

APPENDIX I – COSTING INFORMATION

Costing Information

1.0 Introduction

The Lawrence Park Neighbourhood Investigation of Basement Flooding and Road Improvement Study proposes improvements to existing roads, sanitary sewers, combined sewers and storm sewers. The purpose of the proposed works is to provide a target level of service to an area currently experiencing chronic basement flooding and surface flooding issues.

Cost estimates were developed separately for the Sanitary Area, Combined Area and Road Reconstruction / Storm Sewer Works.

2.0 Cost Estimation

2.1 Sanitary and Combined Area Remedial Measures

2.1.1 Unit Price Estimation

To estimate the capital cost of the recommended remedial measures on a preliminary basis, unit costs were first established. The unit costs are based on the following sources:

- Recent contracts tendered by the City, in the last three years.
- Recent contracts tendered in other Ontario municipalities.
- Unit prices as prepared for the City of Toronto Basement Flooding Program (1-4) being undertaken by the City.

2.1.2 Estimation of Probable Costs

Preliminary capital costs were estimated for each of the two projects.

Table 2.1.1 shows a detailed spreadsheet on the project costs for the proposed sanitary works. Costs for the proposed sanitary works include the installation of the underground storage tank along Valleyanna Drive and the upstream sanitary sewer replacement.

Tables 2.1.2 and 2.1.3 show detailed costing for the proposed combined sewer area remedial measures that include storm sewer works along St. Leonard's Avenue, Dundurn Avenue and Glengowan Avenue.

Table 2.1.4 shows the rounded total for each remedial area.

Table 2.1.1 – Pricing for Sanitary Sewer Remedial Measures

VALLEYANNA DR UNDERGROUND STORAGE TANK AND SANITARY SEWER REPLACEMENT EARTHWORKS & CONSTRUCTION COST						
ITEM	SPEC No.	ITEM DESCRIPTION	UNIT	QTY.	UNIT PRICE (\$)	AMOUNT (\$)
1		Clearing and grubbing	LS	1	20,000.00	20,000.00
2		Mobilization, bonds , insurance , temporary facilities, etc	LS	1	200,000.00	200,000.00
3		Construction fence	LM	2,890	15.00	43,350.00
4		Silt fence	LM	2,890	15.00	43,350.00
5		Disconnect/reconnect sanitary service	EA	54	400.00	21,600.00
6		Road removal (1)	m ²	18,850	70.00	1,319,500.00
7		Construct/remove temporary swale to divert overland flow	LM	1,450	30.00	43,500.00
8		Remove & dispose of excess material offsite	m ³	37,700	75.00	2,827,500.00
9		Supply & install 250mm dia. PVC pipe complete with connections	LM	125	300.00	37,500.00
10		Supply & install 450mm dia. concrete pipe complete with connections	LM	250	350.00	87,500.00
11		Supply & install 525mm dia. concrete pipe complete with connections	LM	80	380.00	30,400.00
12		Supply & install 600mm dia. concrete pipe complete with connections	LM	100	520.00	52,000.00
13		Supply & install 675mm dia. concrete pipe complete with connections	LM	490	610.00	298,900.00
14		Existing concrete manhole rehabilitation	EA	1	3,000.00	3,000.00
15	OPSD 701.030	Supply & install 1200mm dia. precast concrete manhole	EA	23	3,390.00	77,970.00
16	OPSD 701.050	Supply & install 1800mm dia. precast concrete manhole	EA	3	6,825.00	20,475.00
17	OPSD 701.060	Supply & install 2400mm dia. precast concrete manhole	EA	2	8,000.00	16,000.00
18		Underground tank complete with mechanical units & other accessories per dwg (Valleyanna Plan & Profile dwg)	m ³	1,100	2,700.00	2,970,000.00
19		Pumping	EA	2	300,000.00	600,000.00
20		Restore grass area	m ²	1,500	5.00	7,500.00
21		Restore/reconstruct Road	m ²	18,850	100.00	1,885,000.00
22		Relocate existing water/gas service	LS	1	150,000.00	150,000.00
23		CCTV inspections: one @ completion of the project & one @ end of maintenance period	LS	1	5,000.00	5,000.00
		Sub-Total				10,760,045.00
		Engineering cost (5%)				538,002.25
		Inspection & construction cost (5%)				538,002.25
		Contingency cost (20%)				2,152,009.00
		TOTAL				13,988,058.50

