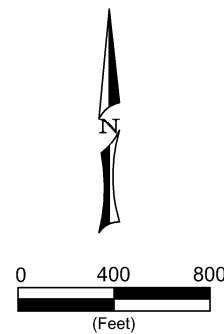
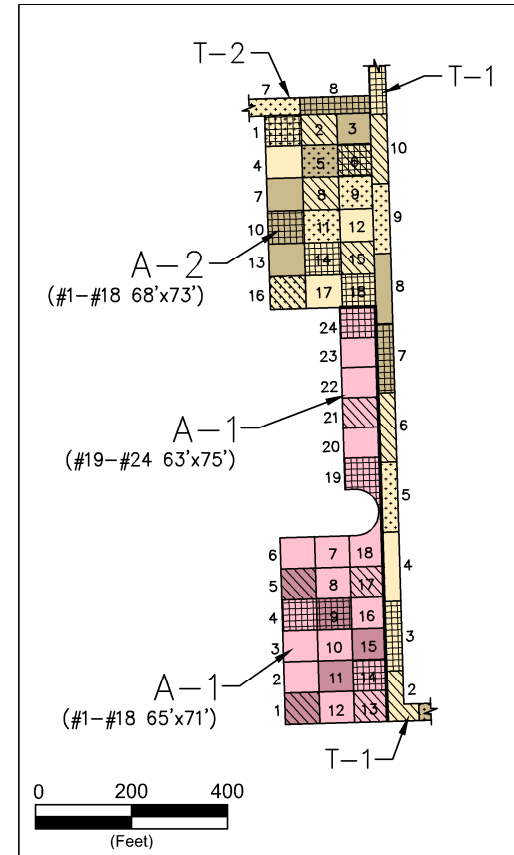
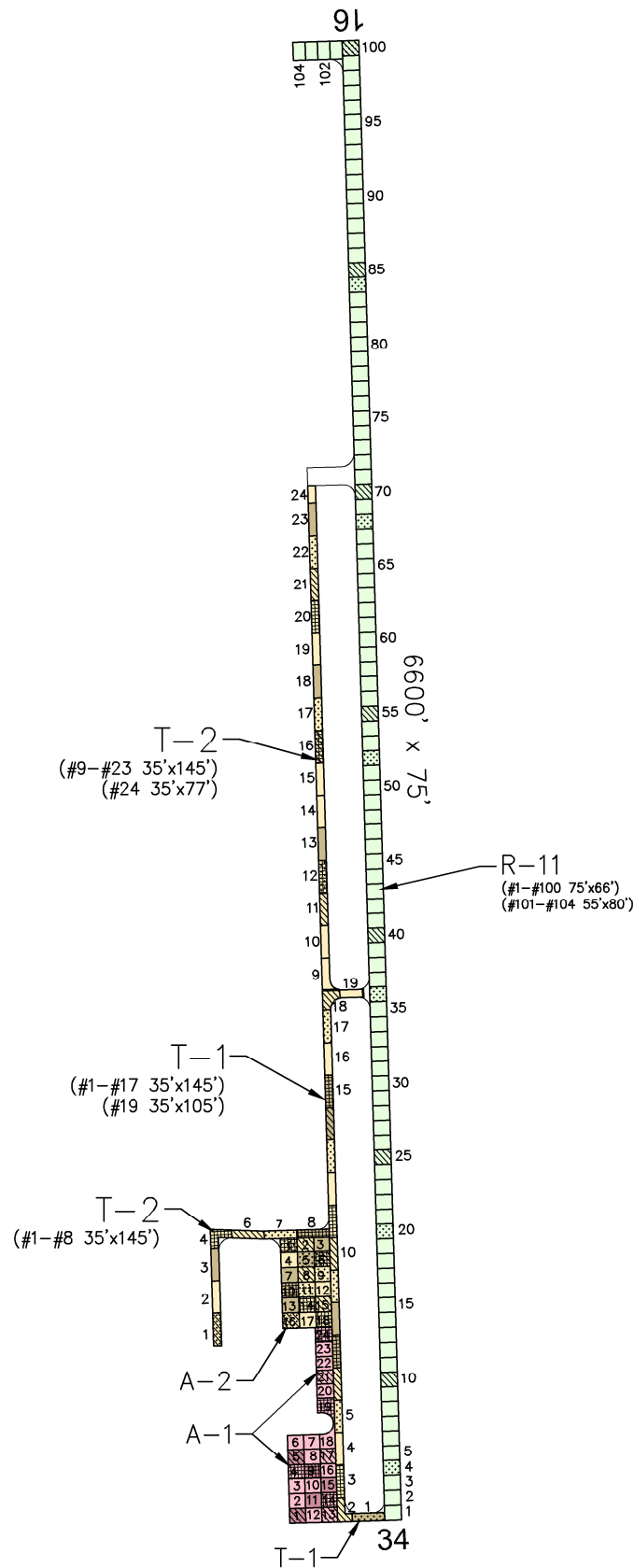


