

Auburn

California



Auburn Municipal Airport Master Plan

2024

APPENDIX A

PAVEMENT MANAGEMENT PLAN

MAY 2025

APPENDIX A

PAVEMENT MANAGEMENT PLAN

AUBURN MUNICIPAL AIRPORT-AUN
2024 AIRPORT PAVEMENT MANAGEMENT SYSTEM UPDATE
(PMP)

Auburn, Placer County, CA



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TABLE OF CONTENTS

	<u>Page</u>
1 Executive Summary.....	1
2 Introduction	2
3 Site Information	3
4 Pavement Inventory.....	4
4.1 Inventory Updates	5
4.2 Inventory Results	5
5 Pavement Evaluation	7
5.1 Pavement Evaluation Methodology	7
5.2 Pavement Evaluation Results.....	8
6 Pavement Maintenance and Rehabilitation Program	12
6.1 Analysis Parameters.....	12
6.1.1 Critical PCIs.....	12
6.1.2 Localized Safety (StopGap) and Preventive Maintenance Policies and Unit Costs	12
6.1.3 Global Preservation Policies and Unit Costs	13
6.1.4 Major Rehabilitation Unit Costs.....	13
6.1.5 Budget and Inflation Rate	13
6.2 Analysis Approach.....	13
6.3 M&R Analysis Results.....	14
6.3.1 Unlimited Budget	14
6.3.2 Allocated Budget.....	16
6.4 General Maintenance Recommendations	17
APPENDIX A. SECTION AND SAMPLE UNIT LAYOUT PLAN	
APPENDIX B. PCI 2024 PLAN	
APPENDIX C. INSPECTION PHOTOGRAPHS	
APPENDIX D. SUMMARY OF DISTRESS SURVEY 2024	
APPENDIX E. LOCALIZED PREVENTIVE MAINTENANCE POLICIES AND UNIT COSTS	
APPENDIX F. M&R PLANS ANNUAL WORK AND COST PER SECTION	
APPENDIX G. M&R WORK ANNUAL DISTRIBUTION PER AREAS	

LIST OF FIGURES

Figure 1. Aerial View of Auburn Municipal Airport	3
Figure 2. Monthly Minimum, Average, and Maximum Temperatures for Auburn Airport	4
Figure 3. Pavement Area (SF) by Surface Type and Branch Use.....	6
Figure 4. Example of PCI versus Pavement Condition	7
Figure 5. PCI versus Pavement Repair Type.....	8
Figure 6. Pavement Area by PCI Range.....	11
Figure 7. Area-Weighted PCI by Branch Use.....	11
Figure 8. Pavement Condition Index (PCI) 2024	12
Figure 9. Summary of Estimated Costs per Pavement Section for the Unlimited Budget M&R Plans Analyzed	16
Figure 10. Summary of Estimated Costs per Pavement Section for the Allocated Budget M&R Plan.....	17

LIST OF TABLES

Table 1. Area-Weighted PCI by Pavement Use.....	1
Table 2. Summary Annual Estimated Costs and PCI Change for the M&R Plans	2
Table 3. Summary of PMP Updates	5
Table 4. Airport Branches Number of Sections and Area	5
Table 5. Pavement Evaluation Results 2024.....	8
Table 6. Summary Annual Estimated Costs for the M&R Plans	14
Table 7. Summary of Annual Estimated Costs per Work Type for 5-Year Plan (Critical PCI 40) ..	15
Table 8. Summary of Annual Estimated Costs per Work Type for 5-Year Plan (Critical PCI 55) ..	15
Table 9. Summary of Estimated Quantities and Costs per Work Type for 1-Year Plan (Localized Preventive Maintenance).....	15

1 Executive Summary

Quality Engineering Solutions, Inc. (QES) was tasked with performing the Airport Pavement Management Program (PMP) for the Auburn Municipal Airport. The development of the plan required a site visit to assess the existing condition of the pavement sections, updates to the maintenance and rehabilitation work completed, updates to the maintenance and rehabilitation policies and unit costs, and updates to the airport network layout. The PAVER software was updated with the collected information and future conditions for three different scenarios were calculated.

Condition

The Pavement Condition Index (PCI) is calculated based on the results of a visual condition survey in which distress types, severity, and quantities are identified. The area-weighted PCI for the airfield pavements that were inspected in 2024 is 54. The PCI is calculated based on the results of a visual condition survey in which distress types, severity, and quantities are identified. A total of 31 pavement sections were inspected in 2024. Table 1 shows a consolidated version of the area-weighted PCI for the airfield pavements. Refer to Sections 4 and 5 and Appendix A for detailed information on the pavement inventory and evaluation.

Table 1. Area-Weighted PCI by Pavement Use

Use Category	Number of Sections	Total Area (SF)	% of Total Area	Weighted Average PCI
Apron	14	881,865	64%	48
Helipad	2	23,446	2%	100
Runway	3	309,108	23%	61
Taxiway	12	154,541	11%	64
All	31	1,370,960	100%	54

Maintenace and Rehabilitation (M&R) Plans

The PAVER software was utilized to generate PCIs and assess the needs for maintenance, rehabilitation, and reconstruction of the pavements at Auburn Municipal Airport. Four distinct maintenance and rehabilitation (M&R) plans were devised. While three plans were based on an unlimited budget, the fourth plan, hereafter referred to as the “Allocated Budget,” incorporated the following specific annual amounts:

- **Localized Safety (Stop Gap) and Preventive Maintenance:** \$40,000, matching the airport’s existing annual maintenance budget.

- **Global Preservation:** \$72,000, determined based on the findings from the unlimited budget analysis.
- **Major Rehabilitation:** \$1.22 million, also derived from the unlimited budget scenario.

Under the unlimited budget scenario, two comprehensive 5-year M&R plans were formulated, along with an additional 1-year plan specifically aimed at addressing immediate localized distresses. In contrast, for the Allocated Budget scenario, a single 5-year plan was established. Table 2 details the annual costs and PCI changes for all four M&R programs evaluated. For an in-depth discussion on the development and outcomes of these M&R plans, refer to Section 6 and Appendices E and F.

Table 2. Summary Annual Estimated Costs and PCI Change for the M&R Plans

Year	Unlimited Budget			Allocated Budget
	5-Year Plan Critical PCI 40	5-Year Plan Critical PCI 55	1-Year Localized Preventive	5-Year Plan Critical PCI 55
2024	\$2,999,853	\$6,554,015	\$871,687	\$1,721,731
2025	\$3,445,381	\$39,467	\$ -	\$1,326,757
2026	\$898,590	\$50,231	\$ -	\$1,234,797
2027	\$88,836	\$62,555	\$ -	\$1,167,653
2028	\$1,146,035	\$76,236	\$ -	\$934,779
Total	\$8,578,694	\$6,782,504	\$871,687	\$6,385,717
2024 PCI	54	54	54	54
2028 PCI	74	78	55	83

2 Introduction

Quality Engineering Solutions, Inc. (QES) was tasked with updating the Airport Pavement Management Program (PMP) for the Auburn Municipal Airport in Auburn, California. This update to the PMP, conducted following FAA Advisory Circular AC No: 150/5380-7B, aims to assist the airport in finding optimum strategies for maintaining pavements in a safe serviceable condition over a specific period for the minimum cost. The tasks included in the PMP update include the following:

- Complete airside pavement distress condition survey following the procedures in ASTM D5340, Standard Test Method for Airport Pavement Condition Index Surveys.
- Updates to the PAVER pavement management software from the 2011 evaluation, including updating any maintenance and rehabilitation (M&R) projects completed since 2011, updating the recommended treatments in the decision tree, updating costs for such treatments, and reviewing the deterioration curves.
- Developing current PCI reports.

- Developing 5-year project plans.
- Submitting a PMP report.

This report documents the findings of a PMP conducted at Auburn Municipal Airport, managed by the City of Auburn. The PMP assesses the current state of the pavement, noting any visible distress, and catalogs historical M&R efforts across the airfield. QES conducted a comprehensive pavement investigation and proposed three M&R strategies for the airport.

The primary goal of the PMP is to outline a prioritized agenda for pavement rehabilitation and reconstruction projects. It also aims to delineate scheduled maintenance activities, ensuring that the pavement network remains serviceable and cost-effective. Additionally, the PMP functions as a guide for scheduling preventive maintenance, which is crucial for prolonging pavement lifespan.

Utilizing the PAVER software, developed by the U.S. Army Corps of Engineers, the analysis incorporated data from recent field investigations to suggest a prioritized and strategic list of projects. This software also aids in predicting future pavement conditions by applying an estimated deterioration rate.

3 Site Information

The Auburn Municipal Airport is a general aviation facility located three miles north of Auburn in Placer County, California. Positioned at an elevation of 1,536 feet with coordinates of 38°57'17"N 121°04'54"W, the facility is managed by the City of Auburn and spans approximately 285 acres. It features one runway, Runway 7/25, which is 3,700 feet long and 75 feet wide, with 240-foot overruns at each end. An aerial view from Google Earth, dated May 17, 2023, is depicted in Figure 1.



Figure 1. Aerial View of Auburn Municipal Airport

The airport provides various services, including air ambulance, aviation fuel supply, flight instruction, private charters, and rentals, alongside aircraft repair and maintenance. It supports essential operations for the Placer County Sheriff's Office and the California Highway Patrol's Valley Division Air Operations.

The weather conditions for Auburn airport typically feature warm, dry summers and cool, wet winters. Figure 2 shows the average monthly temperature variations at the airport location.

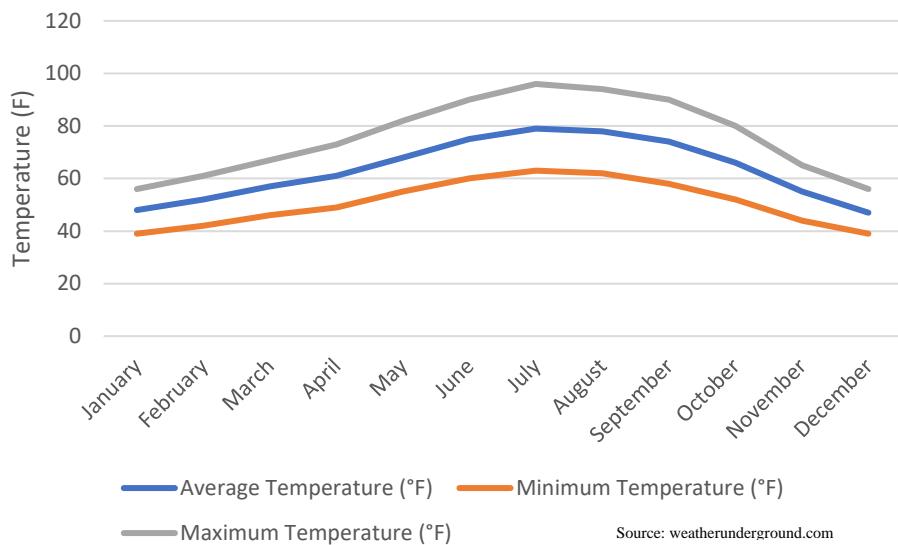


Figure 2. Monthly Minimum, Average, and Maximum Temperatures for Auburn Airport

4 Pavement Inventory

Based on the contents of the pavement inventory, including the pavement use, surface type, and structural composition, the network of airside pavements was divided into smaller, more manageable components for inspection and maintenance management purposes. A description of the three network components is provided below.

- **Branches** - defined as any identifiable part of the pavement network which is a single entity that serves a distinct function within the network, such as runways, which facilitate aircraft takeoffs and landings. Taxiways, aprons, T-Hangers, and Helipads are also categorized as individual branches. This structure allows for targeted maintenance strategies and a clear understanding of the airport's pavement infrastructure needs.
- **Sections** - defined as parts of the branch that share common attributes, such as date of last construction, performance, pavement structure, and/or traffic.
- **Sample Units** - defined as a convenient area of a pavement section which is designated only for the purpose of pavement inspection. For bituminous concrete airfield pavements, ASTM D5340-12 recommends that sample unit areas should measure 5,000 sq. ft. with a tolerance of +/- 2,000 sq. ft. For PCC pavements, sample units are defined by slabs rather than by area. Each sample should have between 12 and 28 slabs, with a target number of 20 slabs.

The existing PMP naming convention was not changed for the Auburn airport for the 2024 update. The PMP nomenclature uses the following conventions:

- **Network ID:** Corresponds to the FAA three letter designation (e.g., AUN)
- **Network Name:** Auburn Municipal Airport
- **Branch ID:** A branch is given an alphanumeric designation, with the first letter being R, T, A, or H for Runway, Taxiway, Apron, or Helipad. Runways, Taxiways, and Aprons were identified sequentially. For instance, R1, T1, T2, T3, A1, A2, A3, etc.
- **Branch Name:** Is the actual facility name. For example, R1 is Runway 7/25, T1 is Taxiway 1, A1 is Apron 1, etc.
- **Section:** A branch is broken into sections of consistent age and cross-section, and then named sequentially with alphabetic letters, starting with A. For example, Apron 1 (A1) consists of two sections A, B, and C.

4.1 Inventory Updates

The following updates to the airport inventory were identified from information provided by the airport and the 2024 field inspection conducted by QES:

Table 3. Summary of PMP Updates

Branch Name	Update	Year
Helipad 1	Removed	2023
Helipad 2	Removed	2023
Helipad 3	Built	2023
Tie-Down Apron 1	Slurry Sealed	2017
Tie-Down Apron 2	Slurry Sealed	2019
Tie-Down Apron 4	Slurry Sealed	2019

4.2 Inventory Results

AUN consists of a single runway with a parallel taxiway, connector taxiways, and apron and helipad areas. The airside consists of Asphalt Concrete (AC) pavements, Asphalt Overlays on AC (AAC) pavements, and Portland Cement Concrete (PCC) slabs in the Helipad 3 area. The runway dimensions at AUN are as follows:

- Runway 07-25: 3,700 ft x 75 feet wide, with 240-foot overruns at each end.

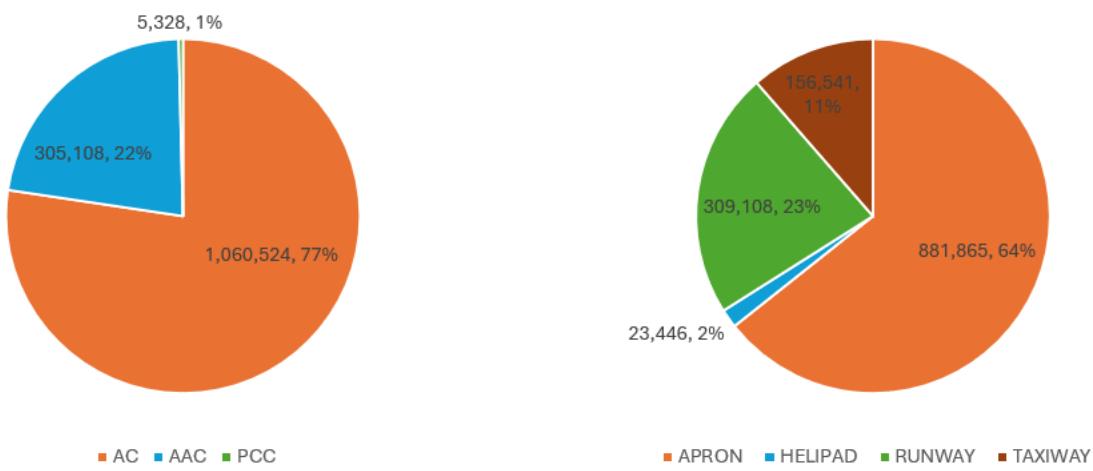
There are 23 branches (facilities) at AUN that include 31 pavement sections and a total area of approximately 2,090,500 square feet. Table 4 lists the pavement branches for AUN.

Table 4. Airport Branches Number of Sections and Area

Branch ID	Branch Name	Number of Sections	Area (SF)
A1	APRON 1	2	78,140
A2	APRON 2	1	77,800
A3	APRON 3	1	8,800
A5	APRON 5	1	8,960
A6	APRON 6	1	4,000
A7	APRON 7	1	18,300

Branch ID	Branch Name	Number of Sections	Area (SF)
A8	APRON 8	1	129,669
A9	APRON 9	1	44,953
H3	HELIPAD 3	2	46,892
R1	RUNWAY 1	3	927,324
T1	TAXIWAY 1	1	91,532
T2	TAXIWAY 2	2	28,200
T3	TAXIWAY 3	1	7,000
T4	TAXIWAY 4	2	18,970
T5	TAXIWAY 5	1	13,200
T6	TAXIWAY 6	1	8,500
T7	TAXIWAY 7	1	6,000
T8	TAXIWAY 8	2	13,448
TD1	APRON	1	268,800
TD2	APRON	1	115,750
TD3	APRON	1	66,518
TD4	APRON	1	53,761
TD5	APRON	1	45,484

Figure 3 presents the distribution of airfield pavement by surface types (area in square feet and area %) along with the distribution of pavement area by usage.



AC: Asphalt Concrete
AAC: Asphalt Overlay Asphalt Concrete
PCC: Portland Cement Concrete

Figure 3. Pavement Area (SF) by Surface Type and Branch Use

An updated Network Definition Plan showing the Branches, Sections, and Sample Units is presented in Appendix A.

5 Pavement Evaluation

5.1 Pavement Evaluation Methodology

A field Pavement Condition Index (PCI) inspection was conducted by QES on February 16, 2024 in accordance with the guidelines and procedures described in the following documents:

- ASTM D5340-20, Standard Test Method for Airport Pavement Condition Index Survey.
- FAA Advisory Circular 150/5380-7B, Airport Pavement Management Program (PMP) (https://www.faa.gov/documentLibrary/media/Advisory_Circular/150-5380-7B.pdf).
- FAA Advisory Circular 150/5380-6C, Guidelines and Procedures for Maintenance of Airport Pavements (https://www.faa.gov/documentLibrary/media/Advisory_Circular/150-5380-6C.pdf)

During a PCI inspection, inspectors walk over the surface of the pavement and identify visible signs of distress within a sample unit. The map used during the inspection to locate the inspected sample units is presented in Appendix A. Each distress type is identified, then classified as low, medium, or high severity, and recorded in our proprietary tablet-based rating software.

The PCI offers a numerical measure of the overall condition of pavement, utilizing the extent and types of deterioration to compute the PCI for each section. Values range from 0, indicative of failed pavement, to 100, denoting pavement in excellent condition. Figure 4 presents an example of different pavement conditions and their corresponding PCI values for three sections of Auburn Airport.



