



BRITISH
COLUMBIA

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Ministry of Transportation and Infrastructure

**CONSTRUCTION AND
REHABILITATION COST GUIDE**

July 2012

CONSTRUCTION AND REHABILITATION COST GUIDE

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INTRODUCTION

This booklet provides the reader with a construction cost guideline for new construction and rehabilitation work based only on historic costs.

The user of this booklet must realize that the comparative costs for the construction work is determined by many components related to design, materials, location, trends and construction methods which can all vary widely throughout the Province.

Unless otherwise stated, this booklet excludes property acquisition, planning and evaluation, surveys, supervision, traffic management, utilities and contingencies.

Where possible, we have provided for the reader a range of cost values from the low tender, or from the construction value, for various types of construction and rehabilitation work.

CONCRETE BARRIER COSTS

Concrete Roadside Barrier (CRB - 690mm)	
average cost to supply and install	\$175/m
Shoulder preparation (supply material, haul and place)	
average cost	\$135/m ²
Concrete Median Barrier (CMB - 810mm)	
average cost to supply and install	\$165/m
Concrete Transition Barrier (CTB - 690mm to 460mm)	
average cost to supply and install	\$135/m
Concrete Drainage Barrier (CDB – 690mm)	
average supply and install	\$190/m
Concrete Bull Nose (CBN – 460mm)	
average cost to supply and install	\$225/m
Bridge Parapet Transition (BPT – 810mm)	
average cost to supply and install	\$380/m

BRIDGE STRUCTURE COATING

costs are shown in 2012 dollars

Major structures Recoating - Lions Gate (2004 - 2006)

cost \$23.3 million (\$315/m²)

Truss coating - Ingram Bridge (2005)

cost\$565,000 (\$365/m²)

BRIDGE DECK RESURFACING COSTS

Deck Resurfacing-high performance concrete overlay

Region 1\$560 - \$1000/m²

Silica fume modified high performance concrete

Region 2 \$680 - \$950/m²

Silica fume modified high performance concrete

Region 3 \$620 – 1100/m²

Hot applied rubberized asphalt membrane.....\$560/m²

Costs can vary due to the following:

- Size of structure
- Grouping of structures
- Percentage of partial and full depth deck repairs
- Complexity of traffic management
- Remoteness of bridge site

Note: Associated Ministry Estimates are included

STRUCTURE CONSTRUCTION COSTS

(Based on bridge deck surface area)

2007 costs are shown in to 2012 dollars

Low level River Crossings and Road Overpass Crossings:

Regions 1, 2 \$2,100 - \$4,100/m²

Region 3 \$2,000 - \$3,300/m²

High level River Crossings:

Regions 1, 2 \$2,600 - \$4,200/m²

Region 3 \$3,700 - \$5,800/m²

Low Volume Road

Creek Crossings \$2,100 - \$3,100/m²

Note: On replacement bridge projects, the above costs are based on structure cost and include mobilization, traffic management & quality management where applicable. Demolition of existing bridge is not included.

Structure Examples

Roberts Bank Rail Corridor - 41B Street Overhead at Deltaport Way

Award Date: October 2010

Completion Date: December 2011

South Coast Region

Works include construction of a 150 metre long 2 lane overpass, pile driving, steel fabrication, preloading, electrical, grading and paving.

bridge construction cost	\$4,512,358
contingencies	\$1,780,900
engineering	\$960,000
materials supplied by MoTI	\$48,000
miscellaneous	\$75,000
utility Relocation	\$68,000
total contract costs	\$12,219,465
bridge construction cost/m2	\$2,577

Highway 3A, Akokli Creek Bridge No. 0957 Replacement-Structure:

Award Date: February 2010

Completion Date: December 2011

Southern Interior Region

The bridge replacement includes a two lane, single span, 51.0 meter long steel box girder bridge on cast in place abutments and a cast in place concrete deck

bridge construction cost	\$3,687,000
contingencies	\$400,000
engineering	\$250,000
miscellaneous	\$1,035,362
total contract costs	\$5,377,362
bridge construction cost/m ²	\$3,287

HWY 14 - Sombrio No. 1 Bridge Replacement Structure No. 1494 and Roadworks

Award Date: March 2012

Completion Date: October 2012

South Coast Region

The project includes the Construction of a 2 span - 124m long steel girder bridge with Cast-in-place abutments including 1.2 km of approach roadwork. The design, supply and installation of MSE walls - north and south bound abutments. The work also consists of but is not limited to Type D and A excavation, aggregate production, Quality and Traffic Management, and the surface deformation repairs, asphalt paving and shouldering of 5.4 km of Highway 14.

