

Alabama Statewide Airport Pavement Management Program Update



Marion County-Rankin Fite Airport (HAB)
Final Report
February 2022



Submitted to

Alabama Aeronautics Bureau

Submitted by



All About Pavements, Inc (API)
www.allaboutpavements.com

Pavement Management – Evaluation – Testing - Design

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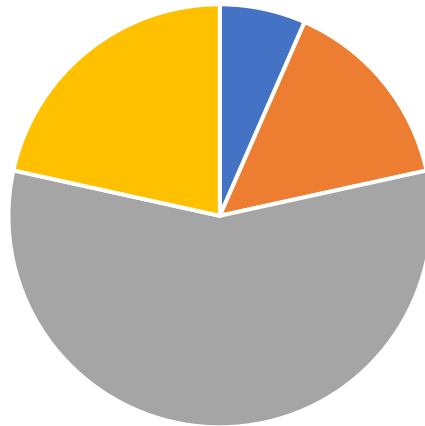
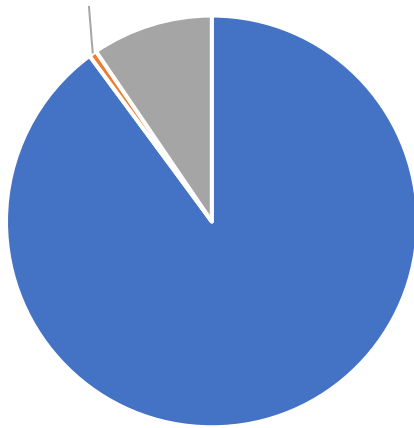
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Executive Summary

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ES.1 Pavement Inventory

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ES.2 Pavement Condition

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1 Introduction

1.1. Overview

1.2. Work Scope

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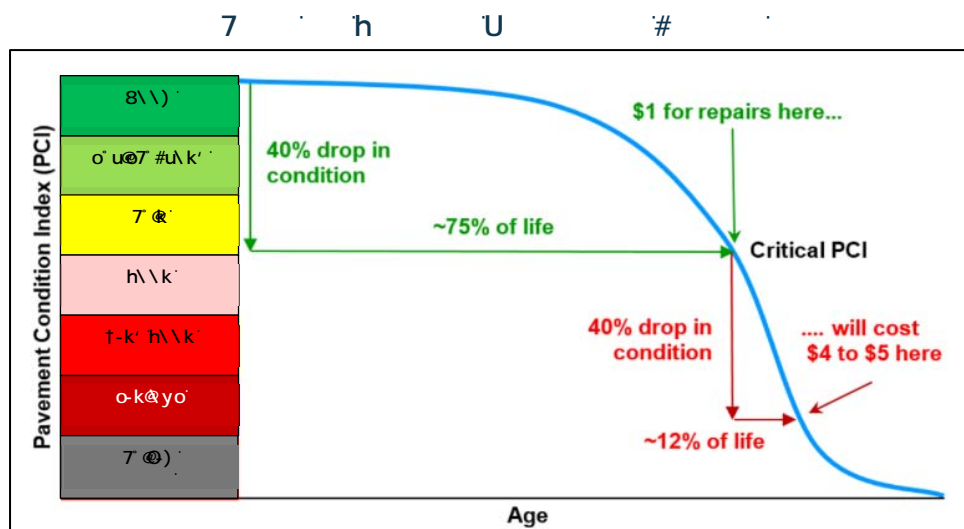
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1.3. Pavement Management Concept



2 Airfield Pavement Inventory

2.1. Introduction

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2.2. Pavement Inventory

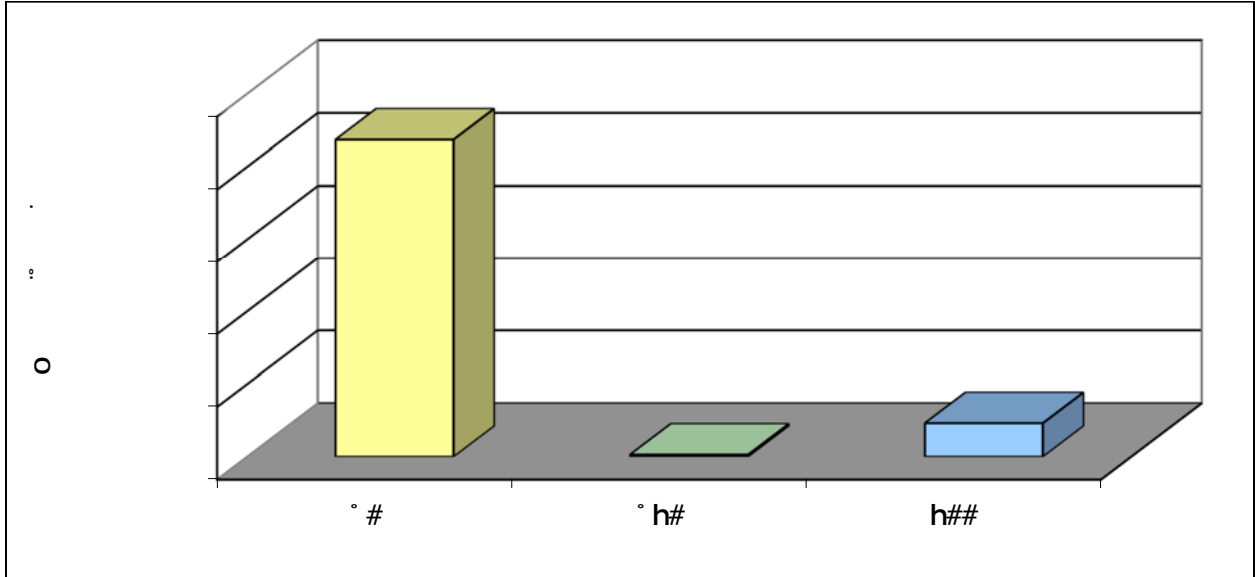
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2.3. Climatic Conditions

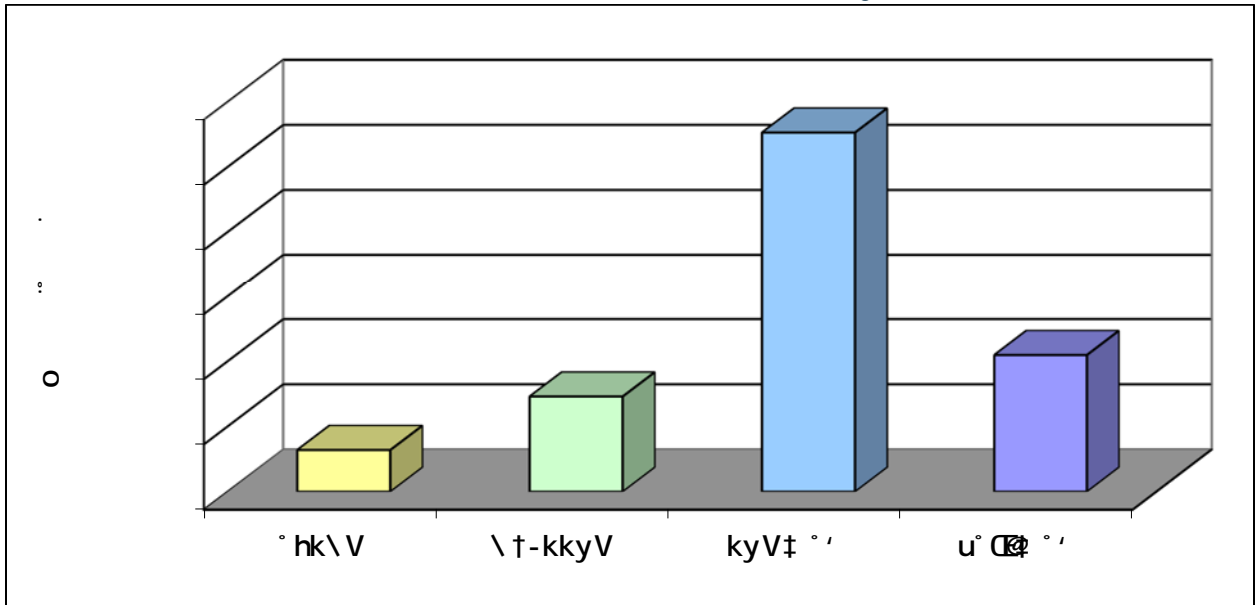
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2.4. Pavement Network Definition

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3 Pavement Condition

3.1. Introduction

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3.2. Pavement Condition Rating Methodology

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	Green		_____
	Light Green		_____
	Yellow		_____
	Light Pink		_____
	Red		_____
	Dark Red		_____
	Grey		_____

3.3. Distress Types

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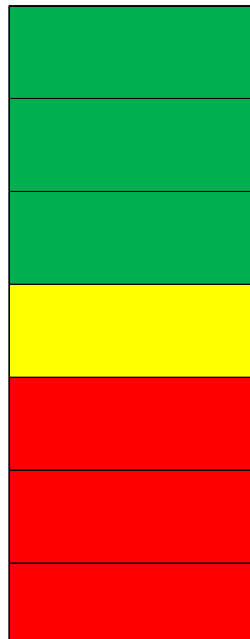
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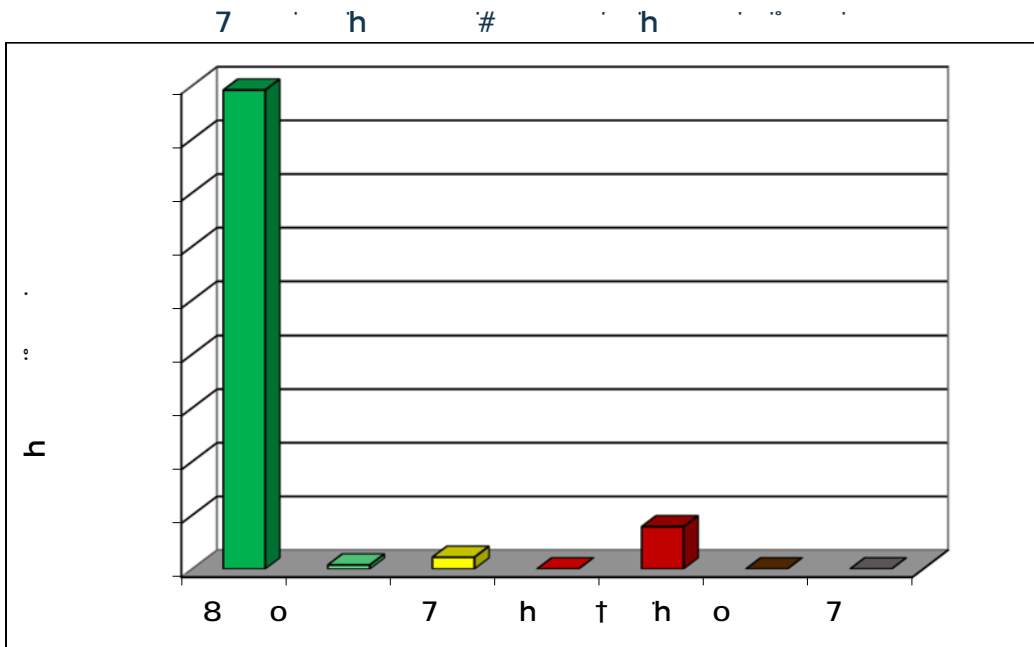
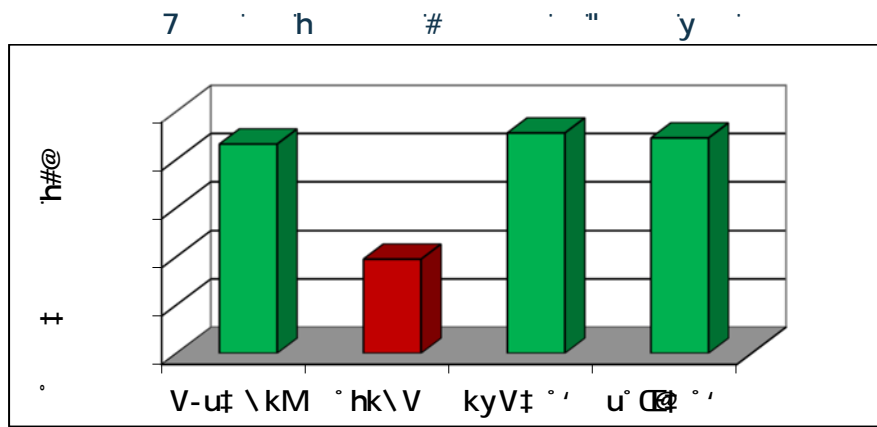
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3.4. Additional PCI-based Indices

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3.5. PCI Survey Results



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3.6. PCC Pavements



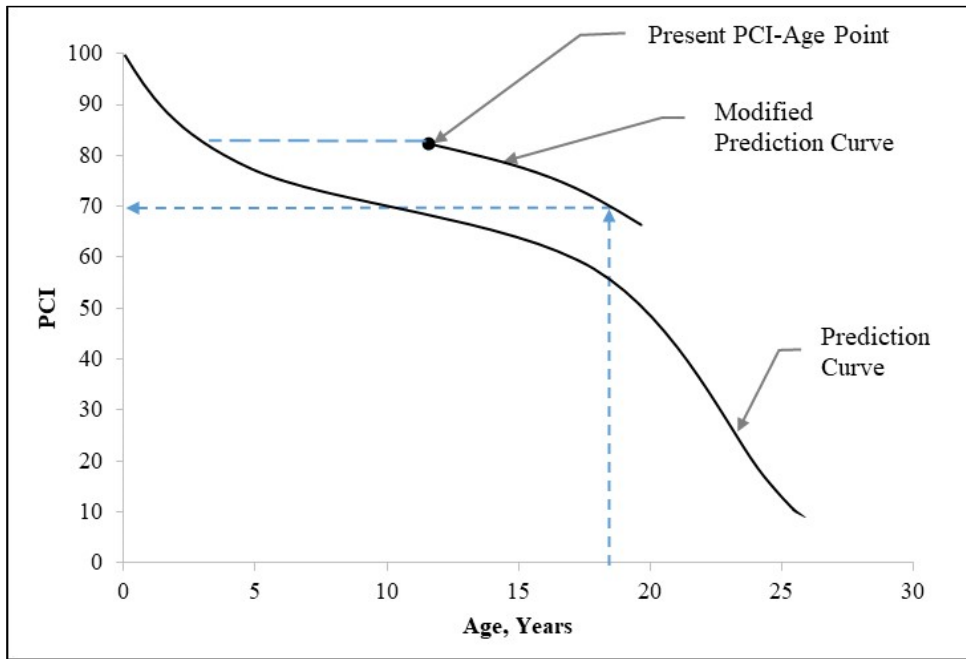
4 Pavement Capital Improvement Program

4.1. Introduction

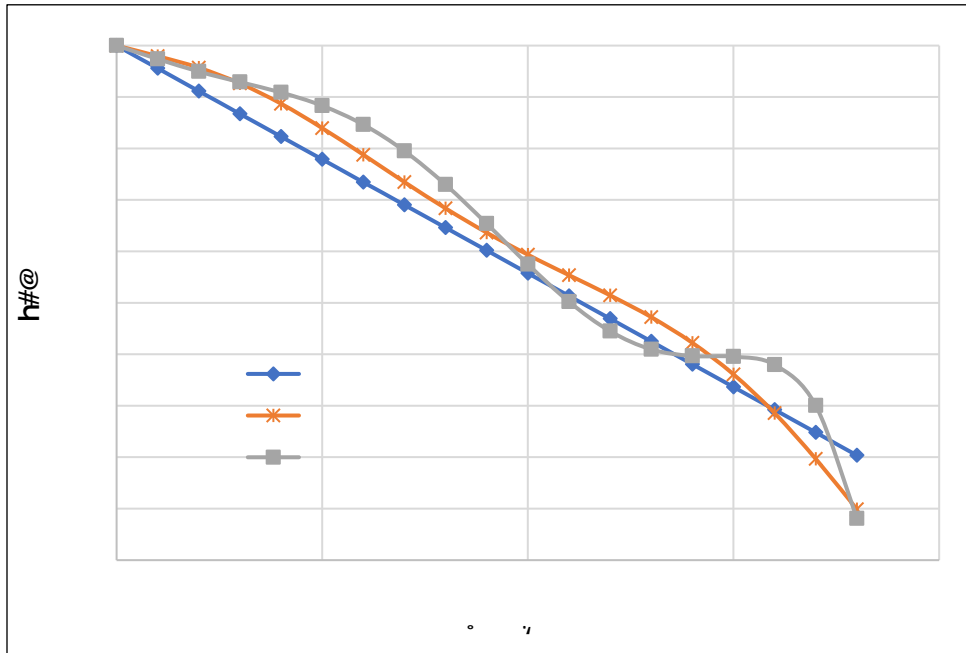
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4.2. Performance Modeling

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4.3. Critical PCI Values

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4.4. M&R Policies and Unit Costs

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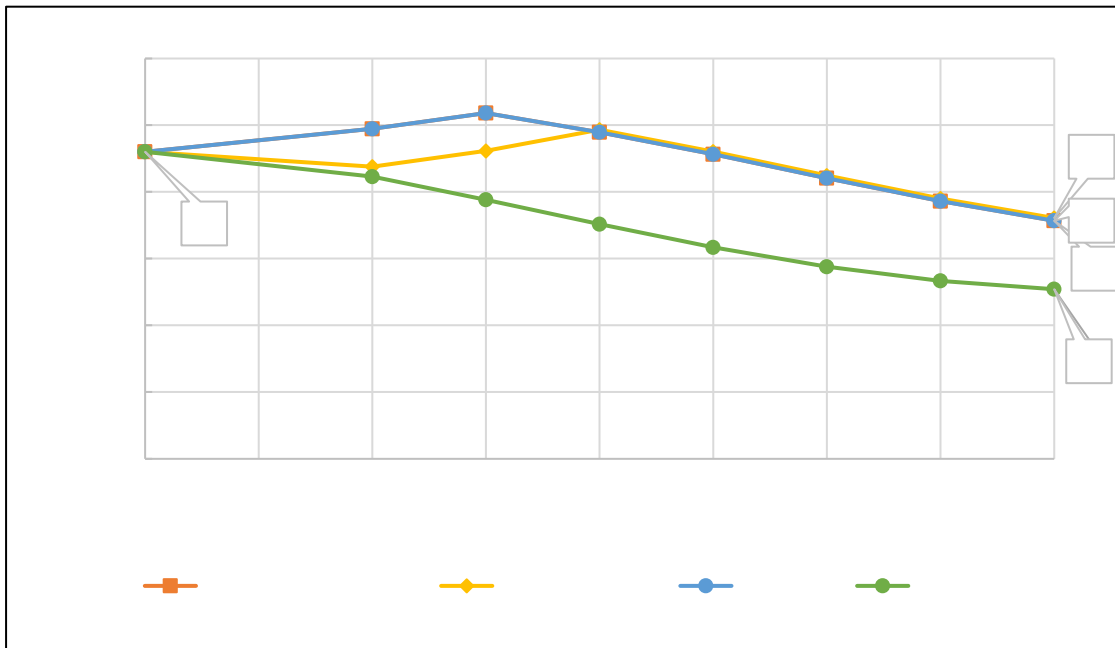
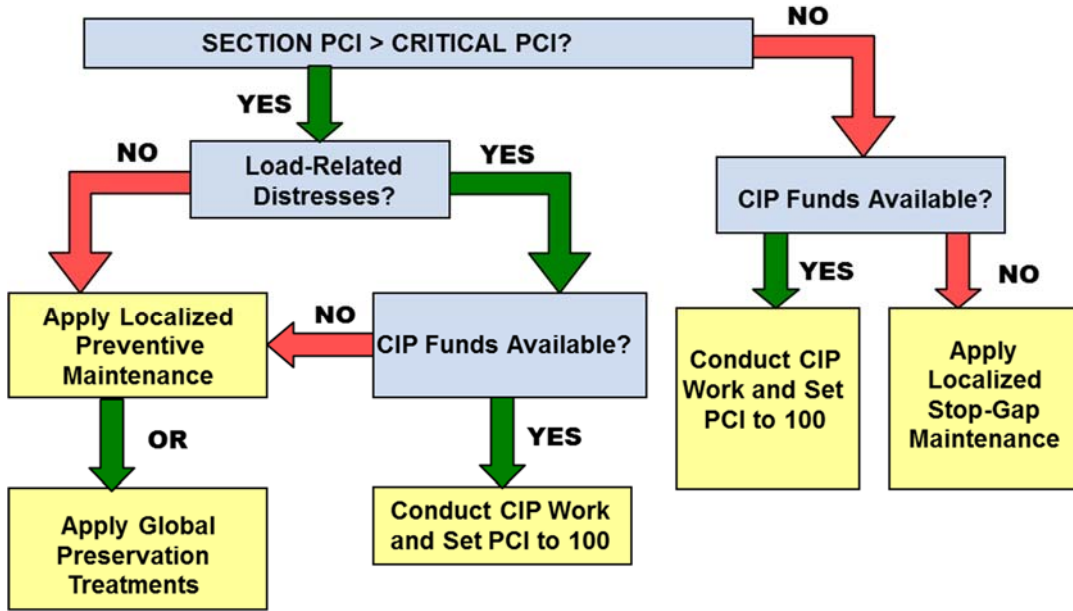
4.5. Pavement CIP Development

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4.6. Pavement Capital Improvement Program

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APPENDIX A
INVENTORY



Appendix A
Pavement Inventory Report
Marion County-Rankin Fite Airport (HAB)

Branch ID	Name	Branch Use	Section ID	Rank ¹	Length (ft)	Width (ft)	Area (sf)	LCD ²	Surface ³
A01	Apron 01 Hamilton	APRON	01	S	456	140	63,840	1/1/1956	AC
ORR18	Overrun Runway 18 End Hamilton	OVERRUN	01	S	1,230	100	123,000	1/1/1956	AC
ORR36	Overrun Runway 36 End Hamilton	OVERRUN	01	S	229	100	22,900	10/1/2015	AC
R1836	Runway 18-36 Hamilton	RUNWAY	01	P	5,530	100	553,000	10/1/2015	AC
TA1	Taxiway A1 Hamilton	TAXIWAY	01	S	170	35	5,950	6/27/2007	APC
TA1	Taxiway A1 Hamilton	TAXIWAY	02	S	2,115	35	74,491	6/1/2002	PCC
TA2	Taxiway Connector 03 Hamilton	TAXIWAY	01	S	231	35	10,763	6/1/2002	PCC
TA2	Taxiway Connector 03 Hamilton	TAXIWAY	02	S	150	35	7,247	6/1/2002	PCC
TA3	Taxiway A3 Hamilton	TAXIWAY	01	S	155	35	7,037	1/1/1956	AC
TA4	Taxiway A4 Hamilton	TAXIWAY	01	T	476	48	22,973	1/1/1956	AC
TC01	Taxiway Connector 01 Hamilton	TAXIWAY	01	S	155	174	26,919	1/1/1956	AC
THANG01	Taxiway Hangar 01 Hamilton	TAXIWAY	01	T	677	28	19,052	10/1/2015	AC
THANG01	Taxiway Hangar 01 Hamilton	TAXIWAY	02	T	432	40	17,693	1/1/1956	AC
TTRW36	Taxiway Turnaround RW 36 Hamilton	TAXIWAY	01	P	183	96	17,449	10/1/2015	AC

¹ P = Primary pavement, S = Secondary pavement, T = Tertiary pavement

² LCD = Last construction date. The date of the last major pavement rehabilitation (e.g. AC overlay)

³ AC = Asphalt Cement Concrete, AAC = Asphalt Overlay AC, PCC = Portland cement Concrete, APC = Asphalt Overlay PCC

