



APPENDIX B COST ESTIMATES

QUEENSBOROUGH DYKE COSTS

All costs presented in 2009 Dollars.

Station: 0+000 to 1+160 Earth Dyke Improvements

Crest Level Increase 0.4 m
Dyke Length 160 m

Item	Unit	Quantity	Unit Price	Cost
Stripping	cu.m	3.0	\$50.00	\$148.60
Filling	cu.m	5.0	\$40.00	\$200.59
Hydroseeding	sq.m	1.3	\$2.00	\$2.53
Rip Rap	tonne	1.1	\$90.00	\$98.82
Gravel Path	tonne	2.0	\$50.00	\$99.20
Filter Cloth	sq.m	1.3	\$5.00	\$6.32
Price per Meter				\$556.06
50% Contingency				\$278.03
Cost per Meter				\$834.09
Length				160
Total Cost				\$133,454.85

Station: 0+160 to 0+290 Earth Dyke Improvements

Crest Level Increase 1.7 m
Dyke Length 130 m

Item	Unit	Quantity	Unit Price	Cost
Stripping	cu.m	7.7	\$50.00	\$382.60
Filling	cu.m	16.3	\$40.00	\$653.34
Hydroseeding	sq.m	5.4	\$2.00	\$10.75
Rip Rap	tonne	4.7	\$90.00	\$419.96
Gravel Path	tonne	2.0	\$50.00	\$99.20
Filter Cloth	sq.m	5.4	\$5.00	\$26.88
Price per Meter				\$1,592.74
50% Contingency				\$796.37
Cost per Meter				\$2,389.11
Length				130
Total Cost				\$310,584.55

Station: 0+290 to 0+560 Earth Dyke Improvements

Crest Level Increase 0.6 m
Dyke Length 270 m

Item	Unit	Quantity	Unit Price	Cost
Stripping	cu.m	3.7	\$50.00	\$184.60
Filling	cu.m	6.8	\$40.00	\$270.24
Hydroseeding	sq.m	1.9	\$2.00	\$3.79
Rip Rap	tonne	1.6	\$90.00	\$148.22
Gravel Path	tonne	2.0	\$50.00	\$99.20
Filter Cloth	sq.m	1.9	\$5.00	\$9.49
Price per Meter				\$715.55
50% Contingency				\$357.78
Cost per Meter				\$1,073.33
Length				270
Total Cost				\$289,798.16

Station: 0+560 to 1+360 No Improvements

Station: 1+360 to 2+200 Earth Dyke Improvements

Crest Level Increase 0.4 m
Dyke Length 840 m

Item	Unit	Quantity	Unit Price	Cost
Stripping	cu.m	3.0	\$50.00	\$148.60
Filling	cu.m	5.0	\$40.00	\$200.59
Hydroseeding	sq.m	1.3	\$2.00	\$2.53
Rip Rap	tonne	1.1	\$90.00	\$98.82
Gravel Path	tonne	2.0	\$50.00	\$99.20
Filter Cloth	sq.m	1.3	\$5.00	\$6.32
Price per Meter				\$556.06
50% Contingency				\$278.03
Cost per Meter				\$834.09
Length				840
Total Cost				\$700,637.97

Station: 2+200 to 2+440 No Improvements

Station: 2+440 to 2+800 Earth Dyke Improvements

Crest Level Increase 1.2 m
Dyke Length 360 m

Item	Unit	Quantity	Unit Price	Cost
Stripping	cu.m	5.9	\$50.00	\$292.60
Filling	cu.m	12.0	\$40.00	\$479.21
Hydroseeding	sq.m	3.8	\$2.00	\$7.59
Rip Rap	tonne	3.3	\$90.00	\$296.45
Gravel Path	tonne	2.0	\$50.00	\$99.20
Filter Cloth	sq.m	3.8	\$5.00	\$18.97
Price per Meter				\$1,194.02
50% Contingency				\$597.01
Cost per Meter				\$1,791.03
Length				360
Total Cost				\$644,769.96

Station: 2+800 to 3+160 Concrete Flood Wall

Crest Level Increase 1 m
Dyke Length 360 m

Item	Unit	Quantity	Unit Price	Cost
Concrete Flood Wall	m	1.0	\$2,500.00	\$2,500.00
Price per Meter				\$2,500.00
50% Contingency				\$1,250.00
Cost per Meter				\$3,750.00
Length				360
Total Cost				\$1,350,000.00

Station: 3+160 Rail Crossing

Item	Unit	Quantity	Unit Price	Cost
Rail Crossing	ea	1.0	\$100,000.00	\$100,000.00
Sub Total				\$100,000.00
50% Contingency				\$50,000.00
Total Cost				\$150,000.00

