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Maple Bridge Subdivision, Phase 2

NATURAL HAZARDS ASSESSMENT

Mason Homes Limited

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Document Contents

1	Introduction	1
1.1	Report Objective	1
1.2	Guidelines & Background Documents.....	1
2	Development Site.....	2
2.1	Location	2
2.2	Site Description	3
2.3	Proposed Development.....	4
3	Existing Conditions.....	5
3.1	Hydrology	5
3.2	Hydraulic Analysis	6
4	Erosion Hazard	13
4.1	Watercourse 4.0	13
4.2	Watercourse 6.1	14
5	Summary.....	16

Tables

Table 1: Regional Peak Flow Summary	6
Table 2: COSINE Benchmark Summary.....	7
Table 3: Watercourse 4.0 Existing Condition Flood Elevation Summary.....	9
Table 4: Watercourse 6.1 Culvert and Bridge Summary	10
Table 5: Watercourse 6.1 Existing Condition Flood Elevation Summary.....	11
Table 6: Watercourse 4.0 (Reach 3) Channel Velocity and Shear Stress Summary	14

Figures

Figure 1: Site Location	2
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Appendices

Appendix A: Hydrologic Model Results

Appendix B: LSRCA HEC-2 Model Results

Appendix C: COSINE Station Reports

Appendix D: Watercourse 4.0 Existing Condition HEC-RAS Model Results

Appendix E: Watercourse 6.1 Existing Condition HEC-RAS Model Results

Drawings

Drawing FLD-1: Existing Conditions Flood Hazard Plan

Drawing NH-1: Natural Hazards Mapping Plan

1 Introduction

Tatham Engineering Limited was retained by Mason Homes Limited to prepare a Natural Hazards Assessment (NHA) in support of a Draft Plan of Subdivision application for Phase 2 of the Maple Bridge Subdivision located northeast of the Centre Road and Oakside Drive intersection in the Township of Uxbridge (Township), within the Regional Municipality of Durham (Region). The location of the development site is illustrated in Figure 1.

1.1 REPORT OBJECTIVE

This report was prepared to establish the natural hazard limits across the subject property, and consequently the allowable development limits, in accordance with the Lake Simcoe Region Conservation Authority (LSRCA) and Ministry of Natural Resources and Forestry (MNRF) natural hazard guidelines.

1.2 GUIDELINES & BACKGROUND DOCUMENTS

This analysis was completed in accordance with the Provincial and Conservation Authority guidelines for natural hazard assessments as follows:

- Lake Simcoe Region Conservation Authority (LSRCA), *Technical Guidelines for Stormwater Management Submissions* (2022);
- Lake Simcoe Region Conservation Authority (LSRCA), *Watershed Development Guidelines* (June 2020);
- Ontario Ministry of Northern Development, Mines, Natural Resources and Forestry (MNDMNRF, formerly known as Ontario Ministry of Natural Resources), *Technical Guide – River and Stream Systems: Flood Hazard Limit* (2002);
- Ontario Ministry of Northern Development, Mines, Natural Resources and Forestry (MNDMNRF, formerly known as Ontario Ministry of Natural Resources), *Technical Guide – River and Stream Systems: Erosion Hazard Limit* (2002); and
- Ministry of Municipal Affairs and Housing, *Provincial Policy Statement* (2020).

The following background documents were also referenced in the preparation of this report:

- Roberts Bell Engineering Limited, *Mason Homes Maple Bridge Phase 1 Drawing Set* (2004); and
- John D. Bell Associates Ltd., *Maple Bridge Development Open Space Corridor Landscape Plans* (2005).

2 Development Site

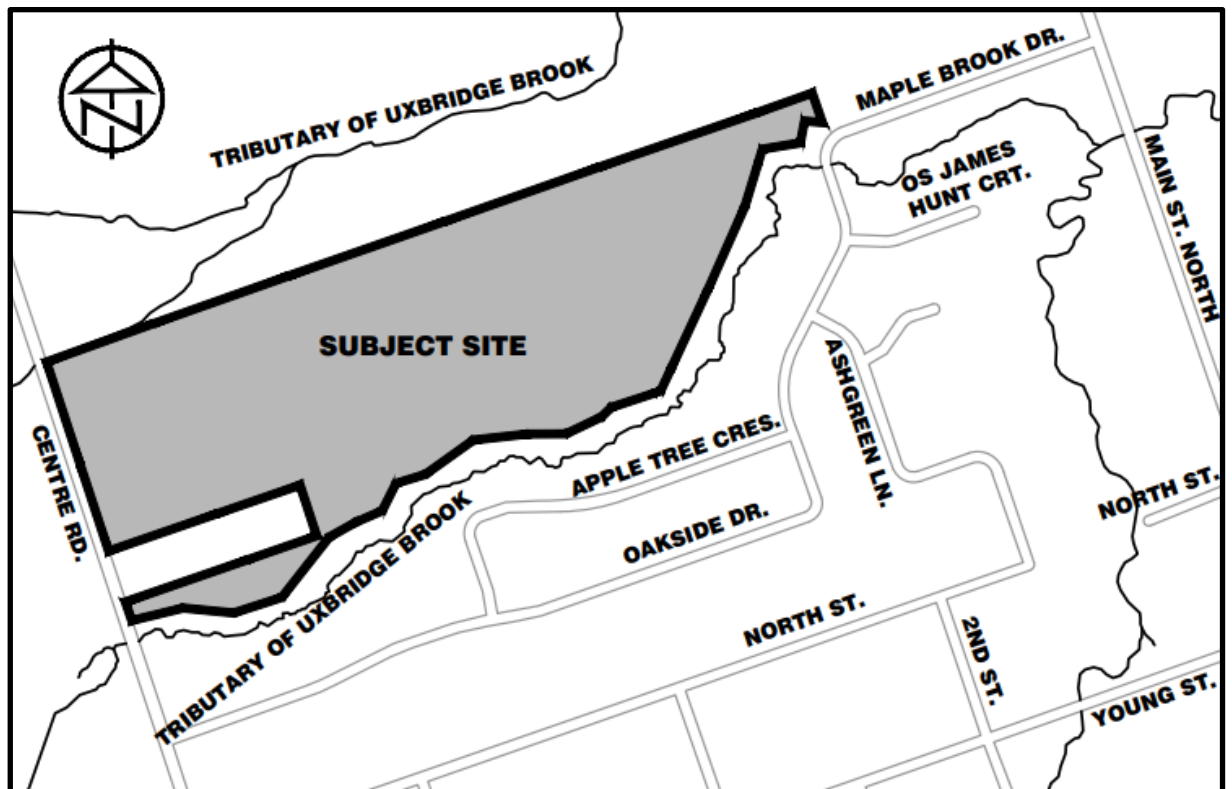
2.1 LOCATION

As illustrated in Figure 1, the subject site is located at the property known municipally as 7309 Centre Road, Township of Uxbridge.

As per the boundary survey completed by H.F. Grander Co. Ltd. in October 2022, the site is legally described as:

(Parts 1, 2, 3, Plan 40R-21667
 Save & Except Parts 1, 2, 3, & 4, Plan 40R-23402,
 Save & Except Parts 1, 2, 3, 4, 5, 6, & 7, Plan 40R-23403,
 And Save & Except Plan 40M-2256)
 Of Part of Lot 33, Concession 6,
 Geographic Township of Uxbridge,
 Now in the, Township of Uxbridge,
 Regional Municipality of Durham

Figure 1: Site Location



2.2 SITE DESCRIPTION

2.2.1 Zoning & Land Uses

Based on the Township's current Official Plan (OP) the property is designated 'Future Residential Area' and 'Natural Hazard Area'. Based on the Township's Zoning By-law the property is within a Rural Zone (RU) and Environmental Protection Zone (EP-27).

The site is located within the LSRCA watershed and is partially located within the LSRCA regulated area due to natural hazards associated with the Uxbridge Brook.

2.2.2 Topography

Information relating to existing topography, ground cover, and drainage patterns was obtained through a review of relevant background studies, available plans, base mapping, site visit and topographic surveys. A detailed topographic survey of the site was completed by IBW Surveyors Ltd., dated September 10, 2019.

The subject property is approximately 13.575 ha in area and consists of agricultural croplands with areas of woodland. It is bound by existing agricultural lands to the north and southwest, Tributary 6.1 of the Uxbridge Brook to the south and east, Tributary 4.0 of the Uxbridge Brook to the north, and Centre Road to the west.

The lands generally slope in an easterly direction towards the bank of the tributary of Uxbridge Brook (Watercourse 6.1) at a moderate slope of approximately 2 to 5%. The tributary of Uxbridge Brook (Watercourse 6.1) flows from southwest to northeast with an average slope of 2.5%.

2.2.3 Geotechnical & Hydrogeological

A geotechnical investigation identified the subsurface conditions as a layer of topsoil over silty sand over basal deposits of either glacial till or clayey silt. Topsoil was found to depths ranging from 0.12 to 0.18 m.

A hydrogeological investigation encountered groundwater at depths ranging from 0.0 to 3.3 mbg. The inferred shallow groundwater flow direction appears to be from northwest to southeast.

2.2.4 Watercourses

The proposed development is considered Phase 2 of the Maple Bridge Subdivision, with Phase 1 and Phase 2 bisected west to east by Watercourse 6.1. Phase 1 lands are located south of Watercourse 6.1 and Phase 2 to the north.

Another tributary of Uxbridge Brook (Watercourse 4.0) is located adjacent to the north property line of the subject property and also meanders in an easterly direction.

The subject property is therefore subject to flood and erosion hazards associated with Watercourse 6.1 and Watercourse 4.0.

2.3 PROPOSED DEVELOPMENT

2.3.1 Land Use

The proposed residential development consists of the following:

- 82 townhouse units;
- 154 single family dwellings; and
- a 0.79 ha stormwater management block.

The Draft Plan also includes Open Space blocks, Walkway blocks, an Environmental Protection block and a Future Road Connection Block.

Refer to Appendix A for the proposed Draft Plan.

2.3.2 Access

The site will be accessed from two new connections to existing roadways. The west connection will be made from Street 'A', which is a 20 m right-of-way, in the northwest corner of the development to Centre Road. The east connection will be made from Street 'A' in the northeast corner of the development to Oakside Drive.

2.3.3 Internal Roads

The internal roadways will be a combination of 20 m road allowances, 17 m road allowances and 7.5 m laneways.

3 Existing Conditions

3.1 HYDROLOGY

To confirm the Regulatory Storm peak flow for the tributaries of Uxbridge Brook included in the LSRCA Generic regulations hydraulic model, a Visual OTTHYMO (VO) model of each tributary watershed was developed. The watersheds for each tributary were delineated and SCS curve numbers, initial abstraction and time of concentration values were calculated for each watershed based on land use, hydrologic soil groups and topography. These parameters are used to estimate infiltration losses and watershed response/runoff from storms.

The data used was obtained from the following sources:

- land use information - MNRF Southern Ontario Land Resource Information System (SOLRIS) dataset;
- soils information - Ontario Ministry of Agriculture, Food, and Rural Affairs (OMAFRA) Soil Survey Complex database; and
- topographic data - LSRCA 0.5m grid Digital Terrain Model.

The Regional Storm peak flows generated through VO were compared against those provided by the LSRCA to validate the Regulatory Storm peak flow used in this assessment. Based on our analysis, the Regional Storm peak flow for the tributaries of Uxbridge Brook provided in the LSRCA HEC-2 model are considered appropriate and have been used in this assessment.

It is noted the upstream drainage area (8.7 ha) for Watercourse 4.0, Reach 3 is significantly less than the LSRCA's threshold for regulating watercourses for flood hazard (125 ha). Instead, the 1:100-year return frequency peak flow was analyzed for this reach to demonstrate safe conveyance with no impacts to the proposed properties at the northwest corner of the subject site.

Table 1 summarizes the modelled peak flows for the watercourse reaches assessed. Detailed hydrologic information is provided in Appendix A for reference.

Table 1: Regional Peak Flow Summary

WATERCOURSE	RIVER REACH	CROSS SECTION	PEAK FLOW (m ³ /s)	
			LSRCA	VO
4.0	Reach 3	192	<u>0.65</u>	-
4.0	Reach 2	1374	6.16	4.65
4.0	Reach 1	1189	7.72	5.47
4.0	Reach 1	299	21.40	18.70
6.1	River 1 Reach 1	1606	16.53	16.54
6.1	River 1 Reach 1	328	51.68	59.70

Note: 0.65 - 1:100-Year return frequency peak flow.

3.2 HYDRAULIC ANALYSIS

The two tributaries of Uxbridge Brook (Watercourse 6.1 and 4.0) generally meander in a northeast direction, adjacent to the north (Watercourse 4.0) and south (Watercourse 6.1) property lines of the subject property.

To establish the existing hydraulic function of the two tributaries, the LSRCA's Generic Regulations hydraulic model of Uxbridge Brook was updated using site specific topographic data. The LSRCA's Generic Regulations HEC-2 hydraulic model is provided in Appendix B for reference. As only the HEC-2 version of the Generic Regulations model was available, hydraulic models of Watercourse 4.0 and Watercourse 6.1 have been created using HEC-RAS hydraulic modelling software version 6.3, as described in the following sections.

3.2.1 Topographic Data & Digital Terrain Model

A topographic survey of the subject site was completed by IBW Surveyors Ltd., dated September 10, 2019. The site-specific topographic survey was supplemented with the 2022 Lake Simcoe LiDAR 0.5m grid Digital Terrain Model (DTM).

A datum adjustment was completed to ensure consistency between the topographic survey (Canadian Geodetic Vertical Datum 28 - CGVD28), and the LSRCA DTM (Canadian Geodetic Vertical Datum 2013 - CGVD2013).

Nearby benchmarks were searched for using the Ontario control survey information exchange (COSINE) database and three results were found in the vicinity of the study area; their station numbers, CGVD2013 and CGVD28 elevations and average differences area summarized in Table

2 below. Copies of the COSINE station reports, and a map showing the location of each benchmark is enclosed in Appendix C.

Table 2: COSINE Benchmark Summary

STATION ID	CGVD28 ELEVATION (m)	CGVD2013 ELEVATION (m)	DIFFERENCE (m)
0011931U517S	272.439	272.067	0.372
00819778487	274.359	273.981	0.378
00819778488	267.903	267.526	0.377
Average	271.567	271.191	0.376

To validate the datum adjustment from CGVD2013 to CGVD28, the centreline road elevations of Centre Road and Oakside Drive from the topographic survey were compared against the Lake Simcoe 2022 LiDAR 0.5m grid DTM elevations. Elevation differences varied between the 18 points compared, with differences ranging from 0.35 m to 0.40 m (LSRCA DTM being lower than the survey points) and an average difference of 0.36 cm, validating the datum adjustment of 0.376 m described previously.

For this assessment, 0.376 m was added to the LSRCA DTM elevations (CGVD2013) to convert from the CGVD2013 datum to the CGVD28 datum. Cross section data has been extracted from the adjusted LSRCA DTM terrain and used in the HEC-RAS 6.3 hydraulic model.

3.2.2 Watercourse 4.0

Manning's Roughness Coefficients

The Manning's roughness coefficients have been updated based on aerial mapping of the study area. The following Manning's roughness coefficients were used for Watercourse 4.0:

- the main channel Manning's roughness coefficient was set to 0.045 to represent a clean, winding channel with some pools, weeds, and stones; and
- the overbank Manning's roughness coefficients were set to 0.08 to represent light brush and trees.

Boundary Conditions

The LSRCA Generic Regulation HEC-2 model specified a known water surface elevation of 259.94 m as the downstream boundary condition at cross section 22.6. This downstream boundary condition has been maintained in the updated HEC-RAS model. A sensitivity analysis on the

downstream boundary condition was conducted. It was determined flood elevations at the subject site are not sensitive to changes in the downstream boundary condition, in part due to the distance of the subject property to the downstream boundary.

Flood Elevations

A summary of the existing condition Regional Storm flood elevations is provided in Table 3. As previously stated, the 1:100-year return frequency peak flow was analyzed instead of the Regional Storm peak flow for Watercourse 4.0, Reach 3 due to the size of the drainage area. Detailed model results are provided in Appendix D for reference.

The results of the HEC-RAS model file *Watercourse 4.0*, plan *Tatham Existing (LSRCA Q)*, geometry *Lake Simcoe DTM (Adjusted)* have been mapped on the appended Existing Condition Flood Hazard Plan (Drawing FLD-1). The results demonstrate the subject property is located outside of the limits of the Regional floodplain.

Table 3: Watercourse 4.0 Existing Condition Flood Elevation Summary

RIVER REACH	HEC-RAS CROSS SECTION ID	REGIONAL PEAK FLOW (m ³ /s)	REGIONAL FLOOD ELEVATION (m)	LEFT OVBANK VELOCITY (m/s)	CHANNEL VELOCITY (m/s)	RIGHT OVBANK VELOCITY (m/s)
Reach 3	192	<u>0.65</u>	<u>285.08*</u>	0.40	0.06	-
	126	<u>0.65</u>	<u>282.67*</u>	0.83	0.16	-
	71	<u>0.65</u>	<u>281.00*</u>	0.18	0.06	0.17
Reach 2	1374	6.16	286.28	0.80	0.18	0.26
	1312	6.16	283.90	0.98	0.35	0.23
	1268	6.16	282.07	1.13	0.40	0.27
	1219	6.16	280.31	1.22	0.42	0.15
Reach 1	1189	7.72	279.34	1.20	0.26	0.35
	1157	7.72	277.61	0.26	0.09	0.70
	1121	7.72	276.56	0.77	0.22	0.79
	1074	7.72	275.61	0.50	0.16	0.57
	1030	7.72	274.80	0.57	0.18	0.70
	973	7.72	273.52	0.51	0.2	0.72
	924	7.72	272.63	0.84	0.21	0.57
	888	7.72	272.03	0.68	0.19	0.65
	863	7.72	271.60	0.45	0.19	0.56
	801	7.72	270.07	0.60	0.23	0.83

Note: 0.65 - 1:100-Year return frequency peak flow; 285.08* - 1:100-Year return frequency Flood Elevation.

3.2.3 Watercourse 6.1

Manning's Roughness Coefficient

The Manning's roughness coefficients have been updated based on aerial mapping of the study area. The following Manning's roughness coefficients were used for Watercourse 6.1:

- the main channel Manning's roughness coefficient was set to 0.045 to represent a clean, winding channel with some pools, weeds, and stones; and
- the overbank Manning's roughness coefficients were set to 0.08 to represent light brush and trees.

Structures

Culverts and bridges have been incorporated into the updated HEC-RAS model to reflect existing conditions. Where available, topographic survey and record drawings have been used to populate culvert/bridge data in the model. Referenced record drawings are provided in Appendix E, while a summary of the bridge data is provided in Table 4.

Table 4: Watercourse 6.1 Culvert and Bridge Summary

HEC-RAS SECTION	LOCATION DESCRIPTION	STRUCTURE TYPE	OPENING SIZE
1513	Trail Bridge 4	Wood Span Bridge with Concrete Footings	Height varies x 3.00 m width
1075	Trail Bridge 3	Wood Span Bridge with Concrete Footings	Height varies x 3.00 m width
718	Trail Bridge 2	Wood Span Bridge with Concrete Footings	Height varies x 3.00 m width
647	Oakside Drive	Arc Span (open bottom)	2.44 m height x 6.10 m width
350	Trail Bridge 1	Wood Span Bridge with Concrete Footings	Height varies x 3.00 m width
285	Main Street North	Concrete Box Culvert	2.44 m height x 3.34 m width

Boundary Conditions

The LSRCA Generic Regulation HEC-2 model specified a known water surface elevation of 258.06 m as the downstream boundary condition at cross section 10.1. This downstream boundary condition has been maintained in the updated HEC-RAS model. A sensitivity analysis on the downstream boundary condition was conducted. It was determined flood elevations at the subject site are not sensitive to changes in the downstream boundary condition.

Flood Elevations

A summary of the existing condition Regional Storm flood elevations is provided in Table 5. Detailed model results are provided in Appendix E for reference.

The results of the HEC-RAS model have been mapped on the appended Existing Condition Flood Hazard Plan (Drawing FLD-1). The corresponding HEC-RAS file is *Watercourse 6.1*, plan *Tatham Existing (LSRCA Q)*, geometry *Tatham Existing (LSRCA Adjusted)* included in the digital submission. The proposed Draft Plan has been developed respecting the established flood hazard limits associated with Watercourse 6.1.

Table 5: Watercourse 6.1 Existing Condition Flood Elevation Summary

RIVER REACH	HEC-RAS CROSS SECTION ID	REGIONAL PEAK FLOW (m ³ /s)	REGIONAL FLOOD ELEVATION (m)	LEFT OVERBANK VELOCITY (m/s)	CHANNEL VELOCITY (m/s)	RIGHT OVERBANK VELOCITY (m/s)
Reach 1	1606	16.53	282.61	0.24	2.26	0.48
	1545	16.53	281.77	0.56	1.55	0.44
	1516	16.53	281.29	0.59	1.7	0.55
	1513 (Trail Bridge 4)					
	1509	16.53	280.81	0.76	2.24	0.78
	1324	16.53	277.35	0.48	2.05	0.63
	1140	16.53	273.5	0.83	2.13	0.57
	1078	16.53	272.79	0.46	1.48	0.61
	1075 (Trail Bridge 3)					
	1072	16.53	272.23	0.73	2.46	0.79
	995	16.53	270.75	0.49	2.18	0.41
	883	16.53	268.64	-	2.7	0.09
	788	16.53	267.16	0.7	2.24	0.81
	725	16.53	266.6	0.27	0.81	0.32
	718 (Trail Bridge 2)					
	715	16.53	266.01	0.77	1.97	0.67

RIVER REACH	HEC-RAS CROSS SECTION ID	REGIONAL PEAK FLOW (m ³ /s)	REGIONAL FLOOD ELEVATION (m)	LEFT OVERBANK VELOCITY (m/s)	CHANNEL VELOCITY (m/s)	RIGHT OVERBANK VELOCITY (m/s)
	680	16.53	265.57	0.36	1.27	0.33
	665	16.53	265.05	1.34	3	-
	647 (Oakside Dr Bridge)					
	636	16.53	264.64	-	3.1	1.5

4 Erosion Hazard

As noted, Watercourses 4.0 and 6.1 are also regulated for erosion hazards. Delineation of the erosion hazard limits has been completed in accordance with the LSRCA *Ontario Regulation 179/09 Implementation Guidelines (Jan 3, 2022)* and the Ministry of Natural Resources *Technical Guide – River & Stream Systems: Erosion Hazard Limit (2002)*.

Unlike the flooding hazard limit, there is no drainage area criteria before the erosion hazard limit can be applied. Therefore, the erosion hazard applies equally to Watercourse 4.0 and Watercourse 6.1.

4.1 WATERCOURSE 4.0

Watercourse 4.0 Reach 1 is considered an unconfined watercourse and has therefore been evaluated for a meander belt erosion hazard limit as follows:

- 20 x the bankfull channel width of the watercourse centered on the meander belt axis; and
- 6 m erosion access allowance.

Based on the topographic data and available aerial photography a conservative bankfull channel width of Watercourse 4.0 Reach 1 adjacent to the subject property is estimated as 5.50 m. This provides a meander belt width of 110 m centered on the meander belt axis, or 55 m to either side of the meander belt axis. The north property limit of the subject property is greater than 80 m from the meander belt axis and the erosion hazard limit associated with Watercourse 4.0 Reach 1 does not encroach into the subject property and has therefore not been mapped.

During an inspection of Watercourse 4.0, Reach 3 was noted to exhibit a heavily vegetated wide shallow cross section with no signs of active erosion. Based on the hydraulic analysis of Watercourse 4.0 Reach 3, the average channel velocity for the various design storms and Regional Storm, as illustrated in Table 6, are less than 0.11 m/s and during significant storm events the preferential flow path in the left overbank, away from the subject property. Both the channel and overbank velocities are generally below the standard thresholds established for erosion for vegetated channels. As such, the erosion potential of Watercourse 4.0 is extremely low, and the channel bed and banks are expected to remain stable.

In addition to the channel velocities, the following additional items support Watercourse 4.0 Reach 3 as a stable reach (and thus there is no associated erosion hazard):

- the topographic survey confirms the right (south) bank of Watercourse 4.0 Reach 3 is generally 3:1 (horizontal:vertical) or less, indicating there are no slope stability concerns; and

- the watershed of Watercourse 4.0 Reach 3 is 8.7 ha in area, which is relatively small and generally considered exempt from the application of natural hazards.

Table 6: Watercourse 4.0 (Reach 3) Channel Velocity and Shear Stress Summary

STORM	CHANNEL VELOCITY (m/s)			TOTAL VELOCITY (m/s)		
	Min	Max	Avg	Min	Max	Avg
25 mm	0.02	0.05	0.04	0.02	0.32	0.17
1:2-Year	0.03	0.10	0.05	0.05	0.50	0.26
1:5-Year	0.04	0.12	0.07	0.07	0.55	0.30
1:10-Year	0.04	0.15	0.08	0.08	0.66	0.34
1:25-Year	0.05	0.16	0.09	0.09	0.72	0.37
1:50-Year	0.05	0.15	0.09	0.10	0.72	0.39
1:100-Year	0.05	0.16	0.09	0.11	0.77	0.41
Regional	0.07	0.18	0.11	0.17	0.97	0.52

4.2 WATERCOURSE 6.1

In reviewing the topography and cross sections, Watercourse 6.1 could be interpreted as an unconfined system, or a confined system, and has therefore been evaluated for both meander belt and toe erosion and stable slope hazards, respectively.

4.2.1 Unconfined System

The erosion hazards associated with an unconfined system (meander belt) is defined as:

- 20 x the bank full width of the watercourse centered on the meander belt axis; and
- a 6 m erosion access allowance.

Based on the topographic data and available aerial photography the representative bankfull channel width of Watercourse 6.1 adjacent to the subject site is estimated as 2.1 m. This provides a meander belt width of 42 m centered on the meander belt axis, or 21 m to either side of the meander belt axis. In comparison, a previous geomorphic assessment by others for the upper reaches of Watercourse 6.1 indicated a meander belt width of 18 m. The more conservative meander belt width (42 m centered on the meander belt axis) was adopted for this assessment.

4.2.2 Confined System

The erosion hazard associated with a confined system is defined by:

- a toe erosion allowance;
- a 3:1 (horizontal:vertical) stable slope to existing grade or the existing top of slope; and
- a 6 m erosion access allowance.

A conservative 15 m wide toe erosion allowance was applied to the majority of the watercourse where the unconfined system was determined to govern the erosion hazard limit.

A more detailed assessment of the toe erosion allowance was undertaken upstream of the Oakside Drive Bridge, where the watercourse is adjacent to the valley slope and characteristic of a confined system. Determination of the toe erosion allowance was based on the observed silty sand soils and evidence of active erosion encountered on the subject site. Consideration was also given to how the bridge structure would disrupt the natural geomorphological processes immediately upstream and downstream.

A minimum toe erosion allowance of 6.0 m was applied upstream of the Oakside Drive Bridge, accounting for the design life of the toe erosion protection that will be implemented at the toe of slope along the north embankment. The proposed road is shown outside of the stable slope allowance. The toe erosion protection will be designed considering geotechnical, geomorphic and environmental factors, as part of the detailed design stage to support the proposed development.

The 6 m erosion access allowance was offset from the greater of the unconfined system and confined system erosion hazard limits. The erosion hazard limit for Tributary 6.1 is shown on the Natural Hazards Mapping Plan (Drawing NH-1) enclosed. The Draft Plan proposed has been developed respecting the established erosion hazard limits associated with Watercourse 6.1. The proposed road will serve as the erosion access allowance where this offset intercepts the proposed right-of-way.

5 Summary

Through this natural hazards assessment, the existing condition Natural Hazard Limits associated with the two tributaries of Uxbridge Brook (Watercourse 6.1 and 4.0) have been established across the subject property and mapped on the Natural Hazards Mapping Plan (Drawing NH-1) enclosed.

Through a hydraulic analysis, it has been confirmed the proposed development is generally located outside the Regulatory floodplain associated with Watercourse 4.0. The proposed Draft Plan has been developed respecting the flood hazard limit associated with Watercourse 6.0.

The erosion hazard limit has been delineated in accordance with *Ministry of Natural Resources Technical Guide - River & Stream Systems: Erosion Hazard Limit* to establish the required development setbacks. The erosion hazard limit for Watercourse 6.1 was established through assessment of both the meander belt allowance for an unconfined system, and the toe erosion allowance and stable slope allowance for a confined system. The 6 m erosion access allowance was offset from the greater of the unconfined system and confined system erosion hazard limits. It is recommended to provide toe of slope erosion protection along the north embankment for erosion protection to support the proposed development. The proposed Draft Plan has been developed respecting the erosion hazard limit associated with Watercourse 6.0.

Based on our site review, it is our opinion no erosion hazard is warranted for Watercourse 4.0 due to the low erosion potential from the small contributing watershed and resulting low flows.

We trust this study provides sufficient information to support subsequent development applications for Phase 2 of the Maple Bridge Subdivision, in Township of Uxbridge.

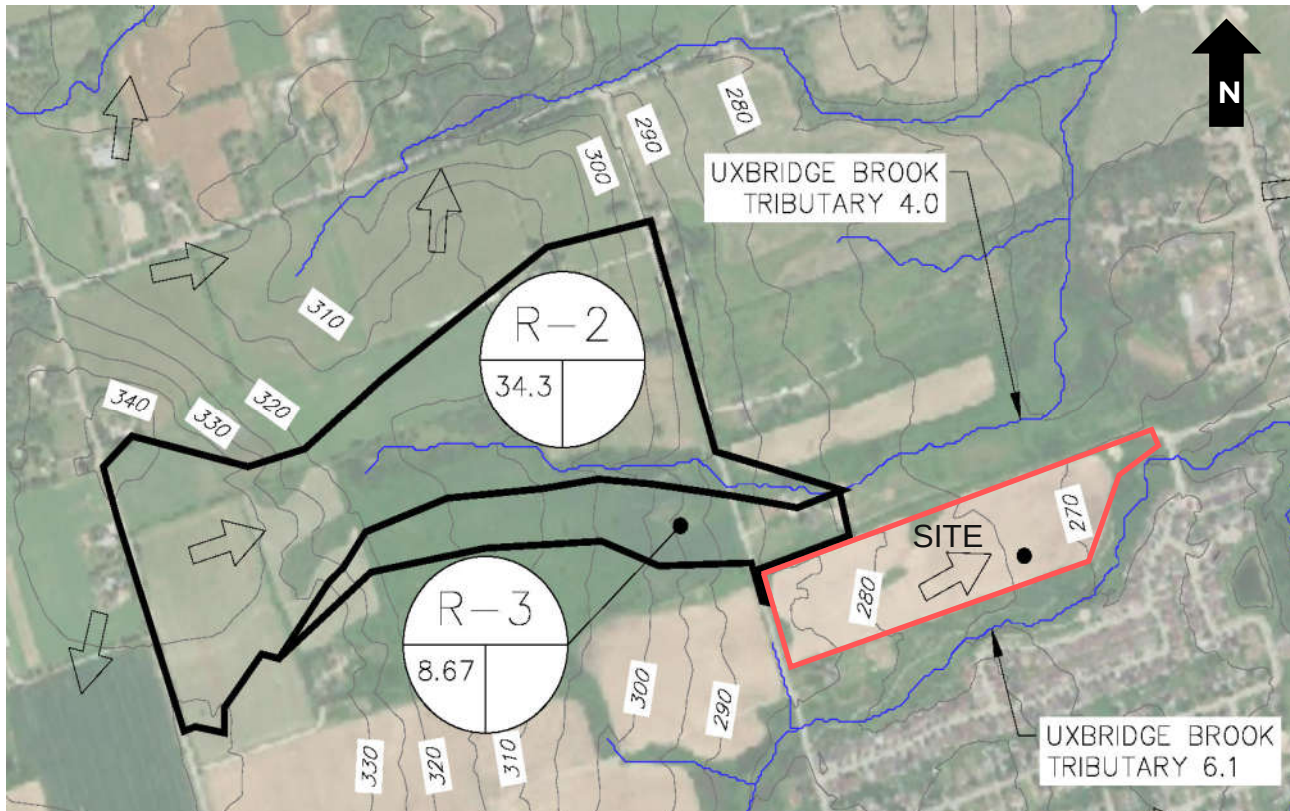
Appendix A: Hydrologic Model Results

PROJECT	Maple Bridge Phase 2	FILE	422492
		DATE	2023-06-15
SUBJECT	Flow Calculation for HEC-RAS	NAME	NHF
		PAGE	1 of 1

Catchment Area = 42.97 ha

Regional Storm Flow = 7.72 m³/s

We have used the LSRCA DTM to delineate the watershed areas of Watercourse 4.0 Reaches 3 and 2, as shown in the figure below.



Reach 2, calculated watershed area = 34.3 ha

Reach 3, calculated watershed area = 8.67 ha

Reach	Area (ha)	% of Total Area	Regional Peak Flow (m ³ /s)
Reach 2	34.30	80%	6.16
Reach 3	8.67	20%	1.56
Reach 1	42.97	100%	7.72

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

Input filename: C:\Program Files (x86)\Visual OTTHYMO 6.2\vo2\voin.dat
Output filename: C:\Users\ATrevers\AppData\Local\Civica\XH5\1e02d851-4ff1-45b7-b18f-7efd2b836d95\0420ddd8-2
Summary filename: C:\Users\ATrevers\AppData\Local\Civica\XH5\1e02d851-4ff1-45b7-b18f-7efd2b836d95\0420ddd8-2

DATE: 04-18-2024 TIME: 09:27:46

USER:

COMMENTS: _____

** SIMULATION : Hazel **

READ STORM	Filename: C:\Users\ATrevers\AppData\Local\Temp\
Ptotal=212.00 mm	e103ec04-249d-4f45-bfd8-83d485bf813b\eb431ed7
	Comments: Hazel

TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.00	6.00	3.00	13.00	6.00	23.00	9.00	53.00
1.00	4.00	4.00	17.00	7.00	13.00	10.00	38.00
2.00	6.00	5.00	13.00	8.00	13.00	11.00	13.00

CALIB	Area (ha)= 120.37	Curve Number (CN)= 87.0
NASHYD (0304)	Ia (mm)= 4.00	# of Linear Res.(N)= 3.00
ID= 1 DT= 5.0 min	U.H. Tp(hrs)= 1.22	

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

---- TRANSFORMED HYETOGRAPH ----							
TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.083	6.00	3.083	13.00	6.083	23.00	9.08	53.00
0.167	6.00	3.167	13.00	6.167	23.00	9.17	53.00
0.250	6.00	3.250	13.00	6.250	23.00	9.25	53.00
0.333	6.00	3.333	13.00	6.333	23.00	9.33	53.00
0.417	6.00	3.417	13.00	6.417	23.00	9.42	53.00
0.500	6.00	3.500	13.00	6.500	23.00	9.50	53.00
0.583	6.00	3.583	13.00	6.583	23.00	9.58	53.00
0.667	6.00	3.667	13.00	6.667	23.00	9.67	53.00
0.750	6.00	3.750	13.00	6.750	23.00	9.75	53.00
0.833	6.00	3.833	13.00	6.833	23.00	9.83	53.00
0.917	6.00	3.917	13.00	6.917	23.00	9.92	53.00
1.000	6.00	4.000	13.00	7.000	23.00	10.00	53.00
1.083	4.00	4.083	17.00	7.083	13.00	10.08	38.00
1.167	4.00	4.167	17.00	7.167	13.00	10.17	38.00
1.250	4.00	4.250	17.00	7.250	13.00	10.25	38.00
1.333	4.00	4.333	17.00	7.333	13.00	10.33	38.00
1.417	4.00	4.417	17.00	7.417	13.00	10.42	38.00
1.500	4.00	4.500	17.00	7.500	13.00	10.50	38.00

1.583	4.00	4.583	17.00	7.583	13.00	10.58	38.00
1.667	4.00	4.667	17.00	7.667	13.00	10.67	38.00
1.750	4.00	4.750	17.00	7.750	13.00	10.75	38.00
1.833	4.00	4.833	17.00	7.833	13.00	10.83	38.00
1.917	4.00	4.917	17.00	7.917	13.00	10.92	38.00
2.000	4.00	5.000	17.00	8.000	13.00	11.00	38.00
2.083	6.00	5.083	13.00	8.083	13.00	11.08	13.00
2.167	6.00	5.167	13.00	8.167	13.00	11.17	13.00
2.250	6.00	5.250	13.00	8.250	13.00	11.25	13.00
2.333	6.00	5.333	13.00	8.333	13.00	11.33	13.00
2.417	6.00	5.417	13.00	8.417	13.00	11.42	13.00
2.500	6.00	5.500	13.00	8.500	13.00	11.50	13.00
2.583	6.00	5.583	13.00	8.583	13.00	11.58	13.00
2.667	6.00	5.667	13.00	8.667	13.00	11.67	13.00
2.750	6.00	5.750	13.00	8.750	13.00	11.75	13.00
2.833	6.00	5.833	13.00	8.833	13.00	11.83	13.00
2.917	6.00	5.917	13.00	8.917	13.00	11.92	13.00
3.000	6.00	6.000	13.00	9.000	13.00	12.00	13.00

Unit Hyd Qpeak (cms)= 3.768

PEAK FLOW (cms)= 11.640 (i)
 TIME TO PEAK (hrs)= 11.333
 RUNOFF VOLUME (mm)= 175.903
 TOTAL RAINFALL (mm)= 212.000
 RUNOFF COEFFICIENT = 0.830

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

CALIB			
NASHYD (0303)	Area (ha)= 193.95	Curve Number (CN)= 88.0	
ID= 1 DT= 5.0 min	Ia (mm)= 6.00	# of Linear Res.(N)= 3.00	
	U.H. Tp(hrs)= 1.44		

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

---- TRANSFORMED HYETOGRAPH ----							
TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.083	6.00	3.083	13.00	6.083	23.00	9.08	53.00
0.167	6.00	3.167	13.00	6.167	23.00	9.17	53.00
0.250	6.00	3.250	13.00	6.250	23.00	9.25	53.00
0.333	6.00	3.333	13.00	6.333	23.00	9.33	53.00
0.417	6.00	3.417	13.00	6.417	23.00	9.42	53.00
0.500	6.00	3.500	13.00	6.500	23.00	9.50	53.00
0.583	6.00	3.583	13.00	6.583	23.00	9.58	53.00
0.667	6.00	3.667	13.00	6.667	23.00	9.67	53.00
0.750	6.00	3.750	13.00	6.750	23.00	9.75	53.00
0.833	6.00	3.833	13.00	6.833	23.00	9.83	53.00
0.917	6.00	3.917	13.00	6.917	23.00	9.92	53.00
1.000	6.00	4.000	13.00	7.000	23.00	10.00	53.00
1.083	4.00	4.083	17.00	7.083	13.00	10.08	38.00
1.167	4.00	4.167	17.00	7.167	13.00	10.17	38.00
1.250	4.00	4.250	17.00	7.250	13.00	10.25	38.00
1.333	4.00	4.333	17.00	7.333	13.00	10.33	38.00
1.417	4.00	4.417	17.00	7.417	13.00	10.42	38.00
1.500	4.00	4.500	17.00	7.500	13.00	10.50	38.00
1.583	4.00	4.583	17.00	7.583	13.00	10.58	38.00
1.667	4.00	4.667	17.00	7.667	13.00	10.67	38.00
1.750	4.00	4.750	17.00	7.750	13.00	10.75	38.00
1.833	4.00	4.833	17.00	7.833	13.00	10.83	38.00
1.917	4.00	4.917	17.00	7.917	13.00	10.92	38.00
2.000	4.00	5.000	17.00	8.000	13.00	11.00	38.00
2.083	6.00	5.083	13.00	8.083	13.00	11.08	13.00
2.167	6.00	5.167	13.00	8.167	13.00	11.17	13.00
2.250	6.00	5.250	13.00	8.250	13.00	11.25	13.00
2.333	6.00	5.333	13.00	8.333	13.00	11.33	13.00
2.417	6.00	5.417	13.00	8.417	13.00	11.42	13.00
2.500	6.00	5.500	13.00	8.500	13.00	11.50	13.00
2.583	6.00	5.583	13.00	8.583	13.00	11.58	13.00
2.667	6.00	5.667	13.00	8.667	13.00	11.67	13.00
2.750	6.00	5.750	13.00	8.750	13.00	11.75	13.00
2.833	6.00	5.833	13.00	8.833	13.00	11.83	13.00
2.917	6.00	5.917	13.00	8.917	13.00	11.92	13.00
3.000	6.00	6.000	13.00	9.000	13.00	12.00	13.00

Unit Hyd Qpeak (cms)= 5.144

PEAK FLOW (cms)= 17.642 (i)
 TIME TO PEAK (hrs)= 11.500
 RUNOFF VOLUME (mm)= 176.349

TOTAL RAINFALL (mm)= 212.000
RUNOFF COEFFICIENT = 0.832

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

CALIB NASHYD (0302) ID= 1 DT= 5.0 min	Area (ha)= 364.83 Ia (mm)= 8.00 U.H. Tp(hrs)= 3.48	Curve Number (CN)= 80.0 # of Linear Res.(N)= 3.00
--	--	--

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

---- TRANSFORMED HYETOGRAPH ----							
TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	6.00	3.083	13.00	6.083	23.00	9.08	53.00
0.167	6.00	3.167	13.00	6.167	23.00	9.17	53.00
0.250	6.00	3.250	13.00	6.250	23.00	9.25	53.00
0.333	6.00	3.333	13.00	6.333	23.00	9.33	53.00
0.417	6.00	3.417	13.00	6.417	23.00	9.42	53.00
0.500	6.00	3.500	13.00	6.500	23.00	9.50	53.00
0.583	6.00	3.583	13.00	6.583	23.00	9.58	53.00
0.667	6.00	3.667	13.00	6.667	23.00	9.67	53.00
0.750	6.00	3.750	13.00	6.750	23.00	9.75	53.00
0.833	6.00	3.833	13.00	6.833	23.00	9.83	53.00
0.917	6.00	3.917	13.00	6.917	23.00	9.92	53.00
1.000	6.00	4.000	13.00	7.000	23.00	10.00	53.00
1.083	4.00	4.083	17.00	7.083	13.00	10.08	38.00
1.167	4.00	4.167	17.00	7.167	13.00	10.17	38.00
1.250	4.00	4.250	17.00	7.250	13.00	10.25	38.00
1.333	4.00	4.333	17.00	7.333	13.00	10.33	38.00
1.417	4.00	4.417	17.00	7.417	13.00	10.42	38.00
1.500	4.00	4.500	17.00	7.500	13.00	10.50	38.00
1.583	4.00	4.583	17.00	7.583	13.00	10.58	38.00
1.667	4.00	4.667	17.00	7.667	13.00	10.67	38.00
1.750	4.00	4.750	17.00	7.750	13.00	10.75	38.00
1.833	4.00	4.833	17.00	7.833	13.00	10.83	38.00
1.917	4.00	4.917	17.00	7.917	13.00	10.92	38.00
2.000	4.00	5.000	17.00	8.000	13.00	11.00	38.00
2.083	6.00	5.083	13.00	8.083	13.00	11.08	13.00
2.167	6.00	5.167	13.00	8.167	13.00	11.17	13.00
2.250	6.00	5.250	13.00	8.250	13.00	11.25	13.00
2.333	6.00	5.333	13.00	8.333	13.00	11.33	13.00
2.417	6.00	5.417	13.00	8.417	13.00	11.42	13.00
2.500	6.00	5.500	13.00	8.500	13.00	11.50	13.00
2.583	6.00	5.583	13.00	8.583	13.00	11.58	13.00
2.667	6.00	5.667	13.00	8.667	13.00	11.67	13.00
2.750	6.00	5.750	13.00	8.750	13.00	11.75	13.00
2.833	6.00	5.833	13.00	8.833	13.00	11.83	13.00
2.917	6.00	5.917	13.00	8.917	13.00	11.92	13.00
3.000	6.00	6.000	13.00	9.000	13.00	12.00	13.00

Unit Hyd Qpeak (cms)= 4.004

PEAK FLOW (cms)= 19.338 (i)
TIME TO PEAK (hrs)= 13.167
RUNOFF VOLUME (mm)= 155.574
TOTAL RAINFALL (mm)= 212.000
RUNOFF COEFFICIENT = 0.734

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

CALIB NASHYD (0301) ID= 1 DT= 5.0 min	Area (ha)= 335.58 Ia (mm)= 9.00 U.H. Tp(hrs)= 5.70	Curve Number (CN)= 64.0 # of Linear Res.(N)= 3.00
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NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----							
TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	6.00	3.083	13.00	6.083	23.00	9.08	53.00
0.167	6.00	3.167	13.00	6.167	23.00	9.17	53.00
0.250	6.00	3.250	13.00	6.250	23.00	9.25	53.00
0.333	6.00	3.333	13.00	6.333	23.00	9.33	53.00
0.417	6.00	3.417	13.00	6.417	23.00	9.42	53.00
0.500	6.00	3.500	13.00	6.500	23.00	9.50	53.00

0.583	6.00	3.583	13.00	6.583	23.00	9.58	53.00
0.667	6.00	3.667	13.00	6.667	23.00	9.67	53.00
0.750	6.00	3.750	13.00	6.750	23.00	9.75	53.00
0.833	6.00	3.833	13.00	6.833	23.00	9.83	53.00
0.917	6.00	3.917	13.00	6.917	23.00	9.92	53.00
1.000	6.00	4.000	13.00	7.000	23.00	10.00	53.00
1.083	4.00	4.083	17.00	7.083	13.00	10.08	38.00
1.167	4.00	4.167	17.00	7.167	13.00	10.17	38.00
1.250	4.00	4.250	17.00	7.250	13.00	10.25	38.00
1.333	4.00	4.333	17.00	7.333	13.00	10.33	38.00
1.417	4.00	4.417	17.00	7.417	13.00	10.42	38.00
1.500	4.00	4.500	17.00	7.500	13.00	10.50	38.00
1.583	4.00	4.583	17.00	7.583	13.00	10.58	38.00
1.667	4.00	4.667	17.00	7.667	13.00	10.67	38.00
1.750	4.00	4.750	17.00	7.750	13.00	10.75	38.00
1.833	4.00	4.833	17.00	7.833	13.00	10.83	38.00
1.917	4.00	4.917	17.00	7.917	13.00	10.92	38.00
2.000	4.00	5.000	17.00	8.000	13.00	11.00	38.00
2.083	6.00	5.083	13.00	8.083	13.00	11.08	13.00
2.167	6.00	5.167	13.00	8.167	13.00	11.17	13.00
2.250	6.00	5.250	13.00	8.250	13.00	11.25	13.00
2.333	6.00	5.333	13.00	8.333	13.00	11.33	13.00
2.417	6.00	5.417	13.00	8.417	13.00	11.42	13.00
2.500	6.00	5.500	13.00	8.500	13.00	11.50	13.00
2.583	6.00	5.583	13.00	8.583	13.00	11.58	13.00
2.667	6.00	5.667	13.00	8.667	13.00	11.67	13.00
2.750	6.00	5.750	13.00	8.750	13.00	11.75	13.00
2.833	6.00	5.833	13.00	8.833	13.00	11.83	13.00
2.917	6.00	5.917	13.00	8.917	13.00	11.92	13.00
3.000	6.00	6.000	13.00	9.000	13.00	12.00	13.00

