STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

AVIATION OFFICE

Statewide Airfield Pavement Management Program

Marco Island Executive Airport– MKY
(General Aviation)
Naples, Florida
(District 1)

May 2011

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES:

TABLE OF CONTENTS

SECTION **PAGE NO.**

APPENDICES

EXECUTIVE SUMMARY

In 2010, the Florida Department of Transportation (FDOT) Aviation Office selected a Consultant team consisting of Kimley-Horn and Associates and their Subconsultants, MACTEC Engineering and Consulting and All About Pavements, Inc., to provide services in support of FDOT in the continuing evaluation and updating of the existing Statewide Airfield Pavement Management Program (SAPMP) to be completed over fiscal years 2011 and 2012.

The tasks required to achieve this objective at Marco Island Executive Airport included:

- Obtain recent construction history from the Airport to update the Pavement Inventory CADD drawings from the previous SAPMP update,
- Perform a visual Pavement Condition Index (PCI) survey of the airfield pavements at the Airport,
- Update the MicroPAVER database to analyze the PCI field data and determine the current condition of the airfield pavements,
- Predict the future deterioration of the pavements,
- Develop a 10-year M&R plan to address the pavement needs at Marco Island Executive Airport, and
- Provide the estimated costs associated with the suggested immediate and future M&R activities

During March 2011, the PCI survey was performed at Marco Island Executive Airport. The results of the survey indicate that, based on a numerical scale of 0 to 100, the overall area-weighted average PCI of the airfield pavements in 2011 is 40, representing a Very Poor overall network condition.

Table I below summarizes the overall condition summary by network branch.

Table I: Condition Summary by Branch

Branch Name	Area Weighted PCI	Condition Rating	FDOT Minimum Service Level	MicroPAVER Minimum PCI	Action Required
North Apron	56	Fair	60	65	X
NW Apron	67	Fair	60	65	
Apron Turnaround RW 35	45	Poor	60	65	X
Runway 17-35	31	Very Poor	75	65	X
Connector Taxiway	21	Serious	65	65	X

Tables II and III below illustrate the area-weighted PCI computed individually for each pavement use and rank, respectively.

Table II: Condition Summary by Pavement Use

Use	Average Area-Weighted PCI	Condition Rating
Runway	31	Very Poor
Taxiway	21	Serious
Apron	57	Fair
All (Weighted)	**40**	**Very Poor**

Table III: Condition Summary by Pavement Rank

Rank*	Average Area-Weighted PCI	Condition Rating
Primary	40	Very Poor
All (Weighted)	**40**	**Very Poor**

*The pavement rank for the airport pavement network is listed on Table 2-3.

The immediate M&R needs, or needs that have been programmed to be completed in the first year of the 10-year M&R plan based on an unlimited budget at Marco Island Executive Airport, include: North Apron, Northwest Apron, Apron Turnaround RW 35, Runway 17-35, and Taxiway Connector. The extent of the distresses located throughout the apron pavements listed above justify mill and overlay rehabilitation activity. The runway and taxiway connector pavement distresses justify full pavement reconstruction. The immediate needs are summarized in Table IV below.

Table IV: Immediate Major M&R Needs

Branch Name	Section ID	Surface Type	Section Area (ft^2)	Major M&R Costs*	PCI Before M&R	M&R Activity	PCI After M&R
North Apron	4205	AC	211,940	$1,333,102.70	47	Mill and Overlay	100
NW Apron	4105	AC	29,220	$183,793.81	47	Mill and Overlay	100
Apron Turnaround RW 35	5105	AC	30,355	$190,932.97	45	Mill and Overlay	100
Runway 17-35	6105	AC	100,000	$1,288,700.37	31	Reconstruction	100
Runway 17-35	6110	AC	300,000	$4,086,001.33	29	Reconstruction	100
Runway 17-35	6115	AC	100,000	$995,500.25	35	Reconstruction	100
Connector Taxiway	105	PCC	7,880	$107,325.63	20	Reconstruction	100
			Total	**$8,185,357.06**	**36**		**100**

* Costs are adjusted for inflation.

A forecast of Major M&R needs for a 10-year period, starting from 2011, was developed using an unlimited budget. The analysis identified ongoing maintenance needs and major M&R during that interval. The results of this analysis are provided in Table V below.

Table V: 10-Year M&R Costs under Unlimited Funding Scenario

Year	Preventative	Major M&R	Total Year Cost
2011	$566.78	$8,185,357.06	$8,185,923.84
2012	$679.30	$0.00	$679.30
2013	$1,872.95	$0.00	$1,872.95
2014	$2,950.33	$0.00	$2,950.33
2015	$4,283.56	$0.00	$4,283.56
2016	$5,714.21	$0.00	$5,714.21
2017	$7,846.50	$0.00	$7,846.50
2018	$9,921.25	$0.00	$9,921.25
2019	$30,360.44	$0.00	$30,360.44
2020	$41,840.20	$0.00	$41,840.20
Total	**$106,035.52**	**$8,185,357.06**	**$8,291,392.58**

Note: Costs are adjusted for inflation.

The implementation of the 10-Year major M&R plan is expected to provide an improvement in the overall condition of the airfield pavement, where the area-weighted PCI would increase from 40 in 2011 to 86 in 2020. Appendix F lists the major M&R for the 10-Year program. Appendix G graphically depicts the activity.

It is important to note that although preventative and some major M&R activities would have to be conducted over several years, the area-weighted PCI value for all Marco Island Executive Airport pavements in 2020 may remain near 86. The airport manager should realize that what is most important is that the pavement repair work (preventative and major M&R) that has been identified for Marco Island Executive Airport is conducted at some point in the 10-year plan.

1. INTRODUCTION

The State of Florida has more than 100 public airports that are vital to the Florida economy as well as the economy of the United States. There are millions of square yards of pavement for the runways, taxiways, aprons and other areas of these airports that support aircraft operations. The timely and proper maintenance and rehabilitation (M&R) of these pavements allows the airports to operate efficiently, economically and without excessive down time.

In order to support the planning, scheduling, and design of the M&R activities based on pavement evaluation and pavement management performance trends, the Florida Department of Transportation (FDOT) Aviation Office implemented the Statewide Airfield Pavement Management Program (SAPMP) in 1992.

In 2010, the FDOT Aviation Office selected a Consultant team consisting of Kimley-Horn and Associates and their Subconsultants, MACTEC Engineering and Consulting and All About Pavements, Inc., to provide services in support of FDOT in the continuing evaluation and updating of the existing SAPMP to be completed over fiscal years 2011 and 2012.

This report discusses the work performed, a summary of the findings, results, and recommendations for M&R planning associated with the update to the SAPMP. It also describes the procedures used to ensure that the appropriate engineering and scientific standards of care, quality, budget, and schedule requirements are implemented during the performance of the SAPMP.

1.1 Purpose

This Florida Airport Pavement Evaluation Report is intended to:

- Describe, briefly, the SAPMP and the roles and responsibilities of the program's participants;
- Provide background information on pavement management principles, objectives, and benefits to this airport;
- Outline the procedures used to collect, evaluate and report pavement inspection results at this airport;
- Present the findings from the pavement inspection;
- Analyze and discuss the needs for Maintenance and Rehabilitation (M&R) activities and associated costs for this airport.

1.2 FDOT Statewide Airfield Pavement Management Program

In 1992, the FDOT implemented the SAPMP to improve the knowledge of pavement conditions at public airports in the State system, identify maintenance needs at individual airports, automate information management, and establish standards to address future needs. The 1992 SAPMP provided valuable information for establishing and performing pavement M&R.

In 1992/1993, and 1998/1999, the FDOT Aviation Office participated in the development of a proprietary software pavement management system and developed and populated a pavement management database that provided valuable information for establishing M&R policies, estimating M&R costs, and developing recommendations for performing routine pavement maintenance. This system, AIRPAV, was implemented, and initial condition surveys were

performed in 1992 and 1993. The SAPMP was updated with additional surveys in 1998 and 1999.

In 2004, the FDOT Aviation Office undertook a project to update the pavement management system software utilized for the SAPMP. This project involved a review of the AIRPAV software and other available pavement management system software. As a result of this review, MicroPAVER was selected as the software for the update project. Data from the 1998/1999 condition surveys were converted to the MicroPAVER system, and the inventory of the pavement systems and drawings of the pavements were updated to reflect maintenance, rehabilitation, and construction activities since 1998/1999. The pavements were inspected between 2006 and 2008, and an updated M&R program was developed based on the new condition of the airfield pavements. As part of the update, procedures for the inspection and collection of pavement data were developed, and a website (www.floridaairportpavement.com) was created for the input of data under secure procedures.

Currently, airports using the AIP Grant Program are required by the Federal Aviation Administration (FAA) to develop a pavement maintenance program (FAA/AC 150/5380-6B "Guidelines and Procedures for Maintenance of Airport Pavements") using trained personnel to perform a detailed inspection of airfield pavements. The inspections are required to be performed at least once a year or every 3 years if pavement inspection is characterized in the form of a Pavement Condition Index (PCI) survey (such as ASTM D 5340 "Standard Test Method for Airport Pavement Condition Index Surveys", (2004 edition)). The 2004 edition was utilized in lieu of the 2010 edition to maintain database integrity and benefit of pavement performance curves from the previous inspections.

In 2010, the FDOT Aviation Office selected a team consisting of the Consultant and their Subconsultants to provided services in support of FDOT in the continuing evaluation and updating of the existing SAPMP to be completed over fiscal years 2011 and 2012.

1.3 Organization

1.3.1 *Aviation Office Program Manager Role*

The Aviation Office Airport Engineering Manager serves as the Aviation Office Program Manager (AO-PM) monitoring the work of the Consultant. The AO-PM has review and approval authority for each program task and also manages the day-to-day details of the SAPMP and the updates.

1.3.2 *Consultant Role*

The Consultant (Kimley-Horn and Associates, Inc.) and their Subconsultants (MACTEC Engineering and Consulting and All About Pavements, Inc.) provide technical and administrative assistance to the AO-PM during the execution of this program, which involves the continuing evaluation of airport pavements and updating of the SAPMP based upon procedures outlined in FAA Advisory Circular 150/5380-6B "Guidelines and Procedures for Maintenance of Airport Pavements" and ASTM D 5340 "Standard Test Method for Airport Pavement Condition Index Surveys" (2004).

1.3.3 *Airport Role*

The airports are the ultimate client for each of the field inspections and reports. Individual airports will be provided final deliverables prepared by the Consultant that have been reviewed and approved by the AO-PM. The airport should provide a current Airport Layout Plan (ALP) to the Consultant and, if they participated in the previous SAPMP update, indicate any construction activity that has been performed since the previous inspections.

1.4 Pavement Types and Pavement Management

1.4.1 *Pavement basics*

A pavement is a prepared surface designed to provide a continuous smooth ride at a certain speed and to support an estimated amount of traffic for a certain number of years. Pavements are constructed of a combination of subgrade soils, subbases, bases and surfacing. There are mainly two types of pavements;

- Flexible pavement, composed of an asphalt concrete (AC) surface, and
- Rigid pavement composed of a Portland Cement Concrete (PCC) surface.

Both pavement types use a combination of layered materials and thicknesses in order to support the traffic loads and protect the underlying natural subgrade soil. Flexible pavements (AC) dissipate the load from layer to layer until the load magnitude is small enough to be supported by the subgrade soil. In rigid pavements (PCC), the Portland Cement Concrete supports most of the load, and the base or subbase layer is mainly constructed to provide a smooth and continuous platform for the construction of the concrete surface.

