



CITY OF FRONTENAC

STORMWATER SYSTEM MASTER IMPROVEMENT PLAN

EDM EDM Incorporated
Consulting Engineers

220 Mansion House Center
St. Louis, Missouri 63102
Phone (314) 231-5485 Fax (314) 231-8167
edm@edm-inc.com

0 200 400



SCALE

UPDATE NO. DATE



FIGURE NO. 3-3

City of Frontenac
Stormwater System Master Improvement Plan
CONCEPTUAL LEVEL ANALYSIS

Project Name: FIGURE 3-3 OVERLAND FLOW
Solutions By: EDM INC. **DATE:** 11-5-08

Problem: Yard ponding at Q389 -401 Steeple Chase Ln.
Strategy: 1) Install berm to catch overland flow and direct to new inlet and pipe system to collect water. Replace undersized system. 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	354	\$15	\$5,310	\$5,310
Single Area Inlet	EA	3	\$1,750	\$5,250	\$5,250
Single Inlet	EA	1	\$1,850	\$1,850	\$1,850
Manhole	EA	2	\$1,500	\$3,000	\$3,000
12" RCP CLASS III	LF	214	\$116	\$24,837	\$24,837
24" RCP CLASS III	LF	275	\$144	\$39,463	\$39,463
Bioswale	LF	359	\$30	\$0	\$10,770
Subtotal				\$79,709	\$90,479
Total Benefit Points				45	81
Individual Benefit Point Ratio				0.27	0.43
Estimated Increased Property Values				\$2,000	\$4,000

Problem: Yard ponding at Q173 - 541 Fox Ridge Rd., (Q240)
Strategy: 1) Resize undersized storm sewer pipe.

Description	Unit	Quantity	Unit Cost	1) Alternative 1	2) Alternative 1
				Without BMP's	With BMP's
42" RCP CLASS III	LF	283	\$215	\$60,783	\$60,783
42" FES	EA	1	\$2,600	\$2,600	\$2,600
Single Area Inlet	EA	1	\$1,750	\$1,750	\$1,750
Subtotal				\$65,133	\$65,133
Total Benefit Points				45	45
Individual Benefit Point Ratio				0.33	0.33
Estimated Increased Property Values				\$7,000	\$7,000

Problem: Yard ponding at Q385 -440 Steeple Chase Ln.
Strategy: 1) Catch water with new inlet and pipe system to collect water. Replace undersized 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 Inlet	EA	2	\$1,850	\$3,700	\$3,700
Single Area Inlet	EA	3	\$1,750	\$5,250	\$5,250
12" RCP CLASS III	LF	260	\$116	\$30,176	\$30,176
18" RCP CLASS III	LF	301	\$129	\$38,913	\$38,913
Rain Garden	EA	1	\$10,000	\$0	\$10,000
Subtotal				\$78,039	\$88,039
Total Benefit Points				45	50
Individual Benefit Point Ratio				0.28	0.27
Estimated Increased Property Values				\$5,000	\$7,000

FIGURE 3-3

Total		\$222,881	\$243,651
Utility Relocation	20%	\$44,576	\$48,730
Clearing	5%	\$11,144	\$12,183
Mobilization	4%	\$8,915	\$9,746
Total with Percent Allowances		\$287,516	\$314,310
Contingency	25%	\$71,879	\$78,577
Probable Construction Cost Estimate		\$359,396	\$392,887
Design Engineering and Geotechnical	30%	\$107,819	\$117,866
Total Conceptual Cost Estimate		\$468,000	\$511,000
Total Benefit Points		140	191
Total Benefit Point Ratio		0.30	0.37

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

FIGURE 3-3

**City of Frontenac
Stormwater System Master Improvement Plan
CONCEPTUAL LEVEL ANALYSIS**

Project Name: FIGURE 3-3 OVERLAND FLOW STRUCTURAL FLOODING
Solutions By: EDM INC. DATE: 11-5-08

Problem: Yard ponding and garage flooding at Q390 - 455 Steeple Chase Ln.

Strategy: 1) Add rain garden to infiltrate runoff and pipe under driveway.

Description	Unit	Quantity	Unit Cost	1) Alternative 1 With BMP's
Rain Garden	EA	1	\$10,000	\$10,000
Subtotal				\$10,000
Total Benefit Points				135
Individual Benefit Point Ratio				6.44
Estimated Increased Property Values				\$2,000

Total **\$10,000**

Utility Relocation			20%	\$2,000
Clearing			5%	\$500
Mobilization			4%	\$400

Total with Percent Allowances **\$12,900**

Contingency 25% \$3,225

Probable Construction Cost Estimate **\$16,125**

Design Engineering and Geotechnical 30% \$4,838

Total Conceptual Cost Estimate **\$21,000**

Total Benefit Points **130**

Total Benefit Point Ratio **6.19**

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 3-3 CHANNEL FTMT2-1
Solutions By: EDM INC. **DATE:** 11/5/2008

Problem: Damage to property due to erosion MSD 28, Q171-525 Fox Ridge, 533 and 517 Fox Ridge Rd, 4 and 6 Coach and Four Lane. For ALT 3 and 4 add Yard Flooding and erosion: Q173, 541 Fox Ridge Rd.creek erosion MSD-1, 3 Countryside Lane
Strategy: 1) Install bank protection on FTMT2-1 at 3 Country Side (200 LF) and from station 14+50 to 17+00 (250 LF) or from station 10+25 to 17+00 (675 LF).

Description	Unit	Quantity	Unit Cost	ALT 1	ALT 2	ALT 3	ALT 4
Hard stabilization (S)	LF	450	\$225	\$101,250	\$0	\$0	\$0
Soft stabilization (S)	LF	450	\$125	\$0	\$56,250	\$0	\$0
Geomorphic Study	Ea.	2	\$10,000	\$0	\$20,000	\$0	\$20,000
Hard stabilization (S)	LF	875	\$225	\$0	\$0	\$196,875	\$0
Soft stabilization (S)	LF	875	\$125	\$0	\$0	\$0	\$109,375
Subtotal				\$101,250	\$76,250	\$196,875	\$129,375
Total				\$101,250	\$76,250	\$196,875	\$129,375
Utility Relocation			20%	\$20,250	\$15,250	\$39,375	\$25,875
Clearing			5%	\$5,063	\$3,813	\$9,844	\$6,469
Mobilization			4%	\$4,050	\$3,050	\$7,875	\$5,175
Total with Percent Allowances				\$130,613	\$98,363	\$253,969	\$166,894
Contingency			25%	\$32,653	\$24,591	\$63,492	\$41,723
Probable Construction Cost Estimate				\$163,266	\$122,953	\$317,461	\$208,617
Design Engineering and Geotechnical			30%	\$48,980	\$36,886	\$95,238	\$62,585
Total Conceptual Cost Estimate				\$213,000	\$160,000	\$413,000	\$272,000
Benefit Points				270	440	320	625
Benefit/Cost Ratio				1.27	2.75	0.77	2.30

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