Unit Hyd Qpeak (cms)= 2.249

PEAK FLOW (cms)= 9.597 (i)
TIME TO PEAK (hrs)= 15.250
RUNOFF VOLUME (mm)= 119.144
TOTAL RAINFALL (mm)= 212.000
RUNOFF COEFFICIENT = 0.562

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

| ROUTE CHN(0601) |
| IN= 2---> OUT= 1 | Routing time step (min)'= 5.00

<----- DATA FOR SECTION (1.1) ----->

Distance	Elevation	Manning	
0.00	297.64	0.0800	
1.59	297.38	0.0800	
2.39	297.11	0.0800	
3.98	296.76	0.0800	
4.77	296.64	0.0800	
5.57	296.57	0.0800	
7.16	296.53	0.0800	
7.96	296.49	0.0800	
9.55	296.48	0.0800	
10.34	296.45	0.0800 /0.0450	Main Channel
11.94	296.40	0.0450	Main Channel
13.53	296.40	0.0450	Main Channel
15.12	296.43	0.0450 /0.0800	Main Channel
16.71	296.82	0.0800	
17.51	296.91	0.0800	
19.10	297.10	0.0800	
20.69	297.19	0.0800	
22.28	297.22	0.0800	
23.08	297.36	0.0800	
23.87	297.48	0.0800	

<----- TRAVEL TIME TABLE ----->

DEPTH	ELEV	VOLUME	FLOW RATE	VELOCITY	TRAV.TIME
(m)	(m)	(cu.m.)	(cms)	(m/s)	(min)
0.03	296.43	.289E+03	0.01	0.17	333.62
0.09	296.49	.131E+04	0.14	0.37	151.50
0.15	296.55	.290E+04	0.41	0.47	118.19
0.21	296.61	.487E+04	0.81	0.56	100.15
0.26	296.66	.705E+04	1.35	0.64	86.99
0.32	296.72	.935E+04	2.02	0.72	77.35
0.38	296.78	.118E+05	2.80	0.80	70.11
0.44	296.84	.143E+05	3.70	0.87	64.46
0.50	296.90	.170E+05	4.71	0.93	60.12
0.56	296.96	.198E+05	5.84	0.99	56.58
0.61	297.01	.228E+05	7.08	1.04	53.63
0.67	297.07	.259E+05	8.44	1.10	51.13

0.73	297.13	.292E+05	9.91	1.14	49.08
0.79	297.19	.327E+05	11.51	1.18	47.36
0.85	297.25	.366E+05	13.21	1.21	46.16
0.91	297.31	.406E+05	15.17	1.25	44.63
0.96	297.36	.448E+05	17.27	1.30	43.22
1.02	297.42	.491E+05	19.44	1.33	42.06
1.08	297.48	.535E+05	21.73	1.37	41.02

		AREA	<---- hydrograph ---->			<-pipe / channel->	
		(ha)	QPEAK	TPEAK	R.V.	MAX DEPTH	MAX VEL
			(cms)	(hrs)	(mm)	(m)	(m/s)
INFLOW :	ID= 2 (0301)	335.58	9.60	15.25	119.14	0.72	1.13
OUTFLOW:	ID= 1 (0601)	335.58	9.45	15.92	119.14	0.71	1.13

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-----
| ADD HYD ( 0901) |
| 1 + 2 = 3 |
-----
ID1= 1 ( 0302): 364.83 19.338 13.17 155.57
+ ID2= 2 ( 0303): 193.95 17.642 11.50 176.35
=====
ID = 3 ( 0901): 558.78 34.051 12.00 162.78

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NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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-----
| ADD HYD ( 0901) |
| 3 + 2 = 1 |
-----
ID1= 3 ( 0901): 558.78 34.051 12.00 162.78
+ ID2= 2 ( 0601): 335.58 9.449 15.92 119.14
=====
ID = 1 ( 0901): 894.36 39.210 12.25 146.41

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NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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| ROUTE CHN( 0602) |
| IN= 2---> OUT= 1 |
-----
Routing time step (min)'= 5.00

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<----- DATA FOR SECTION ( 1.1) ----->
Distance      Elevation      Manning
0.00          268.40          0.0800
2.80          268.18          0.0800
5.61          267.85          0.0800
8.41          267.32          0.0800
9.81          266.95          0.0800
11.21         266.64          0.0800
12.61         266.52          0.0800
14.01         266.45          0.0800
15.41         266.33          0.0800
16.82         266.08          0.0800 /0.0450 Main Channel
18.22         265.66          0.0450 Main Channel
19.62         265.69          0.0450 Main Channel
21.02         265.73          0.0450 Main Channel
22.42         266.10          0.0450 /0.0800 Main Channel
23.82         266.24          0.0800
25.22         266.71          0.0800
26.62         267.08          0.0800
29.43         267.77          0.0800
32.23         268.15          0.0800
35.03         268.40          0.0800

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<----- TRAVEL TIME TABLE ----->
DEPTH      ELEV      VOLUME      FLOW RATE      VELOCITY      TRAV.TIME
(m)        (m)        (cu.m.)      (cms)          (m/s)         (min)
0.14       265.80     .669E+03     0.14           0.42          77.84
0.28       265.94     .177E+04     0.61           0.67          48.24
0.42       266.08     .314E+04     1.39           0.86          37.67
0.56       266.22     .499E+04     2.75           1.07          30.32
0.71       266.37     .738E+04     4.58           1.21          26.87
0.85       266.51     .103E+05     6.88           1.30          25.01
1.00       266.66     .140E+05     9.80           1.36          23.84
1.14       266.80     .181E+05     13.34          1.44          22.64
1.29       266.95     .226E+05     17.45          1.51          21.55
1.43       267.09     .273E+05     22.17          1.58          20.55
1.58       267.24     .324E+05     27.47          1.65          19.67
1.72       267.38     .378E+05     33.33          1.72          18.92
1.87       267.53     .436E+05     39.76          1.78          18.29

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2.01	267.67	.498E+05	46.83	1.83	17.72
2.16	267.82	.564E+05	54.47	1.88	17.25
2.30	267.96	.635E+05	62.42	1.92	16.95
2.45	268.11	.712E+05	71.13	1.95	16.68
2.59	268.25	.797E+05	80.22	1.96	16.55
2.74	268.40	.891E+05	90.08	1.97	16.48

		AREA (ha)	<---- hydrograph ----> QPEAK (cms)	TPEAK (hrs)	R.V. (mm)	<-pipe / channel-> MAX DEPTH (m)	MAX VEL (m/s)
INFLOW :	ID= 2 (0901)	894.36	39.21	12.25	146.41	1.86	1.77
OUTFLOW:	ID= 1 (0602)	894.36	38.92	12.50	146.41	1.84	1.77

CALIB				
NASHYD (0306)	Area (ha)=	12.81	Curve Number (CN)=	71.0
ID= 1 DT= 5.0 min	Ia (mm)=	8.00	# of Linear Res.(N)=	3.00
	U.H. Tp(hrs)=	0.68		

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

---- TRANSFORMED HYETOGRAPH ----							
TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	6.00	3.083	13.00	6.083	23.00	9.08	53.00
0.167	6.00	3.167	13.00	6.167	23.00	9.17	53.00
0.250	6.00	3.250	13.00	6.250	23.00	9.25	53.00
0.333	6.00	3.333	13.00	6.333	23.00	9.33	53.00
0.417	6.00	3.417	13.00	6.417	23.00	9.42	53.00
0.500	6.00	3.500	13.00	6.500	23.00	9.50	53.00
0.583	6.00	3.583	13.00	6.583	23.00	9.58	53.00
0.667	6.00	3.667	13.00	6.667	23.00	9.67	53.00
0.750	6.00	3.750	13.00	6.750	23.00	9.75	53.00
0.833	6.00	3.833	13.00	6.833	23.00	9.83	53.00
0.917	6.00	3.917	13.00	6.917	23.00	9.92	53.00
1.000	6.00	4.000	13.00	7.000	23.00	10.00	53.00
1.083	4.00	4.083	17.00	7.083	13.00	10.08	38.00
1.167	4.00	4.167	17.00	7.167	13.00	10.17	38.00
1.250	4.00	4.250	17.00	7.250	13.00	10.25	38.00
1.333	4.00	4.333	17.00	7.333	13.00	10.33	38.00
1.417	4.00	4.417	17.00	7.417	13.00	10.42	38.00
1.500	4.00	4.500	17.00	7.500	13.00	10.50	38.00
1.583	4.00	4.583	17.00	7.583	13.00	10.58	38.00
1.667	4.00	4.667	17.00	7.667	13.00	10.67	38.00
1.750	4.00	4.750	17.00	7.750	13.00	10.75	38.00
1.833	4.00	4.833	17.00	7.833	13.00	10.83	38.00
1.917	4.00	4.917	17.00	7.917	13.00	10.92	38.00
2.000	4.00	5.000	17.00	8.000	13.00	11.00	38.00
2.083	6.00	5.083	13.00	8.083	13.00	11.08	13.00
2.167	6.00	5.167	13.00	8.167	13.00	11.17	13.00
2.250	6.00	5.250	13.00	8.250	13.00	11.25	13.00
2.333	6.00	5.333	13.00	8.333	13.00	11.33	13.00
2.417	6.00	5.417	13.00	8.417	13.00	11.42	13.00
2.500	6.00	5.500	13.00	8.500	13.00	11.50	13.00
2.583	6.00	5.583	13.00	8.583	13.00	11.58	13.00
2.667	6.00	5.667	13.00	8.667	13.00	11.67	13.00
2.750	6.00	5.750	13.00	8.750	13.00	11.75	13.00
2.833	6.00	5.833	13.00	8.833	13.00	11.83	13.00
2.917	6.00	5.917	13.00	8.917	13.00	11.92	13.00
3.000	6.00	6.000	13.00	9.000	13.00	12.00	13.00

Unit Hyd Qpeak (cms)= 0.720

PEAK FLOW (cms)= 1.243 (i)
 TIME TO PEAK (hrs)= 10.667
 RUNOFF VOLUME (mm)= 135.226
 TOTAL RAINFALL (mm)= 212.000
 RUNOFF COEFFICIENT = 0.638

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

CALIB				
NASHYD (0100)	Area (ha)=	13.85	Curve Number (CN)=	77.0
ID= 1 DT= 5.0 min	Ia (mm)=	7.00	# of Linear Res.(N)=	3.00
	U.H. Tp(hrs)=	0.44		

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

----- TRANSFORMED HYETOGRAPH -----							
TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.083	6.00	3.083	13.00	6.083	23.00	9.08	53.00
0.167	6.00	3.167	13.00	6.167	23.00	9.17	53.00
0.250	6.00	3.250	13.00	6.250	23.00	9.25	53.00
0.333	6.00	3.333	13.00	6.333	23.00	9.33	53.00
0.417	6.00	3.417	13.00	6.417	23.00	9.42	53.00
0.500	6.00	3.500	13.00	6.500	23.00	9.50	53.00
0.583	6.00	3.583	13.00	6.583	23.00	9.58	53.00
0.667	6.00	3.667	13.00	6.667	23.00	9.67	53.00
0.750	6.00	3.750	13.00	6.750	23.00	9.75	53.00
0.833	6.00	3.833	13.00	6.833	23.00	9.83	53.00
0.917	6.00	3.917	13.00	6.917	23.00	9.92	53.00
1.000	6.00	4.000	13.00	7.000	23.00	10.00	53.00
1.083	4.00	4.083	17.00	7.083	13.00	10.08	38.00
1.167	4.00	4.167	17.00	7.167	13.00	10.17	38.00
1.250	4.00	4.250	17.00	7.250	13.00	10.25	38.00
1.333	4.00	4.333	17.00	7.333	13.00	10.33	38.00
1.417	4.00	4.417	17.00	7.417	13.00	10.42	38.00
1.500	4.00	4.500	17.00	7.500	13.00	10.50	38.00
1.583	4.00	4.583	17.00	7.583	13.00	10.58	38.00
1.667	4.00	4.667	17.00	7.667	13.00	10.67	38.00
1.750	4.00	4.750	17.00	7.750	13.00	10.75	38.00
1.833	4.00	4.833	17.00	7.833	13.00	10.83	38.00
1.917	4.00	4.917	17.00	7.917	13.00	10.92	38.00
2.000	4.00	5.000	17.00	8.000	13.00	11.00	38.00
2.083	6.00	5.083	13.00	8.083	13.00	11.08	13.00
2.167	6.00	5.167	13.00	8.167	13.00	11.17	13.00
2.250	6.00	5.250	13.00	8.250	13.00	11.25	13.00
2.333	6.00	5.333	13.00	8.333	13.00	11.33	13.00
2.417	6.00	5.417	13.00	8.417	13.00	11.42	13.00
2.500	6.00	5.500	13.00	8.500	13.00	11.50	13.00
2.583	6.00	5.583	13.00	8.583	13.00	11.58	13.00
2.667	6.00	5.667	13.00	8.667	13.00	11.67	13.00
2.750	6.00	5.750	13.00	8.750	13.00	11.75	13.00
2.833	6.00	5.833	13.00	8.833	13.00	11.83	13.00
2.917	6.00	5.917	13.00	8.917	13.00	11.92	13.00
3.000	6.00	6.000	13.00	9.000	13.00	12.00	13.00

Unit Hyd Qpeak (cms)= 1.202

PEAK FLOW (cms)= 1.612 (i)
 TIME TO PEAK (hrs)= 10.167
 RUNOFF VOLUME (mm)= 149.612
 TOTAL RAINFALL (mm)= 212.000
 RUNOFF COEFFICIENT = 0.706

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

CALIB			
NASHYD (0305)	Area (ha)= 122.14	Curve Number (CN)= 86.0	
ID= 1 DT= 5.0 min	Ia (mm)= 6.00	# of Linear Res.(N)= 3.00	
	U.H. Tp(hrs)= 0.68		

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

----- TRANSFORMED HYETOGRAPH -----							
TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.083	6.00	3.083	13.00	6.083	23.00	9.08	53.00
0.167	6.00	3.167	13.00	6.167	23.00	9.17	53.00
0.250	6.00	3.250	13.00	6.250	23.00	9.25	53.00
0.333	6.00	3.333	13.00	6.333	23.00	9.33	53.00
0.417	6.00	3.417	13.00	6.417	23.00	9.42	53.00
0.500	6.00	3.500	13.00	6.500	23.00	9.50	53.00
0.583	6.00	3.583	13.00	6.583	23.00	9.58	53.00
0.667	6.00	3.667	13.00	6.667	23.00	9.67	53.00
0.750	6.00	3.750	13.00	6.750	23.00	9.75	53.00
0.833	6.00	3.833	13.00	6.833	23.00	9.83	53.00
0.917	6.00	3.917	13.00	6.917	23.00	9.92	53.00
1.000	6.00	4.000	13.00	7.000	23.00	10.00	53.00
1.083	4.00	4.083	17.00	7.083	13.00	10.08	38.00
1.167	4.00	4.167	17.00	7.167	13.00	10.17	38.00
1.250	4.00	4.250	17.00	7.250	13.00	10.25	38.00
1.333	4.00	4.333	17.00	7.333	13.00	10.33	38.00
1.417	4.00	4.417	17.00	7.417	13.00	10.42	38.00
1.500	4.00	4.500	17.00	7.500	13.00	10.50	38.00
1.583	4.00	4.583	17.00	7.583	13.00	10.58	38.00
1.667	4.00	4.667	17.00	7.667	13.00	10.67	38.00

----- TRAVEL TIME TABLE ----->					
DEPTH	ELEV	VOLUME	FLOW RATE	VELOCITY	TRAV.TIME
(m)	(m)	(cu.m.)	(cms)	(m/s)	(min)
0.14	0.25	.274E+02	0.01	0.35	54.14

0.28	0.19	.167E+02	0.00	0.30	63.85
0.42	0.15	.108E+02	0.00	0.26	73.78
0.56	0.14	.849E+01	0.00	0.24	79.98
0.71	0.13	.736E+01	0.00	0.23	83.89
0.85	0.12	.668E+01	0.00	0.22	86.61
1.00	0.12	.603E+01	0.00	0.21	89.64
1.14	0.11	.546E+01	0.00	0.20	92.66
1.29	0.10	.496E+01	0.00	0.20	95.64
1.43	0.10	.455E+01	0.00	0.19	98.46
1.58	0.10	.421E+01	0.00	0.19	101.05
1.72	0.09	.393E+01	0.00	0.18	103.36
1.87	0.09	.369E+01	0.00	0.18	105.55
2.01	0.09	.350E+01	0.00	0.18	107.48
2.16	0.09	.338E+01	0.00	0.17	108.75
2.30	0.08	.327E+01	0.00	0.17	109.88
2.45	0.08	.322E+01	0.00	0.17	110.47
2.59	0.08	.319E+01	0.00	0.17	110.79
2.74	268.40	.175E+09	*****	92.96	0.20

**** WARNING: INFLOW HYDROGRAPH IS DRY!!

ADD HYD (0905)					
1 + 2 = 3					
		AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0100):		13.85	1.612	10.17	149.61
+ ID2= 2 (0306):		12.81	1.243	10.67	135.23
=====					
ID = 3 (0905):		26.66	2.787	10.33	142.70

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0905)					
3 + 2 = 1					
		AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 3 (0905):		26.66	2.787	10.33	142.70
+ ID2= 2 (0603):		122.14	13.802	10.58	171.56
=====					
ID = 1 (0905):		148.80	16.539	10.58	166.39

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0902)					
1 + 2 = 3					
		AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0304):		120.37	11.640	11.33	175.90
+ ID2= 2 (0602):		894.36	38.925	12.50	146.41
=====					
ID = 3 (0902):		1014.72	48.237	12.08	149.91

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0902)					
3 + 2 = 1					
		AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 3 (0902):		1014.72	48.237	12.08	149.91
+ ID2= 2 (0905):		148.80	16.539	10.58	166.39
=====					
ID = 1 (0902):		1163.52	59.690	11.42	152.02

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

CALIB					
NASHYD (0309)					
ID= 1 DT= 5.0 min		Area (ha)=	43.66	Curve Number (CN)=	72.0
		Ia (mm)=	8.00	# of Linear Res.(N)=	3.00
		U.H. Tp(hrs)=	0.35		

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

----- TRANSFORMED HYETOGRAPH -----							
TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	6.00	3.083	13.00	6.083	23.00	9.08	53.00

0.167	6.00	3.167	13.00	6.167	23.00	9.17	53.00
0.250	6.00	3.250	13.00	6.250	23.00	9.25	53.00
0.333	6.00	3.333	13.00	6.333	23.00	9.33	53.00
0.417	6.00	3.417	13.00	6.417	23.00	9.42	53.00
0.500	6.00	3.500	13.00	6.500	23.00	9.50	53.00
0.583	6.00	3.583	13.00	6.583	23.00	9.58	53.00
0.667	6.00	3.667	13.00	6.667	23.00	9.67	53.00
0.750	6.00	3.750	13.00	6.750	23.00	9.75	53.00
0.833	6.00	3.833	13.00	6.833	23.00	9.83	53.00
0.917	6.00	3.917	13.00	6.917	23.00	9.92	53.00
1.000	6.00	4.000	13.00	7.000	23.00	10.00	53.00
1.083	4.00	4.083	17.00	7.083	13.00	10.08	38.00
1.167	4.00	4.167	17.00	7.167	13.00	10.17	38.00
1.250	4.00	4.250	17.00	7.250	13.00	10.25	38.00
1.333	4.00	4.333	17.00	7.333	13.00	10.33	38.00
1.417	4.00	4.417	17.00	7.417	13.00	10.42	38.00
1.500	4.00	4.500	17.00	7.500	13.00	10.50	38.00
1.583	4.00	4.583	17.00	7.583	13.00	10.58	38.00
1.667	4.00	4.667	17.00	7.667	13.00	10.67	38.00
1.750	4.00	4.750	17.00	7.750	13.00	10.75	38.00
1.833	4.00	4.833	17.00	7.833	13.00	10.83	38.00
1.917	4.00	4.917	17.00	7.917	13.00	10.92	38.00
2.000	4.00	5.000	17.00	8.000	13.00	11.00	38.00
2.083	6.00	5.083	13.00	8.083	13.00	11.08	13.00
2.167	6.00	5.167	13.00	8.167	13.00	11.17	13.00
2.250	6.00	5.250	13.00	8.250	13.00	11.25	13.00
2.333	6.00	5.333	13.00	8.333	13.00	11.33	13.00
2.417	6.00	5.417	13.00	8.417	13.00	11.42	13.00
2.500	6.00	5.500	13.00	8.500	13.00	11.50	13.00
2.583	6.00	5.583	13.00	8.583	13.00	11.58	13.00
2.667	6.00	5.667	13.00	8.667	13.00	11.67	13.00
2.750	6.00	5.750	13.00	8.750	13.00	11.75	13.00
2.833	6.00	5.833	13.00	8.833	13.00	11.83	13.00
2.917	6.00	5.917	13.00	8.917	13.00	11.92	13.00
3.000	6.00	6.000	13.00	9.000	13.00	12.00	13.00

Unit Hyd Qpeak (cms)= 4.764

PEAK FLOW (cms)= 5.020 (i)
TIME TO PEAK (hrs)= 10.083
RUNOFF VOLUME (mm)= 137.419
TOTAL RAINFALL (mm)= 212.000
RUNOFF COEFFICIENT = 0.648

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

CALIB			
NASHYD (0310)	Area (ha)= 79.72	Curve Number (CN)= 86.0	
ID= 1 DT= 5.0 min	Ia (mm)= 7.00	# of Linear Res.(N)= 3.00	
	U.H. Tp(hrs)= 0.72		

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

----- TRANSFORMED HYETOGRAPH -----							
TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.083	6.00	3.083	13.00	6.083	23.00	9.08	53.00
0.167	6.00	3.167	13.00	6.167	23.00	9.17	53.00
0.250	6.00	3.250	13.00	6.250	23.00	9.25	53.00
0.333	6.00	3.333	13.00	6.333	23.00	9.33	53.00
0.417	6.00	3.417	13.00	6.417	23.00	9.42	53.00
0.500	6.00	3.500	13.00	6.500	23.00	9.50	53.00
0.583	6.00	3.583	13.00	6.583	23.00	9.58	53.00
0.667	6.00	3.667	13.00	6.667	23.00	9.67	53.00
0.750	6.00	3.750	13.00	6.750	23.00	9.75	53.00
0.833	6.00	3.833	13.00	6.833	23.00	9.83	53.00
0.917	6.00	3.917	13.00	6.917	23.00	9.92	53.00
1.000	6.00	4.000	13.00	7.000	23.00	10.00	53.00
1.083	4.00	4.083	17.00	7.083	13.00	10.08	38.00
1.167	4.00	4.167	17.00	7.167	13.00	10.17	38.00
1.250	4.00	4.250	17.00	7.250	13.00	10.25	38.00
1.333	4.00	4.333	17.00	7.333	13.00	10.33	38.00
1.417	4.00	4.417	17.00	7.417	13.00	10.42	38.00
1.500	4.00	4.500	17.00	7.500	13.00	10.50	38.00
1.583	4.00	4.583	17.00	7.583	13.00	10.58	38.00
1.667	4.00	4.667	17.00	7.667	13.00	10.67	38.00
1.750	4.00	4.750	17.00	7.750	13.00	10.75	38.00
1.833	4.00	4.833	17.00	7.833	13.00	10.83	38.00
1.917	4.00	4.917	17.00	7.917	13.00	10.92	38.00
2.000	4.00	5.000	17.00	8.000	13.00	11.00	38.00
2.083	6.00	5.083	13.00	8.083	13.00	11.08	13.00

2.167	6.00	5.167	13.00	8.167	13.00	11.17	13.00
2.250	6.00	5.250	13.00	8.250	13.00	11.25	13.00
2.333	6.00	5.333	13.00	8.333	13.00	11.33	13.00
2.417	6.00	5.417	13.00	8.417	13.00	11.42	13.00
2.500	6.00	5.500	13.00	8.500	13.00	11.50	13.00
2.583	6.00	5.583	13.00	8.583	13.00	11.58	13.00
2.667	6.00	5.667	13.00	8.667	13.00	11.67	13.00
2.750	6.00	5.750	13.00	8.750	13.00	11.75	13.00
2.833	6.00	5.833	13.00	8.833	13.00	11.83	13.00
2.917	6.00	5.917	13.00	8.917	13.00	11.92	13.00
3.000	6.00	6.000	13.00	9.000	13.00	12.00	13.00

Unit Hyd Qpeak (cms)= 4.229

PEAK FLOW (cms)= 8.872 (i)
 TIME TO PEAK (hrs)= 10.667
 RUNOFF VOLUME (mm)= 170.590
 TOTAL RAINFALL (mm)= 212.000
 RUNOFF COEFFICIENT = 0.805

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

CALIB			
NASHYD (0307)	Area (ha)=	8.67	Curve Number (CN)= 83.0
ID= 1 DT= 5.0 min	Ia (mm)=	8.00	# of Linear Res.(N)= 3.00
	U.H. Tp(hrs)=	0.31	

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

----- TRANSFORMED HYETOGRAPH -----							
TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.083	6.00	3.083	13.00	6.083	23.00	9.08	53.00
0.167	6.00	3.167	13.00	6.167	23.00	9.17	53.00
0.250	6.00	3.250	13.00	6.250	23.00	9.25	53.00
0.333	6.00	3.333	13.00	6.333	23.00	9.33	53.00
0.417	6.00	3.417	13.00	6.417	23.00	9.42	53.00
0.500	6.00	3.500	13.00	6.500	23.00	9.50	53.00
0.583	6.00	3.583	13.00	6.583	23.00	9.58	53.00
0.667	6.00	3.667	13.00	6.667	23.00	9.67	53.00
0.750	6.00	3.750	13.00	6.750	23.00	9.75	53.00
0.833	6.00	3.833	13.00	6.833	23.00	9.83	53.00
0.917	6.00	3.917	13.00	6.917	23.00	9.92	53.00
1.000	6.00	4.000	13.00	7.000	23.00	10.00	53.00
1.083	4.00	4.083	17.00	7.083	13.00	10.08	38.00
1.167	4.00	4.167	17.00	7.167	13.00	10.17	38.00
1.250	4.00	4.250	17.00	7.250	13.00	10.25	38.00
1.333	4.00	4.333	17.00	7.333	13.00	10.33	38.00
1.417	4.00	4.417	17.00	7.417	13.00	10.42	38.00
1.500	4.00	4.500	17.00	7.500	13.00	10.50	38.00
1.583	4.00	4.583	17.00	7.583	13.00	10.58	38.00
1.667	4.00	4.667	17.00	7.667	13.00	10.67	38.00
1.750	4.00	4.750	17.00	7.750	13.00	10.75	38.00
1.833	4.00	4.833	17.00	7.833	13.00	10.83	38.00
1.917	4.00	4.917	17.00	7.917	13.00	10.92	38.00
2.000	4.00	5.000	17.00	8.000	13.00	11.00	38.00
2.083	6.00	5.083	13.00	8.083	13.00	11.08	13.00
2.167	6.00	5.167	13.00	8.167	13.00	11.17	13.00
2.250	6.00	5.250	13.00	8.250	13.00	11.25	13.00
2.333	6.00	5.333	13.00	8.333	13.00	11.33	13.00
2.417	6.00	5.417	13.00	8.417	13.00	11.42	13.00
2.500	6.00	5.500	13.00	8.500	13.00	11.50	13.00
2.583	6.00	5.583	13.00	8.583	13.00	11.58	13.00
2.667	6.00	5.667	13.00	8.667	13.00	11.67	13.00
2.750	6.00	5.750	13.00	8.750	13.00	11.75	13.00
2.833	6.00	5.833	13.00	8.833	13.00	11.83	13.00
2.917	6.00	5.917	13.00	8.917	13.00	11.92	13.00
3.000	6.00	6.000	13.00	9.000	13.00	12.00	13.00

Unit Hyd Qpeak (cms)= 1.068

PEAK FLOW (cms)= 1.140 (i)
 TIME TO PEAK (hrs)= 10.000
 RUNOFF VOLUME (mm)= 162.492
 TOTAL RAINFALL (mm)= 212.000
 RUNOFF COEFFICIENT = 0.766

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

CALIB			
NASHYD (0101)	Area (ha)=	0.62	Curve Number (CN)= 74.0
ID= 1 DT= 5.0 min	Ia (mm)=	7.00	# of Linear Res.(N)= 3.00
	U.H. Tp(hrs)=	0.12	

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

----- TRANSFORMED HYETOGRAPH -----							
TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.083	6.00	3.083	13.00	6.083	23.00	9.08	53.00
0.167	6.00	3.167	13.00	6.167	23.00	9.17	53.00
0.250	6.00	3.250	13.00	6.250	23.00	9.25	53.00
0.333	6.00	3.333	13.00	6.333	23.00	9.33	53.00
0.417	6.00	3.417	13.00	6.417	23.00	9.42	53.00
0.500	6.00	3.500	13.00	6.500	23.00	9.50	53.00
0.583	6.00	3.583	13.00	6.583	23.00	9.58	53.00
0.667	6.00	3.667	13.00	6.667	23.00	9.67	53.00
0.750	6.00	3.750	13.00	6.750	23.00	9.75	53.00
0.833	6.00	3.833	13.00	6.833	23.00	9.83	53.00
0.917	6.00	3.917	13.00	6.917	23.00	9.92	53.00
1.000	6.00	4.000	13.00	7.000	23.00	10.00	53.00
1.083	4.00	4.083	17.00	7.083	13.00	10.08	38.00
1.167	4.00	4.167	17.00	7.167	13.00	10.17	38.00
1.250	4.00	4.250	17.00	7.250	13.00	10.25	38.00
1.333	4.00	4.333	17.00	7.333	13.00	10.33	38.00
1.417	4.00	4.417	17.00	7.417	13.00	10.42	38.00
1.500	4.00	4.500	17.00	7.500	13.00	10.50	38.00
1.583	4.00	4.583	17.00	7.583	13.00	10.58	38.00
1.667	4.00	4.667	17.00	7.667	13.00	10.67	38.00
1.750	4.00	4.750	17.00	7.750	13.00	10.75	38.00
1.833	4.00	4.833	17.00	7.833	13.00	10.83	38.00
1.917	4.00	4.917	17.00	7.917	13.00	10.92	38.00
2.000	4.00	5.000	17.00	8.000	13.00	11.00	38.00
2.083	6.00	5.083	13.00	8.083	13.00	11.08	13.00
2.167	6.00	5.167	13.00	8.167	13.00	11.17	13.00
2.250	6.00	5.250	13.00	8.250	13.00	11.25	13.00
2.333	6.00	5.333	13.00	8.333	13.00	11.33	13.00
2.417	6.00	5.417	13.00	8.417	13.00	11.42	13.00
2.500	6.00	5.500	13.00	8.500	13.00	11.50	13.00
2.583	6.00	5.583	13.00	8.583	13.00	11.58	13.00
2.667	6.00	5.667	13.00	8.667	13.00	11.67	13.00
2.750	6.00	5.750	13.00	8.750	13.00	11.75	13.00
2.833	6.00	5.833	13.00	8.833	13.00	11.83	13.00
2.917	6.00	5.917	13.00	8.917	13.00	11.92	13.00
3.000	6.00	6.000	13.00	9.000	13.00	12.00	13.00

Unit Hyd Qpeak (cms)= 0.197

PEAK FLOW (cms)= 0.077 (i)
TIME TO PEAK (hrs)= 10.000
RUNOFF VOLUME (mm)= 140.917
TOTAL RAINFALL (mm)= 212.000
RUNOFF COEFFICIENT = 0.665

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

ADD HYD (0903)				
1 + 2 = 3	AREA	QPEAK	TPEAK	R.V.
	(ha)	(cms)	(hrs)	(mm)
ID1= 1 (0101):	0.62	0.077	10.00	140.92
+ ID2= 2 (0307):	8.67	1.140	10.00	162.49
=====				
ID = 3 (0903):	9.29	1.217	10.00	161.05

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

CALIB			
NASHYD (0308)	Area (ha)=	34.30	Curve Number (CN)= 86.0
ID= 1 DT= 5.0 min	Ia (mm)=	7.00	# of Linear Res.(N)= 3.00
	U.H. Tp(hrs)=	0.30	

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

----- TRANSFORMED HYETOGRAPH -----							
TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.083	6.00	3.083	13.00	6.083	23.00	9.08	53.00

0.167	6.00	3.167	13.00	6.167	23.00	9.17	53.00
0.250	6.00	3.250	13.00	6.250	23.00	9.25	53.00
0.333	6.00	3.333	13.00	6.333	23.00	9.33	53.00
0.417	6.00	3.417	13.00	6.417	23.00	9.42	53.00
0.500	6.00	3.500	13.00	6.500	23.00	9.50	53.00
0.583	6.00	3.583	13.00	6.583	23.00	9.58	53.00
0.667	6.00	3.667	13.00	6.667	23.00	9.67	53.00
0.750	6.00	3.750	13.00	6.750	23.00	9.75	53.00
0.833	6.00	3.833	13.00	6.833	23.00	9.83	53.00
0.917	6.00	3.917	13.00	6.917	23.00	9.92	53.00
1.000	6.00	4.000	13.00	7.000	23.00	10.00	53.00
1.083	4.00	4.083	17.00	7.083	13.00	10.08	38.00
1.167	4.00	4.167	17.00	7.167	13.00	10.17	38.00
1.250	4.00	4.250	17.00	7.250	13.00	10.25	38.00
1.333	4.00	4.333	17.00	7.333	13.00	10.33	38.00
1.417	4.00	4.417	17.00	7.417	13.00	10.42	38.00
1.500	4.00	4.500	17.00	7.500	13.00	10.50	38.00
1.583	4.00	4.583	17.00	7.583	13.00	10.58	38.00
1.667	4.00	4.667	17.00	7.667	13.00	10.67	38.00
1.750	4.00	4.750	17.00	7.750	13.00	10.75	38.00
1.833	4.00	4.833	17.00	7.833	13.00	10.83	38.00
1.917	4.00	4.917	17.00	7.917	13.00	10.92	38.00
2.000	4.00	5.000	17.00	8.000	13.00	11.00	38.00
2.083	6.00	5.083	13.00	8.083	13.00	11.08	13.00
2.167	6.00	5.167	13.00	8.167	13.00	11.17	13.00
2.250	6.00	5.250	13.00	8.250	13.00	11.25	13.00
2.333	6.00	5.333	13.00	8.333	13.00	11.33	13.00
2.417	6.00	5.417	13.00	8.417	13.00	11.42	13.00
2.500	6.00	5.500	13.00	8.500	13.00	11.50	13.00
2.583	6.00	5.583	13.00	8.583	13.00	11.58	13.00
2.667	6.00	5.667	13.00	8.667	13.00	11.67	13.00
2.750	6.00	5.750	13.00	8.750	13.00	11.75	13.00
2.833	6.00	5.833	13.00	8.833	13.00	11.83	13.00
2.917	6.00	5.917	13.00	8.917	13.00	11.92	13.00
3.000	6.00	6.000	13.00	9.000	13.00	12.00	13.00

Unit Hyd Qpeak (cms)= 4.367

PEAK FLOW (cms)= 4.650 (i)
TIME TO PEAK (hrs)= 10.000
RUNOFF VOLUME (mm)= 170.526
TOTAL RAINFALL (mm)= 212.000
RUNOFF COEFFICIENT = 0.804

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

ADD HYD (0906)				
1 + 2 = 3				
	AREA	QPEAK	TPEAK	R.V.
	(ha)	(cms)	(hrs)	(mm)
ID1= 1 (0308):	34.30	4.650	10.00	170.53
+ ID2= 2 (0903):	9.29	1.217	10.00	161.05
=====				
ID = 3 (0906):	43.59	5.868	10.00	168.51

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ROUTE CHN(0604)	
IN= 2---> OUT= 1	Routing time step (min)'= 5.00

<----- DATA FOR SECTION (1.1) ----->			
Distance	Elevation	Manning	
0.00	274.82	0.0500	
0.70	274.77	0.0500	
1.41	274.73	0.0500	
2.11	274.61	0.0500	
6.32	274.20	0.0500 /0.0300	Main Channel
7.03	274.13	0.0300	Main Channel
7.73	274.08	0.0300	Main Channel
8.43	273.86	0.0300	Main Channel
9.13	273.97	0.0300	Main Channel
10.54	274.15	0.0300	Main Channel
11.95	274.24	0.0300 /0.0500	Main Channel
13.35	274.25	0.0500	
14.05	274.34	0.0500	
14.76	274.30	0.0500	
21.78	274.17	0.0500	
30.22	274.26	0.0500	
40.05	274.20	0.0500	
91.67	274.84	0.0500	

<----- TRAVEL TIME TABLE ----->					
DEPTH (m)	ELEV (m)	VOLUME (cu.m.)	FLOW RATE (cms)	VELOCITY (m/s)	TRAV.TIME (min)
0.05	273.91	.110E+02	0.00	0.35	46.45
0.10	273.96	.439E+02	0.02	0.55	29.26
0.15	274.01	.995E+02	0.07	0.71	22.72
0.19	274.05	.180E+03	0.16	0.86	18.84
0.24	274.10	.289E+03	0.28	0.94	17.14
0.29	274.15	.443E+03	0.47	1.03	15.76
0.34	274.20	.714E+03	0.74	1.01	16.00
0.39	274.25	.174E+04	1.42	0.80	20.33
0.44	274.30	.365E+04	2.97	0.79	20.51
0.50	274.35	.591E+04	5.31	0.87	18.55
0.55	274.41	.843E+04	8.43	0.97	16.67
0.60	274.46	.112E+05	12.27	1.07	15.18
0.65	274.51	.142E+05	16.86	1.15	14.00
0.70	274.56	.174E+05	22.21	1.24	13.05
0.75	274.61	.208E+05	28.34	1.32	12.26
0.80	274.66	.245E+05	35.30	1.40	11.58
0.86	274.72	.284E+05	43.08	1.47	11.00
0.91	274.77	.326E+05	51.63	1.54	10.51
0.96	274.82	.370E+05	61.08	1.60	10.08

<---- hydrograph ---->				<-pipe / channel->		
	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)	MAX DEPTH (m)	MAX VEL (m/s)
INFLOW : ID= 2 (0906)	43.59	5.87	10.00	168.51	0.50	0.89
OUTFLOW: ID= 1 (0604)	43.59	5.47	10.25	168.50	0.50	0.88

ADD HYD (0904)					
1 + 2 = 3					
	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)	
ID1= 1 (0309):	43.66	5.020	10.08	137.42	
+ ID2= 2 (0310):	79.72	8.872	10.67	170.59	
=====					
ID = 3 (0904):	123.38	13.286	10.42	158.85	

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0904)					
3 + 2 = 1					
	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)	
ID1= 3 (0904):	123.38	13.286	10.42	158.85	
+ ID2= 2 (0604):	43.59	5.471	10.25	168.50	
=====					
ID = 1 (0904):	166.97	18.703	10.33	161.37	

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

FINISH

V V I SSSSS U U A L (v 6.2.2015)
V V I SS U U A A L
V V I SS U U AAAAA L
V V I SS U U A A L
VV I SSSSS UUUUU A A LLLLL

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

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***** S U M M A R Y O U T P U T *****

Input filename: C:\Program Files (x86)\visual OTTHYMO 6.2\VO2\voin.dat
Output filename: C:\Users\ATrevers\AppData\Local\Civica\XH5\1e02d851-4ff1-45b7-b18f-7efd2b836d95\2d9511c4-b
Summary filename: C:\Users\ATrevers\AppData\Local\Civica\XH5\1e02d851-4ff1-45b7-b18f-7efd2b836d95\2d9511c4-b

DATE: 04-18-2024 TIME: 09:27:38

USER:

COMMENTS: _____

** SIMULATION : 100yr 12hr 15min SCS **

W/E	COMMAND	HYD	ID	DT	AREA	Qpeak	Tpeak	R.V.	R.C.	Qbase	TSS	CONC	TP	CONC
				min	ha	cms	hrs	mm		cms		mg/l		mg/l
	START @ 0.00 hrs													

	READ STORM				15.0									
	[Ptot=102.89 mm]													
	fname : C:\Users\ATrevers\AppData\Local\Temp\b1291b6e-28f9-4b3c-a995-82906428ae34\63fb521c-605e-4673-bc40-													
	remark: 100yr 12hr 15min SCS													
*														
**	CALIB NASHYD	0304	1	5.0	120.37	5.22	7.42	53.06	0.52	0.000	0.00	0.00		
	[CN=75.0													
	[N = 3.0:Tp 1.22]													
*														
	READ STORM				15.0									
	[Ptot=102.89 mm]													
	fname : C:\Users\ATrevers\AppData\Local\Temp\b1291b6e-28f9-4b3c-a995-82906428ae34\63fb521c-605e-4673-bc40-													
	remark: 100yr 12hr 15min SCS													
*														
**	CALIB NASHYD	0303	1	5.0	193.95	7.36	7.75	52.62	0.51	0.000	0.00	0.00		
	[CN=76.0													
	[N = 3.0:Tp 1.44]													
*														
	READ STORM				15.0									
	[Ptot=102.89 mm]													
	fname : C:\Users\ATrevers\AppData\Local\Temp\b1291b6e-28f9-4b3c-a995-82906428ae34\63fb521c-605e-4673-bc40-													
	remark: 100yr 12hr 15min SCS													
*														
**	CALIB NASHYD	0302	1	5.0	364.83	4.91	10.33	37.97	0.37	0.000	0.00	0.00		
	[CN=64.0													
	[N = 3.0:Tp 3.48]													
*														
	READ STORM				15.0									
	[Ptot=102.89 mm]													
	fname : C:\Users\ATrevers\AppData\Local\Temp\b1291b6e-28f9-4b3c-a995-82906428ae34\63fb521c-605e-4673-bc40-													
	remark: 100yr 12hr 15min SCS													
*														
**	CALIB NASHYD	0301	1	5.0	335.58	1.70	13.17	21.20	0.21	0.000	0.00	0.00		
	[CN=44.0													
	[N = 3.0:Tp 5.70]													
*														
	CHANNEL[2: 0301]	0601	1	5.0	335.58	1.64	14.25	21.20	n/a	0.000				
*														
	ADD [0302+ 0303]	0901	3	5.0	558.78	10.33	8.17	43.05	n/a	0.000	0.00	0.00		
*														
	ADD [0901+ 0601]	0901	1	5.0	894.36	10.54	8.33	34.85	n/a	0.000	0.00	0.00		

```

* CHANNEL[ 2: 0901] 0602 1 5.0 894.36 10.34 8.75 34.85 n/a 0.000
* READ STORM 15.0
  [ Ptot=102.89 mm ]
  fname : C:\Users\ATrevers\AppData\Local\Temp\b1291b6e-28f9-4b3c-a995-82906428ae34\63fb521c-605e-4673-bc40-
  remark: 100yr 12hr 15min SCS
* ** CALIB NASHYD 0306 1 5.0 12.81 0.43 6.92 27.49 0.27 0.000 0.00 0.00
  [CN=52.0 ]
  [ N = 3.0:Tp 0.68]
* READ STORM 15.0
  [ Ptot=102.89 mm ]
  fname : C:\Users\ATrevers\AppData\Local\Temp\b1291b6e-28f9-4b3c-a995-82906428ae34\63fb521c-605e-4673-bc40-
  remark: 100yr 12hr 15min SCS
* ** CALIB NASHYD 0100 1 5.0 13.85 0.80 6.58 34.46 0.33 0.000 0.00 0.00
  [CN=59.8 ]
  [ N = 3.0:Tp 0.44]
* READ STORM 15.0
  [ Ptot=102.89 mm ]
  fname : C:\Users\ATrevers\AppData\Local\Temp\b1291b6e-28f9-4b3c-a995-82906428ae34\63fb521c-605e-4673-bc40-
  remark: 100yr 12hr 15min SCS
* ** CALIB NASHYD 0305 1 5.0 122.14 7.42 6.83 47.87 0.47 0.000 0.00 0.00
  [CN=72.0 ]
  [ N = 3.0:Tp 0.68]
* CHANNEL[ 6: 0000] 1978 3 5.0 0.00 0.00 0.00 0.00 n/a 0.000
* ADD [ 0100+ 0306] 0905 3 5.0 26.66 1.19 6.67 31.11 n/a 0.000 0.00 0.00
* ADD [ 0905+ 0603] 0905 1 5.0 148.80 8.55 6.83 44.86 n/a 0.000 0.00 0.00
* ADD [ 0304+ 0602] 0902 3 5.0 1014.72 14.32 8.17 37.01 n/a 0.000 0.00 0.00
* ADD [ 0902+ 0905] 0902 1 5.0 1163.52 18.57 7.42 38.02 n/a 0.000 0.00 0.00
* READ STORM 15.0
  [ Ptot=102.89 mm ]
  fname : C:\Users\ATrevers\AppData\Local\Temp\b1291b6e-28f9-4b3c-a995-82906428ae34\63fb521c-605e-4673-bc40-
  remark: 100yr 12hr 15min SCS
* ** CALIB NASHYD 0309 1 5.0 43.66 2.38 6.50 27.96 0.27 0.000 0.00 0.00
  [CN=53.0 ]
  [ N = 3.0:Tp 0.35]
* READ STORM 15.0
  [ Ptot=102.89 mm ]
  fname : C:\Users\ATrevers\AppData\Local\Temp\b1291b6e-28f9-4b3c-a995-82906428ae34\63fb521c-605e-4673-bc40-
  remark: 100yr 12hr 15min SCS
* ** CALIB NASHYD 0310 1 5.0 79.72 4.70 6.92 48.27 0.47 0.000 0.00 0.00
  [CN=73.0 ]
  [ N = 3.0:Tp 0.72]
* READ STORM 15.0
  [ Ptot=102.89 mm ]
  fname : C:\Users\ATrevers\AppData\Local\Temp\b1291b6e-28f9-4b3c-a995-82906428ae34\63fb521c-605e-4673-bc40-
  remark: 100yr 12hr 15min SCS
* ** CALIB NASHYD 0308 1 5.0 34.30 2.78 6.58 48.08 0.47 0.000 0.00 0.00
  [CN=73.0 ]
  [ N = 3.0:Tp 0.46]
* READ STORM 15.0
  [ Ptot=102.89 mm ]
  fname : C:\Users\ATrevers\AppData\Local\Temp\b1291b6e-28f9-4b3c-a995-82906428ae34\63fb521c-605e-4673-bc40-
  remark: 100yr 12hr 15min SCS
* ** CALIB NASHYD 0307 1 5.0 8.67 0.63 6.58 41.82 0.41 0.000 0.00 0.00
  [CN=68.0 ]
  [ N = 3.0:Tp 0.43]
* READ STORM 15.0
  [ Ptot=102.89 mm ]
  fname : C:\Users\ATrevers\AppData\Local\Temp\b1291b6e-28f9-4b3c-a995-82906428ae34\63fb521c-605e-4673-bc40-
  remark: 100yr 12hr 15min SCS
* ** CALIB NASHYD 0101 1 5.0 0.62 0.07 6.25 30.39 0.30 0.000 0.00 0.00
  [CN=55.7 ]
  [ N = 3.0:Tp 0.12]

