

Nova Scotia 2012 Pavement Preservation

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Transportation and Infrastructure Renewal

Introduction

- Pavement Preservation Treatments
- 2012 Preservation Capital Program Overview
- Featured Project: Contract 2012-007
 - Highway 103 - CIR & asphalt overlay
- Summary



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Pavement Preservation Treatments

- Micro-Surfacing: 2 year warranty spec.
- Seal Coat (Type A & B): 1 year warranty spec.
- Department's in-house pavement preservation program: Seal Coat introduced 2011, Asphalt paving 2012

2012 Pavement Preservation Capital Program

Tendered Contracts:

- Seal Coat Type A: 3 Contracts: 35 km (22 mi)
- Seal Coat Type B: 6 Contracts: 42 km (27 mi)
- Micro-Surfacing: 6 Contracts: 97 km (60 mi)



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2012 Pavement Preservation Capital Program

In-House Seal Coat/Paving Program:

- Seal Coat Type A: 30 projects: 120 km (75 mi)
- Seal Coat Type B: 16 projects: 52 km (33 mi)
- Single Lift Asphalt Overlay: 8 projects: 53 km (34 mi), 45260 tonnes
- Asphalt tonnage target not met due to late start (plant delivered in August and electronics issues)



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Featured Project

Contract 2012-007:

- Highway 103, Roseway River Bridge westerly to Exit 27, 6.8 km (4.2 mi), Shelburne County
- 2 lane 2 way with climbing lanes: 16.2 km (10.1 mi) total lane length
- Traffic count: 2540 AADT



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Contract 2012-007

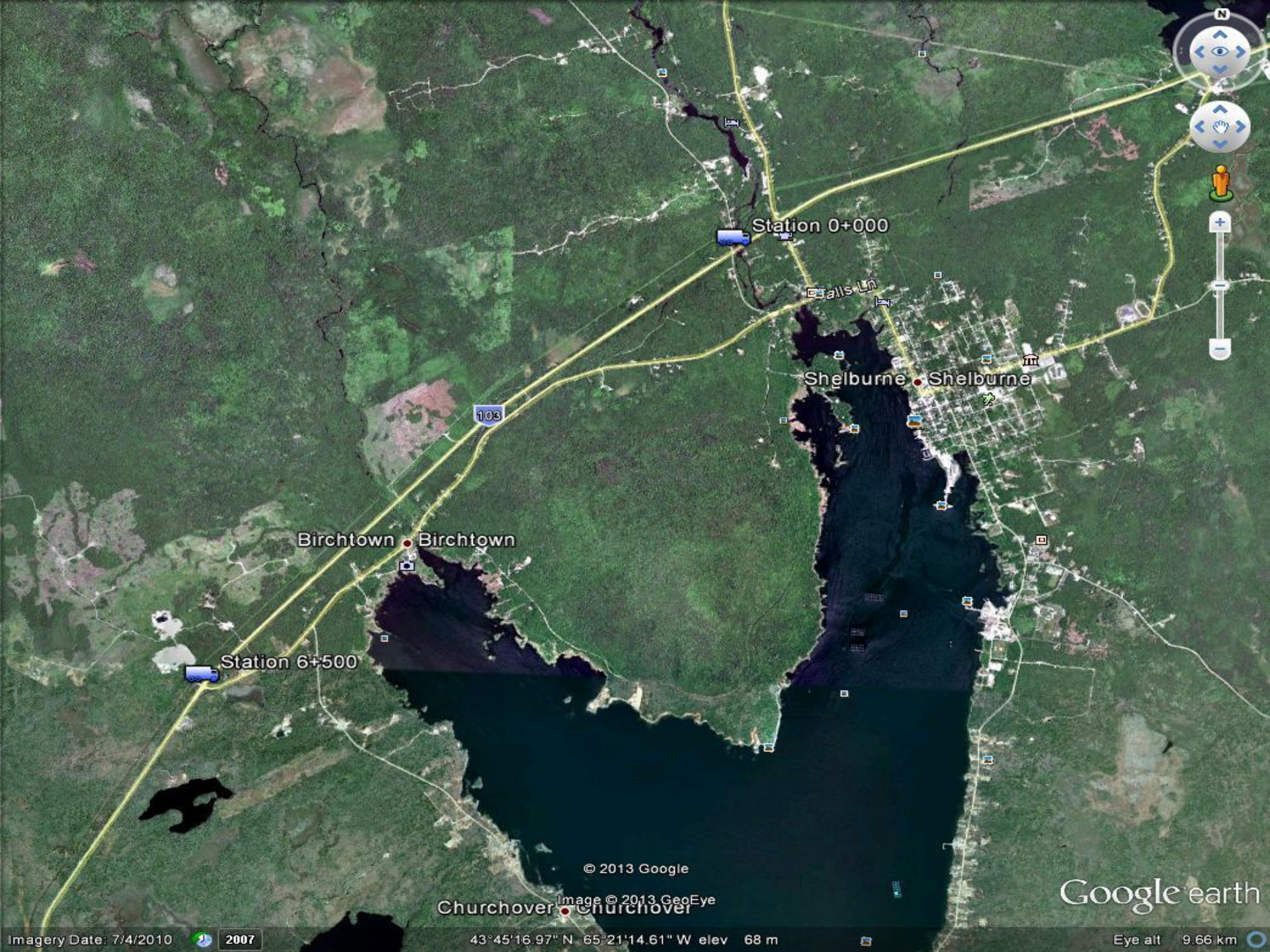
- Cold In-Place Recycling (CIR) overlaid with Type C-HF asphalt surface course
- CIR Binder: Expanded (foamed) AC
- CIR stabilized to a depth of 100 mm (4 in)
- Type C-HF asphalt overlay at 135 kg/m²