(1) Road removal include removal and disposal of asphalt

Table 2.1.2 – Pricing for Combined Sewer Area Remedial Measures – St. Leonard's Avenue and Dundurn Avenue Storm Sewer Works

ST. LEONARDS AVE & DUNDURN RD PROPOSED STORM SEWERS EARTHWORKS & CONSTRUCTION COST						
ITEM	SPEC No.	ITEM DESCRIPTION	UNIT	QTY.	UNIT PRICE (\$)	AMOUNT (\$)
1		Clearing and grubbing	LS	1	10,000.00	10,000.00
2		Mobilization, Bonds, Insurance, Temporary facilities, etc	LS	1	100,000.00	100,000.00
3		Construction fence	LM	1,010	15.00	15,150.00
4		Silt fence	LM	1,010	15.00	15,150.00
5		Disconnect/reconnect sanitary service	EA	42	400.00	16,800.00
6		Road removal (1)	m ²	4,940	70.00	345,800.00
7		Construct/remove temporary swale to divert overland flow	LM	490	30.00	14,700.00
8		Remove & dispose of excess material offsite	m ³	2,470	75.00	185,250.00
9		Supply & install 300mm dia. PVC pipe complete with connections	LM	110	275.00	30,250.00
10		Supply & install 375mm dia. PVC pipe complete with connections	LM	350	315.00	110,250.00
11		Existing concrete manhole rehabilitation	EA	1	3,000.00	3,000.00
12	OPSD 701.030	Supply & install 1200mm dia. precast concrete manhole	EA	6	3,390.00	20,340.00
13		Pumping	EA	2	100,000.00	200,000.00
14		Restore/reconstruct Road	m ²	4,940	75.00	370,500.00
15		Relocate existing water/gas service	LS	1	25,000.00	25,000.00
16		CCTV inspections: one @ completion of the project & one @ end of maintenance period	LS	1	2,000.00	2,000.00
		Sub-Total				1,464,190.00
		Engineering cost (5%)				73,209.50
		Inspection & construction cost (5%)				73,209.50
		Contingency cost (20%)				292,838.00
		TOTAL				1,903,447.00

(1) Road removal include removal and disposal of asphalt

Table 2.1.3 – Pricing for Combined Sewer Area Remedial Measures – Glengowan Avenue Storm Sewer Works

GLENOWAN ROAD PROPOSED STORM SEWERS EARTHWORKS & CONSTRUCTION COST						
ITEM	SPEC No.	ITEM DESCRIPTION	UNIT	QTY.	UNIT PRICE (\$)	AMOUNT (\$)
1		Clearing and grubbing	LS	1	10,000.00	10,000.00
2		Mobilization, Bonds, Insurance, Temporary facilities, etc	LS	1	100,000.00	100,000.00
3		Construction fence	LM	950	15.00	14,250.00
4		Silt fence	LM	950	15.00	14,250.00
5		Disconnect/reconnect sanitary service	EA	41	400.00	16,400.00
6		Road removal (1)	m ²	4,420	70.00	309,400.00
7		Construct/remove temporary swale to divert overland flow	LM	470	30.00	14,100.00
8		Remove & dispose of excess material offsite	m ³	2,210	75.00	165,750.00
9		Supply & install 450mm dia. concrete pipe complete with connections	LM	355	330.00	117,150.00
10		Existing concrete manhole rehabilitation	EA	1	3,000.00	3,000.00
11	OPSD 701.030	Supply & install 1200mm dia. precast concrete manhole	EA	4	3,390.00	13,560.00
12		Pumping	EA	2	100,000.00	200,000.00
13		Restore/reconstruct Road	m ²	4,420	75.00	331,500.00
14		Relocate existing water/gas service	LS	1	25,000.00	25,000.00
15		CCTV inspections: one @ completion of the project & one @ end of maintenance period	LS	1	2,000.00	2,000.00
		Sub-Total				1,336,360.00
		Engineering cost (5%)				66,818.00
		Inspection & construction cost (5%)				66,818.00
		Contingency cost (20%)				267,272.00
		TOTAL				1,737,268.00

