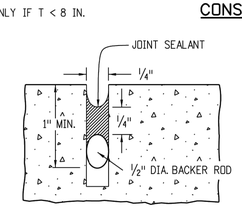


LONGITUDINAL CONSTRUCTION JOINT

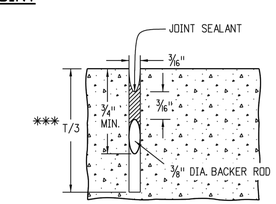
** USE ONLY IF T < 8 IN.



LONGITUDINAL CONSTRUCTION JOINT



SEAL AT CONSTRUCTION JOINT



SAWED JOINT

*** USE T/4 WHEN T < 8 IN.

Know what's **below.** **Call** before you dig.

ENGINEER'S STATEMENT

STANDARD DETAILS SHOWN WERE REVIEWED ONLY AS TO THEIR APPLICATION ON THIS PROJECT

COLORADO REGISTERED PROFESSIONAL ENGINEER MIKE A. BRAMLETT 32314

MIKE A. BRAMLETT, P.E.
COLORADO P.E. 32314
FOR AND ON BEHALF OF JR ENGINEERING, LLC

DATE

UNTIL SUCH TIME AS THESE DRAWINGS ARE APPROVED BY THE APPROPRIATE REVIEWING AGENCIES, JR ENGINEERING APPROVES THEIR USE ONLY FOR THE PURPOSES DESIGNATED BY WRITTEN AUTHORIZATION.

PREPARED FOR
JACKSON DEARBORN PARTNERS
404 S. WELLS ST.
SUITE 400
CHICAGO, ILL 60607
OFFICE PHONE
(734) 216-2577

J·R ENGINEERING
A Westrian Company
Centennial 303-740-9393 • Colorado Springs 719-593-2593
Fort Collins 970-491-9888 • www.jrengineering.com