Contract 2012-007

Core Thickness (mm)

Station:	Thickness:	Station:	Thickness:
0+100	150	4+200	125
0+700	200	4+700	120
1+200	180	5+200	170
1+700	175	5+700	170
2+200	175	5+900	160
2+700	210	6+200	140
3+200	160	6+800	160
3+700	160	Average: 165 mm (6.5 in)	





Station 0+000

Gralls Ln

Shelburne • Shelburne

Birchtown • Birchtown

Station 6+500

Churchover • Churchover

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Image © 2013 GeoEye

Google earth

Imagery Date: 7/4/2010

2007

43°45'16.97" N 65°21'14.61" W elev 68 m

Eye alt 9.66 km

Contract 2012-007

Preconstruction Rutting Data:

Eastbound Lane				Westbound Lane			
Wheel Path	Min.	Max.	Avg.	Wheel Path	Min.	Max.	Avg.
mm							
Right	0.7	47	9.7	Right	1.0	34	9.6
Left	0.8	39	10.3	Left	1.0	36	10.3
inch							
Right	0	1.5	0.4	Right	0	1.3	0.4
Left	0	1.8	0.4	Left	0	1.4	0.4

Contract 2012-007

Preconstruction IRI Data:

Eastbound Lane				Westbound Lane			
Wheel Path	Min.	Max.	Avg.	Wheel Path	Min.	Max.	Avg.
m/km							
Right	0.4	12.9	2.1	Right	0.5	14	2.0
Left	0.4	12.5	1.7	Left	0.3	13.5	1.6
inch/mile							
Right	26	818	137	Right	32	898	131
Left	24	794	108	Left	22	849	102









EXIT 27

3
Birchtown
Gunning Cove
Ingomar
1 km

Reclamation History in Nova Scotia

Year:	CIR:	FDR:	FDR-PCC:	Comments:
	Projects / mi	Projects / mi	Projects / mi	
1997	1 / 3	0	0	CIR: Severe distress due to weather/traffic prior to asphalt overlay
2002	0	2 / 7.5	0	FDR satisfactory
2003	0	9 / 38.5	0	
2004	4 / 16	2 / 8.5	0	
2005	8 / 40	3 / 12.5	0	
2006	6 / 33	3 / 15.5	0	
2007	9 / 53	5 / 23	1 / 4.5	
2008	6 / 26	5 / 20	2 / 6	
2009	10 / 52	3 / 14	4 / 15	
2010	4 / 16	0	0	
2011	8 / 33	5 / 21	1 / 1.5	
2012	4 / 17	4 / 16	0	
2013	3 / 13	3 / 10	0	Contracts awarded as of April 2013
Totals:	33 / 299	44 / 187	8 / 27	

Benefits of CIR

- Conserves energy and paving material
- Provides a smooth surface / grade control
- Provides structural integrity
- Minimal subgrade disturbance
- Mitigates reflective cracking
- Retains surface elevation

Contract 2012-007

- Awarded to Northern Construction Limited - New Brunswick
- Tender cost: \$2,042,000.00
 - \$300, 294.00 / km (\$US 473, 445 / mi)
- CIR completed by Maritime Road Recycling (division of NCL)
- First CIR project in Nova Scotia by Contractor



