



**CIRCLE AIRPORT**

Branch: 38-A

APRON

**A-2**

Length: 280 LF    Width: 125 LF    Area: 34,860 SF    Last Const: 2007    Family: ACAM  
 From: RWY 12-30 STA 9+00    To: RWY 12-30 STA 11+80    Surface: AC

**Inspections**

Samples Surveyed: 3    Total Samples: 7    Last Inspection Date: 8/20/2012    **PCI: 68**

Sample # 2    Area: 4,240 SF

Distress Description	Severity	Quantity
LONGITUDINAL/TRANSVERSE CRACKING	L	72 LF
RAVELING	M	42 SF
WEATHERING	L	4,240 SF
RAVELING	L	420 SF

Sample # 5    Area: 6,325 SF

Distress Description	Severity	Quantity
LONGITUDINAL/TRANSVERSE CRACKING	L	279 LF
ALLIGATOR CRACKING	M	24 LF
RAVELING	L	633 SF
WEATHERING	L	6,328 SF
DEPRESSION	L	24 SF
RAVELING	M	63 SF

Sample # 7    Area: 6,328 SF

Distress Description	Severity	Quantity
LONGITUDINAL/TRANSVERSE CRACKING	L	181 LF
RAVELING	M	63 SF
WEATHERING	L	6,325 SF
RAVELING	L	633 SF

**Extrapolated Distress Quantities\***

Distress Description	Severity	Quantity	Density	Deduct
LONGITUDINAL/TRANSVERSE CRACKING	L	1,098 LF	3.15%	10.43
ALLIGATOR CRACKING	M	50 LF	0.14%	12.79
RAVELING	L	3,479 LF	9.98%	9.81
WEATHERING	L	34,854 LF	99.88%	5.96
DEPRESSION	L	50 SF	0.14%	0.39
RAVELING	M	347 SF	0.99%	7.86

\* 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**

27.0 % Load                      72.0 % Climate/Durability                      1.0 % Other

**CIRCLE AIRPORT**

Branch: 38R

**RUNWAY**

**R-11**

Length: 4,100 LF

Width: 75 LF

Area: 307,500 SF

Last Const: 2007

Family: ACRML

From: RWY 12-30 STA 0+00

To: RWY 12-30 STA 41+00

Surface: AC

**Inspections**

Samples Surveyed: 7

Total Samples: 67

Last Inspection Date: 8/20/2012

**PCI: 88**

Sample # 7

**Distress Description**

LONGITUDINAL/TRANSVERSE CRACKING  
WEATHERING

**Severity**

L  
L

**Quantity**

10 LF  
4,875 SF

Area: 4,875 SF

Sample # 17

**Distress Description**

BLOCK CRACKING  
WEATHERING

**Severity**

M  
L

**Quantity**

44 SF  
4,875 SF

Area: 4,875 SF

Sample # 27

**Distress Description**

WEATHERING

**Severity**

L

**Quantity**

4,875 SF

Area: 4,875 SF

Sample # 37

**Distress Description**

LONGITUDINAL/TRANSVERSE CRACKING  
WEATHERING

**Severity**

L  
L

**Quantity**

5 LF  
4,875 SF

Area: 4,875 SF

Sample # 47

**Distress Description**

LONGITUDINAL/TRANSVERSE CRACKING  
WEATHERING

**Severity**

L  
L

**Quantity**

125 LF  
4,875 SF

Area: 4,875 SF

Sample # 57

**Distress Description**

LONGITUDINAL/TRANSVERSE CRACKING  
LONGITUDINAL/TRANSVERSE CRACKING  
LONGITUDINAL/TRANSVERSE CRACKING  
WEATHERING

**Severity**

L  
M  
H  
L

**Quantity**

70 LF  
12 LF  
3 LF  
4,875 SF

Area: 4,875 SF

Sample # 67

**Distress Description**

WEATHERING

**Severity**

L

**Quantity**

4,875 SF

Area: 4,875 SF

**Extrapolated Distress Quantities\***

Distress Description	Severity	Quantity	Density	Deduct
LONGITUDINAL/TRANSVERSE CRACKING	L	1,892 LF	0.62%	4.25
LONGITUDINAL/TRANSVERSE CRACKING	M	108 LF	0.04%	4.00
LONGITUDINAL/TRANSVERSE CRACKING	H	27 LF	0.01%	7.50
WEATHERING	L	307,500 SF	100.00%	5.96
BLOCK CRACKING	M	396 SF	0.13%	7.83

