HARLOWTON AIRPORT

Branch: 22A **APRON** **A-11**

Length: 230 LF **Width:** 220 LF **Area:** 50,600 SF **Last Const. :** 1997 **Family:** 9ACAM
From: T-1 **To:** HANGARS **Surface:** AC

Inspections

Samples Surveyed: 4 **Total Samples:** 8 **Last Inspection Date:** 8/14/2009 **PCI: 53**

Sample # 1 **Area:** 6160 SF

Distress Description	Severity	Quantity
LONGITUDINAL/TRANSVERSE CRACKING	L	212 LF
WEATHERING/RAVELING	L	380 SF
LONGITUDINAL/TRANSVERSE CRACKING	M	55 LF
DEPRESSION	L	107 SF
WEATHERING/RAVELING	M	30 SF
LONGITUDINAL/TRANSVERSE CRACKING	H	6 LF
PATCHING	L	12 SF
WEATHERING/RAVELING	H	7 SF
DEPRESSION	M	4 SF

Sample # 3 **Area:** 6160 SF

Distress Description	Severity	Quantity
LONGITUDINAL/TRANSVERSE CRACKING	L	197 LF
WEATHERING/RAVELING	L	380 SF
LONGITUDINAL/TRANSVERSE CRACKING	M	62 LF
WEATHERING/RAVELING	M	30 SF
PATCHING	L	17 SF
BLEEDING	N	16 SF
DEPRESSION	L	13 SF
DEPRESSION	M	7 SF
WEATHERING/RAVELING	H	6 SF
DEPRESSION	H	2 SF

Sample # 4 **Area:** 6160 SF

Distress Description	Severity	Quantity
LONGITUDINAL/TRANSVERSE CRACKING	L	287 LF
WEATHERING/RAVELING	L	380 SF
LONGITUDINAL/TRANSVERSE CRACKING	M	52 LF
PATCHING	L	18 SF
DEPRESSION	L	16 SF
WEATHERING/RAVELING	M	8 SF
DEPRESSION	M	6 SF
WEATHERING/RAVELING	H	5 SF
OIL SPILLAGE	N	2 SF

Sample # 7 **Area:** 6160 SF

Distress Description	Severity	Quantity
LONGITUDINAL/TRANSVERSE CRACKING	L	171 LF
WEATHERING/RAVELING	L	380 SF
LONGITUDINAL/TRANSVERSE CRACKING	M	105 LF
WEATHERING/RAVELING	M	30 SF
ALLIGATOR CRACKING	L	15 SF
PATCHING	L	15 SF
DEPRESSION	L	13 SF
BLEEDING	N	10 SF
LONGITUDINAL/TRANSVERSE CRACKING	H	3 LF
DEPRESSION	M	5 SF
WEATHERING/RAVELING	H	3 SF
OIL SPILLAGE	N	3 SF

Extrapolated Distress Quantities*

Distress Description	Severity	Quantity	Density	Deduct
DEPRESSION	H	4 SF	0.01 %	12.00
LONGITUDINAL/TRANSVERSE CRACKING	M	563 LF	1.11 %	11.79
LONGITUDINAL/TRANSVERSE CRACKING	L	1781 LF	3.52 %	11.36
WEATHERING/RAVELING	L	3121 SF	6.17 %	7.63
LONGITUDINAL/TRANSVERSE CRACKING	H	18 LF	0.04 %	7.50
ALLIGATOR CRACKING	L	31 SF	0.06 %	7.00
WEATHERING/RAVELING	H	43 SF	0.09 %	6.00
WEATHERING/RAVELING	M	201 SF	0.40 %	5.70
DEPRESSION	M	45 SF	0.09 %	5.20
DEPRESSION	L	306 SF	0.60 %	4.09
PATCHING	L	127 SF	0.25 %	2.06

HARLOWTON AIRPORT

Branch: 22A **APRON** **A-11**

Extrapolated Distress Quantities*

Distress Description	Severity	Quantity	Density	Deduct
OIL SPILLAGE	N	10 SF	0.02 **%**	2.00
BLEEDING	N	53 SF	0.11 **%**	0.00

* Multiple deduct values are scaled down from their algebraic sum to keep the model consistent with experimental data.