APPENDIX B

PMP Maps

B1: Inventory Maps

B1A: Branch Identification

B1B: Section Identification

B1C: Sample Unit Layout

B1D: Pavement Type

B1E: Branch Use

B1F: Pavement Age

B2: Surface Condition Maps

B2A: 7-Color PCI

B2B: 3-Color PCI

B2C: FOD Rating

B2D: Survey Photo Locations



B3: Pavement Capital Improvement Plan (PCIP) Maps

B3A: 2027 Forecasted PCI without PCIP










B3B: M&R Needs

B3C: PCIP Recommendations

Legend

-  Section Boundary
-  PCC Aprons

Branch Identification

-  Apron 01 Hamilton
-  Runway 18-36 Hamilton
-  Taxiway A1 Hamilton
-  Taxiway A3 Hamilton
-  Taxiway A4 Hamilton
-  Taxiway Connector 01 Hamilton
-  Taxiway Connector 03 Hamilton
-  Taxiway Hangar 01 Hamilton
-  Taxiway Turnaround RW 36 Hamilton

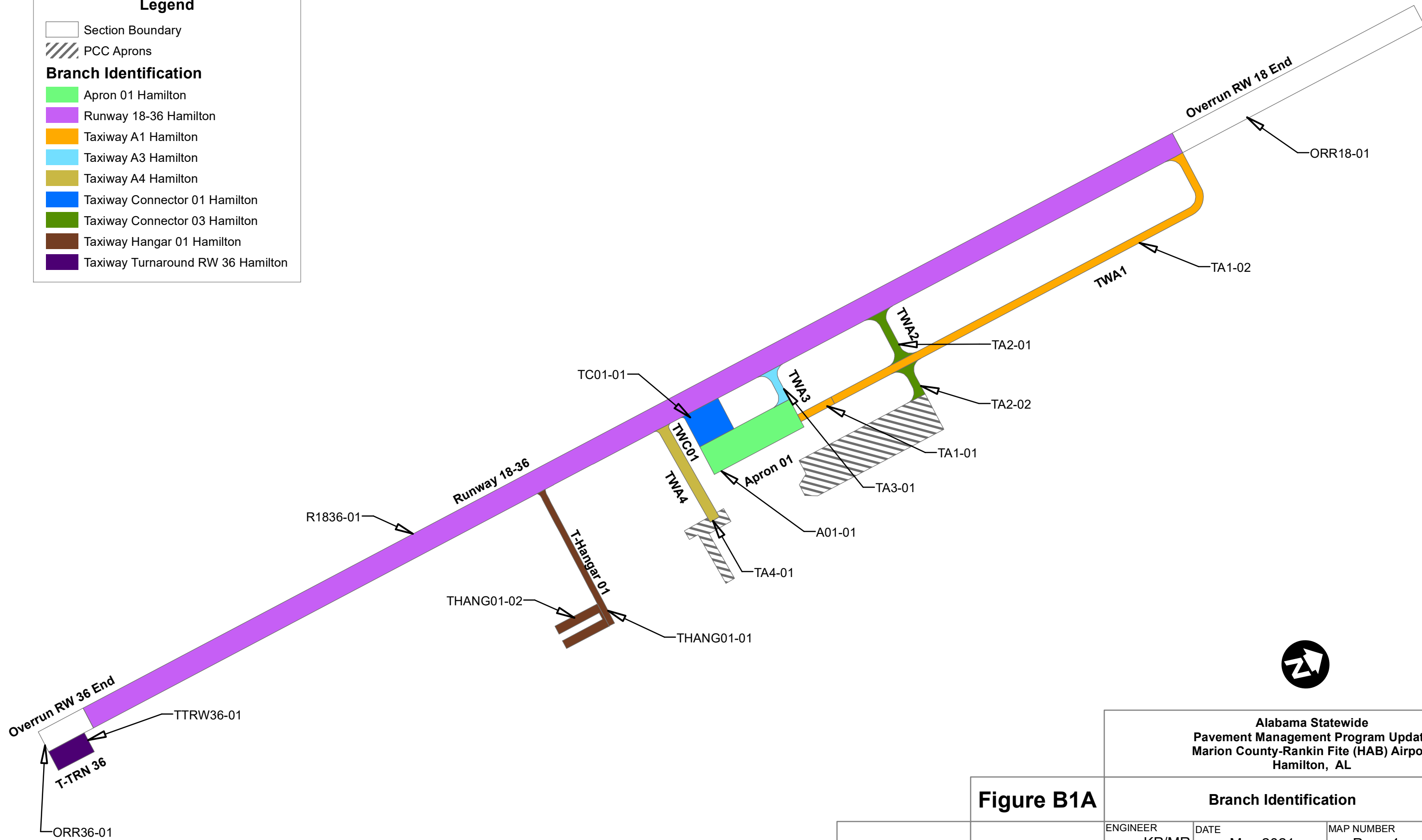


Figure B1A

Alabama Statewide Pavement Management Program Update Marion County-Rankin Fite (HAB) Airport Hamilton, AL		
Branch Identification		
ENGINEER KP/MR	DATE May 2021	MAP NUMBER Page 1
REVISED JMA	SCALE 1 in = 400 ft	FINAL

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Legend

- Section Boundary
- PCC Aprons

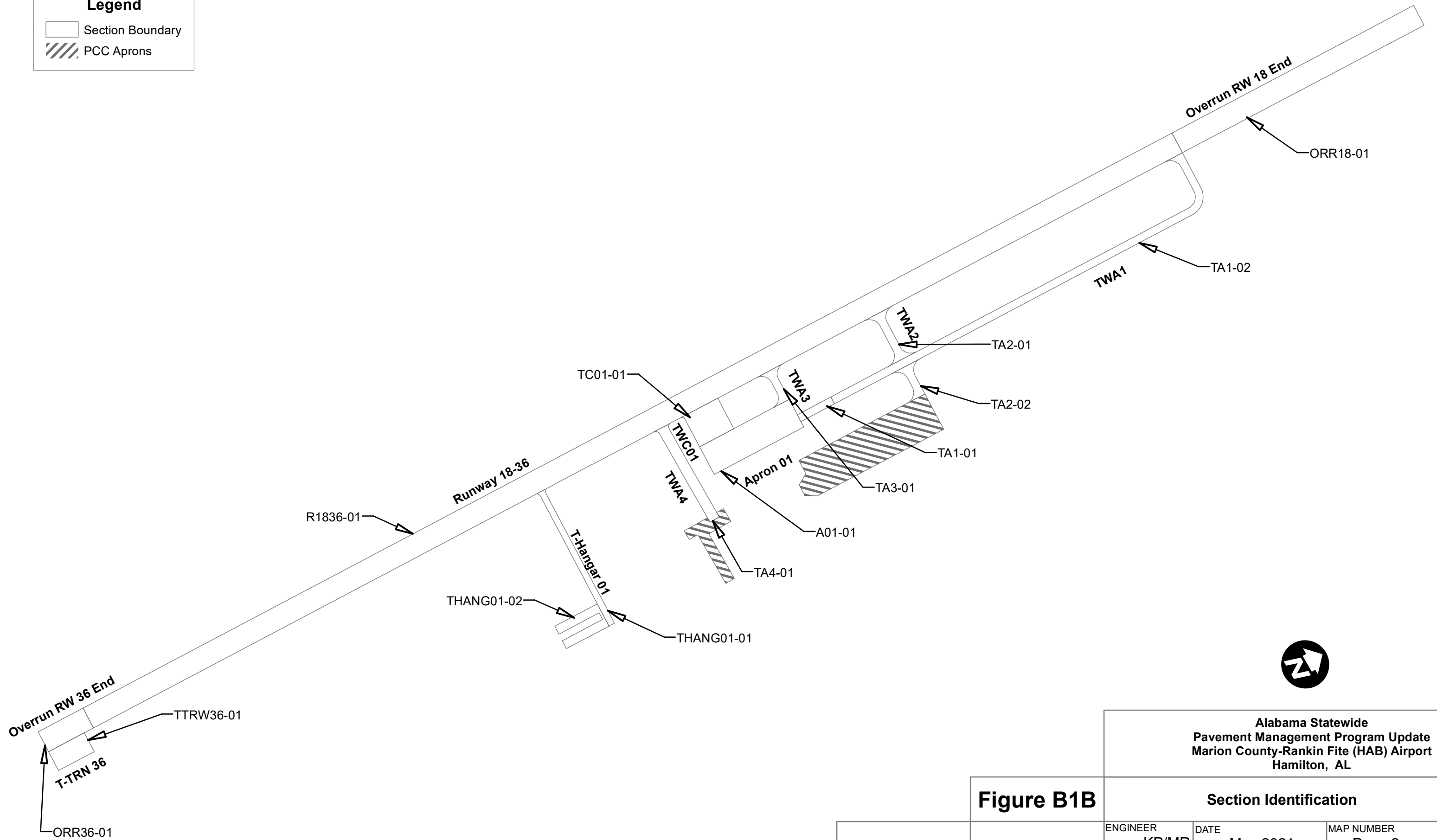


Figure B1B

Alabama Statewide
 Pavement Management Program Update
 Marion County-Rankin Fite (HAB) Airport
 Hamilton, AL

Section Identification

All About Pavements, Inc. (API) <small>www.allaboutpavements.com Telephone: 217-586-2765 FAX: 217-586-1967</small>	ENGINEER	DATE	MAP NUMBER
	KP/MR	May 2021	Page 2
REVISOR	SCALE	FINAL	
JMA	1 in = 400 ft		

Legend

- Section Boundary
- PCC Aprons

Sample Unit Layout

- SU Boundary
- Inspected

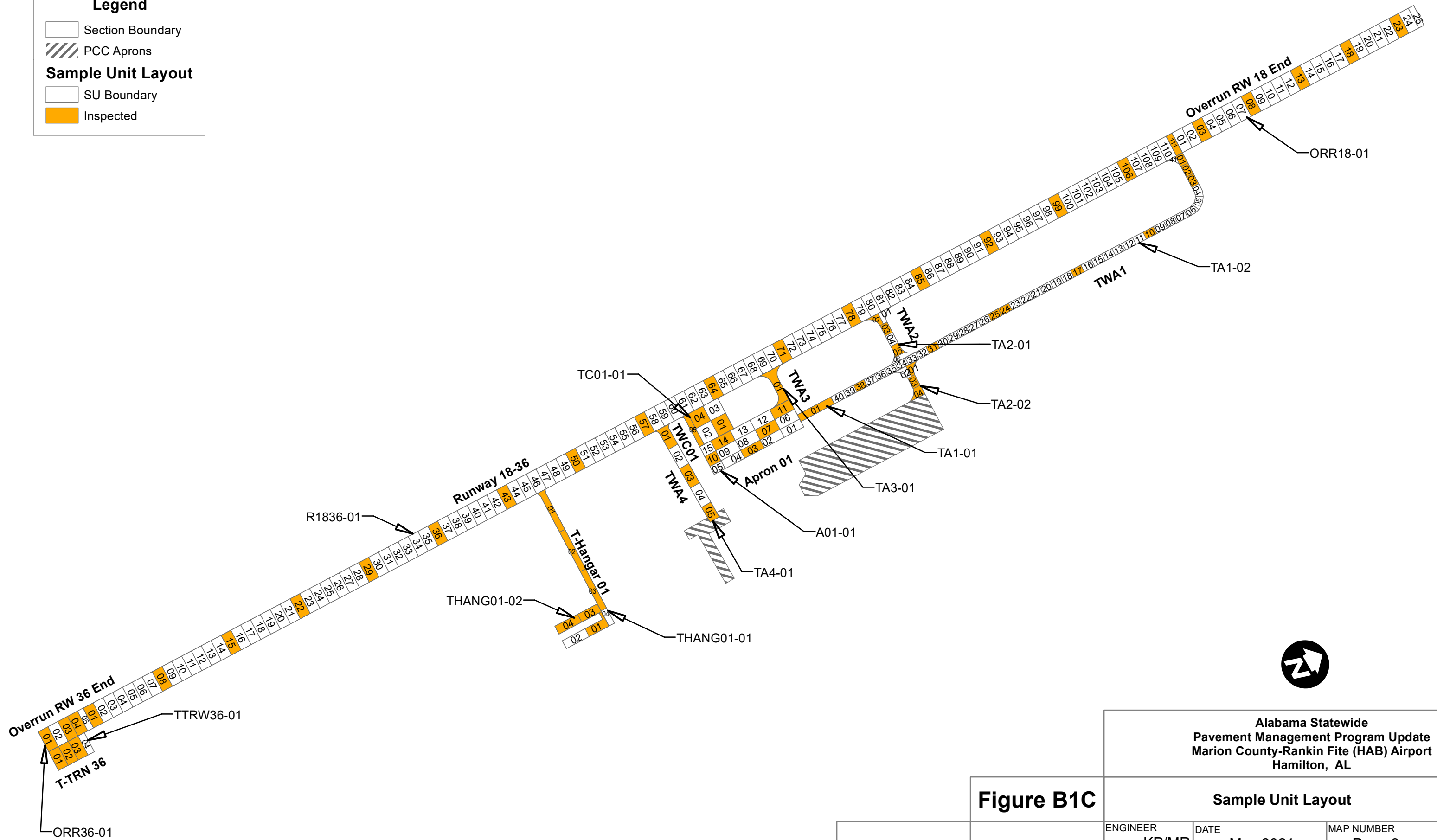




Figure B1C

**Alabama Statewide
Pavement Management Program Update
Marion County-Rankin Fite (HAB) Airport
Hamilton, AL**




Sample Unit Layout

<p>All About Pavements, Inc. (API) www.allaboutpavements.com Telephone: 217-586-2765 FAX: 217-586-1967</p>	<p>ENGINEER KP/MR</p>	<p>DATE May 2021</p>	<p>MAP NUMBER Page 3</p>
	<p>REVISED JMA</p>	<p>SCALE 1 in = 400 ft</p>	<p>FINAL</p>

Legend

-  Section Boundary
-  PCC Aprons

Pavement Type

-  Asphalt Concrete (AC)
-  Asphalt Overlay Over PCC (APC)
-  Portland Cement Concrete (PCC)

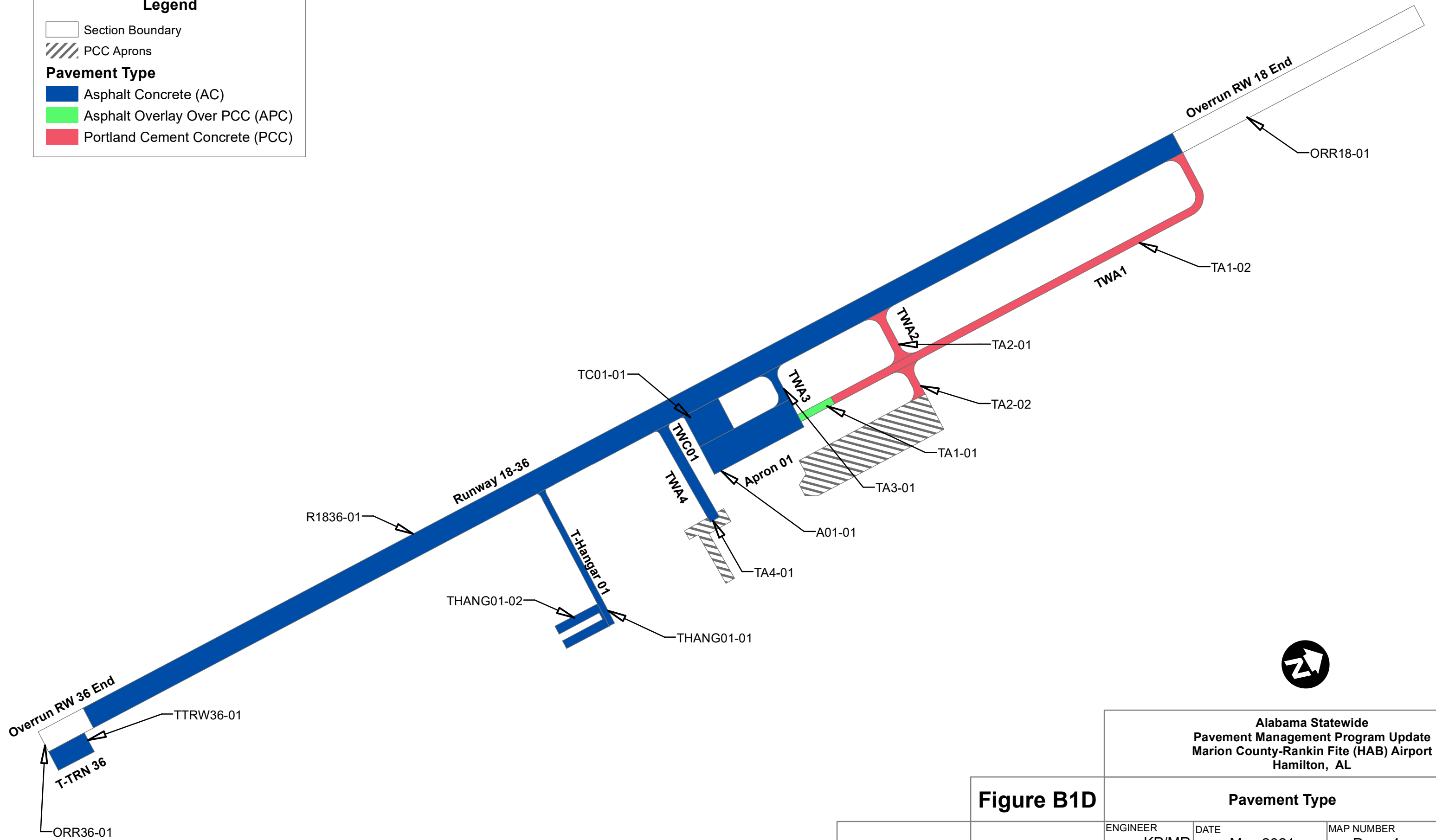







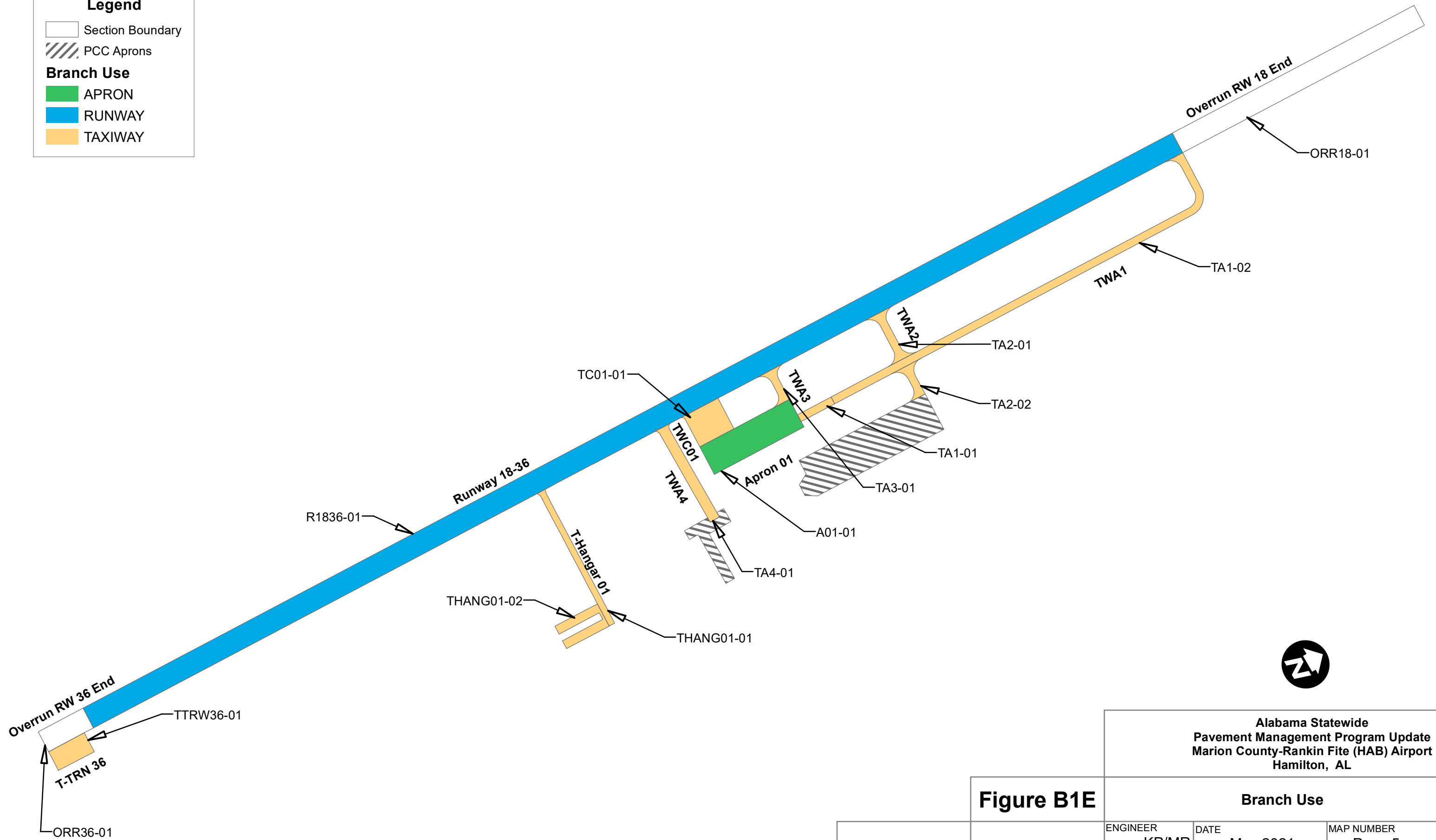
Figure B1D

Alabama Statewide Pavement Management Program Update Marion County-Rankin Fite (HAB) Airport Hamilton, AL		
Pavement Type		
ENGINEER KP/MR	DATE May 2021	MAP NUMBER Page 4
REVISED JMA	SCALE 1 in = 400 ft	FINAL

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Legend

-  Section Boundary
-  PCC Aprons
- Branch Use**
-  APRON
-  RUNWAY
-  TAXIWAY



**Alabama Statewide
Pavement Management Program Update
Marion County-Rankin Fite (HAB) Airport
Hamilton, AL**








Figure B1E

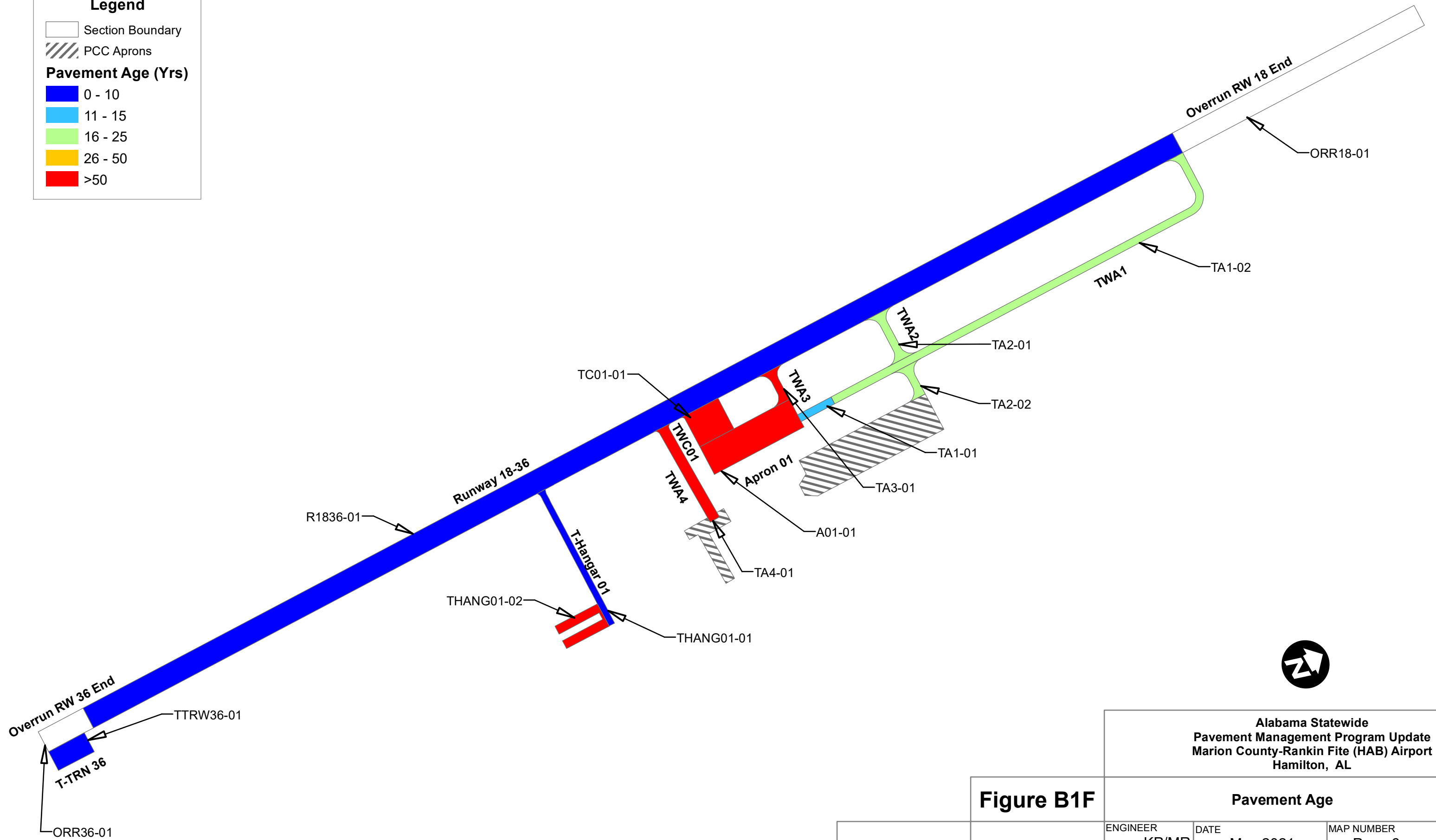
Branch Use		
ENGINEER KP/MR	DATE May 2021	MAP NUMBER Page 5
REVISED JMA	SCALE 1 in = 400 ft	FINAL