\* 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

100.0 % Climate/Durability

0.0 % Other

# CIRCLE AIRPORT

Branch: 38T TAXIWAY T-1

Length: 145 LF Width: 20 LF Area: 2,900 SF Last Const: 2007 Family: ACRML  
 From: NORTH WEST 20' OF T-WAY To: Surface: AC

## Inspections

Samples Surveyed: 1 Total Samples: 1 Last Inspection Date: 8/20/2012 PCI: 78

Sample # 1

Area: 2,800 SF

Distress Description	Severity	Quantity
LONGITUDINAL/TRANSVERSE CRACKING	L	41 LF
RAVELING	L	280 SF
WEATHERING	L	2,800 SF
PATCHING	L	1 SF

## Extrapolated Distress Quantities\*

Distress Description	Severity	Quantity	Density	Deduct
LONGITUDINAL/TRANSVERSE CRACKING	L	42 LF	1.46%	6.02
RAVELING	L	290 SF	10.00%	9.83
WEATHERING	L	2,900 SF	100.00%	5.96
PATCHING	L	1 SF	0.04%	2.00

\* 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

0.0 % Load                      100.0 % Climate/Durability                      0.0 % Other

**CIRCLE AIRPORT**

Branch: 38T TAXIWAY

**T-2**

Length: 145 LF Width: 20 LF Area: 2,900 SF Last Const: 2007 Family: ACRML  
 From: SOUTHEAST 20' OF T-WAY To: Surface: AC

**Inspections**

Samples Surveyed: 1 Total Samples: 1 Last Inspection Date: 8/20/2012 **PCI: 80**

Sample # 1 Area: 2,800 SF

Distress Description	Severity	Quantity
LONGITUDINAL/TRANSVERSE CRACKING	L	46 LF
RAVELING	L	280 SF
WEATHERING	L	2,800 SF

**Extrapolated Distress Quantities\***

Distress Description	Severity	Quantity	Density	Deduct
LONGITUDINAL/TRANSVERSE CRACKING	L	48 LF	1.69%	6.47
RAVELING	L	290 SF	10.00%	9.83
WEATHERING	L	2,900 SF	100.00%	5.96

\* 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                      100.0 % Climate/Durability                      0.0 % Other

## CIRCLE AIRPORT

### FIRST YEAR LOCAL: 2013

LOCAL REPAIR COST: \$3,914

Section	Distress Description	Severity	Quantity	Work Description	Quantity	Cost	Poliv
A-2	ALLIGATOR CR	M	50 SF	Patching - AC Deep	82 SF	\$3,274	PREV.
R-11	BLOCK CR	M	397 SF	Crack Sealing - AC	121 LF	\$302	PREV.
R-11	L & T CR	H	27 LF	Crack Sealing - AC	27 LF	\$68	PREV.
R-11	L & T CR	M	108 LF	Crack Sealing - AC	108 LF	\$270	PREV.

