

2022 Pavement Condition Index Report

Mount Pleasant Regional Airport

For The Charleston County Aviation Authority

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EXECUTIVE SUMMARY

ADC Engineering, Inc. was commissioned by the Charleston County Aviation Authority (CCAA) to conduct the tri-annual Pavement Condition Index (PCI) Survey for all three of the CCAA owned airports. The PCI Survey is conducted to determine the present condition of the airfield pavements, provide an index for comparing the condition and performance of pavements within a network as well as provide a rational basis for justification, planning and budgeting of pavement repair project.

For the 2022 inspections, ADC Engineering contracted with Silent Falcon UAS Technologies to perform the PCI Surveys utilizing drone technology to collect photogrammetry of nearly 100% of all pavements. Silent Falcon UAS then processed the data collected through proprietary Artificial Intelligence software to quantify pavement distresses in accordance with ASTM D 5340. Silent Falcon's data analysists and pavement engineers then verified the results from the AI analysis to confirm PCI ratings for each network, branch and section.

Partnering with Silent Falcon provided a comprehensive inspection of each airport in lieu of the typical ASTM D 5340 procedure where only 25% - 50% of each section are inspected.

Reports for this year's PCI Survey have been generated for each airport. These reports will include both the results of the PCI survey for each airport. This document reports the results of the 2022 PCI survey for the Mount Pleasant Regional Airport (LRO). The Pavement Management Program (PMP) for LRO is provided in an associated report.

The 2022 PCI survey for LRO concludes the following:

Mount Pleasant Regional Airport

- a. The condition of the airfield sections vary from satisfactory to good.
- b. Major distresses in the asphaltic concrete pavement include high weathering, high raveling, low severity longitudinal and transverse cracking and depressions.
- c. The lowest rated pavement is Runway 17/35, Taxiway A and Taxiway B. Runway 17/35 is experiencing high severity raveling and rutting at the paving lanes. Furthermore, longitudinal and transverse cracking has increased in quantity and severity since the last PCI survey. Taxiways A and B are experiencing longitudinal and transverse cracking as well as increased severity weathering/raveling.

Additional details on the condition of all pavements at this airport are contained within this report.

I. INTRODUCTION

A. Intent

The Pavement Condition Index (PCI) procedure provides a systematic method of visually inspecting and evaluating both asphaltic concrete and plain jointed portland cement concrete pavements. Specific objectives of a PCI analysis of a pavement network or networks include:

- Determination of the present condition of pavements in terms of apparent structural integrity and operational surface condition.
- Provide a common index for comparing the condition and performance of pavements within a network or networks.
- Provide feedback on performance of each type of pavement.
- Provide a rational basis for justification, planning, and budgeting of pavement repair projects.

B. PCI Concept

The basic principle of the PCI procedure is to visually inspect random samples of each pavement section and quantify distresses or defects within each random sample. The quantified distresses result in a reduction in the condition rating for the pavement. Condition ratings for each random sample within a pavement section are averaged to yield an overall condition rating for the pavement section. Condition ratings for each pavement section within a pavement network or facility can then be compiled and compared on an objective basis for evaluation of performance and for planning for pavement repair projects.

Utilizing Silent Falcon's drone technology, nearly 100% inspection coverage has been provided for 2022 PCI Survey. With near 100% coverage, one sample unit is needed to analyze each section with the branch and network.

C. PCI Ratings

PCI	Rating	
86 - 100	Good	
71 – 85	Satisfactory	
56 - 70	Fair	
41 - 55	Poor	
26 - 40	Very Poor	
11 - 25	Serious	
0 – 10	Failed	

*Rating system is in accordance with ASTM D 5340.

D. PCI Procedure

1. Divide the pavement facilities in accordance with the following guidelines:

Network:	Facility Level (i.e. County Airport, Town of Mount Pleasant, etc.)
Branch:	Function Level (i.e. Runway 9/27, Coleman Blvd., etc.)
Section:	Usage and Type Level (i.e. Low usage area, concrete area, etc.)