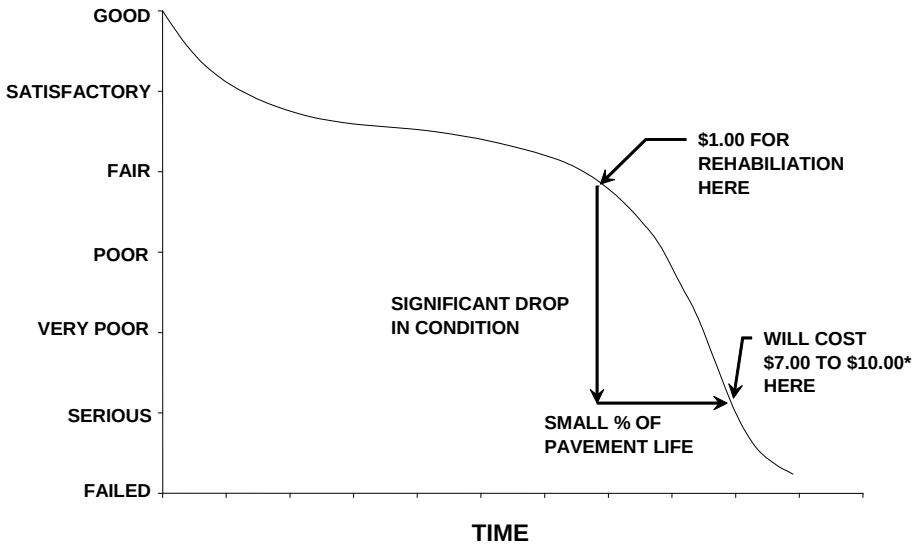
A small percentage of the airport pavements in Florida are composed of asphalt concrete surface over Portland Cement Concrete (APC). This pavement type is known as “composite” pavement.

Due to the different nature of the pavement types and their materials, flexible and rigid pavements have different distresses and failure mechanisms. Understanding the mechanics and failure modes of both pavement types will assist engineers in making adequate and long lasting repairs or rehabilitation to the pavement structures.

1.4.2 *Pavement Management System Concept*

The SAPMP utilized a Pavement Management System (PMS) to develop the M&R recommendations discussed in this report. A PMS is a tool to assist engineers, planners and managing agencies in making decisions when planning pavement M&R. The management of pavements involves scheduling pavement maintenance and rehabilitation before pavements deteriorate to a condition where reconstruction (the most expensive alternative) is the only solution. Figure 1-1 below, taken from FAA/AC 5380-7A “Airport Pavement Management Program”, illustrates how a pavement generally deteriorates and the relative cost of rehabilitation at various times throughout its life. Note that during the first 75 percent of a pavement’s life, it performs relatively well. After that, however, it begins to deteriorate rapidly. The number of years a pavement stays in “good” condition depends on how well it is maintained. As the illustration demonstrates, the cost of maintaining the pavement above a critical condition before rapid deterioration occurs is much less compared to maintaining pavements after substantial deterioration has occurred.

Figure 1-1: Pavement Life Cycle



Source: FAA/AC 150/5380-7A "Airport Pavement Management Program"
**Modified to reflect current construction costs.*

Pavements deteriorate at an accelerated rate with increasing traffic and limited M&R resources. Planned maintenance and rehabilitation, essentially preventing pavements from reaching deteriorated conditions, helps managers/owners/agencies maximize the use of their budgets and prolong the life of the pavements. A PMS provides a tool to schedule and plan maintenance and rehabilitation based on engineering information and existing and predicted conditions of pavements.

There are several components or elements that are essential to a PMS. The first steps in the implementation of a PMS are to know and clearly identify what needs to be managed, the limits of the managing agency's responsibilities and the condition of the existing pavements. Once the cause and the extent of pavement problems are known, the appropriate maintenance and/or rehabilitation can be planned. By using local unit costs and expected yearly budgets, a multi-year M&R plan can be determined.

1.4.3 *Pavement Inspection Methodology for the SAPMP*

Pavement condition assessment is one of the primary decision variables in any airport PMS. Pavement condition assessments generally include visual surveys in accordance with ASTM D 5340, "Standard Test Method for Airport Pavement Condition Index Surveys" and structural evaluation. Pavement condition surveys assess the functional condition of the pavement surface. Typically, most problems within a pavement structure will eventually reflect to the pavement surface. The structural condition and relative support of the pavement layers can be assessed utilizing non-destructive deflection testing (NDT) as well as other in-depth engineering evaluation or sampling and testing methods.

For the Statewide Aviation Pavement Management Program update, only visual surveys were performed. Further structural and geotechnical testing should be conducted to determine the appropriate rehabilitation methods during the design process.

In preparation of the PCI surveys, the airfield pavements are divided into sample units as established in FAA AC 150/5380-6B and ASTM D 5340. Further discussion of how the airport pavements are divided and subdivided into units by construction and use can be found in Section 2 "Network Definition and Pavement Inventory" of this report.

Sample unit sizes are approximately 5000 ± 2000 square feet for AC-surfaced pavements and 20 ± 8 slabs for PCC-surfaced pavements. Prior to conducting the field inspections, the sampling plan was developed based on previous sampling and modified based on the available knowledge of Branches, Sections, use patterns, construction types and history. The sampling rate used for the FDOT Statewide Airfield Pavement Management Program is provided in Table 1-1 below.

Table 1-1: Sampling Rate for FDOT Condition Surveys

AC Pavements			PCC Pavements		
N	**n**		**N**	**n**	
	Runway	**Others**		**Runway**	**Others**
1-4	1	1	1-3	1	1
5-10	2	1	4-6	2	1
11-15	3	2	7-10	3	2
16-30	5	3	11-15	4	2
31-40	7	4	16-20	5	3
41-50	8	5	21-30	7	3
≥51	20% but ≤20	10% but ≤10	31-40	8	4
			41-50	10	5
			≥51	20% but ≤20	10% but ≤10

Where *N = total number of sample units in Section*
n = number of sample units to inspect

The sample units to inspect are determined by a systematic random sampling technique. This means that the locations are determined such that they are distributed evenly throughout the Section. In the case when nonrepresentive distresses are observed in the field, additional sample units were added.

The distress quantities and severity levels from the sample units are used to compute the PCI value for each Section. PCI values range from 0 to 100. As Figure 1-2 below indicates, MicroPAVER provides a rating scale that relates PCI to pavement condition. A PCI between 0 and 10 is considered 'Failed' pavement, and a PCI between 86 and 100 is considered 'Good' pavement, with five other conditions for PCI values between 11 and 85.

Figure 1-2: PCI Rating Scale

	PCI	Condition Rating
	86 – 100	Good
	71 – 85	Satisfactory
	56 – 70	Fair
	41 – 55	Poor
	26 – 40	Very Poor
	11 – 25	Serious
	0 – 10	Failed

1.5 Definitions

Aviation Office - The Aviation Office is charged with responsibility for promoting the safe development of aviation to serve the people of the State of Florida. The Aviation Office Program Manager (AO-PM) has review and approval authority for each program task of the SAPMP.

Base Course - Base Course is a layer of manufactured material, usually crushed rock (aggregate) or stabilized material (asphalt or concrete or Florida Limerock), immediately beneath the surface course of a pavement, which provides support to the surface course.

Branch - A Branch designates pavements that have common usage and functionality, such as an entire runway, taxiway, or apron.

Branch ID - A short form identification for the pavement Branch. In this report, Branch includes the common designation for the item e.g. RW 18-36.

Category - The Category classifies the airport according to the type and volume of aircraft traffic, as follows:

- GA – for general aviation or community airports;
- RL – for regional relievers or small hubs;
- PR – for primary (certified under Part 139 requirements).

Critical PCI - The PCI value considered to be the threshold for M&R decisions. PCI above the Critical generate economical activities expected to preserve and prolong acceptable condition. M&R for PCI values less than Critical make sense only for reasons of safety or to maintain a pavement in operable condition. A pavement section is expected to deteriorate very quickly once it reaches the Critical PCI and the unit cost of repair increases significantly.

Distress Type - A distress type is a defined visible defect in pavement evidenced by cracking, vertical displacement or deterioration of material. In PCI technology, 16 distinct distress types for asphalt surfaced and 15 for Portland Cement Concrete surfaced pavements have been described and rated according to the impact their presence has on pavement condition.

Florida DOT (FDOT) - Florida Department of Transportation was represented in this project by the Office of Aviation.

Global M&R - Global M&R is defined as activities applied to entire pavement Sections with the primary objective of slowing the rate of deterioration. These activities are primary for asphalt surfaced pavements, e.g. surface treatments.

Localized M&R (Maintenance and Repair) - Localized M&R is a temporizing activity performed on existing pavement to extend its serviceability and/or to improve rideability. Localized M&R can be applied either as a safety (stop-gap) measure or preventive measure. Common localized maintenance methods include crack sealing, joint sealing, and patching.

Major M&R (e.g. Rehabilitation) - Activities performed over the entire area of a pavement Section that are intended to restore and/or maintain serviceability. This includes asphalt overlays, milling and replacing asphalt pavement, reconstruction with asphalt, reconstruction with Portland Cement Concrete (PCC) pavements, and PCC overlays.

MicroPAVER - A commercially available software subsidized by FAA and agencies in the US Department of Defense developed to support engineered management of pavement assets using a condition based approach. This software has the functionality such that, if properly implemented, maintained, and operated, it meets the pavement management program requirements described by the FAA in Advisory Circular 150/5380-7A.

Minimum Condition Level - A threshold PCI value established by FDOT to represent the targeted minimum pavement condition that is desirable in the Florida Airport System. These values were established with consideration of pavement function and airport type. For instance, runways have higher minimum condition levels than aprons, and Primary airports have higher minimum condition levels than General Aviation airports.

Network Definition - A Network Definition is a Computer-Aided Drafting & Design (CADD) drawing which shows the airport pavement outline with Branch and Section boundaries. This drawing also includes the PCI sample units and is used to identify those sample units to be surveyed, i.e. the sampling plan. The Network Definition for the airport is in Appendix A along with a table of inventory data.

Pavement Condition Index (PCI) - The Pavement Condition Index is a number which represents the condition of a pavement segment at a specific point in time. It is based on visual identification and measurement of specific distress types commonly found in pavement which has been in service for a period of time. The definitions and procedures for determining the PCI are found in ASTM D 5340, published by ASTM International.

Pavement Evaluation - A systematic approach undertaken by trained and experienced personnel intended for determination of the condition, serviceability, and best corrective action for pavement. Techniques to standardize pavement evaluation include the Pavement Condition Index procedures.

Pavement Management System (PMS) - A Pavement Management System is a broad function that uses pavement evaluation and pavement performance trends as a basis for planning, programming, financing, and maintaining a pavement system.

Pavement Surface Type - The surface of pavement is identified as one of four types:

- AC – for asphalt surface pavements;
- PCC – for Portland Cement Concrete pavements;
- AAC – for asphalt surface pavements that have had an asphalt overlay at some point in their construction history;
- APC – for composite pavements, which consist of asphalt over Portland Cement Concrete pavement.
- PAC – for composite pavements, which consist of Portland Cement Concrete over asphalt pavement.

Rank - Pavement rank in MicroPAVER determines the priority to be assigned to a pavement Section when developing an M&R plan. Pavement Sections are ranked as follows according to their use:

- P – for Primary pavements, such as primary runways, primary taxiways, and primary aprons;
- S – or Secondary pavements, such as secondary runways, secondary taxiways, and secondary aprons;
- T – for Tertiary pavements such as "T" hangars and slightly used aprons.

Reconstruction - Reconstruction includes removal of existing pavement, preparation of subgrade, and construction of new pavement with new or recycled materials. Reconstruction is indicated when distress types evident at the surface indicate failure in the pavement structure or subgrade of a type, and to an extent, not correctable by less extensive construction.

Rehabilitation - Rehabilitation represents construction using existing pavement for a foundation. Rehabilitation most commonly consists of an overlay of existing pavement with a new asphalt or concrete surface. Recently, technology has expanded the options to include recycling of existing pavement and incorporating engineering fabrics or thin layers of elasticized materials to retard reflection of distress types through the new surface.

Sample Unit - Uniformly sized portions of a Section as defined in ASTM D 5340. Sample units are a means to reduce the total amount of pavement actually surveyed using statistics to select and survey enough area to provide a representative measure of Section PCI. Sample Unit sizes are 5,000 ± 2,000 square feet for AC-surfaced pavements and 20 ± 8 slabs for PCC-surfaced pavements.

Section - Sections subdivide Branches into portions of similar pavement. Sections are prescribed by pavement structure, age, condition, and use. Sections are identified on the airport Network Definition. They are the smallest unit used for determining M&R requirements based on condition.