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Overrun RW 36 End
T-TRN 36
ORR36-01
TTRW36-01

Legend

-  Section Boundary
-  PCC Aprons
- Pavement Age (Yrs)**
-  0 - 10
-  11 - 15
-  16 - 25
-  26 - 50
-  >50








**Alabama Statewide
Pavement Management Program Update
Marion County-Rankin Fite (HAB) Airport
Hamilton, AL**

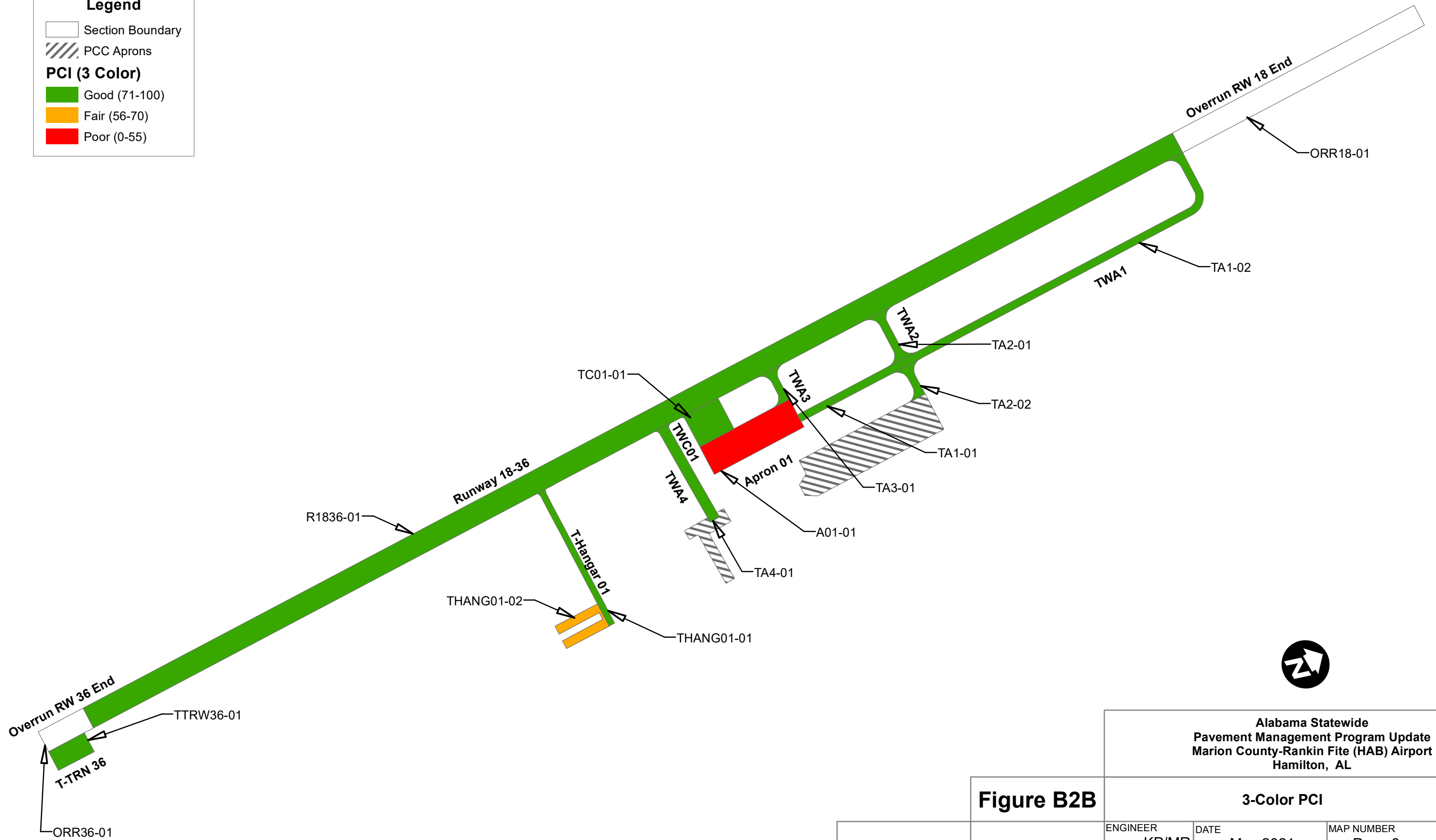
Figure B1F

Pavement Age

<p>All About Pavements, Inc. (API) <small>www.allaboutpavements.com Telephone: 217-586-2765 FAX: 217-586-1967</small></p>	ENGINEER	DATE	MAP NUMBER
	KP/MR	May 2021	Page 6
	REVISOR	SCALE	
	JMA	1 in = 400 ft	FINAL

Legend

-  Section Boundary
-  PCC Aprons
- PCI (3 Color)**
-  Good (71-100)
-  Fair (56-70)
-  Poor (0-55)








**Alabama Statewide
Pavement Management Program Update
Marion County-Rankin Fite (HAB) Airport
Hamilton, AL**

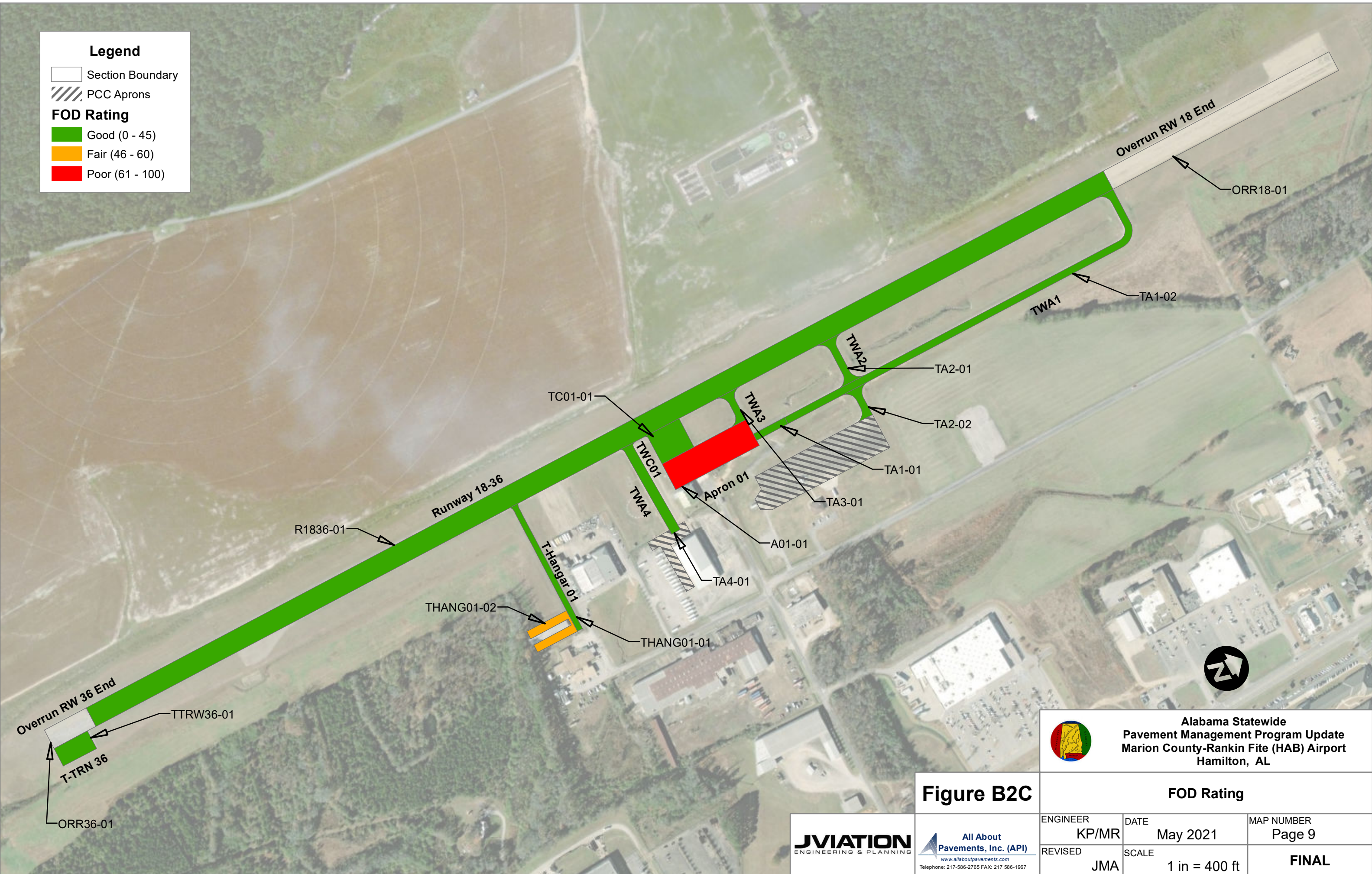
Figure B2B

3-Color PCI		
ENGINEER KP/MR	DATE May 2021	MAP NUMBER Page 8
REVISED JMA	SCALE 1 in = 400 ft	FINAL

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Legend

-  Section Boundary
-  PCC Aprons
- FOD Rating**
-  Good (0 - 45)
-  Fair (46 - 60)
-  Poor (61 - 100)



 **Alabama Statewide Pavement Management Program Update**
 Marion County-Rankin Fite (HAB) Airport
 Hamilton, AL

Figure B2C

FOD Rating		
ENGINEER KP/MR	DATE May 2021	MAP NUMBER Page 9
REVISED JMA	SCALE 1 in = 400 ft	FINAL

JVIATION
ENGINEERING & PLANNING

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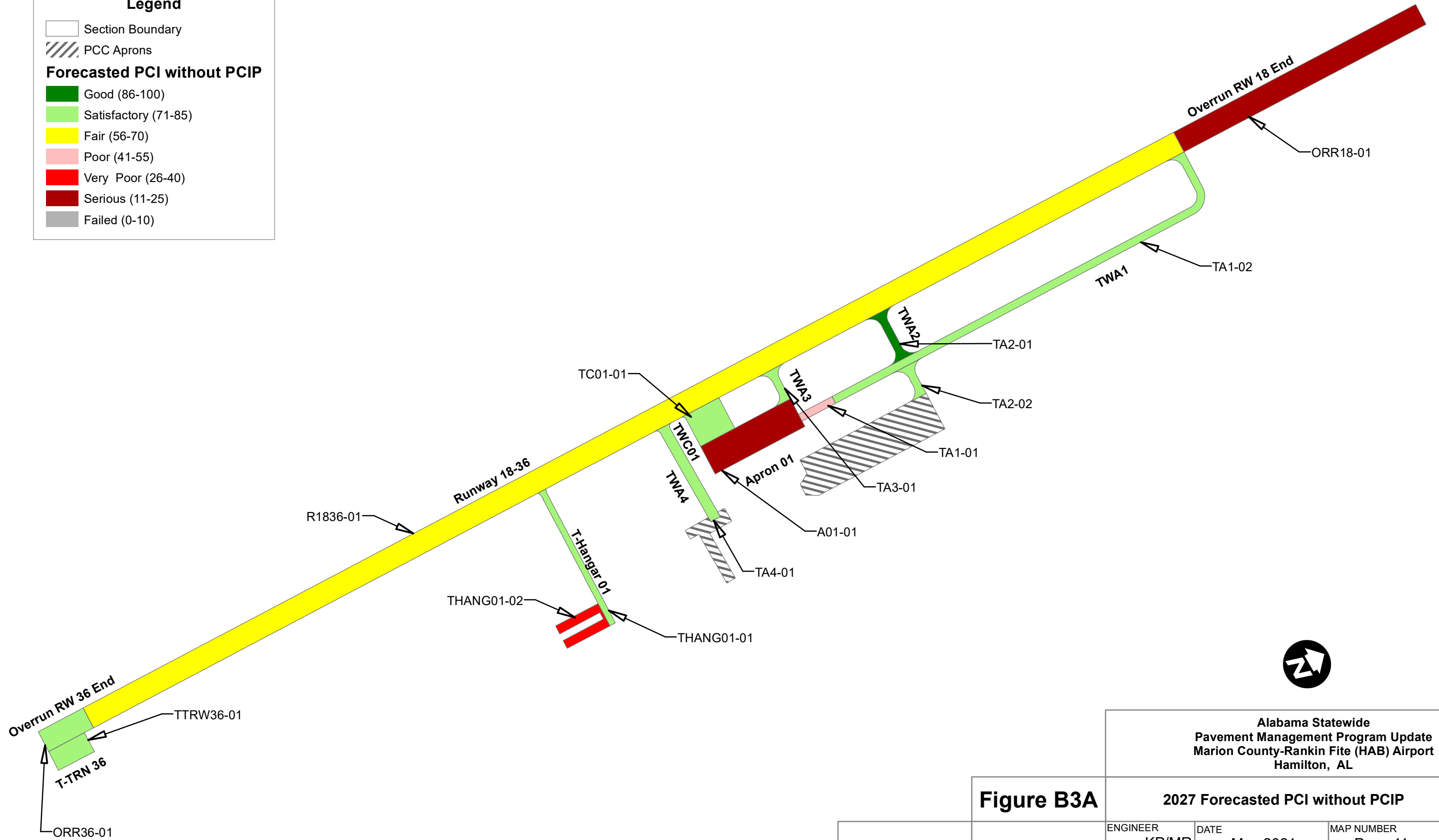
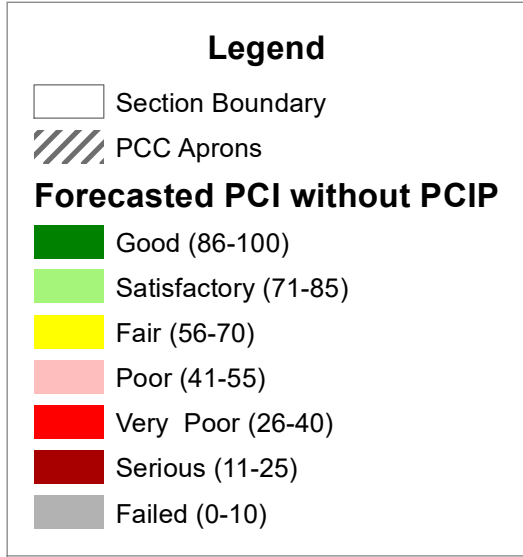








Figure B3A

Alabama Statewide Pavement Management Program Update Marion County-Rankin Fite (HAB) Airport Hamilton, AL		
2027 Forecasted PCI without PCIP		
ENGINEER KP/MR	DATE May 2021	MAP NUMBER Page 11
REVISED JMA	SCALE 1 in = 400 ft	FINAL

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All sections recommended for Rehabilitation or Reconstruction between 2021 and 2024 also receive Surface Treatment in the 3rd year of paving.

Legend

-  Section Boundary
-  PCC Aprons
- Repair Type**
-  No Activity
-  Preservation
-  Reconstruction
-  Rehabilitation

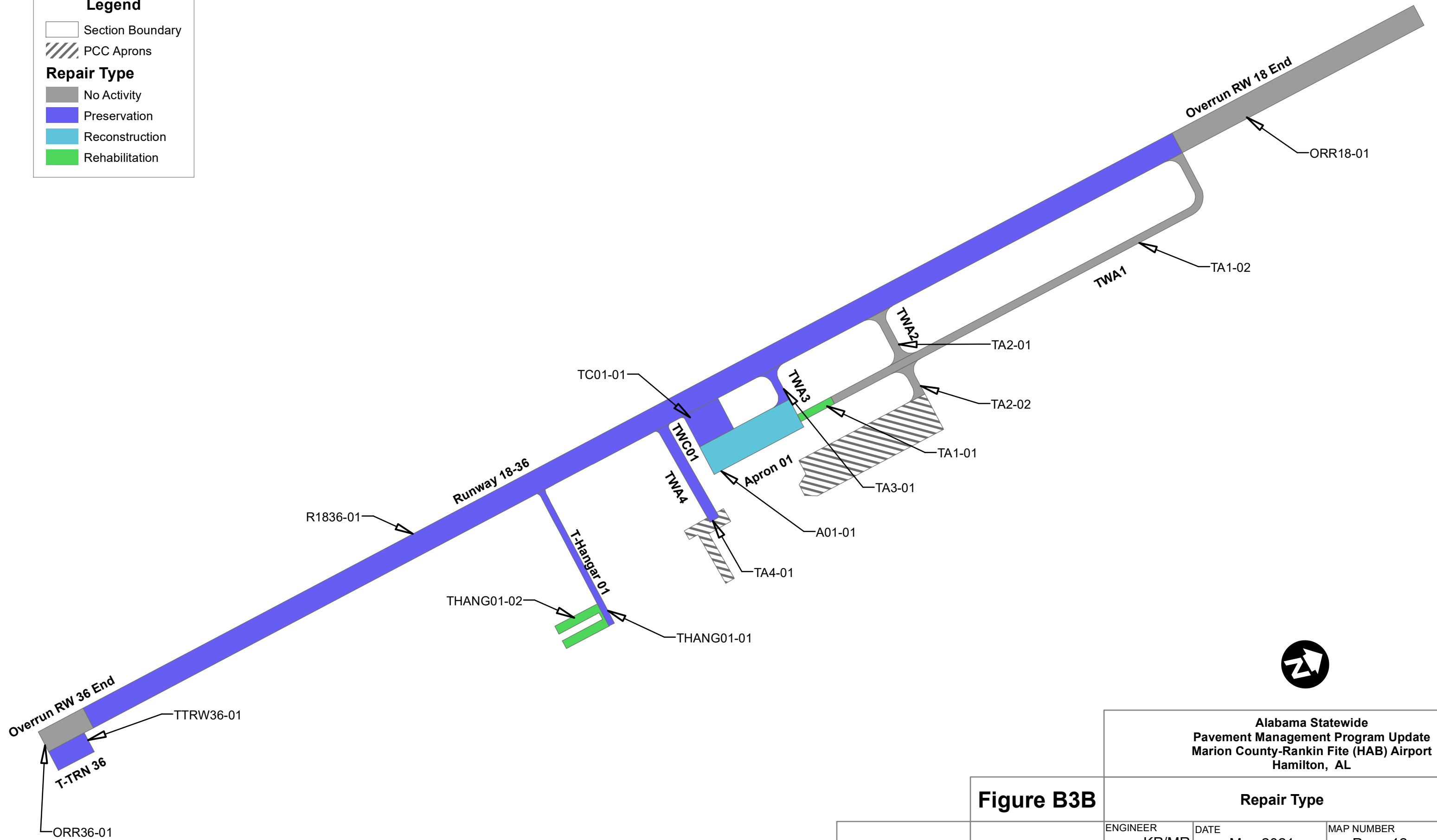


Figure B3B

Alabama Statewide Pavement Management Program Update Marion County-Rankin Fite (HAB) Airport Hamilton, AL		
Repair Type		
ENGINEER KP/MR	DATE May 2021	MAP NUMBER Page 12
REVISED JMA	SCALE 1 in = 400 ft	FINAL

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All sections recommended for Mill & AC Overlay or AC Reconstruction between 2021 and 2024 also receive Surface Treatment in the 3rd year of paving

Legend

Project Name

- HAB_21-01_Runway 18-36 Preservation
- HAB_21-02_Taxiway Preservation
- HAB_22-01_Apron Reconstruction
- HAB_22-02_Taxiway Hangar Rehabilitation
- No Project

M&R Activity

- AC Reconstruction
- Mill 2" & 2" AC OL
- Mill 2" & 2" AC OLP
- Runway Surface Treatment
- Taxiway & Apron Surface Treatment
- No Activity

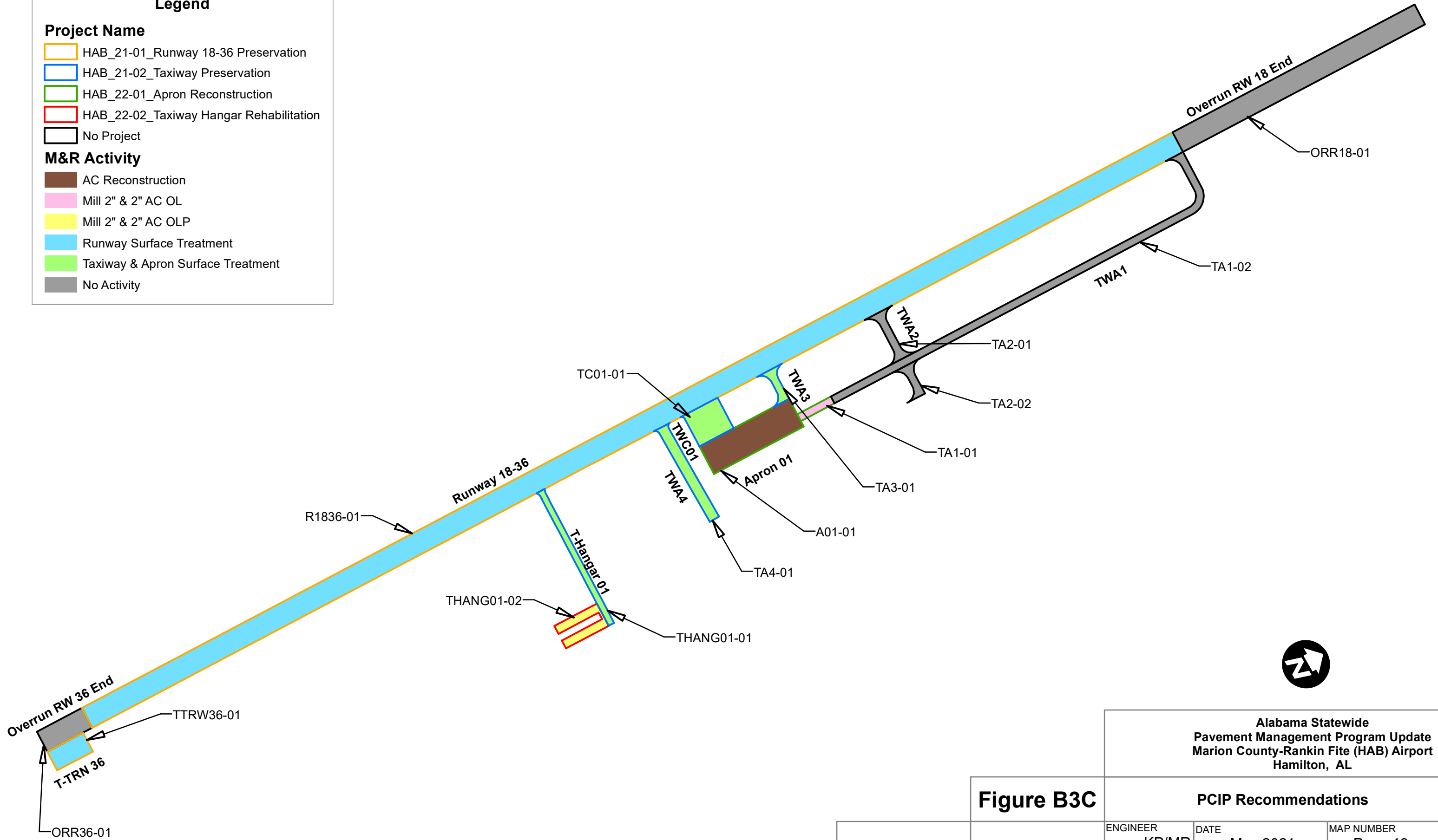


Figure B3C

Alabama Statewide Pavement Management Program Update Marion County-Rankin Fite (HAB) Airport Hamilton, AL		
PCIP Recommendations		
ENGINEER KP/MR	DATE May 2021	MAP NUMBER Page 13
REVISED JMA	SCALE 1 in = 400 ft	FINAL

