



Town of Goderich

Type of Document:

Airport Pavement Condition Evaluation

Project Location:

Goderich Regional Airport
33874 Airport Road
Goderich, Ontario N7A 3Y2

Project Number:

BAR-23008990-A0

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1. Introduction

As requested, EXP Services Inc. (EXP) performed a pavement condition evaluation of the taxiways and runways at the Goderich Regional Airport in Goderich, Ontario. These include two runways (10-25 and 14-32) and one taxiway that connects both runways to the apron area.

The review was conducted in general accordance with document ERD-121 “Guidelines Respecting Airport Pavement Structural Condition Surveys” published by Transport Canada. Photographic and video records of our observations were recorded along with any measurements and other notable observations.

2. Site Description

Originally opened in 1938 with turf runways, Goderich Regional Airport currently has two paved runways. The current main runway is 14-32 (originally 13-31) which was constructed in 1990. The runway is 30 m wide and 1 524 m long (22 m long extension built in 1995). Crack sealing was carried out in 2018 on the paved surface. The secondary runway (main runway prior to 1990) is 10-28, which was first constructed in 1965, extended in 1979 and shortened/narrowed in 1995 to the current 15 m width and 1 200 m length. Crack sealing has been carried out twice on this runway, with the most recent work being completed in 2019. Both runways are connected to the apron area via a single taxiway. The 400 m long section of taxiway between the two runways was constructed in 1990 (same time as runway 14-32) and the short section (69 m) of the taxiway between runway 1-28 and the apron was paved in 1995 at the same time as the reconstruction of 10-28. Data collected since 2014 indicates that there are on average 2 600 aircraft movements annually at this location. The paint shop which was formerly run by Sky Harbour Aircraft was closed in 2011.

Overall, the site is relatively flat, with most of the open areas leased to local farmers for row crop operations. Drainage is accomplished through a series of open ditches. Access to the site is from Airport Road.

A site location plan is presented as Drawing 1 in Appendix B.

3. Procedure

The field work was carried out on November 9, 2023, by EXP staff. The field work consisted of a visual review of the pavement surface. A high-definition video was recorded along the length of each element (multiple overlapping passes for each) and still pictures were also taken at selected locations. Where warranted, measurements of defects were obtained, sometime utilizing a straight edge as a reference surface. These field observations were utilized in the completion of the Defect Recording Forms and Pavement Condition Ratings Summary forms.

4. Observations

4.1 Runway 14-32

The main runway was constructed in 1990 and consists of seven “lanes” of asphalt along the main portion of the runway with wider turn-around areas at each end. The most prevalent defect observed along the length of the runway is lateral and transverse cracking. According to the Town of Goderich, this runway received an application of crack sealing in 2018. Based on the visual appearance of the crack sealing materials, there may have been additional applications as the colour of the sealant varies. The existing crack sealing is starting to fail (open cracks in the sealant are visible within the asphalt cracks) and a new application is required. Additionally, the turn-around area that is shared by both runways appears to have only been partially treated in the past.

In addition to the lateral and transvers cracking, low severity map cracking (less than 5% of the surface area) and low severity raveling (approximately 3% of the surface areas) were also noted to be present. Map cracking is a pattern of cracks with spacing between 0.5 to 2 metres and must be located within the wheel path areas. Typical raveling noted was individual aggregate pop-outs and loss of fines matrix to a depth of no more than 3 mm.

Medium severity rutting (20 to 40 mm depth) was also noted at less than 2% of the wheel path length. All noted defects were recorded on the Defect Recording Form included in Appendix A. The overall structural condition rating (SCR) is 6.9, which is fair to good.

4.2 Runway 10-28

The surface of Runway 10-28, which was first constructed in 1965, then shortened and narrowed and repaved in 1995, is dominated by extensive block cracking that is uniformly distributed across the entire runway surface. Similar to the lateral and transverse cracking detailed above, block cracking has a smaller spacing between the cracks (0.1 to 3 metres), is not limited to wheel paths like alligator cracking and is typically found in older pavements. Based on the observations made during the site visit, the block cracking on Runway 10-28 is of a low severity.

The only other defect noted was low severity raveling, affecting 3 % of the surface area. Typical raveling noted was individual aggregate pop-outs and loss of fines matrix to a depth of no more than 3 mm. All noted defects were recorded on the Defect Recording Form included in Appendix A. The overall structural condition rating (SCR) is 5.2, or fair condition.

