

APPENDIX D: COST ESTIMATES



City of Courtenay
Construction Cost Estimate - Summary
Option 3 - Partial Ring Dike with Floodway

Section 1 - Lewis Centre Dike

Estimated Construction Cost	\$ 763,000
Civil Engineering Design / Management / Inspection	\$ 75,000
Geotechnical Engineering Review / Report / Inspection	\$ 20,000
Archeological Monitoring	\$ 5,000
Environmental Review / Report / Permitting	\$ -
Subtotal	\$ 863,000

Section 2 - Old Island Highway Dike (Ryan Rd to Headquarters Rd)

Estimated Construction Cost	\$ 1,732,000
Civil Engineering Design / Management / Inspection	\$ 170,000
Geotechnical Engineering Review / Report / Inspection	\$ 20,000
Archeological Monitoring	\$ 5,000
Environmental Review / Report / Permitting	\$ 20,000
Subtotal	\$ 1,947,000

Section 3 - Floodway Dike and Culverts

Estimated Construction Cost	\$ 1,682,000
Civil Engineering Design / Management / Inspection	\$ 160,000
Geotechnical Engineering Review / Report / Inspection	\$ 30,000
Archeological Monitoring	\$ 5,000
Environmental Review / Report / Permitting	\$ 20,000
Subtotal	\$ 1,897,000

Section 4 - Hwy 19A Dike

Estimated Construction Cost	\$ 634,000
Civil Engineering Design / Management / Inspection	\$ 60,000
Geotechnical Engineering Review / Report / Inspection	\$ 20,000
Archeological Monitoring	\$ 5,000
Land Survey / Legal Cost	\$ 25,000
Environmental Review / Report / Permitting	\$ 5,000
Subtotal	\$ 749,000

Total Budget	\$ 5,456,000
---------------------	---------------------

**City of Courtenay
Construction Cost Estimate**

Section 1 - Lewis Centre Dike

<i>Description</i>	<i>Unit</i>	<i>Quantity</i>	<i>Unit Price</i>	<i>Sub total</i>	<i>Total</i>
<i>REMOVALS</i>					
<i>Removals Allowance</i>	<i>l.s.</i>	<i>1</i>	<i>\$ 32,500</i>	<i>\$ 32,500</i>	
					<i>\$ 33,000</i>
<i>Earthen Dikes</i>					
<i>Base Prep</i>	<i>sq.m.</i>	<i>3,500</i>	<i>\$ 10</i>	<i>\$ 35,000</i>	
<i>Import Fill placed and compacted</i>	<i>cu.m.</i>	<i>6,000</i>	<i>\$ 50</i>	<i>\$ 300,000</i>	
<i>Top Soil and Hydroseeding</i>	<i>sq.m.</i>	<i>6,500</i>	<i>\$ 15</i>	<i>\$ 97,500</i>	
<i>Traffic Control (3 TCP) & Security</i>	<i>day</i>	<i>25</i>	<i>\$ 1,500</i>	<i>\$ 37,500</i>	
<i>Landscaping Allowance</i>	<i>l.s.</i>	<i>1</i>	<i>\$ 20,000</i>	<i>\$ 20,000</i>	
					<i>\$ 490,000</i>
<i>Combination Retaining Walls / Berms</i>					
<i>Base Prep</i>	<i>l.s.</i>	<i>1</i>	<i>\$ 10,000</i>	<i>\$ 10,000</i>	
<i>Cast-in-Place Wall East Side of Main Parking Lot</i>	<i>l.m.</i>	<i>40</i>	<i>\$ 500</i>	<i>\$ 20,000</i>	
<i>Raised Walkway Along Outdoor Pool</i>	<i>l.m.</i>	<i>40</i>	<i>\$ 800</i>	<i>\$ 32,000</i>	
<i>Landscaped Berm Around New Parking Lot</i>	<i>l.m.</i>	<i>50</i>	<i>\$ 500</i>	<i>\$ 25,000</i>	
					<i>\$ 87,000</i>
				<i>Subtotal (rounded)</i>	<i>\$ 610,000</i>
			<i>Contingency Allowance 25%</i>	<i>\$152,500</i>	
				<i>Total</i>	<i>\$ 762,500</i>

Notes:

1. No geotechnical review undertaken. Structural design and seismic analysis recommendations may alter design.
2. No costs carried for environmental mitigation, nor sediment & erosion control.
3. Design intended to be compliant with Dike Maintenance Act via the BC MFLNRO, Inspector of Dikes.