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APPENDIX C

OVERVIEW OF PAVEMENT DISTRESSES



% 5~|| Ucf7fUWb| f57L

5~|| UcfVUWb| lgUg|YgcZ|HfVbBb| VUWgUgXvZ|| iYZ|ifYcZHY
Ug|UHfUWYg|fZWk\YfYhg|Yg|YgUxg|U|g|\| \Ygi bWk\Y~cUg'HY
VUWgdcd|U|Ylc|hYg|fZW|b|U|n|g|Ug|Ygc|Z|f|U|Y|VUWg'5ZfYUW
H|Z|W|c|U|h| hYVUWgVbBb|Z|fa| |'a|U|ng|X|X|g|U|f|U| |'X|d|W|g|h|U|W|Y|c|d|
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Z|Y|h| |'c|h|Y|c|h| Y|g|X" 5~|| UcfVUWb| 'c|W|g|c|b|n| |b|U|f|g|h|U|f|Y|g| V|U|X|c|'
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b|k|c|f| 'c|Z|U|W|g|h|U|a|U|h|Y| | \h|g|U|Y|X|A| Y|a|!g|j|Y| |n|U| |UcfVUWb| '
|g|X|b|X|v|U|k|Y|!X|b|X|d|U|b|c|Z|H|f|V|b|B|b| |VUWg|k| \Y|Y|U|'d|W|g|
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c|W|f|b|W|c|Z|c|W|V|W|V|h| i|g|U|n|b|X|U|V|g|h|U|h|Y|U|g|U|H|U|g|U|X|b|X|g|j|b|Z|U|h|f|'
6cWVWVh| b|c|a|U|n|c|W|V|g|j|Y|U|U|f|Y|d|c|d|f|b|c|Z|h|Y|d|j|Y|a|Y|H|f|N|Z|V|h|k|j|''
g|a|V|a|Y|c|W|f|c|b|n|b|h|Y|c|b|l|Z|Z|W|V|f|g|'

GjYf|ng

- ◆ @ck! X|b|X|V|n|W|V|g|h|U|f|Y|U|a|c|g|i| |h|n|g|U|Y|Z|V|h|g|h| b|c|Z|f|N| |b|c|V|N|E
X|a|U|Y|E|C|S|E|d|h|U|' |h|Z|' X|W|V|g|U|j|Y|?| |b|W|c|' Y|g|a| Y|b|k|X|h|Z|U|X
Z|' X|W|V|g|U|j|Y|Z|' Y|f|b|g|U|g|U|W|f|n|W|V|h|c|b|/
- ◆ A Y|a ! X|b|X|V|n|W|V|g|h|U|f|Y|a|c|X|U|Y|n|g|U|Y|X|g|a|Y: C|S|'d|h|U|E|Z
i|h|Z|' X|W|V|g|h|U|f|Y|U|a|c|g|i| |h|n|g|U|Y|Z|V|h|g|h|j|Y|U|a|Y|b|k|X|h| |f|U|f|
h|U|?| |b|W|c|Z|' X|W|V|g|h|U|f|Y|U|a|c|g|i| |h|n|g|U|Y|X|V|h|g|h|j|Y|Z|' Y|f|b|'
i|h|g|U|g|U|W|f|n|W|V|h|c|b|/
- ◆ <| | \ ! X|b|X|V|n|W|V|g|h|U|f|Y|g|j|Y|f|n|g|U|Y|Z|V|h|g|h| U|X|b|h|Y: C|S|'
d|h|U|U|'

FYUfD:V|g

- ◆ @ck! B|c|U|f|c|b|/
- ◆ A Y|a ! g|U|W|V|g|U|d|h|n|f|Y|j|Y|U|c|Z|f|W|V|g|j|Z|W|c|f| |U|f|g|U|f|Z|h|U|X
c|j|Y|U|h|
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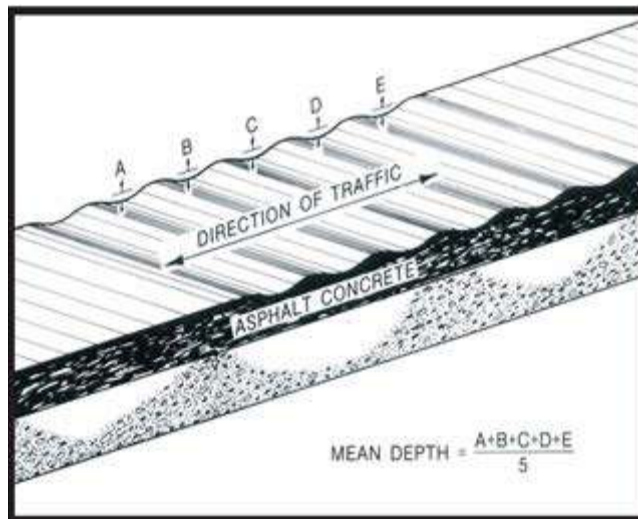
Corrugation

Description

Corrugation is a series of closely spaced ridges and valleys (ripples) occurring at fairly regular intervals, usually less than 5 feet (1.5 meters) along the pavement. The ridges are perpendicular to the traffic direction. Traffic action combined with an unstable pavement surface or base usually causes this type of distress.

Severity Levels

- @** 7cffi [U]dggfYa]bcf UXXc bcdg] b]Vbhn]ZWN]Xe i U]m]gYa Vg] fYa Yh] V]N]UVYckE!
- A** 7cffi [U]dggfYbd]MVYUxg] b]Vbhn]ZWN]Xe i U]m]gYa Vg] fYa Yh] V]N]UVYckE!
- <** 7cffi [U]dggfYg] n]d]VXUxg] Y]m]ZWN]Xe i U]m]gYa Vg] fYa Yh] V]N]UVYckE!



)" SYFYgcbf57L

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hcgYcZhYgffci bNj 'dj Ya YH-ba UnjhgUBWg' ll \hSYFYgcbfYfHcbi
bcjMVYi bH UZFUUbzk \YdbbNj kUF'WUNgVEXWHI UNg/VIH Y
XfYgcbgWbUgc Y'cWPKjnci hfU'VWU g'cZgUhgWUXVndbNj 'cZ
kUF'SYFYgcbgWbVWU g'XVngNia Ya YHcZhYZi bNjdbgc] cfWbVWU j'h
XfjH Wbgf Vdb'SYFYgcbgWU g'fci [\bYgUBzk \YbZ 'Ykjh kUF'cZ
gZVfHhSchzW' XWU g'\nModUbj 'cZUfVZfH

GjYfHg

- ◆ @k! SYFYgcbWbVcVgY Ycf'cWPKVngUjXUfNgcbngll \hm
UNWgdj Ya YHfNj 'ei UjhmUBXa UnWU g'\nModUbj 'dbNjU'cb
fi bkUg'AU]aia Xch % # l % & jWZf fi bkUg' % & l % jWZfU jkUg
UbXUfcbg/
- ◆ A Yia ! HYXfYgcbWbVcVgY Y'acWUYnIZWUgdj Ya YHfNj '
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jWZf fi bkUg' % & l % jWZfU jkUgUbXUfcbg/
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fi bkUg] fUfHUb% jWZfU jkUgUbXUfcbg'

FYUfDe'Vg

- ◆ @k! BcUfcb/
- ◆ A Yia ! GUckzdUfU'cfZ' Xch dUW
- ◆ < ll \ ! GUckzdUfU'cfZ' Xch dUW



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GjYfhi@jYg

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Z'Y'cZU'nk]h]"



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fYUX

GjYfng

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Hh|g|h| WUg/
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cfibZ'X

FYUFD:MG

- ◆ @k! BcU|cb/
- ◆ A W|a ! gUWUg/
- ◆ <||\! gUWUgcfmZfa UZ'X'h'dUW'



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Gj YlNg Bc Xl fYg' Zgj Yl mif YXWj bX' Hgg ZVhlc' bYUyhUic' gd' UY
Ylgg'

FYUFD' MNg

- ◆ Scbchh' /
- ◆ DffU'cfZ' Xh' dUW'



%8' DUWb'`

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Gj YINg

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: C8'd]h]U'

FYUfcd]cbg

- ◆ @ck! BcU]cb/
- ◆ A Y]i a ! g]U]V]W]g]Y]U]f]h]Y]X]g]Y]g]g]]bh]Y]d]U]W]c]f]m]U]W]h]Y]d]U]W
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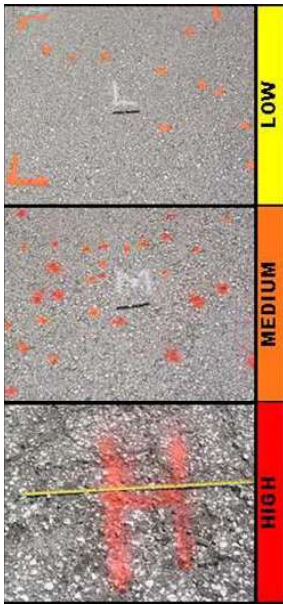
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a YfLNUWgHuj YUfZhYbi a VfCZMUGYU|fUUYdUfMwga]ggh 'g
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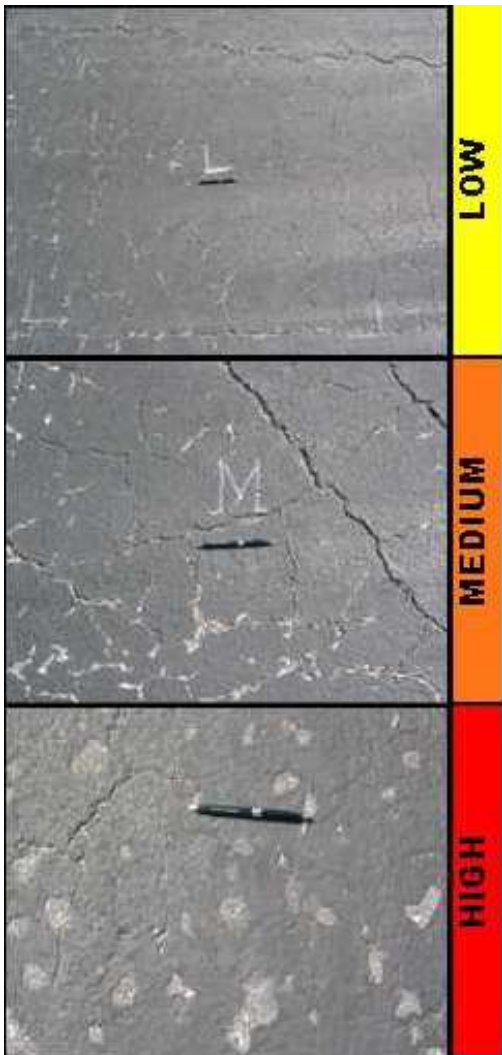
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ddHJU'

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@

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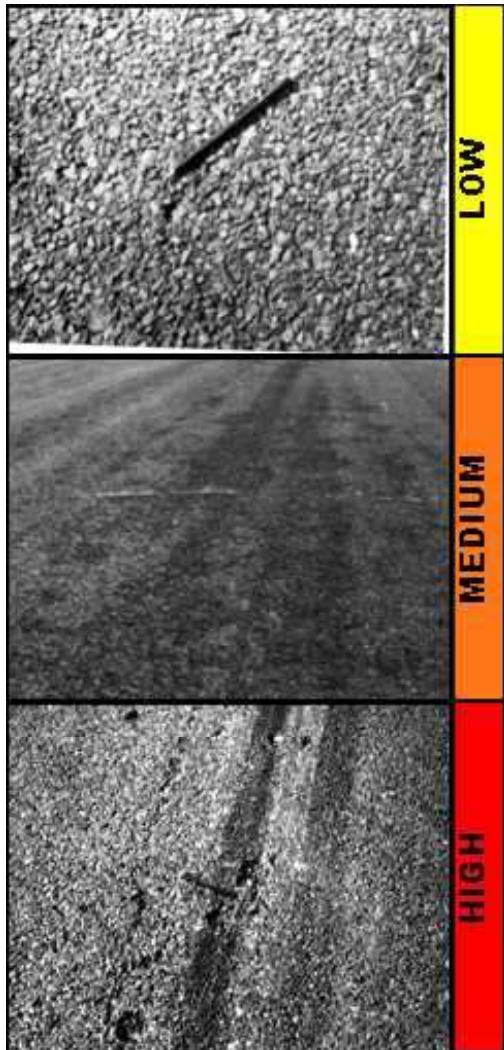
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%" Fi Hh 157L

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gi VifUZ]i fycZhYdj Ya Yh

Gj YfingUgXcbfi hXchL

- ◆ @ck! YghUb']bW]bXch/
- ◆ A Y]ia! VlkYb' Ux%]bW]bXch/
- ◆ <]]\! YVWg%]bW]bXch"

FYUfcdhcg

- ◆ @ck! BcU]cb/
- ◆ A Y]ia! dWUbx]fcj YUm
- ◆ <]]\! dWUbx]fcj YUm



:]ifY7!. "57Fi Hh"

%"G|dd|Y7fUW|b| B57L

G|dd|Y7fUW|b| from the direction of traffic. They are produced when braking or turning wheels cause the **dj Ya Yhg fAWc:g|XUXXZfa"H|gi gUncWfkg\YhYYgUck:g|h' g fAWa|| 'cf dcf VbXVWkYbhYg fAWUxb|hUm' cZdj Ya Yhg Vfy'**

Gj YfNg No degrees of severity are defined. It is sufficient to indicate that a slippage **VWY|g'**

FYUFD:MG

- ◆ **Scbch|d|'**
- ◆ **Dff|U'cfZ`Xdh'dUW'**



:||ifY7% G|dd|Y7fUW|b|"

%"GkY]h] f57L

8Yg]d]b

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G]j]Y]h]m]@]j]Y]g

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@ W]h]g]X]M]U]c]b]'f]c]k]!g]j]Y]h]m]g]k]Y'g]a]U]h]c]h]U]k]U]g]V]c]V]g]j]U]V]Z]V]h]Y]f]
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U]Q]W]Z]g]h]X]Z]f]h]Y]d]j]b]k]]c]W]f]]Z]h]Y]g]k]Y']g]d]f]g]h]!

GkY'Wb]V]c]V]g]j]Y]k]h]c]i]h]Z]V]W]h]m]b]X]U]g]U]g]l]h]Z]W]h]Z]W]c]b]h]Y]
A d]j]Ya]Y]H]g]f]X]e]i]U]h]m]g]X]h]f]a]]b]X]U]h]Y]b]c]f]a]U]U]Q]W]Z]g]h]X]Z]f]h]Y]d]j]Ya]Y]h]
g]m]i]b]i]b]X]W]h]g]X]M]U]c]b]'

GkY'Wb]V]f]D]f]n]c]V]g]j]Y]X]U]X]g]j]Y]Y]m]Z]W]h]Y]d]j]Ya]Y]H]g]f]X]e]i]U]h]m]h]Y]
< b]c]f]a]U]U]Q]W]Z]g]h]X]Z]f]h]Y]d]j]Ya]Y]h]g]m]i]b]i]b]X]W]h]g]X]M]U]c]b]'



%"KXhY[h] 157L

8Yg[d]db

H YkY[h] UkUicZhYUgUHMpXfUXZBYU[fYUYaUq] Zca hYdj Ya Yh
gfAW

GjY[h]eYg

5gUhg fAWW[h]b[h] le'g'ck'g[h]gcZU[h] k\jWaUuYUWYUUXVn
V\UWUWU[h]dg' @cg[h]YZBYU[fYUYaUq] lgc[MVYUXXaUuY
@ UW\dhYXVnZ[h] cZhYUgUHWc" 9N YgcZhYUgYU[fYUYgUY
V[h]b[h] leVYIdgXfNgU\$) jWYgcf%aaE' Dj Ya YhaUuY
fYUj Ynbk f[h]bk Ug* 'adhg'X!

A @cg'cZBYU[fYUYaUq] lgc[MVYUXX YgcZUgYU[fYUYjYVWb'
YIdgXi dlc%# k]X hZHYch YgigXcZhYUgYU[fYUYX Yc hYcg'
cZBYU[fYUYaUq] "

< 9N YgcZUgYU[fYUYjYVWb YIdgX fNMhU%# k]X hZHYch Ygi
gXcZhYUgYU[fYUYHY YgWgXUY Ycg'cZBYU[fYUYaUq]
Y[h] le'd[h]U'cf ga Ycg'cZUgYU[fYUY'



%!"6dk!I d!D77L

8YgAd]b

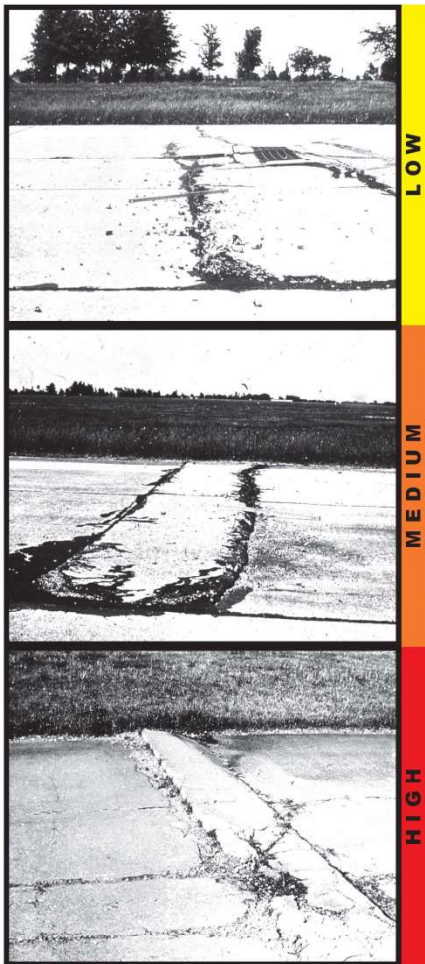
6'dki dg'cWf]b\dkYhYzi gUmHUmhg YgVWcf'c]HhUhg]bck]X
Yci [\ lc'dfa]h]l dlhgdbVnhYWBWYgUG'H Y]hgZ]W]h]k]Xh]gi gUm
W]gXV]h]Z]H]U]bc]Z]W]d]Yg]V]YaUm]Ug]bc]hY'c]h]g]W]K\Y]Y]dlhgdb'
W]b]d]f]Y]Y]Y]ci [\ d]Y]g]f]Z]U]c]W]h]X]i]d]k]f]X]a]j]Y]a]Y]h]c]Z]h]Y]g]U]V]X]Y]g'
f]i]W]h]l]c]f]g]U]M]h]k]~'c]W]f]b]h]Y]j]M]h]c]Z]h]Y'c]h]g]W]K]6'dki dg'cWf]Ug'cWf]U
i]h]h]m]W]g]U]X]U]b]U]Y]b]Y]g]H]g]h]d]c]Z]h]Y]g]g]U]a]c]g]U]k]U]g]f]U]f]X
]a]a]Y]U]Y]m]W]U]g]c]Z]g]Y]Y]X]a]U]Y]d]h]h]U]l]c]U]M]Z]H]6'dki dg'U]Y]b]W]X]X]Z]f'
f]Z]f]W]k\Y]b]W]g]X]g]U]h]g]U]Y]V]h]]Y]U]U]X]Z]f]f]X]d]h]h]"

GjY]h]e]j]Yg

@ 6i W]h] 'cf g'UM]h] \Ug]b]f]b]W]X]h]Y]d]j]Y]a]Y]h]b]c]d]M]U]j]Y]Z]U]X]d]b]n]U]g]l]h]
l]a]c]i]h]c]Z]i [\b]g]Y]l]g'

A 6i W]h] 'cf g'UM]h] \Ug]b]f]b]W]X]h]Y]d]j]Y]a]Y]h]b]c]d]M]U]j]Y]Z]U]h]U]g]l]h]W]h]
l]a]c]i]h]c]Z]i [\b]g]Y]l]g'

< 6i W]h] 'cf g'UM]h] \Ug]b]f]b]W]X]h]Y]d]j]Y]a]Y]h]b]c]d]M]U]j]Y'



%" 7cbf6fU_gfD77L

5 WbfVU_lgUWWhUfhgNghY'chgUUXgUWYghUbcfYiUlc'cbY
\UzhYgUVY[h'cbVch'gXgaYgjfXZca hYWbf'zhYgU': cfYUadYZU
gUkjh Xa Ygdcg'Z& Vri& ZfhUhgUWWhUfhgNgh hY'cbh) ZfhZca
hYWbf'cb'YgXUX% ZYicbhYchY'gW'g'ch'UhgXUXUWbfVU/'hg
UXU'cbUWUW' <ckY YZUWWhUfhgNgh+ ZYicbhYgXUX%SZYicbhY
chY'gW'g'XUXUWbfVU" 5 WbfVU XZfgZca UWbf'gU'bhUHY
WUWYhNgj VUUnhfi [\ hYhYgUVh]Wbggk\]YUWbf'gU'fhgNgh
hY'chUhbU' Y'@UXYh]cbWa VbXkjh`cgg'Zg'dbfUWf'hd' g'ggg'
igUmU'gWbfVU_g'

GjYhNg

- ◆ @ck! 7UW\lgYhY'bc'gU'h' 'cfa'bcfgU'h' fbcZfY[b'cVWNAU'Y
fIC8f'd'fHUE'Z'cb'filled, it has a mean width less than approximately 1 #'
inch (3 millimeters); a filled crack can be of any width, but the filler material
aigWY'bg'lg'UWf'n'Wb]h'cb'HYUfUWkYb'hYWbfVU' UxhY'
^'cb'lg'cb'UWXX
- ◆ A'Wia! One of the following conditions exists: (1) filled or non!filled c'fUW'g'
acXUfYngU'Xh'gaY: C8'd'fHUE'/f'U'cb'filled crack has a mean
width between 1/8 inch (3 millimeters) and 1 inch (25 millimeters); (3) a filled
crack is not spalled or only lightly spalled, but the filler is in unsatisfactory
Wb]h'cb'f'f'HYUfUWkYb'hYWbfVU' UxhY'cb'lg'g'[\h'UWXX
kjh`cc'Y'cfa'gg'h'd'f'f'W'g'
- ◆ <ll\! One of the following conditions exists: (1) filled or non!filled crack is
severely spalled, causing definite FOD potential; (2) a non!filled crack ha'gU
a'Ubk]h' [f'UW'h'U'hd'ja'UfYm'f'W'f'f' 'a]'ja'Y'g'Z'W'U'hd' U'f'Y
Xa'U'Y'd'f'f'U'/'c'f'f'HYUfUWkYb'hYWbfVU' UxhY'cb'lg'g'
g'j'Y'f'm'UWXX'

FYU'f'cd'hd'g

- ◆ @ck! BcU'f'bc'f'gU'W'W'g'
- ◆ A'Wia! gU'W'W'g'
- ◆ <ll\! gU'W'W'g'U'hd'U'Z'~
cfYUW'hYgU'