Section ID - A short form identification for the pavement Section that maintains the original AirPAV identification where 100 series through 3000 series Sections are taxiways, 4000 and 5000 series Sections are aprons (the 5000 series represent run-up aprons and turnarounds), and 6000 series Sections are runways.

Statewide Airfield Pavement Management Program (SAPMP) – The Statewide Airfield Pavement Management Program is a program implemented in 1992 by the Florida Department of Transportation to plan, schedule, and design the maintenance and rehabilitation activities

necessary for the airfield pavement on Florida's public airports to allow the airports to operate efficiently, economically, and without excessive down time.

System Inventory - A System Inventory is a Computer-Aided Drafting & Design (CADD) drawing which shows the airport pavement outline and identifies airfield construction activities since the last inspection. The System Inventory for the airport is included in Appendix A.

Use - In MicroPAVER, Use is the term for the function of the pavement area. This is either Runway, Taxiway, or Apron for purposes of the FDOT Statewide Aviation Pavement Management System.

2. NETWORK DEFINITION AND PAVEMENT INVENTORY

Marco Island Executive Airport (MKY) consists of a single runway; RW 17-35, which is 100-ft wide by 5,000-ft long. Construction is planned to begin within the month of April for a parallel taxiway which will run along the west side of RW 17-35. Currently the airport has multiple hangar facilities and tie-down spaces located throughout the apron, which was recently expanded in 2010. With exception to the one Portland Cement Concrete ramp connector, all of the pavement throughout the airport is constructed of Asphalt Concrete.

It is important to note that the aforementioned runway data in addition to the remaining airfield pavement facilities geometric dimensions may vary slightly from the geometry used in the condition and M&R analysis based on field measurements.

Marco Island Executive Airport is publicly owned and operated by Collier County. This airport is designated as a General Aviation airport and is located in District 1 of the Florida Department of Transportation.

2.1 Network Definition

The pavements within the network are defined in MicroPAVER in terms of manageable units that help to organize the data into similar groups. An organizational hierarchy is used to establish these units.

2.1.1 *Branch Section Identification*

The airport pavement network is subdivided into separate Branches (runways, taxiways, or aprons) that have distinctly different uses. Branches are then further divided into Sections with similar pavement construction and performance that may share other common attributes.

Sections are manageable units used to organize the data collection and are treated individually during the rehabilitation planning stage. A pavement rank, consisting of primary, secondary, and tertiary levels, is assigned to each Section based on their level and type of use. The pavement rankings that were designated for each Section in the previous SAPMP update were again used for this update.

As discussed in Section 1.4.3 “Pavement Inspection Methodology for the SAPMP”, the sections are sub-divided into sample units, which are the smallest subdivision in a pavement network, only for the purpose of conducting the pavement condition survey.

2.1.2 *System Inventory and Network Definition Update*

The System Inventory and Network Definition drawings are used to identify changes in the network since the most recent update from the 2006/2008 inspections and also to plan the field inspection activities for the 2011 survey. Prior to the field inspection process, the System Inventory drawing was updated from the previous inspection with notes indicating recent construction projects on the various Sections of pavement throughout the airfield. This System Inventory drawing is used to update the Network Definition drawing.

The Network Definition drawing shows the airport pavement outline with Branch and Section boundaries. This drawing also includes the PCI sample units and is used to identify those sample

units to be surveyed, i.e. the sampling plan. The previous airport configuration and history was compared with the current airport configuration, and the existing network branch, section and sample unit designations were revised to match the current configuration. This drawing serves not only as a primary guide for the airfield inspectors but also as an important historical record.

The updated System Inventory and Network Definition drawings for Marco Island Executive Airport are provided in Appendix A. Table 2-1 below lists the recent construction projects at the airport.

Table 2-1: Construction Since Last Inspection & Anticipated Construction Activity

Construction Year	Location	Work Type / Pavement Section
2010	North West Apron	Expansion
2011	West side of Runway 17-35	New Full Length Parallel Taxiway

2.2 Pavement Inventory

The detailed pavement inventory was updated to reflect the network definition update and field inspection results.

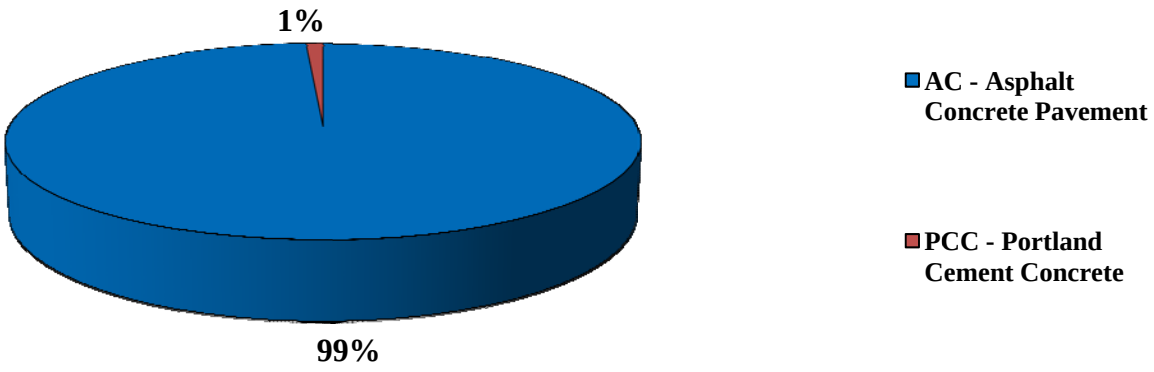
The total airfield pavement area in 2011 at Marco Island Executive Airport is 844,755 square feet. The breakdown of pavement area for each pavement use is provided in Table 2-2.

Table 2-2: Pavement Area by Pavement Use

Use	Area (ft^2)	% of Total Area
Runway	500,000	59%
Taxiway	7,880	1%
Apron	336,875	40%
All (Weighted)	**844,755**	**100%**

Figure 2-1 presents the breakdown of the pavement area at Marco Island Executive Airport by surface type.

Figure 2-1: Pavement Area by Surface Type



Details of pavement Branch and Section information including Branch name (which indicates pavement use), Branch ID, Section ID, section area, rank, surface type, last construction date, number of samples inspected, and number of samples in each Section are given in Table 2-3 below. A more detailed Pavement Inventory Table may be found in Appendix A of this report.

Table 2-3: Branch and Section Inventory

Branch Name	Branch ID	Section ID	True Area (ft^2)	Section Rank	Surface Type	Last Const. Date	Total Samples Inspected	Sample Units in Section
North Apron	AP N	4205	211,940	P	AC	1/1/1975	5	44
North Apron	AP N	4210	41,600	P	AC	1/1/2010	0	9
NW Apron	AP NW	4105	29,220	P	AC	1/1/1996	1	8
NW Apron	AP NW	4110	23,760	P	AC	1/1/1996	1	8
Apron Turnaround RW 35	AP TA RW35	5105	30,355	P	AC	1/1/1976	2	6
Runway 17-35	RW 17-35	6105	100,000	P	AC	1/1/1976	5	20
Runway 17-35	RW 17-35	6110	300,000	P	AC	1/1/1976	15	60
Runway 17-35	RW 17-35	6115	100,000	P	AC	1/1/1976	5	20
Connector Taxiway	TW CONN	105	7,880	P	PCC	1/1/1960	1	1

Note: If a new construction, then survey date = last construction date and PCI is set to 100 by MicroPAVER.

Sections not surveyed due to reasons such as re-sectioning, no escort, not accessible at the time of survey.

3. PAVEMENT CONDITION

Pavement conditions were inspected in accordance with the methods outlined in FAA AC 150/5380-6B and ASTM D 5340-04 "Standard Practice for Airport Pavement Condition Index Surveys." These procedures define distress type, severity and quantity for sampling areas within each section to determine the Pavement Condition Index (PCI).

3.1 Inspection Methodology

A PCI survey is performed by measuring the amount and severity of pavement distresses, which are caused by traffic load, climate, and other factors, observed within a sample unit. This data is imported into MicroPAVER, which calculates PCI values for the pavement sections. Tables 3-1 and 3-2 below list the pavement distress types and related causes for asphalt concrete (AC) and Portland Cement Concrete (PCC), respectively.

Table 3-1: Pavement Distresses for Asphalt Concrete Surfaces

Code	Distress	Mechanism
41	Alligator Cracking	Load
42	Bleeding	Construction Quality / Mix Design
43	Block Cracking	Climate / Age
44	Corrugation	Load / Construction Quality
45	Depression	Subgrade Quality
46	Jet Blast	Aircraft
47	Joint Reflection - Cracking	Climate / Prior Pavement
48	Longitudinal/Transverse Cracking	Climate / Age
49	Oil Spillage	Aircraft / Vehicle
50	Patching	Utility / Pavement Repair
51	Polished Aggregate	Load
52	Weathering/Raveling	Climate / Load
53	Rutting	Load
54	Shoving	Pavement Growth
55	Slippage Cracking	Load / Pavement Bond
56	Swelling	Climate / Subgrade Quality

Source: U.S. Army CERL, FDOT Airfield Inspection Reference Manual

Table 3-2: Pavement Distresses for Portland Cement Concrete Surfaces

Code	Distress	Mechanism
61	Blow-up	Climate
62	Corner Break	Load
63	Linear Cracking	Load
64	Durability Cracking	Climate
65	Joint Seal Damage	Climate
66	Small Patch	Pavement Repair
67	Large Patch/Utility Cut	Utility / Pavement Repair
68	Popout	Climate
69	Pumping	Load
70	Scaling/Crazing	Construction Quality
71	Faulting	Subgrade Quality
72	Shattered Slab	Load
73	Shrinkage Cracking	Construction Quality / Load
74	Joint Spalling	Load
75	Corner Spalling	Load
Source: U.S. Army CERL, FDOT Airfield Inspection Reference Manual		

Prior to conducting the inspections, Global Positioning System (GPS) coordinates were recorded using CADD at the centroid of each sample unit. The centroid is usually the geometric center of the area, but in cases where sample units are irregular in shape, this is the center of mass. These data are presented in a table on the updated Network Definition Map in Appendix A of this report.

Pavement condition inspections at Marco Island Executive Airport were performed in March 2011. Data were recorded in the field in accordance with FAA Advisory Circular 150/5380-6B "Guidelines and Procedures for Maintenance of Airport Pavements" and ASTM D 5340 "Standard Test Method for Airport Pavement Condition Index Surveys" (2004).

After the completion of data collection, the data was imported into MicroPAVER, and PCI values were calculated for the pavement sections.

3.2 Pavement Condition Index Results

According to the 2011 survey, the overall area-weighted PCI at Marco Island Executive Airport is 40, representing a Fair overall network condition.

Overall the airport exhibited pavement distresses associated with climate and age distresses. Asphalt Concrete pavement distresses include; weathering, raveling, longitudinal and transverse cracking, and block cracking distresses of which are common of pavements of similar age.

RW 17-35 exhibited low and medium severity longitudinal and transverse cracking along with medium severity weathering and raveling. Medium severity block cracking was also observed throughout the runway pavement section. Similar distresses were observed throughout the older pavement of the apron section, with low and medium severity block cracking in addition to

medium severity weathering and raveling. The apron expansion was recently constructed in 2010 and was not inspected due to its new condition. This pavement section was assumed to have a PCI of 100.

Appendix B contains a table and a Condition Map which depicts the PCI results by Section, and Appendix C contains a table of PCI results by Branch. Appendix I includes detailed distress data generated by MicroPAVER for each inspected sample unit.

Figure 3-1 provides the PCI distribution by rating category for Marco Island Executive Airport.

