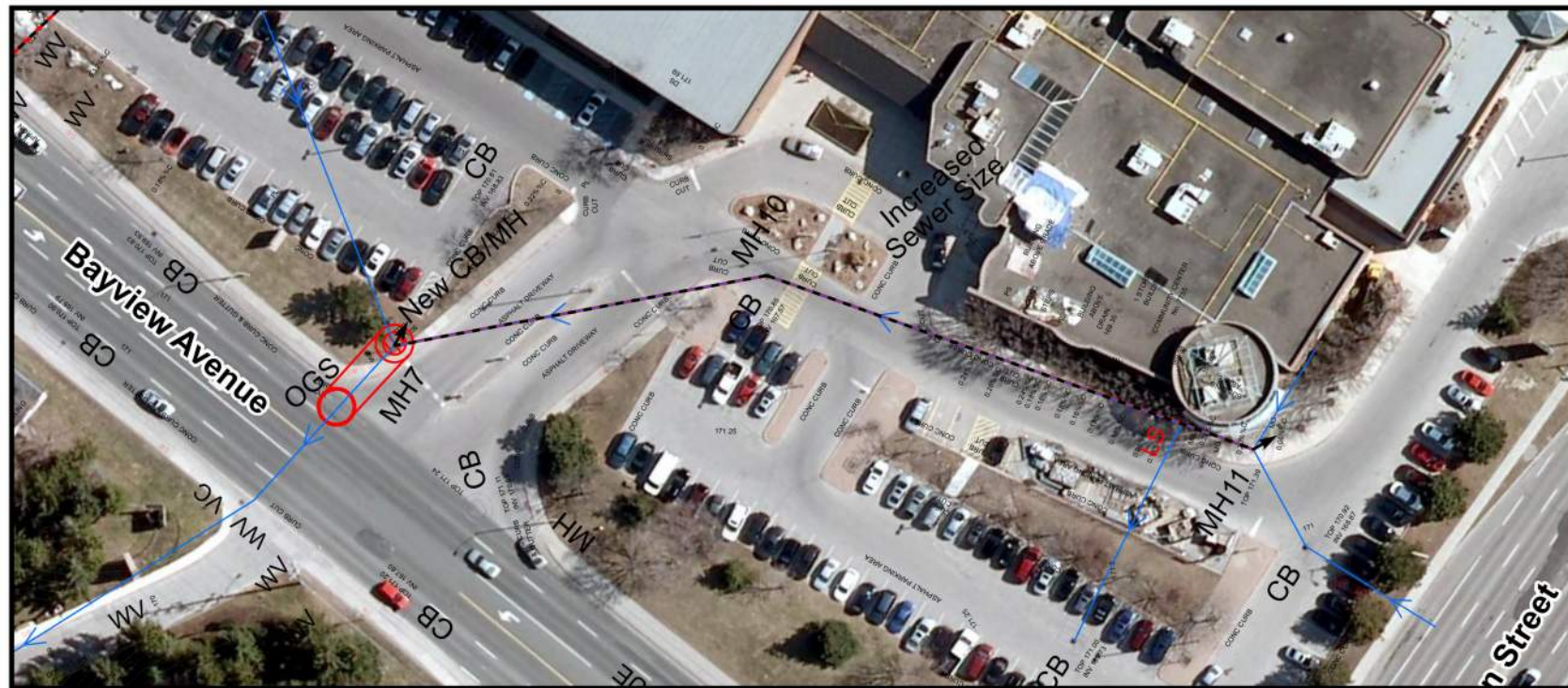


# APPENDIX

# C-1

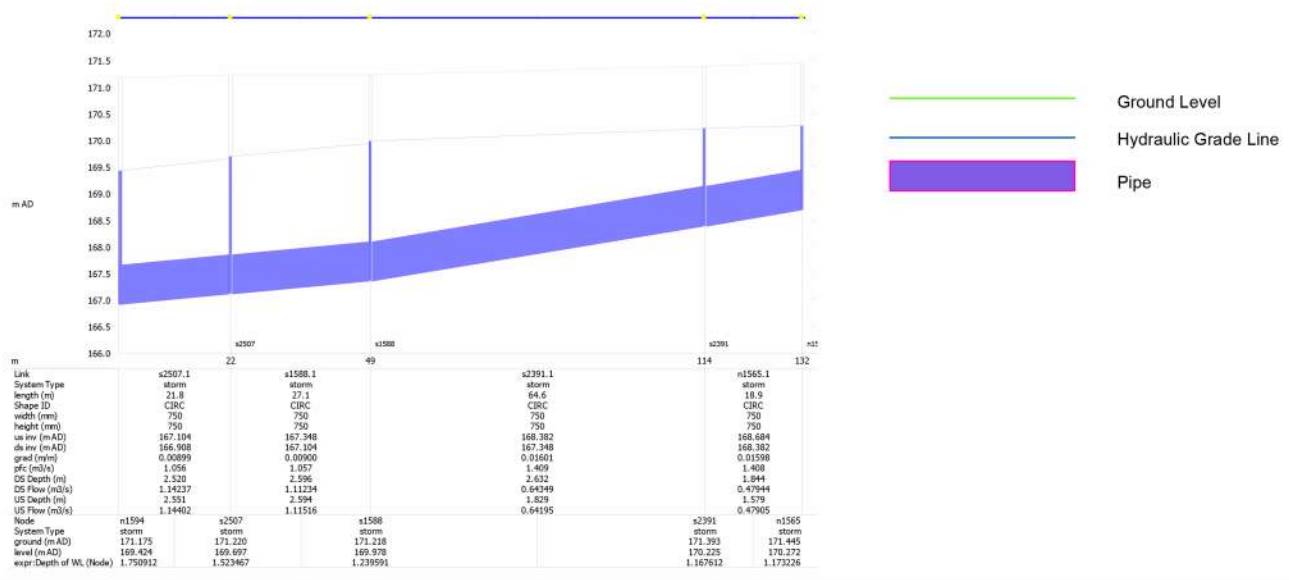
HYDRAULIC  
PROFILES –  
ALTERNATIVE  
SYSTEMS (JAN 2019)





**Legend**

- Proposed Storm
- Existing Storm
- Contour Lines
- T-CATCH BASIN
- Cross Section
- Existing Manhole
- Proposed Manhole



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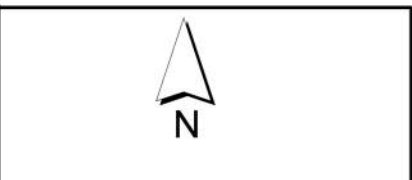
Glynnwood Tributary Class EA



1:600

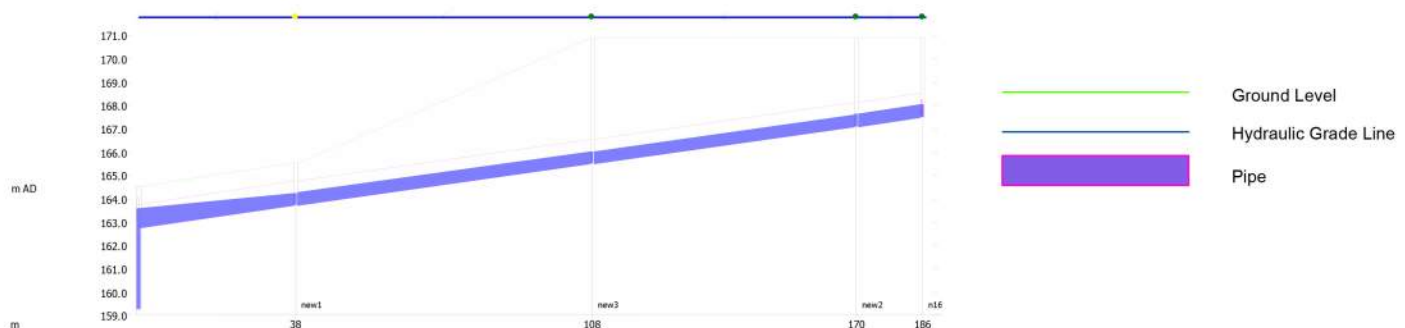
Figure C1.1 Alternative 1

Glynnwood Tributary Area  
Sewer Surcharge Study  
Alternative #1 MH11 to MH7



**Legend**

- Proposed Storm
- Proposed MH
- Existing Storm
- Existing Manhole
- Catch Basin
- Countours
- Cross Section



- Ground Level
- Hydraulic Grade Line
- Pipe

m	new1	new3	new2	n16	
Link	new1.1	new3.1	new2.2	n1613.2	
System Type	storm	storm	storm	storm	
length (m)	37.7	70.2	62.5	15.6	
Shape ID	CIRC	CIRC	CIRC	CIRC	
width (mm)	1050	1050	1050	1050	
height (mm)	1050	1050	1050	1050	
us inv (m AD)	163.708	165.507	167.100	167.512	
ds inv (m AD)	162.732	163.708	165.507	167.100	
grad (m/m)	0.02588	0.02564	0.02588	0.02636	
pf (m <sup>3</sup> /s)	4.394	4.373	4.359	4.434	
DS Depth (m)	0.888	0.562	0.539	0.540	
DS Flow (m <sup>3</sup> /s)	2.17647	2.18085	2.18172	2.18180	
US Depth (m)	0.553	0.534	0.535	0.531	
US Flow (m <sup>3</sup> /s)	2.18073	2.18171	2.18180	2.18183	
Node	n1620	new1	new3	new2	n1613
System Type	storm	storm	storm	storm	storm
ground (m AD)	164.550	165.550	170.891	170.891	-
level (m AD)	163.617	164.270	166.045	167.639	-
expr.Depth of WL (Node)	0.932996	1.280408	4.845651	3.251641	-



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Glynnwood Tributary Class EA



Figure C1.2 Alternative 1

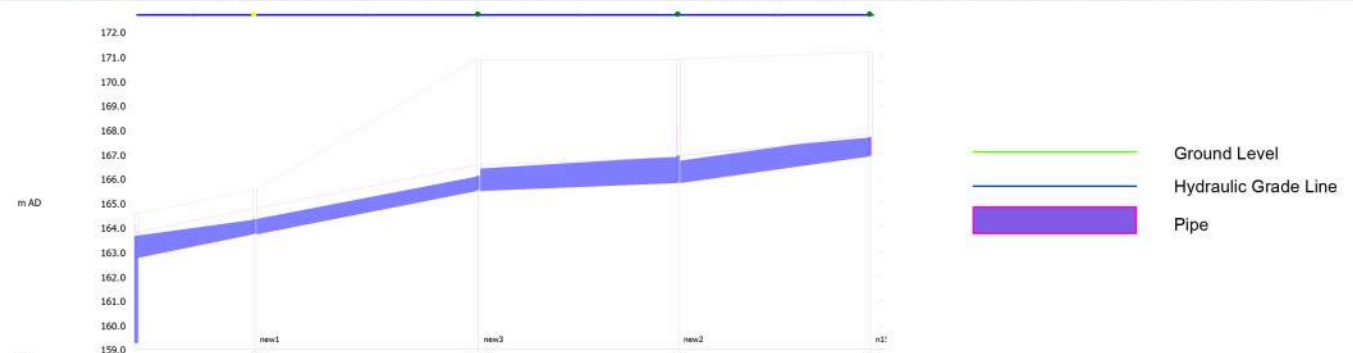
Glynnwood Tributary Area  
Sewer Surcharge Study  
Alternative #1 MH8 to Pond