(1) Road removal include removal and disposal of asphalt

Table 2.1.4 – Rounded Costs Sanitary and Combined Area Works

Area	Reference	Rounded Capital Cost
Separated Sewer Area	Table 2.1.1	\$15,000,000.00
Combined Sewer Area	Table 2.1.2 and 2.1.3	\$4,000,000.00

2.2 Road Reconstruction and Storm Sewer Works

2.2.1 Unit Price Estimation

To estimate the capital cost of the recommended remedial measures on a preliminary basis, unit costs were first established. The unit costs are based on the following sources:

- Recent contracts tendered by the City, in the last three years.
- Recent contracts tendered in other Ontario municipalities.
- Unit prices as prepared for the City of Toronto Basement Flooding Program (1-4) being undertaken by the City.

Unit pricing for each of the locations were based on the preferred rehabilitation measures, road cross section and proposed pipe sizes.

Table 2.2.1 summarizes the unit costs for each rehabilitation measure as well as sidewalk installation.

Table 2.2.1 – Unit Cost Projections for Each Rehabilitation Measures

Rehabilitation Measures	Cost per Linear M
Full depth reconstruction (FD)	\$2,900.00
Full Depth Asphalt Removal (FA)	\$2,500.00
Partial Depth Asphalt Removal (PA)	\$1,000.00
Routine Maintenance (RM)	--
Sidewalks	\$260.00

The costs in the above table include an allowance (10%) for engineering design and construction supervision together with a 20% contingency.

Figure 2.2.1 show the sizing chart used to calculate the approximate unit costs per linear meter of pipe based on pipe size. The bottom trend line is based on current unit pricing. The top trend line factors in contingency and inflation cost; this was used to develop the estimation of probable costs for the storm sewer works. The unit pricing assumes a minimum cover depth of 2.1 m and includes an additional \$400/m to address water quality through perforated pipe systems.

