Memo

To:	Umar Malik, Angelo Capone, City of Burlington
From:	Brian Bishop, Abhijeet Patel, Paul Pagazani
Date:	January 04, 2021
File:	TPB163165
cc:	Andrew Bear, Landform Development Group Inc.
Re:	**Updated Hydraulic Assessment, 401-417 Martha Street**

1. INTRODUCTION

Landform Development Group Inc. has proposed to redevelop the site located at 401-417 Martha Street, Burlington Ontario. The subject site is partially within both the 100 year and Regional storm event floodplains (unregulated) of the Lower Rambo Creek. A hydraulic assessment has been prepared to assess the potential impacts of development, and to address any hydraulic issues with the proposed redevelopment. This memo outlines the hydrologic information prepared for input to the hydraulic model of the proposed site.

A previous hydraulic assessment and summary memo was prepared and submitted to the City on November 30, 2017 and subsequently revised earlier this year (ref. Bishop/Patel/Pagazani-Malik/Capone, April 03, 2020). This current update to the assessment reflects a minor change in the proposed building footprint, in response to the City review comment that the 6.0 m buffer needs to be set from the building to the "landward side" of the proposed retaining wall at the edge of the buffer. This has effectively resulted in a minor shift of a portion of the proposed retaining wall away from the building by approximately 0.5 m, and this has resulted in a revised hydraulic analysis to demonstrate the revision to the required cut-fill balance, and proposed mitigation of any negative impacts to the floodplain. The design flows and the downstream boundary condition has been kept the same as previous hydraulic assessment (ref. Bishop/Patel/Pagazani-Malik/Capone, April 03, 2020). We note that we have also made minor updates to the reach lengths in HEC-RAS for the existing and proposed models (for the main channel, left and right overbank lengths), which we have reviewed and updated.

3450 Harvester Road
Burlington, ON L7N 3W5
+1 905 335 2353
www.woodplc.com

Wood Environment & Infrastructure Solutions
a Division of Wood Canada Limited
Registered office: 2020 Winston Park Drive, Suite 700, Oakville, Ontario L6H 6X7
Registered in Canada No. 773289-9; GST: 899879050 RT0008; DUNS: 25-362-6642

2. HYDROLOGY

Lower Rambo Creek drains approximately 224 ha +/- to the Waterfront Trail crossing. Initially, a standalone SWMHYMO model had been used to estimate peak flows at the site. Subsequently, the City has undertaken a separate hydrologic and hydraulic study for this area and other areas of proposed development. The "Downtown and Burlington Mobility Hubs Study" is still in draft form, and is using PCSWMM and HEC-RAS to model the study area.

The City has stipulated (meeting November 15, 2017) that the DRAFT design flow and downstream boundary conditions derived in this City study, for the subject site, be used for the current hydraulic assessment. It has bene further stipulated by the City that the flows and water surface elevations are not yet fully approved by the City, however the peak flow is not expected to vary significantly as a result of upcoming agency review and comments.

The 100 year and Regional design storms for the City of Burlington have been simulated, and are reported in Table 1 (ref. Appendix A for background information):

Table 1: Peak Flows at Trail Crossing at upstream limit (m^3/s)

Drainage Area (ha)	100 year	Regional
224	29.48	25.62

Since the simulated 100 year design storm event produces the greater peak flow, this has been used to determine the floodline and to conduct the hydraulic assessment.

3. HYDRAULICS

A previously prepared hydraulic model has been updated using the U.S. Army Corps. of Engineers' River Analysis System (HEC-RAS) model. Landform Development Group Inc. had the watercourse surveyed on March 29, 2017 by Mackay Mackay & Peters Ltd., and this topographic data has been used to create the base plan for the HEC-RAS model. The downstream starting water surface elevation has been taken from the City's Mobility Hub study for the downstream boundary condition. This may be changed by the City as that study progresses. The existing and proposed 100-year water surface elevations are shown in Table 2. The existing and proposed 100-year floodline can be seen in the attached proposed Grading Plan Drawing.

Table 2: 100 Year Water Surface Elevations (m)			
Cross-Section	Existing	Proposed	Difference
1	79.73	79.73	0.00
2	79.81	79.81	0.00
2.5	79.82	79.82	0.00
3	79.82	79.82	0.00
4	79.83	79.83	0.00
4.5	79.84	79.84	0.00
5	79.85	79.85	0.00
6	79.84	79.84	0.00
7	79.90	79.90	0.00
8	79.88	79.88	0.00

The results of the above table indicate that there will be no change in the simulated water surface elevations under the proposed conditions compared to the existing conditions. Under the proposed conditions, the proposed grading would ensure that sufficient floodplain storage would be provided in order to compensate for the proposed floodplain encroachment, i.e. a cut-fill balance can be achieved. Moreover, the proposed grading alterations are very localized and within a few metres of the proposed retaining wall, and the overall hydraulic capacity of the channel is not significantly affected. This is also reflected in the proposed unchanged simulated water surface elevations compared to updated existing conditions. The updated existing conditions results are based on fine adjustments to the cross section geometry and channel parameters (i.e. channel length, overbank lengths etc.). Model output cross-sections have been included in Appendix B.

A riparian storage assessment has also been conducted to review the impacts of the proposed building footprint. The existing and proposed conditions riparian storages have been presented in Table 3:

Table 3: Riparian Storage Calculations			
Existing (m^3)	Proposed (m^3)	Difference (m^3)	Difference (%)
1669.80	1670.63	0.83	0.05

The above table indicates that the riparian storage under the proposed conditions will remain almost the same as the existing conditions (i.e. 0.05 % increase). This indicates that there will be no change in the overall volume storage capacity of the floodplain under a 100-year storm event.

4. CONCLUSIONS AND RECOMMENDATIONS

The following conclusions and recommendations have been made based on the results of this assessment.

i) There is no change in the hydrology, i.e. no change in the total drainage area to the waterfront trail crossing on Rambo Creek and hence, there are no changes in the peak flow of formative storm events (i.e. 100 year and Regional Storm) as compared to the previous assessment. (ref. Bishop/Patel/Pagazani-Malik/Capone, April 03, 2020).

ii) The hydraulic assessment indicates that there will be no changes in the simulated water surface elevations due to the proposed building footprint, in combination with a compensatory cut in the vicinity of the proposed wall.

iii) The hydraulic assessment confirms that the cut/fill balance will result in only a nominal change in the riparian storage (0.05% increase) due to the proposed building footprint, and that a nominal increase will not have any negative impact on the channel hydraulics.

We trust that the foregoing satisfies your current requirements. Feel free to contact our office should you have any questions or wish to discuss.

BB/AP



APPENDIX A – Hydrology Background Information

sensitive to the effects of storage and flow attenuation than the Regional Storm Event, which would have a longer hydrograph shape and associated runoff volume (and thus less sensitive to the effects of storage and flow attenuation). As noted previously, hydraulic modelling (as per Section 3.2) is to use the more conservative flows generated by the without structures simulation run, which is also consistent with current Provincial Policy.

Table 3.2: Simulated Peak Flows at Riverine Nodes of Interest (Downtown Mobility Hub) – Without Spill Flows from Hager-Rambo Diversion Channel

Water-course	Location and Model ID	Drainage Area (ha)[1]	With Hydraulic Structures		Without Hydraulic Structures	
			100Y	Regional	100Y	Regional
Lower Hager	Baldwin Street (J752.2523)	36.5	4.94	4.28	6.80	4.59
	Birch Avenue (J426.0621)	44.5	5.24	5.07	7.40	5.63
	Caroline Street (J306.062)	51.8	5.45	5.47	7.46	6.08
	Ontario Street (J97.03847)	76.4	6.90	6.52	9.07	7.42
Lower Rambo	West Branch Upstream of Blairholm Ave (J114.8044)	22.7	3.00	1.19	3.00	1.14
	East Branch at Ghent Avenue (J387.8489)	25.5	4.84	3.56	5.25	3.67
	East Branch at Courtland Place (J39.16557)	30.0	4.98	4.17	5.74	4.30
	Blairholm Ave (J8)	90.8	14.17	12.24	14.80	12.42
	Victoria Avenue (J314.0674)	109.7	17.38	14.33	18.56	14.60
	Caroline Street (J28)	141.5	20.31	16.34	22.01	16.63
	James Street (J552.0832)	151.5	22.66	19.61	25.89	20.23
	South of Waterfront Trail (J419.5095)	224.0	29.48	25.62	35.09	26.70
	Lakeshore Road / Lake Ontario (J59.22536)	259.1	31.39	29.23	44.86	31.95

1. As estimated from PCSWMM. Note that due to interconnectivity of minor and major systems, actual representative drainage area based on flow splits may differ somewhat.

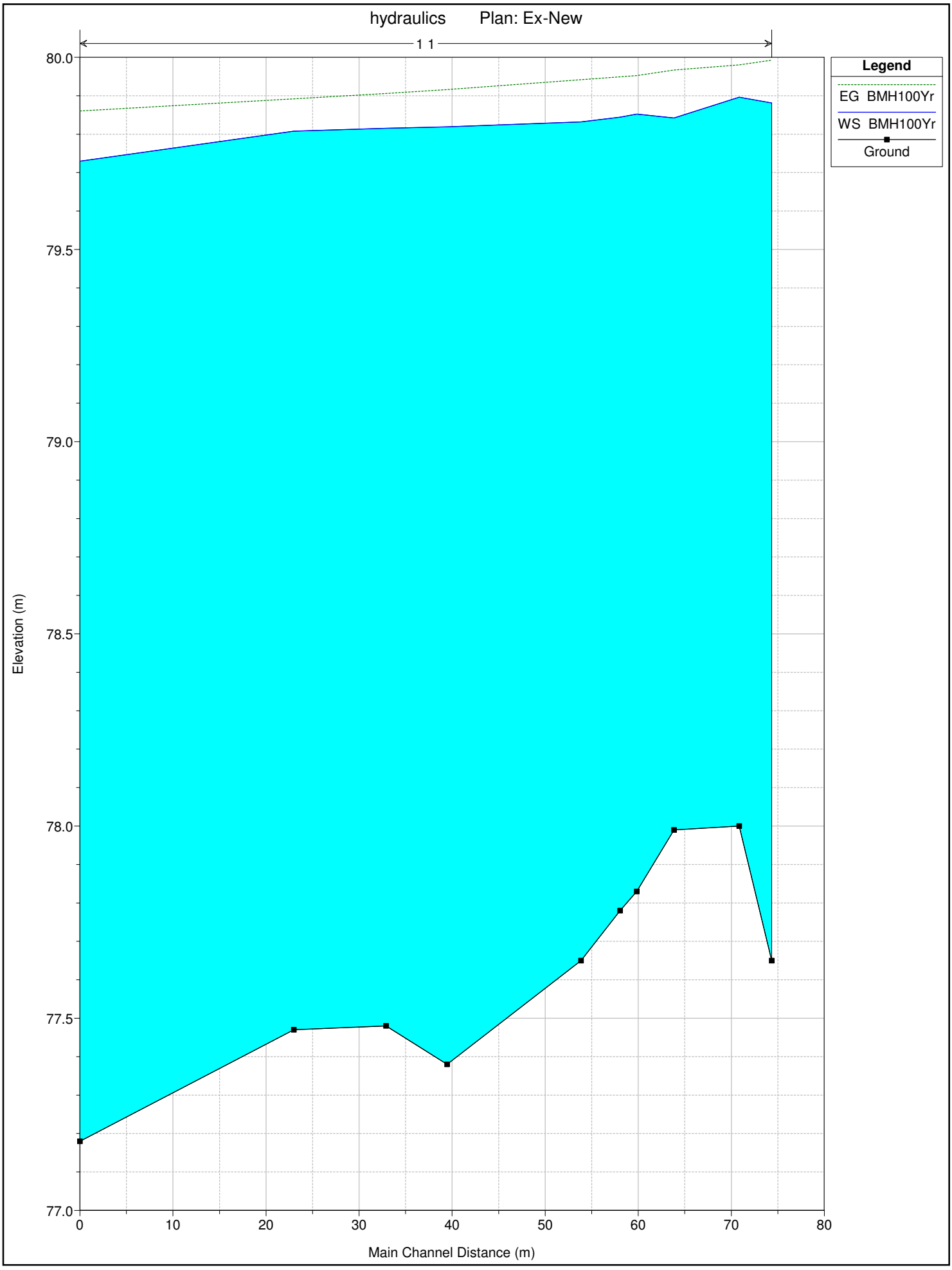
In addition to Table 3.2, consideration also needs to be given to the additional spill flows from the Hager-Rambo Diversion Channel (as discussed in Section 2.2). These additional flows have been added to the PCSWMM modelling as external time-varying hydrographs, at the spill locations discussed in Section 2.2 (Lower Rambo Creek – West Branch and at Brant Street south of Blairholm Avenue). The resultant peak flows incorporating spills are presented in Table 3.3, for the with and without structures scenarios. Note that results have been included for Lower Rambo Creek only, since all spill flows would be directed to this watercourse (none to Lower Hager Creek).