Percent of Deduct Values Based on Distress Mechanism

9.0 **% Load** 63.0 **% Climate/Durability** 28.0 **% Other**

HARLOWTON AIRPORT

Branch: 22R **RUNWAY** **R-11**

Length: 4,200 LF **Width:** 60 LF **Area:** 273,600 SF **Last Const. :** 1997 **Family:** 9ACRML
From: STA 12+00 **To:** STA 54+00 **Surface:** AC

Inspections

Samples Surveyed: 7 **Total Samples:** 46 **Last Inspection Date:** 8/14/2009 **PCI: 59**

Sample # 1 **Area:** 3400 SF

Distress Description	Severity	Quantity
LONGITUDINAL/TRANSVERSE CRACKING	L	226 LF
LONGITUDINAL/TRANSVERSE CRACKING	M	84 LF
WEATHERING/RAVELING	L	102 SF
WEATHERING/RAVELING	M	17 SF
WEATHERING/RAVELING	H	3 SF
SWELLING	L	2 SF

Sample # 8 **Area:** 6000 SF

Distress Description	Severity	Quantity
LONGITUDINAL/TRANSVERSE CRACKING	L	440 LF
LONGITUDINAL/TRANSVERSE CRACKING	M	55 LF
WEATHERING/RAVELING	L	180 SF
WEATHERING/RAVELING	M	30 SF
WEATHERING/RAVELING	H	18 SF
SWELLING	L	18 SF
PATCHING	L	6 SF

Sample # 15 **Area:** 6000 SF

Distress Description	Severity	Quantity
LONGITUDINAL/TRANSVERSE CRACKING	L	309 LF
WEATHERING/RAVELING	L	180 SF
LONGITUDINAL/TRANSVERSE CRACKING	M	33 LF
WEATHERING/RAVELING	M	30 SF
LONGITUDINAL/TRANSVERSE CRACKING	H	3 LF
WEATHERING/RAVELING	H	9 SF
SWELLING	L	8 SF
DEPRESSION	H	3 SF

Sample # 22 **Area:** 6000 SF

Distress Description	Severity	Quantity
LONGITUDINAL/TRANSVERSE CRACKING	L	311 LF
WEATHERING/RAVELING	L	180 SF
LONGITUDINAL/TRANSVERSE CRACKING	M	36 LF
WEATHERING/RAVELING	M	30 SF
WEATHERING/RAVELING	H	22 SF
DEPRESSION	L	18 SF
DEPRESSION	M	15 SF
DEPRESSION	H	10 SF
LONGITUDINAL/TRANSVERSE CRACKING	H	3 LF
SWELLING	L	6 SF

Sample # 29 **Area:** 6000 SF

Distress Description	Severity	Quantity
LONGITUDINAL/TRANSVERSE CRACKING	L	321 LF
WEATHERING/RAVELING	L	180 SF
LONGITUDINAL/TRANSVERSE CRACKING	M	16 LF
WEATHERING/RAVELING	M	37 SF
SWELLING	L	7 SF

Sample # 36 **Area:** 6000 SF

Distress Description	Severity	Quantity
LONGITUDINAL/TRANSVERSE CRACKING	L	455 LF
LONGITUDINAL/TRANSVERSE CRACKING	M	74 LF
WEATHERING/RAVELING	L	180 SF
WEATHERING/RAVELING	M	34 SF
SWELLING	L	4 SF

Sample # 43 **Area:** 6000 SF

Distress Description	Severity	Quantity
LONGITUDINAL/TRANSVERSE CRACKING	L	459 LF
WEATHERING/RAVELING	L	180 SF
LONGITUDINAL/TRANSVERSE CRACKING	M	21 LF
WEATHERING/RAVELING	M	40 SF
DEPRESSION	L	15 SF
SWELLING	L	4 SF

HARLOWTON AIRPORT

Branch: 22R **RUNWAY** **R-11**

Extrapolated Distress Quantities*

Distress Description	Severity	Quantity	Density	Deduct
LONGITUDINAL/TRANSVERSE CRACKING	L	17511 LF	6.40 %	17.57
DEPRESSION	H	90 SF	0.03 %	12.00
LONGITUDINAL/TRANSVERSE CRACKING	M	2216 LF	0.81 %	10.24
LONGITUDINAL/TRANSVERSE CRACKING	H	42 LF	0.02 %	7.50
WEATHERING/RAVELING	H	361 SF	0.13 %	7.09
WEATHERING/RAVELING	M	1514 SF	0.55 %	6.36
DEPRESSION	M	104 SF	0.04 %	5.20
WEATHERING/RAVELING	L	8208 SF	3.00 %	5.08
PATCHING	L	42 SF	0.02 %	2.00
SWELLING	L	340 SF	0.12 %	1.23
DEPRESSION	L	229 SF	0.08 %	0.30

* Multiple deduct values are scaled down from their algebraic sum to keep the model consistent with experimental data.