N

### Legend

- Proposed Storm Sewer
- Proposed Manhole
- Existing Storm Sewer
- Existing Manhole
- Catch Basin
- Contour Lines
- - - Cross Section



Link	new1.1	new3.1	new2.2	n1594.2	
System Type	storm	storm	storm	storm	
length (m)	37.7	70.2	62.5	59.8	
Shape ID	CIRC	CIRC	CIRC	CIRC	
width (mm)	1050	1050	1050	900	
height (mm)	1050	1050	1050	900	
us riv (mAD)	163.708	165.507	165.818	166.908	
os riv (mAD)	162.732	163.708	165.507	165.818	
grad (m/m)	0.02508	0.02564	0.00497	0.01823	
pic (m/s)	4.394	4.373	1.926	2.445	
DS Depth (m)	0.918	0.617	0.884	1.149	
DS Flow (m <sup>3</sup> /s)	2.44522	2.44863	2.44908	1.89783	
US Depth (m)	0.594	0.580	1.087	0.763	
US Flow (m <sup>3</sup> /s)	2.44857	2.44907	2.44923	1.91130	
Node	n1620	new1	new3	new2	n1594
System Type	storm	storm	storm	storm	storm
ground (m AD)	164.550	165.550	170.891	170.891	171.175
level (m AD)	163.646	164.323	166.105	166.958	167.715
expr:Depth of WL (Node)	0.903668	1.226880	4.785653	3.933007	3.459790

Project 121-15461-00

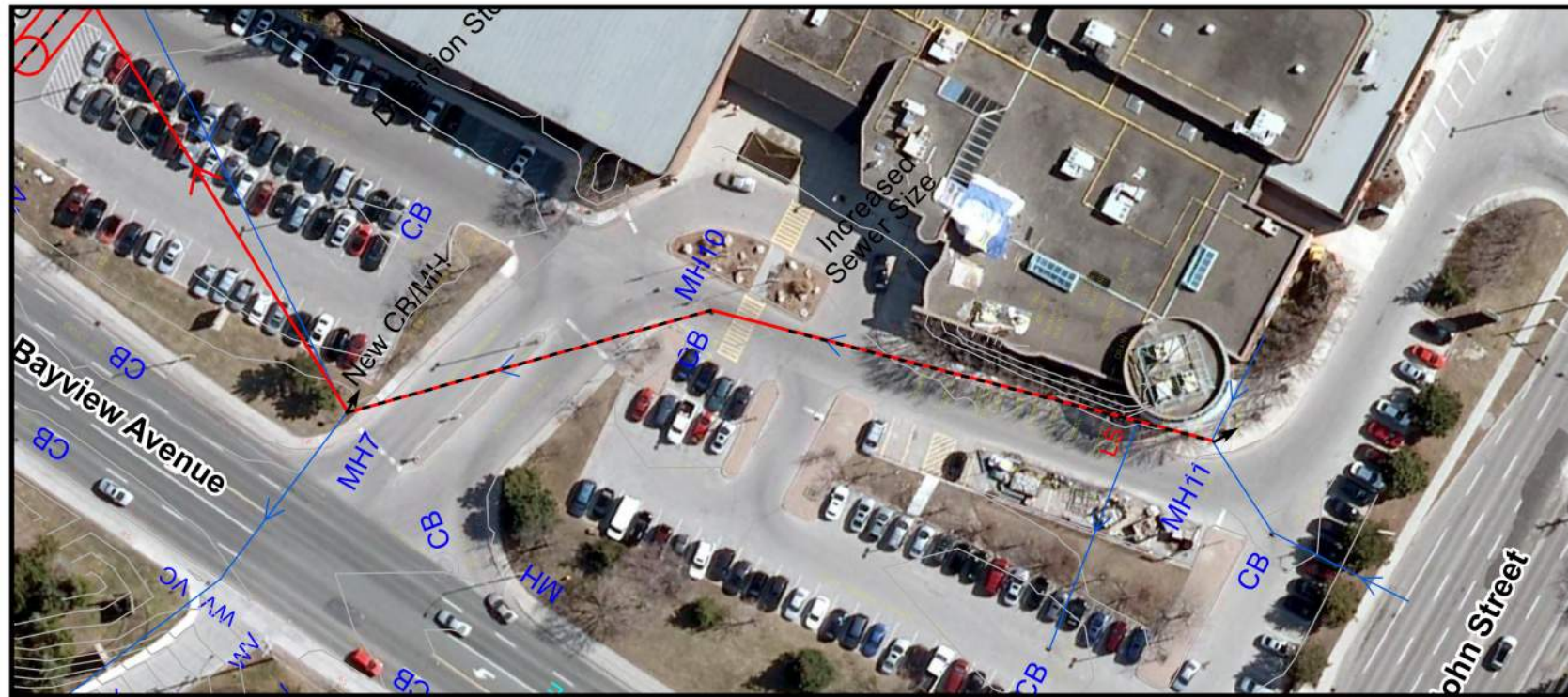
Glynnwood Tributary Class EA

0 5 10 20 30 40  
m

1:800

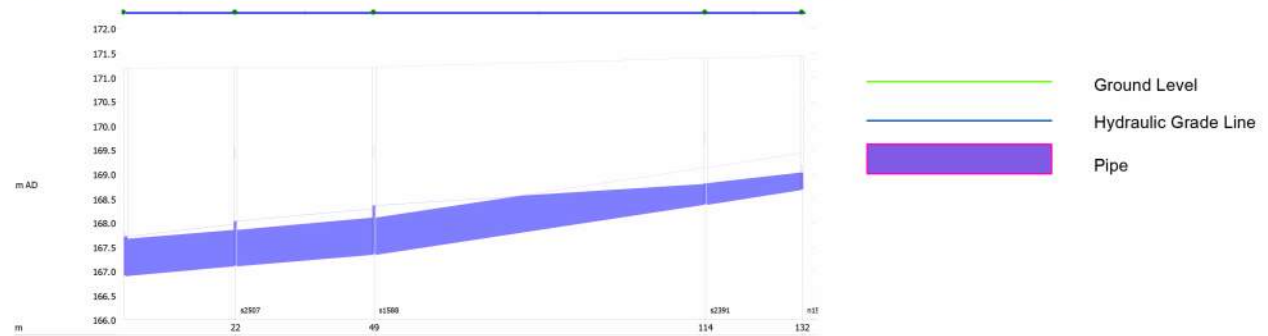
Figure C2.1 Alternative 2

Glynnwood Tributary Area  
Sewer Surcharge Study  
Alternative #2 MH7 to Pond



### Legend

- Proposed Storm Sewer
- Proposed MH
- Existing Storm Sewer
- Existing MH
- Catch Basin
- Contour Lines
- Cross Section



m	s2507.1	s1588.1	s2391.1	n1565.1
Link	s2507.1	s1588.1	s2391.1	n1565.1
System Type	storm	storm	storm	storm
length (m)	21.8	27.1	64.6	18.9
Shape ID	CIRC	CIRC	CIRC	CIRC
width (mm)	750	750	750	750
height (mm)	750	750	750	750
us mv (m AD)	167.104	167.348	168.382	168.684
ds mv (m AD)	166.908	167.104	167.348	168.382
grad (mm)	0.00899	0.00900	0.01601	0.01598
p/c (m/s)	1.056	1.057	1.409	1.408
OS Depth (m)	0.812	0.931	1.015	0.429
OS Flow (m <sup>3</sup> /s)	1.20799	1.16945	0.70549	0.53239
US Depth (m)	0.860	0.948	0.423	0.343
US Flow (m <sup>3</sup> /s)	1.21220	1.17295	0.70248	0.53350
Node	n1594	s2507	s1588	s2391
System Type	storm	storm	storm	storm
ground (m AD)	171.175	171.220	171.218	171.445
level (m AD)	167.715	168.029	168.361	169.027
expr. Depth of WL (Node)	3.459790	3.190810	2.857359	2.582270



Project 121-15461-00

Glynwood Tributary Class EA

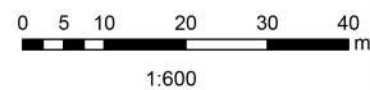
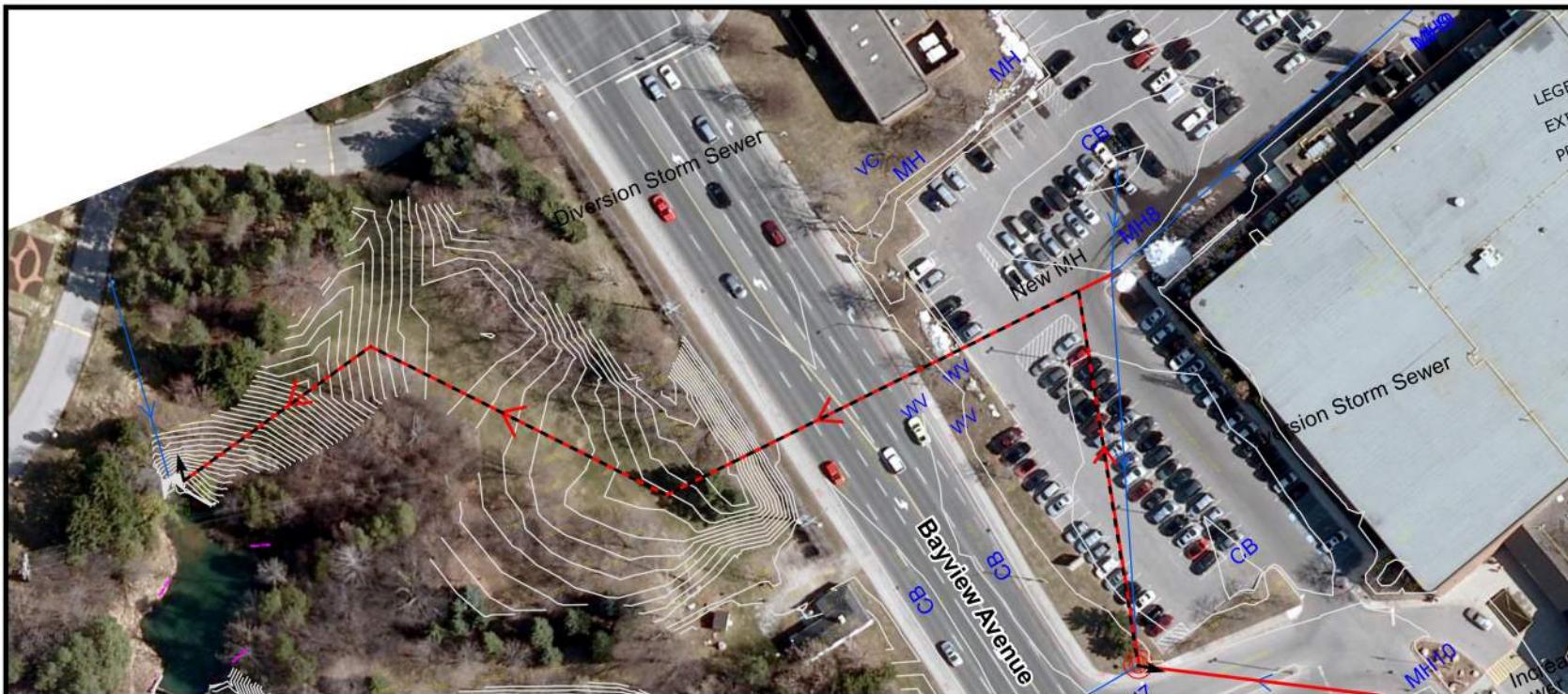


