

Appendix F

Detailed Geomorphic Assessment Summary



Fluvial Geomorphology Summary

Yellow Creek, Don River Watershed

Location:	Yellow Creek	Date:	April 8, 2020
Length Surveyed:	1269 m	Number of Cross Sections:	4

GENERAL SITE CHARACTERISTICS

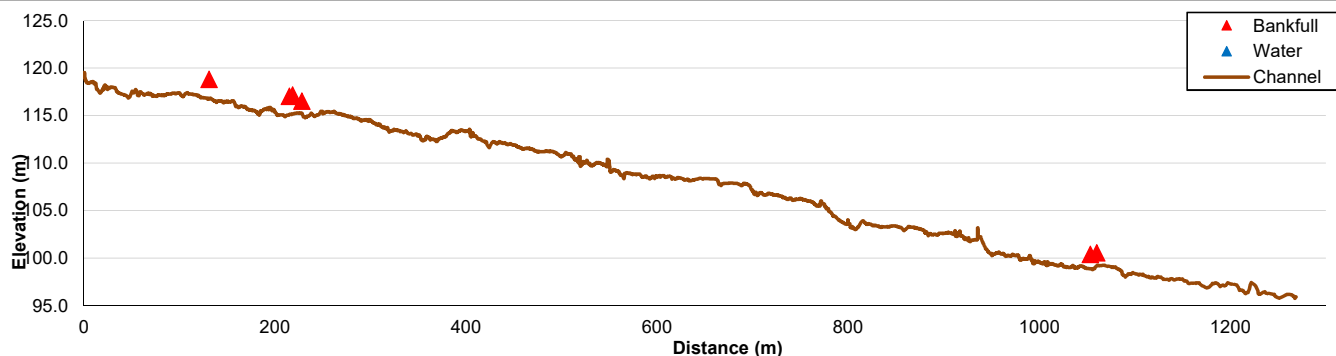
Drainage Area:	Not measured	Riparian Vegetation:	
Geology/Soils:	Newmarket/northern Till	Dominant Vegetation Type:	Trees and shrubs
Surrounding Land Use:	Park and residential	Extent of Riparian Buffer Zone:	Continuous
Channel Disturbances:	Displaced armourstone, outflanked and failed gabion revetments, undermined concrete bed, large valley wall contact	Width of Riparian Buffer Zone:	>5 channel widths
Aquatic Vegetation:		Age Class of Riparian Vegetation:	Established and mature
Dominant Vegetation Type:	Attached algae	Extent of Encroachment into Channel:	Minimal
Portion of Reach with Vegetation:	10	Large Woody Debris:	Present in channel

HYDROLOGY

Measured Discharge:	Not measured m ³ /s	Calculated Bankfull Discharge:	18.56 m ³ /s
Modeled 2-year Discharge:	Not calculated m ³ /s	Calculated Bankfull Velocity:	2.48 m/s
Modeled 2-year Velocity:	Not calculated m/s		

PLANFORM CHARACTERISTICS

<i>Profile</i>		<i>Meander Geometry</i>	
Bankfull Gradient:	1.90 %	Sinuosity:	Not measured
Channel Bed Gradient:	1.90 %	Belt Width:	Not measured m
Riffle Gradient:	3.27 %	Radius of Curvature:	Not measured m
Riffle Length:	5 - 15 m	Amplitude:	Not measured m
Riffle-Pool Spacing:	30 - 40 m	Wavelength:	Not measured m
<i>Longitudinal Profile</i>			