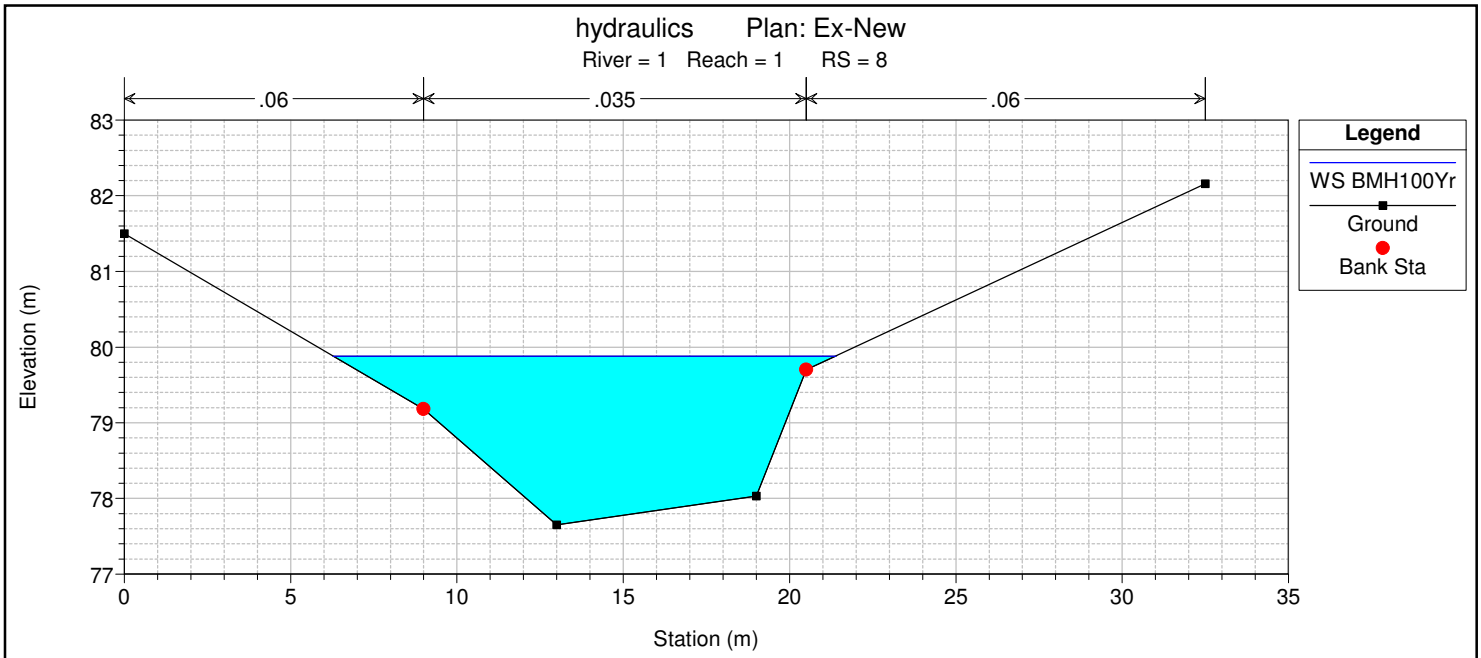
APPENDIX B – Hydraulic Model Output

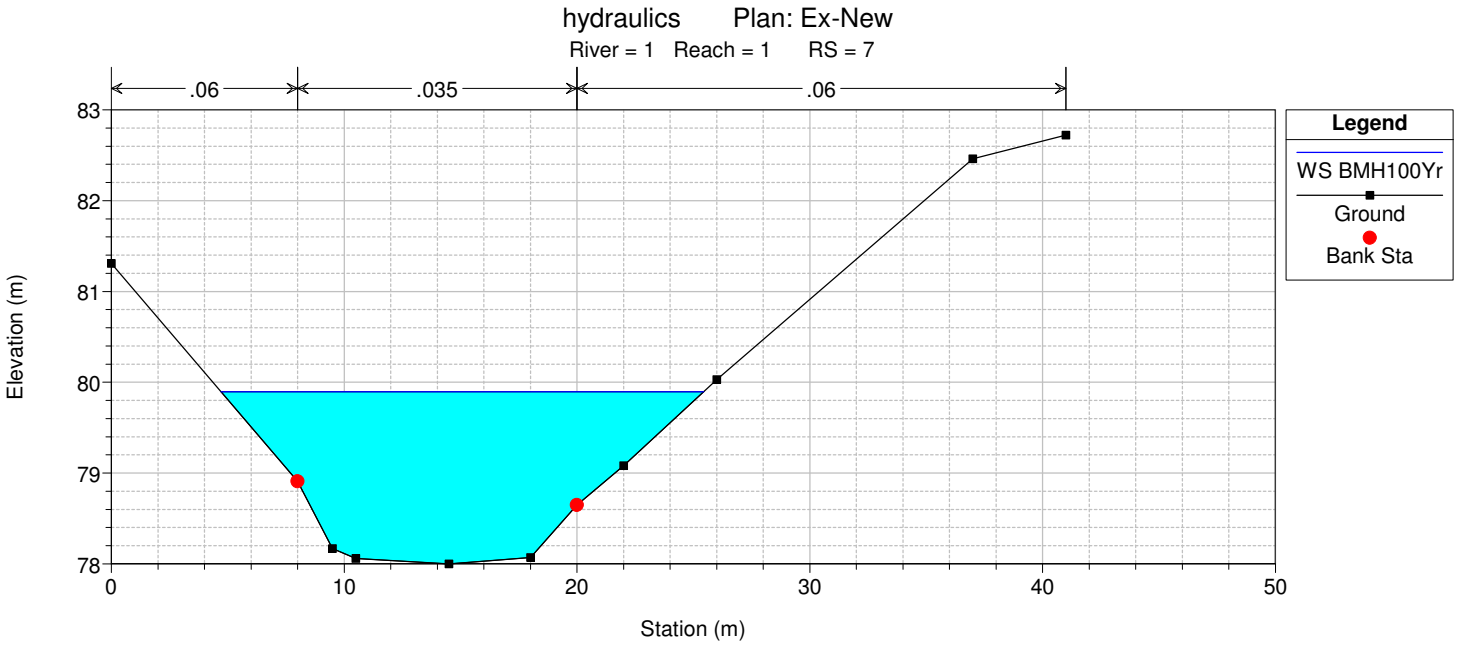
B1 – Existing

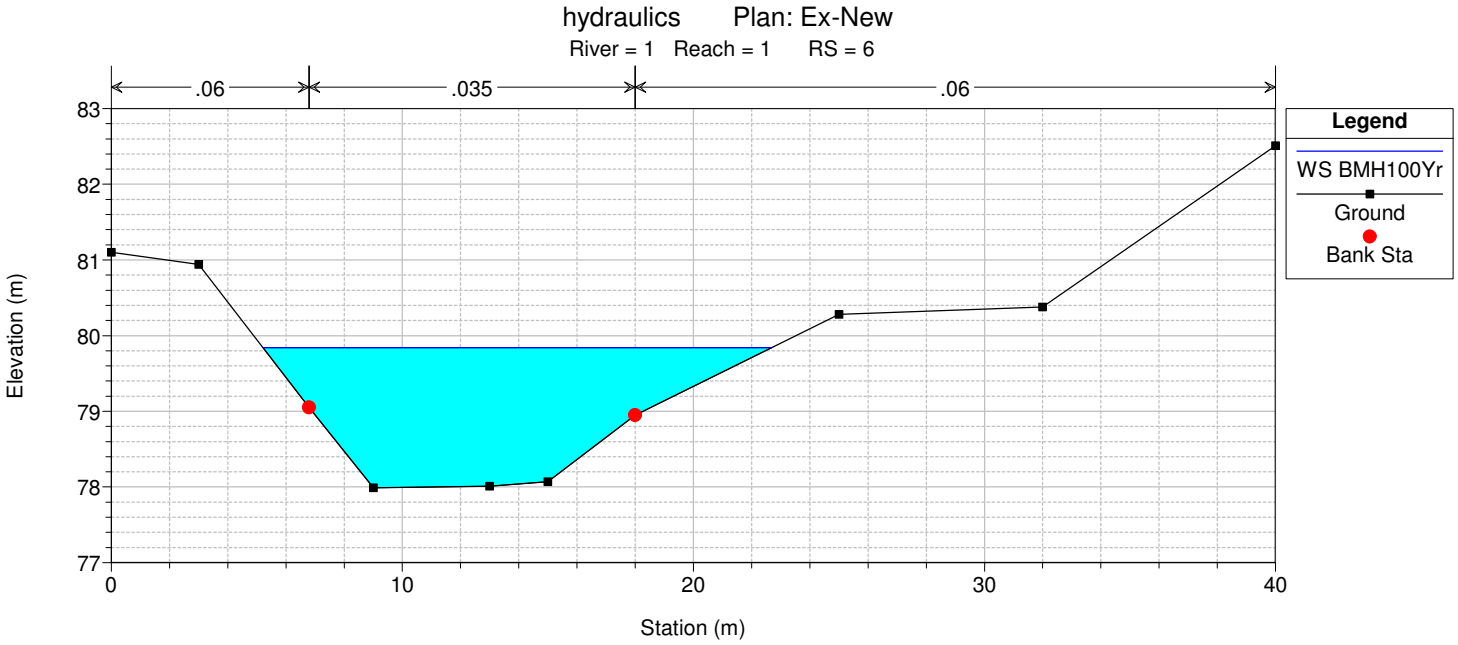
HEC-RAS Plan: Ex-New River: 1 Reach: 1 Profile: BMH100Yr

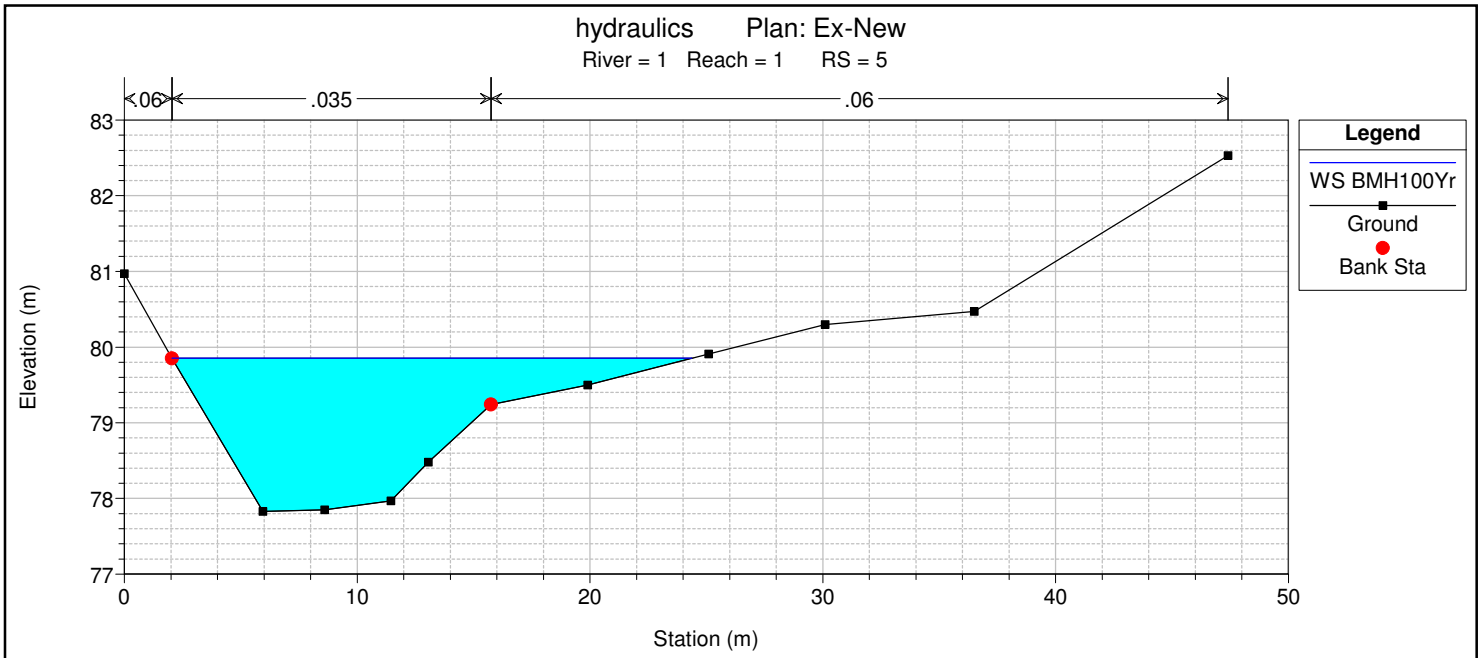
Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(m3/s)	(m)	(m)	(m)	(m)	(m/m)	(m/s)	(m2)	(m)	
1	1	BMH100Yr	29.48	77.18	79.73	78.64	79.86	0.001209	1.66	21.17	12.65	0.35
1	2	BMH100Yr	29.48	77.47	79.81		79.89	0.001161	1.29	23.25	16.42	0.32
1	2.5	BMH100Yr	29.48	77.48	79.82		79.91	0.001227	1.33	22.48	16.90	0.33
1	3	BMH100Yr	29.48	77.38	79.82		79.92	0.001330	1.39	22.62	18.41	0.34
1	4	BMH100Yr	29.48	77.65	79.83		79.94	0.001745	1.48	21.76	20.78	0.39
1	4.5	BMH100Yr	29.48	77.78	79.84		79.95	0.001625	1.46	22.50	22.16	0.38
1	5	BMH100Yr	29.48	77.83	79.85		79.95	0.001588	1.42	22.89	22.32	0.38
1	6	BMH100Yr	29.48	77.99	79.84		79.97	0.001733	1.59	20.60	17.49	0.40
1	7	BMH100Yr	29.48	78.00	79.90		79.98	0.001054	1.32	25.95	20.72	0.32
1	8	BMH100Yr	29.48	77.65	79.88		79.99	0.001487	1.49	20.67	15.10	0.36