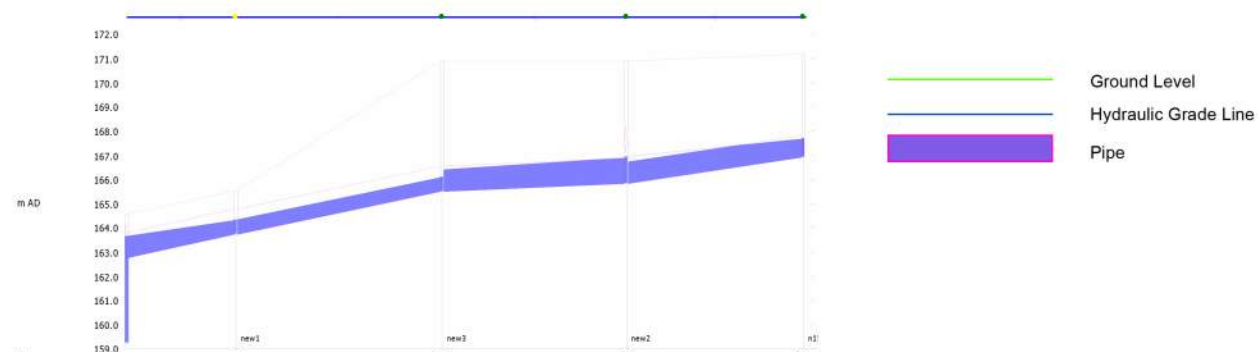
Figure C2.2 Alternative 2

Glynwood Tributary Area  
Sewer Surchage Study  
Alternative #2 MH11 to MH7



### Legend

- Proposed Storm Sewer
- Proposed MH
- Existing Sewer
- Existing MH
- Catch Basin
- Contour Lines
- Cross Section



Link	new1.1	new3.1	new2.2	n1594.2	
System Type	storm	storm	storm	storm	
length (m)	37.7	70.2	62.5	59.8	
Shape ID	CIRC	CIRC	CIRC	CIRC	
width (mm)	1050	1050	1050	900	
height (mm)	1050	1050	1050	900	
us inv (m AD)	163.708	165.507	165.818	166.908	
ds inv (m AD)	162.732	163.708	165.507	165.818	
grad (m/m)	0.02588	0.02564	0.00497	0.01823	
gfc (m/s)	4.394	4.373	1.926	2.445	
DS Depth (m)	0.918	0.817	0.884	1.149	
DS Flow (m <sup>3</sup> /s)	2.44522	2.44863	2.44908	1.89783	
US Depth (m)	0.594	0.580	1.057	0.763	
US Flow (m <sup>3</sup> /s)	2.44857	2.44907	2.44923	1.91130	
Node	n1620	new1	new3	new2	n1594
System Type	storm	storm	storm	storm	storm
ground (m AD)	164.550	165.550	170.891	170.891	171.175
level (m AD)	163.646	164.323	166.105	166.958	167.715
expr:Depth of WL (Node)	0.903668	1.226880	4.785653	3.933007	3.459790



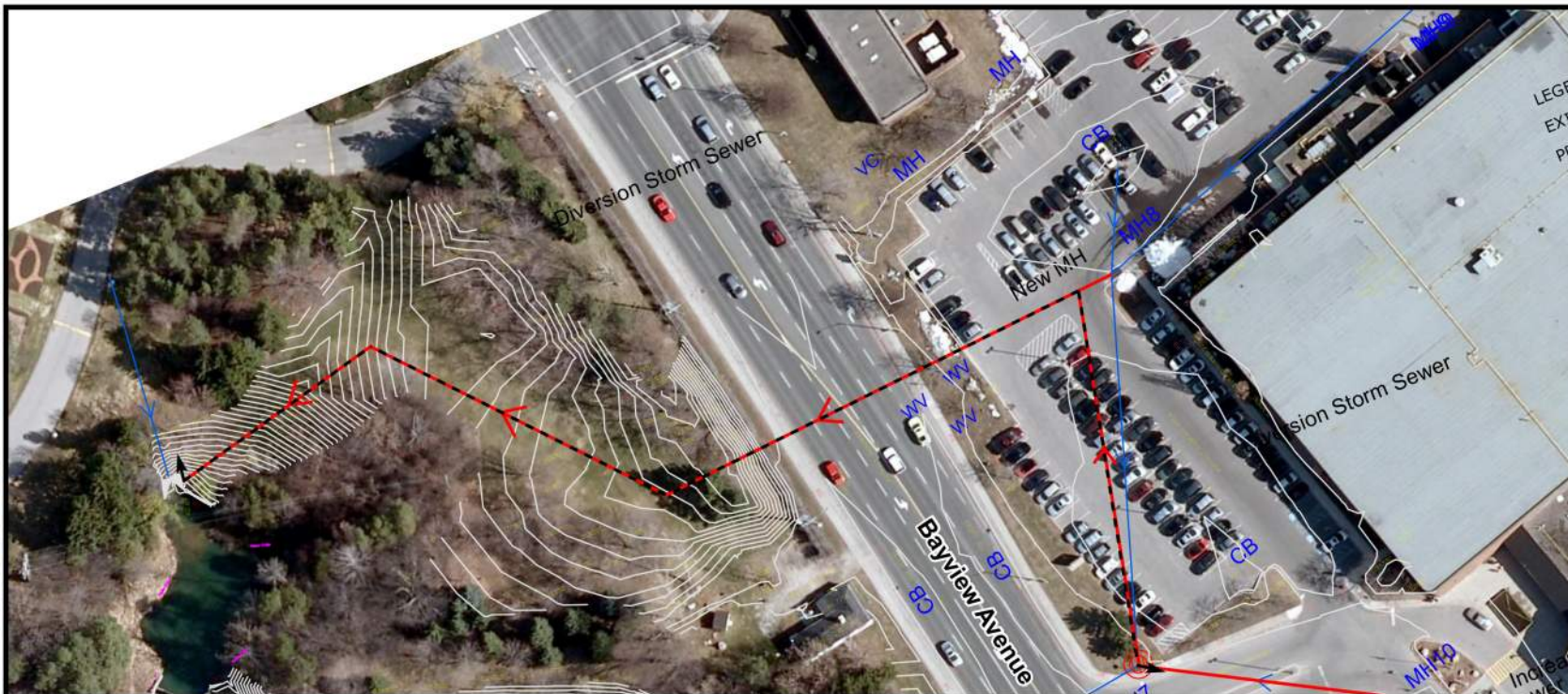
Project 121-15461-00

Glynnwood Tributary Class EA



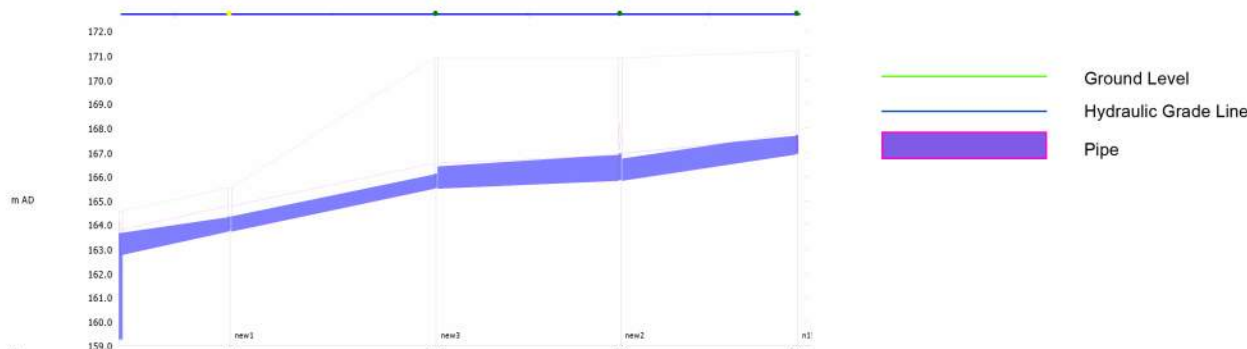
Figure C3.1 Alternative 3

Glynnwood Tributary Area  
Sewer Surcharge Study  
Alternative #3 MH11 to MH7



### Legend

- Proposed Storm Sewer
- Proposed MH
- Existing Sewer
- Existing MH
- Catch Basin
- Contour Lines
- Cross Section



Link	new1.1	new3.1	new2.2	n1594.2	
System Type	storm	storm	storm	storm	
length (m)	37.7	70.2	62.5	59.8	
Shape ID	CIRC	CIRC	CIRC	CIRC	
width (mm)	1050	1050	1050	900	
height (mm)	1050	1050	1050	900	
us inv (m AD)	163.708	165.507	165.818	166.908	
ds inv (m AD)	162.732	163.708	165.507	165.818	
grad (m/m)	0.02588	0.02564	0.00497	0.01823	
gfc (m <sup>3</sup> /s)	4.394	4.373	1.926	2.445	
DS Depth (m)	0.918	0.817	0.884	1.149	
DS Flow (m <sup>3</sup> /s)	2.44522	2.44863	2.44908	1.89783	
US Depth (m)	0.594	0.580	1.057	0.763	
US Flow (m <sup>3</sup> /s)	2.44857	2.44907	2.44923	1.91130	
Node	n1620	new1	new3	new2	n1594
System Type	storm	storm	storm	storm	storm
ground (m AD)	164.550	165.550	170.891	170.891	171.175
level (m AD)	163.646	164.323	166.105	166.958	167.715
expr:Depth of WL (Node)	0.903668	1.226880	4.785653	3.933007	3.459790



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Glynnwood Tributary Class EA



