

# SALEM McNARY FIELD

This report describes how your Pavement Maintenance Management Program (PMMP) was developed. Your Program was developed as part of the Oregon Continuous Aviation System Plan sponsored in part by the Oregon Department of Aviation and the Federal Aviation Administration (FAA). The information and data contained in this report ensures you are in compliance with the requirements of FAA Grant Assurance Number 11 which states that any airport requesting federal funds for pavement improvement projects must have implemented a pavement maintenance management program.

## DATA COLLECTION

To determine how your pavements were constructed and their age, a records review was conducted. Figures SA-1A, SA-1B and SA-1C show the records review results. These figures identify pavement boundaries, dimensions, pavement layer types, thicknesses and dates of construction. The most recent construction date for each pavement can also be found in the Section Condition Report in Appendix 2. Figures SA-1A, SA-1B and SA-1C and the information contained in Appendices 1, 2 and 4 ensure that your airport complies with the “pavement inventory” requirement of FAA’s PMMP guidelines.

The pavements at your airport were divided into branches, sections and sample units in accordance with the methodology outlined in the current edition of ASTM D5430, *Standard Test Method for Airport Condition Index Surveys*. The branches, sections and sample units established at your airport are shown in Figure SA-2. A Branch Condition Report showing all branches, their associated areas, and their area-weighted average condition is provided in Appendix 1. Additionally, the Appendix 2 Section Condition Report provides information used to define each branch and section in the Micro PAVER database.

Using the branch, section and sample unit divisions established, a visual condition survey was conducted at Salem McNary Field in September 2015. During the inspection, pavement defects were identified and measured in accordance with the methodology outlined in ASTM D5430. This inspection ensures your airport complies with the “detailed inspection” requirement of FAA’s PMMP guidelines. After collection, the data were entered into the Micro PAVER software for analysis. These data are reproduced in the Re-Inspection Report attached as Appendix 4.

The Micro PAVER database updated during this project ensures your airport complies with the “record keeping and information retrieval” requirements of FAA’s PMMP guidelines.

Figure SA-1A. Airport Layout, Dimensions and Pavement Cross-Sections – Runways.  
Salem McNary Field

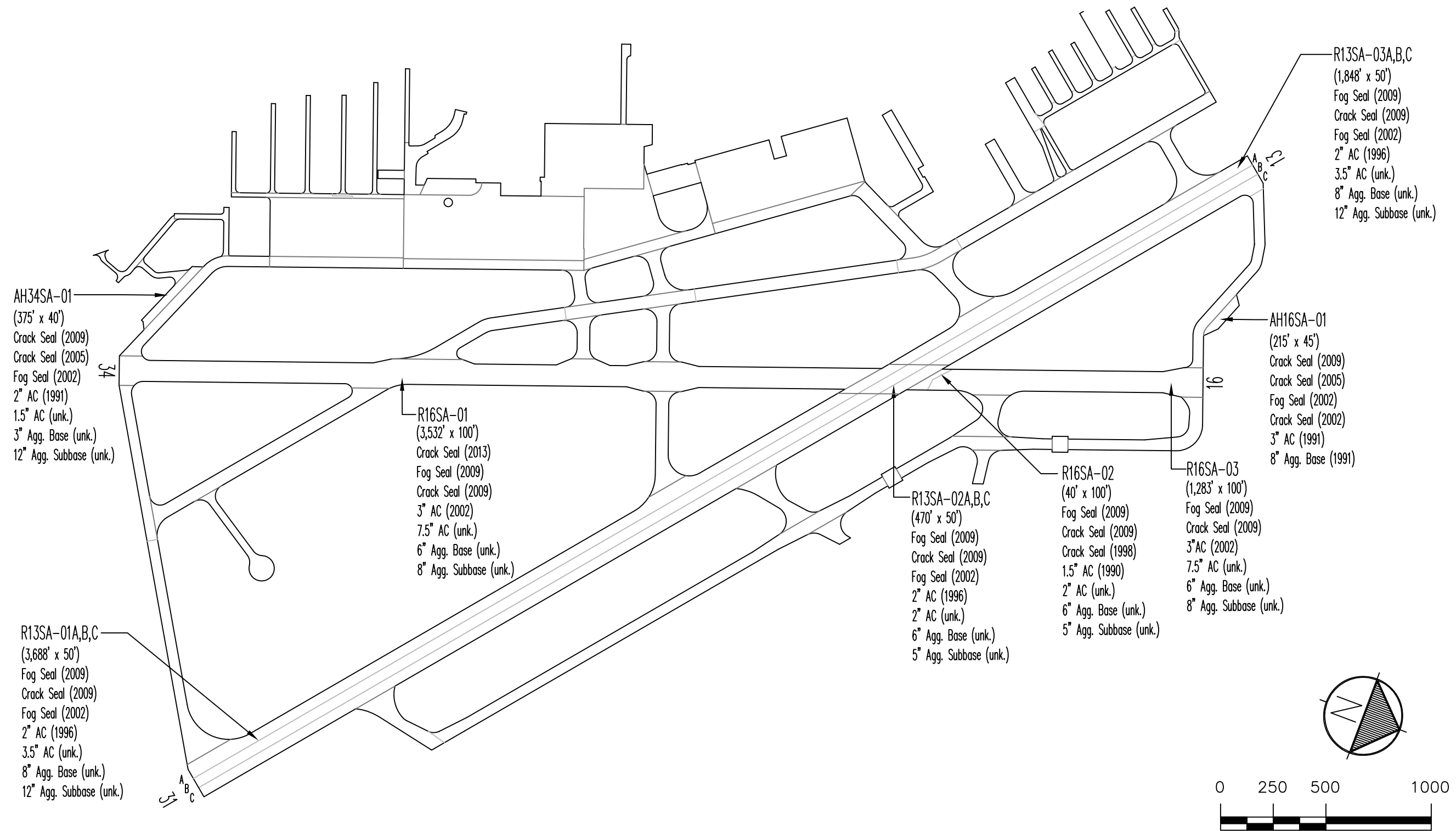
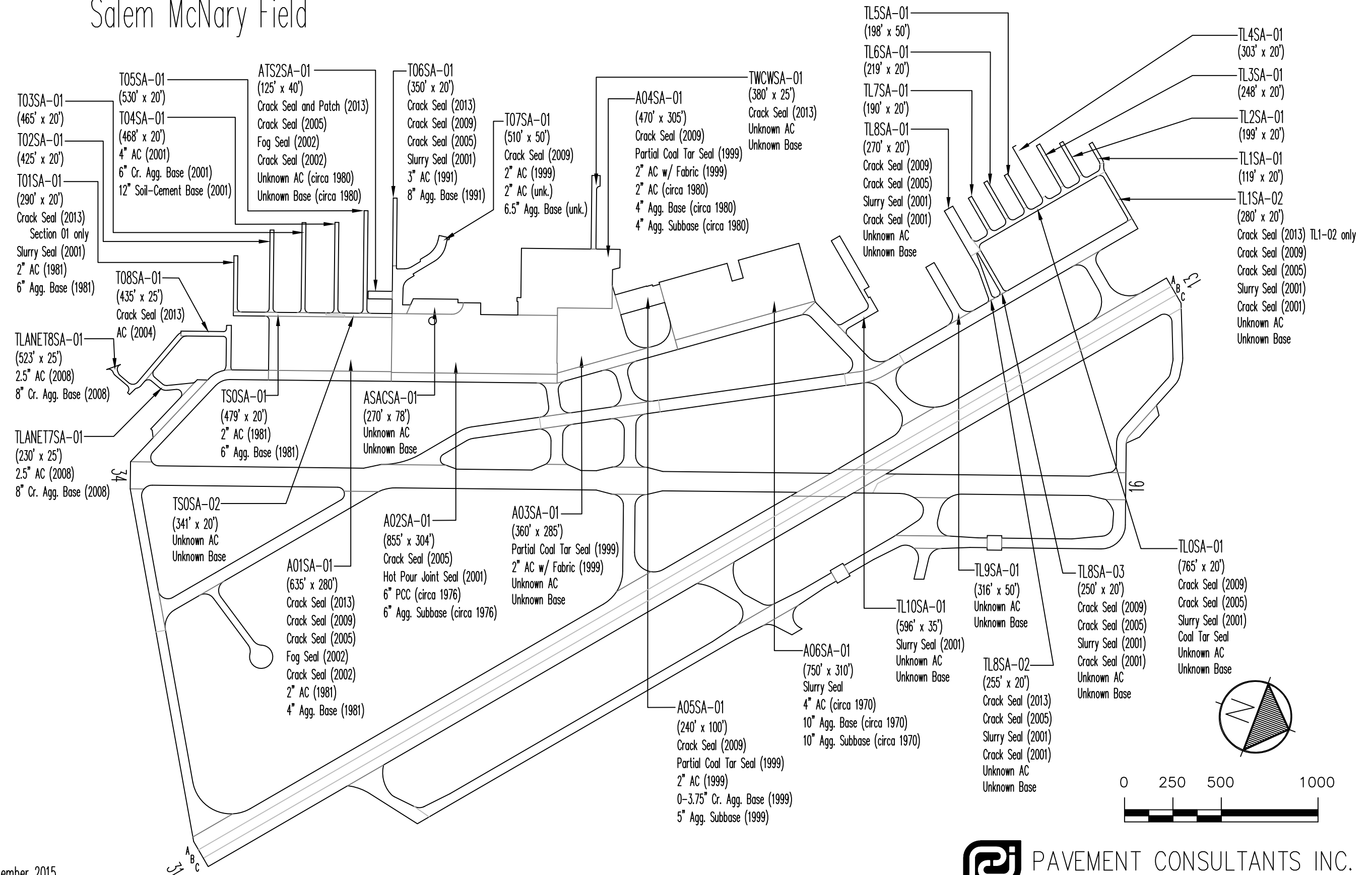