Percent of Deduct Values Based on Distress Mechanism

0.0 **% Load** 75.0 **% Climate/Durability** 25.0 **% Other**

HARLOWTON AIRPORT

Branch: 22T **TAXIWAY** **T-11**

Length: 487 LF **Width:** 35 LF **Area:** 17,045 SF **Last Const. :** 1997 **Family:** 9ACRML

From: R-11 **To:** A-11 **Surface:** AC

Inspections

Samples Surveyed: 3 **Total Samples:** 4 **Last Inspection Date:** 8/14/2009 **PCI: 74**

Sample # 1 **Area:** 4200 SF

Distress Description	Severity	Quantity
LONGITUDINAL/TRANSVERSE CRACKING	L	186 LF
WEATHERING/RAVELING	L	252 SF
LONGITUDINAL/TRANSVERSE CRACKING	M	72 LF
WEATHERING/RAVELING	M	12 SF
DEPRESSION	L	9 SF
WEATHERING/RAVELING	H	2 SF

Sample # 2 **Area:** 4200 SF

Distress Description	Severity	Quantity
WEATHERING/RAVELING	L	252 SF
LONGITUDINAL/TRANSVERSE CRACKING	L	53 LF
LONGITUDINAL/TRANSVERSE CRACKING	M	20 LF
WEATHERING/RAVELING	M	10 SF
DEPRESSION	L	1 SF

Sample # 4 **Area:** 4200 SF

Distress Description	Severity	Quantity
LONGITUDINAL/TRANSVERSE CRACKING	L	113 LF
WEATHERING/RAVELING	L	252 SF
LONGITUDINAL/TRANSVERSE CRACKING	M	17 LF
DEPRESSION	L	3 SF

Extrapolated Distress Quantities*

Distress Description	Severity	Quantity	Density	Deduct
LONGITUDINAL/TRANSVERSE CRACKING	M	147 LF	0.87 %	10.54
LONGITUDINAL/TRANSVERSE CRACKING	L	476 LF	2.79 %	9.51
WEATHERING/RAVELING	L	1023 SF	6.00 %	7.52
WEATHERING/RAVELING	H	3 SF	0.02 %	6.00
WEATHERING/RAVELING	M	30 SF	0.17 %	4.50
DEPRESSION	L	18 SF	0.10 %	0.30

* Multiple deduct values are scaled down from their algebraic sum to keep the model consistent with experimental data.

Percent of Deduct Values Based on Distress Mechanism

0.0 **% Load** 99.0 **% Climate/Durability** 1.0 **% Other**

HARLOWTON AIRPORT

FIRST YEAR LOCAL:2010 LOCAL REPAIR COST: $15,305

Section	Distress Description	Severity	Quantity	Work Description	Quantity	Cost	Policy
A-11	L & T CR	H	19 LF	Crack Sealing - AC	19 LF	$28	PREV.
A-11	OIL SPILLAGE	N	11 SF	Patching - AC Shallow	28 SF	$407	PREV.
A-11	DEPRESSION	H	5 SF	Patching - AC Deep	17 SF	$602	PREV.
A-11	L & T CR	M	563 LF	Crack Sealing - AC	563 LF	$844	PREV.
A-11	DEPRESSION	M	46 SF	Patching - AC Deep	77 SF	$2,821	PREV.
R-11	L & T CR	H	42 LF	Crack Sealing - AC	42 LF	$63	SAFET
R-11	DEPRESSION	H	91 SF	Patching - AC Deep	133 SF	$4,903	SAFET
R-11	WEATH/RAVEL	H	362 SF	Patching - AC Shallow	362 SF	$5,416	SAFET
T-11	L & T CR	M	148 LF	Crack Sealing - AC	148 LF	$221	PREV.