**Station: 3+160 to 4+400
Earth Dyke Improvements - Point Royal Path**

Crest Level Increase 0.5 m
Dyke Length 1240 m

Item	Unit	Quantity	Unit Price	Cost
Stripping	cu.m	3.3	\$50.00	\$166.60
Filling	cu.m	5.9	\$40.00	\$235.42
Hydroseeding	sq.m	1.6	\$2.00	\$3.16
Rip Rap	tonne	1.4	\$90.00	\$123.52
Gravel Path	tonne	2.0	\$50.00	\$99.20
Filter Cloth	sq.m	1.6	\$5.00	\$7.91
Landscaping	sq.m	9.5	\$100.00	\$950.00
Price per Meter				\$1,585.81
50% Contingency				\$792.90
Cost per Meter				\$2,378.71
Length				1240
Total Cost				\$2,949,600.00

**Station: 4+400 to 4+680
New Earth Dyke**

Crest Level Increase 0.8 m
Dyke Length 280 m

Item	Unit	Quantity	Unit Price	Cost
Stripping	cu.m	4.4	\$50.00	\$220.60
Filling	cu.m	8.5	\$40.00	\$339.90
Hydroseeding	sq.m	2.5	\$2.00	\$5.06
Rip Rap	tonne	2.2	\$90.00	\$197.63
Gravel Path	tonne	2.0	\$50.00	\$99.20
Filter Cloth	sq.m	2.5	\$5.00	\$12.65
Price per Meter				\$875.04
50% Contingency				\$437.52
Cost per Meter				\$1,312.56
Length				280
Total Cost				\$367,516.87

**Station: 4+680 to 6+960
Dyke Improvements - South Dyke Road**

Crest Level Increase 0.4 m
Dyke Length 2280 m

Item	Unit	Quantity	Unit Price	Cost
Milling	sq.m	10.4	\$4.00	\$41.60
400mm Sub Base	sq.m	10.4	\$24.00	\$249.60
75mm Base	sq.m	10.4	\$7.00	\$72.80
Asphalt	sq.m	10.4	\$24.00	\$249.60
Curb	m	2.0	\$65.00	\$130.00
Sidewalk	m	2.0	\$170.00	\$340.00
Rip Rap	tonne	1.1	\$90.00	\$98.82
Filter Cloth	sq.m	1.3	\$5.00	\$6.32
Price per Meter				\$1,188.74
50% Contingency				\$594.37
Cost per Meter				\$1,783.11
Length				2280
Total Cost				\$4,065,489.63

**ESTIMATED COST FOR QUEENSBOROUGH DYKE
IMPROVEMENTS..... \$11,000,000**

MAINLAND DYKE COSTS

**Station: 0+000 to 0+520
Sheet Pile Dyke**

Crest Level Increase 0.6 m
Dyke Length 520 m

Item	Unit	Quantity	Unit Price	Cost
Sheet Pile	sq.m	1.8	\$800.00	\$1,440.00
Price per Meter				\$1,440.00
50% Contingency				\$720.00
Cost per Meter				\$2,160.00
Length				520
Total Cost				\$1,123,200.00

**Station: 0+520 to 1+080
Sheet Pile Dyke**

Crest Level Increase 1.1 M
Dyke Length 560 M

Item	Unit	Quantity	Unit Price	Cost
Sheet Pile	sq. m	3.3	\$800.00	\$2,640.00
Price per Meter				\$2,640.00
50% Contingency				\$1,320.00
Cost per Meter				\$3,960.00
Length				560
Total Cost				\$2,217,600.00

**Station: 1+080 to 1+700
Sheet Pile Dyke**

Crest Level Increase 1.1 M
Dyke Length 620 M

Item	Unit	Quantity	Unit Price	Cost
Sheet Pile	sq.m	3.3	\$800.00	\$2,640.00
Price per Meter				\$2,640.00
50% Contingency				\$1,320.00
Cost per Meter				\$3,960.00
Length				620
Dyke Cost				\$2,455,200.00
Demountables				\$50,000.00
Total Cost				\$2,505,200.00

Station: 1+700 to 1+880
Earth Dyke Reconstruction

Crest Level Increase 1.8 m
Dyke Length 180 m

Item	Unit	Quantity	Unit Price	Cost
Stripping	cu.m	8.0	\$50.00	\$400.60
Filling	cu.m	17.2	\$40.00	\$688.17
Hydroseeding	sq.m	5.7	\$2.00	\$11.38
Rip Rap	tonne	5.0	\$90.00	\$444.67
Gravel Path	tonne	2.0	\$50.00	\$99.20
Filter Cloth	sq.m	5.7	\$5.00	\$28.46
Price per Meter				\$1,672.49
50% Contingency				\$836.24
Cost per Meter				\$2,508.73
Length				180
Total Cost				\$451,571.18