Figure 4. Example of PCI versus Pavement Condition

The PCI serves as a guide to the necessary level of rehabilitation for a specific pavement segment. Typically, when the PCI exceeds 60, maintenance efforts like crack sealing, joint sealing, slurry seals, and patching are effective. However, as the PCI decreases, more substantial rehabilitation measures, including overlays, become necessary. In cases where the PCI is significantly low,

indicating severe damage, reconstruction may be the only feasible option to restore the pavement's structural integrity and functionality. Figure 5 presents the relationship between the PCI of a pavement section and the corresponding repair types required along with a typical pavement performance curve. It also includes the color codes used in the report's maps and charts for each PCI range, enabling an understanding of pavement conditions and necessary interventions.

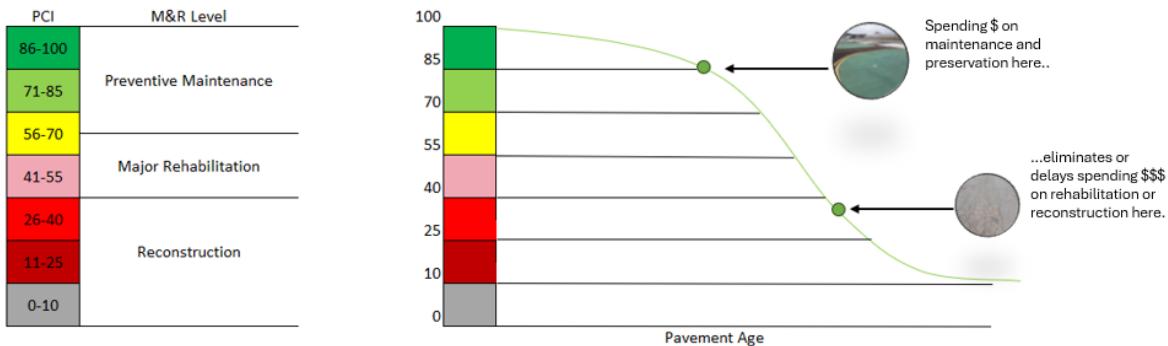


Figure 5. PCI versus Pavement Repair Type

When determining the most suitable repair approach it is important to consider additional factors beyond the PCI score. These factors include the specific types of distress observed, their underlying causes, and the rate at which the pavement deteriorates. Moreover, because the PCI assessment does not account for the structural capacity and integrity of the pavement, incorporating analyses of these aspects is advised to enhance and verify the chosen repair strategy.

5.2 Pavement Evaluation Results

Table 5 presents a summary of the PCI field evaluation conducted for all pavement sections in 2024 at AUN. The Last Major Work date corresponds to the most recent major (e.g., AC overlay) M&R date. The computed PCI values for sections at AUN range from a low of 1 (Apron 9 Section A) to a high of 100 (Helipad 3 Sections A and B). As seen in the table, most of the pavements at AUN are in Fair and Poor condition. The 2024 area-weighted condition of AUN corresponds to 54 (Poor Condition). For the previous inspection, conducted in 2012, the area-weighted reported was 75 (Satisfactory Condition).

Table 5. Pavement Evaluation Results 2024

Branch:Section	Surface Type	Section Area (SF)	Last Major Work Date	PCI	PCI Category	% Distresses due to Climate	% Distresses due to Load	% Distresses due to Other	Distress Types
A1:A	AC	33,470	07-01-1975	57	Fair	57	43	0	Alligator cracking, LT cracking, Weathering

Branch:Section	Surface Type	Section Area (SF)	Last Major Work Date	PCI	PCI Category	% Distresses due to Climate	% Distresses due to Load	% Distresses due to Other	Distress Types
A1:B	AC	5,600	06-01-2001	68	Fair	93	0	7	LT cracking, Oil spillage, Weathering
A2:A	AC	77,800	07-01-1975	65	Fair	100	0	0	LT cracking, Weathering
A3:A	AAC	8,800	01-01-2002	50	Poor	90	0	10	LT cracking, Oil spillage, Weathering
A5:A	AC	8,960	11-17-1993	68	Fair	100	0	0	LT cracking, Weathering
A6:A	AAC	4,000	01-01-2002	64	Fair	100	0	0	LT cracking, Weathering
A7:A	AC	18,300	11-17-1993	63	Fair	85	15	0	Alligator cracking, LT cracking, Raveling, Weathering
A8:A	AC	129,669	01-01-2004	72	Satisfactory	33	67	0	Alligator cracking, LT cracking, Patching, Raveling, Weathering
A9:A	AC	44,953	01-01-2004	1	Failed	30	67	3	Alligator cracking, Block cracking, Depression, Patching, Raveling, Rutting, Weathering
H3:B	PCC	5,328	07-25-2023	100	Good	0	0	0	None
H3:A	AC	18,118	07-25-2023	100	Good	0	0	0	None
R1:B	AAC	279,108	01-01-2004	61	Fair	84	16	0	Alligator cracking, LT cracking, Raveling, Weathering
R1:A	AC	11,625	01-01-2004	66	Fair	100	0	0	LT cracking, Weathering
R1:C	AC	18,375	01-01-2004	66	Fair	100	0	0	LT cracking, Weathering
T1:A	AC	91,532	07-01-1975	67	Fair	87	13	0	Alligator cracking, LT cracking, Raveling, Weathering
T2:A	AC	9,000	07-01-1973	55	Poor	89	0	11	Bleeding, LT cracking, Weathering
T2:B	AC	5,100	06-01-2001	66	Fair	92	0	8	Bleeding, LT cracking, Weathering
T3:A	AC	7,000	07-01-1973	76	Satisfactory	100	0	0	LT cracking, Weathering

Branch:Section	Surface Type	Section Area (SF)	Last Major Work Date	PCI	PCI Category	% Distresses due to Climate	% Distresses due to Load	% Distresses due to Other	Distress Types
T4:A	AC	5,250	07-01-1973	57	Fair	100	0	0	LT cracking, Weathering
T4:B	AC	4,235	06-01-2001	55	Poor	71	29	0	Alligator cracking, LT cracking, Raveling, Weathering
T5:A	AAC	13,200	01-01-2004	46	Poor	57	43	0	Alligator cracking, LT cracking
T6:B	AC	4,500	01-01-2004	64	Fair	100	0	0	LT cracking, Weathering
T6:A	AC	4,000	06-01-2001	66	Fair	100	0	0	LT cracking, Weathering
T7:A	AC	6,000	06-01-2001	66	Fair	100	0	0	LT cracking, Weathering
T8:B	AC	2,944	06-01-2001	61	Fair	100	0	0	LT cracking, Weathering
T8:A	AC	3,780	06-01-2001	67	Fair	100	0	0	LT cracking, Weathering
TD1:A	AC	268,800	11-17-1993	46	Poor	65	32	3	Alligator cracking, Block cracking, Depression, LT cracking, Oil spillage, Patching
TD2:A	AC	115,750	07-01-1975	33	Very Poor	52	48	0	Alligator cracking, Block cracking, LT cracking
TD3:A	AC	66,518	07-01-1973	47	Poor	68	32	0	Alligator cracking, Block cracking, LT cracking
TD4:A	AC	53,761	01-01-2004	22	Serious	46	52	2	Alligator cracking, Block cracking, Depression, LT cracking, Weathering
TD5:A	AC	45,484	01-01-2004	55	Poor	64	36	0	Alligator cracking, LT cracking, Weathering

The map presented in Appendix A illustrates the PCI associated with each section, the total number of Sample Units in each Section, the number of Sample Units inspected for each section, and the PCI for each Sample Unit inspected.

Figure 6 presents the distribution of pavement area categorized by Pavement Condition Index (PCI) ranges. As depicted, the predominant portion of the pavement area is classified within the "Fair" and "Poor" categories.

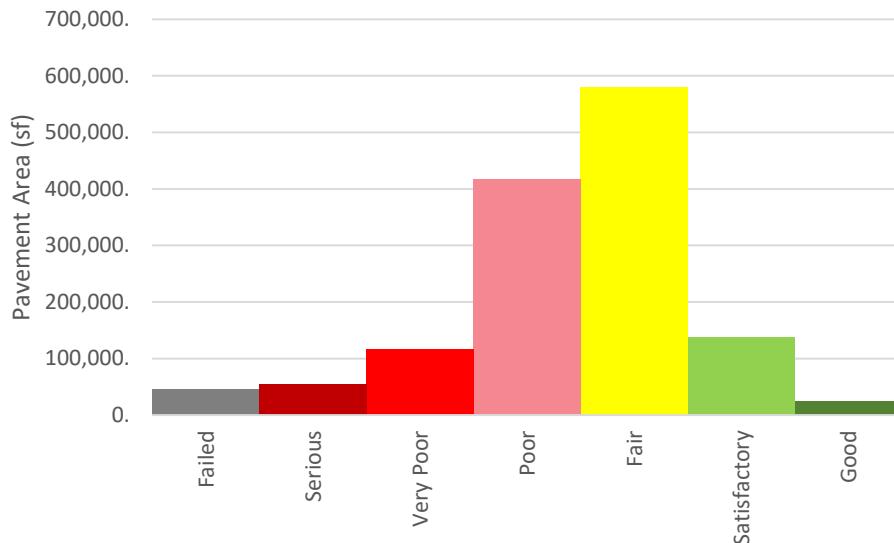


Figure 6. Pavement Area by PCI Range

Figure 7 illustrates the area-weighted Pavement Condition Index (PCI), which represents the average PCI adjusted to reflect the relative size of each pavement section, for each airport branch. The map in Figure 8 illustrates the PCI for each airport branch calculated based on the visual inspection conducted in February 2024. This map is presented in a larger format in Appendix B.

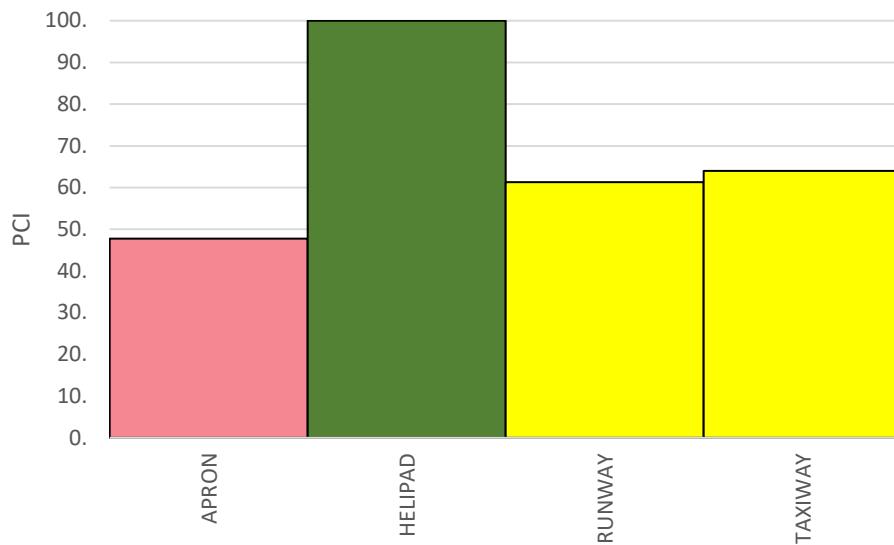


Figure 7. Area-Weighted PCI by Branch Use

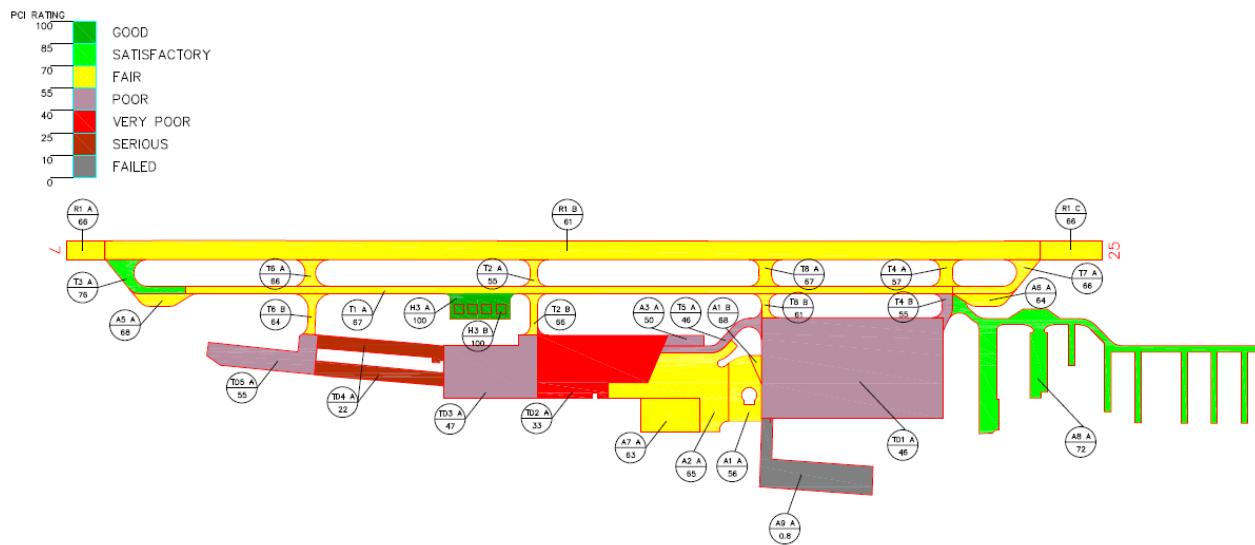


Figure 8. Pavement Condition Index (PCI) 2024

Appendix C presents photographs taken for each Management Section during the PCI field inspection.

Appendix D includes detailed information on the distress severities and extent observed during the field inspection.

6 Pavement Maintenance and Rehabilitation Program

The PAVER pavement management software was updated using the distress information collected during the 2024 pavement inspection, historic records of pavement-related work completed at specific sections, and M&R policies and unit costs. With the updated information, the software PAVER was used to develop three unlimited budget and one allocated budget M&R plans.

6.1 Analysis Parameters

6.1.1 Critical PCIs

PAVER employs critical PCI thresholds to guide the decision-making process between localized preventive maintenance and major rehabilitation efforts. For pavement sections with a PCI above the critical threshold, localized preventive maintenance measures, including crack sealing and patching, are advised. Conversely, for sections falling below this critical PCI, more extensive rehabilitation actions, such as overlaying or reconstruction, are deemed necessary. In the development of the 5-year M&R programs, two distinct critical PCI thresholds were employed (i.e., 55 and 40).

6.1.2 Localized Safety (StopGap) and Preventive Maintenance Policies and Unit Costs

Localized safety and preventive maintenance policies for asphalt-surfaced and Portland Cement Concrete (PCC) pavements have been developed. Table E-1 in Appendix E, outlines maintenance

actions designed to address each various distress types and severities. Table E-2 presents the unit costs for each preventive action, derived from regional pricing and insights from previous projects.

6.1.3 Global Preservation Policies and Unit Costs

Pavement preservation involves activities that are used to extend pavement service life and to delay rehabilitation. These are applied when the pavement is in relatively good condition and does not exhibit structural distresses. Typical applications include slurry seals, chip seals, fog seals, and microsurfacing. The pavement preservation policy used in the development of the M&R plans involves the application of emulsified asphalt seal coats for runway areas, as per FAA specification P-608, and emulsified asphalt slurry seal for non-runway pavements, according to FAA specification P-626. Table E-3 in Appendix E presents the unit costs for global preservation activities used in the development of M&R programs.

6.1.4 Major Rehabilitation Unit Costs

PAVER software estimates the cost of major pavement rehabilitation based on the predicted PCI. Table E-4 in Appendix E details the unit costs for major M&R activities used in the development of M&R programs. When major rehabilitation is recommended within a 5-year outlook, further engineering investigation is recommended. This ensures the selection of the most suitable rehabilitation method and enables a more precise cost estimation for the proposed work.

6.1.5 Budget and Inflation Rate

For the development of the Unlimited Budget M&R plans an unlimited budget was used. For the development of the Allocated Budget M&R plan, the annual budget was distributed as follows:

- **Localized Safety (Stop Gap) and Preventive Maintenance:** \$40,000.
- **Global Preservation:** \$72,000.
- **Major Rehabilitation:** \$1.22 million.

A start date of October 1, 2024, and an inflation rate of 4.0 percent was used for all the M&R plans developed.

6.2 Analysis Approach

As previously noted, under the unlimited budget options, two comprehensive 5-year M&R plans were devised, alongside a separate 1-year plan dedicated solely to addressing localized distresses. The two 5-year plans aim to maintain pavement conditions above established critical PCIs of 55 and 40, offering distinct annual funding alternatives. Conversely, for the Defined Budget option, a singular 5-year plan was developed. The three 5-year analyses encompass three distinct categories of M&R work:

- **Localized Safety (Stop Gap) and Preventive Maintenance:** Localized maintenance policies are meant to identify ongoing, routine maintenance of individual pavement

sections. The safety (stop gap) plan addresses distresses that would affect safety if left unrepaired and is applied to pavements below the critical PCI. The preventive maintenance policy is aimed at slowing the rate of deterioration through consistent pavement maintenance and is generally applied to pavements above the critical PCI.

- **Global Preservation:** Correspond to activities applied to entire pavement sections with the primary objective of slowing down the rate of deterioration. This policy is applied to pavements above the critical PCI.
- **Major M&R:** Correspond to activities applied to the entire pavement section to correct or improve existing structural or functional requirements. It is also used to upgrade pavements below the critical PCI.

The 1-year preventive maintenance plan, using unlimited budget, was conducted to identify the necessary repairs for addressing localized distresses in various pavement sections, aiming to mitigate their deterioration rate. This policy is applied, irrespective of the PCI of each section. Recognizing its limitations, this plan offers an alternative for pavement maintenance when funding for more extensive interventions is unavailable.

6.3 M&R Analysis Results

6.3.1 Unlimited Budget

A summary of the annual costs for the three M&R programs analyzed using unlimited budget is presented in Table 6.

Table 6. Summary Annual Estimated Costs for the M&R Plans

Year	Unlimited Budget		
	5-Year Plan Critical PCI 40	5-Year Plan Critical PCI 55	1-Year Localized Preventive
2024	\$2,999,853	\$6,554,015	\$871,687
2025	\$3,445,381	\$39,467	\$ -
2026	\$898,590	\$50,231	\$ -
2027	\$88,836	\$62,555	\$ -
2028	\$1,146,035	\$76,236	\$ -
Total	\$8,578,694	\$6,782,504	\$871,687

Table 7 and Table 8 present a summary of the annual cost per work type for the two 5-year plans developed using unlimited budget and Critical PCIs of 40 and 55, respectively.