```

000	TTTT	TTTT	H	H	Y	Y	M	M	000	TM
0 0	T	T	H	H	Y	Y	MM	MM	0 0	
0 0	T	T	H	H	Y		M	M	0 0	
000	T	T	H	H	Y		M	M	000	

***** SUMMARY OUTPUT *****

```
Input   filename: C:\Program Files (x86)\visual OTTHYMO 6.2\VO2\voin.dat
Output  filename: C:\Users\ATrevers\AppData\Local\Civica\VH5\1e02d851-4ff1-45b7-b18f-7efd2b836d95\5c6c90cd-0
Summary filename: C:\Users\ATrevers\AppData\Local\Civica\VH5\1e02d851-4ff1-45b7-b18f-7efd2b836d95\5c6c90cd-0
```

USER:

COMMENTS: _____

```
*****
** SIMULATION : 10yr 12hr 15min SCS          **
*****
```

W/E	COMMAND	HYD	ID	DT	AREA	'	Qpeak	Tpeak	R.V.	R.C.	Qbase	TSS	CONC	TP	CONC
				min	ha	'	cms	hrs	mm		cms		mg/l		mg/l

START @ 0.00 hrs

```

READ STORM                      15.0
[ Ptot= 71.62 mm ]
fname : C:\Users\ATrevers\AppData\Local\Temp\b1291b6e-28f9-4b3c-a995-82906428ae34\0a626e59-2b10-4b27-a39d-
remark: 10yr 12hr 15min SCS

```

```

** CALIB NASHYD      0304  1  5.0  120.37      2.90  7.50  29.83 0.42      0.000      0.00      0.00
   [CN=75.0]
   [ N = 3.0:Tp 1.22]

```

```

READ STORM                      15.0
[ Ptot= 71.62 mm ]
fname : C:\Users\ATrevers\AppData\Local\Temp\b1291b6e-28f9-4b3c-a995-82906428ae34\0a626e59-2b10-4b27-a39d-
remark: 10yr 12hr 15min SCS

```

```
** CALIB NASHYD      0303  1  5.0  193.95    4.02  7.75  29.18  0.41    0.000    0.00    0.00
  [CN=76.0          ]
  [ N = 3.0:Tp 1.44]
```

```

READ STORM                      15.0
[ Ptot= 71.62 mm ]
fname : C:\Users\ATrevers\AppData\Local\Temp\b1291b6e-28f9-4b3c-a995-82906428ae34\0a626e59-2b10-4b27-a39d-
remark: 10yr 12hr 15min SCS

```

```
** CALIB NASHYD      0302  1  5.0  364.83    2.52 10.50   19.68 0.27    0.000    0.00    0.00
  [CN=64.0          ]
  [ N = 3.0:Tp 3.48]
```

```

* READ STORM 15.0
[ Ptot= 71.62 mm ]
fname : C:\Users\ATrevers\AppData\Local\Temp\b1291b6e-28f9-4b3c-a995-82906428ae34\0a626e59-2b10-4b27-a39d-
remark: 10yr 12hr 15min SCS
*
** CALIB NASHYD 0301 1 5.0 335.58 0.82 13.25 10.21 0.14 0.000 0.00 0.00
[CN=44.0 ]
[ N = 3.0:Tp 5.70]
*
CHANNEL[ 2: 0301] 0601 1 5.0 335.58 0.77 14.58 10.21 n/a 0.000
*
ADD [ 0302+ 0303] 0901 3 5.0 558.78 5.52 8.25 22.98 n/a 0.000 0.00 0.00
*
ADD [ 0901+ 0601] 0901 1 5.0 894.36 5.58 8.33 18.19 n/a 0.000 0.00 0.00
*
CHANNEL[ 2: 0901] 0602 1 5.0 894.36 5.46 8.83 18.19 n/a 0.000
*
READ STORM 15.0
[ Ptot= 71.62 mm ]
fname : C:\Users\ATrevers\AppData\Local\Temp\b1291b6e-28f9-4b3c-a995-82906428ae34\0a626e59-2b10-4b27-a39d-
remark: 10yr 12hr 15min SCS
*
** CALIB NASHYD 0306 1 5.0 12.81 0.21 6.92 13.70 0.19 0.000 0.00 0.00
[CN=52.0 ]
[ N = 3.0:Tp 0.68]
*
READ STORM 15.0
[ Ptot= 71.62 mm ]
fname : C:\Users\ATrevers\AppData\Local\Temp\b1291b6e-28f9-4b3c-a995-82906428ae34\0a626e59-2b10-4b27-a39d-
remark: 10yr 12hr 15min SCS
*
** CALIB NASHYD 0100 1 5.0 13.85 0.41 6.58 17.72 0.25 0.000 0.00 0.00
[CN=59.8 ]
[ N = 3.0:Tp 0.44]
*
READ STORM 15.0
[ Ptot= 71.62 mm ]
fname : C:\Users\ATrevers\AppData\Local\Temp\b1291b6e-28f9-4b3c-a995-82906428ae34\0a626e59-2b10-4b27-a39d-
remark: 10yr 12hr 15min SCS
*
** CALIB NASHYD 0305 1 5.0 122.14 3.97 6.92 26.10 0.36 0.000 0.00 0.00
[CN=72.0 ]
[ N = 3.0:Tp 0.68]
*
CHANNEL[ 6: 0000] 1978 3 5.0 0.00 0.00 0.00 0.00 n/a 0.000
*
ADD [ 0100+ 0306] 0905 3 5.0 26.66 0.59 6.67 15.79 n/a 0.000 0.00 0.00
*
ADD [ 0905+ 0603] 0905 1 5.0 148.80 4.54 6.83 24.25 n/a 0.000 0.00 0.00
*
ADD [ 0304+ 0602] 0902 3 5.0 1014.72 7.68 8.17 19.57 n/a 0.000 0.00 0.00
*
ADD [ 0902+ 0905] 0902 1 5.0 1163.52 9.91 7.50 20.17 n/a 0.000 0.00 0.00
*
READ STORM 15.0
[ Ptot= 71.62 mm ]
fname : C:\Users\ATrevers\AppData\Local\Temp\b1291b6e-28f9-4b3c-a995-82906428ae34\0a626e59-2b10-4b27-a39d-
remark: 10yr 12hr 15min SCS
*
* CALIB NASHYD 0309 1 5.0 43.66 1.16 6.50 13.88 0.19 0.000 0.00 0.00
[CN=53.0 ]
[ N = 3.0:Tp 0.35]
*
READ STORM 15.0
[ Ptot= 71.62 mm ]
fname : C:\Users\ATrevers\AppData\Local\Temp\b1291b6e-28f9-4b3c-a995-82906428ae34\0a626e59-2b10-4b27-a39d-
remark: 10yr 12hr 15min SCS
*
* CALIB NASHYD 0310 1 5.0 79.72 2.50 6.92 26.19 0.37 0.000 0.00 0.00
[CN=73.0 ]
[ N = 3.0:Tp 0.72]
*
READ STORM 15.0
[ Ptot= 71.62 mm ]
fname : C:\Users\ATrevers\AppData\Local\Temp\b1291b6e-28f9-4b3c-a995-82906428ae34\0a626e59-2b10-4b27-a39d-
remark: 10yr 12hr 15min SCS
*
* CALIB NASHYD 0308 1 5.0 34.30 1.47 6.58 26.03 0.36 0.000 0.00 0.00
[CN=73.0 ]
[ N = 3.0:Tp 0.46]
*
READ STORM 15.0
[ Ptot= 71.62 mm ]

```


[Ptot= 24.99 mm]												
**	CALIB NASHYD	0302	1	5.0	364.83	0.27	5.83	1.84	0.07	0.000	0.00	0.00
	[CN=64.0											
	[N = 3.0:Tp 3.48]											
*	CHIC STORM			10.0								
	[Ptot= 24.99 mm]											
**	CALIB NASHYD	0301	1	5.0	335.58	0.07	8.08	0.77	0.03	0.000	0.00	0.00
	[CN=44.0											
	[N = 3.0:Tp 5.70]											
*	CHANNEL[2: 0301]	0601	1	5.0	335.58	0.05	11.58	0.77	n/a	0.000		
*	ADD [0302+ 0303]	0901	3	5.0	558.78	0.70	4.25	2.40	n/a	0.000	0.00	0.00
*	ADD [0901+ 0601]	0901	1	5.0	894.36	0.70	4.25	1.79	n/a	0.000	0.00	0.00
*	CHANNEL[2: 0901]	0602	1	5.0	894.36	0.66	4.83	1.79	n/a	0.000		
*	CHIC STORM			10.0								
	[Ptot= 24.99 mm]											
**	CALIB NASHYD	0306	1	5.0	12.81	0.02	2.50	1.19	0.05	0.000	0.00	0.00
	[CN=52.0											
	[N = 3.0:Tp 0.68]											
*	CHIC STORM			10.0								
	[Ptot= 24.99 mm]											
**	CALIB NASHYD	0100	1	5.0	13.85	0.03	2.00	1.71	0.07	0.000	0.00	0.00
	[CN=59.8											
	[N = 3.0:Tp 0.44]											
*	CHIC STORM			10.0								
	[Ptot= 24.99 mm]											
**	CALIB NASHYD	0305	1	5.0	122.14	0.41	2.33	3.02	0.12	0.000	0.00	0.00
	[CN=72.0											
	[N = 3.0:Tp 0.68]											
*	CHANNEL[6: 0000]	1978	3	5.0	0.00	0.00	0.00	0.00	n/a	0.000		
*	ADD [0100+ 0306]	0905	3	5.0	26.66	0.04	2.17	1.46	n/a	0.000	0.00	0.00
*	ADD [0905+ 0603]	0905	1	5.0	148.80	0.45	2.33	2.74	n/a	0.000	0.00	0.00
*	ADD [0304+ 0602]	0902	3	5.0	1014.72	0.97	4.25	2.06	n/a	0.000	0.00	0.00
*	ADD [0902+ 0905]	0902	1	5.0	1163.52	1.22	4.08	2.15	n/a	0.000	0.00	0.00
*	CHIC STORM			10.0								
	[Ptot= 24.99 mm]											
*	CALIB NASHYD	0309	1	5.0	43.66	0.07	1.92	1.15	0.05	0.000	0.00	0.00
	[CN=53.0											
	[N = 3.0:Tp 0.35]											
*	CHIC STORM			10.0								
	[Ptot= 24.99 mm]											
*	CALIB NASHYD	0310	1	5.0	79.72	0.24	2.50	2.82	0.11	0.000	0.00	0.00
	[CN=73.0											
	[N = 3.0:Tp 0.72]											
*	CHIC STORM			10.0								
	[Ptot= 24.99 mm]											
*	CALIB NASHYD	0308	1	5.0	34.30	0.12	2.00	2.75	0.11	0.000	0.00	0.00
	[CN=73.0											
	[N = 3.0:Tp 0.46]											
*	CHIC STORM			10.0								
	[Ptot= 24.99 mm]											
*	CALIB NASHYD	0307	1	5.0	8.67	0.02	2.00	2.06	0.08	0.000	0.00	0.00
	[CN=68.0											
	[N = 3.0:Tp 0.43]											
*	CHIC STORM			10.0								
	[Ptot= 24.99 mm]											
*	CALIB NASHYD	0101	1	5.0	0.62	0.00	1.42	1.43	0.06	0.000	0.00	0.00


```

[ Ptot= 84.30 mm ]
fname : C:\Users\ATrevers\AppData\Local\Temp\b1291b6e-28f9-4b3c-a995-82906428ae34\76c64015-312e-4088-9f6e-
remark: 25yr 12hr 15min SCS
*
** CALIB NASHYD          0301  1  5.0  335.58    1.15 13.17  14.28 0.17    0.000    0.00    0.00
[CN=44.0                ]
[ N = 3.0:Tp 5.70]
*
CHANNEL[ 2: 0301]    0601  1  5.0  335.58    1.09 14.50  14.28 n/a    0.000
*
ADD [ 0302+ 0303]    0901  3  5.0  558.78    7.37  8.25  30.70 n/a    0.000    0.00    0.00
*
ADD [ 0901+ 0601]    0901  1  5.0  894.36    7.49  8.42  24.54 n/a    0.000    0.00    0.00
*
CHANNEL[ 2: 0901]    0602  1  5.0  894.36    7.33  8.75  24.54 n/a    0.000
*
READ STORM          15.0
[ Ptot= 84.30 mm ]
fname : C:\Users\ATrevers\AppData\Local\Temp\b1291b6e-28f9-4b3c-a995-82906428ae34\76c64015-312e-4088-9f6e-
remark: 25yr 12hr 15min SCS
*
** CALIB NASHYD          0306  1  5.0   12.81    0.29  6.92  18.87 0.22    0.000    0.00    0.00
[CN=52.0                ]
[ N = 3.0:Tp 0.68]
*
READ STORM          15.0
[ Ptot= 84.30 mm ]
fname : C:\Users\ATrevers\AppData\Local\Temp\b1291b6e-28f9-4b3c-a995-82906428ae34\76c64015-312e-4088-9f6e-
remark: 25yr 12hr 15min SCS
*
** CALIB NASHYD          0100  1  5.0   13.85    0.56  6.58  24.07 0.29    0.000    0.00    0.00
[CN=59.8                ]
[ N = 3.0:Tp 0.44]
*
READ STORM          15.0
[ Ptot= 84.30 mm ]
fname : C:\Users\ATrevers\AppData\Local\Temp\b1291b6e-28f9-4b3c-a995-82906428ae34\76c64015-312e-4088-9f6e-
remark: 25yr 12hr 15min SCS
*
** CALIB NASHYD          0305  1  5.0  122.14    5.30  6.83  34.52 0.41    0.000    0.00    0.00
[CN=72.0                ]
[ N = 3.0:Tp 0.68]
*
CHANNEL[ 6: 0000]    1978  3  5.0    0.00    0.00  0.00    0.00 n/a    0.000
*
ADD [ 0100+ 0306]    0905  3  5.0   26.66    0.82  6.67  21.57 n/a    0.000    0.00    0.00
*
ADD [ 0905+ 0603]    0905  1  5.0  148.80    6.08  6.83  32.20 n/a    0.000    0.00    0.00
*
ADD [ 0304+ 0602]    0902  3  5.0 1014.72   10.24  8.17  26.24 n/a    0.000    0.00    0.00
*
ADD [ 0902+ 0905]    0902  1  5.0 1163.52   13.26  7.50  27.00 n/a    0.000    0.00    0.00
*
READ STORM          15.0
[ Ptot= 84.30 mm ]
fname : C:\Users\ATrevers\AppData\Local\Temp\b1291b6e-28f9-4b3c-a995-82906428ae34\76c64015-312e-4088-9f6e-
remark: 25yr 12hr 15min SCS
*
* CALIB NASHYD          0309  1  5.0   43.66    1.61  6.50  19.16 0.23    0.000    0.00    0.00
[CN=53.0                ]
[ N = 3.0:Tp 0.35]
*
READ STORM          15.0
[ Ptot= 84.30 mm ]
fname : C:\Users\ATrevers\AppData\Local\Temp\b1291b6e-28f9-4b3c-a995-82906428ae34\76c64015-312e-4088-9f6e-
remark: 25yr 12hr 15min SCS
*
* CALIB NASHYD          0310  1  5.0   79.72    3.35  6.92  34.74 0.41    0.000    0.00    0.00
[CN=73.0                ]
[ N = 3.0:Tp 0.72]
*
READ STORM          15.0
[ Ptot= 84.30 mm ]
fname : C:\Users\ATrevers\AppData\Local\Temp\b1291b6e-28f9-4b3c-a995-82906428ae34\76c64015-312e-4088-9f6e-
remark: 25yr 12hr 15min SCS
*
* CALIB NASHYD          0308  1  5.0   34.30    1.98  6.58  34.56 0.41    0.000    0.00    0.00
[CN=73.0                ]
[ N = 3.0:Tp 0.46]
*
READ STORM          15.0
[ Ptot= 84.30 mm ]
fname : C:\Users\ATrevers\AppData\Local\Temp\b1291b6e-28f9-4b3c-a995-82906428ae34\76c64015-312e-4088-9f6e-
remark: 25yr 12hr 15min SCS

```


*
* CALIB NASHYD 0307 1 5.0 8.67 0.44 6.58 29.57 0.35 0.000 0.00 0.00
[CN=68.0]
[N = 3.0:Tp 0.43]
*
READ STORM 15.0
[Ptot= 84.30 mm]
fname : C:\Users\ATrevers\AppData\Local\Temp\b1291b6e-28f9-4b3c-a995-82906428ae34\76c64015-312e-4088-9f6e-
remark: 25yr 12hr 15min SCS
*
* CALIB NASHYD 0101 1 5.0 0.62 0.05 6.25 21.05 0.25 0.000 0.00 0.00
[CN=55.7]
[N = 3.0:Tp 0.12]
*
ADD [0101+ 0307] 0903 3 5.0 9.29 0.45 6.58 29.00 n/a 0.000 0.00 0.00
*
ADD [0308+ 0903] 0906 3 5.0 43.59 2.43 6.58 33.38 n/a 0.000 0.00 0.00
*
CHANNEL[2: 0906] 0604 1 5.0 43.59 1.95 6.92 33.37 n/a 0.000
*
ADD [0309+ 0310] 0904 3 5.0 123.38 4.53 6.75 29.22 n/a 0.000 0.00 0.00
*
ADD [0904+ 0604] 0904 1 5.0 166.97 6.40 6.83 30.31 n/a 0.000 0.00 0.00
*
=====

V V I SSSSS U U A L (v 6.2.2015)
V V I SS U U A A L
V V I SS U U AAAAA L
V V I SS U U A A L
VV I SSSSS UUUUU A A LLLLL
OOO TTTT TTTT H H Y Y M M OOO TM
O O T T H H Y Y MM MM O O
O O T T H H Y M M O O
OOO T T H H Y M M OOO
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***** S U M M A R Y O U T P U T *****
Input filename: C:\Program Files (x86)\visual OTTHYMO 6.2\VO2\voin.dat
Output filename: C:\Users\ATrevers\AppData\Local\Civica\XH5\1e02d851-4ff1-45b7-b18f-7efd2b836d95\300de16-5
Summary filename: C:\Users\ATrevers\AppData\Local\Civica\XH5\1e02d851-4ff1-45b7-b18f-7efd2b836d95\300de16-5

DATE: 04-18-2024 TIME: 09:27:34
USER:
COMMENTS: _____

** SIMULATION : 2yr 12hr 15min SCS **

W/E COMMAND HYD ID DT AREA ' Qpeak Tpeak R.V. R.C. Qbase TSS CONC TP CONC
min ha cms hrs mm cms mg/l mg/l
START @ 0.00 hrs

READ STORM 15.0
[Ptot= 46.27 mm]
fname : C:\Users\ATrevers\AppData\Local\Temp\b1291b6e-28f9-4b3c-a995-82906428ae34\ac96a74f-15e7-48ab-95ac-
remark: 2yr 12hr 15min SCS
*
** CALIB NASHYD 0304 1 5.0 120.37 1.33 7.50 13.92 0.30 0.000 0.00 0.00
[CN=75.0]
[N = 3.0:Tp 1.22]
*
READ STORM 15.0
[Ptot= 46.27 mm]
fname : C:\Users\ATrevers\AppData\Local\Temp\b1291b6e-28f9-4b3c-a995-82906428ae34\ac96a74f-15e7-48ab-95ac-
remark: 2yr 12hr 15min SCS
*
** CALIB NASHYD 0303 1 5.0 193.95 1.76 7.83 13.19 0.28 0.000 0.00 0.00
[CN=76.0]
[N = 3.0:Tp 1.44]

```

* READ STORM 15.0
[ Ptot= 46.27 mm ]
fname : C:\Users\ATrevers\AppData\Local\Temp\b1291b6e-28f9-4b3c-a995-82906428ae34\ac96a74f-15e7-48ab-95ac-
remark: 2yr 12hr 15min SCS
*
** CALIB NASHYD 0302 1 5.0 364.83 1.03 10.67 8.15 0.18 0.000 0.00 0.00
[CN=64.0 ]
[ N = 3.0:Tp 3.48]
*
READ STORM 15.0
[ Ptot= 46.27 mm ]
fname : C:\Users\ATrevers\AppData\Local\Temp\b1291b6e-28f9-4b3c-a995-82906428ae34\ac96a74f-15e7-48ab-95ac-
remark: 2yr 12hr 15min SCS
*
** CALIB NASHYD 0301 1 5.0 335.58 0.31 13.42 3.89 0.08 0.000 0.00 0.00
[CN=44.0 ]
[ N = 3.0:Tp 5.70]
*
CHANNEL[ 2: 0301] 0601 1 5.0 335.58 0.28 15.25 3.89 n/a 0.000
*
ADD [ 0302+ 0303] 0901 3 5.0 558.78 2.36 8.33 9.89 n/a 0.000 0.00 0.00
*
ADD [ 0901+ 0601] 0901 1 5.0 894.36 2.38 8.33 7.64 n/a 0.000 0.00 0.00
*
CHANNEL[ 2: 0901] 0602 1 5.0 894.36 2.30 8.83 7.64 n/a 0.000
*
READ STORM 15.0
[ Ptot= 46.27 mm ]
fname : C:\Users\ATrevers\AppData\Local\Temp\b1291b6e-28f9-4b3c-a995-82906428ae34\ac96a74f-15e7-48ab-95ac-
remark: 2yr 12hr 15min SCS
*
** CALIB NASHYD 0306 1 5.0 12.81 0.08 6.92 5.45 0.12 0.000 0.00 0.00
[CN=52.0 ]
[ N = 3.0:Tp 0.68]
*
READ STORM 15.0
[ Ptot= 46.27 mm ]
fname : C:\Users\ATrevers\AppData\Local\Temp\b1291b6e-28f9-4b3c-a995-82906428ae34\ac96a74f-15e7-48ab-95ac-
remark: 2yr 12hr 15min SCS
*
** CALIB NASHYD 0100 1 5.0 13.85 0.16 6.58 7.33 0.16 0.000 0.00 0.00
[CN=59.8 ]
[ N = 3.0:Tp 0.44]
*
READ STORM 15.0
[ Ptot= 46.27 mm ]
fname : C:\Users\ATrevers\AppData\Local\Temp\b1291b6e-28f9-4b3c-a995-82906428ae34\ac96a74f-15e7-48ab-95ac-
remark: 2yr 12hr 15min SCS
*
** CALIB NASHYD 0305 1 5.0 122.14 1.72 6.92 11.59 0.25 0.000 0.00 0.00
[CN=72.0 ]
[ N = 3.0:Tp 0.68]
*
CHANNEL[ 6: 0000] 1978 3 5.0 0.00 0.00 0.00 0.00 n/a 0.000
*
ADD [ 0100+ 0306] 0905 3 5.0 26.66 0.23 6.67 6.43 n/a 0.000 0.00 0.00
*
ADD [ 0905+ 0603] 0905 1 5.0 148.80 1.93 6.92 10.66 n/a 0.000 0.00 0.00
*
ADD [ 0304+ 0602] 0902 3 5.0 1014.72 3.30 8.33 8.39 n/a 0.000 0.00 0.00
*
ADD [ 0902+ 0905] 0902 1 5.0 1163.52 4.18 7.67 8.68 n/a 0.000 0.00 0.00
*
READ STORM 15.0
[ Ptot= 46.27 mm ]
fname : C:\Users\ATrevers\AppData\Local\Temp\b1291b6e-28f9-4b3c-a995-82906428ae34\ac96a74f-15e7-48ab-95ac-
remark: 2yr 12hr 15min SCS
*
* CALIB NASHYD 0309 1 5.0 43.66 0.44 6.50 5.47 0.12 0.000 0.00 0.00
[CN=53.0 ]
[ N = 3.0:Tp 0.35]
*
READ STORM 15.0
[ Ptot= 46.27 mm ]
fname : C:\Users\ATrevers\AppData\Local\Temp\b1291b6e-28f9-4b3c-a995-82906428ae34\ac96a74f-15e7-48ab-95ac-
remark: 2yr 12hr 15min SCS
*
* CALIB NASHYD 0310 1 5.0 79.72 1.05 7.00 11.46 0.25 0.000 0.00 0.00
[CN=73.0 ]
[ N = 3.0:Tp 0.72]
*
READ STORM 15.0
[ Ptot= 46.27 mm ]

```

fname : C:\Users\ATrevers\AppData\Local\Temp\b1291b6e-28f9-4b3c-a995-82906428ae34\ac96a74f-15e7-48ab-95ac-remark: 2yr 12hr 15min SCS

* CALIB NASHYD 0308 1 5.0 34.30 0.61 6.67 11.34 0.25 0.000 0.00 0.00

[CN=73.0]

[N = 3.0:Tp 0.46]

* READ STORM 15.0

[Ptot= 46.27 mm]

fname : C:\Users\ATrevers\AppData\Local\Temp\b1291b6e-28f9-4b3c-a995-82906428ae34\ac96a74f-15e7-48ab-95ac-remark: 2yr 12hr 15min SCS

* CALIB NASHYD 0307 1 5.0 8.67 0.13 6.58 9.17 0.20 0.000 0.00 0.00

[CN=68.0]

[N = 3.0:Tp 0.43]

* READ STORM 15.0

[Ptot= 46.27 mm]

fname : C:\Users\ATrevers\AppData\Local\Temp\b1291b6e-28f9-4b3c-a995-82906428ae34\ac96a74f-15e7-48ab-95ac-remark: 2yr 12hr 15min SCS

* CALIB NASHYD 0101 1 5.0 0.62 0.01 6.25 6.27 0.14 0.000 0.00 0.00

[CN=55.7]

[N = 3.0:Tp 0.12]

* ADD [0101+ 0307] 0903 3 5.0 9.29 0.13 6.58 8.98 n/a 0.000 0.00 0.00

* ADD [0308+ 0903] 0906 3 5.0 43.59 0.75 6.67 10.84 n/a 0.000 0.00 0.00

* CHANNEL[2: 0906] 0604 1 5.0 43.59 0.65 6.92 10.83 n/a 0.000

* ADD [0309+ 0310] 0904 3 5.0 123.38 1.37 6.83 9.34 n/a 0.000 0.00 0.00

* ADD [0904+ 0604] 0904 1 5.0 166.97 2.01 6.83 9.73 n/a 0.000 0.00 0.00

=====

V V I SSSSS U U A L (v 6.2.2015)

V V I SS U U A A L

V V I SS U U AAAAA L

V V I SS U U A A L

VV I SSSSS UUUUU A A LLLLL

000 TTTTT TTTTT H H Y Y M M 000 TM

O O T T H H Y Y MM MM O O

O O T T H H Y M M O O

000 T T H H Y M M 000

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***** S U M M A R Y O U T P U T *****

Input filename: C:\Program Files (x86)\Visual OTTHYMO 6.2\vo2\voin.dat

Output filename: C:\Users\ATrevers\AppData\Local\Civica\vh5\1e02d851-4ff1-45b7-b18f-7efd2b836d95\3ebbcdde-4

Summary filename: C:\Users\ATrevers\AppData\Local\Civica\vh5\1e02d851-4ff1-45b7-b18f-7efd2b836d95\3ebbcdde-4

DATE: 04-18-2024 TIME: 09:27:37

USER:

COMMENTS: _____

** SIMULATION : 50yr 12hr 15min SCS **

W/E COMMAND	HYD ID	DT min	AREA ha	Qpeak cms	Tpeak hrs	R.V. mm	R.C.	Qbase cms	TSS mg/l	CONC mg/l	TP	CONC mg/l
START @ 0.00 hrs												

READ STORM 15.0												
[Ptot= 93.59 mm]												
fname : C:\Users\ATrevers\AppData\Local\Temp\b1291b6e-28f9-4b3c-a995-82906428ae34\351e1045-5a55-4177-b7ec-remark: 50yr 12hr 15min SCS												
** CALIB NASHYD	0304	1	5.0	120.37	4.50	7.50	45.85	0.49	0.000	0.00		0.00

```

[CN=75.0
[ N = 3.0:Tp 1.22]
*
READ STORM                      15.0
[ Ptot= 93.59 mm ]
fname : C:\Users\ATrevers\AppData\Local\Temp\b1291b6e-28f9-4b3c-a995-82906428ae34\351e1045-5a55-4177-b7ec-
remark: 50yr 12hr 15min SCS
*
** CALIB NASHYD                  0303  1  5.0  193.95      6.32  7.75  45.34 0.48    0.000    0.00    0.00
[CN=76.0
[ N = 3.0:Tp 1.44]
*
READ STORM                      15.0
[ Ptot= 93.59 mm ]
fname : C:\Users\ATrevers\AppData\Local\Temp\b1291b6e-28f9-4b3c-a995-82906428ae34\351e1045-5a55-4177-b7ec-
remark: 50yr 12hr 15min SCS
*
** CALIB NASHYD                  0302  1  5.0  364.83      4.15 10.42  32.16 0.34    0.000    0.00    0.00
[CN=64.0
[ N = 3.0:Tp 3.48]
*
READ STORM                      15.0
[ Ptot= 93.59 mm ]
fname : C:\Users\ATrevers\AppData\Local\Temp\b1291b6e-28f9-4b3c-a995-82906428ae34\351e1045-5a55-4177-b7ec-
remark: 50yr 12hr 15min SCS
*
** CALIB NASHYD                  0301  1  5.0  335.58      1.41 13.17  17.61 0.19    0.000    0.00    0.00
[CN=44.0
[ N = 3.0:Tp 5.70]
*
CHANNEL[ 2: 0301] 0601  1  5.0  335.58      1.36 14.33  17.61 n/a    0.000
*
ADD [ 0302+ 0303] 0901  3  5.0  558.78      8.82  8.17  36.74 n/a    0.000    0.00    0.00
*
ADD [ 0901+ 0601] 0901  1  5.0  894.36      8.99  8.33  29.56 n/a    0.000    0.00    0.00
*
CHANNEL[ 2: 0901] 0602  1  5.0  894.36      8.80  8.75  29.56 n/a    0.000
*
READ STORM                      15.0
[ Ptot= 93.59 mm ]
fname : C:\Users\ATrevers\AppData\Local\Temp\b1291b6e-28f9-4b3c-a995-82906428ae34\351e1045-5a55-4177-b7ec-
remark: 50yr 12hr 15min SCS
*
** CALIB NASHYD                  0306  1  5.0   12.81      0.36  6.92  23.03 0.25    0.000    0.00    0.00
[CN=52.0
[ N = 3.0:Tp 0.68]
*
READ STORM                      15.0
[ Ptot= 93.59 mm ]
fname : C:\Users\ATrevers\AppData\Local\Temp\b1291b6e-28f9-4b3c-a995-82906428ae34\351e1045-5a55-4177-b7ec-
remark: 50yr 12hr 15min SCS
*
** CALIB NASHYD                  0100  1  5.0   13.85      0.68  6.58  29.11 0.31    0.000    0.00    0.00
[CN=59.8
[ N = 3.0:Tp 0.44]
*
READ STORM                      15.0
[ Ptot= 93.59 mm ]
fname : C:\Users\ATrevers\AppData\Local\Temp\b1291b6e-28f9-4b3c-a995-82906428ae34\351e1045-5a55-4177-b7ec-
remark: 50yr 12hr 15min SCS
*
** CALIB NASHYD                  0305  1  5.0  122.14      6.34  6.83  41.06 0.44    0.000    0.00    0.00
[CN=72.0
[ N = 3.0:Tp 0.68]
*
CHANNEL[ 6: 0000] 1978  3  5.0    0.00      0.00  0.00   0.00 n/a    0.000
*
ADD [ 0100+ 0306] 0905  3  5.0   26.66      0.99  6.67  26.19 n/a    0.000    0.00    0.00
*
ADD [ 0905+ 0603] 0905  1  5.0  148.80      7.29  6.83  38.40 n/a    0.000    0.00    0.00
*
ADD [ 0304+ 0602] 0902  3  5.0 1014.72     12.22  8.17  31.49 n/a    0.000    0.00    0.00
*
ADD [ 0902+ 0905] 0902  1  5.0 1163.52     15.85  7.50  32.37 n/a    0.000    0.00    0.00
*
READ STORM                      15.0
[ Ptot= 93.59 mm ]
fname : C:\Users\ATrevers\AppData\Local\Temp\b1291b6e-28f9-4b3c-a995-82906428ae34\351e1045-5a55-4177-b7ec-
remark: 50yr 12hr 15min SCS
*
* CALIB NASHYD                  0309  1  5.0   43.66      1.98  6.50  23.41 0.25    0.000    0.00    0.00
[CN=53.0
[ N = 3.0:Tp 0.35]
*

```

READ STORM 15.0
 [Ptot= 93.59 mm]
 fname : C:\Users\ATrevers\AppData\Local\Temp\b1291b6e-28f9-4b3c-a995-82906428ae34\351e1045-5a55-4177-b7ec-
 remark: 50yr 12hr 15min SCS
 *
 * CALIB NASHYD 0310 1 5.0 79.72 4.01 6.92 41.37 0.44 0.000 0.00 0.00
 [CN=73.0]
 [N = 3.0:Tp 0.72]
 *
 READ STORM 15.0
 [Ptot= 93.59 mm]
 fname : C:\Users\ATrevers\AppData\Local\Temp\b1291b6e-28f9-4b3c-a995-82906428ae34\351e1045-5a55-4177-b7ec-
 remark: 50yr 12hr 15min SCS
 *
 * CALIB NASHYD 0308 1 5.0 34.30 2.37 6.58 41.19 0.44 0.000 0.00 0.00
 [CN=73.0]
 [N = 3.0:Tp 0.46]
 *
 READ STORM 15.0
 [Ptot= 93.59 mm]
 fname : C:\Users\ATrevers\AppData\Local\Temp\b1291b6e-28f9-4b3c-a995-82906428ae34\351e1045-5a55-4177-b7ec-
 remark: 50yr 12hr 15min SCS
 *
 * CALIB NASHYD 0307 1 5.0 8.67 0.53 6.58 35.55 0.38 0.000 0.00 0.00
 [CN=68.0]
 [N = 3.0:Tp 0.43]
 *
 READ STORM 15.0
 [Ptot= 93.59 mm]
 fname : C:\Users\ATrevers\AppData\Local\Temp\b1291b6e-28f9-4b3c-a995-82906428ae34\351e1045-5a55-4177-b7ec-
 remark: 50yr 12hr 15min SCS
 *
 * CALIB NASHYD 0101 1 5.0 0.62 0.06 6.25 25.57 0.27 0.000 0.00 0.00
 [CN=55.7]
 [N = 3.0:Tp 0.12]
 *
 ADD [0101+ 0307] 0903 3 5.0 9.29 0.55 6.58 34.88 n/a 0.000 0.00 0.00
 *
 ADD [0308+ 0903] 0906 3 5.0 43.59 2.92 6.58 39.84 n/a 0.000 0.00 0.00
 *
 CHANNEL[2: 0906] 0604 1 5.0 43.59 2.35 6.92 39.84 n/a 0.000
 *
 ADD [0309+ 0310] 0904 3 5.0 123.38 5.46 6.75 35.01 n/a 0.000 0.00 0.00
 *
 ADD [0904+ 0604] 0904 1 5.0 166.97 7.71 6.83 36.27 n/a 0.000 0.00 0.00
 *
 =====

V V I SSSSS U U A L (v 6.2.2015)
 V V I SS U U A A L
 V V I SS U U A A A L
 V V I SS U U A A L
 VV I SSSSS UUUUU A A LLLLL

000 TTTT TTTT H H Y Y M M 000 TM
 O O T T H H Y Y MM MM O O
 O O T T H H Y M M O O
 000 T T H H Y M M 000

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***** S U M M A R Y O U T P U T *****

Input filename: C:\Program Files (x86)\visual OTTHYMO 6.2\VO2\voin.dat
 Output filename: C:\Users\ATrevers\AppData\Local\Civica\XH5\1e02d851-4ff1-45b7-b18f-7efd2b836d95\64cab595-2
 Summary filename: C:\Users\ATrevers\AppData\Local\Civica\XH5\1e02d851-4ff1-45b7-b18f-7efd2b836d95\64cab595-2

DATE: 04-18-2024 TIME: 09:27:35
 USER:

COMMENTS: _____

 ** SIMULATION : 5yr 12hr 15min SCS **

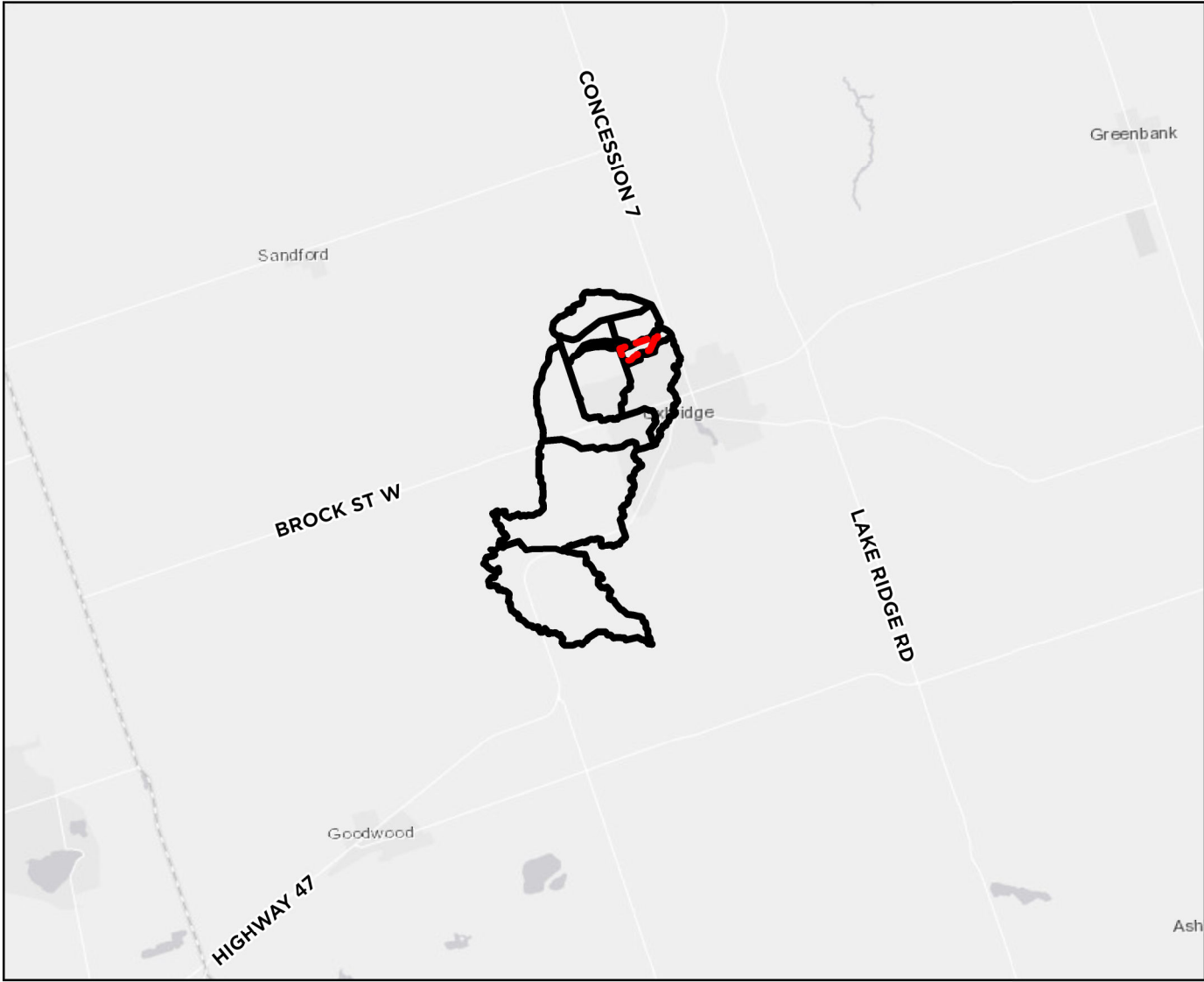
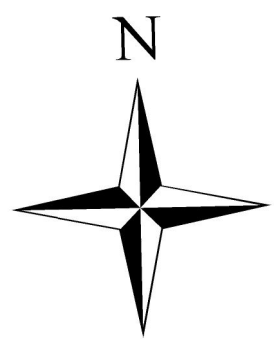
W/E	COMMAND		HYD ID	DT min	AREA ha	Qpeak cms	Tpeak hrs	R.V. mm	R.C.	Qbase cms	TSS mg/l	CONC mg/l	TP CONC mg/l
	START @ 0.00 hrs												

	READ STORM				15.0								
	[Ptot= 61.69 mm]												
	fname : C:\Users\ATrevers\AppData\Local\Temp\b1291b6e-28f9-4b3c-a995-82906428ae34\b46b0555-fbf4-473d-8a4a-												
	remark: 5yr 12hr 15min SCS												
*													
**	CALIB NASHYD		0304	1	5.0	120.37	2.24	7.50	23.20	0.38	0.000	0.00	0.00
	[CN=75.0												
	[N = 3.0:Tp 1.22]												
*													
	READ STORM				15.0								
	[Ptot= 61.69 mm]												
	fname : C:\Users\ATrevers\AppData\Local\Temp\b1291b6e-28f9-4b3c-a995-82906428ae34\b46b0555-fbf4-473d-8a4a-												
	remark: 5yr 12hr 15min SCS												
*													
**	CALIB NASHYD		0303	1	5.0	193.95	3.07	7.75	22.50	0.36	0.000	0.00	0.00
	[CN=76.0												
	[N = 3.0:Tp 1.44]												
*													
	READ STORM				15.0								
	[Ptot= 61.69 mm]												
	fname : C:\Users\ATrevers\AppData\Local\Temp\b1291b6e-28f9-4b3c-a995-82906428ae34\b46b0555-fbf4-473d-8a4a-												
	remark: 5yr 12hr 15min SCS												
*													
**	CALIB NASHYD		0302	1	5.0	364.83	1.88	10.50	14.74	0.24	0.000	0.00	0.00
	[CN=64.0												
	[N = 3.0:Tp 3.48]												
*													
	READ STORM				15.0								
	[Ptot= 61.69 mm]												
	fname : C:\Users\ATrevers\AppData\Local\Temp\b1291b6e-28f9-4b3c-a995-82906428ae34\b46b0555-fbf4-473d-8a4a-												
	remark: 5yr 12hr 15min SCS												
*													
**	CALIB NASHYD		0301	1	5.0	335.58	0.60	13.33	7.43	0.12	0.000	0.00	0.00
	[CN=44.0												
	[N = 3.0:Tp 5.70]												
*													
*	CHANNEL[2: 0301]		0601	1	5.0	335.58	0.56	14.92	7.43	n/a	0.000		
*													
*	ADD [0302+ 0303]		0901	3	5.0	558.78	4.18	8.25	17.43	n/a	0.000	0.00	0.00
*													
*	ADD [0901+ 0601]		0901	1	5.0	894.36	4.22	8.33	13.68	n/a	0.000	0.00	0.00
*													
*	CHANNEL[2: 0901]		0602	1	5.0	894.36	4.11	8.75	13.68	n/a	0.000		
*													
	READ STORM				15.0								
	[Ptot= 61.69 mm]												
	fname : C:\Users\ATrevers\AppData\Local\Temp\b1291b6e-28f9-4b3c-a995-82906428ae34\b46b0555-fbf4-473d-												

