APPENDIX J

Floodplain Analysis Report

FLOODPLAIN ANALYSIS REPORT

DELINEATION OF FLOODPLAIN WITHIN BLOCK 27 UPPER WEST DON RIVER, MESP REPORT CITY OF VAUGHAN

PROJECT:2019-4766 OCTOBER 2024

Revision	Description	Prepared		Checked	
		By	Date	By	Date
0	First Submission	D.Y	May 2023	K.S.	May 2023
1	2ND Submission	D.Y	October 2024	K.S.	October 2024

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Note:
Configuration of SWM Pond A and SWM Pond B will be detailed in the second MESP submission. Currently shown SWM pond A and B blocks do not reflect the latest road network alignment.

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1.0 Introduction

Schaeffers & Associates Ltd (SCE) has been retained by the Block 27 Landowners Group to prepare the floodplain mapping for reaches of the West Don River drainage features within Block 27 in the City of Vaughan. The analysis has been done to assess the impact of the subject development on the existing West Don River and tributary watercourses and determine the floodplain extent. Floodplain analyses have been done to identify the extent of flood hazards through completion of HECRAS modeling and mapping of the regulatory floodline along various drainage features in Block 27, use of the HECRAS model to assist in the design of road crossings to ensure the appropriate hydraulic sizing of crossing openings, calculate 100 year water levels for input to SWM facility design, and as input to the conceptual channel design along DF3.

This report presents floodplain analysis results including a review of the hydraulic modelling parameters and approaches as part of the Master Environmental Servicing Plan (MESP) currently being prepared for the proposed development within Block 27. The floodplain analysis has been conducted along four drainage features within Block 27. It should be noted that TRCA has an approved hydraulic model for the two of the drainage features in Block 27 (i.e., DF1 and DF3). The TRCA model was obtained and amended along Drainage Feature 1 (DF1) and Drainage Feature 3 (DF3). Additional reaches were added to the TRCA model to reflect conditions along Drainage Feature 2 (DF2) and Drainage Feature 4 (DF4).

1.1 Background Information Review

The following reports, drawings, and information were reviewed in the preparation of this report:

- TRCA Stormwater Management Criteria (August 2012);
- Ministry of Transportation (MTO) Drainage Management Manual (1997);
- TRCA Stream Crossing Guideline (2015);
- Detailed topographic survey conducted at different times by R-PE Surveying Ltd. (dated

August 2019, September 2020, July 2021, and December 2021), Gold Park Group (dated April 2021), and First Base Solutions digital elevation models (aerial topographic data);

- Block 27 Subwatershed Study, the City of Vaughan, prepared by COLE Engineering, dated June 2017;
- TRCA approved Don River Hydraulic (HEC-RAS) Model., dated July 2020, received from TRCA on September 4th, 2020;
- Don River Floodplain Mapping Phase II, prepared by TRCA., dated August 11, 2020;
- Block 27 Drainage Features, Wetland and Woodland Numbering System Map (Figure 3), Prepared by Beacon Environmental, dated August, 2022.

2.0 Study Area and Subject Site

The Block 27 Community Area (hereon referred to as Study Area) is bounded by Teston Road to the south, Keele Street to the east, Kirby Road to the north, and Jane Street to the west. **Figure 2.1** shows the location of Block 27.

The Study Area mainly consists of agricultural lands, Trans Canada Energy Ltd. (TCE) easement, Greenbelt designated lands, and several drainage features, wetlands and woodlands. Small areas of existing estate residential development are located in the southwest and northeast corners of the block 27 along the bordering arterial roads. Valley lands are aligned generally north-south through the block. The majority of the topography of the subject site slopes in a southwesterly direction following the drainage pattern of the West Don River.

Two (2) major drainage features (i.e., DF1 and DF3 traverse Block 27 and outlet through existing box culverts at Teston Road; see **Figure 5.1** for the location of these features. In the original TRCA hydraulic model, DF1 and DF3 were defined as "West Don Reach 20" and "West Tributary14 Reach 1" respectively. Drainage features in Block 27 were labeled as DF1, DF2, DF3, and DF4 based on the "Drainage Features, Wetland and Woodland Numbering System" Map, prepared by Beacon Environmental, dated August 2022 (**Appendix D**). Accordingly, the name of the west and the middle drainage features in the current HEC-RAS model has been updated to be "DF1" and "DF3" respectively. In addition to these, two small drainage features, called "DF4" and "DF2" were created in the current hydraulic model. The description of different Drainage Features within lands is outlined below.

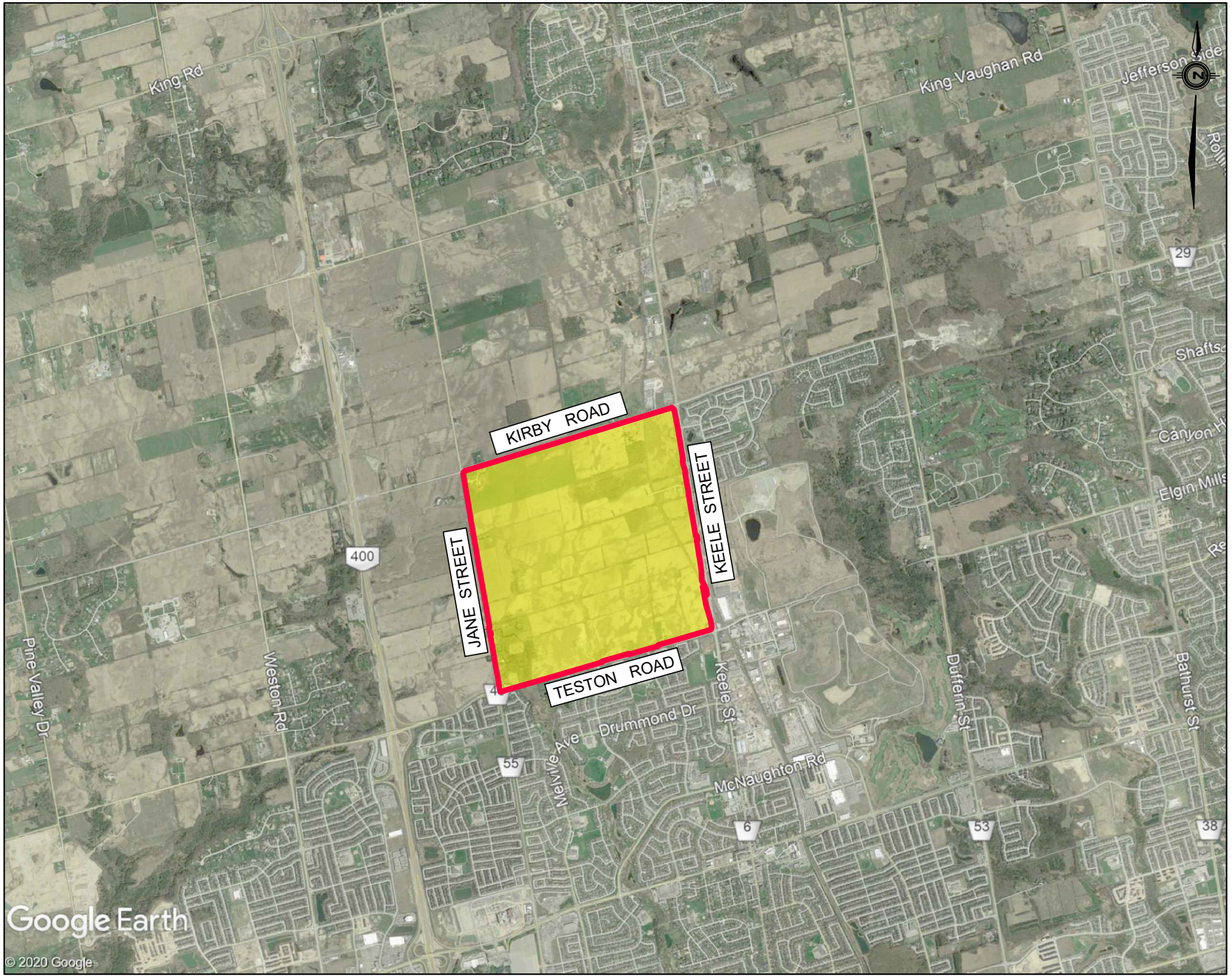
- **Drainage Feature (DF) 1**: DF1 drains the majority of the western portion of Block 27 lands. At Teston Road, this subcatchment drainage area is approximately 304.95 ha. This includes approximately 102.17 ha of the lands within Block 27. A large portion of this subcatchment is located in the Greenbelt Plan Area. Another flow contribution comes from the external area north of Kirby Road. DF1 enters into Block 27 area crossing Kirby Road via existing triple pipe culverts. Within Block 27 limit, the detailed topographic survey depicts that DF1 crosses two farmer access roads at HEC-RAS Cross-Section # 1396

and 1368. DF1 exits the Block 27 area via an existing 3.68m x 1.38m x 48m box culvert at Teston Road. Please note that the existing culvert information was adopted both from the Detailed Topographic Survey and from the TRCA, Don River Floodplain Mapping Phase II report. (Please refer to **Appendix D** for the excerpt from the TRCA, Don River Floodplain Mapping Phase II Report, and the Detailed Topographic Map).

- **Drainage Feature (DF) 3**: DF3 drains the middle and eastern portions of Block 27 lands. At Teston Road, this subcatchment drainage area is approximately 306.64 ha. This includes approximately 228 ha of the Block 27 lands. Other flow contributions come from the external area to the northeast corner of Block 27. Under existing conditions, DF3 crosses Canadian National Railway (CNR) and leaves the Block 27 area through an existing box culvert at Teston Road.

- **Drainage Feature (DF) 4**: A small drainage feature was created in the current hydraulic model to reflect conditions along DF4. In its existing condition, this drainage feature has a drainage area of less than 50ha. This small drainage feature has been labeled as "DF4" in the current HEC-RAS model. DF4 was created in the current hydraulic model for better modelling of the wetland feature along the watercourse and safe conveyance of the future flow. The watercourse joins the DF3 Reach 1 just north of Teston Road.

- **Drainage Feature (DF) 2:** DF2 is a small drainage feature defined in the current HEC-RAS model (i.e., SCE revised HEC-RAS Model) for the small wetland area (near 25 ha drainage area) located in the middle south portion of the Block 27 area. DF2 was established to better define the regulatory flood line north of Teston Road. It should be noted that the regional flood line along DF3 overtops the banks and flows westerly along the upstream side of Teston Road into DF2. During the Regional Storm event, flows overtop Teston Road along the entire frontage between DF2 and DF3. The flows from DF2 and DF3 drain via existing culverts under Teston Road into DF3 just south of Teston Road. Please see Floodplain Maps in Appendix C for detailed information.



BLOCK 27
CITY OF VAUGHAN

LEGEND

BLOCK 27 SITE LOCATION

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FIGURE 2.1
LOCATION PLAN

2019-4766	JULY 2024	SCALE: N.T.S.

Debebe Yilak
W:\4700\94766 - Block 27 MESP\Drawings\Servicing\2022-07-12-4766-Servicing.dwg

3.0 Topographic Surveying

Most of the topographic ground survey of the study area was conducted by R-PE Surveying Ltd. in August 2019, September 2020, July 2021, December 2021, and March 2022. A detailed topographic ground survey for the small parcel (Gold Park area) around DF3 was conducted by Rady Pentek (dated April 2021). Please refer to **Appendix D** for survey information. Topographic information for the areas which are highly vegetated were obtained using First Base Solutions digital elevation models (aerial topographic data).

In this study, the available detailed topographic field data and aerial topographic data (where the detailed survey was not available) were used to produce a high-resolution Triangulated Irregular Network (TIN) for generating digital terrain layers. Furthermore, major road crossings have been surveyed. Please refer to **Appendix D** for the topographic map information.

4.0 Proposed Conditions

Under post-development conditions, the subject site will be developed in accordance with the Block 27 Secondary Plan and the Block Plan. **Figure 4.1** shows the Block Plan reflecting proposed post-development conditions.

The land will be re-graded to capture and convey surface runoff towards stormwater management ponds. Based on the proposed Block 27 development plan, there will be eight new crossing structures within the Block 27 area. All the proposed new crossing structures are required to safely convey the flow with no overtopping. In addition to these, the DF3 watercourse will be realigned/restored for approximately 250m just before exiting the Block 27 area. The existing box culvert at Teston Road will also be extended upstream by (approximately 40m) to convey flows from DF3 under the proposed Street 5A alignment. Detailed discussion on the culvert crossing is presented in *Section 5.3.3*.

BLOCK 27
CITY OF VAUGHAN

LEGEND

SUBJECT SITE

KIRBY ROAD

COLLECTOR STREET 1

COLLECTOR STREET 2

COLLECTOR STREET 3

COLLECTOR STREET 4

COLLECTOR STREET 5

COLLECTOR STREET 6

COLLECTOR STREET 7

COLLECTOR STREET 8

JANE STREET

KEELE STREET

TESTON ROAD

Village Vista Way

Canyon Gate Cres

Crestbank Ct

Maple Forest Dr

Keele St

Teston Rd

Ashton Dr

Kinney Gate

D'Amato Cr

Malmo Ct

Google Earth

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FIGURE 4.1
DEVELOPMENT PLAN

2019-4766	JULY 2024	SCALE: N.T.S.

W:\4700's\4766 - Block 27 MESP\Drawings_MESP\Development\2023-10-31-4766-Development.dwg

5.0 Methodology of HEC-RAS Modelling and Floodplain Analysis

5.1 SCE Modified Existing Conditions HEC-RAS Model

SCE has started the hydraulic (HEC-RAS) modelling using HEC-RAS 5.0.7 based on the latest TRCA-approved hydraulic model of the subject site. It should be noted that the Don River Hydraulic Model (dated July 2020) was received from TRCA on September 4th, 2020.

The Block 27 SWS was completed by Cole Engineering Ltd. dated July 2017 (Please see an excerpt of the SWS report and floodplain mapping in **Appendix D**). Since the TRCA-approved latest hydraulic model was available from TRCA (2020), SCE preferred to establish the SCE existing hydraulic model based on the latest TRCA approved HEC-RAS model.

Detailed topographic survey data were reviewed for the Block 27 development area. Bank location, watercourse center lines, cross-section geometries, hydraulic structures information, and all related information have been updated based on the detailed topographic survey data. Additional HEC-RAS cross-sections and crossing structures were added to the TRCA model to better reflect existing conditions.

As was discussed in the previous sections, Block 27 area was defined by four drainage features (i.e., DF1, DF2, DF3, and DF4). It should be noted that only DF1, DF2, and DF3 drainage features are included in the updated SCE existing conditions. DF1 and DF3 drainage features have regulatory floodplains and DF2 is required to understand the spill characteristic at Teston Road. The other small drainage feature (DF4), has no regulatory floodplain due to its small drainage area however it has been included in the updated SCE model to show that future flows can be conveyed along this drainage feature without entering future private property.

This condition of the model will be referred to as the “SCE Modified Existing HEC-RAS Model” for the remainder of the report. The following table depicts the major changes made to the original TRCA HEC-RAS model in order to establish the SCE Modified Existing HEC-RAS Model.

Table 5.1: Summary of Modifications Applied to Establish SCE Modified Existing HEC-RAS Model

Drainage Feature	Description	Changes Made	TRCA Original	SCE Existing
DF1	Local unnamed farm Road east of Jane St. (Station 1396)	Culvert added	N/A	1.5mx2.4mx5.3m Box culvert based on detailed survey information.
	Local unnamed farm Road east of Jane St. (Station 1368)	Culvert Added	N/A	1.8mx2.4mx6.0m Box culvert based on detailed survey information.
DF2	New drainage feature defined	DF2 defined	N/A	DF2 was not defined in the original TRCA Model. DF2 included in the current model for better modelling of the spill water from DF3 to DF2 and to define floodline conditions north of Teston Rd.
	Teston Rd (Station 791)	Existing Culvert information at Teston Rd.	N/A	Existing box culvert at Teston Road (0.9mx1.4mx30m) was not included in the Original TRCA Model. In the current model, this culvert has been defined based on detailed ground survey data.
DF3	Railway Crossing- (Station 3179.12)	Culvert Information at Railway Crossing	Ø 0.8m x 30m length culvert	Ø 0.7m x 37m PVC culvert Ø 0.7m x 37m PVC culvert Ø 1.5m x 37m CSP culvert all based on recent detailed topographic ground survey information.
	Kirby Rd (Station 3307.12)	Culvert Information at Kirby Rd	Double Ø 0.61m x 10m length culvert	Ø 0.6m x 21m CSP Ø 0.6m x 21m CSP Ø 0.5m x 16m CSP all based on detailed topographic ground survey information.

5.2 SCE Proposed Conditions Model

The SCE proposed condition HEC-RAS model was coded to reflect the proposed grading of the Block 27 development area and associated road crossings . As discussed in the previous section, channel realignment is proposed along approximately 350m length near the south end of DF3 before leaving Block 27 area. The existing box culvert at Teston Road will be extended further

upstream by approximately 40m to convey DF3 flows under new Street 5. In addition to the existing hydraulic structures, there are seven (7) newly proposed culvert structures where the proposed road alignments cross drainage features. Under the proposed condition HEC-RAS Model, DF4 was considered in order to show that future flows can be conveyed along this drainage feature without entering future private property.

The following table summarizes changes applied to the SCE Modified Existing HEC-RAS model to establish the "SCE Proposed HEC-RAS model".

Table 5.2 Summary of Modifications Applied to Establish SCE Proposed HEC-RAS Model

Drainage Feature	Description	Changes Made	SCE Existing	SCE Proposed*
DF1	Proposed culvert structures (DF1)	Three new culverts	N/A	Crossing A: 2.44m x 12.81m x 45m Crossing B: 3.35m x 14.64m x 45m Crossing C: 3.35m x 14.64m x 55m
DF3	Teston Road (Station 924.94)	Extending existing culvert at Teston Rd.	Box Culvert (1.36mx7.744 mx50m)	Crossing H: Length extended further upstream (1.36m x 7.744m x 90m)
		New culvert added at Teston Rd. Crossing	N/A	Crossing H: Ø 1.50m x 90m Concrete pipe installed parallel to Box culvert
		Grading change north of Teston Rd. Crossing	N/A	Ground surface raised north of Teston Rd. Crossing
	Channel Realignment (DF3)		N/A	Channel realignment for about 350m
	Proposed culvert structures (DF3 reach 1)	Four new culverts	N/A	Crossing D: 1.83m x 7.315m x 55m Crossing E: 2.44m x 12.81m x 55m Crossing F: 2.44m x 12.81m x 50m
DF4	New drainage feature	DF4 defined	N/A	DF4 was established to show that future flows can be conveyed along this drainage feature without entering future private property and for modelling wetland feature
	Proposed culvert structure	New culvert	N/A	Crossing G: 1.22m x 4.27m x 40m

Note:
* *Refer to Figure 5.1 and Table 5.4 for the Crossing ID*

5.3 Hydraulic Model Development

5.3.1 General Modelling Procedure

The general modelling procedure and development of the hydraulic model can be summarized as follows:

- Determine georeferenced alignment of the reach (NAD83 / UTM zone 17N);
- Generate surface terrain layer based on the elevation data source;
- Determine cross-section locations considering the hydraulic characteristics of the study area and HEC-RAS Hydraulic Reference Manual criteria;
- Generate geo-referenced cross-sections using a digital terrain layer along a watercourse reach;
- Add hydraulic structures data to the model and calculate Ineffective Flow Areas;
- Determine key model parameters (e.g., Loss Coefficients and Manning's ‘n’ values, Flow lengths, and Ineffective Flow Areas);
- Add simulated storm flows data to the model;
- Determine boundary conditions for hydraulic modelling;
- Conduct Steady Flow analysis and Water Surface Profile calculation; and
- Generate required floodplains for different storm events.

5.3.2 Hydraulic Modelling

Hydraulic model development in HEC-RAS software includes creating proper HEC-RAS cross-section, modelling crossing structures, properly defining Manning’s roughness coefficient, Contraction and Expansion coefficients, and ineffective areas.

In the current hydraulic modelling, HEC-RAS cross-sections are coded left to right looking downstream and alignment of the cross-sections is considered perpendicular to the flow direction and is extended to contain the entire floodplain. Overbank flow lengths were also determined considering Flow Mass centerlines.

Manning's 'n' values at cross-sections for the main channel as well as for the left and the right over banks were coded according to TRCA requirements and HEC-RAS Hydraulic Reference Manual. Manning's 'n' values were selected for various stream reaches through Block 27 based on TRCA standards. In most of the reaches, Manning's 'n' values of 0.035 and 0.08 were chosen for the channel and overbank flow sections respectively.

It should be noted that, in the current model, where changes in river cross-sections are small, and the flow is subcritical (HEC-RAS Hydraulic Reference Manual, Table 3.3), Contraction and Expansion Coefficients were set to 0.1 and 0.3 respectively for gradual transitions. The Contraction and Expansion Coefficients of 0.3 and 0.5 were respectively adopted for the open bottom culvert crossings. In areas where the channel geometry encounters abrupt transitions, the Contraction and Expansion Coefficients of 0.6 and 0.8 were applied respectively.

According to the HEC-RAS modelling recommendations, upstream and downstream boundary conditions are required at the upstream and downstream ends of all reaches that are not connected to other reaches or storage areas. In the current hydraulic modelling, boundary conditions are set to be consistent with the original TRCA approved hydraulic model. The downstream boundary conditions are assigned at junctions. Upstream boundary conditions for along drainage features are assigned as critical depth.

To define Ineffective Flow Areas at the boundary cross-sections of the culverts, the Contraction reach upstream of the culvert was calculated based on a 1:1 contraction rate and the Expansion reach downstream of the culvert was calculated considering a 1.5:1 expansion rate. The elevation of Ineffective Flow areas at the upstream road crossings was set to the lowest elevation of the high chord of the subject crossings and for the downstream cross-section was set to the average elevation of the obvert of crossing and lowest cord elevation of the road.

5.3.3 Road Crossing Design

5.3.3.1 Road Crossing Design Criteria

The proposed crossings were sized based on direction from the TRCA Crossing Guideline for Valley and Stream Corridors, MTO Highway Drainage Design Standards, and MNRF Technical Guide Flooding Hazard Limit. The following summarizes the requirements of each of the guidelines.

TRCA – Watercourse Crossing Design and Submission Requirements (September 2015):

- Early planning considering the natural hazards and natural heritage objectives is essential for new crossings.
- Proposed crossings should be perpendicular to the valley and stream corridors and, where possible, should cross at the narrowest point of the valley/ stream.
- Minimize the total number of crossings in valley corridors to reduce overall impacts;
- Minimize Flood Risk:
    - Ensure that the proposed crossing does not increase flood risk for all storm events up to and including regional storm events;
    - Safely convey the applicable design flows from the upstream tributary considering future land use; and
    - Ensure safe ingress/egress access points in case of overtopping of the culvert during regional storm events.
- Minimize Geomorphic Hazards: Crossing should span the meander belt or the 100-year erosion limit to reduce risks from channel migration over time.
- Minimize Geotechnical Hazards:
    - Avoid sites of active erosion and locations with a risk of slope instability (i.e. over-steepened slopes and locations where the watercourse is coincident with the toe of the slope).
    - Ensure that the construction of the crossing structure does not aggravate valley

slope instability.

- Avoid siting crossing infrastructure where there is a need for permanent dewatering.
- Ensure appropriate restoration of valley slopes where slope treatments are necessary.
- Valley and stream corridor crossings should be sited and designed to avoid or minimize the physical footprint impact on habitats and terrestrial and aquatic connectivity.
- errestrial and aquatic connectivity.

- Minimize impacts on the aquatic and terrestrial habitat;
  - Crossings should be designed to satisfy the openness ratio for the passage of wildlife habitat.

Safe Access and Egress Requirements (Technical Guideline River and Stream Systems: Flooding and Hazard Limit, Ontario Ministry of Natural Resources (MNRF), 2002) (MNRF):

- To provide safe access, when the existing road (Teston Road) is being overtopped, three parameters (velocity, depth, and the product of depth and velocity) should be calculated and assessed. The safe condition for crossing the floodplain is when the combined depth and velocity factor is less than 9 ft^2/s, and the depth of spill is limited to 0.3~0.4m. It should be noted that this depth can increase for a larger vehicle, but 0.3~0.4m depth is considered safe for passenger vehicles. It should be noted that emergency vehicles, like ambulances and police vehicles, have better exhaust system clearance from the ground and stability.

5.3.3.2 Existing and Proposed Road Crossings in Block 27

Figure 5.1 illustrates the road system including eight collector roads, referred to as Streets 1 to 8, that cross the NHS in 8 locations. There are three proposed crossings of DF1, four crossings of DF3, and one crossing of DF4. There are no proposed road crossings of DF2.

The crossing designs should adhere to the requirements of the City of Vaughan, TRCA, as well as MNRF Technical Guideline Flooding Hazard Limit discussed in *Section 5.3.3.1*. In addition to the hydraulic factors, design considerations include the proposed road geometry, grading design, and fluvial geomorphological and ecological conditions and design requirements. Based on the review of all considerations, in all cases, hydraulic requirements dictate the crossing size as they require the largest opening sizes. The proposed culverts alignment was mainly dictated by the channel meandering feature and the proposed road alignment.

The proposed watercourse crossings sizes are summarized in Table 5.3 below. In addition to the proposed water crossings, an existing culvert at Teston Road along DF3 is proposed to be extended upstream to accommodate Street 5A. It should be noted that the proposed culvert type should be selected during the next detailed design phase and must meet all hydraulic and ecological requirements.

Table 5.3: Summary of Existing Road Crossing Data

Street Name	Reach	HEC-RAS Cross Section	Type of Culvert	Culvert Dimensions		Invert Elevation (m)	
				Depth(m) x Span(m)	Length (m)	U/S	D/S
Kirby Rd	DF1	3307.12	CSP	Ø 0.60 CSP Pipe	21	270.99	270.61
			CSP	Ø 0.60 CSP Pipe	21	270.92	270.63
			CSP	Ø 0.50 Conc. Pipe	16	270.86	270.57
Local Road east of Jane St.	DF1	1396	Box	1.50×2.40	5.30	253.59	253.60
		1368	Box	1.80x2.40	6.0	253.52	253.64
Teston Rd	DF1	491.96	Box	2.40x3.60	48	245.23	244.89
Railway Crossing	DF3	3179.2	Pipe	Ø 0.7m PVC	37	277.34	276.36
			Pipe	Ø 0.7m PVC	37	277.34	277.16
			Pipe	Ø 1.5m CSP	37	277.60	277.09
Teston Rd.	DF3	924.94	Box	1.36 x 7.744	50	248.22	248.14
Teston Rd.	DF2	791	Box	0.90 x 1.40	30	247.13	246.945

Table 5.4: Summary of Proposed Road Crossing Data

Street Name and Crossing ID*	Reach	HEC-RAS Cross Section	Type of Culvert	Culvert Dimensions		Invert Elevation (m)	
				Depth(m) x Span(m)	Length (m)	U/S	D/S
Crossing A Street 1	DF1	2828.99	**	2.44×12.81	45	268.00	267.70
Crossing B Street 2	DF1	2299.11	**	3.35×14.64	45	262.76	262.24
Crossing C Street 3	DF1	1650	**	3.35×14.64	55	256.19	256.06
Crossing D Street8	DF3	3230	**	1.83×7.315	55	278.98	277.53
Crossing E Street 2	DF3	2368.51	**	2.44×12.81	55	266.40	265.32
Crossing F Street 3	DF3	1809.25	**	2.44×12.81	50	259.93	259.00
Crossing G Street 3	DF4	1014	**	1.22×4.27	40	264.70	264.14
Crossing H Teston Rd.	DF3	924.94	Box***	1.36×7.744**	90	248.28	248.14
			Pipe	Ø1.5 Conc. Pipe	90	248.28	248.14

Note:
* *Refer to Figure 5.1 for the Crossing ID*
*** The culvert type should be selected during the next detailed design phase and must meet all hydraulic & ecological requirements.*
**** Existing box culvert to be extended in length to accommodate the new road.*

5.3.3.3 Culvert Crossing Low Flow Channel Dimension Calculation

Low flow channel sections were designed for each proposed road crossing. The low flow channel section has a trapezoidal shape, with a 3:1 side slopes, and is designed to convey 2-year flows. Bentley Flowmaster (Version 8i) software was applied to design the sections. Table 5.5 outlines the recommended low flow channel dimensions for the proposed road crossings in Block 27.

Table 5.5: Low Flow Channel Dimensions at the Proposed Road Crossings

Crossing ID*	Location		Type of Culvert	Culvert Dimensions (m)		Low Flow Channel Dimension (m)		
	Reach	HEC-RAS Cross Section		DepthxSpan	Length	Bottom Width	Top Width	Depth
Crossing A	DF1	2828.99	**	2.44×12.81	45	0.35	2.15	0.30
Crossing B	DF1	2299.11	**	3.35×14.64	45	0.70	2.50	0.30
Crossing C	DF1	1650	**	3.35×14.64	55	0.70	2.50	0.30
Crossing D	DF3	3230	**	1.83×7.315	55	1.50	3.30	0.30
Crossing E	DF3	2368.51	**	2.44×12.81	55	2.00	3.80	0.30
Crossing F	DF3	1809.25	**	2.44×12.81	50	1.80	3.60	0.30
Crossing G	DF4	1014	**	1.22x4.27	40	0.80	1.70	0.15
Crossing H	DF3	924.94	Box	1.36x7.744	90	2.5	0.3	0.3

* See Figure 5.1 for crossing locations.
*** The culvert type should be selected during the next detailed design phase and must meet all hydraulic & ecological requirements.*

Mohandeep Singh

KIRBY ROAD

TESTON ROAD

JANE STREET

KEELE STREET

A

B

C

D

E

F

G

H

DF1

DF3

DF4

PIPELINE

BLOCK 27
CITY OF VAUGHAN

LEGEND

BLOCK 27 SITE LOCATION

WATERCOURSE

PROPOSED WATERCOURSE ROAD CROSSING

APPROXIMATE LOCATION OF EXISTING CULVERT

PROPOSED/REALIGNED CULVERT

SCHAEFFERS
CONSULTING ENGINEERS
6 Ronrose Drive, Concord, Ontario L4K 4R3
Tel: (905) 738-6100 Email: general@schaeffers.com
www.schaeffers.com

FIGURE 5.1
PROPOSED
ROAD CROSSINGS

2019-4766 | JULY 2024 | SCALE: N.T.S.

W:\4700\s\4766 - Block 27 MESP\Drawings\Road Crossing\2024-07-26-4766-Road Crossings.dwg

5.3.4 Channel Realignment

In the current hydraulic modelling (i.e., SCE Modified Existing and SCE Proposed), the watercourse alignment of the drainage features was defined following the lowest elevation of the channel. In most parts of the study area, the drainage feature centrelines are marked on the detailed topographic map. In areas where detailed ground survey topographic information was not acquired, satellite imageries were adopted to identify the drainage feature centerlines in addition to the topographic features.

Proposed road alignment and crossings are designed to minimize impacts to existing natural drainage features alignments. In several locations, new crossings require no realignment of drainage features outside of the culverts. However, natural channel realignments are required at the following four places (i.e., at DF3 Culvert D, DF3 Culvert F, DF3 Collector Street 5A, and DF4 Culvert H) in the Block 27 area.

5.3.4.1 Channel Realignment at DF3 (Culvert D)

Culvert D is located where the proposed Collector Street # 8 crosses DF3 as it was shown in **Figure 5-1**. Collector Street 8 has a north-south orientation around the DF3 drainage crossing whereas the drainage feature at the intersection is aligned from an east-west orientation. As a result, the proposed road is perpendicularly aligned to cross the natural drainage feature. However, the existing drainage feature has a curved meandering feature around the proposed culvert. To attain a channel route within the proposed culvert width, the proposed channel route within the proposed culvert length has been realigned.

The proposed channel realignment will stretch around 55m within the culvert. The existing channel geometry shows that the channel bed is not deep and narrow, rather it is wide and shallow. Hence, the proposed realignment will not affect the channel cross-section geometry significantly. The realigned channel shall have a 2.00m bed width and 0.30m depth low-flow channel section. Please see the attached engineering drawings for detailed information (**Appendix D**).

5.3.4.2 Channel Realignment at DF3 (Culvert E)

Culvert E is located at the place where the proposed Collector Street #2 crosses DF3. Collector Street 2 orientation is east-west direction whereas the drainage feature at Culvert E is aligned from northeast to southwest orientation. As a result, the road is not perpendicularly crossing the natural drainage feature. SCE has proposed a minor channel realignment to attain a smooth channel alignment with the proposed culvert arrangement. The proposed channel realignment will stretch around 30m north of the proposed culvert inlet and 55m within the culvert. The realigned channel shall have a 2.0m bed width low-flow channel section. Please see the attached engineering drawings for detailed information (**Appendix D**).

5.3.4.3 Channel Realignment at DF3 (Collect Street 5A)

The Block 27 Master Environmental Servicing Plan (MESP) and Block 27 Collector Roads Municipal Class Environmental Assessment (MCEA) study are underway for the Block 27 Community Area (Block 27). As part of the MCEA and the Block 27 MESP, SCE has reviewed and assessed road crossing design options. A direct connection of the proposed Street 5A in Block 27 to Cranston Park Ave is shown on the Block 27 Secondary Plan. The alignment in the Secondary Plan does not include the full right-of-way and incorporated a skewed intersection that does not meet current road standards. Any new intersection in this location will require new or modified drainage feature crossings and channel realignment of a portion of DF3 and DF4.

The proposed Street 5A alignment option requires the realignment of a portion of DF3 and the extension of the existing culvert at Teston Road by approximately 40m since the current existing headwall is located in the middle of the future intersection. Channel realignment on the DF3 stretches for approximately 350m north from the confluence of DF3 and DF4. The engineered channel aligned parallel to the proposed Street 5A. The proposed channel realignment was made following the proposed concept plan titled “Tributary 3 Design Concept Plan, Profile, and Details”, prepared by BEACON, dated December 16th, 2022. Please see the Engineering drawings for the alignment and sections of the proposed realigned channel as well as the concept plan prepared by BEACON in **Appendix D**.

5.3.4.4 Channel Realignment at DF4 (Culvert G)

Culvert G is located at the place where the proposed Collector Street # 3 crosses DF4 as it was shown in **Figure 5-1**. Collector Street 3 has an east-west orientation around the DF4 drainage crossing whereas the drainage feature at the intersection is aligned in a north-south orientation. The proposed road is perpendicularly aligned to cross the natural drainage feature. However, the existing drainage feature has a curved meandering feature around the proposed culvert. To attain a channel route within the proposed culvert width, minor channel realignment has been made within the proposed crossing. The length of the proposed channel realignment will be around 40m within the culvert. It should be noted that the natural channel is a small drainage feature with relatively shallow and wider geometry over the upstream cross-section and narrow and deeper geometry over the downstream cross-sections. The proposed low flow channel shall have a 0.80m bed width and 0.15m depth. Please see the attached engineering drawings for detailed information (**Appendix D**).

5.4 Hydrologic Data

In the current floodplain analysis, peak flows are computed based on the TRCA (December 2018) model and the SCE Revised Hydrology Model. PCSWMM hydrologic model has been used to simulate hydrographs by modelling rainfall, infiltration, runoff, and routing through a watershed. Peak flows were determined at required nodes located along the reach for the 2 year to 100 year storms (AES 6hr and AES 12 hr distributions) and the Regional uncontrolled storm (Hurricane Hazel, Last 12 hours distribution) event. Similarly, the post development condition peak flows are computed in the current floodplain analysis by considering the proposed development and grading of the Block 27 community. It should be noted that uncontrolled regional and 100 year flows are considered for the floodplain analysis. **Table 7.2** summarizes the HEC-RAS modelling flows for existing and future conditions.

Peak flows were calculated at the outlets of the subcatchments. The subcatchment areas were overlaid on top of the hydraulic model to identify the peak flow nodes for the corresponding

HEC-RAS cross-sections. For those subcatchments which have relatively large subcatchment area, the Ministry of Transportation (MTO) flow proration equation was used to estimate peak flows within subcatchment. It should be noted that the peak flows calculated for each of the outlets of the catchments were used for the HEC-RAS cross-section corresponding to the top of the respective catchment.

Block 27 has ultimate and interim scenarios of hydrology models at the current level of study. The ultimate flood plain is established based on the ultimately built condition of lock 27 when all parcels are participating and the grading and SWM ponds are built based on the MESP. However, since SWM Pond B is currently located in a non-participating landowner, a temporary pond will be required to permit developments on the east of the non-participating landowner. This temporary pond is going to discharge to DF3 until the ultimate swim pond (SWM pond B) is constructed. Thus, on an interim basis, the peak flow in DF 3 will increase from that of the ultimate condition. To ensure the Block 27 development limits are defined properly, both interim and ultimate conditions were modeled. To model the flood plain in Each DF1 and DF3 reaches the maximum of flows were considered.

The middle reach has higher future condition flow in the interim scenario while the west drainage feature (i.e., DF1) will have higher peak flows in the ultimate scenario. To be conservative, future peak flows corresponding to the interim and ultimate scenario results were applied to the middle and west drainage features respectively. Please refer to **Appendix A** (Table A-1 and A-2 as well as Figures A-1 and A-2) for a better understanding of the peak flows computation and adaptation to the hydraulic model. Table 5.6 summarizes peak flows applied to the SCE hydraulic models.

Table 5.6: Peak Flows Applied for SCE Modified Existing and Future Condition HEC-RAS Modelling

SCE Existing					SCE Future				
DF	**PCSWMM Node**	**HEC-RAS Cross-Section ID**	**Regional Flow (m^3/sec)**	**100 Year (m^3/sec) (12hr AES Storm)**	**DF**	**PCSWMM Node**	**HEC-RAS Cross-Section ID**	**Regional (m^3/sec)**	**100 Year (m^3/sec) (12hr AES Storm)**
DF1	J009	5886.58	10.448	0.496	DF1	J009	5886.58	10.448	0.496
		4508.16	16.559	0.491			4508.16	16.646	0.538
	J012	4125	21.003	0.623		J012	4125	21.142	0.683
						J012, NA1	3279.33	21.802	0.843
		3279.33	24.296	1.068		J3	2827.51	27.730	3.202
	J035	2628.8	26.482	1.164		J035	2628.8	27.731	2.990
		1990.35	27.103	1.155		J7	1990.35	29.812	3.355
						J6	1668	32.739	4.540
	J058	1115.08	28.744	1.225		J058	1159	35.318	4.601
DF3					DF3				
	J034	3547.76	11.699	2.132		J034	3547.76	11.682	2.998
		3147.49	15.934	1.734		J2	3147.49	17.187	3.862
		2607.54	18.419	2.004		J8	2607.54	17.766	3.799
	J042		23.433	2.55		J042	2052	23.964	5.847
		1676.47	25.249	3.155		J043,J164 N209,NA11,N202	1676.47	29.025	8.101
		1329	26.047	3.255		J043,J164, N202	1329	30.046	8.385
	J043	970.12	30.467	3.807		J043		42.052	11.736
	J057	947.55	35.116	3.064		J057	970.12	41.96	11.465
	J1	888.03	37.986	4.295		J1	888.03	45.042	12.442
DF2	S0261	1000	2.98	0.24	DF2	S201,S220, S16,and S1	899	2.540	1.07
DF4	N/A	N/A	N/A	N/A	DF4		1044	1.812	0.62
	N/A	N/A	N/A	N/A			649	7.572	2.521
	N/A	N/A	N/A	N/A		J164	416	12.735	4.24

*Note: (Please refer to **Appendix A (Figure A-1, and A-2)** for detailed information on peak flow calculations and flow changing nodes).*

6.0 Hydraulic Modelling and Floodplain Analysis Results

Steady State Flow Analysis in HEC-RAS has been completed to perform hydraulic modelling of the subject development under existing conditions and post-development conditions. Hydraulic modelling has been completed for the 100-year (AES 6hr and AES 12hr distributions) and Regional (Hurricane Hazel) storm events. The SCE Modified Existing HECRAS model is based on existing flows; the SCE Future HECRAS model is based on uncontrolled future development conditions flows. The complete HEC-RAS outputs have been provided in **Appendix B** of this report and are summarized in subsequent sections below.

The water surface elevations for the existing and post-development conditions are summarized for each drainage features. Detailed results can be referred to in detailed summary tables provided in **Appendix B**. The Existing condition Floodplain Mapping drawings (Sheet No. Ex-1 and Ex-2) and post-development condition Floodplain Mapping drawings (Sheet No. FUT-1 and FUT-2) are also provided in **Appendix C**. The digital HEC-RAS models are provided in **Appendix E**.

Hydraulic analysis results are presented separately for each drainage feature in the following subsections.

6.1 DF1 Floodplain Analysis Results

6.1.1 Existing and Proposed Conditions Hydraulic Analysis of the Drainage Feature

The existing and proposed conditions hydraulic analysis results for the DF1 have been summarized in **Table 6.1 and 6.2** respectively. It should be noted that peak flows corresponding to the existing and future uncontrolled regional and 100 year storm events were applied in the existing and proposed conditions hydraulic models respectively. As it is depicted in the summary tables, the regional flows are greater than 100 year flows and therefore the Regional Storm is the regulatory event for both conditions.

Table 6.1: DF1 Existing Condition Hydraulic Analysis Results Summary Table

River	Reach	River Sta	Min Channel Elevation (m)	Water Surface Elevation (m)		
				Regional	100 Year	Regulatory
DF1	Reach20	3479	272.48	273.33	272.77	273.33
DF1	Reach20	3428.83	272.06	272.81	272.3	272.81
DF1	Reach20	3330.15	271.38	272.79	271.56	272.79
DF1	Reach20	3322.69	271.32	272.78	271.46	272.78
DF1	Reach20	3307.12	Culvert (Existing Culvert @ Kirby Rd)			
DF1	Reach20	3289.02	270.49	271.32	270.75	271.32
DF1	Reach20	3279.33	270.39	271.17	270.67	271.17
DF1	Reach20	3228.83	269.86	270.59	270.02	270.59
DF1	Reach20	3130.4	269.08	269.85	269.28	269.85
DF1	Reach20	3084	268.72	269.31	268.91	269.31
DF1	Reach20	3028.87	267.8	268.85	268.16	268.85
DF1	Reach20	2965.4	268	268.39	268.06	268.39
DF1	Reach20	2928.83	266.9	267.87	267.2	267.87
DF1	Reach20	2827.51	266.14	266.85	266.29	266.85
DF1	Reach20	2728.83	265	266.03	265.24	266.03
DF1	Reach20	2628.8	264.56	265.71	264.93	265.71
DF1	Reach20	2525.58	264.43	264.86	264.52	264.86
DF1	Reach20	2466	263.47	264.16	263.56	264.16
DF1	Reach20	2428.87	262.99	263.74	263.18	263.74
DF1	Reach20	2328.83	262.41	263.03	262.52	263.03
DF1	Reach20	2228.89	261.72	262.42	261.91	262.42
DF1	Reach20	2129.24	261	261.61	261.08	261.61
DF1	Reach20	2056.16	260.38	260.99	260.54	260.99
DF1	Reach20	1990.35	259.98	260.44	260.05	260.44
DF1	Reach20	1915.13	259.06	259.5	259.19	259.5
DF1	Reach20	1889	258.64	259.11	258.7	259.11
DF1	Reach20	1815.13	257.37	258.08	257.58	258.08
DF1	Reach20	1715.05	256.51	257.53	256.69	257.53
DF1	Reach20	1666	256.16	257.14	256.45	257.14
DF1	Reach20	1615.13	256.01	256.57	256.18	256.57
DF1	Reach20	1514.84	254.99	256.11	255.13	256.11
DF1	Reach20	1460.2	254.2	256.06	254.4	256.06
DF1	Reach20	1405.39	253.02	256.06	254.43	256.06
DF1	Reach20	1401.29	253.04	256.06	254.42	256.06
DF1	Reach20	1396	Culvert (Existing Culvert @ Unnamed Farm Road Crossing)			

River	Reach	River Sta	Min Channel Elevation (m)	Water Surface Elevation (m)		
				Regional	100 Year	Regulatory
DF1	Reach20	1387.43	253.76	256.01	254.4	256.01
DF1	Reach20	1381.53	253.85	256.01	254.4	256.01
DF1	Reach20	1375.67	253.77	256.01	254.4	256.01
DF1	Reach20	1370.57	253.6	255.98	254.17	255.98
DF1	Reach20	1368	Culvert (Existing Culvert @ Unnamed Farm Road Crossing)			
DF1	Reach20	1362.11	253.72	255.18	253.99	255.18
DF1	Reach20	1358.51	253.81	254.08	253.94	254.08
DF1	Reach20	1357.51	253.76	254.56	253.93	254.56
DF1	Reach20	1312.67	253.53	254.38	253.67	254.38
DF1	Reach20	1311.67	253.4	254.36	253.54	254.36
DF1	Reach20	1251.58	252.86	254.32	253.15	254.32
DF1	Reach20	1245.37	252.36	254.26	253.14	254.26
DF1	Reach20	1240.48	253.01	254.28	253.12	254.28
DF1	Reach20	1231.82	252.44	253.97	252.75	253.97
DF1	Reach20	1220.38	252	252.78	252.14	252.78
DF1	Reach20	1159	251	252.71	251.48	252.71
DF1	Reach20	1115.08	250.33	252.05	250.75	252.05
DF1	Reach20	1071	249.54	250.61	250.03	250.61
DF1	Reach20	1036	249.38	250.99	249.87	250.99
DF1	Reach20	1015.6	249.4	250.7	249.69	250.7
DF1	Reach20	963	248.83	250.15	249.11	250.15
DF1	Reach20	900.79	247.87	249.26	248.16	249.26
DF1	Reach20	818.58	247.25	248.71	247.59	248.71
DF1	Reach20	761.32	247	248.64	247.28	248.64
DF1	Reach20	698.09	246.56	248.62	246.98	248.62
DF1	Reach20	650.88	246.25	248.59	246.83	248.59
DF1	Reach20	600.38	246.16	248.59	246.45	248.59
DF1	Reach20	531.76	245.75	248.59	246.41	248.59
DF1	Reach20	525.59	245.8	248.59	246.39	248.59
DF1	Reach20	491.96	Culvert (Existing Culvert @ Kirby Rd)			
DF1	Reach20	463.91	245.41	246.99	245.97	246.99
DF1	Reach20	447.81	245.29	246.63	245.72	246.63

Table 6.2: DF1 Proposed Condition Hydraulic Analysis Results Summary Table

River	Reach	River Sta	Min Channel Elevation (m)	Water Surface Elevation (m)		
				Regional	100 Year	Regulatory
DF1	Reach20	3479	272.48	273.33	272.76	273.33
DF1	Reach20	3428.83	272.06	272.81	272.3	272.81
DF1	Reach20	3330.15	271.38	272.79	271.57	272.79
DF1	Reach20	3322.69	271.32	272.79	271.47	272.79
DF1	Reach20	3307.12	Culvert (Existing Culvert @ Kirby Rd)			
DF1	Reach20	3289.02	270.49	271.32	270.73	271.32
DF1	Reach20	3279.33	270.39	271.14	270.65	271.14
DF1	Reach20	3228.83	269.86	270.56	270	270.56
DF1	Reach20	3130.4	269.08	269.79	269.27	269.79
DF1	Reach20	3084	268.72	269.32	268.89	269.32
DF1	Reach20	3050	268	269.2	268.27	269.2
DF1	Reach20	2829.44	268	269.17	268.13	269.17
DF1	Reach20	2828.99	Culvert (Culvert A Crossing)			
DF1	Reach20	2828.61	267.4	268.21	267.6	268.21
DF1	Reach20	2828.51	266.9	267.84	267.24	267.84
DF1	Reach20	2827.51	266.14	266.89	266.4	266.89
DF1	Reach20	2728.83	265	266.07	265.39	266.07
DF1	Reach20	2628.8	264.56	265.73	265.10	265.73
DF1	Reach20	2525.58	264.43	264.87	264.55	264.87
DF1	Reach20	2466	263.47	264.18	263.66	264.18
DF1	Reach20	2428.87	262.99	264.04	263.25	264.04
DF1	Reach20	2340	262.76	264.02	263.07	264.02
DF1	Reach20	2328	262.69	264.00	263.04	264.00
DF1	Reach20	2299.11	Culvert (Culvert B Crossing)			
DF1	Reach20	2260	262.05	262.83	262.4	262.83
DF1	Reach20	2259	261.74	262.46	261.98	262.46
DF1	Reach20	2228	261.64	262.36	261.86	262.36
DF1	Reach20	2129.24	261	261.62	261.17	261.62
DF1	Reach20	2056.16	260.38	261.01	260.6	261.01
DF1	Reach20	1990.35	259.98	260.47	260.13	260.47
DF1	Reach20	1915.13	259.06	259.52	259.23	259.52
DF1	Reach20	1889	258.64	259.14	258.79	259.14
DF1	Reach20	1815.13	257.37	258.11	257.62	258.11
DF1	Reach20	1715.05	256.51	257.69	256.92	257.69

River	Reach	River Sta	Min Channel Elevation (m)	Water Surface Elevation (m)		
				Regional	100 Year	Regulatory
DF1	Reach20	1668	256.3	257.61	256.66	257.61
DF1	Reach20	1650	Culvert (Culvert C Crossing)			
DF1	Reach20	1630.19	256.11	257.39	256.45	257.39
DF1	Reach20	1615	256	256.9	256.39	256.9
DF1	Reach20	1514.84	254.99	256.24	255.2	256.24
DF1	Reach20	1460.2	254.2	256.19	255.18	256.19
DF1	Reach20	1405.39	253.02	256.19	255.19	256.19
DF1	Reach20	1401.29	253.04	256.19	255.17	256.19
DF1	Reach20	1396	Culvert (Existing Culvert @ Unnamed Farm Road)			
DF1	Reach20	1387.43	253.76	256.15	255.08	256.15
DF1	Reach20	1381.53	253.85	256.15	255.08	256.15
DF1	Reach20	1375.67	253.77	256.15	255.08	256.15
DF1	Reach20	1370.57	253.6	256.13	254.7	256.13
DF1	Reach20	1368	Culvert (Existing Culvert @ Unnamed Farm Road)			
DF1	Reach20	1362.11	253.72	255.36	254.22	255.36
DF1	Reach20	1358.51	253.81	254.1	254.11	254.1
DF1	Reach20	1357.51	253.76	254.66	254.1	254.66
DF1	Reach20	1312.67	253.53	254.49	253.8	254.49
DF1	Reach20	1311.67	253.4	254.47	253.67	254.47
DF1	Reach20	1251.58	252.86	254.43	253.45	254.43
DF1	Reach20	1245.37	252.36	254.37	253.38	254.37
DF1	Reach20	1240.48	253.01	254.39	253.4	254.39
DF1	Reach20	1231.82	252.44	254.07	253.09	254.07
DF1	Reach20	1220.38	252	252.88	252.28	252.88
DF1	Reach20	1159	251	252.86	251.81	252.86
DF1	Reach20	1115.08	250.33	252.2	251.08	252.2
DF1	Reach20	1071	249.54	250.72	250.41	250.72
DF1	Reach20	1036	249.38	251.08	250.17	251.08
DF1	Reach20	1015.6	249.4	250.84	249.95	250.84
DF1	Reach20	963	248.83	250.28	249.32	250.28
DF1	Reach20	900.79	247.87	249.47	248.45	249.47
DF1	Reach20	818.58	247.25	248.81	247.85	248.81
DF1	Reach20	761.32	247	248.73	247.59	248.73
DF1	Reach20	698.09	246.56	248.71	247.36	248.71
DF1	Reach20	650.88	246.25	248.68	247.2	248.68
DF1	Reach20	600.38	246.16	248.68	246.93	248.68

River	Reach	River Sta	Min Channel Elevation (m)	Water Surface Elevation (m)		
				Regional	100 Year	Regulatory
DF1	Reach20	531.76	245.75	248.67	246.95	248.67
DF1	Reach20	525.59	245.8	248.67	246.93	248.67
DF1	Reach20	491.96	Culvert Existing Culvert @ Teston Rd			
DF1	Reach20	463.91	245.41	247.12	246.29	247.12
DF1	Reach20	447.81	245.29	246.68	246.09	246.68

Table 6.3: DF1 Comparison of Existing and Proposed Condition Hydraulic Analysis Results

Existing			Proposed			Difference (Proposed – Existing)		
River Sta	Min Ch El (m)	W.S. Elev (m)	River Sta	Min Ch El (m)	W.S. Elev (m)	River Sta	Min Ch El (m)	W.S. Elev (m)
3479	272.48	273.33	3479	272.48	273.33	0	0	0
3428.83	272.06	272.81	3428.83	272.06	272.81	0	0	0
3330.15	271.38	272.79	3330.15	271.38	272.79	0	0	0
3322.69	271.32	272.78	3322.69	271.32	272.79	0	0	0.01
3307.12	Culvert		3307.12	Culvert		Existing Culvert @ Kirby Rd.		
3289.02	270.49	271.32	3289.02	270.49	271.32	0	0	0
3279.33	270.39	271.17	3279.33	270.39	271.14	0	0	-0.03
3228.83	269.86	270.59	3228.83	269.86	270.55	0	0	-0.04
3130.4	269.08	269.85	3130.4	269.08	269.79	0	0	-0.06
3084	268.72	269.31	3084	268.72	269.3	0	0	-0.01
3028.87	267.8	268.85	3050	268.05	269.18	N/A	N/A	N/A
N/A	N/A	N/A	3011	Culvert		Culvert A		
2965.4	268	268.39	2965.4	268	268.37	0	0	-0.02
2928.83	266.9	267.87	2928.83	266.9	267.88	0	0	0.01
2827.51	266.14	266.85	2827.51	266.14	266.89	0	0	0.04
2728.83	265	266.03	2728.83	265	266.07	0	0	0.04
2628.8	264.56	265.71	2628.8	264.56	265.73	0	0	0.02
2525.58	264.43	264.86	2525.58	264.43	264.87	0	0	0.01
2466	263.47	264.16	2466	263.47	264.18	0	0	0.02
2428.87	262.99	263.74	2428.87	262.99	264.04	0	0	0.30
2328.83	262.41	263.03	2340	262.76	264.02	N/A	N/A	N/A
N/A	N/A	N/A	2328	262.69	264.00	N/A	N/A	N/A
N/A	N/A	N/A	2299.11	Culvert		Culvert B		

Existing			Proposed			Difference (Proposed – Existing)		
River Sta	**Min Ch El (m)**	**W.S. Elev (m)**	**River Sta**	**Min Ch El (m)**	**W.S. Elev (m)**	**River Sta**	**Min Ch El (m)**	**W.S. Elev (m)**
N/A	N/A	N/A	2260	262.05	262.83	N/A	N/A	N/A
N/A	N/A	N/A	2259	261.74	262.46	N/A	N/A	N/A
2228.89	261.72	262.42	2228	261.64	262.36	N/A	N/A	N/A
2129.24	261	261.61	2129.24	261	261.62	0	0	0.01
2056.16	260.38	260.99	2056.16	260.38	261.01	0	0	0.02
1990.35	259.98	260.44	1990.35	259.98	260.47	0	0	0.03
1915.13	259.06	259.5	1915.13	259.06	259.52	0	0	0.02
1889	258.64	259.11	1889	258.64	259.14	0	0	0.03
1815.13	257.37	258.08	1815.13	257.37	258.11	0	0	0.03
1715.05	256.51	257.53	1715.05	256.51	257.69	0	0	0.16
1666	256.16	257.14	1668	256.3	257.61	N/A	N/A	N/A
N/A	N/A	N/A	1650	Culvert		Culvert C		
N/A	N/A	N/A	1630.19	256.11	257.39	N/A	N/A	N/A
1615.13	256.01	256.57	1615	256	256.9	N/A	N/A	N/A
1514.84	254.99	256.11	1514.84	254.99	256.24	0	0	0.13
1460.2	254.2	256.06	1460.2	254.2	256.19	0	0	0.13
1405.39	253.02	256.06	1405.39	253.02	256.19	0	0	0.13
1401.29	253.04	256.06	1401.29	253.04	256.19	0	0	0.13
1396	Culvert		1396	Culvert		Existing Culvert		
1387.43	253.76	256.01	1387.43	253.76	256.15	0	0	0.14
1381.53	253.85	256.01	1381.53	253.85	256.15	0	0	0.14
1375.67	253.77	256.01	1375.67	253.77	256.15	0	0	0.14
1370.57	253.6	255.98	1370.57	253.6	256.13	0	0	0.15
1368	Culvert		1368	Culvert		Existing Culvert		
1362.11	253.72	255.18	1362.11	253.72	255.36	0	0	0.18
1358.51	253.81	254.08	1358.51	253.81	254.1	0	0	0.02
1357.51	253.76	254.56	1357.51	253.76	254.66	0	0	0.1
1312.67	253.53	254.38	1312.67	253.53	254.49	0	0	0.11
1311.67	253.4	254.36	1311.67	253.4	254.47	0	0	0.11
1251.58	252.86	254.32	1251.58	252.86	254.43	0	0	0.11
1245.37	252.36	254.26	1245.37	252.36	254.37	0	0	0.11
1240.48	253.01	254.28	1240.48	253.01	254.39	0	0	0.11
1231.82	252.44	253.97	1231.82	252.44	254.07	0	0	0.1
1220.38	252	252.78	1220.38	252	252.88	0	0	0.1

Existing			Proposed			Difference (Proposed – Existing)		
River Sta	**Min Ch El (m)**	**W.S. Elev (m)**	**River Sta**	**Min Ch El (m)**	**W.S. Elev (m)**	**River Sta**	**Min Ch El (m)**	**W.S. Elev (m)**
1159	251	252.71	1159	251	252.86	0	0	0.15
1115.08	250.33	252.05	1115.08	250.33	252.2	0	0	0.15
1071	249.54	250.61	1071	249.54	250.72	0	0	0.11
1036	249.38	250.99	1036	249.38	251.08	0	0	0.09
1015.6	249.4	250.7	1015.6	249.4	250.84	0	0	0.14
963	248.83	250.15	963	248.83	250.28	0	0	0.13
900.79	247.87	249.26	900.79	247.87	249.47	0	0	0.21
818.58	247.25	248.71	818.58	247.25	248.81	0	0	0.1
761.32	247	248.64	761.32	247	248.73	0	0	0.09
698.09	246.56	248.62	698.09	246.56	248.71	0	0	0.09
650.88	246.25	248.59	650.88	246.25	248.68	0	0	0.09
600.38	246.16	248.59	600.38	246.16	248.68	0	0	0.09
531.76	245.75	248.59	531.76	245.75	248.67	0	0	0.08
525.59	245.8	248.59	525.59	245.8	248.67	0	0	0.08
491.96	Culvert		491.96	Culvert		Existing Culvert @ Teston Rd.		
463.91	245.41	246.99	463.91	245.41	247.12	0	0	0.13
447.81	245.29	246.63	447.81	245.29	246.68	0	0	0.05

The above table (Table 6.3) depicts a comparison of the existing and proposed conditions of hydraulic analysis results for the DF1. Channel bed level and regulatory water surface elevations are the main parameters chosen for the comparison. It should be noted that if the HEC-RAS cross-sections are taken at the same location with similar alignment in both the existing and proposed condition models, the Cross-Section # will be the same. The comparison shall be done based on cross-sections that have the same Cross-Section #. Please refer to **Appendix B** for detailed comparisons, including regulatory peak flow and velocity parameters. Please refer to **Appendix C** for the floodplain maps.

As it is shown in the summary table, there is no difference observed in channel bed level, which indicates that there are no proposed grading changes over the channel bed. The location and alignment of future condition HEC-RAS cross-sections were influenced by the proposed road

crossing alignment. As the result, there may not be the same HEC-RAS cross-section alignment and geometry as the existing condition in some locations. The channel bed levels were not compared at this location because the existing and proposed conditions HEC-RAS cross-sections were not taken at the same place.

The proposed condition regulatory water surface elevation was found higher than the existing conditions in DF1 except in the reach between Kirby Road and Culvert A. In this section of the reach, the change has come from the changes in peak flows considered in the model. The future condition peak flow was lower than the existing condition in this portion of the reach due to the changes in the drainage outlets in the proposed condition. Please see **Table 5.6** and **Appendix A** for detailed information. In the rest of the DF1 reach, the proposed condition regulatory flood level was observed higher than the existing conditions.

On average, the water level increased by 0.10m. In the north portion of the DF1, a maximum water level increase of 0.16m was observed north of Culvert C (Cross-Section # 1715.05). Similarly, in the southern portion of the DF1 reach, a maximum water level rise of 0.21m (Cross-Section # 900.79) was observed around the woodland valley north of Teston Road. The changes in the regulatory water elevations are related to the changes in the regulatory flows. The floodplain mapping (shown in **Appendix C**) depicts that the regulatory flood line is within the valley of the watercourse in most parts of the DF1. On few places, which attain more gentle bank geometry (for example between Cross-Section # 1159 and # 1115.08), the flood line seems out side the valley of the watercourse but not encroachment to the proposed development.

6.1.2 Water Level Impact on the Proposed SWM ponds (DF1)

The proposed SWM ponds located along DF1 are designed to release flows toward the DF1 natural drainage feature. The regional and 100 year water levels were compared with the permanent pool level and spillway levels of proposed adjacent SWM ponds to see the impact of the water level on the proposed SWM pond design. It should be noted that the water level of the watercourse is more defined by the HEC-RAS cross-section located near the SWM pond outlet.

The proposed SWM ponds along the DF1 drainage feature are SWM A, SWM B, SWM D, and SWM E. For details, please refer to the Floodplain mappings in **Appendix C** and the Engineering Drawings included in the submission package. Note that revisions to the designs of SWM Pond A and SWM Pond B are required due to the updated alignment of Collector Street 1. The detailed configurations for SWM Pond A and SWM Pond B will be provided in the second MESP submission.

As it is depicted in the following table, the 100 year flow is lower than the permanent pool levels and the regulatory flood level is lower than the spill way level of each SWM Pond. Hence, it can be concluded that the proposed flood line does not have an impact on the proposed SWM ponds over the DF1 watercourse.

Table 6.4: SWM Pond Elevations and Floodplain Elevations Comparison (DF1).

SWM Pond Information			**Watercourse Location**		**Future Uncontrolled Water Level**	
SWM Pond ID	PPL	Emergency Spillway Level	Water Course Name	HEC-RAS ID	100 Year	Regional
SWM A*	266.20	268.80	DF1	2728.83	265.39	266.07
SWM B*	267.00	270.00	DF1	2827.51	266.4	266.89
SWM D	257.80	260.80	DF1	1715.05	256.92	257.69
SWM E	253.50	256.25	DF1	963	249.32	250.28

*Note: * Configuration of SWM Pond A and SWM Pond B will be detailed in the second submission of MESP Report.*

6.1.3 Hydraulic Analysis Results of the Proposed Road Crossings in DF1

The hydraulic assessment of the proposed road crossings was completed in HEC-RAS based on the post-development uncontrolled flows generated in PCSWMM. The proposed culverts were sized adequately to convey the regulatory flows. The road crossing design criteria discussed in the *Section 5.3.3* are applied in the current analysis. As discussed in *Section 5.3.3.2*, there are three proposed crossings in DF1 (i.e., Culver A, B, and C).

Table 6.5 below presents a summary of the hydraulic modeling results. The result depicts that there is no flood overtopping over the top of the proposed road crossings as the regulatory water

level is below the road top levels in all three proposed road crossings. It should be noted that for the purpose of reporting, the high water level corresponding to the first upstream HEC-RAS cross-section of each culvert was reported.

Table 6.6 depicts the calculations applied to estimate the provided opening depth within the culvert as well as the clearance depths. The dryland opening depth is the depth below the obvert level of the culvert and the top of the low-flow channel. It determines the provided space to access animals inside the culvert during dry flow season. The freeboard depth is the depth between obvert of the culvert and the high water level. The results show that there is more than 2.0m of dry land opening for animal crossing and more than 1.3m of freeboard above the high flood levels. The provided clearance is more than 1.0m, which satisfies the requirement of MTO.

Table 6.5: DF1 Road Crossings Hydraulic Analysis Results Summary Table

Reach	Street and Crossing ID	Culvert Dimensions (m)		Road Elevation (m)	Future Uncontrolled Flows (m^3/s)		Water Surface Elevation (m)	
		(DepthXspan)	Length		100-Yr	Regional	100-Yr	Regional
DF1	Crossing A Street 1	2.44×12.81	43	272.45	0.84	21.80	268.13	269.17
DF1	Crossing B Street 2	3.35×14.64	45	267.67	2.99	27.73	263.04	264.00
DF1	Crossing C Street 3	3.35×14.64	55	262.11	4.54	32.74	256.66	257.61

Table 6.6: DF1 Road Crossings Culvert Opening and Freeboard Calculation

Reach	Crossing ID	Culvert Dimensions m	Culvert Elevation (m)		Low Flow Channel Depth (m)	Regional Water Elev. (m)	Depth (m)	
			U/S Invert	U/S Obvert*			Above Dryland**	Clearance***
DF1	Crossing A	2.44×12.81x43	268.00	270.49	0.3	269.17	2.14	1.31
DF1	Crossing B	3.35×14.64x45	262.76	266.11	0.3	264.00	3.05	2.11
DF1	Crossing C	3.35×14.64x55	256.19	259.54	0.3	257.61	3.05	1.93

Note:
** Culvert U/S Obvert Elevation = Invert Elevation + Culvert depth (268.00+2.44 = 270.44m)*
***Depth above dryland is the depth available within the culvert to pass animals through during dry water conditions. It is measured above the low flow channel depth and below the obvert level of the culvert = Obvert level – Low flow channel depth – Invert elevation. (270.44 – 0.30 – 268.00 = 2.14m).*
****Clearance is the height between obvert level and the high water level = Obvert level – High water level. (270.44 – 269.17 = 1.27m).*

6.2 DF2, DF3, and DF4 Floodplain Analysis Results

6.2.1 Existing and Proposed Conditions Hydraulic Analysis of the Drainage Feature

As it was discussed in *Section 2*, the middle and east drainage features of Block 27 area were defined by three drainage features (i.e., DF2, DF3, and DF4). The existing and proposed conditions hydraulic analysis results for the middle and east tributary (i.e., DF2, DF3, and DF4) drainage features have been summarized in **Table 6.7** and **6.8** respectively. As it is depicted in the summary tables, the regional flows are the regulatory flows in both conditions.

It should be noted that only DF3 and DF2 drainage features are considered under existing conditions. DF3 is the central tributary area and has a regulatory floodplain. One of the small drainage features (i.e., DF2) is connected with the overflow of DF3. The other small drainage feature (i.e., DF4), which has a drainage area less than 50 ha is not a regulatory floodplain. Hence, floodplain analysis was not conducted for the DF4 at the existing condition. DF4 was considered under the proposed condition HEC-RAS Model to show that DF4 will contain future regional storm flows without entering private property and for modelling of the proposed wetland features along the drainage feature.

Table 6.7: DF3 and DF2 Drainage Features Existing Condition Hydraulic Analysis Results

River	Reach	River Station	Min Channel Elevation (m)	Water Surface Elevation (m)		
				Regional	100 Year	Regulatory
DF3	1	3547.76	284.66	285.19	284.91	285.19
DF3	1	3480.67	281.98	282.24	282.11	282.24
DF3	1	3415.5	280.24	281.61	280.69	281.61
DF3	1	3333.59	279.6	281.66	279.85	281.66
DF3	1	3252.06	278.72	281.66	278.99	281.66
DF3	1	3205.22	277.52	281.66	278.34	281.66
DF3	1	3197.43	277.8	281.65	278.21	281.65
DF3	1	3179.2	Culvert (Existing Culvert @ Railway Crossing)			
DF3	1	3161.25	276.48	278.26	277.72	278.26
DF3	1	3147.49	277.2	278.17	277.6	278.17
DF3	1	3112.66	276.98	277.75	277.29	277.75

River	Reach	River Station	Min Channel Elevation (m)	Water Surface Elevation (m)		
				Regional	100 Year	Regulatory
DF3	1	3073	276.84	277.47	277.06	277.47
DF3	1	3012.6	276.26	276.69	276.4	276.69
DF3	1	2974	275.37	276.07	275.67	276.07
DF3	1	2906.79	273.84	274.29	274.04	274.29
DF3	1	2866	272.97	273.64	273.21	273.64
DF3	1	2807.68	272.78	273.37	272.99	273.37
DF3	1	2773	271.07	271.59	271.26	271.59
DF3	1	2707.68	269.99	270.77	270.45	270.77
DF3	1	2660	269.07	269.85	269.53	269.85
DF3	1	2607.54	268.22	269.02	268.61	269.02
DF3	1	2562	267.75	268.46	268.03	268.46
DF3	1	2507.75	267.25	267.87	267.46	267.87
DF3	1	2460	266.7	267.39	267.02	267.39
DF3	1	2413.07	264.87	266.06	265.41	266.06
DF3	1	2379	264.11	265.39	264.9	265.39
DF3	1	2307.68	264.09	264.76	264.33	264.76
DF3	1	2262	263.22	264.17	263.62	264.17
DF3	1	2206.54	262.74	263.55	263.13	263.55
DF3	1	2148	262.31	263.16	262.64	263.16
DF3	1	2107.79	262.01	263.02	262.44	263.02
DF3	1	2089.36	261.64	262.94	262.34	262.94
DF3	1	2073.67	261.39	262.56	262.19	262.56
DF3	1	2052	261.41	261.96	261.58	261.96
DF3	1	2051	261.39	261.91	261.6	261.91
DF3	1	2007.66	260.37	261.12	260.61	261.12
DF3	1	1960	259.94	261.1	260.42	261.1
DF3	1	1907.68	260.01	260.89	260.37	260.89
DF3	1	1858	259.89	260.48	260.07	260.48
DF3	1	1826.63	259.4	260.41	259.91	260.41
DF3	1	1826.431	259.62	260.26	259.82	260.26
DF3	1	1807.68	258.93	259.35	259.12	259.35
DF3	1	1746.68	258.29	259.12	258.62	259.12
DF3	1	1676.46	257.68	258.25	257.92	258.25
DF3	1	1613	256.37	257.3	256.92	257.3
DF3	1	1604	256.59	257.17	256.82	257.17
DF3	1	1535	254.39	256.17	255.25	256.17

River	Reach	River Station	Min Channel Elevation (m)	Water Surface Elevation (m)		
				Regional	100 Year	Regulatory
DF3	1	1485.85	254.01	255.71	254.7	255.71
DF3	1	1437	253.76	255.46	254.55	255.46
DF3	1	1386.23	253.48	255.33	254.16	255.33
DF3	1	1329	253.53	255.24	254.07	255.24
DF3	1	1282.61	253.3	255.07	253.98	255.07
DF3	1	1225.5	253.03	254.66	253.72	254.66
DF3	1	1225	252.74	254.35	253.4	254.35
DF3	1	1180.6	252.34	254.02	253.15	254.02
DF3	1	1179.6	252.36	253.88	252.91	253.88
DF3	1	1179.37	252.3	253.65	252.76	253.65
DF3	1	1130	251.21	252.74	252.14	252.74
DF3	1	1076.25	251.06	252.35	251.67	252.35
DF3	1	1012.43	249.65	251.29	250.55	251.29
DF3	1	970.12	249.19	250.87	250.1	250.87
DF3	1	955.53	248.98	250.93	249.36	250.93
DF3	1	947.55	248.2	250.92	249.22	250.92
DF3	1	946.95	248.17	250.93	249.22	250.93
DF3	1	924.94	Culvert (Existing Culvert @ Teston Rd)			
DF3	1	895.09	248.46	249.93	249.19	249.93
DF3	1	888.03	248.49	249.89	249.15	249.89
DF3	1	799.85	247.91	249.01	248.42	249.01
DF3	1	696.11	246.69	248.5	247.39	248.5
DF3	1-DS-0	598.11	246.01	248.51	246.33	248.51
DF3	1-DS-0	521.44	245.51	248.51	246.21	248.51
DF3	1-DS-0	516.73	245.49	248.51	245.98	248.51
DF2	1	1000	250.36	250.71	250.49	250.71
DF2	1	956	249.67	249.9	249.75	249.9
DF2	1	899	248.89	249.05	248.96	249.05
DF2	1	842	248.4	248.91	248.47	248.91
DF2	1	820	247.96	248.91	248.07	248.91
DF2	1	809	247.64	248.91	247.79	248.91
DF2	1	791	Culvert (Existing Culvert @ Teston Rd)			
DF2	1	773	246.95	248.49	247.79	248.49
DF2	1	769	247.64	248.52	247.77	248.52

Unlike the DF1, the DF3 and DF4 have proposed grading changes over the floodplain areas. The

gradings are mainly proposed for road crossings and wetland compensation areas. It should be noted that in areas where wetland compensation is proposed, additional land is included in the Natural Heritage Network. The proposed condition HEC-RAS cross-sections are updated to reflect the proposed grading. Please refer to the Engineering drawings titled "Wetland Compensation Area", Drawing # CA-3 to CA-7 in **Appendix D**.

In addition to the wetland features, the approximately 250m of DF3 is proposed for realignment to accommodate new Street 5. As it was discussed in the previous section, there will be channel realignment for about 350m near the south end of DF3 before leaving Block 27 area. The existing box culvert at Teston Road will also be extended further upstream by approximately 40m to convey the DF3 flows under Street 5. The following table summarises the proposed condition hydraulic analysis results for the DF3, DF4, and DF2 drainage features.

