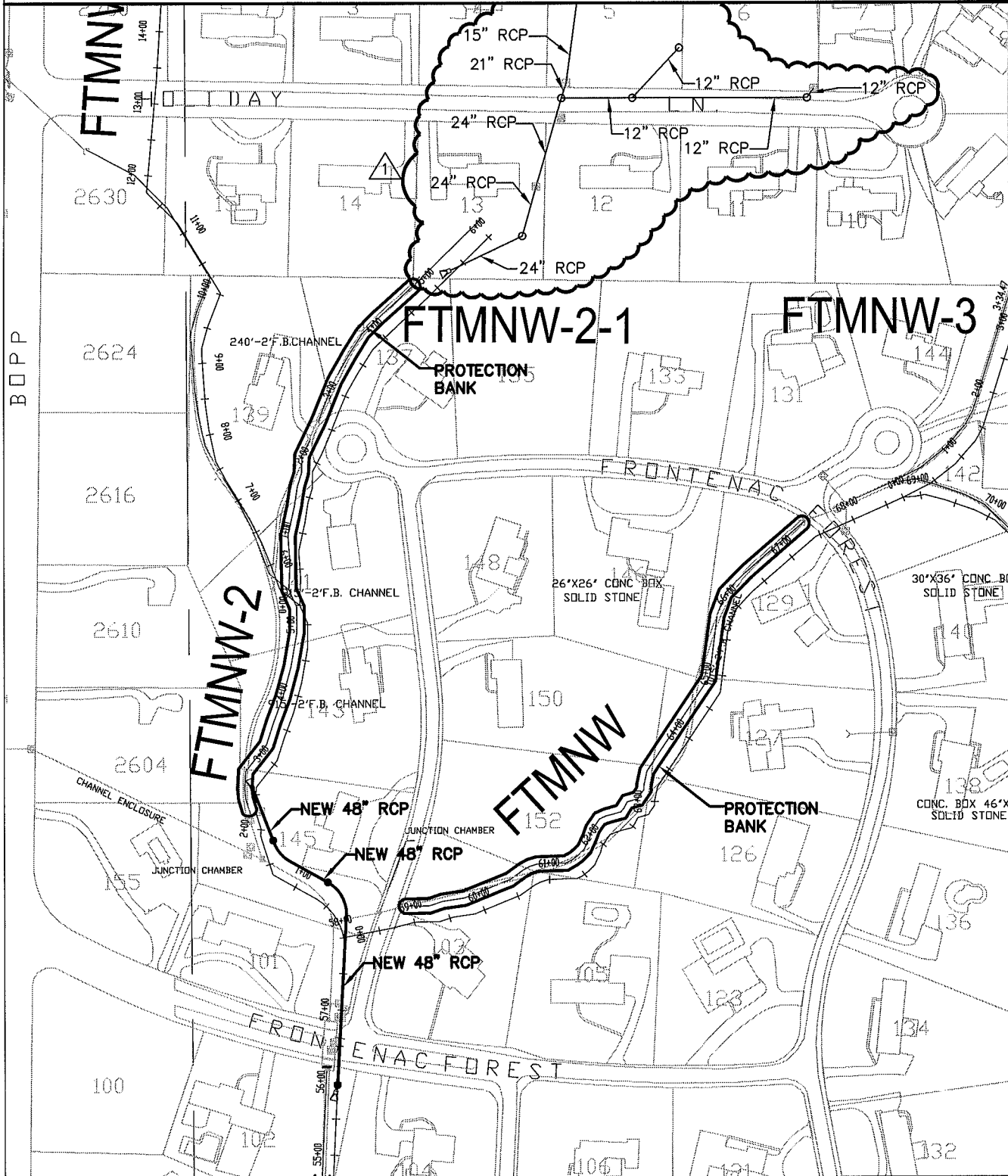


### MATCHLINE 5-2B

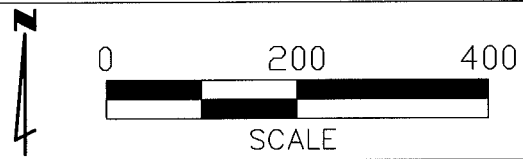


CITY OF FRONTENAC

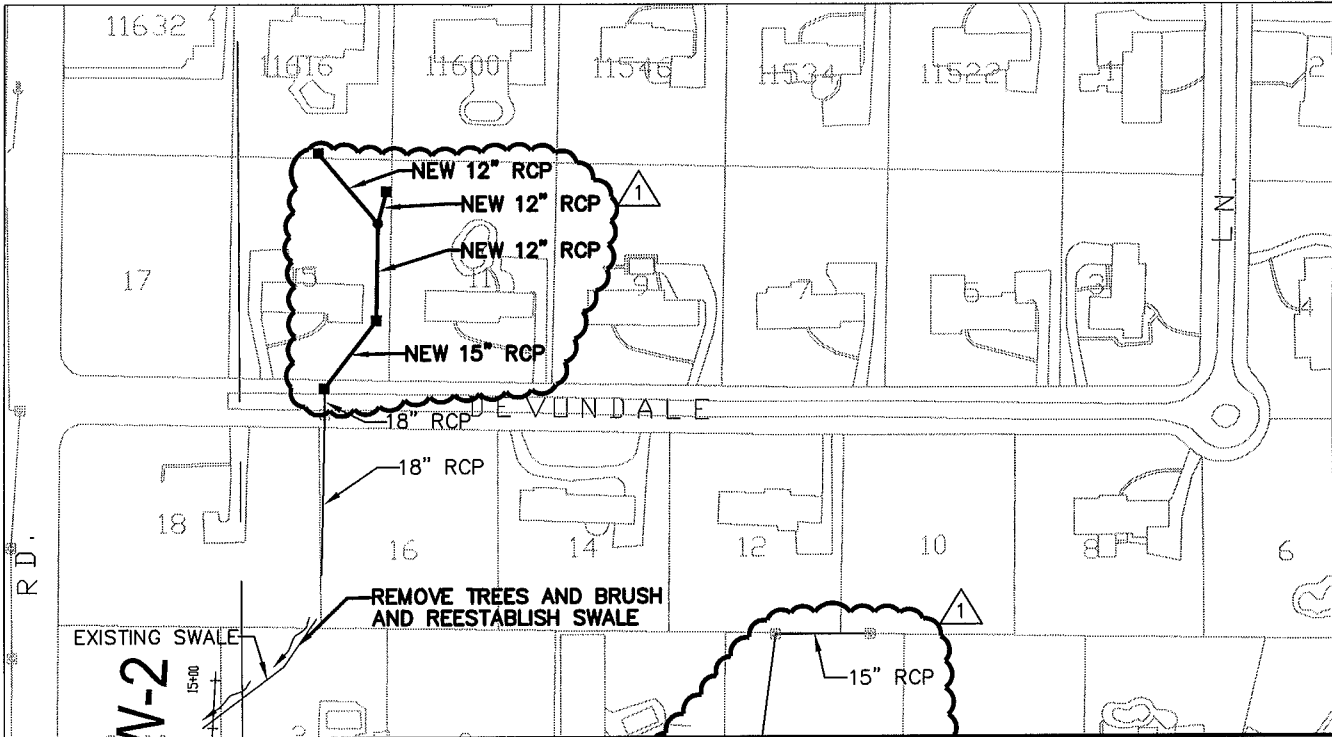
## STORMWATER SYSTEM MASTER IMPROVEMENT PLAN

**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
▲	11/12/08
FIGURE NO.	5-2A



MATCHLINE 5-2A



# 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  
 ▲ 11/12/08

FIGURE NO. 5-2B

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

**Project Name:** FIGURE 5-2 OVERLAND FLOW  
**Solutions By:** EDM INC.                      **DATE:** 11-5-08

**Problem:** Yard ponding at Q165-15 Devondale and Q164 -16 Devondale Place  
**Strategy:** 1) Remove brush and reestablish swale at 16 Devondale Lane and install pipe and inlet system to prevent yard ponding at 15 Devondale Lane. 2) Add Rain Garden and 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 Area Inlet	EA	3	\$1,750	\$5,250	\$5,250
Single Inlet	EA	1	\$1,850	\$1,850	\$1,850
Manhole	EA	1	\$1,500	\$1,500	\$1,500
12" RCP CLASS III	LF	234	\$116	\$27,158	\$27,158
15" RCP CLASS III	LF	90	\$124	\$11,185	\$11,185
Remove Brush	LS	1	\$4,000	\$4,000	\$4,000
Grading	LS	1	\$5,000	\$5,000	\$5,000
Reestablish Swale	LS	1	\$3,000	\$3,000	\$3,000
Rain Garden	LS	1	\$10,000	\$0	\$10,000
<b>Subtotal</b>				<b>\$58,943</b>	<b>\$68,943</b>
<b>Total Benefit Points</b>				<b>40</b>	<b>45</b>
<b>Individual Benefit Point Ratio</b>				<b>0.32</b>	<b>0.31</b>
<b>Estimated Increased Property Values</b>				<b>\$2,000</b>	<b>\$4,000</b>

