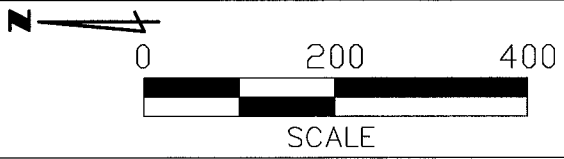


CITY OF FRONTENAC

STORMWATER SYSTEM MASTER IMPROVEMENT PLAN

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UPDATE NO.	DATE
▲	11/12/08
FIGURE NO. <u>1-1</u>	

City of Frontenac
Stormwater System Master Improvement Plan
CONCEPTUAL LEVEL ANALYSIS

Project Name: FIGURE 1-1 OVERLAND FLOW
Solutions By: EDM INC. **DATE:** 11-5-08

Problem: Yard erosion at Q48 - 539 Briar Ridge
Strategy: 1) Install berm to direct water to existing swale on back property line. 2) Add Bioswale to infiltrate runoff and protect natural channels.

Description	Unit	Quantity	Unit Cost	1) Alternative 1	2) Alternative 1
				Without BMP's	With BMP's
New Berm	LF	97	\$15	\$1,455	\$1,455
Regrade Back Property Line	LS	1	\$3,000	\$3,000	\$3,000
Bioswale	LF	98	\$30	\$0	\$2,940
Subtotal				\$4,455	\$7,395
Total Benefit Points				30	40
Individual Benefit Point Ratio				3.21	2.57
Estimated Increased Property Values				\$2,000	\$3,000

Problem: Street ponding at low spot on Briar Ridge Ln.
Strategy: 1) Replace under sized 12" RCP with new 18" RCP

Description	Unit	Quantity	Unit Cost	1) Alternative 1	2) Alternative 1
				Without BMP's	With BMP's
Double Inlet	EA	1	\$3,150	\$3,150	\$3,150
18" RCP CLASS III	LF	26	\$129	\$3,361	\$3,361
Subtotal				\$6,511	\$6,511
Total Benefit Points				25	25
Individual Benefit Point Ratio				1.83	1.83
Estimated Increased Property Values				\$0	\$0

Problem: Yard ponding at Q313 - 1627 N.Geyer Rd. and driveway ponding at Q401 - 515 Timberwyck Dr.

Strategy: 1) Add Rain Garden to infiltrate runoff and protect natural channels.

Description	Unit	Quantity	Unit Cost	1) Alternative 1	2) Alternative 1
				Without BMP's	With BMP's
Single Inlet	EA	1	\$1,850	\$1,850	\$1,850
Manhole	EA	1	\$1,500	\$1,500	\$1,500
12" RCP CLASS III	LF	286	\$116	\$33,193	\$33,193
12" FES	EA	1	\$1,100	\$1,100	\$1,100
Rain Garden	EA	1	\$10,000	\$10,000	\$10,000
Subtotal				\$1,850	\$1,850
Total Benefit Points				45	45
Individual Benefit Point Ratio				11.60	11.60
Estimated Increased Property Values				\$2,000	\$2,000

Total				\$12,816	\$15,756
Utility Relocation			20%	\$2,563	\$3,151
Clearing			5%	\$641	\$788
Mobilization			4%	\$513	\$630
Total with Percent Allowances				\$16,533	\$20,326
Contingency			25%	\$4,133	\$5,081
Probable Construction Cost Estimate				\$20,666	\$25,407
Design Engineering and Geotechnical			30%	\$6,200	\$7,622
Total Conceptual Cost Estimate				\$27,000	\$34,000
Total Benefit Points				150	160
Total Benefit Point Ratio				5.56	4.70

Additional Comments: Unit prices based on MSD Unit Prices January 2006 Construction Costs
Conceptual Cost are rounded to the nearest \$1000

City of Frontenac
Stormwater System Master Improvement Plan
CONCEPTUAL LEVEL ANALYSIS

Project Name: FIGURE 1-1 OVERLAND FLOW STRUCTURAL FLOODING
Solutions By: EDM INC. DATE: 11-5-08

Problem: Yard and basement ponding at Q415 - 585 Twin Fawns Dr.
Strategy: 1) Install berm and curb to direct water away from house.

Description	Unit	Quantity	Unit Cost	1) Alternative 1	2) Alternative 1
				Without BMP's	With BMP's
New Berm	LF	103	\$15	\$1,545	\$1,545
Proposed Curb	LF	83	\$32	\$2,656	\$2,656
Subtotal				\$4,201	\$4,201
Total Benefit Points				330	330
Individual Benefit Point Ratio				37.47	37.47
Estimated Increased Property Values				\$8,000	\$8,000

Problem: Yard ponding and garage flooding at Q412 - 584 Twin Fawns Dr and yard flooding at Q410 - 558 Twin Fawns and Q416-541 Twin Fawns.
Strategy: 1) Install berm to catch overland flow and direct to inlet and pipe system. Upsize downstream storm water system 2) Add Rain Garden to infiltrate runoff and protect natural channels.