4.3 Taxiway - New

The “new” taxiway runs from approximately 45 metres north of Runway 10-28 to Runway 14-32 with an approximately 45 degree bend to the northeast near the mid-point of the taxiway. Constructed in 1990 (same time as Runway 14-32), it is in good condition with low severity lateral/transverse cracking, minor low severity raveling and a single utility crossing that was installed after the taxiway was paved. The patched area has some frost heave and or settlement issues and should be reconstructed.

All noted defects were recorded on the Defect Recording Form included in Appendix A. The overall structural condition rating (SCR) is 9.2.

4.4 Taxiway - Old

The “old” taxiway starts at the apron area, crosses Runway 10-28 and continues to approximately 45 metres north of Runway 10-28. Constructed in 1965 (same time as Runway 10-28), it is poor to fair condition with medium severity map cracking and associated rutting and low severity raveling.

All noted defects were recorded on the Defect Recording Form included in Appendix A. The overall structural condition rating (SCR) is 4.5.

5. Conclusions

Overall, the paved surfaces of the runways and taxiways at the Goderich Municipal Airport are in fair to good condition. It is recommended that crack sealing be maintained on a regular basis to prolong the lifespan of the pavements. Based on discussions with airport staff, the traffic at the airport averages between approximately 2 500 and 3 000 aircraft movements per year, with the busiest times in the summer months (June, July and August). This traffic pattern has held fairly steady since at least 2014. Given the generally unchanging conditions and lack of any significant commercial traffic, the condition of the runways is relatively consistent.

6. Closure

The site assessment was carried out by Mr. Leigh Knecht, P. Eng. Mr. Knecht has over 32 years of experience in the materials testing and construction review, including design and evaluation work at airports in Oro-Medonte, Muskoka, Huronia, Kingston and Algonquin Highlands.

Yours truly,

EXP Services Inc.