**City of Courtenay
Construction Cost Estimate**

Section 2 - Old Island Highway Dike (Ryan Rd to Headquarters Rd)

285 l.m. Raised Reinforced Earth Berm & Walkway

<i>Description</i>	<i>Unit</i>	<i>Quantity</i>	<i>Unit Price</i>	<i>Sub total</i>	<i>Total</i>
REMOVALS					
Remove & Dispose Off-Site: Tree Falling & Removal	<i>l.s.</i>	1	\$ 5,000	\$ 5,000	
Remove & Dispose Off-Site: Asphalt & Concrete	<i>sq. m</i>	1,500	\$ 10	\$ 15,000	
Common Excavation and Disposal ^{Note 1}	<i>cu.m.</i>	7,500	\$ 20	\$ 150,000	
Remove Off-Site Ex. Barricades	<i>l.s.</i>	1	\$ 5,000	\$ 5,000	
					\$ 175,000
ROAD & WALKWAY					
Import Pit Run Gravel (Structural Bulk Fill)	<i>cu.m.</i>	4,500	\$ 25	\$ 112,500	
Import Pit Run Gravel (230mm)	<i>sq.m.</i>	1,500	\$ 15	\$ 22,500	
Crushed gravel base (130mm) - Roadway	<i>sq.m.</i>	1,500	\$ 12	\$ 18,000	
Asphalt paving (100mm)	<i>sq.m.</i>	1,500	\$ 80	\$ 120,000	
Extruded Barrier Curb	<i>l.m.</i>	250	\$ 100	\$ 25,000	
Raised Reinforced Earth Berm & Walkway	<i>l.m.</i>	285	\$ 960	\$ 273,600	
5 course Lock-Block Retaining Wall	<i>sq.m.</i>	950	\$ 450	\$ 427,500	
Final Grading, Topsoil and Hydroseeding	<i>l.s.</i>	1	\$ 3,000	\$ 3,000	
Traffic Control (3 TCP) & Security	<i>day</i>	40	\$ 1,000	\$ 40,000	
Class 250kg Rip Rap	<i>cu.m.</i>	375	\$ 70	\$ 26,250	
Signage & Lines	<i>l.s.</i>	1	\$ 5,000	\$ 5,000	
					\$ 1,073,400
WATER MAIN					
Replace 200mm dia PVC DR18 Watermain	<i>l.m.</i>	235	\$ 200	\$ 47,000	
Install 25mm dia Air Valve	<i>ea</i>	1	\$ 5,000	\$ 5,000	
Connections, testing, etc.,	<i>ea</i>	1	\$ 10,000	\$ 10,000	
					\$ 62,000
DRAINAGE					
Install CB, Lead, Flap Valve & Headwall	<i>ea</i>	5	\$ 5,000	\$ 25,000	
					\$ 25,000
FISHERIES COMPENSATION					
Allowance for Fisheries compensation for HADD ^{Note 3}	<i>l.s.</i>	1	\$ 50,000	\$ 50,000	
					\$ 50,000
					Subtotal (rounded) \$ 1,385,400
				Contingency Allowance 25%	\$346,350
				Total (Rounded)	\$1,732,000

Notes:

1. Common excavation includes all machine excavated materials (ie existing soils, brush, small trees and vegetation, gabion baskets & rock, etc)
2. Preliminary geotechnical review indicates presence of unstable soils. Estimate includes removing and replacing soils, intended to comply with Siesmic guidelines
3. Estimated costs carried for environmental mitigation, sediment & erosion control or Fisheries compensation. Design as proposed will be subject to Fisheries review for Hazardous Alteration, Disruption, Destruction elements.
4. Design intended to be compliant with Dike Maintenance Act via the BC MFLNRO, Inspector of Dikes.
5. Assuming 8 week construction duration expected.