X'h'd'UW

: llifY7%&'D77 7cbf6fU''

%" 7fUWg"@cb|JiXpUZHFUbg YgYUbxS|U|cbU'fD77L

H YgVWUgXj|XhYgU|bc|kc'cfhfYd|WgZUxIfYi gUmWgXVhU
WáVhU|bcZcdXfYh|cbZf|h|'gYgZUxg|fb_UYgYgYg"@ck'gYf|h
VWgUfYbdhWgXfXaUcf|giVfU'XgYgYg'A Yfi a'cf||\gYf|hVWgUfY
igUnkcf|h|VWgUxIfVWgXfXaUcf|giVfU'XgYgYg'

GjYf|ng

- ◆ @ck!%i|bZ`YXVWUg%#|bWlc%&|bWk|Xk|h|bcZi|h|'cf|gU|h|/E
VWgYghU%&|bWk|Xk|h`ck'gYf|ngU|h|/cf'EZ`YXVWUgZ
Unk|Xk|h|Zf|f|dZfa|h|'bUg|g|Uf|naU|b|f|U|X|bcZi|h|'cf
gU|h|/
- ◆ A Yfi a !%i|bZ`YXVWUgVhYb%&|c%|bWk|Xk|h|bcZi|h|'cf
gU|h|'cf&Z`YXVWUgZUnk|Xk|h|Zi|h|`YghU%#|bWcf a Yfi a'
gYf|ngU|h|/
- ◆ <||\!%i|bZ`YXVWUgk|h|Uk|h|[f|n|f|h|U%|bW'&i|bZ`YXVWUgZ
Unk|Xk|h|Zi|h|[f|n|f|h|U%&|bWcf a Yfi a'gYf|ngU|h|/cf'E
Z`YXVWUgZUnk|Xk|h|Zi|h|[f|n|f|h|U%&|bWcf||\gYf|ngU|h|"

FYUfcd|cbg

- ◆ @ck!BcU|b|c|f|gU'VWg/
- ◆ A Yfi a !gU'VWg/
- ◆ <||\!gU'VWgZU|n|U`~Xh'dUWcf|f|U|W|h|YgU'



: ||ifY7%&'D77HUb|YgY7fUWg'

§' Si fUj]m7fUWgID77L

8YgAdjb

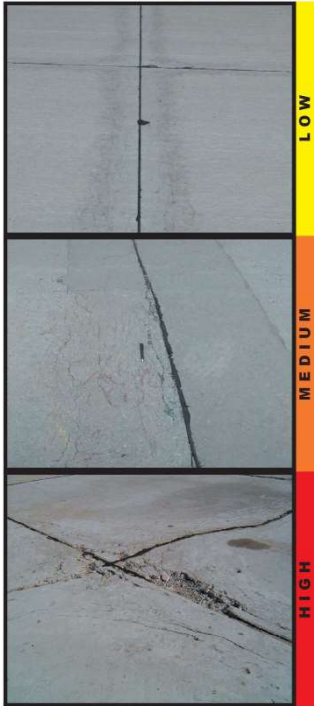
Si fUj]m7fUWg]gWgXVnhYbUj]m7cZhYWBWYk]hgUXXj]fdaYbU' ZWfggWgZYYhukVWg'-hi gUnldNfggUdUMB'cZMwgi bhd' parallel to a joint or linear crack. A dark coloring can usually be seen around the fine XfUj]m7fUWg'H]ghdYcZMwgd' aUnjYbU'mXkXghN]fulbcZhY WBWYk]h]b%c'SZNFSSle*SSa]`jaYgicZhY^chidVW'

GjY]h>@Yg

@ ÍSÍ VVWd] \gXjYodXgYFUWg]MVYUaci hZgUVfUk]h`]hYcf bcXghN]fulbcf: CS'dh]U' cfÍÍÍÍ VVWd] \gWfYX]bU]a]PX UfUcZhYgUzgWg]bcbYcfkcbWgcfUch]`cbY^ch]i h]WgUfY a]gh] UXXghN]fulcb\UgWfYX'GaY: CS'dh]U'

A ÍSÍ VVWd] \gXjYodXgYFUWg]MVYUaci hZgUVfUk]h`]hYcf bcXghN]fulbcf: CS'dh]U' cfÍÍÍÍ VVWd] \gWfYX]bU]a]PX UfUcZhYgUzgWg]bcbYcfkcbWgcfUch]`cbY^ch]i h]WgUfY a]gh] UXXghN]fulcb\UgWfYX'GaY: CS'dh]U'

< ÍSÍ VVWd] \gXjYodXgYFUWg]MVYUaci hZgUVfUk]h` XghN]fulbcZ: CS'dh]U'



8% >chhGU'SUa U YID77L

>chhGU'SUa U YgUmMh\|WYhUVgg]' cfcVgk UWAi 'UYbhY^chh'
cfUck'g| hZUH|b|f|U|bcZkUF''5Wai 'U|bcZ|WadYgVYaUM|Ug|b'
hY'chh|fY YghYgUVZca Ydb|h| Ux|Uing| h|bVW|h|zg UM|h|zcf
gU|h|''D|UVY'chh| YVbXX|chYX YgZ|hYgUgd|fWg^chhZca hY
UWAi 'U|bcZaUM|UgUxUg'cfY YhgkUFZca gM|h| XkbUxgZ|h| hY
Zi bX|dbj dbf|h| hYgV' Hd|W|h|ngZ'chhGU'SUa U YUfY'%g|h|db|h| hY
'chhGU'SUa U YgUmMh\|WYhUVgg]' cfcVgk UWAi 'UYbhY^chh'
'cgicZcbX|chYgUVX YgUx* EUWcfUg|bWczgU|h|bhY'chh

Gj Yfng

- ◆ @ck ! |b| YbU n|ccXWb|h|bhfi [\ci hYgM|b" GUUh|g|MZfa |h| ' kY k|h| dbn|a |b|f|a|ci b|cZ|U|ncZ|hYUj Y|h|ngZ|a| U YdYg|h|
- ◆ A W|a ! |b| YbU n|f|W|h|bhfi [\ci hYgM|b|k|h| db|cf|ad|f|cZ| U|ncZ|hYUj Y|h|ngZ|a| U YdYg|h|c|W|h| |c|U|ac|X|U|Y|f|Y'' GUUh|b|X|g|a| Y|U|Y|f|U|W|a| Y|h|k|h|b|&|n|f|g|
- ◆ <||\ ! |b| YbU n|b|f|W|h|bhfi [\ci hYgM|b|k|h| db|cf|ad|f|cZ| U|ncZ|hYUj Y|h|ngZ|a| U Yg|f|Y|g|h|c|W|h| |c|U|g|j|Y|X|f|Y'' GUUh| b|X|g|a| Y|U|Y|f|U|W|a| Y|h|

FYUfcd|cbg

- ◆ @ck ! Bc U|b|
- ◆ A W|a ! gU^chh|
- ◆ <||\ ! gU^chh|



: ||ifY7% 'D77 >chhGU'SUa U Y'

88! GaU DUWID77L

5' dUWlgUbUk\ YfhYcfll jBU'dj Ya Yh
has been removed and replaced by a filler

aUfjU': cfWbXjcbY U UjcbzdUWj lg'
Xj jXXjhc lkc lndg' gaU fngghU) 'gei UfY
ZNLUXUf Yfj Y) 'gei UfYZNL'@uf YdUWg'
UfYXgUfVXjbhYbl hgXjcb'

Gj Yfng:

- ◆ @k! DUWlgZbUjcbj kY'zkjh'
'jhiYcfbcXfjcfUjcb/
- ◆ A Yjia ! DUW\UgXfjcfUfXZbXf
acXfUfYgdU'j WbVYgXbUfcbXhY
YfYg'DUWa UfjU WbVYg'cX'Yz
kjh WbgXfUfYfZfifh jcf: C8'
dnhjUz
- ◆ <ll\! DUW\UgXfjcfUfXZbXhYfVn
gdU'j UfcbXhYdUWcfWUj'j
kjhjbhYdUWz'c UgUfYk\ jWkUfUhg
fYUWa Yh

FYUfcdjcbg

- ◆ @k ÈScBchj/
- ◆ A Yjia ! FYUWdUWcfFYUWY
gU'
- ◆ <ll\ ÈFYUWdUWcfFYUWYgU'



: llifY7% 'D77 GaU DUW'

&" @Uf YDUWID77L

Patching is the same as defined **ZfUgaU`dUW`
 \ckYVzhYufUcZhYdUWlgacfyhUb) 'gi UfY
 ZNF5 i f]hMhlgUdUWhUgfydUWkhY
 cf]]bU'dj Ya YHMMgycZdUWa YhcZ
 i bXf] fci bXi f]]ng'HYgj Yf]m'j YgcZLi f]]m
 Wf]fYhYga Yg]hcgYZffYi 'Uf dUW]d."**

Gj Yf]ng

- ◆ @ck ? DUW]gZb]f]b]d] kY`zk]h `]h]Ycf
 bcXf]f]cfU]cb/
- ◆ A Y]i a ! DUW\UgXf]f]cfU]XZb]Xf
 acXf]U]YgdU]d] Vb]Yg]Xb]U]fci bXhY
 Y] Y]g]DUWa U]f]U]Vb]VY]g]c]X]Y]zk]h`
 W]g]X]U]V]Y]Z]f]f]h]]bcf: CS'd]h]f]U]L
- ◆ <] \ ! DUW\UgXf]f]cfU]XZ]h]Y]V]m
 g]U]d] U]fci bXhYdUWcfV]W]d] k]h]b]
 hYdUWZc U]g]U]k\]Wk]U]f]U]g]
 f]U]W]a] Y]h]

FYU]fcd]cbg

- ◆ @ck E]8cBch]d] /
- ◆ A Y]i a ! FYU]W]dU]Wcf]f]U]W]h]Y]g]U]
- ◆ <] \ E]FYU]W]dU]Wcf]f]U]W]h]Y]g]U]



:]]ifY7%` 'D77 @Uf YDUW'

&" Dddi lgiD77L

5' dddi HgUga U' dJWcZdj Ya YHhUMFU_g`cogYZca hYg fZWX Ylc ZYH
hUk UWcbJbWa VbUcbkjh Y ddbj YU [fY UHg' Dddi lgi g UnfUj YZca`
Uddid ja UYnfbWlc(JbWYgbXLa YfUkZca %&JbWlc &JbWgXsd"

Gj YHNg

No degrees of severity are defined for popouts. <ckY Yzddi lgaig HYYHNgj Y
VZfYh YnfYw HXUg UXg JYg' YZj YU Yddi hXghiaig H VWX
Uddid ja UYnfbYddi lgidf gi UYnfbXg YhYHfYg UVfU



: ||ifY7%. 'Dddi lgi'

&"D adq id77L

8YAdhb

**D adq lghYYMbcZaUhfUvkUfhci [\ `c hgc VWgWigXVhWZMcb:
cZhYgWibXfdlgh `cXg'5ghYkUf'lgYMWZ]hUfYgdffWgcZ] fJ YzgWZ
WncfgHbXyj lgbUdc fYgj YcgcZdj Ya Yhg ddbHG fAWgUhh Ux
VgYcfj V fUYaUhfU'cbhYdj Ya YhVgYc `c hgc VWgUfyj XbWcZ
d adq "D adq bnf `c hgbXWgdcf `c hgbUY Ux cgcZj ddbk \JWk]"`
`YXlc VWWh i bnfYbUXcXg'**

GjYfm@jYg

BcX] fYgcZj YfmfYXWbX-Hgg ZVbhc]bXUyhUd adq Ylgg'



&" GUVh ID77L

**AUVWVh 'cfVUth fYZfgUbkcf 'cZgUdczZbZcf\UFjBYWVghU
YfXcbnhfi [\ hYiddf g fZWCZhYWBWYHYWVgN6Xc]bMgNth
Uj 'YgZ/8\$X|fyg'AUVWVh 'cfVUth |lgjUmWgXVnj YZhg |hY
WBWYUxaUmXk:cGUh 'cZhYgfZWK\|W|ghYVU_XkbcZhYgU
g fZWC UXd of approximately 1/4 to 1/2 in W'GUh 'aUthg VVWgXVn
|adcfWghj VcbUXdcfU|f|UY'5bchYfW|bhXgi fWcZgdYgghY
fU|bVWkYbhYU_UlgfUc'UX? &E|bga YW YlgUXWUba |bUglb'
ga YU|f|Uhg'UcXVZfa YVnhYVU|bVWkYbhYU_UlgUXU|f|UY
fg |bYd|gcbghUWgYUUVU_Xkb|bhYWBWY'**

GjYfng

- ◆ @k! 7Uth 'cfAUVWVh Ylggj Yg|bZVthgUVfUHYg fZW|gb
|ccXWV|cbk|hbc'GUh 'HYWVdUmbaig|WkY X|bXUX
Yg|nfW|bhX
- ◆ AYia ! GUVggVXkj YUhd |aUfM)1 'cf'YgZZhYgfZWK|h'gaY
: CS'dh|U/
- ◆ <||\! GUVggj YfngVXWgh U||\ : CS'dh|U'U'gUmācfYhU
)1 'cZhYgfZW|gUWEX



&": U 'Hb| 1D77L

GHVa Yhcf Zi 'Hh |g UXZZfWwCZYj U|cbUfU'c|hcf VUWUg gXVnd YjU' c'Vhg' |U|cb'

Gj YfHg

Severity levels are defined by the difference in elevation across the fault and the

	Fi bkUng#U |kUng	5dfcbg
@	0%# jW	%# E%#jW
A	%# E%#jW	%#2 %jW
<	2%#jW	2%jW

FYUfCd|cbg

- ◆ **@k! BcU|cb'**
- ◆ **A Y|a E; f|N|H Uch hY'chh**
- ◆ **<||\ E; f|N|H 'c'c|h|cX|U|gZfYg'fU|cb'**



&" G UMFYXGUVFD77L

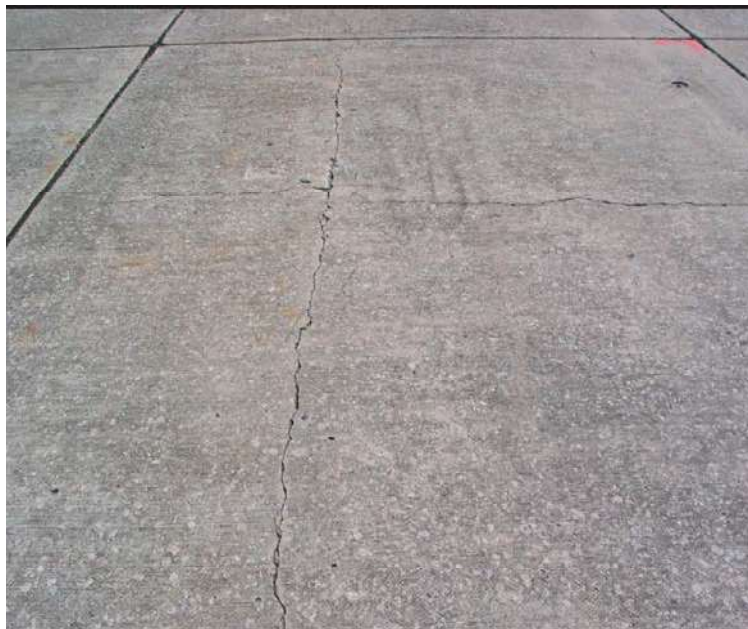
=hfgNMh VUWgUYVUWghUMFU]hcZifcfacydWgVWU gczj YcUjh' UxwfhDSgiUYgdhffHY\| \!severity level of this distress type, as defined below, lghZfYXlc UgUg UMFYXgU'ZU`dWgcfVUWgUYWdUjbxkjh bUWbf VUZhYXgUgUgUW] cfhXUgUgY YWbfVU"

Gj Yfhg

- ◆ **@k! Slab is broken into four or five pieces with the vast majority of the cracks fjh Y,) dWfhcZck!gj Yfh**
- ◆ **AWja !(1) Slab is broken into four or five pieces with over 15 percent of the VUWgZaWja gj Yfhlc \|\!gj YfhVUWg/cffgU]gVc_Y]hc'gl' cfacydWgkjh'gj Y,) dWfhcZhYVUWgZck! /**
- ◆ **<|\! 5hlgY Y'Zgj YfhYgU]gWYXg UMFYXgU]gVc_Y]hc' four or five pieces with some or all of the cracks of high severity; (2) slab is Vc_Y]hc'gl' cfacydWgkjh'gj Y%) dWfhcZhYVUWgZaWja! cf \|\!gj Yfh**

FYUfcdhbg

- ◆ **@k EGU'7UWg/**
- ◆ **AWja !: i`Xdh dUWcffYUWhYgU'**
- ◆ **<|\!: i`Xdh dUWcffYUWhYgU'**



&" Gfb_UY7f0WfD77L

Gfb_UY7f0WfD77L
YH6XWfghYHfYgU'HYfYZfa YXf]h hYg]h] U'XW]h 'cZHY
WfNYU'XigUn'k'bd]N'fX'h'fci[\ hYX'h'cZHYgU'

GjYfng

No degrees of severity are defined. It is sufficient to indicate that shrinkage cracks exist.

FYUfcdhbg

- ◆ 8cBch]h



"

' \$' >chGdUgfD77L

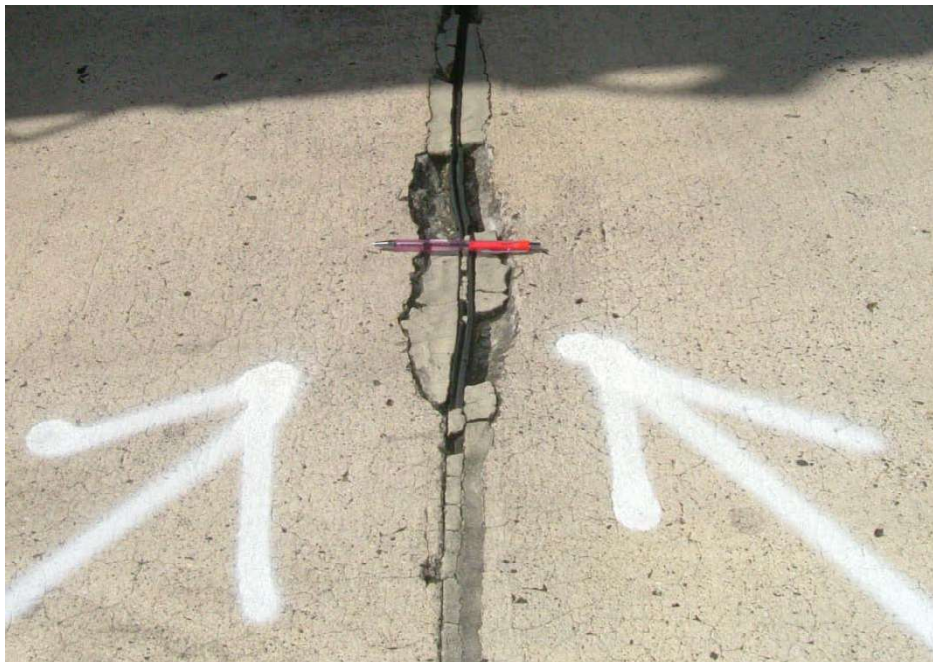
>chigU'h lghYXghN fU'bcZhYgUVX Ygkjh b&ZYh'ZhYgXyZHY'cH'
5'chigU i gUmXygdhN Nbxj YHJUmhfi [\ hYgUzVhHfGgXghY'chH
UbU' Y'GU'h' f'g' l'Zca YWg'j YgYg'gU'hY'cH'UWU gXVn' b' f'U'cb'
cZ'W'ad'f'g'VYaU'h'U'g'cf'f'U'W'U'g' K'Y'U' W'U'Y'U'hY'cH'U'g'XVn'
c'j'Y'k'c'f' h' l'W'a'V'b'X'k'h' l'U'Z'W'U'g'g'U'ch'Y'W'g'Y'c'Z'g'U'h''

GjYfNg

- ◆ @k! c'j'Y'f'&ZYh'cd' U'X'g'V'c' Y'b'hc'bc'ac'f'Y'h'U'bh'f'Y'd'W'g'X'V'X'V'n'
'ck'c'fa'Y'i'a' g'j'Y'f'U'W'g'k'h' \h'Y'c'f'bc': C8'd'h'U'z'c'f'g'&'Y'g'h'U'
&ZYh'cd' U'X'g'V'c' Y'b'hc'ac'f'Y'h'U'bh'f'Y'd'W'g'k'h' \h'Y': C8'c'f'f'Y'
X'a'U'Y'd'h'U'/
- ◆ A'Y'i'a'! c'j'Y'f'&ZYh'cd' U'X'g'V'c' Y'b'hc'ac'f'Y'h'U'bh'f'Y'd'W'g'X'V'X'V'n' \h'
c'fa'Y'i'a' W'U'g'c'f'g'a'Y': C8'd'h'U'Y' l'g'h'z'c'f'g'&'Y'g'h'U'&ZYh'cd' '
U'X'g'V'c' Y'b'hc'c'W'g'c'f'U'a' Y'X'k'h'g'a' Y'c'Z'h'Y'd'W'g'c'g'Y'c'f'U'g'h'z'
W'g'h' W'g'X'V'Y': C8'c'f'f'Y'X'a'U'Y'd'h'U'/
- ◆ <ll\! c'j'Y'f'&ZYh'cd' U'X'g'V'c' Y'b'hc'ac'f'Y'h'U'bh'f'Y'd'W'g'X'V'X'V'n'c'Y'
c'f'ac'Y' \h' g'j'Y'f'U'W'g'k'h' \h': C8'd'h'U'

FYUfCd'bg

- ◆ @k! BcU'f'cb/
- ◆ A'Y'i'a'! c'f'Z'fa' U'd'f'U'X'h'd'U'W'
- ◆ <ll\! c'f'Z'fa' U'd'f'U'X'h'd'U'W'



'% 7cbfGdUgd77L

7cbfGdUd ghYfjYh'cfVfUXkbcZhYgUkjhJbUdIdJaUYn&ZnZ
hYwbf"5 wbfGdU XZGZca UWbfVfU JbUdYgUUh'YgXdkkUX
lcJbGfVhY'chk\]YhYfU YfXgjYfU nhci [\ hYgU'

GjYfng

- ◆ @ck! YhY%hYgU'lgMc_Yb]bc'dYcfkcd]WgXfXVnck'gjYfhn
VWgkjh`JhYcfbc: CS'ddHfU/cf&hYgU'lgXfXVnchYaYfja'
gjYfhnVWgkjh`JhYcfbc: CS'ddHfU/
- ◆ AYfja È%hYgU'lgMc_Yb]bc'kcd'afYd]WgXfXVnchYaYfja'
gjYfhnVWgkjh`ZU'gaU'ZU'aYfjaU'WgU'f'ccg/ &hYgU'lg
XfXVnchYgjYfZU'aYfXVWU'haU'YUW'ad]XVnU'k'
'\Uf]bVWg'cf' hYgU'\UgXfXVnchYd]hk\Yf'ccgYaU'fU'lg
W'gh] : CS'ddHfU/
- ◆ <]] È%hYgU'\UgMc_Yb]bc'kcd'afYd]WgXfXVnchYaYfja'
ZU'aYfXVWgkjh`ccg'cfU'ghU'aYf'&cfWg'ZhYgU'\U'Y
VfXgU'W'k'chYfU'fU'fY'XaU'Y'U'fXV'lg'cf' hYgU'\Ug
XfXVnchYd]hk\Yf'ccgYaU'fU'lgW'gh] \]] : CS'ddHfU'

FYUfCd]bg

- ◆ @ck! BcUfcb/
- ◆ AYfja! d]fU'Xh'dUW
- ◆ <]]! d]fU'Xh'dUW



' &'5GF 'ID77L

5GF 'lgWU gXVhWwWw JW'fUWfcbVWkYbU_UlgUkXWfUbfUWUj Yg'JWa JbMUG
k\JWZfa U|Y' HY|YUgcfVgkUfZUg gh' Y dHgdbk\JWa UnNa UYhY
WbWfYUkXUWfHg VifYg' 5` UlgfYacgicZb'JfcXVWVnhYcbfUk
Ww YHkjh|bhYdj Ya YH' 5GF 'WUW|' a UnYUWYUfXVhWwWw JW'dj Ya YH
X|Wg'