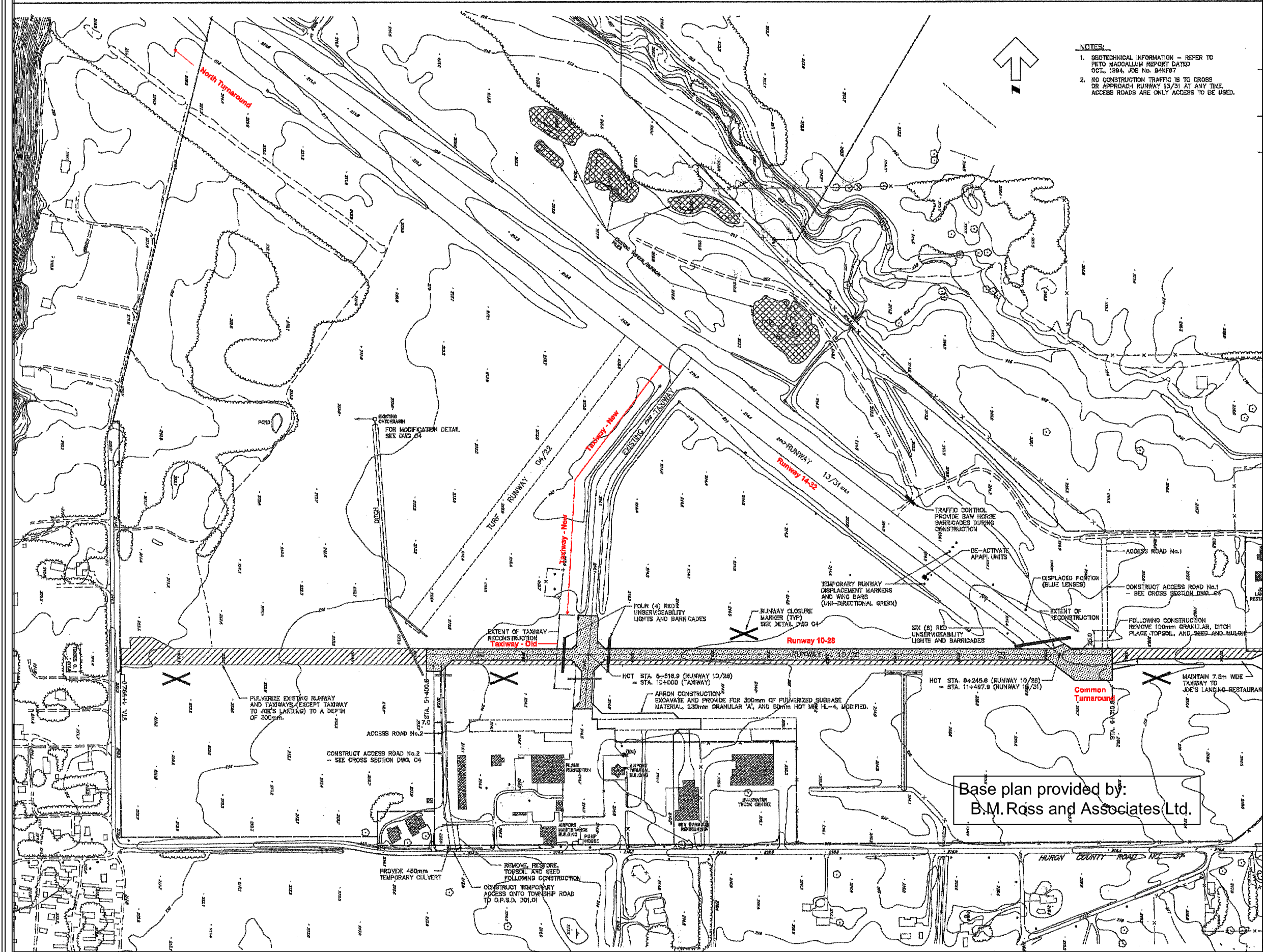


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APPENDIX A – SITE LAYOUT



- NOTES:
1. GEOTECHNICAL INFORMATION - REFER TO PETO MACCALLUM REPORT DATED OCT., 1994, JOB No. 94KF87
 2. NO CONSTRUCTION TRAFFIC IS TO CROSS OR APPROACH RUNWAY 13/31 AT ANY TIME. ACCESS ROADS ARE ONLY ACCESS TO BE USED.

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CLIENT:	Town of Goderich	Goderich Municipal Airport	
PROJECT:			
TITLE:			
scale	1 : 2500	Figure 1	
date	March 2024		
drawn by	E. K.		
project no.	BAR-23008990-A0		

APPENDIX B – FIGURES

Figure A-7: Defects Recording Form for Asphalt Surfaces

AIRPORT	<u>Goderich Regional</u>	FACILITY	<u>10-28</u>	DEFECT RATINGS			
CHAINAGE	From: _____	SECTION	_____	% AT SEVERITY LEVEL			EXTENT
	To: _____	ID NO.	_____	HIGH	MEDIUM	LOW	
INSPECTOR	<u>Leigh Kneqt</u>	DATE	<u>Nov 2023</u>				

TRANSVERSE / LONGITUDINAL (DISCRETE) CRACKING		Average Spacing of Cracks (m)	
Low	Single, clean cracks with no associated breakdown	/	
Medium	Cracks with chipped or ravelling edges, or with secondary cracking	/	
High	Cracks with adjacent asphalt fragments loose or spalled, or with major settlement	/	
		SCR =	

ALLIGATOR CRACKING		% Wheelpath Length Affected	
Low	Initial stages, closely spaced longitudinal hairline cracks in the wheelpath	/	
Medium	Transverse cracking fully developed to complete alligator pattern	/	
High	Cracking with asphalt fragments loose or spalled	/	
		SCR =	

MAP CRACKING		% Wheelpath Length Affected	
Low	Cracking with no associated breakdown	/	
Medium	Cracking with chipped or ravelling edges, or with secondary cracking	/	
High	Cracking with asphalt fragments loose or spalled	/	
		SCR =	

BLOCK CRACKING		% Area Affected	
Low	Cracking with no associated breakdown, spacing > 2 m	90	
Medium	Cracking with chipped or ravelling edges, spacing < 2 m	/	
High	Cracking with asphalt fragments loose or spalled, spacing < 1 m	/	
		SCR =	5.2

RAVELLING		% Area Affected	
Low	Individual coarse aggregate pop-outs or fines matrix loss to depth < 3 mm	3	
Medium	Depth of surface loss not greater than maximum aggregate size	/	
High	Depth of surface loss greater than maximum aggregate size	/	
		SCR =	10

RUTTING		% Wheelpath Length Affected	
Low	Rut depth less than 20 mm	/	
Medium	Rut depth 20 to 40 mm	/	
High	Rut depth greater than 40 mm	/	
		SCR =	

		% Wheelpath Length Affected	
Low		/	
Medium		/	
High		/	
		SCR =	

		% Wheelpath Length Affected	
Low		/	
Medium		/	
High		/	
		SCR =	

Comments / Maintenance Requirements _____ _____ _____ _____	Overall Structural Condition Rating: Guidelines Controlling SCR = <u>5.2</u> Subjective Judgement SCR = <u>5 to 6</u>
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Note: The "Guidelines Controlling SCR" is the lowest of the defect SCR's calculated above.