Table 6.8: DF3, DF4, and DF2 Drainage Features Proposed Condition Hydraulic Analysis Results

River	Reach	River Station	Min Channel Elevation (m)	Water Surface Elevation (m)		
				Regional	100 Yr	Regulatory
DF3	1	3547.76	284.66	285.19	284.95	285.19
DF3	1	3480.67	281.98	282.26	282.15	282.26
DF3	1	3400	280	281.8	280.49	281.8
DF3	1	3370	279.99	281.8	280	281.8
DF3	1	3333.59	279.67	281.8	279.82	281.8
DF3	1	3253	278.82	281.79	279.42	281.79
DF3	1	3230	Culvert D			
DF3	1	3205.22	277.53	281.67	278.46	281.67
DF3	1	3197.43	277.8	281.66	278.4	281.66
DF3	1	3179.2	Existing Culvert @ CPR Railway			
DF3	1	3161.25	276.48	278.31	277.89	278.31
DF3	1	3147.49	277.2	278.21	277.74	278.21
DF3	1	3112.66	276.98	277.78	277.42	277.78
DF3	1	3073	276.84	277.5	277.15	277.5
DF3	1	3012.6	276.26	276.7	276.48	276.7
DF3	1	2974	275.37	276.09	275.76	276.09
DF3	1	2906.79	273.83	274.29	274.11	274.29
DF3	1	2866	272.98	273.73	273.34	273.73

River	Reach	River Station	Min Channel Elevation (m)	Water Surface Elevation (m)		
				Regional	100 Yr	Regulatory
DF3	1	2849	272.78	273.39	273.09	273.39
DF3	1	2773	271.07	271.42	271.26	271.42
DF3	1	2707.68	269.91	270.27	270.1	270.27
DF3	1	2660	269.07	269.83	269.32	269.83
DF3	1	2607.54	268.18	268.94	268.61	268.94
DF3	1	2562	267.72	268.38	268.06	268.38
DF3	1	2507.75	267.25	267.83	267.54	267.83
DF3	1	2465	266.7	267.34	267	267.34
DF3	1	2368.51	Culvert E			
DF3	1	2368	265.32	266.35	265.85	266.35
DF3	1	2367	264.87	265.79	265.53	265.79
DF3	1	2351	264.15	265.56	264.88	265.56
DF3	1	2307.68	264.09	264.58	264.42	264.58
DF3	1	2262	263.22	264.04	263.69	264.04
DF3	1	2206.54	262.82	263.58	263.21	263.58
DF3	1	2148	262.38	262.91	262.55	262.91
DF3	1	2107.79	262.04	262.76	262.35	262.76
DF3	1	2089.36	261.64	262.6	262.19	262.6
DF3	1	2073.67	261.39	262.44	262.08	262.44
DF3	1	2052	261.41	262.21	261.81	262.21
DF3	1	2051	261.39	261.99	261.66	261.99
DF3	1	2007.66	260.37	261.63	260.93	261.63
DF3	1	1960	259.94	261.63	260.93	261.63
DF3	1	1907.68	260.01	261.58	260.9	261.58
DF3	1	1859	259.99	261.27	260.85	261.27
DF3	1	1809.68	260.23	261.15	260.66	261.15
DF3	1	1809.25	Culvert F			
DF3	1	1808.68	259	260.14	259.63	260.14
DF3	1	1807.68	259.01	259.41	259.24	259.41
DF3	1	1746.68	258.29	259.19	258.79	259.19
DF3	1	1676.46	257.68	258.3	258.03	258.3
DF3	1	1613	256.38	257.36	257.07	257.36
DF3	1	1604	256.53	257.21	256.96	257.21
DF3	1	1535	254.39	256.27	255.64	256.27
DF3	1	1485.85	254.01	255.83	255.13	255.83
DF3	1	1437	253.76	255.01	254.57	255.01

River	Reach	River Station	Min Channel Elevation (m)	Water Surface Elevation (m)		
				Regional	100 Yr	Regulatory
DF3	1	1386.23	253.42	254.85	254.29	254.85
DF3	1	1329	253.25	254.63	254.09	254.63
DF3	1	1282.61	253.12	254.46	253.93	254.46
DF3	1	1225.5	253.01	254.37	253.85	254.37
DF3	1	1225	252.96	254.25	253.77	254.25
DF3	1	1180.6	252.87	253.91	253.49	253.91
DF3	1	1179.6	252.59	253.6	253.22	253.6
DF3	1	1179.37	252.41	253.35	253.04	253.35
DF3	1	1130	251.85	252.84	252.41	252.84
DF3	1	1076.25	250.94	251.81	251.49	251.81
DF3	1	1012.43	250.21	251.62	250.74	251.62
DF3	1	974	249.2	251.64	249.78	251.64
DF3	1-DS-0-1	970.12	248.69	251.62	249.65	251.62
DF3	1-DS-0-1	955.53	248.3	251.62	249.64	251.62
DF3	1-DS-0-1	924.94	Culvert H (Teston Rd)			
DF3	1-DS-0-1	895.09	248.46	250.13	249.43	250.13
DF3	1-DS-0-1	888.03	248.49	249.89	249.43	249.89
DF3	1-DS-0-1	799.85	247.91	249.09	248.65	249.09
DF3	1-DS-0-1	696.11	246.69	248.64	247.59	248.64
DF3	1-DS-0	598.11	246.01	248.62	246.95	248.62
DF3	1-DS-0	521.44	245.51	248.61	246.91	248.61
DF3	1-DS-0	516.73	245.49	248.61	246.67	248.61
DF4	1	1044	264.72	265.16	264.94	265.16
DF4	1	1032	264.72	265.16	264.92	265.16
DF4	1	1014	Culvert G			
DF4	1	983	263.92	264.21	264.24	264.21
DF4	1	934	263.85	264.24	264.12	264.24
DF4	1	933	263.75	264.11	264.03	264.11
DF4	1	849	263.5	263.79	263.67	263.79
DF4	1	848	263.07	263.54	263.39	263.54
DF4	1	822	263	263.31	263.21	263.31
DF4	1	815	262.99	263.31	263.19	263.31
DF4	1	797	262.74	263.16	263.03	263.16
DF4	1	785	262.22	262.31	262.27	262.31
DF4	1	751	261.55	261.78	261.7	261.78
DF4	1	728	261.3	261.59	261.5	261.59

River	Reach	River Station	Min Channel Elevation (m)	Water Surface Elevation (m)		
				Regional	100 Yr	Regulatory
DF4	1	665	260.65	260.93	260.84	260.93
DF4	1	649	260.6	260.74	260.65	260.74
DF4	1	550	259.04	259.42	259.16	259.42
DF4	1	416	256.39	257.03	256.79	257.03
DF4	1	343.3	255.81	256.28	255.92	256.28
DF4	1	256	254.76	255.44	255.18	255.44
DF4	1	41	249.79	251.61	250.62	251.61
DF2	1	899	248.89	249.04	249.03	249.04
DF2	1	842	248.4	248.9	248.52	248.9
DF2	1	820	247.96	248.9	248.18	248.9
DF2	1	809	247.64	248.9	247.95	248.9
DF2	1	791	Existing Culvert @ Teston Rd.			
DF2	1	773	246.95	248.6	247.85	248.6
DF2	1	769	247.64	248.62	247.83	248.62

The following **Table 6.9** shows a comparison of the existing and proposed conditions of hydraulic analysis results for the DF3 and DF2. This comparison was done based on cross-sections that have the same Cross-Section #. Channel bed level and regulatory water surface elevations are the main parameters chosen for the comparison. Please refer to **Appendix B** for detailed comparisons, including regulatory peak flows velocity parameters.

Table 6.9: DF3 and DF2 Comparison of Existing and Proposed Condition Hydraulic Analysis Results

River	Existing			Proposed			Difference (Proposed - Existing)		
	River Sta	Min Ch El (m)	W.S. Elev (m)	River Sta	Min Ch El (m)	W.S. Elev (m)	River Sta	Min Ch El (m)	W.S. Elev (m)
DF3	3547.76	284.66	285.19	3547.76	284.66	285.19	0	0	0
DF3	3480.67	281.98	282.24	3480.67	281.98	282.26	0	0	0.02
DF3	3415.5	280.24	281.61	3400	280	281.8	-15.5	N/A	N/A
				3370	279.99	281.8	3370	N/A	N/A
DF3	3333.59	279.6	281.66	3333.59	279.67	281.8	0	0.07	0.14
DF3	3252.06	278.72	281.66						
	N/A	N/A	N/A	3253	278.82	281.79	N/A	N/A	N/A
	N/A	N/A	N/A	3230	Culvert D				
DF3	3205.22	277.52	281.66	3205.22	277.53	281.67	0	0.01	0.01
DF3	3197.43	277.8	281.65	3197.43	277.8	281.66	0	0	0.01
DF3	3179.2	Culvert		3179.2	Existing Culvert @ CPR Railway				
DF3	3161.25	276.48	278.26	3161.25	276.48	278.31	0	0	0.05
DF3	3147.49	277.2	278.17	3147.49	277.2	278.21	0	0	0.04
DF3	3112.66	276.98	277.75	3112.66	276.98	277.78	0	0	0.03
DF3	3073	276.84	277.47	3073	276.84	277.5	0	0	0.03
DF3	3012.6	276.26	276.69	3012.6	276.26	276.7	0	0	0.01
DF3	2974	275.37	276.07	2974	275.37	276.09	0	0	0.02
DF3	2906.79	273.84	274.29	2906.79	273.83	274.29	0	-0.01	0
DF3	2866	272.97	273.64	2866	272.98	273.73	0	0.01	0.09
DF3	2807.68	272.78	273.37	2849	272.78	273.39	41.32	N/A	N/A
DF3	2773	271.07	271.59	2773	271.07	271.42	0	0	-0.17
DF3	2707.68	269.99	270.77	2707.68	269.91	270.27	0	-0.08	-0.5
DF3	2660	269.07	269.85	2660	269.07	269.83	0	0	-0.02
DF3	2607.54	268.22	269.02	2607.54	268.18	268.94	0	-0.04	-0.08
DF3	2562	267.75	268.46	2562	267.72	268.38	0	-0.03	-0.08
DF3	2507.75	267.25	267.87	2507.75	267.25	267.83	0	0	-0.04
DF3	2460	266.7	267.39	2465	266.7	267.34	5	N/A	N/A
	N/A	N/A	N/A	2368.51	Culvert E				
DF3	2413.07	264.87	266.06	2368	265.32	266.35	-45.07	N/A	N/A
DF3	2379	264.11	265.39	2367	264.87	265.79	-12	N/A	N/A
	N/A	N/A	N/A	2351	264.15	265.56	N/A	N/A	N/A
DF3	2307.68	264.09	264.76	2307.68	264.09	264.58	0	0	-0.18
DF3	2262	263.22	264.17	2262	263.22	264.04	0	0	-0.13

River	Existing			Proposed			Difference (Proposed - Existing)		
	River Sta	Min Ch El (m)	W.S. Elev (m)	River Sta	Min Ch El (m)	W.S. Elev (m)	River Sta	Min Ch El (m)	W.S. Elev (m)
DF3	2206.54	262.74	263.55	2206.54	262.82	263.58	0	0.08	0.03
DF3	2148	262.31	263.16	2148	262.38	262.91	0	0.07	-0.25
DF3	2107.79	262.01	263.02	2107.79	262.04	262.76	0	0.03	-0.26
DF3	2089.36	261.64	262.94	2089.36	261.64	262.6	0	0	-0.34
DF3	2073.67	261.39	262.56	2073.67	261.39	262.44	0	0	-0.12
DF3	2052	261.41	261.96	2052	261.41	262.21	0	0	0.25
DF3	2051	261.39	261.91	2051	261.39	261.99	0	0	0.08
DF3	2007.66	260.37	261.12	2007.66	260.37	261.63	0	0	0.51
DF3	1960	259.94	261.1	1960	259.94	261.63	0	0	0.53
DF3	1907.68	260.01	260.89	1907.68	260.01	261.58	0	0	0.69
DF3	1858	259.89	260.48	1859	259.99	261.27	1	0.1	0.79
DF3	1826.63	259.4	260.41	1809.68	260.23	261.15	-16.95	N/A	N/A
	N/A	N/A	N/A	1809.25	Culvert F				
DF3	1826.431	259.62	260.26	1808.68	259	260.14	-17.751	N/A	N/A
DF3	1807.68	258.93	259.35	1807.68	259.01	259.41	0	0.08	0.06
DF3	1746.68	258.29	259.12	1746.68	258.29	259.19	0	0	0.07
DF3	1676.46	257.68	258.25	1676.46	257.68	258.3	0	0	0.05
DF3	1613	256.37	257.3	1613	256.38	257.36	0	0.01	0.06
DF3	1604	256.59	257.17	1604	256.53	257.21	0	-0.06	0.04
DF3	1535	254.39	256.17	1535	254.39	256.27	0	0	0.1
DF3	1485.85	254.01	255.71	1485.85	254.01	255.83	0	0	0.12
DF3	1437	253.76	255.46	1437	253.76	255.01	0	0	-0.45
DF3	1386.23	253.48	255.33	1386.23	253.42	254.85	0	-0.06	-0.48
DF3	1329	253.53	255.24	1329	253.25	254.63	0	-0.28	-0.61
DF3	1282.61	253.3	255.07	1282.61	253.12	254.46	0	-0.18	-0.61
DF3	1225.5	253.03	254.66	1225.5	253.01	254.37	0	-0.02	-0.29
DF3	1225	252.74	254.35	1225	252.96	254.25	0	0.22	-0.1
DF3	1180.6	252.34	254.02	1180.6	252.87	253.91	0	0.53	-0.11
DF3	1179.6	252.36	253.88	1179.6	252.59	253.6	0	0.23	-0.28
DF3	1179.37	252.3	253.65	1179.37	252.41	253.35	0	0.11	-0.3*
DF3	1130	251.21	252.74	1130	251.85	252.84	0	0.64	0.1*
DF3	1076.25	251.06	252.35	1076.25	250.94	251.81	0	-0.12	-0.54*
DF3	1012.43	249.65	251.29	1012.43	250.21	251.62	0	0.56	0.33*
	N/A	N/A	N/A	974	249.2	251.64	N/A	N/A	N/A
DF3	970.12	249.19	250.87	970.12	248.69	251.62	0	-0.5	0.75

River	Existing			Proposed			Difference (Proposed - Existing)		
	River Sta	Min Ch El (m)	W.S. Elev (m)	River Sta	Min Ch El (m)	W.S. Elev (m)	River Sta	Min Ch El (m)	W.S. Elev (m)
DF3	955.53	248.98	250.93	955.53	248.3	251.62	0	-0.68	0.69
DF3	947.55	248.2	250.92	N/A	N/A	N/A	N/A	N/A	N/A
DF3	946.95	248.17	250.93	N/A	N/A	N/A	N/A	N/A	N/A
DF3	924.94			924.94	Culvert H (Teston Rd)				
DF3	895.09	248.46	249.93	895.09	248.46	250.13	0	0	0.2
DF3	888.03	248.49	249.89	888.03	248.49	249.89	0	0	0
DF3	799.85	247.91	249.01	799.85	247.91	249.09	0	0	0.08
DF3	696.11	246.69	248.5	696.11	246.69	248.64	0	0	0.14
DF3	598.11	246.01	248.51	598.11	246.01	248.62	0	0	0.11
DF3	521.44	245.51	248.51	521.44	245.51	248.61	0	0	0.1
DF3	516.73	245.49	248.51	516.73	245.49	248.61	0	0	0.1
DF2	1000	250.36	250.71	N/A	N/A	N/A	N/A	N/A	N/A
DF2	956	249.67	249.9	N/A	N/A	N/A	N/A	N/A	N/A
DF2	899	248.89	249.05	899	248.89	249.04	0	0	-0.01
DF2	842	248.4	248.91	842	248.4	248.9	0	0	-0.01
DF2	820	247.96	248.91	820	247.96	248.9	0	0	-0.01
DF2	809	247.64	248.91	809	247.64	248.9	0	0	-0.01
DF2	791			791	Existing Culvert @ Teston Rd.				
DF2	773	246.95	248.49	773	246.95	248.6	0	0	0.11
DF2	769	247.64	248.52	769	247.64	248.62	0	0	0.1

Note:
[*] *Comparison results are not applicable due to the proposed channel realignment.*

The above comparison **Table 6.9** results are discussed in detail as follows. The discussion is presented reach by reach for better understanding and clarification. The discussion is based on the above table results as well as floodplain mapping drawings.

The proposed condition peak flows assumed for the DF3 (north of proposed Culvert D) were almost the same as the existing conditions (See **Table 5.6** in *Section 5.4*). The proposed condition regulatory water level was observed to increase by 14cm (Cross-Section # 3333.59) due to the proposed road crossing (Culvert D). The proposed culvert is a 1.83mx7.35mx55m culvert which is designed to accommodate future flows under proposed Collector Street 8. Note that 35m downstream of the proposed Culvert D, there is an existing culvert at the railway

crossing. The existing culvert at the railway crossing creates a backwater effect on the upstream reaches. This backwater effect influences the water level increase upstream of the proposed culvert at the proposed Collector Street 8 crossing. It should be noted that the regulatory flood line is within the valley and it does not overtop the proposed Collector Street 8. A 10m buffer is added to the resulting floodline within the constraint limits in this reach of the watercourse.

The regional peak flow rates assigned for DF3 between HEC-RAS Cross-Sections #3147.49 and #2607.54 were 15.934 m³/s for existing conditions and 17.187 m³/s for proposed conditions (refer to Table 5.6 in *Section 5.4*). There are no proposed grading changes in this section of the watercourse except for the planned wetland compensation area between Cross-Sections #2773 and #26620. The comparison table indicates that the proposed regulatory water level for this section has increased slightly, and this increase is proportional to the peak flow changes. The maximum observed increase in water level is 9.0 cm at Cross-Section #2866, attributed to flow changes. The regulatory flood level was found to be within the valley. For further details, please refer to the floodplain mapping in **Appendix C**.

The proposed condition regulatory flood level for the DF3 reach between Cross-Section #2607.54 and Culvert E was found less than the existing conditions. This reach is one of the five places in Block 27 where wetland compensation cuts were proposed. Due to the proposed cut, the proposed water level was reduced by up to 8.0cm (Cross-Section # 2607.54). The regulatory flood line falls within the valley of the reach.

The DF3 reach between Culvert E and Culvert F covers the HEC-RAS Cross-Section # 2368 and # 1858. This reach has also a proposed wetland compensation area. The proposed condition water level was observed less than the existing condition by up to 34.0 cm (Cross-Section # 2089.36). This is due to a combined effect of the proposed wetland compensation cut within the floodplain area and also the proposed condition flow was less than the existing condition. The proposed peak flow was 17.766m^3/s while the existing peak flow was 18.419m^3/s up to Cross-section # 2089.36. Starting from Cross-Section # 2052, the proposed peak flow becomes 23.964m^3/s due to the future drainage plan for the area. As a result, the proposed condition water

level was observed to increase by up to 69cm (Cross-Section # 1907.68) north of Culvert F. The proposed Culvert (2.44m x 12.81m x 50m culvert) designed to cross the Proposed Collector Street 3. The floodplain in this reach is within the valley and the 10m zone is within the constraint limit.

DF3 reach between Collector Street 3 (Culvert F) and Teston Road (Culvert H) is the south end of the drainage feature before leaving Block 27. In this portion of the reach, there is a wetland compensation area between HEC-RAS Cross-Section # 1613 and # 1485.85. There is also proposed channel realignment between Cross-Section # 1180.6 and # 955.53. The proposed condition peak flow is higher than the existing condition in this portion of the reach. A maximum water level increase of 12.0cm was observed at Cross-Section # 1428.85 (north of the proposed channel realign).

As it was mentioned in the previous sections, the channel realignment was made to accommodate the proposed Collector Street 5A alignment and grading. The engineered channel is a 30m wide trapezoidal channel. It has a 1.5m wide low flow channel component. The channel bed level was adjusted to attain a smooth gradient between the inlet of the culvert at Teston Road and the channel bed level at the beginning of the engineered channel. Although the existing and proposed condition HEC-RAS cross-section numbers are the same in this portion of the reach, the proposed channel bed level is not the same as existing due to channel realignment. The proposed channel level was observed higher than the existing one at the beginning of the engineered channel and lower than the existing in the south end of the engineered channel. The regulatory flood level was observed higher than the existing condition (by a maximum of 69.0cm at Cross-Section # 955.53). The regulatory flood line was observed to fall within the valley as well as within the proposed engineered channel. The 10m buffer is also within the constraint limit in this portion of DF3 reach.

The comparison results along DF2 depicts that the first two cross-sections (Cross-section # 100 and # 956) were eliminated at the proposed HEC-RAS modelling due to the proposed grading. It should be noted that in the existing condition, the DF2 watercourse were extended further

upstream in order smoothly connect the spill water level from DF3. However, in the proposed condition, there is no spill water from DF3. The channel bed level and proposed condition water levels are almost the same as the existing one in the remaining HEC-RAS cross-sections located north of the existing Teston Road crossing.

As it was mentioned before, DF4 was not modeled in the existing condition because it was not a regulatory floodplain. Only proposed condition modelling was done for DF4 for analyses of flow conveyance and the proposed wetland features. Hence, the hydraulic analysis results comparison was not done for DF4. The proposed wetland feature in DF4 is located between HEC-RAS Cross–Section # 785 and # 256. There is also a proposed Collector Street 3 crossing (Culvert G) that is a 1.22m x 4.27m x 50m culvert. The proposed regional flood line in DF4 falls within the limits of the drainage feature corridor

6.2.2 Water Level Impact on the Proposed SWM ponds (DF2, DF3, and DF4)

The proposed SWM ponds located along DF3, DF4, and DF2 are SWM C, SWM F, SWM H, and SWM G. Please see the Floodplain mappings (**Appendix C**) as well as Engineering Drawings in the submission package. The 100 year and regional flood impact on the proposed SWM ponds have been evaluated by checking the permanent pool level and spillway level of the SWM ponds. As it is summarized in the following table, the 100 year flow is lower than the permanent pool levels and the regulatory flood level is lower than the spillway level of each SWM Pond. Hence, it can be concluded that the proposed SWM ponds are appropriately designed relative to flood levels in the adjacent receiving drainage feature.

Table 6.10: SWM Pond Elevations and Floodplain Elevations Comparison (DF3, DF4, and DF4 Drainage Features).

SWM Pond Information			Watercourse Location		Future Uncontrolled Water Level	
SWM Pond ID	PPL	Emergency Spillway Level	Water Course Name	HEC-RAS ID	100 Year	Regional
SWM C	260.0	263.0	DF3	1907.68 & 1808.68	259.63[a]	261.58[b]
SWM F	259.0	261.50	DF3	1676.46	258.03	258.3
SWM H	252.50	255.50	DF4, DF3	DF4 -41, DF3-1012.43	250.48[c]	251.62[d]
SWM I	252.0	254.70	DF4	41	250.62	251.62
SWM J	257.50	261.00	DF4	550 & 416	257.40[e]	257.6[f]
SWM G	249.50	252.00	DF2	842	248.52	248.90

Note:
[a] SWM Pond C outlet is piped across Collector Street 3 and released to the DF3 downstream of Culvert G around Cross-Section # 1808.68. Hence, the 100 year water level of Cross-Section # 1808.68 was adopted.
[b] SWM Pond C Spillway is released to DF3 upstream of Culvert G around Cross-Section # 1907.68. Hence, the Regional water level of Cross-Section # 1907.68 was adopted.
[c] SWM Pond H outlet is piped and released to the DF3 just north of the intersection of DF3 and DF4 drainage features around Cross-Section # 1012.43. Hence, the 100 year water level of Cross-Section # 1012.43 was adopted.
[d] SWM Pond H Spillway is released to DF4 upstream of the DF3 and DF4 intersection around Cross-Section # 41. Hence, the Regional water level of Cross-Section # 41 was adopted.
[e] SWM Pond J outlet is piped under Collector Street 6 and released to the DF3 around 35m upstream of Cross-Section # 416. Hence, 100 year water level of Cross-Section # 416 and # 550 was prorated and adopted.
[f] SWM Pond J Spillway is released under Collector Street 6 and released to DF3 around 35m upstream of Cross-Section 416. Hence the regional water level of Cross-sections # 416 and # 550 was prorated and adopted for comparison.

6.2.3 Hydraulic Analysis Results of the Proposed Road Crossings in DF3 and DF4

As discussed in *Section 5.3.3.2*, there are four new proposed crossings in DF3 (i.e., Culverts D, E, F, and H) and there is one new culvert in DF4 (i.e., Culvert G). In addition to the proposed water crossings, an existing culvert at Teston Road along DF3 is proposed to be extended to accommodate the new Street 5A and align with the proposed DF3 channel realignment. In existing conditions, the regulatory flow spills over Teston Road, and the maximum depth of overtopping is estimated to be 0.46m with an average velocity of 0.79m/s. Further discussion for

the proposed design in this location is discussed in *Section 6.2.4.*

Table 6.11 below presents a summary of the hydraulic modeling results for the proposed culverts at the DF3 and DF4. The result depicts that there is no flood overtopping over the top of the proposed road crossings except at the Teston Road crossing. As it was mentioned above, the regional water level of Teston Road crossing is higher than the road elevation. In other crossings, the water level is below the road elevation, which confirms that there is no flood overtopping.

Table 6.11: DF3 and DF4 Road Crossings Hydraulic Analysis Results Summary Table

Reach	Crossing ID	Culvert Dimensions (m)		Road Elevation (m)	Future Uncontrolled Flows (m^3/s)		Water Surface Elevation (m)	
		(DepthXspan)	Length		100-Yr	Regional	100-Yr	Regional
DF3	Crossing D	1.83x7.315	55	283.46	2.998	11.682	279.42	281.79
DF3	Crossing E	2.44x12.81	55	271.04	3.799	17.766	267	267.34
DF3	Crossing F	2.44x12.81	50	264.0	5.847	23.964	260.66	261.15
DF3	Crossing H	1.36x7.744 Ø1.50	90	251.39*	11.46	41.96	249.64	251.62
DF4	Crossing G	1.22x4.27	40	268.11	0.62	1.87	264.92	265.16

Note:
* *Elevation corresponding to the proposed elevated grading north of Teston Road (See Engineering Drawing, **Appendix D**).*

The following **Table 6.12** depicts the calculations applied to estimate the provided opening depth within the culvert as well as the freeboard depths. The dryland opening depth of a culvert determines the available depth within the culvert to pass animals through during dry water conditions. It is the depth below the obvert level of the culvert and above the low flow channel depth. The opening depth above the high water level indicates the available clearance of the culvert.

The result corresponding to the Crossing D indicates that the culvert has a 1.53m depth above the low flow channel. As it was mentioned in the previous sections, there is a railway crossing just downstream of the proposed Culvert D. The existing culvert at the railway crossing has a choking effect on the upstream reaches. This backwater effect influences the water level increase north of the proposed culvert at the Proposed Collector Street 8 crossing. As the result of this, the obvert level of the proposed Culvert D was found 0.98m below the high-water level as it is

shown in the following table. However, the regulatory water level is below the road elevation. The freeboard from the road top level is 1.67m [i.e., Road elevation (283.46) – High water level (281.79) = 1.67m].

Culverts E and F have a 2.14m opening depth above the low flow channel. The clearance height above the high-water level varies from 1.22m to 1.50m. It indicates that there is sufficient depth of clearance provided for these crossings to satisfy the MTO standards. Crossing G was proposed on a non-regulatory floodplain watercourse (i.e., DF4). The following summary table depicts that, Culvert G has a 1.07m depth above the low flow channel and 0.76m clearance above the high water level. It should be noted that the freeboard (depth between the road elevation and high water level) is more than 1.0m. The case of Crossing H (i.e., Teston Road crossing) is discussed separately in *Section 6.2.3* below.

Table 6.12: DF3 and DF4 Road Crossings Culvert Opening and Clearance Calculations

Reach	Crossing ID	Culvert Dimensions m	Culvert Elevation (m)		Low Flow Channel Depth (m)	Regional Water Elev. (m)	Opening Depth (m)	
			U/S Invert	U/S Obvert*			Above Dryland**	Clearance***
DF3	Crossing D	1.83x7.315	278.98	280.81	0.3	281.79	1.53	-0.98
DF3	Crossing E	2.44x12.81	266.4	268.84	0.3	267.34	2.14	1.5
DF3	Crossing F	2.44x12.81	259.93	262.37	0.3	261.15	2.14	1.22
DF3	Crossing H	1.36x7.744	248.28	249.64	0.3	251.62	1.06	-1.98
		Ø1.50	248.28	249.78	N/A	251.62	1.50	-1.84
DF4	Crossing G	1.22x4.27	264.7	265.92	0.15	265.16	1.07	0.76

Note:
* *Culvert U/S Obvert Elevation = Invert Elevation + Culvert depth (278.98+1.83 = 280.81m)*
** *Depth above dryland is the depth available within the culvert to pass animals through during dry water conditions = [Obvert level – Low flow channel depth – Invert elevation]. (280.81 – 0.30 – 278.98 = 1.53m).*
*** *Clearance is the depth between obvert level and the high-water level = [Obvert level – High water level]. = (280.81 – 281.79 = -0.98m). Note that if the clearance is negative, it implies that the water level is higher than the obvert.*

6.2.4 DF3 Teston Road Crossing (Culvert H)

A direct connection of the proposed Street 5 in Block 27 to Cranston Park Ave to the south is shown on the Block 27 Secondary Plan. The alignment in the Secondary Plan does not include the full right-of-way and incorporated a skewed intersection that does not meet current road standards. The MCEA Street 5A alignment includes a full intersection complying with all relevant design standards. Any new intersection in this location will require new or modified

drainage feature crossings and channel realignments.

Schaeffers completed an assessment of hydraulic conditions associated with Street 5A just north of Teston Road. They prepared the Memorandum titled as "Block 27 Street 5A Hydraulic Assessment" dated September 9th, 2022, that was submitted to TRCA. Please refer the document, attached in **Appendix D** for the assessment and recommendations regarding Culvert H design.

7.0 Summary and Conclusion

This report presents hydraulic modelling, calculated water surface elevations, and associated floodlines with the existing and future flows along drainage features in Block 27 development in the City of Vaughan, Regional Municipality of York. A comparison between existing and post-development conditions is also presented to assess the impact of the proposed development on the existing drainage system. The results of the floodplain analysis can be summarized as follows:

- The Study Area falls under the jurisdiction of the TRCA and hydraulic modelling was performed using HEC-RAS software;
- In this study, the available detailed topographic field data and aerial topographic data (where the detailed survey was not available) were used to produce a high-resolution Triangulated Irregular Network (TIN) for generating digital terrain layers;
- Regional storm (Hurricane Hazel) and 100-year storms (AES 6hr and AES 12hr distribution) events were simulated based on the current hydrological information and considered in the hydraulic modelling;
- The west drainage feature of Block 27 area was defined as Drainage Feature (DF1) and the east and middle drainage features were defined as DF3, DF4, and DF2 in the current modelling;
- There are three proposed road crossings along DF1, four crossings along DF3, and one crossing along DF4. There are no proposed road crossings of DF2. The road crossings are designed to adhere to the requirements of the City of Vaughan, TRCA, as well as MNRF Technical Guideline Flooding Hazard Limit. Proposed culvert types should be selected during the next detailed design phase and must meet all hydraulic and ecological requirements;
- The proposed road alignment and crossings are designed to avoid or minimize impacts on

the natural drainage features. However, complete avoidance is not always feasible. Therefore, minor realignments of the channel are proposed at Culvert D, Culvert E, and Culvert G to ensure a smooth integration of the channel with the proposed road and culvert alignment;

- Channel realignment (approximately 350m of natural channel design) was proposed on DF3 around the south end of the watercourse before leaving Block 27 area. Channel realignment was proposed due to the proposed Street 5A alignment and grading. In addition to the channel realignment, the existing culvert at Teston Road has been upgraded and extended by approximately 40m;

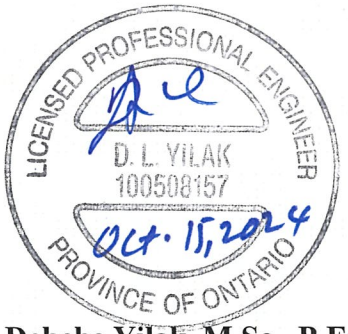
- Analysis results depicted that the 100 year water level is below the permanent pool levels and the regulatory flood level is lower than the spill way level of each SWM Ponds;

- The floodplain mapping depicts that the regulatory flood line that provides natural hazard areas for inclusion in the Natural Heritage Network.

We trust that you will find this analysis satisfactory. If you have any questions or comments concerning hydraulic analysis, please do not hesitate to contact us.

Respectfully Submitted,

SCHAEFFER & ASSOCIATES LTD.



Debebe Yilak, M.Sc., P.Eng.,
Water Resources Engineer

APPENDICES

APPENDIX A

HYDROLOGICAL ANALYSIS RESULTS

Date: Oct-22
Project # 4766 - Block 27

Table A-1: SCE Existing Condition HEC-RAS Model Flows Computed Based on the SCE Existing PCSWMM Hydrology Model.

Water Course	PCSWMM NOD	Flow Changing Nod at HEC-RAS Station	Total Catchment Area at Junction (ha)	Known Large Area (A1), ha	Small Area (A2), ha	Existing Regional (Uncontrolled)			Existing 100 Year (Uncontrolled)			Reamak
						Flow for A1 (Q1), m^3/s	Flow for A2 (Q2), m^3/s	Flow Adopted for Modelling, m^3/s	Flow for A1 (Q1), m^3/s	Flow for A2 (Q2), m^3/s	Flow Adopted for Modelling, m^3/s	
DF1	J009	5886.58	92.614					10.448			0.496	Peak flow = Flow at J009
		4508.16		202.774	147.69	21.003	16.559	16.559	0.623	0.491	0.491	MTO Eqn; A1 = Area at J012 = 202.774ha, A2=A1-(0.5*Area between J009 and J012) = 147.69ha, Q1= Flow at J012 = 21.003m^3/s.
	J012	4125	202.774					21.003			0.623	Peak flow = Flow at J012
		3279.33		258.973	230.87	26.482	24.296	24.296	1.164	1.068	1.068	MTO Eqn; A1 = Area at J035 = 258.9738ha, A2=A1-(0.5*Area between J035 and J012) = 258.973-0.5*56.198 =230.87ha , Q1= Flow at J035 =26.482
	J035	2628.8	258.973					26.482			1.164	Peak flow = Flow at J035
		1990.35		304.946	281.96	28.744	27.103	27.103	1.225	1.155	1.155	MTO Eqn; A1 = Area at J058 =304.946ha, A2=A1-(0.5*Area between J035 and J058) = 304.946-0.5*45.97 =281.96ha , Q1= Flow at J058 =28.744
	J058	1115.08	304.946					28.744			1.225	Peak flow = Flow at J058
DF3	J675		65.81					8.750			2.050	Peak flow = Flow at J675
	J034	3547.76	92.29					11.699			2.132	Peak flow = Flow at J034
		3147.49		196.149	117.294	23.433	15.935	15.935	2.550	1.734	1.734	MTO Eqn; A1 = Area at J042 =196.149ha, A2=[A1-(0.5*$A_{(S3872)}$ - $A_{(S017)}$)] = [196.149-(0.5*49.99-53.86)] =117.294ha , Q1= Flow at J042
		2607.54		196.149	142.289	23.433	18.419	18.419	2.550	2.004	2.004	MTO Eqn; A1 = Area at J042 =196.149ha, A2=[A1 - $A_{(S017)}$)] = [196.149 - 53.86] =142.289ha Q1= Flow at J042
	J042		196.149					23.433			2.550	Peak flow = Flow at J042
		1676.47		263.13	204.826	30.467	25.249	25.249	3.807	3.155	3.155	MTO Eqn; A1 = Area at J043 =263.13ha, A2=[A1-(0.5*$A_{(S021)}$ - $A_{(S022)}$)] = [263.13-(0.5*17.36-49.621)] =204.826ha , Q1= Flow at J043
		1329		263.13	213.509	30.467	26.047	26.047	3.807	3.255	3.255	MTO Eqn; A1 = Area at J043 =263.13ha, A2=[A1- $A_{(S022)}$] = [263.13 -49.621] =213.509ha, Q1= Flow at J043
DF3	J043	970.12	263.13					30.467			3.807	Peak flow = Flow at J043
	J057	947.55	306.64					35.116			4.064	Peak flow = Flow at J057
	J1	888.03	331.237					37.986			4.295	Peak flow = Flow at J1
DF 2	S0261	1000						2.980			0.24	Peak flow = Flow at S0261

Note: Please refer to the attached "Figure A-1: Existing Condition Hydrological Map" for the Tributary area and Flows at the Junctions and subcatchments.

MTO Equation is the Ontario Ministry of Transportation (MTO) Pro-rating Methodology

In some modelling situations, it may be applicable to prorate flows from large catchment area with known flows to a smaller subcatchment area with similar topography, waterched morphology and land cover. The accepted method for prorating flows is using a simplified version of the Modified Index flood method as presented in the Ontario Ministry of Transportation (MTO) Drainage management Manual. (Attached in Append for reference).

The Modified index Flood Method referenced in the MTO Drainage Management Manual is:

$$Q_2 = Q_1\left(\frac{A_2}{A_1}\right)^{0.75}$$

Where;

A_1 = Fow knownlarger Area (ha)

A_2 = Flow unknown smaller subcatchment area (ha)

Q_1 = Flow corresponding to A1 (m^3/s)

Q_2 = Flow corresponding to the A2 (m^3/s)

Date: Oct-22
Project # 4766 - Block 27

Table A-2: SCE Future Uncontrolled (Interim for Midle ad Ultimate for West Tributaries) .

Drainage Feature	PCSWMM NOD	Flow Changing Nod at HEC-RAS Station	Total Catchment Area at Junction (ha)	Known Large Area (A1), ha	Small Area (A2), ha	Future Regional (Uncontrolled)			Future 100 Year (Uncontrolled)			Reamak
						Flow for A1 (Q1), m^3/s	Flow for A2 (Q2), m^3/s	Flow Adopted for Modelling, m^3/s	Flow for A1 (Q1), m^3/s	Flow for A2 (Q2), m^3/s	Flow Adopted for Modelling, m^3/s	
DF1	J009	5886.58	92.614					10.448			0.496	Peak flow = Flow at J009
		4508.16		203.974	148.29	21.142	16.646	16.646	0.683	0.538	0.538	MTO Eqn; A1 = Area at J012 = 196.414ha, A2=A1-(0.5*110.16ha) = 140.69ha, Q1= Flow at J012 = 15.64m^3/s.
	J012	4125.89	203.974					21.142			0.683	Peak flow = Flow at J012
	J012,NA1	3279.33	208.724					21.802			0.843	Peakflow at J012+NHS area (NA1) =21.155+0.66=21.802
	J3	2827.51	256.364					27.730			3.202	Two Ponds outlet, Peak flow = Flow at J3
	J035	2628.8	263.594					27.731			2.990	between J3 and J35 is NHS area =Peak flow = Flow at J035
	J7	1990.35	292.144					29.812			3.355	Peak flow = Flow at J7
	J6	1668	318.514					32.739			4.540	Peak flow = Flow at J6
	J058	1159	346.974					35.318			4.601	Peak flow = Flow at J058
	J034	3547.76	87.19					11.682			2.998	Peak flow = Flow at J034
	J2	3147.49	130.45					17.187			3.862	Peak flow = Flow at J2
	J8	2607.54	135.67					17.766			3.799	Peak flow = Flow at J8
	J042	2052	181.94					23.964			5.847	Peak flow = Flow at J042
	J043, J164, N209, NA11, N202	1676.47		315.53	192.47	42.052	29.025	29.025	11.736	8.101	8.101	MTO Eqn; A1 = Area at J043 =315.53ha, A2=AJ43-[J164+NA202]-0.5*(N209+NA11) = , Q1= Flow at J043
	J043, J164, N202	1329		315.53	201.55	42.052	30.046	30.046	11.736	8.385	8.385	MTO Eqn; A1 = Area at J043 =315.53ha, A2=AJ43-[J164+NA202] = , Q1= Flow at J043
DF3	J043		315.53					42.052			11.736	
	J057	970.12	316.44					41.960			11.465	Peak flow = Flow at J057
	J1	888.03	339.454					45.042			12.442	Peak flow = Flow at J1
DF2	201, 220, S16, and S1	899	18.6236					2.540			1.07	Peak flow = Flow at upstream Catchments
DF4		1044						1.812			0.62	Refer attached calculation sheet "Flows Upstream of DF4".
		649		93.35	46.68	12.735	7.572	7.572	4.240	2.521	2.521	MTO Eqn; A1 = Area at J164= 89.35ha, A2=A1-(0.5*89.325ha) = 44.675ha, Q1= Flow at J164 = 12.215m^3/s.
	J164	416	93.35					12.735			4.24	Peak flow = Flow at J164

Note: Please refer to the attached "Figure A-2: Future Condition Hydrological Map" for the Tributary area and Flows at the Junctions and subcatchments.

Note:

MTO Equation is the Ontario Ministry of Transportation (MTO) Pro-rating Methodology

In some modelling situations, it may be applicable to prorate flows from large catchment area with known flows to a smaller subcatchment area with similar topography, waterched morphology and land cover. The accepted method for prorating flows is using a simplified version of the Modified Index flood method as presented in the Ontario Ministry of Transportation (MTO) Drainage management Manual. (Attached in Append for reference).

The Modified index Flood Method referenced in the MTO Drainage Management Manual is:

$$Q_2 = Q_1(\frac{A_2}{A_1})^{0.75}$$

Where;

A_1 = Fow knownlarger Area (ha)

A_2 = Flow unknown smaller subcatchment area (ha)

Q_1 = Flow corresponding to A1 (m^3/s)

Q_2 = Flow corresponding to the A2 (m^3/s)

PROJECT NO.: 4766
PROJECT NAME: Block 27
LOCATION: City of Vaughan
DATE: Oct-22

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Flows Upstream of DF4

Table 1: Standhyd Parameters and Flows

Catchment	Area (ha)	TIMP (%)	XIMP (%)	Regional Flow (m3/s)*	100-year Flow 12hr AES (m3/s)*
Roof Area Low-Rise Residential to Wetland 16	0.16	100	100	0.024	0.011
Roof Area School to Wetland 15	2.94	100	100	0.433	0.195
Roof Area Low-Rise Mixed Use to Wetland 15	2.14	100	100	0.315	0.142
Roof Area Low-Rise Residential to Wetland 15	0.45	100	100	0.066	0.03

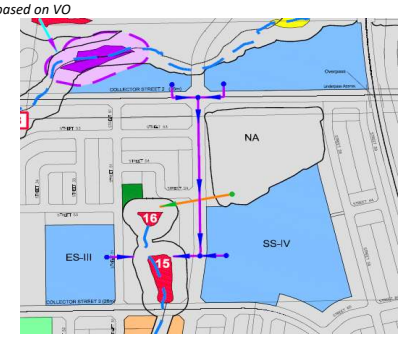
**based on VO*

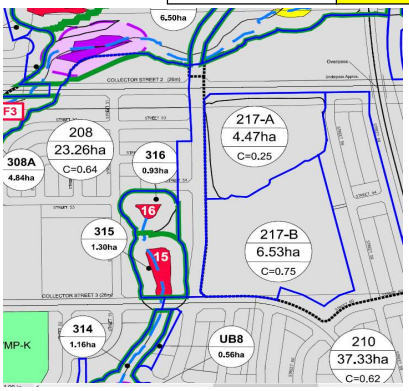
Table 2: Nashyd Parameters and Flows

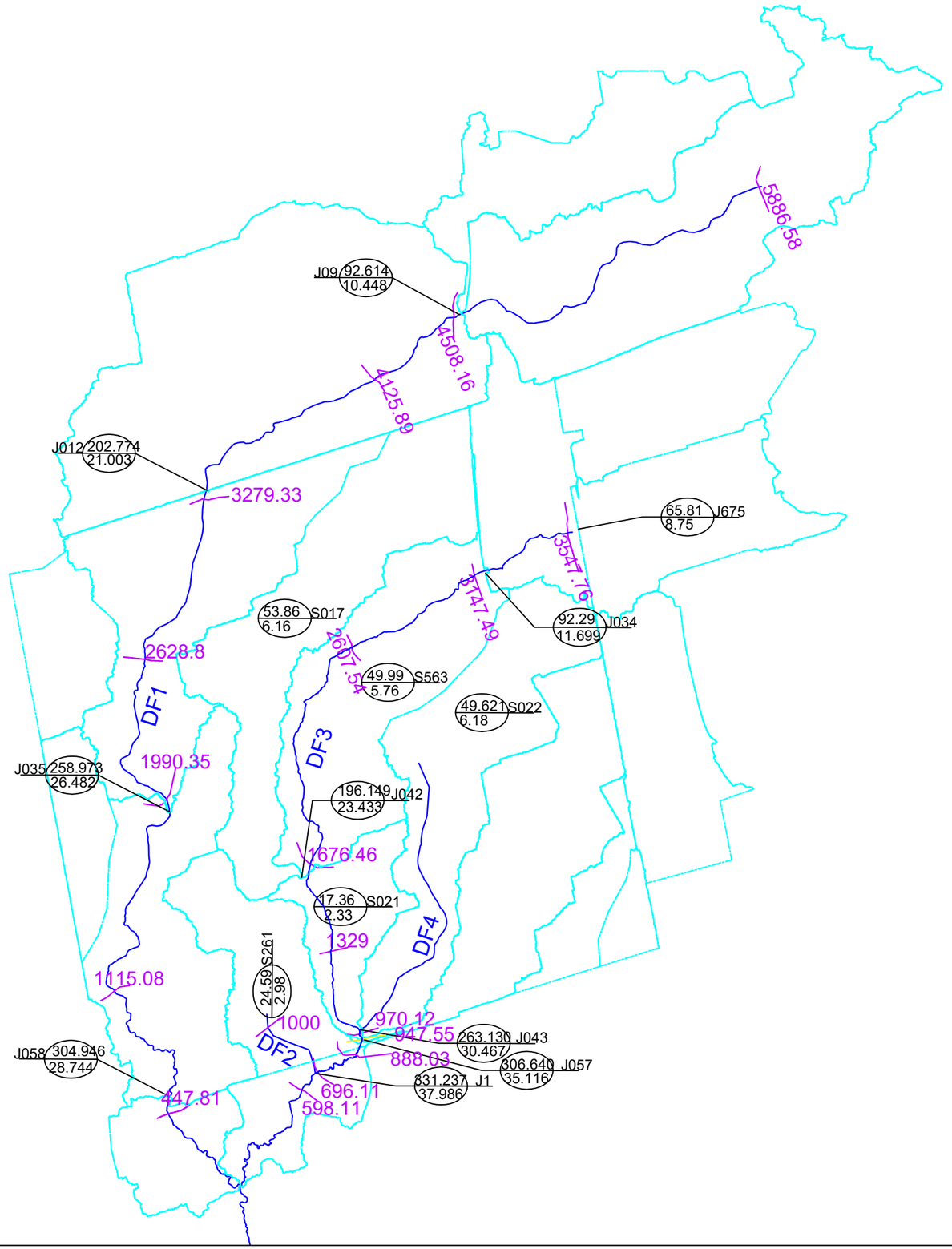
Catchment	Area (ha)	CN II	Ia	Tp**	Regional Flow (m3/s)*	100-year Flow 12hr AES (m3/s)*
217-A to Wetland 16	4.47	80	5	0.08	0.605	0.148
316 + Backyard Low Rise Residential to Wetland 16	1.06	80	5	0.08	0.144	0.035
315 to Wetland 15	1.3	80	5	0.08	0.176	0.043
Backyard Low Rise Residential to Wetland 15	0.36	80	5	0.08	0.049	0.012

**based on VO*

TOTAL U/S of DF4	Regional Flow (m3/s)	100-year Flow 12hr AES (m3/s)
	1.812	0.616







BLOCK 27
CITY OF VAUGHAN

LEGEND

DRAINAGE AREA (ha.)
PCSWMM NODE
87.194 J034 11.699
REGIONAL PEAKFLOW (m^3/s.)

DRAINAGE AREA BOUNDARY (PCSWMM MODEL OUTPUT)

DRAINAGE FEATURE (HEC-RAS MODEL OUTPUT)

416 HEC-RAS CROSS-SECTION [FLOW CHANGING NODE]

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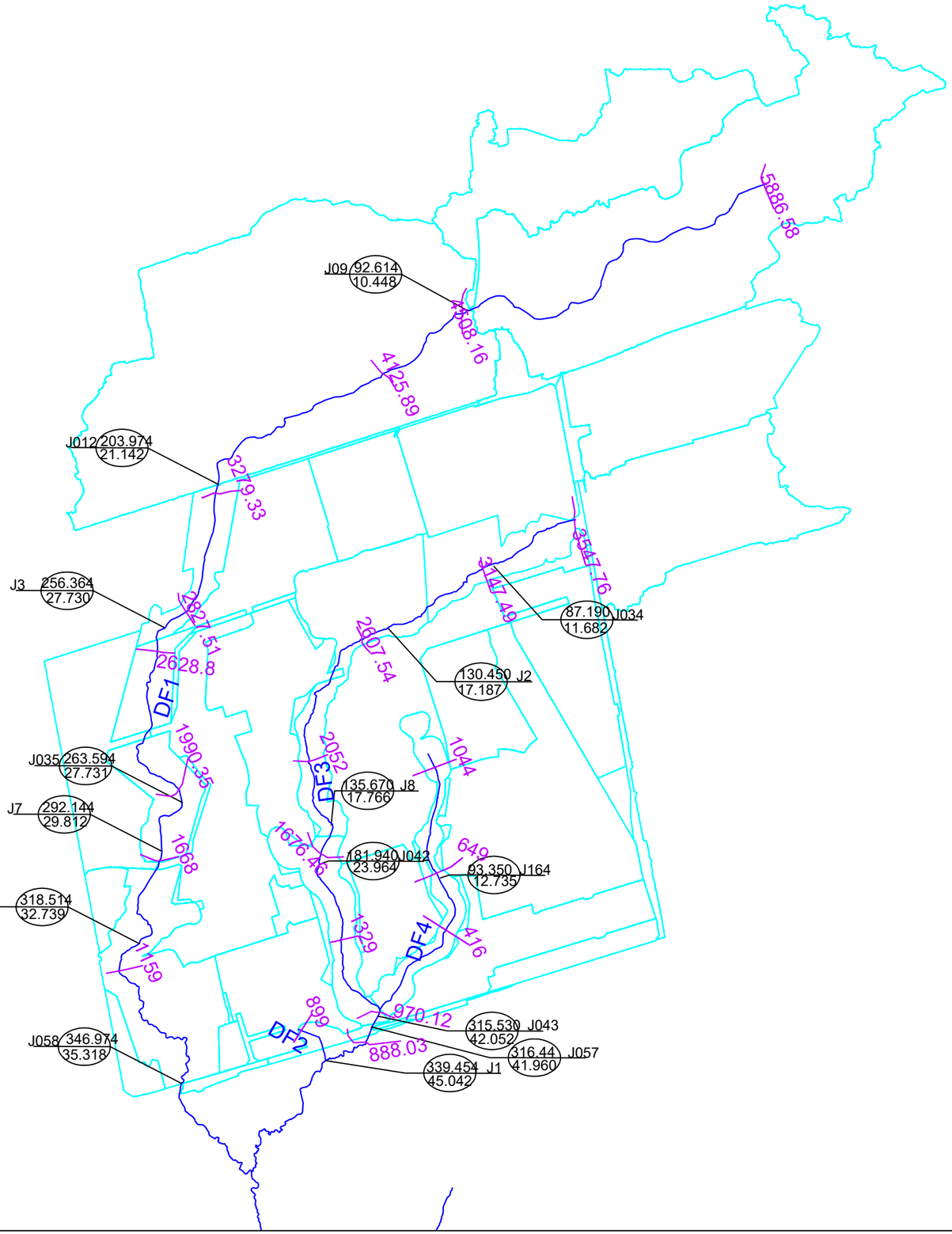
FIGURE A-1
EXISTING CONDITIONS HYDROLOGY MAP
APPLIED FOR HEC-RAS MODELLING

2019-4766	OCTOBER 2022	SCALE: N.T.S.

Debebe Yilak

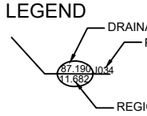
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BLOCK 27
CITY OF VAUGHAN

LEGEND



DRAINAGE AREA BOUNDARY (PCSWMM MODEL OUTPUT)

DRAINAGE FEATURE (HEC-RAS MODEL OUTPUT)

416 HEC-RAS CROSS-SECTION [FLOW CHANGING NODE]

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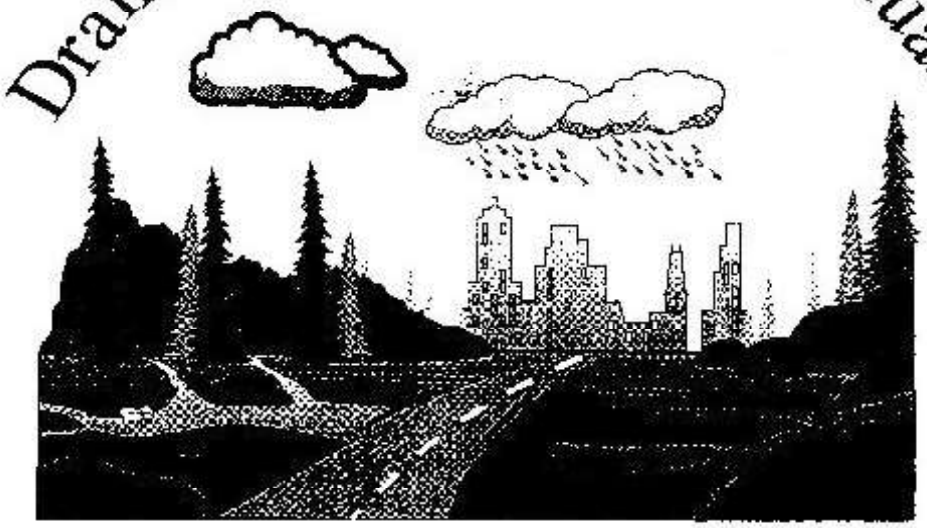
FIGURE A-2
FUTURE CONDITIONS HYDROLOGY MAP
APPLIED FOR HEC-RAS MODELLING

2019-4766	OCTOBER 2022	SCALE: N.T.S.

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Ministry of Transportation
Ontario

MTO Drainage Management Manual



Drainage and Hydrology Section
Transportation Engineering Branch
Quality and Standards Division

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Drainage Management Manual



Chapter 8
Hydrology, Hydraulics and Stormwater Quality

Drainage and Hydrology Section
Transportation Engineering Branch
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Transposition of Flood Discharges

Sometimes it is necessary to transpose a discharge from a gauging station to another point on the same stream or to an adjacent basin where the discharge is unknown. If the basins have similar characteristic, instantaneous peak discharges can be transposed directly using the expression

$$Q_2 = Q_1 \left(\frac{A_2}{A_1} \right)^{0.75} \quad (8.31)$$

Where:

Q_1 = known peak discharge
Q_2 = unknown peak discharge
A_1 = known basin area
A_2 = unknown basin area

This expression is based on the modified index flood method. If the basins have significantly different hydrologic characteristics, it would be preferable to use the modified index flood method directly, possibly using the transposed figure as a check.

Where two or more gauging stations are available in a reasonably homogeneous watershed, the discharge corresponding to a given frequency at each station can be plotted on logarithmic paper and the required discharge interpolated or extrapolated, within reasonable limits.

APPENDIX B

HEC-RAS MODELLING RESULTS

HEC-RAS Plan: SCE Existing Locations: User Defined

River	Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl	Vel Left	Vel Right	Vel Total	Volume
				(m3/s)	(m)	(m)	(m)	(m)	(m/m)	(m/s)	(m2)	(m)		(m/s)	(m/s)	(m/s)	(1000 m3)
DF1	Reach20	5886.58	Regional	10.45	308.00	308.68	308.68	308.77	0.012258	2.39	15.00	59.39	0.94	0.65	0.51	0.70	226.02
DF1	Reach20	5886.58	100 Year	0.50	308.00	308.16	308.16	308.22	0.024707	1.23	0.65	6.14	1.04	0.35	0.42	0.76	13.24
DF1	Reach20	5856.88	Regional	10.45	307.28	307.91	307.99	308.26	0.022938	2.98	6.13	21.37	1.26	0.75	0.64	1.70	225.71
DF1	Reach20	5856.88	100 Year	0.50	307.28	307.44	307.44	307.49	0.024425	0.99	0.53	6.34	0.98	0.17	0.17	0.93	13.22
DF1	Reach20	5827.42	Regional	10.45	306.59	307.15	307.22	307.41	0.034497	3.55	8.15	29.81	1.53	0.89	1.01	1.28	225.50
DF1	Reach20	5827.42	100 Year	0.50	306.59	306.75	306.75	306.80	0.022498	1.19	0.72	7.54	0.99	0.34	0.34	0.69	13.20
DF1	Reach20	5779.22	Regional	10.45	305.66	306.16	306.14	306.27	0.022274	2.59	10.77	37.49	1.20	0.78	0.81	0.97	225.12
DF1	Reach20	5779.22	100 Year	0.50	305.66	305.78	305.75	305.80	0.017637	0.81	1.22	14.23	0.82	0.32	0.30	0.41	13.16
DF1	Reach20	5727.52	Regional	10.45	304.91	305.42	305.34	305.47	0.011243	1.85	15.05	52.96	0.85	0.49	0.66	0.69	224.47
DF1	Reach20	5727.52	100 Year	0.50	304.91	305.05	305.03	305.06	0.011958	0.72	1.48	20.26	0.69	0.23	0.22	0.34	13.09
DF1	Reach20	5627.42	Regional	10.45	303.87	304.56	304.36	304.61	0.007036	1.84	15.74	39.48	0.72	0.58	0.53	0.66	222.96
DF1	Reach20	5627.42	100 Year	0.50	303.87	304.03	303.99	304.05	0.008871	0.75	1.43	14.43	0.62	0.27	0.20	0.35	12.95
DF1	Reach20	5527.42	Regional	10.45	302.93	303.66	303.61	303.78	0.009955	2.26	12.61	39.91	0.86	0.55	0.53	0.83	221.57
DF1	Reach20	5527.42	100 Year	0.50	302.93	303.12	303.09	303.15	0.009139	0.83	0.91	9.16	0.65	0.18	0.20	0.55	12.83
DF1	Reach20	5478	Regional	10.45	302.42	303.06	303.06	303.23	0.012453	2.28	9.79	31.48	0.94	0.58	0.55	1.07	221.01
DF1	Reach20	5478	100 Year	0.50	302.42	302.58		302.61	0.012899	0.80	0.74	8.02	0.73	0.17	0.20	0.67	12.79
DF1	Reach20	5427.38	Regional	10.45	301.63	302.44	302.45	302.63	0.011241	2.56	10.33	30.88	0.93	0.59	0.57	1.01	220.50
DF1	Reach20	5427.38	100 Year	0.50	301.63	301.82	301.81	301.87	0.016584	1.06	0.55	4.98	0.86	0.21	0.23	0.89	12.76
DF1	Reach20	5388	Regional	10.45	301.12	301.80	301.85	302.08	0.017424	2.80	7.48	23.19	1.12	0.68	0.65	1.40	220.15
DF1	Reach20	5388	100 Year	0.50	301.12	301.30	301.27	301.34	0.011039	0.83	0.66	6.01	0.69	0.15	0.17	0.75	12.74
DF1	Reach20	5327.54	Regional	10.45	300.46	301.12	301.01	301.19	0.006083	1.62	15.79	48.60	0.66	0.46	0.39	0.66	219.45
DF1	Reach20	5327.54	100 Year	0.50	300.46	300.62	300.60	300.64	0.011869	0.73	1.00	13.31	0.69	0.19	0.18	0.49	12.69
DF1	Reach20	5227.42	Regional	10.45	299.64	300.35	300.26	300.46	0.008899	2.13	11.68	27.36	0.81	0.59	0.67	0.89	218.08
DF1	Reach20	5227.42	100 Year	0.50	299.64	299.84	299.79	299.86	0.005566	0.70	1.24	11.46	0.51	0.16	0.18	0.40	12.57
DF1	Reach20	5127.42	Regional	10.45	298.62	299.37	299.37	299.52	0.009525	2.23	11.07	34.08	0.84	0.44	0.54	0.94	216.92
DF1	Reach20	5127.42	100 Year	0.50	298.62	298.77	298.77	298.82	0.024410	1.06	0.53	5.60	0.99	0.16	0.27	0.94	12.48
DF1	Reach20	5058.72	Regional	10.45	297.88	298.65	298.41	298.69	0.002699	1.20	18.71	38.32	0.45	0.39	0.54	0.56	215.89
DF1	Reach20	5058.72	100 Year	0.50	297.88	298.15	298.03	298.16	0.000970	0.33	2.50	22.04	0.22	0.09	0.13	0.20	12.38
DF1	Reach20	5041.96	Regional	10.45	297.95	298.46	298.46	298.59	0.014835	2.11	10.02	32.88	0.98	0.65	0.92	1.04	215.64
DF1	Reach20	5041.96	100 Year	0.50	297.95	298.08	298.08	298.11	0.023150	0.88	0.79	13.14	0.93	0.22		0.63	12.35
DF1	Reach20	5028.02	Regional	10.45	297.02	297.29	297.47	298.01	0.226881	5.64	4.05	20.13	3.49	2.00	1.78	2.58	215.54
DF1	Reach20	5028.02	100 Year	0.50	297.02	297.08	297.12	297.27	0.355663	2.39	0.40	12.83	3.33	0.68	0.69	1.24	12.34
DF1	Reach20	4927.42	Regional	10.45	295.41	297.42	295.78	297.42	0.000038	0.28	101.34	71.88	0.06	0.10	0.10	0.10	210.90
DF1	Reach20	4927.42	100 Year	0.50	295.41	295.54	295.53	295.55	0.012255	0.76	1.72	27.15	0.71	0.22	0.20	0.29	12.25
DF1	Reach20	4893.15	Regional	10.45	294.93	297.42		297.42	0.000009	0.15	190.16	112.89	0.03	0.05	0.05	0.05	206.04
DF1	Reach20	4893.15	100 Year	0.50	294.93	295.19	295.19	295.21	0.008596	0.85	1.88	45.26	0.63	0.11	0.13	0.26	12.19
DF1	Reach20	4880.67	Regional	10.45	294.53	297.42	295.18	297.42	0.000005	0.12	240.03	139.10	0.02	0.04	0.04	0.04	203.46
DF1	Reach20	4880.67	100 Year	0.50	294.53	295.12	294.69	295.12	0.000058	0.13	6.94	49.94	0.06	0.03	0.05	0.07	12.13
DF1	Reach20	4859.28		Culvert													
DF1	Reach20	4834.95	Regional	10.45	294.32	295.78	294.62	295.79	0.000261	0.59	34.74	128.56	0.16	0.25	0.27	0.30	200.26
DF1	Reach20	4834.95	100 Year	0.50	294.32	294.33	294.32	294.35	0.134252	0.30	0.71	69.68	1.38	0.75	0.69	0.70	12.02
DF1	Reach20	4814.85	Regional	10.45	294.01	295.79		295.79	0.000030	0.23	102.60	68.46	0.06	0.12	0.09	0.10	197.40
DF1	Reach20	4814.85	100 Year	0.50	294.01	294.08		294.08	0.005925	0.26	2.52	31.69	0.41	0.16	0.19	0.20	11.89
DF1	Reach20	4727.26	Regional	10.45	293.35	295.79		295.79	0.000008	0.15	103.67	67.80	0.03	0.04	0.11	0.10	190.67
DF1	Reach20	4727.26	100 Year	0.50	293.35	293.54	293.50	293.55	0.009846	0.65	1.17	13.27	0.63	0.17	0.25	0.42	11.77
DF1	Reach20	4686	Regional	10.45	292.91	295.79		295.79	0.000012	0.20	146.93	78.49	0.04	0.07	0.06	0.07	185.47
DF1	Reach20	4686	100 Year	0.50	292.91	293.08	293.06	293.11	0.011808	0.84	1.11	12.65	0.71	0.23	0.28	0.45	11.72
DF1	Reach20	4627.42	Regional	10.45	292.18	295.78		295.79	0.000008	0.19	138.96	55.20	0.03	0.06	0.07	0.08	177.14
DF1	Reach20	4627.42	100 Year	0.50	292.18	292.29	292.27	292.31	0.016013	0.76	1.16	16.06	0.78	0.21	0.31	0.43	11.66
DF1	Reach20	4580.55	Regional	10.45	291.13	295.78		295.78	0.000001	0.09	287.01	90.70	0.01	0.03	0.03	0.04	167.91
DF1	Reach20	4580.55	100 Year	0.50	291.13	291.34	291.34	291.41	0.025116	1.14	0.43	3.38	1.02			1.14	11.62
DF1	Reach20	4562.51	Regional	10.45	290.62	295.78	291.45	295.78	0.000003	0.14	164.96	103.86	0.02	0.05	0.06	0.06	162.13
DF1	Reach20	4562.51	100 Year	0.50	290.62	291.30	290.78	291.30	0.000060	0.16	3.60	9.71	0.06	0.03	0.03	0.14	11.58
DF1	Reach20	4549.26		Culvert													
DF1	Reach20	4530.87	Regional	10.45	289.97	290.73	290.73	291.00	0.012632	2.53	5.75	28.79	0.96	0.68	0.86	1.82	160.17
DF1	Reach20	4530.87	100 Year	0.50	289.97	290.13	290.13	290.18	0.024964	0.99	0.50	5.14	0.98	0.12	0.06	0.98	11.56
DF1	Reach20	4508.16	Regional	16.56	289.64	290.40	290.36	290.60	0.015938	2.93	12.41	23.95	1.09	1.02	0.92	1.33	159.89
DF1	Reach20	4508.16	100 Year	0.49	289.64	289.80	289.73	289.81	0.007046	0.61	1.36	11.48	0.54	0.27	0.19	0.36	11.54
DF1	Reach20	4460	Regional	16.56	289.04	289.66	289.66	289.84	0.015459	2.51	14.29	38.99	1.04	0.75	0.73	1.16	159.25
DF1	Reach20	4460	100 Year	0.49	289.04	289.14	289.14	289.17	0.032440	0.91	0.73	11.22	1.07	0.18	0.36	0.67	11.49
DF1	Reach20	4427.42	Regional	16.56	288.26	289.03	288.79	289.13	0.009091	2.25	17.52	35.27	0.83	0.83	0.67	0.95	158.73
DF1	Reach20	4427.42	100 Year	0.49	288.26	288.40	288.33	288.40	0.007157	0.57	1.50	13.51	0.54	0.27	0.15	0.33	11.45
DF1	Reach20	4382.29	Regional	16.56	287.64	288.45	288.45	288.66	0.014176	2.71	12.41	32.10	1.02	1.16	0.72	1.33	158.12
DF1	Reach20	4382.29	100 Year	0.49	287.64	287.86	287.85	287.91	0.022193	1.02	0.55	5.63	0.95		0.25	0.90	11.41
DF1	Reach20	4350	Regional	16.56	286.85	287.37	287.50	287.78	0.068827	4.08	8.35	30.62	2.05	1.65	0.84	1.98	157.79
DF1	Reach20	4350	100 Year	0.49	286.85	286.99	286.97	287.01	0.036039	0.93	0.93	12.75	1.11	0.41		0.53	11.39
DF1	Reach20	4327.42	Regional	16.56	285.97	286.51	286.46	286.62	0.018922	2.36	14.40	42.20	1.10	0.89	1.00	1.15	157.24

HEC-RAS Plan: SCE Existing Locations: User Defined (Continued)