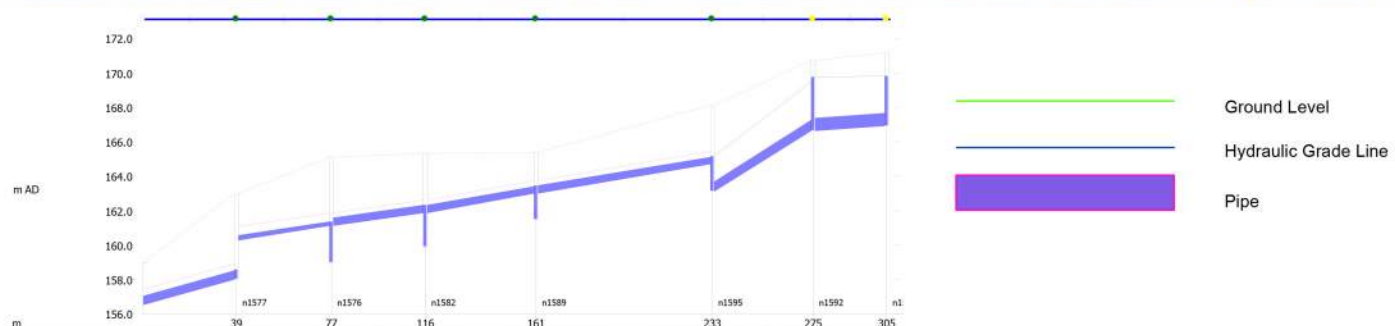
Figure C3.1 Alternative 3

Glynnwood Tributary Area  
Sewer Surcharge Study  
Alternative #3 MH11 to MH7



### Legend

- Proposed Storm Sewer
- Proposed MH
- Existing Storm Sewer
- Existing MH
- Catch Basin
- Contour Lines
- Cross Section

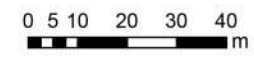


Link	n1577.1	n1576.2	n1582.2	n1589.2	161	n1595.2	n1592.1	n1594.1
System Type	storm	storm	storm	storm		storm	storm	storm
length (m)	38.7	38.7	38.5	45.3		71.8	41.5	30.0
Shape ID	CJRC	CJRC	CJRC	CJRC		CJRC	CJRC	CJRC
width (mm)	900	750	750	750		750	600	750
height (mm)	900	750	750	750		750	600	750
us inv (m AD)	158.027	161.124	161.854	162.995		164.702	166.638	166.908
ds inv (m AD)	156.556	160.306	161.124	161.854		162.995	163.111	166.638
grad (m/m)	0.03801	0.02115	0.01895	0.02517		0.02377	0.08499	0.00900
pfrc (m/s)	3.530	1.619	1.533	1.765		1.717	1.790	1.056
DS Depth (m)	0.506	0.246	0.472	0.496		0.452	2.064	3.099
DS Flow (m³/s)	2.04264	0.33782	1.06025	1.08505		1.02975	1.93557	1.09588
US Depth (m)	0.506	0.246	0.472	0.433		0.428	2.817	2.882
US Flow (m³/s)	2.04315	0.33824	1.06062	1.08594		1.02925	1.93558	1.06333
Node	n1580	n1577	n1576	n1582	n1589	n1595	n1592	n1594
System Type	storm	storm	storm	storm	storm	storm	storm	storm
ground (m AD)	158.997	163.006	165.124	165.354	165.395	168.102	170.736	-
level (m AD)	156.655	158.564	161.370	162.348	163.446	165.145	169.736	-
expr:Depth of WL (Node)	-	4.441791	3.753883	3.006298	1.949398	2.957194	0.999992	-



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Glynnwood Tributary Class EA

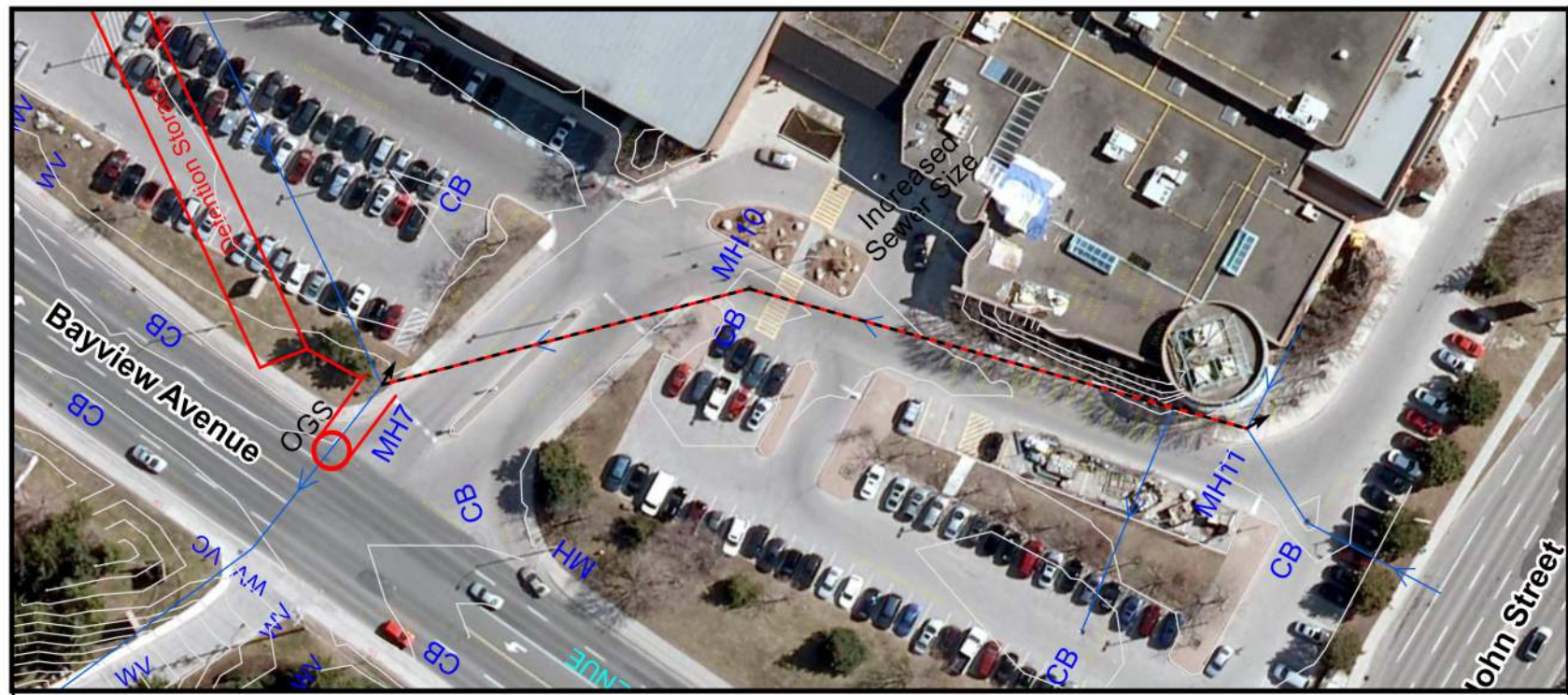


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Figure C4.1 Alternative 4

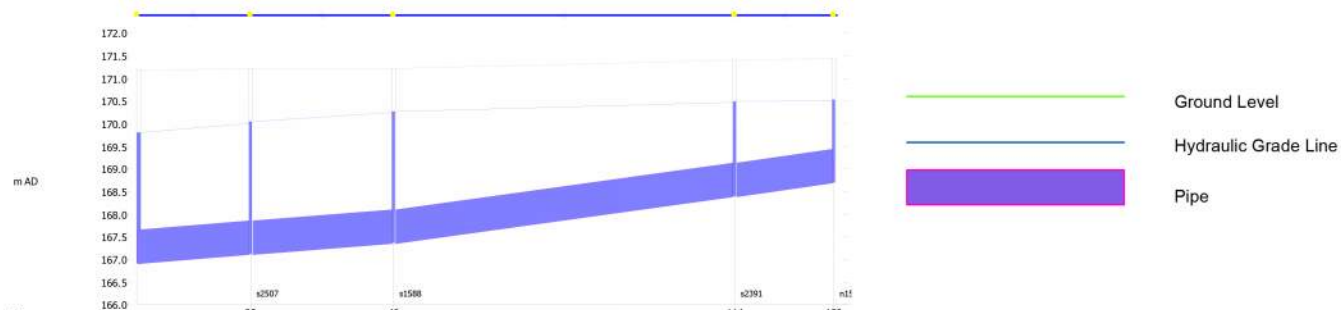
Glynnwood Tributary Area  
Sewer Surcharge Study  
Alternative #4 MH7 to Pond





### Legend

- Proposed Storm Sewer
- Proposed MH
- Existing Storm Sewer
- Existing MH
- Catch Basin
- Contour Lines
- - - ↑ Cross Section



Link	s2507.1	s1588.1	s2391.1	n1565.1	
System Type	storm	storm	storm	storm	
length (m)	21.8	27.1	64.6	18.9	
Shape ID	CIRC	CIRC	CIRC	CIRC	
width (mm)	750	750	750	750	
height (mm)	750	750	750	750	
us inv (mAD)	167.104	167.348	168.382	168.684	
ds inv (mAD)	166.908	167.104	167.348	168.382	
grad (m/m)	0.00899	0.00900	0.01601	0.01598	
ptc (m/s)	1.056	1.057	1.409	1.408	
DS Depth (m)	2.893	2.934	2.926	2.103	
DS Flow (m³/s)	1.13767	1.10971	0.60632	0.46059	
US Depth (m)	2.895	2.895	2.091	1.831	
US Flow (m³/s)	1.13962	1.11235	0.60895	0.46186	
Node	n1594	s2507	s1588	s2391	n1565
System Type	storm	storm	storm	storm	storm
ground (mAD)	171.175	171.220	171.218	171.393	171.445
level (mAD)	169.797	170.035	170.273	170.484	170.521
expr-Depth of Wl. (Node)	1.377545	1.184722	0.945219	0.908961	0.923668



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Glynnwood Tributary Class EA

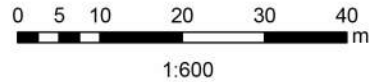


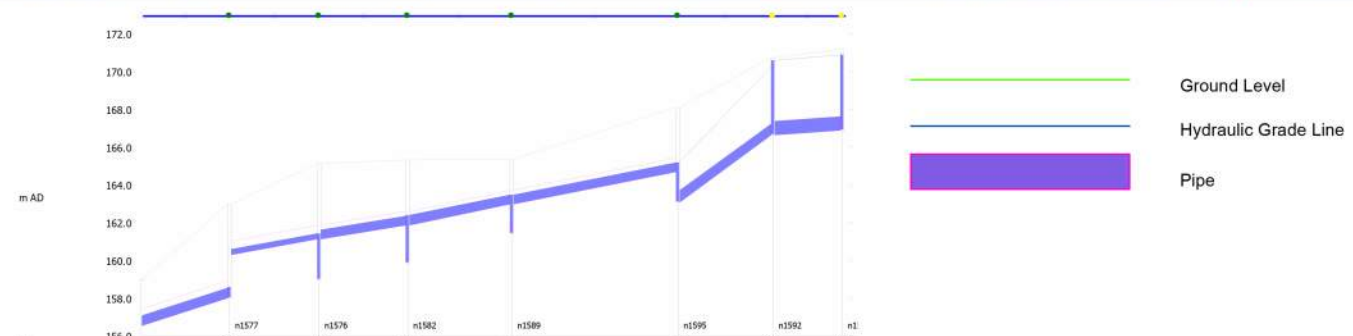
Figure C4.2 Alternative 4

Glynnwood Tributary Area  
Sewer Surcharge Study  
Alternative #4 MH11 to MH7



### Legend

- Proposed Storm Sewer
- Proposed MH
- Existing Storm Sewer
- Existing MH
- Catch Basin
- Contour Lines
- Cross Section