FIFTEEN YEAR PROJECTIONS: ESTIMATED AVERAGE ANNUAL COST: $58,353

PLAN YEAR: 2010 ESTIMATED COST: $517,829

SectionI	Maintenance	Local	Global	Major<Crit	Major>Crit	Total	PCI before	PCI after
A-11	Basic Prev.	$4,702				$4,702	52	52
R-11	Reconstruct			$485,634		$485,634	58	100
T-11	Prev. & Thin AC	$221	$27,272			$27,493	73	87

PLAN YEAR: 2011 ESTIMATED COST: $107,155

SectionI	Maintenance	Local	Global	Major<Crit	Major>Crit	Total	PCI before	PCI after
A-11	Reconstruct			$106,972		$106,972	49	100
T-11	Basic Prev.	$183				$183	84	84

PLAN YEAR: 2012 ESTIMATED COST: $269

SectionI	Maintenance	Local	Global	Major<Crit	Major>Crit	Total	PCI before	PCI after
T-11	Basic Prev.	$269				$269	80	80

PLAN YEAR: 2013 ESTIMATED COST: $1,298

SectionI	Maintenance	Local	Global	Major<Crit	Major>Crit	Total	PCI before	PCI after
R-11	Basic Prev.	$920				$920	88	88
T-11	Basic Prev.	$378				$378	78	78

PLAN YEAR: 2014 ESTIMATED COST: $3,165

SectionI	Maintenance	Local	Global	Major<Crit	Major>Crit	Total	PCI before	PCI after
A-11	Basic Prev.	$192				$192	88	88
R-11	Basic Prev.	$2,494				$2,494	84	84
T-11	Basic Prev.	$479				$479	75	75

PLAN YEAR: 2015 ESTIMATED COST: $59,701

SectionI	Maintenance	Local	Global	Major<Crit	Major>Crit	Total	PCI before	PCI after
A-11	Basic Prev.	$491				$491	84	84
R-11	Prev. & Fog Seal	$3,922	$54,720			$58,642	81	88
T-11	Basic Prev.	$567				$567	73	73

PLAN YEAR: 2016 ESTIMATED COST: $14,029

SectionI	Maintenance	Local	Global	Major<Crit	Major>Crit	Total	PCI before	PCI after
A-11	Prev. & Fog Seal	$772	$10,120			$10,892	81	88
R-11	Basic Prev.	$2,494				$2,494	84	84
T-11	Basic Prev.	$643				$643	71	71

PLAN YEAR: 2017 ESTIMATED COST: $5,125

SectionI	Maintenance	Local	Global	Major<Crit	Major>Crit	Total	PCI before	PCI after
A-11	Basic Prev.	$492				$492	84	84
R-11	Basic Prev.	$3,927				$3,927	81	81
T-11	Basic Prev.	$707				$707	70	70

PLAN YEAR: 2018 ESTIMATED COST: $7,060

SectionI	Maintenance	Local	Global	Major<Crit	Major>Crit	Total	PCI before	PCI after
A-11	Basic Prev.	$773				$773	81	81
R-11	Basic Prev.	$5,549				$5,549	78	78
T-11	Basic Prev.	$739				$739	68	68

PLAN YEAR: 2019 ESTIMATED COST: $9,150

SectionI	Maintenance	Local	Global	Major<Crit	Major>Crit	Total	PCI before	PCI after
A-11	Basic Prev.	$1,142				$1,142	78	78
R-11	Basic Prev.	$7,239				$7,239	76	76
T-11	Basic Prev.	$769				$769	67	67

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PLAN YEAR: 2020					ESTIMATED COST:	$93,018	PCI	
SectionI	**Maintenance**	**Local**	**Global**	**Major<Crit**	**Major>Crit**	**Total**	**before**	**after**
A-11	Basic Prev.	$1,524				$1,524	74	74
R-11	Prev. & Fog Seal	$8,703	$54,720			$63,424	74	78
T-11	Prev. & Thin AC	$799	$27,272			$28,071	66	73

PLAN YEAR: 2021					ESTIMATED COST:	$19,894	PCI	
SectionI	**Maintenance**	**Local**	**Global**	**Major<Crit**	**Major>Crit**	**Total**	**before**	**after**
A-11	Prev. & Fog Seal	$1,891	$10,120			$12,011	72	78
R-11	Basic Prev.	$7,239				$7,239	76	76
T-11	Basic Prev.	$644				$644	71	71

PLAN YEAR: 2022					ESTIMATED COST:	$10,941	PCI	
SectionI	**Maintenance**	**Local**	**Global**	**Major<Crit**	**Major>Crit**	**Total**	**before**	**after**
A-11	Basic Prev.	$1,524				$1,524	74	74
R-11	Basic Prev.	$8,711				$8,711	74	74
T-11	Basic Prev.	$707				$707	70	70