No.	REVISION	BY	DATE

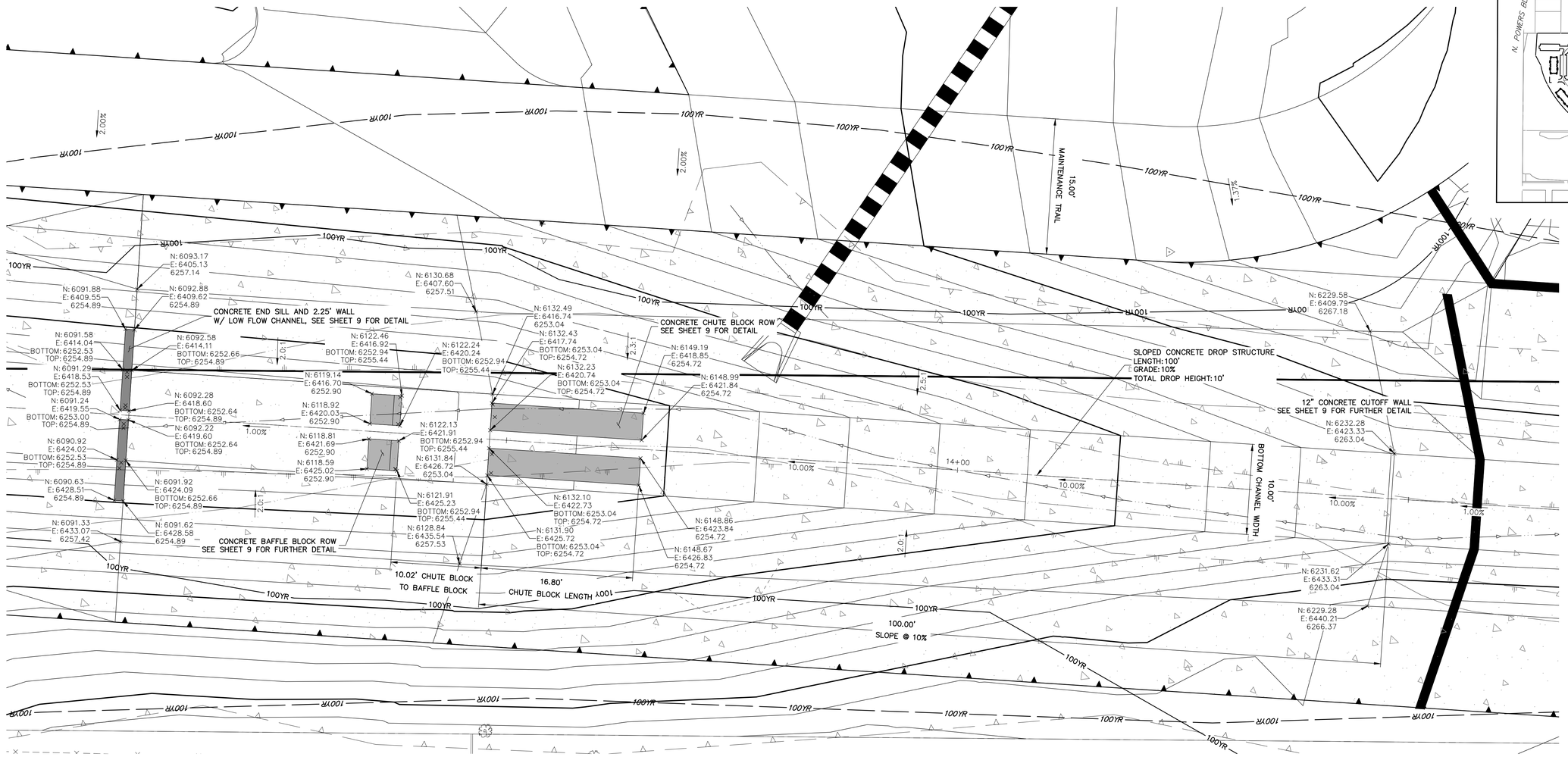
H-SCALE	N/A
V-SCALE	N/A
DATE	11/16/20
DESIGNED BY	JBP
DRAWN BY	JBP
CHECKED BY	

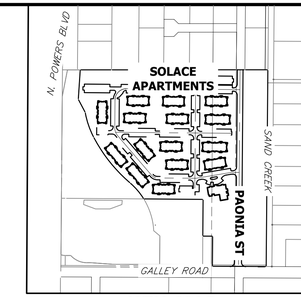
SAND CREEK CENTER TRIBUTARY

CHANNEL DETAILS

SHEET 7 OF 10

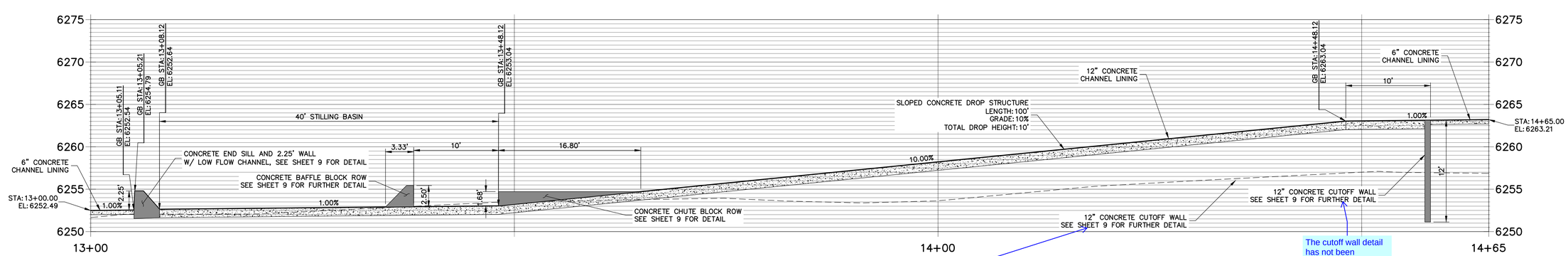
JOB NO. 25174.00





KEY MAP
SCALE 1"=500'

DROP 1 PROFILE
STA 13+00.00 TO 14+65.00



The cutoff wall detail has not been included. Please include for review.

remove the extra text

HORIZONTAL
ORIGINAL SCALE: 1" = 6
VERTICAL
ORIGINAL SCALE: 1" = 6

Know what's **below.**
Call before you dig.