JlgU|bXWfghU5GF'a UnYdYgHh|bWXY'

% 7UW|' cZhYWbWfYdj Ya YHfZb|bUa UfdUMbL

& K\|fZVfckb|fufcfchYWcfX|Y'cfgh|b|' a UnYdYgHhUfYUW
g'fWY

' " 5|[fYUyddi|g

(" bWUg|bWbWfYj'c'ia YfU dHgdb|hUa UnfYg' |bXgdf|bcZkXUWf'c'
|h|fU'g| VifYg'cf'ang|WUYa Ylg'9| UadYg'cZ| dHgdb|bWXYg'cj |h' cZ
UgdUhdj Ya Ylg'|\hWb|b|h'zgUVAi |h|z'c|b|a|gU|| ba YHfUkXU|f'g'bcZ
'c|h|gUg'cf'Y dHgdb'c|h|'Yg'

6WU g'5GF 'ga Uf|U'XVhWwWw5GF 'gl' YbMU ncfYgHh'fci [\c|hYdj Ya Yh
gW|b' 7cf| UkXWbWfYc'fci fU|JWUngg'g'hYcb'nW|b|j Ya YhcXc'
WbZfa hYdYg'bw'cZ5GF' HYZ`ck|h| g'c'XY_Yh|ba |bXk\Yb|Xb|f|h|'
hYdYg'bw'cZ5GF h'ci [\j|gU|bg|W|b

%; YbMU n5GF Xg|Yg'g'fYbdcVg'j YX|bhYZf|Zk' nUgUZY'Wg'f'W|b' b'
Wb|g'z'Ug|Wg'f|b UYUW|b| W'cWf'hYXh'cZUg'f'W|b|UkXg'UdfYh
k|h|bhYZf|nUf'

& 5GF 'gXZfYH|UfXZca 8!7UW|' VnhYdYg'bw'cZUW|b|' d'fWbXWUf'c'
hY'c|hW 8!7UW|' d'fXca |b|h'nYj YodgUg'Ug'f'Yg'ZdfUYUWg'c'
'c|hWgUkX|b|fWUW|b| k|h|bhYg'W'

' " 5GF 'gXZfYH|UfXZca 'AUf7UW|b| #GU|b| VnhYdYg'bw'cZj|gU'g|bg'Z
Y dHgdb'

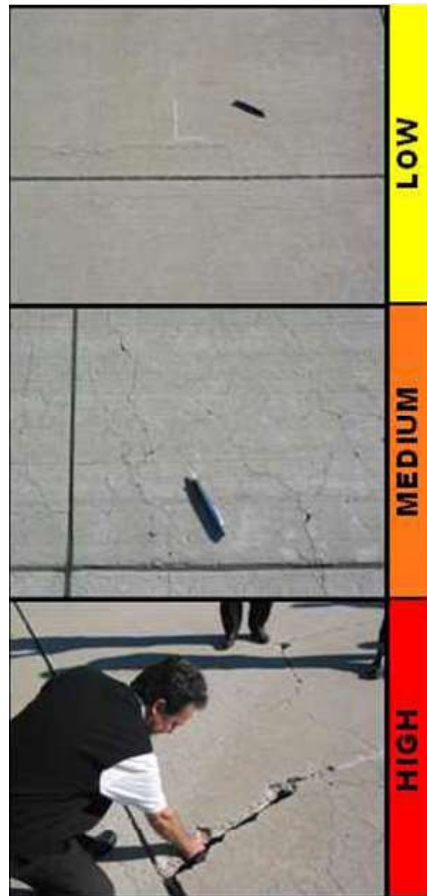
GjYfhi@jYg

@ A|jaUlebc: cf||bCVVNSUaU|YECSE'ddnh|UZca V|Wg'c|hgcf5Gf' fYUWXdddi lg/V|WgU|hYg fZ|WUfYH| \HfYXca|b|hn?aa'cf~YggL@|h|Y lebcY|N|bWcZagY|Yh|bdjY|Yh|cf|g|f|f|b|h| |g|f|V|f|g|cfY|Y|Y|g'

GcaY: CS'ddnh|U/|b|N|g|X|g|Y|h| |'cf|chY: CS'fYagU'aYhcXgaU|hY f|e|f|YX|A|h|Y|Y|N|bWcZg'U|V|agY|Y|h|U|X|cf|gaY|X|a|U|Y|c|U|X|W|h| |g|f|V|f|g|cfY|Y|Y|g'

A A|Y|a'5Gf'X|g|N|g|g|N|Z|f|h|U|X|Z|ca'~ckV|h|U|h| |'cb|Y|c|f|a|c|Y|c|Z|h|Y Z'~ck|h|. |b|N|g|X: CS'ddnh|U|Z|b|N|g|X|W|W|h| |'c|Z|h|Y|g|U|Z|gaY|Z|U|a|Y|g| U|d|h| V|W|g|c|f|U|W|W|h|f|g|N|b|g|d|Y|g|h|g| fZ|W|d|d|i|lg|c|Z|W|N|Y|a|U|h| c|W|Z|d|U|h|b|c|Z|k|N|V|W|g|f|Y|X|a| |b|h|h|?aa'cf|k|N|h|U|a|U|h|Y |g|V|j|N|X|V|h|| \h|f|V|W|g'

< Cb|Y|c|f|V|h|'c|Z|h|Y|Z'~ck|h| |Y|g|h| %|@|c|g|Y|c|f|a|lg|h| W|N|Y|Z|U|a|Y|g|k|\|W| d|g|\|| \: CS'ddnh|U|Z| &E|G|U|g| fZ|W|h|N| |f|h|U|X|Z|b|h|c|b|g|h|Z|W|h|h| N|f|U|X|X|U|d|j|Y|Y|h|e|i| |f|g|a|a|Y|U|h|f|U|f'|a|U|h|U|c|f|e|i| |f|Y|Y|U|g|e| U|X|W|h|g|f|V|f|g|cfY|Y|Y|g'



APPENDIX D

DETAILED PAVEMENT CONDITION DATA



5@8CH67ca VbYSS8%89%

; YdUPASUY

%#888%

DjY%Z%

BYkcf. <56

BuY

AUjcb7cihmFUb_jb: jY5]dch

6fUBW 58%

BuY

5dcb\$% Ua]mb

I g

5DFCB

5fYU

*'z(\$G: h

GMjcb \$%

cZ %

: fca.

HUjkUn7cbNMf\$%

H: 9NYcZDjYh

@Gj7cbg! %%%)*

GfZUW 57

: Ua]m 5@8CH67ca VbYSS8%89%

NcbY

7UWcfm

FUb. G

5fYU

*'z(\$G: h

@Y[h.

()* : h

KPh.

\$(S: h

GUg

GU@Y[h.

: h

GUVKPh.

: h

>ch@Y[h.

: h

Gcd Xf.

GfYHhdY

; fUX \$

@bYg \$

GMjcb7caa Ylg

Kcf_SUY %%%)*

Kcf_HdY Bk7cbg! Vcb! hJU

7cX BI !B

=gAUcFA/ F. HfY

@Gjhg!SUY %%%88%

HRUladYg %

GfjYK)

7cbNjcbg D7= '.

-hgNjcb7caa Ylg

QadYBi aVf. \$

HdY

F

5fYU

(\$\$\$G: h

D7= '+

QadY7caa Ylg

(% 5@@: 5HF7F

A

%'SS G: h

(' 6@C7: 7F57?-B;

A

'-, \$\$\$ G: h

) + K95H9F-B;

A

(\$\$\$G: h

QadYBi aVf. \$-

HdY

F

5fYU

) \$\$\$G: h

D7= (&

QadY7caa Ylg

(' 6@C7: 7F

A

) \$\$\$G: h

) + K95H9F-B;

A

) \$\$\$G: h

QadYBi aVf. %

HdY

F

5fYU

& \$\$\$G: h

D7= '+

QadY7caa Ylg

(' 6@C7: 7F57?-B;

A

& \$\$\$G: h

) & F5J9@B;

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% \$\$\$G: h

) + K95H9F-B;

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& \$\$\$G: h

QadYBi aVf. %

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D7= ',

QadY7caa Ylg

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A

) \$\$\$G: h

) & F5J9@B;

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% \$\$\$G: h

) + K95H9F-B;

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(- \$\$\$G: h

QadYBi aVf. %

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D7= ',

QadY7caa Ylg

(' 6@C7: 7F

A

) \$\$\$G: h

) & F5J9@B;

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% \$\$\$G: h

) + K95H9F-B;

A

(- \$\$\$G: h

BYkcf.	<56	BláY	AUfcb7cihhfUblj: jY5jrbfh
6fUW	CFF%	BláY	CjYhibFihkUm%9bX <Uá]nb
GUfch	%	cZ %	: fca. FihkUm%9bX
GfZAW	57	: Uá]m	5@SCH5dhdg NcbY
5fU	%&\$\$\$Geh	@Y[h.	%&S: h K]Ph.
GUg		GU@Y[h.	: h GUVK]Ph.
Gci Xf.		GfYHhNf	; fUX \$
GUfcb7caaYhg			
Kcf_8UY	%%*)*	Kcf_HndY	Bk7chjgVfcb!h]U
@Gihgl'SUY	%%+8%	HHUcladyg	& GfjYhX)
7cb]hcg	D7= '+		
-hgNfcb7caaYhg			
QádYBiaVf.	\$	HndY	F 5fU)\$\$\$Geh D7= '+
QádY7caaYhg			
(' 6@C7? 7F		A	)\$\$\$Geh
)& F5J9@B;		@	&\$\$Geh
)+ K95H9F-B;		A	(+)\$\$Geh
QádYBiaVf.	\$	HndY	F 5fU)\$\$\$Geh D7= '+
QádY7caaYhg			
(' 6@C7? 7F		A	)\$\$\$Geh
)& F5J9@B;		@	&\$\$Geh
)+ K95H9F-B;		A	(+)\$\$Geh
QádYBiaVf.	%	HndY	F 5fU)\$\$\$Geh D7= '+
QádY7caaYhg			
(' 6@C7? 7F		A	)\$\$\$Geh
)& F5J9@B;		@	&\$\$Geh
)+ K95H9F-B;		A	(+)\$\$Geh
QádYBiaVf.	%	HndY	F 5fU)\$\$\$Geh D7= '+
QádY7caaYhg			
(' 6@C7? 7F		A	)\$\$\$Geh
)& F5J9@B;		@	&\$\$Geh
)+ K95H9F-B;		A	(+)\$\$Geh
QádYBiaVf.	&	HndY	F 5fU)\$\$\$Geh D7= '+
QádY7caaYhg			
(' 6@C7? 7F		A	)\$\$\$Geh
)& F5J9@B;		@	&\$\$Geh
)+ K95H9F-B;		A	(+)\$\$Geh

BYkcf.	<56			BLáY	AUfcb7cihhfUblj: jY5jrbfh		
6fUW	CFP*			BLáY	CjMibFibkUm* 9bX	I gX	CJ9FFI B
					<Uá]ob		5fU
							&& \$\$Gé h
GMfch	%			cZ %	: fca.	FibkUm* 9bX	H. 9(YcZUj YaYh
							@Gj7cbg! %9489%
GfZAW	57			: Uá]m	5@SCH5dhdg	NbY	7Uf]cfm
							FUb. G
5fU				&& \$\$Gé h	@Y[h.	&& : h	K]h.
							%\$\$: h
GUg				GUv@Y[h.	: h	GUVK]h.	: h
							>clh@Y[h.
Gci Xf.				GfYHhNf		; fUXY \$	@Ug \$
							: h
GMfcb7caaYhg							
Kcf_8UY %9489%*				Kcf_HndY Bk7cbg! Vcb! h]U			7cXY BI !-B
							=gAUcfA/ F. HiY
Kcf_8UY %9489%				Kcf_HndY 7cXA] UMGYUá] &hWg			7cXY AC@&
							=gAUcfA/ F. HiY
@Gj7cbg! 8UY %9489%				HUCládYg)			G fj YhX '
7cb]hdg D7= -,							
-hg]Mfcb7caaYhg							
GládYBi aVf. \$%				HndY	F	5fU	) \$\$\$ \$\$Gé h
							D7= -(
GládY7caaYhg							
() 89DF9GGCB				@		% '\$\$ Gé h	
(, @/ H7F				@		% '\$\$: h	
) + K95H: 9F-B;				@		\$\$\$ \$\$ Gé h	
GládYBi aVf. \$				HndY	F	5fU	) \$\$\$ \$\$Gé h
							D7= %\$
GládY7caaYhg							
OBc8jgYg?							
GládYBi aVf. \$(				HndY	F	5fU	) \$\$\$ \$\$Gé h
							D7= %\$
GládY7caaYhg							
OBc8jgYg?							

BYkcf.	<56		BLAY	AUfcb7cihhfUblj: jY5jrbfh		
GFUW	F%*		BLAY	FihkUm%!*<Ua]lab	I g	FI BK5M 5fYU))' \$\$\$Gc h
GMfch	\$%	cZ %	: fca.	FihkUm% 9bX	H.	FihkUm* 9bX @Uj7cbg! %%%48%
GfZAW	57	: Ua]m	5@SCHFKg	NbY	7UH[cfm	FUb. D
5fYU	)')' \$\$\$Gc h	@Y[h.	)j' \$: h	K]Ph.	%\$S: h	
GUg		GUV@Y[h.	: h	GUVK]Ph.	: h	>ch@Y[h. : h
Gci Xf.		GfYWHdY		; fUX \$		@Ubg \$
GMfcb7caaYlg						
Kcf_8UY %%%)*		Kcf_HdY	Bk7cbgUcb! h]U		7cXV BI !-B	=AUcfA/ F. HiY
Kcf_8UY %%%48%		Kcf_HdY	7cXA]~UXjYUm&hWg		7cXV AC@&	=AUcfA/ F. HiY
@Uj7cbg!8UY %%%48%		HRUcladYg	%%%		GfjYbX %	
7cb]cbg D7= -%						
-bg]cb7caaYlg						
QladYBi aVf. \$%		HdY	F	5fYU	) \$\$\$5\$Gc h	D7= - \$
QladY7caaYlg						
(, @/ H7F		@		%)'5\$: h		
QladYBi aVf. \$		HdY	F	5fYU	) \$\$\$5\$Gc h	D7= - &
QladY7caaYlg						
(, @/ H7F		@		- *'5\$: h		
)+ K95H 9F-B;		@		)'5\$ Gc h		
QladYBi aVf. %\$		HdY	F	5fYU	) \$\$\$5\$Gc h	D7= ,)
QladY7caaYlg						
(, @/ H7F		@		&)'5\$: h		
QladYBi aVf. %%%		HdY	F	5fYU	' \$\$\$5\$Gc h	D7= - \$
QladY7caaYlg						
(, @/ H7F		@		-)'5\$: h		
QladYBi aVf. %		HdY	F	5fYU	) \$\$\$5\$Gc h	D7= -(
QladY7caaYlg						
(, @/ H7F		@		+ '5\$: h		
QladYBi aVf. &&		HdY	F	5fYU	) \$\$\$5\$Gc h	D7= -'
QladY7caaYlg						
(, @/ H7F		@		,)'5\$: h		
QladYBi aVf. &		HdY	F	5fYU	) \$\$\$5\$Gc h	D7= -'
QladY7caaYlg						
(, @/ H7F		@		%\$5\$: h		
QladYBi aVf. '*		HdY	F	5fYU	) \$\$\$5\$Gc h	D7= ,+
QladY7caaYlg						
(, @/ H7F		@		&\$5\$: h		
QladYBi aVf. ('		HdY	F	5fYU	) \$\$\$5\$Gc h	D7= - \$
QladY7caaYlg						
(, @/ H7F		@		%)'5\$: h		
QladYBi aVf.)\$		HdY	F	5fYU	) \$\$\$5\$Gc h	D7= -'
QladY7caaYlg						
(, @/ H7F		@		%\$5\$: h		
QladYBi aVf.)+		HdY	F	5fYU	) \$\$\$5\$Gc h	D7= -%
QladY7caaYlg						
(, @/ H7F		@		%&'5\$: h		

QādYBīaVf. *(HdY F 5fU) \$\$\$Gē h D7= ,(

QādY7caaYlg

(, @/ H7F @ & \$\$\$: h
)\$ D5H7<-B; @ \$\$\$ Gē h

QādYBīaVf. +% HdY F 5fU) \$\$\$Gē h D7= - &

QādY7caaYlg

(, @/ H7F @ %'\$\$: h

QādYBīaVf. +, HdY F 5fU) \$\$\$Gē h D7= - &

QādY7caaYlg

(, @/ H7F @ %'\$\$: h

QādYBīaVf. ,) HdY F 5fU) \$\$\$Gē h D7= - \$

QādY7caaYlg

(, @CB; -H 8-B5@HF5BGJ9FG' @ %'\$\$: h
7F57?-B;

QādYBīaVf. - & HdY F 5fU) \$\$\$Gē h D7= - &

QādY7caaYlg

(, @/ H7F @ %'\$\$: h

QādYBīaVf. -- HdY F 5fU) \$\$\$Gē h D7= -)

QādY7caaYlg

(, @/ H7F @))'\$\$: h

BV kcf_	<56		B lāY	A Ufcb7cihhfFUb_jb: jY5jrbfh			
G fUW	H 5%		B lāY	H I]kūi5%< ū]lbb	I g	H 5L-K5M	5 fU , S(%Gē h
G Wfch	S %	c Z &	: fca.	G WfcbS&		H . 5dRbS%	@ g]7cbg]l *#&#SS
G fZAW	5 DV	: ū]m	5 @SCH57HI]kūg	N cbY		7 Uf]cfm	F ub. G
5 fU		)ž)SGe h	@ Y[h.	% S: h	K]Ph.	'): h	
G Ug		G U@Y[h.	: h	G UWk]Ph.	: h	> ch@Y[h.	: h
G ci Xf.		G fYWHdY		; fUX \$		@ bg \$	
G Wfcb7caa Ylg							
K cf_8UY	% #%SS	K cf_HdY	B k7cbg]l Vcb! :h]U		7 cX	B I!-B	= AUcfA/ F. HiY
K cf_8UY	* #&#SS	K cf_HdY	B k7cbg]l Vcb! :h]U		7 cX	B I!-B	= AUcfA/ F. HiY
@ g]hgl'8UY	% #%SS%	H RUclādYg	%		G fjYX	%	
7 cb]hbg	D 7= +)						
= bg]Wfcb7caa Ylg							
Q lādYBi aVf.	S %	H dY	F	5 fU	).) SSS Gē h	D 7= +)	
Q lādY7caa Ylg							
(,	@ / H7F	@		() 'SS : h			
(,	@ / H7F	A		() 'SS : h			
) +	K 95H 9F-B;	A		).) SSS Gē h			

BYkcf.	<56	BláY	AUfcb7cihhfUblj: jY5jrbfh
GfUW	H5%	BláY	HIjkúis%<ú]lób
GWfch	\$&	cZ &	: fca. Fibkúh%!* * H. GWfcb\$%
GfZAW	D77	: Úa]m	5@SCHD77HU]kúg NóbY
5fU		+(~-%Gh	@Y[h. &2%: h K]h. ') : h
GUg	,%	GV@Y[h.	%h GUVK]h. - : h >ch@Y[h. %z*\$: h
Gci Xf.		GfYWHdY	; fUX \$ @Ug \$
GWfcb7caaYlg			
Kcf_8UY	*#4888&	Kcf_HdY	Bk7chjVcb!h]U
@ghjg!8UY	%#488%	HRUladYg	(% GfjYhX -
7ch]hcg	D7=	-%	
hgNWfcb7caaYlg			
QladYBiaVf.	\$%	HdY	F 5fU \$\$\$GUg D7= -'
QladY7caaYlg			
*)	>HC85@8A;	A	\$\$\$ GUg
QladYBiaVf.	\$&	HdY	F 5fU \$\$\$GUg D7= -%
QladY7caaYlg			
*)	>HC85@8A;	A	\$\$\$ GUg
+(	>CBHD5@	@	\$\$\$ GUg
QladYBiaVf.	\$	HdY	F 5fU \$\$\$GUg D7= -'
QladY7caaYlg			
*)	>HC85@8A;	A	\$\$\$ GUg
QladYBiaVf.	;%	HdY	F 5fU \$\$\$GUg D7= -'
QladY7caaYlg			
*)	>HC85@8A;	A	\$\$\$ GUg
QladYBiaVf.	%	HdY	F 5fU \$\$\$GUg D7= -%
QladY7caaYlg			
*)	>HC85@8A;	A	\$\$\$ GUg
+(	>CBHD5@	@	\$\$\$ GUg
QladYBiaVf.	&	HdY	F 5fU \$\$\$GUg D7= ,,
QladY7caaYlg			
*)	>HC85@8A;	A	\$\$\$ GUg
**	GA5@@D5H7<	@	\$\$\$ GUg
+\$	G75@B;	A	\$\$\$ GUg
QladYBiaVf.	&	HdY	5 5fU \$\$\$GUg D7= ++
QladY7caaYlg			
*&	7CFB9F6F95?	<	\$\$\$ GUg
*)	>HC85@8A;	A	\$\$\$ GUg
**	GA5@@D5H7<	A	\$\$\$ GUg
+(	>CBHD5@	@	\$\$\$ GUg
QladYBiaVf.	'%	HdY	F 5fU \$\$\$GUg D7= -&
QladY7caaYlg			
*)	>HC85@8A;	A	\$\$\$ GUg
**	GA5@@D5H7<	@	\$\$\$ GUg
QladYBiaVf.	'	HdY	F 5fU \$\$\$GUg D7= -'
QladY7caaYlg			
*)	>HC85@8A;	A	\$\$\$ GUg

BYkcf.	<56		BUaY	AUfcb7cihhfUblj: jY5jrbfh			
GfUW	H5&		BUaY	HI]kUir7dbNMfS <Ua]lab I g	H5L-K5M	5fU	%\$Geh
GMch	\$%		cZ &	: fca. FibkUir%!* *	H. HI]kUir5%		@g]7cbg]! *#4SS&
GfUW	D77		: Ua]m 5@SCHD77HI]kUig	NdbY	7U]cfm		FU. G
5fU		%\$*! Geh	@Y]h.	&% h	K]h.	) : h	
GUg	%		GU@Y]h.	% h	GUVK]h.	- : h	>ch@Y]h. %& : h
Gci Xf.			GfY]HdY		; fUX \$		@Ug \$
GMcb7caaYlg							
Kcf_SUY	*#4SS&		Kcf_HdY	Bk7cbg]Ucb! : j]U	7cX BI!B		=AUcfA/ F. HiY
@g]7cbg]!SUY	%\$#SS%		HRUladYg	*	GfjYhX	'	
7cb]Uhg	D7= -'						
-hg]Ucb7caaYlg							
QadYBiaVf.	\$&		HdY	F	5fU	&'SS GUg	D7= -'
QadY7caaYlg							
*)	>CHQ95@85A5; 9		A		&'SS GUg		
QadYBiaVf.	\$		HdY	F	5fU	SS\$ GUg	D7= -'
QadY7caaYlg							
*)	>HQ95@8A;		A		SS\$ GUg		
QadYBiaVf.	9		HdY	F	5fU	&'SS GUg	D7= -'
QadY7caaYlg							
*)	>CHQ95@85A5; 9		A		&'SS GUg		