City of Courtenay
Construction Cost Estimate

Section 3 - Courtenay Hotel Site Dike & Floodway

150 l.m. Earthberm, raise roads and culverts

<i>Description</i>	<i>Unit</i>	<i>Quantity</i>	<i>Unit Price</i>	<i>Sub total</i>	<i>Total</i>
REMOVALS					
<i>Remove & Dispose Off-Site: Asphalt & Concrete</i>	<i>sq. m</i>	<i>250</i>	<i>\$ 10</i>	<i>\$ 2,500</i>	
<i>Common Excavation and Disposal</i> ^{Note 1}	<i>cu.m.</i>	<i>6,500</i>	<i>\$ 20</i>	<i>\$ 130,000</i>	
					<i>\$ 132,500</i>
DIKING					
<i>On site soil reuse</i>	<i>cu.m.</i>	<i>1,500</i>	<i>\$ 25</i>	<i>\$ 37,500</i>	
<i>Final Grading, Topsoil and Hydroseeding</i>	<i>l.s.</i>	<i>1</i>	<i>\$ 20,000</i>	<i>\$ 20,000</i>	
<i>Traffic Control (3 TCP) & Security</i>	<i>day</i>	<i>60</i>	<i>\$ 1,000</i>	<i>\$ 60,000</i>	
<i>Landscaping Allowance</i>	<i>l.s.</i>	<i>1</i>	<i>\$ 25,000</i>	<i>\$ 25,000</i>	
<i>Irrigation Within Raised Reinforced Earth Berm Dike</i>	<i>l.s.</i>	<i>1</i>	<i>\$ 20,000</i>	<i>\$ 20,000</i>	
					<i>\$ 162,500</i>
RAISE OLD ISLAND HIGHWAY AND INSTALL CULVERTS					
<i>Raise road 1.6m</i>	<i>l.s.</i>	<i>1</i>	<i>\$ 250,000</i>	<i>\$ 250,000</i>	
<i>Traffic Signals</i>	<i>l.s.</i>	<i>1</i>	<i>\$ 200,000</i>	<i>\$ 200,000</i>	
<i>Culverts</i>	<i>ea</i>	<i>5</i>	<i>\$ 35,000</i>	<i>\$ 175,000</i>	
<i>Utility re-locatation allowance</i>	<i>l.s.</i>	<i>1</i>	<i>\$ 100,000</i>	<i>\$ 100,000</i>	
					<i>\$ 725,000</i>
RAISE HIGHWAY 19A AND INSTALL CULVERTS					
<i>Raise road 1.6m</i>	<i>l.s.</i>	<i>1</i>	<i>\$ 75,000</i>	<i>\$ 75,000</i>	
<i>Culverts</i>	<i>ea</i>	<i>5</i>	<i>\$ 40,000</i>	<i>\$ 200,000</i>	
<i>Utility re-locatation allowance</i>	<i>l.s.</i>	<i>1</i>	<i>\$ 50,000</i>	<i>\$ 50,000</i>	
					<i>\$ 325,000</i>
					<i>\$ 1,345,000</i>
					<i>Contingency Allowance 25%</i>
					<i>\$336,250</i>
					<i>\$1,682,000</i>

Notes:

1. Common excavation includes all machine excavated materials (ie existing soils, brush, small trees and vegetation, gabion baskets & rock, etc)
4. Design intended to be compliant with Dike Maintenance Act via the BC MFLNRO, Inspector of Dikes.
5. Assuming 12 week construction duration expected.

**City of Courtenay
Construction Cost Estimate**

Section 4 - Hwy 19A Dike
FLOOD PROTECTION ON HWY 19A

<i>Description</i>	<i>Unit</i>	<i>Quantity</i>	<i>Unit Price</i>	<i>Sub total</i>	<i>Total</i>
REMOVALS					
<i>On-Site Windrow of Topsoil & Redress Berm</i>	<i>cu.m.</i>	<i>1,275</i>	<i>\$ 15</i>	<i>\$ 19,125</i>	
<i>Remove Ex. Barbed Wire Fencing</i>	<i>l.s.</i>	<i>1</i>	<i>\$ 5,000</i>	<i>\$ 5,000</i>	
<i>Remove & Dispose Off-Site: Asphalt & Concrete</i>	<i>sq. m</i>	<i>2,250</i>	<i>\$ 10</i>	<i>\$ 22,500</i>	
					<i>\$ 46,600</i>
ROAD AND DIKING					
<i>Roadside Earth Dike (4:1 Sideslopes - 2.0m top width)</i>	<i>l.m.</i>	<i>615</i>	<i>\$ 150</i>	<i>\$ 92,250</i>	
<i>Earth Dike (4:1 Sideslopes - 4.0m top width)</i>	<i>l.m.</i>	<i>320</i>	<i>\$ 300</i>	<i>\$ 96,000</i>	
<i>Import Pit Run Gravel (200mm) - Dike-top Road</i>	<i>sq.m.</i>	<i>1,250</i>	<i>\$ 15</i>	<i>\$ 18,750</i>	
<i>Crushed gravel base (100mm) - Dike-top Road</i>	<i>sq.m.</i>	<i>1,250</i>	<i>\$ 12</i>	<i>\$ 15,000</i>	
<i>Finish grading & Hydroseeding</i>	<i>sq.m.</i>	<i>8,500</i>	<i>\$ 4</i>	<i>\$ 34,000</i>	
<i>Traffic Control (3 TCP) & Security</i>	<i>day</i>	<i>60</i>	<i>\$ 1,000</i>	<i>\$ 60,000</i>	
					<i>\$ 316,000</i>
SANITARY SEWER					
<i>Raise / Re-build Manholes</i>	<i>ea</i>	<i>12</i>	<i>\$ 2,000</i>	<i>\$ 24,000</i>	
					<i>\$ 24,000</i>
DRAINAGE					
<i>Install CB, Lead, Flap Valve & Headwall</i>	<i>ea</i>	<i>12</i>	<i>\$ 5,000</i>	<i>\$ 60,000</i>	
					<i>\$ 60,000</i>
MISCELLANEOUS					
<i>Allowance for Fisheries compensation for HADD ^{Note 3}</i>	<i>l.s.</i>	<i>1</i>	<i>\$ 30,000</i>	<i>\$ 30,000</i>	
<i>Sediment and Erosion Control Allowance</i>	<i>l.s.</i>	<i>1</i>	<i>\$ 25,000</i>	<i>\$ 25,000</i>	
<i>Relocate Ex. Crown Isle Signage</i>	<i>l.s.</i>	<i>1</i>	<i>\$ 5,000</i>	<i>\$ 5,000</i>	
					<i>\$ 60,000</i>
					<i>Subtotal (rounded) \$ 507,000</i>
				<i>Contingency Allowance 25%</i>	<i>\$126,750</i>
					<i>Total (Rounded) \$634,000</i>