Table 7. Summary of Annual Estimated Costs per Work Type for 5-Year Plan (Critical PCI 40)

Date	Preventive Maintenance	Global Surface Treatment	Major Rehabilitation	Total
2024	\$150,854	\$387,451	\$2,535,234	\$3,073,539
2025	\$73,274	\$0	\$3,372,585	\$3,445,859
2026	\$71,826	\$0	\$827,344	\$899,171
2027	\$89,529	\$0	\$0	\$89,529
2028	\$84,696	\$0	\$1,062,155	\$1,146,851
Total				\$8,654,948

Table 8. Summary of Annual Estimated Costs per Work Type for 5-Year Plan (Critical PCI 55)

Date	Preventive Maintenance	Global Surface Treatment	Major Rehabilitation	Total
2024	\$59,177	\$361,623	\$6,133,215	\$6,554,015
2025	\$39,467	\$0	\$0	\$39,467
2026	\$50,231	\$0	\$0	\$50,231
2027	\$62,555	\$0	\$0	\$62,555
2028	\$76,236	\$0	\$0	\$76,236
Total				\$6,782,504

Table 9 presents a summary of the work activities included in the 1-year localized preventive maintenance plan developed.

Table 9. Summary of Estimated Quantities and Costs per Work Type for 1-Year Plan (Localized Preventive Maintenance)

Work Description	Work Quantity	Work Units	Work Cost
Crack Sealing Wide Cracks	357	Ft	\$892
Crack Sealing - AC	107,526	Ft	\$215,053
Patching - AC Deep	68,740	SqFt	\$653,026
Patching - AC Shallow	408	SqFt	\$2,716
Total			\$871,687

Figure 9 illustrates the total estimated costs for each pavement section under the three M&R plans analyzed. The sections requiring the most repair funds are identified as the Tie-Down Aprons (TD1, TD2, TD3, TD4, TD5) and the Apron section A9. According to the 2024 PCI inspection, the condition of these sections ranged from 'Poor' to 'Failed', with corresponding PCI values of 46, 33, 47, 22, 55, and 1, respectively.

Detailed information on the annual work type and estimated costs for each pavement section for the three M&R works analyzed is presented in Tables F-1 through F-3 of Appendix F. The annual distribution per areas of M&R work for the two 5-year M&R plans is presented in Appendix G.

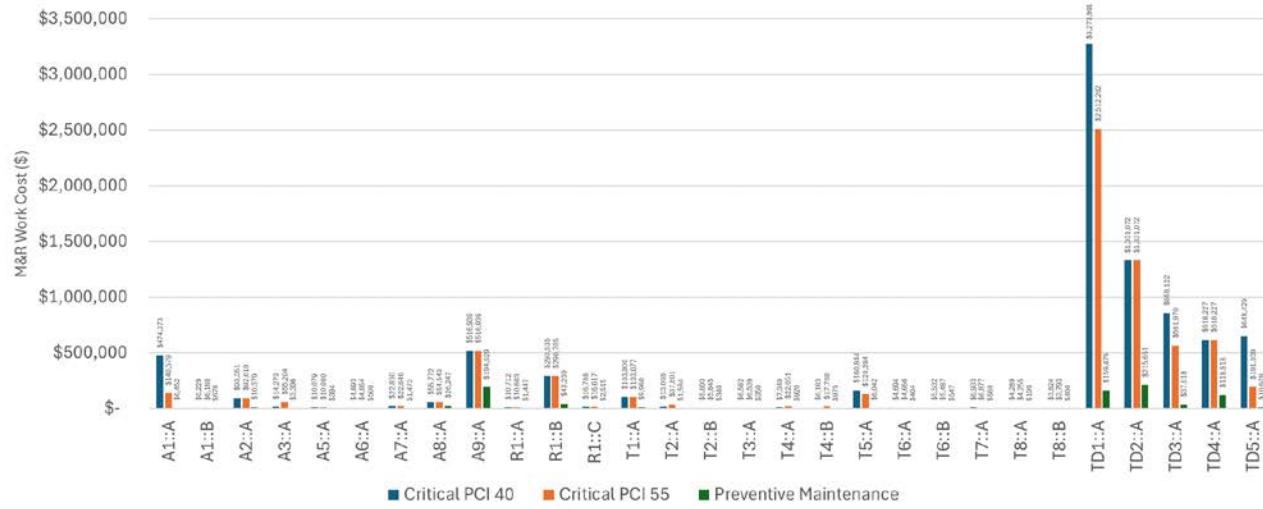


Figure 9. Summary of Estimated Costs per Pavement Section for the Unlimited Budget M&R Plans Analyzed

Considering that the analysis was conducted with an unlimited budget assumption, it is likely that adjustments will be needed to align the pavement repair program with the actual economic and operational constraints at Auburn Municipal Airport. Importantly, the identification of a repair need does not guarantee that funding will be available when needed. It is essential to remember that, irrespective of the report's recommendations, the airport is obligated to prioritize and execute repairs that are critical for maintaining safe operations.

6.3.2 Allocated Budget

A summary of the total estimated costs for the 5-year M&R program analyzed using the allocated budget is presented in Figure 10. The sections requiring the most repair funds are identified as Runway Section B, Tie-Down Aprons (TD1, TD2, TD3, TD4, TD5), and Taxiway 1. According to the 2024 PCI inspection, the condition of these sections ranged from 'Fair' to 'Serious', with corresponding PCI values of 61, 46, 33, 47, 22, 54, and 67, respectively.

Detailed information on the annual work type and estimated costs for each pavement section for the allocated budget M&R plan analyzed is presented in Table F-4 of Appendix F. The annual distribution per areas of M&R work for this 5-year M&R plan is presented in Appendix G.

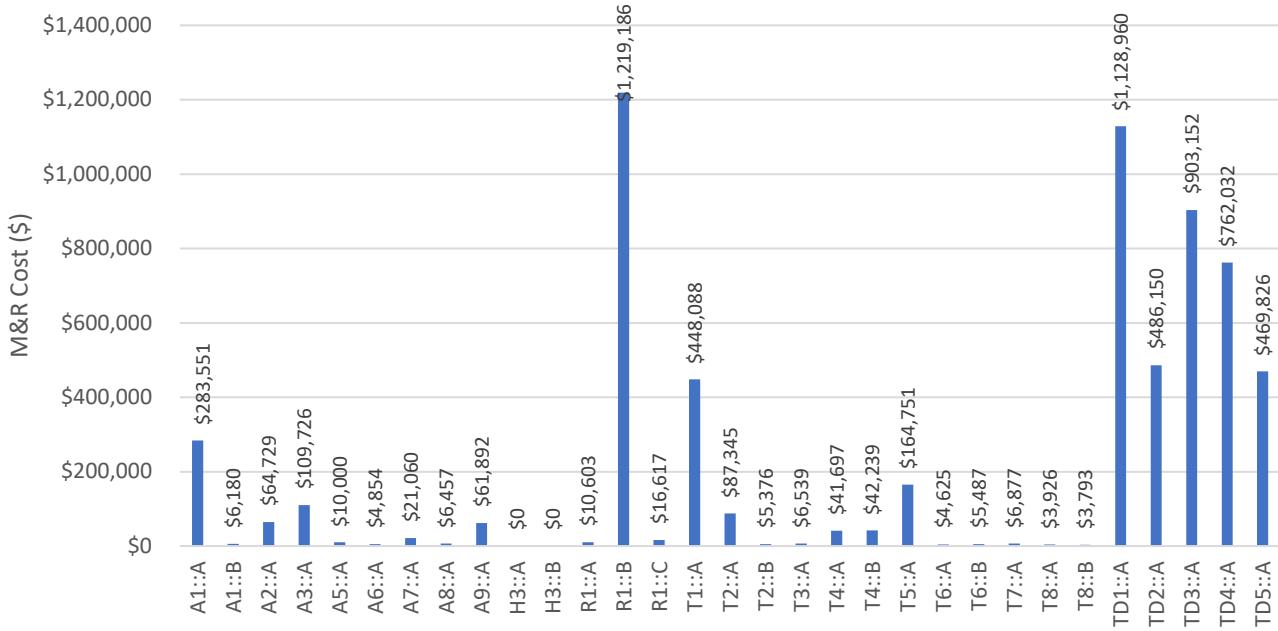


Figure 10. Summary of Estimated Costs per Pavement Section for the Allocated Budget M&R Plan

6.4 General Maintenance Recommendations

In addition to the specific maintenance activities recommended in the M&R programs developed, it is suggested to consider the following strategies to extend pavement life:

Implement Routine Pavement Inspections: Establish a regular inspection schedule to systematically monitor all pavement areas within the airport. This is crucial for detecting any changes in pavement condition and identifying distresses that could impact safety and ride quality.

Maintenance and Rehabilitation Activity Tracking System: Develop a comprehensive system to track and record all maintenance activities stemming from pavement inspections.

Weed Control Program: Initiate a robust weed control strategy, incorporating regular herbicide applications and mowing of safety areas. This will prevent vegetation from growing in pavement cracks, which can accelerate pavement deterioration and compromise structural integrity.

Periodic Sealing of Cracks and Joints: Implement a scheduled maintenance program for sealing cracks and joints in the pavement. This preventive measure is essential to prevent water and debris infiltration, thereby prolonging the pavement's lifespan and maintaining surface integrity.

Recommendations for Sealing of Wide Cracks: For wide cracks, use a hot-applied mastic sealant, which is a polymer modified asphalt binder combined with specially engineered aggregates and modifiers. This type of material is designed to fill wide cracks preventing water infiltration and

restoring ride quality. It should be flexible to perform well in cold weather and have a high softening point to avoid tracking or rutting with traffic.

Materials and Installation:

1. Melting:

- Use an applicator specifically designed for melting, heating, and applying modified polymerized asphalt sealants with aggregate.
- Heat the transfer oils to 450°F - 525°F. Begin agitation when the material melts and continue until it reaches the recommended application temperatures. Agitate continuously during application.

2. Pavement Temperatures:

- Ensure the pavement temperature is at least 40°F during application. If below 40°F, use a heat lance to warm and dry the asphalt, ensuring cracks are clean and dry for optimal adhesion.

3. Preparation:

- Open cracks to a minimum width of 1 inch and depth of 1 inch. Milling or routing to a depth of 1 inch with a width of 4-10 inches may improve bonding and create a smoother finish.
- Clean bonding surfaces of oil, dirt, dust, and moisture. Use high-powered, oil-free compressed air or a heat lance for preparation. Apply a thin coating of a suitable primer to maximize adhesion.

4. Application:

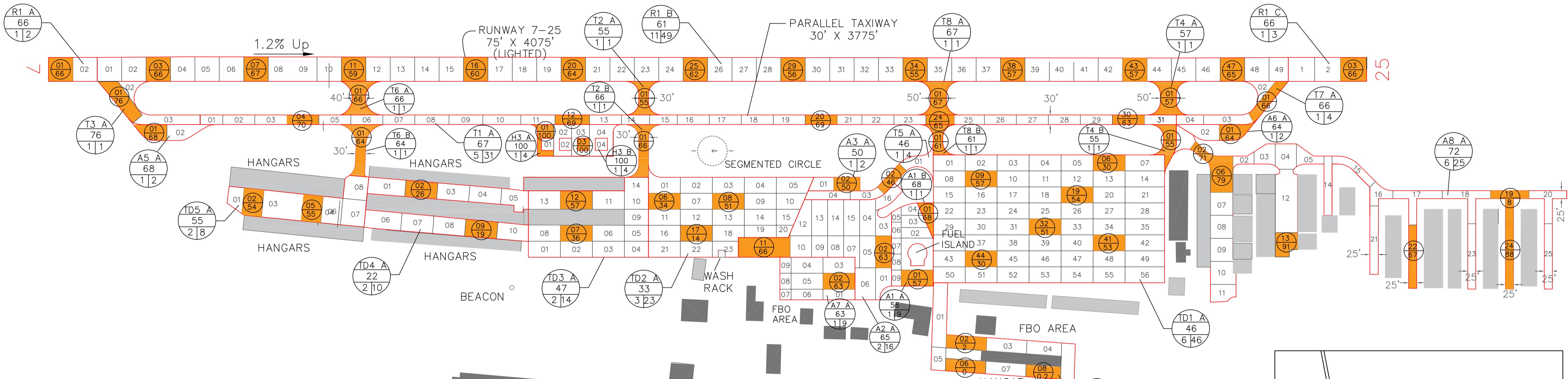
- Apply the hot-applied polymer modified asphalt binder to distressed areas spanning voids no more than 12 inches wide or 4 inches deep.
- Use proper traffic control procedures to ensure safety and prevent access to uncured or molten sealant areas.

Prevent Dirt Accumulation: Ensure regular cleaning to prevent dirt from accumulating along pavement edges, which can impede proper drainage and create water retention issues ("bathtub" effect). Regular removal of debris and dirt will enhance the effectiveness of drainage systems and prevent water-related damages.

Heavy Equipment Movement Monitoring: Strictly monitor and regulate the movement of heavy equipment across the airport. Limit the operation of such equipment to designated pavements that are structurally capable of handling heavy loads to avoid undue stress and potential premature pavement failure

APPENDIX A
SECTION AND SAMPLE UNIT LAYOUT PLAN

LEGEND 1	
	Section Boundary
	Sample Unit Inspected
	Sample Unit Not Inspected

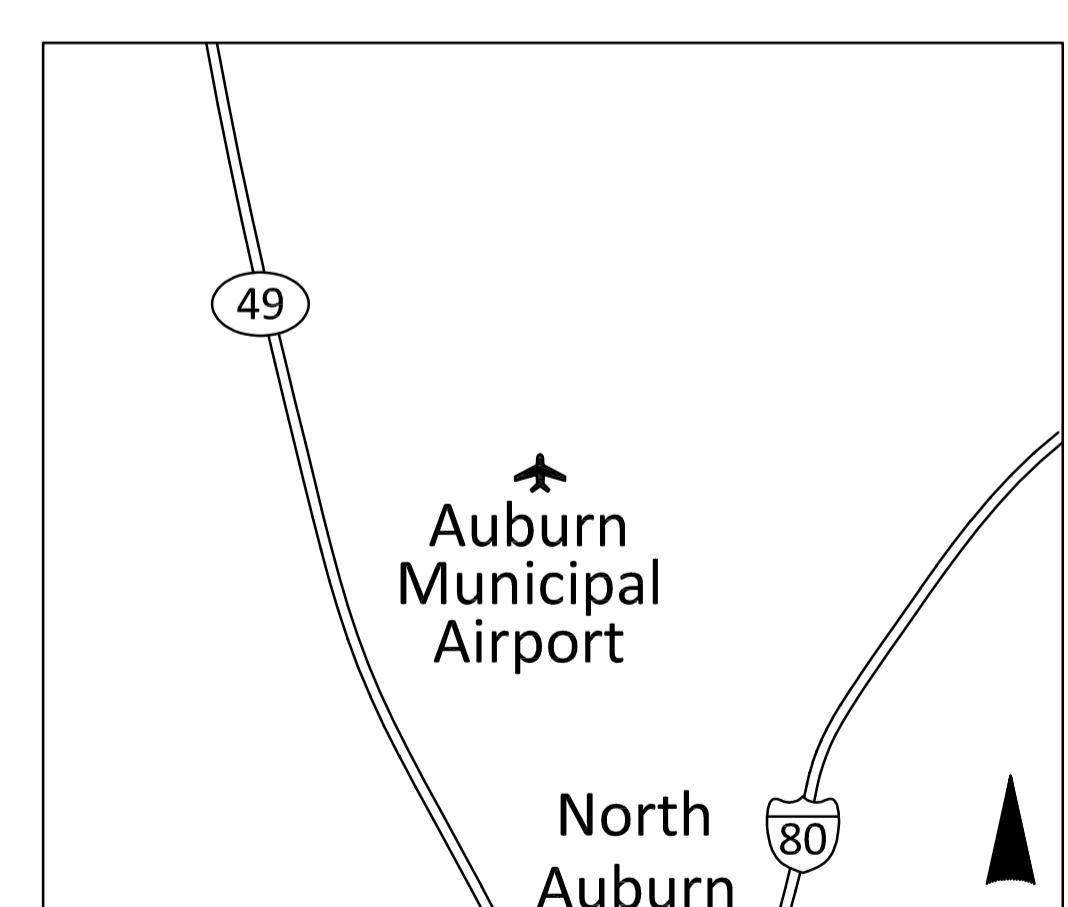


N

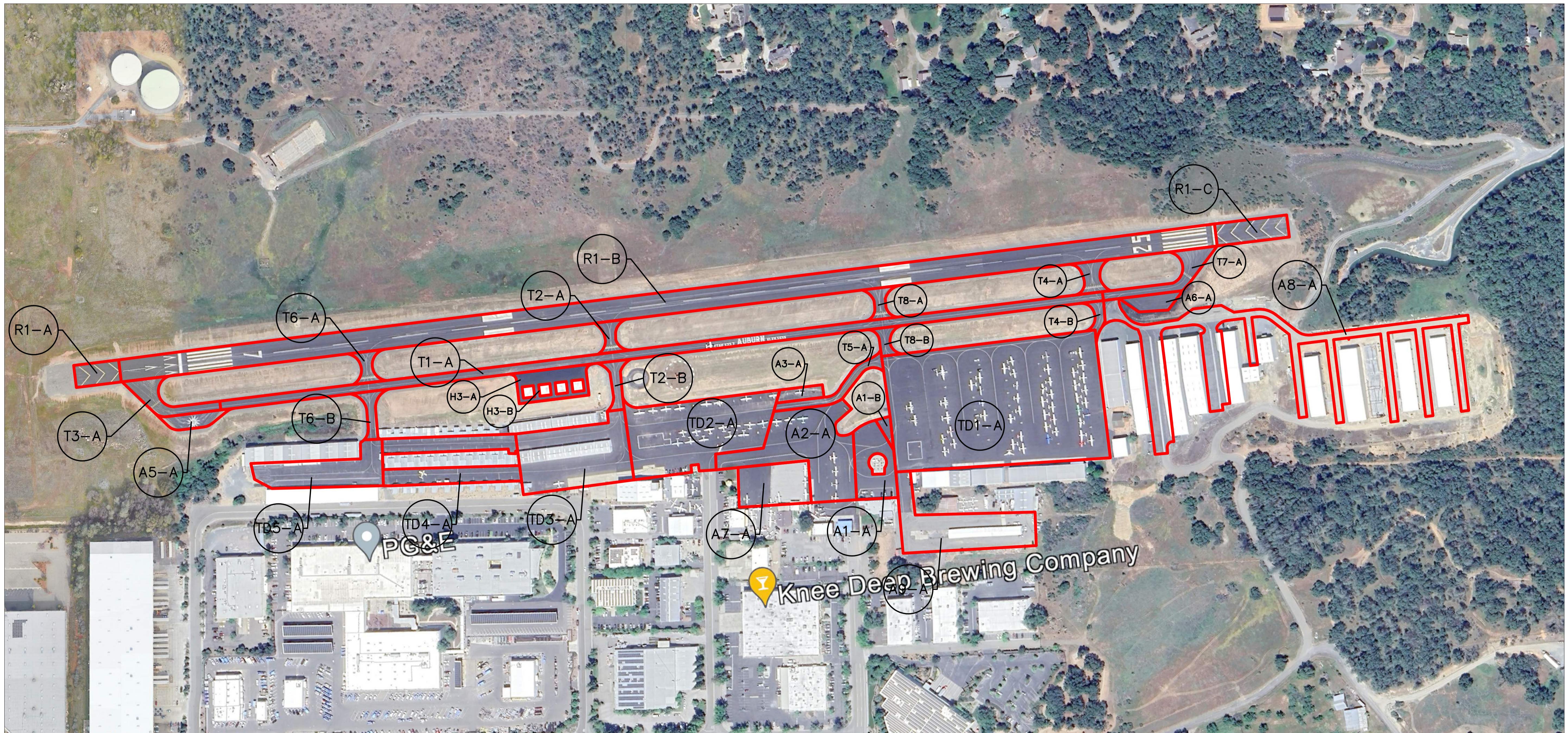
LEGEND 2	
	SECTION NUMBER
	SECTION PCI (PAVEMENT CONDITION INDEX)
	TOTAL NUMBER OF SAMPLE UNITS IN SECTION
	NUMBER OF SAMPLE UNITS INSPECTED
	INSPECTED SAMPLE UNIT NUMBER
	INSPECTED SAMPLE UNIT PCI