Figure A-7: Defects Recording Form for Asphalt Surfaces

AIRPORT	Goderich Regional	FACILITY	14-32	DEFECT RATINGS			
CHAINAGE	From: -----	SECTION	-----	% AT SEVERITY LEVEL			EXTENT
	To: -----	ID NO.	-----	HIGH	MEDIUM	LOW	
INSPECTOR	Leigh Kneet	DATE	Nov 2023				

TRANSVERSE / LONGITUDINAL (DISCRETE) CRACKING			Average Spacing of Cracks (m)	22/6
Low	Single, clean cracks with no associated breakdown			
Medium	Cracks with chipped or ravelling edges, or with secondary cracking			
High	Cracks with adjacent asphalt fragments loose or spalled, or with major settlement			SCR = 6.9

ALLIGATOR CRACKING			% Wheelpath Length Affected	
Low	Initial stages, closely spaced longitudinal hairline cracks in the wheelpath			
Medium	Transverse cracking fully developed to complete alligator pattern			
High	Cracking with asphalt fragments loose or spalled			SCR =

MAP CRACKING			% Wheelpath Length Affected	
Low	Cracking with no associated breakdown			
Medium	Cracking with chipped or ravelling edges, or with secondary cracking		2	
High	Cracking with asphalt fragments loose or spalled			SCR = 7.5

BLOCK CRACKING			% Area Affected	
Low	Cracking with no associated breakdown, spacing > 2 m			
Medium	Cracking with chipped or ravelling edges, spacing < 2 m			
High	Cracking with asphalt fragments loose or spalled, spacing < 1 m			SCR =

RAVELLING			% Area Affected	
Low	Individual coarse aggregate pop-outs or fines matrix loss to depth < 3 mm			
Medium	Depth of surface loss not greater than maximum aggregate size		3	
High	Depth of surface loss greater than maximum aggregate size			SCR = 10.0

RUTTING			% Wheelpath Length Affected	
Low	Rut depth less than 20 mm			
Medium	Rut depth 20 to 40 mm		2	
High	Rut depth greater than 40 mm			SCR = 7.3

			% Wheelpath Length Affected	
Low				
Medium				
High				SCR =

			% Wheelpath Length Affected	
Low				
Medium				
High				SCR =

Comments / Maintenance Requirements ----- ----- ----- -----	Overall Structural Condition Rating: Guidelines Controlling SCR = <u>6.9</u> Subjective Judgement SCR = <u>6 to 7</u>
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Note: The "Guidelines Controlling SCR" is the lowest of the defect SCR's calculated above.

Figure A-7: Defects Recording Form for Asphalt Surfaces

AIRPORT	Goderich Regional	FACILITY	Taxiway (New)
CHAINAGE	From: -----	SECTION	-----
	To: -----	ID NO.	-----
INSPECTOR	Leigh Kneqt	DATE	Nov 2023

DEFECT RATINGS			
% AT SEVERITY LEVEL			EXTENT
HIGH	MEDIUM	LOW	

TRANSVERSE / LONGITUDINAL (DISCRETE) CRACKING		Average Spacing of Cracks (m)	
Low	Single, clean cracks with no associated breakdown	30/5	
Medium	Cracks with chipped or ravelling edges, or with secondary cracking	/	
High	Cracks with adjacent asphalt fragments loose or spalled, or with major settlement	/	
			SCR = 9.2

ALLIGATOR CRACKING		% Wheelpath Length Affected	
Low	Initial stages, closely spaced longitudinal hairline cracks in the wheelpath	3	
Medium	Transverse cracking fully developed to complete alligator pattern	/	
High	Cracking with asphalt fragments loose or spalled	/	
			SCR =

MAP CRACKING		% Wheelpath Length Affected	
Low	Cracking with no associated breakdown	3	
Medium	Cracking with chipped or ravelling edges, or with secondary cracking	/	
High	Cracking with asphalt fragments loose or spalled	/	
			SCR =