Link	n1577.1	n1576.2	n1582.2	n1589.2	n1595.2	n1592.1	n1594.1	
System Type	storm	storm	storm	storm	storm	storm	storm	
length (m)	38.7	38.7	45.3	71.8	41.5	30.0		
Shape ID	CIRC	CIRC	CIRC	CIRC	CIRC	CIRC		
width (mm)	900	750	750	750	750	600		
height (mm)	900	750	750	750	750	600		
us inv (m AD)	158.027	161.124	161.854	162.995	164.702	166.638	166.908	
ds inv (m AD)	156.556	160.306	161.124	161.854	162.995	163.111	166.638	
grad (m/m)	0.03801	0.02115	0.01895	0.02517	0.02377	0.08499	0.00900	
p/c (m/s)	3.530	1.619	1.533	1.766	1.717	1.790	1.056	
DS Depth (m)	0.525	0.300	0.523	0.561	0.516	2.130	3.961	
DS Flow (m³/s)	2.22206	0.50691	1.22689	1.25661	1.19864	2.10382	1.09414	
US Depth (m)	0.525	0.300	0.523	0.480	0.475	3.644	3.983	
US Flow (m³/s)	2.22220	0.50710	1.22696	1.25714	1.19813	2.10384	1.09418	
Node	n1580	n1577	n1576	n1582	n1589	n1595	n1592	n1594
System Type	storm	storm	storm	storm	storm	storm	storm	storm
ground (m AD)	158.997	163.806	165.124	165.354	165.395	168.102	170.786	-
level (m AD)	156.655	158.599	161.425	162.412	163.508	165.206	170.595	-
expr:Depth of WL (Node)	-	4.407489	3.699348	2.942211	1.886852	2.896174	0.141045	-



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Glynnwood Tributary Class EA

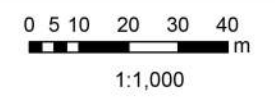
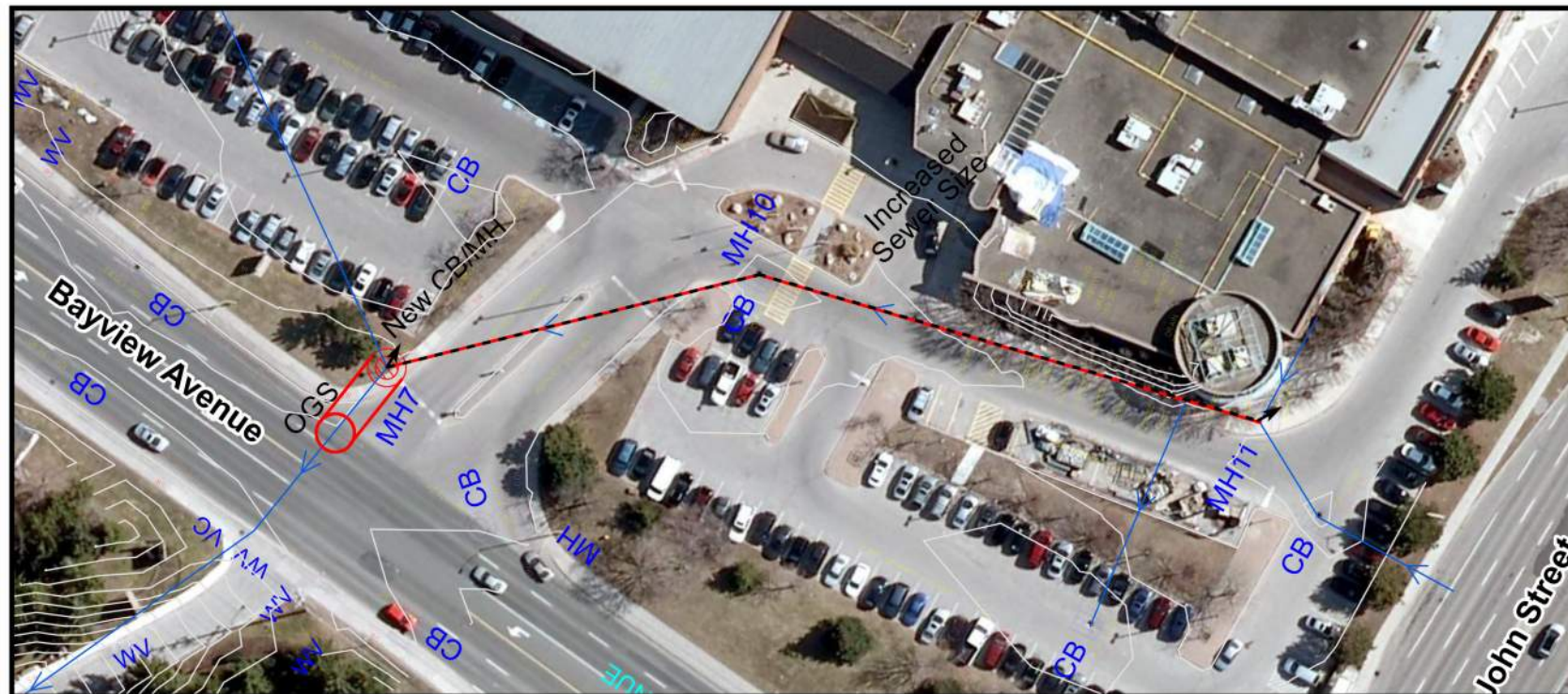


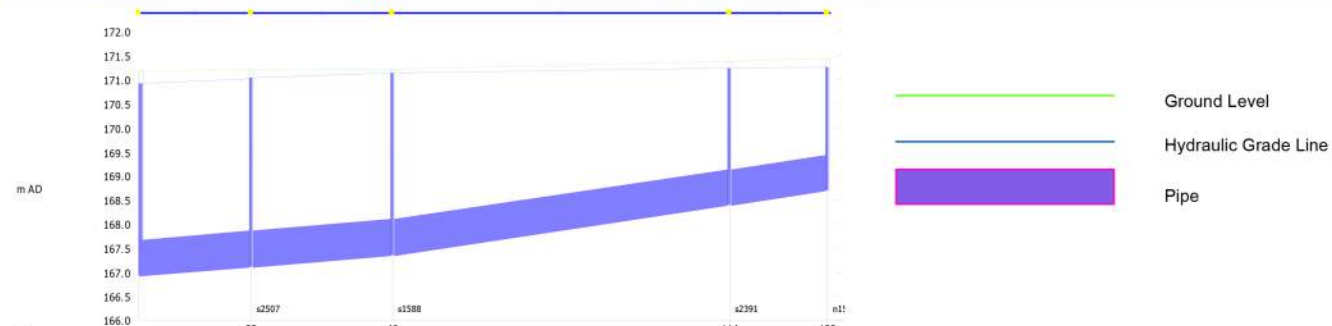
Figure C5.1 Alternative 5

Glynnwood Tributary Area  
Sewer Surchage Study  
Alternative #5 MH7 to Pond



### Legend

- Proposed Storm Sewer
- Proposed MH
- Existing Storm Sewer
- Existing MH
- Catch Basin
- Contour Lines
- Cross Section



Link	s2507.1	s1588.1	s2391.1	n1565.1	
System Type	storm	storm	storm	storm	
length (m)	21.8	27.1	64.6	18.9	
Shape ID	CIRC	CIRC	CIRC	CIRC	
width (mm)	750	750	750	750	
height (mm)	750	750	750	750	
us inv (m AD)	167.104	167.348	168.382	168.684	
ds inv (m AD)	166.906	167.104	167.348	168.382	
grad (m/m)	0.00899	0.00900	0.01601	0.01598	
pfC (m <sup>3</sup> /s)	1.056	1.057	1.409	1.408	
DS Depth (m)	4.020	3.936	3.805	2.872	
DS Flow (m <sup>3</sup> /s)	0.92083	0.93936	0.45216	0.39540	
US Depth (m)	3.919	3.791	2.866	2.587	
US Flow (m <sup>3</sup> /s)	0.92678	0.94679	0.46870	0.42468	
Node	n1594	s2507	s1588	s2391	n1565
System Type	storm	storm	storm	storm	storm
ground (m AD)	171.175	171.220	171.218	171.393	171.445
level (m AD)	170.926	171.039	171.153	171.253	171.274
expr:Depth of WL (Node)	0.248578	0.181243	0.065168	0.139704	0.171105