Figure 3-1: Network PCI Distribution by Rating Category

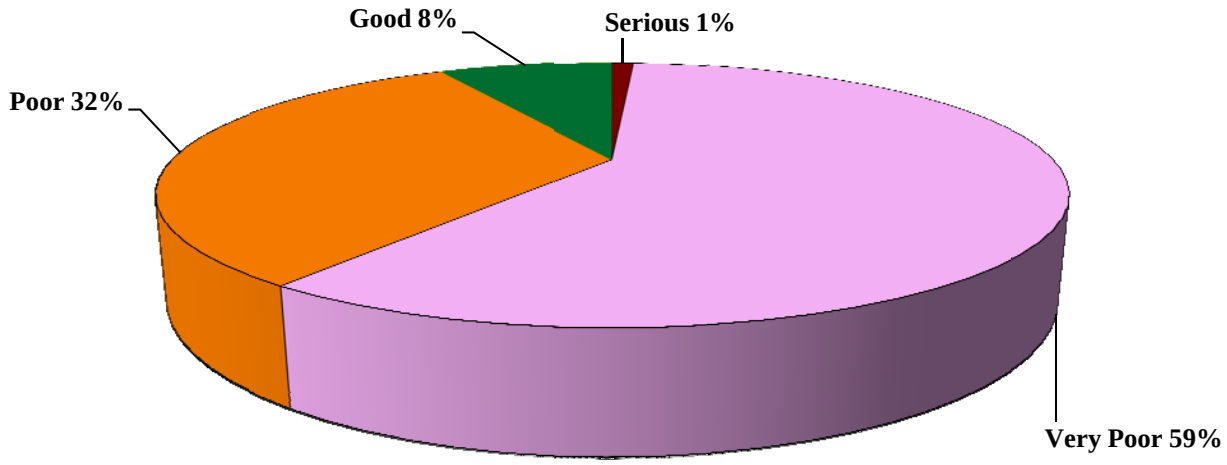


Figure 3-1a: Condition Rating Summary

Condition Rating	Total Area (ft^2)	Percent
Good	65,360	8%
Satisfactory	0	0%
Fair	0	0%
Poor	271,515	32%
Very Poor	500,000	59%
Serious	7,880	1%
Failed	0	0%

Approximately 8% of the network is in Good condition while 60% of the network is in Very Poor and Serious condition. Table 3-3 illustrates the area-weighted PCI computed individually for each pavement use.

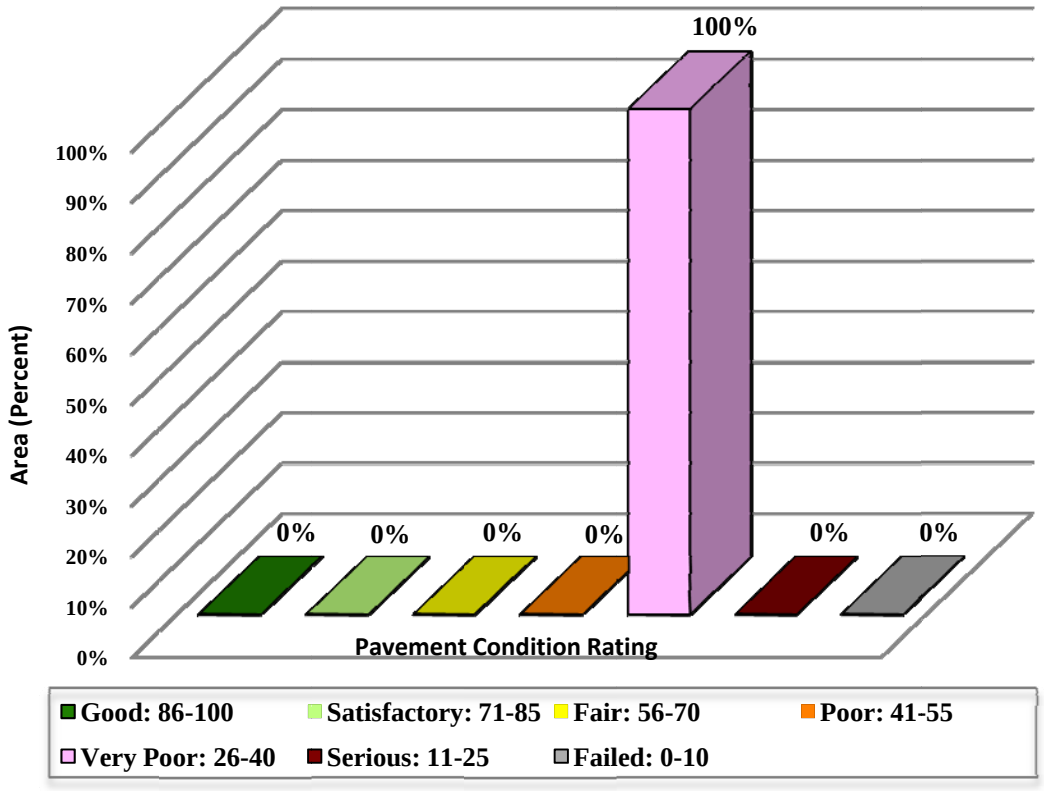
Table 3-3: Condition by Pavement Use

Use	Area-Weighted PCI	Condition Rating
Runway	31	Very Poor
Taxiway	21	Serious
Apron	57	Fair
All (Weighted)	**40**	**Very Poor**

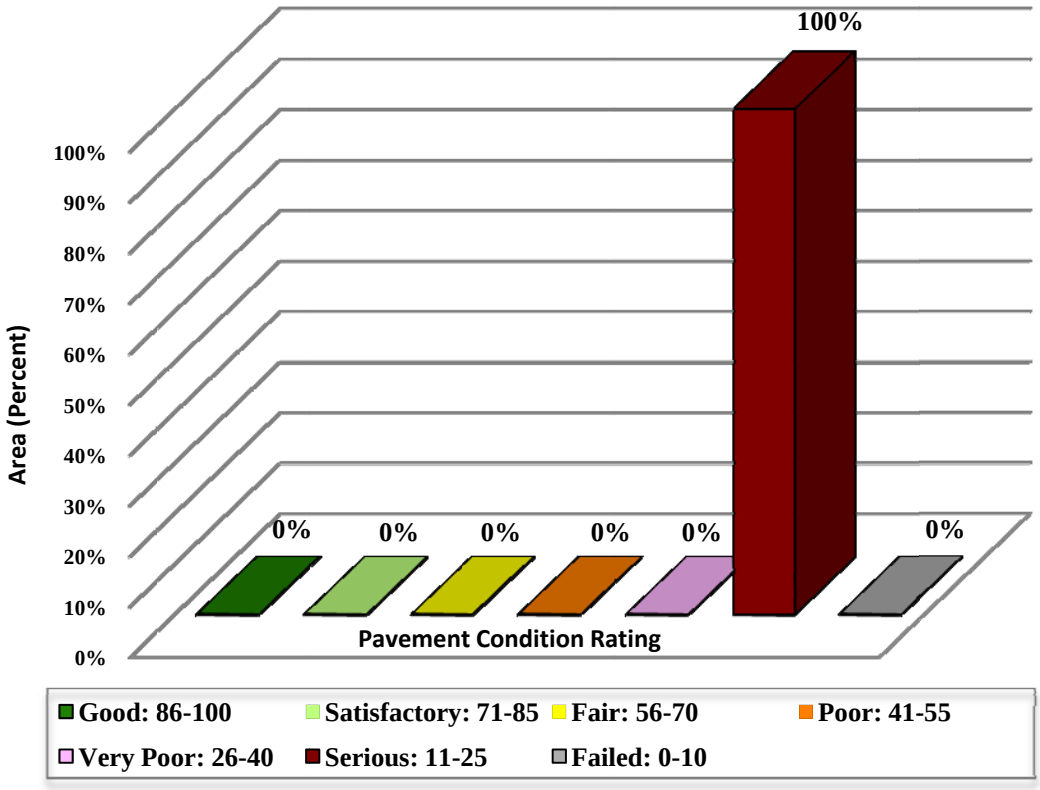
Figure 3-2 presents the breakdown of PCI by range for each pavement use.

Figure 3-2: Percentage of Pavement Area within Each PCI Range by Pavement Use

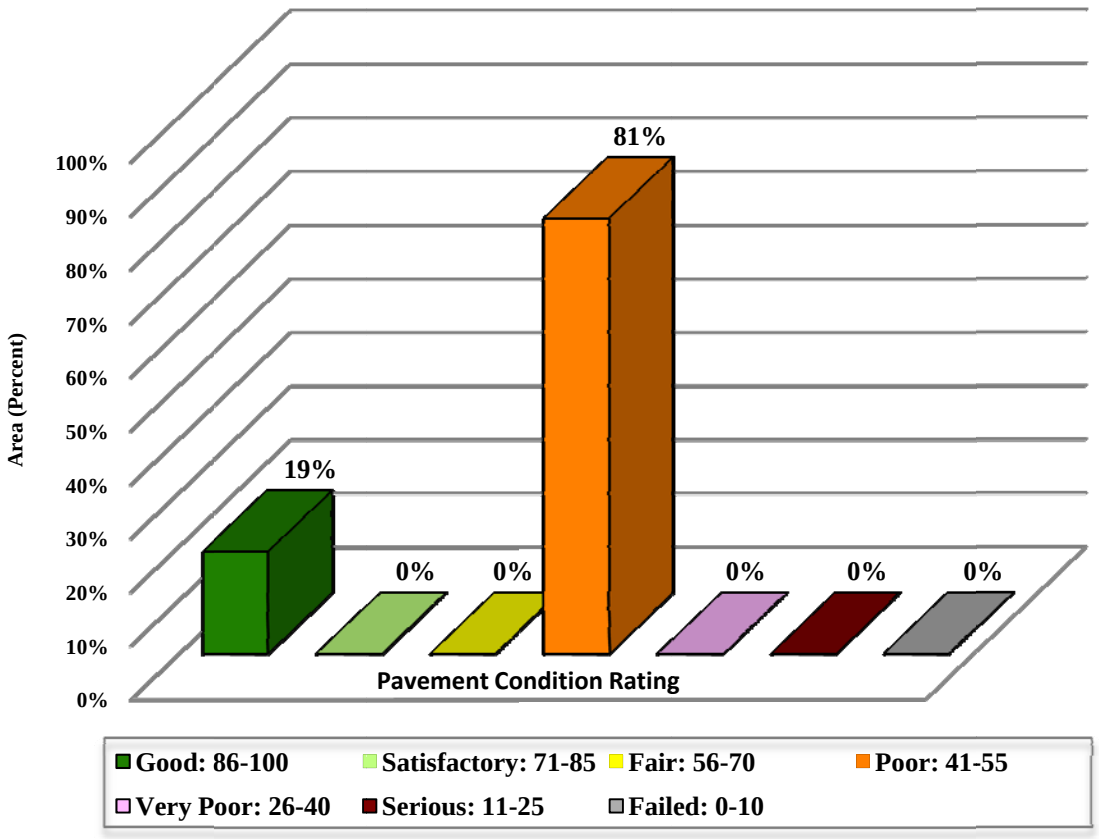
(a) Runway



(b) Taxiway


100%
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
Area (Percent)
0%
0%
0%
0%
0%
0%
Pavement Condition Rating
Good: 86-100
Satisfactory: 71-85
Fair: 56-70
Poor: 41-55
Very Poor: 26-40
Serious: 11-25
Failed: 0-10