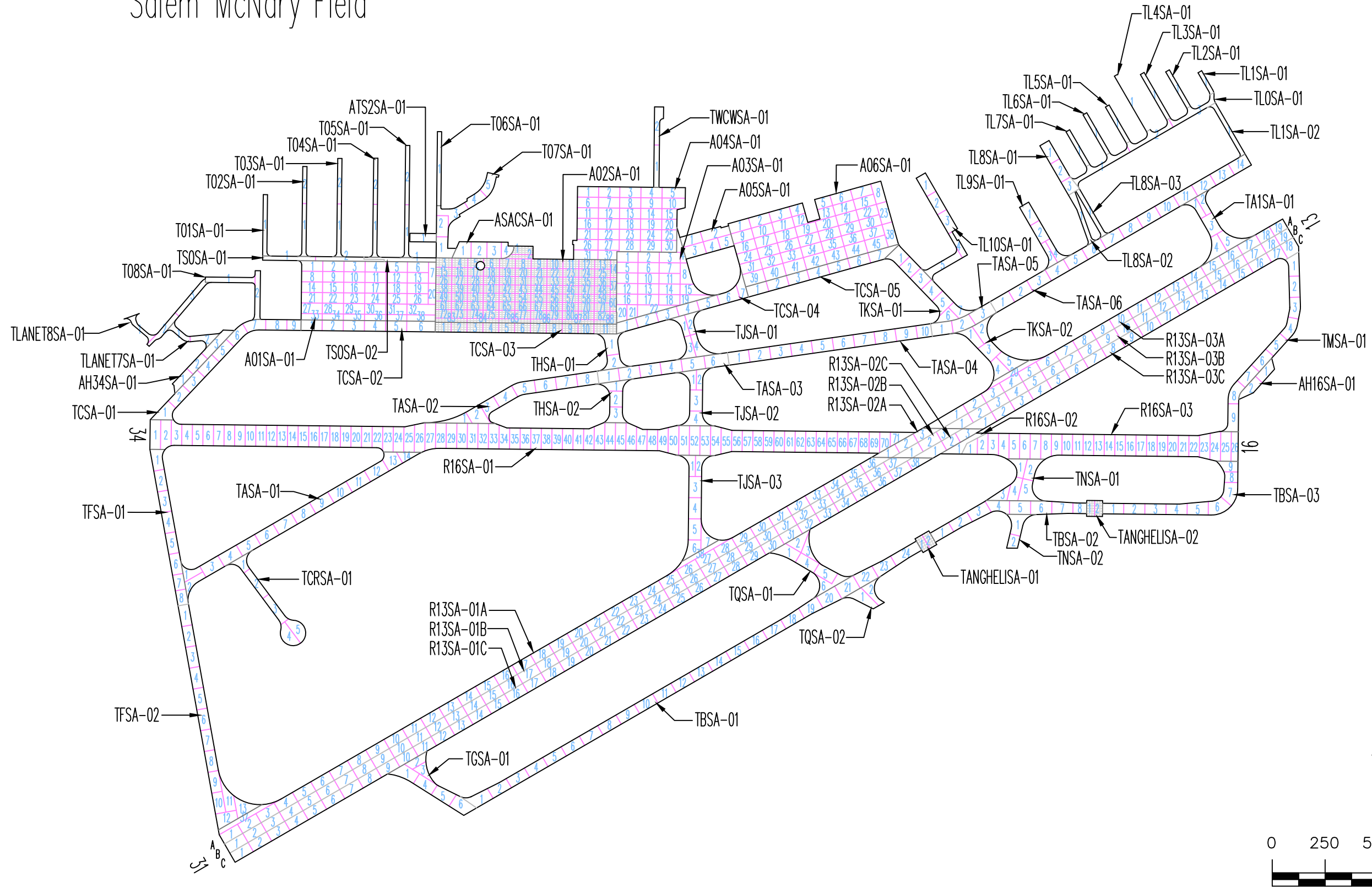
Figure SA-1C. Airport Layout, Dimensions and Pavement Cross-Sections – Aprons and Hangar Areas.