<u>Airport Example:</u> Network = Mount Pleasant Regional Airport Branch = Parking Apron Section = 1 (apron taxilanes) Section = 2 (parking spaces) <u>Roadway Example:</u> Network = Town of Mount Pleasant Branch = Coleman Boulevard Section = 1 (intersections) Section = 2 (non-intersection areas)

- 2. Measure each Section and calculate area.
- 3. Quantify and record all distresses within each inspected sample unit. Assess each distress for type and severity (low, medium, high). A few typical distress types are:

Typical Distresses Types							
Asphalt Pavement	Concrete Pavement						
Alligator Cracking	Spalling						
Rutting	Cracking						
Longitudinal Cracking	Joint Sealant Damage						
Patching	Scaling						
Weathering/Raveling	Corner Breaks						

- Calculate the PCI rating for each sample unit inspected. Each sample unit begins with a PCI rating = 100. Based on the quantity and severity of distresses within the sample unit, reductions are made to yield the actual PCI rating for the sample unit.
- 5. PCI ratings for Sections, Branches and Networks are calculated as follows:

Section PCI =	area weighted average of sample unit PCI ratings within the Section
Branch PCI =	area weighted average of Section PCI ratings within the Branch
Network PCI =	area weighted average of Branch PCI ratings within the Network

In accordance with ASTM D 5340, each section is divided into sample units. For asphalt pavement, these sample units are typically 5,000 sf for airfields and 2,500 sf for roadways. Concrete pavement sample units are typically 20 slabs for airfields and roadways. Using Silent Falcon's drone technology, sections were not broken up into sample units for this PCI Survey as nearly 100% of all areas were surveyed.

II. PAVEMENT CONDITION INDEX REPORT – MOUNT PLEASANT REGIONAL AIRPORT (LRO)

A. 2022 PCI Rating

The Network PCI rating for the 2022 Survey of Mount Pleasant Regional Airport is **74 - Satisfactory**. The following is LRO network ratings for the previous and current PCI studies.

TABLE II.1: LRO Network PCI Rating Summary

Network Summary	2012 PCI	2015 PCI	2019 PCI	2022 PCI
LRO	85 SATISFACTORY	79 SATISFACTORY	85 GOOD	74 SATISFACTORY

Figure II.1 – LRO Section PCI Ratings shows a pictorial overview of the branches and sections with PCI ratings. Refer to Table II.2 for the individual branch/section PCI ratings, and Table II.3 for a network pavement inventory.

B. Construction Since the Last Survey

No work has been performed at LRO since the last survey. At the time of this survey, new T-Hangars were under construction. The new T-Hangar taxiways will be included in the next PCI Survey.

C. Pavement Inventory Updates Since the Last Report

Since the last PCI Survey conducted in 2019, the inventory of pavements has been revised to include pavement thicknesses for all sections within the network.

D. Future Projects

Projects to rehabilitate RWY 17/35 and TWY A should be planned for in the near future.

E. Maintenance and Repair Recommendations

Refer to the Pavement Management Program for LRO for Maintenance and Repair recommendations.



TABLE II-1: LRO BRANCH / SECTION PCI RATINGS									
Branch ID	2006 PCI	2010 PCI	2012 PCI	2015 PCI	2019 PCI	2022 PCI	Change in PCI (From 2019 to 2022)	2019 PCI Rating	
FBO-APRON	01 (T-L)	86	75	71	69	97	85	-12	Satisfactory
FBO-APRON	01 (Park)	78	73	67	61	96	91	-5	Good
FBO-APRON	02 (T-L)	N/A	N/A	N/A	N/A	98	87	-11	Good
FBO-APRON	02 (Park)	N/A	N/A	N/A	N/A	99	82	-17	Satisfactory
FBO-APRON	03 (T-L)	N/A	N/A	N/A	N/A	99	92	-7	Good
FBO-APRON	03 (Park)	N/A	N/A	N/A	N/A	98	74	-24	Satisfactory
RWY 17-35	01	85	100	99	89	75	66	-9	Fair
TH-APRON	01	68	71	58	57	98	84	-14	Satisfactory
TH-APRON	02	94	87	81	75	75	60	-15	Fair
TH-TWY	01	72	64	57	56	92	83	-9	Satisfactory
TH-TWY	02	92	90	89	85	84	81	-3	Satisfactory
TWY-A	01A	94	90	89	83	80	64	-16	Fair
TWY-A	01B	N/A	N/A	N/A	86	78	35	-43	Very Poor
TWY-A	02A	90	85	85	80	76	66	-10	Fair
TWY-A	02B	N/A	N/A	N/A	88	80	79	-1	Satisfactory
TWY B	01	88	84	83	78	75	69	-6	Fair
TWY B	02	N/A	N/A	N/A	84	73	68	-5	Fair