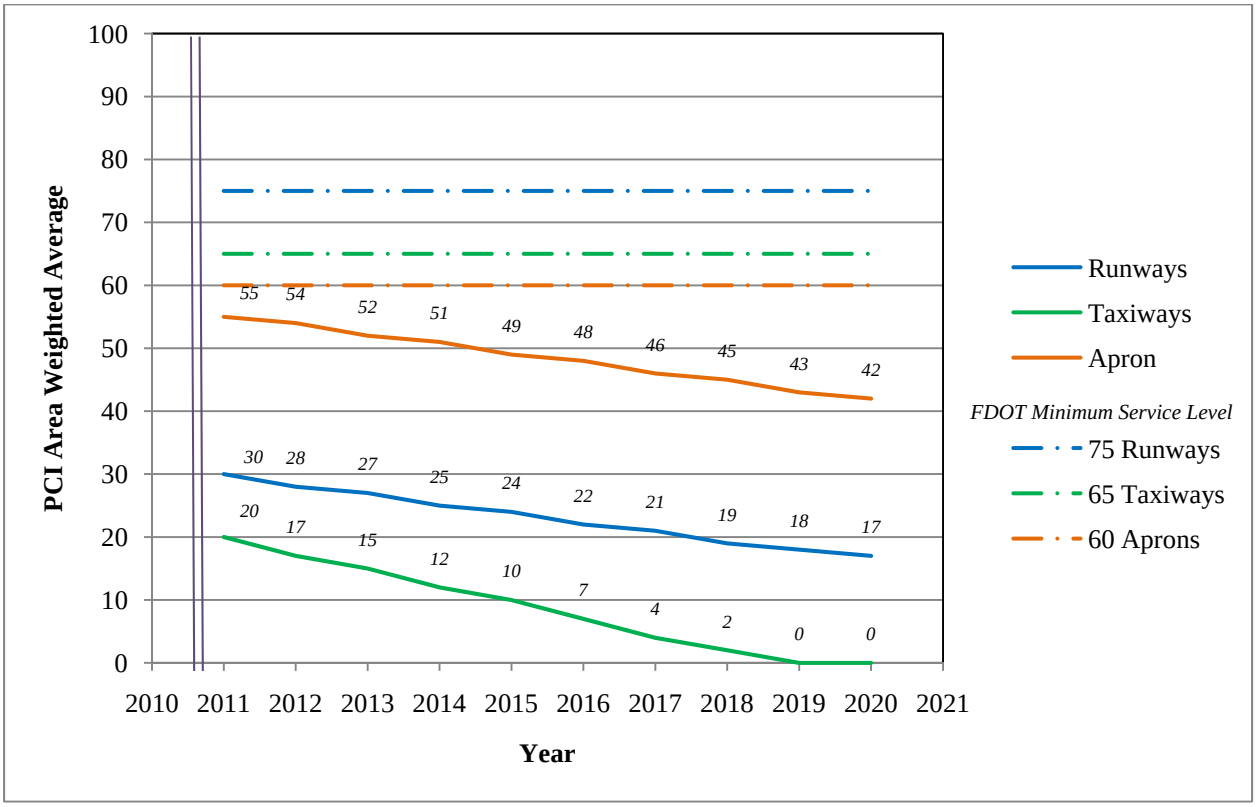
(c) Apron


Area (Percent)
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
19%
0%
0%
81%
0%
0%
0%
Pavement Condition Rating
Good: 86-100
Satisfactory: 71-85
Fair: 56-70
Poor: 41-55
Very Poor: 26-40
Serious: 11-25
Failed: 0-10

4. PAVEMENT CONDITION PREDICTION

Performance prediction models or deterioration curves for PCI were used to develop a condition forecast. The performance models were developed for combinations of variables such as pavement use (runway, taxiway or apron), surface type (AC or PCC) and airport category (GA, RL, or PR). Figure 4-1 illustrates the predicted performance of pavements at Marco Island Executive Airport based on current condition, age since last construction and the deterioration model appropriate for the type of pavement. The figure presents the forecast for each pavement use and displays the FDOT minimum service level for General Aviation (GA) airports.

Figure 4-1: Predicted PCI by Pavement Use



Appendix D presents the tabular summary of the predicted Section PCI for each year from 2011 to 2020.

5. MAINTENANCE POLICIES AND COSTS

5.1 Policies

Maintenance and rehabilitation (M&R) policies are sets of rules used to develop repair recommendations for distresses encountered during the visual inspections.

Maintenance refers to repair-type activities that are applied to specific distress types on the pavement. These activities are preventative and/or corrective in nature and are recommended to help achieve the performance goal.

Table 5-1 provides the list of the maintenance activities used in MicroPAVER to treat specific distress types. MicroPAVER applies repairs to these distresses and adjusts the PCI based on specific rules. These repairs are used only in the first year of an analysis.

Rehabilitation is warranted when the pavement condition decreases below a critical point such that the deterioration is extensive or the rate of deterioration is so great that routine maintenance is no longer cost-efficient. This critical point is called "Critical PCI." The critical PCI levels for different pavement and branch types established in the previous SAPMP update were used in this update for the development of the M&R plan for the airport. Sections above critical PCI levels receive routine maintenances while pavements predicted to deteriorate below their respective critical PCI level during the analysis period will be identified for Major M&R. Table 5-2 gives the critical PCI levels for General Aviation Airports.

The maintenance rehabilitation policy and activity costs have been updated based on the study of readily available construction cost data at the time of this study. The costs depicted in this report are intended for planning purposes.

Table 5-1: Routine Maintenance Activities for Airfield Pavements

Surface	Distress	Severity*	Work Type	Code	Work Unit
AC	Alligator Crack	M, H	Patching - AC Deep	PA-AD	SqFt
	Bleeding	N/A	No Localized M&R	NONE	N/A
	Block Crack	M, H	Crack Sealing – AC	CS-AC	SqFt
	Corrugation	L, M, H	Patching - AC Deep	PA-AD	SqFt
	Depression	M, H	Patching - AC Deep	PA-AD	SqFt
	Jet Blast	N/A	Patching - AC Deep	PA-AD	SqFt
	Joint Ref. Crack	M, H	Crack Sealing – AC	CS-AC	Ft
	L & T Crack	M, H	Crack Sealing – AC	CS-AC	Ft
	Oil Spillage	N/A	Patching - AC Shallow	PA-AS	SqFt
	Patching	M, H	Patching - AC Deep	PA-AD	SqFt
	Polished Agg.	N/A	No Localized M&R	NONE	N/A
	Raveling and Weathering	L	Surface Sealing - Rejuvenating	SS-RE	SqFt
		M	Surface Seal - Coal Tar	SS-CT	SqFt
		H	Microsurfacing	MI-AC	SqFt
	Rutting	M, H	Patching - AC Deep	PA-AD	SqFt
	Shoving	M, H	Grinding (Localized)	GR-LL	SqFt
	Slippage Crack	N/A	Patching - AC Shallow	PA-AS	SqFt
	Swelling	M, H	Patching - AC Deep	PA-AD	SqFt
PCC	Blow-Up	L, M, H	Patching - PCC Full Depth	PA-PF	SqFt
	Corner Break	M, H	Patching - PCC Full Depth	PA-PF	SqFt
	Linear Crack	M, H	Crack Sealing – PCC	CS-PC	Ft
	Durability Crack	H	Slab Replacement – PCC	SL-PC	SqFt
		M	Patching - PCC Full Depth	PA-PF	SqFt
	Jt. Seal Damage	M, H	Joint Seal (Localized)	JS-LC	Ft
	Small Patch	M, H	Patching - PCC Partial Depth	PA-PP	SqFt
	Large Patch	M, H	Patching - PCC Full Depth	PA-PF	SqFt
	Popouts	N/A	No Localized M&R	NONE	N/A
	Pumping	N/A	No Localized M&R	NONE	N/A
	Scaling	H	Slab Replacement – PCC	SL-PC	SqFt
	Faulting	M, H	Grinding (Localized)	GR-PP	Ft
	Shattered Slab	M, H	Slab Replacement – PCC	SL-PC	SqFt
	Shrinkage Crack	N/A	No Localized M&R	NONE	N/A
	Joint Spall	M, H	Patching - PCC Partial Depth	PA-PP	SqFt
	Corner Spall	M, H	Patching - PCC Partial Depth	PA-PP	SqFt

*L = Low, M = Medium, H = High

Table 5-2: Critical PCI for General Aviation Airports

Use	Critical PCI
Runway	65
Taxiway	65
Apron	65

It should be noted that critical PCI is not the same as Minimum PCI or Minimum Condition. The Minimum PCI is a value set by the user so pavement sections are rehabilitated before they fall below the set minimum. Table 5-3 gives the targeted, or desired, Minimum PCI values for runways, taxiways, and aprons of General Aviation Airports.

Table 5-3: FDOT Minimum Service Level PCI for General Aviation Airports

Minimum PCI		
Runway	**Taxiway**	**Apron**
75	65	60

Typical Major M&R activities range from overlays to reconstruction. Based on the critical PCI values in Table 5-2 the PCI trigger range when the likely activity would be a mill and resurface was 40 to 79 and reconstruction at a PCI of 39 or lower. One important concept of pavement management systems is that it is cost effective to maintain pavements that are already in good condition rather than wait for them to get worse and require more expensive rehabilitation.

Crack sealing and full-depth patching are the M&R activities recommended to repair pavements with PCI values between 80 and 90. MicroPAVER considers these as preventative M&R with their primary objective being to slow the rate of pavement deterioration. While the trigger PCI for mill and overlay has been set to 55, MicroPAVER also assigns mill and overlay to sections with a PCI greater than 55 if they exhibit some structural distress. Table 5-4 summarizes the M&R activities for General Aviation Airports based on PCI value.

Table 5-4: M&R Activities for General Aviation Airports

	Activity	PCI Range
Maintenance	Crack Sealing and Full-Depth Patching	80 and 90
Rehabilitation	Mill and Overlay (AC) or Concrete Pavement Restoration (PCC)	40 to 79
	Reconstruction	39 and less

5.2 Unit Costs

FDOT cost databases for airports and highway pavement maintenance and rehabilitation were updated from the previous SAPMP study based on current construction cost trends in order to determine meaningful costs for the program. Table 5-5 presents the unit costs summary.

5.3 M&R Activities

FDOT recognizes that although Mill and Overlay work is recommended for asphalt pavements within a PCI range from 40 to 79, it is conceivable that airports may not have adequate funding to perform this type of rehabilitation. Microsurfacing treatment is a maintenance/rehabilitation measure that can be used in lieu of asphalt pavement mill and overlay; however it should be understood that this measure is intended for short term pavement life extension. While the cost of microsurfacing is significantly lower than that of pavement mill and overlay, it is not intended to be a full rehabilitative measure for long term benefit.

Table 5-5: Maintenance Unit Costs for FDOT

Code	Name	Cost	Unit
GR-LL	Grinding (Localized for AC)	$2.10	SqFt
PA-AL	Patching – AC Leveling	$2.30	SqFt
PA-AS	Patching – AC Shallow	$2.90	SqFt
PA-PF	Patching – PCC Full Depth	$38.11	SqFt
PA-PP	Patching – PCC Partial Depth	$19.06	SqFt
SL-PC	Slab Replacement – PCC	$39.11	SqFt
CS-PC	Crack Sealing – PCC	$4.24	Ft
UN-PC	Undersealing – PCC	$3.40	Ft
CS-AC	Crack Sealing – AC	$2.25	Ft
GR-PP	Grinding (Localized for PCC)	$22.51	Ft
JS-LC	Joint Seal (Localized)	$2.00	Ft
SH-LE	Shoulder Leveling	$2.81	Ft
JS-SI	Joint Seal – Silicon	$2.81	Ft
PA-AD	Patching – AC Deep	$4.90	SqFt
OL-AT	Overlay – AC Thin	$2.80	SqFt
SS-CT	Surface Seal – Coal Tar	$0.40	SqFt
SS-FS	Surface Seal – Fog Seal	$0.40	SqFt
SS-RE	Surface Seal – Rejuvenating	$0.40	SqFt
ST-SB	Surface Treatment – Single Bitum.	$0.30	SqFt
ST-SS	Surface Treatment – Slurry Seal	$0.55	SqFt
ST-ST	Surface Treatment – Sand Tar	$0.28	SqFt
MI-AC	Microsurfacing - AC	$0.65	SqFt

The improvement in condition due to maintenance actions applied to specific distresses is only performed when an inspection was performed recently and only in the first year of the M&R analysis. In subsequent years, MicroPAVER calculates M&R costs based on expected unit costs for pavements in a range of PCIs. That is, for low PCI, it is expected that the repair would be significant (e.g. reconstruction) and therefore very costly.

Using available unit cost data, the Major M&R Cost by Condition table was set up as shown in Table 5-6. The cost assigned to each range of PCI is based on a Transportation Cost Report provided by Office of Planning Policy of FDOT where the unit costs of reconstruction and resurfacing of airfield pavements were included. These costs were then assigned to the appropriate PCI range to arrive at a cost per square foot necessary to restore pavements at that PCI level to new condition, i.e. a PCI of 100.

Table 5-6: M&R Activities and Unit Costs by Condition for General Aviation Airports

	Activity	PCI Trigger	Cost/SqFt
Maintenance	Crack Sealing and Full-Depth Patching	90	$0.06
		80	$0.24
Rehabilitation	Mill and Overlay (AC) or Concrete Pavement Restoration (PCC)	70	$3.00
		60	$3.42
		50	$6.29
		40	$6.29
	Reconstruction	30	$13.62
		20	$13.62

A 3% inflation rate per year was applied to the unit costs during the M&R analysis.