Salem McNary Field



Drawing Date: September 2015

Figure SA-2. Pavement Branch, Section and Sample Unit Layout.  
Salem McNary Field



## RESULTS

Using the data collected during the visual inspection, the Micro PAVER software was used to calculate an area-weighted average Pavement Condition Index (PCI) for each pavement section inspected using the sample units evaluated. Using each section's PCI, a Pavement Condition Rating (PCR) was assigned. The PCIs measured during this inspection are shown in Table 1. The table also contains PCIs from past inspections as well as projected PCIs for 2020 and 2025. The projections were based on pavement deterioration models developed by Micro PAVER using the inspection data from other pavements in the same airport category as your airport, located in the same climatic region, and with the same surface type and use.

The Branch Condition Report in Appendix 1 summarizes current pavement condition by branch while the Section Condition Report in Appendix 2 lists pavement condition by section. The current PCR is shown graphically in Figure SA-3.

**Table 1. Past, Present and Future Pavement Condition Indices.**

Branch	Section	Inspections			Forecast	
		2008	2012	2015	2020	2025
A01SA	1	70	54	49	46	43
A02SA	1	89	90	90	84	82
A03SA	1	100	97	89	66	45
A04SA	1	97	98	92	76	54
A05SA	1	99	95	89	80	71
A06SA	1	29	55	53	49	45
AH16SA	1	77	75	75	67	60
AH34SA	1	92	93	78	58	36
ASACSA	1	19	27	20	18	17
ATS2SA	1	59	52	67	60	55
R13SA	01A	96	84	74	57	46
R13SA	01B	96	76	61	50	38
R13SA	01C	97	85	74	57	46
R13SA	02A	83	82	66	53	41
R13SA	02B	76	74	66	53	41
R13SA	02C	84	82	75	58	47
R13SA	03A	95	84	74	57	46
R13SA	03B	97	78	59	48	37
R13SA	03C	96	82	68	53	42
R16SA	1	88	88	85	83	74
R16SA	2	85	62	54	44	33
R16SA	3	91	85	73	56	46
T01SA	1	61	61	85	78	74
T02SA	1	40	51	59	39	20

**Table 1. Past, Present and Future Pavement Condition Indices.**

Branch	Section	Inspections			Forecast	
		2008	2012	2015	2020	2025
T03SA	1	53	59	53	33	14
T04SA	1	100	100	95	87	78
T05SA	1	100	97	95	87	78
T06SA	1	75	77	78	74	74
T07SA	1	96	85	60	56	52
T08SA	1	100	95	94	85	78
TA1SA	1	100	79	69	55	34
TANGHELISA	1	4	88	88	83	82
TANGHELISA	2	77	86	85	82	82
TASA	1	98	89	80	75	74
TASA	2	95	87	76	74	74
TASA	3	94	85	75	74	73
TASA	4	98	81	71	60	39
TASA	5	94	87	76	74	74
TASA	6	96	87	75	74	73
TBSA	1	96	85	74	71	59
TBSA	2	95	92	78	74	74
TBSA	3	95	92	80	75	74
TCRSA	1	100	100	92	83	76
TCSA	1	89	89	79	75	71
TCSA	2	33	42	59	39	20
TCSA	3	66	64	65	63	60
TCSA	4	38	41	43	24	5
TCSA	5	47	43	43	24	5
TFSA	1	99	98	83	76	74
TFSA	2	85	89	77	73	69
TGSA	1	99	89	72	62	43
THSA	1	93	87	72	62	43
THSA	2	97	90	69	55	34
TJSA	1	95	92	73	66	48
TJSA	2	96	92	74	71	59
TJSA	3	96	89	72	62	43
TKSA	1	94	88	76	74	74
TKSA	2	94	92	72	62	43
TL0SA	1	77	64	70	57	36
TL10SA	1	37	54	45	26	7
TL1SA	1	77	84	80	75	74
TL1SA	2	66	72	84	77	74

**Table 1. Past, Present and Future Pavement Condition Indices.**

Branch	Section	Inspections			Forecast	
		2008	2012	2015	2020	2025
TL2SA	1	71	74	87	79	75
TL3SA	1	74	76	83	76	74
TL4SA	1	77	65	90	81	75
TL5SA	1	77	89	91	82	76
TL6SA	1	85	90	83	76	74
TL7SA	1	77	88	92	83	76
TL8SA	1	76	68	77	74	74
TL8SA	2	44	81	80	75	74
TL8SA	3	72	64	72	62	43
TL9SA	1	100	100	75	74	73
TLANET7SA	1	100	100	100	99	92
TLANET8SA	1	100	100	100	99	92
TMSA	1	75	82	72	62	43
TNSA	1	90	78	84	77	74
TNSA	2	94	91	82	76	74
TQSA	1	95	94	74	71	59
TQSA	2	97	80	63	45	25
TSOSA	1	23	23	16	0	0
TSOSA	2	6	15	12	0	0
TWCWSA	1	70	64	78	74	74