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Glywood Tributary Class EA

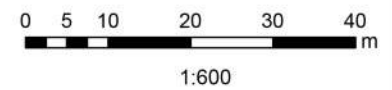
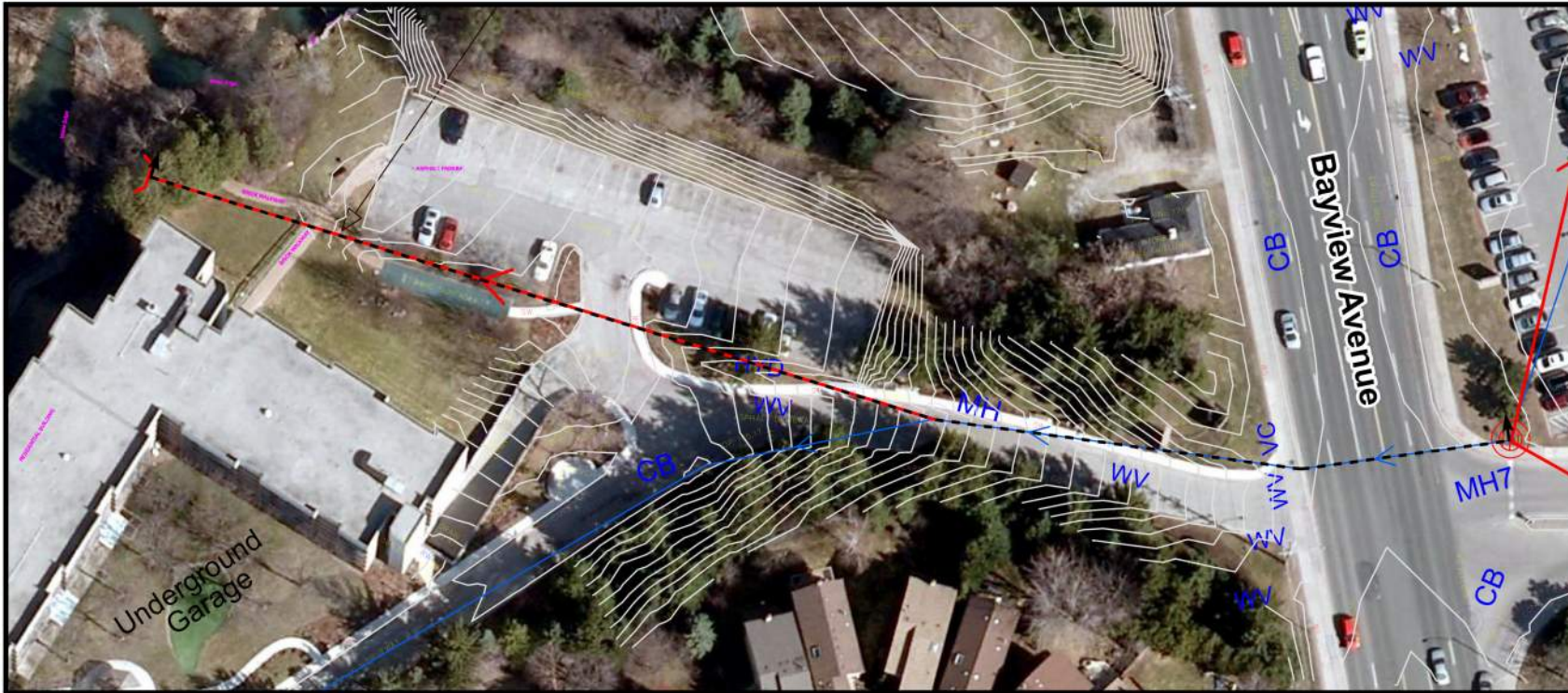


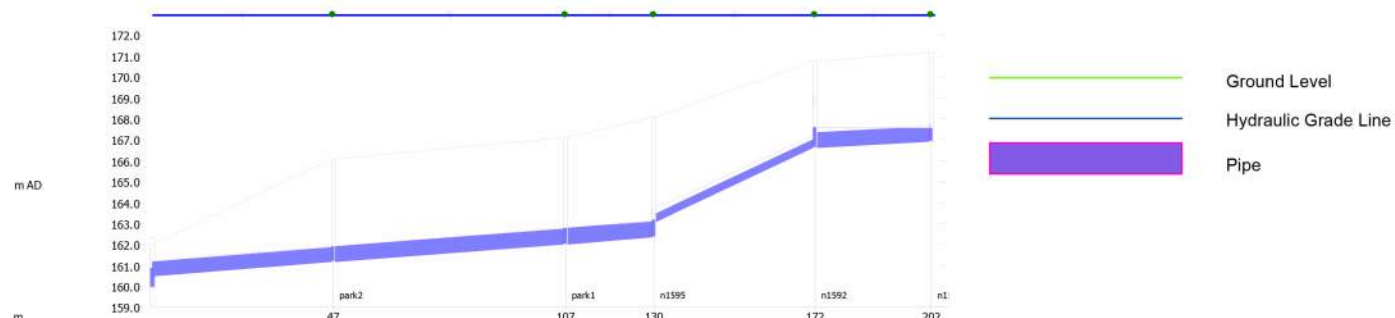
Figure C5.2 Alternative 5

Glywood Tributary Area  
Sewer Surchage Study  
Alternative #5 MH11 to MH7



### Legend

- Proposed Storm Sewer
- Proposed MH
- Existing Storm Sewer
- Existing MH
- Catch Basin
- Contour Lines
- ⊥ Cross Section



m	47	107	130	172	202	
Link	park2.1 storm	park1.1 storm	n1595.3 storm	n1592.1 storm	n1594.1 storm	
System Type	storm	storm	storm	storm	storm	
length (m)	47.2	60.1	22.7	41.5	30.0	
Shape ID	CIRC	CIRC	CIRC	CIRC	CIRC	
width (mm)	750	750	750	600	750	
height (mm)	750	750	750	750	750	
us inv (mAD)	161.176	162.036	162.361	166.638	166.908	
ds inv (mAD)	160.500	161.176	162.036	163.111	166.638	
grad (m/m)	0.01432	0.01430	0.01432	0.08499	0.00900	
pf <sub>c</sub> (m <sup>3</sup> /s)	1.332	1.332	1.332	1.790	1.056	
D6 Depth (m)	0.677	0.736	0.783	0.389	0.964	
D6 Flow (m <sup>3</sup> /s)	1.29321	1.29327	1.31081	1.32053	-0.44286	
US Depth (m)	0.686	0.727	0.777	0.389	0.665	
US Flow (m <sup>3</sup> /s)	1.29326	1.30936	1.31580	1.32055	-0.44548	
Node	pond1 storm	park2 storm	park1 storm	n1595 storm	n1592 storm	n1594 storm
System Type	storm	storm	storm	storm	storm	storm
ground (mAD)	162.000	166.102	167.102	168.102	170.736	171.175
level (mAD)	160.903	161.907	162.814	163.200	167.609	167.573
expr:Depth of WL (Node)	1.096771	4.194545	4.288172	4.902095	3.127296	3.602063



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Glynwood Tributary Class EA

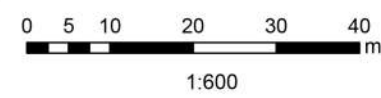
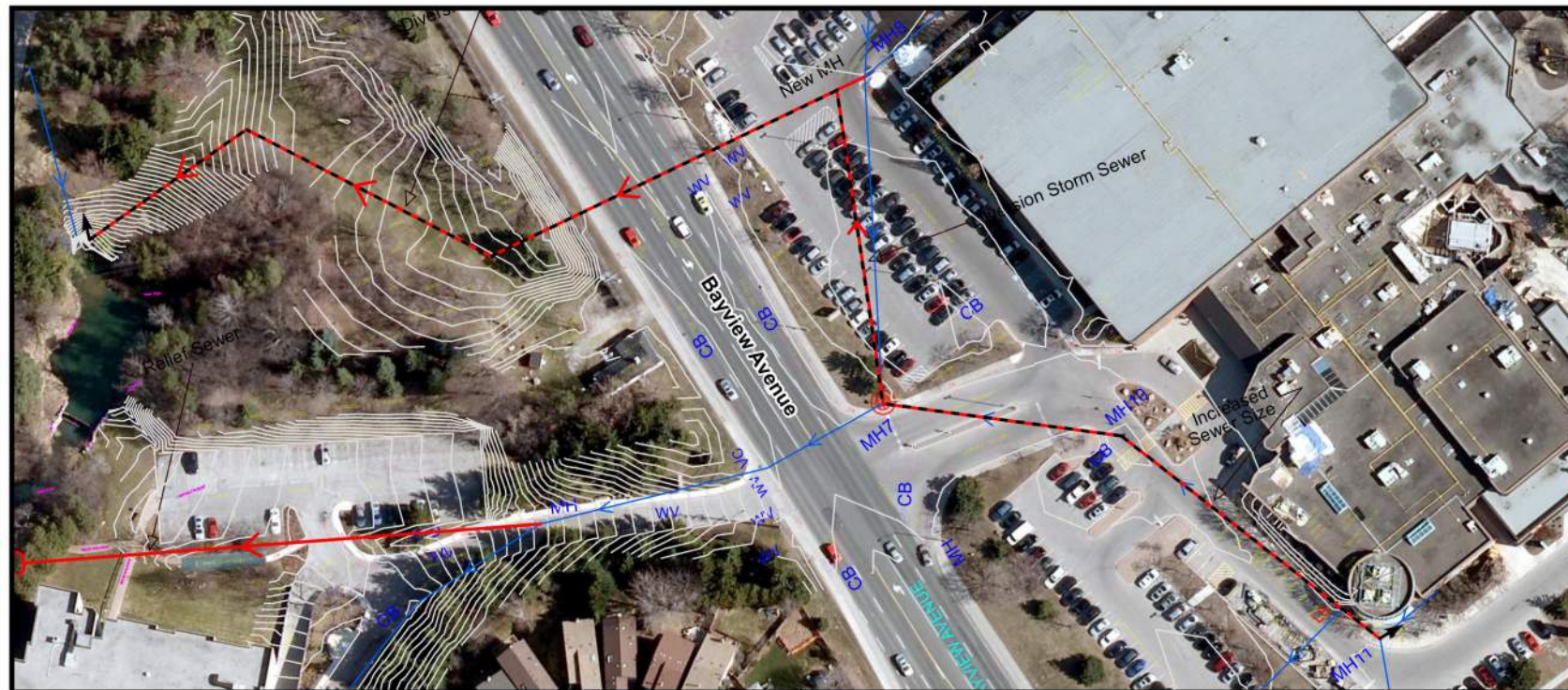


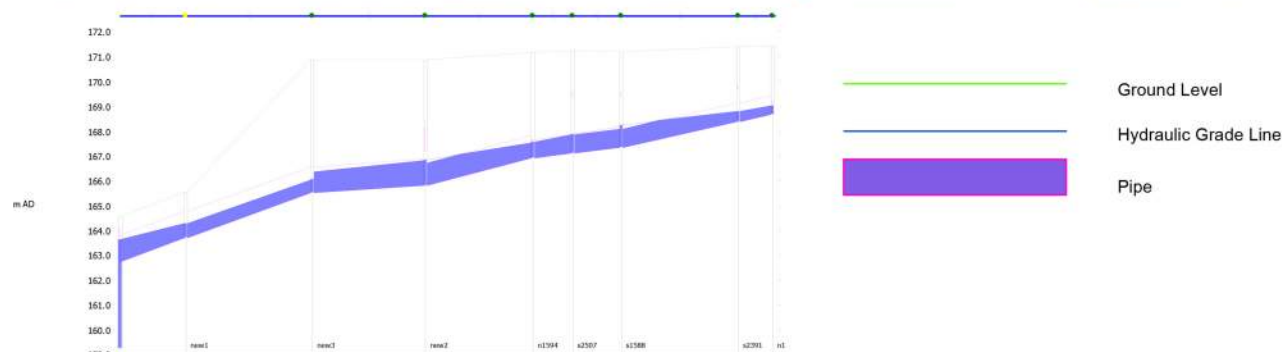
Figure C6.1 Alternative 6

Glynwood Tributary Area  
Sewer Surcharge Study  
Alternative #6 MH7 to Pond



### Legend

- Proposed Storm Sewer
- Proposed MH
- Existing Storm Sewer
- Existing MH
- Catch Basin
- Contour Lines
- Cross Section