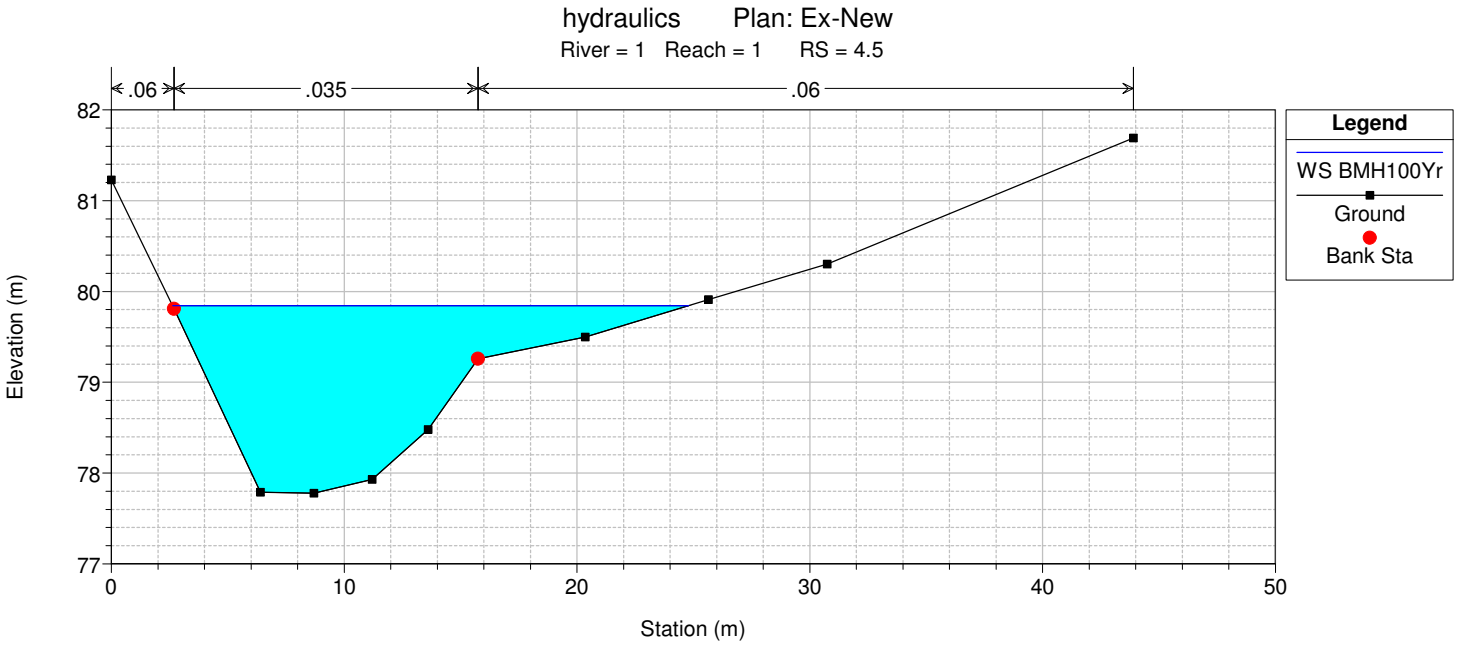

hydraulics Plan: Ex-New
1 1
Legend
EG BMH100Yr
WS BMH100Yr
Ground
80.0
79.5
79.0
78.5
78.0
77.5
77.0
Elevation (m)
0
10
20
30
40
50
60
70
80
Main Channel Distance (m)

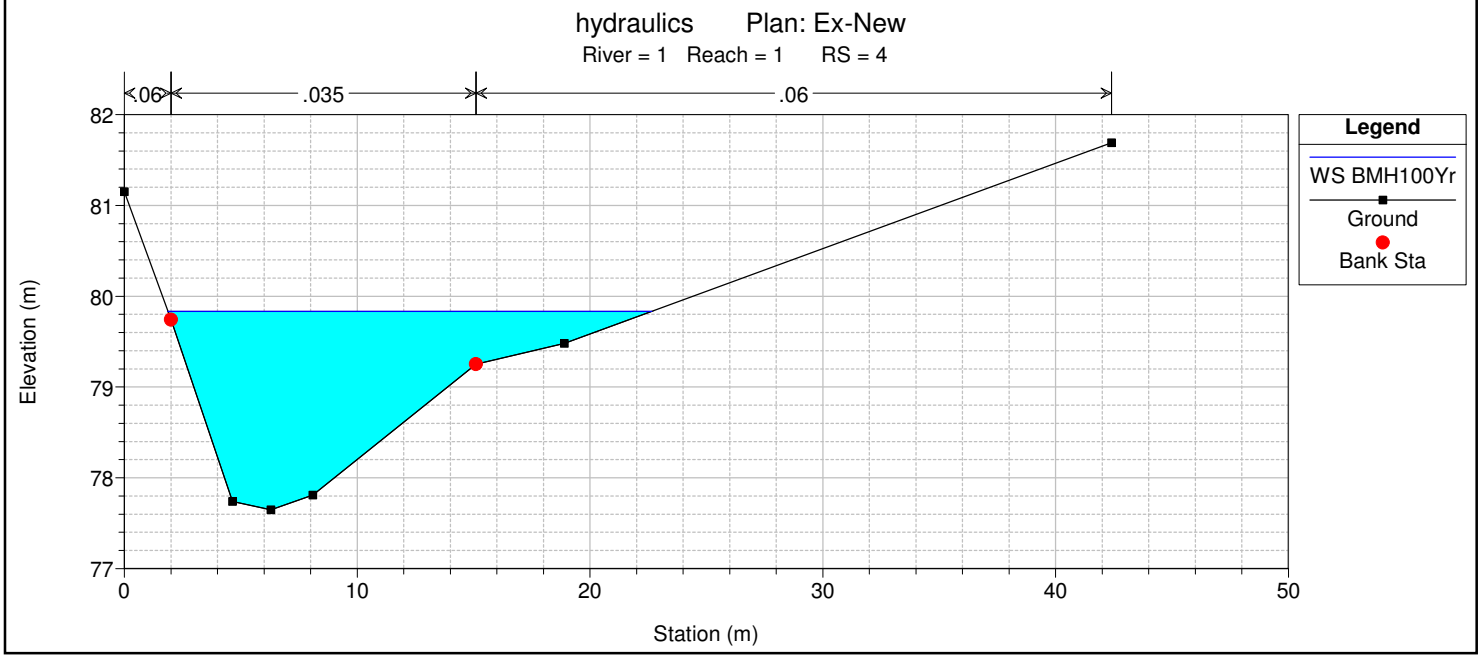

hydraulics Plan: Ex-New
River = 1 Reach = 1 RS = 8
.06
.035
.06
Elevation (m)
Station (m)
Legend
WS BMH100Yr
Ground
Bank Sta

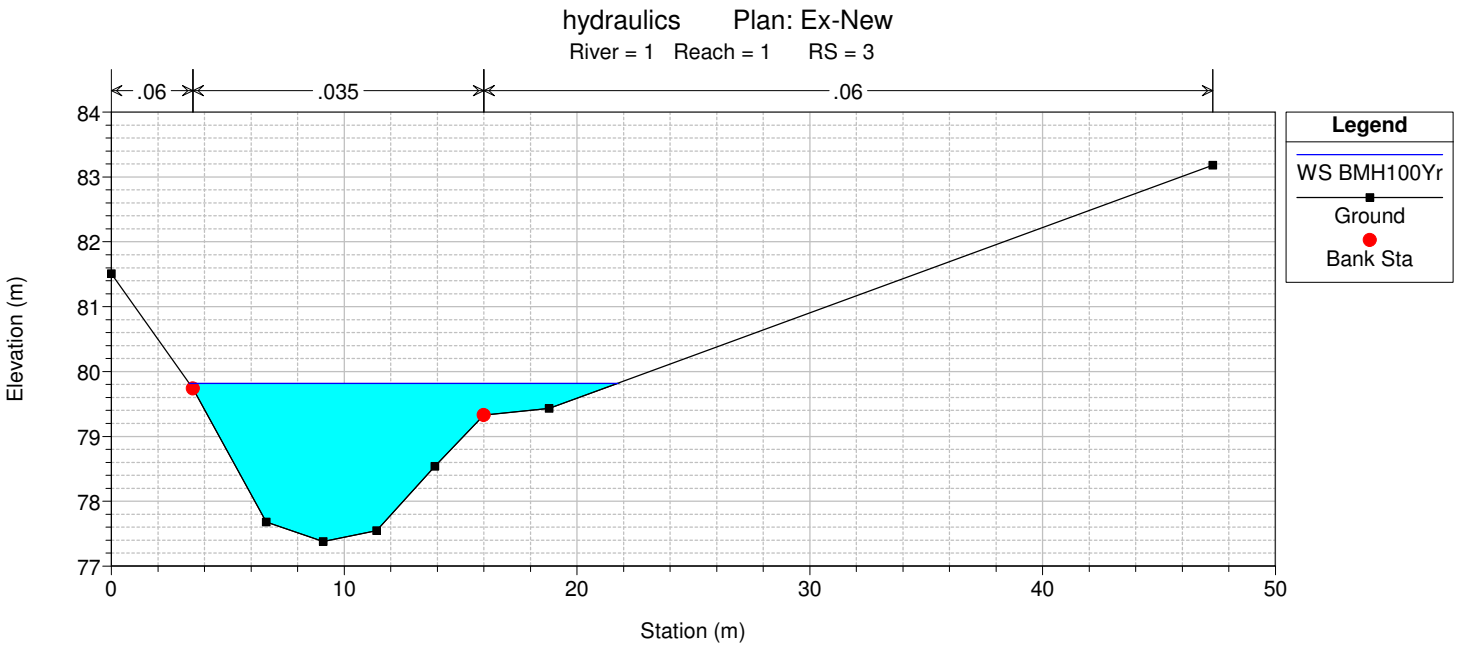

hydraulics Plan: Ex-New
River = 1 Reach = 1 RS = 7
.06
.035
.06
Elevation (m)
Station (m)
Legend
WS BMH100Yr
Ground
Bank Sta

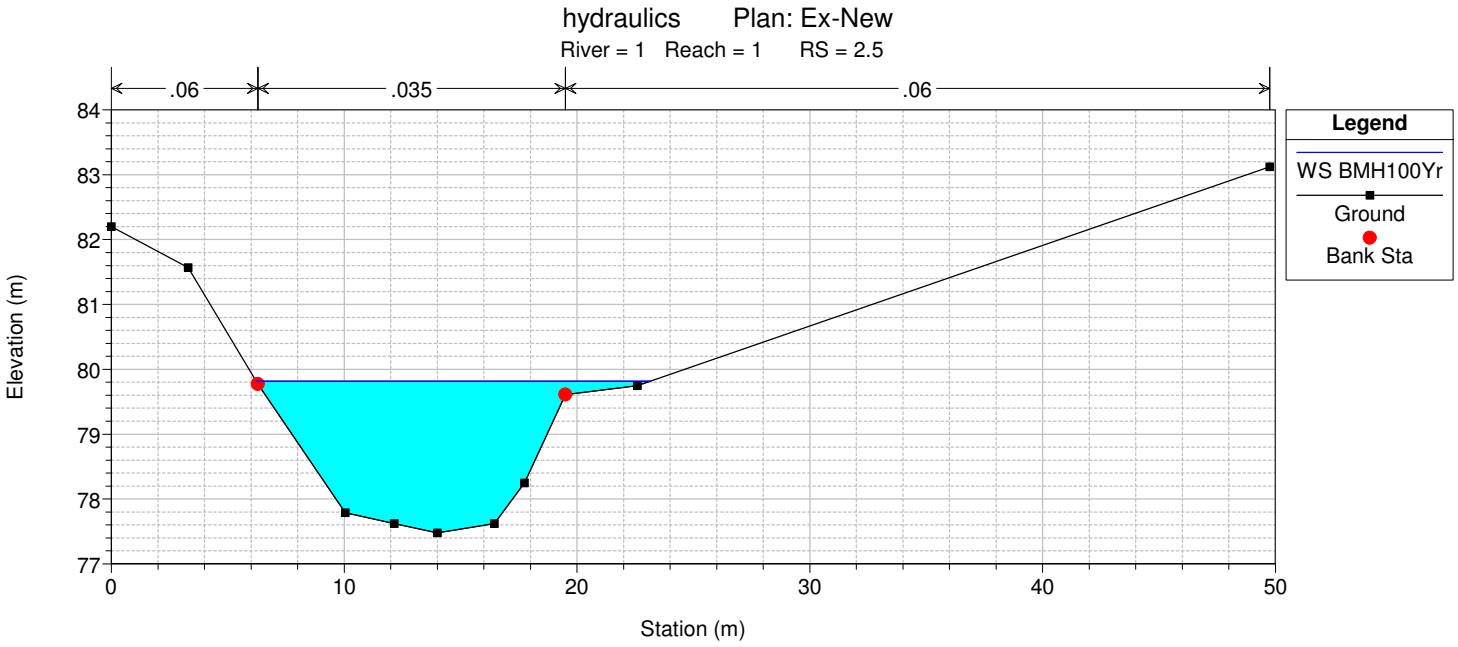

hydraulics Plan: Ex-New
River = 1 Reach = 1 RS = 6
.06
.035
.06
Elevation (m)
Station (m)
Legend
WS BMH100Yr
Ground
Bank Sta