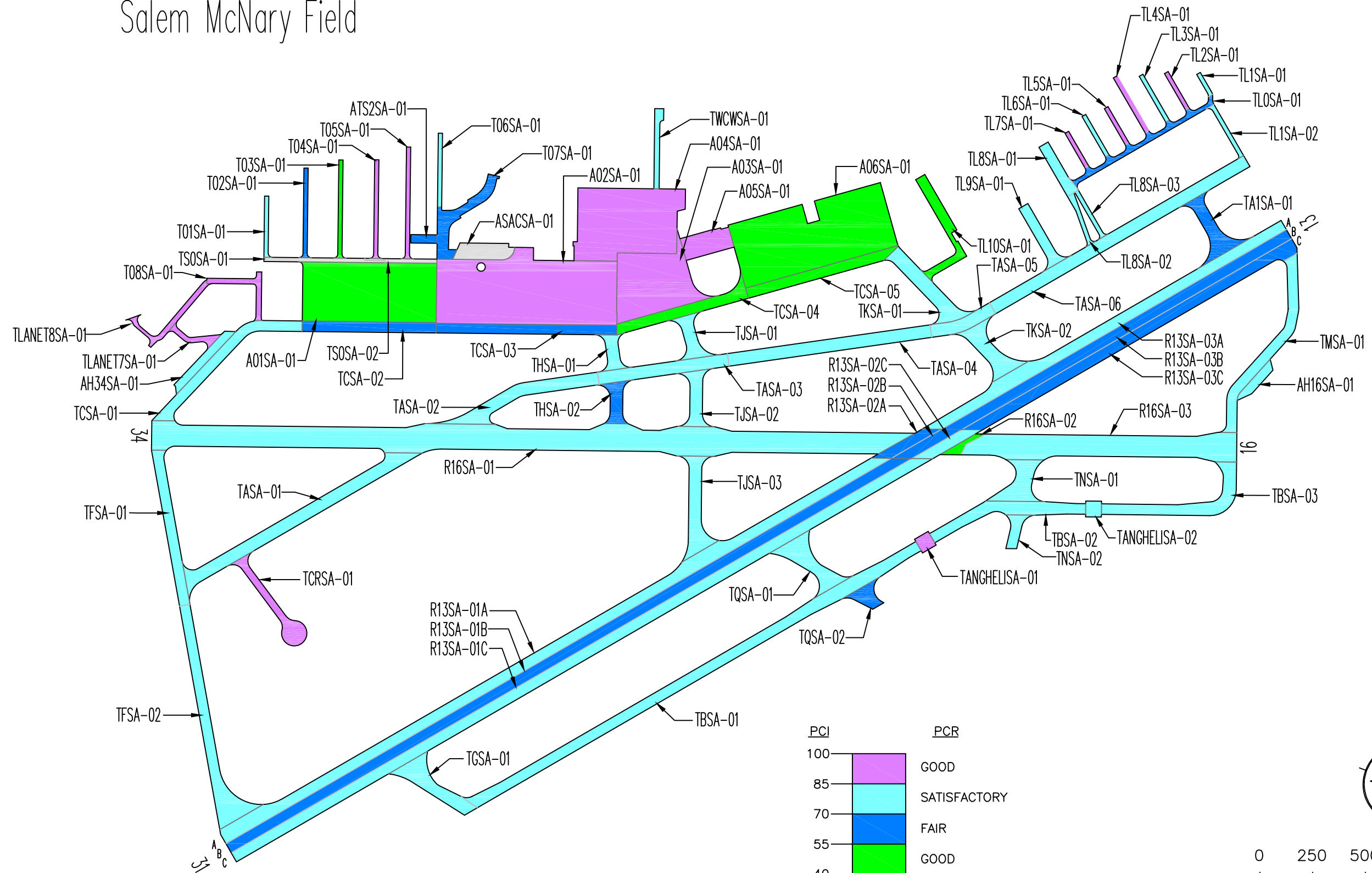
Section PCIs at Salem McNary Field range from a low of 12 (a PCR of “Serious”) to a high of 100 (a PCR of “Good”). The area-weighted average PCI for all airport pavements is 73, corresponding to an overall PCR of “Satisfactory”. Figure SA-4 shows how much pavement area is associated with each Pavement Condition Rating category and also shows pavement condition distribution from the inspections conducted in 2008 and 2012.

The primary distresses observed in the asphalt pavements during the inspection were: longitudinal and transverse cracking, weathering, block cracking, alligator cracking, patching, and raveling, with an isolated occurrence of depressions. The primary distresses observed in the concrete pavements were: linear cracking, corner spalls, joint spalls, joint seal damage, and small patches, with isolated occurrences of shattered slabs and shrinkage cracks.

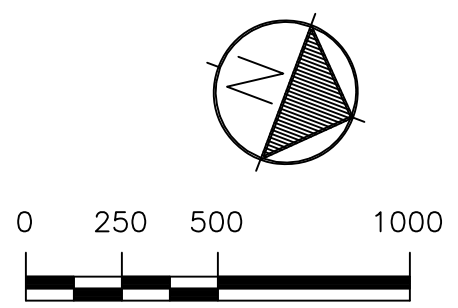
A graphical representation of the projected PCIs listed in Table 1 is shown in Figure SA-5.