TABLE II-2: LRO PAVEMENT INVENTORY								
Branch ID	Section ID	Construction Period (Approximate)	Туре	Remarks				
FBO Apron	01 (Park)	1/1986 10/1995 9/2017	4" AC 6" LABC	Original Apron Parking Construction (2" AC/6" LABC) Overlay (2" AC) Mill and Overlay (2")				
FBO Apron	01 (T-L)	1/1986 10/1995 9/2017	4" AC 6" LABC	Original Apron Parking Construction (2" AC/6" LABC) Overlay (2" AC) Mill and Overlay (2")				
FBO Apron	02 (Park)	10/1995 9/2017	3" AC 8" LABC	Apron Expansion Parking Construction (3" AC / 8" LABC) Mill and Overlay (2")				
FBO Apron	02 (T-L)	10/1995 9/2017	3" AC 8" LABC	Apron Expansion Parking Construction (3" AC / 8" LABC) Mill and Overlay (2")				
FBO Apron	03 (Park)	9/2017	3.25" AC 6" GABC	Apron Expansion (3.25" AC / 6" GABC)				
FBO Apron	03 (T-L)	9/2017	3.25" AC 6" GABC	Apron Expansion (3.25" AC / 6" GABC)				
RWY 17-35	01	1/1986 6/2009	4" AC 6" GABC	Original Construction (2" AC / 6" GABC) Overlay (2" w/ Single Surface Treatment)				
TH-APRON	01	1/1986 9/2017	2.25" AC 5.75" GABC	Original Construction (2.25" AC / 5.75" GABC) Mill and Overlay (2.25" AC)				
TH-APRON	02	1/2003	2.25" AC (assumed) 5.75" GABC (assumed)	Original Construction (2.25" AC / 5.75" GABC)				
TH-TWY	01	1/1986 9/2017	2.25" AC 5.75" GABC	Original Construction (2.25" AC / 5.75" GABC) Mill and Overlay (2.25" AC)				
TH-TWY	02	1/2003	AC	Original Construction				

TABLE II-2: LRO PAVEMENT INVENTORY								
Branch ID	Section ID	Construction Period (Approximate)	Туре	Remarks				
TWY A	01A	1/1986 6/2009	3" AC 8" LABC	Original Construction (3" AC / 8" LABC) Seal Coat				
TWY A	01B	1/1986 6/2009	3" AC 8" LABC	Original Construction (3" AC / 8" LABC) Mill and Overlay (2" AC <u>+</u> with Single Surface Treatment)				
TWY A	02A	1/1986 6/2009	3" AC 8" LABC	Original Construction (3" AC / 8" LABC) Seal Coat				
TWY A	02B	1/1986 6/2009	3" AC 8" LABC	Original Construction (3" AC / 8" LABC) Mill and Overlay (2" AC <u>+</u> with Single Surface Treatment)				
TWY B	01	1/1986 6/2009	3" AC (assumed) 6" LABC (assumed)	Original Construction (2" AC / 6" LABC, assumed) Seal Coat				
TWY B	02	1/1986 6/2009	4" AC (assumed) 6" LABC (assumed)	Original Construction (2" AC / 6" LABC, assumed) Overlay (2" AC)				

F. Photographs – Mount Pleasant Regional Airport

- F. Photographs Mount Pleasant Regional Airport
- LRO FBO Apron Parking Section 1 Photographs