Notes:

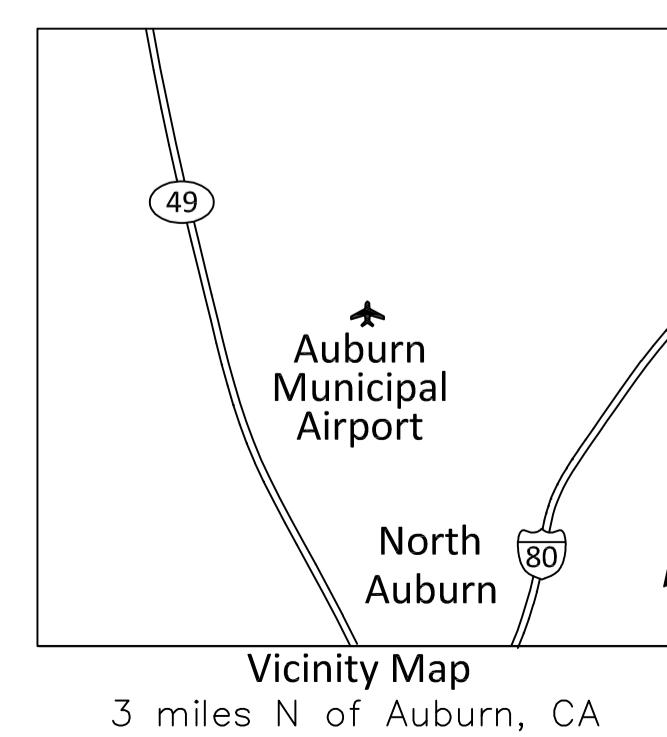
1. Map intended for schematic representation of pavement condition.
Not to scale.



AUBURN MUNICIPAL AIRPORT AUBURN, CALIFORNIA	
BRANCH AND SAMPLE DESIGNATION	
QES Engineering Inspection	FAA Site Number 01273.*A Site Code AUN
	DATE: 4/12/24



Notes: Not to Scale



AUBURN MUNICIPAL AIRPORT
AUBURN, CALIFORNIA

BRANCHES AND SECTION LAYOUT

QES

Engineering
Inspection

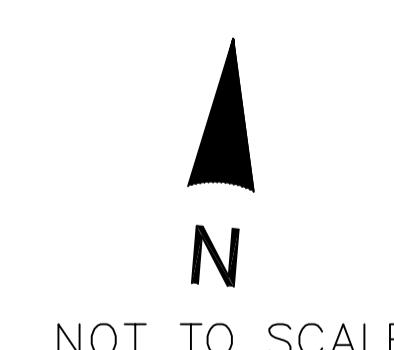
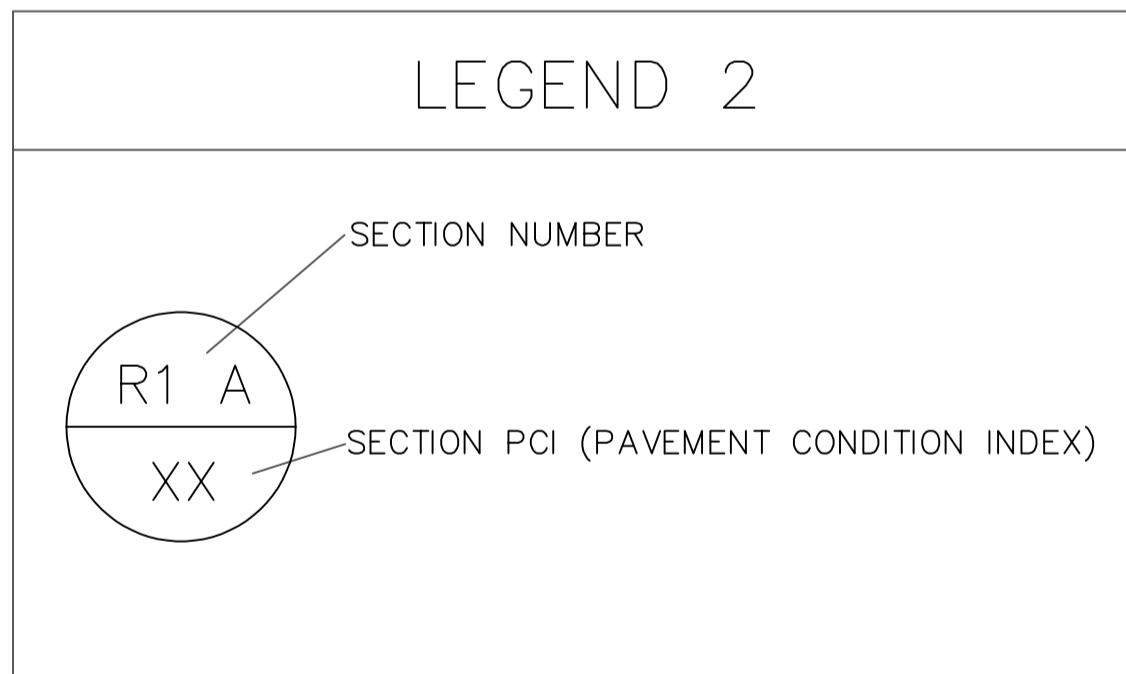
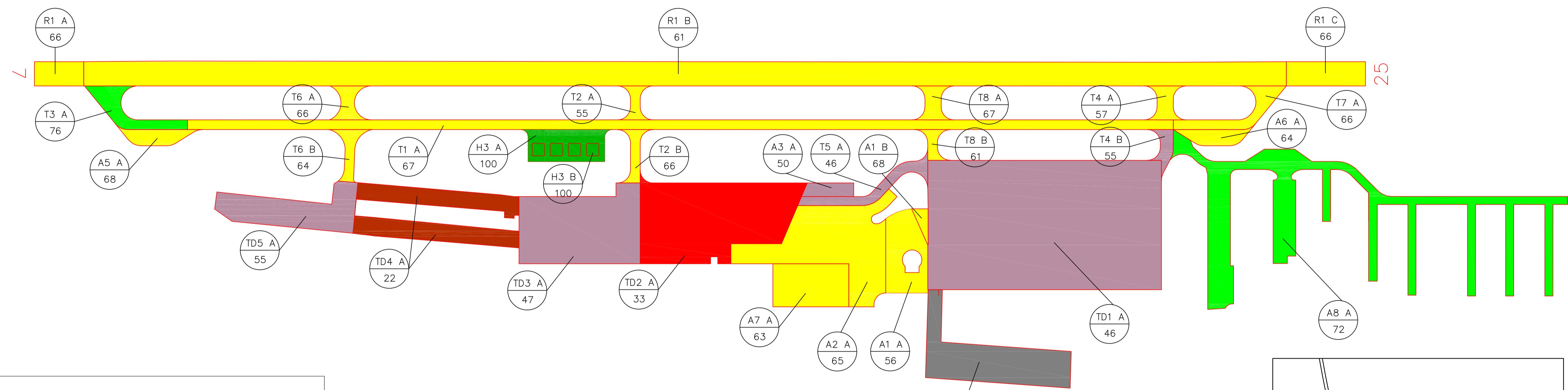
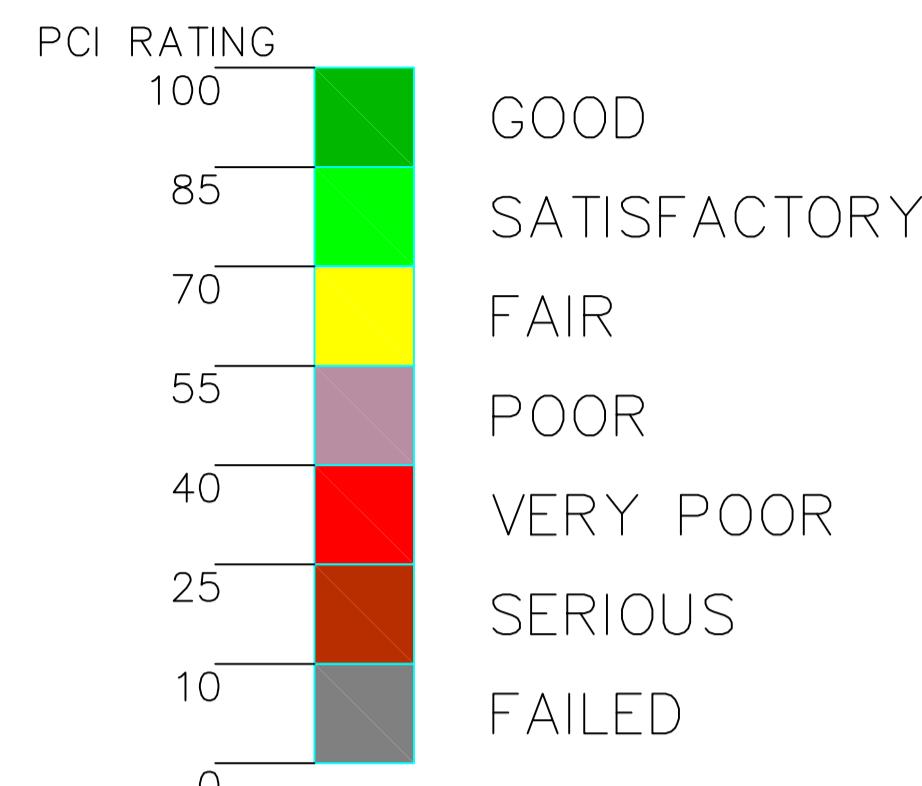
FAA Site Number 01273.*A
Site Code AUN

DATE: 4/12/24

APPENDIX B

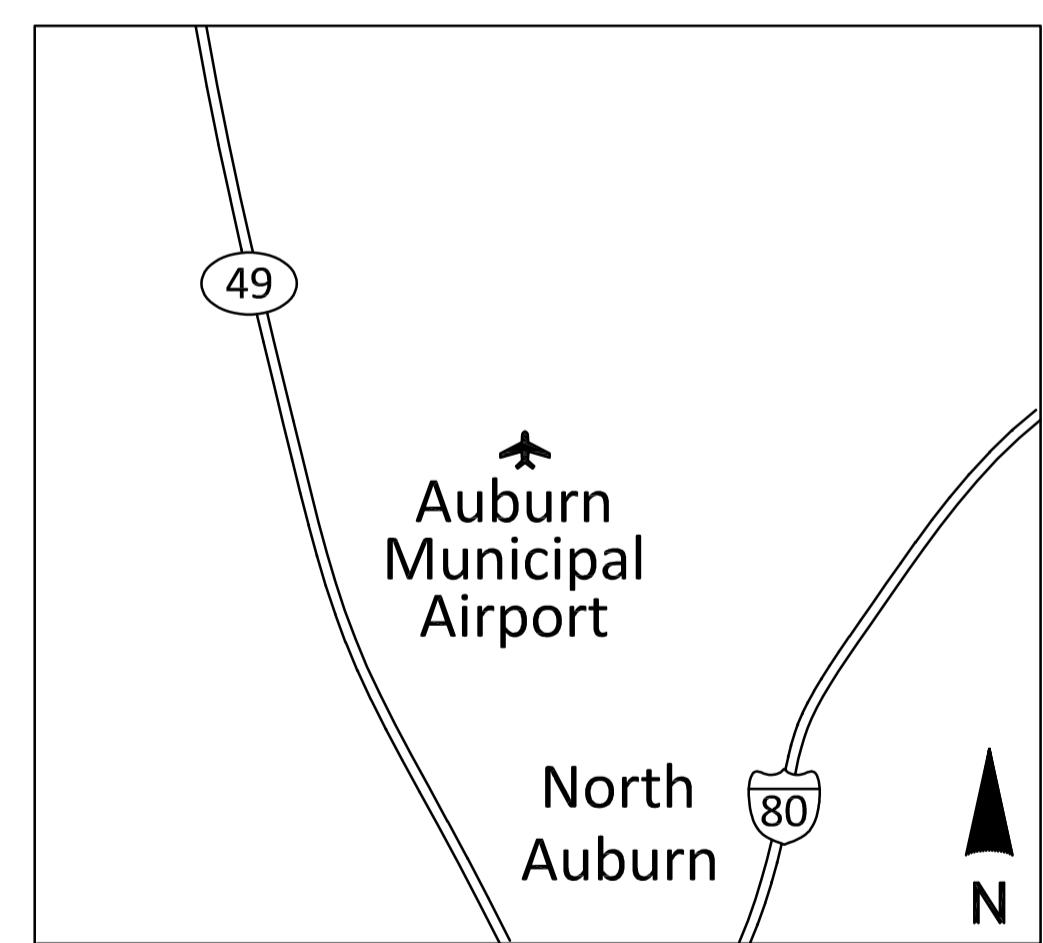
PCI 2024 PLAN

LEGEND



Notes:

1. Map intended for schematic representation of pavement condition.
Not to scale.



Vicinity Map
3 miles N of Auburn, CA

AUBURN MUNICIPAL AIRPORT FAA Site Number 01273.*A	AUBURN, CALIFORNIA Site Code AUN
PCI RATING 2024	
QES Engineering Inspection	DATE: 4/12/24

APPENDIX C
INSPECTION PHOTOGRAPHS



A1 A. Overview.



A1 A. Alligator cracking (Sample Unit No. 01)



A1 A. LT cracking (Sample Unit No. 01)



A1 B. Overview.



A1 B. LT cracking (Sample Unit No. 01)



A1 B. LT cracking (Sample Unit No. 01)



A2 A. Overview.



A2 A. LT cracking (Sample Unit No. 02).



A2 A. (Sample Unit No. 02).



A2 A. Overview. LT cracking (Sample Unit No. 11).



A2 A. LT cracking (Sample Unit No. 11).



A3 A. Overview.



A3 A. Oil Spillage and LT cracking (Sample Unit No. 02).



A3 A. Block and LT cracking (Sample Unit No. 02).



A5 A. Overview.



A5 A. LT cracking (Sample Unit No. 01).



A5 A. LT cracking (Sample Unit No. 01).



A6 A. Overview.



A6 A. LT cracking (Sample Unit No. 01).



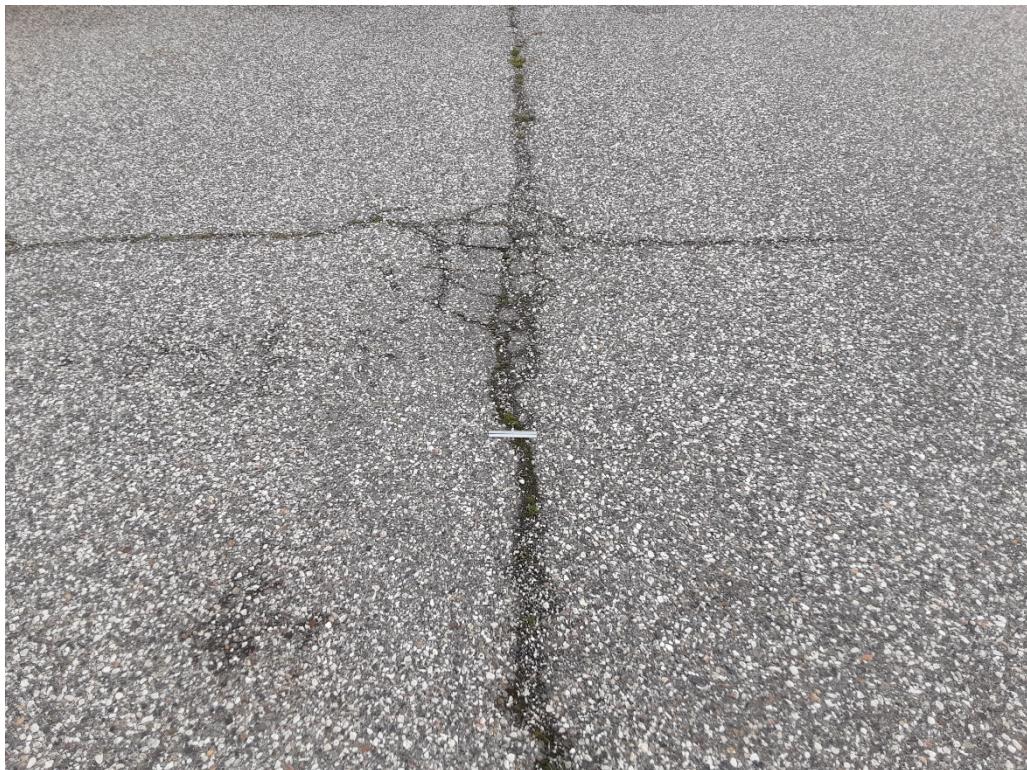
A6 A. LT cracking (Sample Unit No. 01).



A7 A. Overview.