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Contract 2012-007

CIR Expanded AC Equipment Specifications:

- Multi-unit recycling train
- Self propelled cold milling machine
- Mixing unit
- Self propelled paver with vibrating screed
- Vibratory Rollers: Appropriate size and numbers to achieve required compaction

Contract 2012-007

CIR Expanded AC Specifications:

- Mix Design - Dept. QA firm (AMEC Ltd.)
- Liquid AC paid as separate item - Weigh slips
- Payment based on area processed (m²)
- Unacceptable material to be repaired by contractor based on severity of defect

Contract 2012-007

CIR Expanded AC Specifications:

- Liquid AC must meet PGAB Specifications
- Processed material: 100% passing 40 mm sieve
- Thickness: 90% of all measurement to be greater than or equal to spec. minus 20 mm. No individual 30 mm less than Spec.

Contract 2012-007

CIR Expanded AC Specifications:

- Compaction:
 - Tested with nuclear density gauge
 - Mean compaction greater than or equal to 83% MTD
 - No individual reading less than 79% MTD
- Samples taken to confirm thickness, AC & moisture content, compaction density

Contract 2012-007

CIR Expanded AC Specifications:

- Asphalt overlay to be placed within 14 days of placement of stabilized mix
- Overlay may be placed when stabilized mix can support a fully loaded tandem - Proof rolling conducted at completion of CIR
- All repairs must be completed prior to paving

Contract 2012-007

CIR Expanded AC Mix Design:

- Core samples taken at 500 m intervals
- PG58-28 AC: 1.4%
- Total AC: 6.6%
- Optimum water content: 4.5%
- Wet tensile strength: 58 Kpa

Contract 2012-007

Type C-HF Asphalt Mix Design:

- 14 mm aggregate: 42% (Birchtown Quarry granite)
- Crusher dust: 53%
- Blend sand: 5%
- PG58-28 AC: 5.6% (Irving Oil)
- Liquid anti-strip: 0.5% (Redicote C3082)

Contract 2012-007

Project Quantities:

- CIR: 75,500 m² (90,297 yd²)
- CIR liquid asphalt: 225 tonnes
- Emulsified AC tack: 5300 L (1400 Gal)
- Type C-HF asphalt: 11,250 tonnes
- Type C-HF PGAB: 620 tonnes

Contract 2012-007

Project Timeline:

- CIR: September 7 - 15
- Asphalt overlay: October 4 - 12



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Contract 2012-007

Smoothness Testing:

- Conducted on completed asphalt overlay
- Class A Inertial Laser Profiler
- Cat. A Spec.: Full bonus/penalty: 50% localized roughness
- \$111,145 penalty assessed
- Two compulsory repairs (or \$5,000.00 each)

2012-007: **Pre** / Post Construction IRI Comparison:

Eastbound Lane			Westbound Lane		
m/km					
Min.	Max.	Avg.	Min.	Max.	Avg.
0.40	12.73	1.94	0.43	13.79	2.07
0.38	5.22	1.15	0.42	4.57	1.12
inch/mile					
25.62	806.66	123.06	27.34	873.95	131.32
24.08	330.74	73.07	26.61	289.56	71.37

Contract 2012-007

Project Issues:

- CIR roughness mainly due to Contractor's unfamiliarity with new paver
- Asphalt overlay: Slight segregation. Smoothness penalty
- Asphalt overlay: Two compulsory repairs at construction joints
- Contractor concerned that single lift overlay cannot minimize CIR roughness





 **Wirtgen**

ORM-C

3800 CRK















April 2013 - Segregation at Joint

April 2013 - Smoothness Repair Area at Joint



A photograph of a road joint in asphalt pavement. A vertical crack runs down the center of the image, separating two sections of pavement. A horizontal yellow line runs across the lower third of the image, intersecting the vertical crack. The pavement is dark grey and shows some texture and minor wear. The text "April 2013 - Same Joint as Previous" is overlaid in white at the bottom.

April 2013 - Same Joint as Previous

April 2013 - Cracking Along Outer Lane



Summary

- Contract 2012-007 Completed October 2012
- Smoothness penalties, 2 compulsory smoothness repairs at construction joints
- Visual survey April 2013: Several issues noted
- 2013 in-house pavement preservation program to start late spring
 - 100 km (62 mi) asphalt overlay
 - 200 km (124 mi) Type A seal coat

Questions?