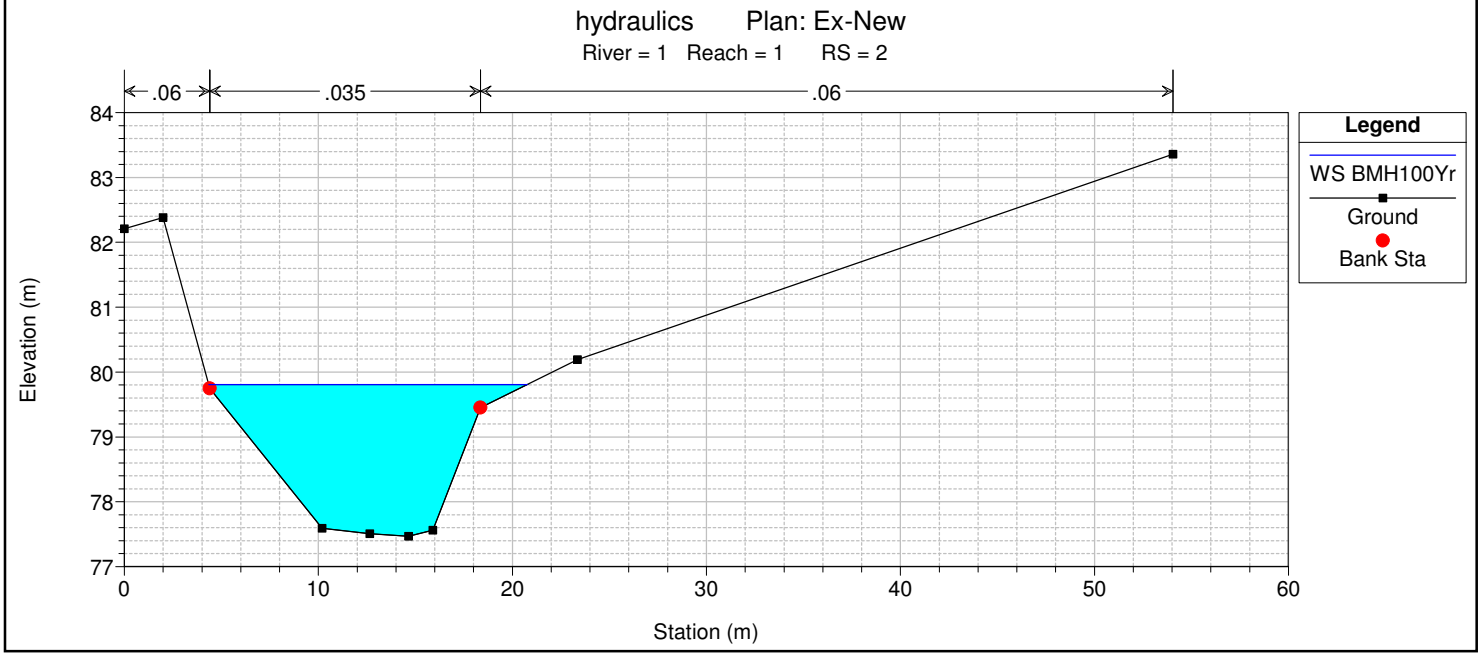

hydraulics Plan: Ex-New
River = 1 Reach = 1 RS = 5
.06
.035
.06
Elevation (m)
Station (m)
Legend
WS BMH100Yr
Ground
Bank Sta

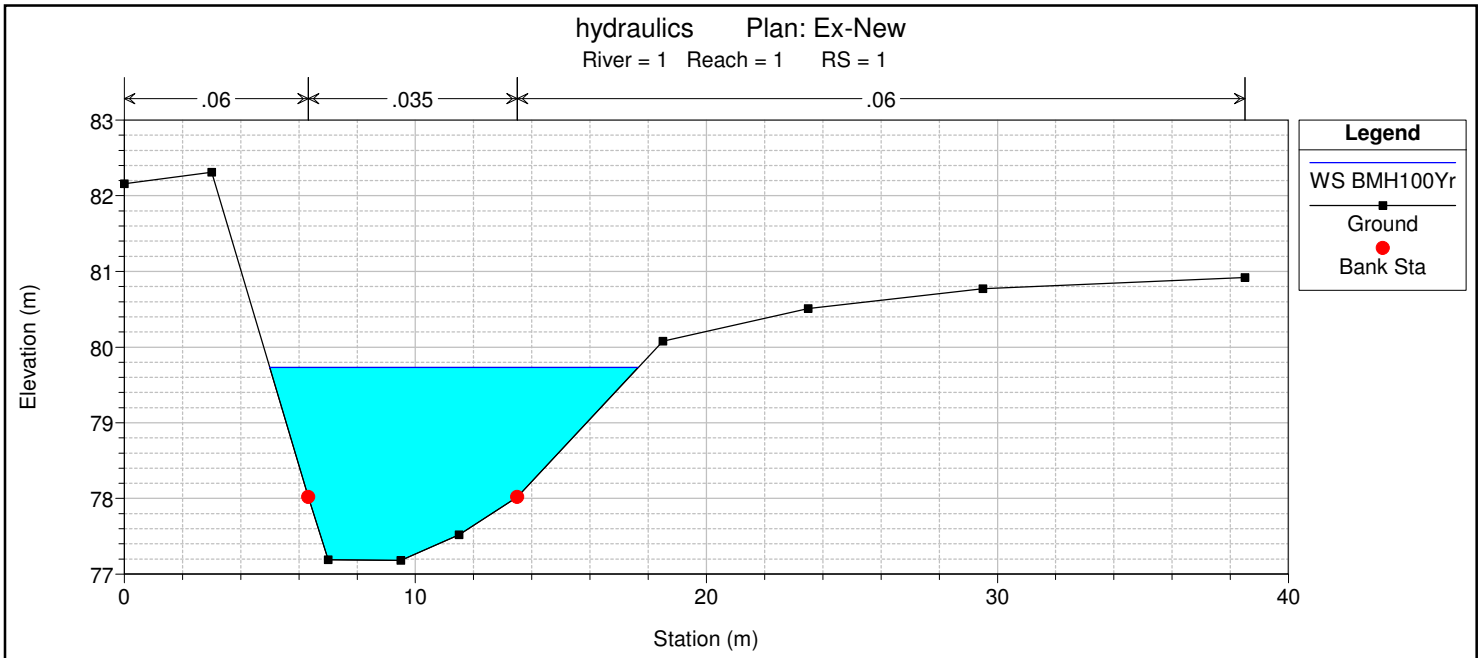

hydraulics Plan: Ex-New
River = 1 Reach = 1 RS = 4.5
.06
.035
.06
Elevation (m)
Station (m)
Legend
WS BMH100Yr
Ground
Bank Sta


hydraulics Plan: Ex-New
River = 1 Reach = 1 RS = 4
.06
.035
.06
Elevation (m)
Station (m)
Legend
WS BMH100Yr
Ground
Bank Sta


hydraulics Plan: Ex-New
River = 1 Reach = 1 RS = 3
.06
.035
.06
Legend
WS BMH100Yr
Ground
Bank Sta
Elevation (m)
Station (m)
84
83
82
81
80
79
78
77
0
10
20
30
40
50


hydraulics Plan: Ex-New
River = 1 Reach = 1 RS = 2.5
.06
.035
.06
Legend
WS BMH100Yr
Ground
Bank Sta
Elevation (m)
Station (m)
84
83
82
81
80
79
78
77
0
10
20
30
40
50

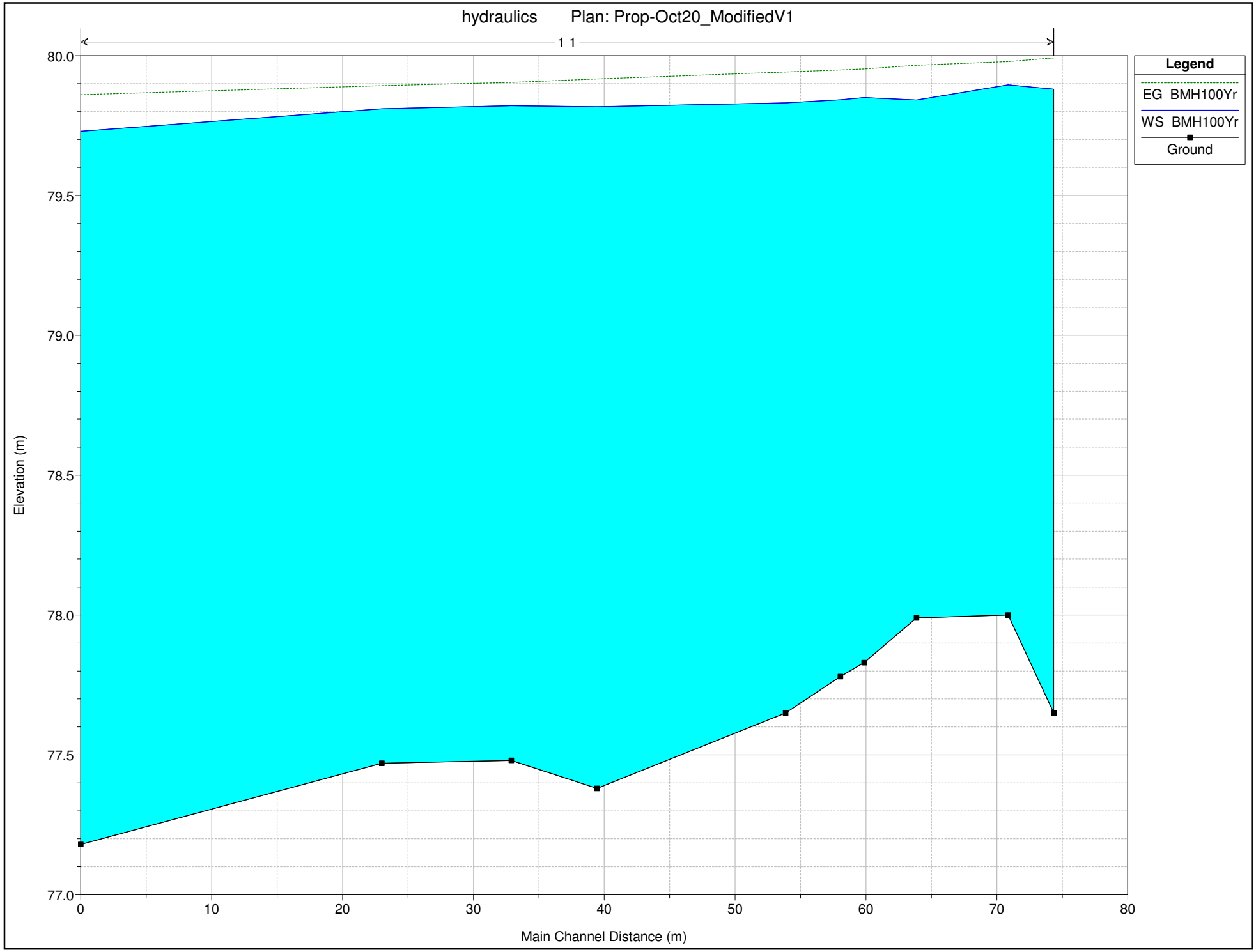

hydraulics Plan: Ex-New
River = 1 Reach = 1 RS = 2
.06
.035
.06
Legend
WS BMH100Yr
Ground
Bank Sta
Elevation (m)
Station (m)
84
83
82
81
80
79
78
77
0
10
20
30
40
50
60