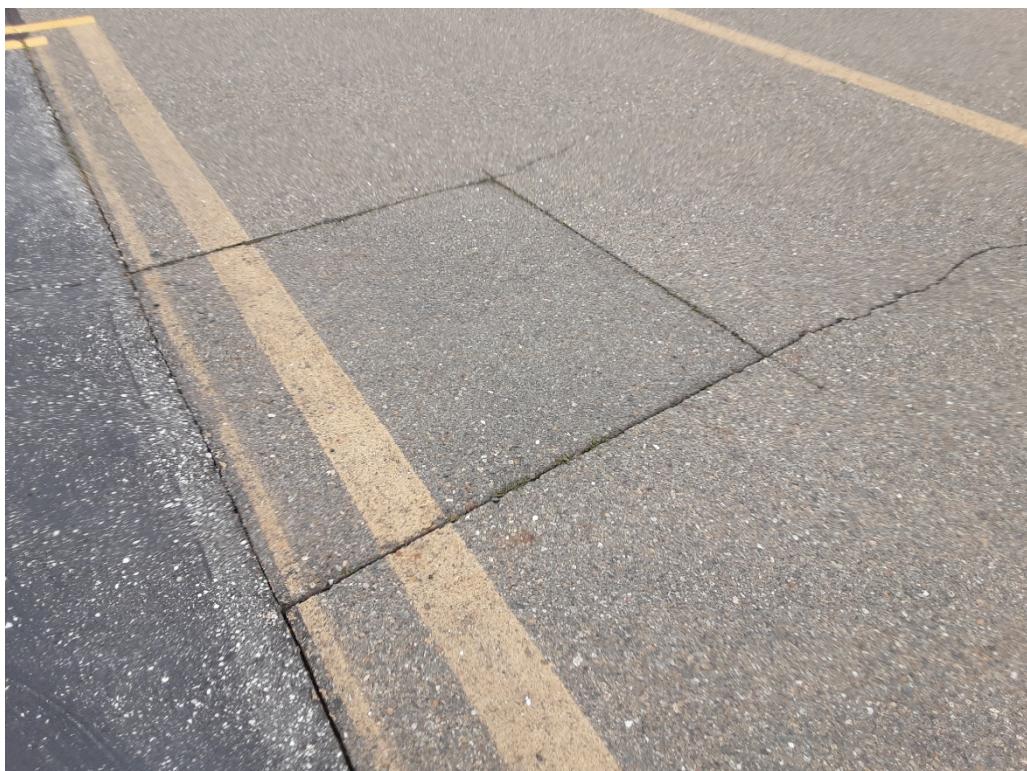
A7 A. LT cracking (Sample Unit No. 02)



A7 A. LT cracking (Sample Unit No. 02)



A8 A. Overview.



A8 A. LT cracking (Sample Unite No. 02).



A8 A. LT cracking (Sample Unite No. 02).



A8 A. LT cracking filled and bleeding (Sample Unite No. 06).



A8 A. LT cracking filled (Sample Unite No. 06).



A8 A. (Sample Unite No. 13).



A8 A. (Sample Unite No. 13).



A8 A. Alligator and LT cracking (Sample Unite No. 19).



A8 A. Alligator cracking and patching (Sample Unit No. 19).



A8 A. Alligator cracking and LT cracking (Sample Unit No. 22).



A8 A. LT cracking (Sample Unite No. 22).



A8 A. (Sample Unite No. 24).



A8 A. (Sample Unite No. 24).



A9 A. Overview.



A9 A. Alligator cracking, patching and LT cracking (Sample Unit No. 02).



A9 A. Alligator cracking (Sample Unit No. 06).



A9 A. Alligator cracking (Sample Unit No. 06).



A9 A. Alligator cracking (Sample Unit No. 08).



A9 A. Alligator cracking (Sample Unit No. 08).



H3 A. Overview.



H3 A. Sample Unit No. 01.



H3 B. Overview. Sample Unit No. 01.



H3 B. Overview. Sample Unit No. 01.



R1 A. Overview.



R1 A. LT cracking (Sample Unit No. 01).



R1 A. LT cracking (Sample Unit No. 01).



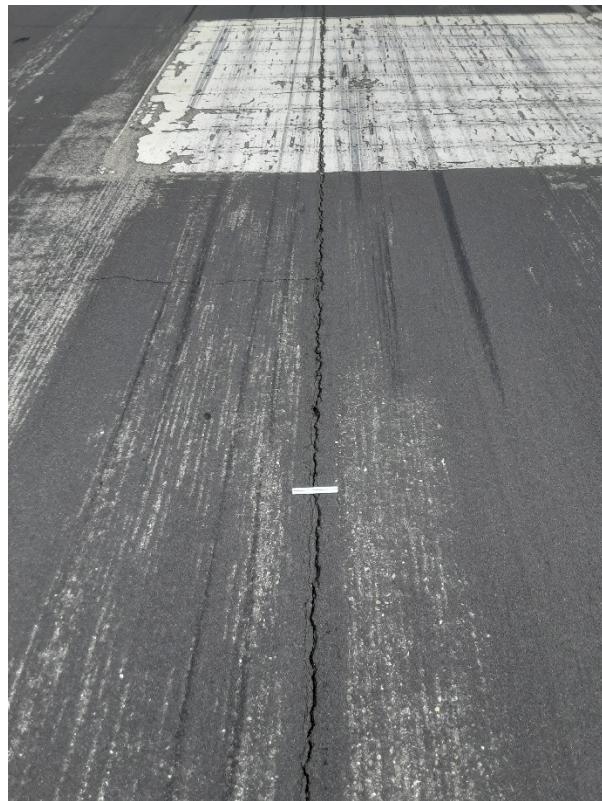
R1 B. LT cracking (Sample Unit No. 03).



R1 B. LT cracking (Sample Unit No. 03).



R1 B. LT cracking (Sample Unit No. 07).



R1 B. LT cracking (Sample Unit No. 07).



R1 B. Overview (Sample Unit No. 11).



R1 B. LT cracking (Sample Unit No. 11).



R1 B. LT cracking (Sample Unit No. 16).



R1 B. LT cracking (Sample Unit No. 16).



R1 B. Overview (Sample Unit No. 20).



R1 B. LT cracking (Sample Unit No. 20).



R1 B. LT cracking (Sample Unit No. 25).



R1 B. LT cracking (Sample Unit No. 25).



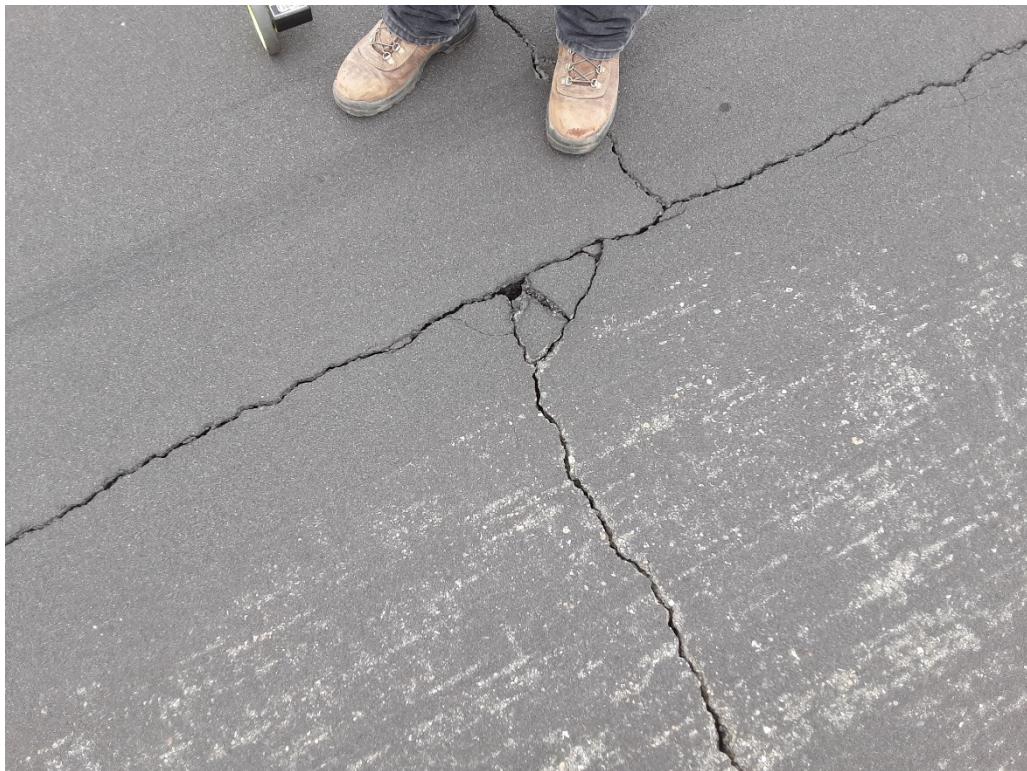
R1 B. LT cracking (Sample Unit No. 25).



R1 B. LT cracking with faulting (Sample Unit No. 25).



R1 B. LT cracking (Sample Unit No. 29).



R1 B. LT cracking with the potential for pothole development and FOD (Sample Unit No. 29).



R1 B. LT cracking (Sample Unit No. 34).



R1 B. LT cracking with the potential for pothole development and FOD (Sample Unit No. 34).



R1 B. LT cracking (Sample Unit No. 38).



R1 B. LT cracking (Sample Unit No. 38).



R1 B. LT cracking (Sample Unit No. 43).



R1 B. LT cracking (Sample Unit No. 47).



R1 B. LT cracking (Sample Unit No. 47).



R1 C. LT cracking (Sample Unit No. 03).



R1 C. LT cracking with moisture under the pavement (Sample Unit No. 03).



T1 A. LT cracking (Sample Unit No. 04).



T1 A. LT cracking (Sample Unit No. 04).



T1 A. LT cracking (Sample Unit No. 12).



T1 A. LT cracking (Sample Unit No. 12).



T1 A. LT cracking (Sample Unit No. 20).



T1 A. Alligator cracking (Sample Unit No. 20).



T1 A. LT cracking (Sample Unit No. 24).



T1 A. LT cracking (Sample Unit No. 30).



T1 A. LT cracking (Sample Unit No. 30).



T2 A. LT cracking (Sample Unit No. 01).



T2 A. LT cracking (Sample Unit No. 01).



T2 B. LT cracking (Sample Unit No. 01).



T2 B. LT cracking (Sample Unit No. 01).



T3 A. LT cracking (Sample Unit No. 01).



T4 A. LT cracking (Sample Unit No. 01).



T4 B. LT cracking (Sample Unit No. 01).



T4 B. LT cracking (Sample Unit No. 01).



T5 A. LT cracking (Sample Unit No. 02).



T5 A. Alligator and LT cracking (Sample Unit No. 02).



T6 A. LT cracking (Sample Unit No. 01).



T6 B. LT cracking (Sample Unit No. 01).



T6 B. LT cracking (Sample Unit No. 01).



T7 A. LT cracking (Sample Unit No. 01).



T7 A. LT cracking (Sample Unit No. 01).



T8 A. LT cracking (Sample Unit No. 01).



T8 A. LT cracking (Sample Unit No. 01).



T8 B. LT cracking (Sample Unit No. 01).



T8 B. LT cracking (Sample Unit No. 01).



TD1 A. LT cracking (Sample Unit No. 06).



TD1 A. LT cracking (Sample Unit No. 06).



TD1 A. Block and LT cracking (Sample Unit No. 09).



TD1 A. Block and LT cracking (Sample Unit No. 19).



TD1 A. Block and LT cracking (Sample Unit No. 32).



TD1 A. Block and LT cracking (Sample Unit No. 41).



TD1 A. Block and LT cracking (Sample Unit No. 44).



TD2 A. Block and LT cracking (Sample Unit No. 06).



TD2 A. Alligator and LT cracking (Sample Unit No. 08).



TD2 A. Alligator cracking (Sample Unit No. 17).



TD2 A. Alligator cracking (Sample Unit No. 17).



TD3 A. Alligator and LT cracking (Sample Unit No. 07).



TD3 A. LT cracking (Sample Unit No. 12).



TD4 A. Alligator and LT cracking (Sample Unit No. 02).



TD4 A. Alligator and LT cracking (Sample Unit No. 09).



TD5 A. LT cracking (Sample Unit No. 02).



TD5 A. LT cracking (Sample Unit No. 05).

APPENDIX D
SUMMARY OF DISTRESS SURVEY 2024

Table D-1 Summary of Distress Survey 2024

Branch ID	Section ID	Distress Description	Distress Quantity	Distress Quantity Units	Severity
T2	A	BLEEDING	30	SqFt	N/A
T2	A	WEATHERING	500	SqFt	Low
T2	A	L & T CR	50	Ft	Low
T2	A	L & T CR	264	Ft	Medium
T2	A	BLEEDING	30	SqFt	N/A
T2	A	WEATHERING	500	SqFt	Low
T2	A	L & T CR	50	Ft	Low
T2	A	L & T CR	264	Ft	Medium
A6	A	L & T CR	45	Ft	Low
A6	A	L & T CR	250	Ft	Medium
A6	A	WEATHERING	2,000	SqFt	Low
A6	A	L & T CR	45	Ft	Low
A6	A	L & T CR	250	Ft	Medium
A6	A	WEATHERING	2,000	SqFt	Low
A3	A	WEATHERING	800	SqFt	Low
A3	A	OIL SPILLAGE	72	SqFt	N/A
A3	A	L & T CR	350	Ft	Medium
A3	A	L & T CR	115	Ft	Low
A3	A	WEATHERING	800	SqFt	Low
A3	A	OIL SPILLAGE	72	SqFt	N/A
A3	A	L & T CR	350	Ft	Medium
A3	A	L & T CR	115	Ft	Low
A5	A	L & T CR	197	Ft	Medium
A5	A	L & T CR	45	Ft	Low
A5	A	WEATHERING	3,000	SqFt	Low
A5	A	L & T CR	197	Ft	Medium
A5	A	L & T CR	45	Ft	Low
A5	A	WEATHERING	3,000	SqFt	Low
R1	B	L & T CR	300	Ft	Medium
R1	B	WEATHERING	2,500	SqFt	Low
R1	B	L & T CR	61	Ft	Low
R1	B	L & T CR	300	Ft	Medium
R1	B	WEATHERING	2,500	SqFt	Low
R1	B	L & T CR	61	Ft	Low
R1	B	WEATHERING	750	SqFt	Low
R1	B	L & T CR	346	Ft	Medium
R1	B	L & T CR	46	Ft	Low
R1	B	WEATHERING	750	SqFt	Low
R1	B	L & T CR	346	Ft	Medium
R1	B	L & T CR	46	Ft	Low

Branch ID	Section ID	Distress Description	Distress Quantity	Distress Quantity Units	Severity
R1	B	L & T CR	30	Ft	Low
R1	B	RAVELING	32	SqFt	High
R1	B	L & T CR	425	Ft	Medium
R1	B	WEATHERING	1,500	SqFt	Low
R1	B	L & T CR	30	Ft	Low
R1	B	RAVELING	32	SqFt	High
R1	B	L & T CR	425	Ft	Medium
R1	B	WEATHERING	1,500	SqFt	Low
R1	B	WEATHERING	750	SqFt	Low
R1	B	RAVELING	25	SqFt	High
R1	B	L & T CR	21	Ft	Low
R1	B	L & T CR	433	Ft	Medium
R1	B	WEATHERING	750	SqFt	Low
R1	B	RAVELING	25	SqFt	High
R1	B	L & T CR	21	Ft	Low
R1	B	L & T CR	433	Ft	Medium
R1	B	L & T CR	420	Ft	Medium
R1	B	L & T CR	42	Ft	Low
R1	B	WEATHERING	1,000	SqFt	Low
R1	B	L & T CR	420	Ft	Medium
R1	B	L & T CR	42	Ft	Low
R1	B	WEATHERING	1,000	SqFt	Low
R1	B	WEATHERING	3,000	SqFt	Low
R1	B	L & T CR	18	Ft	Low
R1	B	L & T CR	450	Ft	Medium
R1	B	WEATHERING	3,000	SqFt	Low
R1	B	L & T CR	18	Ft	Low
R1	B	L & T CR	450	Ft	Medium
R1	B	WEATHERING	1,500	SqFt	Low
R1	B	L & T CR	525	Ft	Medium
R1	B	L & T CR	20	Ft	Low
R1	B	L & T CR	2	Ft	High
R1	B	WEATHERING	1,500	SqFt	Low
R1	B	L & T CR	525	Ft	Medium
R1	B	L & T CR	20	Ft	Low
R1	B	L & T CR	2	Ft	High
R1	B	L & T CR	525	Ft	Medium
R1	B	L & T CR	23	Ft	Low
R1	B	WEATHERING	3,500	SqFt	Low
R1	B	L & T CR	2	Ft	High
R1	B	L & T CR	525	Ft	Medium
R1	B	L & T CR	23	Ft	Low
R1	B	WEATHERING	3,500	SqFt	Low
R1	B	L & T CR	2	Ft	High

Branch ID	Section ID	Distress Description	Distress Quantity	Distress Quantity Units	Severity
R1	B	ALLIGATOR CR	2	SqFt	Medium
R1	B	WEATHERING	2,000	SqFt	Low
R1	B	L & T CR	25	Ft	Low
R1	B	L & T CR	465	Ft	Medium
R1	B	ALLIGATOR CR	2	SqFt	Medium
R1	B	WEATHERING	2,000	SqFt	Low
R1	B	L & T CR	25	Ft	Low
R1	B	L & T CR	465	Ft	Medium
R1	B	L & T CR	20	Ft	Low
R1	B	WEATHERING	750	SqFt	Low
R1	B	L & T CR	510	Ft	Medium
R1	B	RAVELING	5	SqFt	High
R1	B	L & T CR	20	Ft	Low
R1	B	WEATHERING	750	SqFt	Low
R1	B	L & T CR	510	Ft	Medium
R1	B	RAVELING	5	SqFt	High
R1	B	L & T CR	390	Ft	Medium
R1	B	WEATHERING	1,200	SqFt	Low
R1	B	L & T CR	36	Ft	Low
R1	B	L & T CR	390	Ft	Medium
R1	B	WEATHERING	1,200	SqFt	Low
R1	B	L & T CR	36	Ft	Low
T1	A	WEATHERING	200	SqFt	Low
T1	A	L & T CR	27	Ft	Low
T1	A	L & T CR	160	Ft	Medium
T1	A	WEATHERING	200	SqFt	Low
T1	A	L & T CR	27	Ft	Low
T1	A	L & T CR	160	Ft	Medium
T1	A	L & T CR	135	Ft	Medium
T1	A	L & T CR	15	Ft	High
T1	A	WEATHERING	300	SqFt	Low
T1	A	L & T CR	135	Ft	Medium
T1	A	L & T CR	15	Ft	High
T1	A	WEATHERING	300	SqFt	Low
T1	A	ALLIGATOR CR	23	SqFt	Low
T1	A	L & T CR	45	Ft	Medium
T1	A	RAVELING	630	SqFt	Low
T1	A	WEATHERING	700	SqFt	Low
T1	A	ALLIGATOR CR	23	SqFt	Low
T1	A	L & T CR	45	Ft	Medium
T1	A	RAVELING	630	SqFt	Low
T1	A	WEATHERING	700	SqFt	Low
T1	A	L & T CR	24	Ft	Low
T1	A	L & T CR	250	Ft	Medium