6. PAVEMENT REHABILITATION NEEDS ANALYSIS

Maintenance and Rehabilitation (M&R) analyses were performed after the condition data were calculated and MicroPAVER was customized with the maintenance policies and cost settings described in the previous section.

The objective of the M&R analysis is to observe the effect of different fiscal scenarios on the network condition, over a period of ten years, starting from 2011. The analysis was conducted using an unlimited budget. An unlimited budget allows all M&R needs to be identified along with the associated cost regardless of priority.

Table 6-1 presents the M&R list of immediate needs for Major M&R, i.e. Year 1 of the forecast. The importance of this listing is that it points out the major activities triggered by the current condition of the pavements.

Table 6-1: Summary of Immediate Major M&R Needs Option No. 1

Branch Name	Section ID	Surface Type	Section Area (ft^2)	Major M&R Costs*	PCI Before M&R	M&R Activity	PCI After M&R
North Apron	4205	AC	211,940	$1,333,102.70	47	Mill and Overlay	100
NW Apron	4105	AC	29,220	$183,793.81	47	Mill and Overlay	100
Apron Turnaround RW 35	5105	AC	30,355	$190,932.97	45	Mill and Overlay	100
Runway 17-35	6105	AC	100,000	$1,288,700.37	31	Reconstruction	100
Runway 17-35	6110	AC	300,000	$4,086,001.33	29	Reconstruction	100
Runway 17-35	6115	AC	100,000	$995,500.25	35	Reconstruction	100
Connector Taxiway	105	PCC	7,880	$107,325.63	20	Reconstruction	100
			Total	**$8,185,357.06**	**36**		**100**

* Costs are adjusted for inflation.

FDOT recognizes that the costs attributed to the aforementioned ‘Major Activity’ of performing a pavement ‘Mill and Overlay’ may conflict with budgetary constraints. Table 6-2 presents an alternative minor rehabilitative activity to the mid-range performing pavements. The alternative activity is performing a ‘Microsurfacing/Slurry Seal’ to the pavement to retard the degradation of the facility until funding is available for a ‘Mill and Overlay’ activity.

Table 6-2: Summary of Immediate Major M&R Needs Option No. 2

Branch Name	Section ID	Surface Type	Section Area (ft^2)	Major M&R Costs*	PCI Before M&R	M&R Activity	PCI After M&R
North Apron	4205	AC	211,940	$137,761.00	47	Microsurfacing	100
NW Apron	4105	AC	29,220	$18,993.00	47	Microsurfacing	100
Apron Turnaround RW 35	5105	AC	30,355	$19,730.75	45	Microsurfacing	100
Runway 17-35	6105	AC	100,000	$1,288,700.37	31	Reconstruction	100
Runway 17-35	6110	AC	300,000	$4,086,001.33	29	Reconstruction	100
Runway 17-35	6115	AC	100,000	$995,500.25	35	Reconstruction	100
Connector Taxiway	105	PCC	7,880	$107,325.63	20	Reconstruction	100
			Total	**$6,654,012.33**	**36**		**100**

* Costs are adjusted for inflation.

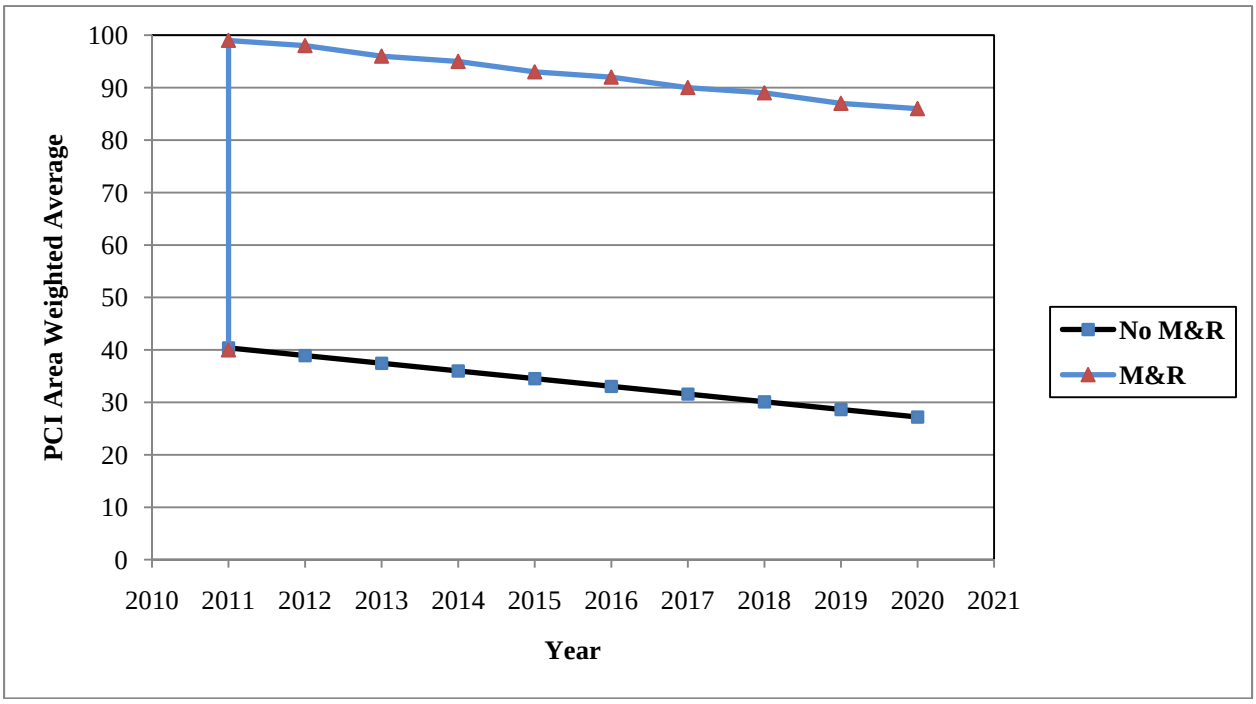
In addition to the immediate Major M&R needs, maintenance activities for pavement areas above critical PCI have been recommended by MicroPAVER for Year 1 and are shown in Table 6-3 below. The costs provided in Table 5-5 were used to calculate the costs associated with this work, which is intended to treat specific distress types. A more detailed table is provided in Appendix E.

Table 6-3: Summary of Year 1 Maintenance Activities

Branch Name	Branch ID	Section ID	Distress Description	Distress Severity	Work Description	Work Quantity	Work Unit	Unit Cost	Work Cost
NW Apron	AP NW	4110	WEATH/RAVEL	L	Surface Seal - Rejuvenating	1,416.90	SqFt	$0.40	$566.78
								Total =	$566.78

The 10 year forecast results are shown in Figure 6-1, illustrating the effect on pavement condition (PCI) of doing no maintenance versus having unlimited funds and performing all M&R actions based on the policies.

Figure 6-1: Budget Scenario Analysis



The following network level observations can be made from the figure above:

- The PCI will deteriorate from 40 in 2011 to 28 in ten years if no M&R activities are performed.
- The PCI will remain at or above 86 through the 10-year analysis period under the unlimited budget scenario. A 2020 PCI of 86 with this scenario is 58 PCI points higher than a "No M&R" scenario. The total cost for Major M&R over this 10-year period is about $8.2 million.

7. MAINTENANCE AND REHABILITATION PLAN

The M&R analysis results include activities that likely exceed a typical annual budget level. These activities would need to be evaluated for feasibility and desirability based on the airport's future plans. In an effort to identify appropriate budget levels, the 10 year M&R analysis was evaluated to determine levels needed to address several specific areas: preventive maintenance, major activities for pavements in poor condition (Major M&R for PCIs less than Critical), and activities that would be desirable to preserve good pavement conditions where they exist (Major M&R for PCI greater than or equal to Critical).

Table 7-1 provides the summary results under the critical PCI unlimited funding scenario.

Table 7-1: M&R Costs under Unlimited Funding Scenario

Year	Preventative	Major M&R	Total Year Cost
2011	$566.78	$8,185,357.06	$8,185,923.84
2012	$679.30	$0.00	$679.30
2013	$1,872.95	$0.00	$1,872.95
2014	$2,950.33	$0.00	$2,950.33
2015	$4,283.56	$0.00	$4,283.56
2016	$5,714.21	$0.00	$5,714.21
2017	$7,846.50	$0.00	$7,846.50
2018	$9,921.25	$0.00	$9,921.25
2019	$30,360.44	$0.00	$30,360.44
2020	$41,840.20	$0.00	$41,840.20
Total	**$106,035.52**	**$8,185,357.06**	**$8,291,392.58**

Note: Costs are adjusted for inflation.

Approximately 100% of the total Major M&R cost is required in the first year (2011). According to the 2011 inspections, the following pavement sections were in immediate need of Major M&R Activity:

- **North Apron** – Asphalt Pavement mill and overlay activity per the FAA P-401 Specification.
- **Northwest Apron** – Asphalt Pavement mill and overlay activity per the FAA P-401 Specification.
- **Apron Turnaround RW 35** – Asphalt Pavement mill and overlay activity per the FAA P-401 Specification.
- **Runway 17-35** – Asphalt Pavement reconstruction activity per the FAA P-401 Specification.
- **Taxiway Connector** – Portland Cement Concrete reconstruction activity per the FAA P-501 Specification.

The unlimited budget scenario provides the basis for estimating the total repair cost.

Appendix F provides details of M&R plan by year under the unlimited funding scenario, and the map of the 10-year M&R plan is provided in Appendix G. It is important to understand that the SAPMP is a network level tool and the M&R costs provided in this report are only for planning purposes.

8. VISUAL AIDS

8.1 System Inventory and Network Definition Drawings

The System Inventory and Network Definition CADD drawings, which show the airport pavement outline with Branch and Section boundaries and identify changes in the network pavement since the last inspection and the sampling plan, respectively, are included in Appendix A of this report.

8.2 Condition Map

A Condition Map that has been prepared based on data linked to the airport's shape file is included in Appendix B. The Condition Map graphically show the inventory and condition of the airport via color coding shown on the shape file. The coding provides a visual representation that illustrates the PCIs for each pavement section.

8.3 10-Year M&R Map

A 10-Year M&R Map that shows the summary of the M&R plan is attached in Appendix G.

8.4 Photographs

Selected digital photographs taken during the pavement inspection are provided in Appendix H to provide visual support to special pavement conditions or distress observed during the inspection of the airport.

9. RECOMMENDATIONS

Pavement condition inspections were performed at Marco Island Executive Airport, and a 10-year M&R plan was developed based on the unlimited funding scenario.

The following recommendations were made based on the 2011 condition inspection and M&R analysis results:

- **North Apron** – Asphalt Pavement mill and overlay activity per the FAA P-401 Specification.
- **Northwest Apron** – Asphalt Pavement mill and overlay activity per the FAA P-401 Specification.
- **Apron Turnaround RW 35** – Asphalt Pavement mill and overlay activity per the FAA P-401 Specification.
- **Runway 17-35** – Asphalt Pavement reconstruction activity per the FAA P-401 Specification.
- **Taxiway Connector** – Portland Cement Concrete reconstruction activity per the FAA P-501 Specification.

Further evaluation of these features is necessary in order to develop repair plans and timing for future budgets since these needs cannot be addressed with typical annual expenditures.