Notes:

1. Common excavation includes all machine excavated materials (ie existing soils, brush, small trees and vegetation, gabion baskets & rock, etc)
2. Geotechnical review needed to confirm presence of stable soils sufficient to support dike construction. No allowance included to reinforce or replace foundation soils. Assumed works within this phase to not qualify as "High Consequence" diking.
3. Estimated costs carried for environmental mitigation, sediment & erosion control or Fisheries compensation. Design as proposed will be subject to Fisheries review for Hazardous Alteration, Disruption, Destruction elements.
4. Design intended to be compliant with Dike Maintenance Act via the BC MFLNRO, Inspector of Dikes.
5. No land owner compensation allowance for occupation of dike on farmland.
6. Assumed 8 week construction period, stand alone, expected.
7. Timing and design of potential road upgrade / improvement projects (Hwy 19A four-laning & Hwy 19A/Tunner Drive) may alter diking scope and concept design.

City of Courtenay

Construction Cost Estimate - Summary for Option 2 - Full Ring Dike

Section 1 - Lewis Centre Dike

Estimated Construction Cost	\$ 763,000
Civil Engineering Design / Management / Inspection	\$ 75,000
Geotechnical Engineering Review / Report / Inspection	\$ 20,000
Archeological Monitoring	\$ 5,000
Environmental Review / Report / Permitting	\$ -
Subtotal	\$ 863,000

Section 2 - Old Island Highway Dike (Ryan Rd to Headquarters Rd)

Estimated Construction Cost	\$ 1,732,000
Civil Engineering Design / Management / Inspection	\$ 170,000
Geotechnical Engineering Review / Report / Inspection	\$ 25,000
Archeological Monitoring	\$ 5,000
Environmental Review / Report / Permitting	\$ 20,000
Subtotal	\$ 1,952,000

Section 3 - Courtenay Slough Dike

Estimated Construction Cost	\$ 1,605,000
Civil Engineering Design / Management / Inspection	\$ 160,000
Geotechnical Engineering Review / Report / Inspection	\$ 30,000
Archeological Monitoring	\$ 5,000
Environmental Review / Report / Permitting	\$ 20,000
Subtotal	\$ 1,820,000

Section 4 - Hwy 19A Dike

Estimated Construction Cost	\$ 1,061,000
Civil Engineering Design / Management / Inspection	\$ 100,000
Geotechnical Engineering Review / Report / Inspection	\$ 20,000
Archeological Monitoring	\$ 5,000
Land Survey / Legal Cost	\$ 25,000
Environmental Review / Report / Permitting	\$ 5,000
Subtotal	\$ 1,216,000