### FIFTEEN YEAR PROJECTIONS

ESTIMATED AVERAGE ANNUAL COST: \$43,429

Plan Year: 2013		Estimated Cost: \$100,562					PCI	
Section	Maintenance	Local	Global	Major<Crit	Major>Crit	Total	Before	After
A-1	Global MR + Preventive	\$2,503	\$6,750	\$0	\$0	\$9,253	66	70
A-2	Global MR + Preventive	\$2,893	\$8,715	\$0	\$0	\$11,608	67	71
R-11	Global MR + Preventive	\$1,260	\$76,876	\$0	\$0	\$78,135	86	93
T-1	Global MR + Preventive	\$68	\$725	\$0	\$0	\$793	77	82
T-2	Global MR + Preventive	\$47	\$725	\$0	\$0	\$772	78	84
Plan Year: 2014		Estimated Cost: \$4,348					PCI	
Section	Maintenance	Local	Global	Major<Crit	Major>Crit	Total	Before	After
A-1	Preventive	\$1,966	\$0	\$0	\$0	\$1,966	68	68
A-2	Preventive	\$2,172	\$0	\$0	\$0	\$2,172	69	69
R-11	Preventive	\$141	\$0	\$0	\$0	\$141	90	90
T-1	Preventive	\$41	\$0	\$0	\$0	\$41	79	79
T-2	Preventive	\$26	\$0	\$0	\$0	\$26	81	81
Plan Year: 2015		Estimated Cost: \$6,927					PCI	
Section	Maintenance	Local	Global	Major<Crit	Major>Crit	Total	Before	After
A-1	Preventive	\$2,592	\$0	\$0	\$0	\$2,592	66	66
A-2	Preventive	\$2,988	\$0	\$0	\$0	\$2,988	67	67
R-11	Preventive	\$1,230	\$0	\$0	\$0	\$1,230	86	86
T-1	Preventive	\$70	\$0	\$0	\$0	\$70	77	77
T-2	Preventive	\$47	\$0	\$0	\$0	\$47	79	79
Plan Year: 2016		Estimated Cost: \$9,507					PCI	
Section	Maintenance	Local	Global	Major<Crit	Major>Crit	Total	Before	After
A-1	Preventive	\$3,231	\$0	\$0	\$0	\$3,231	64	64
A-2	Preventive	\$3,817	\$0	\$0	\$0	\$3,817	65	65
R-11	Preventive	\$2,288	\$0	\$0	\$0	\$2,288	83	83
T-1	Preventive	\$96	\$0	\$0	\$0	\$96	75	75
T-2	Preventive	\$75	\$0	\$0	\$0	\$75	77	77
Plan Year: 2017		Estimated Cost: \$12,049					PCI	
Section	Maintenance	Local	Global	Major<Crit	Major>Crit	Total	Before	After
A-1	Preventive	\$3,881	\$0	\$0	\$0	\$3,881	62	62
A-2	Preventive	\$4,661	\$0	\$0	\$0	\$4,661	63	63
R-11	Preventive	\$3,286	\$0	\$0	\$0	\$3,286	81	81
T-1	Preventive	\$119	\$0	\$0	\$0	\$119	73	73
T-2	Preventive	\$102	\$0	\$0	\$0	\$102	75	75
Plan Year: 2018		Estimated Cost: \$125,301					PCI	
Section	Maintenance	Local	Global	Major<Crit	Major>Crit	Total	Before	After
A-1	Global MR + Preventive	\$4,551	\$7,825	\$0	\$0	\$12,376	60	64
A-2	Global MR + Preventive	\$5,525	\$10,103	\$0	\$0	\$15,628	61	65
R-11	Global MR + Preventive	\$6,229	\$89,120	\$0	\$0	\$95,349	78	84
T-1	Global MR + Preventive	\$141	\$840	\$0	\$0	\$981	72	75
T-2	Global MR + Preventive	\$126	\$840	\$0	\$0	\$966	73	77
Plan Year: 2019		Estimated Cost: \$12,538					PCI	
Section	Maintenance	Local	Global	Major<Crit	Major>Crit	Total	Before	After
A-1	Preventive	\$4,056	\$0	\$0	\$0	\$4,056	62	63
A-2	Preventive	\$4,862	\$0	\$0	\$0	\$4,862	63	63
R-11	Preventive	\$3,391	\$0	\$0	\$0	\$3,391	81	81
T-1	Preventive	\$125	\$0	\$0	\$0	\$125	74	74
T-2	Preventive	\$106	\$0	\$0	\$0	\$106	75	75

**CIRCLE AIRPORT**

Plan Year: 2020		Estimated Cost: \$17,103					PCI		
Section	Maintenance	Local	Global	Major<Crit	Major>Crit	Total	Before	After	
A-1	Preventive	\$4,765	\$0	\$0	\$0	\$4,765	61	61	
A-2	Preventive	\$5,779	\$0	\$0	\$0	\$5,779	62	62	
R-11	Preventive	\$6,279	\$0	\$0	\$0	\$6,279	78	78	
T-1	Preventive	\$148	\$0	\$0	\$0	\$148	72	72	
T-2	Preventive	\$131	\$0	\$0	\$0	\$131	73	73	