River	Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl	Vel Left	Vel Right	Vel Total	Volume
				(m3/s)	(m)	(m)	(m)	(m)	(m/m)	(m/s)	(m2)	(m)		(m/s)	(m/s)	(m/s)	(1000 m3)
DF1	Reach20	4327.42	100 Year	0.49	285.97	286.05		286.06	0.012440	0.38	1.28	10.30	0.60		0.38	0.38	11.33
DF1	Reach20	4302	Regional	16.56	285.29	285.98	285.97	286.16	0.016318	2.67	13.94	36.99	1.08	0.55	0.94	1.19	156.88
DF1	Reach20	4302	100 Year	0.49	285.29	285.34	285.34	285.38	0.088432	0.72	0.52	5.67	1.46		0.96	0.94	11.31
DF1	Reach20	4267	Regional	16.56	284.63	285.41	285.41	285.64	0.014754	2.78	12.34	27.29	1.05	0.68	0.93	1.34	156.43
DF1	Reach20	4267	100 Year	0.49	284.63	284.82	284.77	284.83	0.007099	0.61	1.20	10.90	0.54	0.13	0.24	0.41	11.28
DF1	Reach20	4227.42	Regional	16.56	284.16	284.86	284.75	284.95	0.010056	2.20	16.97	39.13	0.86	0.92	0.78	0.98	155.85
DF1	Reach20	4227.42	100 Year	0.49	284.16	284.22	284.20	284.24	0.049626	0.83	0.85	11.13	1.22		0.54	0.58	11.24
DF1	Reach20	4201	Regional	16.56	283.84	284.58		284.69	0.008964	2.16	18.58	44.77	0.82	0.54	0.65	0.89	155.38
DF1	Reach20	4201	100 Year	0.49	283.84	284.03		284.03	0.002880	0.45	1.75	13.59	0.36	0.12	0.17	0.28	11.21
DF1	Reach20	4164	Regional	16.56	283.61	284.28		284.36	0.008306	1.87	19.45	43.11	0.77	0.54	0.69	0.85	154.67
DF1	Reach20	4164	100 Year	0.49	283.61	283.74	283.74	283.77	0.041679	0.93	0.88	17.27	1.18	0.14	0.34	0.56	11.16
DF1	Reach20	4125.89	Regional	21.00	283.12	284.05		284.15	0.004055	1.57	21.13	37.35	0.56	0.45	0.48	0.99	153.89
DF1	Reach20	4125.89	100 Year	0.62	283.12	283.36	283.29	283.37	0.003927	0.44	1.53	14.24	0.40	0.08	0.12	0.41	11.11
DF1	Reach20	4026.93	Regional	21.00	281.75	283.12	283.12	283.31	0.007535	2.47	16.75	39.08	0.77	0.76	0.72	1.25	150.98
DF1	Reach20	4026.93	100 Year	0.62	281.75	282.06	282.06	282.16	0.022507	1.41	0.44	2.24	1.01			1.41	10.96
DF1	Reach20	3971	Regional	21.00	280.52	281.08	281.37	282.21	0.099389	5.36	6.41	21.06	2.52	1.48	1.55	3.27	150.37
DF1	Reach20	3971	100 Year	0.62	280.52	280.77	280.71	280.79	0.005919	0.63	1.08	10.64	0.51	0.08	0.07	0.58	10.92
DF1	Reach20	3927.42	Regional	21.00	280.12	280.99	280.99	281.25	0.013903	2.94	14.52	27.22	1.04	0.89	0.90	1.45	149.91
DF1	Reach20	3927.42	100 Year	0.62	280.12	280.29	280.29	280.34	0.022054	1.02	0.73	8.40	0.95	0.24	0.23	0.85	10.88
DF1	Reach20	3894	Regional	21.00	279.22	279.74	279.92	280.39	0.056459	4.06	8.34	25.92	1.91	1.22	1.18	2.52	149.53
DF1	Reach20	3894	100 Year	0.62	279.22	279.35	279.36	279.40	0.038316	0.98	0.75	13.63	1.16	0.31	0.20	0.83	10.85
DF1	Reach20	3827.42	Regional	21.00	277.42	278.16	278.07	278.27	0.010956	2.37	21.89	47.30	0.90	0.75	0.76	0.96	148.56
DF1	Reach20	3827.42	100 Year	0.62	277.42	277.58	277.57	277.61	0.018622	0.94	1.25	19.04	0.87	0.25	0.23	0.50	10.79
DF1	Reach20	3791	Regional	21.00	277.04	277.62	277.60	277.77	0.016712	2.47	18.87	51.87	1.07	0.77	0.79	1.11	147.81
DF1	Reach20	3791	100 Year	0.62	277.04	277.20	277.17	277.22	0.006927	0.60	1.52	19.74	0.54	0.12	0.17	0.41	10.74
DF1	Reach20	3727.42	Regional	21.00	276.17	277.15		277.20	0.005174	1.55	28.82	63.14	0.56	0.67	0.36	0.73	146.29
DF1	Reach20	3727.42	100 Year	0.62	276.17	276.47	276.47	276.52	0.019244	1.07	0.79	10.84	0.93	0.19		0.79	10.67
DF1	Reach20	3688.93	Regional	21.00	275.40	276.80	276.80	276.96	0.006821	2.50	26.21	74.56	0.74	0.44	0.50	0.80	145.26
DF1	Reach20	3688.93	100 Year	0.62	275.40	275.74	275.71	275.81	0.015270	1.18	0.53	2.56	0.83			1.18	10.65
DF1	Reach20	3678.29	Regional	21.00	275.26	276.12	276.34	276.77	0.039343	3.99	10.29	51.45	1.64	0.77	0.68	2.04	145.07
DF1	Reach20	3678.29	100 Year	0.62	275.26	275.53	275.53	275.61	0.023221	1.28	0.49	2.98	1.01			1.28	10.64
DF1	Reach20	3628.93	Regional	21.00	274.28	275.05	274.97	275.14	0.007968	2.01	25.38	66.49	0.77	0.48	0.64	0.83	144.19
DF1	Reach20	3628.93	100 Year	0.62	274.28	274.46	274.45	274.51	0.019686	0.96	0.68	7.07	0.89		0.39	0.92	10.61
DF1	Reach20	3593	Regional	21.00	273.70	274.69	274.69	274.85	0.010240	2.55	23.37	67.56	0.89	0.53	0.59	0.90	143.47
DF1	Reach20	3593	100 Year	0.62	273.70	274.02	273.98	274.05	0.008633	0.81	0.82	6.13	0.63	0.07	0.13	0.76	10.58
DF1	Reach20	3528.87	Regional	21.00	272.90	273.91	273.95	274.16	0.011146	2.82	17.94	45.85	0.94	0.62	0.65	1.17	142.14
DF1	Reach20	3528.87	100 Year	0.62	272.90	273.12	273.12	273.18	0.024437	1.07	0.58	5.04	1.00	0.05	0.05	1.07	10.54
DF1	Reach20	3479	Regional	21.00	272.48	273.33	273.35	273.55	0.015765	3.06	18.15	45.75	1.10	0.74	0.85	1.16	141.24
DF1	Reach20	3479	100 Year	0.62	272.48	272.77	272.68	272.79	0.003339	0.62	1.52	10.68	0.41	0.13	0.16	0.41	10.49
DF1	Reach20	3428.83	Regional	21.00	272.06	272.81	272.47	272.81	0.001532	0.37	64.10	128.32	0.14	0.34	0.20	0.33	139.00
DF1	Reach20	3428.83	100 Year	0.62	272.06	272.30	272.28	272.34	0.079002	0.97	0.71	65.27	0.81		0.52	0.87	10.06
DF1	Reach20	3330.15	Regional	21.00	271.38	272.79		272.79	0.000164	0.46	147.10	216.47	0.12	0.15	0.10	0.14	131.54
DF1	Reach20	3330.15	100 Year	0.62	271.38	271.56		271.57	0.003029	0.48	2.73	27.65	0.37	0.14	0.17	0.23	9.65
DF1	Reach20	3322.69	Regional	21.00	271.32	272.78	272.05	272.79	0.000174	0.48	145.97	229.42	0.13	0.14	0.10	0.14	130.55
DF1	Reach20	3322.69	100 Year	0.62	271.32	271.46	271.46	271.51	0.024563	1.01	0.64	7.33	0.98	0.16	0.12	0.97	9.63
DF1	Reach20	3307.12		Culvert													
DF1	Reach20	3289.02	Regional	21.00	270.49	271.32	271.32	271.40	0.004875	1.67	31.09	110.58	0.61	0.42	0.45	0.68	128.86
DF1	Reach20	3289.02	100 Year	0.62	270.49	270.75	270.68	270.76	0.005370	0.64	1.24	21.07	0.50		0.25	0.50	9.62
DF1	Reach20	3279.33	Regional	24.30	270.39	271.17	270.96	271.21	0.012738	1.13	29.50	76.87	0.43	0.79	0.64	0.82	128.53
DF1	Reach20	3279.33	100 Year	1.07	270.39	270.67	270.58	270.68	0.009612	0.43	3.22	30.53	0.30	0.22	0.18	0.33	9.58
DF1	Reach20	3228.83	Regional	24.30	269.86	270.59		270.70	0.008334	1.96	23.32	52.02	0.78	0.51	0.72	1.04	127.23
DF1	Reach20	3228.83	100 Year	1.07	269.86	270.02		270.04	0.017915	0.74	2.06	23.08	0.81		0.34	0.52	9.45
DF1	Reach20	3130.4	Regional	24.30	269.08	269.85	269.68	269.96	0.006741	1.86	22.75	42.57	0.71	0.58	0.66	1.07	124.96
DF1	Reach20	3130.4	100 Year	1.07	269.08	269.28		269.29	0.004131	0.50	3.02	25.04	0.42	0.17	0.18	0.35	9.20
DF1	Reach20	3084	Regional	24.30	268.72	269.31	269.31	269.48	0.018310	2.49	19.87	53.82	1.11	0.86	0.75	1.22	123.99
DF1	Reach20	3084	100 Year	1.07	268.72	268.91	268.91	268.95	0.017488	0.91	1.64	29.96	0.84	0.12	0.21	0.65	9.09
DF1	Reach20	3028.87	Regional	24.30	267.80	268.85	268.47	268.92	0.002762	1.52	32.92	47.63	0.48	0.41	0.51	0.74	122.52
DF1	Reach20	3028.87	100 Year	1.07	267.80	268.16	267.93	268.16	0.000407	0.27	6.67	27.23	0.15	0.06	0.10	0.16	8.86
DF1	Reach20	2965.4	Regional	24.30	268.00	268.39	268.39	268.56	0.022769	2.23	17.16	53.00	1.17	0.63	0.90	1.42	121.12
DF1	Reach20	2965.4	100 Year	1.07	268.00	268.06	268.06	268.08	0.053134	0.82	1.85	37.70	1.25	0.27	0.41	0.58	8.63
DF1	Reach20	2928.83	Regional	24.30	266.90	267.87	267.71	267.94	0.004905	1.88	33.84	64.59	0.63	0.57	0.50	0.72	119.99
DF1	Reach20	2928.83	100 Year	1.07	266.90	267.20	267.13	267.23	0.004472	0.75	2.32	16.93	0.48	0.18	0.17	0.46	8.53
DF1	Reach20	2827.51	Regional	24.30	266.14	266.85	266.85	267.08	0.018350	3.02	18.13	40.37	1.16	1.09	0.83	1.34	117.43
DF1	Reach20	2827.51	100 Year	1.07	266.14	266.29	266.29	266.34	0.024538	1.15	1.61	17.46	1.02	0.38	0.31	0.66	8.34
DF1	Reach20	2728.83	Regional	24.30	265.00	266.03	265.77	266.15	0.003665	1.66	23.78	40.80	0.55	0.38	0.48	1.02	115.35
DF1	Reach20	2728.83	100 Year	1.07	265.00	265.24	265.18	265.26	0.005673	0.60	1.81	13.85	0.50	0.04	0.06	0.59	8.17
DF1	Reach20	2628.8	Regional	26.48	264.56	265.71		265.76	0.003656	1.86	40.50	64.82	0.56	0.51	0.57	0.65	112.13

HEC-RAS Plan: SCE Existing Locations: User Defined (Continued)

River	Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl	Vel Left	Vel Right	Vel Total	Volume
				(m3/s)	(m)	(m)	(m)	(m)	(m/m)	(m/s)	(m2)	(m)		(m/s)	(m/s)	(m/s)	(1000 m3)
DF1	Reach20	2628.8	100 Year	1.16	264.56	264.93	264.79	264.94	0.002102	0.64	4.08	23.78	0.35	0.16	0.15	0.29	7.87
DF1	Reach20	2525.58	Regional	26.48	264.43	264.86	264.86	265.03	0.018359	2.17	19.71	60.02	1.07	0.77	0.70	1.34	109.02
DF1	Reach20	2525.58	100 Year	1.16	264.43	264.52	264.50	264.54	0.009787	0.56	2.80	39.60	0.60	0.19	0.16	0.42	7.52
DF1	Reach20	2466	Regional	26.48	263.47	264.16	264.01	264.28	0.005484	1.58	20.49	42.19	0.63	0.42	0.34	1.29	107.81
DF1	Reach20	2466	100 Year	1.16	263.47	263.56	263.56	263.60	0.028861	0.83	1.40	19.84	1.00			0.83	7.39
DF1	Reach20	2428.87	Regional	26.48	262.99	263.74	263.73	263.98	0.011520	2.48	17.64	36.79	0.93	0.72	0.62	1.50	107.11
DF1	Reach20	2428.87	100 Year	1.16	262.99	263.18	263.12	263.20	0.005602	0.63	2.06	16.15	0.50	0.14	0.07	0.56	7.33
DF1	Reach20	2328.83	Regional	26.48	262.41	263.03		263.13	0.005902	1.58	25.92	56.09	0.65	0.48	0.51	1.02	104.94
DF1	Reach20	2328.83	100 Year	1.16	262.41	262.52		262.53	0.007726	0.53	2.68	32.85	0.54	0.13	0.17	0.43	7.09
DF1	Reach20	2228.89	Regional	26.48	261.72	262.42		262.52	0.006783	1.73	27.30	56.38	0.70	0.39	0.63	0.97	102.42
DF1	Reach20	2228.89	100 Year	1.16	261.72	261.91	261.87	261.92	0.005078	0.50	3.46	34.28	0.46		0.17	0.34	6.79
DF1	Reach20	2129.24	Regional	26.48	261.00	261.61	261.55	261.80	0.009795	2.01	16.59	37.77	0.83	0.47	0.52	1.60	100.35
DF1	Reach20	2129.24	100 Year	1.16	261.00	261.08	261.08	261.12	0.023513	0.78	1.50	19.96	0.91			0.78	6.57
DF1	Reach20	2056.16	Regional	26.48	260.38	260.99		261.11	0.009169	1.86	22.23	45.08	0.79	0.75	0.46	1.19	99.03
DF1	Reach20	2056.16	100 Year	1.16	260.38	260.54		260.54	0.004011	0.42	4.00	35.24	0.40	0.19	0.05	0.29	6.38
DF1	Reach20	1990.35	Regional	27.10	259.98	260.44		260.51	0.008418	1.53	30.65	78.92	0.73	0.52	0.64	0.88	97.25
DF1	Reach20	1990.35	100 Year	1.16	259.98	260.05	260.02	260.06	0.017669	0.51	3.30	56.56	0.74	0.19	0.29	0.35	6.14
DF1	Reach20	1915.13	Regional	27.10	259.06	259.50	259.49	259.67	0.017286	1.98	18.61	56.41	1.02	0.37	0.73	1.46	95.59
DF1	Reach20	1915.13	100 Year	1.16	259.06	259.19	259.16	259.21	0.008695	0.50	2.72	43.68	0.56		0.12	0.42	5.94
DF1	Reach20	1889	Regional	27.10	258.64	259.11	259.05	259.25	0.012870	1.91	21.30	52.42	0.91	0.43	0.78	1.27	95.04
DF1	Reach20	1889	100 Year	1.16	258.64	258.70	258.70	258.73	0.048292	0.81	1.98	40.81	1.20		0.37	0.58	5.87
DF1	Reach20	1815.13	Regional	27.10	257.37	258.08	258.08	258.34	0.013525	2.29	13.00	29.53	0.97	0.44	0.37	2.08	93.89
DF1	Reach20	1815.13	100 Year	1.16	257.37	257.58	257.52	257.60	0.005840	0.58	1.99	14.51	0.50			0.58	5.74
DF1	Reach20	1715.05	Regional	27.10	256.51	257.53	257.18	257.62	0.002503	1.32	23.76	32.84	0.45	0.33	0.34	1.14	92.05
DF1	Reach20	1715.05	100 Year	1.16	256.51	256.69	256.67	256.72	0.014423	0.75	1.54	15.05	0.75			0.75	5.56
DF1	Reach20	1666	Regional	27.10	256.16	257.14	257.07	257.39	0.009565	2.70	19.39	32.27	0.88	0.80	0.76	1.40	90.99
DF1	Reach20	1666	100 Year	1.16	256.16	256.45		256.46	0.002688	0.59	2.77	15.53	0.38	0.18	0.13	0.42	5.46
DF1	Reach20	1615.13	Regional	27.10	256.01	256.57	256.57	256.77	0.015047	2.01	14.90	42.18	0.97	0.42	0.44	1.82	90.12
DF1	Reach20	1615.13	100 Year	1.16	256.01	256.18	256.16	256.20	0.012878	0.66	1.75	18.96	0.70			0.66	5.34
DF1	Reach20	1514.84	Regional	27.10	254.99	256.11	255.59	256.15	0.001786	1.31	49.10	62.96	0.39	0.45	0.41	0.55	86.96
DF1	Reach20	1514.84	100 Year	1.16	254.99	255.13		255.15	0.008808	0.74	2.87	25.12	0.62	0.27	0.24	0.40	5.11
DF1	Reach20	1460.2	Regional	27.10	254.20	256.06		256.10	0.000734	1.15	59.34	61.09	0.27	0.32	0.26	0.46	84.50
DF1	Reach20	1460.2	100 Year	1.16	254.20	254.40	254.40	254.48	0.020387	1.21	1.10	8.87	0.96	0.27	0.22	1.05	5.02
DF1	Reach20	1405.39	Regional	27.10	253.02	256.07		256.08	0.000099	0.58	101.25	61.90	0.11	0.15	0.17	0.27	80.65
DF1	Reach20	1405.39	100 Year	1.16	253.02	254.43	253.25	254.43	0.000005	0.08	25.53	31.71	0.02	0.02	0.02	0.05	4.35
DF1	Reach20	1401.29	Regional	27.10	253.04	256.07	254.77	256.08	0.000105	0.59	94.99	62.33	0.11	0.15	0.15	0.29	80.24
DF1	Reach20	1401.29	100 Year	1.16	253.04	254.42	253.38	254.43	0.000046	0.22	5.84	28.87	0.06	0.09		0.20	4.25
DF1	Reach20	1396		Culvert													
DF1	Reach20	1387.43	Regional	27.10	253.76	256.00	254.83	256.02	0.000216	0.68	90.98	81.28	0.15	0.18	0.18	0.30	79.95
DF1	Reach20	1387.43	100 Year	1.16	253.76	254.40	254.02	254.41	0.000213	0.25	4.98	18.10	0.12	0.07		0.23	4.21
DF1	Reach20	1381.53	Regional	27.10	253.85	256.01		256.01	0.000144	0.56	112.23	97.20	0.12	0.15	0.15	0.24	79.35
DF1	Reach20	1381.53	100 Year	1.16	253.85	254.40		254.40	0.000094	0.17	9.65	30.01	0.08	0.04	0.04	0.12	4.16
DF1	Reach20	1375.67	Regional	27.10	253.77	256.01		256.01	0.000166	0.62	117.81	101.57	0.13	0.16	0.17	0.23	78.68
DF1	Reach20	1375.67	100 Year	1.16	253.77	254.40		254.40	0.000090	0.19	10.89	30.12	0.08	0.06	0.05	0.11	4.10
DF1	Reach20	1370.57	Regional	27.10	253.60	255.98	255.67	256.01	0.001122	1.21	66.06	100.75	0.30	0.26	0.33	0.41	78.30
DF1	Reach20	1370.57	100 Year	1.16	253.60	254.17	254.17	254.35	0.023057	1.85	0.62	1.80	1.01			1.85	4.08
DF1	Reach20	1368		Culvert													
DF1	Reach20	1362.11	Regional	27.10	253.72	255.18	255.18	255.86	0.010829	3.66	7.40	87.28	1.00			3.66	78.06
DF1	Reach20	1362.11	100 Year	1.16	253.72	253.99	253.98	254.06	0.018688	1.22	0.95	7.31	0.93			1.22	4.07
DF1	Reach20	1358.51	Regional	27.10	253.81	254.07	254.35	255.66	0.768811	7.44	5.77	30.89	5.89		3.71	4.69	77.95
DF1	Reach20	1358.51	100 Year	1.16	253.81	253.94	253.91	253.96	0.027545	0.92	2.12	23.36	1.00		0.42	0.54	4.07
DF1	Reach20	1357.51	Regional	27.10	253.76	254.56	254.31	254.65	0.007313	1.87	29.57	57.21	0.73	0.38	0.71	0.92	77.92
DF1	Reach20	1357.51	100 Year	1.16	253.76	253.93		253.94	0.005825	0.54	3.61	25.02	0.49		0.27	0.32	4.06
DF1	Reach20	1312.67	Regional	27.10	253.53	254.38		254.47	0.003816	1.55	28.96	48.84	0.55	0.51	0.41	0.94	76.99
DF1	Reach20	1312.67	100 Year	1.16	253.53	253.67		253.69	0.009529	0.64	2.13	22.46	0.62	0.20	0.09	0.54	3.97
DF1	Reach20	1311.67	Regional	27.10	253.40	254.36		254.45	0.003553	1.62	29.75	43.95	0.54	0.58	0.40	0.91	76.77
DF1	Reach20	1311.67	100 Year	1.16	253.40	253.54	253.54	253.58	0.023313	0.96	1.40	18.71	0.95	0.20	0.03	0.82	3.96
DF1	Reach20	1251.58	Regional	27.10	252.86	254.32		254.36	0.000801	1.02	50.70	53.05	0.27	0.35	0.25	0.53	74.80
DF1	Reach20	1251.58	100 Year	1.16	252.86	253.15	252.99	253.15	0.000910	0.33	4.95	24.08	0.22	0.12	0.04	0.23	3.80
DF1	Reach20	1245.37	Regional	27.10	252.36	254.26		254.34	0.001676	1.65	43.49	58.32	0.40	0.40	0.37	0.62	74.02
DF1	Reach20	1245.37	100 Year	1.16	252.36	253.14		253.14	0.000417	0.40	3.18	7.24	0.17	0.06	0.09	0.36	3.73
DF1	Reach20	1240.48	Regional	27.10	253.01	254.28		254.32	0.001541	1.31	50.26	61.91	0.37	0.37	0.48	0.54	73.79
DF1	Reach20	1240.48	100 Year	1.16	253.01	253.12		253.14	0.019659	0.88	2.36	24.50	0.88	0.29	0.40	0.49	3.72
DF1	Reach20	1231.82	Regional	27.10	252.44	253.97	253.97	254.25	0.009093	2.56	17.11	40.47	0.83	0.56	0.33	1.58	73.35
DF1	Reach20	1231.82	100 Year	1.16	252.44	252.75	252.75	252.87	0.020582	1.50	0.77	3.35	1.00			1.50	3.70
DF1	Reach20	1220.38	Regional	27.10	252.00	252.78	253.14	253.96	0.051540	4.98	7.03	16.53	1.93	1.05	0.93	3.85	73.21
DF1	Reach20	1220.38	100 Year	1.16	252.00	252.14	252.21	252.39	0.114572	2.21	0.52	4.76	2.13			2.21	3.69

HEC-RAS Plan: SCE Existing Locations: User Defined (Continued)

River	Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl	Vel Left	Vel Right	Vel Total	Volume
				(m3/s)	(m)	(m)	(m)	(m)	(m/m)	(m/s)	(m2)	(m)		(m/s)	(m/s)	(m/s)	(1000 m3)
DF1	Reach20	1159	Regional	27.10	251.00	252.71	252.71	253.01	0.008942	2.54	15.50	34.66	0.83	0.46	0.20	1.75	72.57
DF1	Reach20	1159	100 Year	1.16	251.00	251.48	251.43	251.56	0.012091	1.27	0.91	3.38	0.78			1.27	3.64
DF1	Reach20	1115.08	Regional	28.74	250.33	252.05	252.11	252.57	0.010206	3.36	12.00	18.33	0.93	0.55	0.80	2.40	72.01
DF1	Reach20	1115.08	100 Year	1.23	250.33	250.75	250.75	250.87	0.020904	1.55	0.79	3.35	1.01			1.55	3.61
DF1	Reach20	1071	Regional	28.74	249.54	250.61	250.94	251.69	0.043828	4.61	6.24	9.08	1.75	0.29		4.60	71.60
DF1	Reach20	1071	100 Year	1.23	249.54	250.03	249.92	250.06	0.004096	0.71	1.71	6.86	0.46			0.71	3.55
DF1	Reach20	1036	Regional	28.74	249.38	250.99	250.99	251.27	0.007297	2.55	19.13	41.98	0.77	0.48	0.43	1.50	71.16
DF1	Reach20	1036	100 Year	1.23	249.38	249.87		249.91	0.004623	0.89	1.38	4.34	0.50			0.89	3.50
DF1	Reach20	1015.6	Regional	28.74	249.40	250.70	250.76	251.09	0.010162	2.83	13.87	32.43	0.91	0.40	0.44	2.07	70.83
DF1	Reach20	1015.6	100 Year	1.23	249.40	249.69	249.66	249.76	0.013002	1.11	1.11	5.54	0.79			1.11	3.47
DF1	Reach20	963	Regional	28.74	248.83	250.15	250.26	250.58	0.009004	3.12	14.44	31.59	0.89	0.51	0.68	1.99	70.09
DF1	Reach20	963	100 Year	1.23	248.83	249.11		249.16	0.010013	0.97	1.27	6.79	0.70		0.12	0.96	3.41
DF1	Reach20	900.79	Regional	28.74	247.87	249.26	249.34	249.84	0.016068	3.35	8.58	9.01	1.10			3.35	69.40
DF1	Reach20	900.79	100 Year	1.23	247.87	248.16	248.16	248.26	0.021871	1.37	0.89	4.77	1.01			1.37	3.34
DF1	Reach20	818.58	Regional	28.74	247.25	248.71	248.46	248.92	0.004689	2.08	17.27	25.89	0.62		0.38	1.66	68.33
DF1	Reach20	818.58	100 Year	1.23	247.25	247.59	247.47	247.61	0.003800	0.69	1.78	7.19	0.44			0.69	3.23
DF1	Reach20	761.32	Regional	28.74	247.00	248.65		248.73	0.001660	1.41	30.73	42.75	0.39	0.19	0.33	0.94	66.96
DF1	Reach20	761.32	100 Year	1.23	247.00	247.28		247.31	0.007660	0.82	1.50	8.02	0.60			0.82	3.14
DF1	Reach20	698.09	Regional	28.74	246.56	248.62		248.66	0.000632	0.98	57.77	62.72	0.24	0.29	0.19	0.50	64.16
DF1	Reach20	698.09	100 Year	1.23	246.56	246.98		247.01	0.003242	0.71	1.74	5.99	0.42			0.71	3.04
DF1	Reach20	650.88	Regional	28.74	246.25	248.60		248.63	0.000535	0.99	69.50	73.51	0.23	0.25	0.26	0.41	61.16
DF1	Reach20	650.88	100 Year	1.23	246.25	246.83	246.61	246.86	0.002986	0.76	1.60	4.48	0.41			0.76	2.96
DF1	Reach20	600.38	Regional	28.74	246.16	248.60		248.61	0.000194	0.70	118.48	89.62	0.15	0.20	0.21	0.24	57.88
DF1	Reach20	600.38	100 Year	1.23	246.16	246.45	246.45	246.55	0.019401	1.44	0.87	4.20	0.98	0.04	0.24	1.42	2.90
DF1	Reach20	531.76	Regional	28.74	245.75	248.60		248.60	0.000093	0.54	159.21	108.03	0.10	0.16	0.13	0.18	49.99
DF1	Reach20	531.76	100 Year	1.23	245.75	246.41		246.41	0.000560	0.46	4.45	14.83	0.19	0.10	0.11	0.28	2.73
DF1	Reach20	525.59	Regional	28.74	245.80	248.59	247.21	248.60	0.000104	0.55	147.27	105.83	0.11	0.16	0.13	0.20	48.68
DF1	Reach20	525.59	100 Year	1.23	245.80	246.39	246.16	246.41	0.001276	0.54	2.44	7.68	0.28	0.12	0.08	0.50	2.71
DF1	Reach20	491.96		Culvert													
DF1	Reach20	463.91	Regional	28.74	245.41	246.99	246.99	247.40	0.010344	3.64	15.91	24.24	0.95	1.11	1.07	1.81	46.58
DF1	Reach20	463.91	100 Year	1.23	245.41	245.97	245.76	246.00	0.002390	0.82	1.82	5.67	0.38	0.18	0.16	0.67	2.63
DF1	Reach20	447.81	Regional	29.05	245.29	246.63	246.81	247.10	0.038855	4.11	14.21	43.79	1.20	1.33	1.45	2.04	46.32
DF1	Reach20	447.81	100 Year	1.42	245.29	245.72	245.72	245.86	0.041206	1.67	0.88	3.41	0.99		0.47	1.61	2.61
DF1	Reach20	400.02	Regional	29.05	244.44	246.32	246.17	246.43	0.002766	2.09	41.43	77.44	0.51	0.41	0.71	0.70	45.02
DF1	Reach20	400.02	100 Year	1.42	244.44	245.14	244.82	245.16	0.001316	0.66	2.37	5.80	0.29	0.13	0.08	0.60	2.53
DF1	Reach20	360.18	Regional	29.05	244.51	246.10	246.10	246.28	0.005656	2.80	34.23	76.11	0.73	0.51	0.75	0.85	43.69
DF1	Reach20	360.18	100 Year	1.42	244.51	245.01	244.89	245.06	0.005084	1.10	1.61	5.62	0.55	0.21	0.29	0.88	2.45
DF1	Reach20	300.02	Regional	29.05	244.06	244.93	245.10	245.52	0.045437	5.14	17.16	55.41	1.85	1.13	1.37	1.69	42.22
DF1	Reach20	300.02	100 Year	1.42	244.06	244.43	244.43	244.55	0.016393	1.58	1.04	5.79	0.94	0.19	0.37	1.37	2.37
DF1	Reach20	234.9	Regional	29.05	243.92	244.48	244.13	244.49	0.003338	1.01	61.54	131.93	0.46	0.44	0.47	0.47	39.95
DF1	Reach20	234.9	100 Year	1.42	243.92	243.99	243.89	243.99	0.004214	0.24	7.29	70.97	0.35	0.22	0.17	0.19	2.13
DF1	Reach20	156.62	Regional	29.05	243.28	244.42		244.42	0.000597	0.75	112.06	163.73	0.23	0.20	0.27	0.26	35.01
DF1	Reach20	156.62	100 Year	1.42	243.28	243.51	243.51	243.55	0.013386	1.20	3.05	36.88	0.82	0.37	0.24	0.47	1.83
DF1	Reach20	83.97	Regional	29.05	242.47	244.41		244.41	0.000074	0.37	224.72	188.67	0.09	0.12	0.14	0.13	24.49
DF1	Reach20	83.97	100 Year	1.42	242.47	242.97	242.67	242.98	0.001259	0.58	6.93	62.43	0.28	0.09	0.15	0.20	1.48
DF3	1	3547.76	Regional	11.70	284.66	285.19	285.19	285.36	0.014267	1.87	7.34	25.07	0.94	0.61	0.59	1.59	70.50
DF3	1	3547.76	100 Year	2.13	284.66	284.91	284.91	284.98	0.022792	1.16	1.84	13.17	0.99			1.16	9.31
DF3	1	3480.67	Regional	11.70	281.98	282.24	282.46	283.05	0.152588	4.02	3.11	18.59	2.76	0.78	0.51	3.76	70.15
DF3	1	3480.67	100 Year	2.13	281.98	282.11	282.16	282.28	0.088990	1.81	1.18	12.12	1.85	0.11		1.81	9.21
DF3	1	3415.5	Regional	11.70	280.24	281.61	281.16	281.70	0.002110	1.36	11.68	21.87	0.42	0.25	0.22	1.00	69.70
DF3	1	3415.5	100 Year	2.13	280.24	280.69	280.69	280.81	0.021136	1.51	1.41	6.20	1.02			1.51	9.12
DF3	1	3333.59	Regional	11.70	279.60	281.66		281.66	0.000022	0.21	89.62	62.54	0.05	0.06	0.07	0.13	65.55
DF3	1	3333.59	100 Year	2.13	279.60	279.85	279.78	279.87	0.005418	0.63	3.48	24.08	0.50	0.08	0.09	0.61	8.92
DF3	1	3252.06	Regional	11.70	278.72	281.66	279.17	281.66	0.000006	0.14	133.07	66.06	0.03	0.04	0.05	0.09	56.37
DF3	1	3252.06	100 Year	2.13	278.72	278.99	278.99	279.03	0.025822	0.97	2.61	28.86	0.99		0.36	0.81	8.68
DF3	1	3205.22	Regional	11.70	277.52	281.66	278.34	281.66	0.000006	0.16	152.95	64.08	0.03	0.05	0.05	0.08	50.05
DF3	1	3205.22	100 Year	2.13	277.52	278.34	277.93	278.35	0.000455	0.40	5.82	14.86	0.17	0.07	0.06	0.37	8.48
DF3	1	3197.43	Regional	11.70	277.80	281.65	278.65	281.66	0.000035	0.39	32.44	66.43	0.06	0.16		0.36	49.17
DF3	1	3197.43	100 Year	2.13	277.80	278.21	278.21	278.31	0.020962	1.45	1.47	8.86	0.99			1.45	8.46
DF3	1	3179.2		Culvert													
DF3	1	3161.25	Regional	11.70	276.48	278.26	277.83	278.38	0.003105	1.51	8.13	18.11	0.46	0.21	0.39	1.44	48.92
DF3	1	3161.25	100 Year	2.13	276.48	277.72	277.18	277.74	0.001033	0.55	3.85	7.02	0.24		0.03	0.55	8.41
DF3	1	3147.49	Regional	15.93	277.20	278.17	278.06	278.29	0.013761	2.03	13.22	25.84	0.72	0.91	0.70	1.21	48.77
DF3	1	3147.49	100 Year	1.73	277.20	277.60	277.60	277.68	0.030000	1.35	1.63	10.43	0.88	0.43		1.06	8.38
DF3	1	3112.66	Regional	15.93	276.98	277.75		277.93	0.007879	2.11	11.96	23.26	0.77	0.57	0.62	1.33	48.34
DF3	1	3112.66	100 Year	1.73	276.98	277.29	277.16	277.31	0.002781	0.67	3.30	14.05	0.39	0.18	0.21	0.52	8.29

HEC-RAS Plan: SCE Existing Locations: User Defined (Continued)

River	Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl	Vel Left	Vel Right	Vel Total	Volume
				(m3/s)	(m)	(m)	(m)	(m)	(m/m)	(m/s)	(m2)	(m)		(m/s)	(m/s)	(m/s)	(1000 m3)
DF3	1	3073	Regional	15.93	276.84	277.47		277.57	0.007637	1.75	17.67	41.83	0.73	0.52	0.61	0.90	47.70
DF3	1	3073	100 Year	1.73	276.84	277.06	277.04	277.10	0.009865	0.90	3.14	27.91	0.68	0.24	0.24	0.55	8.15
DF3	1	3012.6	Regional	15.93	276.26	276.69	276.68	276.87	0.023875	2.41	11.54	34.94	1.21	0.52	0.93	1.38	46.91
DF3	1	3012.6	100 Year	1.73	276.26	276.40	276.36	276.43	0.015124	0.85	3.15	25.47	0.79	0.06	0.39	0.55	7.98
DF3	1	2974	Regional	15.93	275.37	276.07	276.07	276.26	0.012473	1.96	10.66	43.14	0.90	0.45	0.27	1.49	46.50
DF3	1	2974	100 Year	1.73	275.37	275.66	275.66	275.73	0.023969	1.17	1.48	10.96	1.01			1.17	7.89
DF3	1	2906.79	Regional	15.93	273.84	274.29	274.44	274.79	0.050761	3.35	6.57	26.54	1.75	0.78	0.87	2.43	45.95
DF3	1	2906.79	100 Year	1.73	273.84	274.04	274.05	274.11	0.026574	1.19	1.53	14.30	1.06	0.16	0.22	1.13	7.80
DF3	1	2866	Regional	15.93	272.97	273.64	273.49	273.73	0.004974	1.48	18.00	41.25	0.60	0.43	0.47	0.89	45.44
DF3	1	2866	100 Year	1.73	272.97	273.21	273.14	273.23	0.004940	0.67	3.31	23.24	0.49	0.19	0.12	0.52	7.70
DF3	1	2807.68	Regional	15.93	272.78	273.37	273.37	273.57	0.014326	2.23	11.75	34.25	0.98	0.61	0.63	1.36	45.16
DF3	1	2807.68	100 Year	1.73	272.78	272.99	272.99	273.05	0.021370	1.14	1.69	15.89	0.96	0.23	0.17	1.02	7.65
DF3	1	2773	Regional	15.93	271.07	271.59	271.48	271.66	0.008792	1.64	19.53	55.62	0.76	0.57	0.45	0.82	44.04
DF3	1	2773	100 Year	1.73	271.07	271.26	271.22	271.28	0.007725	0.73	4.12	36.35	0.59	0.24	0.08	0.42	7.44
DF3	1	2707.68	Regional	15.93	269.99	270.77	270.77	270.90	0.016003	2.28	16.65	59.24	1.02	0.68	0.55	0.96	42.87
DF3	1	2707.68	100 Year	1.73	269.99	270.45	270.44	270.55	0.017443	1.41	1.23	19.20	0.93			1.41	7.25
DF3	1	2660	Regional	15.93	269.07	269.85	269.89	270.05	0.019452	2.32	12.49	50.72	1.10	0.55	0.60	1.28	42.17
DF3	1	2660	100 Year	1.73	269.07	269.53	269.53	269.60	0.022380	1.13	1.57	13.77	0.97		0.13	1.10	7.17
DF3	1	2607.54	Regional	18.42	268.22	269.02	269.02	269.23	0.013099	2.38	14.27	39.82	0.96	0.66	0.58	1.29	41.47
DF3	1	2607.54	100 Year	2.00	268.22	268.61	268.58	268.66	0.011354	1.05	2.31	17.04	0.74	0.23	0.17	0.87	7.06
DF3	1	2562	Regional	18.42	267.75	268.46	268.46	268.65	0.012448	2.34	14.96	41.15	0.94	0.59	0.63	1.23	40.81
DF3	1	2562	100 Year	2.00	267.75	268.03	268.01	268.09	0.013749	1.15	1.96	13.92	0.82	0.23	0.17	1.02	6.97
DF3	1	2507.75	Regional	18.42	267.25	267.87	267.79	267.98	0.006884	1.62	17.27	47.49	0.69	0.40	0.44	1.07	39.93
DF3	1	2507.75	100 Year	2.00	267.25	267.46		267.49	0.008690	0.77	2.69	20.43	0.62	0.07	0.13	0.74	6.84
DF3	1	2460	Regional	18.42	266.70	267.39	267.39	267.58	0.013750	2.28	14.97	43.57	0.97	0.60	0.65	1.23	39.24
DF3	1	2460	100 Year	2.00	266.70	267.02	266.99	267.07	0.011332	1.01	2.44	19.08	0.74	0.19	0.22	0.82	6.73
DF3	1	2413.07	Regional	18.42	264.87	266.06	266.07	266.33	0.011119	2.66	13.26	30.82	0.91	0.55	0.71	1.39	37.81
DF3	1	2413.07	100 Year	2.00	264.87	265.40	265.40	265.55	0.020833	1.67	1.20	4.43	1.02			1.67	6.55
DF3	1	2379	Regional	18.42	264.11	265.39	265.59	266.00	0.030540	3.46	5.62	12.52	1.41	0.41	0.45	3.28	37.66
DF3	1	2379	100 Year	2.00	264.11	264.90	264.77	264.97	0.008654	1.20	1.66	4.99	0.67			1.20	6.52
DF3	1	2307.68	Regional	18.42	264.09	264.76	264.78	265.01	0.014538	2.40	11.06	29.12	1.00	0.59	0.62	1.66	37.29
DF3	1	2307.68	100 Year	2.00	264.09	264.33	264.33	264.40	0.022724	1.20	1.70	13.04	1.00	0.18	0.09	1.17	6.45
DF3	1	2262	Regional	18.42	263.22	264.17	264.16	264.44	0.010338	2.49	11.66	26.08	0.89	0.59	0.55	1.58	36.77
DF3	1	2262	100 Year	2.00	263.22	263.62	263.56	263.68	0.008616	1.04	2.00	9.92	0.67	0.15	0.14	1.00	6.36
DF3	1	2206.54	Regional	18.42	262.74	263.55	263.55	263.79	0.012514	2.33	11.41	28.71	0.94	0.53	0.60	1.61	36.12
DF3	1	2206.54	100 Year	2.00	262.74	263.13	263.08	263.17	0.009211	0.93	2.25	13.65	0.67	0.08	0.15	0.89	6.25
DF3	1	2148	Regional	18.42	262.31	263.16	263.03	263.27	0.005422	1.72	19.91	44.36	0.64	0.47	0.47	0.92	35.20
DF3	1	2148	100 Year	2.00	262.31	262.64	262.59	262.68	0.007413	0.90	2.63	19.87	0.61	0.13	0.17	0.76	6.10
DF3	1	2107.79	Regional	18.42	262.01	263.02		263.09	0.003127	1.44	25.07	48.84	0.50	0.42	0.36	0.73	34.30
DF3	1	2107.79	100 Year	2.00	262.01	262.44		262.46	0.003928	0.75	3.32	22.10	0.46	0.12	0.11	0.60	5.98
DF3	1	2089.36	Regional	18.42	261.64	262.94		263.03	0.004533	1.83	25.04	53.29	0.59	0.48	0.45	0.74	33.93
DF3	1	2089.36	100 Year	2.00	261.64	262.34		262.39	0.004717	0.97	3.00	16.90	0.52	0.18	0.18	0.67	5.93
DF3	1	2073.67	Regional	18.42	261.39	262.56	262.56	262.87	0.025077	3.43	12.25	37.01	1.27	0.98	1.24	1.50	33.64
DF3	1	2073.67	100 Year	2.00	261.39	262.19	262.19	262.28	0.010205	1.39	2.31	18.96	0.72	0.21	0.19	0.87	5.89
DF3	1	2052	Regional	18.42	261.41	261.96	262.08	262.40	0.035495	3.21	9.06	34.82	1.51	0.77	0.66	2.03	33.48
DF3	1	2052	100 Year	2.00	261.41	261.58	261.65	261.86	0.161049	2.32	0.86	9.56	2.46	0.04		2.32	5.86
DF3	1	2051	Regional	18.42	261.39	261.91	261.94	262.16	0.026133	2.78	12.32	38.82	1.30	0.93	0.55	1.50	33.40
DF3	1	2051	100 Year	2.00	261.39	261.60	261.59	261.65	0.017209	1.09	2.90	24.48	0.88	0.35	0.06	0.69	5.85
DF3	1	2007.66	Regional	18.42	260.37	261.12	260.92	261.20	0.007914	1.97	21.42	42.15	0.76	0.71	0.67	0.86	32.63
DF3	1	2007.66	100 Year	2.00	260.37	260.61	260.61	260.66	0.027672	1.44	2.90	28.64	1.12	0.51	0.34	0.69	5.72
DF3	1	1960	Regional	18.42	259.94	261.10		261.12	0.000499	0.70	48.33	59.45	0.21	0.23	0.21	0.38	30.96
DF3	1	1960	100 Year	2.00	259.94	260.42	260.08	260.42	0.000190	0.24	13.46	42.25	0.11	0.07	0.06	0.15	5.32
DF3	1	1907.68	Regional	18.42	260.01	260.89	260.74	261.03	0.005429	1.83	15.72	34.74	0.65	0.48	0.36	1.17	28.94
DF3	1	1907.68	100 Year	2.00	260.01	260.37	260.23	260.39	0.002625	0.65	3.38	14.35	0.38	0.12	0.14	0.59	4.80
DF3	1	1858	Regional	18.42	259.89	260.48	260.48	260.66	0.023051	2.09	12.81	38.23	0.90	0.71	0.73	1.44	28.40
DF3	1	1858	100 Year	2.00	259.89	260.07	260.07	260.14	0.037313	1.17	1.73	13.27	1.00		0.21	1.16	4.70
DF3	1	1826.63	Regional	18.42	259.40	260.41	260.01	260.44	0.001663	1.10	38.63	64.89	0.37	0.38	0.30	0.48	27.70
DF3	1	1826.63	100 Year	2.00	259.40	259.91	259.67	259.91	0.000540	0.37	10.96	40.65	0.18	0.11	0.10	0.18	4.52
DF3	1	1826.431	Regional	18.42	259.62	260.25	260.25	260.41	0.011101	2.09	17.69	59.89	0.88	0.58	0.45	1.04	27.54
DF3	1	1826.431	100 Year	2.00	259.62	259.82	259.82	259.90	0.021862	1.23	1.86	13.38	0.99	0.38		1.07	4.49
DF3	1	1807.68	Regional	18.42	258.93	259.35	259.51	259.92	0.077042	4.06	8.08	31.81	2.14	1.27	0.86	2.28	27.30
DF3	1	1807.68	100 Year	2.00	258.93	259.12	259.17	259.26	0.046894	1.68	1.52	25.40	1.43	0.21	0.14	1.32	4.46
DF3	1	1746.68	Regional	18.42	258.29	259.12	258.85	259.17	0.004221	1.59	28.78	53.24	0.57	0.52	0.53	0.64	26.08
DF3	1	1746.68	100 Year	2.00	258.29	258.62	258.53	258.63	0.003416	0.74	6.31	34.82	0.43	0.20	0.25	0.32	4.20
DF3	1	1676.46	Regional	25.25	257.68	258.25	258.25	258.43	0.030556	3.37	19.55	52.62	1.45	1.11	1.09	1.29	24.39
DF3	1	1676.46	100 Year	3.16	257.68	257.92	257.92	257.98	0.026840	1.71	4.58	35.03	1.16	0.49	0.58	0.69	3.83
DF3	1	1613	Regional	25.25	256.37	257.30	257.19	257.43	0.006723	2.05	27.10	60.10	0.72	0.58	0.50	0.93	22.90
DF3	1	1613	100 Year	3.16	256.37	256.92	256.68	256.93	0.001353	0.60	9.10	32.61	0.29	0.19	0.13	0.35	3.39

HEC-RAS Plan: SCE Existing Locations: User Defined (Continued)

River	Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl	Vel Left	Vel Right	Vel Total	Volume
				(m3/s)	(m)	(m)	(m)	(m)	(m/m)	(m/s)	(m2)	(m)		(m/s)	(m/s)	(m/s)	(1000 m3)
DF3	1	1604	Regional	25.25	256.59	257.17	257.17	257.33	0.022699	2.63	21.33	61.56	1.21	0.91	0.88	1.18	22.69
DF3	1	1604	100 Year	3.16	256.59	256.82	256.82	256.89	0.040729	1.49	3.54	31.38	1.31	0.73	0.28	0.89	3.34
DF3	1	1535	Regional	25.25	254.39	256.16	256.18	256.47	0.007856	3.25	20.39	36.05	0.83	0.69	0.72	1.24	21.27
DF3	1	1535	100 Year	3.16	254.39	255.25	255.13	255.39	0.007205	1.72	2.12	5.02	0.69	0.51	0.29	1.49	3.14
DF3	1	1485.85	Regional	25.25	254.01	255.71	255.76	256.07	0.008067	3.09	17.19	32.86	0.83	0.52	0.72	1.47	20.34
DF3	1	1485.85	100 Year	3.16	254.01	254.70	254.67	254.88	0.015506	1.88	1.68	4.06	0.94			1.88	3.05
DF3	1	1437	Regional	25.25	253.76	255.46	255.13	255.56	0.002397	1.80	30.65	39.93	0.47	0.46	0.45	0.82	19.15
DF3	1	1437	100 Year	3.16	253.76	254.55		254.60	0.002301	0.95	3.72	10.50	0.39	0.11	0.15	0.85	2.91
DF3	1	1386.23	Regional	25.25	253.48	255.33		255.43	0.002720	1.97	32.38	48.17	0.50	0.33	0.58	0.78	17.56
DF3	1	1386.23	100 Year	3.16	253.48	254.16	254.14	254.34	0.014706	1.89	1.76	5.61	0.93	0.20	0.23	1.80	2.78
DF3	1	1329	Regional	26.05	253.53	255.24		255.32	0.001292	1.45	31.30	36.88	0.36	0.28	0.44	0.83	15.70
DF3	1	1329	100 Year	3.26	253.53	254.07		254.09	0.001530	0.72	5.39	13.55	0.32	0.18	0.17	0.61	2.57
DF3	1	1282.61	Regional	26.05	253.30	255.07		255.24	0.002795	2.12	24.79	32.11	0.52	0.46	0.50	1.05	14.49
DF3	1	1282.61	100 Year	3.26	253.30	253.98		254.02	0.001932	0.88	5.10	11.51	0.37	0.27	0.17	0.64	2.34
DF3	1	1225.5	Regional	26.05	253.03	254.66	254.63	255.03	0.012193	2.69	9.76	13.78	0.95	0.14	0.10	2.67	13.85
DF3	1	1225.5	100 Year	3.26	253.03	253.72		253.86	0.012261	1.69	1.93	4.70	0.84			1.69	2.21
DF3	1	1225	Regional	26.05	252.74	254.35	254.35	254.79	0.013346	2.94	8.88	10.87	1.00	0.16	0.18	2.93	13.68
DF3	1	1225	100 Year	3.26	252.74	253.40	253.40	253.59	0.018307	1.91	1.70	4.68	1.01			1.91	2.18
DF3	1	1180.6	Regional	26.05	252.34	254.02	253.93	254.41	0.009425	2.78	9.79	13.22	0.86	0.28	0.20	2.66	13.42
DF3	1	1180.6	100 Year	3.26	252.34	253.15	252.94	253.22	0.004695	1.18	2.77	5.68	0.54			1.18	2.12
DF3	1	1179.6	Regional	26.05	252.36	253.88	253.88	254.27	0.011938	2.77	10.09	20.38	0.95	0.24	0.32	2.58	13.30
DF3	1	1179.6	100 Year	3.26	252.36	252.92	252.92	253.11	0.017915	1.93	1.69	4.48	1.01			1.93	2.09
DF3	1	1179.37	Regional	26.05	252.30	253.65	253.74	254.19	0.016220	3.24	8.21	12.25	1.10	0.23	0.27	3.17	13.25
DF3	1	1179.37	100 Year	3.26	252.30	252.76	252.81	252.99	0.026844	2.10	1.55	5.01	1.21			2.10	2.08
DF3	1	1130	Regional	26.05	251.21	252.74	252.85	253.30	0.019991	3.32	7.84	10.24	1.20	0.10		3.32	12.85
DF3	1	1130	100 Year	3.26	251.21	252.13	251.88	252.19	0.003892	1.09	2.99	5.92	0.49			1.09	1.97
DF3	1	1076.25	Regional	26.05	251.06	252.36	252.36	252.65	0.010023	2.73	16.27	50.52	0.90	0.60	0.74	1.60	12.15
DF3	1	1076.25	100 Year	3.26	251.06	251.68	251.68	251.80	0.017534	1.55	2.21	10.54	0.96	0.07	0.24	1.47	1.83
DF3	1	1012.43	Regional	26.05	249.65	251.29	251.12	251.42	0.005253	2.42	28.69	44.49	0.66	0.67	0.34	0.91	10.87
DF3	1	1012.43	100 Year	3.26	249.65	250.55	250.40	250.69	0.006626	1.64	2.20	13.90	0.65	0.26	0.24	1.48	1.64
DF3	1	970.12	Regional	30.47	249.19	250.87	250.87	251.10	0.009662	2.98	25.45	46.68	0.85	0.77	0.47	1.20	9.72
DF3	1	970.12	100 Year	3.81	249.19	250.10	250.10	250.29	0.013378	1.93	2.37	11.09	0.86	0.23		1.61	1.49
DF3	1	955.53	Regional	30.47	248.98	250.92	250.50	251.00	0.001601	1.62	44.30	51.40	0.39	0.43	0.36	0.69	9.21
DF3	1	955.53	100 Year	3.81	248.98	249.36	249.51	249.87	0.076093	3.16	1.21	4.63	1.97			3.16	1.47
DF3	1	947.55	Regional	35.12	248.20	250.92		250.99	0.000755	1.41	51.23	48.91	0.29	0.30	0.28	0.69	8.80
DF3	1	947.55	100 Year	4.06	248.20	249.22	248.79	249.25	0.000949	0.72	6.47	11.69	0.26	0.15	0.14	0.63	1.43
DF3	1	946.95	Regional	35.12	248.17	250.92	249.77	250.98	0.000518	1.12	51.55	48.28	0.24	0.24	0.20	0.68	8.74
DF3	1	946.95	100 Year	4.06	248.17	249.22	248.75	249.24	0.001006	0.72	5.66	12.00	0.27	0.06		0.72	1.43
DF3	1	924.94		Culvert													
DF3	1	895.09	Regional	35.12	248.46	249.93	249.93	250.53	0.010641	3.69	12.42	59.36	0.99	1.51	1.10	2.83	7.77
DF3	1	895.09	100 Year	4.06	248.46	249.19	248.88	249.23	0.001906	0.95	5.22	10.43	0.37	0.36	0.28	0.78	1.02
DF3	1	888.03	Regional	37.99	248.49	249.89	249.68	249.98	0.004563	2.21	47.22	89.16	0.63	0.61	0.61	0.80	7.54
DF3	1	888.03	100 Year	4.30	248.49	249.15		249.21	0.004725	1.25	6.56	23.79	0.55	0.29	0.32	0.66	0.97
DF3	1	799.85	Regional	37.99	247.91	249.01	249.01	249.25	0.018696	4.05	26.98	45.98	1.26	1.30	1.09	1.41	4.27
DF3	1	799.85	100 Year	4.30	247.91	248.42	248.42	248.52	0.014812	2.08	5.40	22.86	0.97	0.53	0.58	0.80	0.45
DF3	1	696.11	Regional	39.13	246.69	248.50	247.88	248.52	0.000954	1.22	85.55	84.59	0.30	0.43	0.34	0.46	
DF3	1	696.11	100 Year	4.56	246.69	247.39	247.40	247.51	0.008766	1.75	5.85	37.04	0.76	0.29	0.33	0.78	
DF3	1-DS-0	598.11	Regional	39.13	246.01	248.51	247.01	248.52	0.000148	0.57	152.83	95.63	0.12	0.24	0.22	0.26	55.33
DF3	1-DS-0	598.11	100 Year	4.56	246.01	246.33	246.65	247.41	0.199305	4.62	1.02	5.57	2.96	1.18	0.67	4.45	13.37
DF3	1-DS-0	521.44	Regional	39.13	245.51	248.51		248.51	0.000084	0.54	187.67	95.03	0.10	0.19	0.20	0.21	46.98
DF3	1-DS-0	521.44	100 Year	4.56	245.51	246.21	246.12	246.26	0.003553	1.31	9.47	39.07	0.51	0.30	0.21	0.48	13.07
DF3	1-DS-0	516.73	Regional	39.13	245.49	248.51	247.27	248.51	0.000100	0.59	173.64	92.56	0.11	0.20	0.22	0.23	45.70
DF3	1-DS-0	516.73	100 Year	4.56	245.49	245.98	245.98	246.18	0.018097	2.31	2.93	19.90	1.08	0.98	0.83	1.56	13.02
DF3	1-DS-0	496.66		Culvert													
DF3	1-DS-0	474.78	Regional	39.13	245.05	247.10	247.10	247.96	0.011252	4.76	12.31	32.42	1.08	1.86	1.76	3.18	44.52
DF3	1-DS-0	474.78	100 Year	4.56	245.05	245.74	245.74	245.96	0.011415	2.22	2.84	9.93	0.90	0.62	0.47	1.61	12.87
DF3	1-DS-0	461.58	Regional	39.13	244.98	245.80	246.20	247.48	0.151732	9.20	12.23	33.19	3.37	2.37	2.38	3.20	44.23
DF3	1-DS-0	461.58	100 Year	4.56	244.98	245.74	245.63	245.77	0.003145	1.26	10.39	31.65	0.48	0.32	0.31	0.44	12.77
DF3	1-DS-0	399.37	Regional	39.13	244.59	245.53	245.53	245.53	0.000040	0.17	157.32	111.19	0.06	0.25	0.03	0.25	38.45
DF3	1-DS-0	399.37	100 Year	4.56	244.59	245.25	245.23	245.45	0.011475	2.16	3.32	98.33	0.89	0.61	0.31	1.37	8.03
DF3	1-DS-0	291.96	Regional	39.13	243.70	245.06	245.04	245.31	0.013002	3.93	28.45	42.57	1.09	1.09	1.18	1.38	30.86
DF3	1-DS-0	291.96	100 Year	4.56	243.70	244.38	244.35	244.49	0.008110	1.93	5.87	19.93	0.76	0.41	0.50	0.78	2.55
DF3	1-DS-0	200	Regional	39.13	242.97	244.43	244.43	244.62	0.010869	3.62	35.43	68.04	0.99	0.96	0.66	1.10	29.29
DF3	1-DS-0	200	100 Year	4.56	242.97	243.97	243.97	244.06	0.004142	1.70	8.14	48.15	0.57	0.24	0.27	0.56	2.15
DF3	1-DS-0	57.02	Regional	39.13	242.07	244.41	243.25	244.41	0.000109	0.51	224.87	166.29	0.11	0.19	0.15	0.17	18.28
DF3	1-DS-0	57.02	100 Year	4.56	242.07	242.89	242.73	242.93	0.003000	1.31	9.95	51.93	0.48	0.29	0.22	0.46	1.23

HEC-RAS Plan: SCE Existing Locations: User Defined (Continued)

River	Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl	Vel Left	Vel Right	Vel Total	Volume
				(m3/s)	(m)	(m)	(m)	(m)	(m/m)	(m/s)	(m2)	(m)		(m/s)	(m/s)	(m/s)	(1000 m3)
DF2	1	1000	Regional	2.98	250.36	250.71	250.71	250.81	0.010592	1.55	2.94	17.35	0.90	0.48	0.52	1.01	2.19
DF2	1	1000	100 Year	0.24	250.36	250.49	250.47	250.51	0.012492	0.66	0.37	5.10	0.77	0.15		0.66	0.15
DF2	1	956	Regional	2.98	249.67	249.90	249.94	250.06	0.031151	1.79	1.74	12.72	1.39	0.37	0.33	1.72	2.09
DF2	1	956	100 Year	0.24	249.67	249.75	249.75	249.78	0.023289	0.72	0.33	6.19	1.00			0.72	0.13
DF2	1	899	Regional	2.98	248.89	249.05	249.05	249.11	0.016761	1.15	2.87	24.29	0.99	0.40	0.45	1.04	1.95
DF2	1	899	100 Year	0.24	248.89	248.96	248.94	248.96	0.004744	0.29	0.85	19.85	0.44	0.05	0.12	0.28	0.10
DF2	1	842	Regional	2.98	248.40	248.91	248.58	248.92	0.000181	0.23	21.88	76.32	0.11	0.06	0.06	0.14	1.25
DF2	1	842	100 Year	0.24	248.40	248.47	248.46	248.48	0.019766	0.45	0.55	15.89	0.74	0.08		0.44	0.06
DF2	1	820	Regional	2.98	247.96	248.91		248.91	0.000059	0.19	31.35	84.88	0.07	0.05	0.02	0.10	0.66
DF2	1	820	100 Year	0.24	247.96	248.07	248.05	248.08	0.016192	0.57	0.42	6.65	0.73			0.57	0.05
DF2	1	809	Regional	2.98	247.64	248.91	248.11	248.91	0.000096	0.25	21.67	70.71	0.09	0.05	0.02	0.14	0.36
DF2	1	809	100 Year	0.24	247.64	247.79	247.79	247.84	0.027100	0.95	0.25	2.73	1.00			0.95	0.04
DF2	1	791		Culvert													
DF2	1	773	Regional	2.98	246.95	248.49	247.81	248.55	0.001660	1.15	2.72	66.59	0.32		0.42	1.10	0.15
DF2	1	773	100 Year	0.24	246.95	247.79	247.15	247.79	0.000141	0.20	1.20	4.06	0.08		0.02	0.20	0.00
DF2	1	769	Regional	2.98	247.64	248.52		248.52	0.000049	0.18	51.82	117.72	0.06	0.05	0.05	0.06	
DF2	1	769	100 Year	0.24	247.64	247.77	247.77	247.79	0.018452	0.68	0.63	20.86	0.80	0.13	0.13	0.38	

HEC-RAS Plan: SCE Future 2024-07-25-4766 Locations: User Defined

River	Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl	Vel Left	Vel Right	Vel Total	Volume
				(m3/s)	(m)	(m)	(m)	(m)	(m/m)	(m/s)	(m2)	(m)		(m/s)	(m/s)	(m/s)	(1000 m3)
DF1	Reach20	5886.58	Regional	10.45	308.00	308.68	308.68	308.77	0.012258	2.39	15.00	59.39	0.94	0.65	0.51	0.70	238.38
DF1	Reach20	5886.58	100 Year	0.50	308.00	308.16	308.16	308.22	0.024707	1.23	0.65	6.14	1.04	0.35	0.42	0.76	24.20
DF1	Reach20	5856.88	Regional	10.45	307.28	307.91	307.99	308.26	0.022938	2.98	6.13	21.37	1.26	0.75	0.64	1.70	238.07
DF1	Reach20	5856.88	100 Year	0.50	307.28	307.44	307.44	307.49	0.024425	0.99	0.53	6.34	0.98	0.17	0.17	0.93	24.18
DF1	Reach20	5827.42	Regional	10.45	306.59	307.15	307.22	307.41	0.034497	3.55	8.15	29.81	1.53	0.89	1.01	1.28	237.86
DF1	Reach20	5827.42	100 Year	0.50	306.59	306.75	306.75	306.80	0.022498	1.19	0.72	7.54	0.99	0.34	0.34	0.69	24.16
DF1	Reach20	5779.22	Regional	10.45	305.66	306.16	306.14	306.27	0.022274	2.59	10.77	37.49	1.20	0.78	0.81	0.97	237.48
DF1	Reach20	5779.22	100 Year	0.50	305.66	305.78	305.75	305.80	0.017637	0.81	1.22	14.23	0.82	0.32	0.30	0.41	24.12
DF1	Reach20	5727.52	Regional	10.45	304.91	305.42	305.34	305.47	0.011243	1.85	15.05	52.96	0.85	0.49	0.66	0.69	236.83
DF1	Reach20	5727.52	100 Year	0.50	304.91	305.05	305.03	305.06	0.011958	0.72	1.48	20.26	0.69	0.23	0.22	0.34	24.05
DF1	Reach20	5627.42	Regional	10.45	303.87	304.56	304.36	304.61	0.007036	1.84	15.74	39.48	0.72	0.58	0.53	0.66	235.32
DF1	Reach20	5627.42	100 Year	0.50	303.87	304.03	303.99	304.05	0.008871	0.75	1.43	14.43	0.62	0.27	0.20	0.35	23.91
DF1	Reach20	5527.42	Regional	10.45	302.93	303.66	303.61	303.78	0.009955	2.26	12.61	39.91	0.86	0.55	0.53	0.83	233.92
DF1	Reach20	5527.42	100 Year	0.50	302.93	303.12	303.09	303.15	0.009139	0.83	0.91	9.16	0.65	0.18	0.20	0.55	23.80
DF1	Reach20	5478	Regional	10.45	302.42	303.06	303.06	303.23	0.012453	2.28	9.79	31.48	0.94	0.58	0.55	1.07	233.37
DF1	Reach20	5478	100 Year	0.50	302.42	302.58		302.61	0.012899	0.80	0.74	8.02	0.73	0.17	0.20	0.67	23.75
DF1	Reach20	5427.38	Regional	10.45	301.63	302.44	302.45	302.63	0.011241	2.56	10.33	30.88	0.93	0.59	0.57	1.01	232.86
DF1	Reach20	5427.38	100 Year	0.50	301.63	301.82	301.81	301.87	0.016584	1.06	0.55	4.98	0.86	0.21	0.23	0.89	23.72
DF1	Reach20	5388	Regional	10.45	301.12	301.80	301.85	302.08	0.017424	2.80	7.48	23.19	1.12	0.68	0.65	1.40	232.51
DF1	Reach20	5388	100 Year	0.50	301.12	301.30	301.27	301.34	0.011039	0.83	0.66	6.01	0.69	0.15	0.17	0.75	23.70
DF1	Reach20	5327.54	Regional	10.45	300.46	301.12	301.01	301.19	0.006083	1.62	15.79	48.60	0.66	0.46	0.39	0.66	231.81
DF1	Reach20	5327.54	100 Year	0.50	300.46	300.62	300.60	300.64	0.011869	0.73	1.00	13.31	0.69	0.19	0.18	0.49	23.65
DF1	Reach20	5227.42	Regional	10.45	299.64	300.35	300.26	300.46	0.008899	2.13	11.68	27.36	0.81	0.59	0.67	0.89	230.44
DF1	Reach20	5227.42	100 Year	0.50	299.64	299.84	299.79	299.86	0.005566	0.70	1.24	11.46	0.51	0.16	0.18	0.40	23.54
DF1	Reach20	5127.42	Regional	10.45	298.62	299.37	299.37	299.52	0.009525	2.23	11.07	34.08	0.84	0.44	0.54	0.94	229.27
DF1	Reach20	5127.42	100 Year	0.50	298.62	298.77	298.77	298.82	0.024410	1.06	0.53	5.60	0.99	0.16	0.27	0.94	23.44
DF1	Reach20	5058.72	Regional	10.45	297.88	298.65	298.41	298.69	0.002699	1.20	18.71	38.32	0.45	0.39	0.54	0.56	228.25
DF1	Reach20	5058.72	100 Year	0.50	297.88	298.15	298.03	298.16	0.000970	0.33	2.50	22.04	0.22	0.09	0.13	0.20	23.34
DF1	Reach20	5041.96	Regional	10.45	297.95	298.46	298.46	298.59	0.014835	2.11	10.02	32.88	0.98	0.65	0.92	1.04	228.00
DF1	Reach20	5041.96	100 Year	0.50	297.95	298.08	298.08	298.11	0.023150	0.88	0.79	13.14	0.93	0.22		0.63	23.31
DF1	Reach20	5028.02	Regional	10.45	297.02	297.29	297.47	298.01	0.226881	5.64	4.05	20.13	3.49	2.00	1.78	2.58	227.90
DF1	Reach20	5028.02	100 Year	0.50	297.02	297.08	297.12	297.27	0.355663	2.39	0.40	12.83	3.33	0.68	0.69	1.24	23.30
DF1	Reach20	4927.42	Regional	10.45	295.41	297.42	295.78	297.42	0.000038	0.28	101.34	71.88	0.06	0.10	0.10	0.10	223.26
DF1	Reach20	4927.42	100 Year	0.50	295.41	295.54	295.53	295.55	0.012255	0.76	1.72	27.15	0.71	0.22	0.20	0.29	23.21
DF1	Reach20	4893.15	Regional	10.45	294.93	297.42		297.42	0.000009	0.15	190.16	112.89	0.03	0.05	0.05	0.05	218.40
DF1	Reach20	4893.15	100 Year	0.50	294.93	295.19	295.19	295.21	0.008596	0.85	1.88	45.26	0.63	0.11	0.13	0.26	23.15
DF1	Reach20	4880.67	Regional	10.45	294.53	297.42	295.18	297.42	0.000005	0.12	240.03	139.10	0.02	0.04	0.04	0.04	215.82
DF1	Reach20	4880.67	100 Year	0.50	294.53	295.12	294.69	295.12	0.000058	0.13	6.94	49.94	0.06	0.03	0.05	0.07	23.09
DF1	Reach20	4859.28		Culvert													
DF1	Reach20	4834.95	Regional	10.45	294.32	295.78	294.62	295.79	0.000261	0.59	34.74	128.56	0.16	0.25	0.27	0.30	212.61
DF1	Reach20	4834.95	100 Year	0.50	294.32	294.33	294.32	294.35	0.134252	0.30	0.71	69.68	1.38	0.75	0.69	0.70	22.98
DF1	Reach20	4814.85	Regional	10.45	294.01	295.79		295.79	0.000030	0.23	102.60	68.46	0.06	0.12	0.09	0.10	209.75
DF1	Reach20	4814.85	100 Year	0.50	294.01	294.08		294.08	0.005925	0.26	2.52	31.69	0.41	0.16	0.19	0.20	22.85
DF1	Reach20	4727.26	Regional	10.45	293.35	295.79		295.79	0.000008	0.15	103.67	67.80	0.03	0.04	0.11	0.10	203.03
DF1	Reach20	4727.26	100 Year	0.50	293.35	293.54	293.50	293.55	0.009846	0.65	1.17	13.27	0.63	0.17	0.25	0.42	22.73
DF1	Reach20	4686	Regional	10.45	292.91	295.79		295.79	0.000012	0.20	146.93	78.49	0.04	0.07	0.06	0.07	197.83
DF1	Reach20	4686	100 Year	0.50	292.91	293.08	293.06	293.11	0.011808	0.84	1.11	12.65	0.71	0.23	0.28	0.45	22.69
DF1	Reach20	4627.42	Regional	10.45	292.18	295.78		295.79	0.000008	0.19	138.96	55.20	0.03	0.06	0.07	0.08	189.50
DF1	Reach20	4627.42	100 Year	0.50	292.18	292.29	292.27	292.31	0.016013	0.76	1.16	16.06	0.78	0.21	0.31	0.43	22.62
DF1	Reach20	4580.55	Regional	10.45	291.13	295.78		295.78	0.000001	0.09	287.01	90.70	0.01	0.03	0.03	0.04	180.26
DF1	Reach20	4580.55	100 Year	0.50	291.13	291.34	291.34	291.41	0.025116	1.14	0.43	3.38	1.02			1.14	22.58
DF1	Reach20	4562.51	Regional	10.45	290.62	295.78	291.45	295.78	0.000003	0.14	164.96	103.86	0.02	0.05	0.06	0.06	174.49
DF1	Reach20	4562.51	100 Year	0.50	290.62	291.30	290.78	291.30	0.000060	0.16	3.60	9.71	0.06	0.03	0.03	0.14	22.55
DF1	Reach20	4549.26		Culvert													
DF1	Reach20	4530.87	Regional	10.45	289.97	290.73	290.73	291.00	0.012632	2.53	5.75	28.79	0.96	0.68	0.86	1.82	172.53
DF1	Reach20	4530.87	100 Year	0.50	289.97	290.13	290.13	290.18	0.024964	0.99	0.50	5.14	0.98	0.12	0.06	0.98	22.52
DF1	Reach20	4508.16	Regional	16.65	289.64	290.40	290.36	290.60	0.015951	2.93	12.46	23.97	1.09	1.02	0.92	1.34	172.25
DF1	Reach20	4508.16	100 Year	0.54	289.64	289.80	289.74	289.81	0.007131	0.64	1.44	11.60	0.55	0.28	0.20	0.37	22.50
DF1	Reach20	4460	Regional	16.65	289.04	289.66	289.66	289.84	0.015468	2.52	14.34	39.02	1.04	0.75	0.73	1.16	171.61
DF1	Reach20	4460	100 Year	0.54	289.04	289.14	289.14	289.18	0.032249	0.94	0.78	11.41	1.07	0.19	0.37	0.69	22.45
DF1	Reach20	4427.42	Regional	16.65	288.26	289.03	288.79	289.13	0.009240	2.26	17.49	35.26	0.84	0.83	0.68	0.95	171.08
DF1	Reach20	4427.42	100 Year	0.54	288.26	288.40	288.33	288.41	0.006932	0.59	1.61	14.00	0.54	0.28	0.15	0.33	22.41
DF1	Reach20	4382.29	Regional	16.65	287.64	288.46	288.46	288.66	0.013772	2.69	12.62	32.49	1.01	1.16	0.71	1.32	170.47
DF1	Reach20	4382.29	100 Year	0.54	287.64	287.86	287.86	287.92	0.023188	1.07	0.57	5.77	0.98	0.03	0.27	0.94	22.36
DF1	Reach20	4350	Regional	16.65	286.85	287.36	287.50	287.78	0.071210	4.14	8.27	30.25	2.08	1.68	0.84	2.01	170.13
DF1	Reach20	4350	100 Year	0.54	286.85	286.99	286.98	287.01	0.034309	0.95	1.00	12.80	1.10	0.42		0.54	22.34
DF1	Reach20	4327.42	Regional	16.65	285.97	286.51	286.46	286.62	0.018909	2.36	14.45	42.23	1.10	0.90	1.00	1.15	169.59

HEC-RAS Plan: SCE Future 2024-07-25-4766 Locations: User Defined (Continued)

River	Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl	Vel Left	Vel Right	Vel Total	Volume
				(m3/s)	(m)	(m)	(m)	(m)	(m/m)	(m/s)	(m2)	(m)		(m/s)	(m/s)	(m/s)	(1000 m3)
DF1	Reach20	4327.42	100 Year	0.54	285.97	286.06		286.06	0.012782	0.41	1.35	10.63	0.62		0.40	0.40	22.28
DF1	Reach20	4302	Regional	16.65	285.29	285.99	285.98	286.17	0.016296	2.68	14.00	37.03	1.08	0.55	0.94	1.19	169.23
DF1	Reach20	4302	100 Year	0.54	285.29	285.35	285.35	285.39	0.082014	0.78	0.58	6.13	1.45		0.95	0.93	22.26
DF1	Reach20	4267	Regional	16.65	284.63	285.41	285.41	285.64	0.014738	2.78	12.39	27.33	1.05	0.69	0.93	1.34	168.77
DF1	Reach20	4267	100 Year	0.54	284.63	284.82		284.84	0.007313	0.64	1.27	11.03	0.56	0.14	0.25	0.42	22.23
DF1	Reach20	4227.42	Regional	16.65	284.16	284.86	284.75	284.95	0.010048	2.21	17.03	39.21	0.86	0.93	0.78	0.98	168.19
DF1	Reach20	4227.42	100 Year	0.54	284.16	284.23	284.21	284.25	0.046082	0.85	0.92	11.24	1.20		0.54	0.59	22.18
DF1	Reach20	4201	Regional	16.65	283.84	284.58		284.69	0.008972	2.16	18.64	44.80	0.82	0.54	0.65	0.89	167.72
DF1	Reach20	4201	100 Year	0.54	283.84	284.03		284.04	0.002907	0.47	1.86	13.77	0.37	0.13	0.17	0.29	22.15
DF1	Reach20	4164	Regional	16.65	283.61	284.29		284.36	0.008243	1.87	19.57	43.18	0.76	0.54	0.69	0.85	167.01
DF1	Reach20	4164	100 Year	0.54	283.61	283.74	283.74	283.77	0.041642	0.96	0.94	17.51	1.19	0.15	0.35	0.57	22.09
DF1	Reach20	4125.89	Regional	21.14	283.12	284.06		284.16	0.004056	1.57	21.23	37.39	0.56	0.45	0.48	1.00	166.23
DF1	Reach20	4125.89	100 Year	0.68	283.12	283.37	283.29	283.38	0.003897	0.45	1.64	14.60	0.40	0.09	0.13	0.42	22.05
DF1	Reach20	4026.93	Regional	21.14	281.75	283.12	283.12	283.32	0.007544	2.47	16.84	39.13	0.77	0.76	0.72	1.26	163.30
DF1	Reach20	4026.93	100 Year	0.68	281.75	282.07	282.07	282.18	0.022175	1.43	0.48	2.31	1.01			1.43	21.88
DF1	Reach20	3971	Regional	21.14	280.52	281.08	281.37	282.21	0.098729	5.36	6.46	21.09	2.52	1.48	1.55	3.27	162.68
DF1	Reach20	3971	100 Year	0.68	280.52	280.78	280.72	280.80	0.005945	0.65	1.17	11.17	0.52	0.09	0.08	0.59	21.84
DF1	Reach20	3927.42	Regional	21.14	280.12	280.99	280.99	281.25	0.013943	2.95	14.58	27.25	1.04	0.89	0.91	1.45	162.22
DF1	Reach20	3927.42	100 Year	0.68	280.12	280.29	280.29	280.35	0.021835	1.06	0.79	8.51	0.95	0.25	0.24	0.87	21.79
DF1	Reach20	3894	Regional	21.14	279.22	279.75	279.92	280.39	0.056253	4.07	8.40	25.97	1.90	1.22	1.18	2.52	161.84
DF1	Reach20	3894	100 Year	0.68	279.22	279.36	279.37	279.41	0.039091	1.02	0.80	13.78	1.18	0.32	0.22	0.85	21.77
DF1	Reach20	3827.42	Regional	21.14	277.42	278.17	278.07	278.28	0.010949	2.38	21.99	47.33	0.90	0.75	0.76	0.96	160.87
DF1	Reach20	3827.42	100 Year	0.68	277.42	277.59	277.58	277.62	0.016131	0.92	1.43	19.79	0.82	0.25	0.23	0.48	21.70
DF1	Reach20	3791	Regional	21.14	277.04	277.62	277.60	277.78	0.016714	2.47	18.98	52.11	1.07	0.77	0.80	1.11	160.11
DF1	Reach20	3791	100 Year	0.68	277.04	277.20	277.17	277.22	0.007640	0.64	1.57	20.26	0.57	0.13	0.19	0.43	21.64
DF1	Reach20	3727.42	Regional	21.14	276.17	277.15		277.20	0.005176	1.55	28.95	63.20	0.56	0.68	0.36	0.73	158.58
DF1	Reach20	3727.42	100 Year	0.68	276.17	276.49	276.49	276.53	0.016294	1.01	0.97	14.13	0.84	0.20		0.70	21.56
DF1	Reach20	3688.93	Regional	21.14	275.40	276.80	276.80	276.97	0.006841	2.51	26.32	74.57	0.74	0.44	0.50	0.80	157.55
DF1	Reach20	3688.93	100 Year	0.68	275.40	275.75	275.72	275.83	0.015906	1.23	0.55	2.61	0.85			1.23	21.54
DF1	Reach20	3678.29	Regional	21.14	275.26	276.12	276.35	276.77	0.039274	3.99	10.38	51.73	1.64	0.78	0.69	2.04	157.36
DF1	Reach20	3678.29	100 Year	0.68	275.26	275.54	275.54	275.63	0.022578	1.30	0.53	3.09	1.01			1.30	21.53
DF1	Reach20	3628.93	Regional	21.14	274.28	275.05	274.98	275.14	0.007945	2.01	25.53	66.53	0.77	0.48	0.64	0.83	156.47
DF1	Reach20	3628.93	100 Year	0.68	274.28	274.48	274.46	274.52	0.014836	0.90	0.81	7.49	0.79		0.40	0.85	21.50
DF1	Reach20	3593	Regional	21.14	273.70	274.69	274.69	274.85	0.010271	2.56	23.48	67.74	0.89	0.53	0.59	0.90	155.75
DF1	Reach20	3593	100 Year	0.68	273.70	274.02	273.98	274.06	0.011160	0.91	0.80	6.04	0.71	0.07	0.14	0.86	21.47
DF1	Reach20	3528.87	Regional	21.14	272.90	273.91	273.95	274.16	0.011119	2.82	18.06	45.90	0.94	0.62	0.65	1.17	154.41
DF1	Reach20	3528.87	100 Year	0.68	272.90	273.14	273.12	273.19	0.016609	0.99	0.70	5.40	0.85	0.10	0.10	0.98	21.42
DF1	Reach20	3479	Regional	21.14	272.48	273.33	273.36	273.55	0.015692	3.06	18.28	45.82	1.10	0.74	0.85	1.16	153.50
DF1	Reach20	3479	100 Year	0.68	272.48	272.76		272.79	0.004609	0.71	1.44	10.39	0.48	0.15	0.18	0.48	21.37
DF1	Reach20	3428.83	Regional	21.14	272.06	272.81	272.47	272.82	0.001432	0.81	64.48	128.68	0.32	0.32	0.20	0.33	151.25
DF1	Reach20	3428.83	100 Year	0.68	272.06	272.30	272.30	272.36	0.021706	1.15	0.70	64.87	0.97		0.29	0.97	20.95
DF1	Reach20	3330.15	Regional	21.14	271.38	272.79		272.79	0.000163	0.46	148.06	215.36	0.12	0.15	0.10	0.14	143.74
DF1	Reach20	3330.15	100 Year	0.68	271.38	271.57	271.48	271.57	0.003086	0.50	2.98	31.72	0.38	0.14	0.17	0.23	20.53
DF1	Reach20	3322.69	Regional	21.14	271.32	272.79	272.06	272.79	0.000164	0.47	145.44	208.11	0.12	0.14	0.11	0.15	142.75
DF1	Reach20	3322.69	100 Year	0.68	271.32	271.47	271.47	271.52	0.022976	1.02	0.70	7.54	0.96	0.16	0.15	0.97	20.51
DF1	Reach20	3307.12		Culvert													
DF1	Reach20	3289.02	Regional	21.14	270.49	271.32	271.32	271.40	0.004939	1.69	31.09	110.58	0.61	0.42	0.45	0.68	141.08
DF1	Reach20	3289.02	100 Year	0.68	270.49	270.73	270.69	270.76	0.008281	0.75	1.15	20.68	0.61		0.30	0.60	20.50
DF1	Reach20	3279.33	Regional	21.80	270.39	271.14	270.94	271.17	0.013773	1.13	26.61	72.07	0.44	0.77	0.65	0.82	140.76
DF1	Reach20	3279.33	100 Year	0.84	270.39	270.65	270.56	270.66	0.008052	0.38	2.78	27.27	0.27	0.22	0.15	0.30	20.46
DF1	Reach20	3228.83	Regional	21.80	269.86	270.56		270.67	0.007879	1.85	21.97	49.33	0.75	0.47	0.69	0.99	139.57
DF1	Reach20	3228.83	100 Year	0.84	269.86	270.00		270.02	0.023428	0.74	1.63	21.97	0.90		0.35	0.52	20.36
DF1	Reach20	3130.4	Regional	21.80	269.08	269.79	269.65	269.90	0.007542	1.85	20.22	41.04	0.74	0.58	0.66	1.08	137.49
DF1	Reach20	3130.4	100 Year	0.84	269.08	269.27		269.28	0.003640	0.44	2.68	24.15	0.39	0.15	0.16	0.31	20.14
DF1	Reach20	3084	Regional	21.80	268.72	269.32	269.27	269.45	0.013586	2.18	20.44	54.02	0.96	0.75	0.66	1.07	136.56
DF1	Reach20	3084	100 Year	0.84	268.72	268.89	268.89	268.93	0.023534	0.92	1.10	20.09	0.95	0.09	0.18	0.77	20.06
DF1	Reach20	3050	Regional	21.80	268.00	269.20		269.27	0.002266	1.43	29.08	51.30	0.44	0.33	0.36	0.75	135.69
DF1	Reach20	3050	100 Year	0.84	268.00	268.27	268.19	268.29	0.003925	0.53	1.64	11.51	0.42	0.09	0.03	0.51	20.01
DF1	Reach20	2829.44	Regional	21.80	268.00	269.17	268.45	269.19	0.000830	0.91	40.84	93.39	0.27	0.36	0.40	0.53	133.52
DF1	Reach20	2829.44	100 Year	0.84	268.00	268.13	268.06	268.14	0.002357	0.36	3.82	31.93	0.32	0.14	0.15	0.22	19.87
DF1	Reach20	2828.99		Culvert													
DF1	Reach20	2828.61	Regional	21.80	267.40	268.21	268.21	268.49	0.014808	2.77	12.25	66.18	1.05	1.08	0.88	1.78	132.31
DF1	Reach20	2828.61	100 Year	0.84	267.40	267.60	267.60	267.65	0.022666	0.99	0.92	11.73	0.95	0.14	0.10	0.92	19.76
DF1	Reach20	2828.51	Regional	21.80	266.90	267.84	267.65	267.90	0.003358	1.46	31.79	61.98	0.51	0.45	0.38	0.69	132.09
DF1	Reach20	2828.51	100 Year	0.84	266.90	267.24	267.11	267.25	0.001098	0.35	3.01	18.18	0.24	0.09	0.05	0.28	19.74
DF1	Reach20	2827.51	Regional	27.73	266.14	266.89	266.89	267.14	0.019127	3.20	19.71	41.74	1.20	1.16	0.88	1.41	129.48
DF1	Reach20	2827.51	100 Year	3.20	266.14	266.40	266.40	266.48	0.022564	1.63	3.72	22.62	1.08	0.56	0.46	0.86	19.40