# ENNIS



# PAVEMENT STRENGTH SURVEY/PAVEMENT CONDITION SURVEY

PAVE. IDENT.	SOIL CLASS	SUB GRADE CLASS	SUBBASE COURSE	BASE COURSE	SURFACE COURSE	OVERLAY	PAVEMENT STRENGTH			REMARKS
							MAX. GROSS LOAD (LBS)			
							SINGLE	DUAL	DUAL TAN.	
<b>RUNWAYS</b>										
R-11	CBR=20		P-152	4"P-209/3"P-207	3" P-401	P-609	30,000	30,000		4,5
<b>TAXIWAYS</b>										
T-1	CBR=4			8" P-208	3" P-401	P-609	12,500			1,3,4,5
T-2			P-152	8" P-208	3" P-401	P-609	12,500			2,3,4,5
<b>APRONS</b>										
A-1	CBR=4			8" P-208	3" P-401	P-609	12,500			1,3,4,5
A-2			P-152	8" P-208	3" P-401	P-609	12,500			2,3,4,5

**REMARKS:**

1. AIP-02, 1990, ALL NEW CONSTRUCTION.
2. AIP-03, 1992, CONSTRUCT PARALLEL TAXIWAY EXTENSION, APRON AND ACCESS TAXIWAY.
3. AIP-05, 2001, CRACK SEAL, FOG SEAL, AND REMARK ALL PAVEMENTS.
4. AIP-010, 2008, RECONSTRUCT RUNWAY (R-11); CONSTRUCT RUNWAY EXTENSION AND TURN AROUND; CRACK SEAL, FOG SEAL, AND REMARK ALL REMAINING PAVEMENTS.
5. AIP-012-2013, CRACK SEAL, FOG SEAL, AND REMARK ALL PAVEMENTS.

**LEGEND**

- 2003 SURVEY AREA
- 2006 SURVEY AREA
- 2009 SURVEY AREA (NOT SURVEYED)
- 2012 SURVEY AREA
- 2015 SURVEY AREA

- MAINTAIN: PCI > 60
- TRANSITION: PCI 45 TO 60
- RECONSTRUCT: PCI < 45

DATE OF PAVEMENT STRENGTH SURVEY: MAR. 12, 1990

EVALUATED BY: S. DALTON

DATE OF MOST RECENT PAVEMENT CONDITION SURVEY: SEPT. 10, 2015

EVALUATED BY: D. SCHANDEL

LOCATION: ENNIS MONTANA

**MONTANA AVIATION SYSTEM PLAN  
2015 UPDATE - PAVEMENT CONDITION INDEXES**

**ENNIS BIG SKY AIRPORT  
(EKS)**

Date: DECEMBER 2015 Prepared For: Prepared By:

DECEMBER 2015



ENNIS

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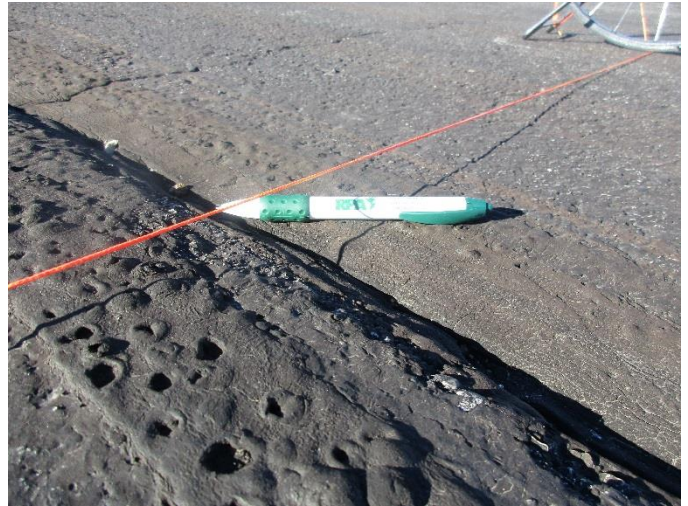
# ENNIS AIRPORT

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9/10/2015



**A-2, Overview**



**A-2, Surface detail with crack and depression**



**R-11, Overview**



**R-11, Surface detail with bore hole**



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# ENNIS AIRPORT

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9/10/2015



**T-1**, Surface detail with cracking



**T-1**, Overview



**T-2**, Overview



**T-2**, Surface detail with swelling & bore hole

**ENNIS AIRPORT**

Branch: 50A

APRON

**A-2**

**Length:** 408 LF **Width:** 216 LF **Area:** 88,128 SF **Last Const. :** 1992 **Family:** ACAM15  
**From:** NORHTERN PORTION OF AP **To:** **Surface:** AC

**Inspections**

**Samples Surveyed:** 5 **Total Samples:** 18 **Last Inspection Date (RPA)** 9/10/2015 **PCI:** 49

**Sample # 1** **Area:** 4964 SF

Distress Description	Severity	Quantity
LONGITUDINAL/TRANSVERSE CRACKING	L	1010 LF
WEATHERING	L	100 SF
LONGITUDINAL/TRANSVERSE CRACKING	M	24 LF
RAVELING	L	50 SF
PATCHING	L	8 SF
RAVELING	M	4 SF

**Sample # 5** **Area:** 4896 SF

Distress Description	Severity	Quantity
LONGITUDINAL/TRANSVERSE CRACKING	L	1150 LF
LONGITUDINAL/TRANSVERSE CRACKING	M	54 LF
WEATHERING	L	100 SF
RAVELING	L	50 SF
PATCHING	L	16 SF
SWELLING	M	9 SF
RAVELING	M	2 SF

**Sample # 9** **Area:** 4896 SF

Distress Description	Severity	Quantity
LONGITUDINAL/TRANSVERSE CRACKING	L	803 LF
LONGITUDINAL/TRANSVERSE CRACKING	M	200 LF
DEPRESSION	L	108 SF
WEATHERING	L	100 SF
RAVELING	L	50 SF
PATCHING	L	4 SF

**Sample # 11** **Area:** 4896 SF

Distress Description	Severity	Quantity
LONGITUDINAL/TRANSVERSE CRACKING	L	1296 LF
LONGITUDINAL/TRANSVERSE CRACKING	M	100 LF
WEATHERING	L	100 SF
RAVELING	L	50 SF
PATCHING	L	13 SF

**Sample # 16** **Area:** 4964 SF

Distress Description	Severity	Quantity
LONGITUDINAL/TRANSVERSE CRACKING	L	901 LF
ALLIGATOR CRACKING	L	576 SF
LONGITUDINAL/TRANSVERSE CRACKING	M	60 LF
WEATHERING	L	100 SF
RAVELING	L	50 SF
RAVELING	M	4 SF