Total Budget	\$ 5,851,000
---------------------	---------------------

**City of Courtenay
Construction Cost Estimate**

Section 1 - Lewis Centre Dike

<i>Description</i>	<i>Unit</i>	<i>Quantity</i>	<i>Unit Price</i>	<i>Sub total</i>	<i>Total</i>
<i>REMOVALS</i>					
<i>Removals Allowance</i>	<i>l.s.</i>	<i>1</i>	<i>\$ 32,500</i>	<i>\$ 32,500</i>	
					<i>\$ 33,000</i>
<i>Earthen Dikes</i>					
<i>Base Prep</i>	<i>sq.m.</i>	<i>3,500</i>	<i>\$ 10</i>	<i>\$ 35,000</i>	
<i>Import Fill placed and compacted</i>	<i>cu.m.</i>	<i>6,000</i>	<i>\$ 50</i>	<i>\$ 300,000</i>	
<i>Top Soil and Hydroseeding</i>	<i>sq.m.</i>	<i>6,500</i>	<i>\$ 15</i>	<i>\$ 97,500</i>	
<i>Traffic Control (3 TCP) & Security</i>	<i>day</i>	<i>25</i>	<i>\$ 1,500</i>	<i>\$ 37,500</i>	
<i>Landscaping Allowance</i>	<i>l.s.</i>	<i>1</i>	<i>\$ 20,000</i>	<i>\$ 20,000</i>	
					<i>\$ 490,000</i>
<i>Combination Retaining Walls / Berms</i>					
<i>Base Prep</i>	<i>l.s.</i>	<i>1</i>	<i>\$ 10,000</i>	<i>\$ 10,000</i>	
<i>Cast-in-Place Wall East Side of Main Parking Lot</i>	<i>l.m.</i>	<i>40</i>	<i>\$ 500</i>	<i>\$ 20,000</i>	
<i>Raised Walkway Along Outdoor Pool</i>	<i>l.m.</i>	<i>40</i>	<i>\$ 800</i>	<i>\$ 32,000</i>	
<i>Landscaped Berm Around New Parking Lot</i>	<i>l.m.</i>	<i>50</i>	<i>\$ 500</i>	<i>\$ 25,000</i>	
					<i>\$ 87,000</i>
				<i>Subtotal (rounded)</i>	<i>\$ 610,000</i>
			<i>Contingency Allowance 25%</i>	<i>\$152,500</i>	
				<i>Total</i>	<i>\$ 762,500</i>

Notes:

1. No geotechnical review undertaken. Structural design and seismic analysis recommendations may alter design.
2. No costs carried for environmental mitigation, nor sediment & erosion control.
3. Design intended to be compliant with Dike Maintenance Act via the BC MFLNRO, Inspector of Dikes.

**City of Courtenay
Construction Cost Estimate**

Section 2 - Old Island Highway Dike (Ryan Rd to Headquarters Rd)

285 l.m. Raised Reinforced Earth Berm & Walkway

<i>Description</i>	<i>Unit</i>	<i>Quantity</i>	<i>Unit Price</i>	<i>Sub total</i>	<i>Total</i>
REMOVALS					
Remove & Dispose Off-Site: Tree Falling & Removal	<i>l.s.</i>	1	\$ 5,000	\$ 5,000	
Remove & Dispose Off-Site: Asphalt & Concrete	<i>sq. m</i>	1,500	\$ 10	\$ 15,000	
Common Excavation and Disposal ^{Note 1}	<i>cu.m.</i>	7,500	\$ 20	\$ 150,000	
Remove Off-Site Ex. Barricades	<i>l.s.</i>	1	\$ 5,000	\$ 5,000	
					\$ 175,000
ROAD & WALKWAY					
Import Pit Run Gravel (Structural Bulk Fill)	<i>cu.m.</i>	4,500	\$ 25	\$ 112,500	
Import Pit Run Gravel (230mm)	<i>sq.m.</i>	1,500	\$ 15	\$ 22,500	
Crushed gravel base (130mm) - Roadway	<i>sq.m.</i>	1,500	\$ 12	\$ 18,000	
Asphalt paving (100mm)	<i>sq.m.</i>	1,500	\$ 80	\$ 120,000	
Extruded Barrier Curb	<i>l.m.</i>	250	\$ 100	\$ 25,000	
Raised Reinforced Earth Berm & Walkway	<i>l.m.</i>	285	\$ 960	\$ 273,600	
5 course Lock-Block Retaining Wall	<i>sq.m.</i>	950	\$ 450	\$ 427,500	
Final Grading, Topsoil and Hydroseeding	<i>l.s.</i>	1	\$ 3,000	\$ 3,000	
Traffic Control (3 TCP) & Security	<i>day</i>	40	\$ 1,000	\$ 40,000	
Class 250kg Rip Rap	<i>cu.m.</i>	375	\$ 70	\$ 26,250	
Signage & Lines	<i>l.s.</i>	1	\$ 5,000	\$ 5,000	
					\$ 1,073,400
WATER MAIN					
Replace 200mm dia PVC DR18 Watermain	<i>l.m.</i>	235	\$ 200	\$ 47,000	
Install 25mm dia Air Valve	<i>ea</i>	1	\$ 5,000	\$ 5,000	
Connections, testing, etc.,	<i>ea</i>	1	\$ 10,000	\$ 10,000	
					\$ 62,000
DRAINAGE					
Install CB, Lead, Flap Valve & Headwall	<i>ea</i>	5	\$ 5,000	\$ 25,000	
					\$ 25,000
FISHERIES COMPENSATION					
Allowance for Fisheries compensation for HADD ^{Note 3}	<i>l.s.</i>	1	\$ 50,000	\$ 50,000	
					\$ 50,000
					Subtotal (rounded) \$ 1,385,400
				Contingency Allowance 25%	\$346,350
				Total (Rounded)	\$1,732,000