HEC-RAS Plan: SCE Future 2024-07-25-4766 Locations: User Defined (Continued)

River	Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl	Vel Left	Vel Right	Vel Total	Volume
				(m3/s)	(m)	(m)	(m)	(m)	(m/m)	(m/s)	(m2)	(m)		(m/s)	(m/s)	(m/s)	(1000 m3)
DF1	Reach20	2728.83	Regional	27.73	265.00	266.07	265.82	266.20	0.004199	1.81	25.17	42.54	0.59	0.42	0.52	1.10	127.25
DF1	Reach20	2728.83	100 Year	3.20	265.00	265.39	265.29	265.43	0.004485	0.85	4.49	21.36	0.50	0.16	0.18	0.71	19.00
DF1	Reach20	2628.8	Regional	27.73	264.56	265.73		265.78	0.003700	1.89	41.76	65.68	0.57	0.52	0.58	0.66	123.90
DF1	Reach20	2628.8	100 Year	2.99	264.56	265.10		265.12	0.002188	0.85	9.16	36.93	0.38	0.22	0.21	0.33	18.31
DF1	Reach20	2525.58	Regional	27.73	264.43	264.87	264.87	265.05	0.018080	2.20	20.47	60.58	1.07	0.78	0.71	1.35	120.68
DF1	Reach20	2525.58	100 Year	2.99	264.43	264.55	264.55	264.60	0.020932	1.01	4.13	41.99	0.93	0.35	0.31	0.72	17.63
DF1	Reach20	2466	Regional	27.73	263.47	264.18	264.02	264.30	0.005333	1.59	21.43	42.91	0.62	0.42	0.34	1.29	119.43
DF1	Reach20	2466	100 Year	2.99	263.47	263.66		263.70	0.011275	0.86	3.52	24.54	0.71	0.12		0.85	17.40
DF1	Reach20	2428.87	Regional	27.73	262.99	264.04	263.74	264.14	0.003329	1.68	29.96	45.85	0.53	0.49	0.44	0.93	118.48
DF1	Reach20	2428.87	100 Year	2.99	262.99	263.25	263.21	263.31	0.009797	1.08	3.40	19.92	0.71	0.26	0.19	0.88	17.27
DF1	Reach20	2340	Regional	27.73	262.76	264.02		264.05	0.000899	0.99	58.53	78.57	0.28	0.30	0.26	0.47	116.34
DF1	Reach20	2340	100 Year	2.99	262.76	263.07		263.09	0.002413	0.63	6.89	31.36	0.37	0.19	0.16	0.43	17.02
DF1	Reach20	2328	Regional	27.73	262.69	264.00	263.26	264.03	0.000790	0.94	45.72	105.65	0.27	0.41	0.36	0.61	114.92
DF1	Reach20	2328	100 Year	2.99	262.69	263.04	262.87	263.05	0.001557	0.50	8.62	43.26	0.29	0.22	0.12	0.35	16.86
DF1	Reach20	2299.11		Culvert													
DF1	Reach20	2260	Regional	27.73	262.05	262.83	262.70	262.96	0.006952	1.73	20.89	59.81	0.70	0.60		1.33	113.36
DF1	Reach20	2260	100 Year	2.99	262.05	262.40	262.32	262.42	0.004692	0.65	5.41	48.27	0.47	0.22		0.55	16.62
DF1	Reach20	2259	Regional	27.73	261.74	262.46	262.36	262.58	0.006517	1.71	25.27	60.14	0.68	0.42	0.55	1.10	111.74
DF1	Reach20	2259	100 Year	2.99	261.74	261.98	261.95	262.02	0.012069	0.91	3.66	26.71	0.74	0.06	0.28	0.82	16.24
DF1	Reach20	2228.0	Regional	27.73	261.64	262.36		262.47	0.006577	1.81	26.68	47.76	0.70	0.45	0.71	1.04	111.32
DF1	Reach20	2228.0	100 Year	2.99	261.64	261.86		261.87	0.006281	0.73	6.11	32.11	0.55	0.14	0.34	0.49	16.16
DF1	Reach20	2129.24	Regional	27.73	261.00	261.62	261.57	261.82	0.009961	2.06	17.07	38.27	0.84	0.48	0.53	1.62	109.57
DF1	Reach20	2129.24	100 Year	2.99	261.00	261.17		261.21	0.011260	0.91	3.42	23.27	0.72	0.16	0.17	0.88	15.78
DF1	Reach20	2056.16	Regional	27.73	260.38	261.01		261.13	0.008949	1.88	23.10	45.49	0.79	0.75	0.47	1.20	108.21
DF1	Reach20	2056.16	100 Year	2.99	260.38	260.60		260.61	0.006567	0.71	6.12	36.63	0.55	0.31	0.13	0.49	15.46
DF1	Reach20	1990.35	Regional	29.81	259.98	260.47		260.54	0.008395	1.58	32.69	80.05	0.74	0.54	0.66	0.91	106.33
DF1	Reach20	1990.35	100 Year	3.36	259.98	260.13		260.14	0.007681	0.65	8.21	63.48	0.57	0.22	0.30	0.41	14.98
DF1	Reach20	1915.13	Regional	29.81	259.06	259.52	259.52	259.70	0.017208	2.05	19.86	57.02	1.03	0.39	0.76	1.50	104.56
DF1	Reach20	1915.13	100 Year	3.36	259.06	259.23	259.22	259.27	0.021595	0.98	4.23	46.78	0.93		0.28	0.79	14.57
DF1	Reach20	1889	Regional	29.81	258.64	259.14	259.07	259.28	0.012662	1.97	22.79	53.06	0.91	0.45	0.81	1.31	103.98
DF1	Reach20	1889	100 Year	3.36	258.64	258.79	258.75	258.82	0.012441	0.83	5.77	44.52	0.73	0.06	0.36	0.58	14.43
DF1	Reach20	1815.13	Regional	29.81	257.37	258.11	258.11	258.39	0.013347	2.36	14.04	30.66	0.97	0.46	0.40	2.12	102.74
DF1	Reach20	1815.13	100 Year	3.36	257.37	257.62	257.62	257.70	0.022418	1.28	2.62	15.96	1.01			1.28	14.15
DF1	Reach20	1715.05	Regional	29.81	256.51	257.69	257.22	257.76	0.001704	1.22	29.14	34.85	0.38	0.31	0.32	1.02	100.58
DF1	Reach20	1715.05	100 Year	3.36	256.51	256.92	256.76	256.94	0.002117	0.56	6.12	23.73	0.34	0.10	0.03	0.55	13.71
DF1	Reach20	1668	Regional	32.74	256.30	257.61	257.19	257.70	0.002669	1.71	36.47	46.00	0.49	0.64	0.49	0.90	99.70
DF1	Reach20	1668	100 Year	4.54	256.30	256.66	256.66	256.77	0.015113	1.58	4.22	23.77	0.92	0.37	0.33	1.08	13.57
DF1	Reach20	1650		Culvert													
DF1	Reach20	1630.19	Regional	32.74	256.11	257.39	256.78	257.46	0.001802	1.40	34.00	71.83	0.40	0.57	0.61	0.96	98.00
DF1	Reach20	1630.19	100 Year	4.54	256.11	256.45	256.33	256.48	0.004384	0.86	7.68	42.38	0.50	0.27	0.35	0.59	13.17
DF1	Reach20	1615	Regional	32.74	256.00	256.90	256.90	257.33	0.015197	3.20	13.18	60.27	1.10		1.37	2.48	97.72
DF1	Reach20	1615	100 Year	4.54	256.00	256.39	256.28	256.44	0.005833	1.10	5.32	45.21	0.59		0.45	0.85	13.11
DF1	Reach20	1514.84	Regional	32.74	254.99	256.24	255.65	256.28	0.001670	1.36	57.41	65.65	0.39	0.47	0.43	0.57	92.93
DF1	Reach20	1514.84	100 Year	4.54	254.99	255.20	255.20	255.30	0.031773	1.83	4.81	29.59	1.26	0.65	0.58	0.94	12.25
DF1	Reach20	1460.2	Regional	32.74	254.20	256.19		256.23	0.000777	1.24	67.33	64.01	0.28	0.35	0.28	0.49	90.09
DF1	Reach20	1460.2	100 Year	4.54	254.20	255.18	254.62	255.20	0.000454	0.58	16.14	35.44	0.19	0.13	0.15	0.28	11.77
DF1	Reach20	1405.39	Regional	32.74	253.02	256.19		256.21	0.000121	0.66	109.23	64.07	0.12	0.17	0.19	0.30	85.87
DF1	Reach20	1405.39	100 Year	4.54	253.02	255.19		255.19	0.000012	0.16	54.73	44.78	0.04	0.04	0.05	0.08	10.04
DF1	Reach20	1401.29	Regional	32.74	253.04	256.19	254.99	256.21	0.000135	0.69	103.51	70.92	0.13	0.16	0.18	0.32	85.43
DF1	Reach20	1401.29	100 Year	4.54	253.04	255.17	253.68	255.19	0.000146	0.55	9.44	41.42	0.12	0.22		0.48	9.82
DF1	Reach20	1396		Culvert													
DF1	Reach20	1387.43	Regional	32.74	253.76	256.15	254.94	256.17	0.000232	0.73	103.26	85.89	0.16	0.19	0.20	0.32	85.09
DF1	Reach20	1387.43	100 Year	4.54	253.76	255.08	254.22	255.08	0.000155	0.38	12.93	49.18	0.12	0.14		0.35	9.74
DF1	Reach20	1381.53	Regional	32.74	253.85	256.15		256.16	0.000156	0.61	126.99	103.57	0.13	0.17	0.17	0.26	84.41
DF1	Reach20	1381.53	100 Year	4.54	253.85	255.08		255.08	0.000049	0.22	39.66	59.62	0.07	0.06	0.06	0.11	9.54
DF1	Reach20	1375.67	Regional	32.74	253.77	256.15		256.16	0.000178	0.67	133.21	107.58	0.14	0.18	0.19	0.25	83.65
DF1	Reach20	1375.67	100 Year	4.54	253.77	255.08		255.08	0.000060	0.26	41.13	61.81	0.07	0.06	0.07	0.11	9.30
DF1	Reach20	1370.57	Regional	32.74	253.60	256.13	255.74	256.16	0.000940	1.17	82.02	106.02	0.27	0.27	0.33	0.40	83.20
DF1	Reach20	1370.57	100 Year	4.54	253.60	254.70	254.70	254.99	0.019695	2.41	1.89	4.23	1.00			2.41	9.21
DF1	Reach20	1368		Culvert													
DF1	Reach20	1362.11	Regional	32.74	253.72	255.36	255.36	256.14	0.010554	3.92	8.36	98.50	1.01			3.92	82.86
DF1	Reach20	1362.11	100 Year	4.54	253.72	254.22	254.22	254.43	0.016531	2.03	2.23	32.42	1.01			2.03	9.19
DF1	Reach20	1358.51	Regional	32.74	253.81	254.10	254.40	255.93	0.805622	7.95	6.43	31.64	6.10		4.04	5.09	82.72
DF1	Reach20	1358.51	100 Year	4.54	253.81	253.94	254.04	254.28	0.405347	3.50	2.09	23.20	3.84		1.75	2.18	9.18
DF1	Reach20	1357.51	Regional	32.74	253.76	254.66	254.37	254.75	0.006666	1.95	35.28	62.64	0.71	0.41	0.72	0.93	82.69
DF1	Reach20	1357.51	100 Year	4.54	253.76	254.10	253.96	254.12	0.006445	0.87	8.87	33.86	0.57		0.42	0.51	9.17

HEC-RAS Plan: SCE Future 2024-07-25-4766 Locations: User Defined (Continued)

River	Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl	Vel Left	Vel Right	Vel Total	Volume
				(m3/s)	(m)	(m)	(m)	(m)	(m/m)	(m/s)	(m2)	(m)		(m/s)	(m/s)	(m/s)	(1000 m3)
DF1	Reach20	1312.67	Regional	32.74	253.53	254.49		254.59	0.003551	1.63	34.45	53.22	0.54	0.53	0.41	0.95	81.58
DF1	Reach20	1312.67	100 Year	4.54	253.53	253.80		253.85	0.009513	1.09	5.57	29.55	0.70	0.33	0.23	0.81	8.94
DF1	Reach20	1311.67	Regional	32.74	253.40	254.47		254.56	0.003383	1.70	34.66	47.33	0.53	0.62	0.43	0.94	81.33
DF1	Reach20	1311.67	100 Year	4.54	253.40	253.67	253.67	253.76	0.018434	1.46	4.47	27.00	0.97	0.43	0.27	1.01	8.91
DF1	Reach20	1251.58	Regional	32.74	252.86	254.43		254.47	0.000886	1.12	56.43	55.59	0.29	0.38	0.28	0.58	79.10
DF1	Reach20	1251.58	100 Year	4.54	252.86	253.45	253.12	253.46	0.000805	0.54	13.32	31.96	0.23	0.19	0.11	0.34	8.46
DF1	Reach20	1245.37	Regional	32.74	252.36	254.37		254.45	0.001779	1.76	49.68	61.08	0.42	0.44	0.41	0.66	78.22
DF1	Reach20	1245.37	100 Year	4.54	252.36	253.38		253.44	0.001791	1.05	6.20	21.79	0.37	0.13	0.19	0.73	8.30
DF1	Reach20	1240.48	Regional	32.74	253.01	254.39		254.43	0.001605	1.41	56.89	64.33	0.39	0.40	0.51	0.58	77.96
DF1	Reach20	1240.48	100 Year	4.54	253.01	253.40		253.41	0.003334	0.87	10.26	31.74	0.45	0.29	0.36	0.44	8.26
DF1	Reach20	1231.82	Regional	32.74	252.44	254.07	254.07	254.36	0.008394	2.64	21.69	44.63	0.82	0.59	0.42	1.51	77.45
DF1	Reach20	1231.82	100 Year	4.54	252.44	253.09	253.09	253.31	0.017576	2.09	2.18	5.04	1.01			2.09	8.18
DF1	Reach20	1220.38	Regional	32.74	252.00	252.88	253.28	254.08	0.045242	5.10	8.74	18.29	1.85	1.14	1.02	3.74	77.27
DF1	Reach20	1220.38	100 Year	4.54	252.00	252.28	252.44	252.86	0.119327	3.36	1.35	6.76	2.40			3.36	8.16
DF1	Reach20	1159	Regional	35.32	251.00	252.86	252.86	253.17	0.008315	2.69	21.24	42.21	0.82	0.54	0.29	1.66	76.43
DF1	Reach20	1159	100 Year	4.60	251.00	251.81	251.79	252.02	0.015173	2.02	2.28	4.98	0.95			2.02	8.05
DF1	Reach20	1115.08	Regional	35.32	250.33	252.20	252.26	252.77	0.009792	3.55	14.98	20.01	0.93	0.67	0.86	2.36	75.71
DF1	Reach20	1115.08	100 Year	4.60	250.33	251.08	251.08	251.31	0.017185	2.10	2.19	5.02	1.01		0.05	2.10	7.95
DF1	Reach20	1071	Regional	35.32	249.54	250.72	251.09	251.92	0.039783	4.85	7.36	9.94	1.71	0.51	0.33	4.80	75.21
DF1	Reach20	1071	100 Year	4.60	249.54	250.41	250.14	250.46	0.002920	1.01	4.54	8.20	0.43			1.01	7.80
DF1	Reach20	1036	Regional	35.32	249.38	251.08	251.08	251.39	0.007510	2.73	23.18	43.55	0.79	0.57	0.52	1.52	74.68
DF1	Reach20	1036	100 Year	4.60	249.38	250.17		250.30	0.008034	1.54	2.99	6.13	0.70			1.54	7.67
DF1	Reach20	1015.6	Regional	35.32	249.40	250.84	250.87	251.22	0.008869	2.88	18.42	33.69	0.86	0.53	0.55	1.92	74.26
DF1	Reach20	1015.6	100 Year	4.60	249.40	249.95		250.09	0.012123	1.66	2.77	7.09	0.85			1.66	7.61
DF1	Reach20	963	Regional	35.32	248.83	250.28	250.37	250.74	0.008877	3.31	19.02	36.91	0.90	0.45	0.78	1.86	73.28
DF1	Reach20	963	100 Year	4.60	248.83	249.32	249.29	249.47	0.012091	1.72	2.97	9.18	0.86	0.31	0.37	1.55	7.46
DF1	Reach20	900.79	Regional	35.32	247.87	249.47	249.63	250.03	0.015352	3.30	11.26	20.24	1.08	0.26		3.14	72.40
DF1	Reach20	900.79	100 Year	4.60	247.87	248.45	248.43	248.63	0.014763	1.86	2.47	6.11	0.94			1.86	7.29
DF1	Reach20	818.58	Regional	35.32	247.25	248.80	248.60	249.06	0.005335	2.32	19.67	27.05	0.67	0.05	0.46	1.80	71.13
DF1	Reach20	818.58	100 Year	4.60	247.25	247.85		247.92	0.005245	1.18	3.92	9.00	0.57			1.18	7.03
DF1	Reach20	761.32	Regional	35.32	247.00	248.73		248.84	0.001966	1.59	34.35	45.07	0.42	0.23	0.39	1.03	69.58
DF1	Reach20	761.32	100 Year	4.60	247.00	247.59		247.64	0.004310	1.06	4.36	10.16	0.51			1.06	6.79
DF1	Reach20	698.09	Regional	35.32	246.56	248.70		248.74	0.000810	1.15	62.59	64.31	0.28	0.33	0.23	0.56	66.52
DF1	Reach20	698.09	100 Year	4.60	246.56	247.36		247.41	0.003047	1.00	4.60	8.88	0.44			1.00	6.51
DF1	Reach20	650.88	Regional	35.32	246.25	248.67		248.71	0.000668	1.13	74.73	74.17	0.26	0.30	0.31	0.47	63.28
DF1	Reach20	650.88	100 Year	4.60	246.25	247.20	246.98	247.26	0.003618	1.10	5.35	17.79	0.48	0.20		0.86	6.27
DF1	Reach20	600.38	Regional	35.32	246.16	248.67		248.68	0.000251	0.81	124.89	90.20	0.17	0.23	0.25	0.28	59.79
DF1	Reach20	600.38	100 Year	4.60	246.16	246.93	246.75	247.05	0.005103	1.60	3.76	12.43	0.61	0.20	0.37	1.22	6.07
DF1	Reach20	531.76	Regional	35.32	245.75	248.67		248.67	0.000126	0.64	166.82	110.41	0.12	0.19	0.15	0.21	51.52
DF1	Reach20	531.76	100 Year	4.60	245.75	246.95		246.96	0.000363	0.58	21.68	50.36	0.18	0.12	0.13	0.21	5.31
DF1	Reach20	525.59	Regional	35.32	245.80	248.66	247.33	248.67	0.000138	0.64	154.60	107.34	0.13	0.19	0.15	0.23	50.15
DF1	Reach20	525.59	100 Year	4.60	245.80	246.93	246.41	246.95	0.000741	0.73	9.36	41.11	0.24	0.17	0.17	0.49	5.18
DF1	Reach20	491.96		Culvert													
DF1	Reach20	463.91	Regional	35.32	245.41	247.12	247.12	247.58	0.010878	3.93	18.05	25.78	0.99	1.25	1.21	1.96	47.64
DF1	Reach20	463.91	100 Year	4.60	245.41	246.29	246.11	246.41	0.005110	1.68	4.21	10.54	0.60	0.36	0.32	1.09	4.96
DF1	Reach20	447.81	Regional	35.73	245.29	246.67	246.86	247.25	0.047501	4.64	16.11	49.76	1.33	1.45	1.65	2.22	47.34
DF1	Reach20	447.81	100 Year	4.61	245.29	246.09	246.09	246.25	0.020161	1.98	3.39	11.30	0.78	0.49	0.64	1.36	4.89
DF1	Reach20	400.02	Regional	35.73	244.44	246.41	246.26	246.53	0.002897	2.21	48.82	79.77	0.53	0.45	0.76	0.73	45.82
DF1	Reach20	400.02	100 Year	4.61	244.44	245.54	245.13	245.60	0.001793	1.12	5.44	9.12	0.37	0.26	0.26	0.85	4.69
DF1	Reach20	360.18	Regional	35.73	244.51	246.15	246.15	246.36	0.006873	3.14	37.56	77.28	0.81	0.60	0.86	0.95	44.31
DF1	Reach20	360.18	100 Year	4.61	244.51	245.19	245.19	245.43	0.013320	2.30	2.79	6.89	0.96	0.53	0.62	1.66	4.53
DF1	Reach20	300.02	Regional	35.73	244.06	245.00	245.16	245.53	0.040402	5.12	20.97	56.43	1.77	1.22	1.37	1.70	42.64
DF1	Reach20	300.02	100 Year	4.61	244.06	244.75	244.76	244.84	0.006739	1.66	7.48	49.86	0.68	0.26	0.42	0.62	4.23
DF1	Reach20	234.9	Regional	35.73	243.92	244.51	244.16	244.53	0.004123	1.17	65.67	132.29	0.52	0.51	0.54	0.54	40.14
DF1	Reach20	234.9	100 Year	4.61	243.92	244.10	243.96	244.11	0.004073	0.43	17.67	104.77	0.40	0.28	0.24	0.26	3.50
DF1	Reach20	156.62	Regional	35.73	243.28	244.42		244.43	0.000881	0.92	112.94	163.80	0.28	0.24	0.34	0.32	35.06
DF1	Reach20	156.62	100 Year	4.61	243.28	243.61	243.61	243.67	0.016053	1.69	8.84	79.75	0.95	0.35	0.40	0.52	2.75
DF1	Reach20	83.97	Regional	35.73	242.47	244.41		244.41	0.000112	0.46	225.00	188.71	0.11	0.14	0.17	0.16	24.50
DF1	Reach20	83.97	100 Year	4.61	242.47	243.06	243.02	243.09	0.003809	1.14	15.37	105.87	0.50	0.19	0.23	0.30	1.93
DF3	1	3547.76	Regional	11.68	284.66	285.19	285.19	285.37	0.014865	1.92	7.36	25.10	0.96	0.43	0.41	1.59	83.16
DF3	1	3547.76	100 Year	3.00	284.66	284.95	284.95	285.03	0.022640	1.29	2.33	14.97	1.02	0.06	0.10	1.29	20.71
DF3	1	3480.67	Regional	11.68	281.98	282.26	282.46	282.92	0.110628	3.64	3.52	20.55	2.39	0.73	0.49	3.32	82.75
DF3	1	3480.67	100 Year	3.00	281.98	282.15	282.20	282.32	0.065739	1.83	1.65	13.60	1.65	0.24		1.82	20.56
DF3	1	3400	Regional	11.68	280.00	281.80	280.79	281.80	0.000006	0.09	217.61	109.40	0.02	0.05	0.04	0.05	75.16
DF3	1	3400	100 Year	3.00	280.00	280.49	280.49	280.61	0.019938	1.57	1.91	7.60	1.00			1.57	20.44
DF3	1	3370	Regional	11.68	279.99	281.80	280.00	281.80	0.000004	0.09	242.40	114.47	0.02	0.05	0.03	0.05	68.78
DF3	1	3370	100 Year	3.00	279.99	280.00	280.00	280.00	0.000025	0.01	53.98	65.35	0.02	0.06		0.06	19.66

HEC-RAS Plan: SCE Future 2024-07-25-4766 Locations: User Defined (Continued)

River	Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl	Vel Left	Vel Right	Vel Total	Volume
				(m3/s)	(m)	(m)	(m)	(m)	(m/m)	(m/s)	(m2)	(m)		(m/s)	(m/s)	(m/s)	(1000 m3)
DF3	1	3333.59	Regional	11.68	279.67	281.80		281.80	0.000029	0.25	96.94	63.96	0.06	0.08	0.09	0.12	62.53
DF3	1	3333.59	100 Year	3.00	279.67	279.82	279.86	279.96	0.105901	1.93	2.02	18.76	2.00	1.11	0.33	1.49	18.63
DF3	1	3253	Regional	11.68	278.82	281.79	279.42	281.80	0.000034	0.33	37.45	77.31	0.06		0.14	0.31	55.00
DF3	1	3253	100 Year	3.00	278.82	279.42	279.15	279.43	0.001076	0.54	5.85	37.25	0.26		0.24	0.51	18.12
DF3	1	3230		Culvert													
DF3	1	3205.22	Regional	11.68	277.53	281.67	278.38	281.67	0.000008	0.20	153.58	64.15	0.03	0.06	0.06	0.08	53.93
DF3	1	3205.22	100 Year	3.00	277.53	278.46	278.01	278.47	0.000606	0.61	8.49	15.75	0.21	0.16	0.18	0.35	17.93
DF3	1	3197.43	Regional	11.68	277.80	281.66	278.64	281.67	0.000034	0.38	32.50	66.49	0.06	0.16		0.36	53.05
DF3	1	3197.43	100 Year	3.00	277.80	278.40	278.27	278.45	0.005425	1.04	2.89	11.66	0.55	0.06		1.04	17.89
DF3	1	3179.2		Culvert													
DF3	1	3161.25	Regional	11.68	276.48	278.31	277.83	278.41	0.002706	1.45	8.50	19.38	0.43	0.22	0.38	1.37	52.80
DF3	1	3161.25	100 Year	3.00	276.48	277.89	277.31	277.91	0.000843	0.60	5.08	9.02	0.22	0.05	0.06	0.59	17.83
DF3	1	3147.49	Regional	17.19	277.20	278.21	278.08	278.33	0.013062	2.04	14.21	26.24	0.71	0.93	0.72	1.21	52.63
DF3	1	3147.49	100 Year	3.86	277.20	277.74	277.74	277.84	0.024551	1.63	3.55	17.38	0.85	0.56	0.33	1.09	17.78
DF3	1	3112.66	Regional	17.19	276.98	277.78	277.68	277.97	0.008218	2.20	12.49	23.70	0.79	0.60	0.65	1.38	52.18
DF3	1	3112.66	100 Year	3.86	276.98	277.42	277.27	277.46	0.003882	1.01	5.27	16.71	0.49	0.27	0.31	0.73	17.62
DF3	1	3073	Regional	17.19	276.84	277.50		277.59	0.007544	1.79	18.72	42.31	0.73	0.54	0.62	0.92	51.51
DF3	1	3073	100 Year	3.86	276.84	277.15		277.20	0.009884	1.18	5.78	31.90	0.73	0.31	0.37	0.67	17.39
DF3	1	3012.6	Regional	17.19	276.26	276.70	276.70	276.90	0.024227	2.49	12.12	35.67	1.23	0.54	0.95	1.42	50.67
DF3	1	3012.6	100 Year	3.86	276.26	276.48	276.43	276.52	0.015562	1.20	5.15	27.52	0.87	0.19	0.52	0.75	17.09
DF3	1	2974	Regional	17.19	275.37	276.09	276.10	276.28	0.012269	2.00	11.62	45.61	0.90	0.47	0.29	1.48	50.23
DF3	1	2974	100 Year	3.86	275.37	275.76	275.76	275.86	0.020874	1.39	2.82	15.80	1.00	0.19		1.37	16.94
DF3	1	2906.79	Regional	17.19	273.83	274.29	274.45	274.81	0.053543	3.35	6.72	27.02	1.78	0.86	0.65	2.56	49.65
DF3	1	2906.79	100 Year	3.86	273.83	274.11	274.14	274.24	0.031016	1.61	2.66	17.75	1.21	0.38	0.08	1.45	16.76
DF3	1	2866	Regional	17.19	272.98	273.73	273.52	273.80	0.003720	1.38	21.28	42.98	0.52	0.41	0.45	0.81	49.07
DF3	1	2866	100 Year	3.86	272.98	273.34	273.23	273.37	0.003760	0.82	6.85	30.37	0.46	0.24	0.21	0.56	16.57
DF3	1	2849	Regional	17.19	272.78	273.39	273.39	273.60	0.016132	2.37	12.34	34.77	1.04	0.71	0.61	1.39	48.69
DF3	1	2849	100 Year	3.86	272.78	273.09	273.09	273.19	0.019380	1.48	3.63	22.53	0.99	0.43	0.26	1.06	16.45
DF3	1	2773	Regional	17.19	271.07	271.42	271.50	271.70	0.051272	3.00	10.90	47.89	1.70	1.02	0.71	1.58	47.86
DF3	1	2773	100 Year	3.86	271.07	271.26	271.28	271.36	0.037306	1.62	4.10	36.01	1.30	0.52	0.20	0.94	16.17
DF3	1	2707.68	Regional	17.19	269.91	270.27	270.10	270.28	0.002979	0.63	36.04	67.38	0.40	0.42	0.50	0.48	46.35
DF3	1	2707.68	100 Year	3.86	269.91	270.10	270.10	270.10	0.000858	0.18	17.22	40.34	0.18		0.23	0.22	15.49
DF3	1	2660	Regional	17.19	269.07	269.83	269.83	270.01	0.011251	2.24	15.45	49.06	0.89	0.45	0.60	1.11	45.13
DF3	1	2660	100 Year	3.86	269.07	269.32	269.47	269.90	0.171707	3.40	1.22	9.91	2.76		0.57	3.17	15.05
DF3	1	2607.54	Regional	17.77	268.18	268.94	268.93	269.12	0.011879	2.29	15.23	41.40	0.92	0.58	0.64	1.17	44.32
DF3	1	2607.54	100 Year	3.80	268.18	268.61	268.59	268.69	0.011528	1.39	3.97	23.78	0.80	0.24	0.31	0.96	14.91
DF3	1	2562	Regional	17.77	267.72	268.38	268.36	268.55	0.012844	2.26	14.71	39.35	0.95	0.53	0.71	1.21	43.63
DF3	1	2562	100 Year	3.80	267.72	268.06	268.03	268.13	0.013038	1.34	4.34	24.81	0.83	0.22	0.39	0.88	14.72
DF3	1	2507.75	Regional	17.77	267.25	267.83	267.78	267.96	0.008595	1.72	15.34	45.65	0.76	0.41	0.46	1.16	42.80
DF3	1	2507.75	100 Year	3.80	267.25	267.54		267.59	0.007381	0.94	4.60	27.34	0.62	0.13	0.20	0.83	14.47
DF3	1	2465	Regional	17.77	266.70	267.34	267.34	267.52	0.012093	2.08	13.44	41.26	0.90	0.55	0.47	1.32	42.18
DF3	1	2465	100 Year	3.80	266.70	267.00	267.00	267.10	0.019234	1.40	2.98	17.41	0.97	0.29		1.27	14.31
DF3	1	2368.51		Culvert													
DF3	1	2368	Regional	17.77	265.32	266.35	266.35	266.69	0.013061	3.08	9.98	15.10	1.01	0.95	0.95	1.78	41.33
DF3	1	2368	100 Year	3.80	265.32	265.85	265.85	265.99	0.012586	1.81	3.10	12.06	0.88	0.42	0.42	1.22	14.02
DF3	1	2367	Regional	17.77	264.87	265.79	265.95	266.30	0.036002	3.65	8.98	32.87	1.54	0.53	0.89	1.98	41.17
DF3	1	2367	100 Year	3.80	264.87	265.53	265.58	265.71	0.022098	1.90	2.35	15.85	1.09	0.27	0.22	1.62	13.98
DF3	1	2351	Regional	17.77	264.15	265.56	265.61	265.91	0.013367	2.65	7.86	19.00	0.97	0.47	0.28	2.26	41.03
DF3	1	2351	100 Year	3.80	264.15	264.88	264.98	265.22	0.039558	2.57	1.48	4.50	1.43			2.57	13.94
DF3	1	2307.68	Regional	17.77	264.09	264.58	264.70	264.98	0.038811	3.09	8.36	27.62	1.55	0.81	1.07	2.13	40.68
DF3	1	2307.68	100 Year	3.80	264.09	264.42	264.39	264.49	0.012017	1.22	4.14	23.44	0.79	0.27	0.37	0.92	13.82
DF3	1	2262	Regional	17.77	263.22	264.04	264.04	264.26	0.014396	2.41	11.94	29.25	1.00	0.80	0.47	1.49	40.20
DF3	1	2262	100 Year	3.80	263.22	263.69	263.69	263.79	0.018037	1.51	3.33	18.79	0.96	0.39	0.03	1.14	13.65
DF3	1	2206.54	Regional	17.77	262.82	263.58	263.39	263.66	0.004685	1.54	19.73	37.56	0.59	0.49	0.53	0.90	39.32
DF3	1	2206.54	100 Year	3.80	262.82	263.21	263.11	263.24	0.003969	0.85	6.86	31.86	0.48	0.21	0.26	0.55	13.36
DF3	1	2148	Regional	17.77	262.38	262.91	262.75	263.13	0.022861	2.50	11.62	34.84	1.20	0.99	0.38	1.53	38.40
DF3	1	2148	100 Year	3.80	262.38	262.55	262.55	262.65	0.058543	1.63	3.01	17.59	1.54	1.10		1.26	13.07
DF3	1	2107.79	Regional	17.77	262.04	262.76	262.35	262.80	0.003217	1.17	26.23	38.75	0.48	0.61	0.37	0.68	37.64
DF3	1	2107.79	100 Year	3.80	262.04	262.35	262.35	262.36	0.001568	0.39	11.75	32.17	0.28	0.33	0.19	0.32	12.78
DF3	1	2089.36	Regional	17.77	261.64	262.60	262.41	262.70	0.007779	2.04	17.64	30.91	0.76	0.76	0.65	1.01	37.24
DF3	1	2089.36	100 Year	3.80	261.64	262.19	262.15	262.23	0.006769	1.12	6.43	25.51	0.62	0.37	0.47	0.59	12.61
DF3	1	2073.67	Regional	17.77	261.39	262.44	262.30	262.57	0.008704	1.89	14.02	27.79	0.77	0.79	0.46	1.27	36.99
DF3	1	2073.67	100 Year	3.80	261.39	262.08	261.99	262.12	0.007694	0.97	5.51	21.65	0.62	0.45	0.12	0.69	12.52
DF3	1	2052	Regional	23.96	261.41	262.21	262.21	262.41	0.010636	2.34	19.84	56.75	0.89	0.52	0.59	1.21	36.72
DF3	1	2052	100 Year	5.85	261.41	261.81	261.81	261.93	0.014999	1.61	4.96	25.69	0.92	0.38	0.29	1.18	12.43
DF3	1	2051	Regional	23.96	261.39	261.99	262.07	262.30	0.026419	3.08	15.30	46.39	1.33	0.93	0.54	1.57	36.61

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River	Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl	Vel Left	Vel Right	Vel Total	Volume
				(m3/s)	(m)	(m)	(m)	(m)	(m/m)	(m/s)	(m2)	(m)		(m/s)	(m/s)	(m/s)	(1000 m3)
DF3	1	2051	100 Year	5.85	261.39	261.66	261.67	261.80	0.034360	1.92	4.47	21.85	1.31	0.86		1.31	12.41
DF3	1	2007.66	Regional	23.96	260.37	261.63	261.00	261.66	0.001531	1.26	45.14	50.60	0.37	0.47	0.40	0.53	35.23
DF3	1	2007.66	100 Year	5.85	260.37	260.93	260.72	260.95	0.002850	0.94	13.83	36.84	0.43	0.35	0.32	0.42	11.99
DF3	1	1960	Regional	23.96	259.94	261.63		261.64	0.000197	0.56	83.75	73.97	0.14	0.20	0.16	0.29	32.16
DF3	1	1960	100 Year	5.85	259.94	260.93		260.93	0.000095	0.27	38.22	54.56	0.09	0.09	0.08	0.15	10.75
DF3	1	1907.68	Regional	23.96	260.01	261.58		261.61	0.000732	1.01	46.97	55.76	0.26	0.27	0.26	0.51	28.02
DF3	1	1907.68	100 Year	5.85	260.01	260.90		260.92	0.000511	0.57	16.23	35.67	0.20	0.15	0.11	0.36	9.03
DF3	1	1859	Regional	23.96	259.99	261.27	261.17	261.57	0.007169	2.74	15.99	27.97	0.79	0.62	0.54	1.50	27.78
DF3	1	1859	100 Year	5.85	259.99	260.85		260.90	0.002221	1.15	7.31	15.09	0.41	0.31	0.21	0.80	8.94
DF3	1	1809.68	Regional	23.96	260.23	261.15	261.15	261.44	0.014645	3.26	14.81	46.18	1.09	0.85	1.24	1.62	27.57
DF3	1	1809.68	100 Year	5.85	260.23	260.66	260.66	260.81	0.018156	2.18	4.98	16.78	1.07	0.59	0.72	1.17	8.86
DF3	1	1809.25		Culvert													
DF3	1	1808.68	Regional	23.96	259.00	260.14	260.14	260.52	0.014149	3.44	13.03	17.56	1.07	1.11	1.11	1.84	26.92
DF3	1	1808.68	100 Year	5.85	259.00	259.63	259.63	259.79	0.012600	2.07	4.80	14.47	0.91	0.56	0.56	1.22	8.58
DF3	1	1807.68	Regional	23.96	259.01	259.41	259.63	260.22	0.109601	4.67	8.49	33.35	2.53	1.49	0.97	2.82	26.86
DF3	1	1807.68	100 Year	5.85	259.01	259.24	259.34	259.59	0.104126	2.83	3.01	27.86	2.19	0.71	0.17	1.94	8.56
DF3	1	1746.68	Regional	23.96	258.29	259.19	258.92	259.25	0.005141	1.86	32.38	55.36	0.64	0.61	0.61	0.74	25.60
DF3	1	1746.68	100 Year	5.85	258.29	258.79	258.64	258.82	0.003989	1.09	12.96	42.22	0.51	0.33	0.37	0.45	8.07
DF3	1	1676.46	Regional	29.03	257.68	258.30	258.30	258.48	0.027815	3.41	22.19	54.13	1.40	1.14	1.10	1.31	23.70
DF3	1	1676.46	100 Year	8.10	257.68	258.03	258.03	258.13	0.028308	2.31	9.02	42.73	1.28	0.69	0.83	0.90	7.30
DF3	1	1613	Regional	29.03	256.38	257.36	257.24	257.49	0.006538	2.10	30.62	59.88	0.72	0.66	0.52	0.95	22.02
DF3	1	1613	100 Year	8.10	256.38	257.07	256.86	257.11	0.003181	1.11	14.79	47.60	0.47	0.30	0.25	0.55	6.55
DF3	1	1604	Regional	29.03	256.53	257.21	257.21	257.39	0.019041	2.73	24.18	63.01	1.15	0.90	0.83	1.20	21.78
DF3	1	1604	100 Year	8.10	256.53	256.96	256.96	257.05	0.017296	1.78	9.52	50.63	0.99	0.62	0.37	0.85	6.44
DF3	1	1535	Regional	29.03	254.39	256.27	256.06	256.43	0.004303	2.01	24.22	38.53	0.60	0.45	0.52	1.20	20.12
DF3	1	1535	100 Year	8.10	254.39	255.64	255.52	255.76	0.007028	1.53	5.86	18.60	0.67	0.19	0.18	1.38	5.91
DF3	1	1485.85	Regional	29.03	254.01	255.83	255.83	256.15	0.007031	3.04	21.15	35.19	0.78	0.57	0.74	1.37	19.03
DF3	1	1485.85	100 Year	8.10	254.01	255.13	255.04	255.38	0.008549	2.24	4.35	9.10	0.78	0.34	0.36	1.86	5.67
DF3	1	1437	Regional	29.03	253.76	255.01	255.20	255.60	0.017554	3.84	14.29	31.83	1.20	0.82	0.72	2.03	18.15
DF3	1	1437	100 Year	8.10	253.76	254.57	254.57	254.84	0.013287	2.33	3.96	11.33	0.95	0.29	0.36	2.05	5.46
DF3	1	1386.23	Regional	29.03	253.42	254.85	254.51	254.92	0.003458	2.01	37.70	47.71	0.55	0.64	0.56	0.77	16.85
DF3	1	1386.23	100 Year	8.10	253.42	254.29	254.12	254.35	0.003723	1.46	13.92	35.46	0.53	0.41	0.33	0.58	5.01
DF3	1	1329	Regional	30.05	253.25	254.63		254.71	0.003909	2.04	33.65	37.28	0.58	0.70	0.71	0.89	14.80
DF3	1	1329	100 Year	8.39	253.25	254.09		254.14	0.003489	1.33	14.69	34.05	0.50	0.40	0.39	0.57	4.19
DF3	1	1282.61	Regional	30.05	253.12	254.46		254.54	0.003977	2.00	34.58	39.57	0.58	0.69	0.70	0.87	13.31
DF3	1	1282.61	100 Year	8.39	253.12	253.93		253.98	0.003853	1.35	14.75	36.17	0.52	0.39	0.42	0.57	3.55
DF3	1	1225.5	Regional	30.05	253.01	254.37		254.41	0.002730	1.66	42.61	46.00	0.47	0.61	0.60	0.71	11.94
DF3	1	1225.5	100 Year	8.39	253.01	253.85		253.87	0.002236	1.06	19.67	42.59	0.39	0.34	0.34	0.43	2.94
DF3	1	1225	Regional	30.05	252.96	254.25	253.94	254.34	0.004695	2.14	32.58	39.21	0.63	0.77	0.69	0.92	11.26
DF3	1	1225	100 Year	8.39	252.96	253.77	253.61	253.81	0.004051	1.40	14.27	36.08	0.54	0.45	0.35	0.59	2.63
DF3	1	1180.6	Regional	30.05	252.87	253.91	253.84	254.13	0.013892	3.19	20.99	30.28	1.05	1.15	1.07	1.43	10.55
DF3	1	1180.6	100 Year	8.39	252.87	253.49	253.49	253.62	0.014703	2.22	8.64	28.28	0.98	0.69	0.58	0.97	2.32
DF3	1	1179.6	Regional	30.05	252.59	253.60	253.60	253.88	0.017749	3.52	19.11	30.20	1.18	1.22	1.14	1.57	10.24
DF3	1	1179.6	100 Year	8.39	252.59	253.22	253.24	253.38	0.016180	2.34	8.07	27.99	1.03	0.70	0.59	1.04	2.20
DF3	1	1179.37	Regional	30.05	252.41	253.35	253.41	253.68	0.024051	3.88	18.49	35.03	1.35	1.24	1.18	1.62	10.08
DF3	1	1179.37	100 Year	8.39	252.41	253.04	253.08	253.22	0.018397	2.50	8.06	32.29	1.09	0.68	0.56	1.04	2.13
DF3	1	1130	Regional	30.05	251.85	252.84	252.84	253.12	0.019939	3.67	18.49	29.25	1.24	1.15	1.37	1.62	9.59
DF3	1	1130	100 Year	8.39	251.85	252.41	252.47	252.62	0.026276	2.76	6.72	26.27	1.28	0.55	0.97	1.25	1.93
DF3	1	1076.25	Regional	30.05	250.94	251.81	251.86	252.15	0.026713	3.91	16.89	29.00	1.41	1.32	1.43	1.78	8.84
DF3	1	1076.25	100 Year	8.39	250.94	251.49	251.50	251.64	0.020005	2.38	7.85	26.98	1.12	0.66	0.80	1.07	1.62
DF3	1	1012.43	Regional	30.05	250.21	251.62	251.11	251.69	0.003429	1.98	34.30	33.42	0.55	0.71	0.74	0.88	7.98
DF3	1	1012.43	100 Year	8.39	250.21	250.74	250.77	250.90	0.024098	2.54	7.52	27.62	1.21	0.66	0.89	1.11	1.37
DF3	1	974	Regional	30.05	249.20	251.64	249.86	251.65	0.000203	0.71	103.95	80.92	0.15	0.28	0.24	0.29	4.74
DF3	1	974	100 Year	8.39	249.20	249.78	249.61	249.81	0.004722	1.21	16.03	40.97	0.55	0.44	0.46	0.52	0.81
DF3	1-DS-0-1	970.12	Regional	41.96	248.69	251.62	249.74	251.64	0.000243	0.87	120.03	85.56	0.16	0.30	0.31	0.35	24.06
DF3	1-DS-0-1	970.12	100 Year	11.47	248.69	249.65	249.39	249.68	0.002352	1.21	22.38	40.64	0.42	0.36	0.42	0.51	5.85
DF3	1-DS-0-1	955.53	Regional	41.96	248.30	251.62	249.46	251.63	0.000206	0.89	116.31	75.61	0.16	0.31	0.29	0.36	23.29
DF3	1-DS-0-1	955.53	100 Year	11.47	248.30	249.64	248.98	249.66	0.000754	0.90	25.55	31.56	0.26	0.33	0.35	0.45	5.68
DF3	1-DS-0-1	924.94		Culvert													
DF3	1-DS-0-1	895.09	Regional	41.96	248.46	250.13	250.13	250.34	0.004465	2.60	33.47	72.59	0.66	0.79	0.72	1.25	20.59
DF3	1-DS-0-1	895.09	100 Year	11.47	248.46	249.43	249.20	249.58	0.004942	1.87	8.23	11.42	0.63	0.55	0.56	1.39	4.18
DF3	1-DS-0-1	888.03	Regional	45.04	248.49	249.89	249.75	250.00	0.005177	2.37	47.62	87.81	0.67	0.81	0.74	0.95	20.28
DF3	1-DS-0-1	888.03	100 Year	12.44	248.49	249.43	249.33	249.51	0.005052	1.73	16.84	50.62	0.61	0.61	0.42	0.74	4.08
DF3	1-DS-0-1	799.85	Regional	45.04	247.91	249.09	249.09	249.33	0.018398	4.20	30.66	54.92	1.26	1.35	1.17	1.47	17.58
DF3	1-DS-0-1	799.85	100 Year	12.44	247.91	248.65	248.65	248.82	0.017978	3.01	11.71	33.18	1.15	0.89	0.70	1.06	3.06
DF3	1-DS-0-1	696.11	Regional	45.04	246.69	248.64	247.92	248.66	0.000859	1.22	97.02	85.58	0.29	0.44	0.35	0.46	12.73
DF3	1-DS-0-1	696.11	100 Year	12.44	246.69	247.59	247.60	247.73	0.009745	2.27	15.06	51.94	0.85	0.52	0.40	0.83	2.04

HEC-RAS Plan: SCE Future 2024-07-25-4766 Locations: User Defined (Continued)

River	Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl	Vel Left	Vel Right	Vel Total	Volume
				(m3/s)	(m)	(m)	(m)	(m)	(m/m)	(m/s)	(m2)	(m)		(m/s)	(m/s)	(m/s)	(1000 m3)
DF3	1-DS-0	598.11	Regional	43.62	246.01	248.62	247.04	248.62	0.000151	0.60	162.84	95.95	0.12	0.25	0.23	0.27	56.51
DF3	1-DS-0	598.11	100 Year	11.89	246.01	246.95	246.70	246.97	0.002296	1.13	26.61	59.65	0.39	0.36	0.26	0.45	18.17
DF3	1-DS-0	521.44	Regional	43.62	245.51	248.61		248.62	0.000088	0.57	197.64	96.21	0.10	0.20	0.21	0.22	47.67
DF3	1-DS-0	521.44	100 Year	11.89	245.51	246.91		246.92	0.000435	0.74	47.23	73.96	0.20	0.20	0.23	0.25	16.29
DF3	1-DS-0	516.73	Regional	43.62	245.49	248.61	247.40	248.62	0.000105	0.62	183.34	93.64	0.11	0.21	0.23	0.24	46.31
DF3	1-DS-0	516.73	100 Year	11.89	245.49	246.67	246.34	246.86	0.005145	2.27	7.81	37.76	0.67	0.98	0.92	1.52	16.04
DF3	1-DS-0	496.66		Culvert													
DF3	1-DS-0	474.78	Regional	43.62	245.05	247.23	247.23	248.15	0.011200	4.95	13.20	34.11	1.09	1.94	1.85	3.31	44.87
DF3	1-DS-0	474.78	100 Year	11.89	245.05	246.13	246.13	246.53	0.011982	3.14	5.57	13.88	1.00	1.08	0.96	2.14	15.76
DF3	1-DS-0	461.58	Regional	43.62	244.98	245.82	246.23	247.66	0.163814	9.72	12.89	33.64	3.52	2.50	2.55	3.38	44.54
DF3	1-DS-0	461.58	100 Year	11.89	244.98	245.64	245.80	246.20	0.055452	4.75	7.23	30.37	1.96	1.22	1.04	1.64	15.65
DF3	1-DS-0	399.37	Regional	43.62	244.59	245.53	245.53	245.53	0.000050	0.18	157.32	111.19	0.06	0.28	0.04	0.28	38.75
DF3	1-DS-0	399.37	100 Year	11.89	244.59	245.53	245.53	245.53	0.000004	0.05	157.32	111.18	0.02	0.08	0.01	0.08	9.99
DF3	1-DS-0	291.96	Regional	43.62	243.70	245.11	245.08	245.38	0.013446	4.09	30.46	44.13	1.11	1.15	1.22	1.43	31.08
DF3	1-DS-0	291.96	100 Year	11.89	243.70	244.32	244.60	245.42	0.089453	6.00	4.76	17.63	2.49	1.34	1.43	2.50	3.35
DF3	1-DS-0	200	Regional	43.62	242.97	244.46	244.46	244.67	0.011241	3.74	37.82	68.75	1.01	1.02	0.70	1.15	29.41
DF3	1-DS-0	200	100 Year	11.89	242.97	244.15	244.15	244.26	0.005819	2.28	18.09	58.18	0.70	0.46	0.37	0.66	2.77
DF3	1-DS-0	57.02	Regional	43.62	242.07	244.41	243.28	244.41	0.000135	0.57	224.95	166.30	0.12	0.22	0.17	0.19	18.29
DF3	1-DS-0	57.02	100 Year	11.89	242.07	242.92	243.04	243.18	0.016781	3.18	11.77	61.79	1.13	0.73	0.32	1.01	1.30
DF4	1	1044	Regional	1.81	264.72	265.16	264.94	265.17	0.000611	0.36	8.07	37.21	0.19	0.09	0.08	0.22	7.94
DF4	1	1044	100 Year	0.62	264.72	264.94	264.86	264.95	0.002431	0.38	1.77	15.59	0.32	0.08	0.02	0.35	2.98
DF4	1	1032	Regional	1.81	264.72	265.16	264.91	265.16	0.000540	0.35	6.59	39.15	0.18	0.14	0.14	0.27	7.83
DF4	1	1032	100 Year	0.62	264.72	264.92	264.84	264.93	0.001744	0.34	2.30	24.00	0.28	0.10	0.11	0.27	2.96
DF4	1	1014		Culvert													
DF4	1	983	Regional	1.81	263.92	264.21	264.29	264.46	0.094233	2.21	0.85	8.74	1.97	0.42		2.14	7.72
DF4	1	983	100 Year	0.62	263.92	264.24	264.18	264.26	0.006485	0.63	1.03	10.77	0.53	0.15	0.03	0.60	2.92
DF4	1	934	Regional	1.81	263.85	264.24	264.13	264.26	0.003138	0.67	4.03	24.09	0.41	0.16	0.17	0.45	7.65
DF4	1	934	100 Year	0.62	263.85	264.12		264.13	0.002942	0.45	1.69	16.08	0.36	0.10	0.09	0.37	2.88
DF4	1	933	Regional	1.81	263.75	264.11	264.07	264.15	0.008820	0.93	2.46	17.80	0.66	0.11	0.22	0.74	7.58
DF4	1	933	100 Year	0.62	263.75	264.03	263.97	264.04	0.006231	0.58	1.18	11.78	0.51		0.10	0.53	2.85
DF4	1	849	Regional	1.81	263.50	263.79	263.74	263.82	0.008025	0.94	2.88	19.80	0.64	0.14	0.28	0.63	7.47
DF4	1	849	100 Year	0.62	263.50	263.67	263.65	263.70	0.013484	0.76	1.03	12.48	0.73		0.20	0.60	2.80
DF4	1	848	Regional	1.81	263.07	263.54		263.57	0.003782	0.87	3.04	14.73	0.47	0.20	0.19	0.60	7.34
DF4	1	848	100 Year	0.62	263.07	263.39		263.41	0.003563	0.58	1.24	8.91	0.42	0.14	0.09	0.50	2.75
DF4	1	822	Regional	1.81	263.00	263.31	263.30	263.40	0.014612	1.35	1.80	11.53	0.87	0.24	0.34	1.00	7.27
DF4	1	822	100 Year	0.62	263.00	263.21		263.25	0.012077	0.85	0.83	7.45	0.72	0.14	0.20	0.75	2.72
DF4	1	815	Regional	1.81	262.99	263.31		263.34	0.003185	0.68	3.35	17.93	0.42	0.16	0.13	0.54	7.25
DF4	1	815	100 Year	0.62	262.99	263.19		263.20	0.003143	0.45	1.47	12.07	0.37	0.09	0.04	0.42	2.71
DF4	1	797	Regional	1.81	262.74	263.16	263.16	263.23	0.011465	1.42	2.76	21.86	0.80	0.32	0.19	0.66	7.20
DF4	1	797	100 Year	0.62	262.74	263.03	263.03	263.09	0.014811	1.14	0.72	7.99	0.84	0.18	0.14	0.86	2.69
DF4	1	785	Regional	1.81	262.22	262.31	262.39	262.74	0.937108	4.11	0.78	13.13	5.46	1.85		2.33	7.18
DF4	1	785	100 Year	0.62	262.22	262.27	262.32	262.49	1.067741	2.90	0.36	10.79	5.25	1.40		1.71	2.69
DF4	1	751	Regional	1.81	261.55	261.78	261.78	261.84	0.018435	1.17	2.09	19.76	0.92	0.29	0.25	0.87	7.13
DF4	1	751	100 Year	0.62	261.55	261.70	261.70	261.74	0.024369	0.86	0.79	12.17	0.94	0.19	0.12	0.78	2.67
DF4	1	728	Regional	1.81	261.30	261.59	261.51	261.62	0.005644	0.74	3.21	19.14	0.53	0.15	0.28	0.56	7.07
DF4	1	728	100 Year	0.62	261.30	261.50	261.44	261.51	0.005176	0.47	1.60	14.67	0.45	0.06	0.24	0.39	2.64
DF4	1	665	Regional	1.81	260.65	260.93	260.93	260.99	0.020803	1.17	1.85	16.65	0.96	0.24	0.29	0.98	6.91
DF4	1	665	100 Year	0.62	260.65	260.84	260.84	260.88	0.025127	0.90	0.71	9.18	0.96	0.05	0.16	0.87	2.57
DF4	1	649	Regional	7.57	260.60	260.74	260.65	260.76	0.009358	0.52	12.73	48.38	0.58	0.64	0.35	0.59	6.78
DF4	1	649	100 Year	2.52	260.60	260.65	260.65	260.65	0.001985	0.11	8.79	32.17	0.22	0.31	0.12	0.29	2.48
DF4	1	550	Regional	7.57	259.04	259.42	259.42	259.55	0.016470	1.76	6.70	29.54	0.97	0.52	0.38	1.13	5.82
DF4	1	550	100 Year	2.52	259.04	259.16	259.27	259.88	0.631896	3.78	0.71	12.66	4.63	0.63		3.57	2.01
DF4	1	416	Regional	12.74	256.39	257.03	257.07	257.30	0.016849	2.39	7.02	20.76	1.06	0.54	0.54	1.81	4.90
DF4	1	416	100 Year	4.24	256.39	256.79	256.79	256.92	0.017442	1.60	2.89	13.62	0.97	0.31	0.27	1.47	1.77
DF4	1	343.3	Regional	12.74	255.81	256.28	255.86	256.30	0.003641	0.93	23.55	52.88	0.47	0.23	0.50	0.54	3.83
DF4	1	343.3	100 Year	4.24	255.81	255.92	255.86	255.92	0.003470	0.23	9.86	27.46	0.33		0.44	0.43	1.33
DF4	1	256	Regional	12.74	254.76	255.44	255.44	255.63	0.024831	3.41	10.39	27.09	1.33	1.01	1.01	1.23	2.35
DF4	1	256	100 Year	4.24	254.76	255.18	255.18	255.29	0.023012	2.37	4.57	18.50	1.18	0.69	0.74	0.93	0.70
DF4	1	41	Regional	12.74	249.79	251.61	251.05	251.69	0.001770	1.30	11.98	20.94	0.38	0.17	0.23	1.06	
DF4	1	41	100 Year	4.24	249.79	250.62	250.63	250.83	0.019054	2.04	2.08	5.32	1.04			2.04	
DF2	1	899	Regional	2.54	248.89	249.04	249.04	249.10	0.017343	1.09	2.55	23.65	0.99	0.38	0.43	0.99	1.93
DF2	1	899	100 Year	1.07	248.89	249.03	248.98	249.04	0.004452	0.51	2.26	23.07	0.49	0.17	0.20	0.47	0.20
DF2	1	842	Regional	2.54	248.40	248.90	248.57	248.90	0.000145	0.20	21.02	74.70	0.10	0.06	0.05	0.12	1.26
DF2	1	842	100 Year	1.07	248.40	248.52	248.51	248.55	0.023398	0.77	1.55	24.08	0.90	0.21		0.69	0.10
DF2	1	820	Regional	2.54	247.96	248.90		248.90	0.000046	0.16	30.42	83.97	0.06	0.04	0.02	0.08	0.69
DF2	1	820	100 Year	1.07	247.96	248.18		248.21	0.010615	0.79	1.35	9.68	0.68			0.79	0.06

HEC-RAS Plan: SCE Future 2024-07-25-4766 Locations: User Defined (Continued)

River	Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl	Vel Left	Vel Right	Vel Total	Volume
				(m3/s)	(m)	(m)	(m)	(m)	(m/m)	(m/s)	(m2)	(m)		(m/s)	(m/s)	(m/s)	(1000 m3)
DF2	1	809	Regional	2.54	247.64	248.90	248.08	248.90	0.000074	0.22	20.95	68.52	0.08	0.04	0.02	0.12	0.40
DF2	1	809	100 Year	1.07	247.64	247.95	247.95	248.03	0.022053	1.27	0.84	5.07	1.00			1.27	0.05
DF2	1	791		Culvert													
DF2	1	773	Regional	2.54	246.95	248.60	247.71	248.64	0.000899	0.90	2.98	92.62	0.24		0.34	0.85	0.19
DF2	1	773	100 Year	1.07	246.95	247.85	247.42	247.89	0.002041	0.82	1.33	4.52	0.32		0.13	0.81	0.01
DF2	1	769	Regional	2.54	247.64	248.62		248.62	0.000018	0.12	64.28	118.92	0.04	0.03	0.04	0.04	
DF2	1	769	100 Year	1.07	247.64	247.83	247.83	247.87	0.022501	1.12	1.99	23.98	0.98	0.33	0.31	0.54	

Jul-24

Table: Existing and Proposed Conditions Detailed Comparison Table Corresponding to the Channel Bed Level, Regulatory Water Level, and Velocity

Existing									Proposed								Difference (Proposed - Existing)						
River	Reach	River Sta	Min Ch El (m)	W.S. Elev Regional	Vel Chnl (m/s)	Vel Left (m/s)	Vel Right (m/s)	Vel Total (m/s)	River	River Sta	Min Ch El (m)	W.S. Elev (m) Regional	Vel Chnl (m/s)	Vel Left (m/s)	Vel Right (m/s)	Vel Total (m/s)	River Sta	Min Ch El (m)	W.S. Elev (m) Regional	Vel Chnl (m/s)	Vel Left (m/s)	Vel Right (m/s)	Vel Total (m/s)
DF1	Reach20	3479	272.48	273.33	3.06	0.74	0.85	1.16	DF1	3479	272.48	273.33	3.06	0.74	0.85	1.16	0	0	0	0	0	0	0
DF1	Reach20	3428.83	272.06	272.81	0.37	0.34	0.2	0.33	DF1	3428.83	272.06	272.81	0.81	0.32	0.2	0.33	0	0	0	0.44	-0.02	0	0
DF1	Reach20	3330.15	271.38	272.79	0.46	0.15	0.1	0.14	DF1	3330.15	271.38	272.79	0.46	0.15	0.1	0.14	0	0	0	0	0	0	0
DF1	Reach20	3322.69	271.32	272.78	0.48	0.14	0.1	0.14	DF1	3322.69	271.32	272.79	0.47	0.14	0.11	0.15	0	0	0.01	-0.01	0	0.01	0.01
DF1	Reach20	3307.12							DF1	3307.12	Culvert (Existing Culvert at Kirby rd)												
DF1	Reach20	3289.02	270.49	271.32	1.67	0.42	0.45	0.68	DF1	3289.02	270.49	271.32	1.69	0.42	0.45	0.68	0	0	0	0.02	0	0	0
DF1	Reach20	3279.33	270.39	271.17	1.13	0.79	0.64	0.82	DF1	3279.33	270.39	271.14	1.13	0.77	0.65	0.82	0	0	-0.03	0	-0.02	0.01	0
DF1	Reach20	3228.83	269.86	270.59	1.96	0.51	0.72	1.04	DF1	3228.83	269.86	270.56	1.85	0.47	0.69	0.99	0	0	-0.03	-0.11	-0.04	-0.03	-0.05
DF1	Reach20	3130.4	269.08	269.85	1.86	0.58	0.66	1.07	DF1	3130.4	269.08	269.79	1.85	0.58	0.66	1.08	0	0	-0.06	-0.01	0	0	0.01
DF1	Reach20	3084	268.72	269.31	2.49	0.86	0.75	1.22	DF1	3084	268.72	269.32	2.18	0.75	0.66	1.07	0	0	0.01	-0.31	-0.11	-0.09	-0.15
DF1	Reach20	3028.87	267.8	268.85	1.52	0.41	0.51	0.74	DF1	3050	268	269.2	1.43	0.33	0.36	0.75	21.13	N/A	N/A	N/A	N/A	N/A	N/A
DF1	Reach20	2965.4	268	268.39	2.23	0.63	0.9	1.42	DF1	2829.44	268	269.17	0.91	0.36	0.4	0.53	-135.96	N/A	N/A	N/A	N/A	N/A	N/A
		N/A	N/A	N/A	N/A	N/A	N/A	N/A	DF1	2828.99	Culvert A												
DF1	Reach20	2928.83	266.9	267.87	1.88	0.57	0.5	0.72	DF1	2828.61	267.4	268.21	2.77	1.08	0.88	1.78	-100.22	N/A	N/A	N/A	N/A	N/A	N/A
		N/A	N/A	N/A	N/A	N/A	N/A	N/A	DF1	2828.51	266.9	267.84	1.46	0.45	0.38	0.69	N/A	N/A	N/A	N/A	N/A	N/A	N/A
DF1	Reach20	2827.51	266.14	266.85	3.02	1.09	0.83	1.34	DF1	2827.51	266.14	266.89	3.2	1.16	0.88	1.41	0	0	0.04	0.18	0.07	0.05	0.07
DF1	Reach20	2728.83	265	266.03	1.66	0.38	0.48	1.02	DF1	2728.83	265	266.07	1.81	0.42	0.52	1.1	0	0	0.04	0.15	0.04	0.04	0.08
DF1	Reach20	2628.8	264.56	265.71	1.86	0.51	0.57	0.65	DF1	2628.8	264.56	265.73	1.89	0.52	0.58	0.66	0	0	0.02	0.03	0.01	0.01	0.01
DF1	Reach20	2525.58	264.43	264.86	2.17	0.77	0.7	1.34	DF1	2525.58	264.43	264.87	2.2	0.78	0.71	1.35	0	0	0.01	0.03	0.01	0.01	0.01
DF1	Reach20	2466	263.47	264.16	1.58	0.42	0.34	1.29	DF1	2466	263.47	264.18	1.59	0.42	0.34	1.29	0	0	0.02	0.01	0	0	0
DF1	Reach20	2428.87	262.99	263.74	2.48	0.72	0.62	1.5	DF1	2428.87	262.99	264.04	1.68	0.49	0.44	0.93	0	0	0.3	-0.8	-0.23	-0.18	-0.57
		N/A	N/A	N/A	N/A	N/A	N/A	N/A	DF1	2340	262.76	264.02	0.99	0.3	0.26	0.47	N/A	N/A	N/A	N/A	N/A	N/A	N/A
		N/A	N/A	N/A	N/A	N/A	N/A	N/A	DF1	2328	262.69	264	0.94	0.41	0.36	0.61	N/A	N/A	N/A	N/A	N/A	N/A	N/A
		N/A	N/A	N/A	N/A	N/A	N/A	N/A	DF1	2299.11	Culvert B												
		N/A	N/A	N/A	N/A	N/A	N/A	N/A	DF1	2260	262.05	262.83	1.73	0.6	0	1.33	N/A	N/A	N/A	N/A	N/A	N/A	N/A
DF1	Reach20	2328.83	262.41	263.03	1.58	0.48	0.51	1.02	DF1	2259	261.74	262.46	1.71	0.42	0.55	1.1	-69.83	N/A	N/A	N/A	N/A	N/A	N/A
DF1	Reach20	2228.89	261.72	262.42	1.73	0.39	0.63	0.97	DF1	2228	261.64	262.36	1.81	0.45	0.71	1.04	-0.89	N/A	N/A	N/A	N/A	N/A	N/A
DF1	Reach20	2129.24	261	261.61	2.01	0.47	0.52	1.6	DF1	2129.24	261	261.62	2.06	0.48	0.53	1.62	0	0	0.01	0.05	0.01	0.01	0.02
DF1	Reach20	2056.16	260.38	260.99	1.86	0.75	0.46	1.19	DF1	2056.16	260.38	261.01	1.88	0.75	0.47	1.2	0	0	0.02	0.02	0	0.01	0.01
DF1	Reach20	1990.35	259.98	260.44	1.53	0.52	0.64	0.88	DF1	1990.35	259.98	260.47	1.58	0.54	0.66	0.91	0	0	0.03	0.05	0.02	0.02	0.03
DF1	Reach20	1915.13	259.06	259.5	1.98	0.37	0.73	1.46	DF1	1915.13	259.06	259.52	2.05	0.39	0.76	1.5	0	0	0.02	0.07	0.02	0.03	0.04
DF1	Reach20	1889	258.64	259.11	1.91	0.43	0.78	1.27	DF1	1889	258.64	259.14	1.97	0.45	0.81	1.31	0	0	0.03	0.06	0.02	0.03	0.04
DF1	Reach20	1815.13	257.37	258.08	2.29	0.44	0.37	2.08	DF1	1815.13	257.37	258.11	2.36	0.46	0.4	2.12	0	0	0.03	0.07	0.02	0.03	0.04
DF1	Reach20	1715.05	256.51	257.53	1.32	0.33	0.34	1.14	DF1	1715.05	256.51	257.69	1.22	0.31	0.32	1.02	0	0	0.16	-0.1	-0.02	-0.02	-0.12
DF1	Reach20	1666	256.16	257.14	2.7	0.8	0.76	1.4	DF1	1668	256.3	257.61	1.71	0.64	0.49	0.9	2	0.14	0.47	-0.99	-0.16	-0.27	-0.5
		N/A	N/A	N/A	N/A	N/A	N/A	N/A	DF1	1650	Culvert C												
		N/A	N/A	N/A	N/A	N/A	N/A	N/A	DF1	1630.19	256.11	257.39	1.4	0.57	0.61	0.96	N/A	N/A	N/A	N/A	N/A	N/A	N/A
DF1	Reach20	1615.13	256.01	256.57	2.01	0.42	0.44	1.82	DF1	1615	256	256.9	3.2	0	1.37	2.48	-0.13	N/A	N/A	N/A	N/A	N/A	N/A
DF1	Reach20	1514.84	254.99	256.11	1.31	0.45	0.41	0.55	DF1	1514.84	254.99	256.24	1.36	0.47	0.43	0.57	0	0	0.13	0.05	0.02	0.02	0.02
DF1	Reach20	1460.2	254.2	256.06	1.15	0.32	0.26	0.46	DF1	1460.2	254.2	256.19	1.24	0.35	0.28	0.49	0	0	0.13	0.09	0.03	0.02	0.03
DF1	Reach20	1405.39	253.02	256.06	0.58	0.15	0.17	0.27	DF1	1405.39	253.02	256.19	0.66	0.17	0.19	0.3	0	0	0.13	0.08	0.02	0.02	0.03
DF1	Reach20	1401.29	253.04	256.06	0.59	0.15	0.15	0.29	DF1	1401.29	253.04	256.19	0.69	0.16	0.18	0.32	0	0	0.13	0.1	0.01	0.03	0.03
DF1	Reach20	1396							DF1	1396	Culvert (Existing Culvert)												
DF1	Reach20	1387.43	253.76	256.01	0.67	0.18	0.18	0.3	DF1	1387.43	253.76	256.15	0.73	0.19	0.2	0.32	0	0	0.14	0.06	0.01	0.02	0.02
DF1	Reach20	1381.53	253.85	256.01	0.56	0.15	0.15	0.24	DF1	1381.53	253.85	256.15	0.61	0.17	0.17	0.26	0	0	0.14	0.05	0.02	0.02	0.02
DF1	Reach20	1375.67	253.77	256.01	0.62	0.16	0.17	0.23	DF1	1375.67	253.77	256.15	0.67	0.18	0.19	0.25	0	0	0.14	0.05	0.02	0.02	0.02
DF1	Reach20	1370.57	253.6	255.98	1.2	0.26	0.32	0.41	DF1	1370.57	253.6	256.13	1.17	0.27	0.33	0.4	0	0	0.15	-0.03	0.01	0.01	-0.01
DF1	Reach20	1368							DF1	1368	Culvert (Existing Culvert)												