bridge construction cost	\$9,817,700
contingencies	\$255,815
engineering	\$250,000
miscellaneous	\$1,963,000
utility Relocation	\$10,000
total contract costs	\$12,296,515
bridge construction costs/m ²	\$6,797

INTERCHANGES

1992 costs are shown in 2012 dollars

Rural Interchange

A diamond, multi-plate underpass, minimum design standards

cost range..... \$4,300,000 - \$8,500,000

Urban Interchange

A diamond, partial cloverleaf, trumpet, or directional interchange, concrete structures, high multiplate pipe underpass.

cost range..... \$22,050,000 - \$35,300,000

Hwy 91A Queensborough Interchange

North end of the Queensborough Bridge - Marine Way Flyover – Lower Mainland

Completion Date: October 2008

Work consisted of:

Single steel span pedestrian bridge. Six span pile foundation concrete viaduct. Concrete bridge demolition. Grading, drainage, paving, electrical, traffic signals, signs, landscaping pavement markings.

South Coast Region

Conventional contracting methods unless otherwise noted.

2008 costs are shown in 2012 dollars

	2008	2012
contract cost	\$19,350,000	\$20,600,000
contingencies	\$1,100,000	\$1,172,000
engineering	\$2,100,000	\$2,337,500
ministry materials	\$55,000	\$58,600
miscellaneous	\$470,000	\$500,760
utility relocation	\$150,000	\$160,000
total	\$23,225,000	\$24,828,860

Highway 17/ McTavish Road Interchange - Pedestrian Overpass

Award Date: April 2010

Completion Date: June 2011

South Coast Region

Work consisted of:

Layout of work, quality management, erosion control, traffic management, retaining wall construction, modification and installation of new and existing storm sewers and water main, Type D excavation, supply and install of signs, new sidewalk, curb and gutter, fence construction, supply and install of concrete barrier, construction of piling, reinforced concrete foundations, abutments, columns, superstructure and decks for roadway and pedestrian structure; Approx. area: 226m²

pedestrian o/p \$ only, associated min estimates at 14%

contract cost	\$1,711,000
contingencies	\$94,500
engineering	\$94,500
material	\$28,210
miscellaneous	\$149,380
total contract costs	\$2,077,590

CURB AND GUTTER CONSTRUCTION COSTS

2006 costs are shown in 2012 dollars

2-Lane Highway.....\$108/m

..(Includes remove/dispose asphalt pavement)\$240/m

4-Lane Highway.....\$108/m

Slip form only. When Curb and Gutter work includes different aspects such as landscaping, utility work or electrical work the cost per metre will vary depending on the additional work

SIDEWALK COSTS

1.5m wide concrete sidewalk \$65 m²

1.8m wide concrete sidewalk\$75 m²

Sidewalk costs do not include such things as: remove and dispose of existing sidewalks, new driveway letdowns, and other work such as landscaping, utility work, will vary the cost per sq. metre depending on these additional works.

FENCING COSTS

Standard Wire Fence

Average cost for fencing

Type A, B, or C range fence, wire fabric or barbed wire,
mixed wood and steel posts

Type A, B wire fabric \$25-\$40/m

Type C barbed wire \$15-\$20/m

Type D chain link \$95-\$125/m

Wildlife Exclusion Fencing

2007 costs are shown in 2012 dollars

2.4 m high heavy gauge Paige wire, mixed wood and steel
posts.

Flat to rolling terrain with no rock outcroppings

cost \$37-\$47/m

Rocky conditions where drilling and metal posts are required

cost \$80-\$90/m

*Note: Fencing costs shown are per side of highway. Contractor
supplied material and labour costs included.*

Fencing Costs (continued)

Bridge Sidewalk Fencing

costs are shown in 2012 dollars

	Qty	Avg Price	Award Price
2 Rail Sidewalk Fence (2008 \$)	36	\$245	\$168
3 Rail Sidewalk Fence (Gal)(2010)	113	\$185	\$194
3 Rail Sidewalk Fence (Blk)(2010)	123	\$198	\$197

2 Rail Fence: Hwy 1 Stocking Creek 16198-0001(May 2008)

3 Rail Sidewalk Fence: SS2009 – see amendment (SS741-07-01) McTavish Interchange 04338-0001 (Apr 2010)

The numbers reflected above are based on different quantities and market conditions for each identified year

GRADING CONSTRUCTION COSTS

2 - Lane Low Volume Road Construction:

Easy Conditions..... \$525,000 - \$840,000/km

Moderate Conditions.....\$840,000 - \$1,000,000/km

Difficult Conditions.....\$1,000,000 - \$2,100,000/km

Very Difficult Conditions..\$2,100,000 - \$3,150,000/km

2 - Lane High Volume Road Construction:

Easy Conditions.....\$840,000 - \$1,470,000/km

Moderate Conditions.....\$1,470,000 - \$2,620,000/km

Difficult Conditions.....\$2,620,000 - \$3,150,000/km

Very Difficult Conditions.\$3,150,000 - \$5,000,000/km

4 - Lane High Volume Road Construction:

Easy Conditions.....\$1,500,000 - \$2,750,000/km

Moderate Conditions.....\$2,750,000 - \$3,500,000/km

Difficult Conditions.....\$3,500,000 - \$5,000,000/km

Very Difficult Conditions..\$5,000,000 - \$10,500,000/km

Note: The above range of costs for highway construction include construction, contingencies, engineering, materials supplied by MOT, miscellaneous and utility relocation but does not include engineering design or property acquisition

Highway 97 Plett Road to Stone Creek, Bridge Construction and Four Laning

Award Date: February 2010

Completed: March 2011

Northern Region

8 lane km

Work consisted of:

New bridge and four lane construction on Highway 97 from Plett Road to Stone Creek Bridge. Approximately 2 kilometers of 4-lane highway construction, 2 intersections, bridge and approaches. Hydro and Telus pole moves, property acquisition, creek channelization and riprap, gravel crushing , waste disposal management.

contract cost	\$12,064,797
ministry materials	\$20,000
miscellaneous	\$209,000
utility relocation	\$116,300

total contract costs \$14,092,000

cost per lane km \$1,761,500

Highway 7 Rapid Bus Lane - Drainage, Grading, Paving and Electrical

Award Date: August 2010

Completed: March 2011

South Coast Region

1.58 lane km

Work consisted of:

Drainage, waterworks, grading, paving and electrical

contract cost	\$5,131,141
ministry materials	\$35,000
utility relocation	\$245,875
contingencies	\$650,000

total contract costs \$6,062,016

cost per lane km \$3,836,719

Highway No.97A - Enderby Intersection Improvements,
Grading and Paving 0.6 km

Southern Interior Region

Award Date: February 2009

Completed: November 2010

1.2 lane km

Work consisted of:

The work includes: Excavation (7,350 m³), Pavement milling and removal (14,900 m²), Granular Materials (5300 m³), Underground Electrical, Waterline upgrades, Sanitary Sewer upgrades, Storm Sewer Upgrades, Paving (2,600 tonnes), Lighting, Traffic Signals, and Signing.

contract cost	\$4,169,615
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total contract costs \$4,169,615

cost per lane km \$3,474,679

Highway 7 - Nelson Street Intersection Improvements

South Coast Region

Award Date: April 2011

Completed: November 2011

1.7 lane km

Work consisted of:

Four lane widening of Highway 7 from 2 lane 850 m west of Nelson Street Intersection with tie-in to 4 lane east of intersections. Nelson Street Intersection realignment. Works associated with improvements include: Surcharge removal, Clearing/Grubbing, Grading, Drainage, Paving/Pavement Marking, Signing. Electrical and Intersection Signalization.

contract cost	\$3,276,254
miscellaneous	\$57,092

total contract costs \$3,333,346

cost per lane km \$1,960,792

Highway 16 Tabor Mountain Passing Lane and Purden Ski Hill Road Intersection

Award Date: May 2012

Completed: September 2012

Northern Region

.685 Lane km

Work consisted of:

Quality Management, Survey Layout, Aggregate Production and Placement, Supply and Install Culvert Extensions, Pavement Removal, Supply and Apply Asphalt Concrete Pavement, Revegetative Seeding.

contract costs	\$1,596,762
contingencies	\$250,000
miscellaneous	\$386,400
total contracts costs:	\$2,233,162
cost per lane km	\$3,260,091

GROOVED RUMBLE STRIPS

Grooved Rumble strips are on the paved shoulder of the road. Generally 8-10 mm deep with a 300 mm radius by 140 mm wide, 300-400 mm apart.

average cost including traffic control:

shoulder \$575 /lin. km

centre line with median barrier \$613 /lin. km

double solid centre line \$647 /lin. km

(lin. km = linear kilometre)

LANDSCAPE ESTABLISHMENT COSTS

Rural Standard

Primarily the grading of existing soils, seeding to rough grass and naturalized/functional plantings; limited use of imported soils, decorative plants and bark mulch; usually no irrigation.

Suburban Standard

A mix of rural and urbanized conditions entailing significant use of imported or amended soils, seeding to mowed grass, upgraded planting and irrigation of shrubs and trees.