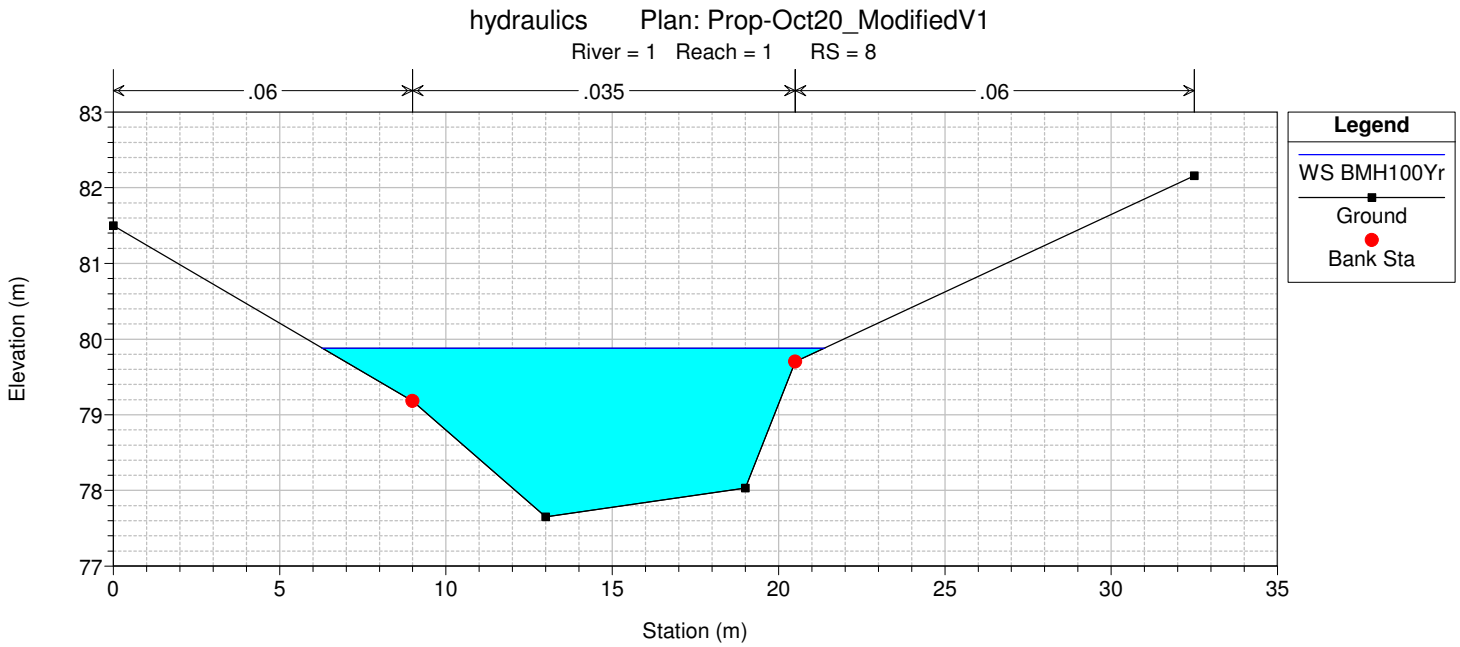

hydraulics Plan: Ex-New
River = 1 Reach = 1 RS = 1
.06
.035
.06
Legend
WS BMH100Yr
Ground
Bank Sta
Elevation (m)
Station (m)
83
82
81
80
79
78
77
0
10
20
30
40

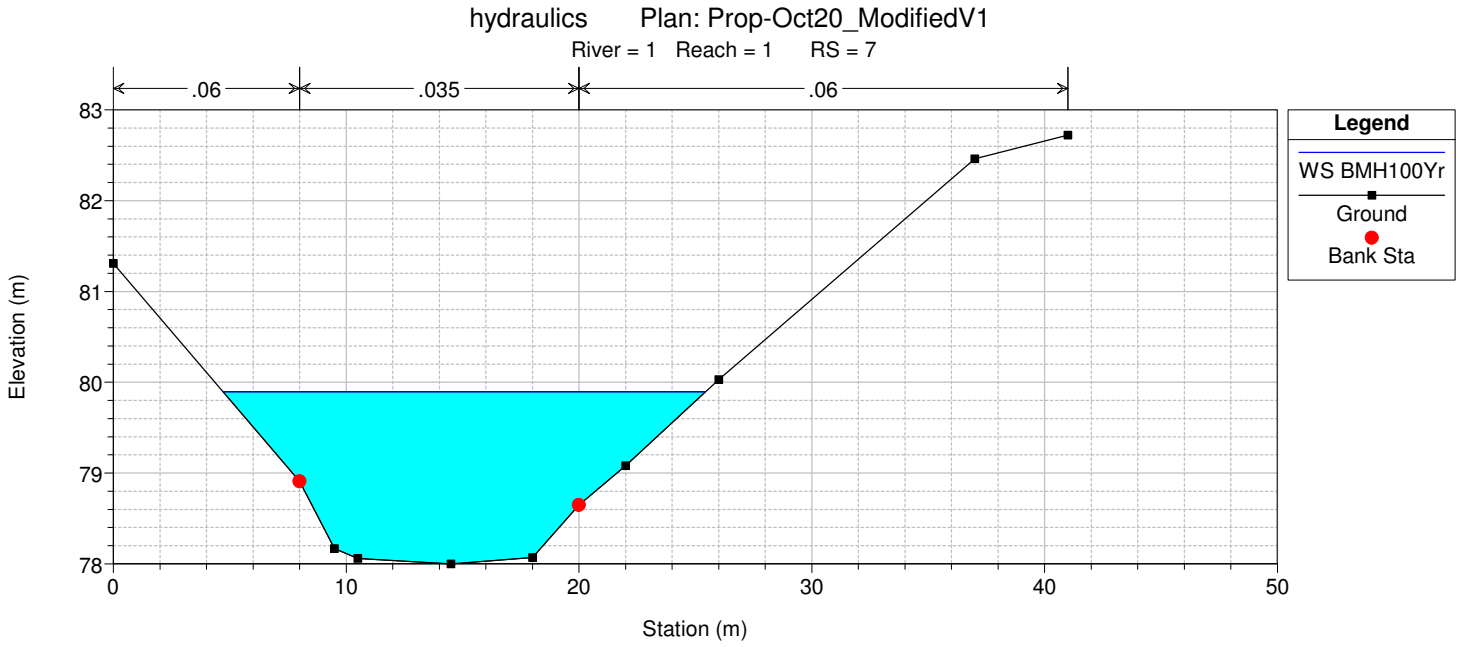
B2 – Proposed

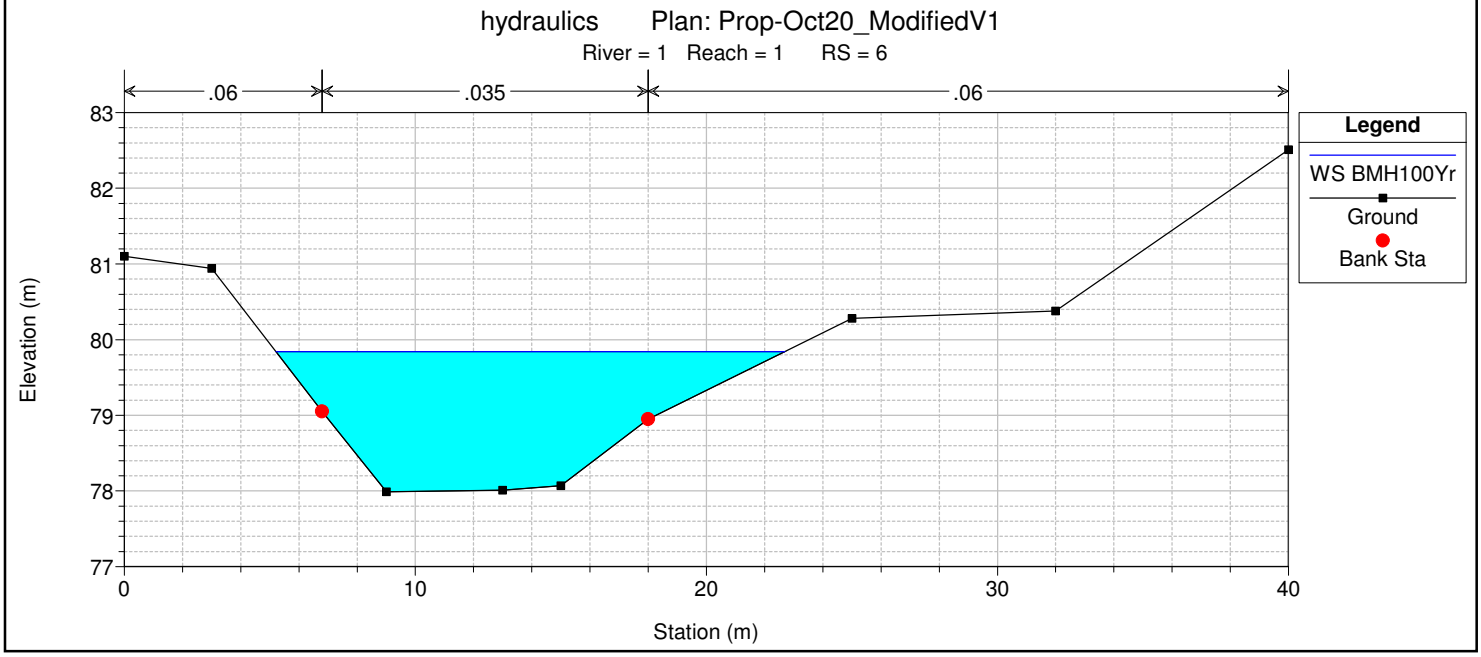
HEC-RAS Plan: Prop-Oct20_V1 River: 1 Reach: 1 Profile: BMH100Yr

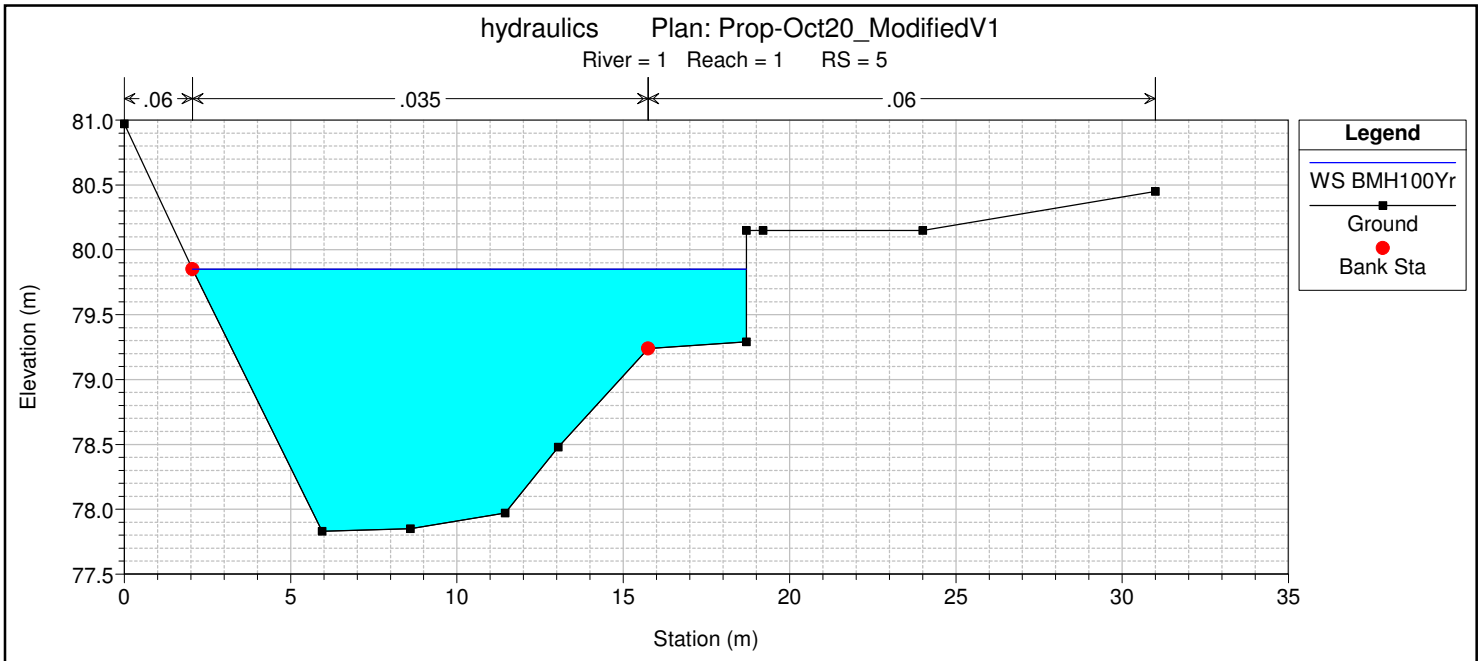
Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(m3/s)	(m)	(m)	(m)	(m)	(m/m)	(m/s)	(m2)	(m)	
1	1	BMH100Yr	29.48	77.18	79.73	78.64	79.86	0.001209	1.66	21.17	12.65	0.35
1	2	BMH100Yr	29.48	77.47	79.81		79.89	0.001191	1.27	23.16	13.90	0.31
1	2.5	BMH100Yr	29.48	77.48	79.82		79.90	0.001082	1.30	24.54	15.83	0.31
1	3	BMH100Yr	29.48	77.38	79.82		79.92	0.001308	1.41	22.18	14.60	0.34
1	4	BMH100Yr	29.48	77.65	79.83		79.94	0.001718	1.50	21.36	16.13	0.39
1	4.5	BMH100Yr	29.48	77.78	79.84		79.95	0.001647	1.47	21.48	16.56	0.38
1	5	BMH100Yr	29.48	77.83	79.85		79.95	0.001613	1.43	21.79	16.65	0.38
1	6	BMH100Yr	29.48	77.99	79.84		79.97	0.001737	1.59	20.58	17.48	0.40
1	7	BMH100Yr	29.48	78.00	79.90		79.98	0.001056	1.32	25.93	20.72	0.32
1	8	BMH100Yr	29.48	77.65	79.88		79.99	0.001490	1.49	20.66	15.10	0.36