Branch ID	Section ID	Distress Description	Distress Quantity	Distress Quantity Units	Severity
T1	A	L & T CR	24	Ft	Low
T1	A	L & T CR	250	Ft	Medium
T1	A	L & T CR	190	Ft	Medium
T1	A	WEATHERING	700	SqFt	Low
T1	A	L & T CR	25	Ft	High
T1	A	L & T CR	190	Ft	Medium
T1	A	WEATHERING	700	SqFt	Low
T1	A	L & T CR	25	Ft	High
T5	A	L & T CR	120	Ft	Low
T5	A	L & T CR	300	Ft	Medium
T5	A	ALLIGATOR CR	65	SqFt	Medium
T5	A	L & T CR	120	Ft	Low
T5	A	L & T CR	300	Ft	Medium
T5	A	ALLIGATOR CR	65	SqFt	Medium
TD1	A	ALLIGATOR CR	650	SqFt	Medium
TD1	A	L & T CR	775	Ft	Low
TD1	A	DEPRESSION	75	SqFt	Low
TD1	A	ALLIGATOR CR	650	SqFt	Medium
TD1	A	L & T CR	775	Ft	Low
TD1	A	DEPRESSION	75	SqFt	Low
TD1	A	BLOCK CR	2,000	SqFt	Medium
TD1	A	ALLIGATOR CR	25	SqFt	Medium
TD1	A	BLOCK CR	2,000	SqFt	Medium
TD1	A	ALLIGATOR CR	25	SqFt	Medium
TD1	A	BLOCK CR	2,000	SqFt	Medium
TD1	A	BLOCK CR	3,000	SqFt	Low
TD1	A	BLOCK CR	2,000	SqFt	Medium
TD1	A	BLOCK CR	3,000	SqFt	Low
TD1	A	BLOCK CR	2,500	SqFt	Low
TD1	A	OIL SPILLAGE	10	SqFt	N/A
TD1	A	BLOCK CR	2,500	SqFt	Medium
TD1	A	BLOCK CR	2,500	SqFt	Low
TD1	A	OIL SPILLAGE	10	SqFt	N/A
TD1	A	BLOCK CR	2,500	SqFt	Medium
TD1	A	BLOCK CR	2,500	SqFt	Medium
TD1	A	BLOCK CR	2,500	SqFt	Low
TD1	A	BLOCK CR	2,500	SqFt	Medium
TD1	A	BLOCK CR	2,500	SqFt	Medium
TD1	A	BLOCK CR	2,500	SqFt	Low
TD1	A	PATCHING	240	SqFt	Medium
TD1	A	ALLIGATOR CR	150	SqFt	Medium
TD1	A	BLOCK CR	2,500	SqFt	Medium
TD1	A	BLOCK CR	2,000	SqFt	Low
TD1	A	PATCHING	240	SqFt	Medium
TD1	A	ALLIGATOR CR	150	SqFt	Medium

Branch ID	Section ID	Distress Description	Distress Quantity	Distress Quantity Units	Severity
TD1	A	BLOCK CR	2,500	SqFt	Medium
TD1	A	BLOCK CR	2,000	SqFt	Low
A7	A	ALLIGATOR CR	5	SqFt	Medium
A7	A	L & T CR	150	Ft	Medium
A7	A	L & T CR	40	Ft	Low
A7	A	RAVELING	2,000	SqFt	Low
A7	A	WEATHERING	2,500	SqFt	Medium
A7	A	ALLIGATOR CR	5	SqFt	Medium
A7	A	L & T CR	150	Ft	Medium
A7	A	L & T CR	40	Ft	Low
A7	A	RAVELING	2,000	SqFt	Low
A7	A	WEATHERING	2,500	SqFt	Medium
TD3	A	BLOCK CR	2,000	SqFt	Medium
TD3	A	L & T CR	76	Ft	Low
TD3	A	L & T CR	200	Ft	Medium
TD3	A	ALLIGATOR CR	120	SqFt	Medium
TD3	A	BLOCK CR	2,000	SqFt	Medium
TD3	A	L & T CR	76	Ft	Low
TD3	A	L & T CR	200	Ft	Medium
TD3	A	ALLIGATOR CR	120	SqFt	Medium
TD3	A	BLOCK CR	1,700	SqFt	Medium
TD3	A	L & T CR	120	Ft	Low
TD3	A	L & T CR	200	Ft	Medium
TD3	A	BLOCK CR	1,700	SqFt	Medium
TD3	A	L & T CR	120	Ft	Low
TD3	A	L & T CR	200	Ft	Medium
A2	A	L & T CR	377	Ft	Medium
A2	A	WEATHERING	6	SqFt	High
A2	A	L & T CR	33	Ft	Low
A2	A	L & T CR	377	Ft	Medium
A2	A	WEATHERING	6	SqFt	High
A2	A	L & T CR	33	Ft	Low
A2	A	WEATHERING	300	SqFt	Low
A2	A	L & T CR	290	Ft	Medium
A2	A	L & T CR	231	Ft	Low
A2	A	WEATHERING	300	SqFt	Low
A2	A	L & T CR	290	Ft	Medium
A2	A	L & T CR	231	Ft	Low
T3	A	L & T CR	30	Ft	Low
T3	A	WEATHERING	5,000	SqFt	Low
T3	A	L & T CR	150	Ft	Medium
T3	A	L & T CR	30	Ft	Low
T3	A	WEATHERING	5,000	SqFt	Low
T3	A	L & T CR	150	Ft	Medium

Branch ID	Section ID	Distress Description	Distress Quantity	Distress Quantity Units	Severity
A1	A	ALLIGATOR CR	55	SqFt	Medium
A1	A	L & T CR	163	Ft	Medium
A1	A	WEATHERING	1,300	SqFt	Low
A1	A	L & T CR	289	Ft	Low
A1	A	ALLIGATOR CR	55	SqFt	Medium
A1	A	L & T CR	163	Ft	Medium
A1	A	WEATHERING	1,300	SqFt	Low
A1	A	L & T CR	289	Ft	Low
TD2	A	ALLIGATOR CR	140	SqFt	Medium
TD2	A	BLOCK CR	1,900	SqFt	Medium
TD2	A	BLOCK CR	2,960	SqFt	Low
TD2	A	ALLIGATOR CR	140	SqFt	Medium
TD2	A	BLOCK CR	1,900	SqFt	Medium
TD2	A	BLOCK CR	2,960	SqFt	Low
TD2	A	L & T CR	140	Ft	Medium
TD2	A	ALLIGATOR CR	130	SqFt	Medium
TD2	A	L & T CR	250	Ft	Low
TD2	A	L & T CR	140	Ft	Medium
TD2	A	ALLIGATOR CR	130	SqFt	Medium
TD2	A	L & T CR	250	Ft	Low
TD2	A	BLOCK CR	1,700	SqFt	Low
TD2	A	BLOCK CR	700	SqFt	Medium
TD2	A	ALLIGATOR CR	2,400	SqFt	Medium
TD2	A	BLOCK CR	1,700	SqFt	Low
TD2	A	BLOCK CR	700	SqFt	Medium
TD2	A	ALLIGATOR CR	2,400	SqFt	Medium
T4	A	WEATHERING	5,250	SqFt	Low
T4	A	L & T CR	106	Ft	Low
T4	A	L & T CR	460	Ft	Medium
T4	A	WEATHERING	5,250	SqFt	Low
T4	A	L & T CR	106	Ft	Low
T4	A	L & T CR	460	Ft	Medium
H3	B	-	-	-	-
H3	A	-	-	-	-
R1	A	L & T CR	350	Ft	Medium
R1	A	WEATHERING	1,500	SqFt	Low
R1	A	L & T CR	50	Ft	Low
R1	A	L & T CR	350	Ft	Medium
R1	A	WEATHERING	1,500	SqFt	Low
R1	A	L & T CR	50	Ft	Low
T7	A	WEATHERING	3,000	SqFt	Low
T7	A	L & T CR	96	Ft	Low
T7	A	L & T CR	280	Ft	Medium
T7	A	WEATHERING	3,000	SqFt	Low

Branch ID	Section ID	Distress Description	Distress Quantity	Distress Quantity Units	Severity
T7	A	L & T CR	96	Ft	Low
T7	A	L & T CR	280	Ft	Medium
TD4	A	L & T CR	225	Ft	Medium
TD4	A	ALLIGATOR CR	310	SqFt	Medium
TD4	A	BLOCK CR	2,000	SqFt	Medium
TD4	A	DEPRESSION	50	SqFt	Low
TD4	A	WEATHERING	3,000	SqFt	Low
TD4	A	L & T CR	225	Ft	Medium
TD4	A	ALLIGATOR CR	310	SqFt	Medium
TD4	A	BLOCK CR	2,000	SqFt	Medium
TD4	A	DEPRESSION	50	SqFt	Low
TD4	A	WEATHERING	3,000	SqFt	Low
TD4	A	ALLIGATOR CR	2,000	SqFt	Medium
TD4	A	BLOCK CR	2,400	SqFt	Medium
TD4	A	WEATHERING	1,000	SqFt	Low
TD4	A	ALLIGATOR CR	2,000	SqFt	Medium
TD4	A	BLOCK CR	2,400	SqFt	Medium
TD4	A	WEATHERING	1,000	SqFt	Low
A1	B	WEATHERING	25	SqFt	Medium
A1	B	L & T CR	250	Ft	Low
A1	B	L & T CR	224	Ft	Medium
A1	B	OIL SPILLAGE	15	SqFt	N/A
A1	B	WEATHERING	25	SqFt	Medium
A1	B	L & T CR	250	Ft	Low
A1	B	L & T CR	224	Ft	Medium
A1	B	OIL SPILLAGE	15	SqFt	N/A
R1	C	WEATHERING	1,500	SqFt	Low
R1	C	L & T CR	385	Ft	Medium
R1	C	L & T CR	8	Ft	Low
R1	C	WEATHERING	1,500	SqFt	Low
R1	C	L & T CR	385	Ft	Medium
R1	C	L & T CR	8	Ft	Low
TD5	A	ALLIGATOR CR	40	SqFt	Medium
TD5	A	WEATHERING	4,250	SqFt	Low
TD5	A	L & T CR	382	Ft	Medium
TD5	A	ALLIGATOR CR	40	SqFt	Medium
TD5	A	WEATHERING	4,250	SqFt	Low
TD5	A	L & T CR	382	Ft	Medium
TD5	A	ALLIGATOR CR	15	SqFt	Medium
TD5	A	WEATHERING	4,250	SqFt	Low
TD5	A	L & T CR	100	Ft	Low
TD5	A	L & T CR	285	Ft	Medium
TD5	A	ALLIGATOR CR	15	SqFt	Medium
TD5	A	WEATHERING	4,250	SqFt	Low

Branch ID	Section ID	Distress Description	Distress Quantity	Distress Quantity Units	Severity
TD5	A	L & T CR	100	Ft	Low
TD5	A	L & T CR	285	Ft	Medium
T8	B	L & T CR	200	Ft	Medium
T8	B	WEATHERING	1,000	SqFt	Low
T8	B	L & T CR	147	Ft	Low
T8	B	L & T CR	200	Ft	Medium
T8	B	WEATHERING	1,000	SqFt	Low
T8	B	L & T CR	147	Ft	Low
T6	B	WEATHERING	2,000	SqFt	Low
T6	B	L & T CR	246	Ft	Medium
T6	B	L & T CR	22	Ft	High
T6	B	WEATHERING	2,000	SqFt	Low
T6	B	L & T CR	246	Ft	Medium
T6	B	L & T CR	22	Ft	High
T2	B	L & T CR	170	Ft	Medium
T2	B	L & T CR	100	Ft	Low
T2	B	WEATHERING	5,100	SqFt	Low
T2	B	BLEEDING	25	SqFt	N/A
T2	B	L & T CR	170	Ft	Medium
T2	B	L & T CR	100	Ft	Low
T2	B	WEATHERING	5,100	SqFt	Low
T2	B	BLEEDING	25	SqFt	N/A
A8	A	L & T CR	187	Ft	Medium
A8	A	PATCHING	20	SqFt	Low
A8	A	ALLIGATOR CR	6	SqFt	Medium
A8	A	L & T CR	6	Ft	Low
A8	A	L & T CR	187	Ft	Medium
A8	A	PATCHING	20	SqFt	Low
A8	A	ALLIGATOR CR	6	SqFt	Medium
A8	A	L & T CR	6	Ft	Low
A8	A	L & T CR	50	Ft	Low
A8	A	WEATHERING	2,000	SqFt	Low
A8	A	L & T CR	50	Ft	Low
A8	A	WEATHERING	2,000	SqFt	Low
A8	A	ALLIGATOR CR	365	SqFt	High
A8	A	RAVELING	12	SqFt	High
A8	A	L & T CR	50	Ft	Low
A8	A	L & T CR	40	Ft	Medium
A8	A	WEATHERING	2,500	SqFt	Low
A8	A	ALLIGATOR CR	102	SqFt	Medium
A8	A	ALLIGATOR CR	365	SqFt	High
A8	A	RAVELING	12	SqFt	High
A8	A	L & T CR	50	Ft	Low
A8	A	L & T CR	40	Ft	Medium

Branch ID	Section ID	Distress Description	Distress Quantity	Distress Quantity Units	Severity
A8	A	WEATHERING	2,500	SqFt	Low
A8	A	ALLIGATOR CR	102	SqFt	Medium
A8	A	L & T CR	35	Ft	Low
A8	A	L & T CR	65	Ft	Medium
A8	A	ALLIGATOR CR	36	SqFt	Medium
A8	A	WEATHERING	1,500	SqFt	Low
A8	A	L & T CR	35	Ft	Low
A8	A	L & T CR	65	Ft	Medium
A8	A	ALLIGATOR CR	36	SqFt	Medium
A8	A	WEATHERING	1,500	SqFt	Low
A8	A	WEATHERING	2,500	SqFt	Low
A8	A	L & T CR	22	Ft	Medium
A8	A	WEATHERING	2,500	SqFt	Low
A8	A	L & T CR	22	Ft	Medium
A8	A	L & T CR	304	Ft	Low
A8	A	WEATHERING	3,250	SqFt	Low
A8	A	L & T CR	304	Ft	Low
A8	A	WEATHERING	3,250	SqFt	Low
T8	A	L & T CR	77	Ft	High
T8	A	L & T CR	3	Ft	Medium
T8	A	WEATHERING	3,000	SqFt	Low
T8	A	L & T CR	77	Ft	High
T8	A	L & T CR	3	Ft	Medium
T8	A	WEATHERING	3,000	SqFt	Low
T4	B	RAVELING	30	SqFt	High
T4	B	L & T CR	323	Ft	Medium
T4	B	ALLIGATOR CR	15	SqFt	Medium
T4	B	WEATHERING	1,000	SqFt	Low
T4	B	RAVELING	30	SqFt	High
T4	B	L & T CR	323	Ft	Medium
T4	B	ALLIGATOR CR	15	SqFt	Medium
T4	B	WEATHERING	1,000	SqFt	Low
T6	A	L & T CR	202	Ft	Medium
T6	A	L & T CR	56	Ft	Low
T6	A	WEATHERING	4,000	SqFt	Low
T6	A	L & T CR	202	Ft	Medium
T6	A	L & T CR	56	Ft	Low
T6	A	WEATHERING	4,000	SqFt	Low
A9	A	WEATHERING	5,000	SqFt	Medium
A9	A	PATCHING	400	SqFt	Low
A9	A	BLOCK CR	2,000	SqFt	Medium
A9	A	ALLIGATOR CR	2,000	SqFt	High
A9	A	RUTTING	75	SqFt	Medium
A9	A	WEATHERING	5,000	SqFt	Medium

Branch ID	Section ID	Distress Description	Distress Quantity	Distress Quantity Units	Severity
A9	A	PATCHING	400	SqFt	Low
A9	A	BLOCK CR	2,000	SqFt	Medium
A9	A	ALLIGATOR CR	2,000	SqFt	High
A9	A	RUTTING	75	SqFt	Medium
A9	A	ALLIGATOR CR	2,000	SqFt	Medium
A9	A	ALLIGATOR CR	1,000	SqFt	High
A9	A	WEATHERING	5,000	SqFt	Medium
A9	A	DEPRESSION	200	SqFt	Low
A9	A	ALLIGATOR CR	2,000	SqFt	Medium
A9	A	ALLIGATOR CR	1,000	SqFt	High
A9	A	WEATHERING	5,000	SqFt	Medium
A9	A	DEPRESSION	200	SqFt	Low
A9	A	ALLIGATOR CR	500	SqFt	High
A9	A	RAVELING	1,500	SqFt	Medium
A9	A	WEATHERING	1,500	SqFt	Medium
A9	A	BLOCK CR	1,500	SqFt	Medium
A9	A	ALLIGATOR CR	1,000	SqFt	Medium
A9	A	ALLIGATOR CR	500	SqFt	High
A9	A	RAVELING	1,500	SqFt	Medium
A9	A	WEATHERING	1,500	SqFt	Medium
A9	A	BLOCK CR	1,500	SqFt	Medium
A9	A	ALLIGATOR CR	1,000	SqFt	Medium

APPENDIX E

LOCALIZED PREVENTIVE MAINTENANCE POLICIES AND UNIT COSTS

Table E-1 Localized Preventive Maintenance Policy

Distress Type	Severity	Preventive Maintenance Action
ALLIGATOR CR	High	Patching - AC Deep
ALLIGATOR CR	Medium	Patching - AC Deep
BLOCK CR	High	Crack Sealing Wide Cracks
BLOCK CR	Medium	Crack Sealing - AC
DEPRESSION	Medium	Patching - AC Deep
DEPRESSION	High	Patching - AC Deep
JT REF. CR	High	Crack Sealing Wide Cracks
JT REF. CR	Medium	Crack Sealing - AC
L & T CR	Medium	Crack Sealing - AC
L & T CR	High	Crack Sealing Wide Cracks
OIL SPILLAGE		Patching - AC Shallow
PATCHING	Medium	Patching - AC Deep
PATCHING	High	Patching - AC Deep
RUTTING	High	Patching - AC Deep
RUTTING	Medium	Patching - AC Deep
SHOVING	High	Patching - AC Shallow
SHOVING	Medium	Patching - AC Shallow
SLIPPAGE CR		Patching - AC Shallow
SWELLING	High	Patching - AC Deep
SWELLING	Medium	Patching - AC Deep
BLOW-UP	Low	Patching - PCC Full Depth
BLOW-UP	Medium	Patching - PCC Full Depth
BLOW-UP	High	Patching - PCC Full Depth
CORNER BREAK	High	Patching - PCC Full Depth
CORNER BREAK	Medium	Patching - PCC Full Depth
LINEAR CR	High	Crack Sealing - PCC
LINEAR CR	Medium	Crack Sealing - PCC
DURABIL. CR	High	Slab Replacement - PCC
DURABIL. CR	Medium	Patching - PCC Full Depth
SMALL PATCH	Medium	Patching - PCC Partial Depth
SMALL PATCH	High	Patching - PCC Partial Depth
LARGE PATCH	High	Patching - PCC Full Depth
LARGE PATCH	Medium	Patching - PCC Full Depth
SCALING	High	Slab Replacement - PCC
SCALING	Medium	Slab Replacement - PCC
FAULTING	Medium	Grinding (Localized)
FAULTING	High	Grinding (Localized)
SHAT. SLAB	Medium	Slab Replacement - PCC
SHAT. SLAB	High	Slab Replacement - PCC
JOINT SPALL	High	Patching - PCC Partial Depth