Figure SA-3. Pavement Condition in September 2015.  
Salem McNary Field

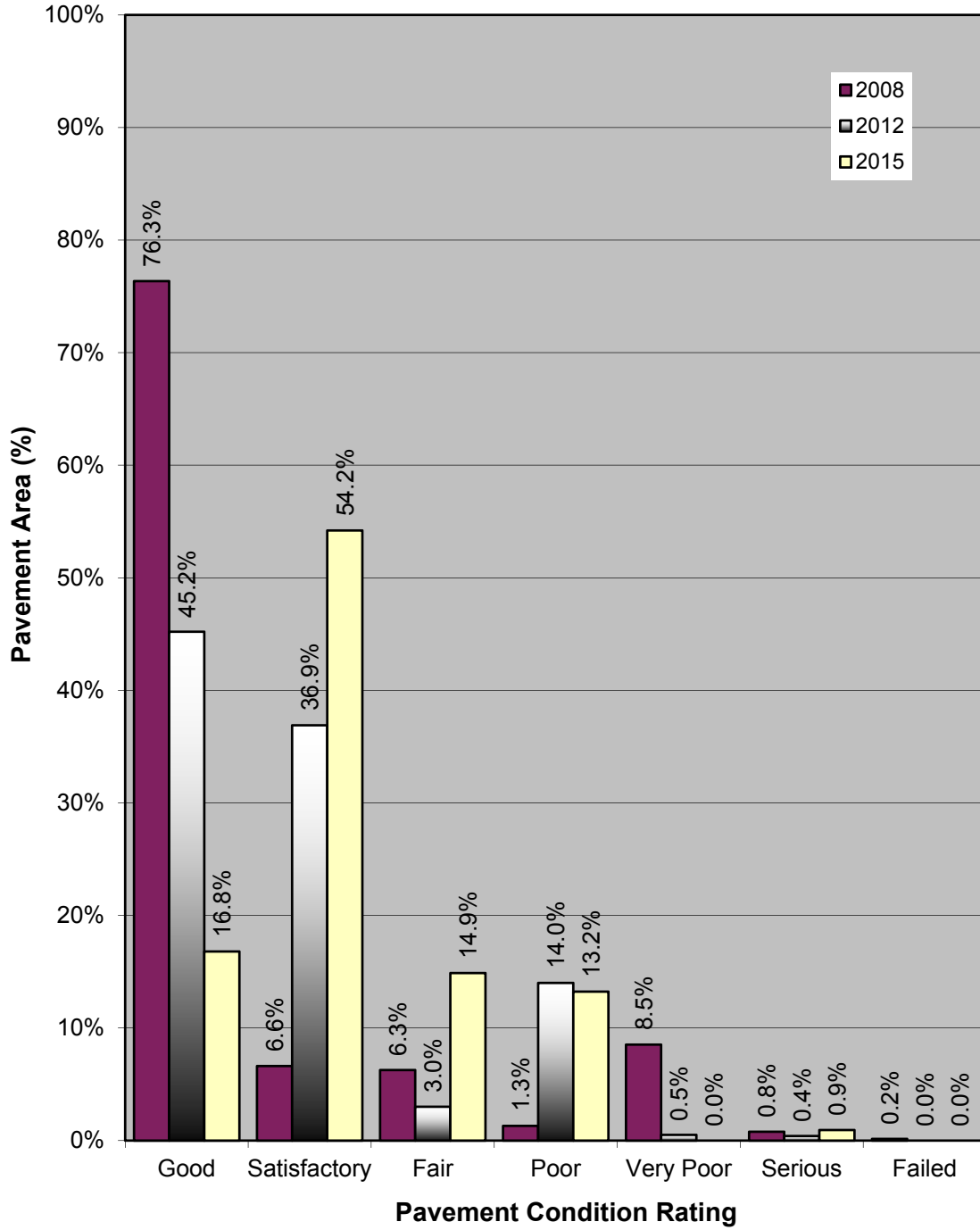


PCI	Color	PCR
100	Purple	GOOD
85	Light Blue	SATISFACTORY
70	Blue	FAIR
55	Green	GOOD
40	Yellow	VERY POOR
25	Grey	SERIOUS
10	Orange	FAILED
0	Red	FAILED