ENGINEER'S STATEMENT

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MIKE A. BRAMLETT, P.E.
COLORADO P.E. 32314
FOR AND ON BEHALF OF JR ENGINEERING, LLC

DATE

COLORADO REGISTERED PROFESSIONAL ENGINEER MIKE A. BRAMLETT 32314

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SUITE 400
CHICAGO, ILL 60607
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Fort Collins 970-491-9888 • www.jrengineering.com

No.	REVISION	BY	DATE

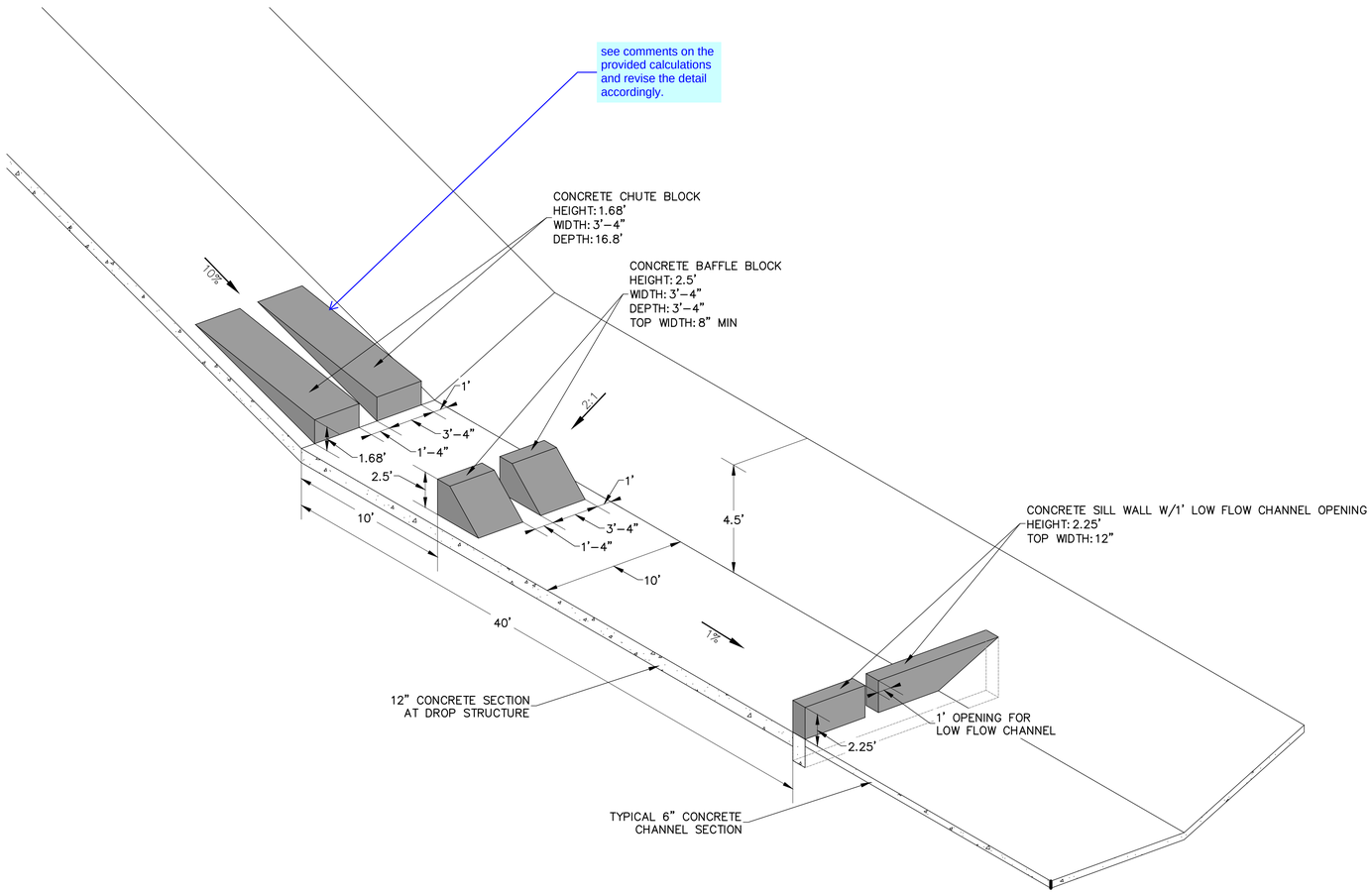
H-SCALE	1"=6'
V-SCALE	1"=6'
DATE	11/16/20
DESIGNED BY	JBP
DRAWN BY	JBP
CHECKED BY	