Plan Year: 2021		Estimated Cost: \$22,510					PCI		
Section	Maintenance	Local	Global	Major<Crit	Major>Crit	Total	Before	After	
A-1	Preventive	\$5,690	\$0	\$0	\$0	\$5,690	59	59	
A-2	Preventive	\$6,776	\$0	\$0	\$0	\$6,776	60	60	
R-11	Preventive	\$9,720	\$0	\$0	\$0	\$9,720	76	76	
T-1	Preventive	\$169	\$0	\$0	\$0	\$169	71	71	
T-2	Preventive	\$155	\$0	\$0	\$0	\$155	72	72	

Plan Year: 2022		Estimated Cost: \$28,179					PCI		
Section	Maintenance	Local	Global	Major<Crit	Major>Crit	Total	Before	After	
A-1	Preventive	\$6,769	\$0	\$0	\$0	\$6,769	57	57	
A-2	Preventive	\$8,160	\$0	\$0	\$0	\$8,160	58	58	
R-11	Preventive	\$12,886	\$0	\$0	\$0	\$12,886	74	75	
T-1	Preventive	\$188	\$0	\$0	\$0	\$188	70	70	
T-2	Preventive	\$176	\$0	\$0	\$0	\$176	71	71	

Plan Year: 2023		Estimated Cost: \$159,764					PCI		
Section	Maintenance	Local	Global	Major<Crit	Major>Crit	Total	Before	After	
A-1	Global MR + Preventive	\$7,903	\$9,072	\$0	\$0	\$16,975	55	59	
A-2	Global MR + Preventive	\$9,606	\$11,712	\$0	\$0	\$21,319	56	60	
R-11	Global MR + Preventive	\$15,787	\$103,314	\$0	\$0	\$119,101	73	77	
T-1	Global MR + Preventive	\$223	\$974	\$0	\$0	\$1,198	69	71	
T-2	Global MR + Preventive	\$197	\$974	\$0	\$0	\$1,172	70	72	

Plan Year: 2024		Estimated Cost: \$29,406					PCI		
Section	Maintenance	Local	Global	Major<Crit	Major>Crit	Total	Before	After	
A-1	Preventive	\$7,069	\$0	\$0	\$0	\$7,069	57	57	
A-2	Preventive	\$8,519	\$0	\$0	\$0	\$8,519	58	58	
R-11	Preventive	\$13,433	\$0	\$0	\$0	\$13,433	75	75	
T-1	Preventive	\$198	\$0	\$0	\$0	\$198	70	70	
T-2	Preventive	\$185	\$0	\$0	\$0	\$185	71	71	

Plan Year: 2025		Estimated Cost: \$35,302					PCI		
Section	Maintenance	Local	Global	Major<Crit	Major>Crit	Total	Before	After	
A-1	Preventive	\$8,275	\$0	\$0	\$0	\$8,275	56	56	
A-2	Preventive	\$10,050	\$0	\$0	\$0	\$10,050	57	57	
R-11	Preventive	\$16,537	\$0	\$0	\$0	\$16,537	73	73	
T-1	Preventive	\$234	\$0	\$0	\$0	\$234	69	69	
T-2	Preventive	\$206	\$0	\$0	\$0	\$206	70	70	

Plan Year: 2026		Estimated Cost: \$41,106					PCI		
Section	Maintenance	Local	Global	Major<Crit	Major>Crit	Total	Before	After	
A-1	Preventive	\$9,552	\$0	\$0	\$0	\$9,552	54	54	
A-2	Preventive	\$11,672	\$0	\$0	\$0	\$11,672	55	55	
R-11	Preventive	\$19,365	\$0	\$0	\$0	\$19,365	72	72	
T-1	Preventive	\$271	\$0	\$0	\$0	\$271	69	69	
T-2	Preventive	\$245	\$0	\$0	\$0	\$245	69	69	