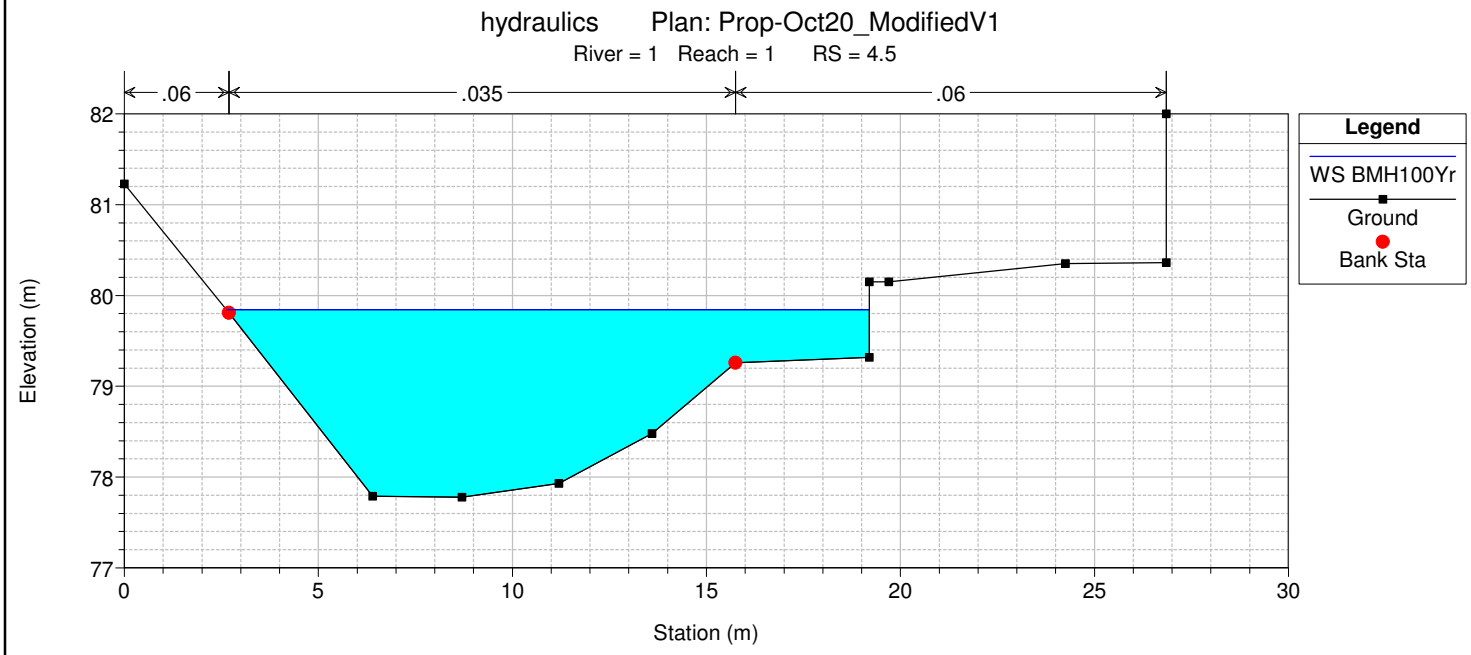

hydraulics Plan: Prop-Oct20_ModifiedV1
1 1
Legend
EG BMH100Yr
WS BMH100Yr
Ground
Elevation (m)
80.0
79.5
79.0
78.5
78.0
77.5
77.0
0
10
20
30
40
50
60
70
80
Main Channel Distance (m)

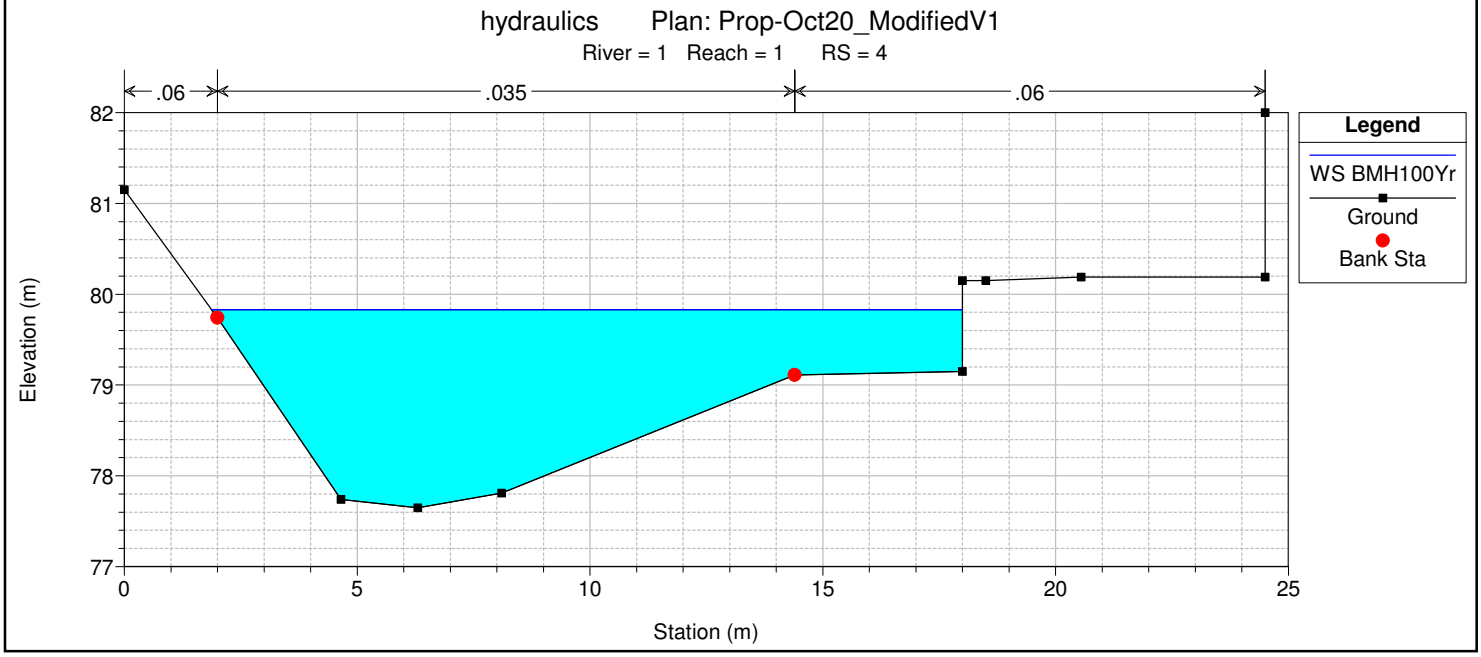

hydraulics Plan: Prop-Oct20_ModifiedV1
River = 1 Reach = 1 RS = 8
.06
.035
.06
Legend
WS BMH100Yr
Ground
Bank Sta
Elevation (m)
Station (m)

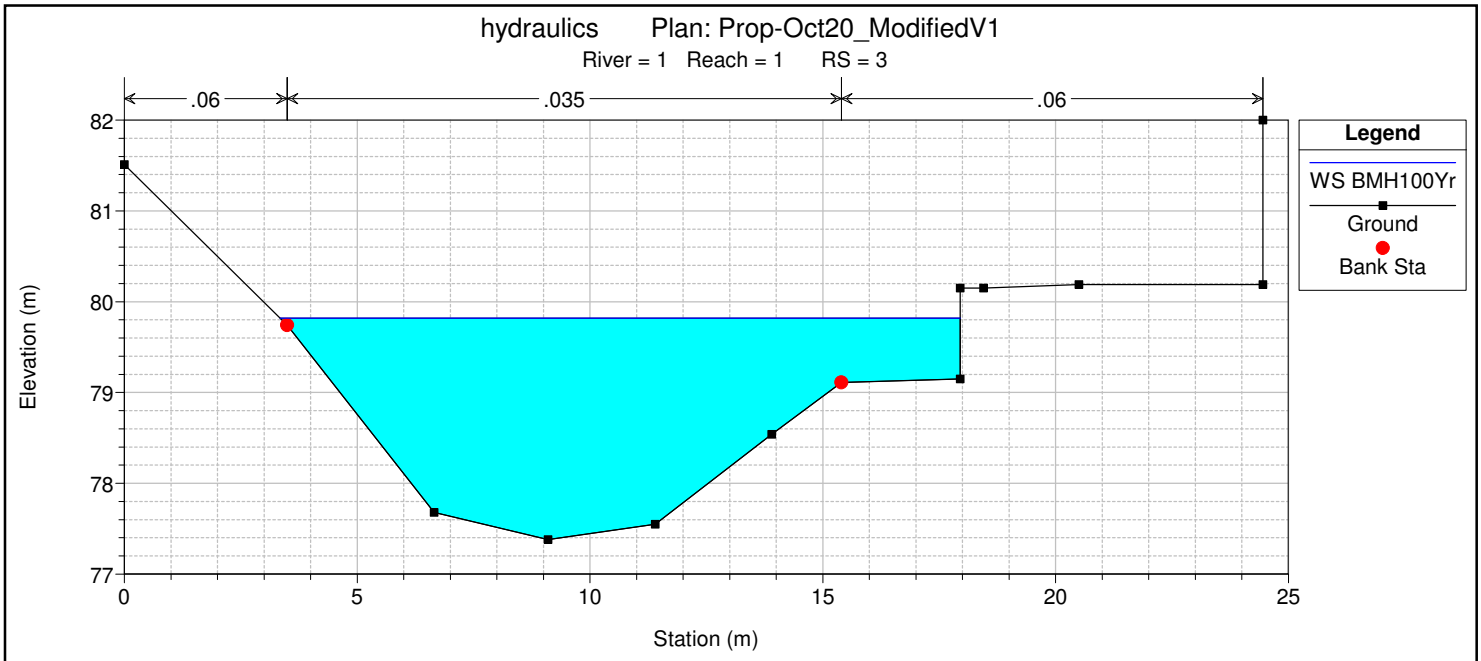

hydraulics Plan: Prop-Oct20_ModifiedV1
River = 1 Reach = 1 RS = 7
.06
.035
.06
Legend
WS BMH100Yr
Ground
Bank Sta
Elevation (m)
Station (m)

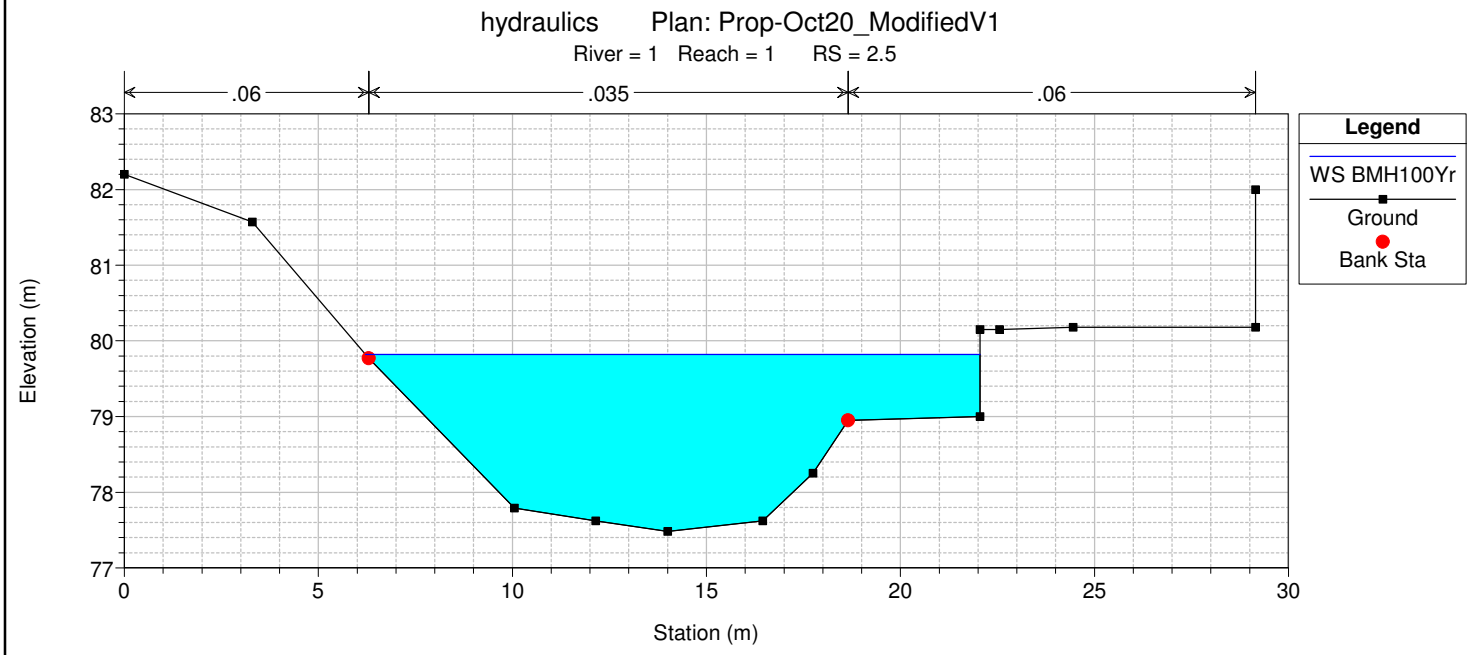

hydraulics Plan: Prop-Oct20_ModifiedV1
River = 1 Reach = 1 RS = 6
.06
.035
.06
Legend
WS BMH100Yr
Ground
Bank Sta
Elevation (m)
Station (m)