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* ADD [ 0902+ 0905] 0902 1 5.0 1163.52 7.51 7.58 15.28 n/a 0.000 0.00 0.00
* READ STORM 15.0
  [ Ptot= 61.69 mm ]
  fname : C:\Users\ATrevers\AppData\Local\Temp\b1291b6e-28f9-4b3c-a995-82906428ae34\b46b0555-fbf4-473d-8a4a-
  remark: 5yr 12hr 15min SCS
* * CALIB NASHYD 0309 1 5.0 43.66 0.84 6.50 10.22 0.17 0.000 0.00 0.00
  [CN=53.0 ]
  [ N = 3.0:Tp 0.35]
* READ STORM 15.0
  [ Ptot= 61.69 mm ]
  fname : C:\Users\ATrevers\AppData\Local\Temp\b1291b6e-28f9-4b3c-a995-82906428ae34\b46b0555-fbf4-473d-8a4a-
  remark: 5yr 12hr 15min SCS
* * CALIB NASHYD 0310 1 5.0 79.72 1.89 6.92 19.99 0.32 0.000 0.00 0.00
  [CN=73.0 ]
  [ N = 3.0:Tp 0.72]
* READ STORM 15.0
  [ Ptot= 61.69 mm ]
  fname : C:\Users\ATrevers\AppData\Local\Temp\b1291b6e-28f9-4b3c-a995-82906428ae34\b46b0555-fbf4-473d-8a4a-
  remark: 5yr 12hr 15min SCS
* * CALIB NASHYD 0308 1 5.0 34.30 1.11 6.58 19.84 0.32 0.000 0.00 0.00
  [CN=73.0 ]
  [ N = 3.0:Tp 0.46]
* READ STORM 15.0
  [ Ptot= 61.69 mm ]
  fname : C:\Users\ATrevers\AppData\Local\Temp\b1291b6e-28f9-4b3c-a995-82906428ae34\b46b0555-fbf4-473d-8a4a-
  remark: 5yr 12hr 15min SCS
* * CALIB NASHYD 0307 1 5.0 8.67 0.24 6.58 16.51 0.27 0.000 0.00 0.00
  [CN=68.0 ]
  [ N = 3.0:Tp 0.43]
* READ STORM 15.0
  [ Ptot= 61.69 mm ]
  fname : C:\Users\ATrevers\AppData\Local\Temp\b1291b6e-28f9-4b3c-a995-82906428ae34\b46b0555-fbf4-473d-8a4a-
  remark: 5yr 12hr 15min SCS
* * CALIB NASHYD 0101 1 5.0 0.62 0.03 6.25 11.45 0.19 0.000 0.00 0.00
  [CN=55.7 ]
  [ N = 3.0:Tp 0.12]
* ADD [ 0101+ 0307] 0903 3 5.0 9.29 0.25 6.58 16.17 n/a 0.000 0.00 0.00
* ADD [ 0308+ 0903] 0906 3 5.0 43.59 1.36 6.58 19.06 n/a 0.000 0.00 0.00
* CHANNEL[ 2: 0906] 0604 1 5.0 43.59 1.13 7.00 19.05 n/a 0.000
* ADD [ 0309+ 0310] 0904 3 5.0 123.38 2.49 6.75 16.53 n/a 0.000 0.00 0.00
* ADD [ 0904+ 0604] 0904 1 5.0 166.97 3.58 6.83 17.19 n/a 0.000 0.00 0.00
*

```

KEY PLAN

LEGEND

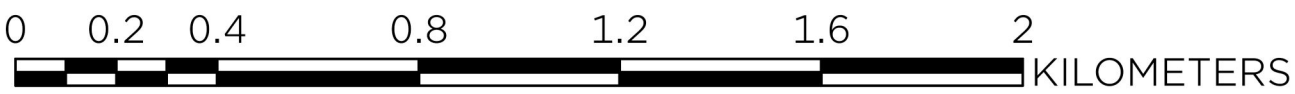
- SUBJECT PROPERTY
- CATCHMENTS
- WATERCOURSE

CATCHMENT ID
CN NUMBER/% IMPERVIOUS
CATCHMENT AREA (ha)

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MAPLE BRIDGE RESIDENTIAL
DEVELOPMENT - PHASE 2
TOWNSHIP OF UXBRIDGE
MASON HOMES LIMITED



DESIGN: AT	FILE: 422492	MAP:
DRAWN: ASO	DATE: APR. 2024	ODP-1
CHECK: AT	SCALE: 1: 15,000	

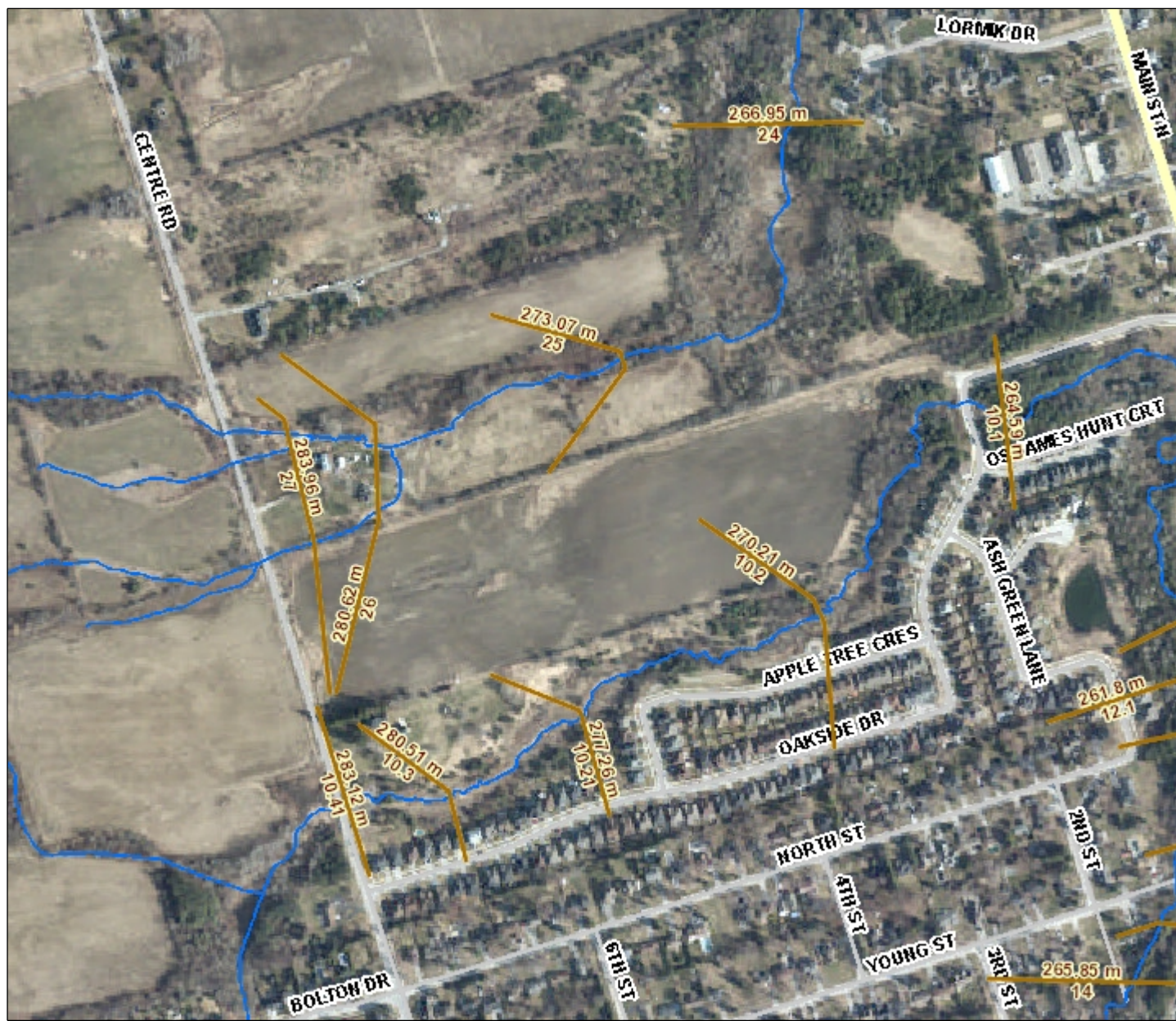
Appendix B: LSRCA HEC-2 Model Results



APID 300195 - Uxbridge Brook Tributaries - Hydraulic Cross Sections and Regulatory Flood Elevations

Features

- LSRCA Watershed Boundary
- LSPP Watershed Boundary
- Cross Sections - Engineering
- Watercourse
- Lake Simcoe
- Roads
 - Hwy 400 Series
 - Highway, Arterials
 - Local Road
- Railway
- Lower Tier Municipality



Printed On:
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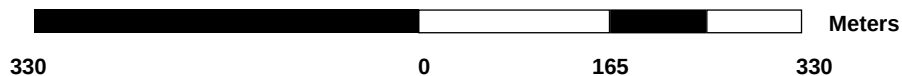


WGS_1984_Web_Mercator_
Auxiliary_Sphere

Mapped By: KN

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Scale 1: 6,491



HEC-2 RESULTS - WATERCOURSE 4.0

HEC-RAS Plan: LSRCA HEC2 River: RIVER-1 Reach: Reach-1 Profile: PF 1

Reach	River Sta	Profile	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
Reach-1	35	PF 1	7.72	283.50	283.96	283.96	284.08	0.021661	1.72	5.47	23.84	1.15
Reach-1	34	PF 1	7.72	280.00	280.62	280.62	280.78	0.017540	1.90	4.63	14.91	1.09
Reach-1	33	PF 1	7.72	272.70	273.07	273.07	273.17	0.020074	2.29	7.17	35.83	1.20
Reach-1	32	PF 1	7.72	266.50	266.96	266.96	267.08	0.017080	2.42	6.55	26.68	1.14
Reach-1	31	PF 1	21.40	260.50	261.59	261.59	261.80	0.009778	3.27	18.02	41.13	1.00
Reach-1	30	PF 1	21.40	256.96	259.55		259.56	0.000364	0.88	99.64	94.95	0.18
Reach-1	29	PF 1	21.40	256.96	259.54	259.11	259.55	0.000369	0.89	99.11	94.70	0.18
Reach-1	28	PF 1	21.40	256.96	259.55	258.29	259.55	0.000117	0.50	99.42	94.85	0.10
Reach-1	27.5	Bridge										
Reach-1	27	PF 1	21.40	256.96	259.08		259.09	0.000420	0.83	60.32	73.60	0.18
Reach-1	26	PF 1	21.40	256.96	259.08	258.86	259.09	0.000421	0.83	60.29	73.58	0.18
Reach-1	25	PF 1	21.40	256.96	259.07		259.08	0.000429	0.83	59.81	73.28	0.18
Reach-1	24	PF 1	21.40	256.73	259.06	258.30	259.06	0.000167	0.35	85.23	75.80	0.08
Reach-1	23	PF 1	21.40	256.73	259.06	257.92	259.06	0.000128	0.65	84.85	75.40	0.14
Reach-1	22.5	Bridge										
Reach-1	22	PF 1	21.40	256.73	258.00		258.15	0.004445	2.38	21.95	47.09	0.75
Reach-1	21	PF 1	21.40	256.73	258.05	258.05	258.10	0.005974	1.37	24.15	48.20	0.42
Reach-1	20	PF 1	21.40	256.50	257.50		257.56	0.008815	1.69	22.24	41.95	0.56
Reach-1	19	PF 1	21.40	256.00	256.43		256.48	0.005370	1.14	26.02	79.57	0.57

CROSS SECTION 27

HEC-2 RESULTS - WATERCOURSE 6.1

HEC-RAS Plan: LSRCA HEC 2 River: RIVER-1 Reach: Reach-1 Profile: PF 1

Reach	River Sta	Profile	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
Reach-1	95	PF 1	9.70	324.00	324.62		324.67	0.008095	1.79	11.94	53.35	0.74
Reach-1	94	PF 1	9.70	322.10	323.00	322.92	323.08	0.005641	1.84	10.45	31.07	0.64
Reach-1	93	PF 1	9.70	320.90	321.12	321.12	321.21	0.020217	1.31	7.57	45.68	1.00
Reach-1	92	PF 1	12.58	315.22	319.37		319.37	0.000013	0.27	92.29	43.32	0.04
Reach-1	91	PF 1	12.58	315.22	319.10	317.07	319.31	0.000116	2.03	6.21	40.56	0.33
Reach-1	90.5		Bridge									
Reach-1	90	PF 1	12.58	315.22	317.07	317.07	317.99	0.001366	4.25	2.96	19.95	1.00
Reach-1	89	PF 1	12.58	315.22	316.25	316.25	316.53	0.012214	3.19	6.53	11.57	1.00
Reach-1	88	PF 1	12.58	311.00	312.04		312.04	0.000046	0.20	65.98	72.01	0.06
Reach-1	87	PF 1	12.58	311.50	312.01	311.85	312.03	0.003070	0.64	19.71	77.31	0.40
Reach-1	86	PF 1	12.58	311.50	311.85	311.85	311.94	0.021993	1.33	9.48	54.03	1.01
Reach-1	85	PF 1	12.58	308.00	309.72		309.73	0.000029	0.22	64.71	49.55	0.05
Reach-1	84	PF 1	12.58	307.80	309.72		309.72	0.000016	0.18	87.74	67.38	0.04
Reach-1	83	PF 1	16.11	309.00	309.68	309.48	309.71	0.003127	0.84	21.40	59.12	0.44
Reach-1	82	PF 1	16.11	309.00	309.48	309.48	309.61	0.019745	1.61	11.16	46.06	1.04
Reach-1	81	PF 1	16.11	301.64	307.88		307.88	0.000019	0.28	169.47	63.80	0.04
Reach-1	80	PF 1	16.11	301.64	307.88	303.97	307.88	0.000019	0.28	169.46	63.80	0.04
Reach-1	79	PF 1	16.11	301.64	307.88	303.48	307.88	0.000003	0.16	169.47	63.80	0.02
Reach-1	78.5		Bridge									
Reach-1	78	PF 1	16.11	301.64	305.44		305.44	0.000074	0.56	50.54	33.72	0.09
Reach-1	77	PF 1	16.11	301.64	303.97	303.97	305.10	0.021942	4.72	3.42	15.72	1.00
Reach-1	76	PF 1	16.11	301.64	303.41	303.41	303.73	0.013030	3.01	7.00	10.55	0.73
Reach-1	75	PF 1	16.11	294.80	297.50		297.50	0.000051	0.38	106.82	137.07	0.07
Reach-1	74	PF 1	16.11	289.30	297.50		297.50	0.000000	0.02	1667.29	303.25	0.00
Reach-1	73	PF 1	16.11	281.70	297.50		297.50	0.000000	0.01	3741.14	310.00	0.00
Reach-1	72	PF 1	16.11	274.06	297.50		297.50	0.000000	0.00	8164.29	409.00	0.00
Reach-1	71	PF 1	16.11	274.06	297.50	275.87	297.50	0.000000	0.00	8164.29	409.00	0.00
Reach-1	70	PF 1	16.11	274.06	297.50	275.04	297.50	0.000000	0.01	8164.29	409.00	0.00
Reach-1	69.5		Bridge									
Reach-1	69	PF 1	16.11	274.06	297.50		297.50	0.000000	0.01	8164.29	409.00	0.00
Reach-1	68	PF 1	16.11	274.06	297.50	275.35	297.50	0.000000	0.00	8164.29	409.00	0.00
Reach-1	67	PF 1	16.11	274.06	297.50		297.50	0.000000	0.00	8164.29	409.00	0.00
Reach-1	66	PF 1	37.22	273.90	297.50	275.06	297.50	0.000000	0.01	4123.92	190.00	0.00
Reach-1	65	PF 1	16.53	284.15	297.50		297.50	0.000000	0.01	2134.91	170.00	0.00
Reach-1	64	PF 1	16.53	284.15	297.50		297.50	0.000000	0.01	2134.91	170.00	0.00
Reach-1	63	PF 1	16.53	282.30	297.50		297.50	0.000000	0.01	2219.05	170.00	0.00
Reach-1	62	PF 1	16.53	279.90	297.50		297.50	0.000000	0.01	2358.03	156.00	0.00