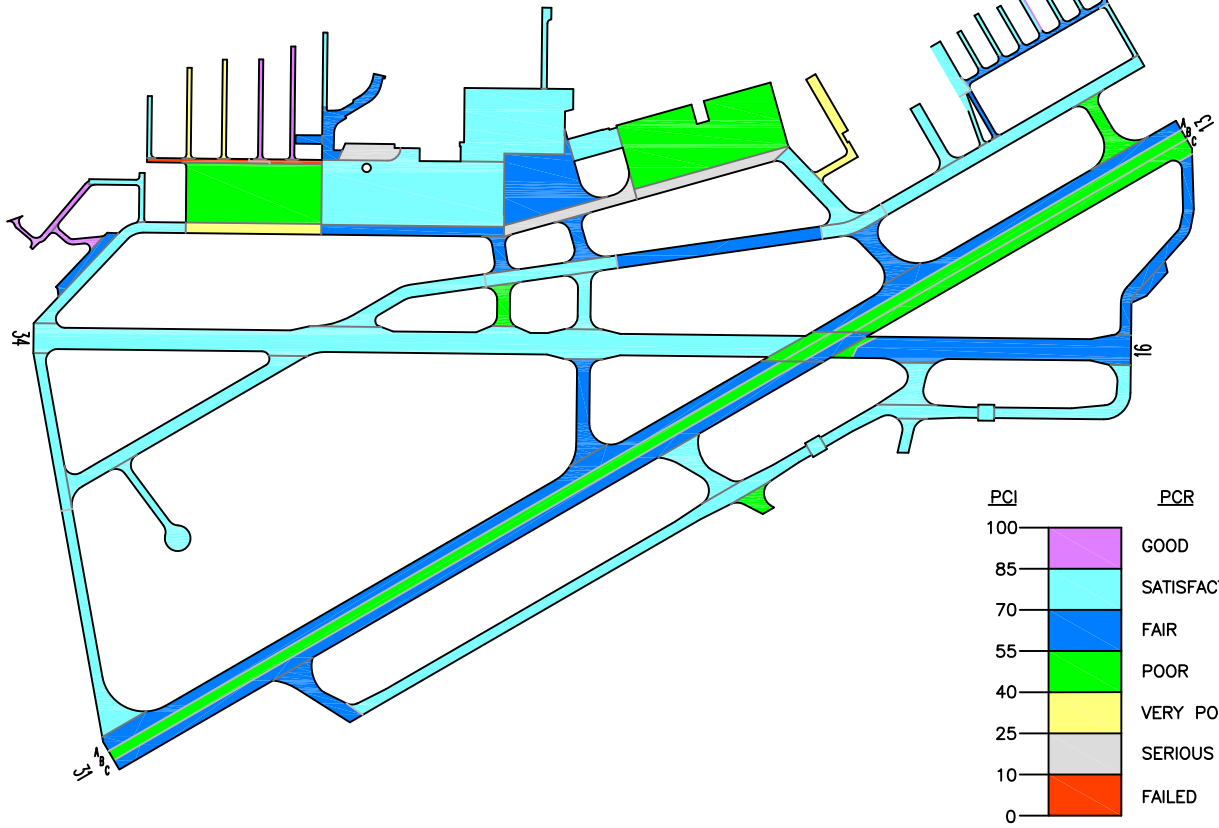


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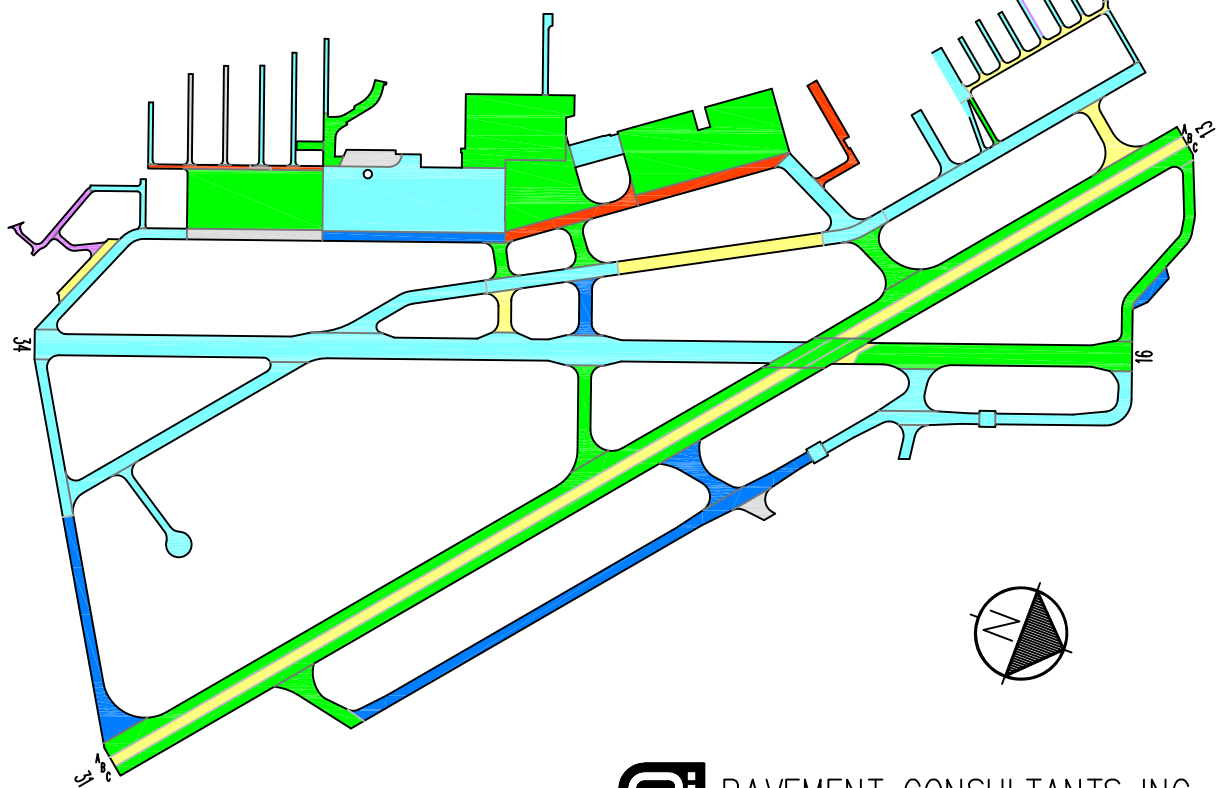
**Figure SA-4. Pavement Condition Distribution  
Salem Municipal Airport - McNary Field**



**Predicted Condition in 2020.**



**Predicted Condition in 2025.**



Drawing Date: September 2015

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**Figure SA-5. Future Pavement Condition.**

## RECOMMENDATIONS

Data collected during the visual condition survey were used by the Micro PAVER software to generate the Network Maintenance Report contained in Appendix 3. This report identifies, for each pavement section, the recommended localized maintenance activities (i.e.-crack sealing, patching) that should be completed to repair the defects observed during the visual inspection. The repair quantities identified in the report were extrapolated to cover the entire pavement section, based on the distresses measured in the inspected sample units. If the repair activities identified are completed, the pavement deterioration rate will be slowed.

The recommended localized maintenance activities to be applied are selected by the Micro PAVER software based on a Distress Maintenance Policy established for the Oregon airport system. The report results indicate that, over your entire airport, the following quantities of localized maintenance are needed:

- 84,552 linear feet of asphalt concrete crack sealing
- 10,897 square feet of asphalt concrete deep patching
- 16 square feet of asphalt concrete shallow patching
- 3 square feet of portland cement concrete partial depth patching.

The Micro PAVER software can also identify and schedule recommended global (applied over an entire section) maintenance activities such as fog seals, slurry seals and other surface treatments, as well as major rehabilitation activities such as asphalt concrete overlays and complete reconstruction. Micro PAVER schedules global maintenance on a user-defined interval. To schedule major rehabilitation Micro PAVER uses pavement deterioration models developed during this project. These models are used to estimate future pavement condition and to schedule rehabilitation based on a trigger PCI.

During this project a 5-year program outlining recommended global maintenance and rehabilitation was developed. The program begins in the year 2016 to allow time for project development. These recommendations are presented in Table 2, which identifies the pavement section requiring rehabilitation, the year the action should be completed, the type of action, and an associated cost. This information is also presented graphically in Figure SA-6.