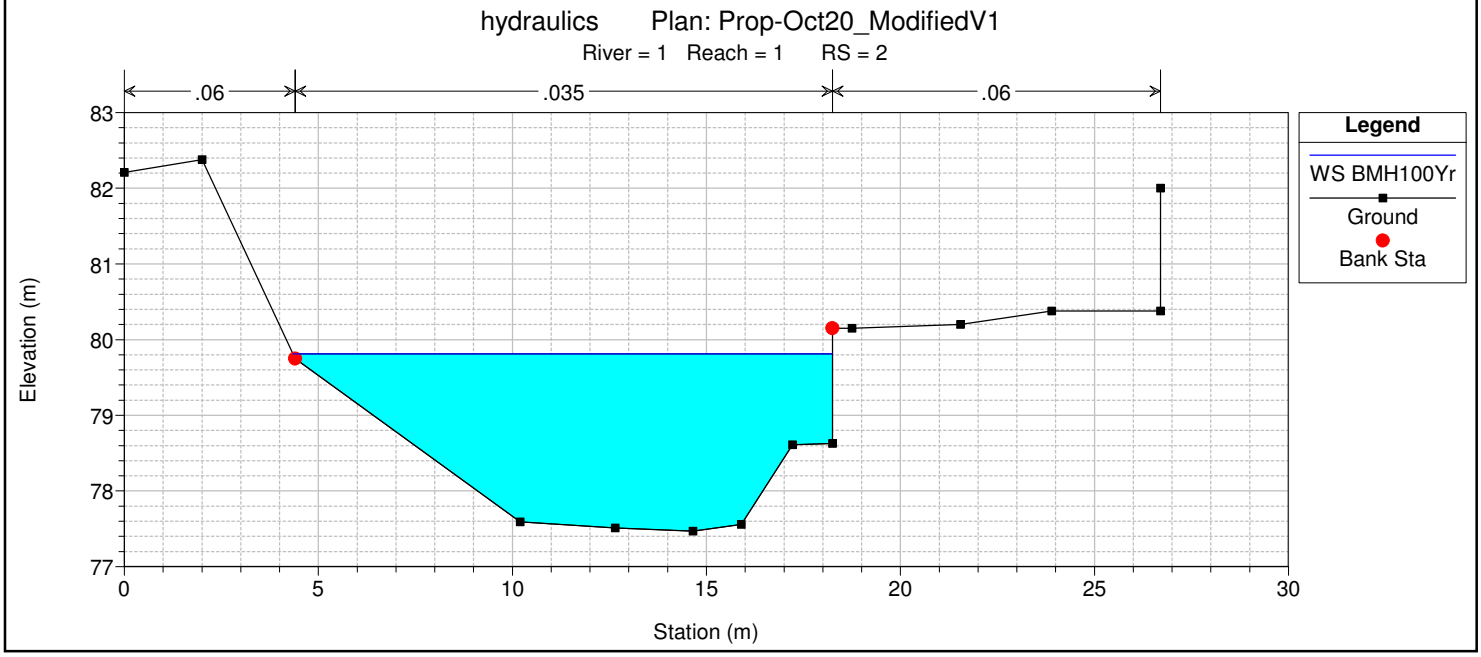

hydraulics Plan: Prop-Oct20_ModifiedV1
River = 1 Reach = 1 RS = 5
.06
.035
.06
Elevation (m)
Station (m)
Legend
WS BMH100Yr
Ground
Bank Sta

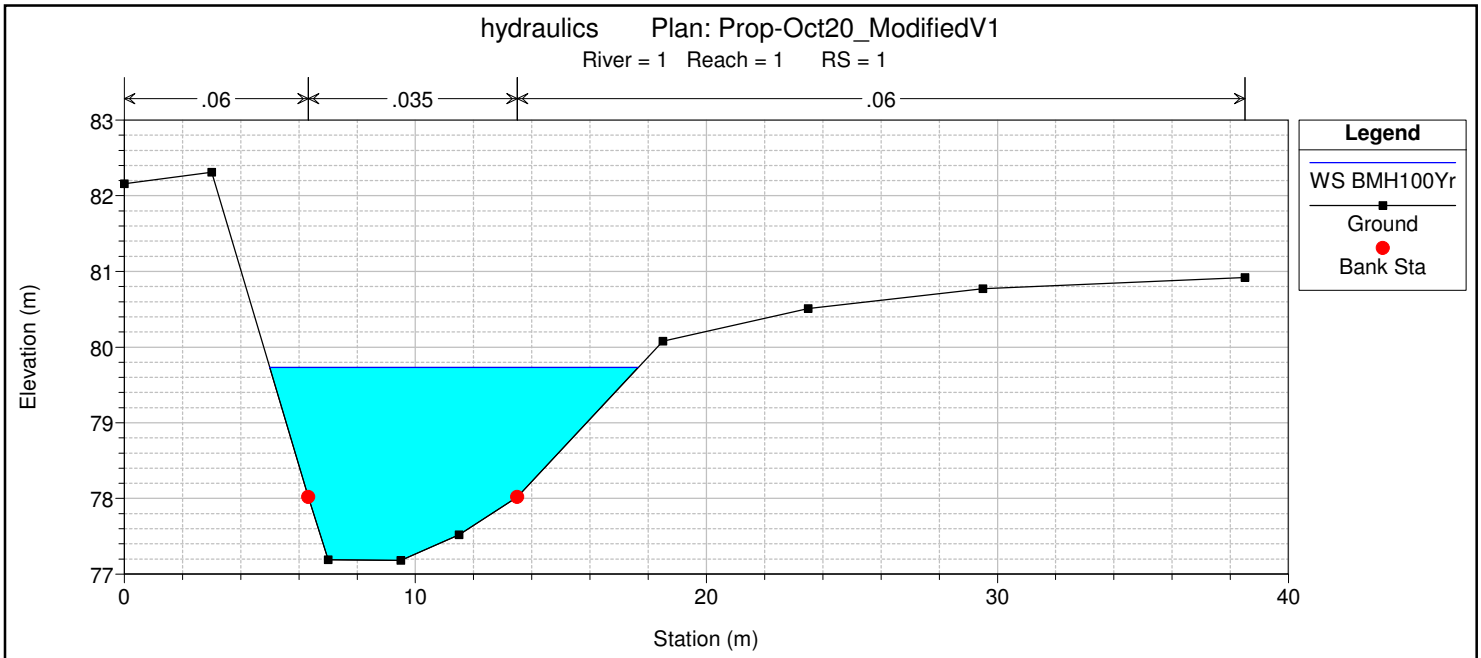

hydraulics Plan: Prop-Oct20_ModifiedV1
River = 1 Reach = 1 RS = 4.5
.06
.035
.06
Elevation (m)
Station (m)
Legend
WS BMH100Yr
Ground
Bank Sta


hydraulics Plan: Prop-Oct20_ModifiedV1
River = 1 Reach = 1 RS = 4
.06
.035
.06
Elevation (m)
Station (m)
Legend
WS BMH100Yr
Ground
Bank Sta


hydraulics Plan: Prop-Oct20_ModifiedV1
River = 1 Reach = 1 RS = 3
.06
.035
.06
Legend
WS BMH100Yr
Ground
Bank Sta
Elevation (m)
Station (m)


hydraulics Plan: Prop-Oct20_ModifiedV1
River = 1 Reach = 1 RS = 2.5
.06
.035
.06
Legend
WS BMH100Yr
Ground
Bank Sta
Elevation (m)
Station (m)


hydraulics Plan: Prop-Oct20_ModifiedV1
River = 1 Reach = 1 RS = 2
.06
.035
.06
Legend
WS BMH100Yr
Ground
Bank Sta
Elevation (m)
Station (m)


hydraulics Plan: Prop-Oct20_ModifiedV1
River = 1 Reach = 1 RS = 1
.06
.035
.06
Legend
WS BMH100Yr
Ground
Bank Sta
Elevation (m)
Station (m)
83
82
81
80
79
78
77
0
10
20
30
40

APPENDIX C – Drawings (Site Grading Plan, Sections)

NOTES:

1. ALL SURVEY POINTS AMD EXISTING PIPE INVERT ELEVATIONS SHALL BE VERIFIED IN THE FIELD BY THE CONTRACTOR.
2. ANY DISCREPANCIES BETWEEN SITE CONDITIONS AND THE DRAWING MUST BE REPORTED TO THE CONSULTANT PRIOR TO COMMENCEMENT OF CONSTRUCTION.
3. CONTRACTOR SHALL VERIFY ALL LOCATIONS OF GASMAINS, WATERMAINS, TV CABLES, HYDRO AND TELEPHONE DUCTS, SANITARY AND STORM SEWERS AND ALL EXISTING PRIVATE SEWER, WATER AND UTILITY SERVICES PRIOR TO START OF CONSTRUCTION.
4. CONTRACTOR SHALL VERIFY DEPTHS OF ALL EXISTING SANITARY AND STORM SEWERS AND WATERMAINS PRIOR TO START OF CONSTRUCTION, AND NOTIFY THE ENGINEER OF ANY DISCREPANCIES.

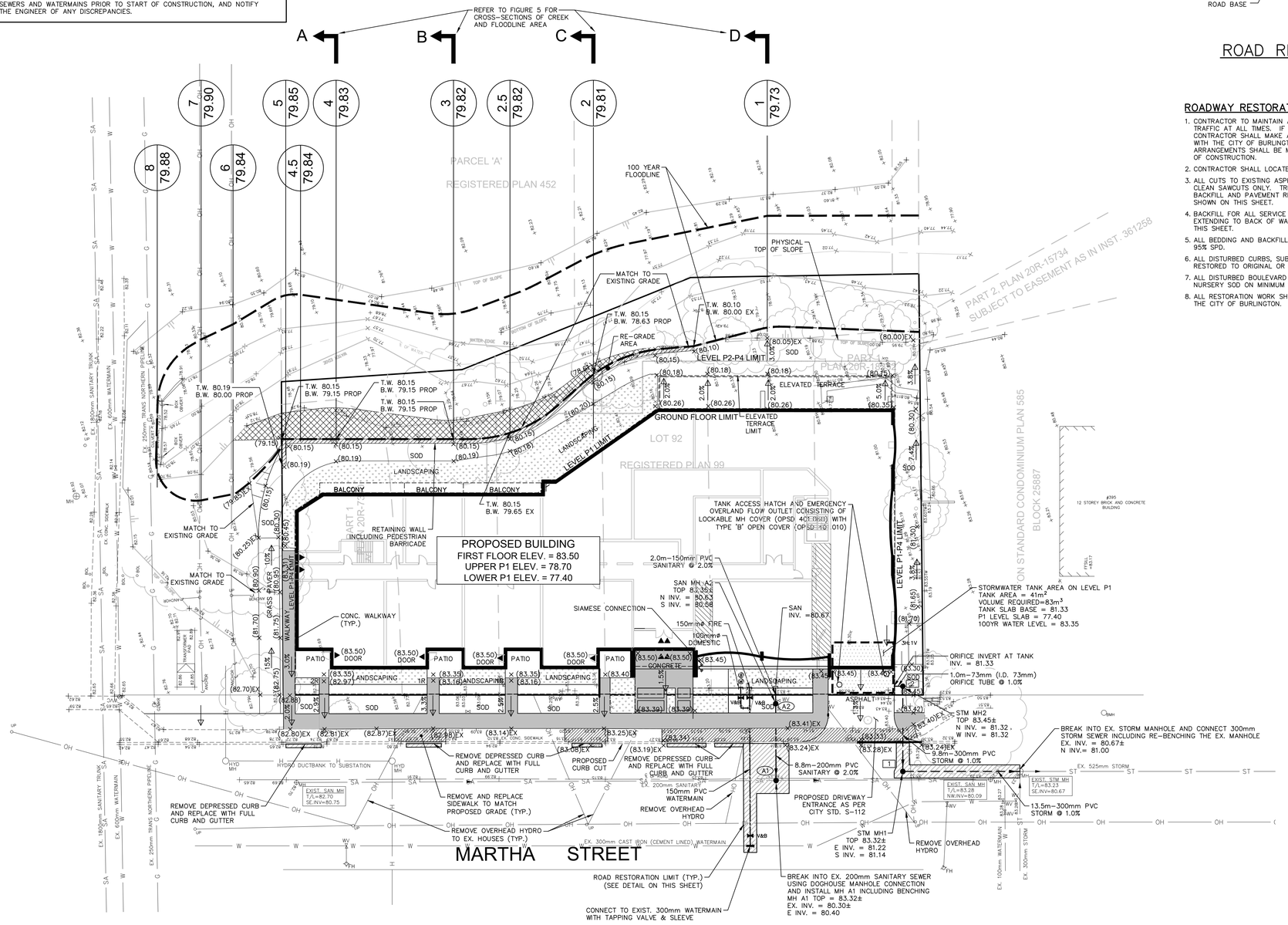
EXISTING WATER SERVICE ABANDONMENT

ALL EXISTING WATER SERVICES TO BE ABANDONED SHALL BE ABANDONED AS FOLLOWS:

1. PAVEMENT RESTORATION, IF NECESSARY, SHALL BE PER NOTES AND DETAIL ON THIS SHEET.
2. MAINSTOP SHALL BE SHUT OFF AT MAIN AND COPPER SERVICE DISCONNECTED AND CRIMPED.
3. CURB STOP BARREL TO BE REMOVED AT STREET LINE AND COPPER SERVICE CRIMPED.

EXISTING SANITARY LATERAL ABANDONMENT

EXISTING SANITARY LATERALS SHALL BE REMOVED TO BACK OF SIDEWALK OR AS SHOWN ON THE DRAWING, AND CAPPED/PLUGGED. THE REMAINING PIPING TO BE ABANDONED BY INSERTION OF A WATER TIGHT PLUG INSIDE THE EXISTING SEWER MAIN. AFTER THE INSERTION OF PLUGS, THE ENTIRE LENGTH OF SEWER FROM MANHOLE TO MANHOLE SHALL BE FLUSHED AND VIDEO RECORDED WITH VIDEO DETAILING OF PLUGS TO DISPLAY WATER TIGHTNESS.