Link	new1.1	new1.1	new2.2	new2.2	n1594.2	s2507.1	s1588.1	s2391.1	s1565.3
System Type	storm	storm	storm	storm	storm	storm	storm	storm	storm
length (m)	37.7	70.2	62.5	59.8	59.8	21.8	27.1	64.6	18.9
Shape ID	CIRC	CIRC	CIRC	CIRC	CIRC	CIRC	CIRC	CIRC	CIRC
width (mm)	1050	1050	1050	900	900	750	750	750	750
height (mm)	1050	1050	1050	900	900	750	750	750	750
in inv (m AD)	163.708	165.507	165.818	166.908	167.104	167.348	166.382	168.684	168.382
ds inv (m AD)	162.732	163.708	165.507	165.818	166.908	167.104	167.348	168.382	168.382
grad (m/m)	0.02588	0.02564	0.00997	0.01823	0.00899	0.00900	0.01601	0.01598	0.01598
pic (m/s)	4.394	4.373	1.926	2.445	1.056	1.057	1.409	1.408	1.408
DS Depth (m)	0.896	0.578	0.852	1.025	0.668	0.790	0.912	0.405	0.405
DS Flow (m³/s)	2.24277	2.24649	2.24733	1.75763	1.21974	1.17259	0.70944	0.53371	0.53371
LS Depth (m)	0.365	0.343	0.365	0.632	0.740	0.848	0.401	0.339	0.339
LS Flow (m³/s)	2.24640	2.24732	2.24749	1.77473	1.21990	1.17393	0.70371	0.53367	0.53367
Node	n1620	new1	new3	new2	n1594	s2507	s1588	s2391	-
System Type	storm	storm	storm	storm	storm	storm	storm	storm	-
ground (m AD)	165.550	170.891	170.891	170.891	171.175	171.220	171.218	171.393	-
level (m AD)	-	164.285	166.057	166.837	167.573	167.890	168.258	168.787	-
enpr:Depth of WL(Node)	-	1.264767	0.835942	0.835942	0.835942	0.835942	0.835942	0.835942	-



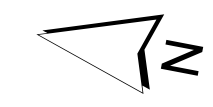
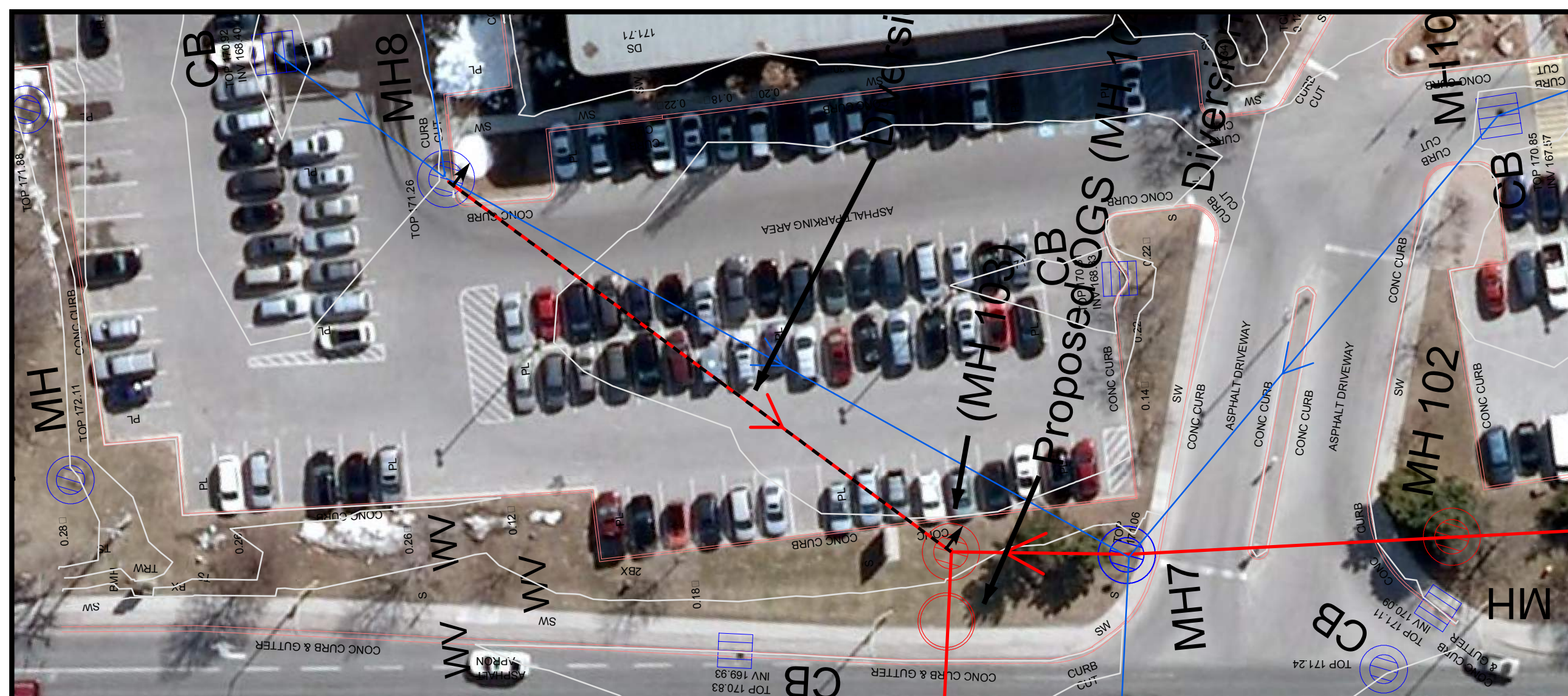
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Glynnwood Tributary Class EA

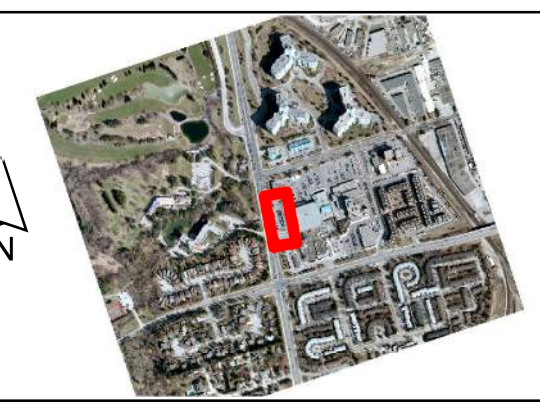


1:950

Figure C6.2 Alternative 6  
Glynnwood Tributary Area  
Sewer Surcharge Study  
Alternative #6 MH11 to Pond

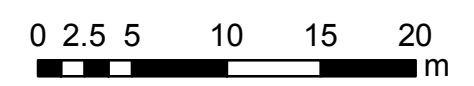


- ### Legend
- Proposed Storm Sewer
  - Proposed MH
  - Existing Storm Sewer
  - Existing MH
  - ▤ Catch Basin
  - Contour Lines
  - - - Cross Sections



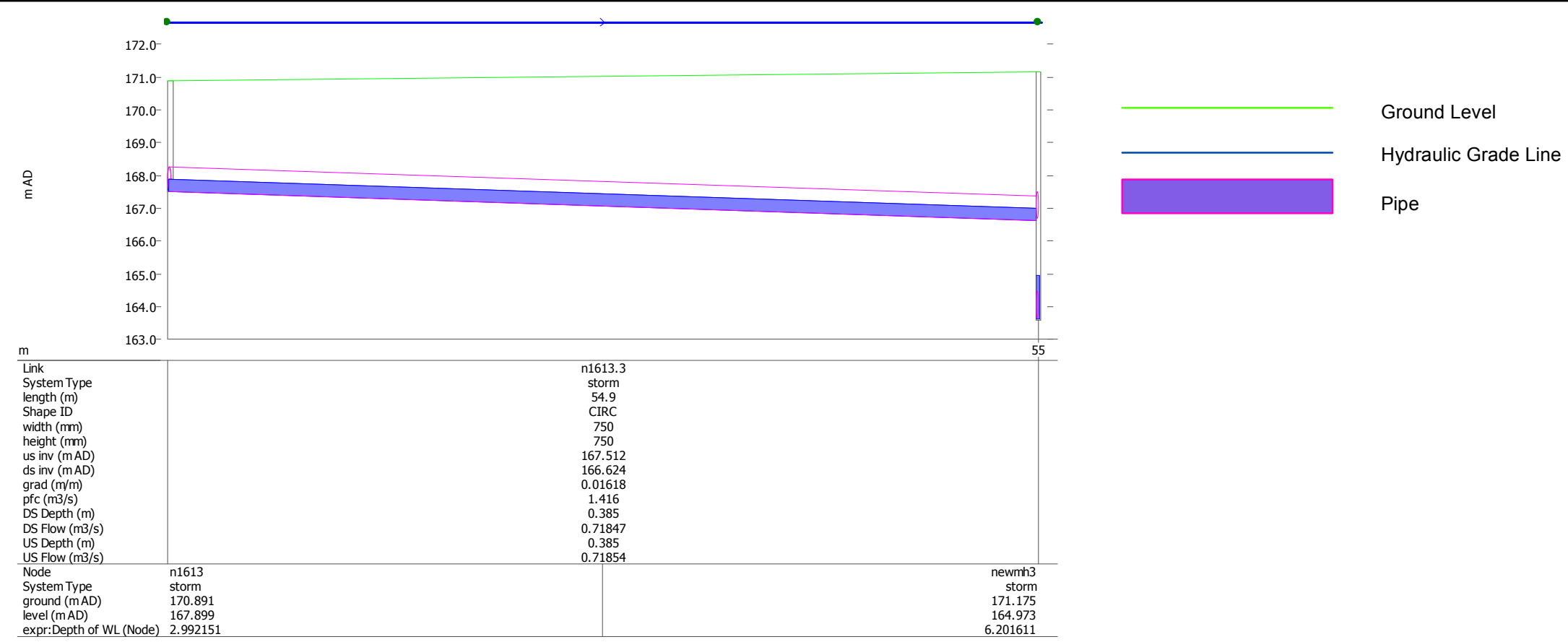
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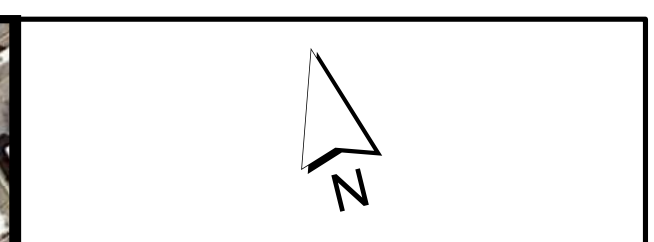
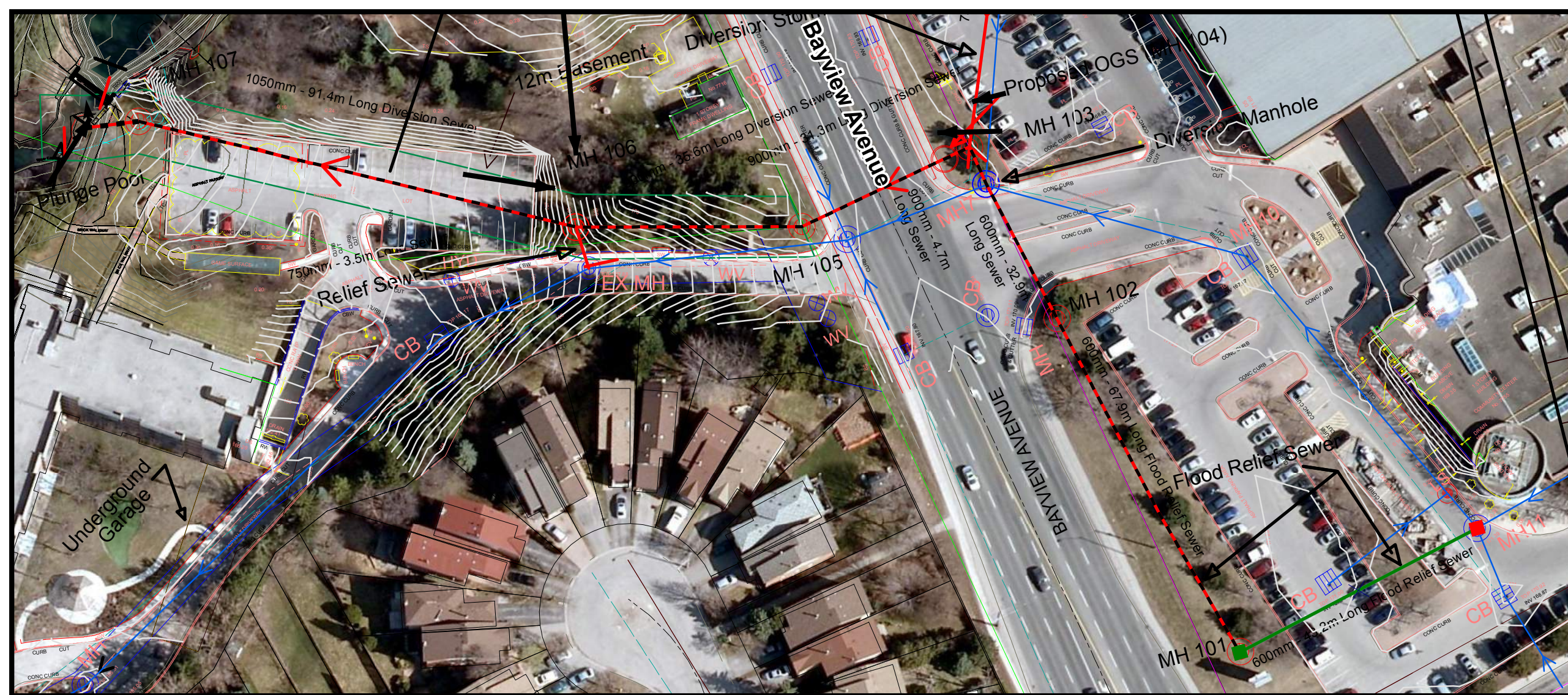
Glynwood Tributary Class EA