Notes:

1. Common excavation includes all machine excavated materials (ie existing soils, brush, small trees and vegetation, gabion baskets & rock, etc)
2. Preliminary geotechnical review indicates presence of unstable soils. Estimate includes removing and replacing soils, intended to comply with Siesmic guidelines
3. Estimated costs carried for environmental mitigation, sediment & erosion control or Fisheries compensation. Design as proposed will be subject to Fisheries review for Hazardous Alteration, Disruption, Destruction elements.
4. Design intended to be compliant with Dike Maintenance Act via the BC MFLNRO, Inspector of Dikes.
5. Assuming 8 week construction duration expected.

City of Courtenay
Construction Cost Estimate

Section 3 - Courtenay Slough Dike

300 l.m. Raised Reinforced Earth Berm & 70m Concrete Wall

<i>Description</i>	<i>Unit</i>	<i>Quantity</i>	<i>Unit Price</i>	<i>Sub total</i>	<i>Total</i>
REMOVALS					
<i>Remove & Dispose Off-Site: Asphalt & Concrete</i>	<i>sq. m</i>	<i>1,570</i>	<i>\$ 10</i>	<i>\$ 15,700</i>	
<i>Common Excavation and Disposal</i> ^{Note 1}	<i>cu.m.</i>	<i>5,000</i>	<i>\$ 20</i>	<i>\$ 100,000</i>	
					<i>\$ 115,700</i>
ROAD & DIKING					
<i>Import Pit Run Gravel (Structural Bulk Fill)</i>	<i>cu.m.</i>	<i>5,000</i>	<i>\$ 25</i>	<i>\$ 125,000</i>	
<i>Import Pit Run Gravel (230mm)</i>	<i>sq.m.</i>	<i>875</i>	<i>\$ 15</i>	<i>\$ 13,125</i>	
<i>Crushed gravel base (130mm) - Roadway</i>	<i>sq.m.</i>	<i>875</i>	<i>\$ 12</i>	<i>\$ 10,500</i>	
<i>Concrete Sidewalk w/Raised Wall</i>	<i>l.m.</i>	<i>75</i>	<i>\$ 875</i>	<i>\$ 65,625</i>	
<i>Asphalt paving (50mm)</i>	<i>sq.m.</i>	<i>875</i>	<i>\$ 40</i>	<i>\$ 35,000</i>	
<i>Extruded Barrier Curb</i>	<i>l.m.</i>	<i>75</i>	<i>\$ 100</i>	<i>\$ 7,500</i>	
<i>Steel Handrails (one side)</i>	<i>l.m.</i>	<i>200</i>	<i>\$ 100</i>	<i>\$ 20,000</i>	
<i>Raised Reinforced Earth Berm Dike</i>	<i>l.m.</i>	<i>300</i>	<i>\$ 960</i>	<i>\$ 288,000</i>	
<i>5 course Lock-Block Retaining Wall</i>	<i>sq.m.</i>	<i>950</i>	<i>\$ 450</i>	<i>\$ 427,500</i>	
<i>Final Grading, Topsoil and Hydroseeding</i>	<i>l.s.</i>	<i>1</i>	<i>\$ 15,000</i>	<i>\$ 15,000</i>	
<i>Traffic Control (3 TCP) & Security</i>	<i>day</i>	<i>45</i>	<i>\$ 1,000</i>	<i>\$ 45,000</i>	
<i>Class 250kg Rip Rap</i>	<i>cu.m.</i>	<i>225</i>	<i>\$ 70</i>	<i>\$ 15,750</i>	
<i>Signage & Lines</i>	<i>l.s.</i>	<i>1</i>	<i>\$ 5,000</i>	<i>\$ 5,000</i>	
<i>Irrigation Within Raised Reinforced Earth Berm Dike</i>	<i>l.s.</i>	<i>1</i>	<i>\$ 20,000</i>	<i>\$ 20,000</i>	
					<i>\$ 1,093,000</i>
DRAINAGE					
<i>Install CB, Lead, Flap Valve & Headwall</i>	<i>ea</i>	<i>5</i>	<i>\$ 5,000</i>	<i>\$ 25,000</i>	
					<i>\$ 25,000</i>
FISHERIES COMPENSATION					
<i>Allowance for Fisheries compensation for HADD</i> ^{Note 3}	<i>l.s.</i>	<i>1</i>	<i>\$ 50,000</i>	<i>\$ 50,000</i>	
					<i>\$ 50,000</i>
					<i>\$ 1,283,700</i>
				<i>Contingency Allowance 25%</i>	<i>\$320,925</i>
				<i>Total (Rounded)</i>	<i>\$1,605,000</i>