Existing									Proposed								Difference (Proposed - Existing)						
River	Reach	River Sta	Min Ch El (m)	W.S. Elev Regional	Vel Chnl (m/s)	Vel Left (m/s)	Vel Right (m/s)	Vel Total (m/s)	River	River Sta	Min Ch El (m)	W.S. Elev (m) Regional	Vel Chnl (m/s)	Vel Left (m/s)	Vel Right (m/s)	Vel Total (m/s)	River Sta	Min Ch El (m)	W.S. Elev (m) Regional	Vel Chnl (m/s)	Vel Left (m/s)	Vel Right (m/s)	Vel Total (m/s)
DF1	Reach20	1362.11	253.72	255.18	3.66	0	0	3.66	DF1	1362.11	253.72	255.36	3.92	0	0	3.92	0	0	0.18	0.26	0	0	0.26
DF1	Reach20	1358.51	253.81	254.08	7.08	0	3.56	4.49	DF1	1358.51	253.81	254.1	7.95	0	4.04	5.09	0	0	0.02	0.87	0	0.48	0.6
DF1	Reach20	1357.51	253.76	254.56	1.87	0.38	0.71	0.92	DF1	1357.51	253.76	254.66	1.95	0.41	0.72	0.93	0	0	0.1	0.08	0.03	0.01	0.01
DF1	Reach20	1312.67	253.53	254.38	1.55	0.51	0.41	0.94	DF1	1312.67	253.53	254.49	1.63	0.53	0.41	0.95	0	0	0.11	0.08	0.02	0	0.01
DF1	Reach20	1311.67	253.4	254.36	1.62	0.58	0.4	0.91	DF1	1311.67	253.4	254.47	1.7	0.62	0.43	0.94	0	0	0.11	0.08	0.04	0.03	0.03
DF1	Reach20	1251.58	252.86	254.32	1.02	0.35	0.25	0.53	DF1	1251.58	252.86	254.43	1.12	0.38	0.28	0.58	0	0	0.11	0.1	0.03	0.03	0.05
DF1	Reach20	1245.37	252.36	254.26	1.65	0.4	0.37	0.62	DF1	1245.37	252.36	254.37	1.76	0.44	0.41	0.66	0	0	0.11	0.11	0.04	0.04	0.04
DF1	Reach20	1240.48	253.01	254.28	1.31	0.37	0.48	0.54	DF1	1240.48	253.01	254.39	1.41	0.4	0.51	0.58	0	0	0.11	0.1	0.03	0.03	0.04
DF1	Reach20	1231.82	252.44	253.97	2.56	0.56	0.33	1.58	DF1	1231.82	252.44	254.07	2.64	0.59	0.42	1.51	0	0	0.1	0.08	0.03	0.09	-0.07
DF1	Reach20	1220.38	252	252.78	4.98	1.05	0.93	3.85	DF1	1220.38	252	252.88	5.1	1.14	1.02	3.74	0	0	0.1	0.12	0.09	0.09	-0.11
DF1	Reach20	1159	251	252.71	2.54	0.46	0.2	1.75	DF1	1159	251	252.86	2.69	0.54	0.29	1.66	0	0	0.15	0.15	0.08	0.09	-0.09
DF1	Reach20	1115.08	250.33	252.05	3.36	0.55	0.8	2.4	DF1	1115.08	250.33	252.2	3.55	0.67	0.86	2.36	0	0	0.15	0.19	0.12	0.06	-0.04
DF1	Reach20	1071	249.54	250.61	4.61	0.29	0	4.6	DF1	1071	249.54	250.72	4.85	0.51	0.33	4.8	0	0	0.11	0.24	0.22	0.33	0.2
DF1	Reach20	1036	249.38	250.99	2.55	0.48	0.43	1.5	DF1	1036	249.38	251.08	2.73	0.57	0.52	1.52	0	0	0.09	0.18	0.09	0.09	0.02
DF1	Reach20	1015.6	249.4	250.7	2.83	0.4	0.44	2.07	DF1	1015.6	249.4	250.84	2.88	0.53	0.55	1.92	0	0	0.14	0.05	0.13	0.11	-0.15
DF1	Reach20	963	248.83	250.15	3.12	0.51	0.68	1.99	DF1	963	248.83	250.28	3.31	0.45	0.78	1.86	0	0	0.13	0.19	-0.06	0.1	-0.13
DF1	Reach20	900.79	247.87	249.26	3.35	0	0	3.35	DF1	900.79	247.87	249.47	3.3	0.26	0	3.14	0	0	0.21	-0.05	0.26	0	-0.21
DF1	Reach20	818.58	247.25	248.71	2.09	0	0.38	1.68	DF1	818.58	247.25	248.8	2.32	0.05	0.46	1.8	0	0	0.09	0.23	0.05	0.08	0.12
DF1	Reach20	761.32	247	248.64	1.42	0.19	0.33	0.95	DF1	761.32	247	248.73	1.59	0.23	0.39	1.03	0	0	0.09	0.17	0.04	0.06	0.08
DF1	Reach20	698.09	246.56	248.62	0.99	0.3	0.19	0.5	DF1	698.09	246.56	248.7	1.15	0.33	0.23	0.56	0	0	0.08	0.16	0.03	0.04	0.06
DF1	Reach20	650.88	246.25	248.59	1	0.25	0.26	0.42	DF1	650.88	246.25	248.67	1.13	0.3	0.31	0.47	0	0	0.08	0.13	0.05	0.05	0.05
DF1	Reach20	600.38	246.16	248.59	0.71	0.2	0.21	0.24	DF1	600.38	246.16	248.67	0.81	0.23	0.25	0.28	0	0	0.08	0.1	0.03	0.04	0.04
DF1	Reach20	531.76	245.75	248.59	0.54	0.16	0.13	0.18	DF1	531.76	245.75	248.67	0.64	0.19	0.15	0.21	0	0	0.08	0.1	0.03	0.02	0.03
DF1	Reach20	525.59	245.8	248.59	0.55	0.16	0.13	0.2	DF1	525.59	245.8	248.66	0.64	0.19	0.15	0.23	0	0	0.07	0.09	0.03	0.02	0.03
DF1	Reach20	491.96							DF1	491.96	Culvert (Existing Culvert at Teston Rd)												
DF1	Reach20	463.91	245.41	246.99	3.64	1.11	1.07	1.81	DF1	463.91	245.41	247.12	3.93	1.25	1.21	1.96	0	0	0.13	0.29	0.14	0.14	0.15
DF1	Reach20	447.81	245.29	246.63	4.07	1.31	1.44	2.02	DF1	447.81	245.29	246.67	4.64	1.45	1.65	2.22	0	0	0.04	0.57	0.14	0.21	0.2
DF1	Reach20	400.02	244.44	246.32	2.09	0.41	0.71	0.7	DF1	400.02	244.44	246.41	2.21	0.45	0.76	0.73	0	0	0.09	0.12	0.04	0.05	0.03
DF1	Reach20	360.18	244.51	246.1	2.8	0.51	0.75	0.85	DF1	360.18	244.51	246.15	3.14	0.6	0.86	0.95	0	0	0.05	0.34	0.09	0.11	0.1
DF1	Reach20	300.02	244.06	244.93	5.14	1.13	1.37	1.69	DF1	300.02	244.06	245	5.12	1.22	1.37	1.7	0	0	0.07	-0.02	0.09	0	0.01
DF1	Reach20	234.9	243.92	244.48	1.01	0.44	0.47	0.47	DF1	234.9	243.92	244.51	1.17	0.51	0.54	0.54	0	0	0.03	0.16	0.07	0.07	0.07
DF1	Reach20	156.62	243.28	244.42	0.75	0.2	0.27	0.26	DF1	156.62	243.28	244.42	0.92	0.24	0.34	0.32	0	0	0	0.17	0.04	0.07	0.06
DF1	Reach20	83.97	242.47	244.41	0.37	0.12	0.14	0.13	DF1	83.97	242.47	244.41	0.46	0.14	0.17	0.16	0	0	0	0.09	0.02	0.03	0.03
DF3	1	3547.76	284.66	285.19	1.87	0.61	0.59	1.59	DF3	3547.76	284.66	285.19	1.92	0.43	0.41	1.59	0	0	0	0.05	-0.18	-0.18	0
DF3	1	3480.67	281.98	282.24	4.02	0.78	0.51	3.76	DF3	3480.67	281.98	282.26	3.64	0.73	0.49	3.32	0	0	0.02	-0.38	-0.05	-0.02	-0.44
DF3	1	3415.5	280.24	281.61	1.36	0.25	0.22	1	DF3	3400	280	281.8	0.09	0.05	0.04	0.05	-15.5	N/A	N/A	N/A	N/A	N/A	N/A
					0.21	0.06	0.07	0.13	DF3	3370	279.99	281.8	0.09	0.05	0.03	0.05	3370	N/A	N/A	N/A	N/A	N/A	N/A
DF3	1	3333.59	279.6	281.66						3333.59	279.67	281.8	0.25	0.08	0.09	0.12	0	0.07	0.14				
DF3	1	3252.06	278.72	281.66	0.14	0.04	0.05	0.09	DF3											N/A	N/A	N/A	N/A
		N/A	N/A	N/A	N/A	N/A	N/A	N/A	DF3	3253	278.82	281.79	0.33	0	0.14	0.31	N/A	N/A	N/A	N/A	N/A	N/A	N/A
		N/A	N/A	N/A	N/A	N/A	N/A	N/A	DF3	3230	Culvert D												
DF3	1	3205.22	277.52	281.66	0.16	0.05	0.05	0.08	DF3	3205.22	277.53	281.67	0.2	0.06	0.06	0.08	0	0.01	0.01	0.04	0.01	0.01	0
DF3	1	3197.43	277.8	281.65	0.39	0.16	0	0.36	DF3	3197.43	277.8	281.66	0.38	0.16	0	0.36	0	0	0.01	-0.01	0	0	0
DF3	1	3179.2	Culvert						DF3	3179.2	Existing Culvert @ CPR Railway												
DF3	1	3161.25	276.48	278.26	1.51	0.21	0.39	1.44	DF3	3161.25	276.48	278.31	1.45	0.22	0.38	1.37	0	0	0.05	-0.06	0.01	-0.01	-0.07
DF3	1	3147.49	277.2	278.17	2.03	0.91	0.7	1.21	DF3	3147.49	277.2	278.21	2.04	0.93	0.72	1.21	0	0	0.04	0.01	0.02	0.02	0
DF3	1	3112.66	276.98	277.75	2.11	0.57	0.62	1.33	DF3	3112.66	276.98	277.78	2.2	0.6	0.65	1.38	0	0	0.03	0.09	0.03	0.03	0.05
DF3	1	3073	276.84	277.47	1.75	0.52	0.61	0.9	DF3	3073	276.84	277.5	1.79	0.54	0.62	0.92	0	0	0.03	0.04	0.02	0.01	0.02
DF3	1	3012.6	276.26	276.69	2.41	0.52	0.93	1.38	DF3	3012.6	276.26	276.7	2.49	0.54	0.95	1.42	0	0	0.01	0.08	0.02	0.02	0.04
DF3	1	2974	275.37	276.07	1.96	0.45	0.27	1.49	DF3	2974	275.37	276.09	2	0.47	0.29	1.48	0	0	0.02	0.04	0.02	0.02	-0.01

Existing									Proposed								Difference (Proposed - Existing)						
River	Reach	River Sta	Min Ch El (m)	W.S. Elev Regional	Vel Chnl (m/s)	Vel Left (m/s)	Vel Right (m/s)	Vel Total (m/s)	River	River Sta	Min Ch El (m)	W.S. Elev (m) Regional	Vel Chnl (m/s)	Vel Left (m/s)	Vel Right (m/s)	Vel Total (m/s)	River Sta	Min Ch El (m)	W.S. Elev (m) Regional	Vel Chnl (m/s)	Vel Left (m/s)	Vel Right (m/s)	Vel Total (m/s)
DF3	1	2906.79	273.84	274.29	3.35	0.78	0.87	2.43	DF3	2906.79	273.83	274.29	3.35	0.86	0.65	2.56	0	-0.01	0	0	0.08	-0.22	0.13
DF3	1	2866	272.97	273.64	1.48	0.43	0.47	0.89	DF3	2866	272.98	273.73	1.38	0.41	0.45	0.81	0	0.01	0.09	-0.1	-0.02	-0.02	-0.08
DF3	1	2807.68	272.78	273.37	2.23	0.61	0.63	1.36	DF3	2849	272.78	273.39	2.37	0.71	0.61	1.39	41.32	N/A	N/A	N/A	N/A	N/A	N/A
DF3	1	2773	271.07	271.59	1.64	0.57	0.45	0.82	DF3	2773	271.07	271.42	3	1.02	0.71	1.58	0	0	-0.17	1.36	0.45	0.26	0.76
DF3	1	2707.68	269.99	270.77	2.28	0.68	0.55	0.96	DF3	2707.68	269.91	270.27	0.63	0.42	0.5	0.48	0	-0.08	-0.5	-1.65	-0.26	-0.05	-0.48
DF3	1	2660	269.07	269.85	2.32	0.55	0.6	1.28	DF3	2660	269.07	269.83	2.24	0.45	0.6	1.11	0	0	-0.02	-0.08	-0.1	0	-0.17
DF3	1	2607.54	268.22	269.02	2.38	0.66	0.58	1.29	DF3	2607.54	268.18	268.94	2.29	0.58	0.64	1.17	0	-0.04	-0.08	-0.09	-0.08	0.06	-0.12
DF3	1	2562	267.75	268.46	2.31	0.59	0.62	1.21	DF3	2562	267.72	268.38	2.26	0.53	0.71	1.21	0	-0.03	-0.08	-0.05	-0.06	0.09	0
DF3	1	2507.75	267.25	267.87	1.62	0.4	0.44	1.07	DF3	2507.75	267.25	267.83	1.72	0.41	0.46	1.16	0	0	-0.04	0.1	0.01	0.02	0.09
DF3	1	2460	266.7	267.39	2.28	0.6	0.65	1.23	DF3	2465	266.7	267.34	2.08	0.55	0.47	1.32	5	N/A	N/A	N/A	N/A	N/A	N/A
		N/A	N/A	N/A	N/A	N/A	N/A	N/A	DF3	2368.51	Culvert E												
DF3	1	2413.07	264.87	266.06	2.66	0.55	0.71	1.39	DF3	2368	265.32	266.35	3.08	0.95	0.95	1.78	-45.07	N/A	N/A	N/A	N/A	N/A	N/A
DF3	1	2379	264.11	265.39	3.46	0.41	0.45	3.28	DF3	2367	264.87	265.79	3.65	0.53	0.89	1.98	-12	N/A	N/A	N/A	N/A	N/A	N/A
		N/A	N/A	N/A	N/A	N/A	N/A	N/A	DF3	2351	264.15	265.56	2.65	0.47	0.28	2.26	N/A	N/A	N/A	N/A	N/A	N/A	N/A
DF3	1	2307.68	264.09	264.76	2.4	0.59	0.62	1.66	DF3	2307.68	264.09	264.58	3.09	0.81	1.07	2.13	0	0	-0.18	0.69	0.22	0.45	0.47
DF3	1	2262	263.22	264.17	2.49	0.59	0.55	1.58	DF3	2262	263.22	264.04	2.41	0.8	0.47	1.49	0	0	-0.13	-0.08	0.21	-0.08	-0.09
DF3	1	2206.54	262.74	263.55	2.33	0.53	0.6	1.61	DF3	2206.54	262.82	263.58	1.54	0.49	0.53	0.9	0	0.08	0.03	-0.79	-0.04	-0.07	-0.71
DF3	1	2148	262.31	263.16	1.72	0.47	0.47	0.92	DF3	2148	262.38	262.91	2.5	0.99	0.38	1.53	0	0.07	-0.25	0.78	0.52	-0.09	0.61
DF3	1	2107.79	262.01	263.02	1.44	0.42	0.36	0.73	DF3	2107.79	262.04	262.76	1.17	0.61	0.37	0.68	0	0.03	-0.26	-0.27	0.19	0.01	-0.05
DF3	1	2089.36	261.64	262.94	1.83	0.48	0.45	0.74	DF3	2089.36	261.64	262.6	2.04	0.76	0.65	1.01	0	0	-0.34	0.21	0.28	0.2	0.27
DF3	1	2073.67	261.39	262.56	3.43	0.98	1.24	1.5	DF3	2073.67	261.39	262.44	1.89	0.79	0.46	1.27	0	0	-0.12	-1.54	-0.19	-0.78	-0.23
DF3	1	2052	261.41	261.96	3.21	0.77	0.66	2.03	DF3	2052	261.41	262.21	2.34	0.52	0.59	1.21	0	0	0.25	-0.87	-0.25	-0.07	-0.82
DF3	1	2051	261.39	261.91	2.78	0.93	0.55	1.5	DF3	2051	261.39	261.99	3.08	0.93	0.54	1.57	0	0	0.08	0.3	0	-0.01	0.07
		N/A	N/A	N/A	N/A	N/A	N/A	N/A	DF4	1044	264.72	265.16	0.36	0.09	0.08	0.22	N/A	N/A	N/A	N/A	N/A	N/A	N/A
		N/A	N/A	N/A	N/A	N/A	N/A	N/A	DF4	1032	264.72	265.16	0.35	0.14	0.14	0.27	N/A	N/A	N/A	N/A	N/A	N/A	N/A
		N/A	N/A	N/A	N/A	N/A	N/A	N/A	DF4	1014	Culvert G												
		N/A	N/A	N/A	N/A	N/A	N/A	N/A	DF4	983	263.92	264.21	2.21	0.42	0	2.14	N/A	N/A	N/A	N/A	N/A	N/A	N/A
		N/A	N/A	N/A	N/A	N/A	N/A	N/A	DF4	934	263.85	264.24	0.67	0.16	0.17	0.45	N/A	N/A	N/A	N/A	N/A	N/A	N/A
		N/A	N/A	N/A	N/A	N/A	N/A	N/A	DF4	933	263.75	264.11	0.93	0.11	0.22	0.74	N/A	N/A	N/A	N/A	N/A	N/A	N/A
		N/A	N/A	N/A	N/A	N/A	N/A	N/A	DF4	849	263.5	263.79	0.94	0.14	0.28	0.63	N/A	N/A	N/A	N/A	N/A	N/A	N/A
		N/A	N/A	N/A	N/A	N/A	N/A	N/A	DF4	848	263.07	263.54	0.87	0.2	0.19	0.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A
		N/A	N/A	N/A	N/A	N/A	N/A	N/A	DF4	822	263	263.31	1.35	0.24	0.34	1	N/A	N/A	N/A	N/A	N/A	N/A	N/A
		N/A	N/A	N/A	N/A	N/A	N/A	N/A	DF4	815	262.99	263.31	0.68	0.16	0.13	0.54	N/A	N/A	N/A	N/A	N/A	N/A	N/A
		N/A	N/A	N/A	N/A	N/A	N/A	N/A	DF4	797	262.74	263.16	1.42	0.32	0.19	0.66	N/A	N/A	N/A	N/A	N/A	N/A	N/A
		N/A	N/A	N/A	N/A	N/A	N/A	N/A	DF4	785	262.22	262.31	4.11	1.85	0	2.33	N/A	N/A	N/A	N/A	N/A	N/A	N/A
		N/A	N/A	N/A	N/A	N/A	N/A	N/A	DF4	751	261.55	261.78	1.17	0.29	0.25	0.87	N/A	N/A	N/A	N/A	N/A	N/A	N/A
		N/A	N/A	N/A	N/A	N/A	N/A	N/A	DF4	728	261.3	261.59	0.74	0.15	0.28	0.56	N/A	N/A	N/A	N/A	N/A	N/A	N/A
		N/A	N/A	N/A	N/A	N/A	N/A	N/A	DF4	665	260.65	260.93	1.17	0.24	0.29	0.98	N/A	N/A	N/A	N/A	N/A	N/A	N/A
		N/A	N/A	N/A	N/A	N/A	N/A	N/A	DF4	649	260.6	260.74	0.52	0.64	0.35	0.59	N/A	N/A	N/A	N/A	N/A	N/A	N/A
		N/A	N/A	N/A	N/A	N/A	N/A	N/A	DF4	550	259.04	259.42	1.76	0.52	0.38	1.13	N/A	N/A	N/A	N/A	N/A	N/A	N/A
		N/A	N/A	N/A	N/A	N/A	N/A	N/A	DF4	416	256.39	257.03	2.39	0.54	0.54	1.81	N/A	N/A	N/A	N/A	N/A	N/A	N/A
		N/A	N/A	N/A	N/A	N/A	N/A	N/A	DF4	343.3	255.81	256.28	0.93	0.23	0.5	0.54	N/A	N/A	N/A	N/A	N/A	N/A	N/A
		N/A	N/A	N/A	N/A	N/A	N/A	N/A	DF4	256	254.76	255.44	3.41	1.01	1.01	1.23	N/A	N/A	N/A	N/A	N/A	N/A	N/A
		N/A	N/A	N/A	N/A	N/A	N/A	N/A	DF4	41	249.79	251.61	1.3	0.17	0.23	1.06	N/A	N/A	N/A	N/A	N/A	N/A	N/A
DF2	1	1000	250.36	250.71	1.55	0.48	0.52	1.01		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
DF2	1	956	249.67	249.9	1.79	0.37	0.33	1.72		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
DF2	1	899	248.89	249.05	1.15	0.4	0.45	1.04	DF2	899	248.89	249.04	1.09	0.38	0.43	0.99	0	0	-0.01	-0.06	-0.02	-0.02	-0.05
DF2	1	842	248.4	248.91	0.23	0.06	0.06	0.14	DF2	842	248.4	248.9	0.2	0.06	0.05	0.12	0	0	-0.01	-0.03	0	-0.01	-0.02
DF2	1	820	247.96	248.91	0.19	0.05	0.02	0.1	DF2	820	247.96	248.9	0.16	0.04	0.02	0.08	0	0	-0.01	-0.03	-0.01	0	-0.02
DF2	1	809	247.64	248.91	0.25	0.05	0.02	0.14	DF2	809	247.64	248.9	0.22	0.04	0.02	0.12	0	0	-0.01	-0.03	-0.01	0	-0.02

Existing									Proposed								Difference (Proposed - Existing)						
River	Reach	River Sta	Min Ch El (m)	W.S. Elev Regional	Vel Chnl (m/s)	Vel Left (m/s)	Vel Right (m/s)	Vel Total (m/s)	River	River Sta	Min Ch El (m)	W.S. Elev (m) Regional	Vel Chnl (m/s)	Vel Left (m/s)	Vel Right (m/s)	Vel Total (m/s)	River Sta	Min Ch El (m)	W.S. Elev (m) Regional	Vel Chnl (m/s)	Vel Left (m/s)	Vel Right (m/s)	Vel Total (m/s)
DF2	1	791							DF2	791	Culvert H (Existing Culvert @ Teston Rd).												
DF2	1	773	246.95	248.49	1.15	0	0.42	1.1	DF2	773	246.95	248.6	0.9	0	0.34	0.85	0	0	0.11	-0.25	0	-0.08	-0.25
DF2	1	769	247.64	248.52	0.18	0.05	0.05	0.06	DF2	769	247.64	248.62	0.12	0.03	0.04	0.04	0	0	0.1	-0.06	-0.02	-0.01	-0.02

APPENDIX C

FLOODPLAIN MAPPING DRAWINGS

KIRBY ROAD

KIRBY ROAD

KEELE STREET

JANE STREET

JANE STREET

KEELE

3479 273.33 272.77
3428.83 272.81 272.30
3330.15 272.79 271.56
3322.69 272.78 271.46
3289.02 271.32 270.75
3279.33 271.17 270.67
3228.83 270.59 270.02
3130.4 269.85 269.28
3084 269.31 268.91
3028.87 268.85 268.16
2965.4 268.39 268.06
2928.83 267.87 267.20
2827.51 266.85 266.29
2728.83 266.03 265.24
2628.8 265.71 264.93
2525.58 264.86 264.52
2466 264.16 263.56
2428.87 263.74 263.18
2328.83 263.03 262.52
2228.89 262.42 261.91
2129.24 261.61 261.08
2056.16 260.99 260.54
1990.35 260.44 260.05
1915.13 259.50 259.19
1889 259.11 258.70
1815.13 258.08 257.58
2460 267.39 267.02
2413.07 266.07 265.41
2379 265.39 264.90
2307.68 264.76 264.33
2262 264.17 263.62
2206.54 263.55 263.13
2148 263.16 262.64
2107.79 263.02 262.44
2089.36 262.94 262.34
2073.67 262.56 262.19
2052 261.96 261.58
2051 261.91 261.60
2007.66 261.12 260.61
2773 271.59 271.26
2707.68 270.77 270.45
2660 269.85 269.53
2607.54 269.02 268.61
2562 268.46 268.03
2507.75 267.87 267.46
3161.25 278.26 277.72
3147.49 278.17 277.60
3112.66 277.75 277.29
3073 277.47 277.06
3012.6 276.69 276.40
2974 276.07 275.67
2906.79 274.29 274.04
2866 273.64 273.21
2807.68 273.37 272.99
3480.67 282.24 282.11
3415.5 281.61 280.65
3547.76 258.19 284.91
3252.06 281.66 278.99
3333.59 281.66 279.85
3205.22 281.66 278.34
3197.43 281.65 278.21

REVISIONS

NO.	DESCRIPTION	BY	DATE

LEGEND
Cross-Section Label
Regional Flood Elevation (m)
Cross-Section Leader Line
Cross-Section Number
19.8600
235.96
235.96
100 Year Flood Elevation (m)
Cross-Section Length
REGULATORY FLOOD ELEVATION IS THE HIGHER OF THE TWO ELEVATIONS DISPLAYED

LEGEND

Contour, Index
Intermediate
Supplementary
Approximate
Depression
Spot Elevation, Water Level
River, Stream, Canal
Approximate Alignment
Disappearing
Split
Lake
Flooded Land
Marsh, Swamp
Ditch, Drain
Rapids
Reservoir
Falls
Building, Garage, Shed
Under Construction, Foundation
Ruins
Road, Hard Surface, with Median
Driveway, or Loose Surface
Farm Lane, Cart Track, Wagon Road
Footpath, Trail
Bridge, Footbridge
Fence
Cliff, Cut and Fill
Culvert
Dam, Beaver Dam
Pipeline
Airport Runway
Power Transmission Line, with Poles, with Pylons
Railway
Wooded Area
Chimney
Hedge
Wall
Regional Flood Line
100 Year Flood Line

This map was compiled photogrammetrically from 1/10 000 aerial photograhy exposed in April 1977.
The vertical datum is mean sea level as established by the Geodetic Survey of Canada.
North American Datum 1927, U.T.M. 6° projection Zone 17, Central Meridian 81° W.
Transformed to North American Datum 1983 Zone 17, Central Meridian 81° W. in 2007
Grid Interval 100 metres.

PLEASE NOTE:
FLOODLINE ELEVATIONS ARE SUBJECT TO CHANGE DUE TO REVISED INFORMATION.

SCHAEFFERS
CONSULTING ENGINEERS

LICENSED PROFESSIONAL ENGINEER
K. SHAHBIKIAN
PROVINCE OF ONTARIO

PLEASE NOTE:
THE PROFESSIONAL ENGINEER'S STAMP VERIFIES THE FLOOD LINE AND ASSOCIATED DATA NOT THE MAP DATA UNLESS OTHERWISE NOTED

FLOOD PLAIN MAPPING PROGRAM

FLOODLINE APPROVED DATE:

TORONTO AND REGION Conservation
for The Living City
5 Shoreham Drive Downsview Ontario M3N 1S4 (416) 661-6600

Scale 1:2000
100 Metres 0 100 200 Metres
200 Feet 0 200 400 600 800 1000 Feet
CONTOUR INTERVAL 1.0 METRES:

DON RIVER

SHEET No. EX-1

JANE STREET

KEELE STREET

TESTON ROAD

TESTON ROAD

Vespucci Drive

Ashton Drive

Ashton Drive

Ashton Drive

Copper Creek Court

Mariton Park Avenue

Bellefontaine Ct

Royal Ridge Crescent

Royal Ridge Crescent

Royal Ridge Crescent

Thorton Crescent

St Joan of Arc Avenue

Giancola Crescent

D'Amato Crescent

Isaac Murray Ave

Isaac Murray Ave

Isaac Murray Ave

Isaac Murray Ave

Isaac Murray Ave

1405.39 256.06 254.43

1460.2 256.06 254.40

1401.29 256.06 254.42

1387.43 256.01 254.40

1381.53 256.01 254.40

1375.67 256.01 254.40

1370.57 255.98 254.17

1362.11 255.18 253.99

1358.51 254.08 253.94

1357.51 254.56 253.93

1312.67 254.38 253.67

1311.67 254.36 253.54

1251.58 254.32 253.15

1245.37 254.26 253.14

1240.48 254.28 253.12

1231.82 253.97 252.75

1220.38 252.78 252.14

1159 252.71 251.48

1115.08 252.05 250.75

1071 250.61 250.03

1036 250.99 249.87

1015.6 250.70 249.69

963 250.15 249.11

900.79 249.26 248.16

818.58 248.71 247.59

761.32 248.64 247.28

698.09 248.62 246.98

650.88 248.59 246.83

600.38 248.59 246.45

531.76 248.59 246.41

463.91 246.99 245.97

447.81 246.63 245.72

400.22 246.32 245.14

1889 259.11 258.70

1815.13 258.08 257.58

1715.05 257.53 256.69

1666 257.14 256.45

1615.13 256.57 256.18

1514.84 256.11 255.13

2051 261.91 261.60

2007.66 261.12 260.61

1960 261.10 260.42

1907.68 260.89 260.37

1858 260.48 260.07

1826.63 260.41 259.91

1826.431 260.28 259.82

1807.68 259.35 259.12

1746.68 259.12 258.62

1676.46 258.25 257.92

1613 257.30 256.92

1604 257.17 256.82

1180.6 254.02 253.15

1179.6 253.88 252.91

1179.37 253.65 252.76

1000 250.71 250.49

956 249.90 249.75

842 248.91 248.47

820 248.91 248.07

809 248.91 247.79

775 248.49 247.79

709 248.52 247.77

598.11 248.51 246.56

521.44 248.51 246.21

256.17 255.25 1535

255.71 254.70 1485.85

255.46 254.55 1437

255.33 254.16 1386.23

255.24 254.07 1329

255.07 253.98 1282.61

254.66 253.72 1225.5

254.35 253.40 1225

252.74 252.14 1130

252.35 251.67 1076.25

251.29 250.55 1012.43

250.87 250.10 970.12

250.93 249.36 955.53

250.92 249.22 947.55

250.93 249.22 946.95

249.93 249.19 895.09

249.89 249.15 858.03

249.01 248.42 799.85

248.43 247.39 696.11

248.51 245.98 516.73

REVISIONS

NO.	DESCRIPTION	BY	DATE

LEGEND

Cross-Section Label

Cross-Section Leader Line

Regional Flood Elevation (m)

Cross-Section Number — 19.8600 — 235.96 / 235.96

100 Year Flood Elevation (m)

Cross-Section Length

REGULATORY FLOOD ELEVATION IS THE HIGHER OF THE TWO ELEVATIONS DISPLAYED

LEGEND

Contour, Index
Intermediate
Supplementary
Approximate
Depression
Spot Elevation, Water Level
River, Stream, Canal
Approximate Alignment
Disappearing
Split
Lake
Flooded Land
Marsh, Swamp
Ditch, Drain
Rapids
Reservoir
Falls
Building, Garage, Shed
Under Construction, Foundation
Ruins

Road, Hard Surface, with Median
Driveway, or Loose Surface
Farm Lane, Cart Track, Wagon Road
Footpath, Trail
Bridge, Footbridge
Fence
Cliff, Cut and Fill
Culvert
Dam, Beaver Dam
Pipeline
Airport Runway
Power Transmission Line, with Poles, with Pylons
Railway
Wooded Area
Chimney
Hedge
Wall
Regional Flood Line
100 Year Flood Line

This map was compiled photogrammetrically from 1/10 000 aerial photography exposed in April 1977.

The vertical datum is mean sea level as established by the Geodetic Survey of Canada.

North American Datum 1927, U.T.M. 6° projection Zone 17, Central Meridian 81° W.

Transformed to North American Datum 1983 Zone 17, Central Meridian 81° W. in 2007

Grid Interval 100 metres.

PLEASE NOTE:
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SCHAEFFERS
CONSULTING ENGINEERS

PLEASE NOTE:
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LICENSED PROFESSIONAL ENGINEER
K. SHAHBIKIAN
PROVINCE OF ONTARIO

FLOOD PLAIN MAPPING PROGRAM

FLOODLINE APPROVED DATE:

TORONTO AND REGION Conservation
for The Living City
5 Shoreham Drive Downsview Ontario M3N 1S4 (416) 661-6600

Scale 1:2000

Metres 100 0 100 200 Metres

Feet 200 0 200 400 600 800 1000 Feet

CONTOUR INTERVAL 1.0 METRES:

DON RIVER

SHEET No. EX-2

KIRBY ROAD

KIRBY ROAD

KEELE STREET

JANE STREET

JANE STREET

KEELE

3479 273.33 272.76
3428.83 272.81 272.30
3330.15 272.79 271.57
3322.69 272.79 271.47
3289.02 271.32 270.73
3279.33 271.14 270.65
3228.83 270.56 270.00
3130.4 269.79 269.27
3084 269.32 268.89
3050 269.20 268.27
2829.44 269.17 268.13
2827.51 266.89 266.40
2728.83 266.07 265.39
268.21 267.60
2628.51
267.64 267.24
2628.51
2628.8 265.73 265.10
2525.58 264.87 264.55
2466 264.18 263.66
2428.87 264.04 263.25
2340 264.02 263.07
2328 264.00 263.04
2260 262.83 262.40
2259 262.46 261.98
2228 262.36 261.86
2129.24 261.62 261.17
2056.16 260.90 260.60
1990.35 260.47 260.13
1915.13 259.52 259.23
1889 259.14 258.79
1815.13 258.11 257.62
2368 266.35 265.85
2367 265.79 265.53
2351 265.60 264.89
2307.68 264.58 264.42
2262 264.04 263.69
2206.54 263.58 263.21
2148 262.91 262.55
2107.79 262.76 262.35
2089.36 262.60 262.19
2073.67 262.44 262.08
2052 262.21 261.81
2051 261.99 261.66
2007.66 261.63 260.95
2562 268.38 268.06
2607.54 268.94 268.61
2660 269.83 269.32
2707.68 270.27 270.10
2773 271.42 271.26
2849 273.39 273.09
2866 273.73 273.34
2906.79 274.29 274.11
2974 276.09 275.76
3012.6 276.79 276.48
3073 277.50 277.15
3112.66 278.29 277.42
3147.49 278.61 277.74
3161.25 278.31 277.86
3197.43 281.66 278.40
3205.22 281.67 278.46
3253 281.79 279.42
3333.59 281.80 279.82
3370 281.80 280.00
3400 281.80 280.40
3480.67 282.26 282.15
3547.76 285.19 284.95
2465 267.34 267.00
2507.75 267.93 267.54

REVISIONS

NO.	DESCRIPTION	BY	DATE

LEGEND
Cross-Section Label
Cross-Section Leader Line
Regional Flood Elevation (m)
Cross-Section Number
19.8600
235.96
235.96
100 Year Flood Elevation (m)
Cross-Section Length
REGULATORY FLOOD ELEVATION IS THE HIGHER OF THE TWO ELEVATIONS DISPLAYED

LEGEND

Contour, Index
Intermediate
Supplementary
Approximate
Depression
Spot Elevation, Water Level
River, Stream, Canal
Approximate Alignment
Disappearing
Split
Lake
Flooded Land
Marsh, Swamp
Ditch, Drain
Rapids
Reservoir
Falls
Building, Garage, Shed
Under Construction, Foundation
Ruins
Road, Hard Surface, with Median
Driveway, or Loose Surface
Farm Lane, Cart Track, Wagon Road
Footpath, Trail
Bridge, Footbridge
Fence
Cliff, Cut and Fill
Culvert
Dam, Beaver Dam
Pipeline
Airport Runway
Power Transmission Line, with Poles, with Pylons
Railway
Wooded Area
Chimney
Hedge
Boil
Regional Flood Line
100 Year Flood Line

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Grid interval 100 metres.

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LICENSED PROFESSIONAL ENGINEER
K. SHAHBIKIAN
PROVINCE OF ONTARIO

FLOOD PLAIN MAPPING PROGRAM

FLOODLINE APPROVED DATE:

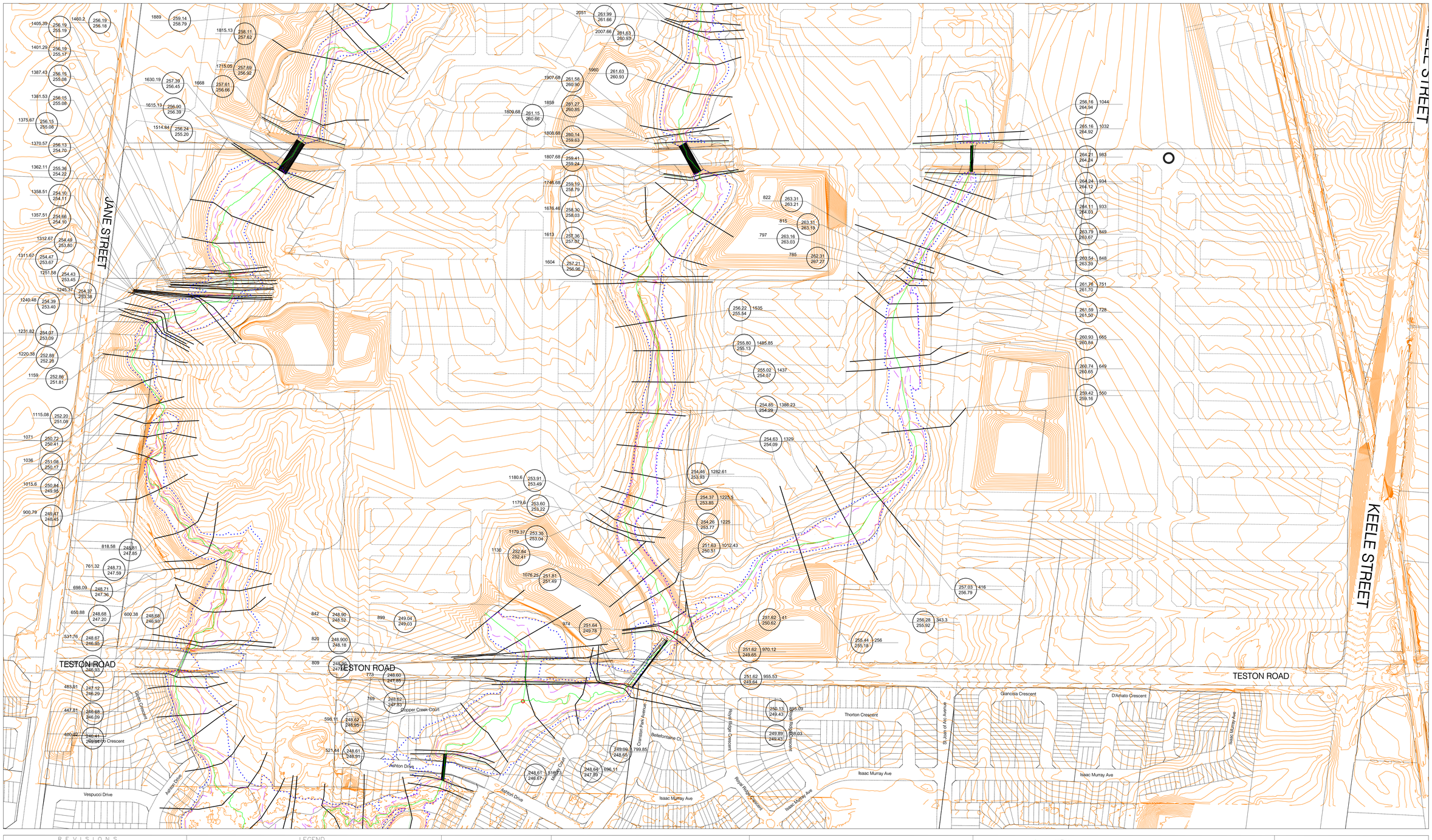
TORONTO AND REGION Conservation
for The Living City
5 Shoreham Drive Downsview Ontario M3N 1S4 (416) 661-6600

Scale 1:2000
Metres 100 0 100 200
Feet 200 0 200 400 600 800 1000

CONTOUR INTERVAL 1.0 METRES:

DON RIVER

SHEET No. FUT-1



REVISIONS

NO.	DESCRIPTION	BY	DATE

LEGEND
Cross-Section Label
Cross-Section Leader Line
Regional Flood Elevation (m)
Cross-Section Number
19.8600
235.96
235.96
100 Year Flood Elevation (m)
Cross-Section Length
REGULATORY FLOOD ELEVATION IS THE HIGHER OF THE TWO ELEVATIONS DISPLAYED

LEGEND

Contour, Index
Intermediate
Supplementary
Approximate
Depression
Spot Elevation, Water Level
River, Stream, Canal
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Disappearing
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Flooded Land
Marsh, Swamp
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Rapids
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Falls
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Cliff, Cut and Fill
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Power Transmission Line, with Poles, with Pylons
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100 Year Flood Line

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PROFESSIONAL ENGINEER
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PROVINCE OF ONTARIO

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FLOOD PLAIN MAPPING PROGRAM

FLOODLINE APPROVED DATE:

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Scale 1:2000
Metres 100 0 100 200 Metres
Feet 200 0 200 400 600 800 1000 Feet
CONTOUR INTERVAL 1.0 METRES:

DON RIVER

SHEET No. FUT-2

APPENDIX D
SUPPORTING DOCUMENTS

- Block 27 Street 5A Hydraulic Assessment Memo, prepared by SCE, dated September 9th, 2022;
- Engineering Drawings, prepared by SCE
- Block 27 Natural Features, prepared by BEACON, dated April 2022;
- Floodplain Mapping, prepared by COLE Engineering, dated December 2018;
- Excerpt TRCA Don River Floodplain Mapping Phase II;
- Block 27 Detailed Topographic Map
  - Prepared by R-PE Surveying Ltd, dated March 2022
  - Prepared by Gold Park Group, dated April 2021

APPENDIX D:

- Block 27 Street 5A Hydraulic Assessment Memo, prepared by SCE, dated September 9th, 2022.

SCHAEFFERS
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T.O. Line: (416) 213-5590

MEMORANDUM

To: **K. Kung, LEA Consulting Ltd.**
From: **Debebe Yilak**

Date: **September 9, 2022**

Our File: **2019-4766**

Subject: **Block 27 Street 5A Hydraulic Assessment**

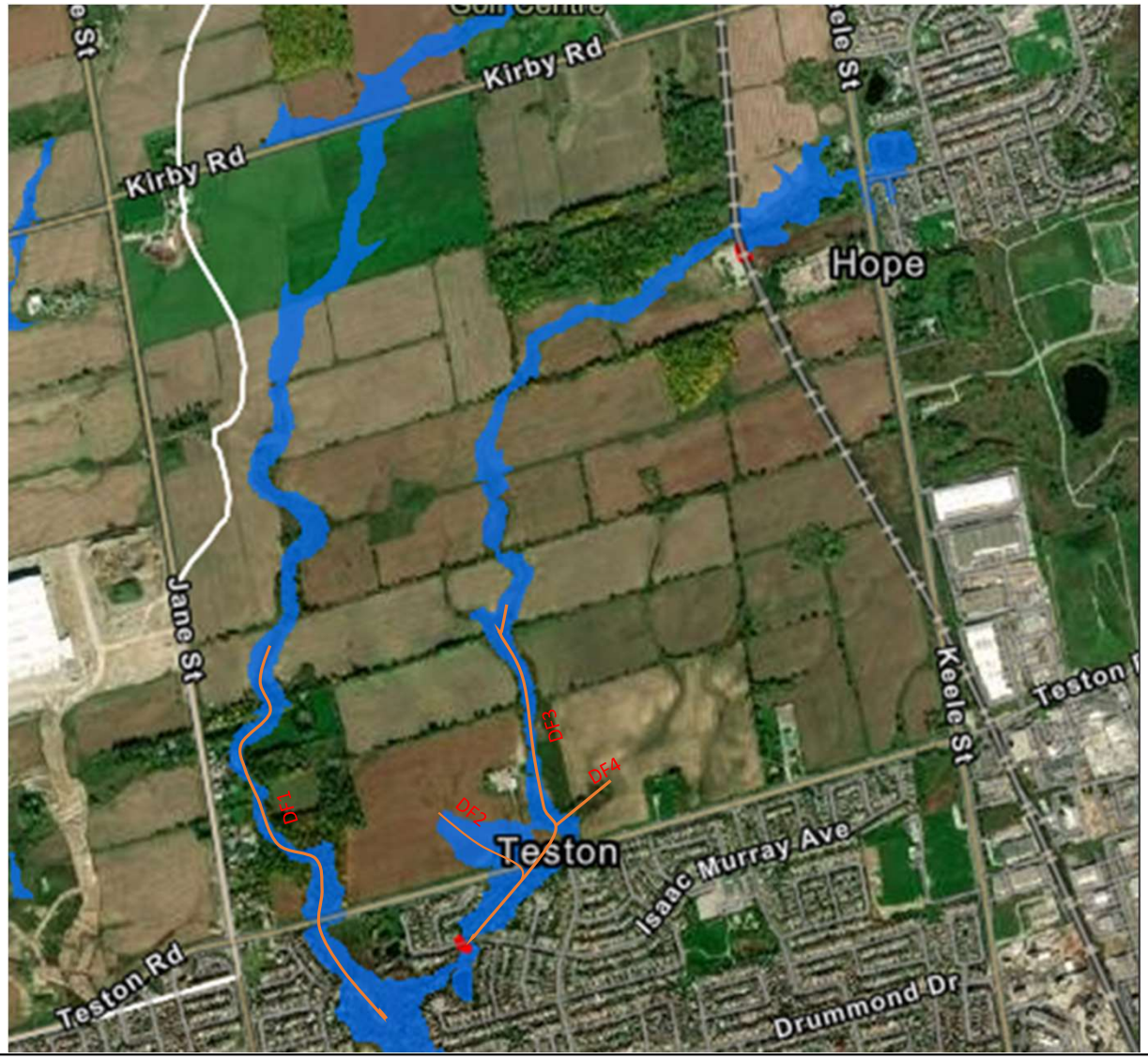
1.0 Introduction

The Block 27 Master Environmental Servicing Plan (MESP) and Block 27 Collector Roads Municipal Class Environmental Assessment (MCEA) study are underway for the Block 27 Community Area (Block 27).

The purpose of the Block 27 Collector Roads MCEA study is to develop, identify, evaluate and recommend alternative design options for the collector road network within Block 27 and to support long-term growth and the efficient movement of goods and people in the area. Consultation with the City and TRCA is underway regarding road alignment options/evaluations.

As part of the MCEA and the Block 27 MESP, Schaeffers & Associates Ltd has reviewed and assessed road crossing design options. This memo has been prepared to document the MCEA Street 5A road alignment evaluations addressing the implications of road design to flooding conditions at Teston Road. This includes a flooding assessment of existing conditions and alternative Street 5A crossing designs to maintain or improve existing flood conditions along Teston Road.

Based on existing conditions and available TRCA flood plain mapping, Teston Rd and Cranston Park Ave are located within the regulatory floodplain. During the Regional Storm, flows overtop Teston Road. TRCA flood line mapping is illustrated below.



BLOCK 27

STREET 5A HYDRAULIC ASSESSMENT

LEGEND

TRCA FLOODPLAIN

DRAINAGE FEATURE

SCHAEFFERS
CONSULTING ENGINEERS
6 Ronrose Drive, Concord Ontario, L4K 4R3
Tel: (905) 738-6100 Email: general@schaeffers.com
www.schaeffers.com

FIGURE A
TRCA FLOODPLAIN MAP
(Source: TRCA Interactive Floodplain Map)

2019-4766	August 2022	SCALE: N.T.S.

2.0 Existing Conditions

The Street 5A alignment identified in the MECA is located in the central portion of the block. This hydraulic assessment has focused on the hydraulic conditions associated with Street 5A just north of Teston Road. As shown in Figure 1, there are two drainage features in this location referred to as Drainage Feature 3 (DF3) and Drainage Feature 4 (DF4). These drainage features join together a short distance upstream of Teston Road and leave the block through an existing 7.74m x 1.36m box culvert under Teston Road. In the original TRCA HEC-RAS Model, the DF3 was defined as "Westtrib14 Reach-1". DF4 was added to the HEC-RAS model.

Drainage Feature 2 (DF2) crosses Teston Road approximately 180m west of the DF3 crossing of Teston Road. The flow from DF2 crosses Teston Road via the existing 1.40x0.90m box culvert. Since the flood flows will spill from DF3 to DF2, to model the floodplain, a new reach (called "DF2") was added to the HEC-RAS Model. The inverts of the existing culverts were obtained from detailed topography from TRCA culvert data sheet. The existing floodplain was analyzed based on the modified HEC-RAS Model. The existing condition floodplain shown in Figure 1 depicts the regional flows overtop Teston Road both at the DF3 and DF2 watercourse crossings of Teston Road. Overtopping of the road extends for a length of approximately 195m along Teston Road, with a maximum depth of 0.46m. Teston Road centerline elevation decreases from Cranston Park Ave and Teston Road intersection towards the west direction. Hence, the overtopping depth over Teston Road is minimum just west of the Cranston Park Ave / Teston Road intersection. The maximum depth will occur near 40m further west of the intersection. Please see the illustration figure in Attachment A.

3.0 Future Conditions

A direct connection of the proposed Street 5 in Block 27 to Cranston Park Ave to the south is shown on the Block 27 Secondary Plan. The alignment in the Secondary Plan does not include the full right-of-way and incorporated a skewed intersection that does not meet current road standards. The MCEA Street 5A alignment includes a full intersection complying with all relevant design standards. Any new intersection in this

location will require new or modified drainage feature crossings and channel realignment of a portion of DF3 and DF4.

The proposed Street 5A realignment option requires the extension of the existing culvert by approximately 40m since the current existing headwall is located in the middle of the future intersection. Realignment of a portion of DF3 is also required to accommodate the road alignment. Figure 2 illustrates these works conceptually. Further details on the channel realignment and design will be included in the MESP.

The HEC-RAS Model has been updated to reflect the Street 5A road alignment, crossing options, and conceptual channel realignment. The future condition flood line was generated accordingly. The flood line still overtops Teston Road crossing in all options.

4.0 Hydraulic Analysis Results

Hydraulic analysis was performed for different scenarios to evaluate the performance of the Teston Road Crossing designs. The culvert capacity and the extent of overtopping were analyzed using HEC-RAS software. The model distributes the flows into the barrel (i.e., Culvert) and the excess flow as a weir flow (i.e., overtopping over the road).

The following four scenarios were analyzed to evaluate the impact of the proposed Road 5A alignment on the overall hydraulic performance of the Teston Road crossing structure. Please see the detailed HEC-RAS results in the attachment.

Please see **Table 1** for the detailed summary report noting flows, water levels, depths of flooding over the road, and velocity. The flood line around the Teston Road crossing has been generated. The product of depth and velocity (dxv) was also computed to give feedback on the safe ingress/egress requirements. Please see **Figure 1** for the existing condition and **Figure 2** for the future condition flood lines. Digital Copy of HEC-RAS Model is also attached for the following scenarios.

- Scenario 1: Existing Uncontrolled Peak Flows – Existing Box Culvert Condition. The model was run considering the existing uncontrolled peak flow (i.e., 35.12m^3/s) and the existing box culvert at Teston Road crossing (i.e., 7.74mx1.36mx50m).

Under this scenario, the flow was observed and it is distributed between Barrel Flow (28.71m^3/s) and Weir Flow over the Road (6.41m^3/s). Upstream water surface elevation was 250.93m and the depth of flow over the road was maximum of 0.46m. Weir flow velocity and Vxd were calculated to be 0.79m/s and 0.36 respectively. Note that Teston Road has a road top level of 250.47 at the place where maximum weir flow depth was observed.

Please note that by developing Block27, the uncontrolled flow will increase from 35.12m^3/s to 41.96m^3/s. Therefore, if Block27 is built without any change to the existing culvert at Teston road, it is anticipated that the depth of water over the Teston Road will increase. The following scenario discusses the future condition with the extension of the existing culvert.

- Scenario 2: Future Uncontrolled Peak Flows – Existing Box Culvert (Extended) and raised the ground at the northeast corner of the proposed intersection of Teston Road and Road 5A. This concept reflects the hydraulic implications of lengthening the culvert and allowing water levels to rise at the upstream of the crossing to reduce weir flow which naturally minimizes the flow depths over the road. The proposed grading will have a relatively uniform level that makes weir flow to be uniformly distributed over the proposed graded surface and results in a shallower flow depth. The conceptual grading configuration adjacent to Street 5A is illustrated in Figure 3. The weir flow of this scenario was defined by connecting the proposed grading north of Teston Road and Road 5A. The maximum weir flow depth will happen at the intersection of the proposed grading and Road 5A.

  This scenario resulted in a weir flow of 5.84m^3/s and a maximum weir flow depth of 0.40m. The upstream water elevation was calculated to be 251.77m. This scenario increases the flood plain elevation upstream of the road but reduces the depth of flow over the road. As it was mentioned above, the weir length was increased. It is assumed that once the flow overtops the top of the bank north of Teston Road, the water level will be reduced uniformly to hit the tailwater level. In the current condition, the upstream and tailwater levels were observed to be 251.77m and 250.13m respectively.

Scenario 3: Future Uncontrolled Peak Flows – Existing Box Culvert (Extended) and ground north of Teston Road is not raised. The future peak flow of 41.96m^3/s and extended box culvert (i.e., 7.74mx1.36mx90m) were considered. In this scenario, the weir geometry was assumed by connecting Teston Road and Road 5A. The lowest road top level happened at the intersection of Teston and Road 5A. This scenario resulted in a weir flow of 14.29m^3/s and a maximum weir flow depth of 0.52m. The maximum flow depth was observed at the intersection of Teston Road and Road 5A. Upstream water elevation was estimated to be 251.07m. This scenario increases the upstream water elevation compared to that of the existing condition and increases the flow and depth overtopping the road. This was anticipated since the length of the culvert as well as flow was increased compared to the existing conditions.

- Scenario 4: Future peak flow of 41.96m^3/s and extended box culvert (i.e., 7.74mx1.36mx90m) was considered. In addition to this, an additional 1.50m diameter concrete pipe culvert is proposed parallel to the extended existing box culvert. This will increase the conveyance capacity of the culverts and reduce the overtopping over the road. Similar to Scenario 2, the weir geometry of this scenario was defined by connecting the proposed grading north of Teston Road and Road 5A. The maximum weir flow depth occurs at the intersection of the proposed grading and Road 5A.

  This scenario resulted in a weir flow of 1.61m^3/s and maximum weir flow depth of 0.24m at the intersection of the proposed grading north of Teston Road and Road 5A. weir flow velocity and Vxd calculations results were computed to be 0.52m/s and 0.13 respectively. The two culverts were calculated to convey a total of 40.35m^3/s (i.e., the Box culvert = 34.41m^3/s and the pipe culvert = 5.94m^3/s). Upstream and tailwater elevations were estimated to be 251.62m and 250.13m respectively. The result depicts that flow over Road 5A is smaller than in scenarios 2 and 3. The upstream water surface elevation is higher than the existing condition for about 80m upstream but it was confirmed that it does not impact the proposed grading and it can be contained within the open space within Block 27.

As it was mentioned above, the weir geometry of this scenario was defined by connecting the proposed grading north of Teston Road and Road 5A. Hence, the depth of water on Teston Road was not directly computed from the HEC-RAS result. Instead, a separate analysis was conducted to analyze the overflow over Teston Road. When the 1.61 m^3/s flow reaches to the Teston Road, it spills in two (south and west directions). The flow first starts flowing towards the west along the north gutter and gradually starts spilling over the crown when the water elevation at the north side of the Teston Road is raised. Then, the spilled water initially starts flowing towards the west along the south gutter till the water elevation gradually raised and the water spills back into the creek on the south side of Teston Road. The crown of Teston Road acts as a side weir since the flow along the gutter on Teston Road will be parallel to the crown.

Based on the attached calculations, the maximum water depth over the crown of Teston Road is 0.04m and the depth of water over the south curb before spilling into the river is 0.01m. Therefore, the maximum depth of water on the south half of the Teston Road is estimated to be 0.16m (i.e., 0.15m Curb+0.01m) and the depth of water on the north half of the Teston Road is estimated to be 0.18m (i.e., 0.14m [i.e., the elevation difference between the crown and gutter] + 0.04m). The calculations are based on the 1.5% slope along the Teston Road and side weir length of 113m. Please see the calculation summary Table in the attached Table 2 and Table 3.

5.0 Conclusion

From the analysis it can be concluded that;

- Under existing conditions, during the Regional Storm, flows overtop Teston Road at a maximum depth of 0.46m, average velocity of 0.79m/s, and Vxd of 0.36m^2/s
- Due to the proposed road alignment/grading and channel realignment, the existing culvert at Teston Road should be extended further to the north by approximately 40m to accommodate the road design; and
- Scenario 4 (i.e., extending the existing culvert, adding an extra 1.5m diameter pipe culvert, and raising the ground north of Teston Road, will reduce but not

eliminate flow overtopping Teston Road during the Regional Storm in the future condition. This proposal would improve flooding conditions over existing conditions by reducing the depth and the amount of flow overtopping the road. The maximum weir flow depth, velocity, weir flow, and Vxd on top of Road 5A were estimated to be 0.24m, 0.52m/s, 1.61m^3/s, and 0.13m^2/s respectively. In future conditions, the maximum water depth over Teston Road was estimated to be 0.18m. The overtopping flow (i.e., 1.61m^3/s) was found significantly lower than the existing condition (i.e., 6.41m^3/s). Similarly, the flow depth on Teston road (i.e., 0.18m) was computed to be lower than the existing condition (i.e., 0.46m).

We trust that you will find this analysis satisfactory. If you have any questions or comments with respect to hydraulic analysis, please do not hesitate to contact us.

Respectfully Submitted,

SCHAEFFER & ASSOCIATES LTD.



Debebe, Yilak, M.Sc, P.Eng.
Water Resources Engineer

Attachments:

A. Hydraulic Analysis Results
B. Digital Copy of HEC-RAS Model

ATTACHMENTS:

A. Hydraulic Analysis Results

Table 1: Hydraulic Analysis Results Summary Table

Scenario	Input Parameters		Outputs		Weir Flow at
1. Existing Flow Existing Culvert Condition	Peak Flow	35.12	Culvert Flow, $Q_{culvert}$	28.71m^3/s	Teston Road
	Culvert	Existing Box Culvert (7.74x1.36m)	Weir Flow, Q_{weir}	6.41m^3/s	
	Culvert Length	50m	U/s Water Surface Elevation	250.93m	
	Road Top Level	250.8	Maximum Flow Depth Over the Road, d	0.46m	
			Weir Flow Area on top of the Road, A(1)	8.1m^2	
			Weir Flow Velocity, V(2)	0.79m/s	
			(Vxd) calculatio	0.36m^2/s	
2. Future Uncontrolled Flow - Future Culvert - Ground north of Teston Road raised to the level of the upcoming Road 5	Peak Flow	41.96	Culvert Flow, $Q_{culvert}$	36.12m^3/s	Grading North of Teston Road and Road 5A intersection
	Culvert	Box Culvert (7.74x1.36m)	Weir Flow, Q_{weir}	5.84m^3/s	
	Culvert Length	90m	U/s Water Surface Elevation	251.77m	
	Road Top Level	251.39m	Maximum Flow Depth Over the Road, d	0.40m	
			Weir Flow Area on top of the Road, A	8.72m^2	
			Weir Flow Velocity, V	0.67m/s	
			(Vxd) calculatio	0.27m^2/s	
3. Future Uncontrolled Flow - Future Culvert - Ground north of Teston Road NOT raised to the level of the upcoming Road 5	Peak Flow	41.96	Culvert Flow, $Q_{culvert}$	27.67m^3/s	Teston and Road 5A intersection
	Culvert	Box Culvert (7.74x1.36m)	Weir Flow, Q_{weir}	14.29m^3/s	
	Culvert Length	90m	U/s Water Surface Elevation	251.07m	
	Road Top Level	250.8	Maximum Flow Depth Over the Road, d	0.52m	
			Weir Flow Area on top of the Road, A	16.51m^2	
			Weir Flow Velocity, V	0.91m/s	
			(Vxd) calculatio	0.47m^2/s	
4. Future Uncontrolled Flow - Future Culvert - Ground north of Teston Road raised to the level of the upcoming Road 5 and additional pipe culvert added	Peak Flow	41.96	Culvert Flow, Qculvert(3)	(34.41+5.94)=40.35m^3/s	Grading North of Teston Road and Road 5A intersection
	Culvert	Box Culvert (7.74x1.36m)	Weir Flow, Q_{weir}	1.61m^3/s	
		Con. Pipe Culvert (1.5m Diameter)			
	Culvert Length	90m	U/s Water Surface Elevation	251.62m	
	Road Top Level	251.39	Maximum Flow Depth Over the Road, d	0.24m	
			Weir Flow Area on top of the Road, A	3.08m^2	
			Weir Flow Velocity, V	0.52m/s	
			(Vxd) calculatio	0.13m^2/s	

Note:

(1). Weir flow area = Flow area on top os the road as shown in the HEC-RAS output summary Table

(2). Weir flow Velocity = Weir flow divided by Weir flow area.

(3). Culvert flow for Scenario 4 was estimated to be 34.41m^3/s for the Box culvert and 5.94m^3/s for the pipe culvert.

CW	2
Le	113

$Q=CwLe^{0.83}He^{1.67}$

Table 2: North Side weir overflow calculations

Qt	Qr	Qrs	He
1.61	0.54	1.07	0.066
1.61	1.53	0.08	0.014
1.61	0.74	0.87	0.058
1.61	1.49	0.12	0.018
1.61	0.79	0.82	0.056
1.61	1.45	0.16	0.021
1.61	0.84	0.77	0.054
1.61	1.41	0.2	0.024
1.61	0.89	0.72	0.052
1.61	1.37	0.24	0.027
1.61	0.93	0.68	0.050
1.61	1.33	0.28	0.029
1.61	0.98	0.63	0.048
1.61	1.3	0.31	0.031
1.61	1	0.61	0.047
1.61	1.28	0.33	0.032
1.61	1.03	0.58	0.045
1.61	1.26	0.35	0.034
1.61	1.05	0.56	0.045
1.61	1.24	0.37	0.035
1.61	1.07	0.54	0.044
1.61	1.22	0.39	0.036
1.61	1.08	0.53	0.043
1.61	1.21	0.4	0.036
1.61	1.1	0.51	0.042
1.61	1.19	0.42	0.037
1.61	1.12	0.49	0.041
1.61	1.17	0.44	0.039
1.61	1.13	0.48	0.041

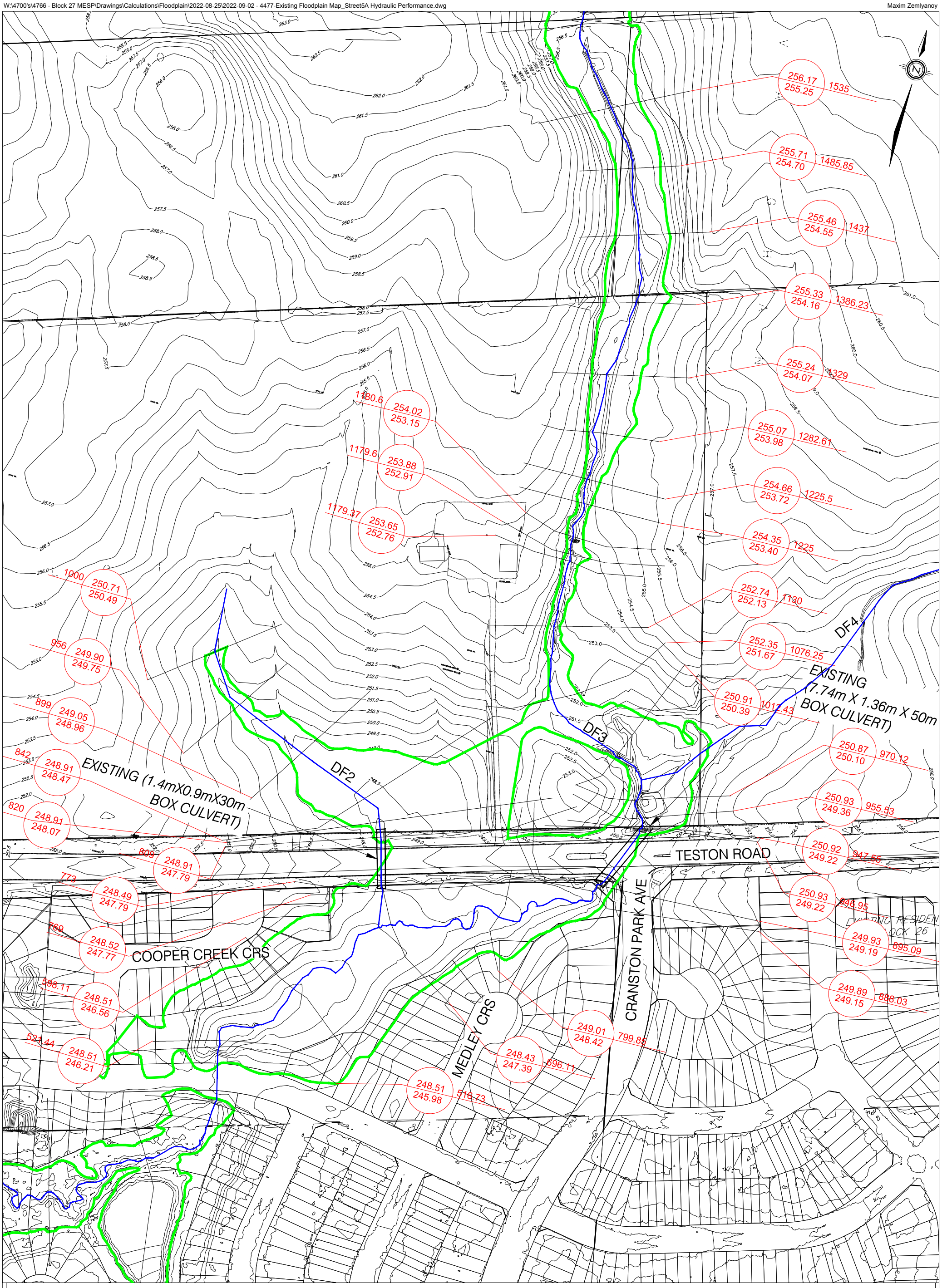
CW	2
Le	113

$Q=CwLe^{0.83}He^{1.67}$

Table 3: North Side weir overflow calculations

Qt	Qr	Qrs	He
0.48	0.35	0.13	0.0186
0.48	0.42	0.06	0.0117
0.48	0.44	0.04	0.0092

Maxim Zemlyanoy



STREET 5A HYDRAULIC ASSESSMENT
BLOCK 27

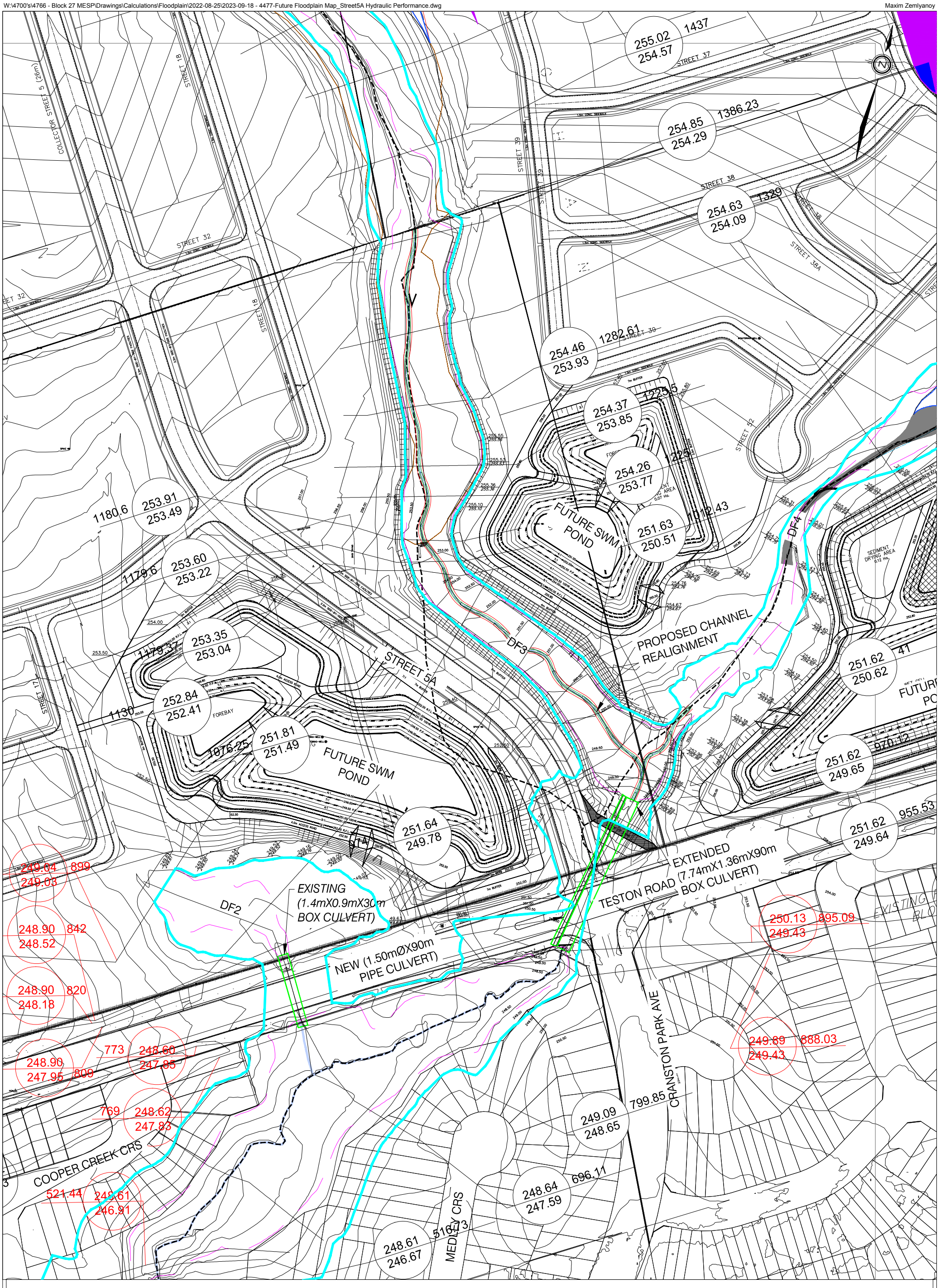
SCHAEFFERS
CONSULTING ENGINEERS
6 Ronrose Drive, Concord, Ontario L4K 4R3
Tel: (905) 738-6100 Email: general@schaeffers.com
www.schaeffers.com

LEGEND

- WATERCOURSE
- EXISTING FLOODLINE
- 244.41 / 242.92 — 57.02 — REGIONAL FLOODLINE ELEV. / SECTION ID / 100 YR FLOODLINE ELEV.

FIGURE 1
EXISTING FLOODLINE (EXISTING UNCONTROLLED REGIONAL FLOW ON EXISTING TOPO)

2019-4766	SEPTEMBER 2022	SCALE: N.T.S.