SAND CREEK CENTER
TRIBUTARY

DROP STRUCTURES PLAN AND PROFILE

SHEET 8 OF 10

JOB NO. 25174.00



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COLORADO REGISTERED PROFESSIONAL ENGINEER MIKE A. BRAMLETT 32314

MIKE A. BRAMLETT, P.E.
COLORADO P.E. 32314
FOR AND ON BEHALF OF JR ENGINEERING, LLC DATE

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No.	REVISION	BY	DATE

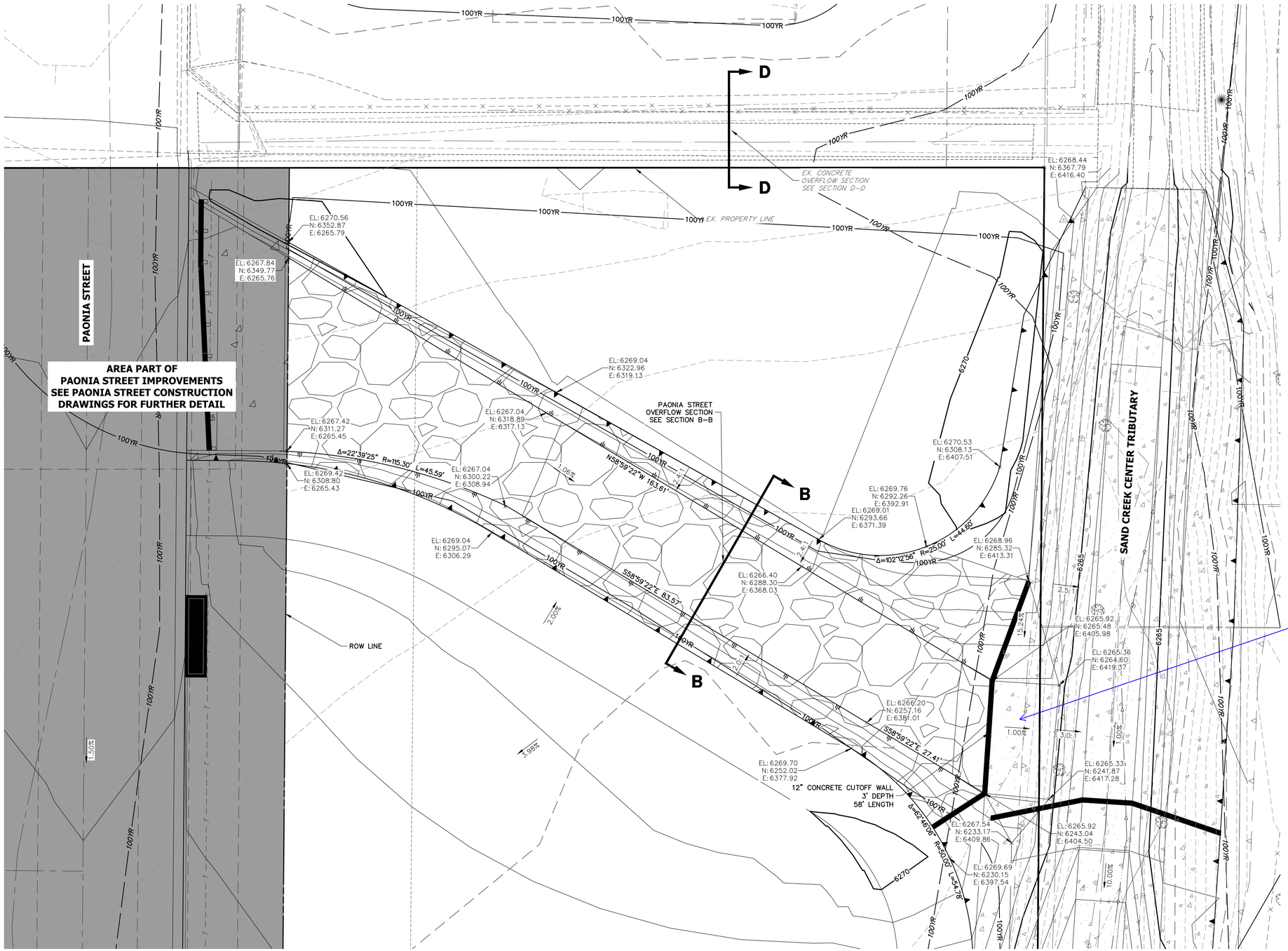
H-SCALE	N/A
V-SCALE	N/A
DATE	11/16/20
DESIGNED BY	JBP
DRAWN BY	JBP
CHECKED BY	

SAND CREEK CENTER TRIBUTARY

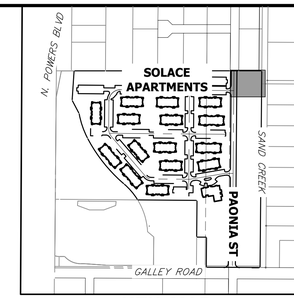
DROP STRUCTURE DETAIL SHEETS

SHEET 9 OF 10

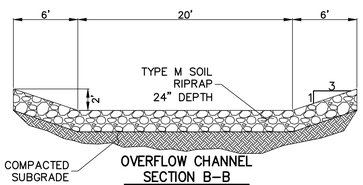
JOB NO. 25174.00



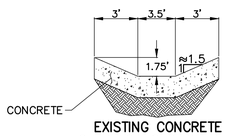
Will the concrete lining extend to the overflow riprap? Please indicate on the plans what will occur at this interface.



KEY MAP
SCALE 1"=500'



OVERFLOW CHANNEL
SECTION B-B
SCALE: NTS



EXISTING CONCRETE
OVERFLOW SECTION D-D
SCALE: NTS

10 5 0 10 20
ORIGINAL SCALE: 1" = 10'

Know what's **below.**
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ENGINEER'S STATEMENT

PREPARED UNDER MY DIRECT SUPERVISION AND ON BEHALF OF JR ENGINEERING

MIKE A. BRAMLETT, P.E.
COLORADO P.E. 32314
FOR AND ON BEHALF OF JR ENGINEERING, LLC

DATE

COLORADO LICENSED
MIKE A. BRAMLETT
32314
PROFESSIONAL ENGINEER

UNTIL SUCH TIME AS THESE DRAWINGS ARE APPROVED BY THE APPROPRIATE REVIEWING AGENCIES, JR ENGINEERING APPROVES THEIR USE ONLY FOR THE PURPOSES DESIGNATED BY WRITTEN AUTHORIZATION.

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SUITE 400
CHICAGO, ILL 60607
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No.	REVISION	BY	DATE