Notes:

1. Common excavation includes all machine excavated materials (ie existing soils, brush, small trees and vegetation, gabion baskets & rock, etc)
2. Geotechnical review to be conducted. Assume presence of unstable soils. Estimate includes removing and replacing soils, intended to comply with Siesmic guidelines
3. Estimated costs carried for environmental mitigation, sediment & erosion control or Fisheries compensation. Design as proposed will be subject to Fisheries review for Hazardous Alteration, Disruption, Destruction elements.
4. Design intended to be compliant with Dike Maintenance Act via the BC MFLNRO, Inspector of Dikes.
5. Assuming 6 week construction duration expected.

City of Courtenay
Construction Cost Estimate

Section 4 - Hwy 19A Dike

FLOOD PROTECTION ON HWY 19A TO COMOX ROAD

Description	Unit	Quantity	Unit Price	Sub total	Total
REMOVALS					
On-Site Windrow of Topsoil & Redress Berm	cu.m.	1,275	\$ 15	\$ 19,125	
Remove Ex. Barbed Wire Fencing	l.s.	1	\$ 5,000	\$ 5,000	
Remove & Dispose Off-Site: Asphalt & Concrete	sq. m	2,250	\$ 10	\$ 22,500	
					\$ 46,600
ROAD AND DIKING					
Roadside Earth Dike (4:1 Sideslopes - 2.0m top width)	l.m.	750	\$ 150	\$ 112,500	
Earth Dike (4:1 Sideslopes - 4.0m top width)	l.m.	400	\$ 300	\$ 120,000	
Import Pit Run Gravel (200mm) - Dike-top Road	sq.m.	1,600	\$ 15	\$ 24,000	
Crushed gravel base (100mm) - Dike-top Road	sq.m.	1,600	\$ 12	\$ 19,200	
Import Pit Run Gravel (300mm) - MoTI Spec	sq.m.	2,250	\$ 17	\$ 38,250	
Crushed gravel base (150mm) - MoTI Spec	sq.m.	2,250	\$ 15	\$ 33,750	
Asphalt paving (100mm) - MoTI Spec	sq.m.	2,250	\$ 60	\$ 135,000	
Extruded Barrier Curb	l.m.	50	\$ 100	\$ 5,000	
Concrete Sidewalk	l.m.	50	\$ 120	\$ 6,000	
Finish grading & Hydroseeding	sq.m.	10,000	\$ 4	\$ 40,000	
Traffic Control (3 TCP) & Security	day	60	\$ 1,000	\$ 60,000	
Signage & Lines	l.s.	1	\$ 3,000	\$ 3,000	
Barbed Wire Fence	l.m.	1,100	\$ 15	\$ 16,500	
Landscaping Restoration - Comox Road Intersection	l.s.	1	\$ 10,000	\$ 10,000	
					\$ 623,200
SANITARY SEWER					
Raise / Re-build Manholes	ea	17	\$ 2,000	\$ 34,000	
					\$ 34,000
DRAINAGE					
Install CB, Lead, Flap Valve & Headwall	ea	17	\$ 5,000	\$ 85,000	
					\$ 85,000
MISCELLANEOUS					
Allowance for Fisheries compensation for HADD ^{Note 3}	l.s.	1	\$ 30,000	\$ 30,000	
Sediment and Erosion Control Allowance	l.s.	1	\$ 25,000	\$ 25,000	
Relocate Ex. Crown Isle Signage	l.s.	1	\$ 5,000	\$ 5,000	
					\$ 60,000
					Subtotal (rounded) \$ 848,800
				Contingency Allowance 25%	\$212,200
				Total (Rounded)	\$1,061,000