Reach-1	61	PF 1	16.53	276.75	297.50		297.50	0.000000	0.01	3863.44	210.00	0.00
Reach-1	60	PF 1	16.53	269.20	297.50		297.50	0.000000	0.00	7713.22	300.00	0.00
Reach-1	59	PF 1	16.53	263.60	297.50		297.50	0.000000	0.00	5516.46	180.00	0.00
Reach-1	58	PF 1	51.68	255.50	297.50		297.50	0.000000	0.01	10759.32	285.00	0.00
Reach-1	57	PF 1	4.43	296.70	297.45	297.33	297.50	0.005634	1.05	6.38	25.51	0.60
Reach-1	56	PF 1	13.75	294.90	295.69	295.55	295.79	0.008659	2.49	21.17	46.15	0.89
Reach-1	55	PF 1	13.75	291.90	292.57	292.57	292.81	0.021594	3.52	12.76	27.97	1.37
Reach-1	54	PF 1	13.75	288.00	289.28		289.28	0.000062	0.29	78.28	118.50	0.08
Reach-1	53	PF 1	13.75	287.28	289.15	289.07	289.25	0.002667	1.90	33.32	90.28	0.45
Reach-1	52	PF 1	13.75	287.28	289.19	288.94	289.21	0.000552	0.88	37.00	94.04	0.20
Reach-1	51.5		Bridge									
Reach-1	51	PF 1	13.75	287.28	289.08		289.11	0.001267	1.27	26.45	82.79	0.31
Reach-1	50	PF 1	13.75	287.28	289.07	288.94	289.11	0.001287	1.28	26.28	82.60	0.31
Reach-1	49	PF 1	13.75	287.28	288.93	288.93	289.05	0.003866	2.10	15.62	63.48	0.53
Reach-1	48	PF 1	13.75	285.70	286.56	286.10	286.58	0.001463	0.68	27.87	170.23	0.32
Reach-1	47	PF 1	13.75	284.90	285.17	285.17	285.26	0.058609	2.80	12.45	62.21	1.73
Reach-1	46	PF 1	25.22	283.08	283.61		283.62	0.001466	0.66	74.39	197.46	0.30
Reach-1	45	PF 1	25.22	281.85	283.21	283.17	283.31	0.008013	1.75	27.38	103.23	0.72
Reach-1	44	PF 1	25.22	280.23	281.28		281.33	0.009454	1.80	31.58	77.74	0.75
Reach-1	43	PF 1	25.22	277.80	279.01	279.01	279.17	0.008201	2.34	21.47	63.14	0.76
Reach-1	42	PF 1	25.22	274.56	276.10		276.15	0.002986	1.47	28.91	49.28	0.47
Reach-1	41	PF 1	37.22	273.90	275.34		275.43	0.004240	2.20	33.22	46.87	0.60
Reach-1	40	PF 1	42.95	272.70	273.95	273.95	274.29	0.017221	4.24	22.43	43.50	1.21
Reach-1	39	PF 1	42.95	270.53	272.36		272.38	0.000822	1.13	106.51	170.76	0.27
Reach-1	38	PF 1	42.95	270.53	272.33	272.30	272.36	0.001326	1.42	100.87	169.31	0.34
Reach-1	37.5		Bridge									
Reach-1	37	PF 1	42.95	270.53	271.93	271.93	272.08	0.006033	2.56	42.78	68.15	0.69
Reach-1	36	PF 1	42.95	270.53	271.89		272.06	0.007048	2.72	40.04	65.86	0.75
Reach-1	35	PF 1	42.95	269.30	271.48		271.52	0.001581	2.02	59.66	87.15	0.44
Reach-1	34	PF 1	42.95	269.40	271.45		271.46	0.000251	0.78	152.25	156.58	0.17
Reach-1	33	PF 1	42.95	268.48	271.43	271.10	271.45	0.000436	1.14	116.20	168.91	0.21
Reach-1	32	PF 1	42.95	268.48	271.43	270.12	271.45	0.000163	0.96	116.64	169.16	0.18
Reach-1	31.5		Bridge									
Reach-1	31	PF 1	42.95	268.48	271.15		271.19	0.000415	1.43	72.62	141.93	0.28
Reach-1	30	PF 1	42.95	268.48	271.15	270.87	271.18	0.000478	1.11	73.38	142.45	0.22
Reach-1	29	PF 1	42.95	268.30	270.39	270.39	270.97	0.006680	4.45	15.01	12.55	0.98
Reach-1	28	PF 1	42.95	267.10	269.55		269.67	0.002732	2.64	53.28	63.22	0.54

HEC-2 RESULTS - WATERCOURSE 6.1

HEC-RAS Plan: LSRCA HEC 2 River: RIVER-1 Reach: Reach-1 Profile: PF 1 (Continued)

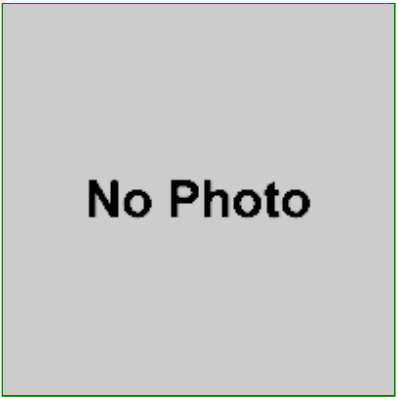
Reach	River Sta	Profile	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
Reach-1	27	PF 1	42.95	266.35	269.57	268.90	269.59	0.000441	1.13	139.57	130.00	0.20
Reach-1	26	PF 1	42.95	266.35	269.58	267.88	269.59	0.000106	0.84	140.20	130.70	0.15
Reach-1	25.5	Bridge										
Reach-1	25	PF 1	42.95	266.35	268.73		268.76	0.000435	1.38	70.28	66.16	0.29
Reach-1	24	PF 1	42.95	266.35	268.66	268.66	268.74	0.001916	2.06	65.98	64.07	0.43
Reach-1	23	PF 1	42.95	266.35	268.26	268.05	268.47	0.005221	3.00	42.96	51.47	0.70
Reach-1	22	PF 1	42.95	264.80	266.19	266.19	266.55	0.013482	4.24	20.97	28.49	1.15
Reach-1	21	PF 1	42.95	263.70	265.86		265.89	0.000839	1.37	83.11	85.75	0.30
Reach-1	20	PF 1	42.95	263.50	265.80		265.82	0.000434	0.85	75.14	66.91	0.21
Reach-1	19	PF 1	42.95	262.86	265.79	265.07	265.80	0.000249	0.88	135.67	129.71	0.16
Reach-1	18	PF 1	42.95	262.86	265.75	264.55	265.79	0.000322	1.40	130.85	127.74	0.26
Reach-1	17.5	Bridge										
Reach-1	17	PF 1	42.95	262.86	265.06	264.55	265.31	0.001901	2.84	55.36	91.38	0.61
Reach-1	16	PF 1	42.95	262.86	265.10	265.10	265.27	0.002172	2.46	59.03	93.47	0.53
Reach-1	15	PF 1	42.95	262.10	263.49		263.58	0.004589	2.81	51.23	63.76	0.76
Reach-1	14	PF 1	42.95	260.00	261.87	261.87	262.21	0.006531	3.38	21.47	31.09	0.80
Reach-1	13	PF 1	42.95	259.80	261.84		261.87	0.000604	0.92	55.58	57.91	0.21
Reach-1	12	PF 1	42.95	260.20	261.84		261.87	0.000612	1.04	54.97	57.88	0.26
Reach-1	11	PF 1	42.95	260.20	261.83		261.87	0.003625	1.85	54.52	57.68	0.46
Reach-1	10	PF 1	42.95	259.10	261.83	261.20	261.87	0.003409	1.37	56.25	57.80	0.27
Reach-1	9	PF 1	42.95	259.80	261.17	261.17	261.48	0.011911	3.64	36.20	55.03	1.03
Reach-1	8	PF 1	51.68	255.50	259.57		259.57	0.000015	0.28	332.18	169.75	0.04
Reach-1	7	PF 1	51.68	255.50	259.57	258.48	259.57	0.000015	0.28	332.14	169.74	0.04
Reach-1	6	PF 1	51.68	255.50	259.57	256.92	259.57	0.000091	0.70	331.32	169.59	0.11
Reach-1	5.5	Bridge										
Reach-1	5	PF 1	51.68	255.50	259.54		259.54	0.000095	0.71	326.20	168.65	0.11
Reach-1	4	PF 1	51.68	255.50	259.54	258.17	259.54	0.000095	0.71	326.19	168.65	0.11
Reach-1	3	PF 1	51.68	254.62	257.61	257.61	259.10	0.008310	5.40	9.56	92.44	1.00
Reach-1	2	PF 1	51.68	255.60	257.82		257.85	0.000392	0.88	113.38	103.27	0.20
Reach-1	1	PF 1	221.00	253.50	256.79	256.63	257.36	0.005152	4.72	156.41	109.97	0.84

Appendix C: COSINE Station Reports

	Ontario Ministry of Natural Resources and Forestry	COSINE Station Report Retrieval Date: 2023-Feb-21
	Control Survey Information Exchange AKA Names: 00131U517S, 31U517S, 517S, VA159S Number of Ref Sketches: 0 Networks [usage]:	Station: 0011931U517S Known Status: Existing Last Reported Visit: Monument Type: BM Station Type: SPIR

Location Description:

UXBRIDGE - UNITED CHURCH, TABLET IN SOUTH SIDEWALL, 17.2 M FROM
SOUTHEAST CORNER, 1.57 M BELOW BRICKWORK, MIDWAY BETWEEN TWO LARGE
BASEMENT WINDOWS.



Horizontal (Ellipsoidal) Control Data

Datum: NAD-1983:ORIG	Horiz Order: Unclassified	Ellipsoidal Order: Unclassified
Latitude: N44° 6' 36.6xxxxx"	Longitude: W79° 7' 10.7xxxxx"	Ellipsoidal elev: 236.XXX
*UTM Zone: 17 E: E650476.XXX	N: N4885830.XXX	C. S. F.: 0.99984140
		Mrdl Conv: 1° 18' 32.5"
*MTM Zone: 10 E: E335246.XXX	N: N4885648.XXX	C. S. F.: 0.99987431
		Mrdl Conv: 0° 15' 53.0"

Vertical (Geoidal) Control Data

Datum: CGVD2013	Vert Order: Second Order	Elevation: 272.067
Geoid:	Meridional defl:	Prime vert defl:
		Undulation:

Datum: CGVD28:78	Vert Order: Second Order	Elevation: 272.439
Geoid:	Meridional defl:	Prime vert defl:
		Undulation:

Maintenance / History

Date	Description
2019-Mar-20	Found Feb 2016, appears stable. Approx coords updated with GPS.

Reference Sketches

Reference sketch for 0011931U517S is not available.



Ontario Ministry of Natural Resources
and Forestry

COSINE Station Report

Retrieval Date: 2023-Feb-21

Control Survey Information Exchange

Station:

00819778487

Known Status: Existing

Last Reported Visit:

Monument Type: BM

Station Type: SPIR

AKA Names: 778487

Number of Ref Sketches: 0

Networks [usage]:

Location Description:

778487: TWO STOREY RED BRICK HOUSE ON SOUTH SIDE OF HWY 47 (BROCK ST) IN THE TOWN OF UXBRIDGE, 118.9 M EAST OF MARIETTA ST, 18.4 M WEST OF FRANKLIN ST AND 15.9 M SOUTH OF CENTERLINE OF HWY 47. TABLET IS SET HORIZONTALLY IN EAST FACE OF CONCRETE FOUNDATION, 3.9 M SOUTH OF N.E. CORNER, 30 CM ABOVE GROUND LEVEL AND 34 CM BELOW BRICKWORK.

No Photo

Horizontal (Ellipsoidal) Control Data

Datum: NAD-1983:ORIG	Horiz Order: Unclassified	Ellipsoidal Order: Unclassified