BYkcf.	<56		BUAY	AUfcb7cihhfUblj: jY5jrbh			
GFUW	H5&		BUAY	HIjkUir7dbNMfS <Ua]lab IgY	H5L-K5M	5fU	%\$Geh
GMch	\$&		cZ &	: fca. HIjkUis%	H. 7dMAY5drb		@gh7dgh' *#4SS&
GfzW	D77		: Ua]m 5@SCHD77HIjkUig	NbY	7Uf[cfm		Fub. G
5fU		+&+ Geh	@Y[h.	%\$: h	K]Ph.	) : h	
GUg	- &		GV@Y[h.	% h	GVK]Ph.	- : h	>ch@Y[h. -%: h
Gci Xf.			GfYWHdY		; fUX \$		@Ug \$
GMcb7caaYlg							
Kcf_SUY	*#4SS&		Kcf_HdY Bk7dgh' Vcb' h]U		7cX BI!B		=AUcfA/ F. HiY
@gh7dgh'SUY	%#4SS%		HRUladYg (		GfjYhX '		
7dgh' Vcb' D7=	- %						
hgNMcb7caaYlg							
QladYBiaVf.	\$%		HdY	F	5fU	&SS GUg	D7= -'
QladY7caaYlg							
*)	>CBHQ5@85A5; 9		A		&SS GUg		
QladYBiaVf.	\$		HdY	F	5fU	&SS GUg	D7= - \$
QladY7caaYlg							
*)	>HQ5@8A;		A		&SS GUg		
+(	>CBHQ5@		@		&SS GUg		
QladYBiaVf.	\$		HdY	F	5fU	&'SS GUg	D7= - %
QladY7caaYlg							
*)	>CBHQ5@85A5; 9		A		&'SS GUg		
+) 7CFB9F'GD5@			@		%SS GUg		

BYkcf.	<56		BLáY	AUfcb7cihhfUbl: jY5jfbh			
GfUW	H5'		BLáY	HI]kúis' <Uá]bb	I gY	H5L-K5M	5fU
							+S + G: h
GM]ch	\$%	cZ %	: fca.	Fibkúh%!' *		H: 5dRb\$%	@Gj7cbgH' %%%)*
GfUW	57	: Uá]m	5@SCH57HI]kúg	NbY		7UH]cfm	FU. G
5fU		+S + G: h	@Y[h.	%) : h	K]h.	') : h	
GUg		GU@Y[h.	: h	GUVK]h.	: h	>ch@Y[h.	: h
Gci XE.		GfYWHdY		; fUX \$		@Ug \$	
GM]cb7caaYlg							
Kcf_8UY %%%)*		Kcf_HdY	Bk7cbgU]cb: h]U		7cX BI!B		=AUcfA/ F. HfY
@Gj7cbgH'8UY %%%)*		HRU]adYg %		GfjYhX %			
7cb]hcg D7= -,							
-hgNM]cb7caaYlg							
GládYBiaVf. \$%		HdY	F	5fU	+S +'SSG: h	D7= -,	
GládY7caaYlg							
(, @/ H7F		@		, 'SS : h			

BYkcf.	<56		BláY	AUfcb7cihhfUblj: jY5jfbfh				
GfUW	H5(		BláY	HI]kúis(<Uá]lob	I gY	H5L-K5M	5fYU	&&+' G& h
GMfch	\$%	cZ %	: fca.	Fibkúh%!" *		H. <U]Ufg		@g]7cbg]l %%%)*
GfZUW	57	: Uá]m	5@SCH57HI]Ubg	NbY		7U]cfm		FU. H
5fYU		&&+' G& h	@Y]h.	(+* :h	K]Ph.	(, :h		
GUg		GU@Y]h.	:h	GUVK]Ph.	:h	>ch@Y]h.		:h
Gci Xf.		GfY]HdY		; fUX \$		@Ubg \$		
GMfcb7caaYlg								
Kcf_8UY %%%)*		Kcf_HdY	Bk7cbg]Ucb' h]U		7cXV BI!B			=AUcfA/ F. HfY
@g]hgl'SUY %%%)*		HRUladYg)			GfjYhX '			
7cb]hbg D7= -&								
hg]Ufcb7caaYlg								
QladYBiaVf. \$%		HdY	F	5fYU	(- &'\$\$G& h	D7= -'		
QladY7caaYlg								
(, @/ H7F		@		- '\$\$:h				
QladYBiaVf. \$		HdY	F	5fYU	(, \$\$\$G& h	D7= -(
QladY7caaYlg								
(, @/ H7F		@		+ '\$\$:h				
QladYBiaVf. \$		HdY	F	5fYU	'*.'\$\$G& h	D7= -\$		
QladY7caaYlg								
(, @/ H7F		@		)\$\$ :h				
(, @/ H7F		A		* '\$\$:h				

BYkcf.	<56	BLaY	AUfcb7cihhfUblj: jY5jrbfh				
GfUW	H7S%	BLaY	HI]kUn7dbNMfS%<Ua]lab I gY	H5L-K5M	5fU	&Z% G: h	
GM]ch	\$%	cZ %	: fca. FibkUn%!*	H: 5drb\$%		@Gj7cbg! %%%)*	
GfZUW	57	: Ua]m 5@SCH57HI]kUg	NdbY	7UH]cfm		FUb. G	
5fU	&Z% G: h	@Y[h.	%) : h	K]Ph.	%(: h		
GUg		GU@Y[h.	: h	GUVK]Ph.	: h	>ch@Y[h.	: h
Gci XE.		GfYWHdY		; fUX \$		@Ug \$	
GM]cb7caaYlg							
Kcf_8UY %%%)*		Kcf_HndY Bk7cbg]Vcb! :h]U		7cX BI!B		=AUcfA/ F. HfY	
@Gj7cbg!8UY %%%)*		HRUcladYg)		GfjYnX '			
7cb]hcg D7= -&							
-hgNM]cb7caaYlg							
CladYBiaVE. \$%		HndY	F	5fU	*SS\$G: h	D7= -+	
CladY7caaYlg							
(, @/ H7F		@		%SS : h			
CladYBiaVE. \$		HndY	F	5fU	) * &'SS G: h	D7= ,*	
CladY7caaYlg							
(, @/ H7F		@		&('SS : h			
CladYBiaVE. \$		HndY	F	5fU	'* -SS G: h	D7= -(
CladY7caaYlg							
(, @/ H7F		@		))'SS : h			

BYkcf.	<56		BLAY	AUfcb7cihhfUblj: jY5jrbfh			
GfUW	H5B; %		BLAY	HI]kUia U]Uf\$%<Ua]lab	I gY	H5L-K5M	5fU
GWfch	\$&	cZ &	: fca.	GWfcb\$%		H. H<U]Ug	@g]7cbg]l %%%)*
GfUW	57	: Ua]m	5@SCH57HI]UBg	NbY		7U]cfm	FU. H
5fU	%Z-' G&h	@Y]h.	(' &h	K]Ph.		(\$:h	
GUg		GU@Y]h.	:h	GUVK]Ph.	:h	>ch@Y]h.	:h
Gci Xf.		GfY]HhY		; fUX \$		@Ubg \$	
GWfcb7caa Ylg							
Kcf_8UY %%%)*		Kcf_HhY	Bk7cbg]Ucb:]h]U		7cXV BI!-B	=gAUcfA/ F. HhY	
@g]hgl'8UY %%%)*		HRUcladYg	(	GfjYhX	'		
7cb]hbg D7= *)							
hg]Wfcb7caa Ylg							
GladyBiaVf. \$%		HhY	F	5fU	('-'\$G&h	D7= %*	
Glady7caa Ylg							
(, @/ H7F		A		%\$\$\$:h			
(, @/ H7F		<		(\$\$\$:h			
)\$ D5H<-B;		@		*\$\$\$ G&h			
)+ K95H9F-B;		@		'-'\$G&h			
)+ K95H9F-B;		A		)\$\$\$\$ G&h			
GladyBiaVf. \$		HhY	F	5fU	(\$\$\$\$\$G&h	D7= *'	
Glady7caa Ylg							
(, @/ H7F		A		&\$\$\$:h			
)\$ D5H<-B;		@		*\$\$\$ G&h			
)+ K95H9F-B;		A		'-(\$\$\$ G&h			
GladyBiaVf. \$		HhY	F	5fU	*((\$\$\$G&h	D7= +&	
Glady7caa Ylg							
(, @/ H7F		A		%\$\$\$:h			
)+ K95H9F-B;		A		*((\$\$\$ G&h			

BYkcf.	<56	BLáY	AUfcb7cihhfUblj: jY5]rbfh
GfUW	H 5B, \$%	BLáY	HI]kUia U]Uf\$%< U]lab I g̃ H5L-K5M 5fYU ' *z() Gē h
GMfch	\$%	cZ &	: fca. FibkUñ%!" * H. GMfcb\$& @Uj7cbgH' %\$#48\$%
GfUW	57	: U]m 5@SCH57HI]Ubg	NcbY 7UH]cfm FUb. H
5fYU	%\$) &Gē h	@Y[h.	*++: h K]Ph. & : h
GUg		GUV@Y[h.	: h GUVK]Ph. : h >cbh@Y[h. : h
Gci Xf.		GfYWHndY	; fUX \$ @Ubg \$
GMfcb7caaYlg			
Kcf_8UY	%\$#)*	Kcf_HndY Bk7cbgU]cb! :h]U	7cXY BI!-B =gAUcfA/ F. HiY
Kcf_8UY	%\$#48\$%)	Kcf_HndY 7cXA]~&/ &C]Yfm	7cXY 7A!C@& =gAUcfA/ F. HiY
@Uj7cbg'8UY	%\$#48\$%	HBUcladyg (	GfjYXK '
7cb]hbg	D7= -'		
-bg]Mfcb7caaYlg			
QádYBi aVf.	\$%	HndY F	5fYU)- %'\$\$Gē h D7= -+
QádY7caaYlg			
(, @/ H7F		@	%'\$\$: h
QádYBi aVf.	\$&	HndY F	5fYU)*\$\$\$Gē h D7= -'
QádY7caaYlg			
(, @/ H7F		@	-- '\$\$: h
QádYBi aVf.	\$	HndY F	5fYU)*\$\$\$Gē h D7= ,,
QádY7caaYlg			
(, @/ H7F		@	+\$\$\$: h
(, @/ H7F		A	%'\$\$: h

BYkcf.	<56		BláY	AUfcb7cihhfUblj: jY5jrbfh			
GfUW	HFk'*		BláY	HUjkuHfHfciBKFk'*	IgY	H5L-K5M	5fU
				<Uá]ob			%Z(- Gc h
GWfch	%		cZ %	: fca.	CjYfifFihkúh* 9bX	H. 9[YcZUj YaYh	@Gj7chg' %848%
GfZAW	57		: Uá]m	5@SCH57HU]kúg	NbY	7U]cfm	FUb. D
5fU		%Z(- Gc h	@Y[h.	%' :h	K]h.	-* :h	
GUg		GU@Y[h.		:h	GUVK]h.	:h	>clh@Y[h. :h
Gci Xf.		GfYHhY			; fUY \$	@Ug \$	
GWfcb7caaYhg							
Kcf_8UY %848%*			Kcf_HdY Bk7chg' Vcb! :h]U			7cXY BI !B	=gAUcfA/ F. HiY
Kcf_8UY %848%			Kcf_HdY 7cXA]~UMGjYUn' &hWg			7cXY AC@&	=gAUcfA/ F. HiY
@Gj7chg' 8UY %848%			HUcládYg (			GfjYhX '	
7cb]hdg D7=	- +						
-hgNWfcb7caaYhg							
QádYBi aVf. %		HdY	F	5fU	(, \$\$\$Gc h	D7=	-*
QádY7caaYhg							
(, @/ H7F		@		%'\$\$:h			
) + K95H 9F-B;		@		) \$\$\$ Gc h			
QádYBi aVf. \$&		HdY	F	5fU	(, \$\$\$Gc h	D7=	%\$
QádY7caaYhg							
OBc8]gYg?							
QádYBi aVf. \$		HdY	F	5fU	(, \$\$\$Gc h	D7=	-*
QádY7caaYhg							
() 89IF9GCB		@		*'\$\$ Gc h			
(, @/ H7F		@		%\$\$:h			

APPENDIX E
DISTRESS SUMMARY REPORT



) ° :
 U # k 7 ° ' = ° "

"	o	o	o	)	)	)	o	j	j)
				v		U			y	
°		°#			OV8ey) @° Ouk° Vof- lo° #k° #MOS.....	#)	O		7	
°		°#			OV8ey) @° Ouk° Vof- lo° #k° #MOS.....	#)	U		7	
°		°#			‡ - ° u- kOS.....	#)	O		o7	
°		°#			OV8ey) @° Ouk° Vof- lo° #k° #MOS.....	#)	O		7	
°		°#			OV8ey) @° Ouk° Vof- lo° #k° #MOS.....	#)	U		7	
°		°#			k† - OS.....	#)	O		o7	
°		°#			‡ - ° u- kOS.....	#)	O		o7	
°		°#			‡ - ° u- kOS.....	#)	U		o7	
°		°h			K@uk 7@#u@V#k° #MOS.....	#)	O		7	
°		°h			K@uk 7@#u@V#k° #MOS.....	#)	U		7	
k		°#			OV8ey) @° Ouk° Vof- lo° #k° #MOS.....	#)	O		7	
k		°#			OV8ey) @° Ouk° Vof- lo° #k° #MOS.....	#)	U		7	
k		°#			k† - OS.....	#)	O		o7	
k		°#			‡ - ° u- kOS.....	#)	O		o7	
u°		°#			) - Hk @@V.....	\	O		o7	
u°		°#			OV8ey) @° Ouk° Vof- lo° #k° #MOS.....	#)	O		7	
u°		°#			OV8ey) @° Ouk° Vof- lo° #k° #MOS.....	#)	U		7	
u°		°#			‡ - ° u- kOS.....	#)	O		o7	
u°		°#			‡ - ° u- kOS.....	#)	U		o7	

U) ° :
 # k 7 ° ' = ° "

"	o	o	o	)	)	)	o	j	j)
u° V8		° #		v		U	o		y)
u° V8		° #			O V8 y) @° Ouk° Vd- ko'	#)	o		7	
u° V8		° #			#k #M8.....	#)	o		o7	
					‡ - ° u- k08.....	#)	o			

° # ° # # ° ° # ° \ ° # h## h # # ° h# ° \ h##

APPENDIX F

INVENTORY

F1: Section Forecasted Pavement Condition Rating

F2: Branch PCI Rating

F3: Branch FOD Rating

Appendix F1
Forecasted Section PCI
Marion County-Rankin Fite Airport (HAB)

Branch ID	Section ID	Forecasted PCI						
		2021	2022	2023	2024	2025	2026	2027
A01	01	36	34	32	30	28	25	23
R1836	01	87	84	80	76	73	71	70
TA1	01	72	70	66	62	57	52	48
TA1	02	90	89	88	87	87	86	85
TA2	01	92	91	90	89	89	88	87
TA2	02	90	89	88	87	87	86	85
TA3	01	96	94	92	89	87	84	82
TA4	01	89	86	84	81	79	77	75
TC01	01	89	86	84	81	79	77	75
THANG01	01	90	87	85	82	80	78	76
THANG01	02	60	55	50	46	45	41	37

6fUw7cbYhcbFYhfh DjY%Z&
 DjYaYHSUUVgy 5@SCH7ca VbYSS%89%

6fUw7s	Bi a VfcZ GMfcbg	G a 'GMfcb' @b|h HE	5j| 'GMfcb' KPh HE	Hi Y5fYU RGe HE	I gy	5j YU Y D7=	GRbXEX 8Y Jfcb' D7=	KY| \HX 5j YU Y D7=
59%	%	() *'SS	%8SS	*'ž (\$SS	5DFCB	' - 'SS	\$SS	' - 'SS
F%' *	%	)ž' \$SS	%89SS	)' žSS\$SS	FI BK5M	- %SS	\$SS	- %SS
H5%	&	88z)'SS	')'SS	, 8z ('8SS	H5L-K5M	, 'SS	, 'SS	, - ' &
H5&	&	' , %SS	')'SS	%ž89SS	H5L-K5M	- 8SS	%SS	- 8SS
H5'	%	%)'SS	')'SS	+ž + 'SS	H5L-K5M	- , 'SS	\$SS	- , 'SS
H5(	%	(+*'SS	(, 'SS	88z + 'SS	H5L-K5M	- 8SS	\$SS	- 8SS
H79%	%	%)'SS	%('SS	88z %'SS	H5L-K5M	- 8SS	\$SS	- 8SS
H 5B; 9%	&	926 'SS	' ('SS	' *ž() 'SS	H5L-K5M	+ 'SS	%'SS	+ ') &

%#SS%
6fubW7cbYhcbFYbch
DjY&cZ&
DjYaYHSUWUy 5@BCH7caVbYSS%SS%

I gY7UW cfm	Bi a VYfcZ GWI cbg	HEU'5fYUQe: IL	5f ha Y W 5j YU YD7=	5j YU YG B D7=	KY \ BX 5j YU YD7=
5DFCB	%	*' ž (SSS	' - 'SS	SSS	' - 'SS
FI BK5M	%))' zSSSS	- %SS	SSS	- %SS
H5L-K5M	-	%&@'SS	, +' ,	- " -	, , " (
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6fUw:8	Bi a VfcZ GMfcbg	G a 'GMfcb' @b h HE	5j 'GMfcb' KPh HE	Hi Y5fYU fGe HE	I gY	5j YU Y : CS' DcHhJU	GRbXEX 8Y U cb' : CS DcHh	KY \fX 5j YU Y : CS DcHh
AO1	1	4600	1400	638000	APRON	750	000	750
R1836	1	553000	1000	5300000	RUNWAY	1900	000	1900
TA1	2	228500	3500	8044100	TAXIWAY	3550	250	3337
TA2	2	38100	3500	1801000	TAXIWAY	3250	150	3221
TA3	1	15500	3500	703700	TAXIWAY	1100	000	1100
TA4	1	47600	4800	2297300	TAXIWAY	1800	000	1800
TC01	1	15500	17400	2691900	TAXIWAY	1800	000	1800
THANG01	2	1,10900	3400	367500	TAXIWAY	3250	1650	3189

6fubW7cbYljbFYlcfh **DJY&cZ&**
DjYaYHSUWUy 5@BCHSS\$ %

I gY7UW| cfm	Bi a VYfcZ GWIcbg	HEU'5fYUQe IL	5fha YjW 5j YU Y: CS	5j YU YGB : CS DcHbJU	KY| \HX 5j YU Y: CS D
APRON	1	638100	750	000	750
RUNWAY	1	530000	1900	000	1900
TAXIWAY	9	192,12500	2756	11.75	2817
ALL	11	80896500	3109	1766	2560

APPENDIX G

SAFETY AND PREVENTIVE MAINTENANCE POLICIES



Appendix G1
Localized Safety (Stopgap) Repair Policy

Distress	Distress Severity	Description	Code	Work Type	Work Unit
41	High	ALLIGATOR CR	PA-FD	Patching - AC Full-Depth	SqFt
43	High	BLOCK CR	CS-AC	Crack Sealing - AC	Ft
45	High	DEPRESSION	PA-FD	Patching - AC Full-Depth	SqFt
47	High	JT REF. CR	CS-AC	Crack Sealing - AC	Ft
48	High	L & T CR	CS-AC	Crack Sealing - AC	Ft
50	High	PATCHING	PA-FD	Patching - AC Full-Depth	SqFt
53	High	RUTTING	PA-FD	Patching - AC Full-Depth	SqFt
54	High	SHOVING	PA-PD	Patching - AC Partial-Depth	SqFt
55	NA	SLIPPAGE CR	PA-PD	Patching - AC Partial-Depth	SqFt
56	High	SWELLING	PA-FD	Patching - AC Full-Depth	SqFt
61	High	BLOW-UP	SL-PC	Slab Replacement - PCC	SqFt
61	Medium	BLOW-UP	PA-PF	Patching - PCC Full Depth	SqFt
62	High	CORNER BREAK	PA-PF	Patching - PCC Full Depth	SqFt
63	High	LINEAR CR	PA-PF	Patching - PCC Full Depth	SqFt
63	Medium	LINEAR CR	CS-PC	Crack Sealing - PCC	Ft
64	High	DURABIL. CR	SL-PC	Slab Replacement - PCC	SqFt
64	Medium	DURABIL. CR	PA-PF	Patching - PCC Full Depth	SqFt
66	High	SMALL PATCH	PA-PP	Patching - PCC Partial Depth	SqFt
67	High	LARGE PATCH	PA-PF	Patching - PCC Full Depth	SqFt
70	High	SCALING	SL-PC	Slab Replacement - PCC	SqFt
71	High	FAULTING	GR-PP	Grinding (Localized)	Ft
72	High	SHAT. SLAB	SL-PC	Slab Replacement - PCC	SqFt
74	High	JOINT SPALL	PA-PP	Patching - PCC Partial Depth	SqFt
75	High	CORNER SPALL	PA-PP	Patching - PCC Partial Depth	SqFt
76	High	ASR	SL-PC	Slab Replacement - PCC	SqFt

Appendix G2
Localized Preventive Repair Policy

Distress	Distress Severity	Description	Code	Work Type	Work Unit
41	Medium	ALLIGATOR CR	PA-AD	Patching - AC Full-Depth	SqFt
41	High	ALLIGATOR CR	PA-AD	Patching - AC Full-Depth	SqFt
42	N/A	BLEEDING	PA-AS	Patching - AC Partial-Depth	SqFt
43	High	BLOCK CR	PA-AD	Patching - AC Full-Depth	SqFt
43	Medium	BLOCK CR	CS-AC	Crack Sealing - AC	Ft
44	Low	CORRUGATION	PA-AS	Patching - AC Partial-Depth	SqFt
44	High	CORRUGATION	PA-AS	Patching - AC Partial-Depth	SqFt
44	Medium	CORRUGATION	PA-AS	Patching - AC Partial-Depth	SqFt
45	Medium	DEPRESSION	PA-AD	Patching - AC Full-Depth	SqFt
45	Low	DEPRESSION	PA-AD	Patching - AC Full-Depth	SqFt
45	High	DEPRESSION	PA-AD	Patching - AC Full-Depth	SqFt
47	High	JT REF. CR	CS-AC	Crack Sealing - AC	Ft
47	Medium	JT REF. CR	CS-AC	Crack Sealing - AC	Ft
48	High	L & T CR	CS-AC	Crack Sealing - AC	Ft
48	Medium	L & T CR	CS-AC	Crack Sealing - AC	Ft
49	N/A	OIL SPILLAGE	PA-AD	Patching - AC Full-Depth	SqFt
50	High	PATCHING	PA-AD	Patching - AC Full-Depth	SqFt
50	Medium	PATCHING	PA-AD	Patching - AC Full-Depth	SqFt
52	High	RAVELING	PA-AS	Patching - AC Partial-Depth	SqFt
53	High	RUTTING	PA-AD	Patching - AC Full-Depth	SqFt
53	Low	RUTTING	PA-AD	Patching - AC Full-Depth	SqFt
53	Medium	RUTTING	PA-AD	Patching - AC Full-Depth	SqFt
55	N/A	SLIPPAGE CR	PA-AD	Patching - AC Full-Depth	SqFt
56	Low	SWELLING	PA-AD	Patching - AC Full-Depth	SqFt
56	Medium	SWELLING	PA-AD	Patching - AC Full-Depth	SqFt
61	Low	BLOW-UP	PA-PF	Patching - PCC Full Depth	SqFt
61	Medium	BLOW-UP	PA-PF	Patching - PCC Full Depth	SqFt
61	High	BLOW-UP	PA-PF	Patching - PCC Full Depth	SqFt
62	Medium	CORNER BREAK	PA-PF	Patching - PCC Full Depth	SqFt
62	High	CORNER BREAK	PA-PF	Patching - PCC Full Depth	SqFt
62	Low	CORNER BREAK	CS-PC	Crack Sealing - PCC	Ft
63	Medium	LINEAR CR	CS-PC	Crack Sealing - PCC	Ft
63	High	LINEAR CR	PA-PP	Patching - PCC Partial Depth	SqFt
64	Medium	DURABIL. CR	PA-PF	Patching - PCC Full Depth	SqFt
64	High	DURABIL. CR	SL-PC	Slab Replacement - PCC	SqFt
65	High	JT SEAL DMG	JS-LC	Joint Seal (Localized)	Ft
65	Medium	JT SEAL DMG	JS-LC	Joint Seal (Localized)	Ft
66	High	SMALL PATCH	PA-PP	Patching - PCC Partial Depth	SqFt
66	Medium	SMALL PATCH	PA-PP	Patching - PCC Partial Depth	SqFt
67	Medium	LARGE PATCH	PA-PF	Patching - PCC Full Depth	SqFt

Appendix G2
Localized Preventive Repair Policy

Distress	Distress Severity	Description	Code	Work Type	Work Unit
67	High	LARGE PATCH	PA-PF	Patching - PCC Full Depth	SqFt
69	N/A	PUMPING	JS-LC	Joint Seal (Localized)	Ft
70	Medium	SCALING	PA-PP	Patching - PCC Partial Depth	SqFt
70	High	SCALING	SL-PC	Slab Replacement - PCC	SqFt
71	High	FAULTING	GR-PP	Grinding (Localized)	Ft
71	Medium	FAULTING	GR-PP	Grinding (Localized)	Ft
72	Medium	SHAT. SLAB	SL-PC	Slab Replacement - PCC	SqFt
72	High	SHAT. SLAB	SL-PC	Slab Replacement - PCC	SqFt
74	High	JOINT SPALL	PA-PP	Patching - PCC Partial Depth	SqFt
74	Medium	JOINT SPALL	PA-PP	Patching - PCC Partial Depth	SqFt
75	Medium	CORNER SPALL	PA-PP	Patching - PCC Partial Depth	SqFt
75	High	CORNER SPALL	PA-PP	Patching - PCC Partial Depth	SqFt
76	Medium	ASR	SL-PC	Slab Replacement - PCC	SqFt
76	High	ASR	SL-PC	Slab Replacement - PCC	SqFt

APPENDIX H

M&R UNIT COSTS

H1: M&R Unit Costs

H2: Component Costs for Repair

H3: Airport Category



Maintenance and Repair (M&R) Unit Costs

The M&R costs developed for the ALDOT PMP include costs for maintenance, preservation, and repair activities and are described below.