ROAD RESTORATION DETAIL

N.T.S.

KEY PLAN

ROADWAY RESTORATION NOTES

1. CONTRACTOR TO MAINTAIN A MINIMUM OF ONE LANE OF TRAFFIC AT ALL TIMES. IF THIS IS NOT FEASIBLE, THE CONTRACTOR SHALL MAKE ALL NECESSARY ARRANGEMENTS WITH THE CITY OF BURLINGTON FOR ROAD CLOSURES. THESE ARRANGEMENTS SHALL BE MADE FAR IN ADVANCE OF START OF CONSTRUCTION.
2. CONTRACTOR SHALL LOCATE AND PROTECT ALL UTILITIES.
3. ALL CUTS TO EXISTING ASPHALT AND CONCRETE SHALL BE CLEAN SAWCUTS ONLY. TRENCH BEDDING, COVER MATERIAL, BACKFILL AND PAVEMENT RESTORATION SHALL BE PER DETAIL SHOWN ON THIS SHEET.
4. BACKFILL FOR ALL SERVICE TRENCHES WITHIN ROADWAY AND EXTENDING TO BACK OF WALK SHALL BE AS PER DETAIL ON THIS SHEET.
5. ALL BEDDING AND BACKFILL SHALL BE COMPACTED TO MIN. 95% SPD.
6. ALL DISTURBED CURBS, SUBDRAINS, CULVERTS ETC. SHALL BE RESTORED TO ORIGINAL OR BETTER CONDITIONS.
7. ALL DISTURBED BOULEVARD SHALL BE RESTORED WITH No. 1 NURSERY SOD ON MINIMUM 150mm TOPSOIL.
8. ALL RESTORATION WORK SHALL BE TO THE SATISFACTION OF THE CITY OF BURLINGTON.



TRUE NORTH



CONSTRUCTION NORTH

LEGEND

EXISTING GROUND ELEVATION	×100.00
PROPOSED GROUND ELEVATION	×(100.00)
PROPOSED GROUND ELEVATION TO MATCH EXISTING GRADE	×(100.00)EX
DIRECTION OF SHEET FLOW	
STORM SEWER	ST
SANITARY SEWER	SA
WATER SERVICE	W
WATER METER	W
BACKFLOW PREVENTER	B
EXISTING STORM SEWER	ST
EXISTING SANITARY SEWER	SA
EXISTING WATERMAIN	W
EXISTING UNDERGROUND HYDRO	H
EXISTING OVERHEAD WIRE	OH
EXISTING MANHOLE	MH
EXISTING HYDRANT	FH
EXISTING WATER VALVE	WV
EXISTING WATER VALVE CHAMBER	WVC
EXISTING LIGHT STANDARD	LS
EXISTING PADMOUNT TRANSFORMER	
EXISTING UTILITY POLE	UP
EXISTING BELL PEDESTAL	
EXISTING CABLE PEDESTAL	
EXISTING CHAIN LINK FENCE	X
EXISTING GASMAIN	G
MANHOLE	
GROUND FLOOR LAYOUT	
UNDERGROUND P1 OUTLINE	
UNDERGROUND P2-P4 OUTLINE	
100 YEAR FLOODLINE	
CONCRETE WALKWAYS	
LANDSCAPING AREAS	
REINFORCED EARTH EMBANKMENT	
RETAINING WALL	

100-YEAR WSEL — 1 SECTION NO. / 79.73 ELEV.

SURVEY:

TOPOGRAPHIC SURVEY PROVIDED BY MACKAY MACKAY & PETERS LTD. DATED APRIL 27, 2017.

BENCHMARK:

CITY OF BURLINGTON
BENCHMARK No. 198
DESCRIPTION: PLATE ON PUMP HOUSE LOCATED JUST WEST OF RAMBO CREEK, BEING 320m EAST OF BRANT STREET ON LAKESHORE ROAD. PLATE IS FIXED TO THE SOUTH FACE OF BRICK BUILDING, BEING 0.15m EAST OF THE SOUTHWEST CORNER AND 0.30m ABOVE EXISTING CONCRETE SIDEWALK.
ELEVATION = 78.036 METRES (CGVD-1928: 1978 ADJUSTMENT)

NOT ISSUED FOR CONSTRUCTION

SCALE VALID ONLY FOR 24"x36" VERSION

No	Date	Drawn	Appr'd	Revisions
4	JAN 04, 21	ML	PP	RE-ISSUED FOR SITE PLAN APPLICATION
3	NOV 03, 20	ML	PP	RE-ISSUED FOR SITE PLAN APPLICATION
2	MAR 31, 20	ML	PP	RE-ISSUED FOR SITE PLAN APPLICATION
1	NOV 19, 18	ML	PP	ISSUED FOR SITE PLAN APPLICATION

APPROVALS

Design	PP	Checked	MD
Drawn	ML	Checked	PP
Scale	1:250		
Date	NOVEMBER 2018		

LICENSED PROFESSIONAL ENGINEER — P. PAGAZANI 100053989 — Jan 04, 2021 — PROVINCE OF ONTARIO

401 - 417 MARTHA STREET CITY OF BURLINGTON, ON

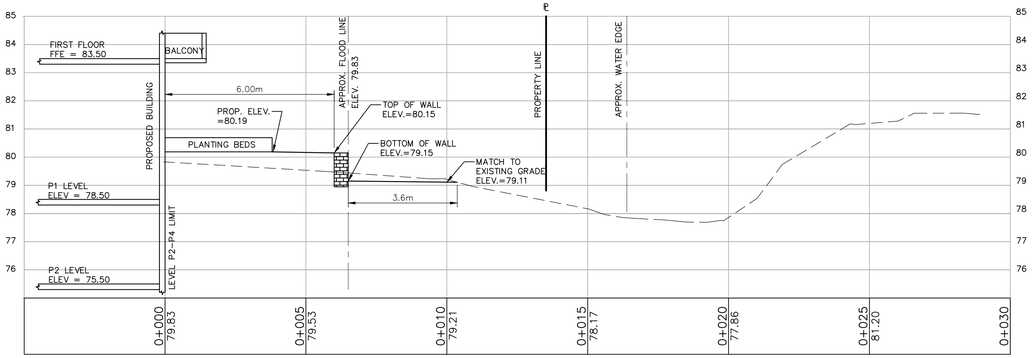
2413350 ONTARIO INC.

FUNCTIONAL SITE SERVICING AND GRADING PLAN

wood.
3450 HARVESTER ROAD, SUITE 100
BURLINGTON, ON. L7N 3W5
TEL: +1 (905) 335-2353

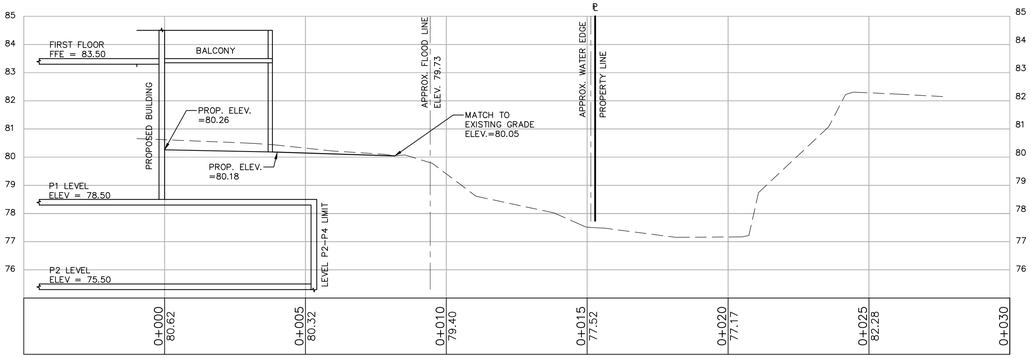
Scale 1:250
Consultant File No. TPB163165
Drawing No. FIGURE 3

Plotted: 2021-01-04
Last Saved: 2020-11-18
Plotted By: paul.pagazani
Last Saved By: paul.pagazani
Path: P:\2016\Projects\TPB163165 - Hydraulic Assessment 401-417 Martha Street\06_DES-ENG\01_CAD\02_DWGS\01_LO\DWG\FSR6\TPB163165-02.dwg



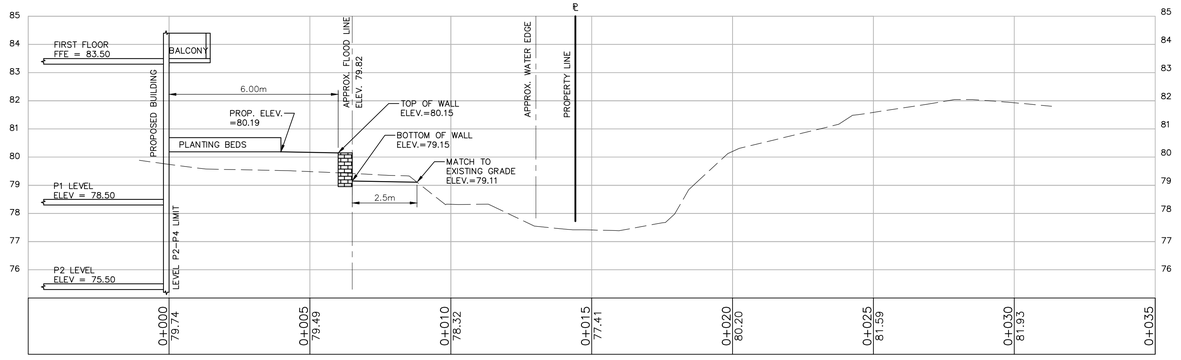
SECTION A–A

H 1:100
V 1:100



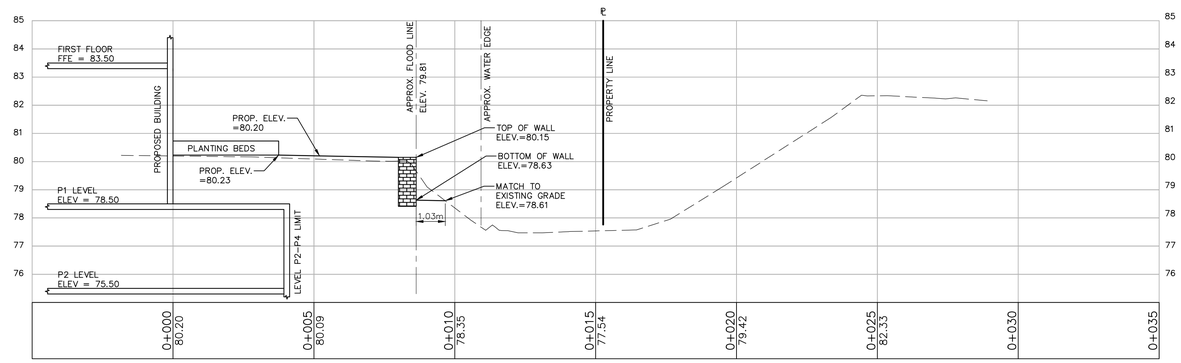
SECTION D–D

H 1:100
V 1:100



SECTION B–B

H 1:100
V 1:100



SECTION C–C

H 1:100
V 1:100

SURVEY:

TOPOGRAPHIC SURVEY PROVIDED BY MACKAY MACKAY & PETERS LTD. DATED APRIL 27, 2017.

BENCHMARK:

CITY OF BURLINGTON
BENCHMARK No. 198
DESCRIPTION: PLATE ON PUMP HOUSE LOCATED JUST WEST OF RAMBO CREEK, BEING 320m EAST OF BRANT STREET ON LAKESHORE ROAD. PLATE IS FIXED TO THE SOUTH FACE OF BRICK BUILDING, BEING 0.15m EAST OF THE SOUTHWEST CORNER AND 0.30m ABOVE EXISTING CONCRETE SIDEWALK.
ELEVATION = 78.036 METRES (CGVD–1928: 1978 ADJUSTMENT)

NOT ISSUED FOR CONSTRUCTION SCALE VALID ONLY FOR 24"x36" VERSION

Plotted: 2020–11–04
Last Saved: 2020–11–02
Plotted By: paul.pagazani
Last Saved By: paul.pagazani
Path: P:\2016\Projects\TPB163165 – Hydraulic Assessment 401–417 Martha Street\06_DES–ENG\01_CAD\02_DWGS\01_LDT\DWG\TSR6\TPB163165–03 –Sections.dwg

No	Date	Drawn	Appr'd	Revisions
2	NOV 03, 20	ML	PP	RE–ISSUED FOR SITE PLAN APPLICATION
1	MAR 31, 20	ML	PP	ISSUED FOR SITE PLAN APPLICATION

APPROVALS

Design	PP	Checked	BB
Drawn	ML	Checked	PP
Scale	AS NOTED		
Date	AUGUST 2019		

LICENSED PROFESSIONAL ENGINEER
P. PAGAZANI
100053989
Nov 03, 2020
PROVINCE OF ONTARIO

401 - 417 MARTHA STREET
CITY OF BURLINGTON, ON
2413350 ONTARIO INC.

CROSS-SECTIONS

wood.
3450 HARVESTER ROAD, SUITE 100
BURLINGTON, ON. L7N 3W5
TEL: +1 (905) 335-2353

Scale: AS NOTED
Consultant File No.: TPB163165
Drawing No.: FIGURE 5