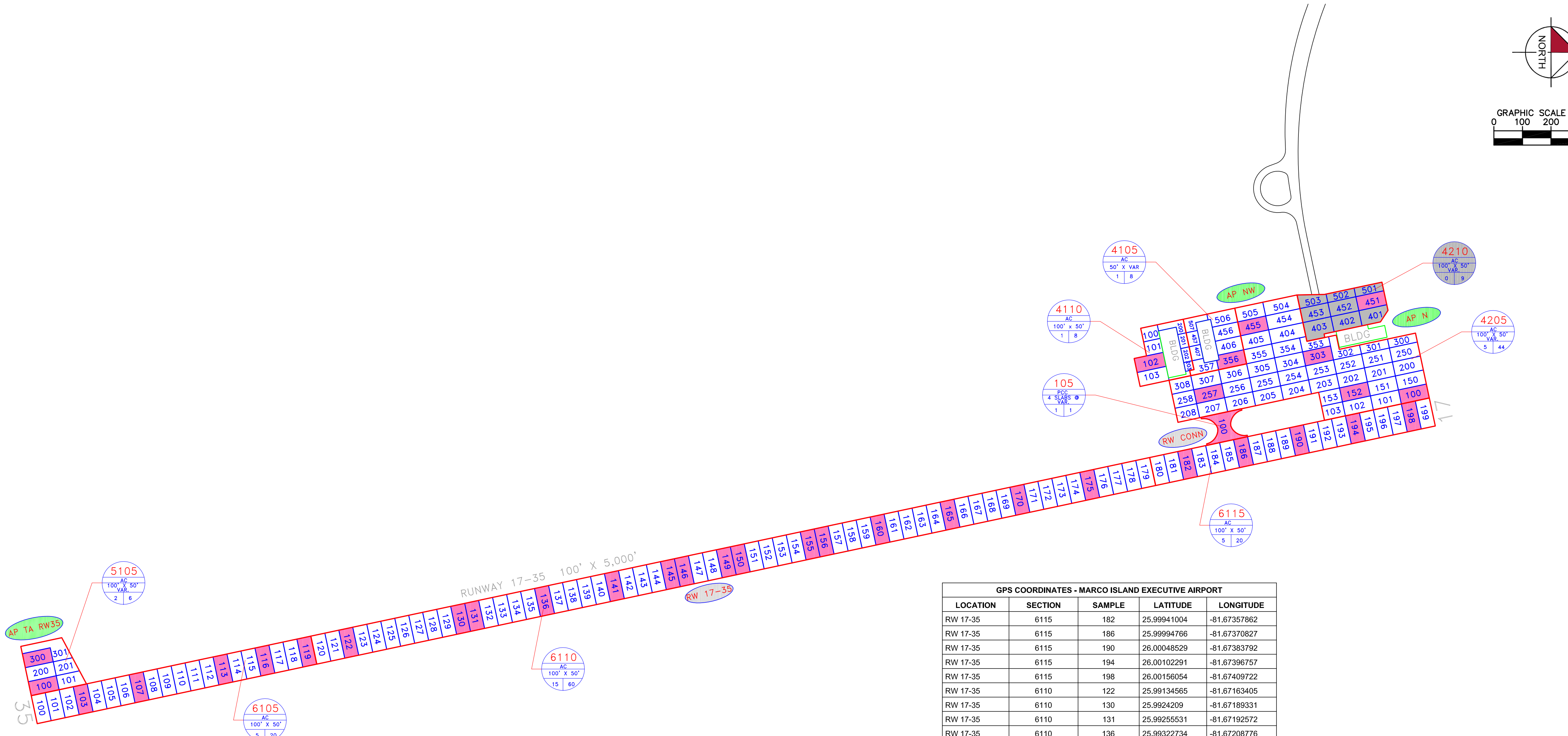
APPENDIX A

NETWORK DEFINITION MAP

SYSTEM INVENTORY MAP

PAVEMENT INVENTORY TABLE

WORK HISTORY REPORT



GPS COORDINATES - MARCO ISLAND EXECUTIVE AIRPORT				
LOCATION	SECTION	SAMPLE	LATITUDE	LONGITUDE
RW 17-35	6115	182	25.99941004	-81.67357862
RW 17-35	6115	186	25.99994766	-81.67370827
RW 17-35	6115	190	26.00048529	-81.67383792
RW 17-35	6115	194	26.00102291	-81.67396757
RW 17-35	6115	198	26.00156054	-81.67409722
RW 17-35	6110	122	25.99134565	-81.67163405
RW 17-35	6110	130	25.9924209	-81.67189331
RW 17-35	6110	131	25.99255531	-81.67192572
RW 17-35	6110	136	25.99322734	-81.67208776
RW 17-35	6110	141	25.99389938	-81.6722498
RW 17-35	6110	145	25.994437	-81.67237943
RW 17-35	6110	146	25.99457141	-81.67241184
RW 17-35	6110	149	25.99497463	-81.67250907
RW 17-35	6110	150	25.99510904	-81.67254148
RW 17-35	6110	155	25.99578107	-81.67270353
RW 17-35	6110	156	25.99591547	-81.67273594
RW 17-35	6110	160	25.9964531	-81.67286558
RW 17-35	6110	165	25.99712513	-81.67302763
RW 17-35	6110	170	25.99779716	-81.67318968
RW 17-35	6110	175	25.99846919	-81.67335174
RW 17-35	6105	103	25.98879192	-81.67101832
RW 17-35	6105	107	25.98932954	-81.67114795
RW 17-35	6105	113	25.99013599	-81.67134238
RW 17-35	6105	116	25.99053921	-81.6714396
RW 17-35	6105	119	25.99094243	-81.67153683
AP TA RW35	5105	100	25.98841197	-81.67116038
AP TA RW35	5105	300	25.98835339	-81.67145782
AP N	4210	451	26.00117059	-81.67532745
AP N	4205	100	26.0015838	-81.67433653
AP N	4205	152	26.00101689	-81.6743556
AP N	4205	257	25.99961425	-81.67432894
AP N	4205	303	26.0006602	-81.67473697
AP N	4205	455	26.0000347	-81.67505351
AP NW	4110	102	25.99904479	-81.67465899
AP NW	4105	356	25.99982609	-81.67469007
TW CONN	105	100	25.99976109	-81.67397506

NOTE: GEODETICS REPRESENT DECIMAL DEGREES (NAD 83 FLORIDA STATE PLANES, EAST ZONE, US FOOT). ALL GPS COORDINATES ARE AT THE CENTROID OF THE SAMPLE UNITS.

LEGEND

- RW 13-31 — TYPICAL RUNWAY BRANCH ID
- TW A — TYPICAL TAXIWAY BRANCH ID
- AP S — TYPICAL APRON BRANCH ID
- 4105 / AC / 100' x 50' / 5 / 14 — SECTION NUMBER; PAVEMENT TYPE; TYPICAL SAMPLE UNIT INFORMATION: FLEXIBLE (AC) PAVEMENT LENGTH & WIDTH, RIGID (PCC) PAVEMENT NO. OF SLABS AND SLAB SIZE; NUMBER OF SAMPLE UNITS IN SECTION; NUMBER OF SAMPLE UNITS TO BE INSPECTED
- 605 / AC / 100' x 50' / 1 / 8 — SECTION NOT INSPECTED DUE TO RECENT CONSTRUCTION. SEE SYSTEM INVENTORY MAP FOR CONSTRUCTION DATES.
- 100 — INSPECTED SAMPLE UNITS. GPS COORDINATES ARE AT THE CENTROID OF THE SAMPLE UNIT.

TOTAL SAMPLES INSPECTED = 36

RUNWAY LENGTHS DEPICTED IN THIS DRAWING ARE FOR PAVEMENT MANAGEMENT PURPOSES ONLY AND MAY NOT MATCH PUBLISHED RUNWAY LENGTHS.

NUMBER	DATE	REVISIONS

DESIGNED: ELT | DRAWN: ALB | CHECKED: DRB | DATE:

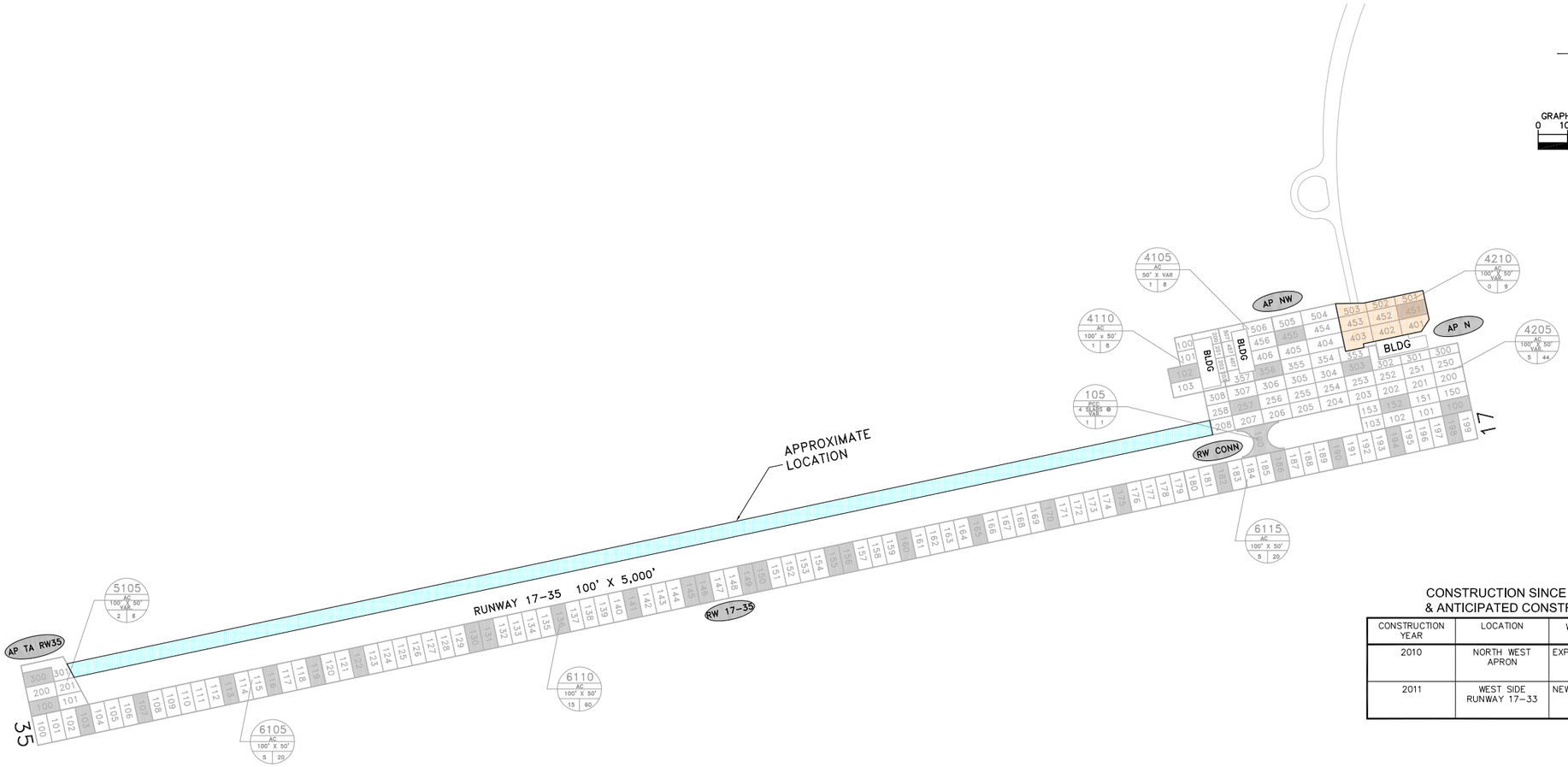
NETWORK DEFINITION MAP

MARCO ISLAND EXECUTIVE AIRPORT
COLLIER COUNTY, FLORIDA

FLORIDA DEPARTMENT OF TRANSPORTATION - AVIATION OFFICE

IDENTIFIER: MKY

FDOT DISTRICT: 1



CONSTRUCTION SINCE LAST INSPECTION
& ANTICIPATED CONSTRUCTION ACTIVITY

CONSTRUCTION YEAR	LOCATION	WORK TYPE / PAVEMENT SECTION
2010	NORTH WEST APRON	EXPANSION
2011	WEST SIDE RUNWAY 17-33	NEW FULL LENGTH PARALLEL TAXIWAY

LEGEND

- PROJECTS YEAR 2006
- PROJECTS YEAR 2007
- PROJECTS YEAR 2008
- PROJECTS YEAR 2009
- PROJECTS YEAR 2010
- PROJECTS YEAR 2011
- PROJECTS YEAR 2012
- PROJECTS YEAR 2013
- PROJECTS YEAR 2014
- PROJECTS YEAR 2015
- PROJECTS YEAR 2016
- PROJECTS YEAR 2017

RUNWAY LENGTHS DEPICTED IN THIS DRAWING ARE FOR PAVEMENT MANAGEMENT PURPOSES ONLY AND MAY NOT MATCH PUBLISHED RUNWAY LENGTHS.