Unit Costs Source Data

The source for the M&R costs data is RSMMeans, which has data for 14 locations throughout Alabama, as identified by the yellow highlighted boxes in Figure 1. The cost data is presented in terms of individual line items like asphalt wearing course, aggregate base etc., which were consolidated to develop the activity costs described below.

The cost data show a distinct difference in costs between locations north and south of Birmingham, especially for the higher value items like the asphalt layers. Therefore, the unit costs were developed accordingly for the airports north and south of Birmingham, as identified in Figure 1. Appendix H2 presents the component costs used in developing the M&R costs.

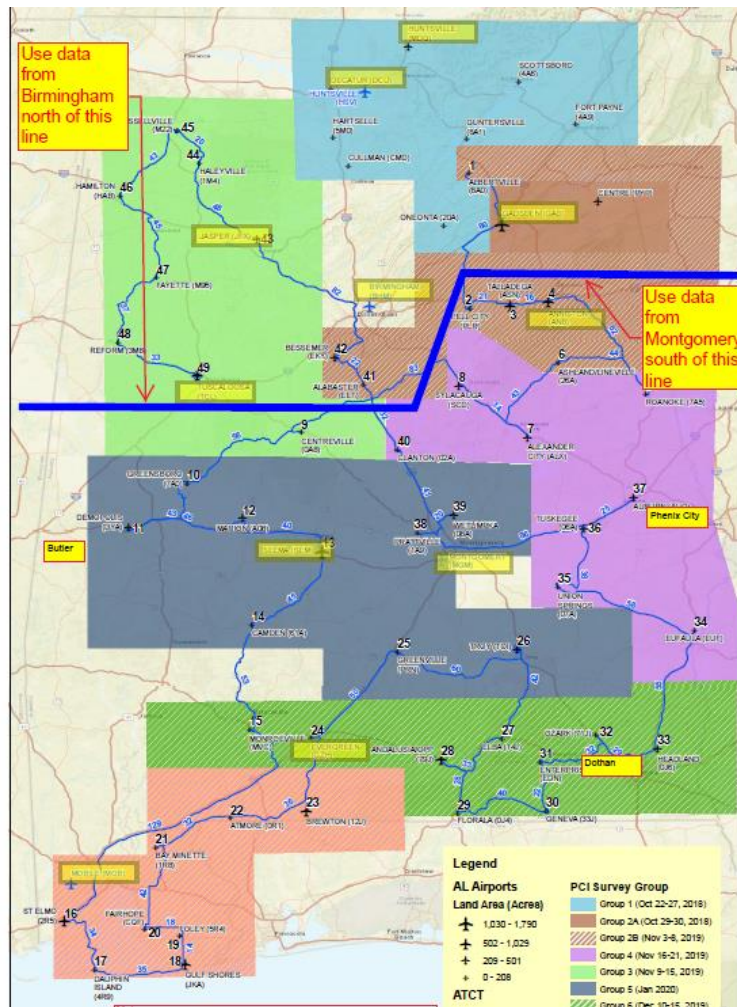


Figure 1: RSMMeans Unit Costs Locations.

Maintenance & Repair (M&R) Activities

Maintenance activities are localized activities which are typically assigned in the first year of the M&R plan based on the observed distresses.

Repair activities are further subdivided into preservation, rehabilitation, and reconstruction. Repair activities are conducted for larger areas, typically at the section level and are assigned based on the Critical Pavement Condition Index, denoted as CP in Table 1. The CP is based on the section’s rank or importance within the overall network and typically ranges from 55 to 70. The CP was set at 70 for the ALDOT runway pavements and 65 for the other pavements.

Table 1: Repair Activities.

Activity Type	PCI	Activity
Preservation	> CP	Runway Surface Treatment
		Taxiway and Apron Surface Treatment
Rehabilitation	> CP	2" AC OL ¹
	55 - CP	Mill 2" & 2" AC OL
	45 - 55	Mill 2" & 3" AC OL
Reconstruction	0 - 45	Reconstruct with AC

¹For Sections with Structural Distress and PCI greater than Critical PCI

The depths for the milling and overlay (AC OL) in Table 1 were established by creating a balance between removal of surficial distress and providing additional pavement structural capacity. All overlay options include full-depth patching to repair localized distresses.

From the FAA 5010 records, the Alabama airport network includes a wide range of allowable aircraft loads. The airports were divided into three categories of allowable aircraft loads based on requirements for minimum pavement thickness and the use of a P-401 surface layer. The categories are based on the aircraft maximum gross takeoff weight (MGTOW) and include: less than 12,500 lbs, 12,500 to 30,000 lbs, and 30,000 to 100,000 lbs. Appendix H3 presents the category for each airport.

For any sections requiring reconstruction, the pavement sections were established primarily in accordance with the requirements in Table 3 of the FAA’s Advisory Circular 150/5320-6F. The pavement sections used for developing the cost estimates are:

- ≤ 12,500 lbs 4" P-403 (State HMA Mix) + 6" P-209 Base
- 12,500 – 30,000 lbs 4" P-403 (State HMA Mix) + 8" P-209 Base
- 30,000 – 100,000 lbs 5" P-401 + 10" P-209 Base

It is important to note that while the FAA requires a stabilized base for those pavements that support aircraft operations with MGTOWs that are greater than 100,000 lbs, the number of such operations is minimal for those airports shown in Appendix H3. As a result, the cost of a stabilized base is excluded in the development of the unit costs for ALDOT’s PMP update. However, based on the Engineer’s future design and aircraft fleet mix development, project-level construction work could include the use of a stabilized base at that time.

M&R Unit Costs

Paving projects typically include additional project costs like mobilization, design, construction administration and inspections, and drainage improvements. A summary of non-direct pavement construction line items has been included in the unit costs in Tables 5 and 6 as described below. These non-direct items are expressed as a percentage of the total component costs for each activity.

These non-direct pavement construction items were developed from API’s extensive experience with APMP project cost estimation. These percentages may vary for Alabama airport construction projects; however, since the direct pavement scope of work is estimated in a network-level evaluation, these conservative estimates serve as a good starting point for the development of realistic total project costs and annual APMP budgets for ALDOT. For repair activities such as Mill & Overlay, which typically do not include significant drainage work, the corresponding multiplier was reduced by 50 percent. The non-direct cost factors are presented in Table 2.

Table 2: Cost Factors.

Factor	Function of	Estimate		
		Preservation	Rehabilitation	Reconstruction
Mobilization	All costs, less design	10%	10%	10%
Drainage Improvements	Paving costs	-	4%	8%
Contingency	All costs, less mobilization and design	10%	20%	20%
Design & CM	All costs, less mobilization and design	15%	20%	20%

The M&R unit costs for maintenance, preservation, and repair activities were developed from the RSMMeans cost data and are presented in the following section.

Maintenance

The maintenance activities include crack seal, and full and partial-depth patching. The unit costs are presented in Table 3.

Table 3: Unit Costs for Maintenance.

Activity	Unit Cost	Unit
Seal Cracks - AC	\$3.95	lf
AC Full-Depth Patching	\$25.05	sf
AC Partial-Dept Patching	\$16.28	sf
Seal Cracks – PCC	\$6.00	lf
PCC Full-Depth Patching	\$35.00	sf
PCC Partial-Depth Patching	\$175.00	sf
Jt. Seal	\$8.00	lf
Slab Replacement	\$20.00	sf

Preservation

The unit costs for the surface treatments are presented in Table 4. They include sealing of cracks and application of pavement markings.

Table 4: Unit Costs for Preservation Activities.

Activity	Unit Cost	Unit
Runway Surface Treatment	\$0.57	sf
Taxiway and Apron Surface Treatment	\$0.88	sf

Rehabilitation and Reconstruction

As discussed previously, repair activities are also divided into rehabilitation and reconstruction. The unit costs for airport repair for the Northern Region (Birmingham Area) and Southern Region (Montgomery Area) are shown in Tables 5 and 6, respectively.

Table 5: Unit Costs for Repair Activities, Northern Region.

Activity Type	Activity	MGTOV, thousand lbs		
		≤ 12.5	12.5-30	30-100
Rehabilitation	2" AC OL	\$3.78		\$4.19
	Mill 2" & 2" AC OL	\$4.15		\$4.56
	Mill 2" & 3" AC OL	\$5.18		\$5.79
Reconstruction	AC Reconstruction	\$8.40	\$9.10	\$10.91

Table 6: Unit Costs for Repair Activities, Southern Region.

Activity Type	Activity	MGTOV, thousand lbs		
		≤ 12.5	12.5-30	30-100
Rehabilitation	2" AC OL	\$3.54		\$3.91
	Mill 2" & 2" AC OL	\$3.90		\$4.27
	Mill 2" & 3" AC OL	\$4.82		\$5.37
Reconstruction	AC Reconstruction	\$7.63	\$8.25	\$9.87

Appendix H2
Component Costs for Repair

Activity Type	Unit	Birmingham (Northern)	Montgomery (Southern)	Comments
Milling 1" to 3"	SY	\$2.08	\$2.01	
Pavement Demolition	SY	\$6.34	\$6.12	
Haulage - For Demolition & AC	CY	\$6.08	\$5.87	
Haulage for 12" Thick Demolition	SY	\$2.03	\$1.96	
Haulage for 2" Thick AC Paving	SY	\$0.34	\$0.33	
Haulage for 3" Thick AC Paving	SY	\$0.51	\$0.49	
Haulage for 4" Thick AC Paving	SY	\$0.68	\$0.65	
AC Wearing Course	Ton	\$97.42	\$86.90	
AC Binder Course	Ton	\$87.80	\$78.17	
P401 - For airports with >60 kip aircraft	Ton	\$116.90	\$104.28	Assumed P401 cost to be 20% greater than AC Wearing Course
6" Aggregate Base (P208)	SY	\$10.17	\$9.12	
8" Aggregate Base (P208)	SY	\$13.29	\$11.89	
6" P209 Aggregate Base	SY	\$12.20	\$10.94	Assumed P209 cost to be 20% greater than P208
8" P209 Aggregate Base	SY	\$15.95	\$14.27	Assumed P209 cost to be 20% greater than P208
10" P209 Aggregate Base	SY	\$19.94	\$17.84	Direct multiplier for 10" from 8"
4" P154 Aggregate Base	SY	\$5.42	\$4.86	Assumed P154 cost to be 20% lower than P208
6" P154 Aggregate Base	SY	\$8.14	\$7.30	Assumed P154 cost to be 20% lower than P208
Pavement Markings	sf	\$1.48	\$1.39	

**Appendix H3
Airport Category**

Region	City	FAA ID	Max Gross Weight (Thousand lbs)			Max GW	Category
			S	D	2D		
Birmingham	Reform	3M8	12.5	-	-	12.5	<= 12,500
	Fayette	M95	15.0	-	-	15.0	12,500-30,000
	Hamilton	HAB	15.0	-	-	15.0	12,500-30,000
	Scottsboro	4A6	15.0	-	-	15.0	12,500-30,000
	Alabaster	EET	16.0	-	-	16.0	12,500-30,000
	Centre-Piedmont	PYP	16.0	-	-	16.0	12,500-30,000
	Fort Payne	4A9	16.0	-	-	16.0	12,500-30,000
	Haleyville	1M4	20.0	-	-	20.0	12,500-30,000
	Hartselle	5M0	20.0	-	-	20.0	12,500-30,000
	Guntersville	8A1	24.0	-	-	24.0	12,500-30,000
	Cullman	CMD	30.0	-	-	30.0	12,500-30,000
	Russellville	M22	30.0	-	-	30.0	12,500-30,000
	Jasper	JFX	50.0	-	-	50.0	> 30,000
	Oneonta	20A	20.0	35.0	55.0	55.0	> 30,000
	Bessemer	EKY	60.0	60.0	-	60.0	> 30,000
	Albertville	8A0	60.0	90.0	130.0	130.0	> 30,000
	Madison	MDQ	60.0	75.0	140.0	140.0	> 30,000
	Decatur	DCU	75.0	125.0	150.0	150.0	> 30,000
	Tuscaloosa	TCL	61.0	87.0	168.0	168.0	> 30,000
	Gadsden	GAD	90.0	115.0	195.0	195.0	> 30,000
Montgomery	Florala	0J4	-	-	-	-	<= 12,500
	Elba	14J	4.0	-	-	4.0	<= 12,500
	Headland	0J6	12.0	-	-	12.0	<= 12,500
	Roanoke	7A5	12.0	-	-	12.0	<= 12,500
	Greenville	PRN	15.0	-	-	15.0	12,500-30,000
	Union Springs	07A	15.0	-	-	15.0	12,500-30,000
	Wetumpka	08A	15.0	-	-	15.0	12,500-30,000
	Atmore	0R1	16.0	-	-	16.0	12,500-30,000
	Clanton	02A	16.0	-	-	16.0	12,500-30,000
	Eufaula	EUF	16.0	-	-	16.0	12,500-30,000
	Geneva	33J	16.0	-	-	16.0	12,500-30,000
	Greensboro	7A0	16.0	-	-	16.0	12,500-30,000
	Centreville	0A8	18.0	-	-	18.0	12,500-30,000
	Ashland-Lineville	26A	20.0	-	-	20.0	12,500-30,000
	Sylacauga	SCD	20.0	-	-	20.0	12,500-30,000
	St. Elmo	2R5	23.0	-	-	23.0	12,500-30,000
	Ozark	71J	-	25.0	-	25.0	12,500-30,000
	Camden	61A	27.0	-	-	27.0	12,500-30,000
	Bay Minette	1R8	28.0	-	-	28.0	12,500-30,000
	Foley	5R4	28.0	-	-	28.0	12,500-30,000
Tuskegee	06A	28.5	-	-	28.5	12,500-30,000	

**Appendix H3
Airport Category**

Region	City	FAA ID	Max Gross Weight (Thousand lbs)			Max GW	Category
			S	D	2D		
Montgomery	Alexander City	ALX	30.0	-	-	30.0	12,500-30,000
	Dauphin Island	4R9	30.0	-	-	30.0	12,500-30,000
	Pell City	PLR	30.0	-	-	30.0	12,500-30,000
	Prattville	1A9	30.0	-	-	30.0	12,500-30,000
	Enterprise	EDN	-	-	-	-	> 30,000
	Evergreen	GZH	30.0	50.0	-	50.0	> 30,000
	Marion	A08	30.0	50.0	-	50.0	> 30,000
	Selma	SEM	33.0	54.0	-	54.0	> 30,000
	Fairhope	CQF	36.0	58.0	-	58.0	> 30,000
	Brewton	12J	40.0	60.0	-	60.0	> 30,000
	Demopolis	DYA	30.0	38.0	60.0	60.0	> 30,000
	Monroeville	MVC	70.0	-	-	70.0	> 30,000
	Auburn-Opelika	AUO	45.0	75.0	-	75.0	> 30,000
	Talladega	ASN	30.0	65.0	95.0	95.0	> 30,000
	Gulf Shores	JKA	80.0	100.0	-	100.0	> 30,000
	Troy	TOI	24.0	80.0	140.0	140.0	> 30,000
	Anniston	ANB	28.0	43.5	260.0	260.0	> 30,000
Andalusia-OPP	79J	98.0	160.0	275.0	275.0	> 30,000	

APPENDIX I

PAVEMENT CAPITAL IMPROVEMENT PROGRAM

I1: PCIP Summary

I2: Year 1 Maintenance Plan



**Appendix I1
PCIP Summary**

Marion County-Rankin Fite Airport (HAB)

Branch & Section	2021	2022	2023	2024	2025	2026	2027
A01-01	StopGap \$6500.89 Before:36.36 After:36.36	Required Project Major Below Critical \$616056 Before:34.15 After:100	Preventive \$152.9 Before:97.79 After:97.79	Preventive \$314.97 Before:95.58 After:95.58	Preventive + Required Project Global MR \$42621.7 Before:93.36 After:97.79	Preventive \$334.15 Before:95.58 After:95.58	Preventive \$516.27 Before:93.37 After:93.37
R1836-01	Preventive + Required Project Global MR \$327870.9 Before:87.38 After:92.86	Preventive \$5535.08 Before:90.49 After:90.49	Preventive \$7559.72 Before:87.39 After:87.39	Preventive \$10060.16 Before:83.71 After:83.71	Preventive \$12865.72 Before:79.75 After:79.75	Preventive \$15491.07 Before:75.99 After:75.99	Preventive \$17863.63 Before:72.88 After:72.88
TA1-01	Preventive \$164.23 Before:72.29 After:72.29	Required Project Major Below Critical \$26239.5 Before:69.51 After:100	Preventive \$6.57 Before:98.98 After:98.98	Preventive \$14.32 Before:97.85 After:97.85	Preventive + Required Project Global MR \$3952.13 Before:96.33 After:98.98	Preventive \$15.19 Before:97.85 After:97.85	Preventive \$26.67 Before:96.33 After:96.33
TA3-01	Preventive + Required Project Global MR \$6219.89 Before:96.2 After:99.91	Preventive \$8.15 Before:98.9 After:98.9	Preventive \$17.2 Before:97.75 After:97.75	Preventive \$29.86 Before:96.2 After:96.2	Preventive \$47.09 Before:94.18 After:94.18	Preventive \$68.44 Before:91.79 After:91.79	Preventive \$92.82 Before:89.19 After:89.19

Appendix I1
PCIP Summary
Marion County-Rankin Fite Airport (HAB)

Branch & Section	2021	2022	2023	2024	2025	2026	2027
TA4-01	Preventive + Required Project Global MR \$20477.05 Before:88.89 After:96	Preventive \$146.63 Before:93.94 After:93.94	Preventive \$211.25 Before:91.52 After:91.52	Preventive \$284.76 Before:88.9 After:88.9	Preventive \$363.2 Before:86.25 After:86.25	Preventive \$442.88 Before:83.73 After:83.73	Preventive \$521.15 Before:81.41 After:81.41
TC01-01	Preventive + Required Project Global MR \$23994.32 Before:88.89 After:96	Preventive \$171.81 Before:93.94 After:93.94	Preventive \$247.54 Before:91.52 After:91.52	Preventive \$333.67 Before:88.9 After:88.9	Preventive \$425.59 Before:86.25 After:86.25	Preventive \$518.95 Before:83.73 After:83.73	Preventive \$610.67 Before:81.41 After:81.41
THANG01-01	Preventive + Required Project Global MR \$16960.99 Before:89.97 After:96.71	Preventive \$103.73 Before:94.83 After:94.83	Preventive \$154.17 Before:92.54 After:92.54	Preventive \$213.14 Before:89.98 After:89.98	Preventive \$277.9 Before:87.32 After:87.32	Preventive \$344.72 Before:84.73 After:84.73	Preventive \$410.86 Before:82.33 After:82.33
THANG01-02	StopGap \$365.73 Before:59.75 After:59.75	Required Project Major Below Critical \$97311.5 Before:54.85 After:100	Preventive \$19.53 Before:98.98 After:98.98	Preventive \$42.57 Before:97.85 After:97.85	Preventive \$74.74 Before:96.33 After:96.33	Preventive \$118.52 Before:94.35 After:94.35	Preventive \$172.91 Before:91.99 After:91.99

Appendix I2
Localized Maintenance Plan
Marion County-Rankin Fite Airport (HAB)

Branch ID	Section ID	Policy	Distress Code	Description	Severity	Distress Qty	Distress Unit	Percent Distress	Work Description	Work Qty	Work Unit	Unit Cost	Work Cost
A01	01	Safety	41	ALLIGATOR CR	Medium	53	SqFt	0.08	No Localized M & R	0		\$0.00	\$0
A01	01	Safety	43	BLOCK CR	Medium	63,787	SqFt	99.92	No Localized M & R	0		\$0.00	\$0
A01	01	Safety	52	RAVELING	Low	879	SqFt	1.38	No Localized M & R	0		\$0.00	\$0
A01	01	Safety	57	WEATHERING	Medium	62,961	SqFt	98.62	No Localized M & R	0		\$0.00	\$0
R1836	01	Preventive	48	L & T CR	Low	14,671	Ft	2.65	No Localized M & R	0		\$0.00	\$0
R1836	01	Preventive	50	PATCHING	Low	13	SqFt	0	No Localized M & R	0		\$0.00	\$0
R1836	01	Preventive	57	WEATHERING	Low	233	SqFt	0.04	No Localized M & R	0		\$0.00	\$0
TA1	01	Preventive	48	L & T CR	Low	45	Ft	0.76	No Localized M & R	0		\$0.00	\$0
TA1	01	Preventive	48	L & T CR	Medium	45	Ft	0.76	Crack Sealing - AC	45	Ft	\$3.95	\$178
TA1	01	Preventive	57	WEATHERING	Medium	5,950	SqFt	100	No Localized M & R	0		\$0.00	\$0
TA3	01	Preventive	48	L & T CR	Low	8	Ft	0.11	No Localized M & R	0		\$0.00	\$0
TA4	01	Preventive	48	L & T CR	Medium	10	Ft	0.04	Crack Sealing - AC	10	Ft	\$3.95	\$41
TA4	01	Preventive	48	L & T CR	Low	380	Ft	1.65	No Localized M & R	0		\$0.00	\$0
TC01	01	Preventive	48	L & T CR	Low	582	Ft	2.16	No Localized M & R	0		\$0.00	\$0
THANG01	01	Preventive	48	L & T CR	Low	205	Ft	1.07	No Localized M & R	0		\$0.00	\$0
THANG01	01	Preventive	48	L & T CR	Medium	20	Ft	0.11	Crack Sealing - AC	20	Ft	\$3.95	\$79
THANG01	02	Safety	48	L & T CR	High	54	Ft	0.31	Crack Sealing - AC	54	Ft	\$3.95	\$214
THANG01	02	Safety	48	L & T CR	Medium	760	Ft	4.3	No Localized M & R	0		\$0.00	\$0
THANG01	02	Safety	50	PATCHING	Low	163	SqFt	0.92	No Localized M & R	0		\$0.00	\$0
THANG01	02	Safety	57	WEATHERING	Low	5,206	SqFt	29.43	No Localized M & R	0		\$0.00	\$0
THANG01	02	Safety	57	WEATHERING	Medium	12,324	SqFt	69.65	No Localized M & R	0		\$0.00	\$0