PLAN YEAR: 2023					ESTIMATED COST:	$12,618	PCI	
SectionI	**Maintenance**	**Local**	**Global**	**Major<Crit**	**Major>Crit**	**Total**	**before**	**after**
A-11	Basic Prev.	$1,890				$1,890	72	72
R-11	Basic Prev.	$9,989				$9,989	72	72
T-11	Basic Prev.	$739				$739	68	68

PLAN YEAR: 2024					ESTIMATED COST:	$14,037	PCI	
SectionI	**Maintenance**	**Local**	**Global**	**Major<Crit**	**Major>Crit**	**Total**	**before**	**after**
A-11	Basic Prev.	$2,171				$2,171	69	69
R-11	Basic Prev.	$11,098				$11,098	70	70
T-11	Basic Prev.	$769				$769	67	67

HARLOWTON AIRPORT

8/14/2009

A-11, overview

A-11, surface detail with bleeding

T-11, overview with depression

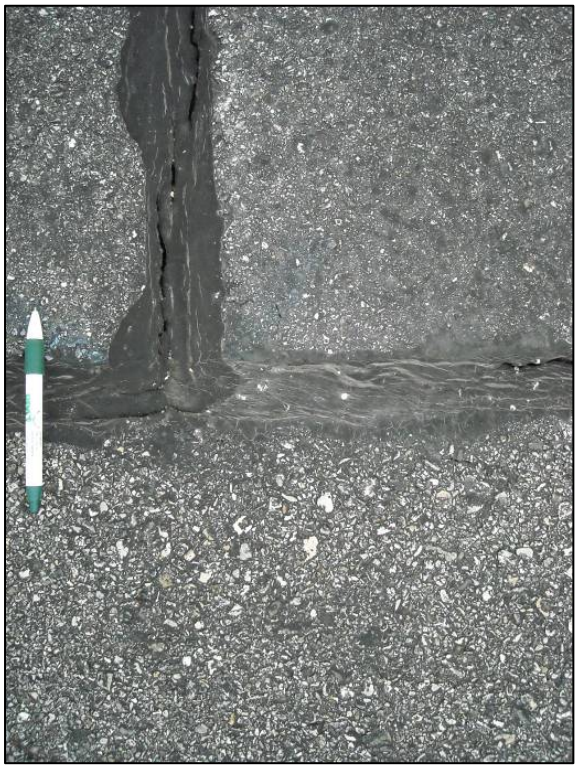
T-11, surface detail

HARLOWTON AIRPORT

8/14/2009

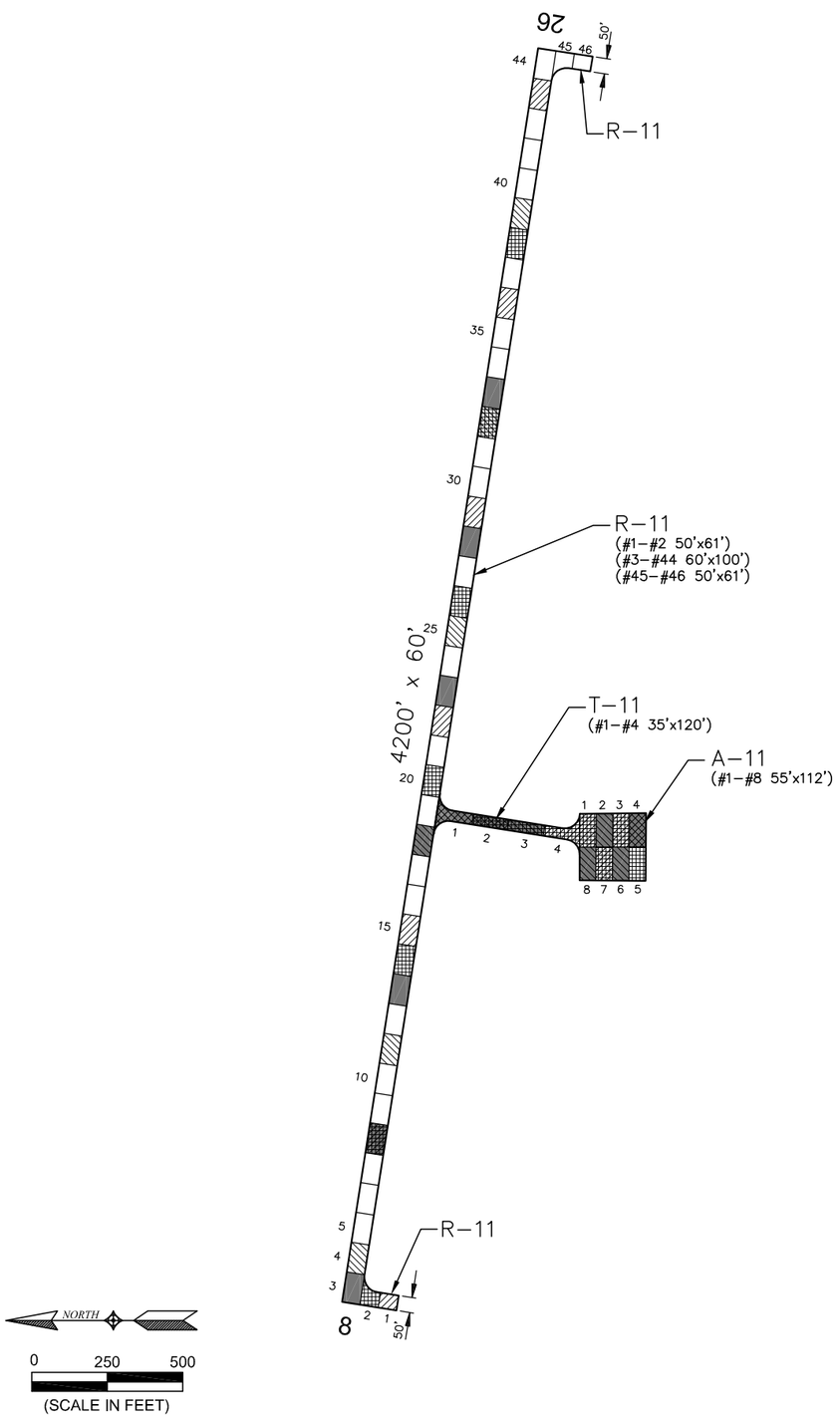
R-11, overview

R-11, surface detail with pavement collapse



R-11, surface detail with cracks

HARLOWTON



PAVEMENT STRENGTH SURVEY/PAVEMENT CONDITION SURVEY

HARLOWTON

PAVE. IDENT.	SOIL CLASS	SUB GRADE CLASS	SUBBASE COURSE	BASE COURSE	SURFACE COURSE	OVERLAY	PAVEMENT STRENGTH MAX. GROSS LOAD (LBS) SINGLE	DUAL	DUAL TAN.	REMARKS
