
APPENDIX I
COST ESTIMATE



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MEMO TO FILE

RE: Highway 7 Planning Study – Kitchener to Guelph
OUR FILE: 2029-200
PREPARED BY: Melissa Green
CC: Martin Scott
DATE: October 16, 2002; Updated June 21, 2004
SUBJECT: Construction Cost Estimate – Recommended Route (2002)

Construction Cost Estimate

The following cost estimate uses a pavement structure of 170mm Hot Mix, 150mm Granular “A” and 450mm Granular “B”. The Unit costs are as follows:

Unit Costs

	Unit Cost	Unit
Hot Mix	\$45.00	/tonne
Granular "A"	\$12.00	/tonne
Granular "B"	\$10.00	/tonne
Structural Cost	\$1,200.00	/m ³
Excavation Cost	\$6.00	/m ³
Surplus Cost	\$6.00	/m ³
Borrow Cost	\$8.00	/m ³
Contaminated Soil Removal Cost	\$100.00	/m ³
Culverts 1200 mm Cost	\$300.00	/m
Culverts 1800x3000mm Cost	\$2,700.00	/m
Storm Water Management Basins	\$35.00	/m ³

The cost estimate also includes 15% for minor items, 10% for engineering and 10% contingency. This cost estimate does not include property costs.

LOCATION	COST	ROUNDED COST
Structure from KWE easterly including Regional Road 17	\$ 51,727,200	\$ 52 M
Grading, granular and paving of Highway 7 from KWE easterly to Regional Road 17	\$ 27,537,780	\$ 28 M
Complete construction (including structures) from Regional Road 17 easterly to Regional Road 30.	\$ 21,933,000	\$22 M
Complete construction (including structures) from Regional Road 30 easterly to County Road 86	\$ 33,979,620	\$ 34 M
Complete construction (including structures) from County Road 86 easterly to connection with the Hanlon Expressway	\$ 10,328,880	\$11 M
TOTAL COST	\$145,506,480	\$ 147 M

The detailed summary cost table for each section is attached.

Note: In order to determine the amount of borrow or surplus for each section the Grand River, Hopewell Creek and Ellis Creek were used as the major constraints that could not be crossed to haul material. Therefore, the material was distributed between each of the water crossings which would result in either some surplus or borrow for each of the sections.

24+900 to 29+275 (Option 2)

Regional Rd 17 to Regional Road 30 Cost Estimate

Highway 7
W.O. 2029-299

Location	Length (m)	Highway		Rural road		Rural Road	Ramp	Exit taper/gore		Entrance taper/gore		Structure		
		typical (m)	barrier (m)	2-lane (m)	4-lane (m)	1-Lane (m)	inner (m ²)	outer (m ²)	inner (m ²)	outer (m ²)	length (m)	width (m)	(m ²)	
Main Highway change	4375	4345												
Hopewell Creek Structure														1464
Woolwich Road 66	525			480										1080
Woolwich Road 72	600			735										1080
Regional Road 30	895			625										1296
W-N/S Ramp	494					406		1807.6						
N/S-E Ramp	406					406				2224.3				
N-W Ramp	510					510	862.5			2370.5				
E-N/S Ramp	406					406		1807.6						
S-W Ramp	288					288	862.5			2370.5				
Total Length		4345	0	1820	0	2196	1965	3615.2	4741	2224.3	0	0	4929	
Taper Depth Pavement								0.13	0.17	0.17	0.17			
Taper Depth Granular A								0.15	0.15	0.15	0.15			
Taper Depth Granular B								0.45	0.45	0.45	0.45			
Pavement m ²		3.88		1.38	2.36	0.94								
Granular A		4.34		1.99	3.1	1.37								
Granular B		18.8		7.5	11.68	5.48								
Pavement Total tonnes		40866	0	8103	0	4811	621	1493	1859	919				
Granular A		45823	0	8757	0	7011	716	1316	1726	811				
Granular B		145982	0	27300	0	22998	1789	3254	4267	2002				
Cost pavement / tonne	\$45.00	\$1,843,488	\$0	\$274,643	\$0	\$216,474	\$27,933	\$67,205	\$86,133	\$41,349				\$2,580,000
Cost Granular A / tonne	\$12.00	\$549,879	\$0	\$105,061	\$0	\$84,133	\$8,595	\$15,813	\$20,737	\$9,729				\$794,000
Cost Granular B / tonne	\$10.00	\$1,459,820	\$0	\$273,000	\$0	\$229,975	\$17,665	\$32,537	\$42,669	\$20,019				\$2,076,000
Cost Median barrier / m	\$370.00		\$0											\$0
Structural cost / m ²	\$1,200													\$5,904,000
Excavation cost / m ²	\$6.00													\$5,460,000
Surplus Cost / m ²	\$6.00													\$93,000
Borrow Cost/m ²	\$6.00													
Culverts 1200 mm Cost / m	\$300.00													\$82,000
Culverts 1800 x 3000 mm Cost / m	\$2,700.00													\$203,000
m ³ Water Management Basins 5m ³ Storage														
Basin 6	\$35.00												1190	\$42,000
Basin 7	\$35.00												1744	\$62,000
Basin 8	\$35.00												5341	\$187,000
SUB TOTAL														\$17,463,000
15% minor items	15%													\$414,600
TOTAL COST (before contingency)														\$18,277,600
10% Engineering	10%													\$1,827,760
10% contingency	10%													\$1,827,760
TOTAL COST ESTIMATE														\$21,933,120

