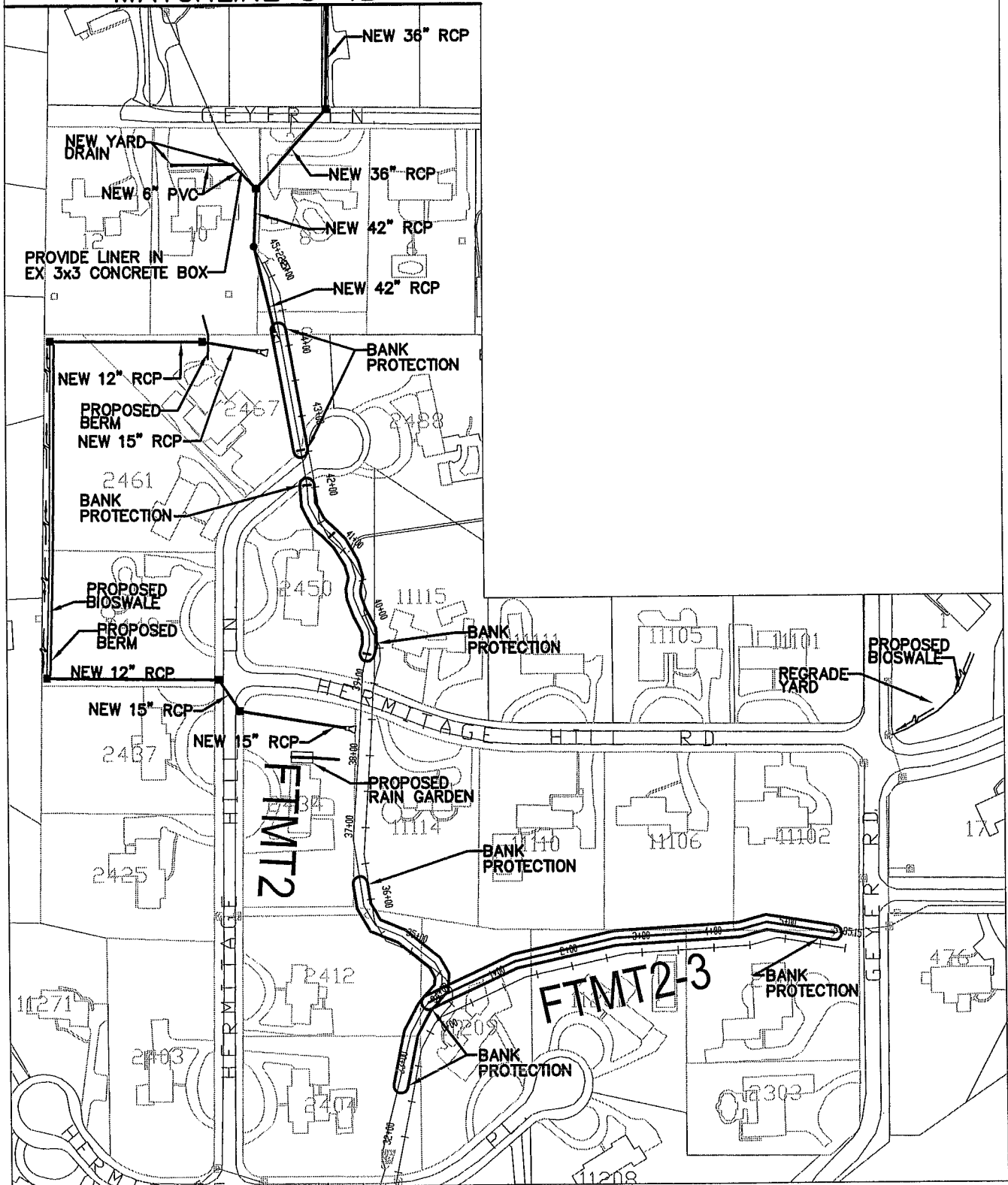


# MATCHLINE 3-1B



CITY OF FRONTENAC

## STORMWATER SYSTEM MASTER IMPROVEMENT PLAN

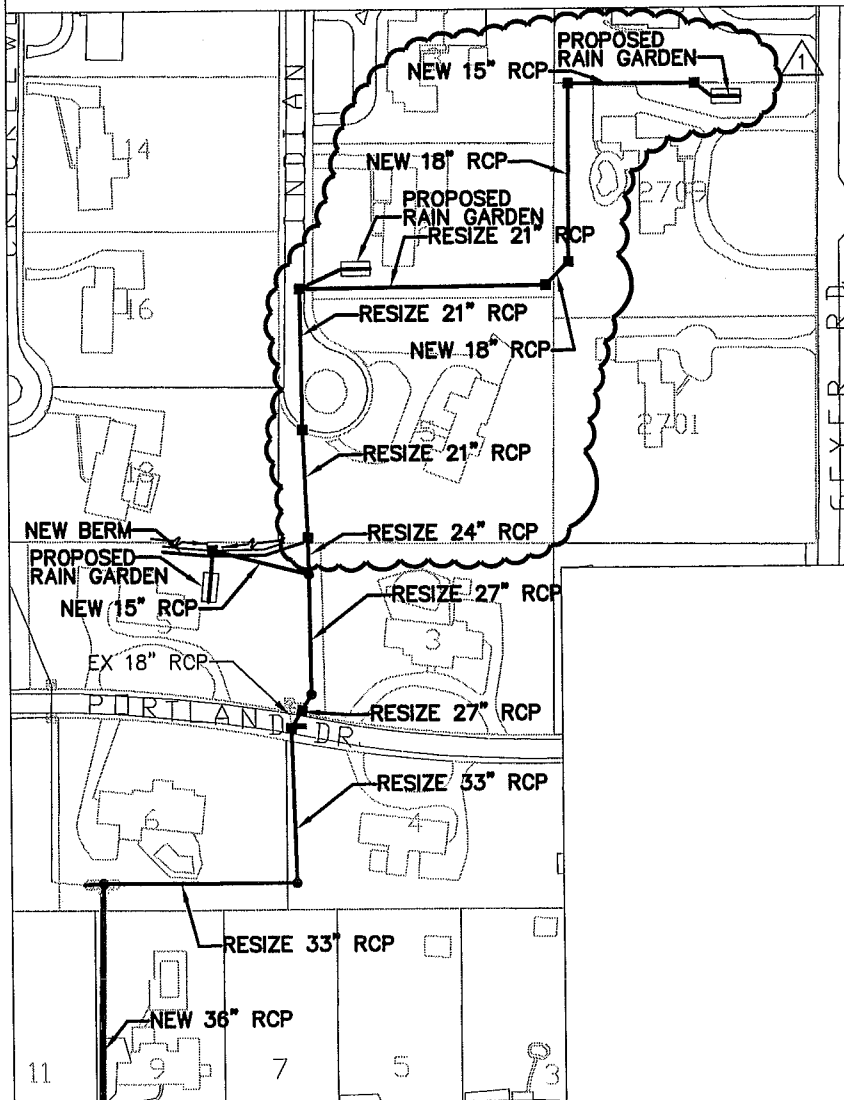
**EDM** EDM Incorporated  
Consulting Engineers

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. 3-1A



MATCHLINE 3-1A



# STORMWATER SYSTEM MASTER IMPROVEMENT PLAN

**EDM** EDM Incorporated  
Consulting Engineers

220 Mansion House Center  
St. Louis, Missouri 63102  
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0 200 400



SCALE

UPDATE NO. DATE



11/12/08

FIGURE NO. 3-1B

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

**Project Name:** FIGURE 3-1 OVERLAND FLOW  
**Solutions By:** EDM INC. **DATE:** 11-5-08

**Problem:** Yard erosion and ponding at Q430 - 10 West Geyer Ln. and Q360 - 5 Portland Dr. And yard ponding at Q431 - 9 West Geyer Ln. and Q334-2709 North Geyer Rd.  
**Strategy:** 1) Line existing box culvert to prevent water from causing erosions at joints and install yard drains to fix yard ponding in the front yard. Install berm to catch overland flow and direct to inlet and pipe system. Replace undersized stormwater system . 2) Add Rain Gardens to infiltrate runoff and protect natural channels.