RUNWAYS										
R–11			9" COMP. T-99	10" P-208, P-207	2" P–401	P–609	12,500			1 2 3
TAXIWAYS										
T–11			4" P–154	5" P-208, 2" P-207	2" P–401	P–609	12,500			1 2 3
APRONS										
A–11			4" P–154	5" P-208, 2" P-207	2" P–401	P–609	12,500			1 2 3

REMARKS:

1. AIP–01, 1997, REHABILITATE AND WIDEN RUNWAY; REHABILITATE APRON AND TAXIWAY.
2. AIP–02, 2002, CRACK SEAL, FOG SEAL, AND REMARK ALL PAVEMENTS.
3. AIP–003, 2006, CRACK SEAL, FOG SEAL, AND REMARK ALL PAVEMENTS [INSPECTED PRIOR TO COMPLETION].

LEGEND

- 1997 SURVEY AREA (NOT SURVEYED)
- 2000 SURVEY AREA
- 2003 SURVEY AREA
- 2006 SURVEY AREA
- 2009 SURVEY AREA

DATE OF PAVEMENT STRENGTH SURVEY:	SEPT. 23, 1987
EVALUATED BY:	C. NEW
DATE OF MOST RECENT PAVEMENT CONDITION SURVEY:	AUG. 14, 2009
EVALUATED BY:	B. BURKLAND

MONTANA AVIATION SYSTEM PLAN
2009 UPDATE - PAVEMENT CONDITION INDEXES

WHEATLAND COUNTY AIRPORT

PREPARED FOR: MONTANA AERONAUTICS DIVISION

HARLOWTON
MONTANA

DATE: NOV. 2009

PREPARED BY: RPA