1:400

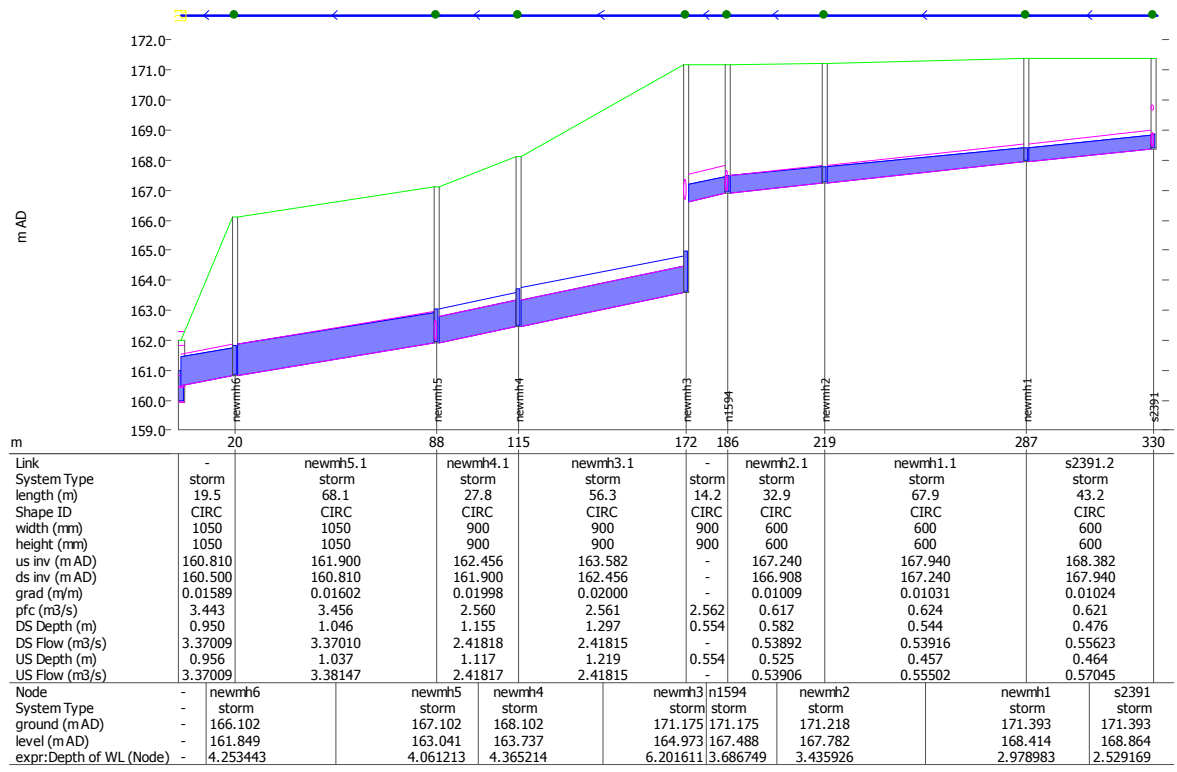
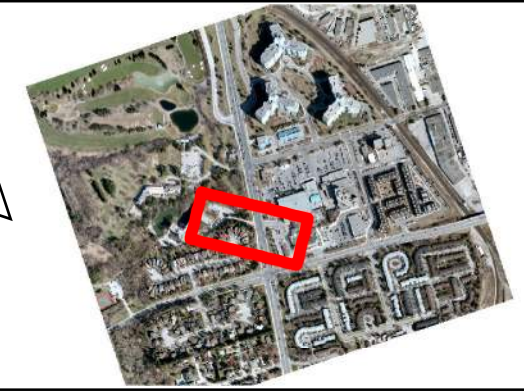
Figure C6-1.1 Recommended Alternative  
 Glynwood Tributary Area  
 Sewer Surcharge Study  
 Recommended Alternative  
 MH8 to MH 103





### Legend

- 0
- Proposed Cond Revised
- Proposed MH
- Existing Storm Sewer
- Existing MH
- Catch Basin
- Contour Lines
- Cross Section

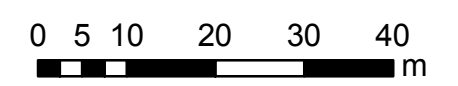


- Ground Level
- Hydraulic Grade Line
- Pipe



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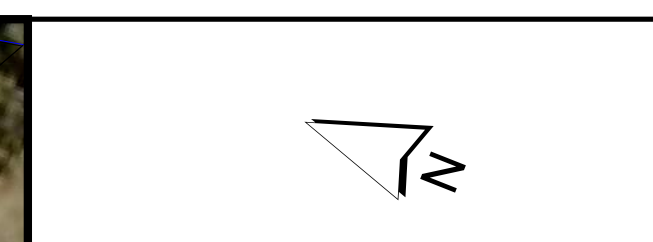
Glywood Tributary Class EA



1:850

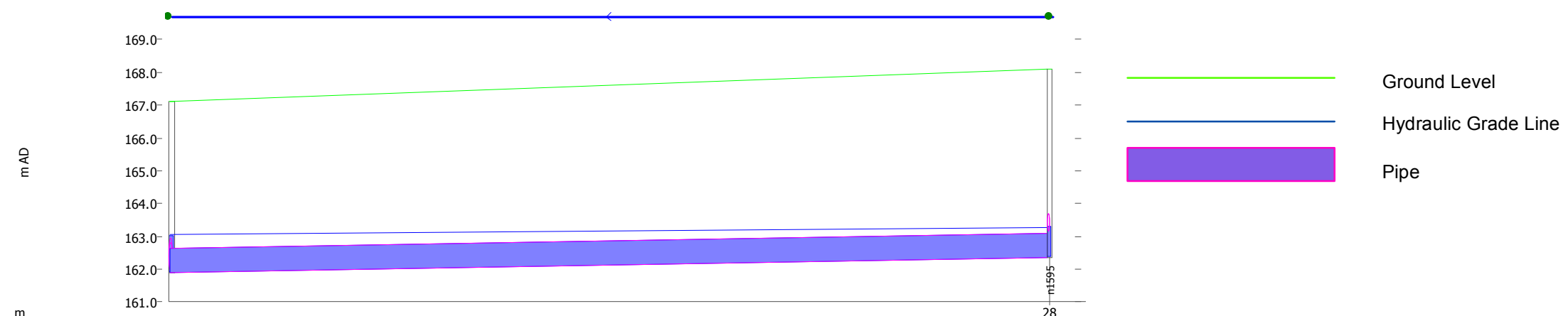
Figure C6-1.2 Recommended Alternative

Glywood Tributary Area  
Sewer Surchage Study  
Recommended Alternative  
MH11 to Pond



### Legend

- Proposed Cond Revised
- ⊗ Proposed MH
- Existing Storm Sewer
- ⊗ Existing MH
- ▭ Catch Basin
- Contour Lines

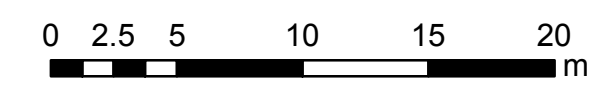


Link	n1595.2	n1595
System Type	storm	storm
length (m)	28.4	
Shape ID	CIRC	
width (mm)	750	
height (mm)	750	
us inv (mAD)	162.361	168.102
ds inv (mAD)	161.900	163.312
grad (m/m)	0.01623	
pfc (m <sup>3</sup> /s)	1.418	
DS Depth (m)	1.146	
DS Flow (m <sup>3</sup> /s)	1.24068	
US Depth (m)	0.906	
US Flow (m <sup>3</sup> /s)	1.23655	
Node	newmh5	n1595
System Type	storm	storm
ground (mAD)	167.102	168.102
level (mAD)	163.041	163.312
expr:Depth of WL (Node)	4.061213	4.789820



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Glynwood Tributary Class EA



1:300

Figure C6-1.3 Recommended Alternative

Glynwood Tributary Area  
Sewer Surchage Study  
Recommended Alternative  
MH 106 to MH 107