STREET 5A HYDRAULIC ASSESSMENT
BLOCK 27

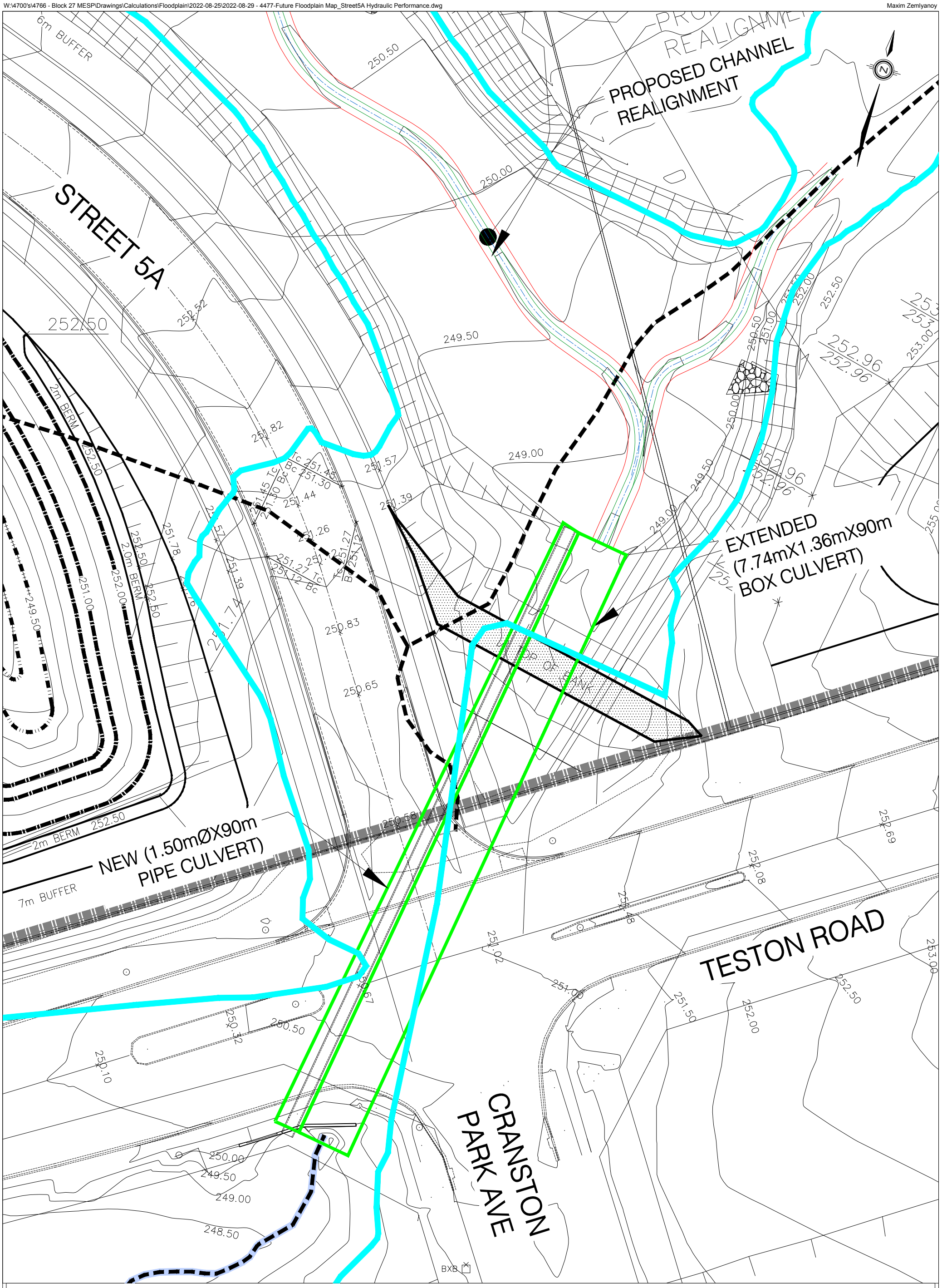
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LEGEND
- DRAINAGE FEATURE
- FUTURE FLOODLINE
- 244.41 / 242.92 — 57.02 — REGIONAL FLOODLINE ELEV. / SECTION ID / 100 YR FLOODLINE ELEV.

FIGURE 2
FUTURE FLOODLINE
(FUTURE UNCONTROLLED REGIONAL FLOW ON FUTURE TOPO)

2019-4766	SEPTEMBER 2023	SCALE: N.T.S.

Maxim Zemlyanoy



STREET 5A HYDRAULIC ASSESSMENT
BLOCK 27

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LEGEND

- DRAINAGE FEATURE
- FUTURE FLOODLINE

FIGURE 3
PROPOSED GRADING DESIGN
NORTH OF TESTON ROAD

2019-4766	SEPTEMBER 2023	SCALE: N.T.S.

Scenario 1
Existing Flow Existing Culvert Condition

Plan: 1. SCE Existing Flow_Existing Box Culvert_Teston Rd DF3 1-DS-0-1 RS: 924.94 Culv Gro

Q Culv Group (m3/s)	28.71	Culv Full Len (m)	50.00
# Barrels	1	Culv Vel US (m/s)	2.73
Q Barrel (m3/s)	28.71	Culv Vel DS (m/s)	2.73
E.G. US. (m)	250.98	Culv Inv El Up (m)	248.22
W.S. US. (m)	250.93	Culv Inv El Dn (m)	248.14
E.G. DS (m)	250.53	Culv Frctn Ls (m)	0.27
W.S. DS (m)	249.93	Culv Exit Loss (m)	0.00
Delta EG (m)	0.46	Culv Entr Loss (m)	0.19
Delta WS (m)	1.00	Q Weir (m3/s)	6.41
E.G. IC (m)	250.64	Weir Sta Lft (m)	78.25
E.G. OC (m)	250.98	Weir Sta Rgt (m)	111.10
Culvert Control	Outlet	Weir Submerg	0.00
Culv WS Inlet (m)	249.58	Weir Max Depth (m)	0.46
Culv WS Outlet (m)	249.50	Weir Avg Depth (m)	0.25
Culv Nml Depth (m)		Weir Flow Area (m2)	8.10
Culv Crt Depth (m)	1.12	Min El Weir Flow (m)	250.52

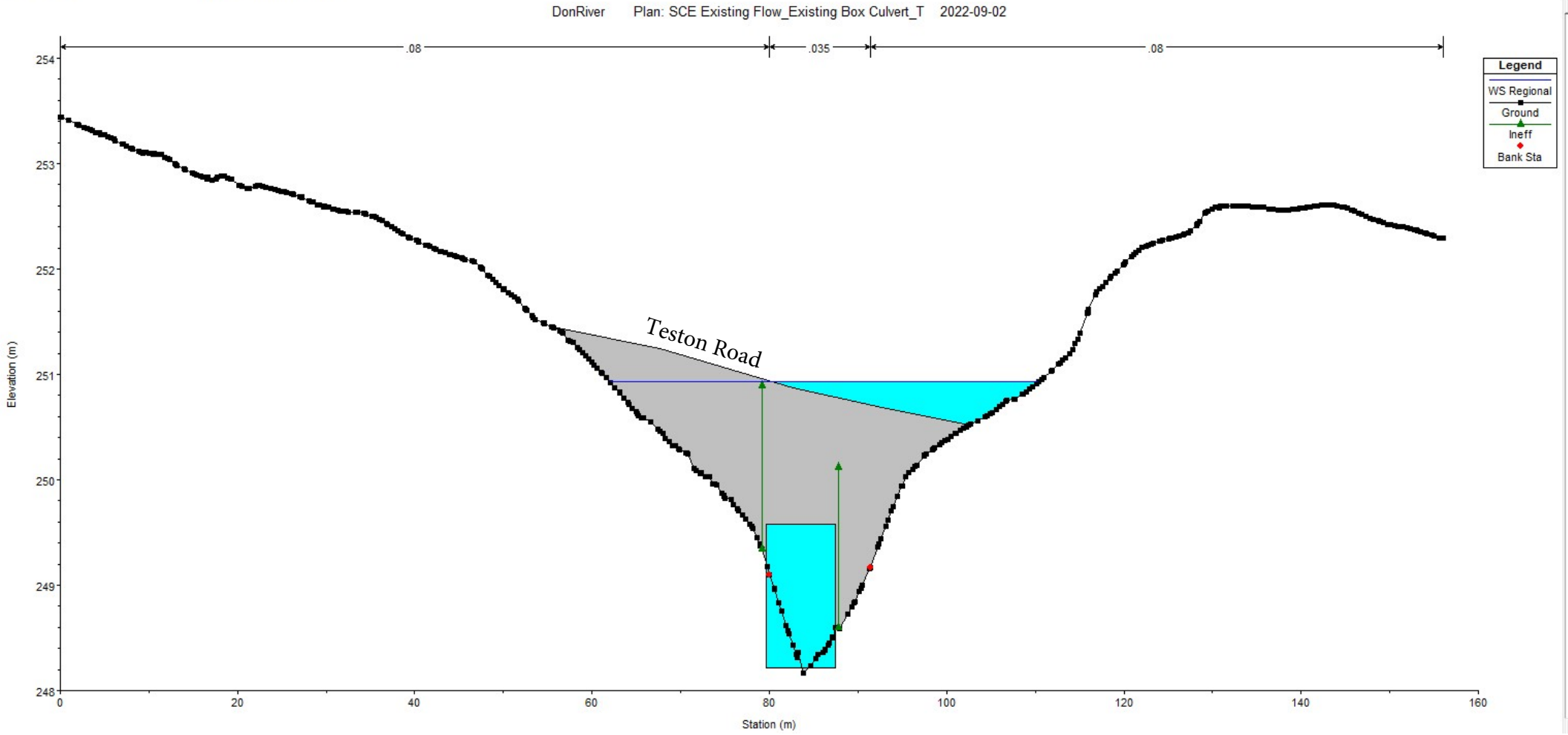
HEC-RAS Plan: 1. SCE Existing Flow_Existing Box Culvert_Teston Rd Locations: User Defined

River	Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
				(m3/s)	(m)	(m)	(m)	(m)	(m/m)	(m/s)	(m2)	(m)	
DF3	1-DS-0-1	970.12	Regional	30.47	249.19	250.87	250.87	251.10	0.009661	2.98	25.45	46.68	0.85
DF3	1-DS-0-1	970.12	100 Year	3.81	249.19	250.10	250.10	250.28	0.013407	1.93	2.36	11.05	0.87
DF3	1-DS-0-1	955.53	Regional	30.47	248.98	250.93	250.50	251.00	0.001592	1.62	44.40	51.43	0.39
DF3	1-DS-0-1	955.53	100 Year	3.81	248.98	249.36	249.51	249.86	0.075690	3.15	1.21	4.63	1.97
DF3	1-DS-0-1	947.55	Regional	35.12	248.20	250.92		250.99	0.000753	1.41	51.32	48.96	0.29
DF3	1-DS-0-1	947.55	100 Year	4.06	248.20	249.22	248.79	249.25	0.000951	0.72	6.47	11.69	0.27
DF3	1-DS-0-1	946.95	Regional	35.12	248.17	250.93	249.77	250.98	0.000516	1.12	51.64	48.32	0.24
DF3	1-DS-0-1	946.95	100 Year	4.06	248.17	249.22	248.75	249.24	0.001008	0.72	5.66	12.00	0.27
DF3	1-DS-0-1	924.94		Culvert									
DF3	1-DS-0-1	895.09	Regional	35.12	248.46	249.93	249.93	250.53	0.010638	3.69	12.42	59.38	0.99
DF3	1-DS-0-1	895.09	100 Year	4.06	248.46	249.19	248.88	249.23	0.001910	0.95	5.22	10.43	0.37
DF3	1-DS-0-1	888.03	Regional	37.99	248.49	249.89	249.68	249.98	0.004502	2.19	47.44	89.25	0.62
DF3	1-DS-0-1	888.03	100 Year	4.30	248.49	249.15		249.21	0.004694	1.24	6.57	23.80	0.55
DF3	1-DS-0-1	799.85	Regional	37.99	247.91	249.01	249.01	249.25	0.019072	4.08	26.80	45.93	1.27
DF3	1-DS-0-1	799.85	100 Year	4.30	247.91	248.42	248.42	248.52	0.014816	2.08	5.40	22.85	0.97
DF3	1-DS-0-1	696.11	Regional	39.13	246.69	248.53	247.88	248.55	0.000872	1.18	88.10	84.80	0.29
DF3	1-DS-0-1	696.11	100 Year	4.56	246.69	247.39	247.40	247.51	0.008763	1.75	5.85	37.04	0.76

Cross Section

File Options Help

River: DF3 Reach: 1-DS-0-1 River Sta.: 924.94 Culv U Reload Data



Scenario 2
Future Flow - Future Culvert - Ground north of Teston Road raised to the level of the upcoming Road 5

Plan: 2. Future Flow_Future Box Culvert_Raised Ground U/s of Teston WestTrib14 1-DS-0-1 RS:

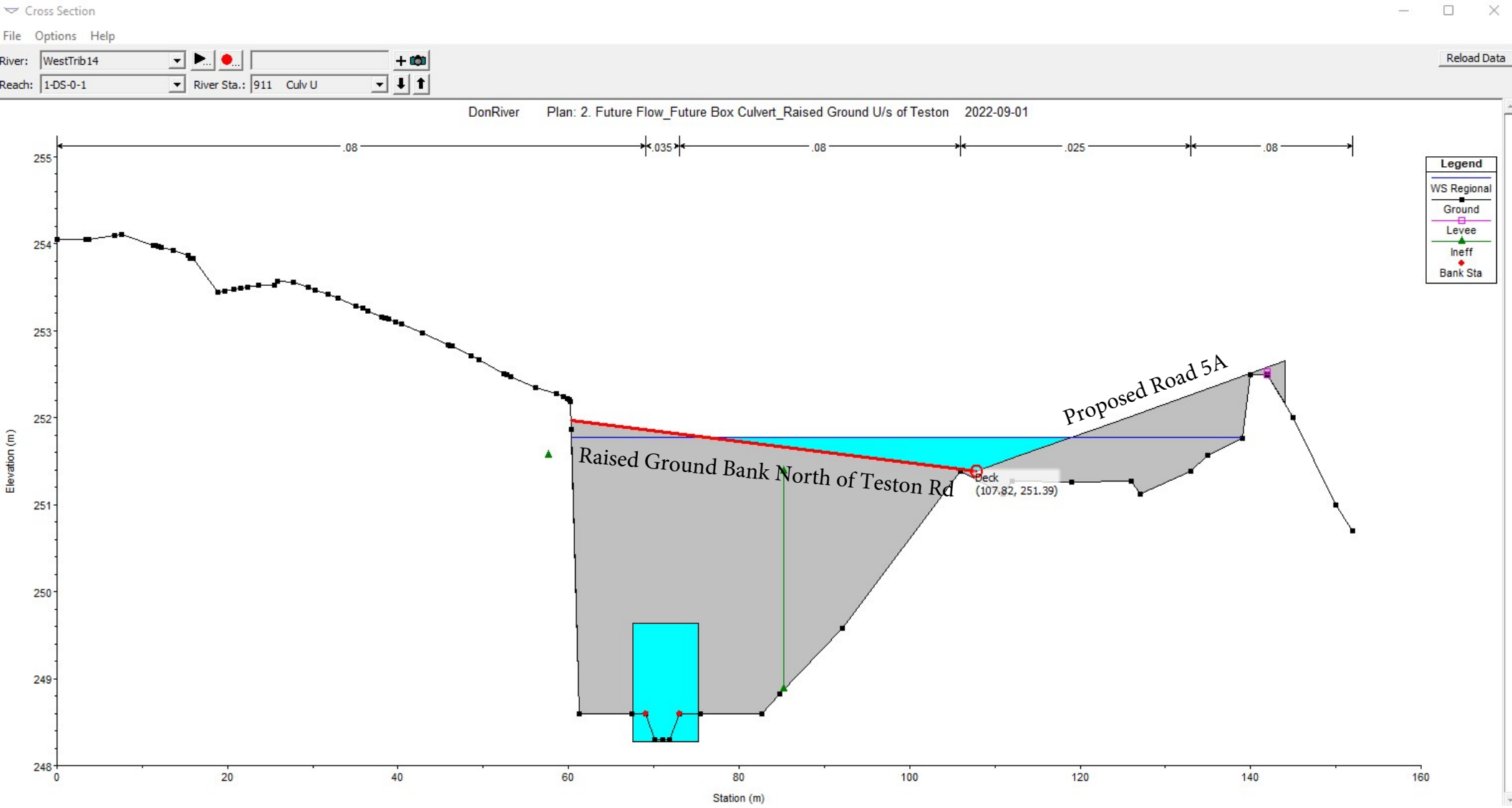
Q Culv Group (m3/s)	36.12	Culv Full Len (m)	90.00
# Barrels	1	Culv Vel US (m/s)	3.43
Q Barrel (m3/s)	36.12	Culv Vel DS (m/s)	3.43
E.G. US. (m)	251.78	Culv Inv El Up (m)	248.28
W.S. US. (m)	251.77	Culv Inv El Dn (m)	248.14
E.G. DS (m)	250.34	Culv Frctn Ls (m)	0.76
W.S. DS (m)	250.13	Culv Exit Loss (m)	0.39
Delta EG (m)	1.45	Culv Entr Loss (m)	0.30
Delta WS (m)	1.65	Q Weir (m3/s)	5.84
E.G. IC (m)	251.26	Weir Sta Lft (m)	75.16
E.G. OC (m)	251.78	Weir Sta Rgt (m)	119.24
Culvert Control	Outlet	Weir Submerg	0.00
Culv WS Inlet (m)	249.64	Weir Max Depth (m)	0.40
Culv WS Outlet (m)	249.50	Weir Avg Depth (m)	0.20
Culv Nml Depth (m)		Weir Flow Area (m2)	8.72
Culv Crt Depth (m)	1.30	Min El Weir Flow (m)	251.39

HEC-RAS Plan: 2. Future Flow_Future Box Culvert_Raised Ground U/s of Teston Locations: User Defined

River	Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
				(m3/s)	(m)	(m)	(m)	(m)	(m/m)	(m/s)	(m2)	(m)	
DF3	1-DS-0-1	970.12	Regional	41.96	248.49	251.78	249.23	251.79	0.000105	0.63	159.08	85.39	0.11
DF3	1-DS-0-1	970.12	100 Year	11.47	248.49	250.18	248.91	250.18	0.000097	0.38	66.66	46.86	0.10
DF3	1-DS-0-1	955.53	Regional	41.96	248.30	251.77	249.46	251.78	0.000155	0.79	128.25	78.65	0.14
DF3	1-DS-0-1	955.53	100 Year	11.47	248.30	250.17	248.98	250.18	0.000206	0.60	38.43	35.79	0.14
DF3	1-DS-0-1	911		Culvert									
DF3	1-DS-0-1	895.09	Regional	41.96	248.46	250.13	250.13	250.34	0.004493	2.60	33.25	72.46	0.66
DF3	1-DS-0-1	895.09	100 Year	11.47	248.46	249.43	249.20	249.58	0.004944	1.87	8.23	11.42	0.63
DF3	1-DS-0-1	888.03	Regional	45.04	248.49	249.89	249.75	250.00	0.005122	2.36	47.80	87.85	0.67
DF3	1-DS-0-1	888.03	100 Year	12.44	248.49	249.43	249.33	249.51	0.005057	1.73	16.83	50.60	0.61
DF3	1-DS-0-1	799.85	Regional	45.04	247.91	249.08	249.08	249.33	0.018776	4.23	30.42	54.64	1.27
DF3	1-DS-0-1	799.85	100 Year	12.44	247.91	248.65	248.65	248.82	0.017978	3.01	11.71	33.18	1.15
DF3	1-DS-0-1	696.11	Regional	45.04	246.69	248.64	247.92	248.66	0.000859	1.22	97.02	85.58	0.29
DF3	1-DS-0-1	696.11	100 Year	12.44	246.69	247.59	247.60	247.73	0.009745	2.27	15.06	51.94	0.85

Plan: 2. Future Flow_Future Box Culvert_Raised Ground U/s of Teston WestTrib14 1-DS-0-1 RS:

Q Culv Group (m3/s)	36.12	Culv Full Len (m)	90.00
# Barrels	1	Culv Vel US (m/s)	3.43
Q Barrel (m3/s)	36.12	Culv Vel DS (m/s)	3.43
E.G. US. (m)	251.78	Culv Inv El Up (m)	248.28
W.S. US. (m)	251.77	Culv Inv El Dn (m)	248.14
E.G. DS (m)	250.34	Culv Frctn Ls (m)	0.76
W.S. DS (m)	250.13	Culv Exit Loss (m)	0.39
Delta EG (m)	1.45	Culv Entr Loss (m)	0.30
Delta WS (m)	1.65	Q Weir (m3/s)	5.84
E.G. IC (m)	251.26	Weir Sta Lft (m)	75.16
E.G. OC (m)	251.78	Weir Sta Rgt (m)	119.24
Culvert Control	Outlet	Weir Submerg	0.00
Culv WS Inlet (m)	249.64	Weir Max Depth (m)	0.40
Culv WS Outlet (m)	249.50	Weir Avg Depth (m)	0.20
Culv Nml Depth (m)		Weir Flow Area (m2)	8.72
Culv Crt Depth (m)	1.30	Min El Weir Flow (m)	251.39


Cross Section
File Options Help
River: WestTrib14
Reach: 1-DS-0-1
River Sta.: 911 Culv U
Reload Data
DonRiver Plan: 2. Future Flow_Future Box Culvert_Raised Ground U/s of Teston 2022-09-01
.08
.035
.08
.025
.08
Legend
WS Regional
Ground
Levee
Ineff
Bank Sta
Proposed Road 5A
Raised Ground Bank North of Teston Rd
Deck
(107.82, 251.39)
Elevation (m)
Station (m)
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254
253
252
251
250
249
248
0
20
40
60
80
100
120
140
160

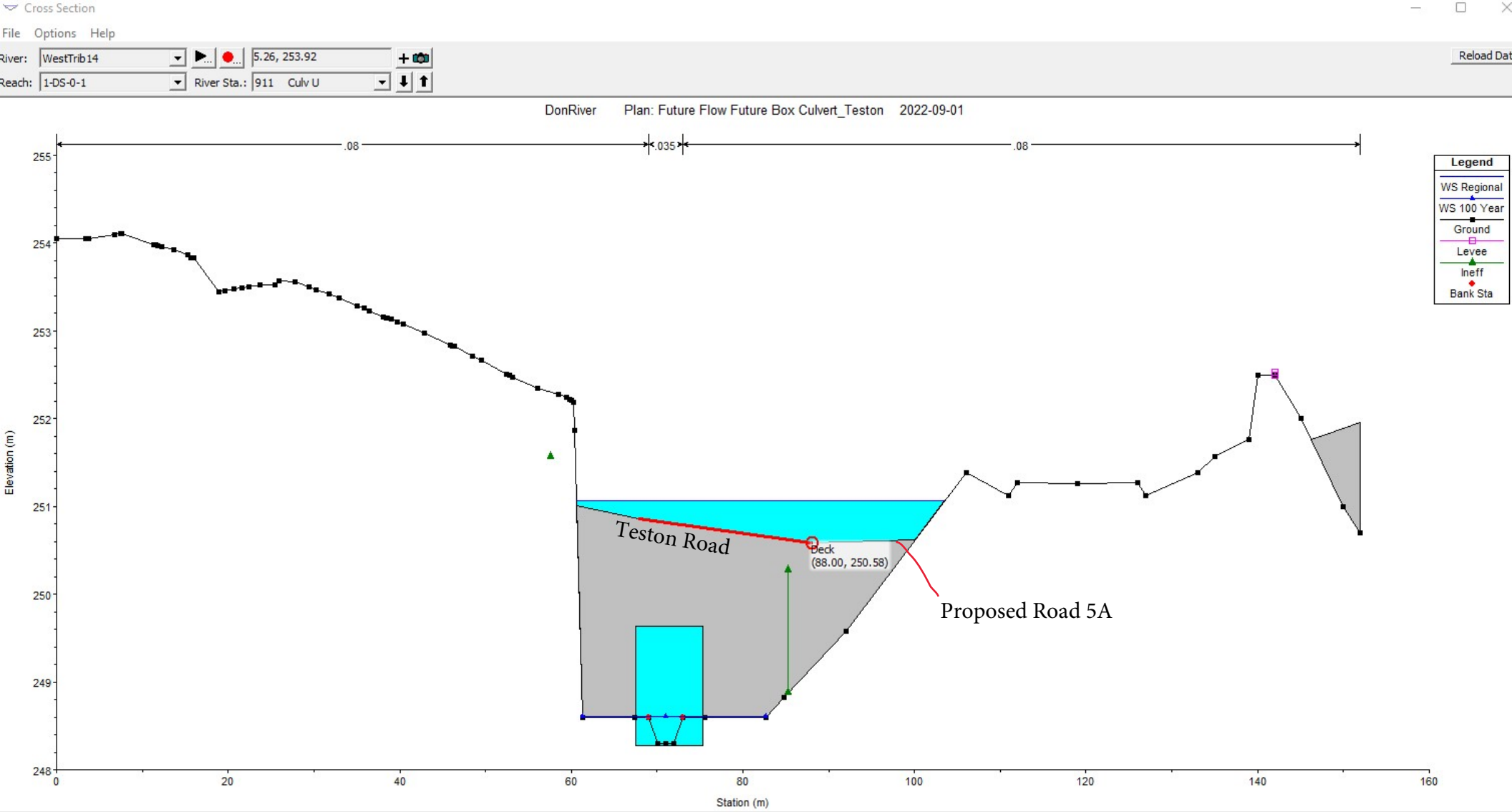
Scenario 3
Future Flow - Future Culvert - Ground north of Teston Road NOT raised to the level of the upcoming Road 5

Plan: 3. SCE Future Flow Future Box Culvert_Teston WestTrib14 1-DS-0-1 RS: 911 Culv Group

Q Culv Group (m3/s)	27.67	Culv Full Len (m)	90.00
# Barrels	1	Culv Vel US (m/s)	2.63
Q Barrel (m3/s)	27.67	Culv Vel DS (m/s)	2.63
E.G. US. (m)	251.10	Culv Inv El Up (m)	248.28
W.S. US. (m)	251.07	Culv Inv El Dn (m)	248.14
E.G. DS (m)	250.34	Culv Frctn Ls (m)	0.45
W.S. DS (m)	250.13	Culv Exit Loss (m)	0.14
Delta EG (m)	0.76	Culv Entr Loss (m)	0.18
Delta WS (m)	0.94	Q Weir (m3/s)	14.29
E.G. IC (m)	250.88	Weir Sta Lft (m)	60.56
E.G. OC (m)	251.10	Weir Sta Rgt (m)	103.76
Culvert Control	Outlet	Weir Submerg	0.00
Culv WS Inlet (m)	249.64	Weir Max Depth (m)	0.52
Culv WS Outlet (m)	249.50	Weir Avg Depth (m)	0.36
Culv Nml Depth (m)		Weir Flow Area (m2)	15.71
Culv Crt Depth (m)	1.09	Min El Weir Flow (m)	250.58

HEC-RAS Plan: 3. SCE Future Flow Future Box Culvert_Teston Locations: User Defined

River	Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
				(m3/s)	(m)	(m)	(m)	(m)	(m/m)	(m/s)	(m2)	(m)	
DF3	1-DS-0-1	970.12	Regional	41.96	248.49	251.10	249.23	251.11	0.000273	0.86	112.26	52.66	0.17
DF3	1-DS-0-1	970.12	100 Year	11.47	248.49	250.18	248.91	250.18	0.000097	0.38	66.66	46.86	0.10
DF3	1-DS-0-1	955.53	Regional	41.96	248.30	251.07	249.45	251.10	0.000507	1.23	81.62	42.96	0.24
DF3	1-DS-0-1	955.53	100 Year	11.47	248.30	250.17	248.98	250.18	0.000206	0.60	38.43	35.79	0.14
DF3	1-DS-0-1	911		Culvert									
DF3	1-DS-0-1	895.09	Regional	41.96	248.46	250.13	250.13	250.34	0.004493	2.60	33.25	72.46	0.66
DF3	1-DS-0-1	895.09	100 Year	11.47	248.46	249.43	249.20	249.58	0.004944	1.87	8.23	11.42	0.63
DF3	1-DS-0-1	888.03	Regional	45.04	248.49	249.89	249.75	250.00	0.005122	2.36	47.80	87.85	0.67
DF3	1-DS-0-1	888.03	100 Year	12.44	248.49	249.43	249.33	249.51	0.005057	1.73	16.83	50.60	0.61
DF3	1-DS-0-1	799.85	Regional	45.04	247.91	249.08	249.08	249.33	0.018776	4.23	30.42	54.64	1.27
DF3	1-DS-0-1	799.85	100 Year	12.44	247.91	248.65	248.65	248.82	0.017978	3.01	11.71	33.18	1.15
DF3	1-DS-0-1	696.11	Regional	45.04	246.69	248.64	247.92	248.66	0.000859	1.22	97.02	85.58	0.29
DF3	1-DS-0-1	696.11	100 Year	12.44	246.69	247.59	247.60	247.73	0.009745	2.27	15.06	51.94	0.85


Cross Section
File Options Help
River: WestTrib14
Reach: 1-DS-0-1
River Sta.: 911 Culv U
5.26, 253.92
Reload Dat
DonRiver Plan: Future Flow Future Box Culvert_Teston 2022-09-01
.08
.035
.08
Legend
WS Regional
WS 100 Year
Ground
Levee
Ineff
Bank Sta
Teston Road
Deck
(88.00, 250.58)
Proposed Road 5A
Elevation (m)
Station (m)
255
254
253
252
251
250
249
248
0
20
40
60
80
100
120
140
160

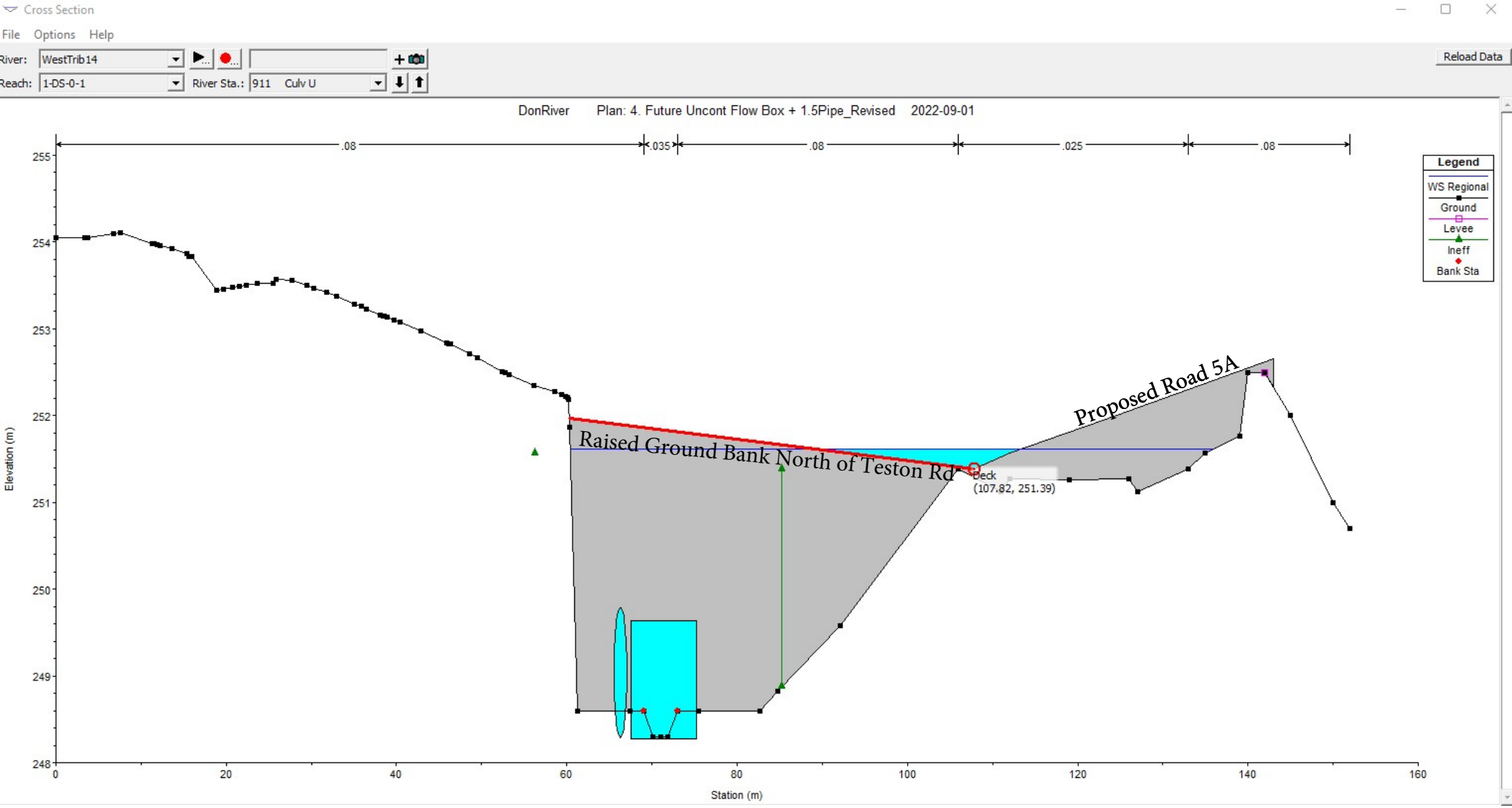
Scenario 4
Future Flow - Future Culvert - Ground north of Teston Road raised to the level of the upcoming Road 5 and additional 1.50m diameter Concrete Pipe Culvert added

Plan: 4. Future Uncont Flow Box + 1.5Pipe_Revised WestTrib14 1-DS-0-1 RS: 911 Culv Group:

Q Culv Group (m3/s)	34.41	Culv Full Len (m)	90.00
# Barrels	1	Culv Vel US (m/s)	3.27
Q Barrel (m3/s)	34.41	Culv Vel DS (m/s)	3.27
E.G. US. (m)	251.63	Culv Inv El Up (m)	248.28
W.S. US. (m)	251.62	Culv Inv El Dn (m)	248.14
E.G. DS (m)	250.34	Culv Frctn Ls (m)	0.69
W.S. DS (m)	250.13	Culv Exit Loss (m)	0.33
Delta EG (m)	1.29	Culv Entr Loss (m)	0.27
Delta WS (m)	1.49	Q Weir (m3/s)	1.61
E.G. IC (m)	250.66	Weir Sta Lft (m)	87.93
E.G. OC (m)	251.63	Weir Sta Rgt (m)	113.76
Culvert Control	Outlet	Weir Submerg	0.00
Culv WS Inlet (m)	249.64	Weir Max Depth (m)	0.24
Culv WS Outlet (m)	249.50	Weir Avg Depth (m)	0.12
Culv Nml Depth (m)		Weir Flow Area (m2)	3.08
Culv Crt Depth (m)	1.26	Min El Weir Flow (m)	251.39

HEC-RAS Plan: 4. Future Uncont Flow Box + 1.5Pipe_Revised Locations: User Defined

River	Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
				(m3/s)	(m)	(m)	(m)	(m)	(m/m)	(m/s)	(m2)	(m)	
DF3	1-DS-0-1	970.12	Regional	41.96	248.49	251.63	249.23	251.64	0.000134	0.68	146.25	83.61	0.12
DF3	1-DS-0-1	970.12	100 Year	11.47	248.49	249.67	248.91	249.67	0.000382	0.58	43.06	44.77	0.18
DF3	1-DS-0-1	955.53	Regional	41.96	248.30	251.62	249.46	251.63	0.000207	0.89	116.31	75.61	0.16
DF3	1-DS-0-1	955.53	100 Year	11.47	248.30	249.64	248.98	249.66	0.000754	0.90	25.55	31.56	0.26
DF3	1-DS-0-1	911		Culvert									
DF3	1-DS-0-1	895.09	Regional	41.96	248.46	250.13	250.13	250.34	0.004465	2.60	33.47	72.59	0.66
DF3	1-DS-0-1	895.09	100 Year	11.47	248.46	249.43	249.20	249.58	0.004944	1.87	8.23	11.42	0.63
DF3	1-DS-0-1	888.03	Regional	45.04	248.49	249.89	249.75	250.00	0.005122	2.36	47.80	87.85	0.67
DF3	1-DS-0-1	888.03	100 Year	12.44	248.49	249.43	249.33	249.51	0.005057	1.73	16.83	50.60	0.61
DF3	1-DS-0-1	799.85	Regional	45.04	247.91	249.08	249.08	249.33	0.018776	4.23	30.42	54.64	1.27
DF3	1-DS-0-1	799.85	100 Year	12.44	247.91	248.65	248.65	248.82	0.017978	3.01	11.71	33.18	1.15
DF3	1-DS-0-1	696.11	Regional	45.04	246.69	248.64	247.92	248.66	0.000859	1.22	97.02	85.58	0.29
DF3	1-DS-0-1	696.11	100 Year	12.44	246.69	247.59	247.60	247.73	0.009745	2.27	15.06	51.94	0.85

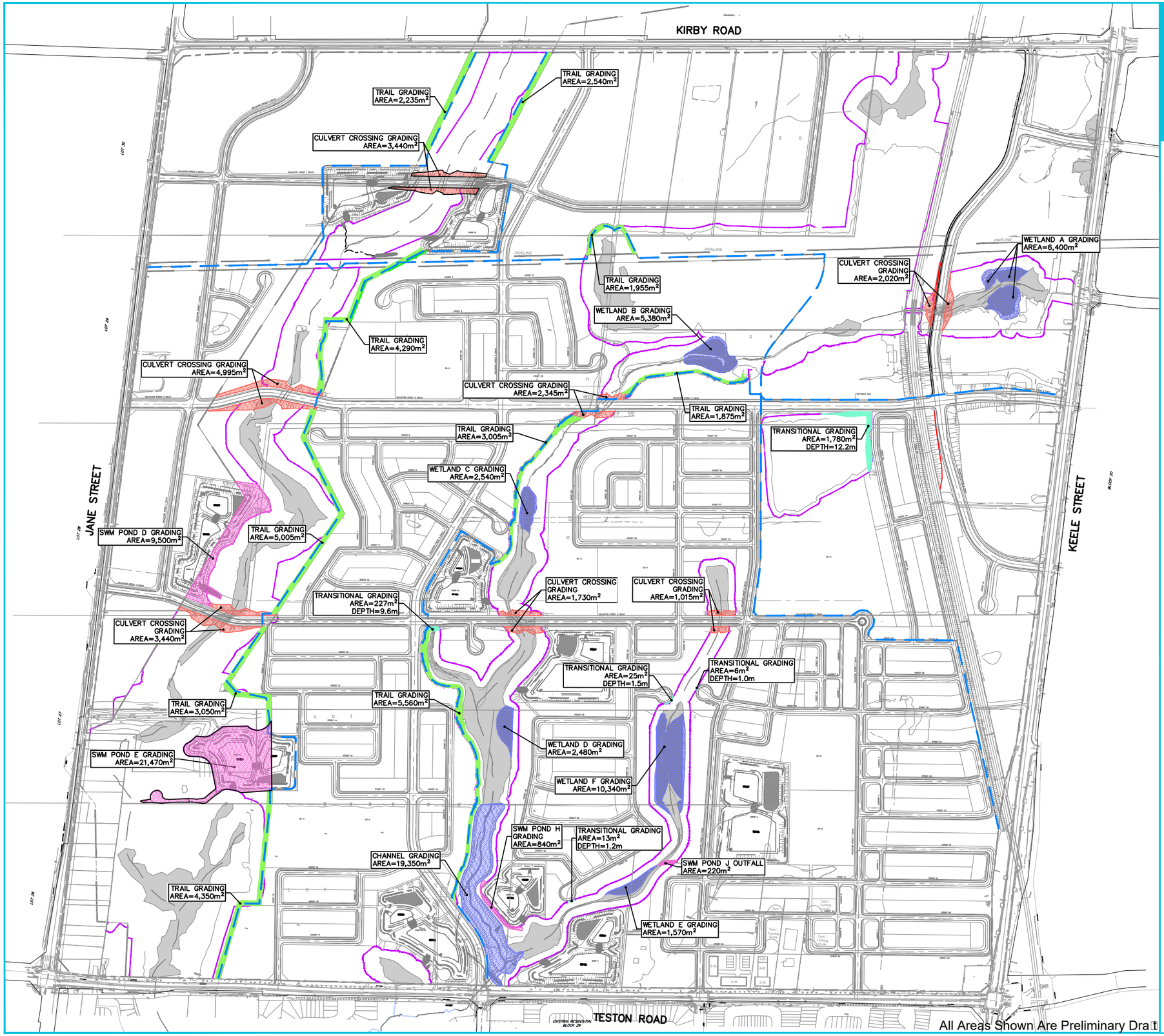

Cross Section
File Options Help
River: WestTrib14
Reach: 1-DS-0-1
River Sta.: 911 Culv U
Reload Data
DonRiver Plan: 4. Future Uncont Flow Box + 1.5Pipe_Revised 2022-09-01
.08
.035
.08
.025
.08
Legend
WS Regional
Ground
Levee
Ineff
Bank Sta
Proposed Road 5A
Raised Ground Bank North of Teston Rd
Deck
(107.82, 251.39)
Elevation (m)
Station (m)
255
254
253
252
251
250
249
248
0
20
40
60
80
100
120
140
160

APPENDIX D:

- Engineering Drawings, prepared by SCE

B□□C□ □□□

MA□□E□ E□□□□ □ME□□A□ □E□ □C□G□□A□



All Areas Shown Are Preliminary Dra□

□EGE□D

- NHN LIMIT
- CULVERT CROSSING GRADING AREA
- TRANSITIONAL GRADING AREA
- TRAIL GRADING AREA
- WETLAND/CHANNEL GRADING AREA
- SWM POND OUTFALL/SPILLWAY GRADING AREA
- PROPOSED TRAIL ALIGNMENT

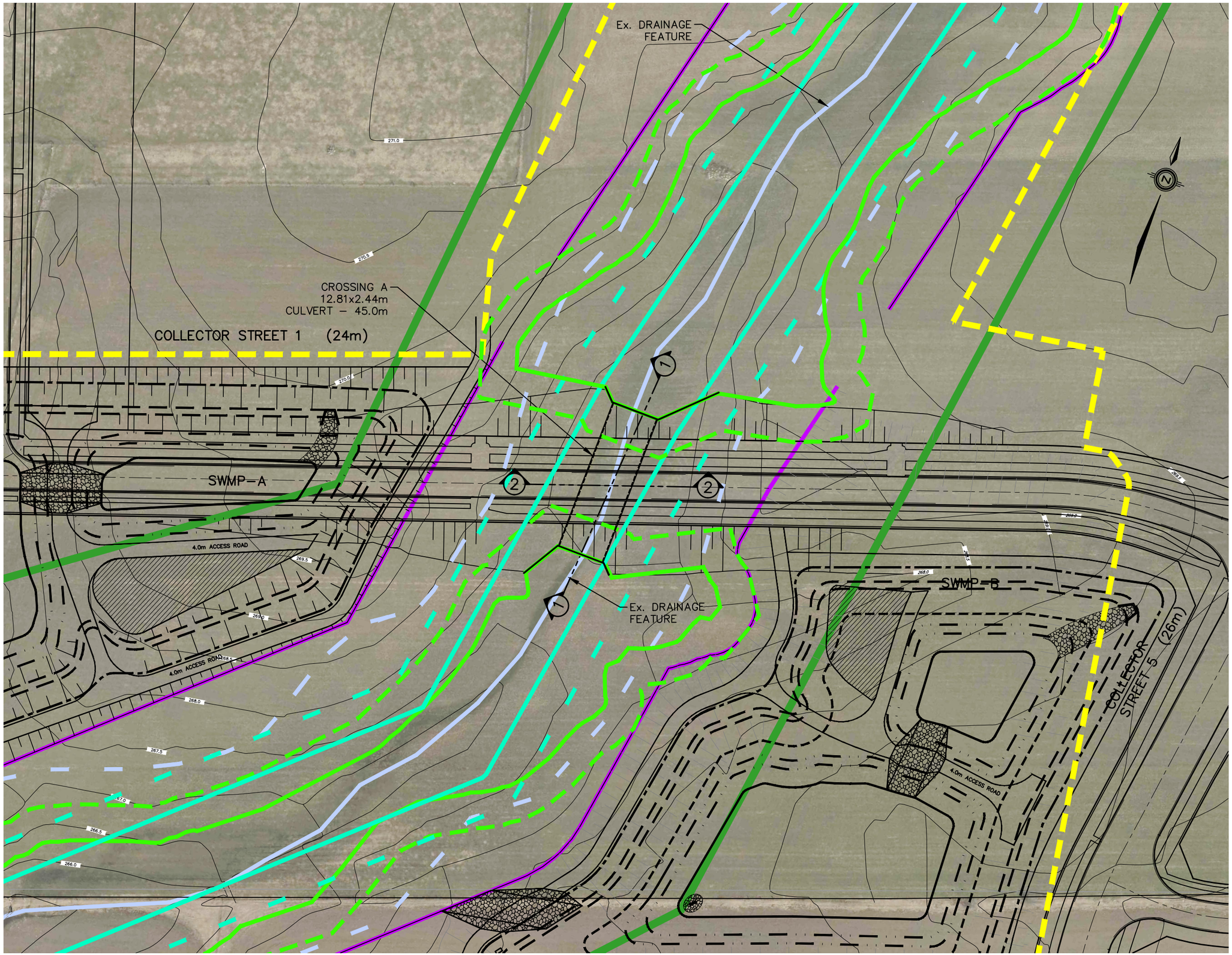
NOTE:
PROPOSED TRAIL ALIGNMENT IS CONCEPTUAL. SUBJECT TO RE□IEW IN LATER STAGES.

F□G□ □E□□□1

G□AD□□G□□□ □□HE□□H□

N

JULY 2024



BLOCK 27

LEGEND

- NHN LIMIT
- GREENBELT
- INTERMITTENT AND PERMANENT DRAINAGE FEATURES
- INTERMITTENT AND PERMANENT DRAINAGE FEATURES + 30m
- FUTURE FLOODPLAIN
- FUTURE FLOODPLAIN + 10m
- MEANDER BELT
- MEANDER BELT + 10m
- PROPOSED TRAIL
- 268.0 EXISTING CONTOUR

NOTE:
PROPOSED TRAIL ALIGNMENT IS CONCEPTUAL. SUBJECT TO REVIEW IN LATER STAGES.

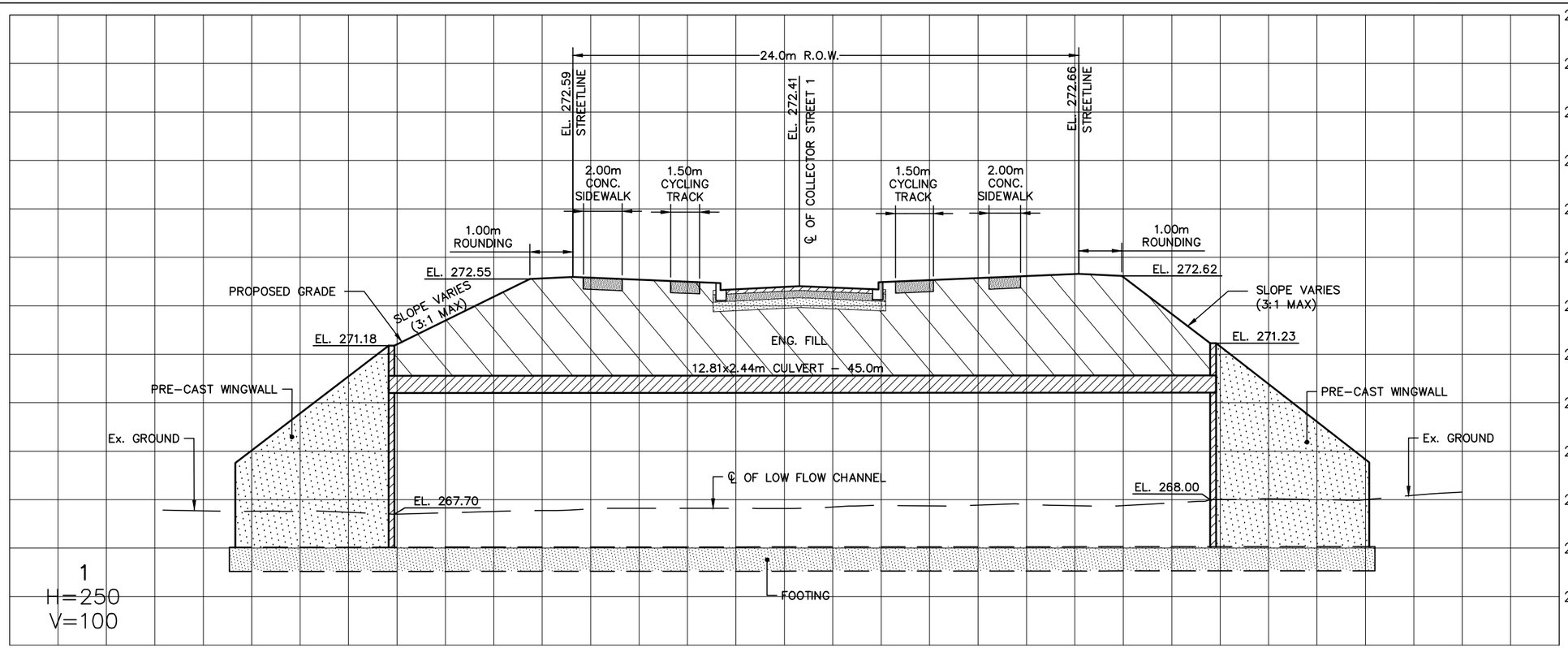
NOTE:
FOR SECTIONS 1 AND 2
REFER TO FIGURE 8.3A

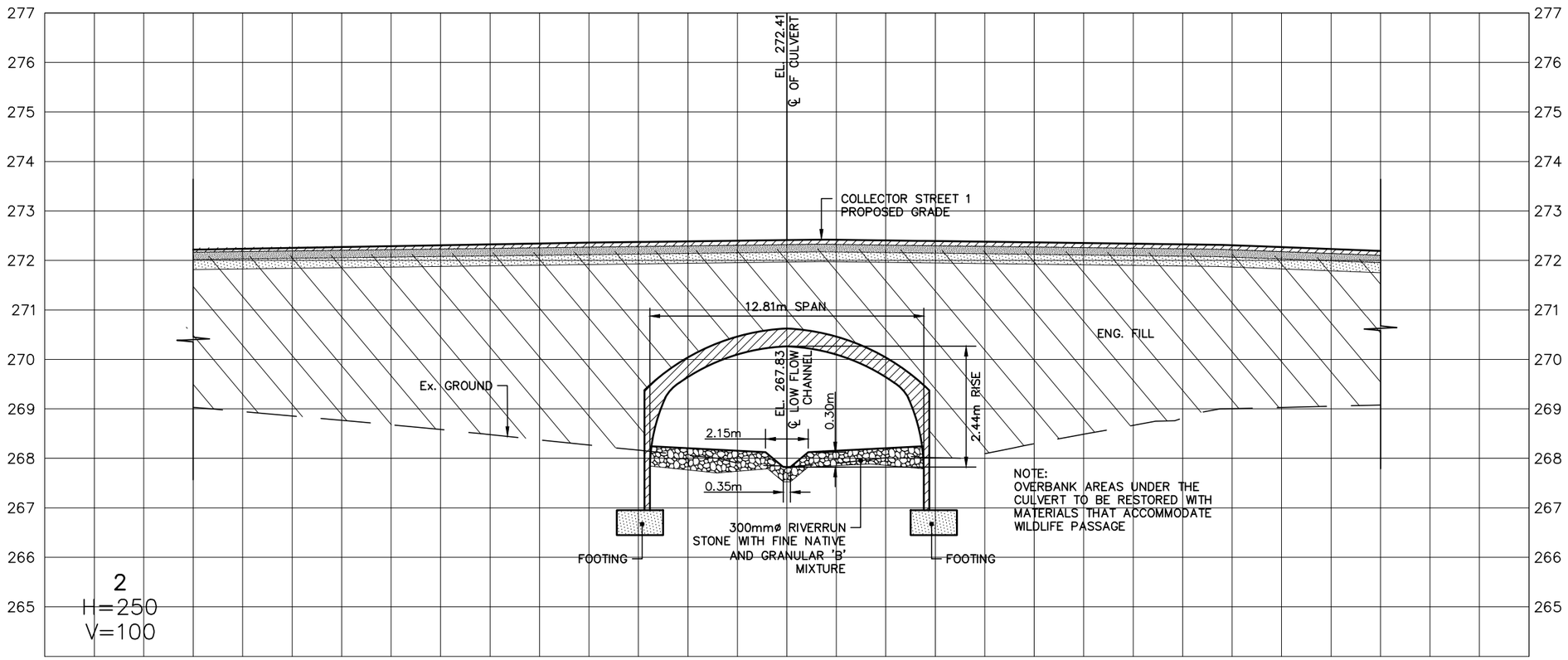
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CROSSING A
12.81x2.44m CULVERT - 45.0m
COLLECTOR STREET 1
REACH DF1

SCALE 1:1000

2019-4766	OCTOBER 2024	FIGURE 8.3





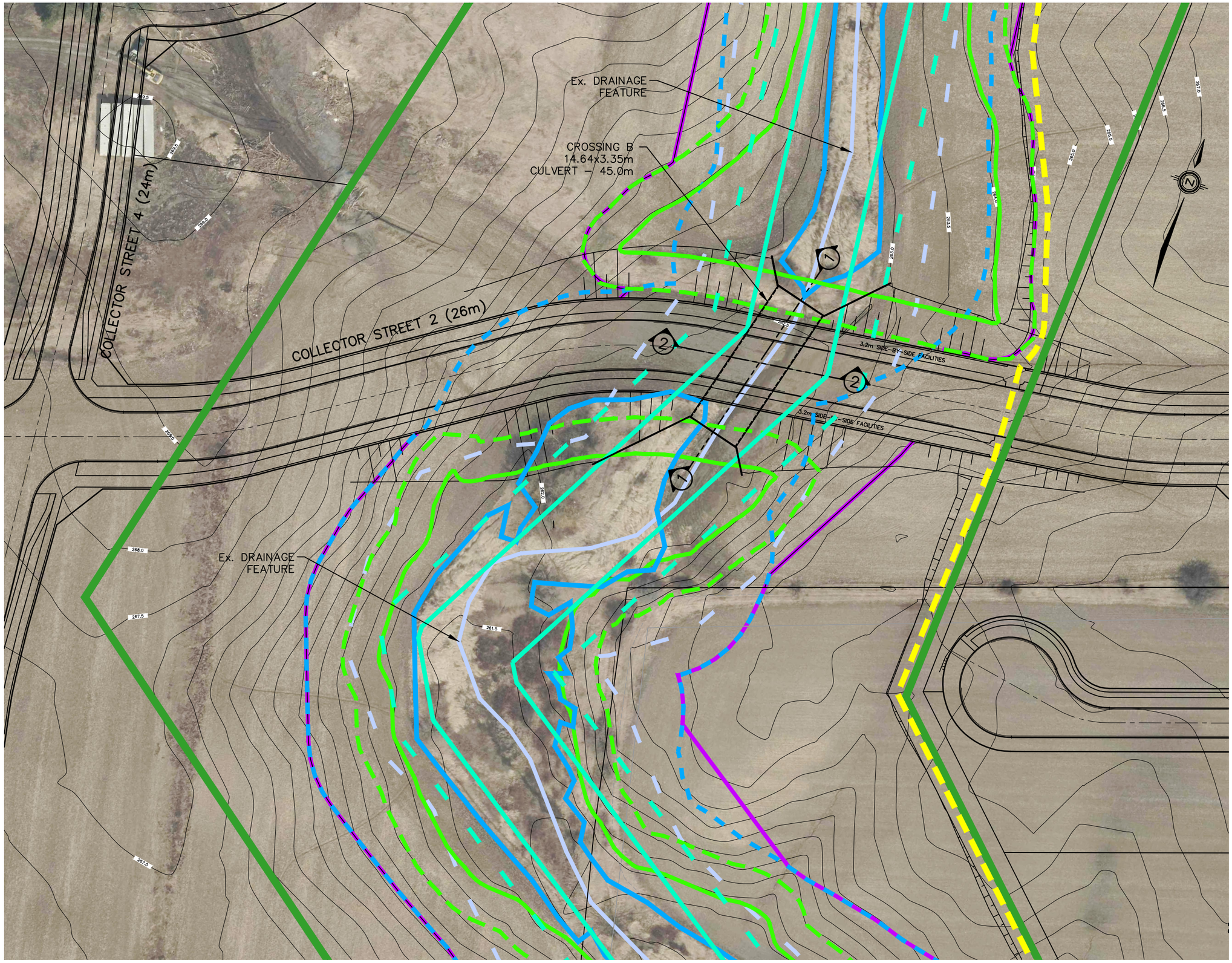
BLOCK 27

NOTE:
FOR LOCATION OF SECTIONS 1 AND 2
REFER TO FIGURE 8.3

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CROSSING A
12.81□2.44m CULVERT - 45.0m
COLLECTOR STREET 1
REACH DF1

SCALE AS SHO□ N



BLOCK 27

LEGEND

- NHN LIMIT
- GREENBELT
- INTERMITTENT AND PERMANENT DRAINAGE FEATURES
- INTERMITTENT AND PERMANENT DRAINAGE FEATURES + 30m
- FUTURE FLOODPLAIN
- FUTURE FLOODPLAIN + 10m
- STAKED PSW (MNRF)
- STAKED PSW (MNRF) + 30m
- MEANDER BELT
- MEANDER BELT + 10m
- PROPOSED TRAIL
- 268.0 EXISTING CONTOUR

NOTE:
PROPOSED TRAIL ALIGNMENT IS CONCEPTUAL. SUB□ECT TO REVIE□ IN LATER STAGES.

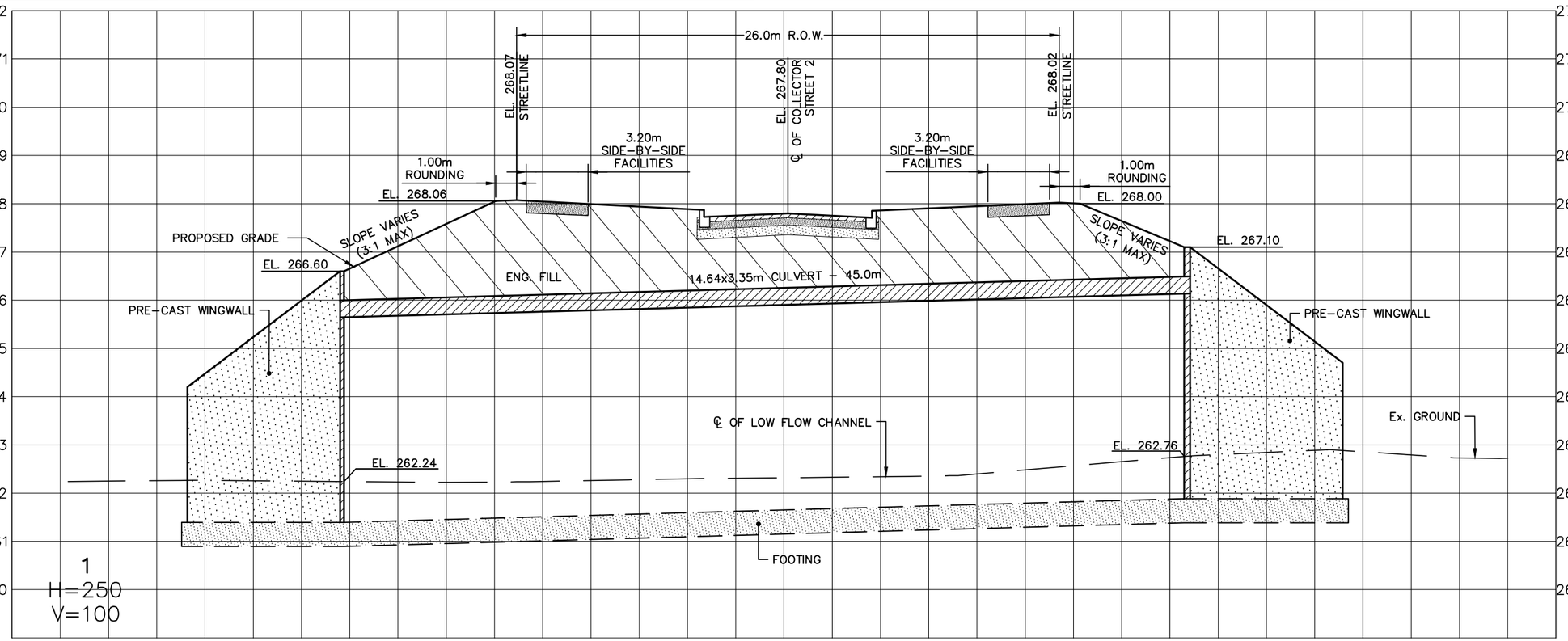
NOTE:
FOR SECTIONS 1 AND 2
REFER TO FIGURE 8.4A

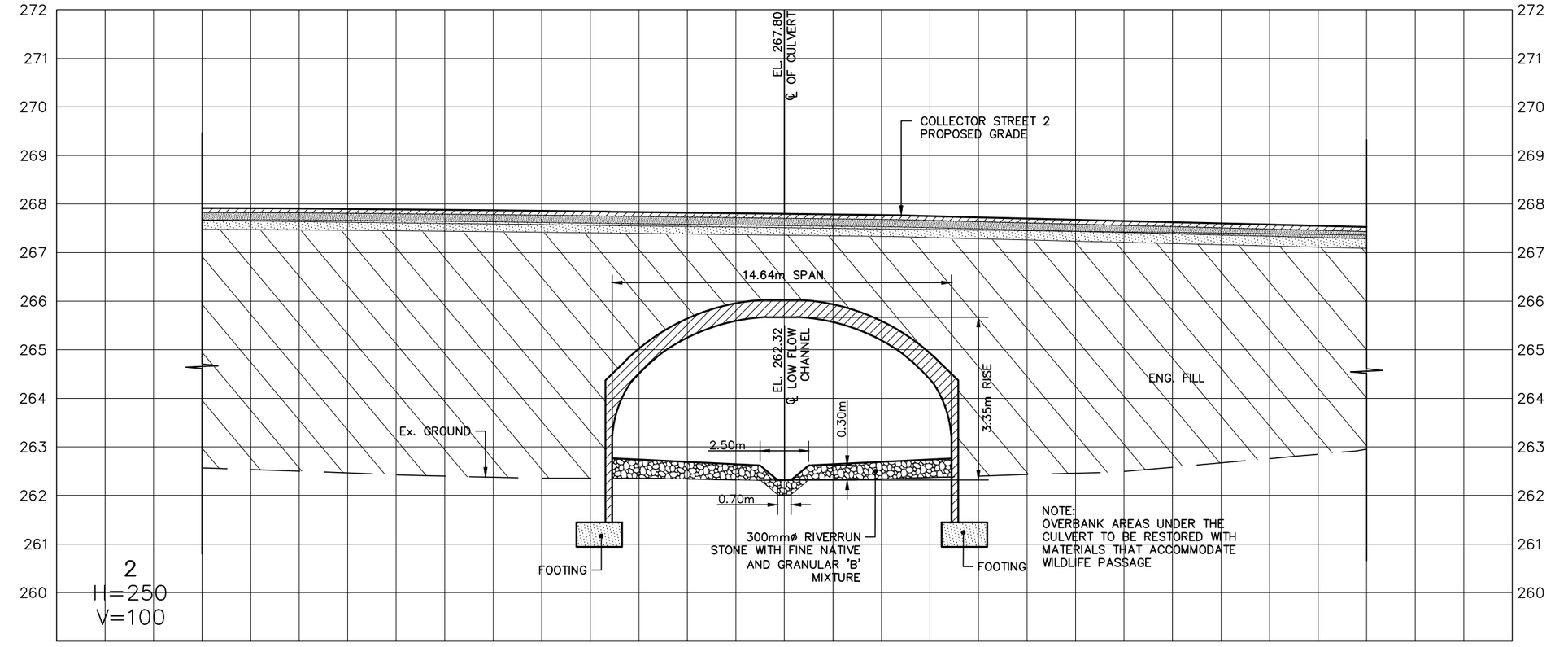
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CROSSING B
14.64□3.35m CULVERT - 45.0m
COLLECTOR STREET 2
REACH DF1

SCALE 1:1000

2019-4766	OCTOBER 2024	FIGURE 8.4





BLOCK 27

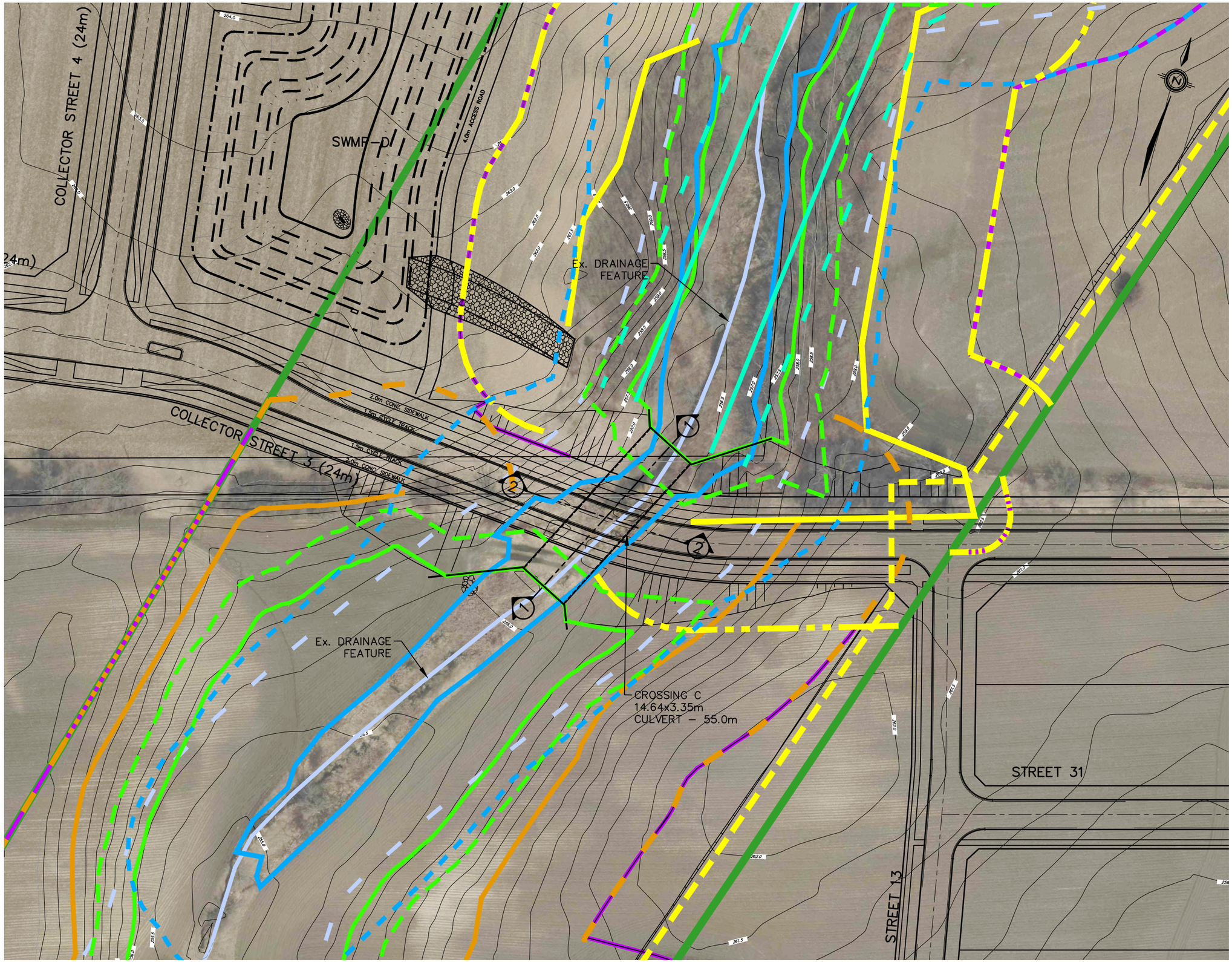
NOTE:
FOR LOCATION OF SECTIONS 1 AND 2
REFER TO FIGURE 8.4

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CROSSING B
14.64□3.35m CULVERT - 45.0m
COLLECTOR STREET 2
REACH DF1

SCALE AS SHO□ N

2019-4766 | OCTOBER 2024 | FIGURE 8.4A



BLOCK 27

LEGEND

- NHN LIMIT
- GREENBELT
- INTERMITTENT AND PERMANENT DRAINAGE FEATURES
- INTERMITTENT AND PERMANENT DRAINAGE FEATURES + 30m
- FUTURE FLOODPLAIN
- FUTURE FLOODPLAIN + 10m
- PROPOSED TRAIL
- STAKED PSW (MNRF)
- STAKED PSW (MNRF) + 15m
- MEANDER BELT
- MEANDER BELT + 10m
- STAKED WOODLANDS IN GREENBELT
- STAKED WOODLAND IN GREENBELT + 10m
- STAKED WOODLAND IN GREENBELT + 30m
- STAKED TOP OF BANK
- STAKED TOP OF BANK + 10m
- STAKED TOP OF BANK + 30m
- 268.0 EXISTING CONTOUR

NOTE:
PROPOSED TRAIL ALIGNMENT IS CONCEPTUAL. SUBJECT TO REVIEW IN LATER STAGES.