Plan Year: 2027		Estimated Cost: \$46,839					PCI		
Section	Maintenance	Local	Global	Major<Crit	Major>Crit	Total	Before	After	
A-1	Preventive	\$10,917	\$0	\$0	\$0	\$10,917	52	52	
A-2	Preventive	\$13,398	\$0	\$0	\$0	\$13,398	53	53	
R-11	Preventive	\$21,934	\$0	\$0	\$0	\$21,934	71	71	
T-1	Preventive	\$307	\$0	\$0	\$0	\$307	68	68	
T-2	Preventive	\$283	\$0	\$0	\$0	\$283	69	69	

CIRCLE AIRPORT

8/20/2012



A-1, Overview



A-1, Surface detail raveling of coal tar sealer



A-2, Overview



A-2, Surface detail

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CIRCLE AIRPORT

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8/20/2012



R-11, Medium and high severity cracking



R-11, Overview

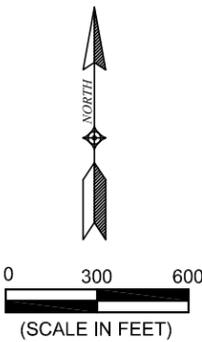
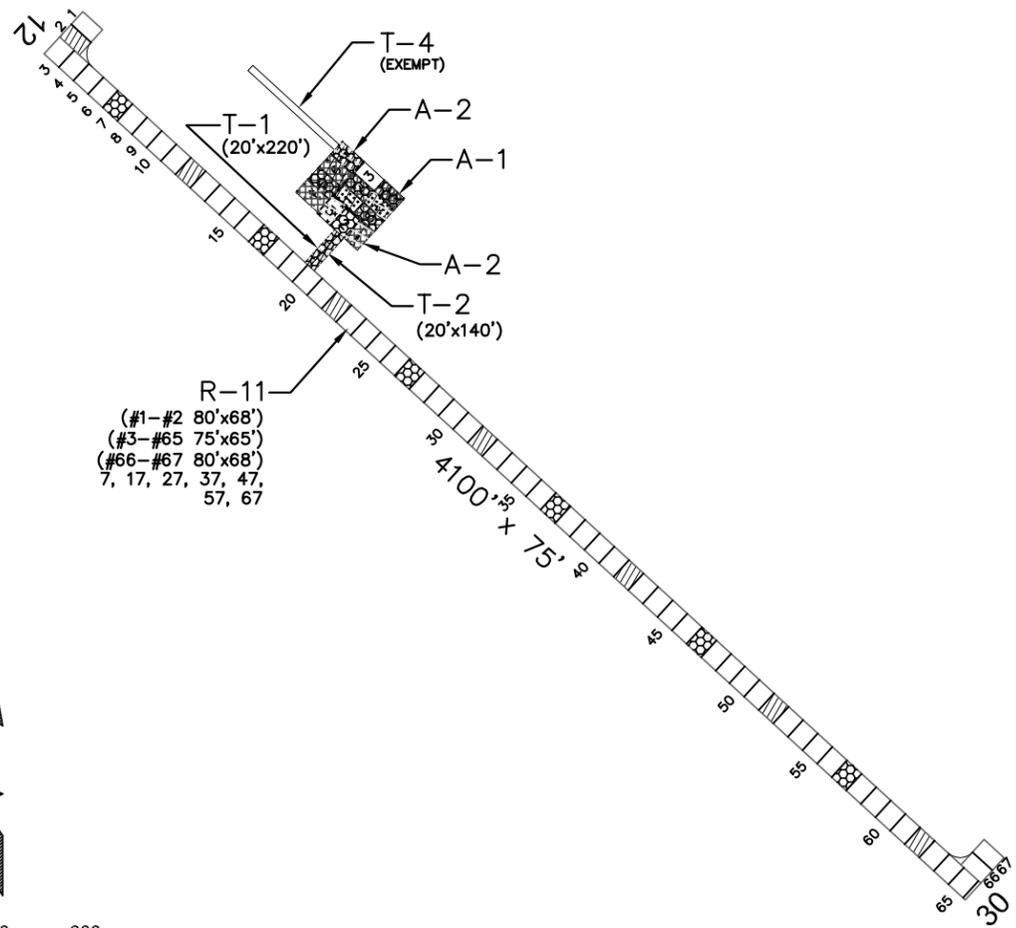
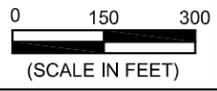
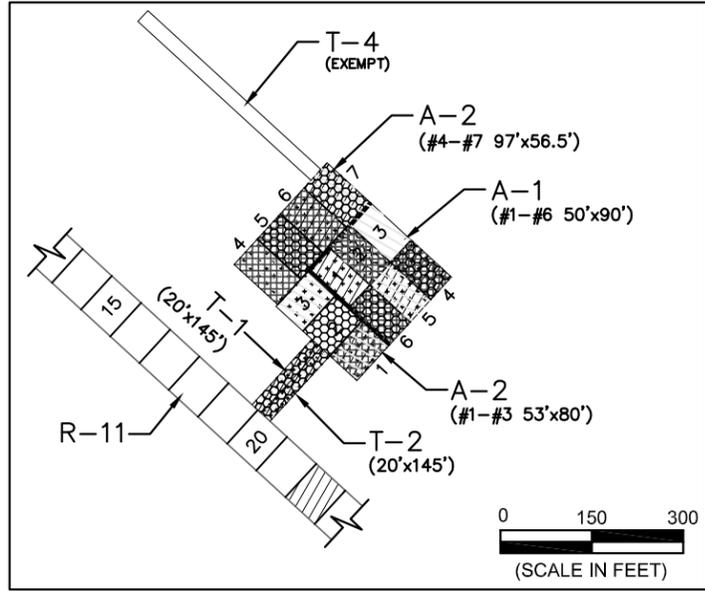