Distress Type	Severity	Preventive Maintenance Action
JOINT SPALL	Medium	Patching - PCC Partial Depth
CORNER SPALL	Medium	Patching - PCC Partial Depth
CORNER SPALL	High	Patching - PCC Partial Depth

Table E-2 2024 Unit Costs for Preventive Maintenance Activities

Preventive Maintenance	Cost	Units
Crack Sealing - AC	\$ 2.00	Ft
Crack Sealing - PCC	\$ 4.20	Ft
Crack Sealing Wide Cracks	\$ 2.50	Ft
Grinding (Localized)	\$ 7.58	Ft
Joint Seal (Localized)	\$ 5.34	Ft
Patching - AC Deep	\$ 9.50	SqFt
Patching - AC Leveling	\$ 3.33	SqFt
Patching - AC Shallow	\$ 6.65	SqFt
Patching - PCC Full Depth	\$ 25.00	SqFt
Patching - PCC Partial Depth	\$ 35.00	SqFt
Slab Replacement - PCC	\$ 25.00	SqFt
Undersealing - PCC	\$ 4.50	Ft

Table E-3 2024 Unit Costs for Global Preservation Activities

Preventive Maintenance	Cost	Units
Emulsified Asphalt Seal Coat	\$ 0.55	SqFt
Emulsified Asphalt Slurry Seal	\$ 0.80	SqFt

Table E-4 2024 Unit Costs based on PCI Ranges

PCI	Cost	Unit
0	\$ 11.50	SqFt
10	\$ 11.50	SqFt
20	\$ 11.50	SqFt
30	\$ 11.50	SqFt
40	\$ 11.50	SqFt
50	\$ 4.20	SqFt
60	\$ 4.20	SqFt
70	\$ 4.20	SqFt
80	\$ -	SqFt
90	\$ -	SqFt
100	\$ -	SqFt

APPENDIX F

M&R PLANS ANNUAL WORK AND COST PER SECTION

Table F-1 Summary of Work Type and Cost for 5-Year M&R Program (Critical PCI 40)-Unlimited Budget

Branch: Section	2024		2025		2026		2027		2028		Total Cost in Thousands \$
	Work Type	Cost in Thousands \$									
A1::A	PVT	\$ 4.4	PVT	\$ 5.1	PVT	\$ 6.5	PVT	\$ 8.1	Major	\$ 450.3	\$ 474.4
A1::B	PVT + ST	\$ 4.9	PVT	\$ 0.2	PVT	\$ 0.3	PVT	\$ 0.4	PVT	\$ 0.5	\$ 6.2
A2::A	PVT + ST	\$ 69.2	PVT	\$ 3.9	PVT	\$ 5.2	PVT	\$ 6.7	PVT	\$ 8.3	\$ 93.4
A3::A	PVT + ST	\$ 8.6	PVT	\$ 1.1	PVT	\$ 1.3	PVT	\$ 1.5	PVT	\$ 1.9	\$ 14.3
A5::A	PVT + ST	\$ 7.8	PVT	\$ 0.4	PVT	\$ 0.5	PVT	\$ 0.6	PVT	\$ 0.8	\$ 10.1
A6::A	PVT + ST	\$ 3.6	PVT	\$ 0.2	PVT	\$ 0.3	PVT	\$ 0.4	PVT	\$ 0.4	\$ 4.9
A7::A	PVT + ST	\$ 16.4	PVT	\$ 1.1	PVT	\$ 1.4	PVT	\$ 1.8	PVT	\$ 2.1	\$ 22.8
A8::A	PVT	\$ 6.5	PVT	\$ 8.6	PVT	\$ 10.9	PVT	\$ 13.5	PVT	\$ 16.4	\$ 55.8
A9::A	Major	\$ 516.9	-	\$ -	-	\$ -	-	\$ -	-	\$ -	\$ 516.9
R1::A	PVT + ST	\$ 7.4	PVT	\$ 0.5	PVT	\$ 0.7	PVT	\$ 0.9	PVT	\$ 1.2	\$ 10.7
R1::B	PVT + ST	\$ 184.0	PVT	\$ 19.2	PVT	\$ 24.3	PVT	\$ 29.9	PVT	\$ 36.2	\$ 293.5
R1::C	PVT + ST	\$ 11.6	PVT	\$ 0.8	PVT	\$ 1.1	PVT	\$ 1.4	PVT	\$ 1.8	\$ 16.8
T1::A	PVT + ST	\$ 80.2	PVT	\$ 3.8	PVT	\$ 5.0	PVT	\$ 6.6	PVT	\$ 8.4	\$ 103.9
T2::A	PVT + ST	\$ 8.4	PVT	\$ 0.9	PVT	\$ 1.0	PVT	\$ 1.2	PVT	\$ 1.5	\$ 13.1
T2::B	PVT + ST	\$ 4.5	PVT	\$ 0.2	PVT	\$ 0.3	PVT	\$ 0.4	PVT	\$ 0.5	\$ 5.9
T3::A	PVT + ST	\$ 5.9	PVT	\$ 0.1	PVT	\$ 0.1	PVT	\$ 0.2	PVT	\$ 0.3	\$ 6.6
T4::A	PVT + ST	\$ 4.9	PVT	\$ 0.5	PVT	\$ 0.6	PVT	\$ 0.7	PVT	\$ 0.8	\$ 7.3
T4::B	PVT + ST	\$ 4.0	PVT	\$ 0.4	PVT	\$ 0.5	PVT	\$ 0.6	PVT	\$ 0.7	\$ 6.2
T5::A	PVT	\$ 3.0	Major	\$ 157.9	-	\$ -	-	\$ -	-	\$ -	\$ 160.8
T6::A	PVT + ST	\$ 3.5	PVT	\$ 0.2	PVT	\$ 0.2	PVT	\$ 0.3	PVT	\$ 0.4	\$ 4.7
T6::B	PVT + ST	\$ 4.0	PVT	\$ 0.3	PVT	\$ 0.3	PVT	\$ 0.4	PVT	\$ 0.5	\$ 5.5
T7::A	PVT + ST	\$ 5.3	PVT	\$ 0.3	PVT	\$ 0.3	PVT	\$ 0.5	PVT	\$ 0.6	\$ 6.9
T8::A	PVT + ST	\$ 3.3	PVT	\$ 0.2	PVT	\$ 0.2	PVT	\$ 0.3	PVT	\$ 0.3	\$ 4.3
T8::B	PVT + ST	\$ 2.7	PVT	\$ 0.2	PVT	\$ 0.3	PVT	\$ 0.3	PVT	\$ 0.4	\$ 3.8
TD1::A	PVT	\$ 59.3	Major	\$ 3,214.7	-	\$ -	-	\$ -	-	\$ -	\$ 3,274.0
TD2::A	Major	\$ 1,331.1	-	\$ -	-	\$ -	-	\$ -	-	\$ -	\$ 1,331.1
TD3::A	PVT	\$ 13.8	PVT	\$ 16.9	Major	\$ 827.3	-	\$ -	-	\$ -	\$ 858.1
TD4::A	Major	\$ 618.2	-	\$ -	-	\$ -	-	\$ -	-	\$ -	\$ 618.2
TD5::A	PVT	\$ 6.4	PVT	\$ 7.9	PVT	\$ 10.0	PVT	\$ 12.2	Major	\$ 611.9	\$ 648.4

PVT=Preventive Treatment

ST= Surface Treatment

Major= Major Rehabilitation

Table F-2 Summary of Work Type and Cost for 5-Year M&R Program (Critical PCI 55)-Unlimited Budget

Branch: Section	2024		2025		2026		2027		2028		Total Cost in Thousands \$
	Work Type	Cost in thousands \$	Work Type	Cost in thousands \$							
A1::A	Major	\$ 140.6	-	\$ -	-	-	-	\$ -	-	\$ -	\$ 140.6
A1::B	PVT + ST	\$ 4.9	PVT	\$ 0.2	PVT	\$ 274	PVT	\$ 0.4	PVT	\$ 0.5	\$ 280.2
A2::A	PVT + ST	\$ 69.2	PVT	\$ 3.9	PVT	\$ 5,087	PVT	\$ 6.5	PVT	\$ 8.0	\$ 5,174.5
A3::A	Major	\$ 55.2	-	\$ -	-	-	-	\$ -	-	\$ -	\$ 55.2
A5::A	PVT + ST	\$ 7.8	PVT	\$ 0.3	PVT	\$ 457	PVT	\$ 0.6	PVT	\$ 0.8	\$ 466.9
A6::A	PVT + ST	\$ 3.6	PVT	\$ 0.2	PVT	\$ 280	PVT	\$ 0.4	PVT	\$ 0.4	\$ 284.3
A7::A	PVT + ST	\$ 16.4	PVT	\$ 1.1	PVT	\$ 1,366	PVT	\$ 1.7	PVT	\$ 2.1	\$ 1,387.0
A8::A	PVT	\$ 6.5	PVT	\$ 8.4	PVT	\$ 10,673	PVT	\$ 13.1	PVT	\$ 15.8	\$ 10,716.5
A9::A	Major	\$ 516.9	-	\$ -	-	-	-	\$ -	-	\$ -	\$ 516.9
R1::A	PVT + ST	\$ 7.4	PVT	\$ 0.5	PVT	\$ 694	PVT	\$ 0.9	PVT	\$ 1.1	\$ 704.0
R1::B	PVT + ST	\$ 184.0	PVT	\$ 18.9	PVT	\$ 23,744	PVT	\$ 29.1	PVT	\$ 35.0	\$ 24,010.6
R1::C	PVT + ST	\$ 11.6	PVT	\$ 0.8	PVT	\$ 1,068	PVT	\$ 1.4	PVT	\$ 1.7	\$ 1,083.9
T1::A	PVT + ST	\$ 80.2	PVT	\$ 3.7	PVT	\$ 4,827	PVT	\$ 6.3	PVT	\$ 8.0	\$ 4,925.1
T2::A	Major	\$ 37.8	-	\$ -	-	-	-	\$ -	-	\$ -	\$ 37.8
T2::B	PVT + ST	\$ 4.5	PVT	\$ 0.2	PVT	\$ 288	PVT	\$ 0.4	PVT	\$ 0.5	\$ 293.8
T3::A	PVT + ST	\$ 5.9	PVT	\$ 0.1	PVT	\$ 126	PVT	\$ 0.2	PVT	\$ 0.3	\$ 132.7
T4::A	Major	\$ 22.1	-	\$ -	-	-	-	\$ -	-	\$ -	\$ 22.1
T4::B	Major	\$ 17.8	-	\$ -	-	-	-	\$ -	-	\$ -	\$ 17.8
T5::A	Major	\$ 128.3	-	\$ -	-	-	-	\$ -	-	\$ -	\$ 128.3
T6::A	PVT + ST	\$ 3.5	PVT	\$ 0.2	PVT	\$ 240	PVT	\$ 0.3	PVT	\$ 0.4	\$ 244.7
T6::B	PVT + ST	\$ 4.0	PVT	\$ 0.2	PVT	\$ 320	PVT	\$ 0.4	PVT	\$ 0.5	\$ 325.2
T7::A	PVT + ST	\$ 5.3	PVT	\$ 0.3	PVT	\$ 339	PVT	\$ 0.4	PVT	\$ 0.6	\$ 345.6
T8::A	PVT + ST	\$ 3.3	PVT	\$ 0.2	PVT	\$ 199	PVT	\$ 0.3	PVT	\$ 0.3	\$ 203.2
T8::B	PVT + ST	\$ 2.7	PVT	\$ 0.2	PVT	\$ 249	PVT	\$ 0.3	PVT	\$ 0.4	\$ 252.4
TD1::A	Major	\$ 2,512.3	-	\$ -	-	-	-	\$ -	-	\$ -	\$ 2,512.3
TD2::A	Major	\$ 1,331.1	-	\$ -	-	-	-	\$ -	-	\$ -	\$ 1,331.1
TD3::A	Major	\$ 562.0	-	\$ -	-	-	-	\$ -	-	\$ -	\$ 562.0
TD4::A	Major	\$ 618.2	-	\$ -	-	-	-	\$ -	-	\$ -	\$ 618.2
TD5::A	Major	\$ 191.0	-	\$ -	-	-	-	\$ -	-	\$ -	\$ 191.0

PVT=Preventive Treatment

ST= Surface Treatment

Major= Major Rehabilitation

Table F-3 Summary of Work Type and Cost for 1-Year M&R Program Localized Preventive Maintenance- Unlimited Budget

Branch ID	Section ID	Description	Severity	Distress Qty	Distress Unit	Work Description	Work Qty	Work Unit	Unit Cost in Thousands \$	Work Cost in Thousands \$
T6	B	L & T CR	High	22.01	Ft	Crack Sealing Wide Cracks	22.	Ft	\$0.0025	\$0.1
T6	B	L & T CR	Medium	246.	Ft	Crack Sealing - AC	246.1	Ft	\$0.0020	\$0.5
R1	C	L & T CR	Medium	1,257.68	Ft	Crack Sealing - AC	1,257.6	Ft	\$0.0020	\$2.5
A8	A	L & T CR	Medium	1,361.78	Ft	Crack Sealing - AC	1,361.9	Ft	\$0.0020	\$2.7
A8	A	ALLIGATOR CR	Medium	624.52	SqFt	Patching - AC Deep	728.7	SqFt	\$0.0095	\$6.9
A8	A	ALLIGATOR CR	High	1,582.94	SqFt	Patching - AC Deep	1,747.	SqFt	\$0.0095	\$16.6
A9	A	RUTTING	Medium	217.32	SqFt	Patching - AC Deep	217.4	SqFt	\$0.0095	\$2.1
A9	A	ALLIGATOR CR	Medium	8,691.1	SqFt	Patching - AC Deep	9,070.8	SqFt	\$0.0095	\$86.2
A9	A	BLOCK CR	Medium	10,139.71	SqFt	Crack Sealing - AC	3,090.6	Ft	\$0.0020	\$6.2
A9	A	ALLIGATOR CR	High	10,139.71	SqFt	Patching - AC Deep	10,548.6	SqFt	\$0.0095	\$100.2
T8	A	L & T CR	Medium	2.99	Ft	Crack Sealing - AC	3.	Ft	\$0.0020	\$0.0
T8	A	L & T CR	High	77.	Ft	Crack Sealing Wide Cracks	77.1	Ft	\$0.0025	\$0.2
A1	B	OIL SPILLAGE	N/A	14.96	SqFt	Patching - AC Shallow	34.4	SqFt	\$0.0067	\$0.2
A1	B	L & T CR	Medium	224.02	Ft	Crack Sealing - AC	224.1	Ft	\$0.0020	\$0.4
TD5	A	ALLIGATOR CR	Medium	294.29	SqFt	Patching - AC Deep	367.1	SqFt	\$0.0095	\$3.5
TD5	A	L & T CR	Medium	3,569.16	Ft	Crack Sealing - AC	3,569.2	Ft	\$0.0020	\$7.1
T6	A	L & T CR	Medium	202.	Ft	Crack Sealing - AC	202.1	Ft	\$0.0020	\$0.4
TD4	A	BLOCK CR	Medium	20,168.12	SqFt	Crack Sealing - AC	6,147.3	Ft	\$0.0020	\$12.3
TD4	A	L & T CR	Medium	1,031.33	Ft	Crack Sealing - AC	1,031.2	Ft	\$0.0020	\$2.1
TD4	A	ALLIGATOR CR	Medium	10,588.24	SqFt	Patching - AC Deep	11,006.1	SqFt	\$0.0095	\$104.6
T2	A	L & T CR	Medium	791.99	Ft	Crack Sealing - AC	792.	Ft	\$0.0020	\$1.6
A6	A	L & T CR	Medium	250.	Ft	Crack Sealing - AC	250.	Ft	\$0.0020	\$0.5
A3	A	L & T CR	Medium	892.75	Ft	Crack Sealing - AC	892.7	Ft	\$0.0020	\$1.8
A3	A	OIL SPILLAGE	N/A	183.63	SqFt	Patching - AC Shallow	242.2	SqFt	\$0.0067	\$1.6
A5	A	L & T CR	Medium	197.01	Ft	Crack Sealing - AC	196.9	Ft	\$0.0020	\$0.4
R1	B	ALLIGATOR CR	Medium	8.93	SqFt	Patching - AC Deep	24.8	SqFt	\$0.0095	\$0.2
R1	B	L & T CR	High	17.95	Ft	Crack Sealing Wide Cracks	18.	Ft	\$0.0025	\$0.0
R1	B	L & T CR	Medium	21,477.95	Ft	Crack Sealing - AC	21,478.	Ft	\$0.0020	\$43.0
T1	A	L & T CR	Medium	4,679.99	Ft	Crack Sealing - AC	4,680.1	Ft	\$0.0020	\$9.4
T1	A	L & T CR	High	239.99	Ft	Crack Sealing Wide Cracks	240.2	Ft	\$0.0025	\$0.6
T5	A	L & T CR	Medium	1,320.01	Ft	Crack Sealing - AC	1,319.9	Ft	\$0.0020	\$2.6
T5	A	ALLIGATOR CR	Medium	286.	SqFt	Patching - AC Deep	358.4	SqFt	\$0.0095	\$3.4
TD1	A	ALLIGATOR CR	Medium	7,392.01	SqFt	Patching - AC Deep	7,742.5	SqFt	\$0.0095	\$73.5
TD1	A	BLOCK CR	Medium	103,040.01	SqFt	Crack Sealing - AC	31,406.5	Ft	\$0.0020	\$62.8