Notes:

1. Common excavation includes all machine excavated materials (ie existing soils, brush, small trees and vegetation, gabion baskets & rock, etc)
2. Geotechnical review needed to confirm presence of stable soils sufficient to support dike construction. No allowance included to reinforce or replace foundation soils. Assumed works within this phase to not qualify as "High Consequence" diking.
3. Estimated costs carried for environmental mitigation, sediment & erosion control or Fisheries compensation. Design as proposed will be subject to Fisheries review for Hazardous Alteration, Disruption, Destruction elements.
4. Design intended to be compliant with Dike Maintenance Act via the BC MFLNRO, Inspector of Dikes.
5. No land owner compensation allowance for occupation of dike on farmland.
6. Assumed 8 week construction period, stand alone, expected.
7. Timing and design of potential road upgrade / improvement projects (Hwy 19A four-laning & Hwy 19A/Tunner Drive) may alter diking scope and concept design.

Tsolum River Flood Wall
Construction Cost Estimate
City of Courtenay

11-Jan-11

<i>Description</i>	<i>Unit</i>	<i>Quantity</i>	<i>Unit Price</i>	<i>Sub total</i>	<i>Total</i>
REMOVALS					
<i>Remove & Dispose Off-Site:Vegetation</i>	<i>l.s.</i>	<i>1</i>	<i>\$ 2,750</i>	<i>\$ 2,750</i>	
<i>Remove & Dispose Off-Site: Asphalt & Concrete</i>	<i>sq. m</i>	<i>2,000</i>	<i>\$ 6</i>	<i>\$ 12,000</i>	
<i>Common Excavation and Disposal</i>	<i>cu.m.</i>	<i>500</i>	<i>\$ 16</i>	<i>\$ 8,000</i>	
<i>Remove Off-Site Ex. Barricades</i>	<i>l.s.</i>	<i>1</i>	<i>\$ 1,000</i>	<i>\$ 1,000</i>	
					<i>\$ 24,000</i>
ROAD & WALKWAY					
<i>Import Pit Run Gravel (230mm)</i>	<i>sq.m.</i>	<i>350</i>	<i>\$ 15</i>	<i>\$ 5,250</i>	
<i>Crushed gravel base (130mm) - Roadway</i>	<i>sq.m.</i>	<i>350</i>	<i>\$ 13</i>	<i>\$ 4,550</i>	
<i>Crushed gravel base (200mm) - Retaining Wall</i>	<i>sq.m.</i>	<i>1,250</i>	<i>\$ 15</i>	<i>\$ 18,750</i>	
<i>Asphalt paving (75mm)</i>	<i>sq.m.</i>	<i>375</i>	<i>\$ 55</i>	<i>\$ 20,625</i>	
<i>Extruded Barrier Curb</i>	<i>l.m.</i>	<i>250</i>	<i>\$ 95</i>	<i>\$ 23,750</i>	
<i>1.2m High Concrete Integral Retaining Wall & Sidewalk</i>	<i>l.m.</i>	<i>470</i>	<i>\$ 450</i>	<i>\$ 211,500</i>	
<i>Concrete Sidewalk</i>	<i>sq.m.</i>	<i>80</i>	<i>\$ 65</i>	<i>\$ 5,200</i>	
<i>Boulevard Grading, Topsoil and Hydroseeding</i>	<i>l.s.</i>	<i>1</i>	<i>\$ 3,000</i>	<i>\$ 3,000</i>	
<i>Traffic Control (3 TCP)</i>	<i>day</i>	<i>10</i>	<i>\$ 1,000</i>	<i>\$ 10,000</i>	
<i>Signage & Lines</i>	<i>l.s.</i>	<i>1</i>	<i>\$ 1,500</i>	<i>\$ 1,500</i>	
					<i>\$ 305,000</i>
DRAINAGE					
<i>Install CB, Lead, Flap Valve & Headwall</i>	<i>ea</i>	<i>6</i>	<i>\$ 2,500</i>	<i>\$ 15,000</i>	
<i>Install Walkway Basin, Lead, Flap Valve & Headwall</i>	<i>ea</i>	<i>2</i>	<i>\$ 5,000</i>	<i>\$ 10,000</i>	
					<i>\$ 25,000</i>
				<i>Subtotal</i>	<i>\$ 354,000</i>
				<i>Contingency Allowance</i>	<i>\$96,000</i>
				<i>Total (Rounded)</i>	<i>\$450,000</i>