Station: 1+880 to 2+160
Earth Dyke Construction

Crest Level Increase 0.8 m
Dyke Length 280 m

Item	Unit	Quantity	Unit Price	Cost
Stripping	cu.m	4.4	\$50.00	\$220.60
Filling	cu.m	8.5	\$40.00	\$339.90
Hydroseeding	sq.m	2.5	\$2.00	\$5.06
Rip Rap	tonne	2.2	\$90.00	\$197.63
Gravel Path	tonne	2.0	\$50.00	\$99.20
Filter Cloth	sq.m	2.5	\$5.00	\$12.65
Price per Meter				\$875.04
50% Contingency				\$437.52
Cost per Meter				\$1,312.56
Length				280
Total Cost				\$367,516.87

Station: 2+160 to 2+600
Earth Dyke Construction

Crest Level Increase 0.6 m
Dyke Length 440 m

Item	Unit	Quantity	Unit Price	Cost
Stripping	cu.m	3.7	\$50.00	\$184.60
Filling	cu.m	6.8	\$40.00	\$270.24
Hydroseeding	sq.m	1.9	\$2.00	\$3.79
Rip Rap	tonne	1.6	\$90.00	\$148.22
Gravel Path	tonne	2.0	\$50.00	\$99.20
Filter Cloth	sq.m	1.9	\$5.00	\$9.49
Landscaping	sq.m	9.8	\$100.00	\$980.00
Price per Meter				\$1,695.55
50% Contingency				\$847.78
Cost per Meter				\$2,543.33
Length				440
Total Cost				\$1,119,063.67

Station: 2+600 to 3+280
Earth Dyke Construction

Crest Level Increase 1 M
Dyke Length 680 M

Item	Unit	Quantity	Unit Price	Cost
Stripping	cu.m	5.1	\$50.00	\$256.60
Filling	cu.m	10.2	\$40.00	\$409.55
Hydroseeding	sq.m	3.1	\$2.00	\$6.32
Rip Rap	tonne	2.7	\$90.00	\$247.04
Gravel Path	tonne	2.0	\$50.00	\$99.20
Filter Cloth	sq.m	3.2	\$5.00	\$15.81
Landscaping	sq.m	11.0	\$100.00	\$1,100.00
Price per Meter				\$2,134.53
50% Contingency				\$1,067.26
Cost per Meter				\$3,201.79
Length				680
Total Cost				\$2,177,219.89

Station: 3+280 to 3+700
Demountable Dyke Construction

Crest Level Increase 1 m
Dyke Length 420 m

Item	Unit	Quantity	Unit Price	Cost
Demountable	m	1.0	\$5,000.00	\$5,000.00
Price per Meter				\$5,000.00
50% Contingency				\$2,500.00
Cost per Meter				\$7,500.00
Length				420
Total Cost				\$3,150,000.00

Station: 3+700 to 4+000
Sheet Pile Dyke with Redevelopment

Crest Level Increase 1.2 m
Dyke Length 300 m

Item	Unit	Quantity	Unit Price	Cost
Sheet Pile	sq.m	3.6*	\$800.00	\$2,880.00
Price per Meter				\$2,880.00
50% Contingency				\$1,440.00
Cost per Meter				\$4,320.00
Length				300
Total Cost				\$1,296,000.00

This is an incremental price. Actual sheetpile is 15.5 m above river bed; however, this considered to be cost of development, else it could be installed inland.

Station: 4+000 to 4+460
Earth Dyke with Park Construction

Crest Level Increase 1.5 m
Dyke Length 460 m

Item	Unit	Quantity	Unit Price	Cost
Stripping	cu.m	6.9	\$50.00	\$346.60
Filling	cu.m	14.6	\$40.00	\$583.69
Hydroseeding	sq.m	4.7	\$2.00	\$9.49
Rip Rap	tonne	4.1	\$90.00	\$370.56
Gravel Path	tonne	2.0	\$50.00	\$99.20
Filter Cloth	sq.m	4.7	\$5.00	\$23.72
Price per Meter				\$1,433.25
50% Contingency				\$716.63
Cost per Meter				\$2,149.88
Length				460
Total Cost				\$988,943.99

Station: 4+460 to 6+360
No Proposed Improvements

Station: 6+360 to 6+480
Earth Dyke

Crest Level Increase 1.7 m
Dyke Length 120 m

Item	Unit	Quantity	Unit Price	Cost
Stripping	cu.m	7.7	\$50.00	\$382.60
Filling	cu.m	16.3	\$40.00	\$653.34
Hydroseeding	sq.m	5.4	\$2.00	\$10.75
Rip Rap	tonne	4.7	\$90.00	\$419.96
Gravel Path	tonne	2.0	\$50.00	\$99.20
Filter Cloth	sq.m	5.4	\$5.00	\$26.88
Price per Meter				\$1,592.74
50% Contingency				\$796.37
Cost per Meter				\$2,389.11
Length				120
Total Cost				\$286,693.43