<b>Total</b>				<b>\$58,943</b>	<b>\$68,943</b>
Utility Relocation			20%	\$11,789	\$13,789
Clearing			5%	\$2,947	\$3,447
Mobilization			4%	\$2,358	\$2,758
<b>Total with Percent Allowances</b>				<b>\$76,037</b>	<b>\$88,937</b>
Contingency			25%	\$19,009	\$22,234
<b>Probable Construction Cost Estimate</b>				<b>\$95,046</b>	<b>\$111,171</b>
Design Engineering and Geotechnical			30%	\$28,514	\$33,351
<b>Total Conceptual Cost Estimate</b>				<b>\$124,000</b>	<b>\$145,000</b>
<b>Total Benefit Points</b>				<b>40</b>	<b>45</b>
<b>Total Benefit Point Ratio</b>				<b>0.32</b>	<b>0.31</b>

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

FIGURE 5-2

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

**Project Name:** FIGURE 5-2 OVERLAND FLOW STRUCTURAL FLOODING  
**Solutions By:** EDM INC. DATE: 11-5-08

**Problem:** Yard ponding and basement flooding at Q183 - 101 Frontenac Forest

**Strategy:** Install a diversion pipe to reduce flow to existing undersized culvert.

Description	Unit	Quantity	Unit Cost	Alternative 1
48" RCP CLASS III	LF	230	\$254	\$58,310
48" FES	EA	2	\$3,200	\$6,400
Manhole	EA	3	\$1,500	\$4,500
Erosion Protection	LS	1	\$10,000	\$10,000
Restoration	LS	1	\$10,000	\$10,000
<b>Subtotal</b>				<b>\$89,210</b>
<b>Total Benefit Points</b>				<b>270</b>
<b>Individual Benefit Point Ratio</b>				<b>1.44</b>
<b>Estimated Increased Property Values</b>				<b>\$10,000</b>

**Total** **\$89,210**

Utility Relocation	20%	\$17,842
Clearing	5%	\$4,460
Mobilization	4%	\$3,568

**Total with Percent Allowances** **\$115,080**

Contingency	25%	\$28,770
-------------	-----	----------

**Probable Construction Cost Estimate** **\$143,850**

Design Engineering and Geotechnical	30%	\$43,155
-------------------------------------	-----	----------

**Total Conceptual Cost Estimate** **\$188,000**

**Total Benefit Points** **270**

**Total Benefit Point Ratio** **1.44**

**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 5-2 CHANNEL FTMNW, FTMNW-2, FTMNW-2-1  
**Solutions By:** EDM INC. **DATE:** 11/5/2008

**Problem:** Yard erosion Q188-129 Frontenac Forest also EDM-146, 127, 150, 152, 103 Frontenac Forest and 137, 139, 141, 143, and 145 Frontenac Forest, Yard Flooding Q188

**Strategy:** Install Bank Protection on FTMNW from Station 59+00 to 67+50 (850 LF), on FTMNW-2 from 2+00 to 5+25 (325 LF), and on FTMNW-2-1 from 0+00 to 4+50 (450 LF).

<b>Description</b>	<b>Unit</b>	<b>Quantity</b>	<b>Unit Cost</b>	<b>ALT 1</b>	<b>ALT 2</b>
Hard stabilization (S)	LF	1,625	\$225	\$365,625	\$0
Soft stabilization (S)	LF	1,625	\$125	\$0	\$203,125
Geomorphic Study	Ea.	4	\$10,000		\$40,000
<b>Total</b>				<b>\$365,625</b>	<b>\$243,125</b>
				<b>\$365,625</b>	<b>\$243,125</b>
Utility Relocation					
Clearing			20%	\$73,125	\$48,625
Mobilization			5%	\$18,281	\$12,156
			4%	\$14,625	\$9,725
<b>Total with Percent Allowances</b>				<b>\$471,656</b>	<b>\$313,631</b>
Contingency			25%	\$117,914	\$78,408
<b>Probable Construction Cost Estimate</b>				<b>\$589,570</b>	<b>\$392,039</b>
Design Engineering and Geotechnical			30%	\$176,871	\$117,612
<b>Total Conceptual Cost Estimate</b>				<b>\$767,000</b>	<b>\$510,000</b>
<b>Benefit Points</b>				<b>520</b>	<b>1,065</b>
<b>Benefit/Cost Ratio</b>				<b>0.68</b>	<b>2.09</b>

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