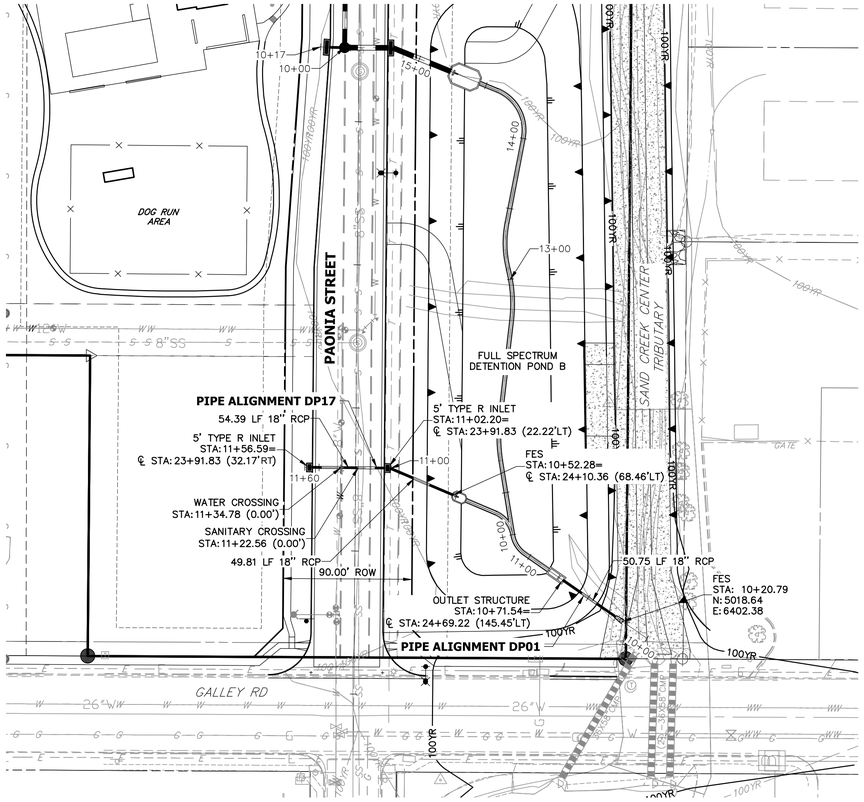
H-SCALE	1"=10'
V-SCALE	N/A
DATE	11/16/20
DESIGNED BY	JBP
DRAWN BY	JBP
CHECKED BY	

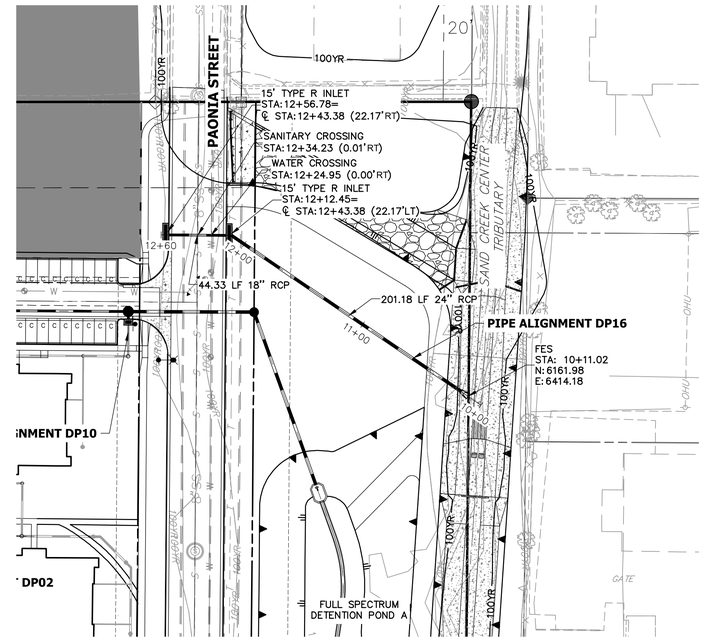
SAND CREEK CENTER TRIBUTARY
PAONIA STREET OVERFLOW PLAN

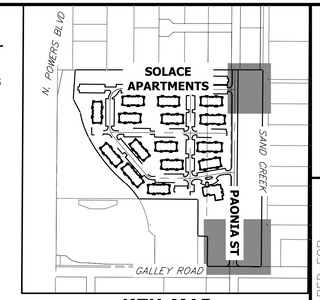
SHEET 10 OF 10
JOB NO. 25174.00

STORM SEWER NOTES

1. SEE DETAIL SHEET 29 FOR APPLICABLE STORM SEWER DETAILS.
2. PIPE LENGTHS MEASURED FROM CENTER OF MANHOLES TO CENTER OF MANHOLES, INSIDE FACE OF INLETS, OUTLET END OF FLARED END SECTIONS AND FACE OF WALLS WHERE APPLICABLE.
3. ℄ STATIONS & OFFSETS ARE LABELED AT CENTER OF STRUCTURE.
4. CONTRACTOR TO FIELD VERIFY EXISTING UTILITY LOCATIONS, PRIOR TO EXTENSION OF MAINS AND SERVICE CONNECTIONS. CONTRACTOR TO COORDINATE CONNECTIONS WITH UTILITY PROVIDER.
5. ALL PUBLIC WATER LINES ARE OWNED BY CHEROKEE METROPOLITAN DISTRICT.