Station: 6+400 & 7+720
Flood Gate

Item	Unit	Quantity	Unit Price	Cost
Flood Gate	each	2.0	\$1,000,000.00	\$2,000,000.00
Price per Meter				\$2,000,000.00
50% Contingency				\$1,000,000.00
Total Cost				\$3,000,000.00

Station: 6+480 to 7+680
Sheet Pile Dyke

Crest Level Increase 1.2 m
Dyke Length 1200 m

Item	Unit	Quantity	Unit Price	Cost
Sheet Pile	sq.m	3.6	\$800.00	\$2,880.00
Price per Meter				\$2,880.00
50% Contingency				\$1,440.00
Cost per Meter				\$4,320.00
Length				1200
Total Cost				\$5,184,000.00

Station: 7+730 to 7+780
Earth Dyke Construction

Crest Level Increase 1 m
Dyke Length 50 m

Item	Unit	Quantity	Unit Price	Cost
Stripping	cu.m	5.1	\$50.00	\$256.60
Filling	cu.m	10.2	\$40.00	\$409.55
Hydroseeding	sq.m	3.2	\$2.00	\$6.32
Rip Rap	tonne	2.7	\$90.00	\$247.04
Gravel Path	tonne	2.0	\$50.00	\$99.20
Filter Cloth	sq.m	3.2	\$5.00	\$15.81
Price per Meter				\$1,034.53
50% Contingency				\$517.26
Cost per Meter				\$1,551.79
Length				50
Total Cost				\$77,589.70

Station: 7+780 to 7+920
No Proposed Improvements

Station: 7+920 to 8+200
Integrate with Future Road

Station: 8+200 to 8+460
Earth Dyke

Crest Level Increase 1.6 m
Dyke Length 210 m

Item	Unit	Quantity	Unit Price	Cost
Stripping	cu.m	7.3	\$50.00	\$364.60
Filling	cu.m	15.5	\$40.00	\$618.52
Hydroseeding	sq.m	5.1	\$2.00	\$10.12
Rip Rap	tonne	4.4	\$90.00	\$395.26
Gravel Path	tonne	2.0	\$50.00	\$99.20
Filter Cloth	sq.m	5.1	\$5.00	\$25.30
Price per Meter				\$1,513.00
50% Contingency				\$756.50
Cost per Meter				\$2,269.50
Length				210
Total Cost				\$476,593.97

Station: 8+460 to 8+6860
No Proposed Improvements

Station: 8+680 to 8+780
Earth Dyke

Crest Level Increase 1.6 m
Dyke Length 100 m

Item	Unit	Quantity	Unit Price	Cost
Stripping	cu.m	7.3	\$50.00	\$364.60
Filling	cu.m	15.5	\$40.00	\$618.52
Hydroseeding	sq.m	5.1	\$2.00	\$10.12
Rip Rap	tonne	4.4	\$90.00	\$395.26
Gravel Path	tonne	2.0	\$50.00	\$99.20
Filter Cloth	sq.m	5.1	\$5.00	\$25.30
Price per Meter				\$1,513.00
50% Contingency				\$756.50
Cost per Meter				\$2,269.50
Length				100
Total Cost				\$226,949.51

Station: 8+780 to 8+860
Concrete Flood Wall & Demountables

Crest Level Increase 1.6 m
Dyke Length 80 m

Item	Unit	Quantity	Unit Price	Cost
Concrete Flood Wall	m	1.000	\$4,000.00	\$4,000.00
Price per Meter				\$4,000.00
Length				80
Dyke Cost				\$320,000.00
Demountables				\$1,000,000.00
Sub Total				\$1,320,000.00
50% Contingency				\$660,000.00
Total Cost				\$1,980,000.00

Station: 8+860 to 9+020
Earth Dyke

Crest Level Increase 1.6 m
Dyke Length 160 m

Item	Unit	Quantity	Unit Price	Cost
Stripping	cu.m	7.3	\$50.00	\$364.60
Filling	cu.m	15.5	\$40.00	\$618.52
Hydroseeding	sq.m	5.1	\$2.00	\$10.12
Rip Rap	tonne	4.4	\$90.00	\$395.26
Gravel Path	tonne	2.0	\$50.00	\$99.20
Filter Cloth	sq.m	5.1	\$5.00	\$25.30
Price per Meter				\$1,513.00
50% Contingency				\$756.50
Cost per Meter				\$2,269.50
Length				160
Total Cost				\$363,119.21

**ESTIMATED COST FOR MAINLAND DYKE CONSTRUCTION /
IMPROVEMENTS..... \$28,000,000**