Note: The overall borrow is included at the end of the alignment (35+900 to 38+300)

29+275 to 35+900 (Option 2)													
Regional Rd 30 to County Road 86 Cost Estimate													
Highway 7													
W.O. 2029-299													
Location	Length (m)	Highway		Rural road		Rural Road	Ramp	Exit taper/gore		Entrance taper/gore		Structure	
		typical (m)	barrier (m)	2-lane (m)	4-lane (m)	1-Lane (m)	inner (m ²)	outer (m ²)	inner (m ²)	outer (m ²)	length (m)	width (m)	(m ²)
Main highway chainage	8825	6390											
Ella Creel Structure											235	12	5640
Townline Road	512			442									1276
Guelph Road 3	270			200									1320
County Road 86	780				680								1728
N/S-W Ramp	298					298	1215			2370.5			
N/S-E Ramp	300					300	1215			2370.5			
E-N/S Ramp	380					380		1807.6					
W-N/S Ramp	378					378		1807.6					
Total Length		6390	0	642	680	1384	2430	3615.2	4741	0	235	12	9964
Taper Depth Pavement							0.13	0.17	0.17	0.17			
Taper Depth Granular A							0.15	0.15	0.15	0.15			
Taper Depth Granular B							0.45	0.45	0.45	0.45			
Pavement m ²	3.88			1.38	2.36	0.94							
Granular A	4.34			1.98	3.1	1.37							
Granular B	16.6			7.3	11.66	5.46							
Pavement Total tonnes	80247	0	2153	3900	3093	788	1493	1959	0				
Granular A	87390	0	3089	5122	4508	886	1316	1728	0				
Granular B	214704	0	9630	15688	14788	2187	3254	4267	0				
Cost pavement / tonne	\$45.00	\$2,711,136	\$0	\$96,880	\$175,485	\$138,178	\$34,544	\$67,206	\$88,133	\$0			\$3,313,000
Cost Granular A / tonne	\$12.00	\$808,683	\$0	\$37,067	\$81,489	\$54,091	\$10,629	\$15,813	\$20,737	\$0			\$1,009,000
Cost Granular B / tonne	\$10.00	\$2,147,040	\$0	\$96,300	\$156,578	\$147,857	\$21,870	\$32,537	\$42,669	\$0			\$2,647,000
Cost Median barrier / m	\$370.00	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0			\$0
Structural cost / m ²	\$1,200												\$11,856,800
Excavation cost / m ²	\$8.00												\$5,280,000
Surplus Cost / m ²	\$8.00												\$1,849,000
Barrow Cost/m ²	\$8.00												\$0
Culverts 1200 mm Cost / m	\$300.00												\$96,000
Culverts 1800 x 3000 mm Cost / m	\$2,700.00												\$558,000
/ Storm Water Management Basins 5m ³ Storage													
Basin 10	\$35.00												1501
Basin 12	\$35.00												3900
Basin 13	\$35.00												2127
Basin 14	\$35.00												5593
SUB TOTAL													\$27,271,000
15% minor items	15%												\$1,045,350
TOTAL COST (before contingency)													\$28,316,350
10% Engineering	10%												\$2,831,635
10% contingency	10%												\$2,831,635
TOTAL COST ESTIMATE													\$33,979,620