**Extrapolated Distress Quantities\***

Distress Description	Severity	Quantity	Density	Deduct
LONGITUDINAL/TRANSVERSE CRACKING	L	18473 LF	20.96 %	33.49
ALLIGATOR CRACKING	L	2062 SF	2.34 %	28.63
LONGITUDINAL/TRANSVERSE CRACKING	M	1568 LF	1.78 %	14.80
SWELLING	M	32 SF	0.04 %	10.00
RAVELING	M	36 SF	0.04 %	4.00
DEPRESSION	L	387 SF	0.44 %	2.80
RAVELING	L	895 SF	1.02 %	2.64
PATCHING	L	147 SF	0.17 %	2.01
WEATHERING	L	1790 SF	2.03 %	0.69

\* 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**

29.0 % Load

58.0 % Climate/Durability

13.0 % Other

**ENNIS AIRPORT**

Branch: 50R

**RUNWAY**

**R-11**

**Length:** 6,600 LF    **Width:** 75 LF    **Area:** 495,000 SF    **Last Const. :** 2008    **Family:** ACRMU15  
**From:** RWY 34-16 STA 0+00    **To:** RWY 34-16 STA 66+00    **Surface:** AC

**Inspections**

**Samples Surveyed:** 7    **Total Samples:** 7    **Last Inspection Date (RPA)** 9/10/2015    **PCI:** 86

**Sample # 4**    **Area:** 4950 SF

Distress Description	Severity	Quantity
LONGITUDINAL/TRANSVERSE CRACKING	L	58 LF
WEATHERING	L	120 SF
RAVELING	L	96 SF
RAVELING	M	2 SF

**Sample # 20**    **Area:** 4950 SF

Distress Description	Severity	Quantity
WEATHERING	L	120 SF
LONGITUDINAL/TRANSVERSE CRACKING	L	31 LF
RAVELING	L	96 SF
PATCHING	L	2 SF

**Sample # 36**    **Area:** 4950 SF

Distress Description	Severity	Quantity
WEATHERING	L	120 SF
RAVELING	L	96 SF
LONGITUDINAL/TRANSVERSE CRACKING	L	22 LF
DEPRESSION	M	10 SF
DEPRESSION	L	5 SF
OIL SPILLAGE	N	1 SF

**Sample # 52**    **Area:** 4950 SF

Distress Description	Severity	Quantity
LONGITUDINAL/TRANSVERSE CRACKING	L	70 LF
WEATHERING	L	120 SF
WEATHERING	M	100 SF
RAVELING	L	96 SF
DEPRESSION	L	3 SF
SWELLING	L	2 SF

**Sample # 68**    **Area:** 4950 SF

Distress Description	Severity	Quantity
LONGITUDINAL/TRANSVERSE CRACKING	L	47 LF
WEATHERING	L	120 SF
RAVELING	L	96 SF
PATCHING	L	1 SF
OIL SPILLAGE	N	1 SF

**Sample # 84**    **Area:** 4950 SF

Distress Description	Severity	Quantity
WEATHERING	L	120 SF
RAVELING	L	96 SF
LONGITUDINAL/TRANSVERSE CRACKING	L	28 LF
PATCHING	L	1 SF
PATCHING	M	1 SF

**Sample # 100**    **Area:** 4950 SF

Distress Description	Severity	Quantity
WEATHERING	L	120 SF
RAVELING	L	96 SF
SWELLING	L	10 SF
RAVELING	M	4 SF
PATCHING	L	1 SF
DEPRESSION	L	1 SF

**Extrapolated Distress Quantities\***

Distress Description	Severity	Quantity	Density	Deduct
PATCHING	M	14 SF	0.00 %	6.20
DEPRESSION	M	143 SF	0.03 %	5.20
LONGITUDINAL/TRANSVERSE CRACKING	L	3657 LF	0.74 %	4.45
RAVELING	M	86 SF	0.02 %	4.00
RAVELING	L	9600 SF	1.94 %	3.91
OIL SPILLAGE	N	29 SF	0.01 %	2.00
PATCHING	L	71 SF	0.01 %	2.00