Description	Unit	Quantity	Unit Cost	1) Alternative 1	2) Alternative 1
				Without BMP's	With BMP's
Single Area Inlet	EA	3	\$1,750	\$5,250	\$5,250
Single Inlet	EA	3	\$1,850	\$5,550	\$5,550
Double Inlet	EA	2	\$3,150	\$6,300	\$6,300
Manhole	EA	1	\$1,500	\$1,500	\$1,500
12" RCP CLASS III	LF	274	\$116	\$31,800	\$31,800
18" RCP CLASS III	LF	340	\$129	\$43,955	\$43,955
24" RCP CLASS III	LF	460	\$144	\$66,010	\$66,010
30" RCP CLASS III	LF	191	\$163	\$31,179	\$31,179
33" RCP CLASS III	LF	292	\$174	\$50,934	\$50,934
New Berm	LF	142	\$15	\$2,130	\$2,130
Rain Garden	EA	2	\$10,000	\$0	\$20,000
Subtotal				\$244,608	\$264,608
Total Benefit Points				205	215
Individual Benefit Point Ratio				0.40	0.39
Estimated Increased Property Values				\$11,000	\$13,000

Problem: Yard ponding and basement flooding at Q45-564 Briar Ridge Ln.
Strategy: 1) Install berm to catch overland flow and direct to inlet and pipe system. Upsize downstream storm water system 2) Add Rain Garden to infiltrate runoff and protect natural channels.

Description	Unit	Quantity	Unit Cost	1) Alternative 1	2) Alternative 1
				Without BMP's	With BMP's
Single Area Inlet	EA	2	\$1,750	\$3,500	\$3,500
12" RCP CLASS III	LF	211	\$116	\$24,489	\$24,489
12" FES	EA	1	\$1,100	\$1,100	\$1,100
New Berm	LF	128	\$15	\$1,920	\$1,920
Rain Garden	EA	1	\$10,000	\$0	\$10,000
Subtotal				\$31,009	\$41,009
Total Benefit Points				0	0
Individual Benefit Point Ratio				0.00	0.00
Estimated Increased Property Values				\$0	\$2,000

FIGURE 1-1 STRUCTURAL

Problem:	Yard ponding and basement flooding at Q404 - 592 Timberwyck Dr.				
Strategy:	1) Install berm to catch overland flow and direct to inlet and pipe system. 2) Add Bioswale to infiltrate runoff and protect natural channels.				
				1) Alternative 1	2) Alternative 1
Description	Unit	Quantity	Unit Cost	Without BMP's	With BMP's
Single Area Inlet	EA	1	\$1,750	\$1,750	\$1,750
12" RCP CLASS III	LF	151	\$116	\$17,525	\$17,525
12" FES	EA	1	\$1,100	\$1,100	\$1,100
New Berm	LF	147	\$15	\$2,205	\$2,205
Erosion Protection	LS	1	\$2,000	\$2,000	\$2,000
Bioswale	LF	107	\$30	\$0	\$3,210
Subtotal				\$24,580	\$27,790
Total Benefit Points				280	291
Individual Benefit Point Ratio				5.43	4.99
Estimated Increased Property Values				\$9,000	\$10,000

Total				\$304,398	\$337,608
Utility Relocation			20%	\$60,880	\$67,522
Clearing			5%	\$15,220	\$16,880
Mobilization			4%	\$12,176	\$13,504
Total with Percent Allowances				\$392,673	\$435,514
Contingency			25%	\$98,168	\$108,879
Probable Construction Cost Estimate				\$490,841	\$544,393
Design Engineering and Geotechnical			30%	\$147,252	\$163,318
Total Conceptual Cost Estimate				\$639,000	\$708,000
Total Benefit Points				1,065	1,101
Total Benefit Point Ratio				1.67	1.55

Additional Comments: Unit prices based on MSD Unit Prices January 2006 Construction Costs
Conceptual Cost are rounded to the nearest \$1000

FIGURE 1-1 STRUCTURAL

City of Frontenac
Stormwater System Master Improvement Plan
CONCEPTUAL LEVEL ANALYSIS

Project Name: FIGURE 1-1 - CHANNEL FTMT1
Solutions By: EDM INC. **DATE:** 11/5/2008

Problem: Creek incision, bank erosion and gully formation SR 3, MSD 18, Q400, Q49, Q47, Q44, Q406, 564, 558, 550, 538, 526 Briar Ridge Lane and 545, 593, 599, 592 Timberwyck, 701 & 705 Timber Trail, and 1600 & 1609 Forest Aire Dr.

Strategy: 1) Install bank protection, Station 23+50 to 37+25 (1,375LP). Remove cantilevered pipe at Station 37+25 Line 150' long gully at station 27+00 (right descending bank) with blocks and pavers. Remove blockage in creek at station 28+00, clean out and video storm pipe at station 28+50, replace if necessary.

Description	Unit	Quantity	Unit Cost	ALT 1	ALT 2
Hard stabilization (L)	LF	1375	\$300	\$412,500	\$0
Soft stabilization (L)	LF	1375	\$200	\$0	\$275,000
Geomorphic Study	Ea.	3	\$10,000	\$0	\$30,000
Remove pipe	Ea.	1	\$1,000	\$1,000	\$1,000
Line gully	LF	150	\$35	\$5,250	\$5,250
Remove blockage	Ea.	1	\$1,000	\$1,000	\$1,000
Clean out pipe	Ea.	1	\$2,000	\$2,000	\$2,000
Video pipe	Ea.	1	\$2,000	\$2,000	\$2,000
12" RCP Class III	LF	158	\$54	\$8,532	\$8,532
Subtotal				\$423,750	\$316,250
Total				\$423,750	\$316,250
Utility Relocation			20%	\$84,750	\$63,250
Clearing			5%	\$21,188	\$15,813
Mobilization			4%	\$16,950	\$12,650
Total with Percent Allowances				\$546,638	\$407,963
Contingency			25%	\$136,659	\$101,991
Probable Construction Cost Estimate				\$683,297	\$509,953
Design Engineering and Geotechnical			30%	\$204,989	\$152,986
Total Conceptual Cost Estimate				\$889,000	\$663,000
Benefit Points				605	1,090
Benefit/Cost Ratio				0.68	1.64

Additional Comments: Unit prices based on MSD January 2006 Construction Costs and EDM Experience. Conceptual Cost are rounded to the nearest \$1000