R-11, Transverse cracking



T-1 & T-2, Overview

# CIRCLE



# 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	E-7	CBR=2.5	8" P-208	5"P-207,3"P-208	3" P-403		12,500			△ 2 △ 3 △ 4
<b>TAXIWAYS</b>										
T-1	E-7	CBR=2.5	6" P-208	10"P-207,3"P-208	3" P-403		12,500			△ 2 △ 3 △ 4
T-2	E-7	CBR=2.5	10" AGG, 2"P-208	10"P-207,3"P-208	3" P-403		12,500			△ 2 △ 3 △ 4
<b>APRONS</b>										
A-1	E-7	CBR=2.5		8" P-208	1"P-216,2"P-403		12,500			△ 2 △ 3 △ 4
A-2	E-7	CBR=2.5	10"	4" P-208	2" P-403		12,500			△ 2 △ 3 △ 4

**REMARKS:**

- △ 1 ADAP-01, 1984, EXTEND, WIDEN AND OVERLAY RUNWAY.
- △ 2 AIP-001, 1989, ALL PAVEMENTS OVERLAYED WITH 1" P-402.
- △ 3 2001, NON-FEDERAL 3/8" CHIP SEAL WITH CRS-2P OIL.
- △ 4 AIP-004, 2007, RECONSTRUCT RUNWAY 12-30 AND TAXIWAYS; 2" MILL AND REPLACE ON APRONS.

<b>LEGEND</b> [Pattern] 1997 SURVEY AREA [Pattern] 2000 SURVEY AREA [Pattern] 2003 SURVEY AREA [Pattern] 2006 SURVEY AREA (NOT SURVEYED) [Pattern] 2009 SURVEY AREA [Pattern] 2012 SURVEY AREA	DATE OF PAVEMENT STRENGTH SURVEY:	SEPT. 22, 1987	<b>MONTANA AVIATION SYSTEM PLAN 2012 UPDATE - PAVEMENT CONDITION INDEXES</b>
	EVALUATED BY:	C. NEW	
	DATE OF MOST RECENT PAVEMENT CONDITION SURVEY:	AUG. 20, 2012	<b>CIRCLE TOWN/COUNTY</b>
	EVALUATED BY:	M. BECKHOFF	
			PREPARED FOR: 
			PREPARED BY: 
			CIRCLE MONTANA DATE: NOV. 2012

CIRCLE