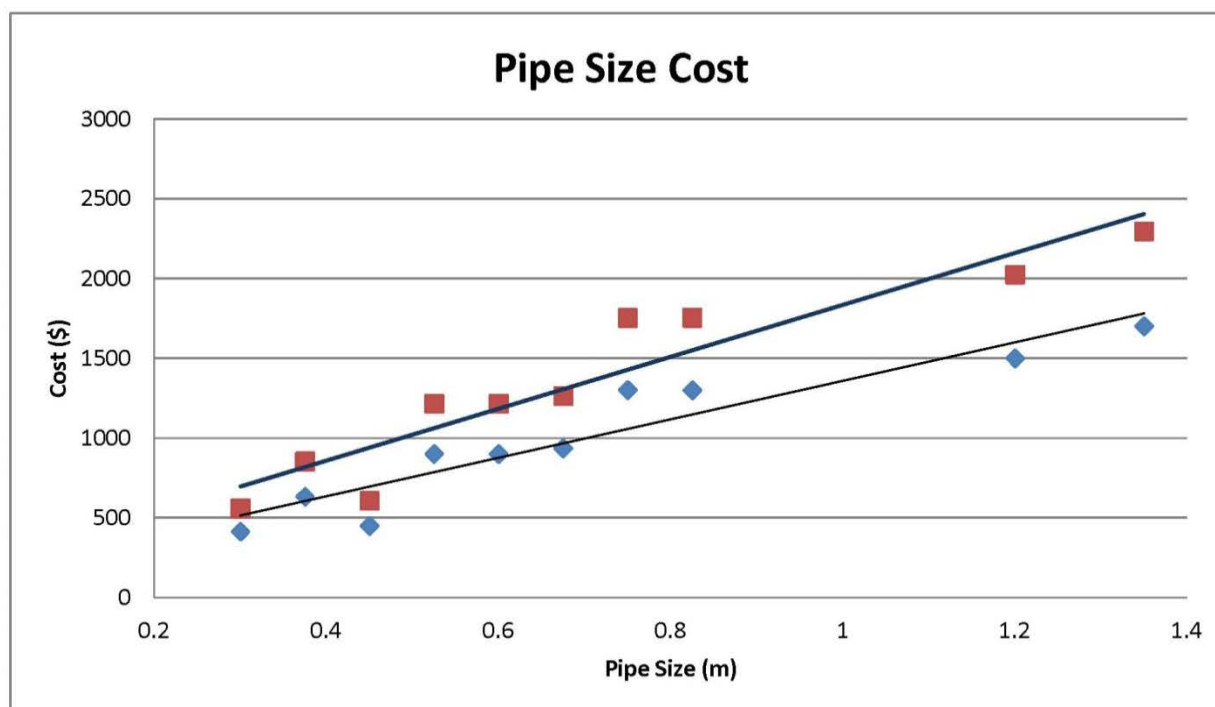


Figure 2.2.1 – Storm Sewer Unit Pricing Based on Pipe Size

2.2.2 Estimation of Probable Costs

Preliminary capital costs were estimated for each of the eighteen (18) locations and are provided below. Cost estimates for storm sewer outfall works are also provided as a separate line item. The estimated costs take into consideration the additional cost to install storm sewers along Strathgowan Crescent and Strathgowan Avenue as well as under Bayview Avenue due to the requirement of jack and bore construction. Additionally, the initial preferred solution for Glengowan Road proposed under the basement flooding solution was superseded by the preferred solution developed under the road and storm drainage assessment.

The pricing details are shown in Table 2.2.2. The costs include an allowance 10% for engineering design and construction supervision together with a 20% contingency.