Urban Standard Landscaping

A more developed, premium level of landscaping with imported topsoil, significant plantings and bark mulching and/or aesthetic hard surfacing, seeding or sodding to lawn grade grass, and irrigation as required.

To clarify the parameters of the costs noted below:

2006 costs shown in 2012 dollars

the costs have been based on projects encompassing several hectares, but actual values may be highly variable

Landscape items: include supply and planting costs

unirrigated grass\$9.5 - \$11.5/m ²
irrigated lawn.....	\$20 - \$22/m ²
irrigated lawn with	
boulevard trees	\$28.5 - \$33.5/m ²
unirrigated plantations.....	\$22 - \$28.5/m ²
irrigated plantations.....	\$40 - \$57/m ²
decorative stamped concrete/pavers	\$84 - \$95.5/m ²
hydroseeding	\$0.75 - \$0.85 m ²

Hydroseeding –including base per/ha material application rates of 1,500kg mulch, 40kg tackifier, 75kg standard seed mix, and 300kg standard fertilizer

Note: The above landscape establishment costs, with the exception of general hydroseeding, usually includes a one year maintenance agreement, which is typically a standard requirement for MoT Landscaping Projects.

PAVEMENT REHABILITATION COSTS

2011/2012 dollars

Hot Mix Paving overlay 50mm (minimal base repair)			
Overlay Width	Life Expectancy	Cost / lane km	Average
Overlay width 1 lane only	15+years	\$100,500 - \$134,500	\$117,000

Pavement Rehabilitation (continued)

Mill and Fill (50 mm) (The recycled asphalt pavement is stockpiled locally)			
	Life Expectancy	Cost/ lane km	Average
1 Lane	15+ years	\$123,000 - \$168,000	\$145,500

Hot In Place Recycle with Add Mix and rejuvenating agent (50 mm depth)			
	Life Expectancy	Cost/ lane km	Average
1 lane	9-11 years	\$50,000 - 58,000	\$54,000

Milling & Placement of Milling on Side roads (50 mm depth)		
	Life Expectancy	Cost/ lane km
1 lane	7-10 years	\$62,500

Pavement Rehabilitation (continued)

Surface Treatments			
	Life Expectancy	Cost / One lane km	Average
Single Graded Aggregate Seal	3-7 years	\$20,000 - \$26,250	\$23,000
Graded Aggregate Double Seal	3-7 years	\$27,300 - \$31,500	\$29,400
Microsurfacing	7-11 years	\$36,750 - \$55,650	\$57,500

Note: All the above costs include pavement rehabilitation, project management, Ministry of Transportation site supervision, centre line marking, geotechnical evaluations, construction costs, labour, equipment and materials.

Pavement Rehabilitation examples

Asphalt Pavement SS-502 EPS HWY 3 & 5 Hope Overpass to Nicolum Creek Bridge (38.8 LKMs)

Award Date: April 2012

Completed: July 2012

Work consisted of:

Cold Milling and inlaying deteriorated sections of pavement,
and overlaying with asphalt pavement under SS 502 - EPS

contract cost	\$4,169,615
miscellaneous	\$1,079,500
engineering	\$311,000
ministry material	\$9,000

construction cost	\$5,107,917
cost per lane km	\$131,647

Asphalt Surfacing Highway No. 99, Regional Boundary to Long Cayoosh Bridge (15.4 Lane km)

Award Date: April 2010

Completed: September 2010

Work consisted of:

Asphalt Surfacing, Highway No. 99, Regional Boundary to Long Cayoosh Bridge (15.4 Lane Km). The Work consists of Quality Management, Survey Layout, Aggregate Production, Cold Milling Tie-ins, Supply, Install, Removal and Replacement of Concrete Roadside Barrier, Increased compaction and Shoulder Build up, Asphalt Pavement – Levelling Course, Asphalt Pavement – Top Lift – 16mm Class 1 Medium Mix, Asphalt Integral Curb and Spillways, and Shouldering.

contract cost	\$1,763,823
miscellaneous	\$85,000
contingencies	\$19,200
engineering	\$135,000

construction cost \$2,011,023

cost per lane km \$130,586

Highway 37N Single Sealcoat - Hodder Lake to Burrage Airstrip_ (181 Lane Km)

Award Date: April 2012

Completed: August 2012

Work consisted of:

Crushing of sealcoat aggregate and a single pass graded aggregate seal over 92 kilometres of Highway 37 from the Hodder Lake Rest Area to the top of the Burrage River Hill