Branch ID	Section ID	Description	Severity	Distress Qty	Distress Unit	Work Description	Work Qty	Work Unit	Unit Cost in Thousands \$	Work Cost in Thousands \$
TD1	A	OIL SPILLAGE	N/A	89.56	SqFt	Patching - AC Shallow	131.3	SqFt	\$0.0067	\$0.9
TD1	A	PATCHING	Medium	2,150.41	SqFt	Patching - AC Deep	2,341.2	SqFt	\$0.0095	\$22.2
A7	A	ALLIGATOR CR	Medium	18.3	SqFt	Patching - AC Deep	39.8	SqFt	\$0.0095	\$0.4
A7	A	L & T CR	Medium	549.02	Ft	Crack Sealing - AC	548.9	Ft	\$0.0020	\$1.1
TD3	A	L & T CR	Medium	3,409.09	Ft	Crack Sealing - AC	3,409.1	Ft	\$0.0020	\$6.8
TD3	A	ALLIGATOR CR	Medium	1,022.68	SqFt	Patching - AC Deep	1,155.	SqFt	\$0.0095	\$11.0
TD3	A	BLOCK CR	Medium	31,534.06	SqFt	Crack Sealing - AC	9,611.6	Ft	\$0.0020	\$19.2
A2	A	L & T CR	Medium	5,189.27	Ft	Crack Sealing - AC	5,189.3	Ft	\$0.0020	\$10.4
T3	A	L & T CR	Medium	175.	Ft	Crack Sealing - AC	174.9	Ft	\$0.0020	\$0.4
A1	A	ALLIGATOR CR	Medium	368.13	SqFt	Patching - AC Deep	449.9	SqFt	\$0.0095	\$4.3
A1	A	L & T CR	Medium	1,091.11	Ft	Crack Sealing - AC	1,091.2	Ft	\$0.0020	\$2.2
TD2	A	BLOCK CR	Medium	20,063.28	SqFt	Crack Sealing - AC	6,115.2	Ft	\$0.0020	\$12.2
TD2	A	ALLIGATOR CR	Medium	20,603.52	SqFt	Patching - AC Deep	21,185.5	SqFt	\$0.0095	\$201.3
TD2	A	L & T CR	Medium	1,080.35	Ft	Crack Sealing - AC	1,080.4	Ft	\$0.0020	\$2.2
T4	A	L & T CR	Medium	460.01	Ft	Crack Sealing - AC	460.	Ft	\$0.0020	\$0.9
T8	B	L & T CR	Medium	200.	Ft	Crack Sealing - AC	200.1	Ft	\$0.0020	\$0.4
H1	A	DEPRESSION	High	34.98	SqFt	Patching - AC Deep	62.4	SqFt	\$0.0095	\$0.6
H1	A	ALLIGATOR CR	High	1,499.95	SqFt	Patching - AC Deep	1,659.8	SqFt	\$0.0095	\$15.8
T2	B	L & T CR	Medium	170.01	Ft	Crack Sealing - AC	170.	Ft	\$0.0020	\$0.3
T4	B	ALLIGATOR CR	Medium	14.96	SqFt	Patching - AC Deep	34.4	SqFt	\$0.0095	\$0.3
T4	B	L & T CR	Medium	323.	Ft	Crack Sealing - AC	323.2	Ft	\$0.0020	\$0.6
T7	A	L & T CR	Medium	279.99	Ft	Crack Sealing - AC	279.9	Ft	\$0.0020	\$0.6
R1	A	L & T CR	Medium	723.33	Ft	Crack Sealing - AC	723.4	Ft	\$0.0020	\$1.4

Table F-4 Summary of Work Type and Cost for 5-Year M&R Program (Critical PCI 55)-Allocated Budget

Branch:: Section	2024		2025		2026		2027		2028	
	Work Type	Cost in Thousands \$	Work Type	Cost in Thousands \$	Work Type	Cost in Thousands \$	Work Type	Cost in Thousands \$	Work Type	Cost in Thousands \$
A1::A	StopGap	\$0.33	StopGap	\$0.36	Major	\$282.85	-	\$0.00	-	\$0.00
A1::B	PVT + ST	\$4.88	PVT	\$0.21	PVT	\$0.27	PVT	\$0.36	PVT	\$0.46
A2::A	-	\$0.00		\$64.73	-	\$0.00	-	\$0.00	-	\$0.00
A3::A	StopGap	\$0.11	StopGap	\$0.16	Major	\$109.45	-	\$0.00	-	\$0.00
A5::A	PVT + ST	\$7.84	PVT	\$0.35	PVT	\$0.46	PVT	\$0.60	PVT	\$0.76
A6::A	PVT + ST	\$3.58	PVT	\$0.21	PVT	\$0.28	PVT	\$0.35	PVT	\$0.43
A7::A	PVT + ST	\$16.45	PVT	\$1.06	PVT	\$1.37	-	\$0.00	PVT	\$2.18
A8::A	PVT	\$6.46	-	\$0.00	-	\$0.00	-	\$0.00	-	\$0.00
A9::A	-	\$0.00	-	\$0.00	-	\$0.00	StopGap	\$30.34	StopGap	\$31.55
H3::A	-	\$0.00	-	\$0.00	-	\$0.00	-	\$0.00	-	\$0.00
H3::B	-	\$0.00	-	\$0.00	-	\$0.00	-	\$0.00	-	\$0.00
R1::A	PVT + ST	\$7.37	PVT	\$0.53	PVT	\$0.69	PVT	\$0.89	PVT	\$1.11
R1::B	-	\$0.00	Major	\$1,219.19	-	\$0.00	-	\$0.00	-	\$0.00
R1::C	PVT + ST	\$11.62	PVT	\$0.82	PVT	\$1.07	PVT	\$1.38	PVT	\$1.73
T1::A	PVT	\$7.02	PVT	\$8.62	-	\$0.00	Major	\$432.45	-	\$0.00
T2::A	StopGap	\$0.09	StopGap	\$0.11	Major	\$87.14	-	\$0.00	-	\$0.00
T2::B	PVT + ST	\$4.49	PVT	\$0.22	PVT	\$0.29	PVT	\$0.37	-	\$0.00
T3::A	PVT + ST	\$5.86	PVT	\$0.07	PVT	\$0.13	PVT	\$0.20	PVT	\$0.29
T4::A	StopGap	\$0.05	StopGap	\$0.05	Major	\$41.59	-	\$0.00	-	\$0.00
T4::B	StopGap	\$0.04	StopGap	\$0.05	Major	\$42.14	-	\$0.00	-	\$0.00
T5::A	StopGap	\$0.23	StopGap	\$0.34	Major	\$164.18	-	\$0.00	-	\$0.00
T6::A	PVT	\$0.34	PVT + ST	\$3.74	PVT	\$0.24	PVT	\$0.31	-	\$0.00
T6::B	PVT + ST	\$4.03	PVT	\$0.25	PVT	\$0.32	PVT	\$0.40	PVT	\$0.49
T7::A	PVT + ST	\$5.28	PVT	\$0.26	PVT	\$0.34	PVT	\$0.44	PVT	\$0.55
T8::A	PVT + ST	\$3.31	PVT	\$0.15	PVT	\$0.20	PVT	\$0.26	-	\$0.00
T8::B	PVT + ST	\$2.67	PVT	\$0.20	PVT	\$0.25	PVT	\$0.30	PVT	\$0.37
TD1::A	Major	\$1,128.96	-	\$0.00	-	\$0.00	-	\$0.00	-	\$0.00
TD2::A	Major	\$486.15	-	\$0.00	-	\$0.00	-	\$0.00	-	\$0.00
TD3::A	StopGap	\$1.05	StopGap	\$1.46	StopGap	\$2.22	StopGap	\$3.57	Major	\$894.86
TD4::A	StopGap	\$13.06	StopGap	\$23.01	StopGap	\$30.55	Major	\$695.42	-	\$0.00
TD5::A	StopGap	\$0.45	StopGap	\$0.60	Major	\$468.77	-	\$0.00	-	\$0.00

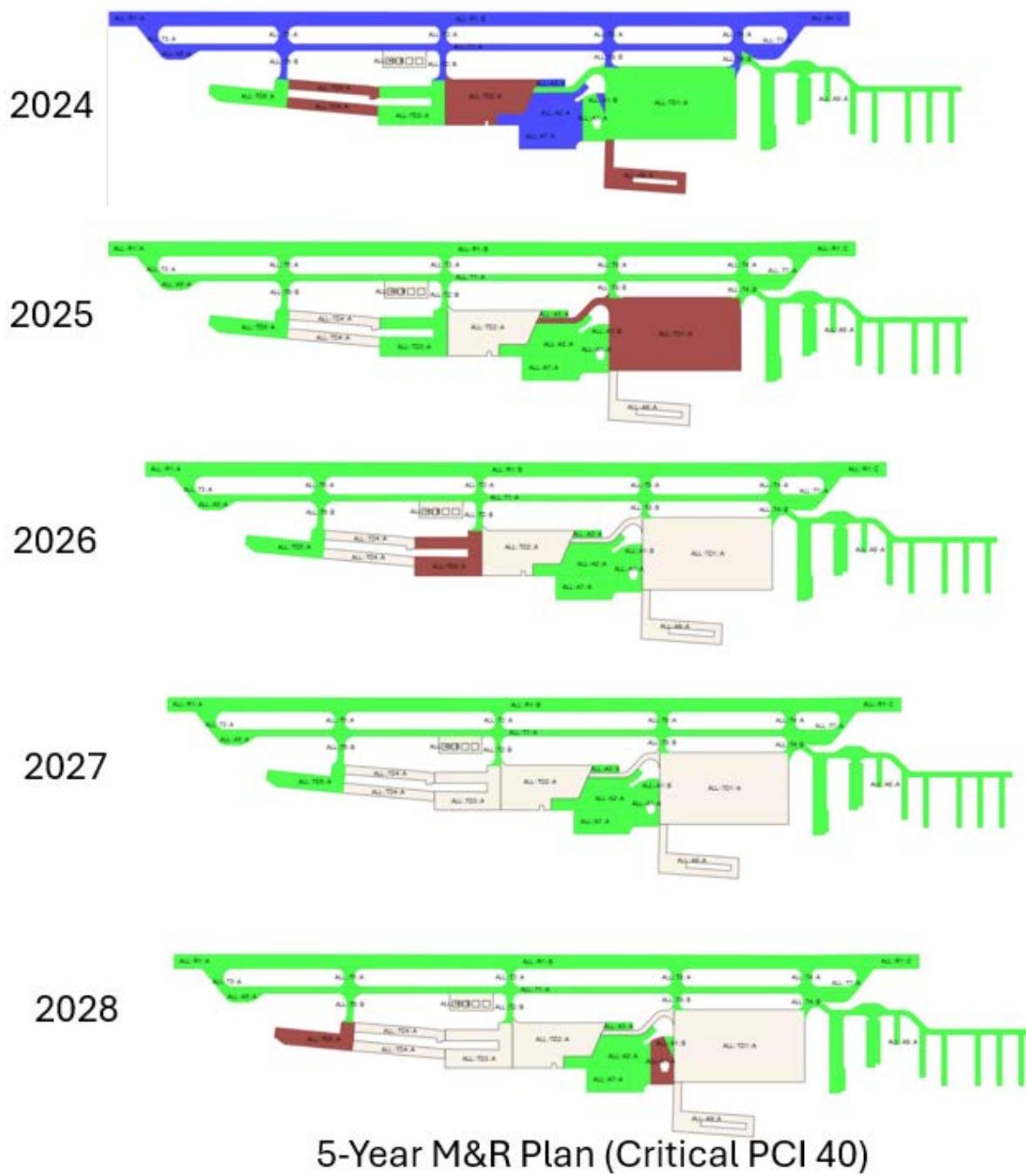
PVT=Preventive Treatment

ST= Surface Treatment

Major= Major Rehabilitation

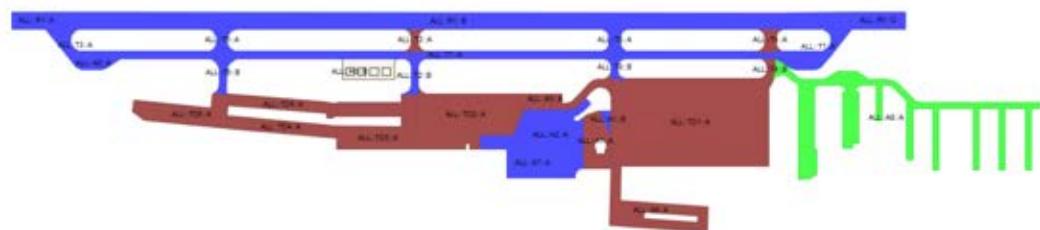
APPENDIX G

M&R WORK ANNUAL DISTRIBUTION PER AREAS

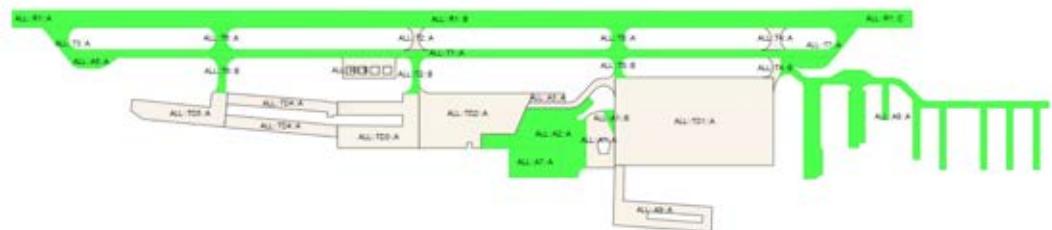


Major Rehabilitation
Preventive + Surface Treatment
Preventive

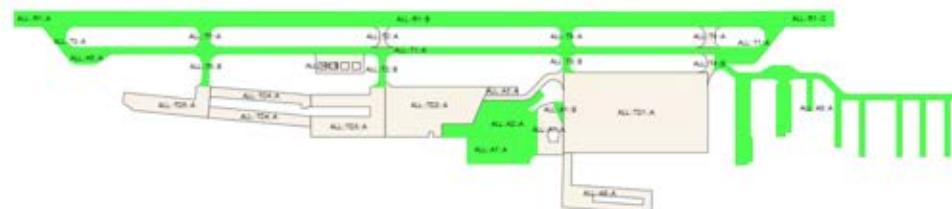
2024



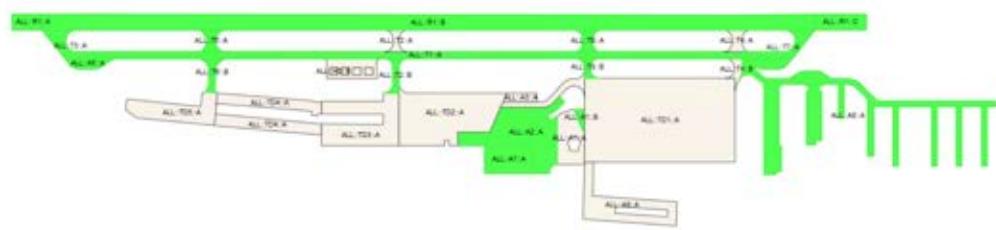
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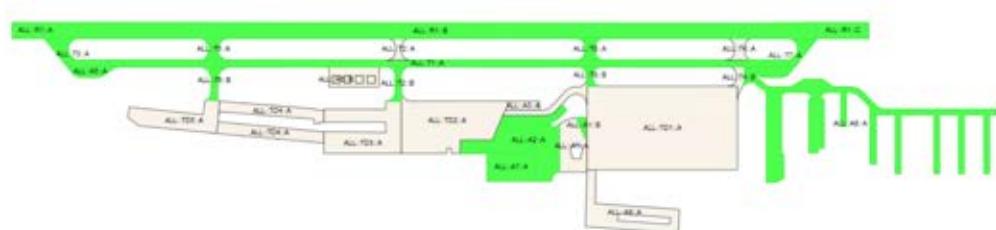
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2027

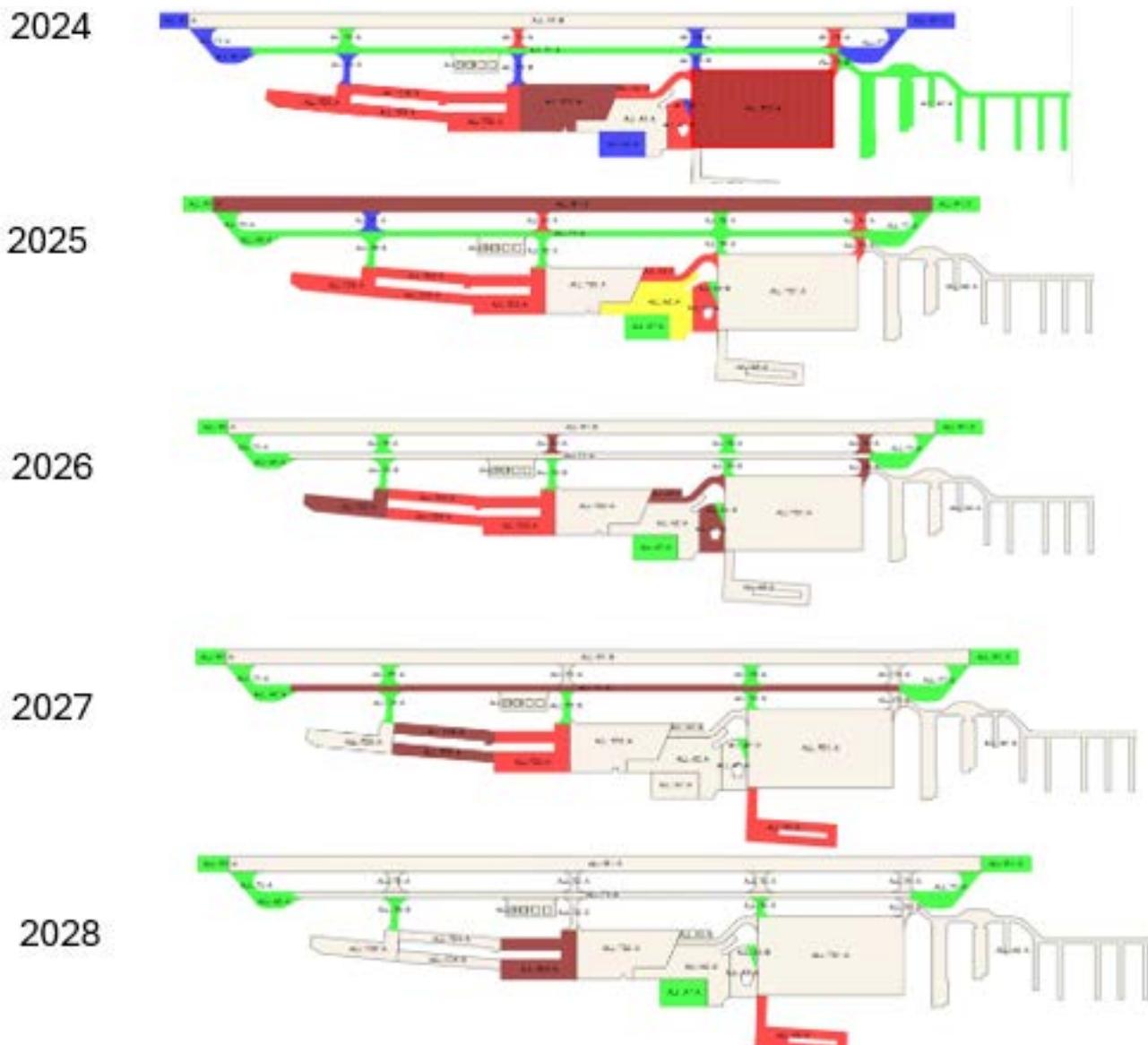


2028



5-Year M&R Plan (Critical PCI 55)

Major Rehabilitation
Preventive + Surface Treatment
Preventive



5-Year M&R Plan Allocated Budget