**Table 2. Five-Year Global Maintenance and Rehabilitation Plan.**

Year	Branch	Section	Action	Area (sf)	Unit Cost (\$/sf)	Total Cost (\$)
2016	A01SA	1	2" AC Overlay	177,886	2.50	\$444,715
2016	A03SA	1	Slurry Seal	105,040	0.25	\$26,260
2016	A04SA	1	Slurry Seal	157,081	0.25	\$39,270
2016	A05SA	1	Slurry Seal	24,887	0.25	\$6,222
2016	A06SA	1	Slurry Seal	226,801	0.25	\$56,700
2016	AH16SA	1	Slurry Seal	9,337	0.25	\$2,334
2016	AH34SA	1	Slurry Seal	15,075	0.25	\$3,769
2016	ASACSA	1	Reconstruct with 4" AC / 6" Bituminous Base / 9" Subbase	20,255	13.65	\$276,481
2016	ATS2SA	1	Slurry Seal	5,000	0.25	\$1,250
2016	R13SA	01A	2" AC Overlay	191,383	2.50	\$478,458
2016	R13SA	01B	2" AC Overlay	184,395	2.50	\$460,988
2016	R13SA	01C	2" AC Overlay	188,605	2.50	\$471,513
2016	R13SA	02A	2" AC Overlay	13,711	2.50	\$34,278
2016	R13SA	02B	2" AC Overlay	13,711	2.50	\$34,278
2016	R13SA	02C	2" AC Overlay	13,711	2.50	\$34,278
2016	R13SA	03A	2" AC Overlay	101,604	2.50	\$254,010
2016	R13SA	03B	2" AC Overlay	92,395	2.50	\$230,988
2016	R13SA	03C	2" AC Overlay	90,290	2.50	\$225,725
2016	R16SA	1	Slurry Seal	385,886	0.25	\$96,472
2016	R16SA	2	2" AC Overlay	5,750	2.50	\$14,375
2016	R16SA	3	Slurry Seal	136,838	0.25	\$34,210
2016	T01SA	1	Slurry Seal	5,886	0.25	\$1,472
2016	T02SA	1	2" AC Overlay	8,672	2.50	\$21,680
2016	T03SA	1	2" AC Overlay	9,471	2.50	\$23,678
2016	T04SA	1	Slurry Seal	9,532	0.25	\$2,383
2016	T05SA	1	Slurry Seal	10,772	0.25	\$2,693
2016	T06SA	1	Slurry Seal	7,000	0.25	\$1,750
2016	T07SA	1	2" AC Overlay	28,623	2.50	\$71,558
2016	T08SA	1	Slurry Seal	11,821	0.25	\$2,955
2016	TA1SA	1	Slurry Seal	25,704	0.25	\$6,426
2016	TASA	1	Slurry Seal	76,728	0.25	\$19,182
2016	TASA	2	Slurry Seal	45,210	0.25	\$11,303
2016	TASA	3	Slurry Seal	37,331	0.25	\$9,333
2016	TASA	4	Slurry Seal	58,207	0.25	\$14,552
2016	TASA	5	Slurry Seal	18,988	0.25	\$4,747

**Table 2. Five-Year Global Maintenance and Rehabilitation Plan.**

Year	Branch	Section	Action	Area (sf)	Unit Cost (\$/sf)	Total Cost (\$)
2016	TASA	6	Slurry Seal	83,572	0.25	\$20,893
2016	TBSA	1	Slurry Seal	130,289	0.25	\$32,572
2016	TBSA	2	Slurry Seal	42,757	0.25	\$10,689
2016	TBSA	3	Slurry Seal	45,385	0.25	\$11,346
2016	TCRSA	1	Slurry Seal	26,148	0.25	\$6,537
2016	TCSA	1	Slurry Seal	44,129	0.25	\$11,032
2016	TCSA	2	2" AC Overlay	31,750	2.50	\$79,375
2016	TCSA	4	Reconstruct with 4" AC / 6" Bituminous Base /9" Subbase	34,397	13.65	\$469,519
2016	TCSA	5	Reconstruct with 4" AC / 6" Bituminous Base /9" Subbase	35,570	13.65	\$485,531
2016	TFSA	1	Slurry Seal	37,702	0.25	\$9,426
2016	TFSA	2	Slurry Seal	67,170	0.25	\$16,793
2016	TGSA	1	Slurry Seal	31,225	0.25	\$7,806
2016	THSA	1	Slurry Seal	11,797	0.25	\$2,949
2016	THSA	2	Slurry Seal	14,205	0.25	\$3,551
2016	TJSA	1	Slurry Seal	16,562	0.25	\$4,141
2016	TJSA	2	Slurry Seal	19,037	0.25	\$4,759
2016	TJSA	3	Slurry Seal	34,614	0.25	\$8,654
2016	TKSA	1	Slurry Seal	34,704	0.25	\$8,676
2016	TKSA	2	Slurry Seal	27,756	0.25	\$6,939
2016	TL0SA	1	2" AC Overlay	20,821	2.50	\$52,053
2016	TL10SA	1	2" AC Overlay	25,375	2.50	\$63,438
2016	TL1SA	1	Slurry Seal	2,388	0.25	\$597
2016	TL1SA	2	Slurry Seal	5,782	0.25	\$1,446
2016	TL2SA	1	Slurry Seal	3,980	0.25	\$995
2016	TL3SA	1	Slurry Seal	4,960	0.25	\$1,240
2016	TL4SA	1	Slurry Seal	6,060	0.25	\$1,515
2016	TL5SA	1	Slurry Seal	3,960	0.25	\$990
2016	TL6SA	1	Slurry Seal	4,380	0.25	\$1,095
2016	TL7SA	1	Slurry Seal	3,800	0.25	\$950
2016	TL8SA	1	Slurry Seal	13,899	0.25	\$3,475
2016	TL8SA	2	Slurry Seal	5,855	0.25	\$1,464
2016	TL8SA	3	Slurry Seal	5,173	0.25	\$1,293
2016	TL9SA	1	Slurry Seal	17,098	0.25	\$4,275
2016	TLANET7SA	1	Fog Seal	7,245	0.11	\$797