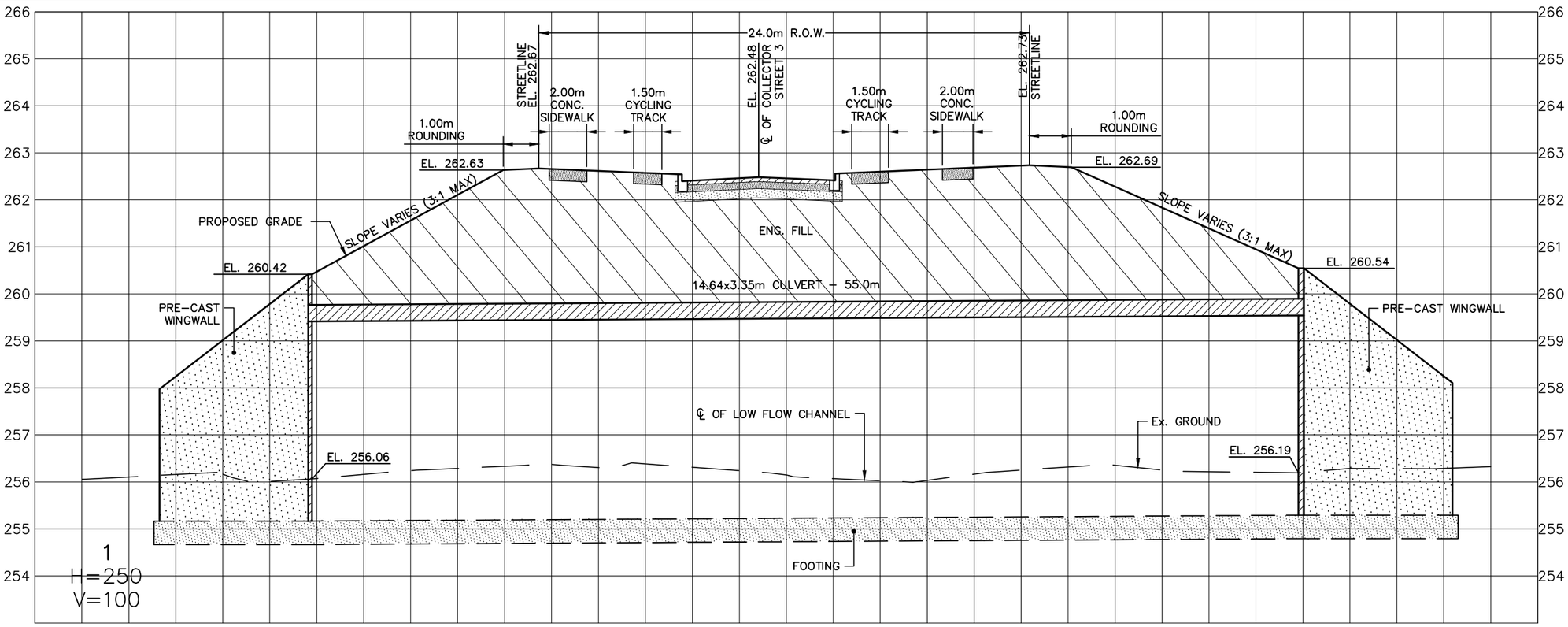
NOTE:
FOR SECTIONS 1 AND 2
REFER TO FIGURE 8.5A

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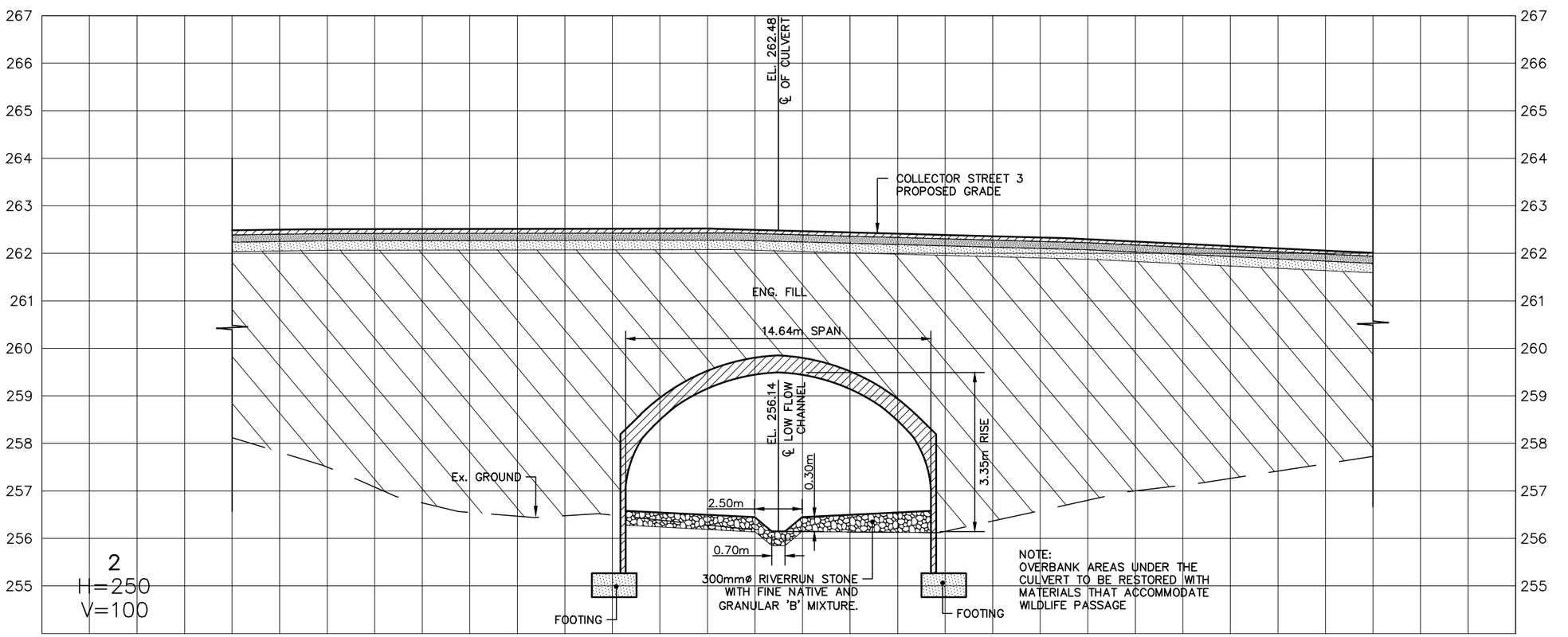
CROSSING C
14.64x3.35m CULVERT - 55.0m
COLLECTOR STREET 3
REACH DF1

SCALE 1:1000

2019-4766 | OCTOBER 2024 | FIGURE 8.5



1
H=250
V=100



2
H=250
V=100

BLOCK 27

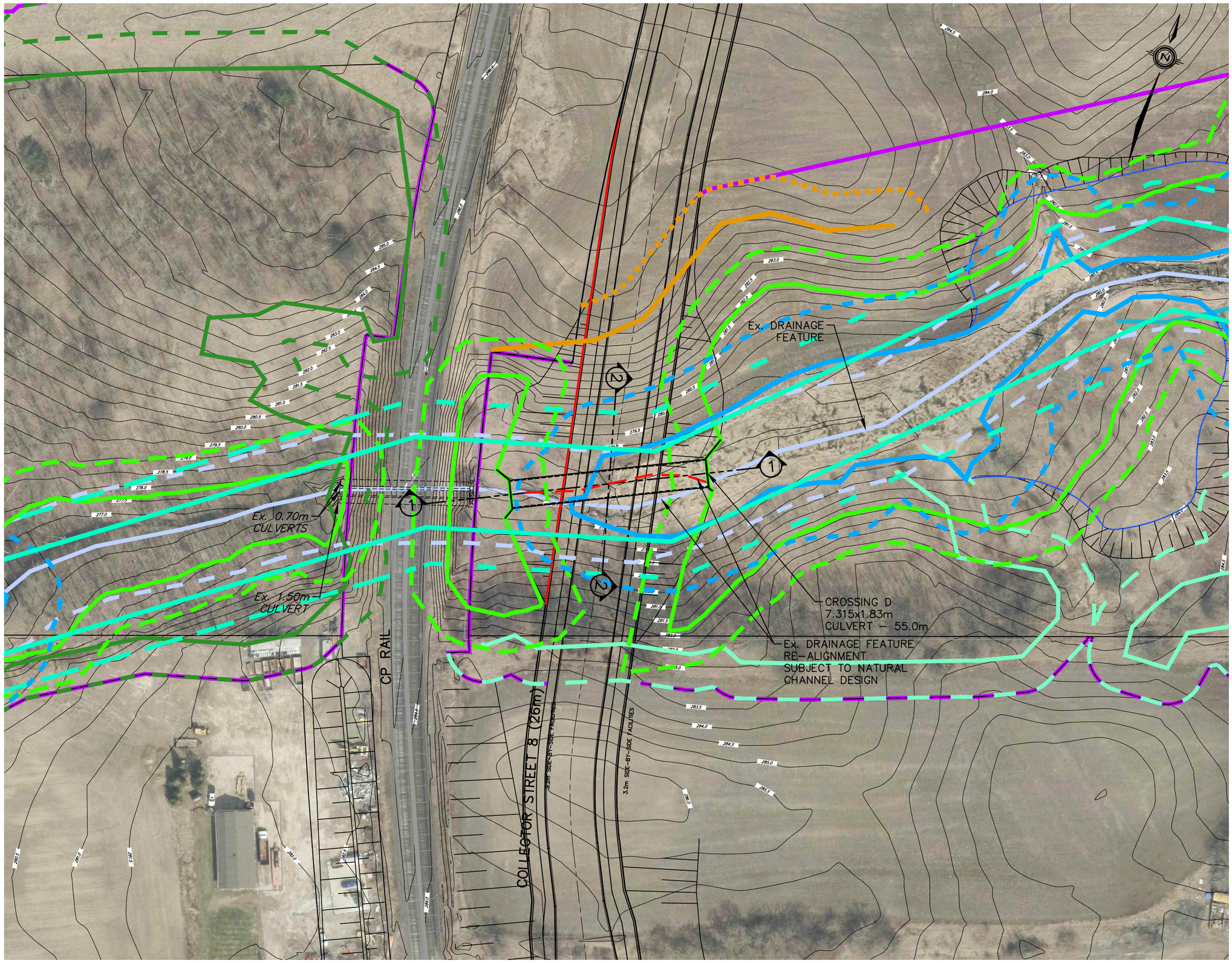
NOTE:
FOR LOCATION OF SECTIONS 1 AND 2
REFER TO FIGURE 8.5

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CROSSING C
14.64□3.35m CULVERT - 55.0m
COLLECTOR STREET 3
REACH DF1

SCALE AS SHO□ N

2019-4766 | OCTOBER 2024 | FIGURE 8.5A



BLOCK 27

LEGEND

- NHN LIMIT
- INTERMITTENT AND PERMANENT DRAINAGE FEATURES
- INTERMITTENT AND PERMANENT DRAINAGE FEATURES + 30m
- FUTURE FLOODPLAIN
- FUTURE FLOODPLAIN + 10m
- STAKED PSW (MNRF)
- STAKED PSW (MNRF) + 15m
- STAKED WOODLOT
- STAKED WOODLOT + 10m
- CONTIGUOUS VEGETATION
- CONTIGUOUS VEGETATION + 10m
- STAKED TOP OF BANK
- STAKED TOP OF BANK + 10m
- Ex. DRAINAGE FEATURE RE-ALIGNMENT SUBJECT TO NATURAL CHANNEL DESIGN
- MEANDER BELT
- MEANDER BELT + 10m
- 268.0 EXISTING CONTOUR

NOTE:
FOR SECTIONS 1 AND 2
REFER TO FIGURE 8.6A

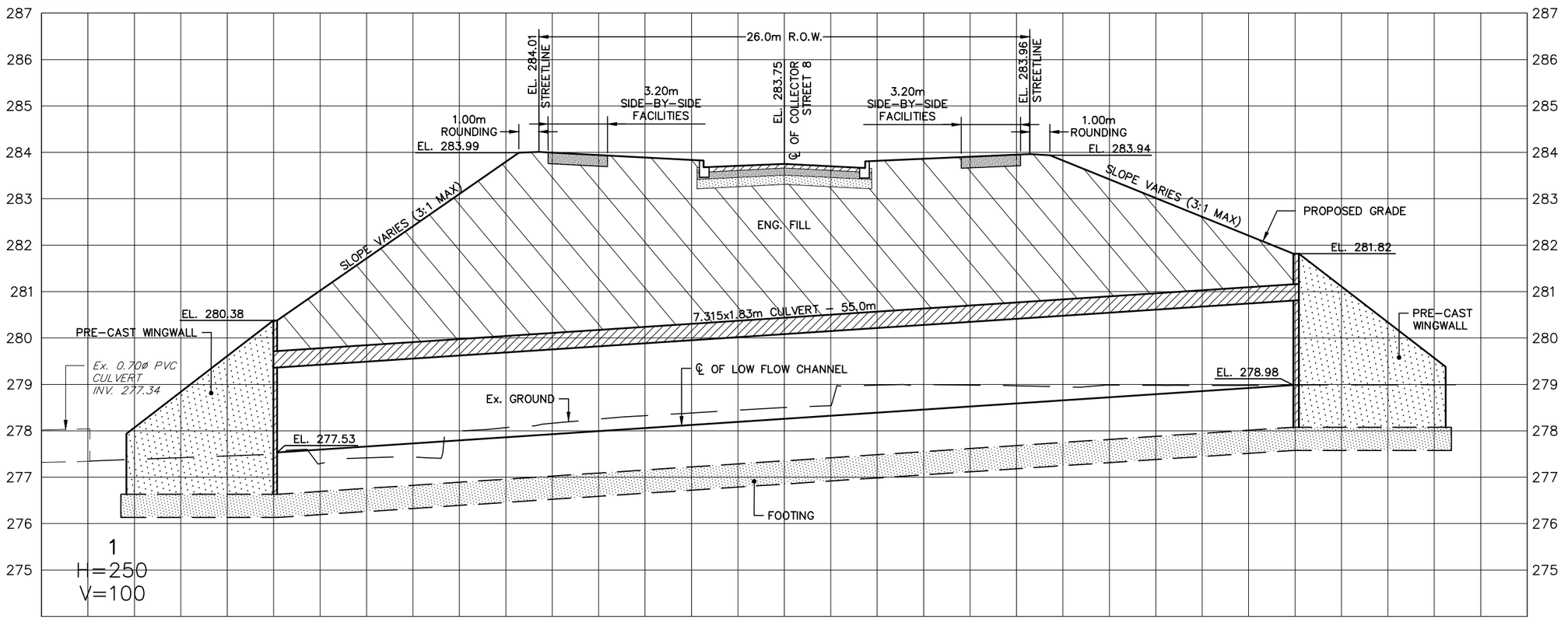
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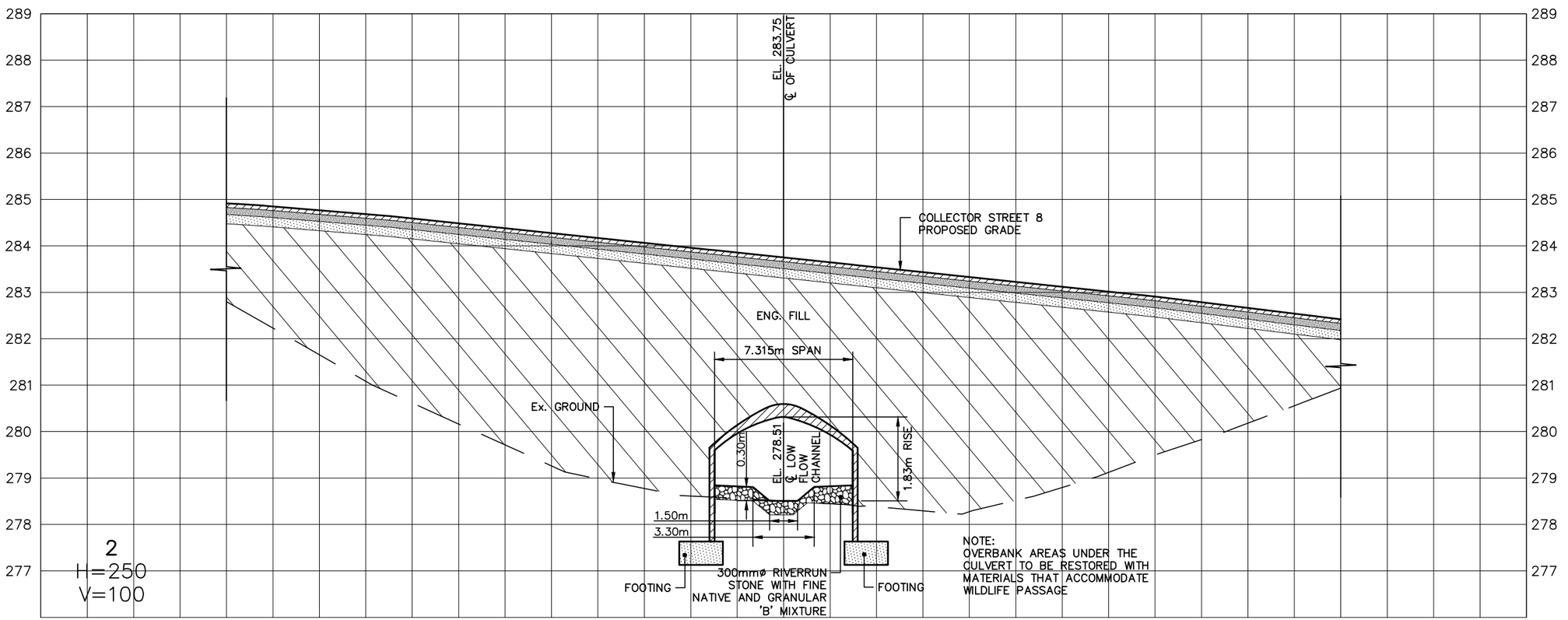
CROSSING D
7.315□1.83m CULVERT - 55.0m
COLLECTOR STREET 8
REACH DF3

SCALE 1:1000

2019-4766	OCTOBER 2024	FIGURE 8.6

BLOCK 27



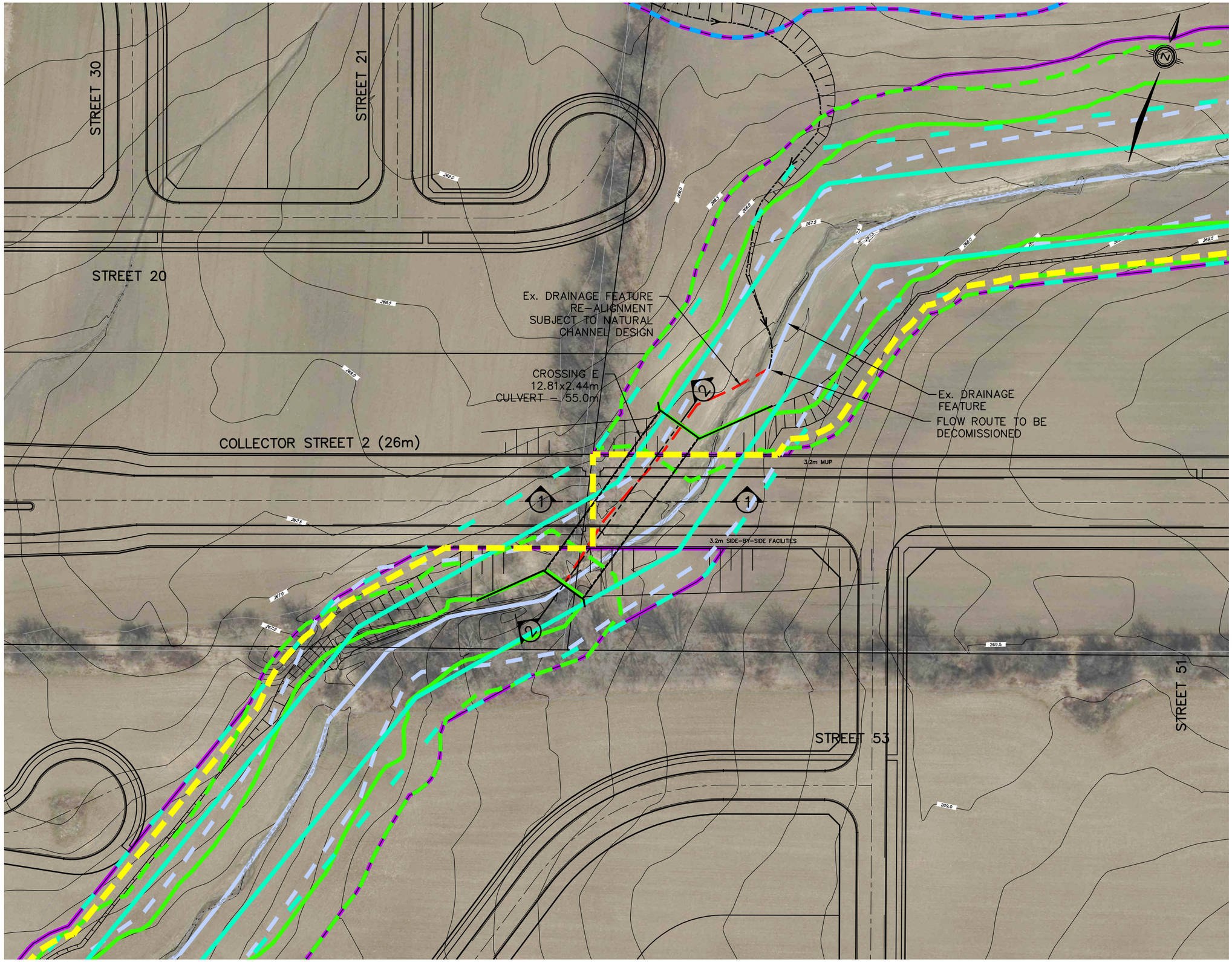


NOTE:
FOR LOCATION OF SECTIONS 1 AND 2
REFER TO FIGURE 8.6

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CROSSING D
7.315□1.83m CULVERT - 55.0m
COLLECTOR STREET 8
REACH DF3

SCALE AS SHO□ N



BLOCK 27

LEGEND

- NHN LIMIT
- INTERMITTENT AND PERMANENT DRAINAGE FEATURES
- INTERMITTENT AND PERMANENT DRAINAGE FEATURES + 15m
- FUTURE FLOODPLAIN
- FUTURE FLOODPLAIN + 10m
- STAKED PSW (MNRF)
- STAKED PSW (MNRF) + 15m
- FLOW ROUTE TO BE DECOMMISSIONED
- Ex. DRAINAGE FEATURE RE-ALIGNMENT SUBJECT TO NATURAL CHANNEL DESIGN
- MEANDER BELT
- MEANDER BELT + 10m
- PROPOSED TRAIL
- 268.0 EXISTING CONTOUR

NOTE:
PROPOSED TRAIL ALIGNMENT IS CONCEPTUAL. SUBJECT TO REVIEW IN LATER STAGES.

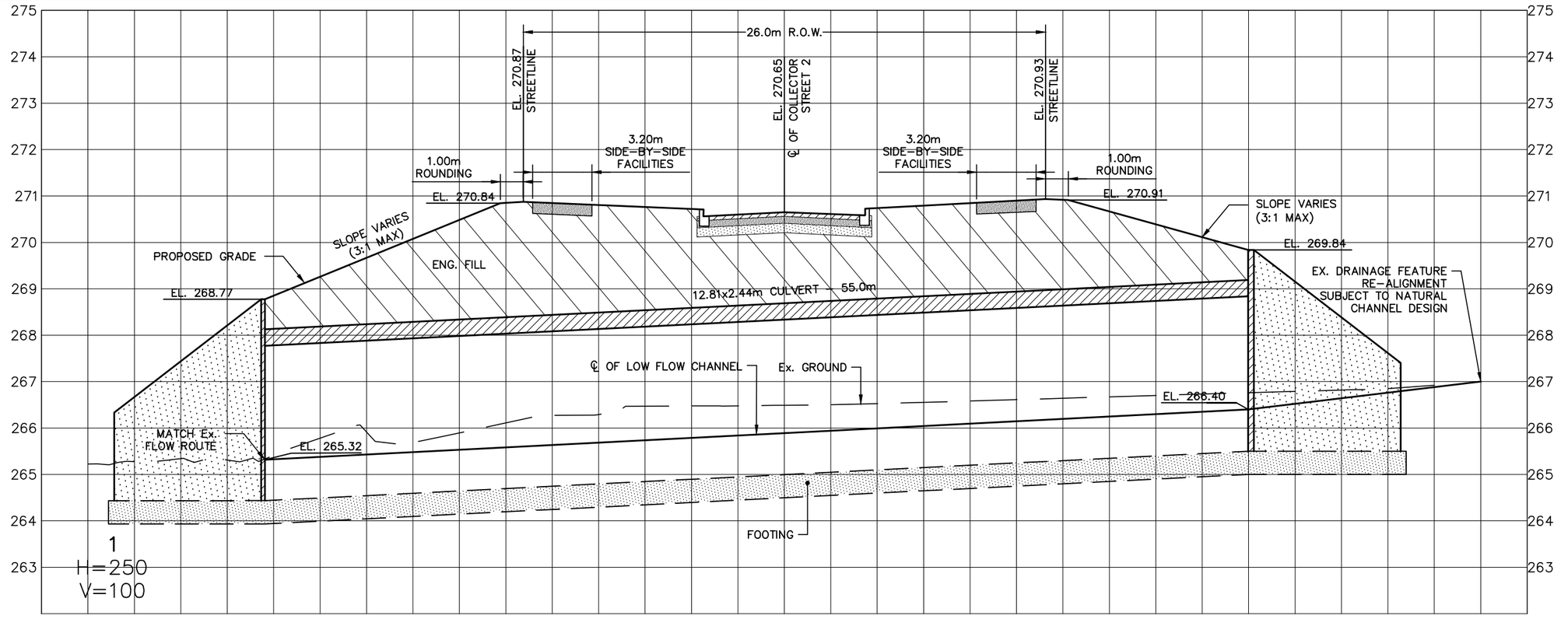
NOTE:
FOR SECTIONS 1 AND 2
REFER TO FIGURE 8.7A

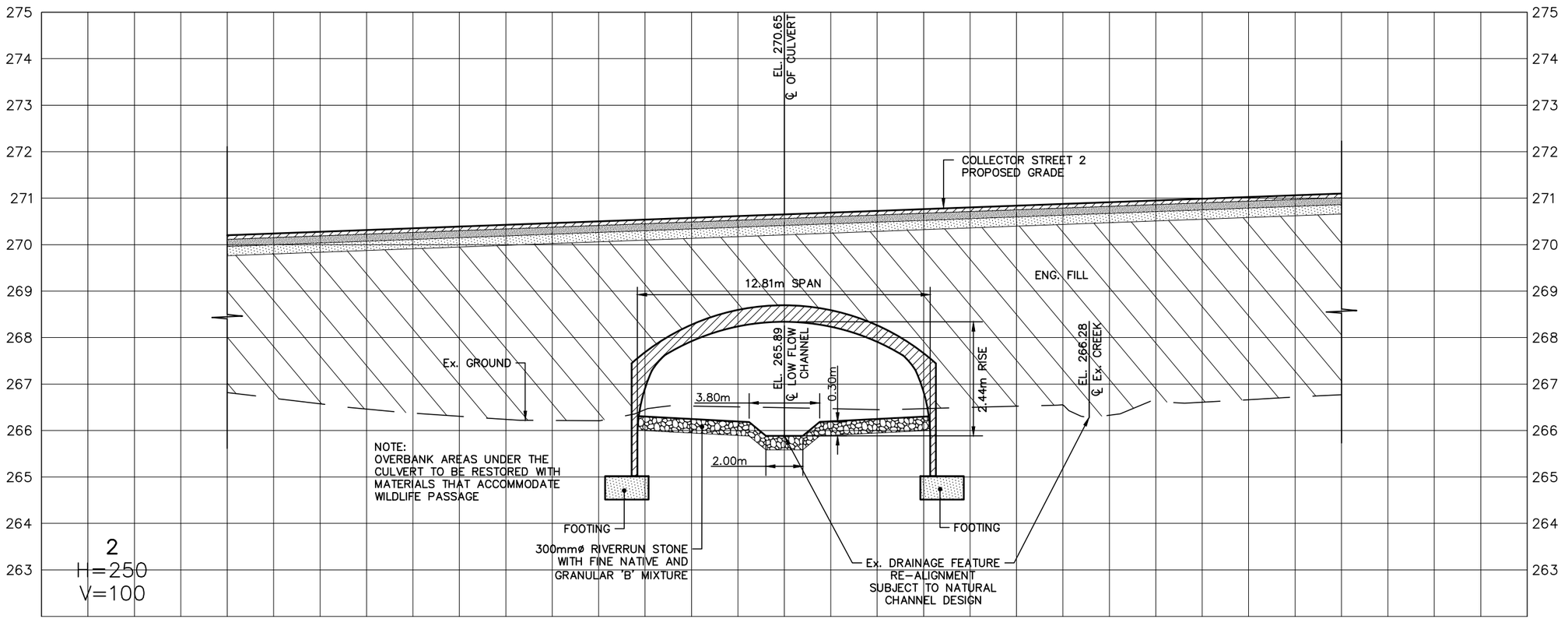
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CROSSING E
12.81x2.44m CULVERT - 55.0m
COLLECTOR STREET 2
REACH DF3

SCALE 1:1000

2019-4766	OCTOBER 2024	FIGURE 8.7





BLOCK 27

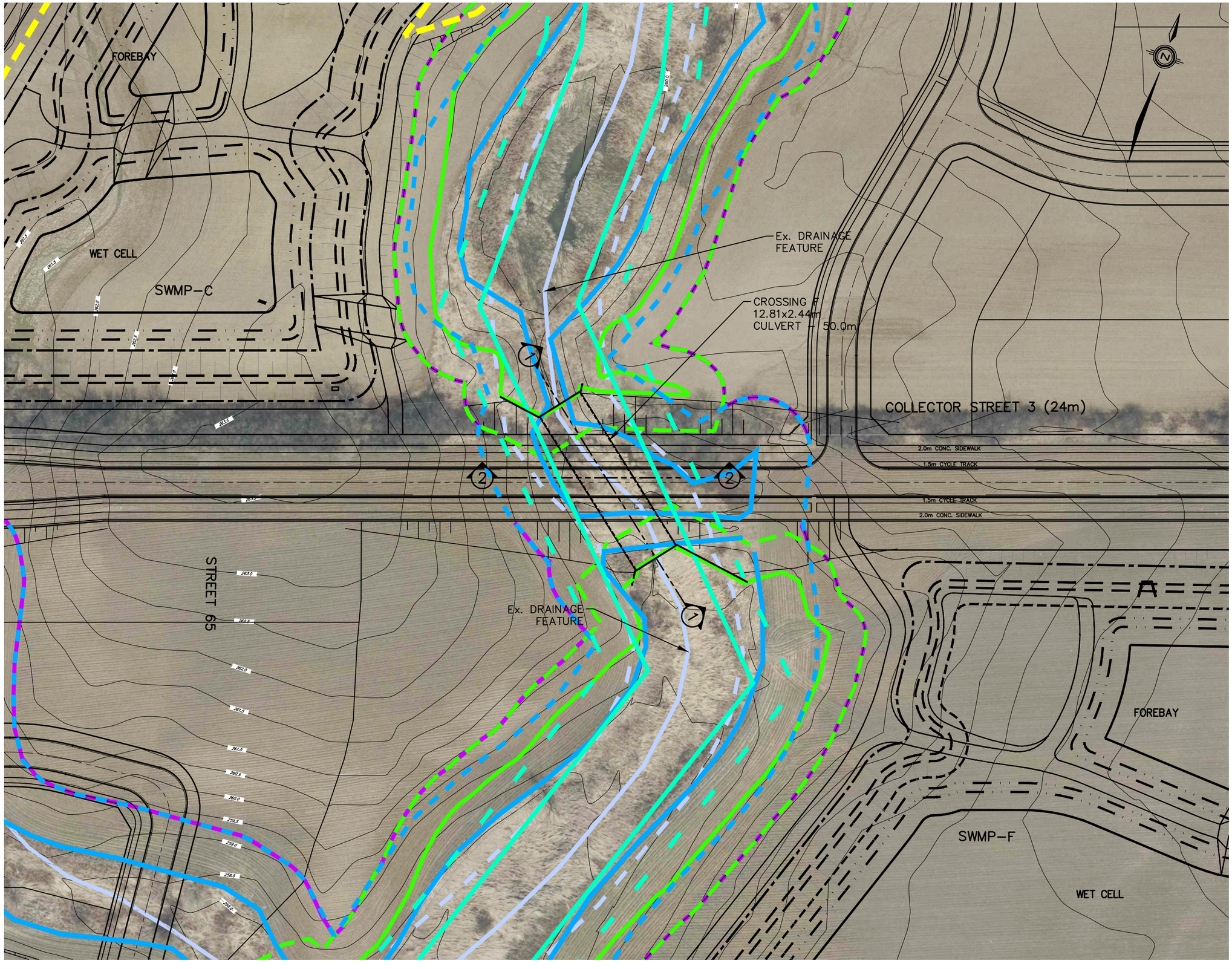
NOTE:
FOR LOCATION OF SECTIONS 1 AND 2
REFER TO FIGURE 8.7

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CROSSING E
12.81□2.44m CULVERT - 55.0m
COLLECTOR STREET 2
REACH DF3

SCALE AS SHO□ N

2019-4766 | OCTOBER 2024 | FIGURE 8.7A



BLOCK 27

LEGEND

- NHN LIMIT
- INTERMITTENT AND PERMANENT DRAINAGE FEATURES
- INTERMITTENT AND PERMANENT DRAINAGE FEATURES + 15m
- FUTURE FLOODPLAIN
- FUTURE FLOODPLAIN + 10m
- STAKED PSW (MNRF)
- STAKED PSW (MNRF) + 15m
- MEANDER BELT
- MEANDER BELT + 10m
- PROPOSED TRAIL
- 268.0 EXISTING CONTOUR

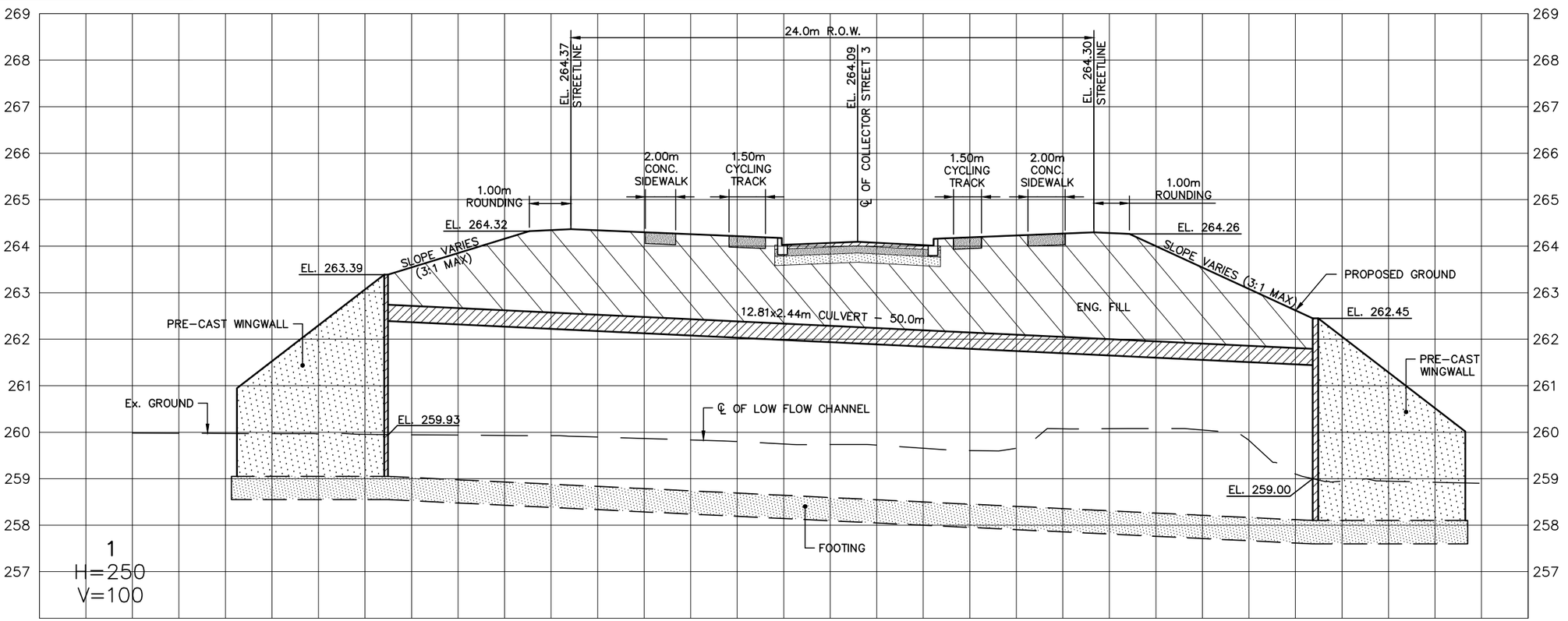
NOTE:
PROPOSED TRAIL ALIGNMENT IS CONCEPTUAL. SUBJECT TO REVIEW IN LATER STAGES.

NOTE:
FOR SECTIONS 1 AND 2 REFER TO FIGURE 8.8A

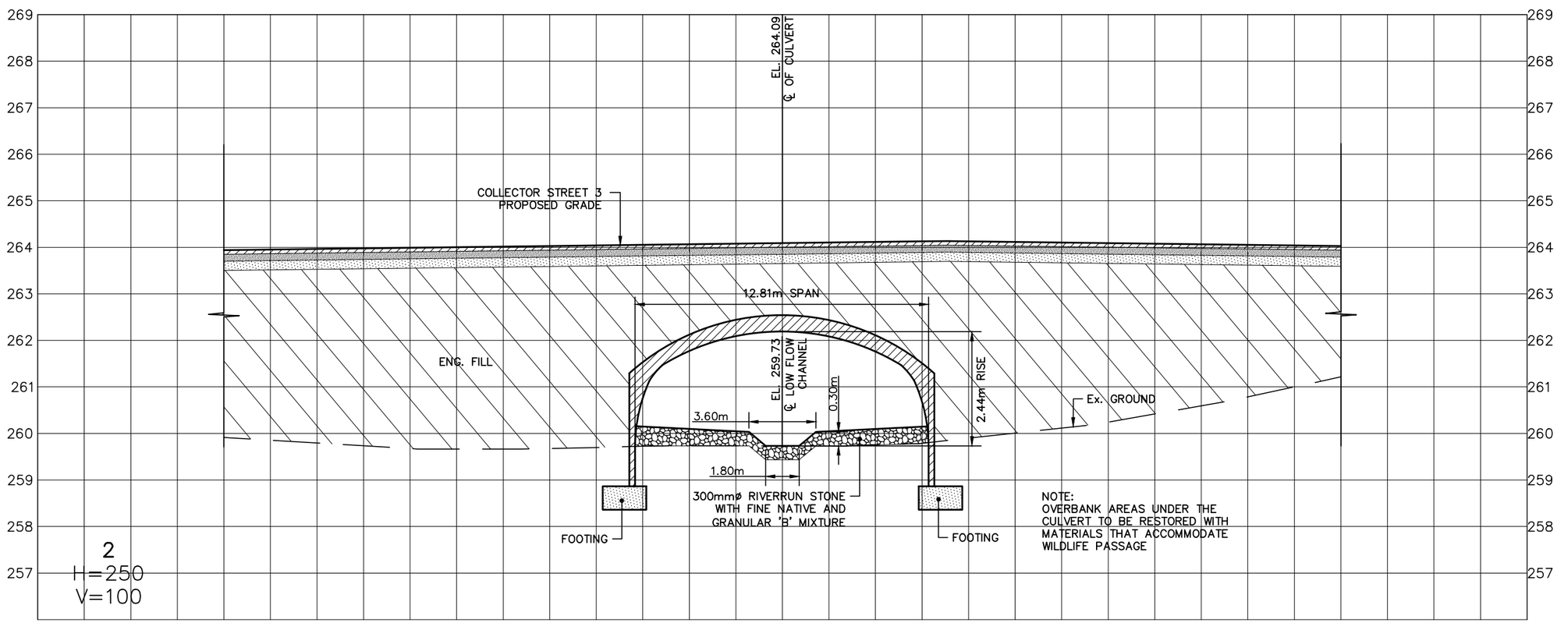
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CROSSING F
12.81x2.44m CULVERT - 50.0m
COLLECTOR STREET 3
REACH DF3

SCALE 1:1000



1
H=250
V=100



2
H=250
V=100

BLOCK 27

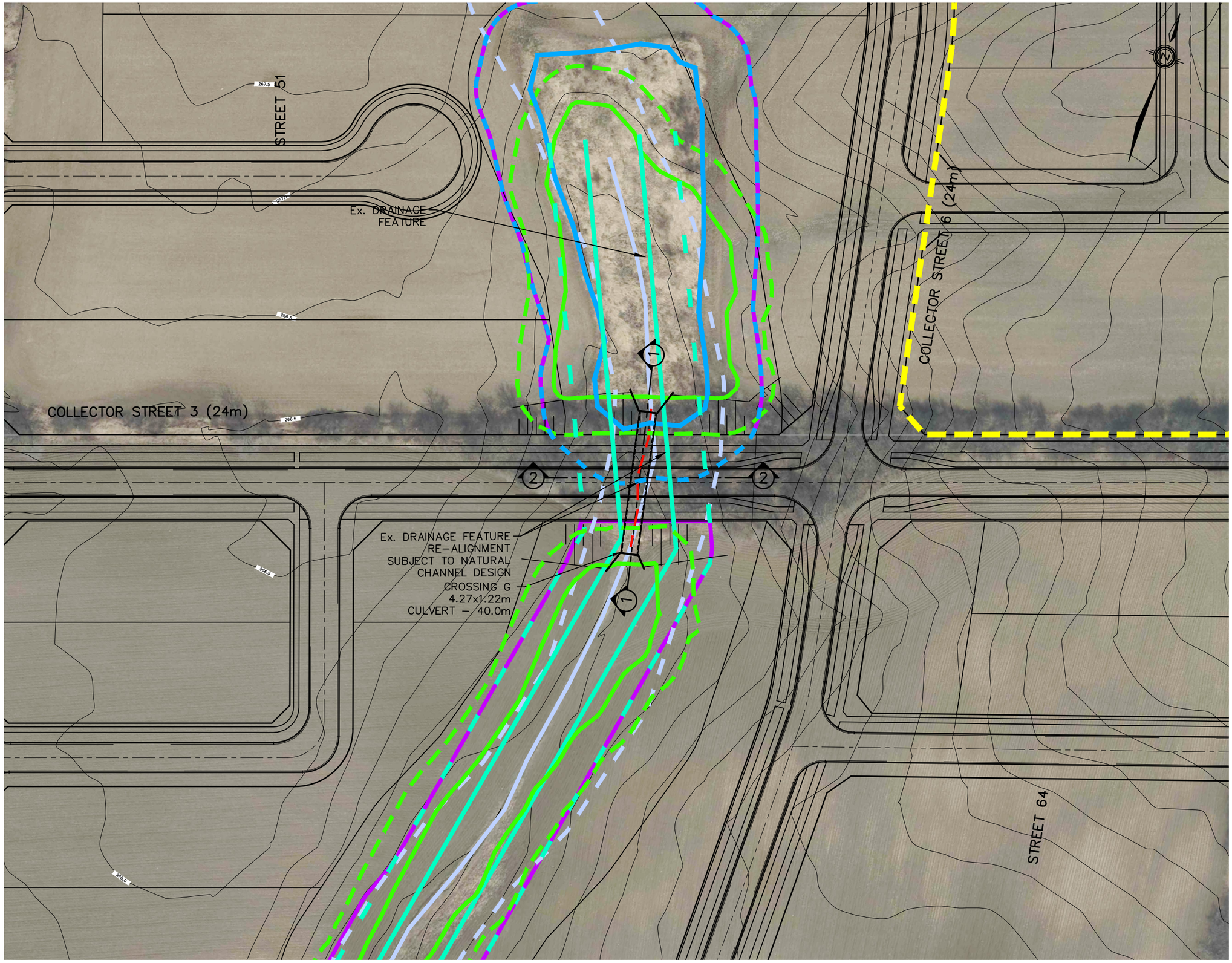
NOTE:
FOR LOCATION OF SECTIONS 1 AND 2
REFER TO FIGURE 8.8

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CROSSING F
12.81□2.44m CULVERT - 50.0m
COLLECTOR STREET 3
REACH DF3

SCALE AS SHO□ N

2019-4766 | OCTOBER 2024 | FIGURE 8.8A



BLOCK 27

LEGEND

- NHN LIMIT
- INTERMITTENT AND PERMANENT DRAINAGE FEATURES
- INTERMITTENT AND PERMANENT DRAINAGE FEATURES + 15m
- FUTURE FLOODPLAIN
- FUTURE FLOODPLAIN + 10m
- STAKED PSW (MNRF)
- STAKED PSW (MNRF) + 30m
- MEANDER BELT
- MEANDER BELT + 10m
- Ex. DRAINAGE FEATURE RE-ALIGNMENT SUBJECT TO NATURAL CHANNEL DESIGN
- PROPOSED TRAIL
- 268.0 EXISTING CONTOUR

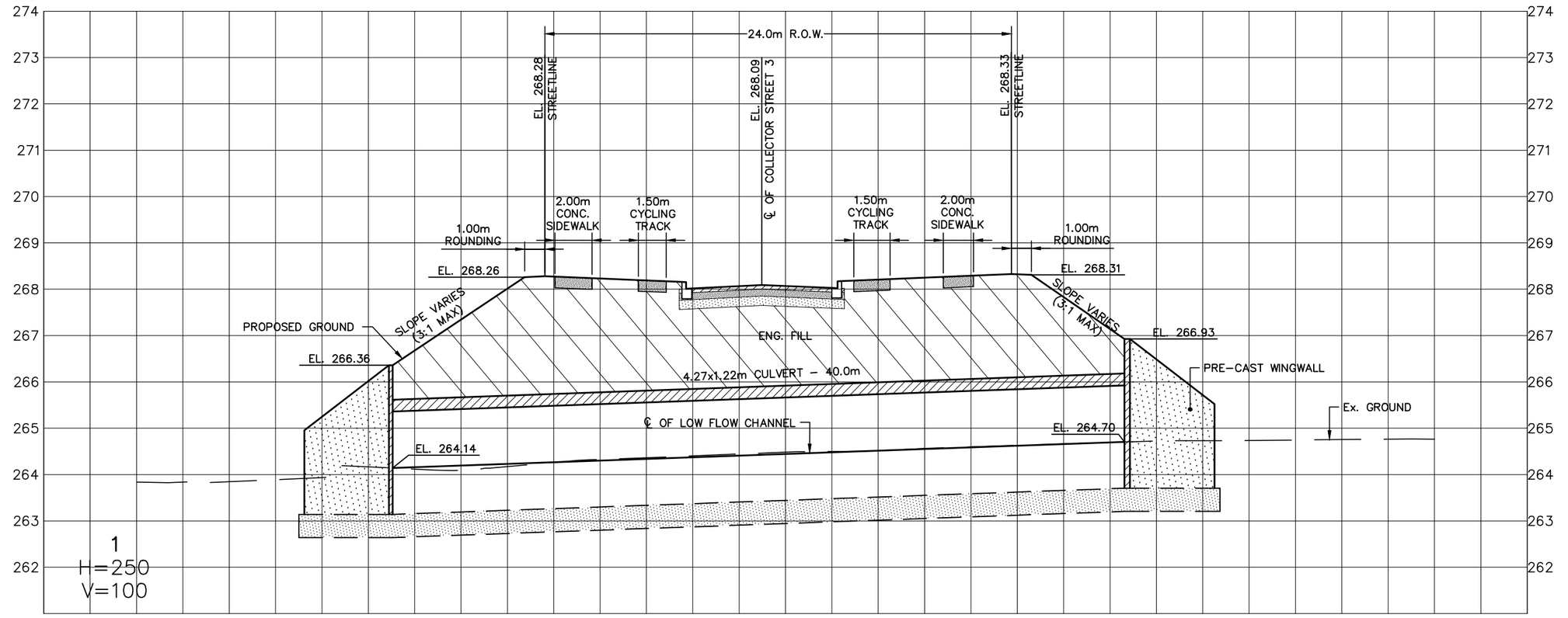
NOTE:
PROPOSED TRAIL ALIGNMENT IS CONCEPTUAL. SUBJECT TO REVIEW IN LATER STAGES.

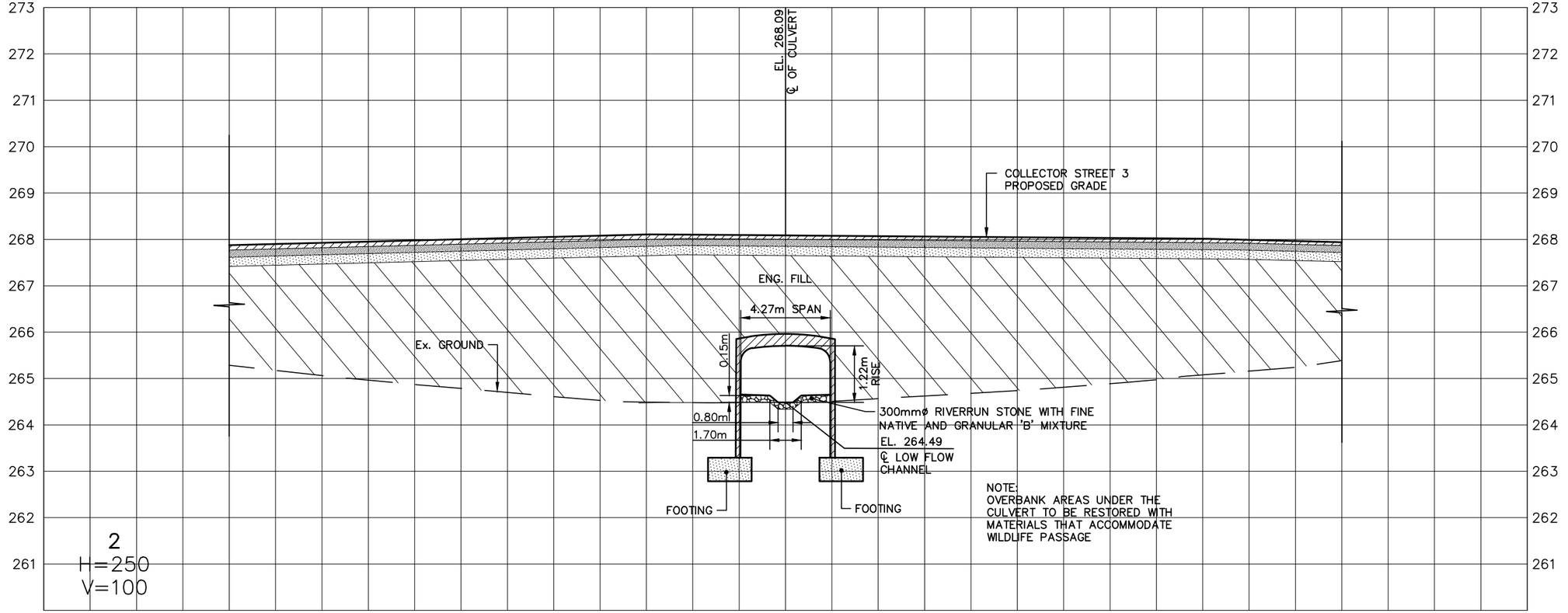
NOTE:
FOR SECTIONS 1 AND 2 REFER TO FIGURE 8.9A

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CROSSING G
4.27x1.22m CULVERT - 40.0m
COLLECTOR STREET 3
REACH DF4

SCALE 1:1000





BLOCK 27

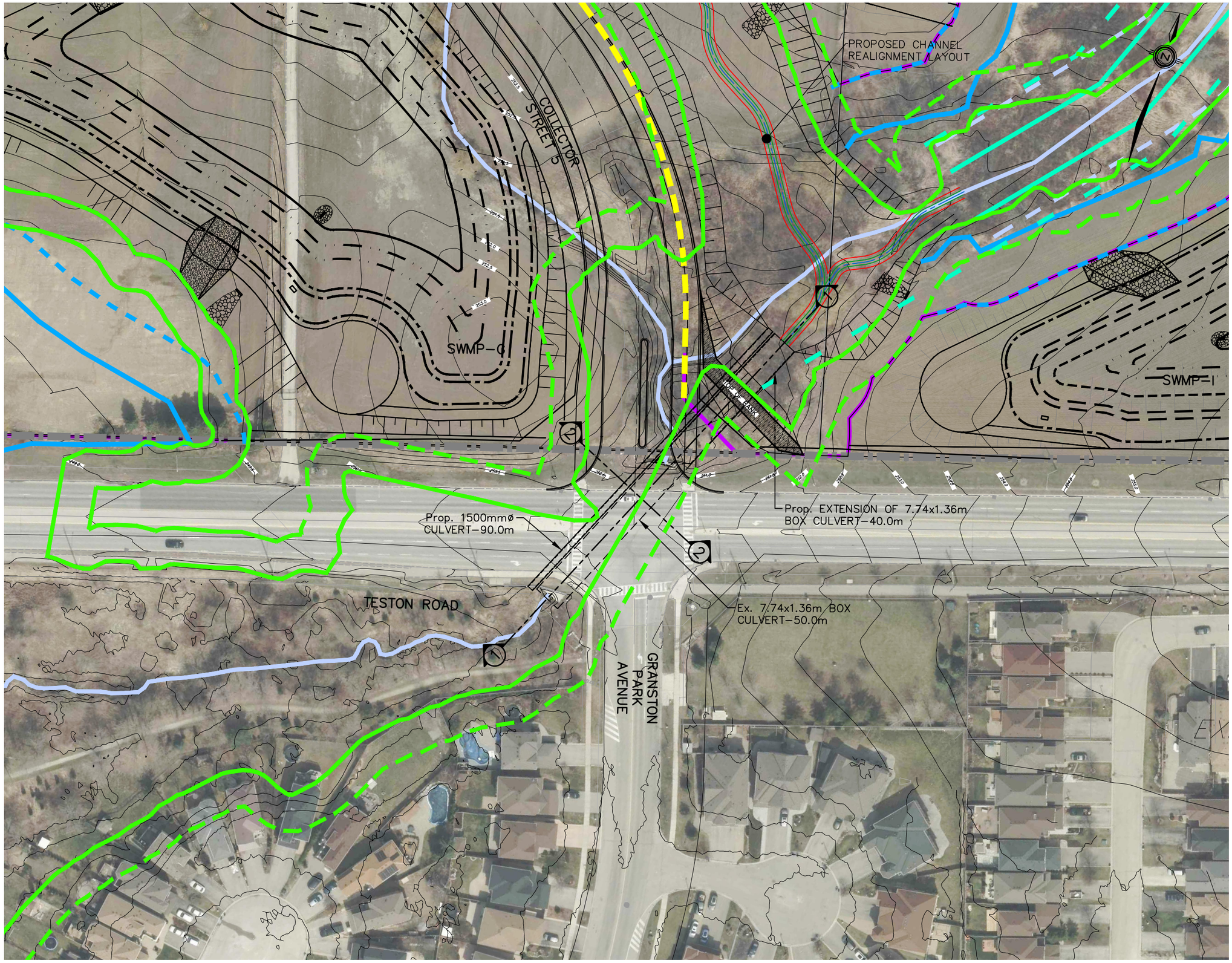
NOTE:
FOR LOCATION OF SECTIONS 1 AND 2
REFER TO FIGURE 8.9

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CROSSING G
4.27□1.22m CULVERT - 40.0m
COLLECTOR STREET 3
REACH DF4

SCALE AS SHO□ N

2019-4766 | OCTOBER 2024 | FIGURE 8.9A



BLOCK 27

LEGEND

- NHN LIMIT
- INTERMITTENT AND PERMANENT DRAINAGE FEATURES
- INTERMITTENT AND PERMANENT DRAINAGE FEATURES + 15m
- FUTURE FLOODPLAIN
- FUTURE FLOODPLAIN + 10m
- STAKED PSW (MNRF)
- STAKED PSW (MNRF) + 15m
- MEANDER BELT
- MEANDER BELT + 10m
- PROPOSED TRAIL
- 268.0 EXISTING CONTOUR

NOTE:
PROPOSED TRAIL ALIGNMENT IS CONCEPTUAL. SUBJECT TO REVIEW IN LATER STAGES.

NOTE:
FOR SECTIONS 1 AND 2
REFER TO FIGURE 8.10A

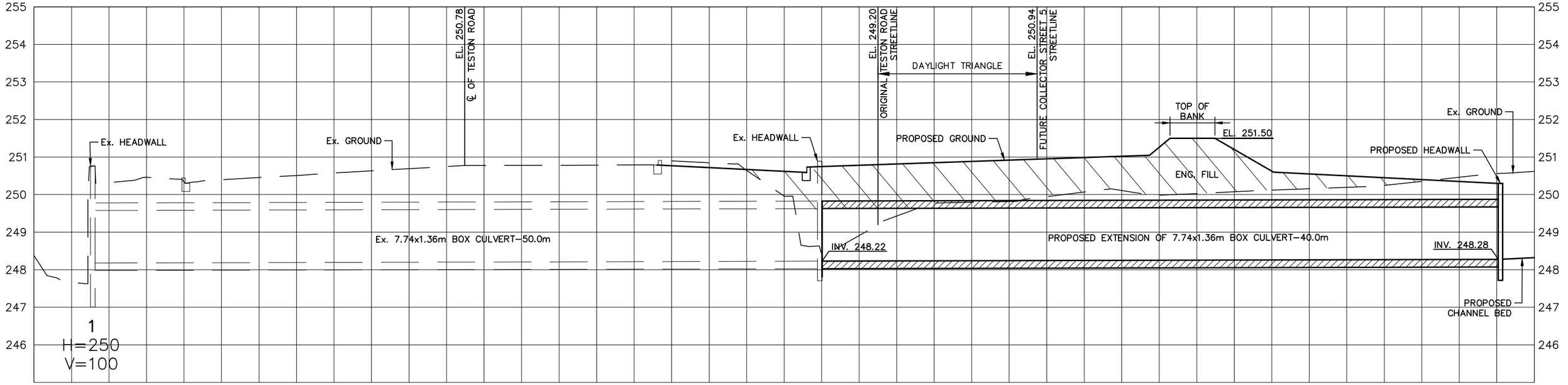
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TESTON ROAD CROSSING
7.74x1.36m BOX CULVERT AND
1500mm CIRCULAR CULVERT
REACH DF3

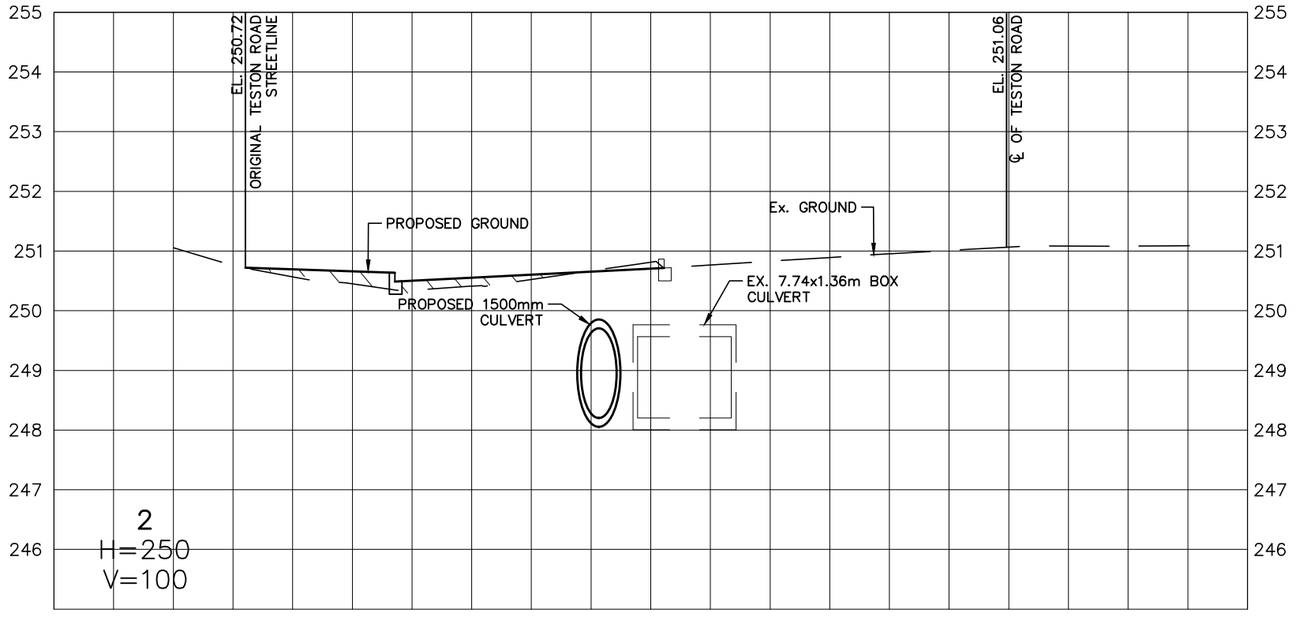
SCALE 1:1000

2019-4766	OCTOBER 2024	FIGURE 8.10

BLOCK 27



1
H=250
V=100



2
H=250
V=100

NOTE:
FOR LOCATION OF SECTIONS 1 AND 2
REFER TO FIGURE 8.10

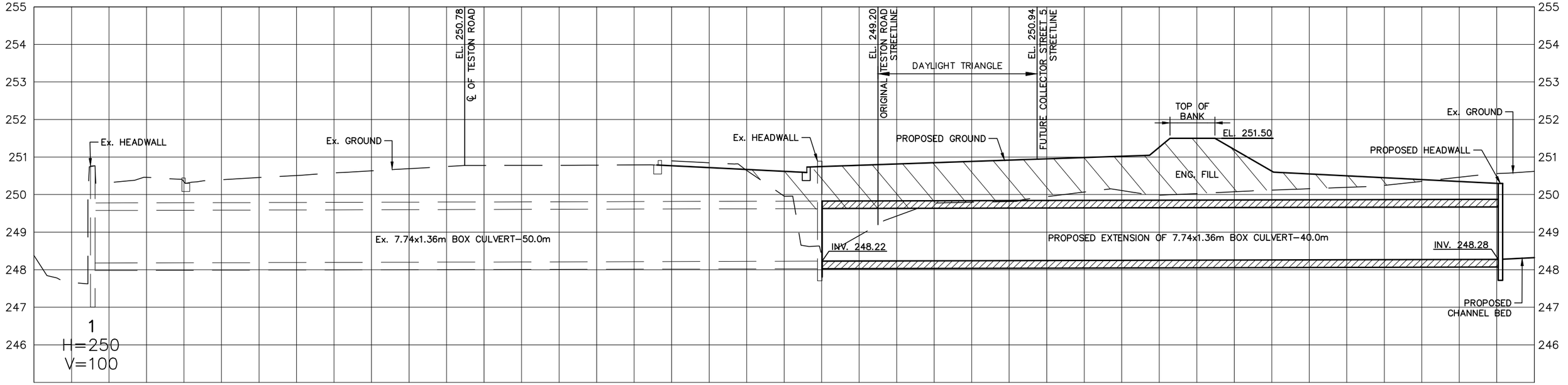
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Tel: (905) 738-6100 Email: general@schaeffers.com
www.schaeffers.com

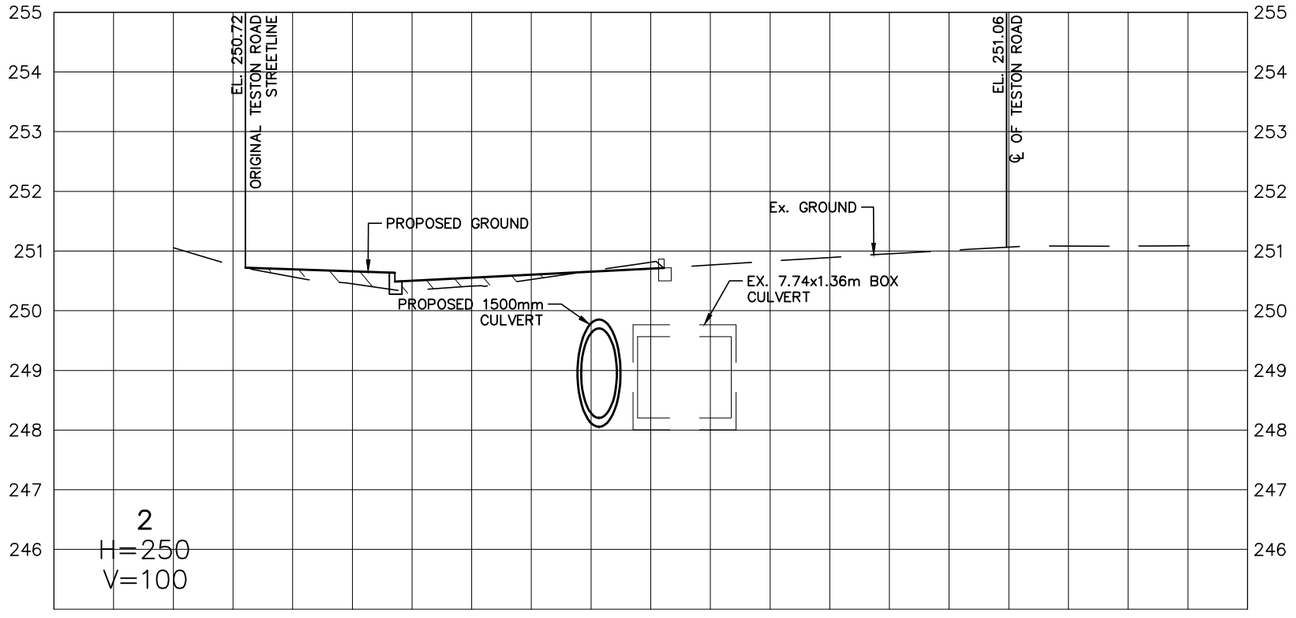
TESTON ROAD CROSSING
7.74□1.36m BO□ CULVERT AND
1500mm CIRCULAR CULVERT
REACH DF3

SCALE AS SHO□ N

2019-4766 | OCTOBER 2024 | FIGURE 8.10A

BLOCK 27





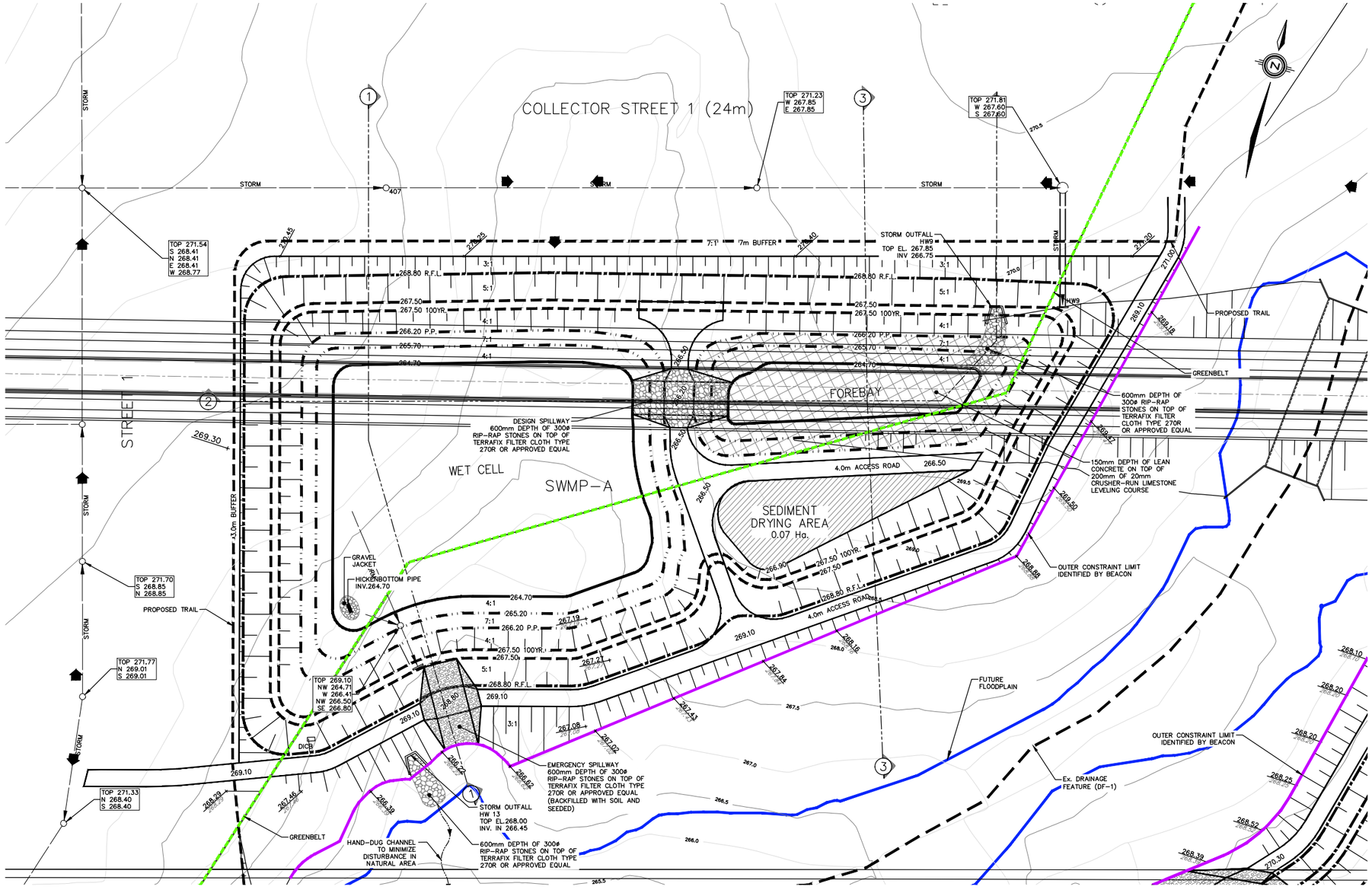
NOTE:
FOR LOCATION OF SECTIONS 1 AND 2
REFER TO FIGURE 8.10

SCHAEFFERS
CONSULTING ENGINEERS
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TESTON ROAD CROSSING
7.74□1.36m BO□ CULVERT AND
1500mm CIRCULAR CULVERT
REACH DF3

SCALE AS SHO□ N

2019-4766 | □ULY 2024 | FIGURE 8.10A



NOTES:

1. THE LOCATION OF ALL UNDERGROUND AND ABOVE GROUND UTILITIES AND STRUCTURES IS NOT NECESSARILY SHOWN ON CONTRACT DRAWINGS, AND WHERE SHOWN THE ACCURACY OF THE LOCATION AND ELEVATION OF SUCH UTILITIES AND STRUCTURES IS NOT GUARANTEED. PRIOR TO COMMENCING CONSTRUCTION, THE CONTRACTOR SHALL VERIFY EXACT LOCATION AND ELEVATION OF SUCH UTILITIES AND STRUCTURES AND SHALL ASSUME ALL LIABILITIES OF DAMAGE.
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-150mm COMPACTED DEPTH OF 20mm DIAMETER CRUSHER RUN LIMESTONE
-300mm COMPACTED DEPTH OF 50mm DIAMETER CRUSHER RUN LIMESTONE

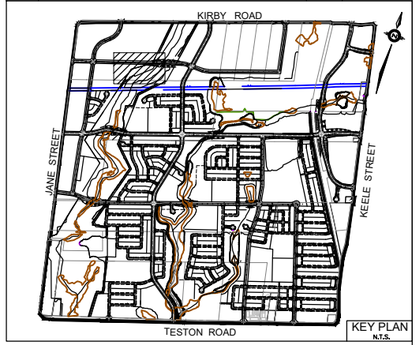
DESCRIPTION	PROVIDED STORAGE	REQUIRED STORAGE
PERMANENT POOL EL.264.70–266.20	6,240m^3	1,947m^3
100YR POOL EL.266.20–267.50	9,250m^3	6,812m^3
REGIONAL POOL EL.266.20–268.80	22,490m^3	16,384m^3

DESCRIPTION	PROVIDED AREA	REQUIRED AREA
SEDIMENT DRYING AREA	700m^2	574m^2

FOR SECTIONS REFER TO DWG. No. SWM-A-2

REVISIONS

No.	DESCRIPTION	By	Date



KEY PLAN N.T.S.

LEGEND

TOP 195.50 N 192.20 S 192.15	DENOTES TOP ELEVATION DENOTES STORM IN OBVERT ELEVATION DENOTES STORM OUT OBVERT ELEVATION
211.0	DENOTES EXISTING CONTOUR ELEVATION
208.00	DENOTES PROPOSED ELEVATION
	DENOTES 100 YR. WATER LEVEL
	DENOTES 5 YR. WATER LEVEL
	DENOTES PERMANENT POOL LEVEL
	DENOTES PROPOSED POND CONTOUR LINE
	DENOTES PROPERTY LIMIT
	DENOTES MAINTENANCE ACCESS ROAD
	DENOTES RIP-RAP STONE ON TOP OF TERRAFIX FILTER CLOTH TYPE 270R OR APPROVED EQUAL.
	DENOTES 150mm DEPTH OF LEAN CONCRETE (5–10MPa.) ON TOP OF 200mm OF 20mm CRUSHER-RUN LIMESTONE LEVELLING COURSE.
	DENOTES SEDIMENT DRYING AREA
	DENOTES NHN LIMIT
	DENOTES FUTURE FLOODPLAIN
	DENOTES GREENBELT

No.	Date	Issued for
1.	23/10/31	MASTER ENVIRONMENTAL SERVICING PLAN

APPROVED AS TO FORM IN RELIANCE, UPON THE PROFESSIONAL SKILL AND ABILITY OF SCHAEFFERS CONSULTING ENGINEERS AS TO DESIGN AND SPECIFICATION

DIRECTOR OF DEVELOPMENT ENGINEERING DATE

BLOCK 27 RESIDENTIAL SUBDIVISION

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CONSULTING ENGINEERS
SCHAEFFER & ASSOCIATES LTD.
6 Ronrose Drive, Concord, Ontario L4K 4R3
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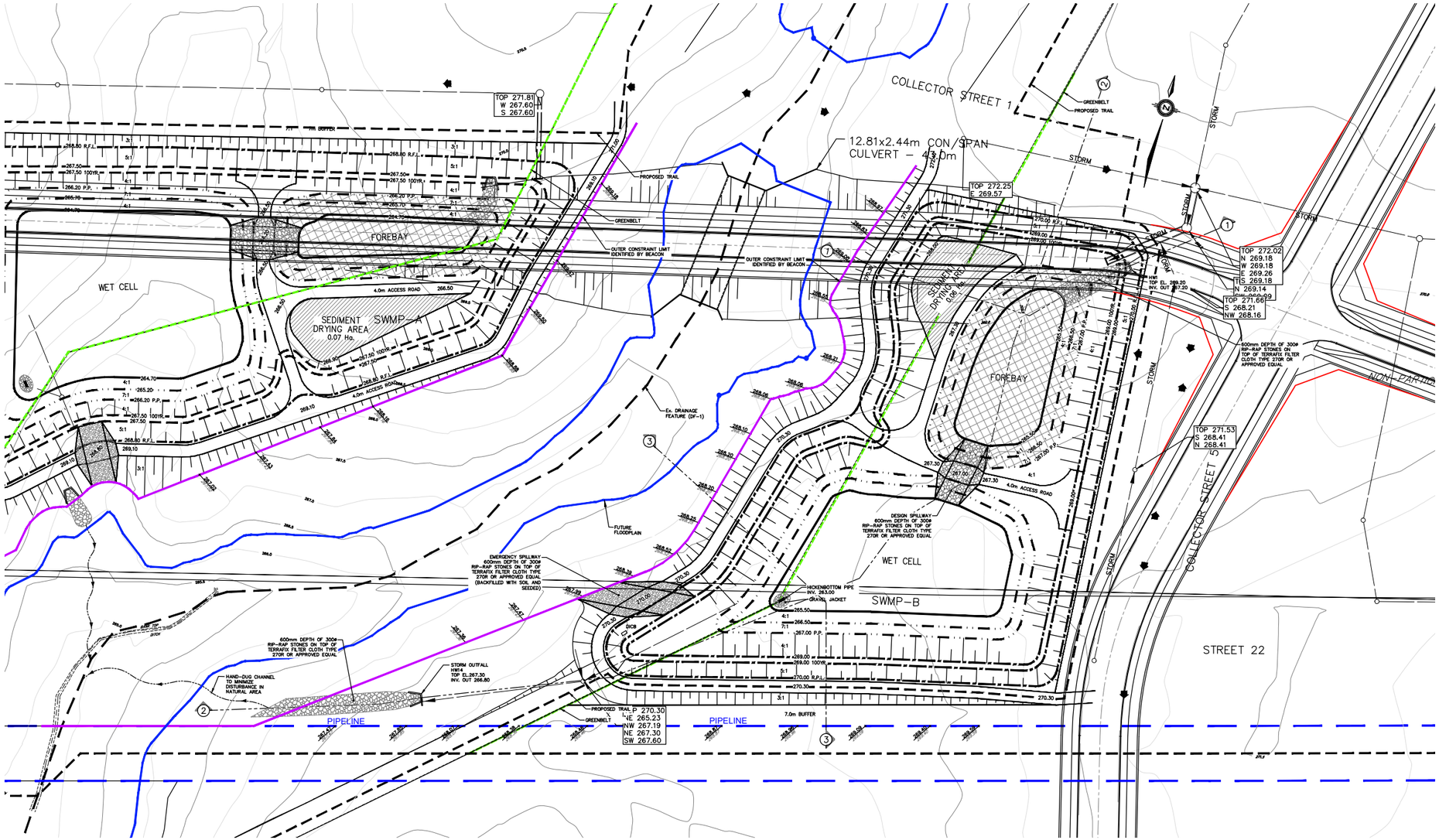
VAUGHAN

SWM POND A

REGION FILE: CITY FILE: BL.27.2020

PROJECT No.	2021 - 4766	DRAWING No.	SWM-A-1
DRAWN BY:	L.O.	CHECKED BY: F.T.	DATE: MARCH 2022
DESIGNED BY:	F.T.	APPROVED BY: P.S	

SCALE: 1:500 0 5 10 15 20 25 30 35 40 45 50m



REVISIONS			
No.	DESCRIPTION	By	Date

KEY PLAN N.T.S.