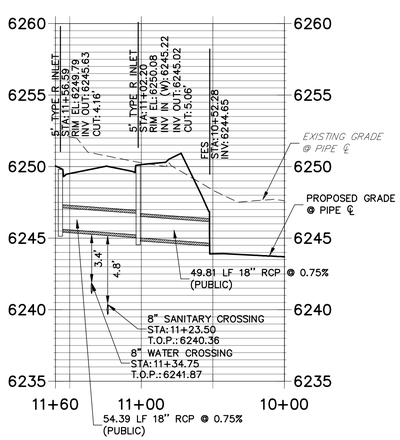




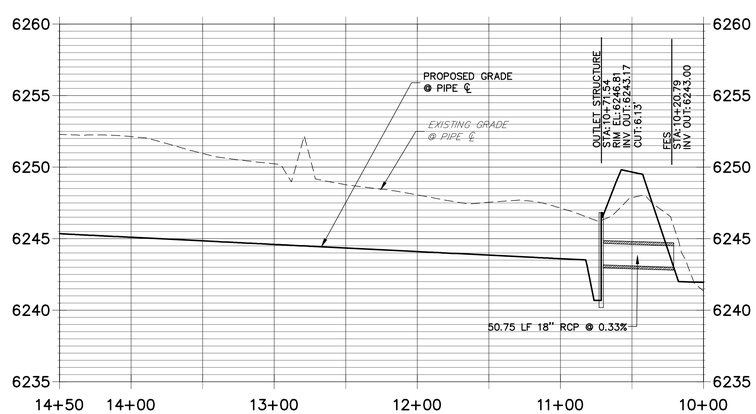


KEY MAP
SCALE 1"=500'

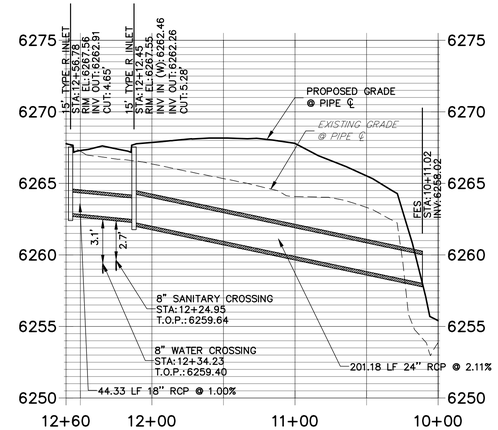
DP17 PROFILE
STA 10+00.00 TO 11+60.00



DP01 PROFILE (1)
STA 10+00.00 TO 14+50.00



DP16 PROFILE
STA 10+00.00 TO 12+60.00



HORIZONTAL
ORIGINAL SCALE: 1" = 50'
VERTICAL
ORIGINAL SCALE: 1" = 5'

Know what's **below.**
Call before you dig.

ENGINEER'S STATEMENT
PREPARED UNDER MY SUPERVISION

MIKE A. BRAMLETT, P.E. DATE
COLORADO P.E. 32314
FOR AND ON BEHALF OF JR ENGINEERING, LLC

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No.	REVISION	BY	DATE

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V-SCALE	1"=5'
DATE	11/20/20
DESIGNED BY	JRM
DRAWN BY	JRM
CHECKED BY	

SOLACE APARTMENTS – FILING NO. 1

STORM SEWER PLAN AND PROFILE

SHEET 15 OF 32

JOB NO. 25174.00

X:\2510000.all\25174\0\Drawings\sheet dwgs\Construction Drawings\25174\0\DP01.dwg, DP01-11, 11/25/2020 12:01:26 PM, GE