Description	Unit	Quantity	Unit Cost	1) Alternative 1	2) Alternative 1 With
				Without BMP's	BMP's
Single Inlet	EA	1	\$1,850	\$1,850	\$1,850
Single Area Inlet	EA	8	\$1,750	\$14,000	\$14,000
Double Inlet	EA	1	\$3,150	\$3,150	\$3,150
Manhole	EA	2	\$1,500	\$3,000	\$3,000
Large Diameter Manhole	EA	3	\$6,000	\$18,000	\$18,000
Large Diameter Inlet	EA	2	\$6,000	\$12,000	\$12,000
15" RCP CLASS III	LF	236	\$124	\$29,330	\$29,330
18" RCP CLASS III	LF	220	\$129	\$28,442	\$28,442
21" RCP CLASS III	LF	516	\$137	\$70,635	\$70,635
24" RCP CLASS III	LF	38	\$144	\$5,453	\$5,453
27" RCP CLASS III	LF	166	\$150	\$24,918	\$24,918
33" RCP CLASS III	LF	364	\$174	\$63,493	\$63,493
36" RCP CLASS III	LF	521	\$186	\$96,927	\$96,927
42" RCP CLASS III	LF	204	\$215	\$43,815	\$43,815
42" FES	EA	1	\$2,600	\$2,600	\$2,600
Yard Drain	EA	2	\$500	\$1,000	\$1,000
6" PVC	LF	132	\$15	\$1,980	\$1,980
3x3 Box Culvert Liner	LF	94	\$70	\$6,580	\$6,580
Grading	LS	1	\$10,000	\$10,000	\$10,000
New Berm	LF	148	\$15	\$0	\$2,220
Rain Garden	EA	3	\$10,000	\$0	\$30,000
Erosion Protection	LS	1	\$30,000	\$30,000	\$30,000
<b>Subtotal</b>				<b>\$467,173</b>	<b>\$499,393</b>
<b>Total Benefit Points</b>				<b>80</b>	<b>95</b>
<b>Individual Benefit Point Ratio</b>				<b>0.08</b>	<b>0.09</b>
<b>Estimated Increased Property Values</b>				<b>\$21,000</b>	<b>\$28,000</b>

**Problem:** Yard erosion at Q348 - 1 Outer Ladue Drive, (Q349)  
**Strategy:** 1) Regrade yard to existing area inlet. 2) Add Bioswale to infiltrate runoff and protect natural channels.

Description	Unit	Quantity	Unit Cost	1) Alternative 1	2) Alternative 1 With
				Without BMP's	BMP's
Regrade yard	LS	1	\$4,000	\$4,000	\$4,000
Bioswale	LF	167	\$30	\$0	\$5,010
<b>Subtotal</b>				<b>\$4,000</b>	<b>\$9,010</b>
<b>Total Benefit Points</b>				<b>30</b>	<b>47</b>
<b>Individual Benefit Point Ratio</b>				<b>3.58</b>	<b>2.47</b>
<b>Estimated Increased Property Values</b>				<b>\$1,000</b>	<b>\$3,000</b>

FIGURE 3-1

**Problem:** Yard ponding at Q231 - 2437 Hermitage Hills Ln. and Q233 - 2467 Hermitage Hills Ln. and yard erosion at Q232 -2434 Hermitage Hills Ln.

**Strategy:** 1) Install berm to catch overland flow and direct to inlet and pipe system. 2) Add Bioswale and Rain Gardens to infiltrate runoff and protect natural channels.