Latitude: N44° 6' 35.5xxxxx"	Longitude: W79° 7' 02.9xxxxx"	Ellipsoidal elev: 238.XXX
*UTM Zone: 17 E: E650651.XXX	N: N4885798.XXX	C. S. F.: 0.99984174
*MTM Zone: 10 E: E335420.XXX	N: N4885612.XXX	C. S. F.: 0.99987414
		Mrdl Conv: 1° 18' 38.0"
		Mrdl Conv: 0° 15' 58.5"

Vertical (Geoidal) Control Data

Datum: CGVD2013	Vert Order: First Order	Elevation: 273.981
Geoid:	Meridional defl:	Prime vert defl:
		Undulation:
Datum: CGVD28:78	Vert Order: First Order	Elevation: 274.359
Geoid:	Meridional defl:	Prime vert defl:
		Undulation:

Maintenance / History

Date	Description
2019-Mar-20	Found Feb 2016, appears stable. Approx coords updated with GPS.

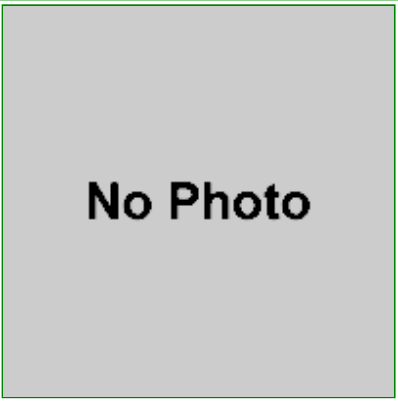
Reference Sketches

Reference sketch for 00819778487 is not available.

	Ontario Ministry of Natural Resources and Forestry	COSINE Station Report Retrieval Date: 2023-Feb-21
	Control Survey Information Exchange	Station: 00819778488
AKA Names: 778488	Known Status: Existing	
Number of Ref Sketches: 0	Last Reported Visit:	
Networks [usage]:	Monument Type: CAP	
	Station Type: SPIR	

Location Description:

778488: STEEL ROD WITH BRASS CAP BENCH MARK ON NORTH SIDE OF HWY 47, 1.9 KM EAST OF DURHAM REG RD 1 IN THE TOWN OF UXBRIDGE, 0.5 KM WEST OF DURHAM REG RD 23 AND 18.0 M NORTH OF CENTERLINE OF HWY 47. BENCH MARK IS LOCATED 28.8 M EAST OF HYDRO POLE, 52 CM SOUTH OF NORTH RIGHT-OF-WAY FENCELINE AND 45 CM WEST OF A BLACK AND YELLOW MARKER POST.


Horizontal (Ellipsoidal) Control Data

Datum: NAD-1983:ORIG	Horiz Order: Unclassified	Ellipsoidal Order: Unclassified
Latitude: N44° 6' 53.2xxxxx"	Longitude: W79° 5' 52.9xxxxx"	Ellipsoidal elev: 232.XXX
*UTM Zone: 17 E: E652193.XXX	N: N4886380.XXX	C. S. F.: 0.99984850
*MTM Zone: 10 E: E336973.XXX	N: N4886166.XXX	C. S. F.: 0.99987635
		Mrdl Conv: 1° 19' 27.1"
		Mrdl Conv: 0° 16' 47.3"

Vertical (Geoidal) Control Data

Datum: CGVD2013	Vert Order: First Order	Elevation: 267.526
Geoid:	Meridional defl:	Prime vert defl:
		Undulation:

Datum: CGVD28:78	Vert Order: First Order	Elevation: 267.903
Geoid:	Meridional defl:	Prime vert defl:
		Undulation:

Maintenance / History

Date	Description
2019-Mar-20	Found Oct 26, 2013 - appears stable. MTO

Reference Sketches

Reference sketch for 00819778488 is not available.

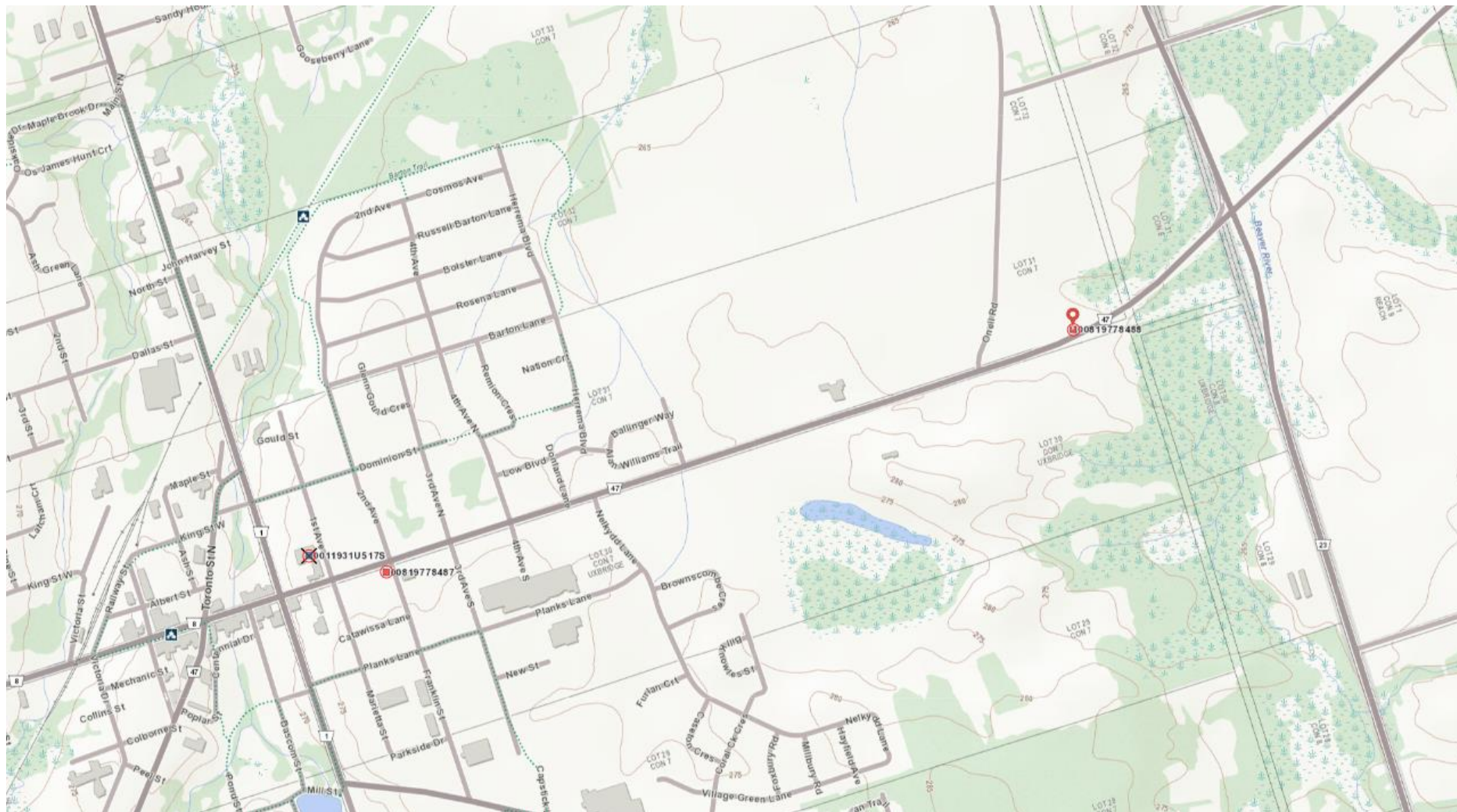


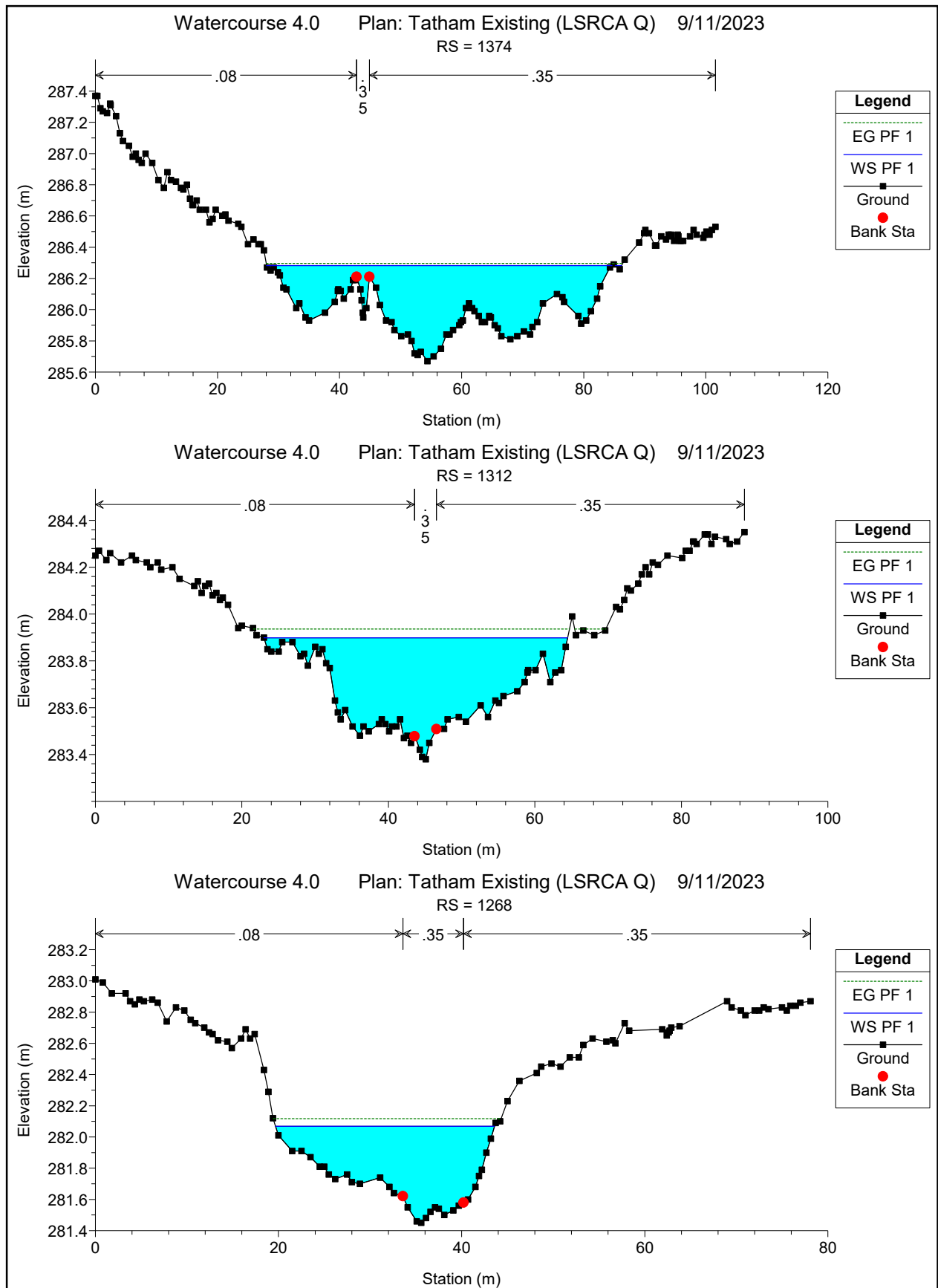
Figure 1: COSINE analysis benchmark locations.

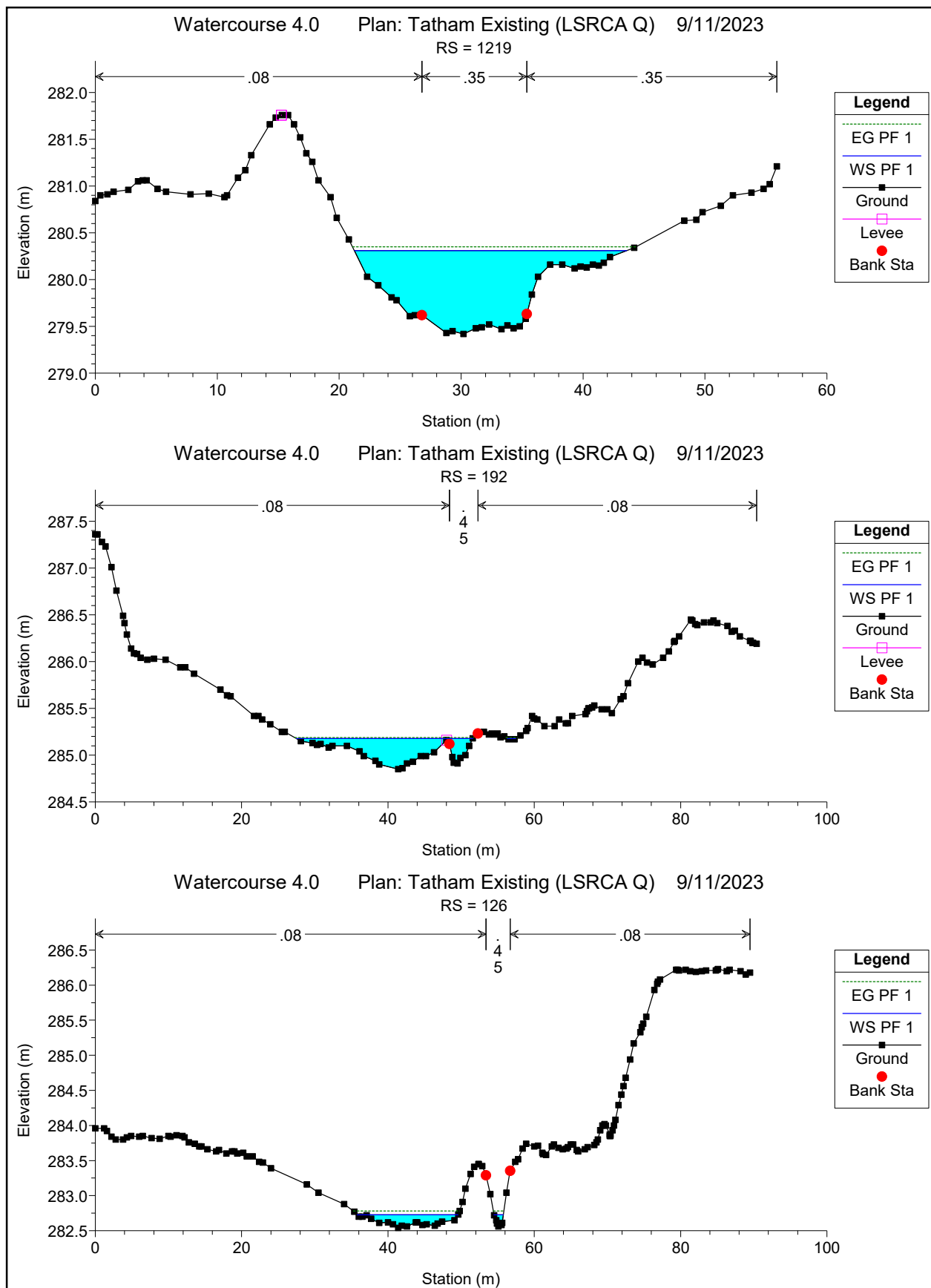


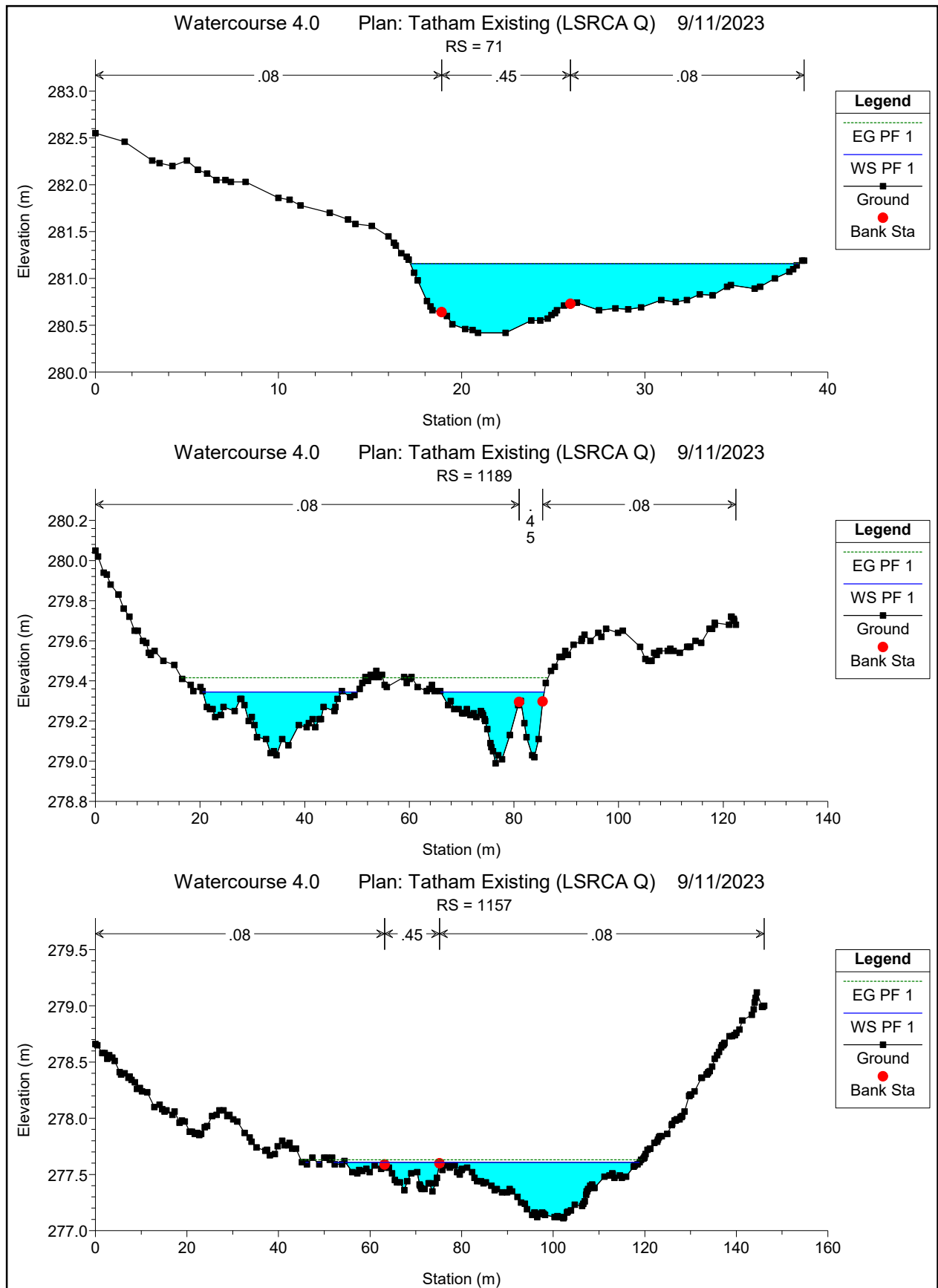
Appendix D: Watercourse 4.0 Existing Condition HEC-RAS Model Results

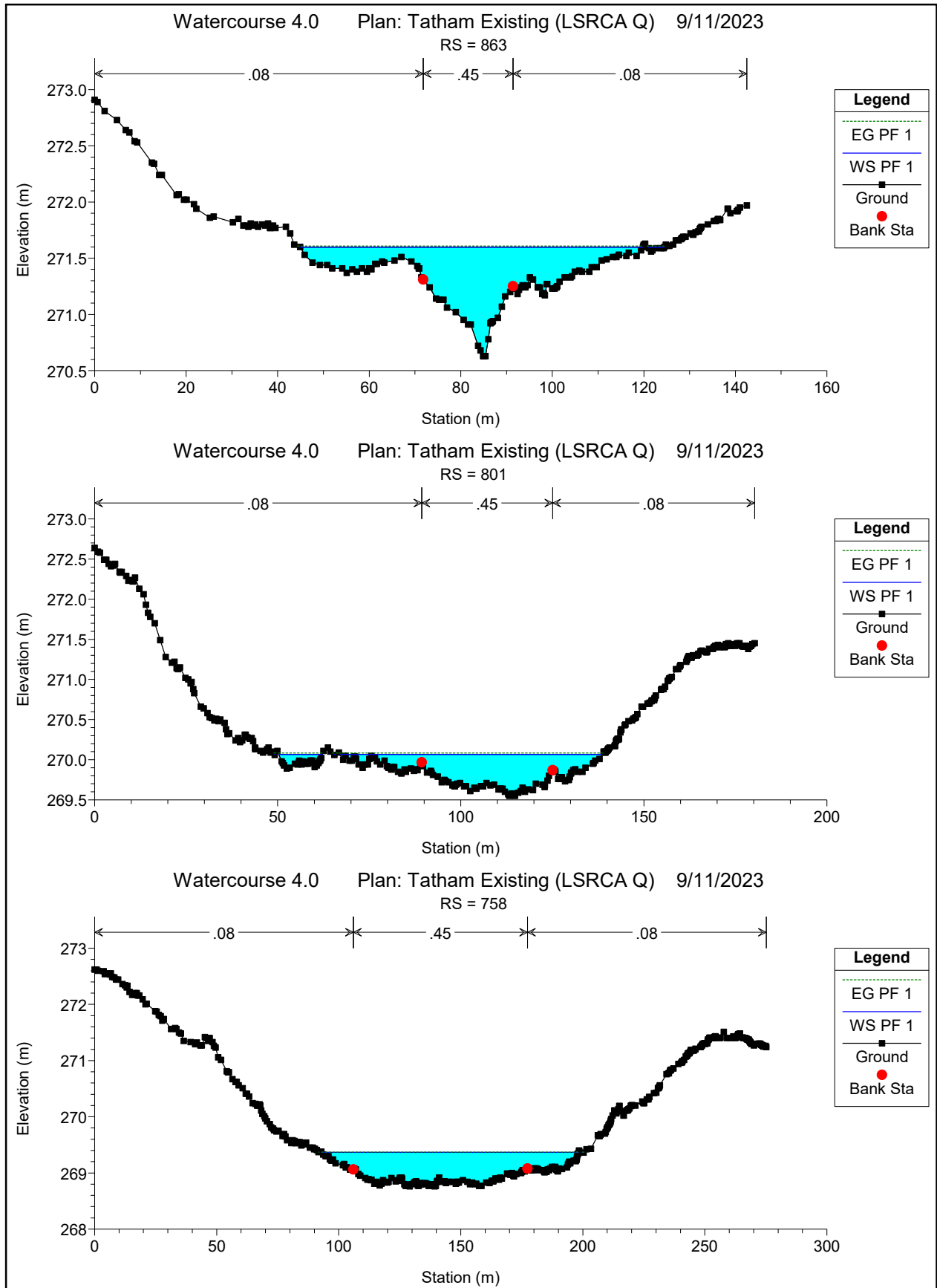
HEC-RAS Plan: Tatham Existing (LSRCA Q) Profile: Hazel

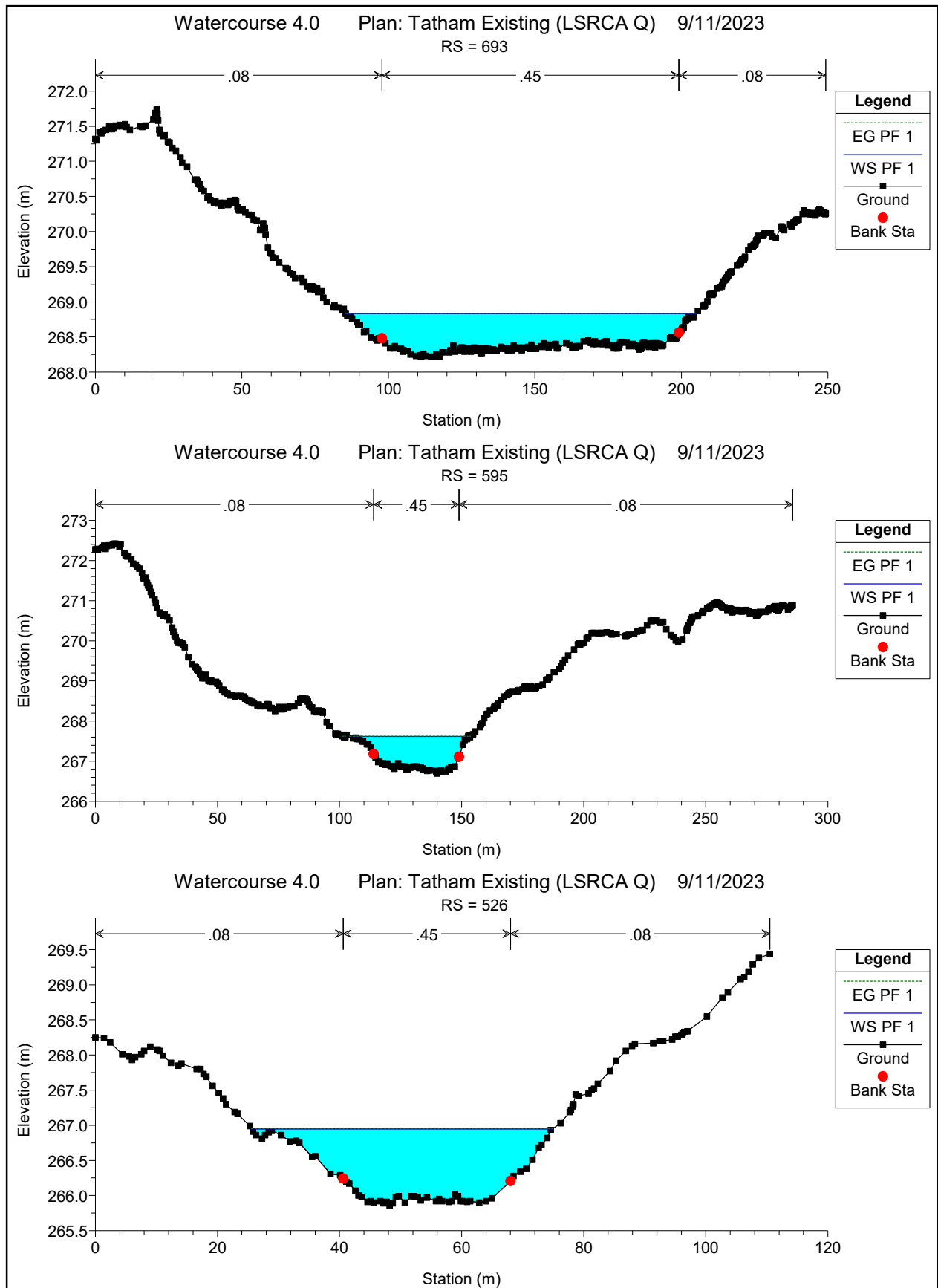
Reach	River Sta	Profile	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Left (m/s)	Vel Chnl (m/s)	Vel Right (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl	Volume (1000 m3)
Reach 2	1374	Hazel	6.16	285.95	286.28		286.30	0.034027	0.80	0.18	0.26	17.48	57.63	0.13	1.86
Reach 2	1312	Hazel	6.16	283.38	283.90		283.94	0.043120	0.98	0.35	0.23	10.55	41.46	0.17	1.05
Reach 2	1268	Hazel	6.16	281.45	282.07		282.12	0.044457	1.13	0.40	0.27	8.55	23.91	0.17	0.64
Reach 2	1219	Hazel	6.16	279.42	280.31	279.90	280.35	0.028038	1.22	0.42	0.15	10.95	22.31	0.15	0.15
Reach 3	192	Hazel	1.56	284.91	285.18	285.07	285.19	0.016638	0.47	0.09	0.06	3.80	25.22	0.07	1.06
Reach 3	126	Hazel	1.56	282.56	282.73	282.73	282.78	0.138442	1.04	0.18		1.61	15.07	0.18	0.89
Reach 3	71	Hazel	1.56	280.42	281.16		281.16	0.001801	0.25	0.07	0.26	9.34	21.20	0.03	0.58
Reach 1	1189	Hazel	7.72	279.02	279.34	279.34	279.42	0.118175	1.20	0.26	0.35	7.15	48.84	0.19	35.26
Reach 1	1157	Hazel	7.72	277.35	277.61		277.63	0.021150	0.26	0.09	0.70	12.91	67.45	0.08	34.94
Reach 1	1121	Hazel	7.72	276.07	276.56		276.58	0.036252	0.77	0.22	0.79	11.80	55.86	0.11	34.47
Reach 1	1074	Hazel	7.72	275.11	275.61		275.63	0.016521	0.50	0.16	0.57	15.82	73.11	0.08	33.90
Reach 1	1030	Hazel	7.72	274.28	274.80	274.70	274.82	0.024415	0.57	0.18	0.70	12.45	55.81	0.09	33.32
Reach 1	973	Hazel	7.72	272.91	273.52		273.53	0.020442	0.51	0.20	0.72	25.48	68.60	0.09	32.22
Reach 1	924	Hazel	7.72	271.92	272.63	272.34	272.66	0.016241	0.84	0.21	0.57	17.19	37.06	0.08	31.20
Reach 1	888	Hazel	7.72	271.38	272.03		272.05	0.018057	0.68	0.19	0.65	20.67	55.92	0.09	30.52
Reach 1	863	Hazel	7.72	270.63	271.60	271.26	271.61	0.015310	0.45	0.19	0.56	22.18	78.40	0.08	29.96
Reach 1	801	Hazel	7.72	269.55	270.07		270.08	0.036220	0.60	0.23	0.83	20.26	83.94	0.12	28.60
Reach 1	758	Hazel	7.72	268.76	269.37		269.37	0.007577	0.35	0.12	0.45	43.76	105.78	0.05	27.13
Reach 1	693	Hazel	7.72	268.22	268.83		268.84	0.009088	0.43	0.13	0.28	52.26	119.64	0.06	24.04
Reach 1	595	Hazel	7.72	266.69	267.62		267.62	0.018148	0.45	0.25	0.59	28.78	50.42	0.09	20.06
Reach 1	526	Hazel	7.72	265.86	266.95		266.95	0.005815	0.41	0.17	0.52	33.97	49.32	0.05	17.88
Reach 1	425	Hazel	7.72	264.11	264.52	264.52	264.75	3.657510		1.59	3.79	4.38	24.11	1.06	15.95
Reach 1	299	Hazel	21.40	262.48	263.41		263.43	0.005361	0.24	0.12	0.58	52.00	96.49	0.05	12.86
Reach 1	186	Hazel	21.40	261.14	262.11		262.15	0.033373	0.87	0.36	1.12	38.71	64.89	0.13	7.62
Reach 1	20	Hazel	21.40	258.52	259.94	259.33	259.96	0.007063	0.45	0.20	0.72	53.29	77.17	0.06	

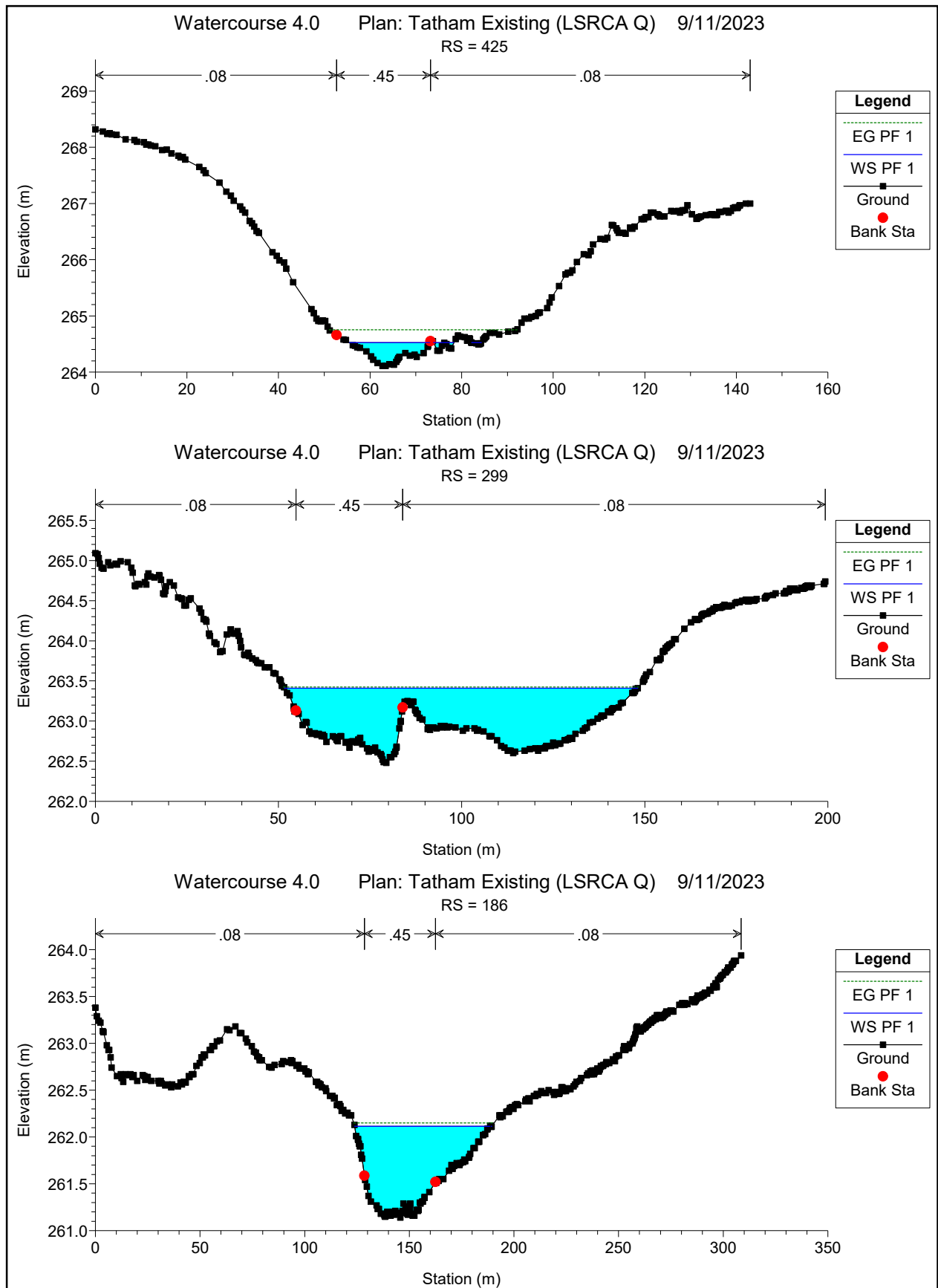




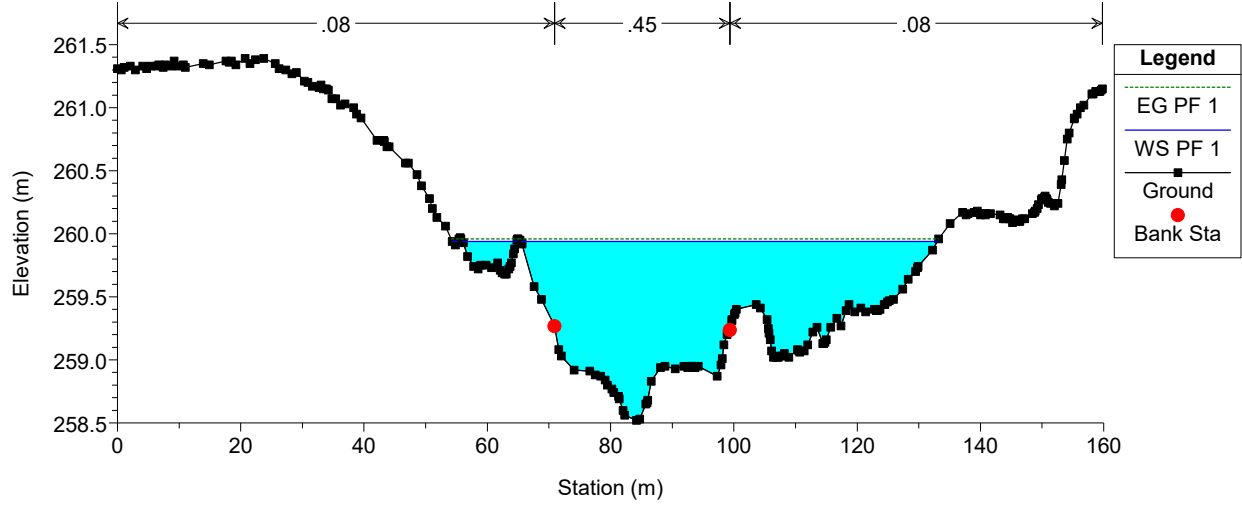


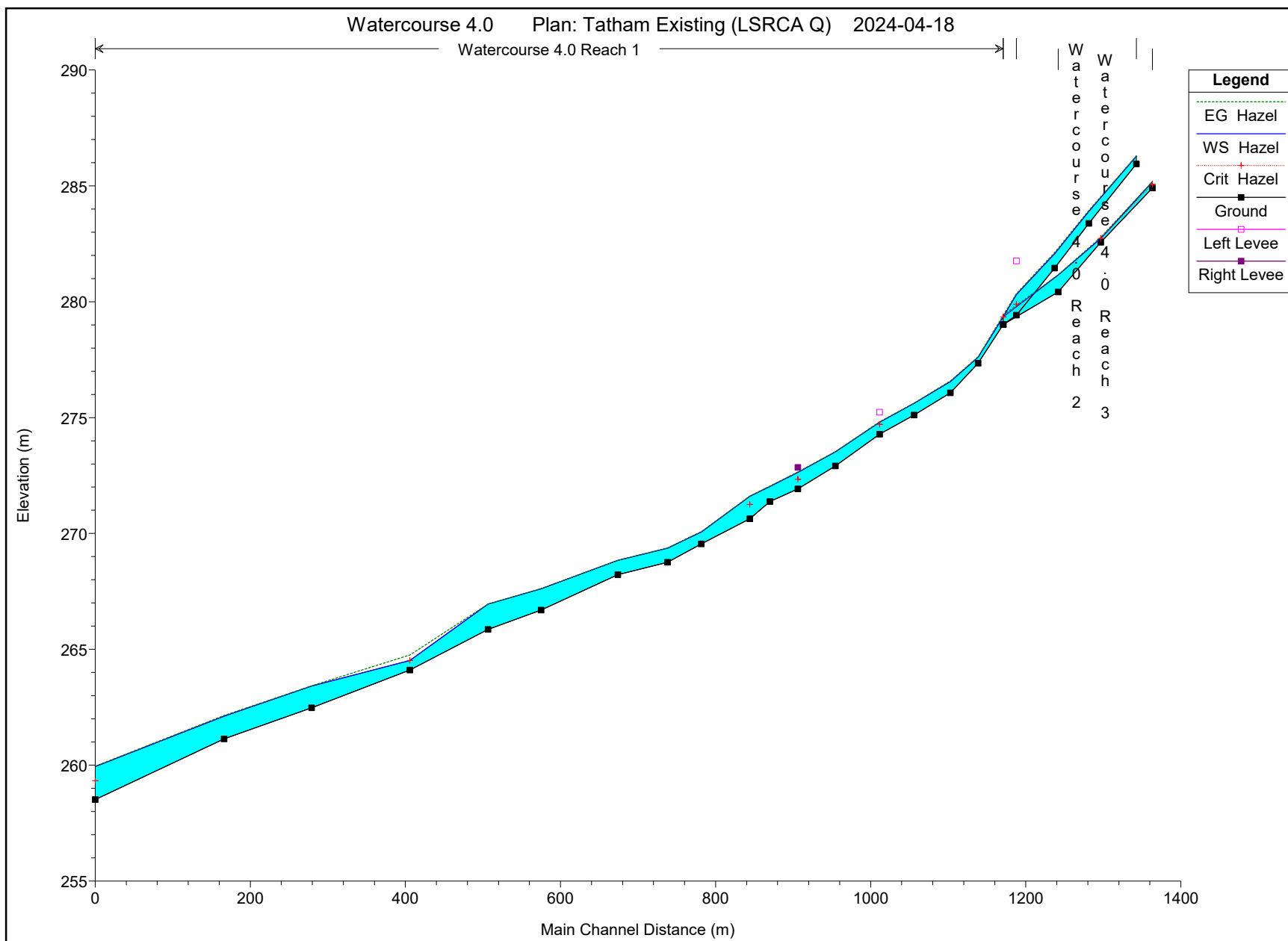






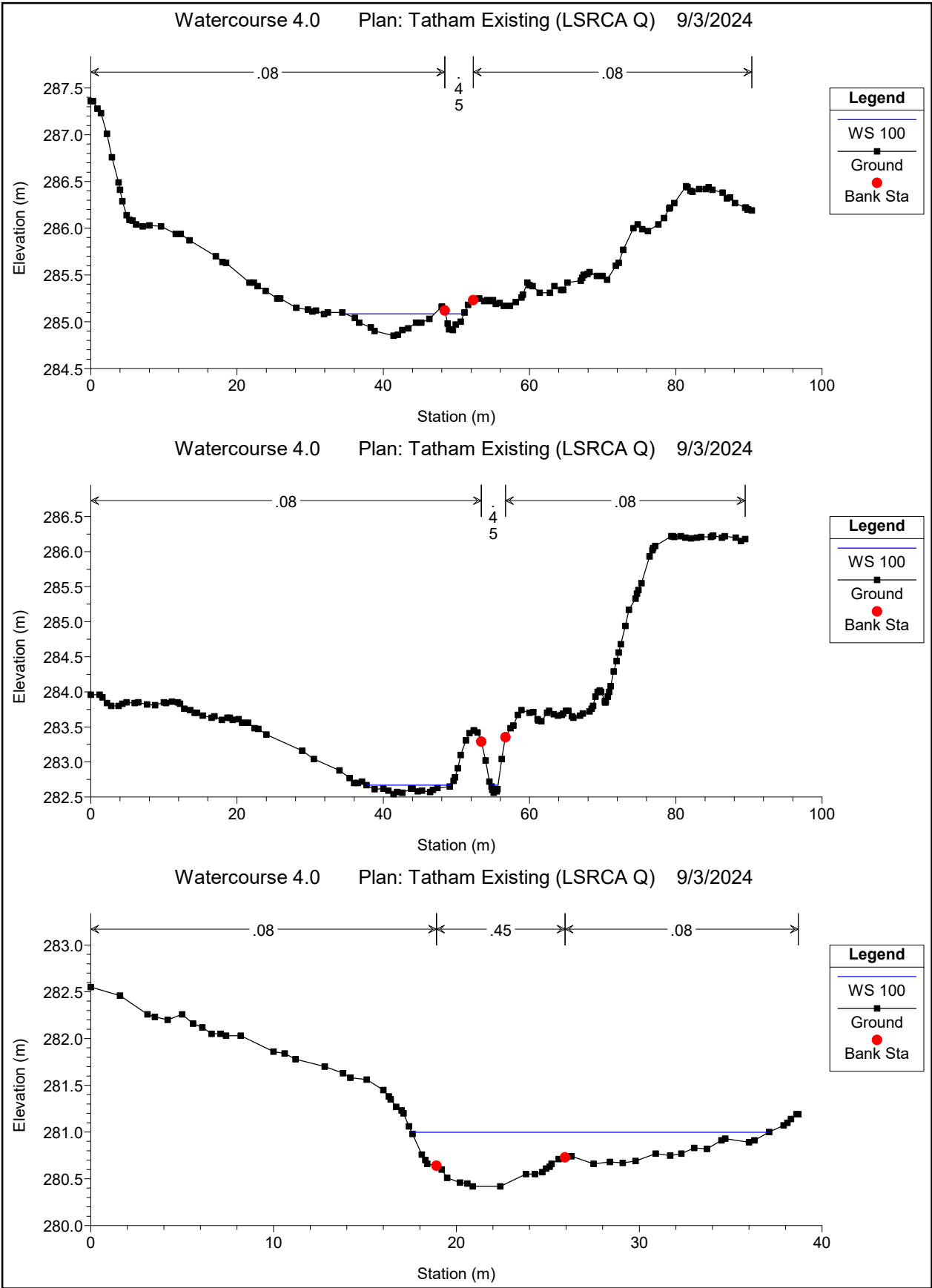
Watercourse 4.0 Plan: Tatham Existing (LSRCA Q) 9/11/2023
RS = 20



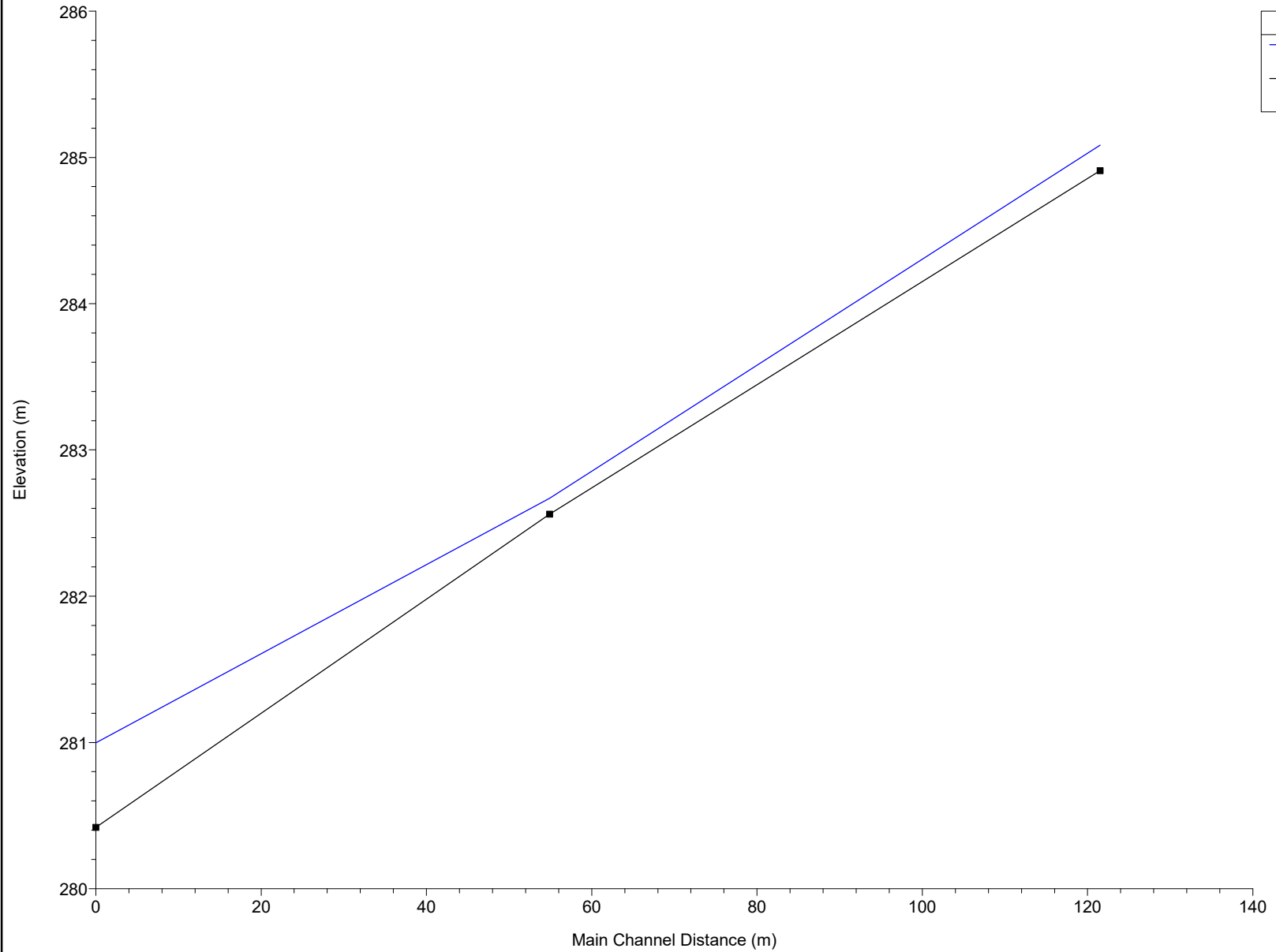


HEC-RAS Plan: Tatham Existing (LSRCA Q) River: Watercourse 4.0 Reach: Reach 3 Profile: 100

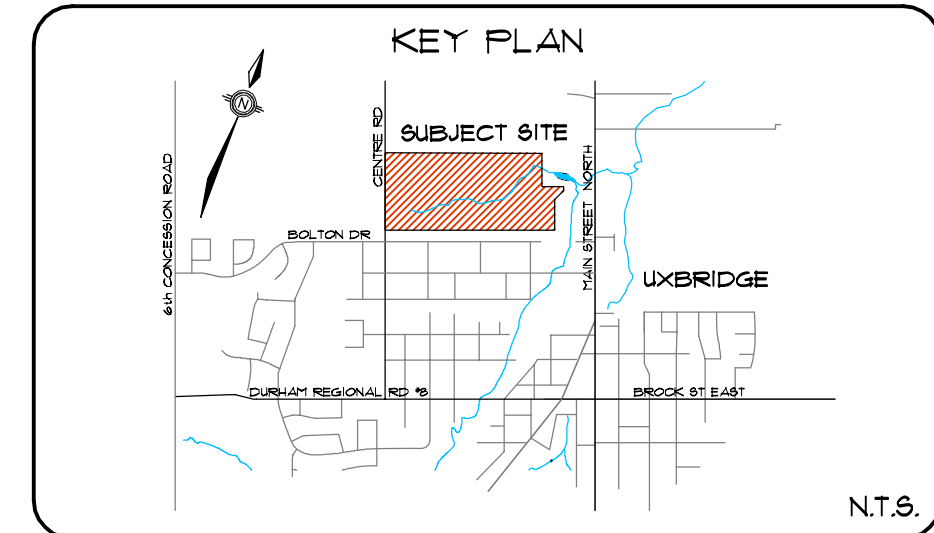
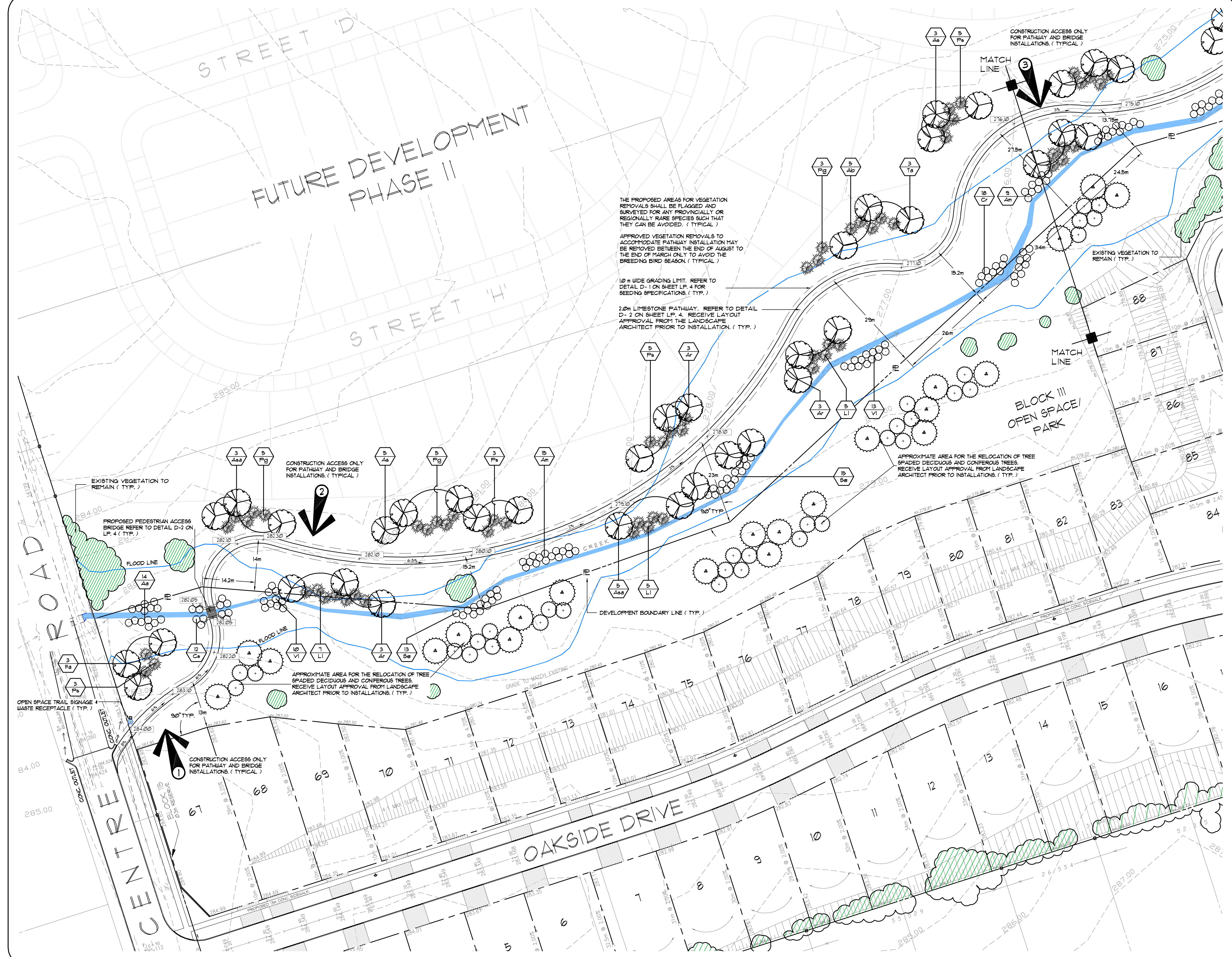
Reach	River Sta	Profile	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Left (m/s)	Vel Chnl (m/s)	Vel Right (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl	Volume (1000 m3)
Reach 3	192	100	0.65	284.91	285.08	285.00	285.09	0.015616	0.40	0.06		1.85	14.94	0.06	0.64
Reach 3	126	100	0.65	282.56	282.67	282.67	282.70	0.162879	0.83	0.16		0.84	12.49	0.18	0.55
Reach 3	71	100	0.65	280.42	281.00		281.00	0.001513	0.18	0.05	0.17	6.08	19.52	0.02	0.36



Legend	
WS 100	
Ground	■



Appendix E: Watercourse 6.1 Existing Condition HEC-RAS Model Results



LEGEND

- EXISTING VEGETATION TO REMAIN (TYP.)
- PROPOSED CONIFEROUS, DECIDUOUS TREES AND SHRUBS (TYP.)
- EXISTING VEGETATION RELOCATED BY TREESPADE (TYP.)
- PROPOSED PEDESTRIAN PATHWAY AND BRIDGE (TYP.)
- CONSTRUCTION ACCESS ONLY FOR PATHWAY AND BRIDGE INSTALLATIONS. (TYP.)

NO.	REVISIONS	DATE	APPRVD.
5	REVISED AS PER JAN. 21/05 LERCA COMMENTS	MAR. 24/05	NS
4	REVISED AS PER TOWNSHIP COMMENTS	OCT. 1/04	NS
3	TOWNSHIP SUBMISSION FOR APPROVAL	JUNE 29/04	NS
2	SUBMITTED FOR TENDER TO ROBERTS BELL ENG. LTD.	JUNE 18/04	NS
1	CLIENT SUBMISSION FOR COMMENT	MAY 11/04	NS

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SIGNED _____ DATE _____

TOWN OF UXBRIDGE APPROVED

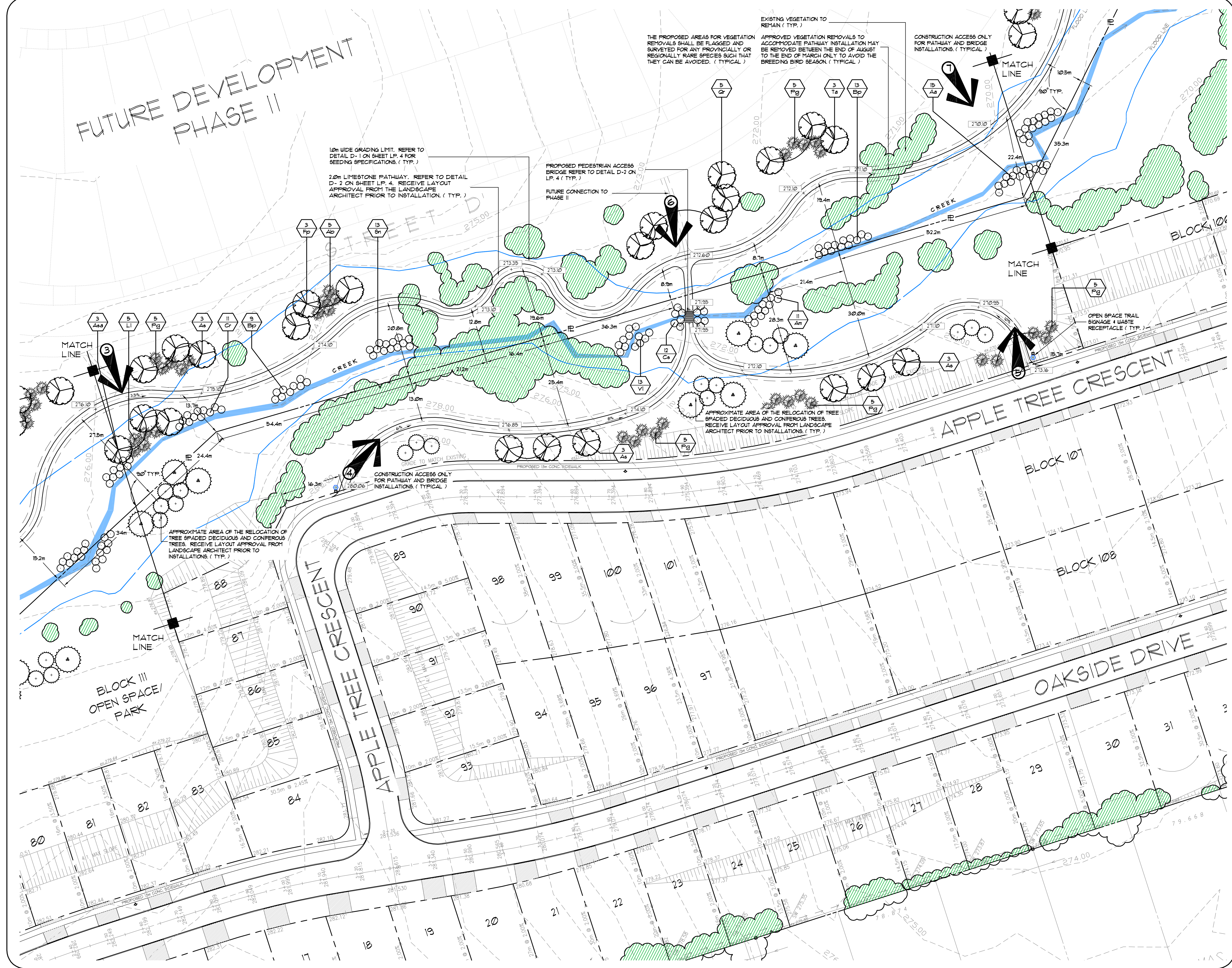
DATE _____
PRINT NAME _____
SIGNED _____

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Ecological Planners
Landscape Architects
Site Planners
RR#3, Box#322
Shanley Bay, Ontario
L0L 2L0
Fax: 705-722-5660
Tel: 705-722-6278

MAPLE BRIDGE DEVELOPMENT
PART OF LOT 33, CONCESSION 6
TOWNSHIP OF UXBRIDGE
REGIONAL MUNICIPALITY OF DURHAM
OPEN SPACE CORRIDOR

SCALE: 1:5000	DATE PLOTTED: JUNE 25, 2004	DESIGNED BY: N. BLA16	REVIEWED BY: J. BELL
FILE REF. • SUB 97-3	OUR FILE REF. • 521A-03	DRAWN BY: N. BLA16	LP. 1 of 4