**ENNIS AIRPORT**

Branch: 50R

**RUNWAY**

**R-11**

**Extrapolated Distress Quantities\***

<b>Distress Description</b>	<b>Severity</b>	<b>Quantity</b>	<b>Density</b>	<b>Deduct</b>
WEATHERING	M	1429 SF	0.29 %	1.31
SWELLING	L	171 SF	0.03 %	1.00
WEATHERING	L	12000 SF	2.42 %	0.75
DEPRESSION	L	129 SF	0.03 %	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**                      73.0 % **Climate/Durability**                      27.0 % **Other**





**ENNIS AIRPORT**

Branch: 50T

**TAXIWAY**

**T-1**

**Extrapolated Distress Quantities\***

<b>Distress Description</b>	<b>Severity</b>	<b>Quantity</b>	<b>Density</b>	<b>Deduct</b>
DEPRESSION	L	361 SF	0.37 %	2.27
PATCHING	L	144 SF	0.15 %	2.01
WEATHERING	L	1900 SF	1.97 %	0.68

\* 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**

14.0 % Load                      59.0 % Climate/Durability                      27.0 % Other





# ENNIS AIRPORT

**FIFTEEN YEAR PROJECTIONS: ESTIMATED AVERAGE ANNUAL COST: \$226,864**

PLAN YEAR: 2016			ESTIMATED COST:			\$937,445	PCI	
SectionID	Maintenance	Local	Global	Major<Crit	Major>Crit	Total	before	after
A-2	Reconstruct			\$487,832		\$487,832	46	100
T-2	Prev. & Thin AC	\$25,617	\$229,661			\$255,278	56	65
R-11	Prev. & Seal Coat	\$3,164	\$138,600			\$141,764	84	90
T-1	Prev. & Seal Coat	\$25,572	\$26,999			\$52,571	52	56
PLAN YEAR: 2017			ESTIMATED COST:			\$39,629	PCI	
SectionID	Maintenance	Local	Global	Major<Crit	Major>Crit	Total	before	after
T-1	Basic Prev.	\$23,077				\$23,077	55	55
T-2	Basic Prev.	\$14,885				\$14,885	63	63
R-11	Basic Prev.	\$1,667				\$1,667	87	87
PLAN YEAR: 2018			ESTIMATED COST:			\$47,351	PCI	
SectionID	Maintenance	Local	Global	Major<Crit	Major>Crit	Total	before	after
T-2	Basic Prev.	\$17,406				\$17,406	61	61
T-1	Basic Prev.	\$26,745				\$26,745	53	53
R-11	Basic Prev.	\$3,200				\$3,200	84	84
PLAN YEAR: 2019			ESTIMATED COST:			\$56,351	PCI	
SectionID	Maintenance	Local	Global	Major<Crit	Major>Crit	Total	before	after
T-1	Basic Prev.	\$30,883				\$30,883	50	51
T-2	Basic Prev.	\$20,444				\$20,444	59	60
A-2	Basic Prev.	\$270				\$270	87	87
R-11	Basic Prev.	\$4,754				\$4,754	81	81
PLAN YEAR: 2020			ESTIMATED COST:			\$606,849	PCI	
SectionID	Maintenance	Local	Global	Major<Crit	Major>Crit	Total	before	after
A-2	Basic Prev.	\$608				\$608	84	84
T-2	Basic Prev.	\$24,397				\$24,397	58	58
T-1	Reconstruct			\$573,242		\$573,242	48	100
R-11	Basic Prev.	\$8,602				\$8,602	79	79
PLAN YEAR: 2021			ESTIMATED COST:			\$204,719	PCI	
SectionID	Maintenance	Local	Global	Major<Crit	Major>Crit	Total	before	after
R-11	Prev. & Seal Coat	\$14,437	\$160,676			\$175,112	76	82
A-2	Basic Prev.	\$935				\$935	81	81
T-2	Basic Prev.	\$28,672				\$28,672	56	56
PLAN YEAR: 2022			ESTIMATED COST:			\$43,759	PCI	
SectionID	Maintenance	Local	Global	Major<Crit	Major>Crit	Total	before	after
A-2	Basic Prev.	\$1,877				\$1,877	78	78
R-11	Basic Prev.	\$8,489				\$8,489	79	79
T-2	Basic Prev.	\$33,393				\$33,393	54	54
PLAN YEAR: 2023			ESTIMATED COST:			\$56,418	PCI	
SectionID	Maintenance	Local	Global	Major<Crit	Major>Crit	Total	before	after
A-2	Basic Prev.	\$3,060				\$3,060	75	76
T-2	Basic Prev.	\$38,675				\$38,675	52	52
R-11	Basic Prev.	\$14,683				\$14,683	76	77
PLAN YEAR: 2024			ESTIMATED COST:			\$70,207	PCI	
SectionID	Maintenance	Local	Global	Major<Crit	Major>Crit	Total	before	after
T-2	Basic Prev.	\$44,646				\$44,646	50	50
A-2	Basic Prev.	\$4,238				\$4,238	73	73
R-11	Basic Prev.	\$20,943				\$20,943	74	74
T-1	Basic Prev.	\$380				\$380	87	87
PLAN YEAR: 2025			ESTIMATED COST:			\$855,404	PCI	
SectionID	Maintenance	Local	Global	Major<Crit	Major>Crit	Total	before	after
R-11	Basic Prev.	\$27,181				\$27,181	72	72
A-2	Basic Prev.	\$5,418				\$5,418	71	71
T-2	Reconstruct			\$822,057		\$822,057	48	100
T-1	Basic Prev.	\$748				\$748	84	84
PLAN YEAR: 2026			ESTIMATED COST:			\$228,789	PCI	
SectionID	Maintenance	Local	Global	Major<Crit	Major>Crit	Total	before	after
A-2	Basic Prev.	\$7,675				\$7,675	69	69
R-11	Prev. & Seal Coat	\$33,726	\$186,267			\$219,993	70	75
T-1	Basic Prev.	\$1,121				\$1,121	81	81