- Single Seal Application 716,602 m²

contract cost	\$2,974,332
miscellaneous	\$365,000
engineering	\$150,000

construction cost \$3,489,332

cost per lane km \$19,300

Hot-In-Place Recycling, Kamloops Area, Trans Canada Highway 1, Tobiano To Highway No. 5 Junction (56.6 Lane Km) Hot-In-Place Recycling Hwy No. 1, Quartz Road to Walhachin Road (53.5 Lane Kms)

Award Date: February 2012

Completed: June 2012

Work consisted of:

Quality Management, Survey Layout, 16mm Aggregate Production, 16mm Asphalt mix design for Admix, Supply asphalt cement with anti-strip, Supply HIPR rejuvenating agent, Hot-In-Place recycled asphalt pavement with admix and rejuvenating agent and Supply and application of restorative joint seal.

contract cost	\$2,659,624
contingencies	\$20,000
engineering	\$188,000
miscellaneous	\$161,250

construction cost \$3,028,874

cost per lane km \$27,510

Hot-In-Place Recycling 2012/13 Hwy 16 Tintagel to Endako
(98.4 lane km)

Award Date: April 2012

Completed: October 2012

Work consisted of:

Hot-In-Place recycling of 42.5 kilometres of Highway 16 from the Tintagel Rest Area east of Burns Lake to the community of Endako. Supply of asphalt aggregates and asphalt cement as well as rejuvenating agent.

contract cost	\$5,255,950
contingencies	\$25,000
engineering	\$350,000
miscellaneous	\$570,200

construction cost	\$6,201,150
cost per lane km	\$63,020

RAILWAY CROSSING COSTS

(Two Lane Level crossings are an average 12 m in width)

2007 costs are shown in 2012 dollars

Level Crossing Surface (Single Track)

softwood planked	\$5,250 - \$7,350
paved	\$7,350 - \$9,500
concrete	\$11,550 - \$15,750
full depth rubber	\$12,600 - \$18,900

Track Reconstruction for Level Crossings (Not including surface)

simple reconstruction	\$9,500 - \$12,600
upgrade rail components	\$20,000 - \$30,500

Underpass Structures (Rail over road, single track)

2 Lane Hwy	\$2,100,000 - \$2,835,000
4 Lane Hwy	\$2,730,000 - \$3,675,000

Overhead Structures (Road over rail)

2 Lane overhead	
no sidewalk	\$3,675 - \$4,935/m ²

RUNAWAY FACILITIES

2001 costs are shown in 2012 dollars

Arrestor Bed Type

Coarse gravel arrestor bed; approaching and departing lanes and a service lane..... \$470,350 - \$784,250

Gravitational Type

Gravitational type runaway facilities consist of a runaway lane terminating in a minimal depth arrestor bed on a steep uphill grade.

When constructed in conjunction with a highway construction project \$188,250 – \$548,875

NOISE ATTENUATION SYSTEM

Highway 1 McCallum Interchange Noise Barrier – Jackson Street

Award Date: February 2012

Completed: March 2012

Installation of a 270m long and 3m high noise barrier. A pilot project to utilize a wood panel and concrete or steel post noise attenuation system.

contract cost	\$355,380
contingencies	\$30,000
total	\$385,380

RETAINING WALL STRUCTURE COSTS

2007 costs are shown in 2012 dollars

(Supply and install)

Gabion, Lock Block (no Geogrid)

up to 3 courses high (2.25 m to 3 m) \$510-730/m²

Lock Block with Geogrid and Geosynthetic

Soil Anchored Retaining Wall.....\$970-\$1,220/m²

Binwalls and Greenwalls \$970-\$1,155/m²

*Mechanically Stabilized Earth Walls . \$850-\$1,220/m²

(*not economical under 3 m high)

SIGNALIZATION AND LIGHTING COSTS

2007 costs are shown in 2012 dollars

Electrical Installation Type	Engineering Design Cost	Construction Cost	Annual Power and Maintenance
Urban Traffic Signal	\$8,400 - \$12,600	\$206,800 – \$291,850	\$3,570 - \$3,780
Rural Traffic Signal	\$8,400 - \$12,600	\$182,700 - \$243,570	\$3,570 - \$3,780
Pedestrian Signal	\$4,830 -\$7,350	\$127,500 - \$183,725	\$1,785
Continuous Lighting *	\$3,045 -\$4,200	\$168,000 - \$194,225/km	\$4,410 - \$6,090/km
Intersection Lighting	\$2,415 -\$3,675	\$13,650 - \$26,250 (~\$6,720/ lum.)	\$252 - \$305/lum

Note Continuous lighting costs assumes lighting two lanes with approximately 50m spaced – 250W HPS luminaries