BLOCK CRACKING		% Area Affected	
Low	Cracking with no associated breakdown, spacing > 2 m	3	
Medium	Cracking with chipped or ravelling edges, spacing < 2 m	/	
High	Cracking with asphalt fragments loose or spalled, spacing < 1 m	/	
			SCR =

RAVELLING		% Area Affected	
Low	Individual coarse aggregate pop-outs or fines matrix loss to depth < 3 mm	3	
Medium	Depth of surface loss not greater than maximum aggregate size	/	
High	Depth of surface loss greater than maximum aggregate size	/	
			SCR = 10.0

RUTTING		% Wheelpath Length Affected	
Low	Rut depth less than 20 mm	3	
Medium	Rut depth 20 to 40 mm	/	
High	Rut depth greater than 40 mm	/	
			SCR =

Patches		% Wheelpath Length Affected	
Low		1	
Medium		/	
High		/	
			SCR = See Comments

		% Wheelpath Length Affected	
Low		3	
Medium		/	
High		/	
			SCR =

Comments / Maintenance Requirements Frost Heave/Settlement at crossing. Patch should be replaced and crossing ----- ----- -----	Overall Structural Condition Rating: Guidelines Controlling SCR = 9.2 Subjective Judgement SCR = 8 to 9
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Note: The "Guidelines Controlling SCR" is the lowest of the defect SCR's calculated above.

Figure A-7: Defects Recording Form for Asphalt Surfaces

AIRPORT	Goderich Regional FACILITY Taxiway (Old)	DEFECT RATINGS			
CHAINAGE From: -----	SECTION -----	% AT SEVERITY LEVEL		EXTENT	
To: -----	ID NO. -----	HIGH	MEDIUM		LOW
INSPECTOR Leigh Knegt	DATE Nov 2023				

TRANSVERSE / LONGITUDINAL (DISCRETE) CRACKING		Average Spacing of Cracks (m)	
Low	Single, clean cracks with no associated breakdown	/	/
Medium	Cracks with chipped or ravelling edges, or with secondary cracking	/	
High	Cracks with adjacent asphalt fragments loose or spalled, or with major settlement	/	
			SCR =

ALLIGATOR CRACKING		% Wheelpath Length Affected	
Low	Initial stages, closely spaced longitudinal hairline cracks in the wheelpath	/	/
Medium	Transverse cracking fully developed to complete alligator pattern	/	
High	Cracking with asphalt fragments loose or spalled	/	
			SCR =

MAP CRACKING		% Wheelpath Length Affected	
Low	Cracking with no associated breakdown	/	/
Medium	Cracking with chipped or ravelling edges, or with secondary cracking	10	
High	Cracking with asphalt fragments loose or spalled	/	
			SCR = 4.5

BLOCK CRACKING		% Area Affected	
Low	Cracking with no associated breakdown, spacing > 2 m	/	/
Medium	Cracking with chipped or ravelling edges, spacing < 2 m	/	
High	Cracking with asphalt fragments loose or spalled, spacing < 1 m	/	
			SCR =

RAVELLING		% Area Affected	
Low	Individual coarse aggregate pop-outs or fines matrix loss to depth < 3 mm	/	3
Medium	Depth of surface loss not greater than maximum aggregate size	/	
High	Depth of surface loss greater than maximum aggregate size	/	
			SCR = 10.0

RUTTING		% Wheelpath Length Affected	
Low	Rut depth less than 20 mm	/	/
Medium	Rut depth 20 to 40 mm	10	
High	Rut depth greater than 40 mm	/	
			SCR = 5.4

		% Wheelpath Length Affected	
Low		/	/
Medium		/	
High		/	
			SCR =

		% Wheelpath Length Affected	
Low		/	/
Medium		/	
High		/	
			SCR =

Comments / Maintenance Requirements ----- ----- ----- -----	Overall Structural Condition Rating: Guidelines Controlling SCR = <u>4.5</u> Subjective Judgement SCR = <u>4 to 5</u>
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Note: The "Guidelines Controlling SCR" is the lowest of the defect SCR's calculated above.

APPENDIX C – SITE VISIT PICTURES



20mm Rut and Map cracking – Runway 14-32.



Map and Edge cracking – Runway 14-32 turnaround – North end



Map Cracking – Old Taxiway



Transvers and Lateral cracking with small Map cracking area Runway 14-32



Unsealed Cracks – Common Turnaround