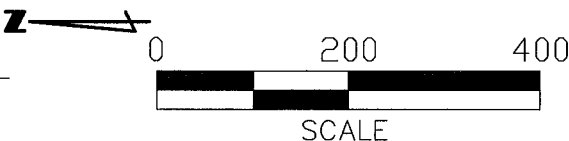


CITY OF FRONTENAC

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



UPDATE NO. _____ DATE _____

FIGURE NO. 6-1

City of Frontenac
Stormwater System Master Improvement Plan
CONCEPTUAL LEVEL ANALYSIS

Project Name: FIGURE 6-1 OVERLAND FLOW
Solutions By: EDM INC. DATE: 11-5-08

Problem: Yard Erosion at Q92 - 9 Clayton Downs
Strategy: 1) Rip Rap existing channel to prevent erosion.

Description	Unit	Quantity	Unit Cost	1) Alternative 1 Without BMP's
Rip Rap Channel	LF	116	\$67	\$7,772
Subtotal				\$7,772
Total Benefit Points				30
Individual Benefit Point Ratio				1.84
Estimated Increased Property Values				\$3,000

Problem: Yard erosion at Q94 - 13 Clayton Downs
Strategy: 1) Install turf reinforcement mat to prevent erosion.

Description	Unit	Quantity	Unit Cost	1) Alternative 1 Without BMP's
Turf Reinforcement Mat	LF	279	\$20	\$5,580
Subtotal				\$5,580
Total Benefit Points				30
Individual Benefit Point Ratio				2.56
Estimated Increased Property Values				\$2,000

Problem: Yard erosion by Clayton Rd. at Q97 - 11161 Clayton Rd.
Strategy: 1) Rip Rap existing channel to prevent erosion.

Description	Unit	Quantity	Unit Cost	1) Alternative 1 Without BMP's
Rip Rap Channel	LF	150	\$67	\$10,050
Subtotal				\$10,050
Total Benefit Points				30
Individual Benefit Point Ratio				1.42
Estimated Increased Property Values				\$3,000

Total **\$23,402**

Utility Relocation	20%	\$4,680
Clearing	5%	\$1,170
Mobilization	4%	\$936

Total with Percent Allowances **\$30,189**

Contingency 25% \$7,547

Probable Construction Cost Estimate **\$37,736**

Design Engineering and Geotechnical 30% \$11,321

Total Conceptual Cost Estimate **\$50,000**

Total Benefit Points **140**

Total Benefit Point Ratio **2.80**

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 6-1 OVERLAND FLOW STRUCTURAL FLOODING
Solutions By: EDM INC. DATE: 11-5-08

Problem: Basement flooding and yard erosion at Q68 - 6 Carole Ln., garage flooding and yard erosion at Q67 - 5 Carole Ln., and yard ponding at Q63 - 7 Carole Ln.

Strategy: 1) Install berm to catch overland flow and direct to inlet and pipe system. Connect to existing box culvert. Add Rain Garden to infiltrate runoff and protect natural channels. 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
Single Inlet	EA	4	\$1,850	\$7,400	\$7,400
Manhole	EA	1	\$1,500	\$1,500	\$1,500
New Berm	LF	401	\$15	\$6,015	\$6,015
New Asphalt Curb	LF	40	\$32	\$1,280	\$1,280
12" RCP CLASS III	LF	230	\$116	\$26,694	\$26,694
15" RCP CLASS III	LF	216	\$124	\$26,844	\$26,844
18" RCP CLASS III	LF	85	\$129	\$10,989	\$10,989
Box Culvert Connection	LS	1	\$2,000	\$2,000	\$2,000
Rain Garden	EA	1	\$10,000	\$10,000	\$10,000
Bioswale	LF	288	\$30	\$0	\$8,640
Subtotal				\$92,722	\$101,362
Total Benefit Points				455	484
Individual Benefit Point Ratio				2.34	2.28
Estimated Increased Property Values				\$9,000	\$16,000

Total				\$92,722	\$101,362
Utility Relocation			20%	\$18,544	\$20,272
Clearing			5%	\$4,636	\$5,068
Mobilization			4%	\$3,709	\$4,054
Total with Percent Allowances				\$119,611	\$130,757
Contingency			25%	\$29,903	\$32,689
Probable Construction Cost Estimate				\$149,514	\$163,446
Design Engineering and Geotechnical			30%	\$44,854	\$49,034
Total Conceptual Cost Estimate				\$195,000	\$213,000
Total Benefit Points				400	439
Total Benefit Point Ratio				2.05	2.06

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 6-1 CHANNEL FDCST-1
Solutions By: EDM INC. **DATE:** 11/5/2008

Problem: Yard runoff and erosion MSD-10. Open ditch in front yard is deteriorating FR-9, Q96 11141 and 11155 Clayton Road, Yard Flooding and Erosion Q63-7 Carole Lane

Strategy: 1) Install bank protection on FDCST-1 from station 7+50 to 10+00 (250 LF) and behind 7 Carole Lane (280 LF).

Description	Unit	Quantity	Unit Cost	ALT 1	ALT 2
Hard stabilization (S)	LF	530	\$225	\$119,250	\$0
Soft stabilization (S)	LF	530	\$125	\$0	\$66,250
Geomorphic Study	Ea.	2	\$10,000		\$20,000
Subtotal				\$119,250	\$86,250
Total				\$119,250	\$86,250
Utility Relocation			20%	\$23,850	\$17,250
Clearing			5%	\$5,963	\$4,313
Mobilization			4%	\$4,770	\$3,450
Total with Percent Allowances				\$153,833	\$111,263
Contingency			25%	\$38,458	\$27,816
Probable Construction Cost Estimate				\$192,291	\$139,078
Design Engineering and Geotechnical			30%	\$57,687	\$41,723
Total Conceptual Cost Estimate				\$250,000	\$181,000
Benefit Points				140	235
Benefit/Cost Ratio				0.56	1.30

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