**Table 2. Five-Year Global Maintenance and Rehabilitation Plan.**

Year	Branch	Section	Action	Area (sf)	Unit Cost (\$/sf)	Total Cost (\$)
2016	TLANET8SA	1	Fog Seal	13,110	0.11	\$1,442
2016	TMSA	1	Slurry Seal	47,509	0.25	\$11,877
2016	TNSA	1	Slurry Seal	25,921	0.25	\$6,480
2016	TNSA	2	Slurry Seal	9,579	0.25	\$2,395
2016	TQSA	1	Slurry Seal	31,173	0.25	\$7,793
2016	TQSA	2	Slurry Seal	10,901	0.25	\$2,725
2016	TSOSA	1	Reconstruct with 4" AC / 6" Bituminous Base /9" Subbase	10,540	13.65	\$143,871
2016	TSOSA	2	Reconstruct with 4" AC / 6" Bituminous Base /9" Subbase	5,860	13.65	\$79,989
2016	TWCWSA	1	Slurry Seal	10,560	0.25	\$2,640
<b>2016 Total</b>						<b>\$5,016,300</b>
<b>5-Year Total</b>						<b>\$5,016,300</b>

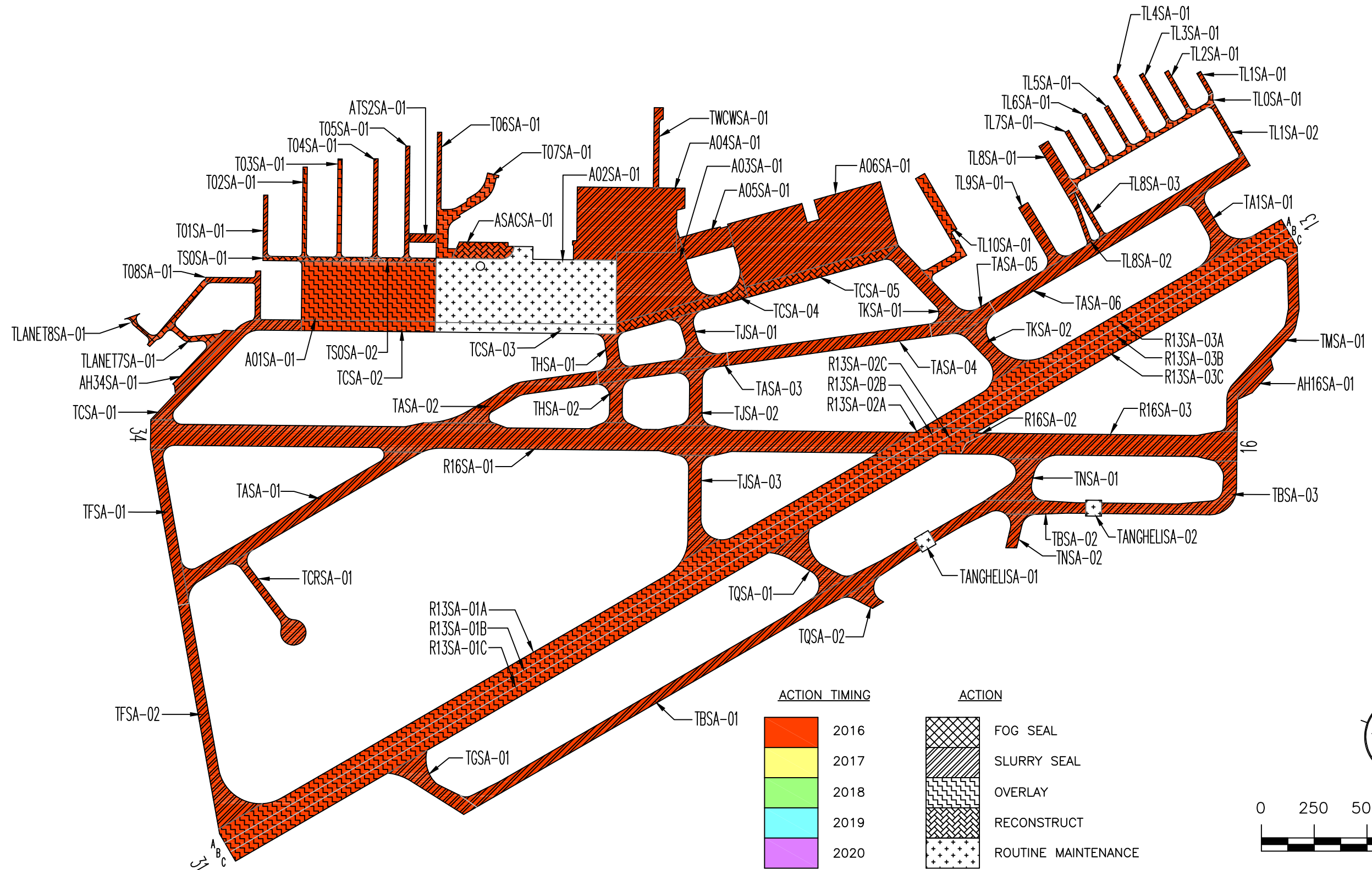
If the global maintenance and/or rehabilitation activities recommended in Table 2 are not completed, the localized maintenance activities identified in the Network Maintenance Report (Appendix 3) for that section should be done. Additionally, for those sections not listed in Table 2 as requiring global maintenance or rehabilitation, the localized maintenance activities outlined in the Network Maintenance Report should be completed. By completing the localized maintenance activities, pavement condition is improved, life is extended, deterioration is slowed and the length of time until major repair or rehabilitation is required is increased.

## **INSPECTION SCHEDULE**

To comply with the inspection schedule requirement of FAA Grant Assurance Number 11, a detailed visual inspection should be conducted every 3 years using the methodology described in ASTM D5430. The next scheduled detailed visual inspection should take place in 2018.

In addition, the FAA requires that a drive-by inspection be conducted monthly to detect unforeseen changes in pavement condition. The results of each drive-by inspection should be recorded and kept in a file. At a minimum, the date of the inspection and an indication of any maintenance performed since the last drive-by inspection should be recorded.

Figure SA-6. Five-Year Pavement Management Plan.  
Salem McNary Field



Drawing Date: September 2015