Photograph 1: Typical Oil Spillage



Photograph 2: Typical Low Severity Weathering



LRO – FBO Apron Parking Section 2 Photographs

Photograph 3: Typical Low Severity Cracking



Photograph 4: Typical Medium Severity Cracking



LRO – FBO Apron Parking Section 2 Photographs

Photograph 5: Typical Low Severity Raveling

LRO – FBO Apron Parking Section 3 Photographs



Photograph 6: Low Severity Raveling



LRO – FBO Apron Taxilane Section 1 Photographs

Photograph 7: Typical Low Severity Raveling



Photograph 8: Typical Medium Severity Longitudinal Cracking



LRO – FBO Apron Taxilane Section 2 Photographs

Photograph 9: Typical Low Severity Longitudinal Crack



Photograph 10: Typical Medium Severity Longitudinal Crack



LRO – FBO Apron Taxilane Section 3 Photographs

Photograph 11: Typical Low Severity Longitudinal Crack



Photograph 12: Typical Low Severity Weathering



LRO – Runway 17/35 Section 1 Photographs

Photograph 13: Typical Low Severity Longitudinal Crack



Photograph 14: Typical Low Severity Longitudinal Crack



LRO – Runway 17/35 Section 1 Photographs



Photograph 15: Typical Medium Severity Longitudinal Crack



Photograph 16: Typical Medium Severity Longitudinal Crack



LRO – Runway 17/35 Section 1 Photographs



Photograph 17: Typical Low Severity Patch



Photograph 18: Typical Low Severity Raveling



LRO – T-Hangar Apron Section 1 Photographs

Photograph 19: Typical Low Severity Longitudinal Crack



Photograph 20: Typical Low Severity Longitudinal Crack



LRO – T-Hangar Apron Section 2 Photographs

Photograph 21: Low Severity Alligator Cracking



Photograph 22: Typical Medium Severity Longitudinal Crack



LRO – T-Hangar Taxilane Section 1 Photographs

Photograph 23: Typical Low Severity Longitudinal Crack



Photograph 24: Typical Medium Severity Longitudinal Crack



LRO – T-Hangar Apron Section 2 Photographs

Photograph 25: Typical Medium Severity Longitudinal Crack



Photograph 26: Typical Low Severity Raveling

LRO – Taxiway A Section 1A Photographs



Photograph 27: Typical Low Severity Longitudinal Crack



Photograph 28: Typical Medium Severity Longitudinal Crack



LRO – Taxiway A Section 1B Photographs

Photograph 29: Low Severity Alligator Cracking



Photograph 30: Typical Medium Severity Longitudinal Crack

LRO – Taxiway A Section 2A Photographs



Photograph 31: Typical Low Severity Longitudinal Crack



Photograph 32: Typical Medium Severity Longitudinal Crack

LRO – Taxiway A Section 2B Photographs



Photograph 33: Typical Low Severity Longitudinal Crack



Photograph 34: Typical Medium Severity Longitudinal Crack





Photograph 35: Typical Low Severity Longitudinal Crack



Photograph 36: Typical Medium Severity Longitudinal Crack

LRO – Taxiway B Section 2 Photographs



Photograph 37: Typical Low Severity Longitudinal Crack



Photograph 38: Typical Medium Severity Longitudinal Crack

APPENDIX A – SECTION DISTRESSES AND SECTION PCI VALUES

Branch	Section	Material	Distress	Level	Distress Quantity SQFT	Distress Quantity LINEAR	Pavement Quantity SQFT	Percent Density	Total Section Distresses	Section PCI
FBO Apron	01 (Park)	Asphalt	Oil Spillage	Х	243		28949	0.84%	2	91
FBO Apron	01 (Park)	Asphalt	Weathering	L	28949		28949	100%	2	91
FBO Apron	01 (T-L)	Asphalt	Longitudinal and Transverse Cracking	М		239	87053	0.27%	4	85
FBO Apron	01 (T-L)	Asphalt	Longitudinal and Transverse Cracking	L		494	87053	0.57%	4	85
FBO Apron	01 (T-L)	Asphalt	Raveling	L	44		87053	0.05%	4	85
FBO Apron	01 (T-L)	Asphalt	Weathering	L	86736		87053	99.64%	4	85
FBO Apron	02 (Park)	Asphalt	Longitudinal and Transverse Cracking	L		39	22984	0.17%	5	82
FBO Apron	02 (Park)	Asphalt	Longitudinal and Transverse Cracking	М		25	22984	0.11%	5	82
FBO Apron	02 (Park)	Asphalt	Oil Spillage	X	335		22984	1.46%	5	82
FBO Apron	02 (Park)	Asphalt	Raveling	L	14		22984	0.06%	5	82
FBO Apron	02 (Park)	Asphalt	Weathering	L	22984		22984	100%	5	82
FBO Apron	02 (T-L)	Asphalt	Longitudinal and Transverse Cracking	М		207	60642	0.34%	3	87
FBO Apron	02 (T-L)	Asphalt	Longitudinal and Transverse Cracking	L		277	60642	0.46%	3	87
FBO Apron	02 (T-L)	Asphalt	Weathering	L	60561		60642	100%	3	87
FBO Apron	03 (Park)	Asphalt	Longitudinal and Transverse Cracking	М		45	2043	2.18%	4	74
FBO Apron	03 (Park)	Asphalt	Longitudinal and Transverse Cracking	L		4	2043	0.21%	4	74
FBO Apron	03 (Park)	Asphalt	Raveling	L	11		2043	0.55%	4	74
FBO Apron	03 (Park)	Asphalt	Weathering	L	2036		2043	100%	4	74
FBO Apron	03 (T-L)	Asphalt	Longitudinal and Transverse Cracking	L		12	41420	0.03%	2	92
FBO Apron	03 (T-L)	Asphalt	Weathering	L	41401		41420	99.95%	2	92
RWY 17-35	01	Asphalt	Longitudinal and Transverse Cracking	М		2035	269794	0.75%	5	66
RWY 17-35	01	Asphalt	Longitudinal and Transverse Cracking	L		20075	269794	7.44%	5	66
RWY 17-35	01	Asphalt	Patching and Utility Cut Patching	М	44		269794	0.02%	5	66
RWY 17-35	01	Asphalt	Raveling	L	4		269794	0.00%	5	66
RWY 17-35	01	Asphalt	Weathering	L	269794		269794	100%	5	66
TH-APRON	01	Asphalt	Longitudinal and Transverse Cracking	L		209	37193	0.56%	3	84
TH-APRON	01	Asphalt	Longitudinal and Transverse Cracking	М		137	37193	0.37%	3	84
TH-APRON	01	Asphalt	Weathering	L	37193		37193	100%	3	84
TH-APRON	02	Asphalt	Alligator Cracking	L	276		26076	1.06%	5	60
TH-APRON	02	Asphalt	Longitudinal and Transverse Cracking	М		738	26076	2.83%	5	60
TH-APRON	02	Asphalt	Longitudinal and Transverse Cracking	L		2093	26076	8.03%	5	60
TH-APRON	02	Asphalt	Weathering	L	25980		26076	99.63%	5	60