KEY PLAN

LEGEND

- EXISTING VEGETATION TO REMAIN (TYP.)
- PROPOSED CONIFEROUS, DECIDUOUS TREES AND SHRUBS (TYP.)
- EXISTING VEGETATION RELOCATED BY TREESPADE (TYP.)
- PROPOSED PEDESTRIAN PATHWAY AND BRIDGE (TYP.)
- CONSTRUCTION ACCESS ONLY FOR PATHWAY AND BRIDGE INSTALLATIONS (TYPICAL)

NO.	REVISIONS	DATE	APPRVD.
5	REVISED AS PER JAN 21/05 LBRCA COMMENTS	MAR 24/05	NB
4	REVISED AS PER TOWNSHIP COMMENTS	OCT 1/04	NB
3	TOWNSHIP SUBMISSION FOR APPROVAL	JUNE 25/04	NB
2	SUBMITTED FOR TENDER TO ROBERTS BELL ENG. LTD.	JUNE 10/04	NB
1	CLIENT SUBMISSION FOR COMMENT	MAY 11/04	NB

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TOWN OF UXBRIDGE
APPROVED

DATE _____

PRINT NAME _____

SIGNED _____

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STAMP

JOHN D. BELL ASSOCIATES LTD.

Ecological Planners
Landscape Architects
Site Planners

RR#3, Box#322
Shanty Bay, Ontario
L0L 2L0

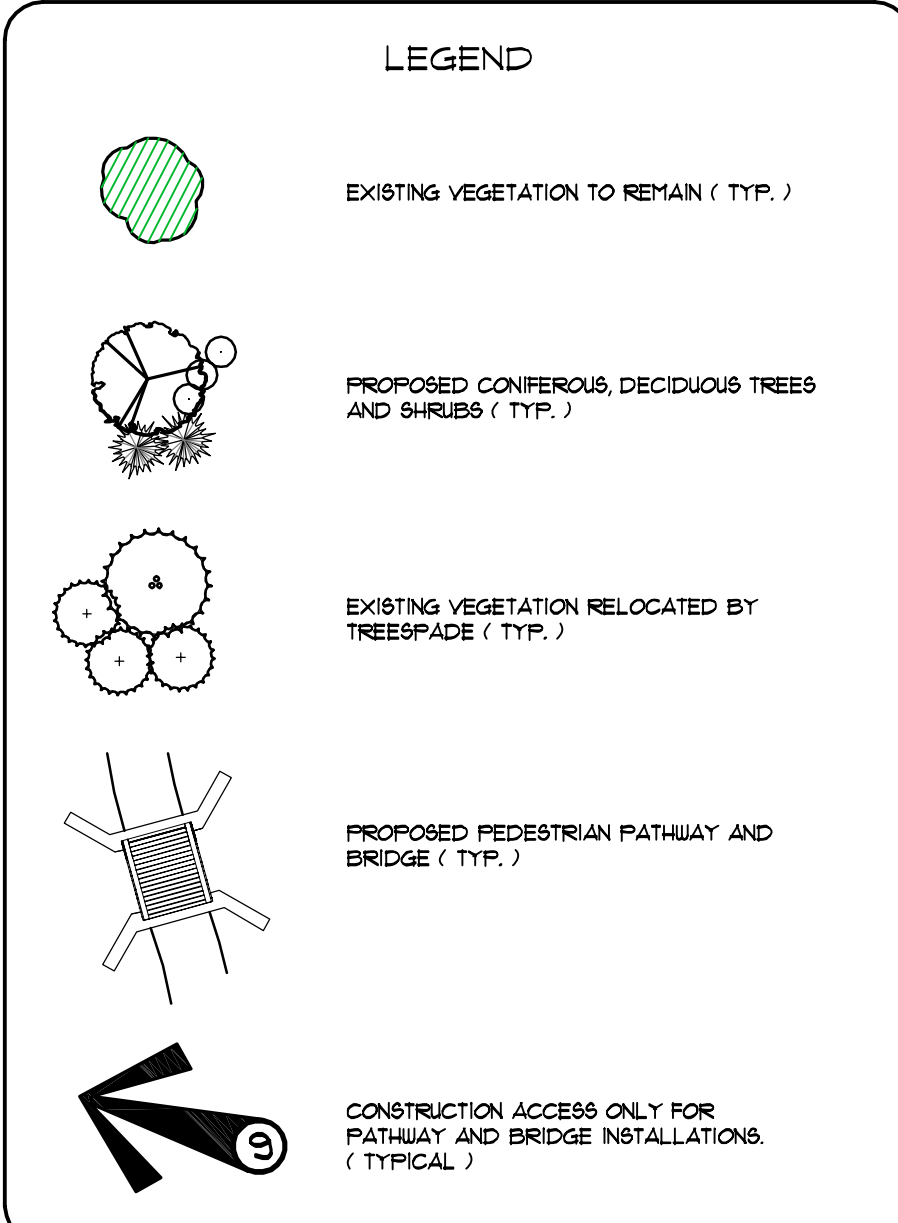
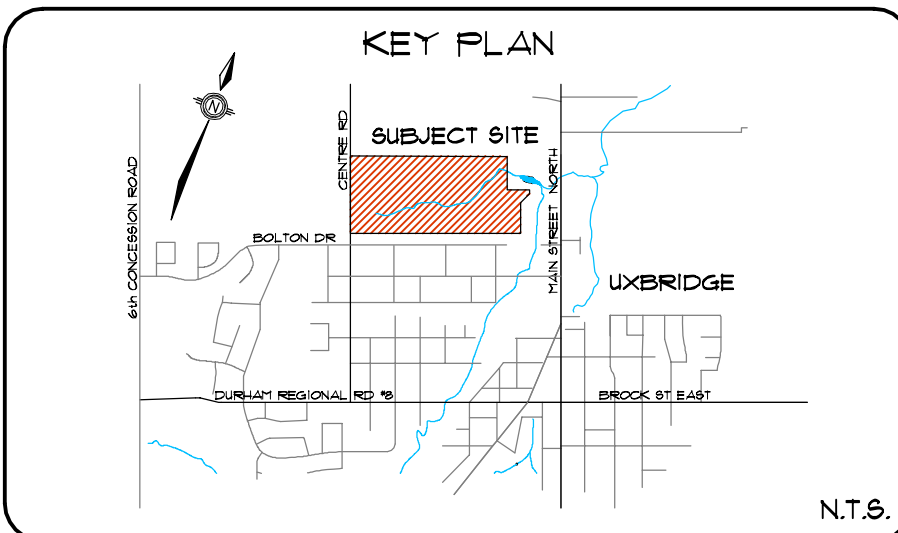
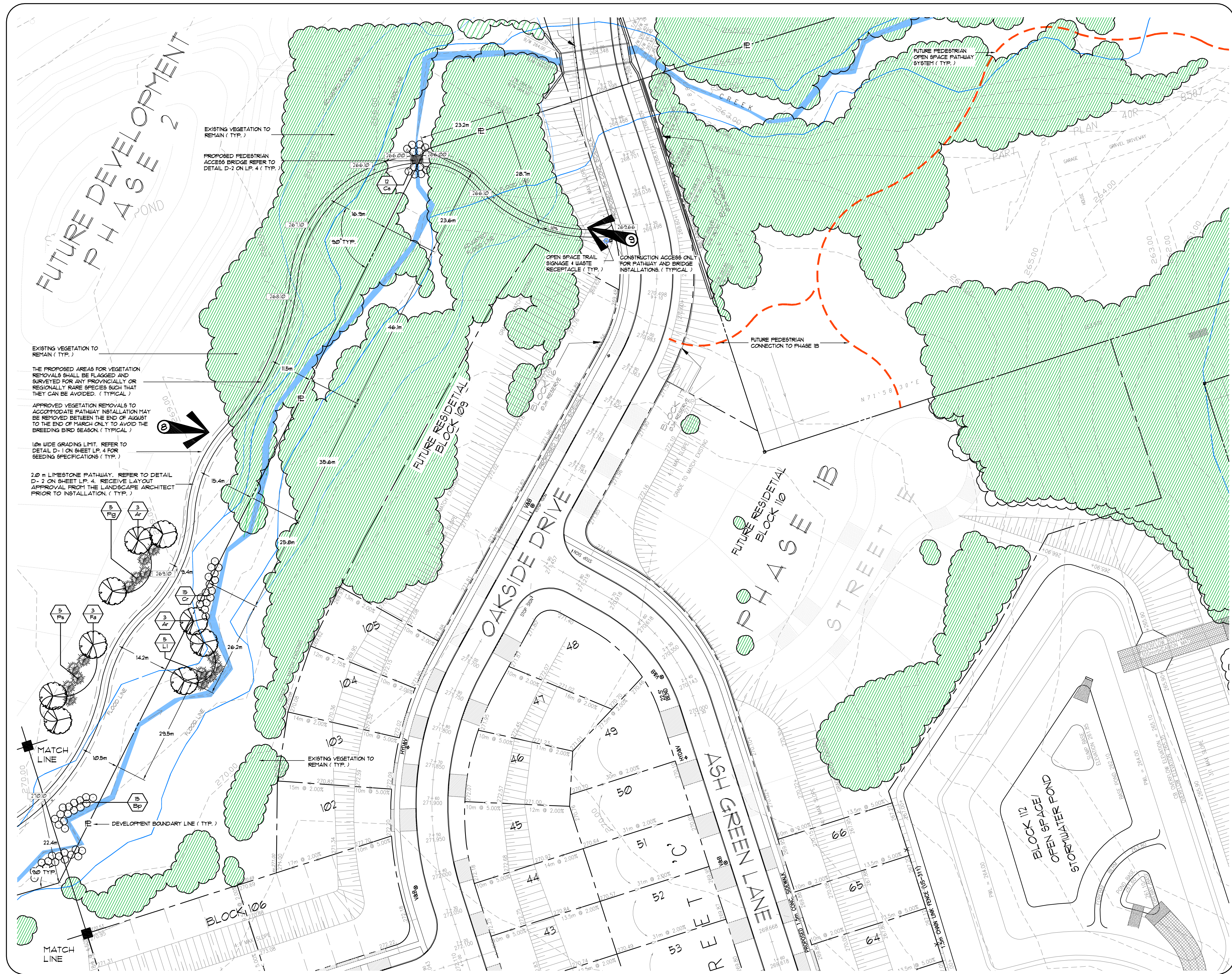
Fax: 705-722-5660
Tel: 705-722-5278

MAPLE BRIDGE
DEVELOPMENT

PART OF LOT 33, CONCESSION 6
TOWNSHIP OF UXBRIDGE
REGIONAL MUNICIPALITY OF DURHAM

OPEN SPACE CORRIDOR

SCALE: 1:500	DATE PLOTTED: JUNE 25, 2004	DESIGNED BY: N. BLAIS	REVIEWED BY: J. BELL
FILE REF. * SUB 91-3	OUR FILE REF. * 521A-03	DRAWN BY: N. BLAIS	LP. 2 of 4



No.	REVISIONS	DATE	APPRD.
5	REVISED AS PER JAN. 21/05 LARCA COMMENTS	MAR. 24/05	NB
4	REVISED AS PER TOWNSHIP COMMENTS	OCT. 1/04	NB
3	TOWNSHIP SUBMISSION FOR APPROVAL	JUNE 25/04	NB
2	SUBMITTED FOR TENDER TO ROBERTS BELL ENG. LTD.	JUNE 10/04	NB
1	CLIENT SUBMISSION FOR COMMENT	MAY 11/04	NB

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SIGNED _____ DATE _____

TOWN OF UXBRIDGE
APPROVED

DATE _____
PRINT NAME _____
SIGNED _____

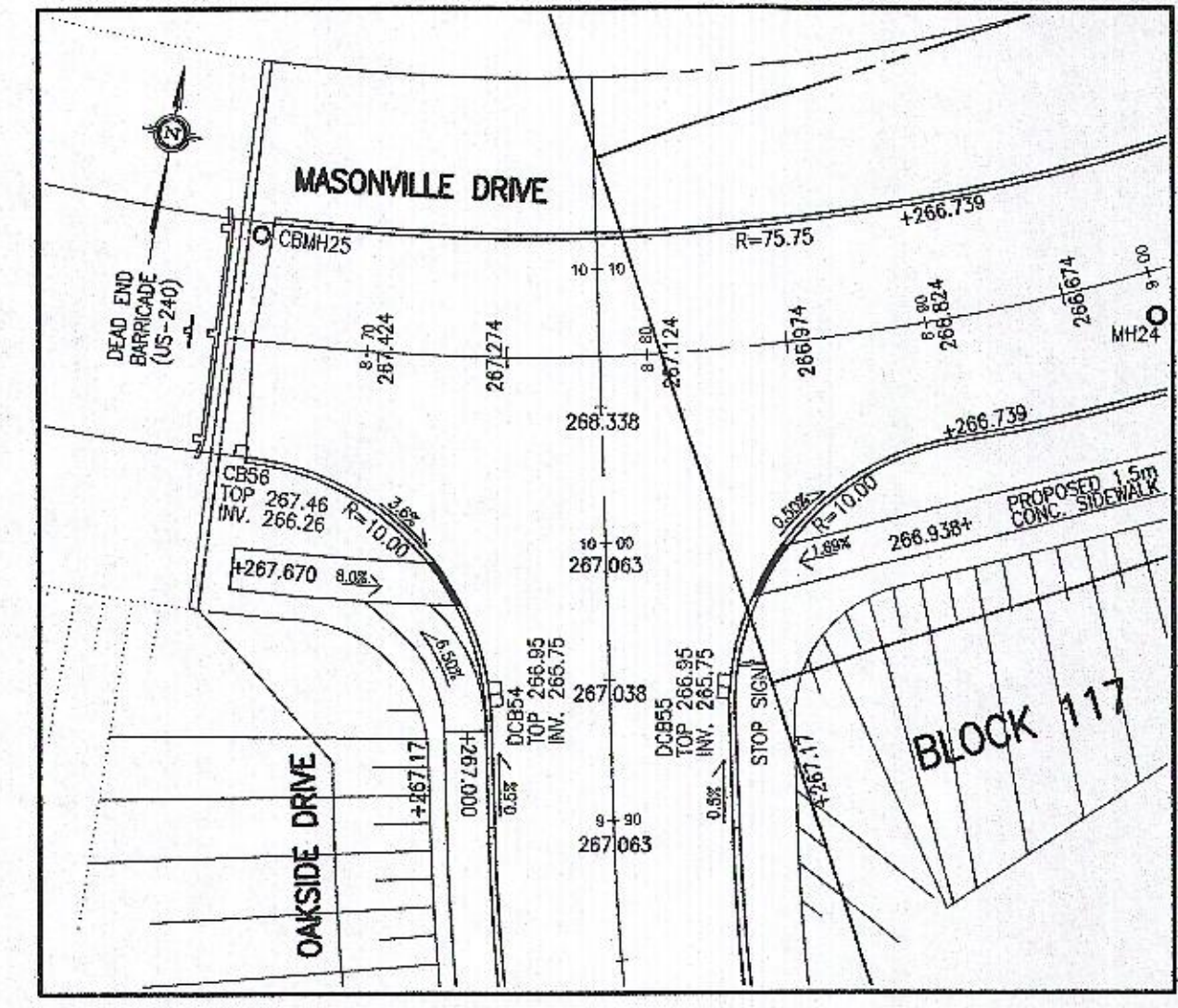
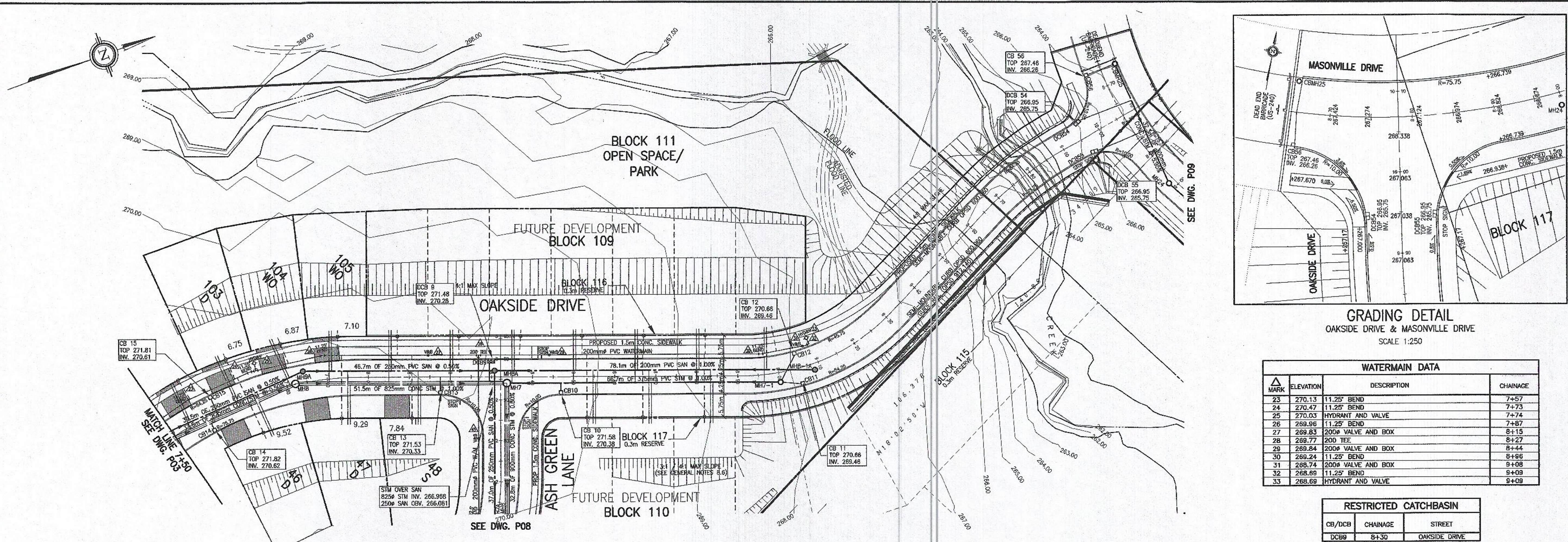
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Tel: 705-722-6278

MAPLE BRIDGE
DEVELOPMENT
PART OF LOT 33, CONCESSION 6
TOWNSHIP OF UXBRIDGE
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OPEN SPACE CORRIDOR

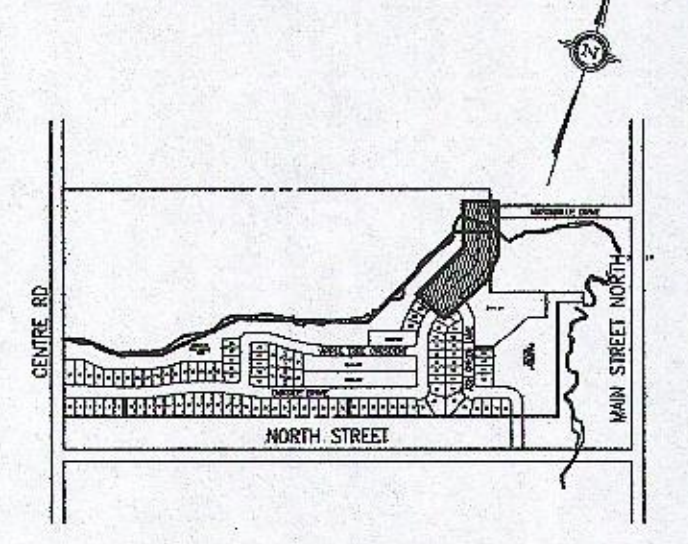
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GRADING DETAIL
OAKSIDE DRIVE & MASONVILLE DRIVE
SCALE 1:250

WATERMAIN DATA		
MARK	ELEVATION	DESCRIPTION
23	270.13	11.25' BEND
24	270.42	11.25' BEND
25	270.03	HYDRANT AND VALVE
26	269.96	11.25' BEND
27	269.83	200# VALVE AND BOX
28	269.77	200 TEE
29	269.84	200# VALVE AND BOX
30	269.24	11.25' BEND
31	269.74	200# VALVE AND BOX
32	268.69	11.25' BEND
33	268.69	HYDRANT AND VALVE

RESTRICTED CATCHBASIN		
CB/DCB	CHAINAGE	STREET
DCB9	8+30	OAKSIDE DRIVE



KEY PLAN
SCALE 1:12,500

LEGEND

- EXISTING CONTOUR
- EXISTING STORM MANHOLE
- EXISTING SANITARY MANHOLE
- EXISTING CATCHBASIN
- PROPOSED SWALE, OR GUTTER LINE
- PROPOSED DITCH
- PROPOSED STORM MANHOLE
- PROPOSED SANITARY MANHOLE
- PROPOSED CATCHBASIN/RESTRICTED
- PROPOSED DOUBLE CATCHBASIN
- PROPOSED WATER BOX/WATER VALVE
- PROPOSED HYDRANT AND VALVE
- PROPOSED 4:1/3:1 MAX SLOPE
- PROPOSED DRIVEWAY & CURB CUT
- PROPOSED WATER SERVICE
- PROPOSED SANITARY SERVICE
- PROPOSED STORM SERVICE
- PROPOSED FRONT DRAINAGE LOT
- PROPOSED SPLIT DRAINAGE LOT
- PROPOSED DECK LOT
- PROPOSED WALKOUT LOT

ROAD PAVEMENT DESIGN

COURSE (OPS SPECIFICATIONS)	THICKNESS (mm)
ASPHALT SURFACE (HL-3)	40
ASPHALT BINDER (HL-8)	50
GRANULAR BASE - GRANULAR 'A'	150
GRANULAR SUB-BASE LOCAL - GRANULAR 'B'	350

NOTE:
REFER TO DRAWINGS DE1 TO DE6 FOR NOTES & DETAILS
SURVEY INFORMATION
TOPOGRAPHIC INFORMATION PROVIDED BY
H.F. GRANDER O.L.S.

BENCHMARK
UXBRIDGE, UNITED CHURCH, TABLE IN SOUTH SIDEWALK, 17.2m FROM SOUTHEAST CORNER, 1.57m BELOW BRICKWORK, MIDWAY BETWEEN TWO LARGE BASEMENT WINDOWS.
CSC - 31U5175 - ELEV. 272.440 (1978 ADJUSTED)
CSC - 31U5175 - ELEV. 272.528 (1931 ADJUSTED)

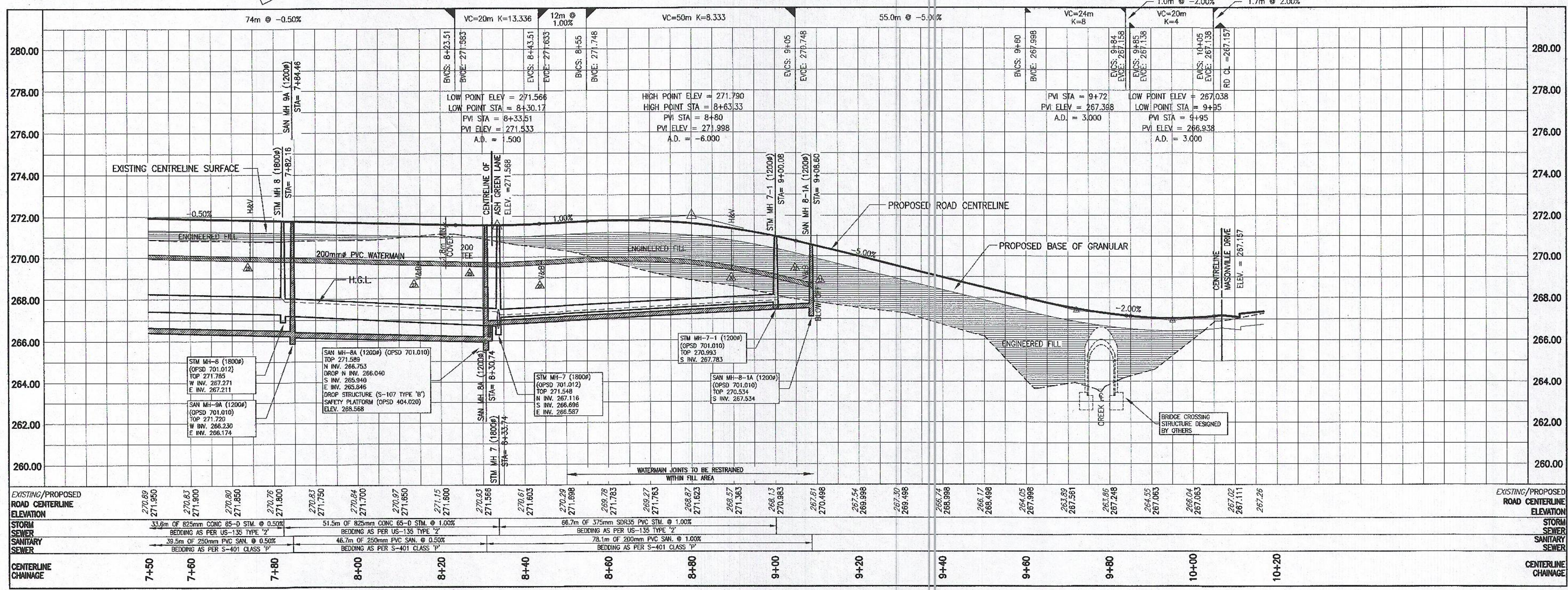
APPROVAL
Paul Allen
DATE: Oct 20, 2004

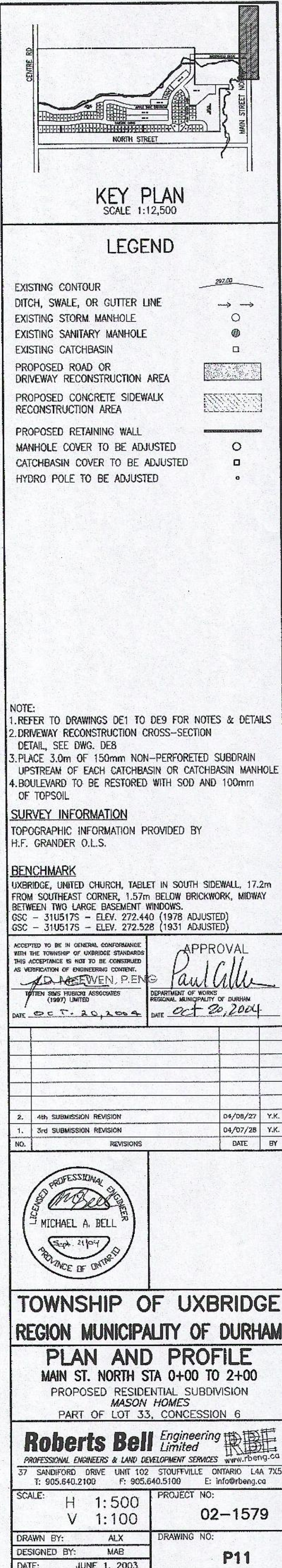
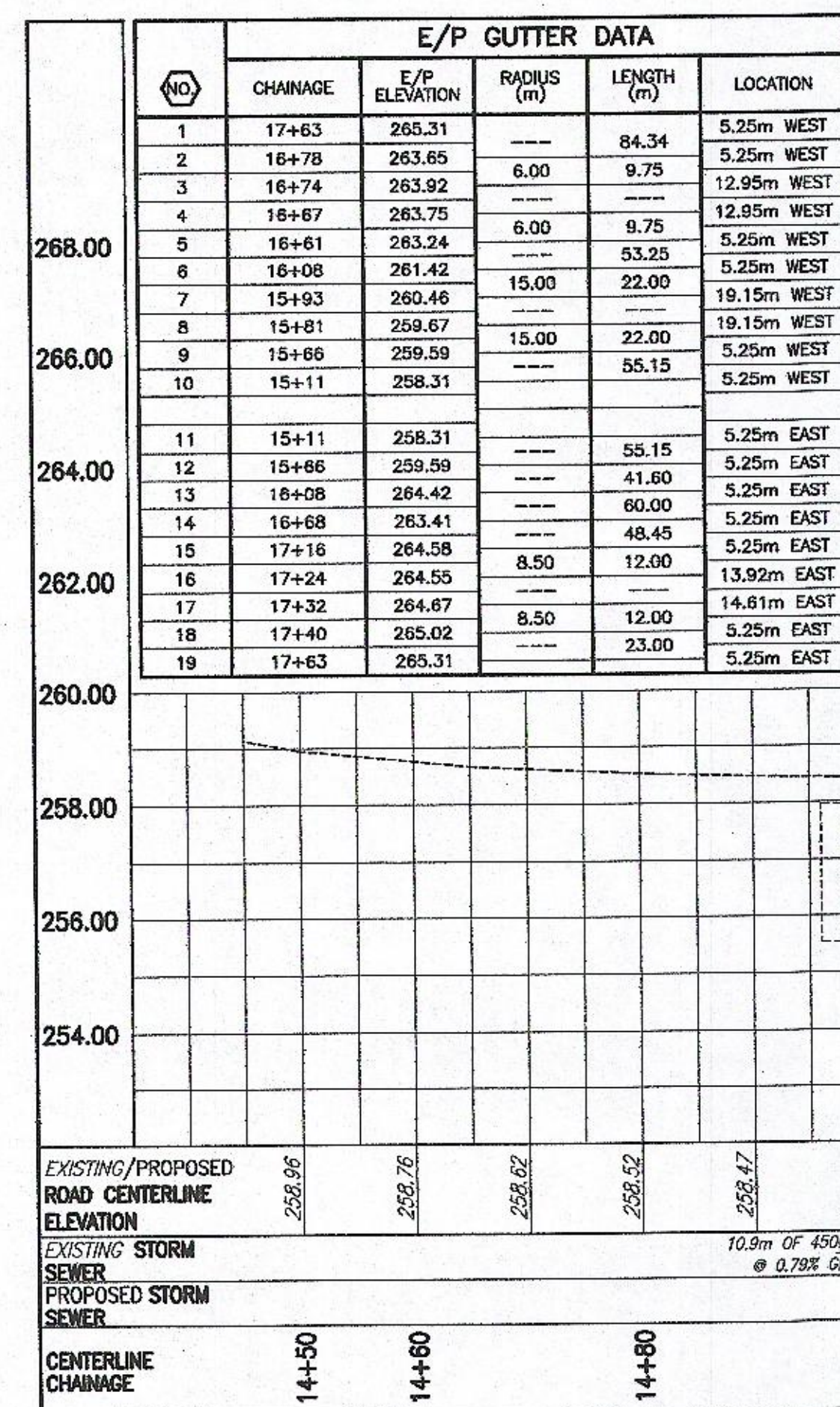
NO.	REVISIONS	DATE	BY
5.	6th SUBMISSION REVISIONS	04/10/07	ALX
4.	4th SUBMISSION REVISIONS	04/08/07	Y.K.
3.	3rd SUBMISSION REVISIONS	04/07/07	Y.K.
2.	2nd SUBMISSION REVISIONS	04/05/03	Y.K.
1.	REVISED AS PER COMMENTS BY T.S.H.	04/03/12	DLT



TOWNSHIP OF UXBRIDGE
REGION MUNICIPALITY OF DURHAM
PLAN AND PROFILE
OAKSIDE DRIVE STA 7+50 TO 10+17
PROPOSED RESIDENTIAL SUBDIVISION
PART OF LOT 33, CONCESSION 6

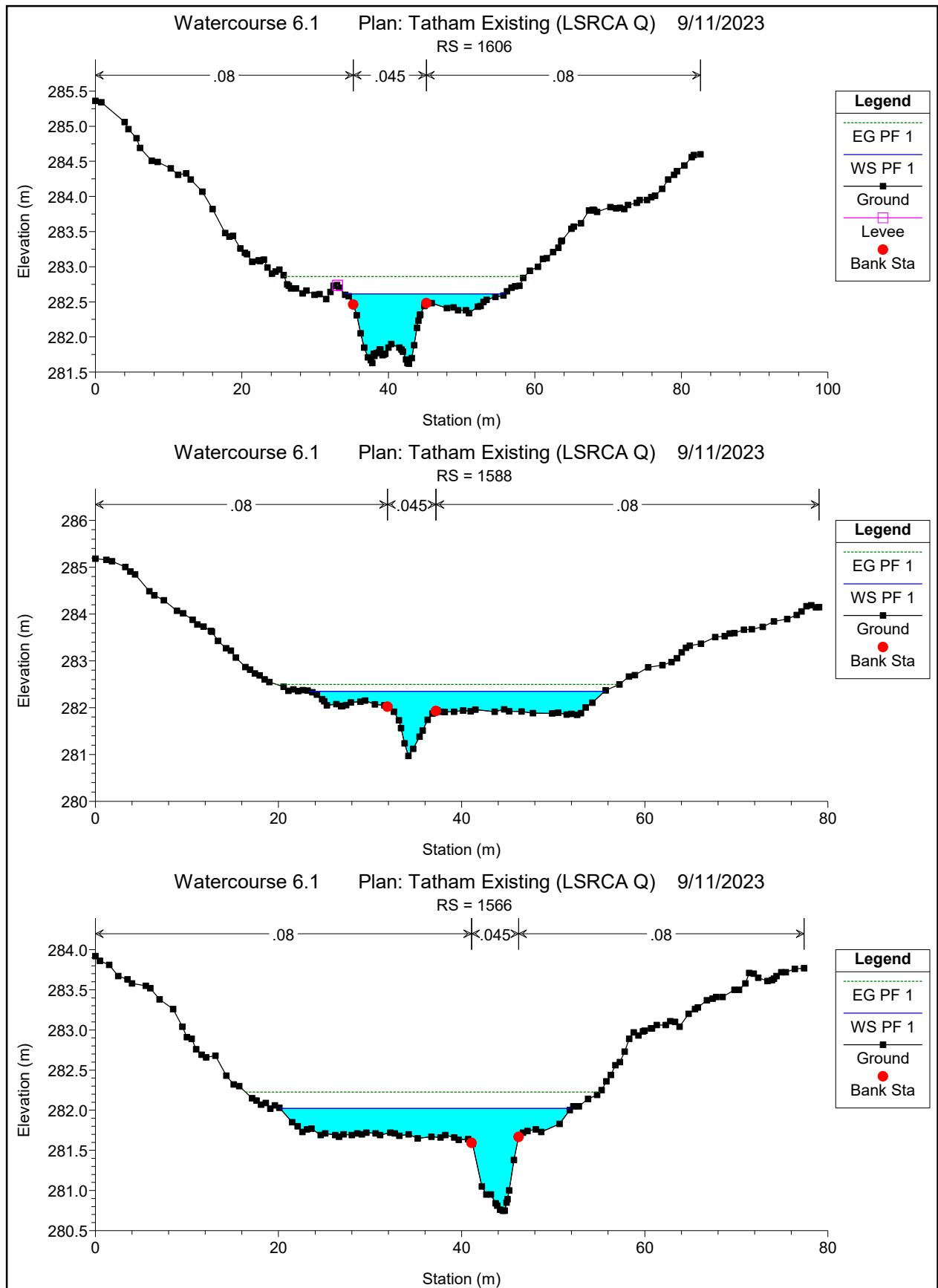
Roberts Bell Engineering Ltd.
PROFESSIONAL ENGINEERS & LAND DEVELOPMENT SERVICES
37 SANDFORD DRIVE UNIT 102 STOUFVILLE ONTARIO L4A 7X6
T: 905.640.2100 F: 905.640.5100 E: info@rbeng.ca
SCALE: H 1:500 V 1:100
PROJECT NO: 02-1579
DRAWN BY: DLT
DESIGNED BY: ALX
CHECKED BY: MAB
DATE: JUNE 1, 2003
DRAWING NO:
P04

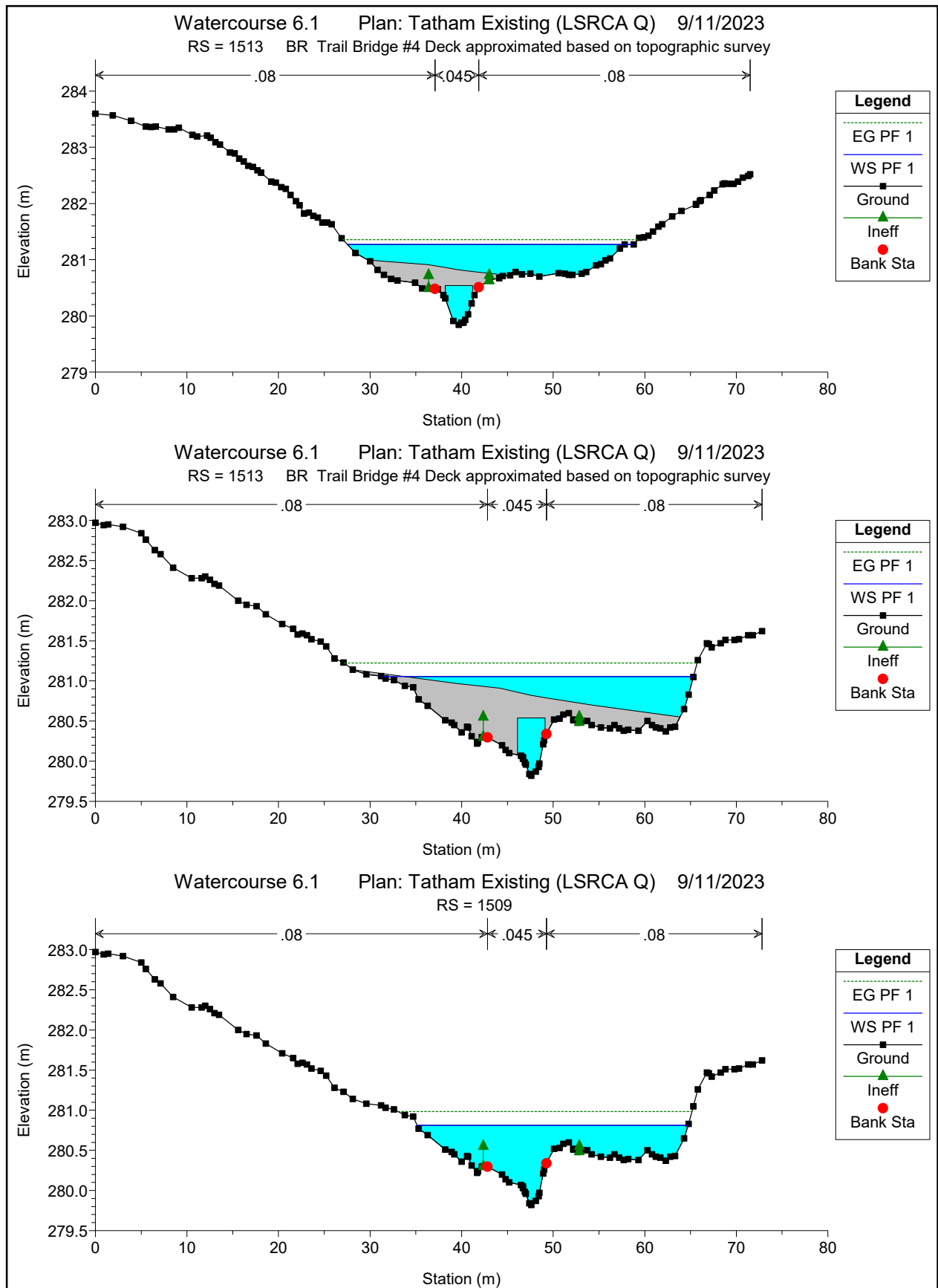


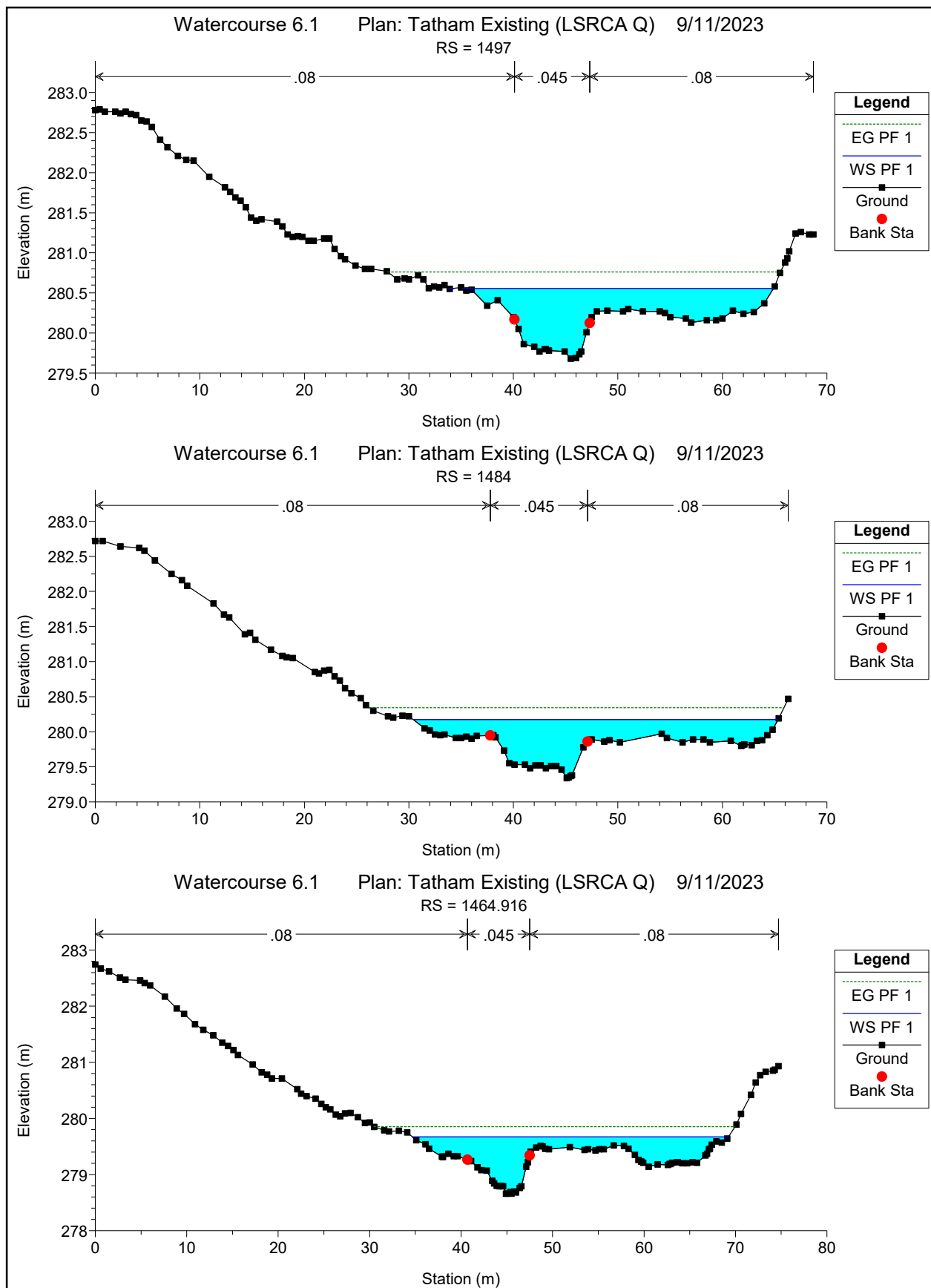


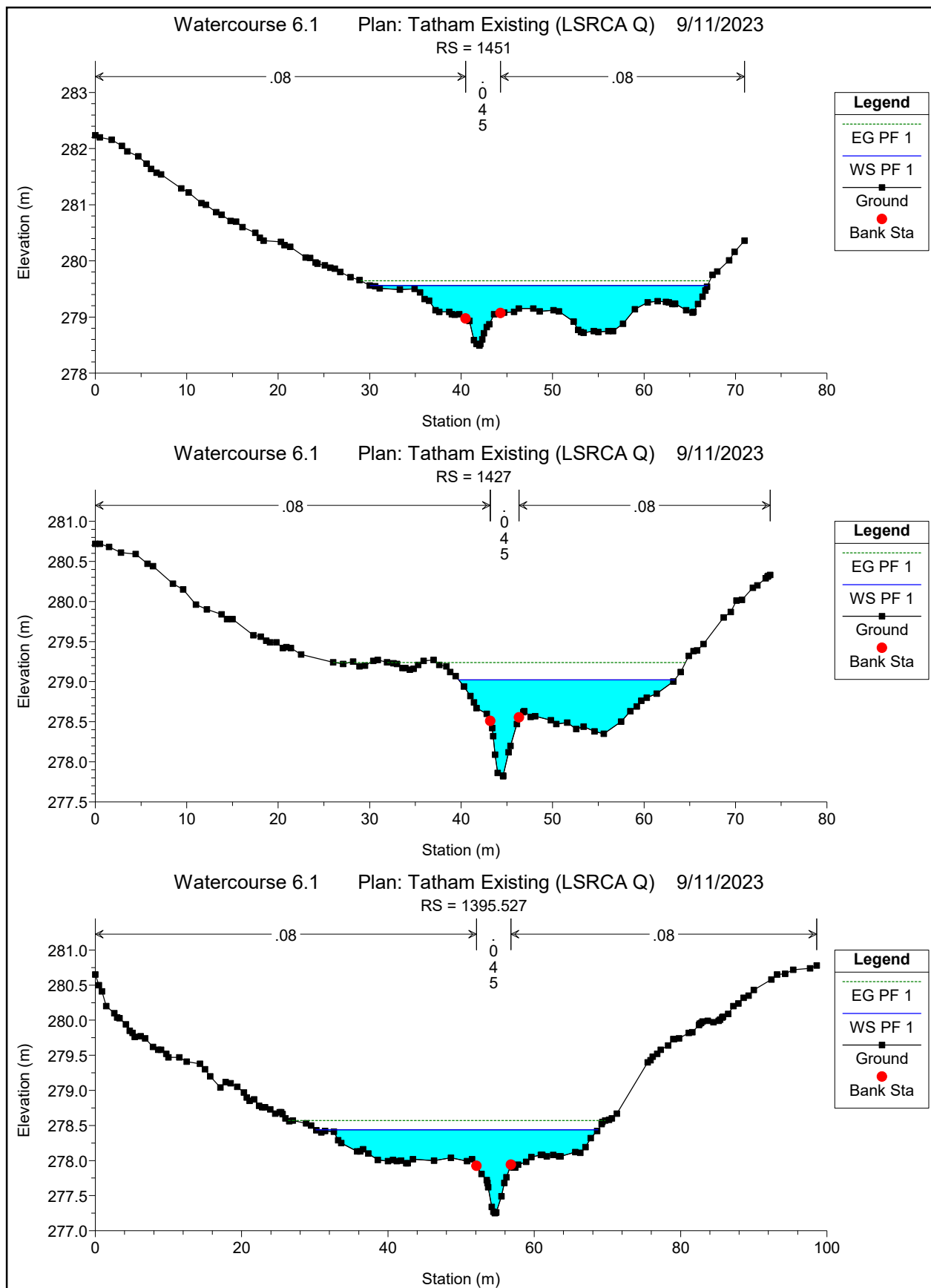
HEC-RAS Plan: Tatham Existing (LSRCA Q) River: River 1 Reach: Reach 1 Profile: PF 1

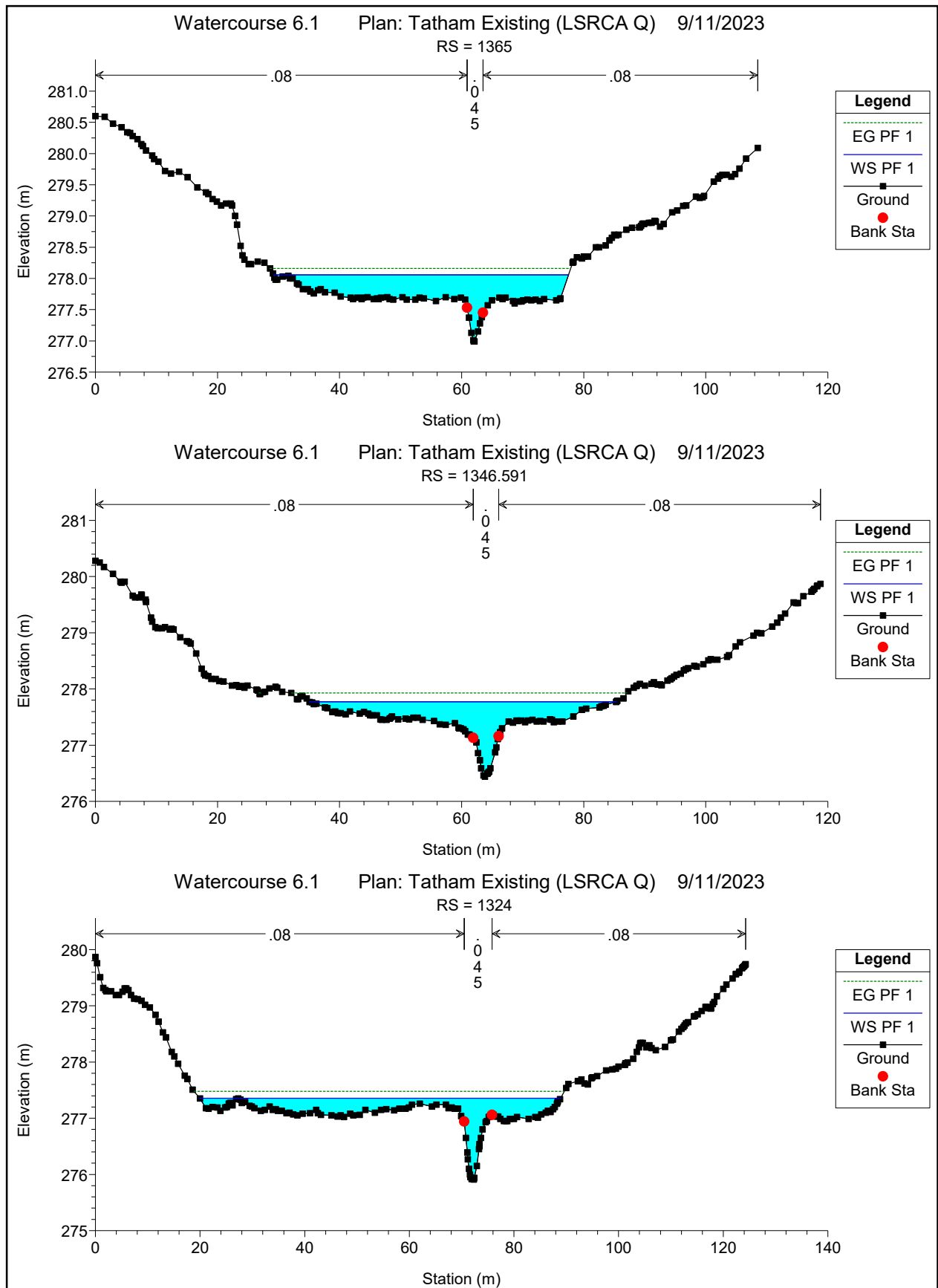
Reach	River Sta	Profile	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Left (m/s)	Vel Chnl (m/s)	Vel Right (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl	Volume (1000 m3)
Reach 1	1606 Centre Street	PF 1	16.53	281.62	282.61	282.61	282.86	0.017726	0.24	2.26	0.48	8.69	21.90	0.86	44.41
Reach 1	1588	PF 1	16.53	280.97	282.35	282.31	282.50	0.014308	0.57	2.16	0.83	13.81	32.21	0.77	44.22
Reach 1	1566	PF 1	16.53	280.75	282.02	282.02	282.23	0.013470	0.67	2.36	0.54	12.70	31.87	0.77	44.00
Reach 1	1545	PF 1	16.53	280.59	281.77		281.88	0.007500	0.56	1.55	0.44	13.71	26.79	0.58	43.74
Reach 1	1532	PF 1	16.53	280.20	281.50	281.50	281.73	0.016609	0.87	2.52	0.73	11.22	24.32	0.86	43.58
Reach 1	1516	PF 1	16.53	279.84	281.29	281.07	281.38	0.005267	0.59	1.70	0.55	18.47	31.46	0.51	43.35
Reach 1	1513 Trail Bridge 4														
Reach 1	1509	PF 1	16.53	279.82	280.81	280.79	280.98	0.016268	0.76	2.24	0.78	12.55	29.61	0.84	43.26
Reach 1	1497	PF 1	16.53	279.68	280.56	280.56	280.76	0.016651	0.47	2.30	0.74	11.54	30.26	0.86	43.11
Reach 1	1484	PF 1	16.53	279.34	280.17	280.17	280.34	0.018618	0.59	2.13	0.74	12.26	34.92	0.88	42.95
Reach 1	1464.916	PF 1	16.53	278.66	279.67	279.67	279.85	0.015990	0.64	2.24	0.69	12.85	34.58	0.83	42.74
Reach 1	1451	PF 1	16.53	278.49	279.56		279.65	0.012118	0.52	1.94	0.86	16.57	36.89	0.72	42.58
Reach 1	1427	PF 1	16.53	277.82	279.02	279.02	279.24	0.022211	0.77	2.81	1.08	11.18	23.60	0.96	42.24
Reach 1	1395.527	PF 1	16.53	277.25	278.44		278.57	0.013269	0.70	2.16	0.71	15.47	38.57	0.76	41.83
Reach 1	1365	PF 1	16.53	276.99	278.06		278.16	0.014984	0.70	2.31	0.82	17.59	48.35	0.80	41.37
Reach 1	1346.591	PF 1	16.53	276.44	277.77	277.77	277.93	0.010773	0.56	2.24	0.53	16.95	50.27	0.71	41.06
Reach 1	1324	PF 1	16.53	275.91	277.35	277.35	277.48	0.012600	0.48	2.05	0.63	18.57	68.93	0.72	40.66
Reach 1	1295.994	PF 1	16.53	275.52	276.77	276.77	276.92	0.013209	0.55	2.12	0.55	16.61	59.09	0.75	40.21
Reach 1	1255	PF 1	16.53	274.66	275.86	275.86	276.02	0.013865	0.50	2.17	0.65	15.44	48.42	0.77	39.63
Reach 1	1231.595	PF 1	16.53	274.13	275.30	275.30	275.46	0.014517	0.57	2.34	0.80	14.56	39.06	0.81	39.30
Reach 1	1194	PF 1	16.53	273.41	274.49	274.46	274.64	0.013699	0.72	2.11	0.36	13.76	33.21	0.77	38.79
Reach 1	1159.490	PF 1	16.53	272.78	273.82	273.82	274.03	0.022338	1.02	2.50	0.77	10.47	22.77	0.97	38.37
Reach 1	1140	PF 1	16.53	272.53	273.50		273.65	0.014295	0.83	2.13	0.57	13.17	27.59	0.79	38.15
Reach 1	1111	PF 1	16.53	272.12	273.18		273.33	0.013208	0.78	2.30	0.77	14.59	31.91	0.78	37.86