Description	Unit	Quantity	Unit Cost	1) Alternative 1	2) Alternative 1 With
				Without BMP's	BMP's
New Berm	LF	583	\$15	\$8,745	\$8,745
12" RCP CLASS III	LF	455	\$116	\$52,807	\$52,807
15" RCP CLASS III	LF	277	\$124	\$34,426	\$34,426
15" FES	EA	2	\$1,200	\$2,400	\$2,400
Single Area Inlet	EA	5	\$1,750	\$8,750	\$8,750
Erosion Protection	LS	1	\$5,000	\$5,000	\$5,000
Bioswale	LF	458	\$30	\$0	\$13,740
Rain Garden	EA	1	\$10,000	\$0	\$10,000
<b>Subtotal</b>				<b>\$112,128</b>	<b>\$135,868</b>
<b>Total Benefit Points</b>				<b>50</b>	<b>101</b>
<b>Individual Benefit Point Ratio</b>				<b>0.21</b>	<b>0.35</b>
<b>Estimated Increased Property Values</b>				<b>\$12,000</b>	<b>\$14,000</b>
<b>Total</b>				<b>\$583,301</b>	<b>\$644,271</b>
Utility Relocation			20%	\$116,660	\$128,854
Clearing			5%	\$29,165	\$32,214
Mobilization			4%	\$23,332	\$25,771
<b>Total with Percent Allowances</b>				<b>\$752,458</b>	<b>\$831,109</b>
Contingency			25%	\$188,114	\$207,777
<b>Probable Construction Cost Estimate</b>				<b>\$940,572</b>	<b>\$1,038,886</b>
Design Engineering and Geotechnical			30%	\$282,172	\$311,666
<b>Total Conceptual Cost Estimate</b>				<b>\$1,223,000</b>	<b>\$1,351,000</b>
<b>Total Benefit Points</b>				<b>210</b>	<b>318</b>
<b>Total Benefit Point Ratio</b>				<b>0.17</b>	<b>0.24</b>

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

FIGURE 3-1

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

**Project Name:** Figure 3-1 CHANNEL - FTMT2 and FTM2-2  
**Solutions By:** EDM INC. **DATE:** 11/5/2008

**Problem:** Channel incision/yard erosion SR-6, MSD-29, 11115 Hermitage Hill Road Q224, 11209 Hermitage Hill Place, Q225, 2404 Hermitage Hill Lane Q230, 2307 N. Geyer Road Q330, 11102, 11106, and 11114 Hermitage Hill Road, 11201 Hermitage Hill Place, 2412, 2434, 2450, 2467 Hermitage Hill Lane

**Strategy:** 1) Install bank protection on FTMT2 from station 32+50 to 36+00 (350 LF), station 39+20 to 41+80 (260 LF), station 42+30 to 44+00 (170 LF), and on FTMT 2-3 from station 0+00 to 5+85 (585 LF).

Description	Unit	Quantity	Unit Cost	ALT 1	ALT 2
Hard stabilization (L)	LF	1,365	\$300	\$409,500	\$0
Soft stabilization (L)	LF	1,365	\$200	\$0	\$273,000
Geomorphic Study	Ea.	4	\$10,000	\$0	\$40,000
<b>Subtotal</b>				<b>\$409,500</b>	<b>\$313,000</b>
<b>Total</b>				<b>\$409,500</b>	<b>\$313,000</b>
Utility Relocation			20%	\$81,900	\$62,600
Clearing			5%	\$20,475	\$15,650
Mobilization			4%	\$16,380	\$12,520
<b>Total with Percent Allowances</b>				<b>\$528,255</b>	<b>\$403,770</b>
Contingency			25%	\$132,064	\$100,943
<b>Probable Construction Cost Estimate</b>				<b>\$660,319</b>	<b>\$504,713</b>
Design Engineering and Geotechnical			30%	\$198,096	\$151,414
<b>Total Conceptual Cost Estimate</b>				<b>\$859,000</b>	<b>\$657,000</b>
<b>Benefit Points</b>				<b>555</b>	<b>1,035</b>
<b>Benefit/Cost Ratio</b>				<b>0.65</b>	<b>1.58</b>

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