Branch	Section	Material	Distress	Level	Distress Quantity SQFT	Distress Quantity LINEAR	Pavement Quantity SQFT	Percent Density	Total Section Distresses	Section PCI
TH-TWY	01	Asphalt	Longitudinal and Transverse Cracking	L		585	26538	2.20%	3	83
TH-TWY	01	Asphalt	Longitudinal and Transverse Cracking	М		21	26538	0.08%	3	83
TH-TWY	01	Asphalt	Weathering	L	26538		26538	100%	3	83
TH-TWY	02	Asphalt	Longitudinal and Transverse Cracking	М		363	67075	0.54%	5	81
TH-TWY	02	Asphalt	Longitudinal and Transverse Cracking	L		1031	67075	1.54%	5	81
TH-TWY	02	Asphalt	Raveling	L	113		67075	0.17%	5	81
TH-TWY	02	Asphalt	Weathering	L	40848		67075	60.90%	5	81
TWY A	01A	Asphalt	Longitudinal and Transverse Cracking	L		3084	69129	4.46%	3	64
TWY A	01A	Asphalt	Longitudinal and Transverse Cracking	М		787	69129	1.14%	3	64
TWY A	01A	Asphalt	Weathering	М	69129		69129	100%	3	64
TWY A	01B	Asphalt	Alligator Cracking	L	1192		10211	11.68%	6	35
TWY A	01B	Asphalt	Longitudinal and Transverse Cracking	L		1385	10211	13.56%	6	35
TWY A	01B	Asphalt	Longitudinal and Transverse Cracking	М		269	10211	2.64%	6	35
TWY A	01B	Asphalt	Raveling	L	18		10211	0.18%	6	35
TWY A	01B	Asphalt	Weathering	L	9059		10211	88.72%	6	35
TWY A	01B	Asphalt	Weathering	М	1151		10211	11.28%	6	35
TWY A	02A	Asphalt	Longitudinal and Transverse Cracking	М		763	57703	1.32%	3	66
TWY A	02A	Asphalt	Longitudinal and Transverse Cracking	L		2874	57703	4.98%	3	66
TWY A	02A	Asphalt	Weathering	М	57396		57703	99.47%	3	66
TWY A	02B	Asphalt	Longitudinal and Transverse Cracking	L		404	12213	3.31%	3	79
TWY A	02B	Asphalt	Longitudinal and Transverse Cracking	М		48	12213	0.40%	3	79
TWY A	02B	Asphalt	Weathering	L	12137		12213	99.38%	3	79
TWY B	1	Asphalt	Longitudinal and Transverse Cracking	L		404	4596	8.79%	3	69
TWY B	1	Asphalt	Longitudinal and Transverse Cracking	М		27	4596	0.58%	3	69
TWY B	1	Asphalt	Weathering	L	4596		4596	100%	3	69
TWY B	2	Asphalt	Longitudinal and Transverse Cracking	L		576	5677	10.15%	3	68
TWY B	2	Asphalt	Longitudinal and Transverse Cracking	М		4	5677	0.07%	3	68
TWY B	2	Asphalt	Weathering	L	5677		5677	100%	3	68