Reach 1	1092	PF 1	16.53	271.52	272.82	272.82	273.07	0.015662	0.72	2.80	0.91	11.59	24.17	0.86	37.65
Reach 1	1078	PF 1	16.53	271.28	272.79	272.43	272.85	0.003673	0.46	1.48	0.61	21.81	31.55	0.43	37.43
Reach 1	1075 Trail Bridge 3														
Reach 1	1072	PF 1	16.53	271.08	272.23	272.23	272.45	0.015758	0.73	2.46	0.79	11.10	24.14	0.85	37.35
Reach 1	1055	PF 1	16.53	270.65	271.80	271.73	271.99	0.011823	0.58	2.01	0.33	10.66	26.72	0.72	37.18
Reach 1	1028	PF 1	16.53	270.21	271.42	271.42	271.60	0.017991	0.76	2.36	0.77	12.82	33.37	0.88	36.87
Reach 1	995	PF 1	16.53	269.50	270.75	270.75	270.97	0.014993	0.49	2.18	0.41	10.29	30.13	0.81	36.52
Reach 1	971	PF 1	16.53	269.29	270.30		270.43	0.008185	0.28	1.61	0.38	12.11	28.57	0.60	36.25
Reach 1	950	PF 1	16.53	268.79	269.99	269.99	270.20	0.014382	0.45	2.15	0.42	10.90	34.86	0.79	36.01
Reach 1	921	PF 1	16.53	268.31	269.62	269.62	269.81	0.012458	0.50	2.09	0.35	12.23	44.56	0.74	35.69
Reach 1	883	PF 1	16.53	267.42	268.64	268.64	269.01	0.023845		2.70	0.09	6.14	9.38	1.00	35.35
Reach 1	851.2186	PF 1	16.53	266.99	268.17		268.33	0.010237		1.73		9.55	13.69	0.66	35.10
Reach 1	819	PF 1	16.53	266.69	267.69	267.64	267.90	0.017160		2.02	0.30	9.07	26.74	0.84	34.80
Reach 1	788	PF 1	16.53	266.12	267.16	267.16	267.35	0.019094	0.70	2.24	0.81	11.72	30.68	0.89	34.49
Reach 1	767	PF 1	16.53	265.78	266.67	266.67	266.81	0.021178	0.57	2.20	0.83	15.10	51.87	0.93	34.21
Reach 1	725	PF 1	16.53	265.04	266.60	266.09	266.63	0.001126	0.27	0.81	0.32	33.39	44.16	0.24	33.40
Reach 1	718 Trail Bridge 2														
Reach 1	715	PF 1	16.53	265.03	266.01	266.01	266.12	0.011096	0.77	1.97	0.67	16.42	37.43	0.70	33.19
Reach 1	695	PF 1	16.53	264.34	265.62	265.62	265.80	0.021689		2.21	0.77	12.04	34.53	0.92	33.03
Reach 1	680	PF 1	16.53	263.91	265.57		265.64	0.003169	0.36	1.27	0.33	21.86	44.82	0.39	32.85
Reach 1	665	PF 1	16.53	263.83	265.05	265.05	265.51	0.021149	1.34	3.00		5.56	26.47	1.00	32.61
Reach 1	647 Oakside Bridge														
Reach 1	636	PF 1	16.53	263.42	264.64	264.64	265.11	0.021187		3.10	1.50	5.70	30.82	1.01	32.37
Reach 1	592	PF 1	16.53	262.84	263.65	263.65	263.84	0.021051	0.86	2.34	0.86	11.22	27.57	0.95	31.73
Reach 1	572	PF 1	16.53	262.00	262.90	262.90	263.13	0.023516	0.97	2.37	0.50	9.23	20.31	0.99	31.52
Reach 1	538	PF 1	16.53	260.85	261.95	261.95	262.25	0.022570		2.44	0.68	7.21	12.94	0.97	31.27
Reach 1	520	PF 1	16.53	260.28	261.35	261.35	261.56	0.021788	0.36	2.12	0.66	9.27	23.63	0.93	31.12
Reach 1	495	PF 1	16.53	259.69	260.80		260.84	0.004309	0.26	1.25	0.58	22.44	35.86	0.44	30.70
Reach 1	472	PF 1	16.53	259.09	260.24	260.24	260.61	0.023854		2.70	0.07	6.12	8.24	1.00	30.38
Reach 1	439	PF 1	16.53	258.12	258.98		259.03	0.007663	0.25	1.28	0.92	16.97	25.92	0.55	30.07
Reach 1	410	PF 1	16.53	257.16	258.95		258.97	0.000941	0.22	0.80	0.29	37.71	52.70	0.22	29.46
Reach 1	360	PF 1	16.53	256.65	258.95	257.51	258.96	0.000086	0.14	0.32	0.07	93.68	85.87	0.07	26.24
Reach 1	350 Trail Bridge 1														
Reach 1	344	PF 1	16.53	256.50	258.95	257.67	258.95	0.000117	0.14	0.36	0.11	98.03	99.69	0.08	24.78
Reach 1	328	PF 1	51.68	256.00	258.95		258.95	0.000119	0.15	0.39	0.22	240.09	139.35	0.09	22.24
Reach 1	300	PF 1	51.68	255.79	258.94	258.41	258.95	0.000202	0.18	0.62	0.26	181.99	116.93	0.12	16.54
Reach 1	285 Main Street														
Reach 1	271.0259	PF 1	51.68	255.47	258.21	258.21	258.26	0.001461	0.55	1.41	0.26	77.96	73.34	0.30	15.19
Reach 1	259	PF 1	51.68	255.37	258.08		258.11	0.000968	0.49	1.13	0.15	85.10	69.48	0.24	14.17
Reach 1	209.5053	PF 1	51.68	255.09	258.06		258.08	0.000442	0.34	0.86	0.29	133.53	93.53	0.17	10.01
Reach 1	111	PF 1	51.68	254.44	258.06	256.17	258.06	0.000089	0.15	0.42	0.13	251.68	158.83	0.08	

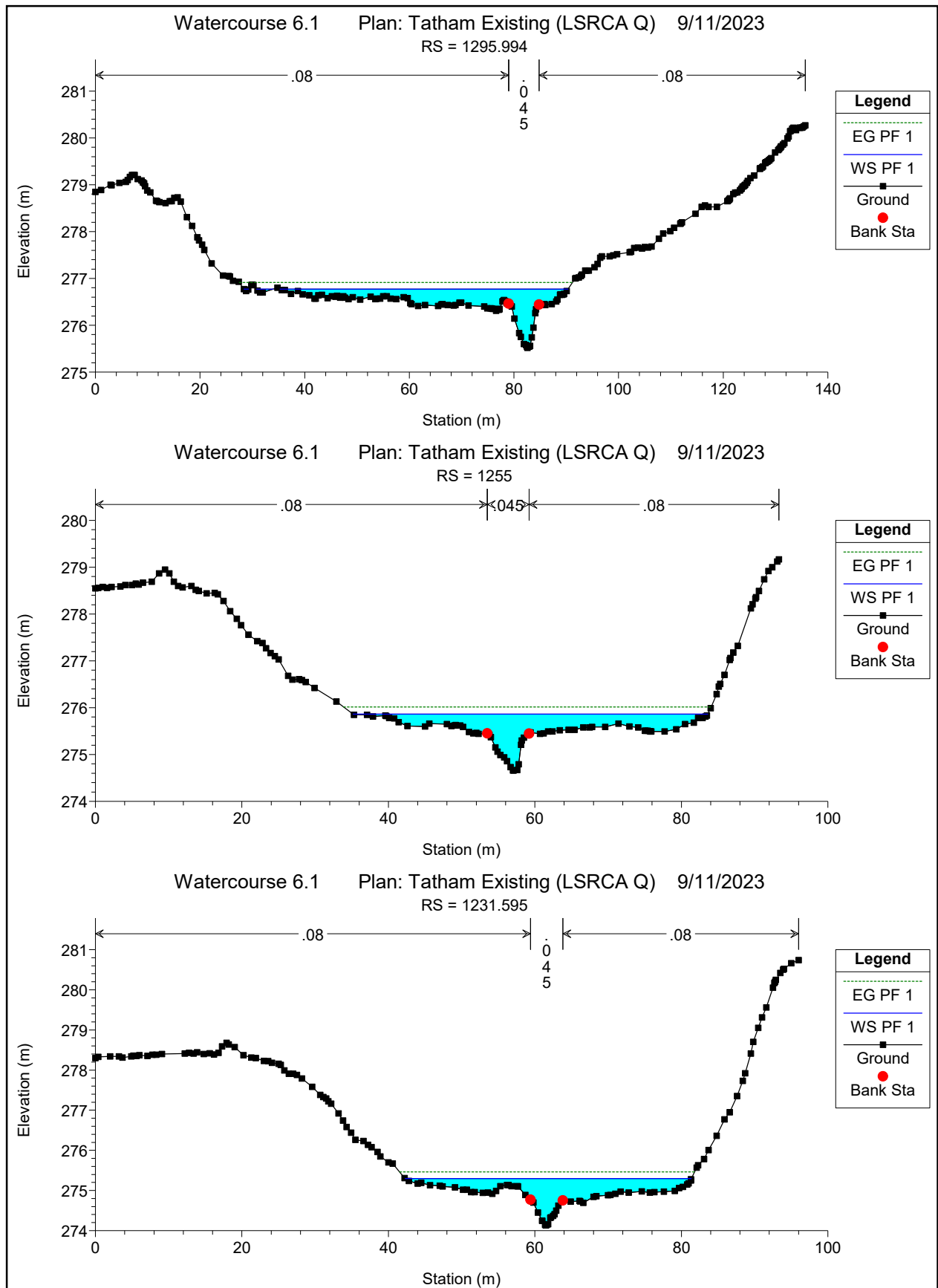


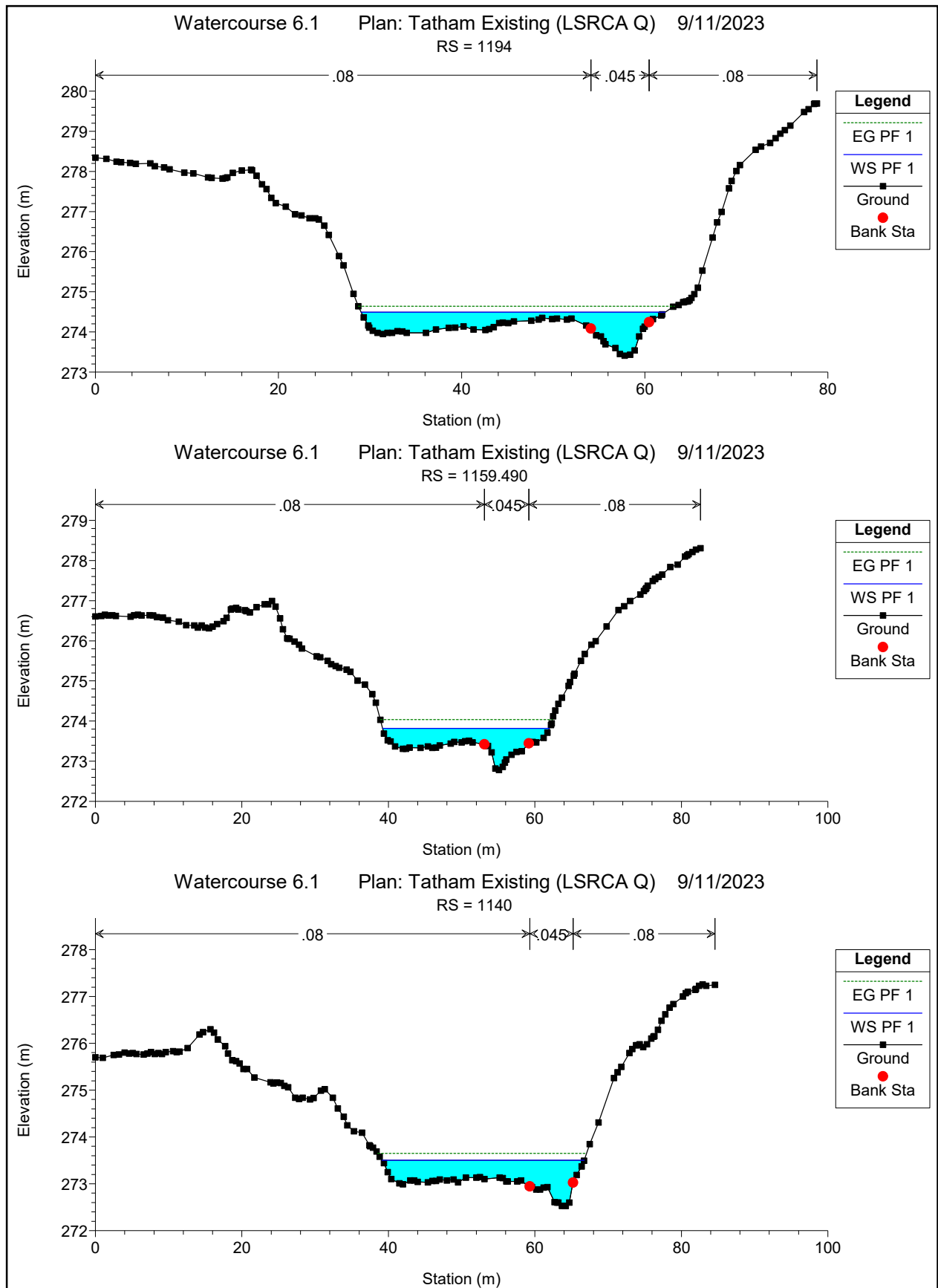


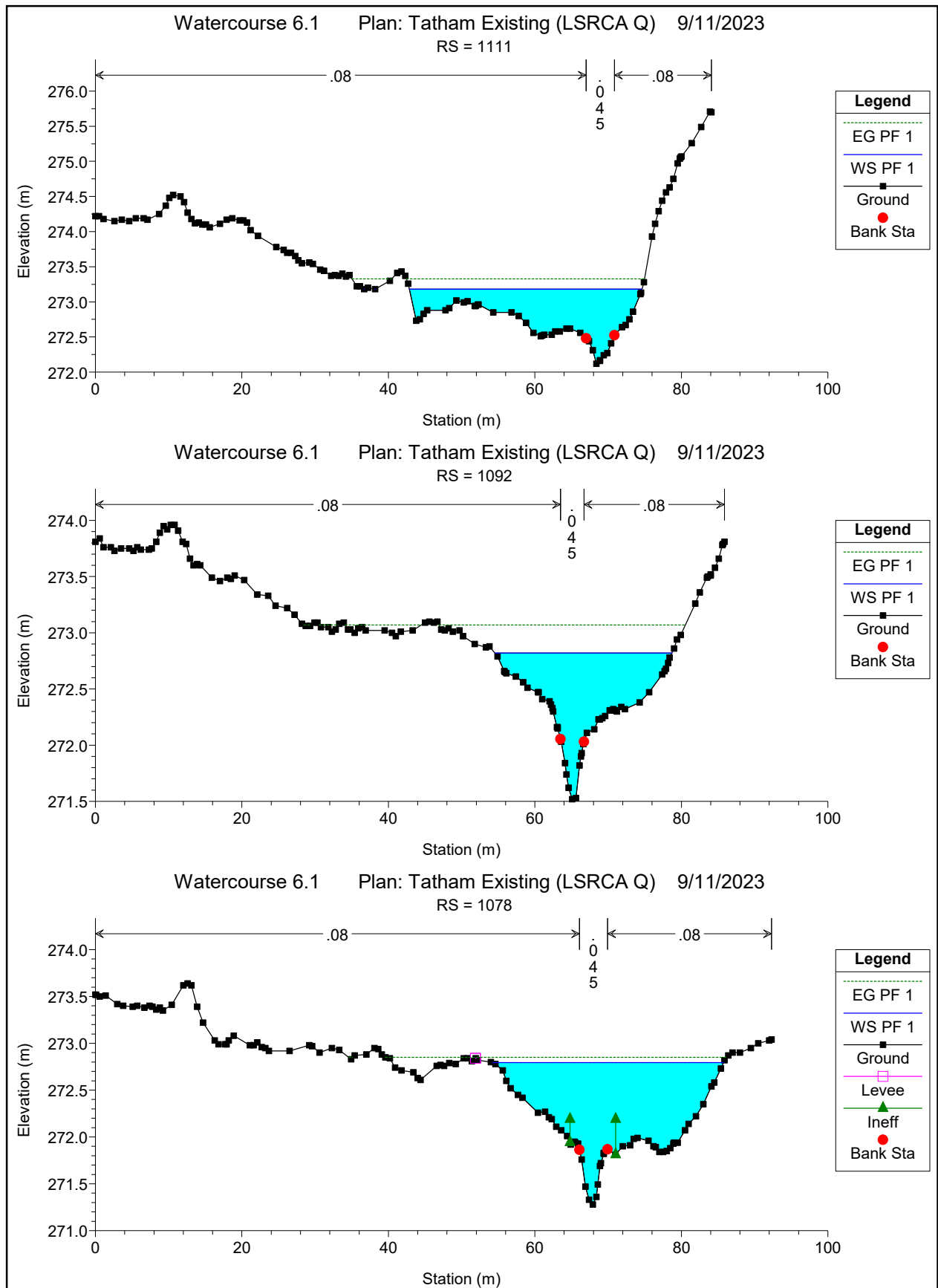


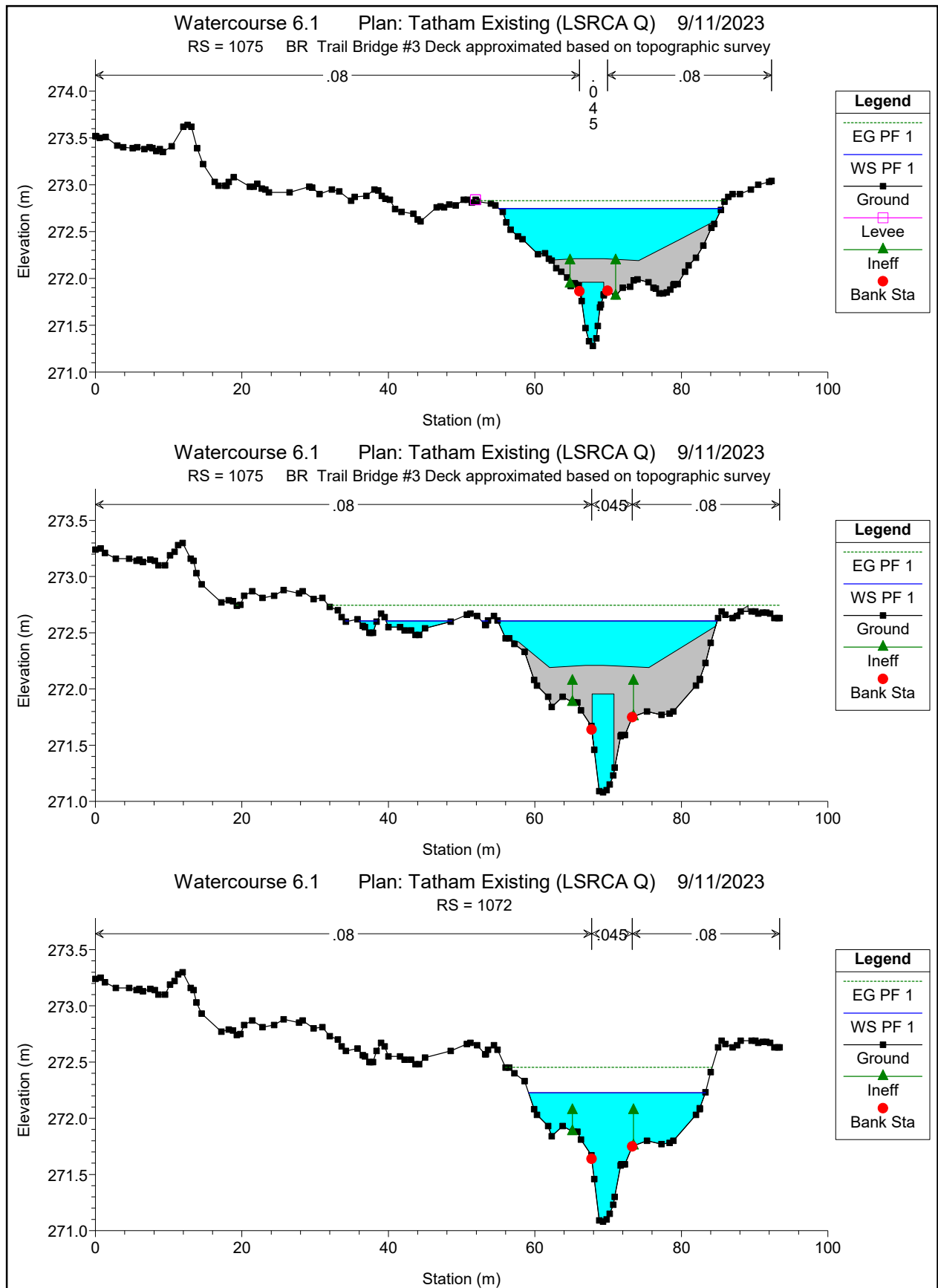


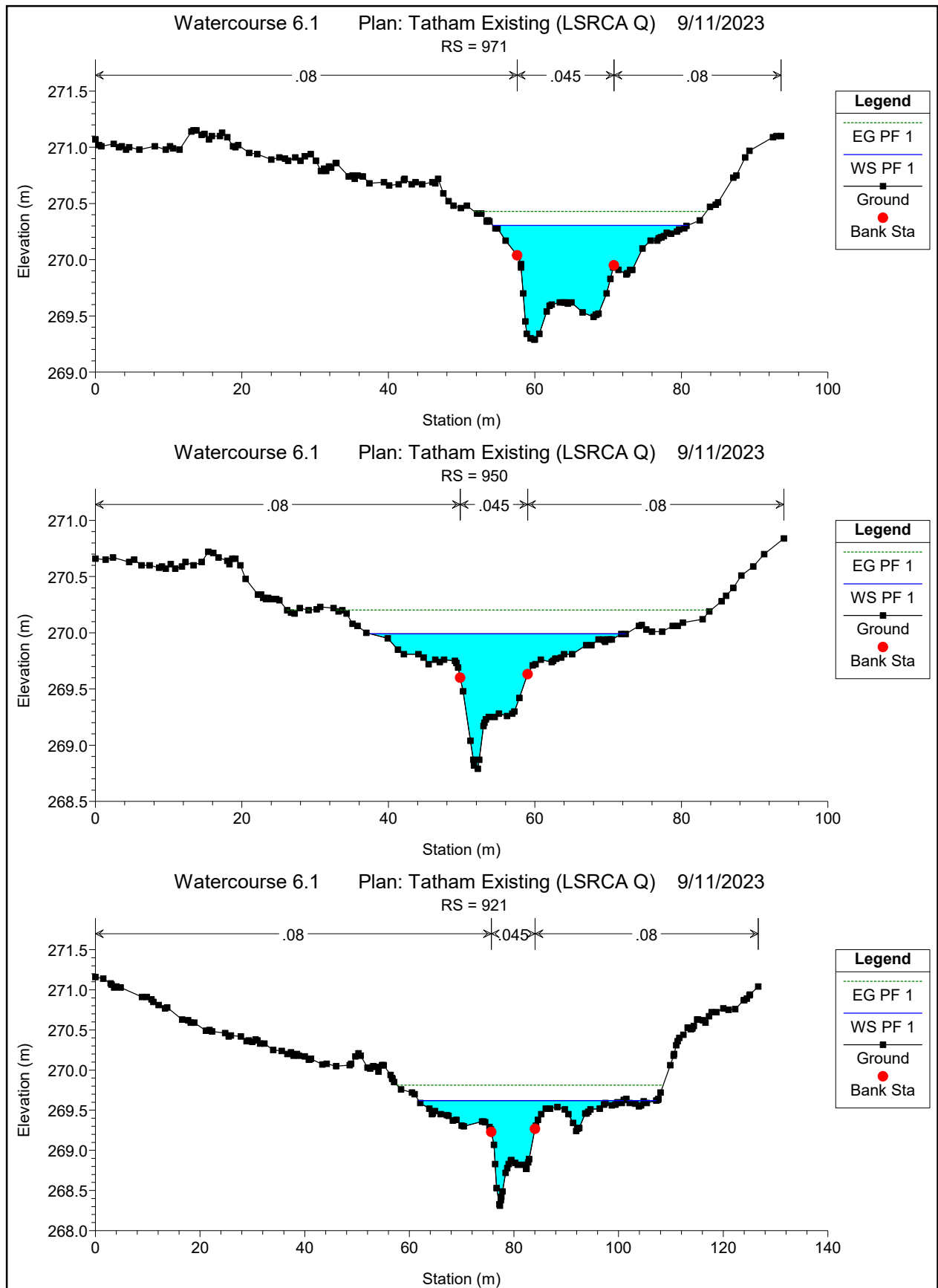


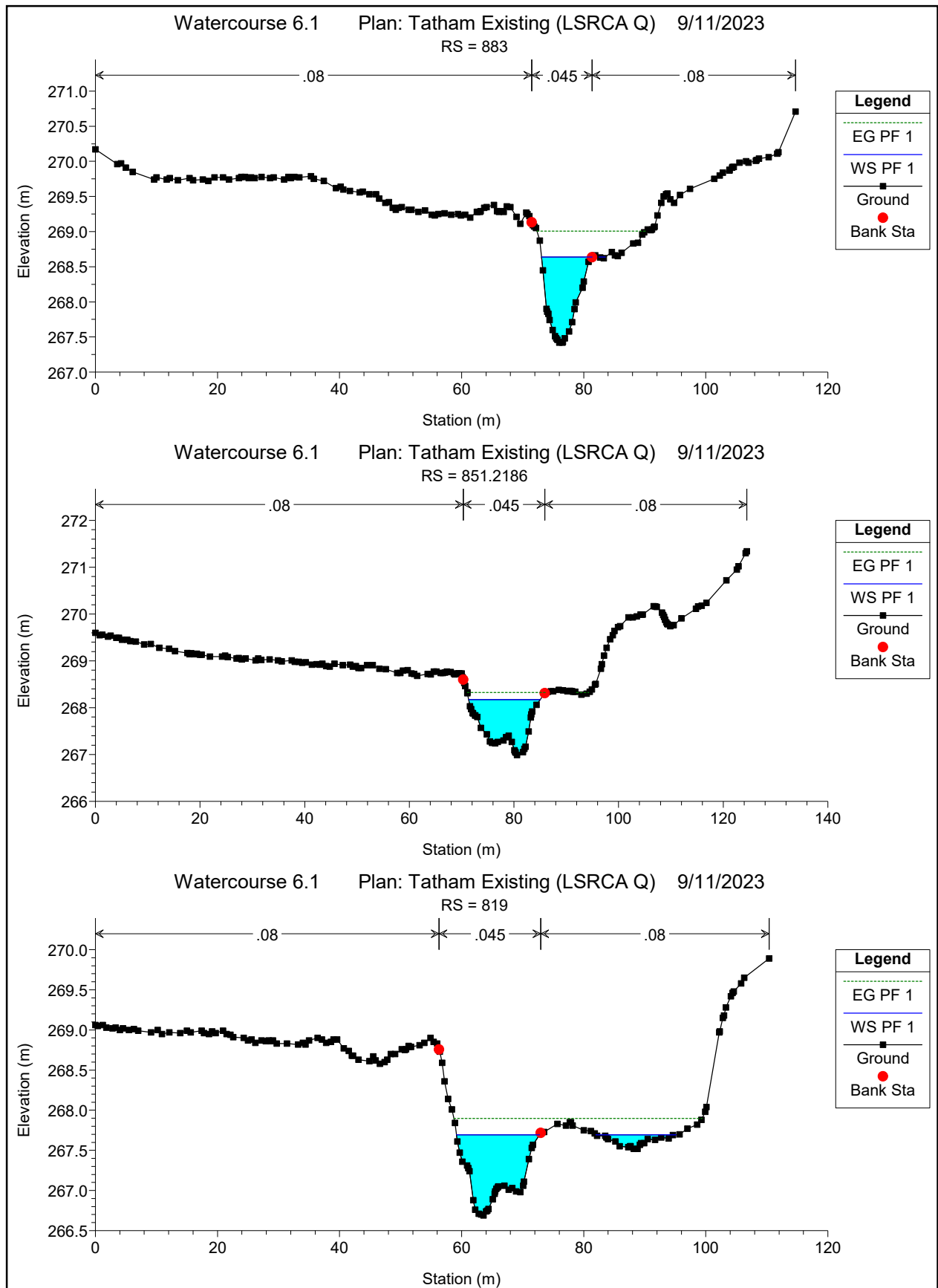


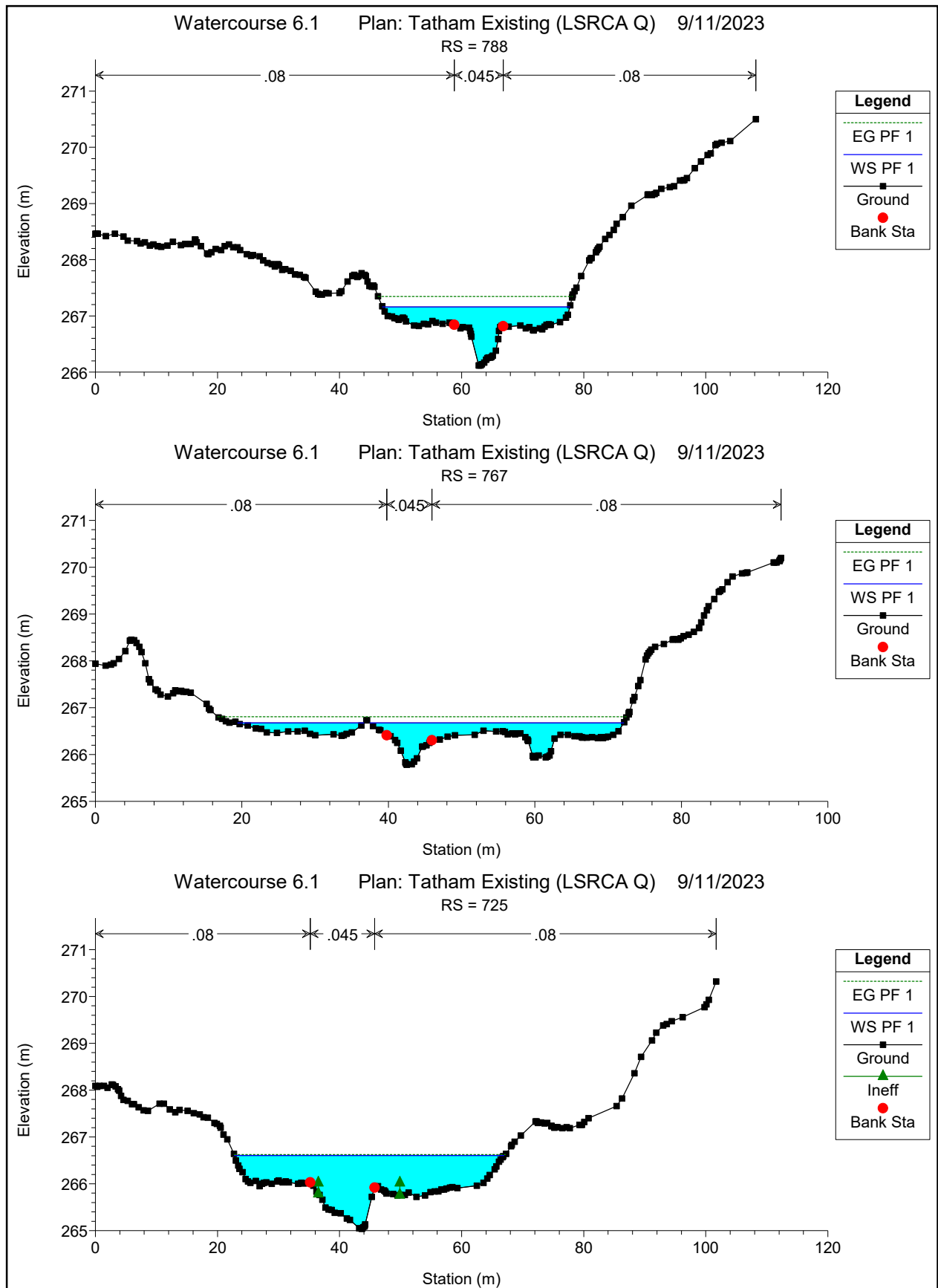


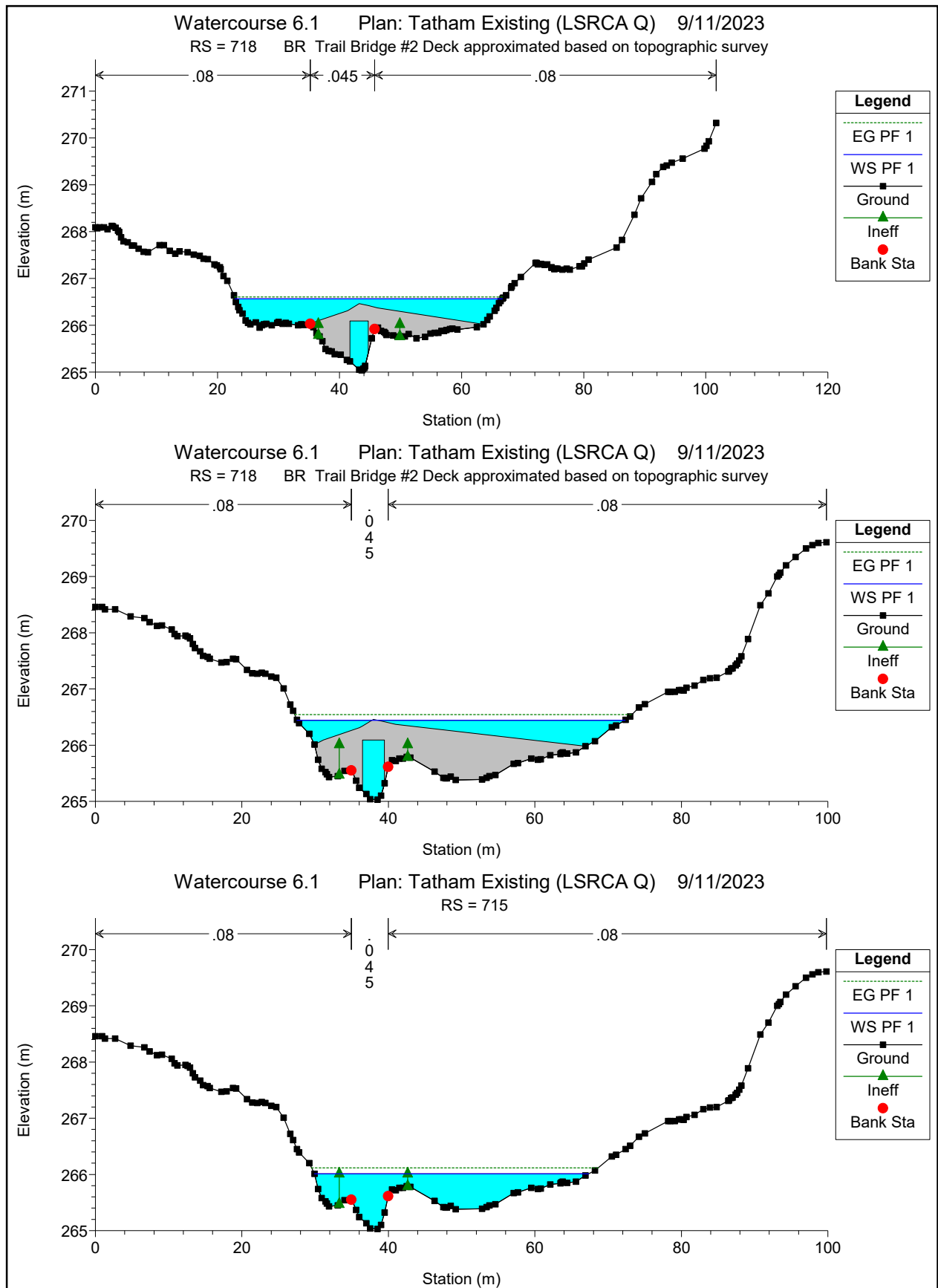


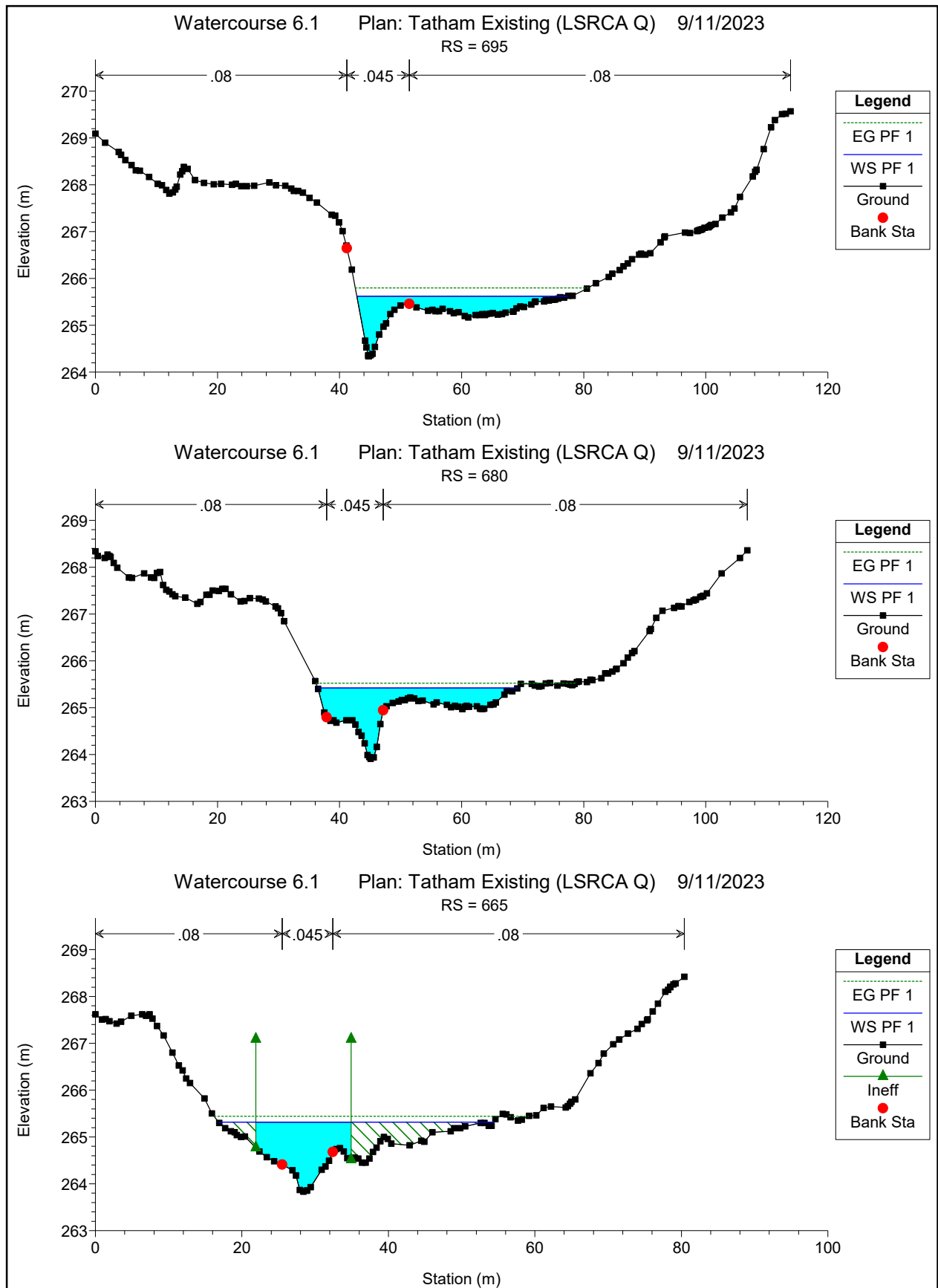


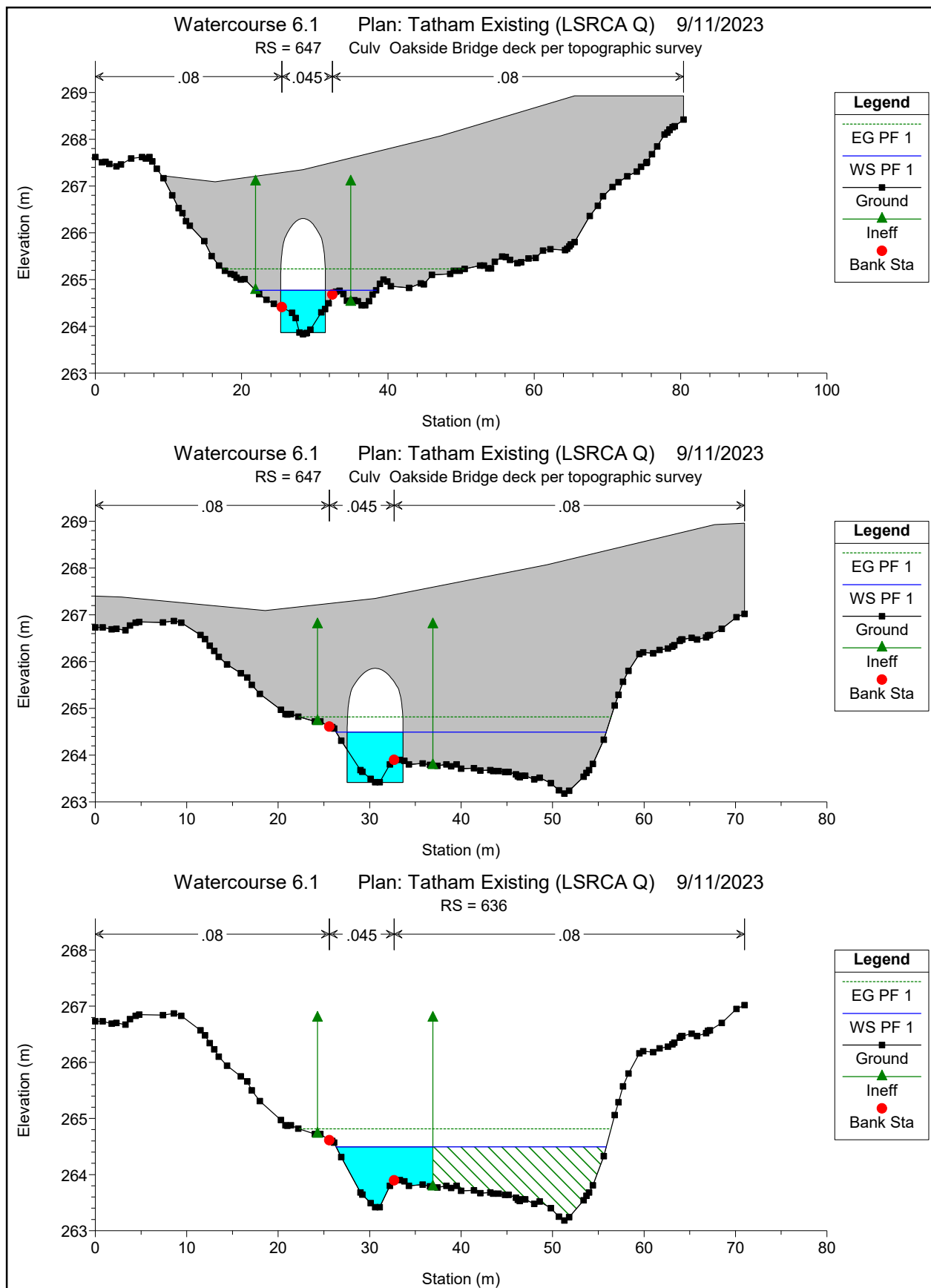


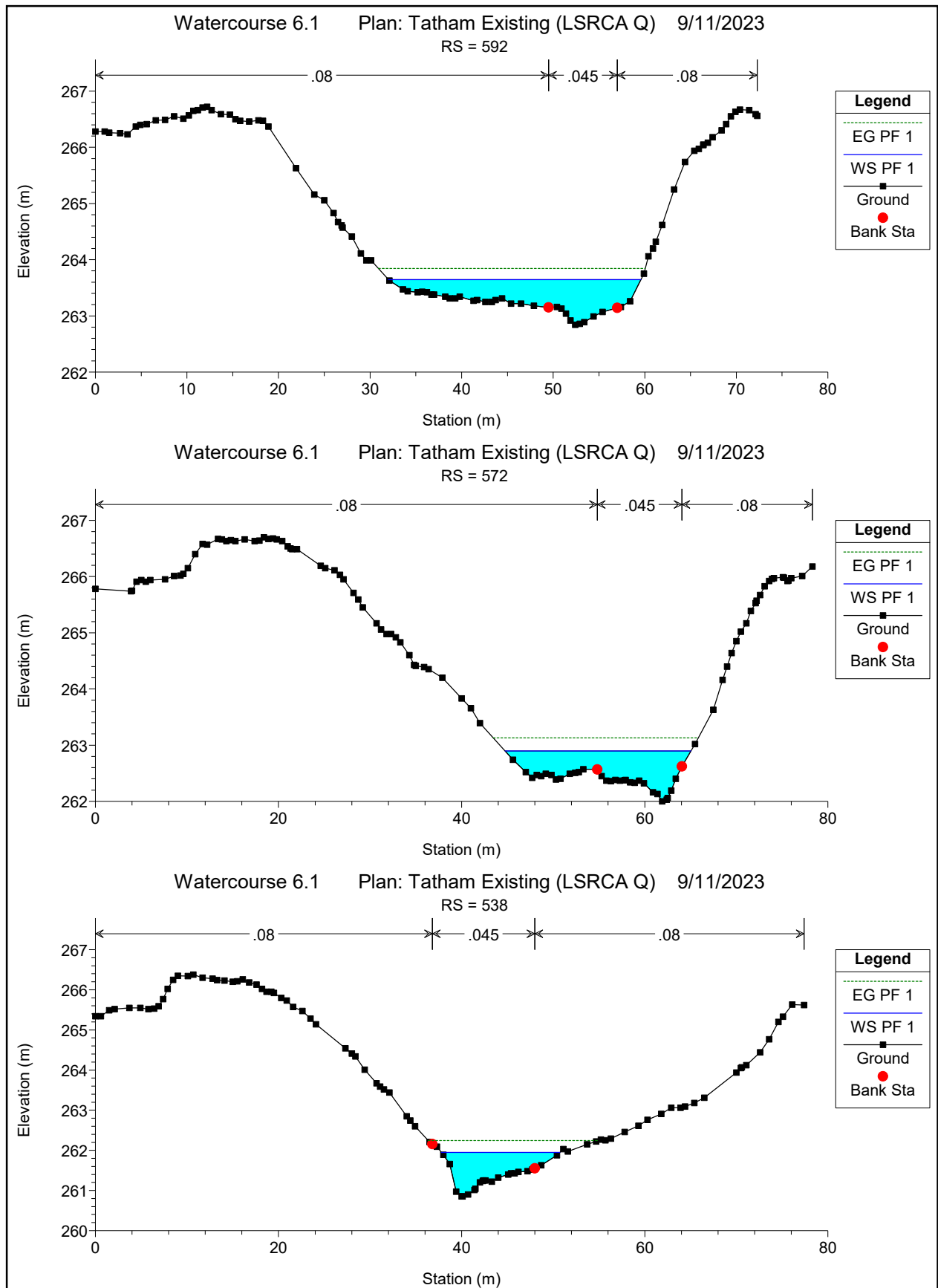


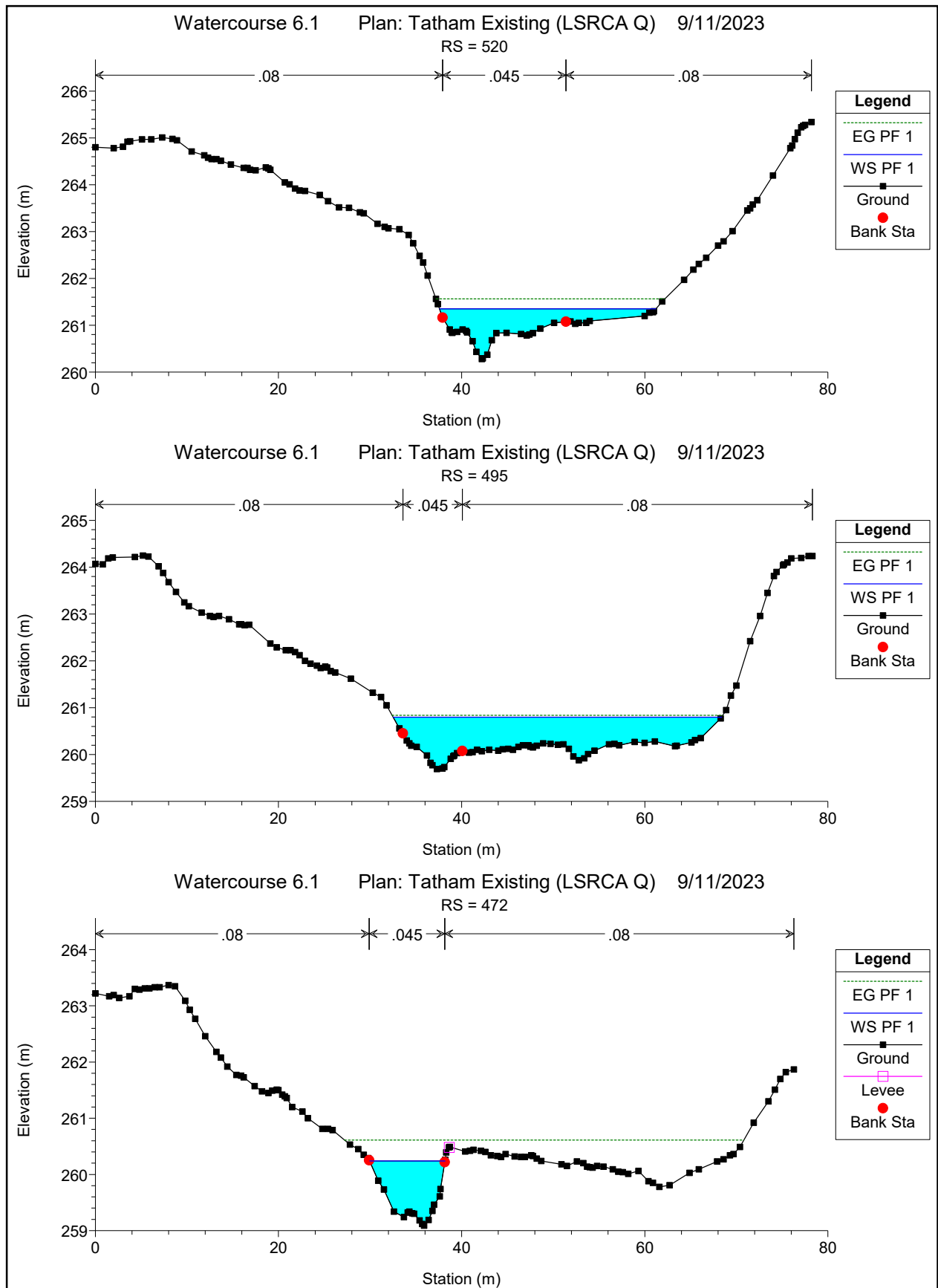


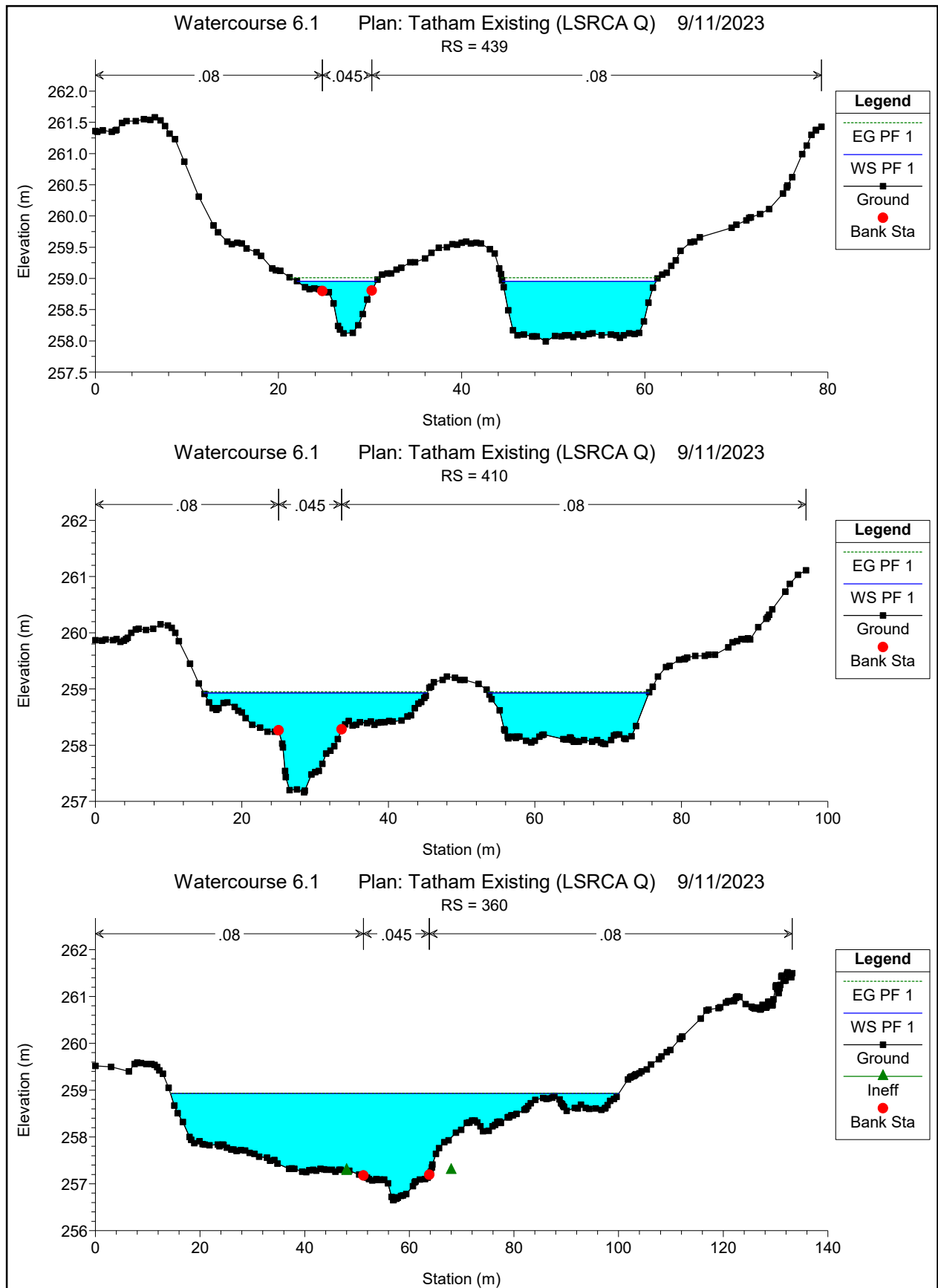


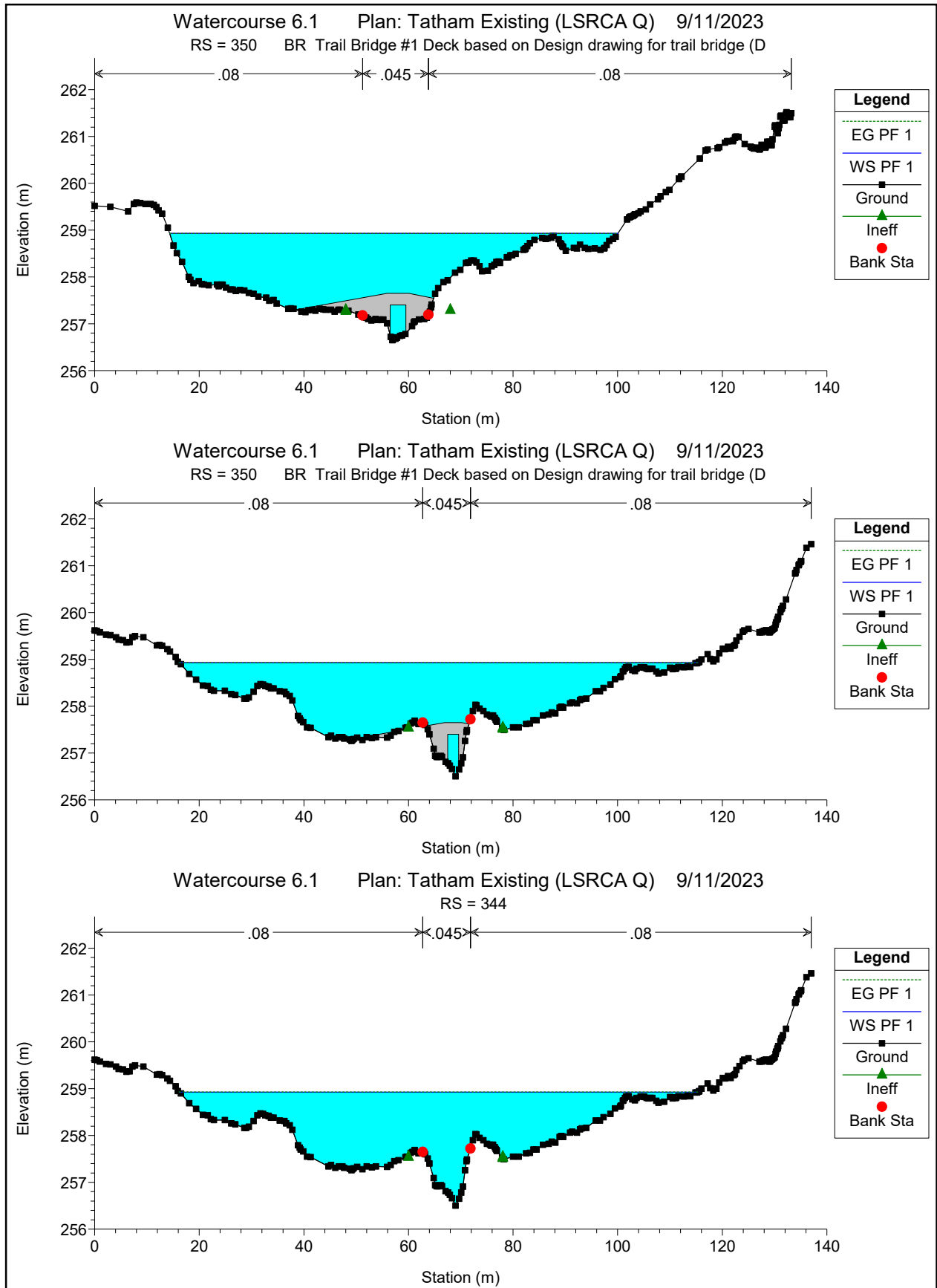


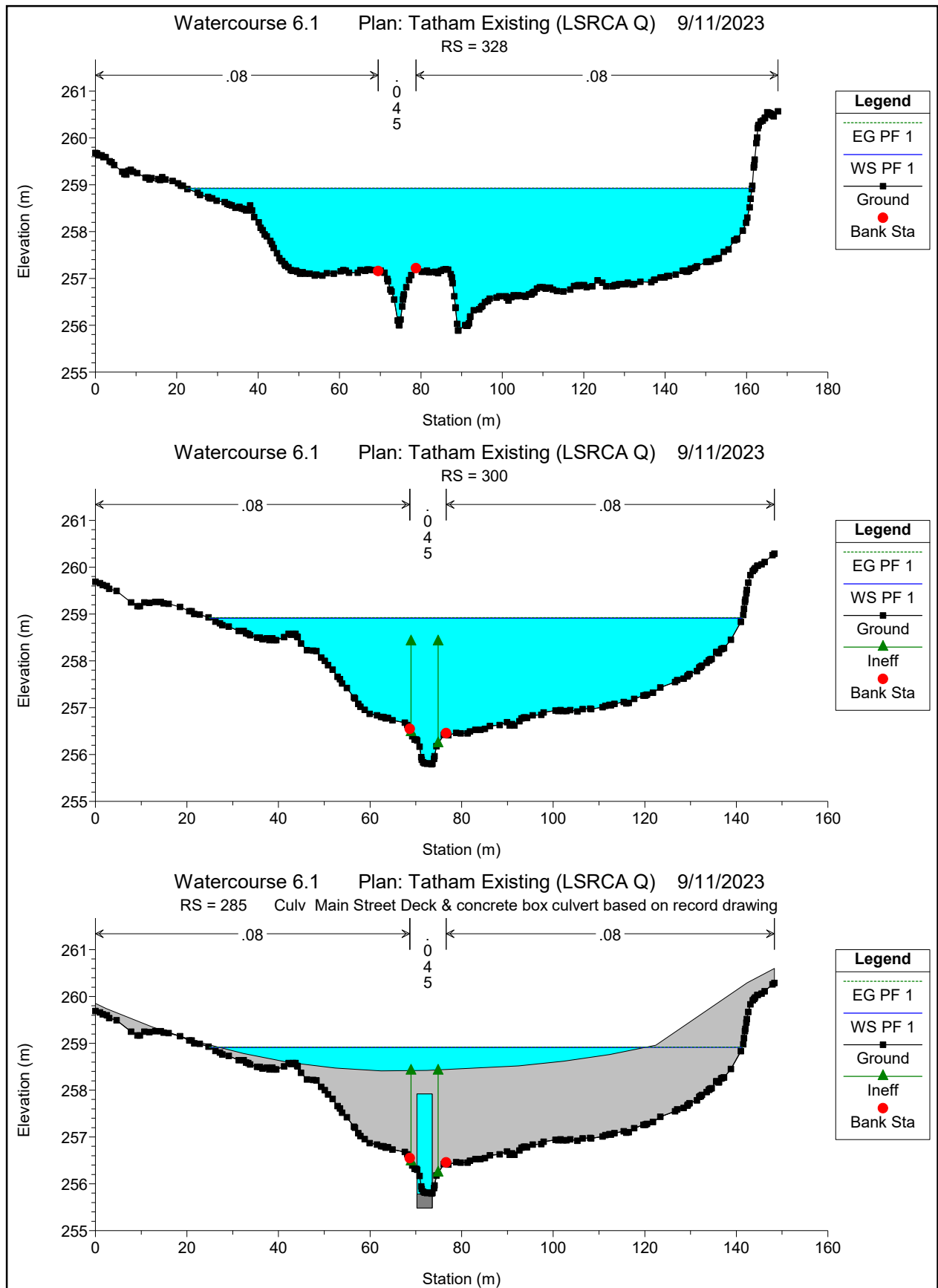




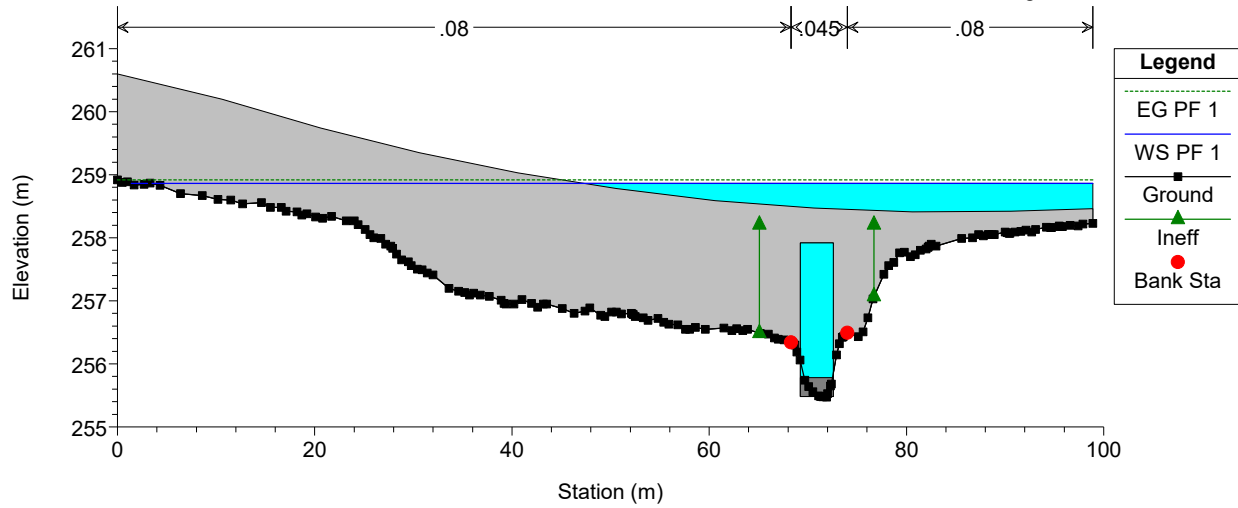




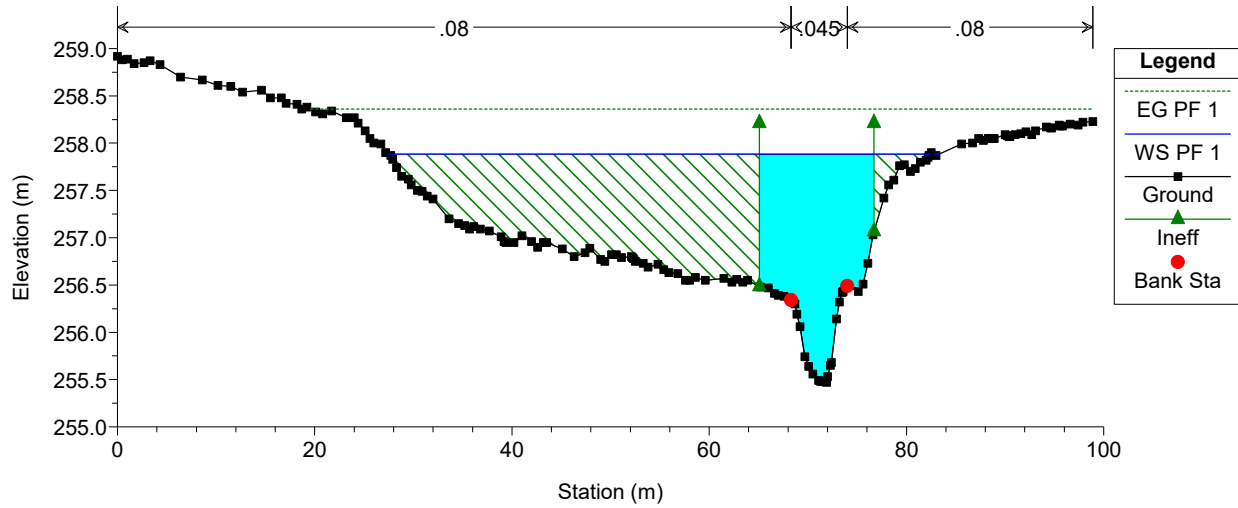




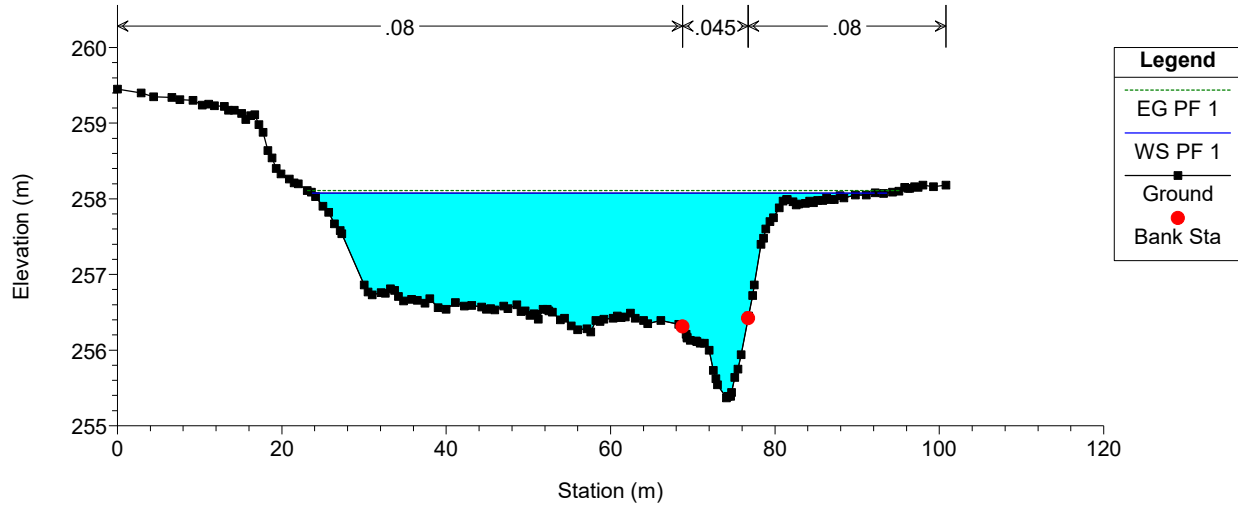
Watercourse 6.1 Plan: Tatham Existing (LSRCA Q) 9/11/2023
 RS = 285 Culv Main Street Deck & concrete box culvert based on record drawing

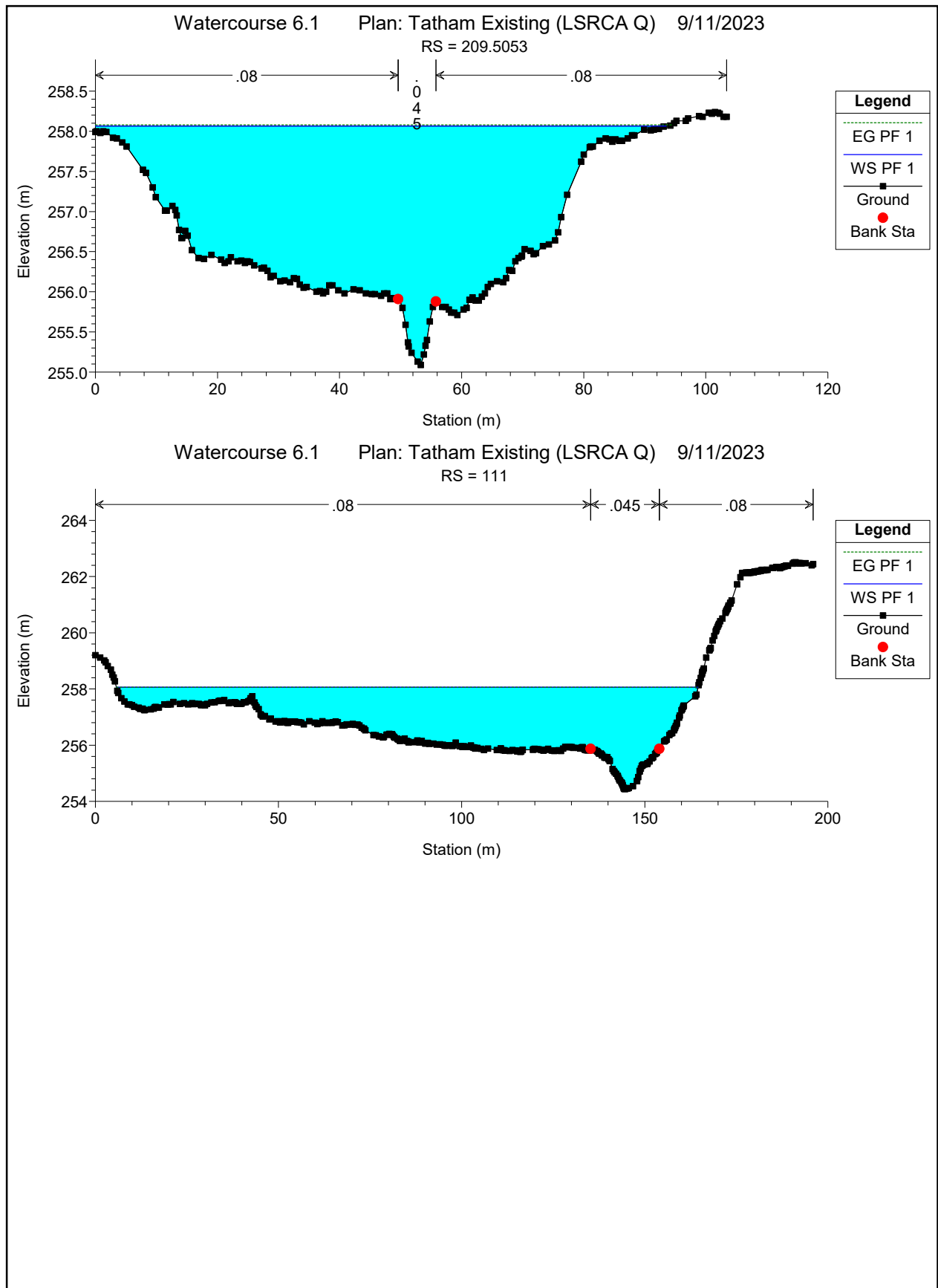


Watercourse 6.1 Plan: Tatham Existing (LSRCA Q) 9/11/2023
 RS = 271.0259



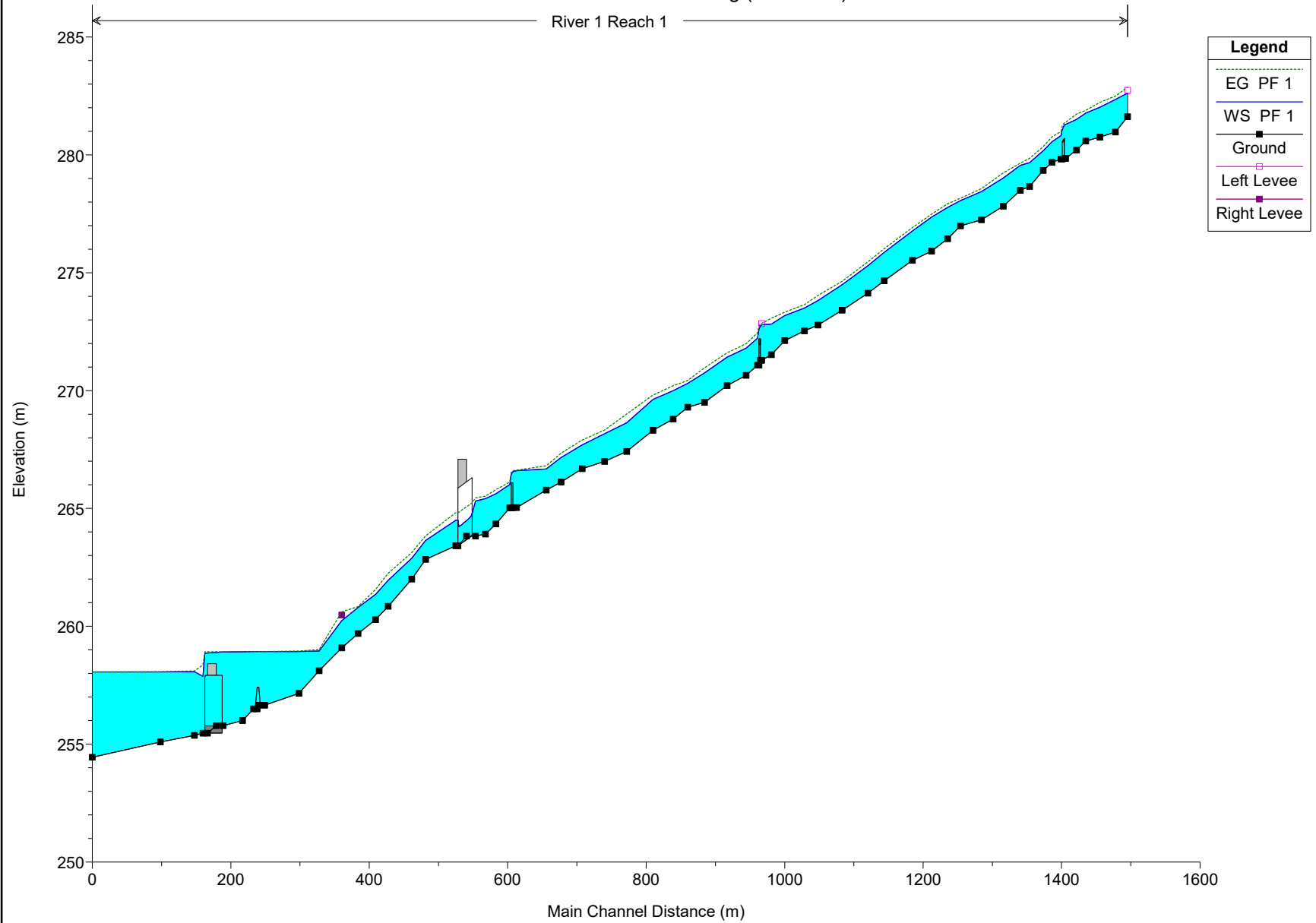
Watercourse 6.1 Plan: Tatham Existing (LSRCA Q) 9/11/2023
 RS = 259



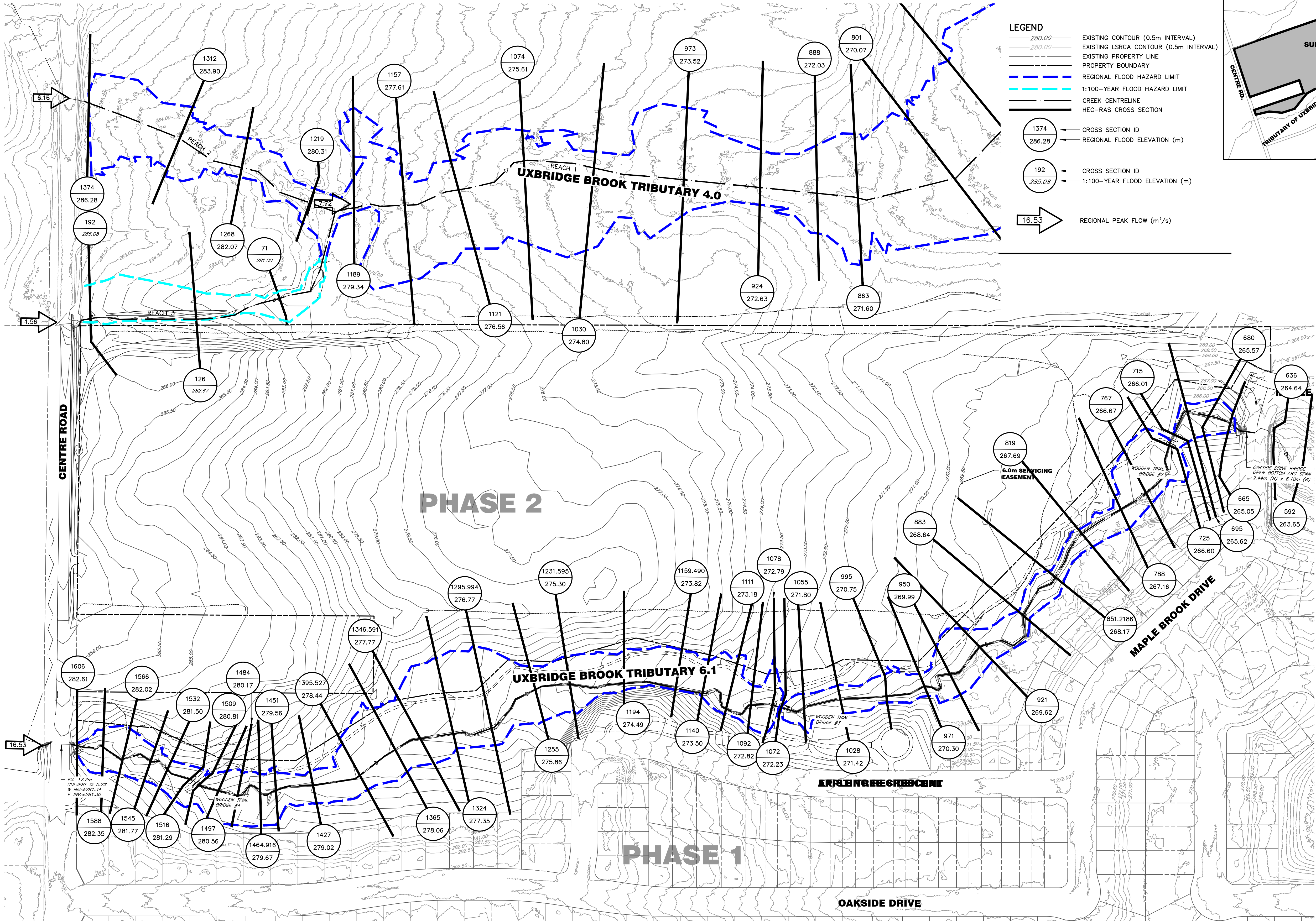


Watercourse 6.1 Plan: Tatham Existing (LSRCA Q) 9/11/2023

River 1 Reach 1



Appendix F: Drawings



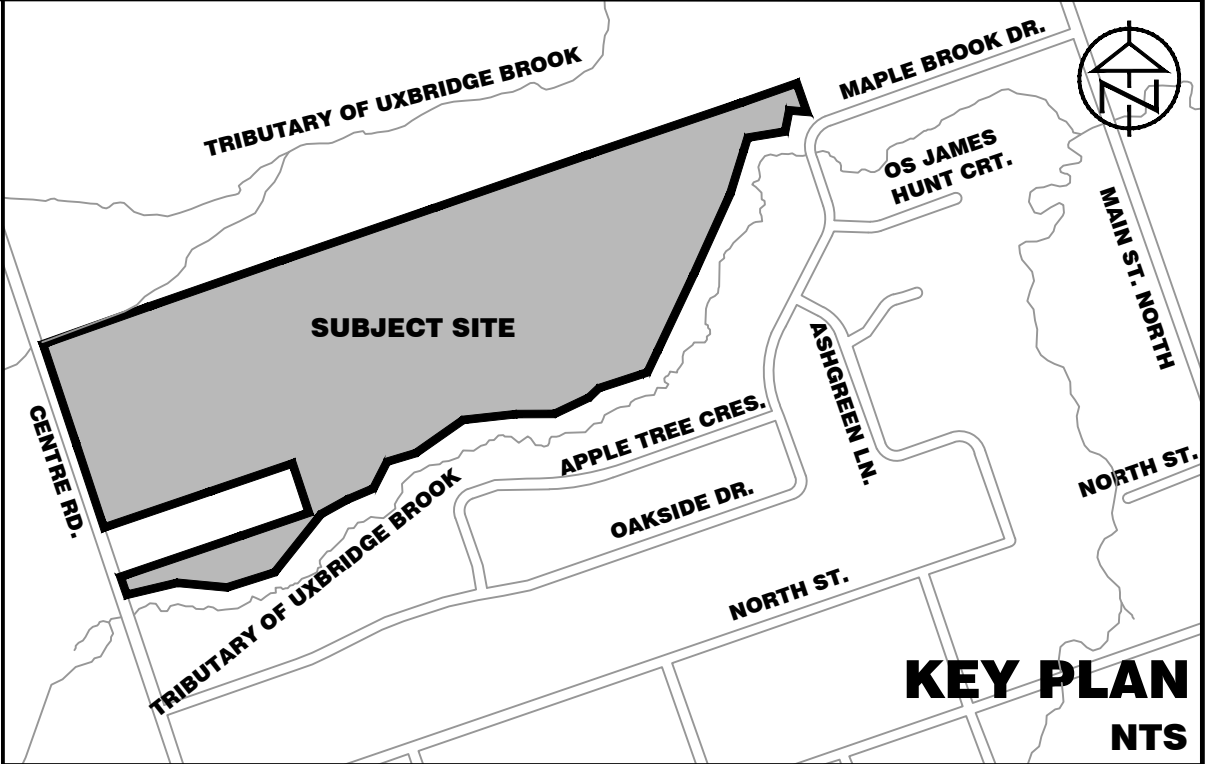
LEGEND

- 280.00 — EXISTING CONTOUR (0.5m INTERVAL)
- 280.00 — EXISTING LSRC CONTOUR (0.5m INTERVAL)
- EXISTING PROPERTY LINE
- PROPERTY BOUNDARY
- REGIONAL FLOOD HAZARD LIMIT
- 1:100-YEAR FLOOD HAZARD LIMIT
- CREEK CENTRELINE
- HEC-RAS CROSS SECTION

1374 — CROSS SECTION ID
286.28 — REGIONAL FLOOD ELEVATION (m)

192 — CROSS SECTION ID
285.08 — 1:100-YEAR FLOOD ELEVATION (m)

16.53 — REGIONAL PEAK FLOW (m³/s)



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TOPOGRAPHIC FEATURES, CONTOURS AND LEGAL BOUNDARIES SHOWN ON THIS PLAN BASED ON SURVEY COMPLETED BY IBW SURVEYORS LTD., COMPLETED ON SEPTEMBER 10, 2019 AND H.F.GRANDER Co. LTD., COMPLETED AND APRIL 6, 2023.

SUPPLEMENTARY SURVEY DATA GENERATED FROM LSRC DIGITAL TERRAIN MODEL. REFER TO NATURAL HAZARD ASSESSMENT PREPARED BY TATHAM ENGINEERING LIMITED FOR DETAILS.

DRAFT PLAN INFORMATION SHOWN ON THIS PLAN BASED ON PLAN PROVIDED BY IPS, DATED MARCH 11, 2024.

NOTES:

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No.	REVISION DESCRIPTION	DATE
1.	ISSUED FOR DRAFT PLAN APPROVAL	APR. 17/24
2.	REVISED PER LSRC COMMENTS	OCT. 1/24

ENGINEER STAMP

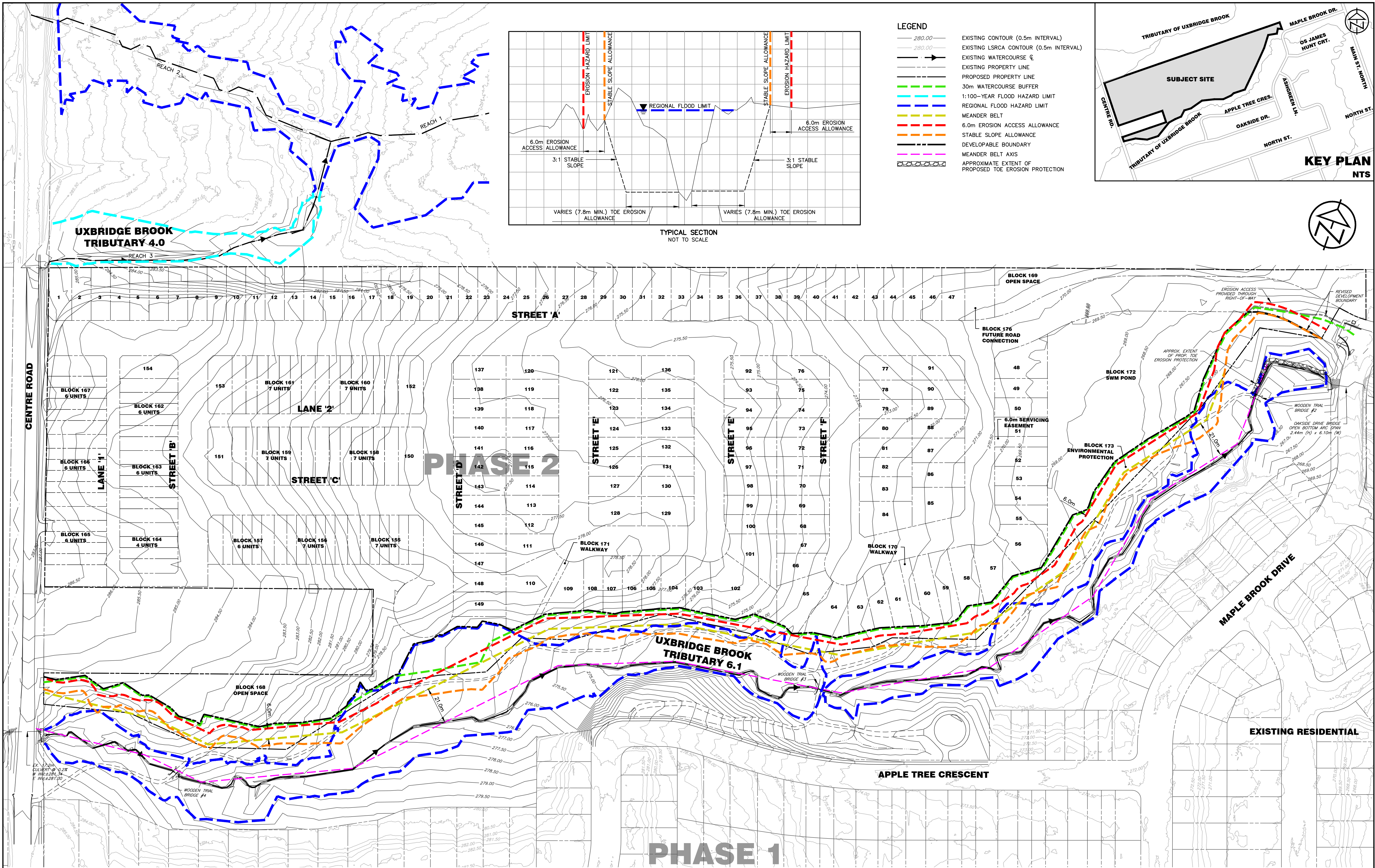


MAPLE BRIDGE RESIDENTIAL DEVELOPMENT - PHASE 2
TOWNSHIP OF UXBRIDGE
REGIONAL MUNICIPALITY OF DURHAM
MASON HOMES LIMITED

**EXISTING CONDITION
FLOOD HAZARD PLAN**



DESIGN: AMT	FILE: 422492	FLD-1
DRAWN: NB	DATE: APRIL 2024	
CHECK: DRT	SCALE: 1:1250	



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DRAWING REFERENCES
TOPOGRAPHIC FEATURES, CONTOURS AND LEGAL BOUNDARIES SHOWN ON THIS PLAN BASED ON SURVEY COMPLETED BY IBW SURVEYORS LTD., COMPLETED ON SEPTEMBER 10, 2019 AND H.F. GRANDER CO. LTD., COMPLETED AND APRIL 6, 2023.

SUPPLEMENTARY SURVEY DATA GENERATED FROM LSRCA DIGITAL TERRAIN MODEL. REFER TO NATURAL HAZARD ASSESSMENT PREPARED BY TATHAM ENGINEERING LIMITED FOR DETAILS.
DRAFT PLAN INFORMATION SHOWN ON THIS PLAN BASED ON PLAN PROVIDED BY IPS, DATED MARCH 11, 2024.

NOTES:
DRAWING IS TO BE READ IN CONJUNCTION WITH THE NATURAL HAZARDS ASSESSMENT BY TATHAM ENGINEERING, DATED OCTOBER 4, 2024.

No.	REVISION DESCRIPTION	DATE	ENGINEER STAMP
1.	ISSUED FOR DRAFT PLAN APPROVAL	APR. 17/24	
2.	REVISED PER LSRCA COMMENTS	OCT. 1/24	



MAPLE BRIDGE RESIDENTIAL DEVELOPMENT - PHASE 2
TOWNSHIP OF UXBRIDGE
REGIONAL MUNICIPALITY OF DURHAM
MASON HOMES LIMITED

NATURAL HAZARDS PLAN

		DWG: NH-1
DESIGN: AMT	FILE: 422492	
DRAWN: NB	DATE: APRIL 2024	
CHECK: DRT	SCALE: 1:1,000	