Table 2.2.2 – Proposed Road Reconstruction and Storm Sewer Costs

65319 Lawrence Park Pricing for Road Reconstruction and Storm Sewer

Projects	Description and Quantities							Unit Pricing			Total Cost		Amount
	Road			Type FD/FA/PA/RM	Storm Sewer			Road \$/lm	Sidewalk \$/lm	Storm Sewer Base Cost \$/lm	Road \$	Sewer \$	
	Length m	Width	Sidewalk #		Avg Pipe Size mm	Avg Storage m3	Length m						
1 - Mildenhall Road South	958.00	7.20	2	FD	300		100.00	2,900.00	260.00	700.00	3,027,280.00	91,000.00	3,118,280.00
2 - Buckingham Avenue	320.00	7.20	-	FD	450		320.00	2,900.00	260.00	900.00	1,011,200.00	374,400.00	1,385,600.00
3 - Cheltenham Avenue	326.00	7.20	-	FD	600		320.00	2,900.00	260.00	1,200.00	1,030,160.00	499,200.00	1,529,360.00
4 - Rochester Avenue	509.00	7.20	-	FD	600		500.00	2,900.00	260.00	1,200.00	1,608,440.00	780,000.00	2,388,440.00
5 - St Leonards Avenue	717.00	7.20	1	FD	1,200		560.00	2,900.00	260.00	2,200.00	2,265,720.00	1,601,600.00	3,867,320.00
6 - Lewes Crescent	245.00	7.20	-	FD	1,500		160.00	2,900.00	260.00	2,800.00	774,200.00	582,400.00	1,356,600.00
6 - Pembury Avenue	103.00	7.20	-	FD	375		96.00	2,900.00	260.00	750.00	325,480.00	93,600.00	419,080.00
7 - Dawlish Avenue (east)	410.00	7.20	1	FD	900		390.00	2,900.00	260.00	1,700.00	1,295,600.00	861,900.00	2,157,500.00
7 - Bayview Avenue *					1,500		145.00			2,800.00	-	527,800.00	527,800.00
7 - Danewood Rd/Glenallen Rd / Stratheden Rd *					450		200.00			900.00	-	234,000.00	234,000.00
8 - Glenallan Road	287.00	7.20	1	FA	450		270.00	2,500.00	260.00	900.00	792,120.00	315,900.00	1,108,020.00
8 - Pinedale Avenue	166.00	7.20	1	FD	450		263.00	2,900.00	260.00	900.00	524,560.00	307,710.00	832,270.00
8 - Strathgowan Crescent	93.00	7.20	1	FD	900		121.00	2,900.00	260.00	1,700.00	293,880.00	267,410.00	561,290.00
8 - Pine Forest Road *			-	FA**	450		53.00			900.00	-	62,010.00	62,010.00
9 - Stratheden Road	430.00	7.20	-	FA	450		270.00	2,500.00	260.00	700.00	1,186,800.00	245,700.00	1,432,500.00
9 - Strathgowan Crescent	72.00	7.20	-	FD	900		80.00	2,900.00	260.00	1,700.00	227,520.00	176,800.00	404,320.00
10A - Garland Avenue	102.00	7.20	1	FD	300		90.00	2,900.00	260.00	700.00	322,320.00	81,900.00	404,220.00
10A - Strathgowan Avenue (proposed deep storm)**	137.00	7.20	1	FA	900		510.00	2,500.00	260.00	5,000.00	378,120.00	3,315,000.00	3,693,120.00
10B - Strathgowan Avenue	245.00	7.20	-	FA	900		245.00	2,500.00	260.00	1,700.00	676,200.00	541,450.00	1,217,650.00
11 - Blyth Hill Road	465.00	7.20	-	FD	825		370.00	2,900.00	260.00	1,510.00	1,469,400.00	726,310.00	2,195,710.00
11 - Blyth Hill Road (proposed storage)	70.00	7.20	-	FD	4200X2400	800.00	70.00	2,900.00	260.00	22,000.00	221,200.00	2,002,000.00	2,223,200.00
12 - Blyth Dale Road	238.00	7.20	-	FD	1,200		238.00	2,900.00	260.00	2,200.00	752,080.00	680,680.00	1,432,760.00
12 - Blanchard Road	157.00	7.20	-		600		157.00	2,900.00	260.00	1,200.00	496,120.00	244,920.00	741,040.00
13 - Braeside Crescent	131.00	7.20	-	FD	600		90.00	2,900.00	260.00	1,200.00	413,960.00	140,400.00	554,360.00
13 - Proctor Crescent	120.00	7.20	-		600		120.00	2,900.00	260.00	1,200.00	379,200.00	187,200.00	566,400.00
14 - Rothmere Drive	260.00	7.20	-	FD	1,050		235.00	2,900.00	260.00	1,900.00	821,600.00	580,450.00	1,402,050.00
15 - Mildenhall Road North	360.00	7.20	-	FD	1,050		360.00	2,900.00	260.00	1,900.00	1,137,600.00	889,200.00	2,026,800.00
15 - Mildenhall Road North - Rothmere - Lawrence	104.00	7.20	1		-		-	2,900.00		-	301,600.00	-	301,600.00
16 - Bayview Wood	335.00	7.20	-	FD	1,200		297.00	2,900.00	260.00	2,200.00	1,058,600.00	849,420.00	1,908,020.00
16 - St. Aubyn's Crescent	145.00	7.20	-	FD	1,500		145.00	2,900.00	260.00	2,800.00	458,200.00	527,800.00	986,000.00
16 - Wood Avenue	99.00	7.20	-	FD				2,900.00	260.00	1,200.00	312,840.00	-	312,840.00
17 - Fidelia Avenue			-	RM	300		82.00	-		700.00	-	74,620.00	74,620.00
17 - Dawlish Avenue (west)	234.00	7.20	-	FD	450		234.00	2,900.00	260.00	900.00	739,440.00	273,780.00	1,013,220.00
17 - St. Leonard's Crescent	143.00	7.20	-	FD	300		121.00	2,900.00	260.00	700.00	451,880.00	110,110.00	561,990.00
Storm Sewer Outfall #1 - TFS and ravine				FD	1,200		317.00	2,900.00	260.00	2,200.00	-	906,620.00	906,620.00
Storm Sewer Outfall #2 - Bayview and St, Leonards into ravine **			-	FD	2,100		292.00	2,900.00	260.00	5,000.00	-	1,898,000.00	1,898,000.00
Storm Sewer Outfall #4 - Strathgowan Avenue West Limit **			-	FA	900		60.00	2,500.00	260.00	1,700.00	-	132,600.00	132,600.00
Storm Sewer Outfall #4 - Strathgowan Crescent (proposed deep storm) **			-	FA	900		130.00	-	260.00	5,000.00	-	845,000.00	845,000.00
Glengowan Road	355.00	8.50	1	FD	600		300.00	3,100.00	260.00	1,200.00	1,192,800.00	468,000.00	1,660,800.00
											-	-	-
TOTAL	8,336.00						8,311.00				25,946,120.00	22,496,890.00	48,443,010.00
* storm sewer only													
** jack and bore costs								ROUNDED COST					48,500,000.00