Note: The overall borrow is included at the end of the alignment (35+900 to 38+300)

35+900 to 38+300 (Option 2)
County Road 86 to South of Woodlawn Road Cost Estimate

Location	Length (m)	Highway		Rural road	Ramp	Exit taper/grade		Entrance taper/grade		Structure			
		typical (m)	barrier (m)	2-lane (m)	1-lane (m)	inner (m ²)	outer	inner (m ²)	outer	length (m)	width (m)	(m ²)	
Main highway change	2400	2375											
Highway 7 over Woodlawn Road													2000
N/S-W Ramp Silvercreek Parkway	255				255				2224.3				
S-E Ramp to Silvercreek Parkway	275				275	982.5	1807.8						
E-E Ramp from Woodlawn Road	120				120								
W-E/W Ramp to Woodlawn Road	320				320		1807.8						
W-E Ramp from Woodlawn Road	420				420	1215			2224.3				
Total Length		2375	0	0	1390	2107.5	3615.2	0	4448.6	0	0	2000	
Taper Depth Pavement						0.13	0.17	0.17	0.17				
Taper Depth Granular A						0.15	0.15	0.15	0.15				
Taper Depth Granular B						0.45	0.45	0.45	0.45				
Pavement m2	3.88			1.38	0.94								
Granular A	4.34			1.98	1.37								
Granular B	16.8			7.5	5.46								
Pavement Total tonnes	22382	0	0	3175	694	1493	0	1838					
Granular A	25047	0	0	4827	801	1318	0	1822					
Granular B	79800	0	0	15179	1978	3254	0	4004					
Cost pavement / tonne	\$45.00	\$1,007,660	\$0	\$0	\$142,877	\$31,239	\$67,205	\$0	\$82,697				\$1,332,000
Cost Granular A / tonne	\$12.00	\$300,567	\$0	\$0	\$55,529	\$9,612	\$15,813	\$0	\$19,458				\$401,000
Cost Granular B / tonne	\$10.00	\$798,000	\$0	\$0	\$151,788	\$19,778	\$32,537	\$0	\$40,037				\$1,043,000
Cost Median barrier / m	\$370.00		\$0										\$0
Structural cost / m ²	\$1,200												\$2,400,000
Excavation cost / m ²	\$6.00										total m ² excavated	110,000.00	\$660,000
Surplus Cost / m ²	\$6.00										total m ² Borrow	270,000.00	\$2,160,000
Borrow Cost/m ²	\$8.00												
Culverts 1200 mm Cost / m	\$300.00										total length of culvert	106	\$32,000
Culverts 1800 x 3000 mm Cost / m	\$2,700.00										total length of culvert	0	\$0
Cost / Storm Water Management Basins 5m ³ Storage													
Basin 15	\$35.00										Storage Volume in SWM Basins	4640	\$163,000
SUB TOTAL													\$8,191,000
15% minor items	15%												\$416,400
TOTAL COST (before contingency)													\$8,607,400
10% Engineering	10%												\$860,740
10% contingency	10%												\$860,740
TOTAL COST ESTIMATE													\$10,328,880

Note: The overall borrow is included at the end of the alignment (35+900 to 38+300)