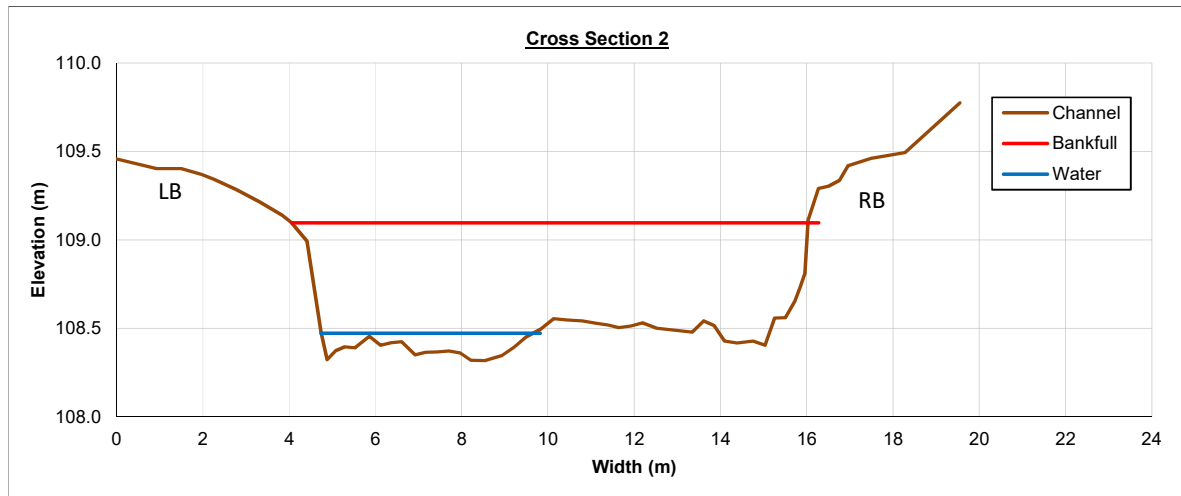
BANK CHARACTERISTICS

	<i>Minimum</i>	<i>Maximum</i>	<i>Average</i>		<i>Minimum</i>	<i>Maximum</i>	<i>Average</i>
Bank Height (m):	0.3	1.3	0.8				
Bank Angle (degrees):	35.0	90.0	66.9	Torvane Value (kg/cm ²):	Not Measured		
Root Depth (m):	0.1	0.2	0.1	Penetrometer Value (kg/cm ²):	Not Measured		
Root Density (%):	5.0	75.0	36.3	Bank Material (range):	Silt to Small Cobble		
Undercut Banks (%):		20.0					
Depth of Undercut (m):		0 - 0.15					

CROSS-SECTIONAL CHARACTERISTICS

	Minimum	Maximum	Average
Bankfull Width (m):	11.9	12.7	12.2
Average Bankfull Depth (m):	0.5	0.7	0.6
Bankfull Width/Depth:	17.8	23.8	20.3
Wetted Width (m):	4.3	8.5	6.1
Average Water Depth (m):	0.1	0.3	0.1
Wetted Width/Depth:	31.5	62.0	45.9
Max. Wetted Depth (m):	0.15	0.67	0.33
Manning's n:	0.04		

Representative Cross-Section (#2)



SUBSTRATE CHARACTERISTICS

Particle size

D ₁₀	1 mm
D ₅₀	18 mm
D ₉₀	120 mm

Subpavement:

Particle shape:

Embeddedness (%):

Particle range (riffle):

Particle Range (pool):

Sand

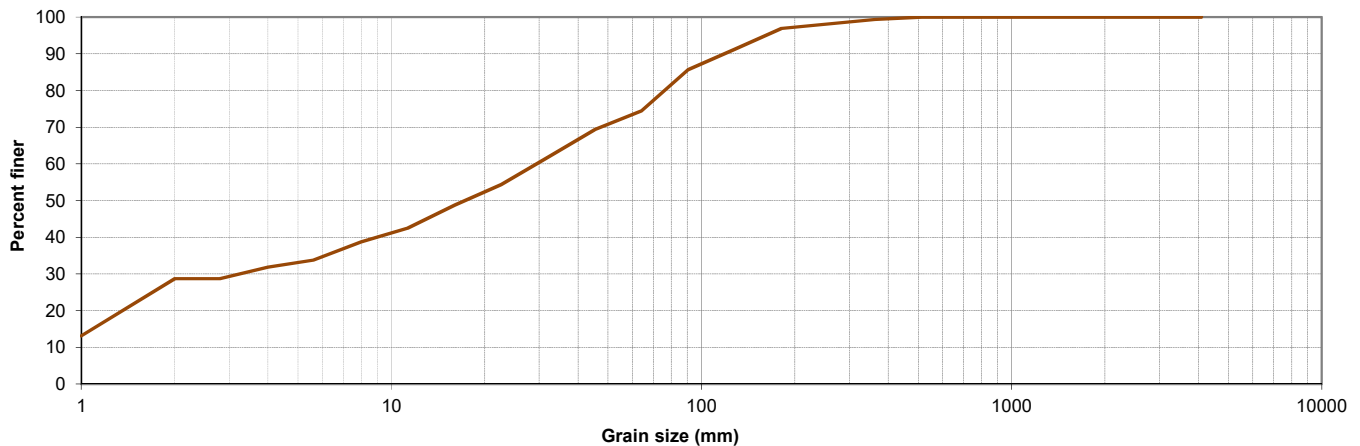
Sub-angular to sub-rounded

20-60

Silt - Cobble

Sand - Cobble

Cumulative Particle Size Distribution (Averaged for all 4 Cross Sections)



CHANNEL THRESHOLDS

Flow Competency:		Tractive Force at Bankfull:	114 N/m ²
for D ₅₀ :	0.7 m/s	Tractive Force at 2-year flow:	Not calculated N/m ²
for D ₈₄ :	1.6 m/s	Critical Shear Stress:	13.1 N/m ²
Unit Stream Power at Bankfull:	283 W/m ²		

GENERAL FIELD OBSERVATIONS

Channel substrate was a combination of native material and material displaced from failed gabion. Substrate sorting was moderate throughout the site. Scour was observed along both banks at multiple cross-section. Banks at the water edge were moderate in height and angle, while steeper and higher banks were set back from the edge. Exposed roots and fallen and leaning trees were observed.



Downstream view of cross section # 3