PLAN YEAR: 2027			ESTIMATED COST:			\$40,723	PCI	
SectionID	Maintenance	Local	Global	Major<Crit	Major>Crit	Total	before	after
A-2	Basic Prev.	\$10,504				\$10,504	66	67
T-1	Basic Prev.	\$1,987				\$1,987	79	79
R-11	Basic Prev.	\$28,232				\$28,232	72	72
PLAN YEAR: 2028			ESTIMATED COST:			\$51,778	PCI	
SectionID	Maintenance	Local	Global	Major<Crit	Major>Crit	Total	before	after
A-2	Basic Prev.	\$13,470				\$13,470	64	64
T-1	Basic Prev.	\$3,387				\$3,387	76	76
R-11	Basic Prev.	\$34,921				\$34,921	70	70
PLAN YEAR: 2029			ESTIMATED COST:			\$71,451	PCI	
SectionID	Maintenance	Local	Global	Major<Crit	Major>Crit	Total	before	after
T-1	Basic Prev.	\$4,793				\$4,793	74	74
R-11	Basic Prev.	\$49,502				\$49,502	68	68
A-2	Basic Prev.	\$16,618				\$16,618	62	62
T-2	Basic Prev.	\$538				\$538	87	87
PLAN YEAR: 2030			ESTIMATED COST:			\$92,080	PCI	
SectionID	Maintenance	Local	Global	Major<Crit	Major>Crit	Total	before	after
A-2	Basic Prev.	\$19,982				\$19,982	60	60
T-2	Basic Prev.	\$1,059				\$1,059	84	84
T-1	Basic Prev.	\$6,196				\$6,196	72	72
R-11	Basic Prev.	\$64,843				\$64,843	66	66