LEGEND

TOP 195.50 N 192.20 S 192.15	DENOTES TOP ELEVATION DENOTES STORM IN OBVERT ELEVATION DENOTES STORM OUT OBVERT ELEVATION
211.0	DENOTES EXISTING CONTOUR ELEVATION
208.00	DENOTES PROPOSED ELEVATION
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	DENOTES 5 YR. WATER LEVEL
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	DENOTES SEDIMENT DRYING AREA
	DENOTES NHN LIMIT
	DENOTES FUTURE FLOODPLAIN
	DENOTES GREENBELT

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-150mm COMPACTED DEPTH OF 20mm DIAMETER CRUSHER RUN LIMESTONE
-300mm COMPACTED DEPTH OF 50mm DIAMETER CRUSHER RUN LIMESTONE

DESCRIPTION	PROVIDED STORAGE	REQUIRED STORAGE
PERMANENT POOL EL.265.50-267.00	6,990 m^3	4,521 m^3
100YR POOL EL.267.00-269.00	17,520 m^3	14,969 m^3
REGIONAL POOL EL.267.00-270.00	32,660 m^3	31,051 m^3

DESCRIPTION	PROVIDED AREA	REQUIRED AREA
SEDIMENT DRYING AREA	630m^2	600m^2

FOR SECTIONS REFER TO DWG. No. SWM-B-2

No.	Date	Issued for
1.	23/10/31	MASTER ENVIRONMENTAL SERVICING PLAN

APPROVED AS TO FORM IN RELIANCE, UPON THE PROFESSIONAL SKILL AND ABILITY OF SCHAEFFERS CONSULTING ENGINEERS AS TO DESIGN AND SPECIFICATION

DIRECTOR OF DEVELOPMENT ENGINEERING DATE

BLOCK 27
RESIDENTIAL SUBDIVISION

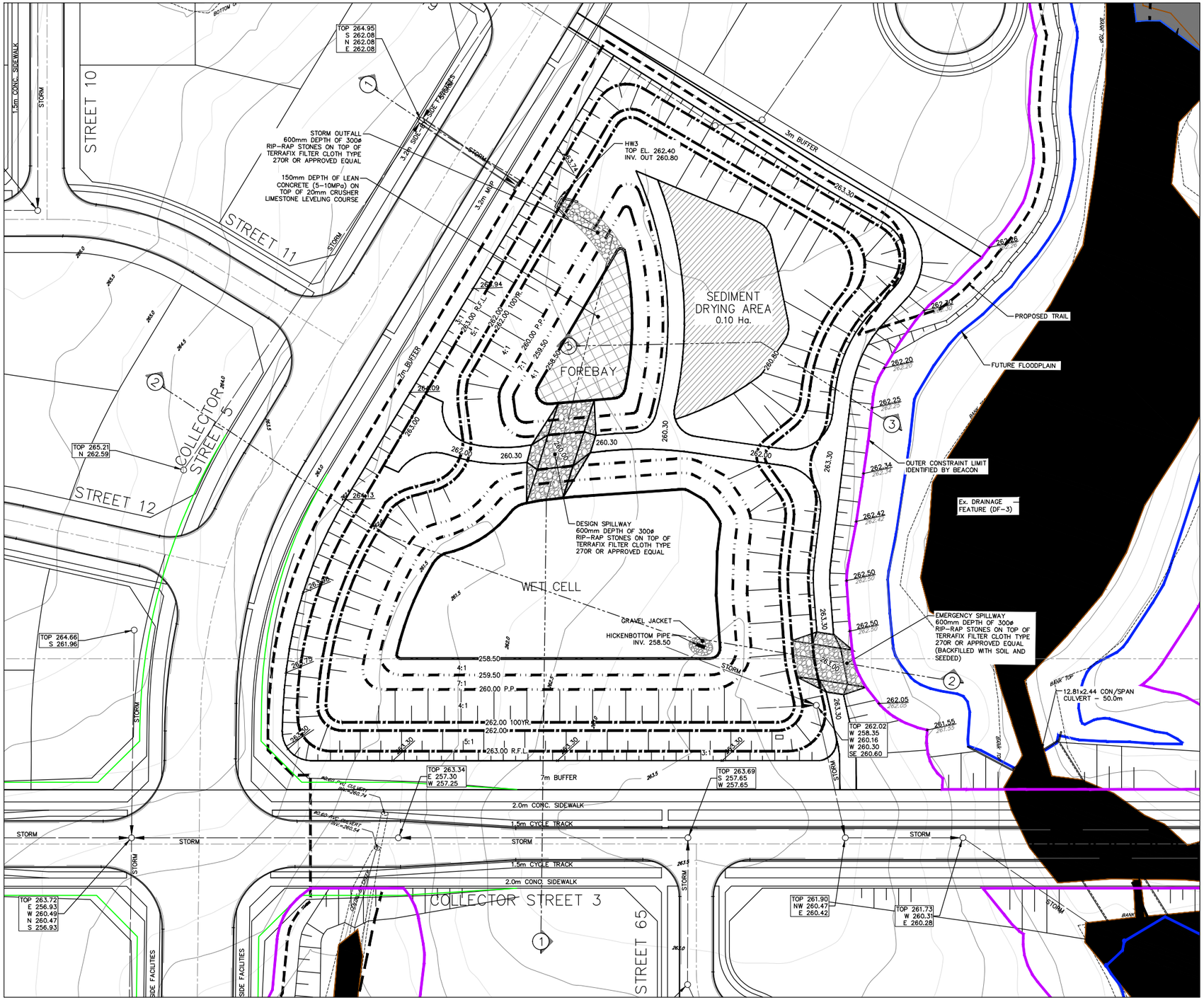
SCHAEFFERS
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E-mail: design@schaeffers.com

VAUGHAN

SWM POND B

REGION FILE:		CITY FILE: BL.27.2020	
PROJECT No.	2021 - 4766	DRAWING No.	SWM-B-1
DRAWN BY:	L.O.	CHECKED BY: F.T.	DATE: MARCH 2022
DESIGNED BY:	F.T.	APPROVED BY: P.S	

SCALE: 1:750 0 15 30 45 60 75m



NOTES:

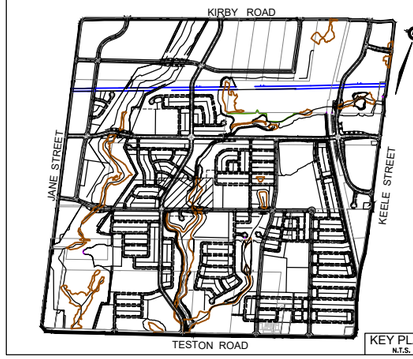
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- 150mm COMPACTED DEPTH OF 20mm DIAMETER CRUSHER RUN LIMESTONE
- 300mm COMPACTED DEPTH OF 50mm DIAMETER CRUSHER RUN LIMESTONE

DESCRIPTION	PROVIDED STORAGE	REQUIRED STORAGE
PERMANENT POOL EL.258.50-260.00	4,900m^3	3,841m^3
100YR POOL EL.260.00-262.00	14,070m^3	12,919m^3
REGIONAL POOL EL.260.00-263.00	24,920m^3	18,175m^3

DESCRIPTION	PROVIDED AREA	REQUIRED AREA
SEDIMENT DRYING AREA	1,000m^2	800m^2

FOR SECTIONS REFER TO DWG. No. SWM-C-2

REVISIONS			
No.	DESCRIPTION	By	Date



LEGEND

TOP 195.50 N 192.20 S 192.15	DENOTES TOP ELEVATION; DENOTES STORM IN OBVERT ELEVATION; DENOTES STORM OUT OBVERT ELEVATION
211.0	DENOTES EXISTING CONTOUR ELEVATION
208.00	DENOTES PROPOSED ELEVATION
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	DENOTES MAINTENANCE ACCESS ROAD
	DENOTES RIP-RAP STONE ON TOP OF TERRAFIX FILTER CLOTH TYPE 270R OR APPROVED EQUAL.
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	DENOTES SEDIMENT DRYING AREA
	DENOTES NHN LIMIT
	DENOTES FUTURE FLOODPLAIN

No.	Date	Issued for
1.	23/10/31	MASTER ENVIRONMENTAL SERVICING PLAN

APPROVED AS TO FORM IN RELIANCE, UPON THE PROFESSIONAL SKILL AND ABILITY OF SCHAEFFERS CONSULTING ENGINEERS AS TO DESIGN AND SPECIFICATION

DIRECTOR OF DEVELOPMENT ENGINEERING DATE

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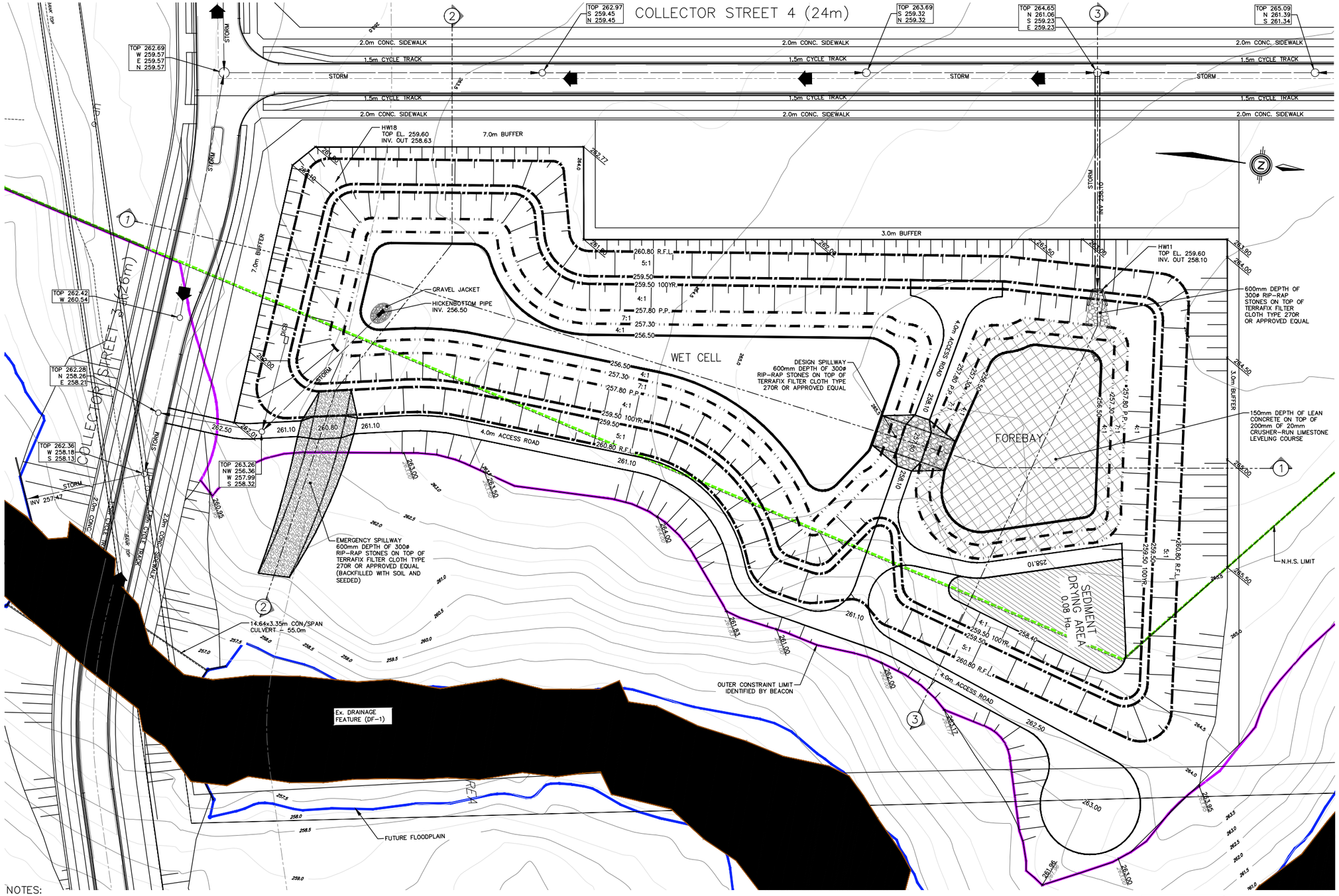
VAUGHAN

SWM POND C

REGION FILE: CITY FILE: BL.27.2020

PROJECT No. 2021 - 4766		DRAWING No.	SWM-C-1
DRAWN BY: L.O.	CHECKED BY: F.T.	DATE:	MARCH 2022
DESIGNED BY: F.T.	APPROVED BY: P.S		

SCALE: 1:500 0 5 10 15 20 25 30 35 40 45 50m





KEY PLAN
N.T.S.

REVISIONS

No.	DESCRIPTION	By	Date

LEGEND

TOP 195.50 N 192.20 S 192.15	DENOTES TOP ELEVATION DENOTES STORM IN OBVERT ELEVATION DENOTES STORM OUT OBVERT ELEVATION
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-150mm COMPACTED DEPTH OF 20mm DIAMETER CRUSHER RUN LIMESTONE
-300mm COMPACTED DEPTH OF 50mm DIAMETER CRUSHER RUN LIMESTONE

DESCRIPTION	PROVIDED STORAGE	REQUIRED STORAGE
PERMANENT POOL EL.256.50-257.80	5,630m^3	2,811m^3
100YR POOL EL.257.80-259.50	14,980m^3	11,354m^3
REGIONAL POOL EL.257.80-260.80	32,000m^3	29,822m^3

DESCRIPTION	PROVIDED AREA	REQUIRED AREA
SEDIMENT DRYING AREA	800m^2	700m^2

FOR SECTIONS REFER TO DWG. No. SWM-D-2

No.	Date	Issued for
1.	23/10/31	MASTER ENVIRONMENTAL SERVICING PLAN

APPROVED AS TO FORM IN RELIANCE, UPON THE PROFESSIONAL SKILL AND ABILITY OF SCHAEFFERS CONSULTING ENGINEERS AS TO DESIGN AND SPECIFICATION

DIRECTOR OF DEVELOPMENT ENGINEERING DATE

BLOCK 27
RESIDENTIAL SUBDIVISION

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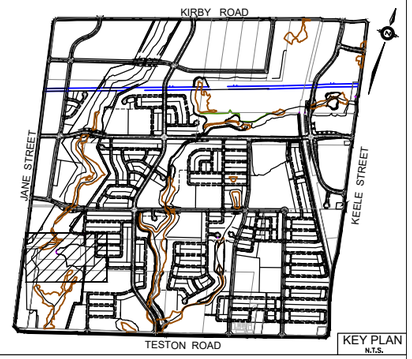
SWM POND D

REGION FILE: CITY FILE: BL.27.2020

PROJECT No.	2021 - 4766	DRAWING No.	SWM-D-1
DRAWN BY:	L.O.	CHECKED BY:	F.T.
DESIGNED BY:	F.T.	APPROVED BY:	P.S
DATE:	MARCH 2022		

SCALE: 1:500 0 5 10 15 20 25 30 35 40 45 50m

REVISIONS			
No.	DESCRIPTION	By	Date



KEY PLAN N.T.S.

LEGEND

TOP 195.50 N 192.20 S 192.15	DENOTES TOP ELEVATION DENOTES STORM IN OBVERT ELEVATION DENOTES STORM OUT OBVERT ELEVATION
211.0	DENOTES EXISTING CONTOUR ELEVATION
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7. IF SAND WAS ENCOUNTERED DURING CONSTRUCTION OF POND, THE UPPER LAYER OF THE SIDE SLOPE AND THE BOTTOM OF THE POND SHALL BE REPLACED WITH A LAYER OF SILTY CLAY TILL MATERIAL THICKNESS TO BE DETERMINED BY SOIL CONSULTANT COMPACTED TO 95% OR + STANDARD PROCTOR DRY DENSITY. AN INTERCEPT SUBDRAIN SYSTEM (SEE DETAIL) SHOULD ALSO BE CONSTRUCTED TO STABILIZE THE SIDE.
8. IN ALL SEWER TRENCHES, WHERE SUBGRADE CONSISTS OF WET SANDS AND SANDY SILT, THE PIPE JOINTS SHALL BE WRAPPED WITH WATERPROOF MEMBRANE.
9. ASPHALT APRON BETWEEN STREET CURB AND SIDEWALK SHALL BE HEAVY DUTY ASPHALT.
   - 50mm COMPACTED DEPTH HL-3 ASPHALT TOP COURSE
   - 75mm COMPACTED DEPTH HL-8 ASPHALT BASE COURSE
   - 150mm COMPACTED DEPTH OF 20mm DIAMETER CRUSHER RUN LIMESTONE
   - 300mm COMPACTED DEPTH OF 50mm DIAMETER CRUSHER RUN LIMESTONE

DESCRIPTION	PROVIDED STORAGE	REQUIRED STORAGE
PERMANENT POOL EL.252.00-253.50	8,290m³	3,901m³
100YR POOL EL.253.50-255.00	13,840m³	13,472m³
REGIONAL POOL EL.253.50-256.25	34,150m³	33,285m³

DESCRIPTION	PROVIDED AREA	REQUIRED AREA
SEDIMENT DRYING AREA	1,000m²	900m²

FOR SECTIONS REFER TO DWG. No. SWM-E-2

No.	Date	Issued for
1.	23/10/31	MASTER ENVIRONMENTAL SERVICING PLAN

APPROVED AS TO FORM IN RELIANCE, UPON THE PROFESSIONAL SKILL AND ABILITY OF SCHAEFFERS CONSULTING ENGINEERS AS TO DESIGN AND SPECIFICATION

DIRECTOR OF DEVELOPMENT ENGINEERING DATE

BLOCK 27 RESIDENTIAL SUBDIVISION

SCHAEFFERS CONSULTING ENGINEERS
SCHAEFFER & ASSOCIATES LTD.
6 Ronrose Drive, Concord, Ontario L4K 4R3
Tel: (905) 738-6100
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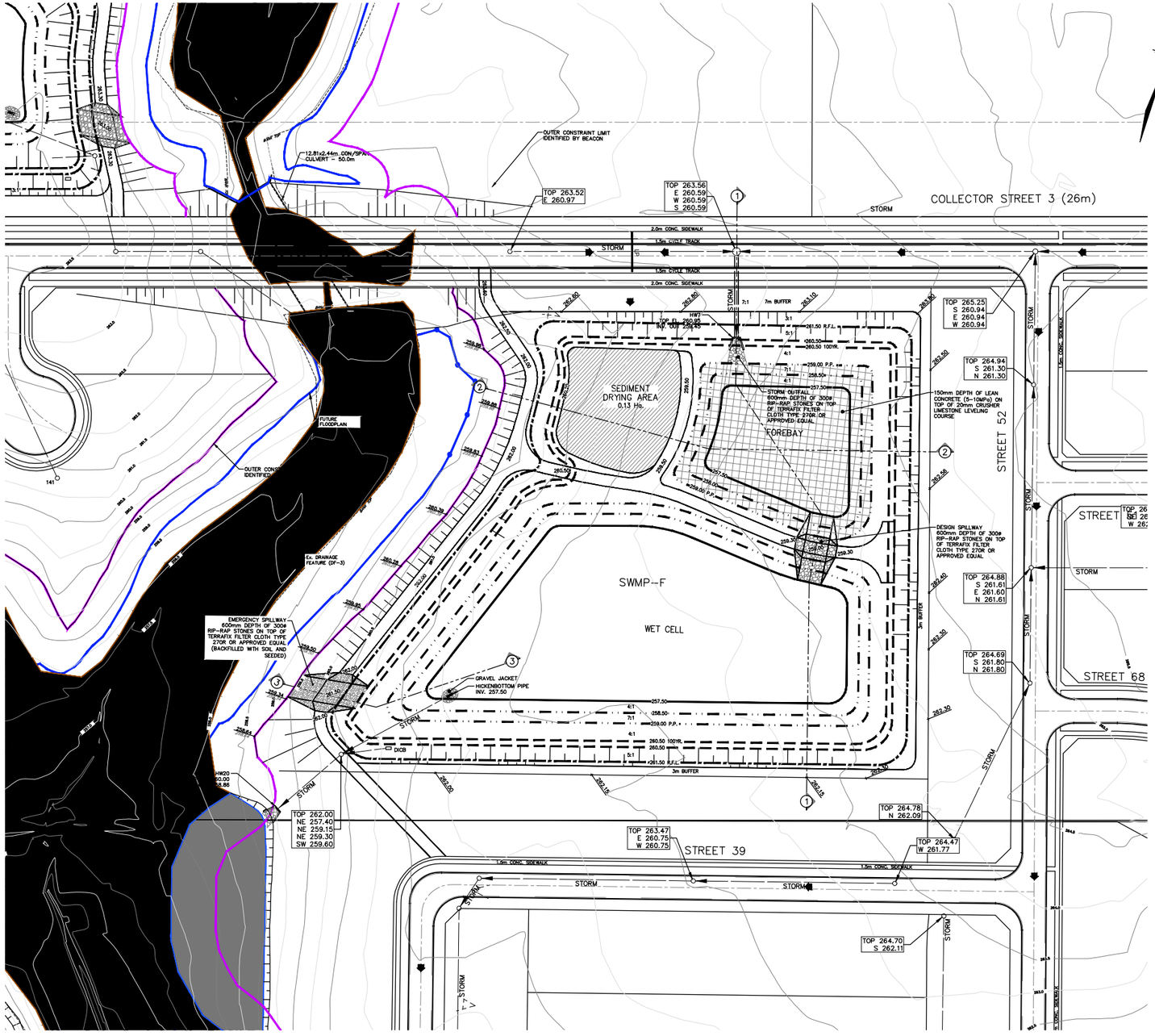
VAUGHAN

SWM POND E

REGION FILE: CITY FILE: BL.27.2020

PROJECT No.	2021 - 4766	DRAWING No.	SWM-E-1
DRAWN BY:	L.O.	CHECKED BY:	F.T.
DESIGNED BY:	F.T.	APPROVED BY:	P.S
DATE:	MARCH 2022		

SCALE: 1:750 0 15 30 45 60 75m



NOTES:

1. THE LOCATION OF ALL UNDERGROUND AND ABOVE GROUND UTILITIES AND STRUCTURES IS NOT NECESSARILY SHOWN ON CONTRACT DRAWINGS, AND WHERE SHOWN THE ACCURACY OF THE LOCATION AND ELEVATION OF SUCH UTILITIES AND STRUCTURES IS NOT GUARANTEED. PRIOR TO COMMENCING CONSTRUCTION, THE CONTRACTOR SHALL VERIFY EXACT LOCATION AND ELEVATION OF SUCH UTILITIES AND STRUCTURES AND SHALL ASSUME ALL LIABILITIES OF DAMAGE.
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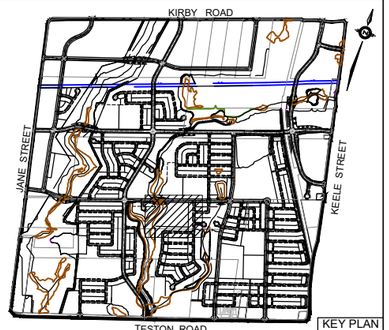
DESCRIPTION	PROVIDED STORAGE	REQUIRED STORAGE
PERMANENT POOL EL.257.50-259.00	9,900m^3	4,000m^3
100YR POOL EL.259.00-260.50	15,360m^3	13,628m^3
REGIONAL POOL EL.259.00-261.50	29,346m^3	19,394m^3

DESCRIPTION	PROVIDED AREA	REQUIRED AREA
SEDIMENT DRYING AREA	1,300m^2	900m^2

FOR SECTIONS REFER TO DWG. No. SWM-F-2

REVISIONS

No.	DESCRIPTION	By	Date



LEGEND

TOP 195.50 N 192.20 S 192.15	DENOTES TOP ELEVATION DENOTES STORM IN OBVERT ELEVATION DENOTES STORM OUT OBVERT ELEVATION
211.0	DENOTES EXISTING CONTOUR ELEVATION
208.00	DENOTES PROPOSED ELEVATION
	DENOTES 100 YR. WATER LEVEL
	DENOTES 5 YR. WATER LEVEL
	DENOTES PERMANENT POOL LEVEL
	DENOTES PROPOSED POND CONTOUR LINE
	DENOTES PROPERTY LIMIT
	DENOTES MAINTENANCE ACCESS ROAD
	DENOTES RIP-RAP STONE ON TOP OF TERRAFIX FILTER CLOTH TYPE 270R OR APPROVED EQUAL.
	DENOTES 150mm DEPTH OF LEAN CONCRETE (5-10MPa.) ON TOP OF 200mm OF 20mm CRUSHER-RUN LIMESTONE LEVELLING COURSE.
	DENOTES SEDIMENT DRYING AREA
	DENOTES NHN LIMIT
	DENOTES FUTURE FLOODPLAIN

No.	Date	Issued for
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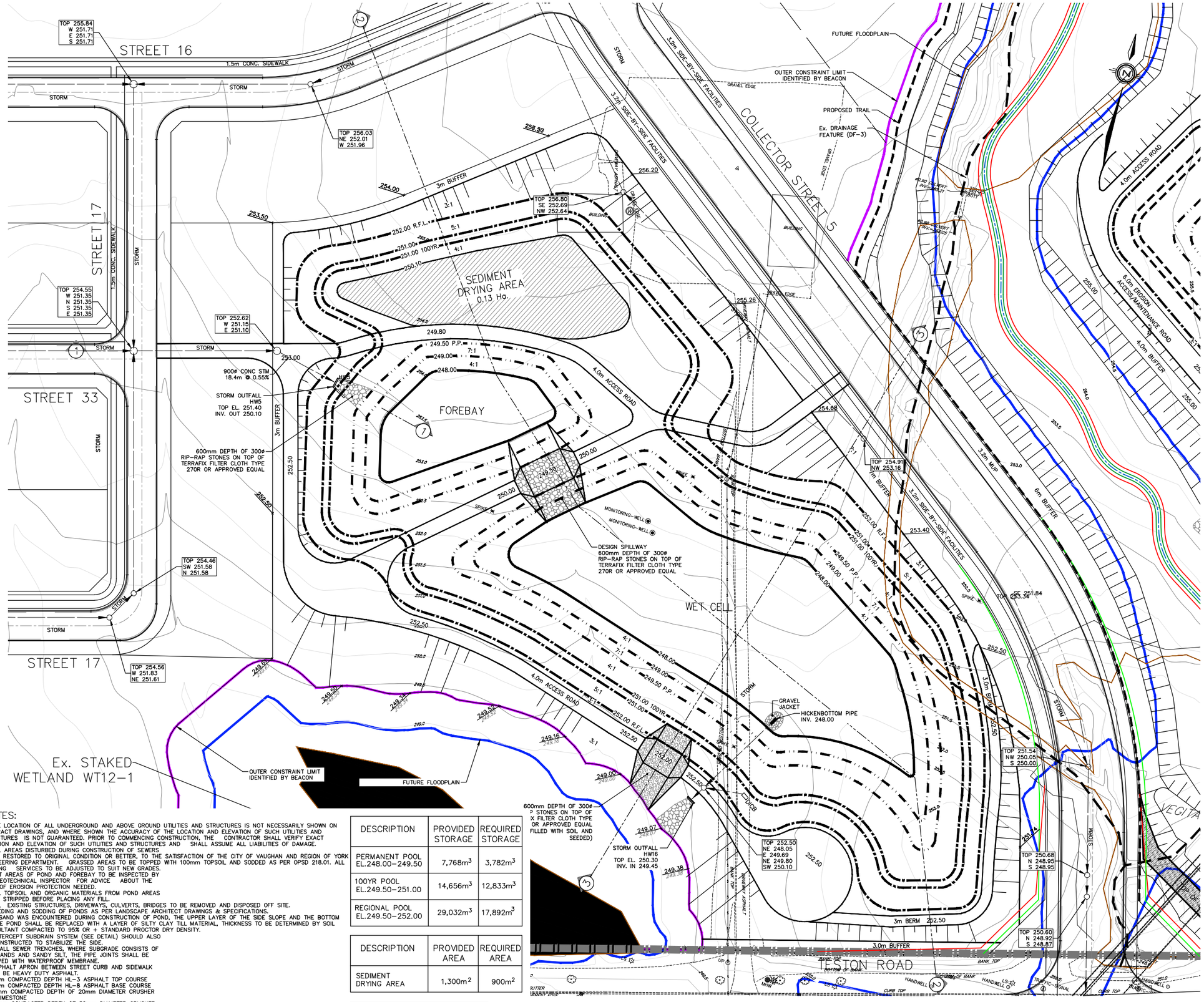
VAUGHAN

SWM POND F

REGION FILE: CITY FILE: BL.27.2020

PROJECT No. 2021 - 4766		DRAWING No.	SWM-F-1
DRAWN BY: L.O.	CHECKED BY: F.T.	DATE:	MARCH 2022
DESIGNED BY: F.T.	APPROVED BY: P.S		

SCALE: 1:750 0 15 30 45 60 75m



No.	DESCRIPTION	By	Date



KEY PLAN
N.T.S.

LEGEND

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208.00	DENOTES PROPOSED ELEVATION
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	DENOTES 5 YR. WATER LEVEL
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DESCRIPTION	PROVIDED STORAGE	REQUIRED STORAGE
PERMANENT POOL EL.248.00-249.50	7,768m^3	3,782m^3
100YR POOL EL.249.50-251.00	14,656m^3	12,833m^3
REGIONAL POOL EL.249.50-252.00	29,032m^3	17,892m^3

DESCRIPTION	PROVIDED AREA	REQUIRED AREA
SEDIMENT DRYING AREA	1,300m^2	900m^2

FOR SECTIONS REFER TO DWG. No. SWM-G-2

No.	Date	Issued for
1.	23/10/31	MASTER ENVIRONMENTAL SERVICING PLAN

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DIRECTOR OF DEVELOPMENT ENGINEERING DATE

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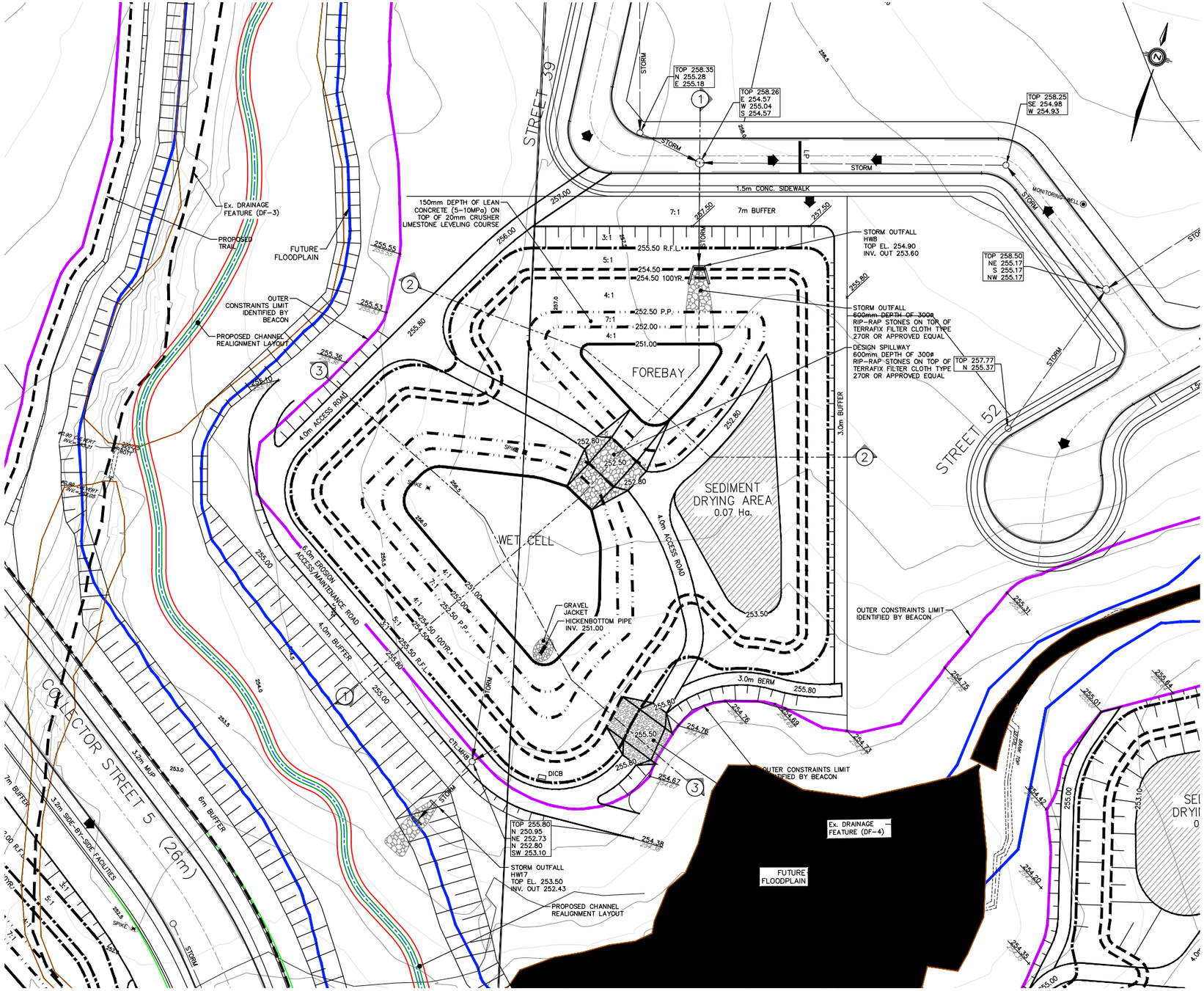
VAUGHAN

SWM POND G

REGION FILE: CITY FILE: BL.27.2020

PROJECT No.	2021 - 4766	DRAWING No.	SWM-G-1
DRAWN BY:	L.O.	CHECKED BY:	F.T.
DESIGNED BY:	F.T.	APPROVED BY:	P.S
		DATE:	MARCH 2022

SCALE: 1:500 0 5 10 15 20 25 30 35 40 45 50m



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-300mm COMPACTED DEPTH OF 50mm DIAMETER CRUSHER RUN LIMESTONE

DESCRIPTION	PROVIDED STORAGE	REQUIRED STORAGE
PERMANENT POOL EL.251.00–252.50	2,640m^3	2,123m^3
100YR POOL EL.252.50–254.50	7,300m^3	7,074m^3
REGIONAL POOL EL.252.50–255.50	11,820m^3	9,442m^3

DESCRIPTION	PROVIDED AREA	REQUIRED AREA
SEDIMENT DRYING AREA	700m^2	400m^2

FOR SECTIONS REFER TO DWG. No. SWM-H-2

REVISIONS			
No.	DESCRIPTION	By	Date



KEY PLAN N.T.S.

LEGEND

TOP 195.50 N 192.20 S 192.15	DENOTES TOP ELEVATION, DENOTES STORM IN OBVERT ELEVATION, DENOTES STORM OUT OBVERT ELEVATION
211.0	DENOTES EXISTING CONTOUR ELEVATION
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No.	Date	Issued for
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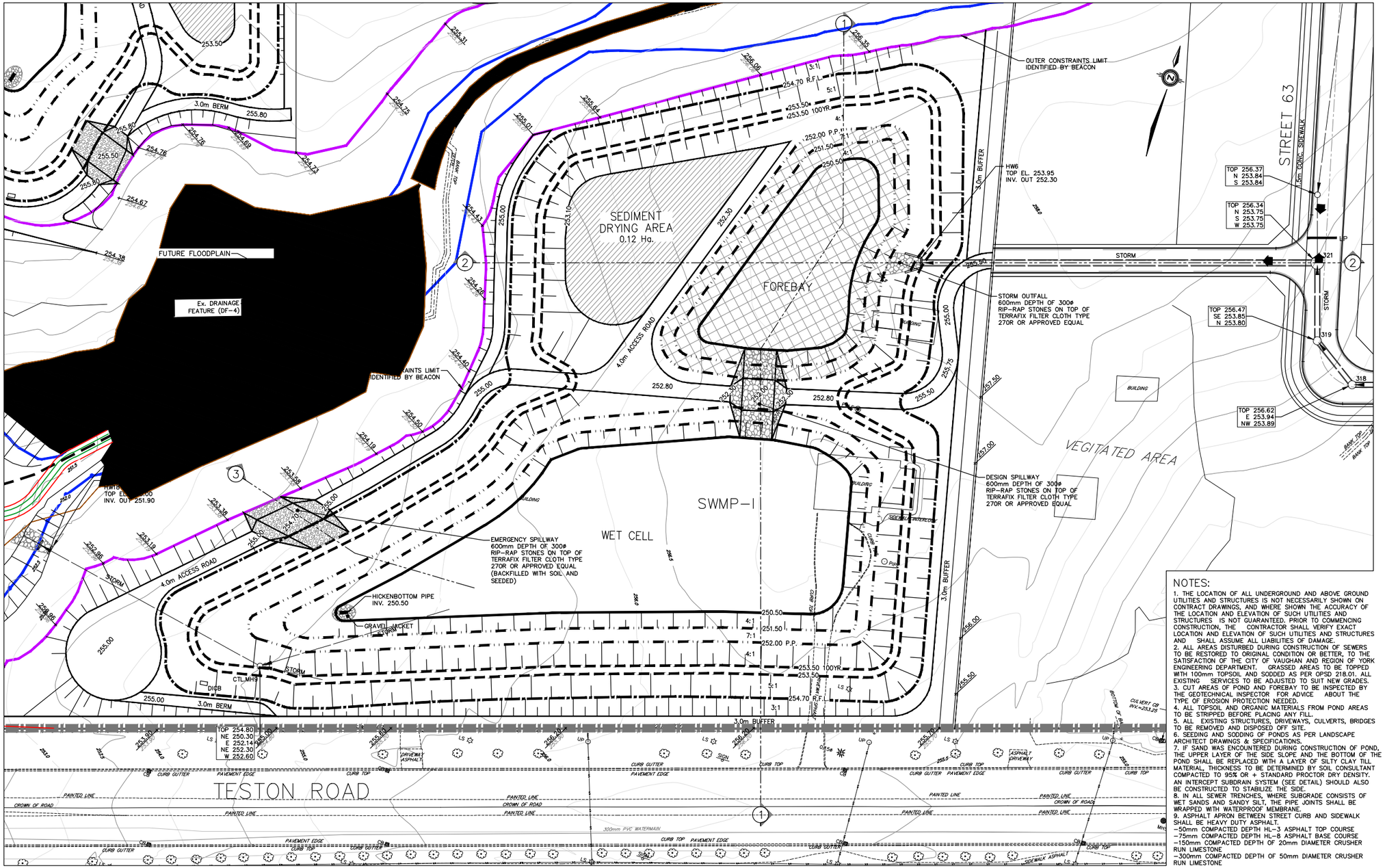
VAUGHAN

SWM POND H

REGION FILE: CITY FILE: BL.27.2020

PROJECT No. 2021 - 4766		DRAWING No.	SWM-H-1
DRAWN BY: L.O.	CHECKED BY: F.T.	DATE:	MARCH 2022
DESIGNED BY: F.T.	APPROVED BY: P.S		

SCALE: 1:500 0 5 10 15 20 25 30 35 40 45 50m



DESCRIPTION	PROVIDED STORAGE	REQUIRED STORAGE
PERMANENT POOL EL.250.50-252.00	8,540m^3	3,875m^3
100YR POOL EL.252.00-253.50	15,500m^3	13,990m^3
REGIONAL POOL EL.252.00-254.70	33,810m^3	28,024m^3

DESCRIPTION	PROVIDED AREA	REQUIRED AREA
SEDIMENT DRYING AREA	1,200m^2	800m^2

FOR SECTIONS REFER TO DWG. No. SWM-I-2

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REVISIONS

No.	DESCRIPTION	By	Date



KEY PLAN N.T.S.

LEGEND

TOP 195.50 N 192.20 S 192.15	DENOTES TOP ELEVATION DENOTES STORM IN OBVERT ELEVATION DENOTES STORM OUT OBVERT ELEVATION
211.0	DENOTES EXISTING CONTOUR ELEVATION
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DIRECTOR OF DEVELOPMENT ENGINEERING DATE

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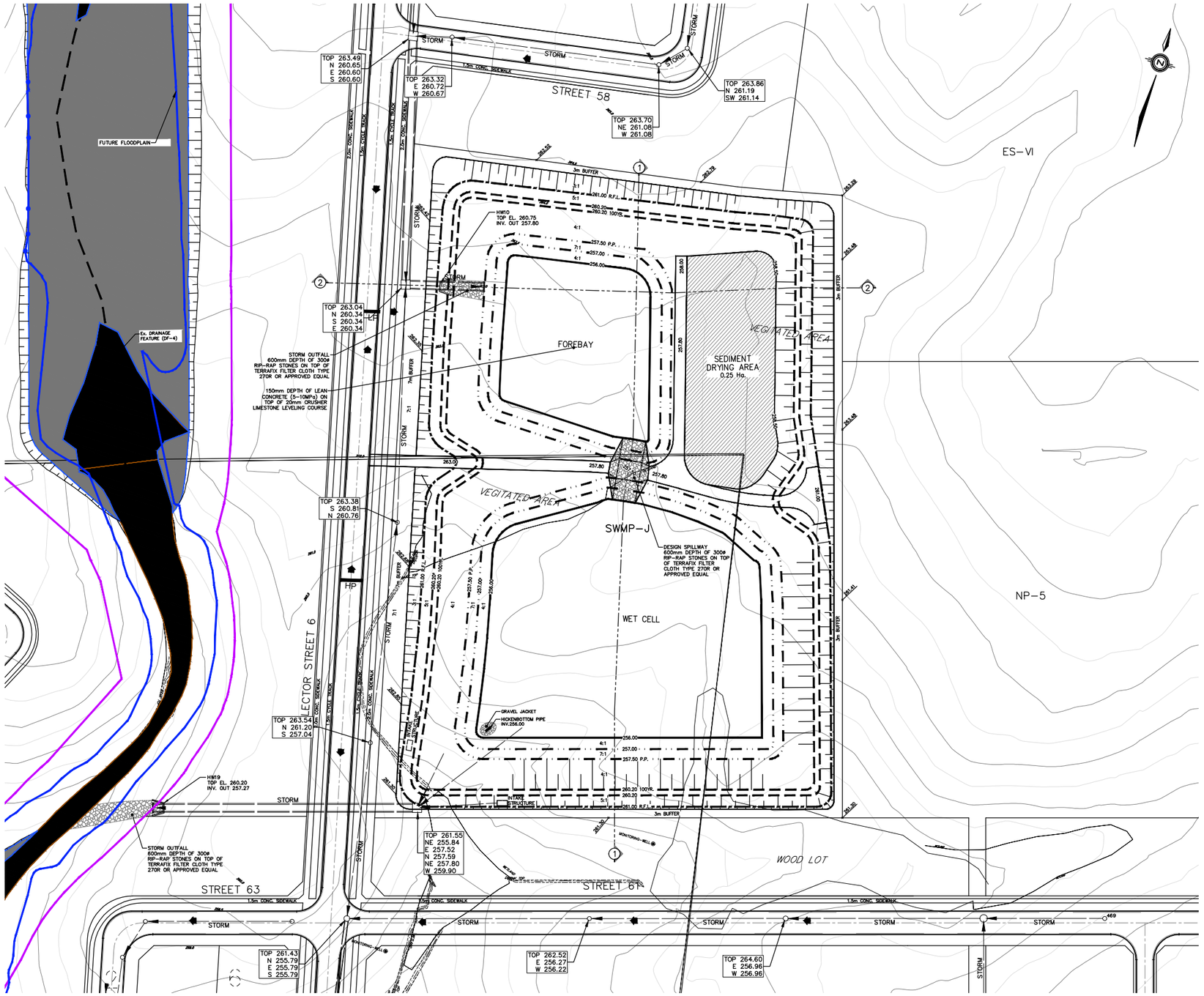
VAUGHAN

SWM POND I

REGION FILE: CITY FILE: BL.27.2020

PROJECT No.	2021 - 4766	DRAWING No.	SWM-I-1
DRAWN BY:	L.O.	CHECKED BY: F.T.	DATE: MARCH 2022
DESIGNED BY:	F.T.	APPROVED BY: P.S	

SCALE: 1:500 0 5 10 15 20 25 30 35 40 45 50m



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6. SEEDING AND SODDING OF PONDS AS PER LANDSCAPE ARCHITECT DRAWINGS & SPECIFICATIONS.
7. IF SAND WAS ENCOUNTERED DURING CONSTRUCTION OF POND, THE UPPER LAYER OF THE SIDE SLOPE AND THE BOTTOM OF THE POND SHALL BE REPLACED WITH A LAYER OF SILTY CLAY TILL MATERIAL, THICKNESS TO BE DETERMINED BY SOIL CONSULTANT COMPACTED TO 95% OR + STANDARD PROCTOR DRY DENSITY. AN INTERCEPT SUBDRAIN SYSTEM (SEE DETAIL) SHOULD ALSO BE CONSTRUCTED TO STABILIZE THE SIDE.
8. IN ALL SEWER TRENCHES, WHERE SUBGRADE CONSISTS OF WET SANDS AND SANDY SILT, THE PIPE JOINTS SHALL BE WRAPPED WITH WATERPROOF MEMBRANE.
9. ASPHALT APRON BETWEEN STREET CURB AND SIDEWALK SHALL BE HEAVY DUTY ASPHALT.
-50mm COMPACTED DEPTH HL-3 ASPHALT TOP COURSE
-75mm COMPACTED DEPTH HL-8 ASPHALT BASE COURSE
-150mm COMPACTED DEPTH OF 20mm DIAMETER CRUSHER RUN LIMESTONE
-300mm COMPACTED DEPTH OF 50mm DIAMETER CRUSHER RUN LIMESTONE

DESCRIPTION	PROVIDED STORAGE	REQUIRED STORAGE
PERMANENT POOL EL.256.00-257.50	14,850m^3	13,749m^3
100YR POOL EL.257.50-260.20	48,450m^3	45,294m^3
REGIONAL POOL EL.257.50-261.00	67,260m^3	63,110m^3

DESCRIPTION	PROVIDED AREA	REQUIRED AREA
SEDIMENT DRYING AREA	3,000m^2	2,900m^2

FOR SECTIONS REFER TO DWG. No. SWM-J-2

REVISIONS			
No.	DESCRIPTION	By	Date



KEY PLAN N.T.S.

LEGEND

TOP 195.50 N 192.20 S 192.15	DENOTES TOP ELEVATION DENOTES STORM IN OBVERT ELEVATION DENOTES STORM OUT OBVERT ELEVATION
211.0	DENOTES EXISTING CONTOUR ELEVATION
208.00	DENOTES PROPOSED ELEVATION
	DENOTES 100 YR. WATER LEVEL
	DENOTES 5 YR. WATER LEVEL
	DENOTES PERMANENT POOL LEVEL
	DENOTES PROPOSED POND CONTOUR LINE
	DENOTES PROPERTY LIMIT
	DENOTES MAINTENANCE ACCESS ROAD
	DENOTES RIP-RAP STONE ON TOP OF TERRAFIX FILTER CLOTH TYPE 270R OR APPROVED EQUAL.
	DENOTES 150mm DEPTH OF LEAN CONCRETE (5-10MPa.) ON TOP OF 200mm OF 20mm CRUSHER-RUN LIMESTONE LEVELLING COURSE.
	DENOTES SEDIMENT DRYING AREA
	DENOTES NHN LIMIT
	DENOTES FUTURE FLOODPLAIN

No.	Date	Issued for
1.	23/10/31	MASTER ENVIRONMENTAL SERVICING PLAN

APPROVED AS TO FORM IN RELIANCE, UPON THE PROFESSIONAL SKILL AND ABILITY OF SCHAEFFERS CONSULTING ENGINEERS AS TO DESIGN AND SPECIFICATION

DIRECTOR OF DEVELOPMENT ENGINEERING DATE

BLOCK 27
RESIDENTIAL SUBDIVISION

SCHAEFFERS
CONSULTING ENGINEERS
SCHAEFFER & ASSOCIATES LTD.
6 Ronrose Drive, Concord, Ontario L4K 4R3
Tel: (905) 738-6100
Fax: (905) 738-6875
E-mail: design@schaeffers.com

VAUGHAN

SWM POND J

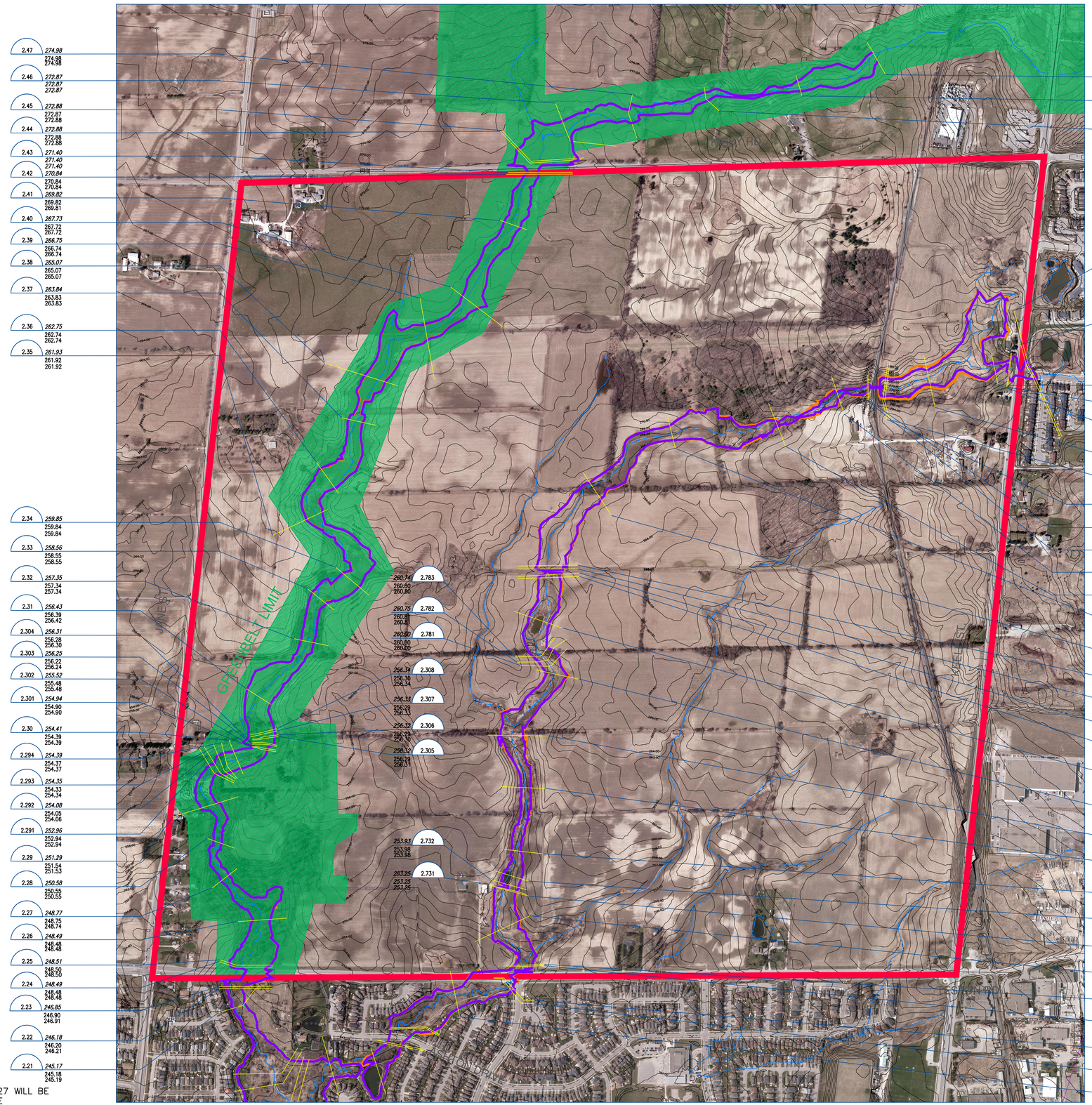
REGION FILE: CITY FILE: BL.27.2020

PROJECT No.	2021 - 4766	DRAWING No.	SWM-J-1
DRAWN BY:	L.O.	CHECKED BY: F.T.	DATE: MARCH 2022
DESIGNED BY:	F.T.	APPROVED BY: P.S	

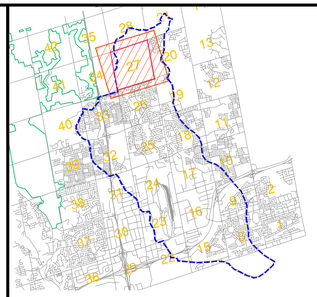
SCALE: 1:750 0 15 30 45 60 75m

APPENDIX D:

- Floodplain Mapping, prepared by COLE Engineering, dated December 2018.



NOTE: FLOODLINES FOR BLOCK 27 WILL BE COMPLETED AT THE MESP STAGE



KEY PLAN (N.T.S.)

LEGEND

- SECTION NUMBER
- EXISTING REGIONAL FLOOD LINE ELEVATION — 240.98 — 2.50
- PROPOSED REGIONAL FLOOD LINE ELEVATION — 240.98
- FUTURE REGIONAL FLOOD LINE ELEVATION — 240.98
- EXISTING REGIONAL STORM FLOODLINE
- PROPOSED REGIONAL FLOODLINE (2031 SCENARIO)
- FUTURE REGIONAL FLOODLINE (FULL BUILD-OUT SCENARIO)
- BLOCK 27 SECONDARY PLAN AREA
- WATERCOURSE
- GREENBELT PLAN AREA
- OAK RIDGES MORAINE PLAN AREA
- POSSIBLE FLOOD VULNERABLE LOCATIONS (FVL)

TOPOGRAPHICAL INFORMATION OBTAINED FROM THE CITY OF VAUGHAN ON SEPTEMBER 2014.
HEC-RAS MODEL WITH THE CROSS SECTION LOCATIONS OBTAINED FROM THE TRCA ON SEPTEMBER 2014.

No.	DESCRIPTION	BY	DATE
3	RESUBMISSION PER TRCA COMMENTS	D.W.	2018-07-20
2	TRCA SUBMISSION	D.W.	2018-06-07
1	DRAFT SUBMISSION FOR REVIEW	B.A.	2015-02-13

REVISIONS

COLE ENGINEERING
70 VALLEYWOOD DRIVE, MARKHAM, ON L3R 4T5
T:416.987.6161 / 905.940.6161 F:905.940.2064

BLOCK 27 LANDOWNERS GROUP
UPPER WEST DON SUBWATERSHED STUDY

FLOODPLAIN MAPPING

DESIGNED BY: BA	DATE: DECEMBER 2016		CHECKED BY: DW
DRAWN BY: AN/JJ	PROJECT No. WR14-0418		APPROVED BY: NK
SCALE: 1:5000			DWG No. FP-1

APPENDIX D:

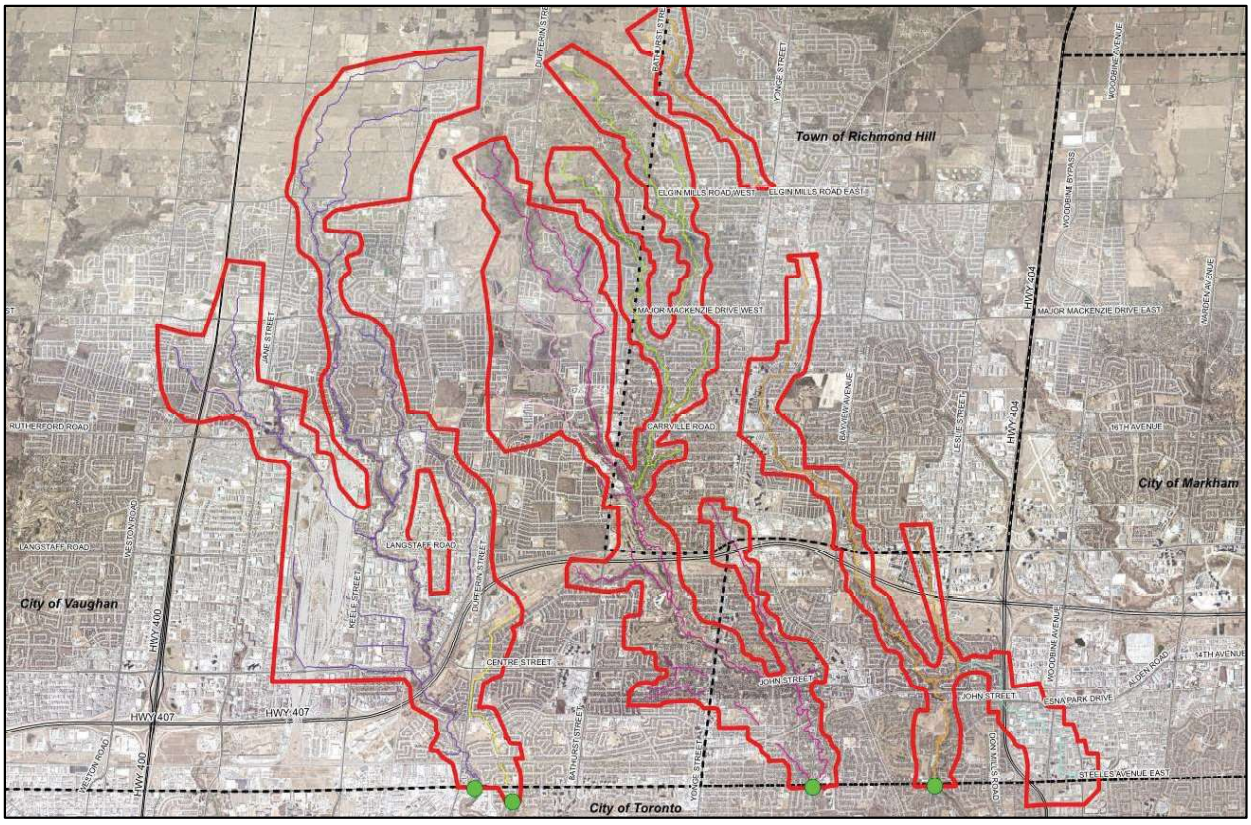
- Excerpt TRCA Don River Floodplain Mapping Phase II.

Toronto and Region Conservation Authority
Report Number: Contract #10020950

Don River Floodplain Mapping Phase II

August 11, 2020

Final



Don River Floodplain Mapping Phase II

Toronto and Region Conservation Authority

Final

Project No.: 19M-00961-00
Client Ref: Contract #10020950
Date: August 11, 2020

WSP
100 Commerce Valley Drive West
Thornhill, ON
Canada L3T 0A1

T: +1 905 882-1100
F: +1 905 882-0055
wsp.com

WSP Canada Group Limited

APPENDIX

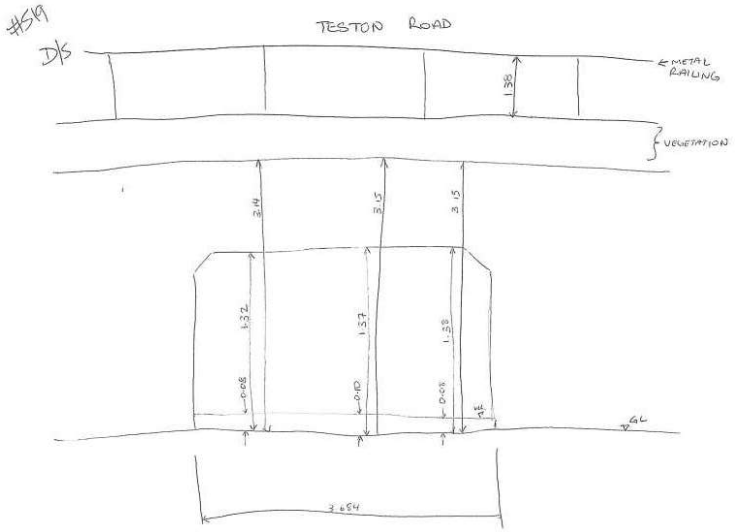
A Structure Data Sheets

CROSSING # DON 519 - HYDRAULIC STRUCTURE INVENTORY SHEET

Watershed and Location Information	Structure Configuration and Dimensions		Current Flow Information
Date : 09/09/2019	Structure Type (Culvert/Bridge): Culvert		Flow Present (Y/N): Y
Field Crew: DQ SE	Number of Openings: 1	Open Footing (Yes/No):	Approx. Depth (m): 0.1
Watershed Name: West Don	Opening Shape: Box	Material (Conc/Steel): Conc	Approx. Velocity (m/s):
River Name: West Don	Opening Height (m): 1.38	Opening Width/Bridge Span (m): 3.684	Upstream Erosion (Y/N): N
Reach ID: Reach 20, R.S. 491.96	Opening Length in direction of flow (m): 48		Downstream Erosion (Y/N): N
Municipality:	Inlet Type (Projecting/Mitered/Headwall): Headwall		Additional Flow Information / Field Notes:
Location: Teston Road (Culvert, West)	Skew Angle of Crossing (Degrees): Measure from GIS / Aerophoto		The U/S face has a depth of approx. 1.76 to obvert. This indicates sediment build up at D/S end consistently across the opening
Latitude: 4858348.6917	Height from Obvert to Top of Road (m): 1.77		
Longitude: 617441.2208	Railing height (m): 1.38	Depth of Siltation (mm):	

Site Photograph and Additional Field Notes

Site Sketch:





Upstream Structure Face (Photo #480)



Downstream Structure Face (Photo #478)



Watercourse Looking Upstream (Photo #481)



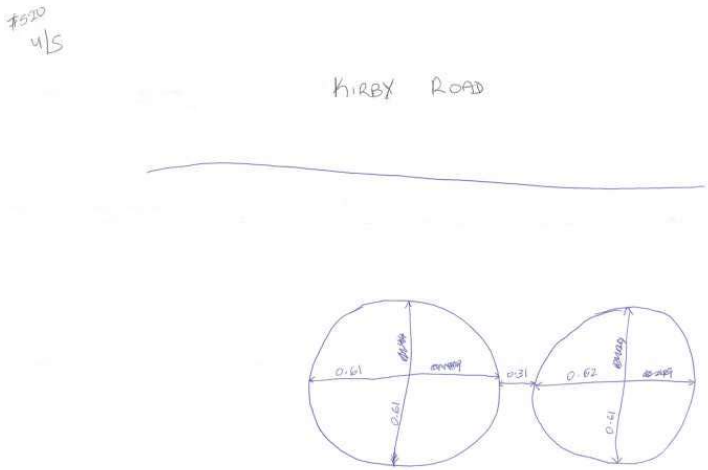
Watercourse Looking Downstream (Photo #479)

CROSSING # DON 520 - HYDRAULIC STRUCTURE INVENTORY SHEET

Watershed and Location Information	Structure Configuration and Dimensions		Current Flow Information
Date: 09/09/2019	Structure Type (Culvert/Bridge): Culvert		Flow Present (Y/N): N
Field Crew: DQ & SE	Number of Openings: 2	Open Footing (Yes/No): No	Approx. Depth (m):
Watershed Name: West Don	Opening Shape: Circular	Material (Conc/Steel): Steel	Approx. Velocity (m/s):
River Name: West Don	Opening Height (m): 0.61 & 0.61	Opening Width/Bridge Span (m): 0.61 & 0.62	Upstream Erosion (Y/N): N
Reach ID: Reach 20, R.S. 3307.12	Opening Length in direction of flow (m): 10		Downstream Erosion (Y/N): N
Municipality:	Inlet Type (Projecting/Mitered/Headwall): Projecting		Additional Flow Information / Field Notes:
Location: Kirby Road	Skew Angle of Crossing (Degrees): Measure from GIS / Aerophoto		
Latitude: 4860519.3354	Height from Obvert to Top of Road (m):		
Longitude: 617577.3341	Railing height (m):	Depth of Siltation (mm):	

Site Photograph and Additional Field Notes

Site Sketch:





Upstream Structure Face (Photo #491)



Downstream Structure Face (Photo #489)



Watercourse Looking Upstream (Photo #492)



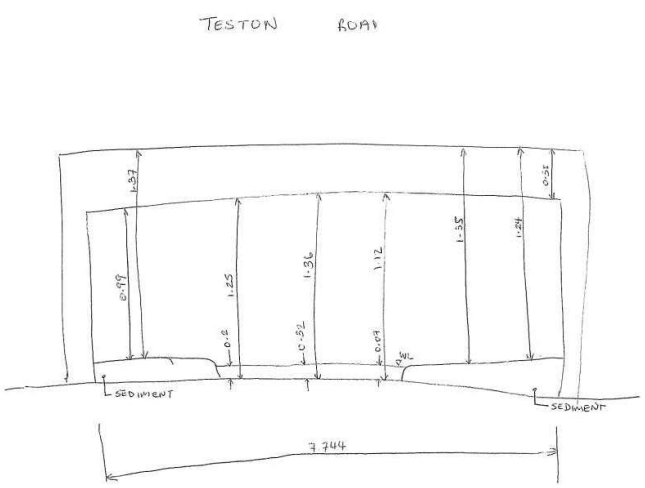
Watercourse Looking Downstream (Photo #490)

CROSSING # DON 620 - HYDRAULIC STRUCTURE INVENTORY SHEET

Watershed and Location Information	Structure Configuration and Dimensions		Current Flow Information
Date : 09/09/2019	Structure Type (Culvert/Bridge): Culvert		Flow Present (Y/N): Y
Field Crew: DQ SE	Number of Openings: 1	Open Footing (Yes/No):	Approx. Depth (m): 0.32
Watershed Name: West Don	Opening Shape: Box	Material (Conc/Steel): Conc	Approx. Velocity (m/s):
River Name: West Don Tributary #14	Opening Height (m): 1.36	Opening Width/Bridge Span (m): 7.744	Upstream Erosion (Y/N): N
Reach ID: Reach 1, R.S. 924.94	Opening Length in direction of flow (m): 50		Downstream Erosion (Y/N): N
Municipality:	Inlet Type (Projecting/Mitered/Headwall): Headwall		Additional Flow Information / Field Notes:
Location: Teston Road	Skew Angle of Crossing (Degrees): Measure from GIS / Aerophoto		
Latitude: 4858550.2618	Height from Obvert to Top of Road (m):		
Longitude: 618124.2154	Railing height (m):	Depth of Siltation (mm):	

Site Photograph and Additional Field Notes

Site Sketch:





Upstream Structure Face (Photo #474)



Downstream Structure Face (Photo #477)



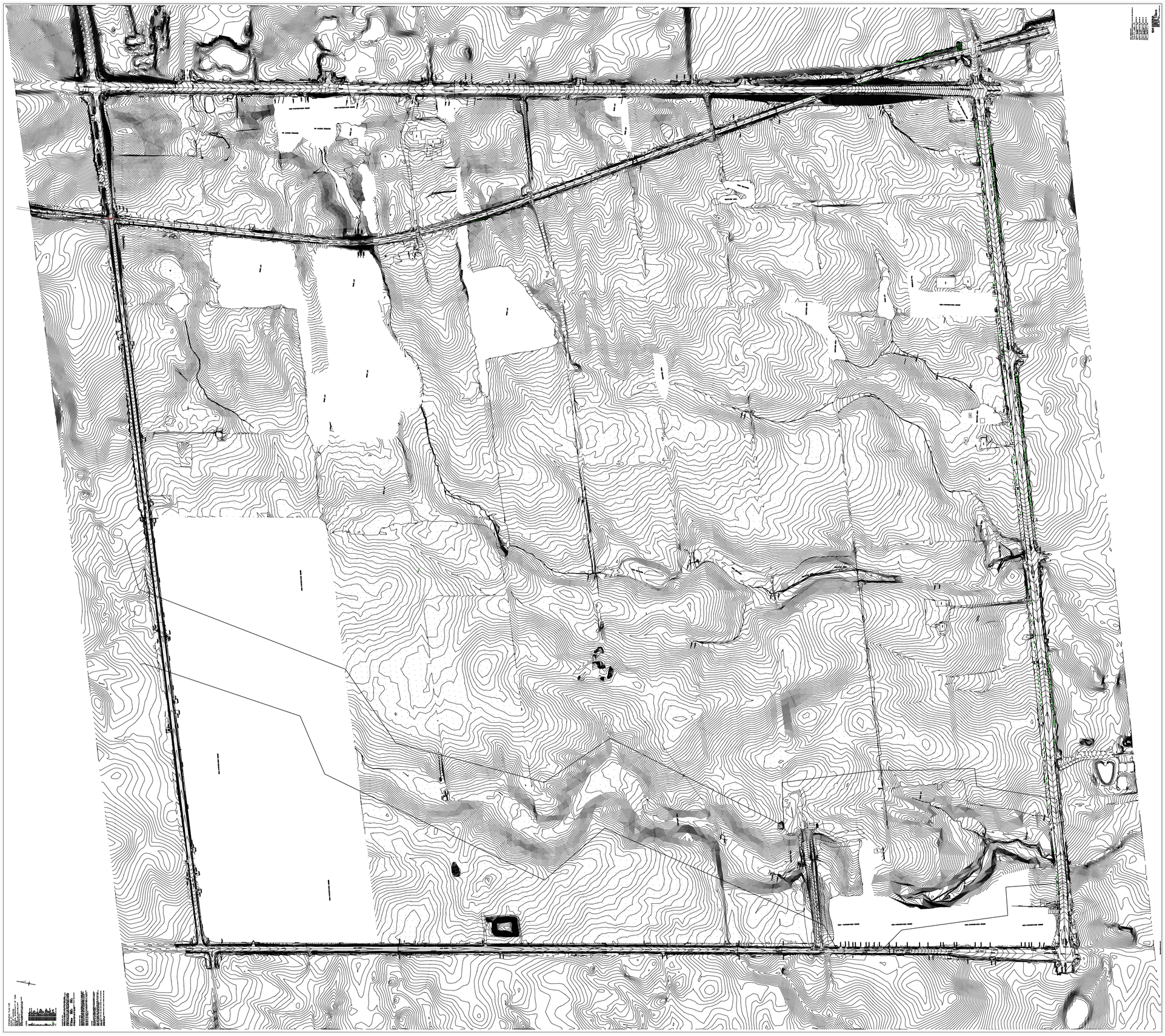
Watercourse Looking Upstream (Photo #475)



Watercourse Looking Downstream (Photo #476)

APPENDIX D:

- Block 27 Detailed Topographic Map
  - Prepared by R-PE Surveying Ltd, dated March 2022
  - Prepared by Gold Park Group, dated April 2021



N 03344-0062 (LT)

4-0064 (LT)

T 2,
R-27990
-0065 (LT)

T 1
R-27990
0201 (LT)

067 (LT)

68 (LT)

0092 (LT)

R-5754

) (LT)

(LT)

LT)

.T)

LOT 26,

PART 1
PLAN 65R-15741
PIN 03344-0197 (LT)

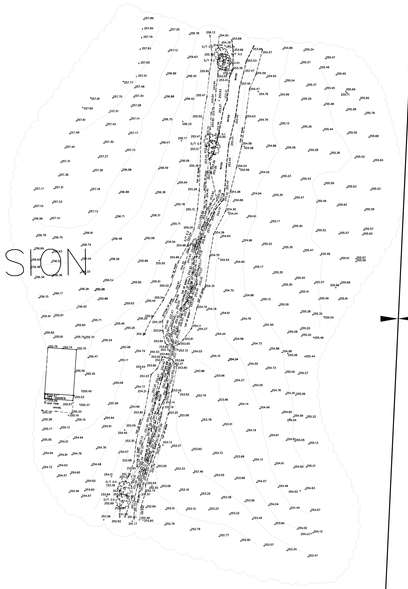
PART 2,
PLAN 64R-5754
PIN 03344-0093 (R)

GOLDEN PARK (MAPLE) INC.
AREA = 29.95 acres

CONCESSION

PART 2, PLAN 64R-2957
PIN 03344-0197 (LT)

GOLD PARK (MAPLE) INC.
AREA = 52.03 acres



NO EASEMENT SHOWN ON PIN

B

PART 2,
PLAN 65R-25880
PIN 03344-0192 (LT)

PART 1,
PLAN 65R-25880
PIN 03344-0191 (LT)

PART 1, PLAN 65R-25982

PIN 03344 - 0196 (LT)
FOUND NO DEDICATION BY-LAW REGISTERED

PART 11
PLAN 64R-2835
PIN 03344 - 0002 (LT)

PART 10
PLAN 64R-
PIN 03344 - 0

435

KNOWN AS TESTON SIDE ROAD
(ROAD ALLOWANCE BETWEEN LOTS 25 AND 26, CONCESSION 4)
PIN 03344 - 0002 (LT)

APPENDIX E

DIGITAL COPY OF HEC-RAS MODEL