NUMBER	DATE	REVISIONS

DESIGNED:	ELT	DRAWN:	ALB	CHECKED:	DRB	DATE:

K:\SPB_Aviation\140376001\ACAD\PLANSHEETS\MKY\EXHIBIT2202-MKY-INVENTORY.dwg PLOTTED: July 13, 2011 - 7:21 AM, BY Stanford, Rex

SYSTEM INVENTORY MAP

MARCO ISLAND EXECUTIVE AIRPORT
COLLIER COUNTY, FLORIDA

FLORIDA DEPARTMENT OF TRANSPORTATION - AVIATION OFFICE

IDENTIFIER: MKY
FDOT DISTRICT: 1

Table A-1: Pavement Inventory

Branch Name	Branch ID	Branch Use	Section ID	Length (ft)	Width (ft)	True Area (ft^2)	Section Rank	Surface Type	Last Const. Date	Last Insp. Date	Total Samples
North Apron	AP N	APRON	4205	878	232	211,940	P	AC	1/1/1975	3/31/2011	44
North Apron	AP N	APRON	4210	300	135	41,600	P	AC	1/1/2010	1/1/2010	9
NW Apron	AP NW	APRON	4105	131	199	29,220	P	AC	1/1/1996	3/31/2011	8
NW Apron	AP NW	APRON	4110	90	199	23,760	P	AC	1/1/1996	3/31/2011	8
Apron Turnaround RW 35	AP TA RW35	APRON	5105	176	150	30,355	P	AC	1/1/1976	3/31/2011	6
Runway 17-35	RW 17-35	RUNWAY	6105	1,000.00	100	100,000	P	AC	1/1/1976	3/31/2011	20
Runway 17-35	RW 17-35	RUNWAY	6110	3,000.00	100	300,000	P	AC	1/1/1976	3/31/2011	60
Runway 17-35	RW 17-35	RUNWAY	6115	1,000.00	100	100,000	P	AC	1/1/1976	3/31/2011	20
Connector Taxiway	TW CONN	TAXIWAY	105	100	46	7,880	P	PCC	1/1/1960	3/31/2011	1

Note: If a new construction, then survey date = last construction date and PCI is set to 100 by MicroPAVER.

Sections not surveyed due to reasons such as re-sectioning, no escort, not accessible at the time of survey.

Network: MKY **Branch**: AP N (NORTH APRON) **Section:** 4205 **Surface:** AC
L.C.D.: 01/01/1975 **Use:** APRON **Rank** P **Length:** 878.00 Ft **Width:** 232.00 Ft **True Area:** 211,940.00 SqF

Work Date	Work Code	Work Description	Cost	Thickness (in)	Major M&R	Comments
01/01/1975	IMPORTED	BUILT			True	EST 1975 AC

Network: MKY **Branch**: AP N (NORTH APRON) **Section:** 4210 **Surface:** AC
L.C.D.: 01/01/2010 **Use:** APRON **Rank** P **Length:** 300.00 Ft **Width:** 135.00 Ft **True Area:** 41,600.00 SqF

Work Date	Work Code	Work Description	Cost	Thickness (in)	Major M&R	Comments
01/01/2010	INITIAL	Initial Construction	$0	0.00	True	

Network: MKY **Branch**: AP NW (NW APRON) **Section:** 4105 **Surface:** AC
L.C.D.: 01/01/1996 **Use:** APRON **Rank** P **Length:** 131.00 Ft **Width:** 199.00 Ft **True Area:** 29,220.00 SqF

Work Date	Work Code	Work Description	Cost	Thickness (in)	Major M&R	Comments
01/01/1996	IMPORTED	BUILT			True	EST 1996 AC PAVEMENT

Network: MKY **Branch**: AP NW (NW APRON) **Section:** 4110 **Surface:** AC
L.C.D.: 01/01/1996 **Use:** APRON **Rank** P **Length:** 90.00 Ft **Width:** 199.00 Ft **True Area:** 23,760.00 SqF

Work Date	Work Code	Work Description	Cost	Thickness (in)	Major M&R	Comments
01/01/1996	INITIAL	Initial Construction	$0	0.00	True	

Network: MKY **Branch**: AP TA RW35 (APRON TURNAROUND RW 35) **Section:** 5105 **Surface:** AC
L.C.D.: 01/01/1976 **Use:** APRON **Rank** P **Length:** 176.00 Ft **Width:** 150.00 Ft **True Area:** 30,355.00 SqF

Work Date	Work Code	Work Description	Cost	Thickness (in)	Major M&R	Comments
01/01/1976	IMPORTED	BUILT		3.00	True	1976: 3" AC ON 7" SOIL-CEMENT

Network: MKY **Branch**: RW 17-35 (RUNWAY 17-35) **Section:** 6105 **Surface:** AC
L.C.D.: 01/01/1976 **Use:** RUNWAY **Rank** P **Length:** 1,000.00 Ft **Width:** 100.00 Ft **True Area:** 100,000.00 SqF

Work Date	Work Code	Work Description	Cost	Thickness (in)	Major M&R	Comments
01/01/1976	IMPORTED	BUILT		3.00	True	1976: 3" AC ON 7" SOIL-CEMENT

Network: MKY **Branch**: RW 17-35 (RUNWAY 17-35) **Section:** 6110 **Surface:** AC
L.C.D.: 01/01/1976 **Use:** RUNWAY **Rank** P **Length:** 3,000.00 Ft **Width:** 100.00 Ft **True Area:** 300,000.00 SqF

Work Date	Work Code	Work Description	Cost	Thickness (in)	Major M&R	Comments
01/01/1976	IMPORTED	BUILT		2.00	True	1976: 2" AC ON 7" SOIL-CEMENT

Network: MKY **Branch**: RW 17-35 (RUNWAY 17-35) **Section:** 6115 **Surface:** AC
L.C.D.: 01/01/1976 **Use:** RUNWAY **Rank** P **Length:** 1,000.00 Ft **Width:** 100.00 Ft **True Area:** 100,000.00 SqF

Work Date	Work Code	Work Description	Cost	Thickness (in)	Major M&R	Comments
01/01/1976	IMPORTED	BUILT		3.00	True	1976: 3" AC ON 7" SOIL-CEMENT

Network: MKY **Branch**: TW CONN (CONNECTOR TAXIWAY) **Section:** 105 **Surface:** PCC
L.C.D.: 01/01/1960 **Use:** TAXIWAY **Rank** P **Length:** 100.00 Ft **Width:** 46.00 Ft **True Area:** 7,880.00 SqF

Work Date	Work Code	Work Description	Cost	Thickness (in)	Major M&R	Comments
01/01/1960	IMPORTED	BUILT			True	EST 1960 PCC

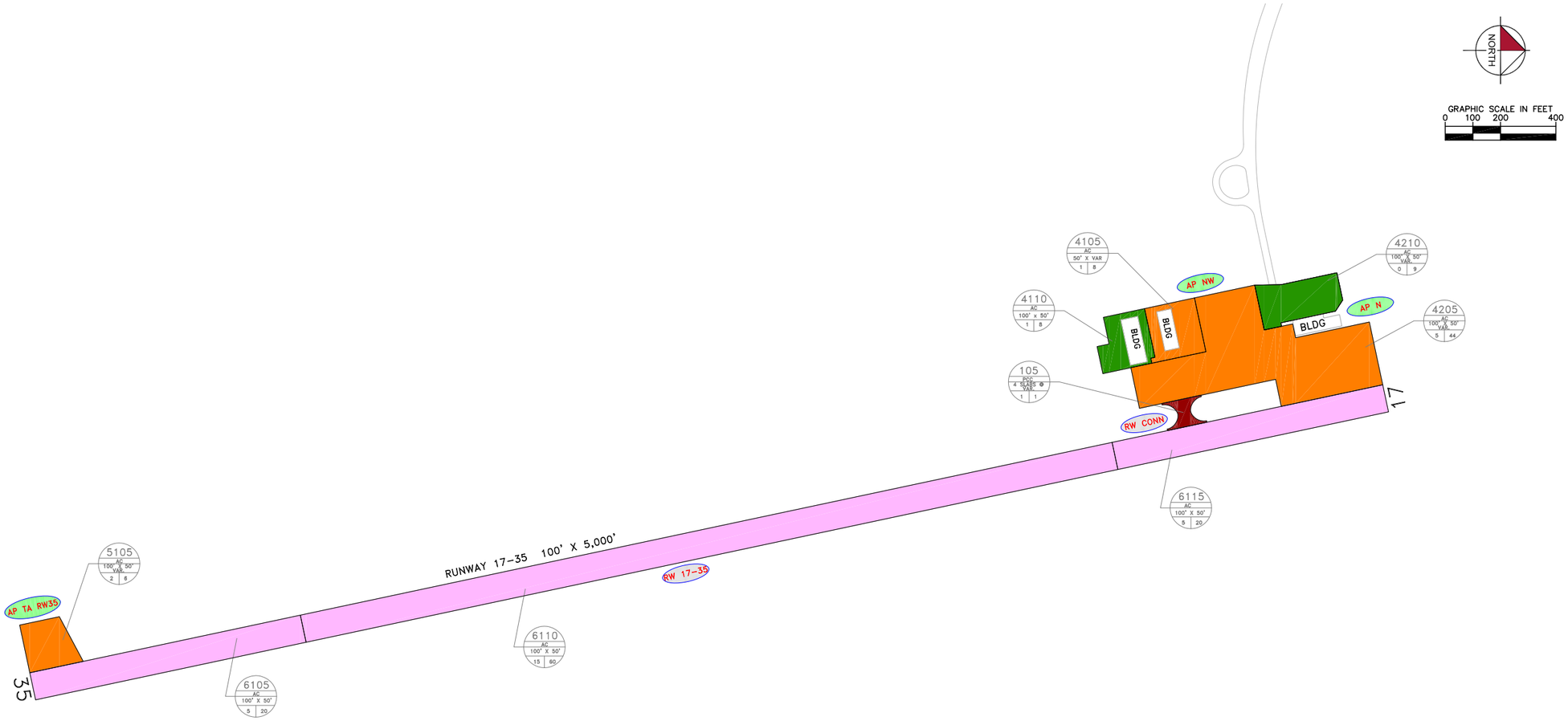
Summary:

Work Description	Section Count	Area Total (SqFt)	Thickness Avg (in)	Thickness STD (in)
BUILT	7	779,395.00	2.75	.50
Initial Construction	2	65,360.00	.00	.00

STD = Standard Deviation

APPENDIX B

2011 CONDITION MAP
PAVEMENT CONDITION INDEX TABLE



LEGEND

- RW 13-31 — TYPICAL RUNWAY BRANCH ID
- TW A — TYPICAL TAXIWAY BRANCH ID
- AP S — TYPICAL APRON BRANCH ID

- PCI 86–100 GOOD
- PCI 71–85 SATISFACTORY
- PCI 56–70 FAIR
- PCI 41–55 POOR
- PCI 26–40 VERY POOR
- PCI 11–25 SERIOUS
- PCI 0–10 FAILED

RUNWAY LENGTHS DEPICTED IN THIS DRAWING ARE FOR PAVEMENT MANAGEMENT PURPOSES ONLY AND MAY NOT MATCH PUBLISHED RUNWAY LENGTHS.

NUMBER	DATE	REVISIONS

DESIGNED: ELT | DRAWN: ALB | CHECKED: DRB | DATE:

K:\AVN_Aviation\1-427900\01\CAD\PLANSHEETS\MKY_EXHIBIT2_2011-MKY-CONDITION.dwg PLOTTED: July 13, 2011 – 7:22 AM, BY: Stanford, Rex

2011 CONDITION MAP

MARCO ISLAND EXECUTIVE AIRPORT
COLLIER COUNTY, FLORIDA

FLORIDA DEPARTMENT OF TRANSPORTATION - AVIATION OFFICE

IDENTIFIER: MKY

FDOT DISTRICT: 1

Table B-1: Pavement Condition Index

Branch Name	Branch ID	Branch Use	Section ID	True Area (ft^2)	Section Rank	Surface Type	Total Samples Inspected	Total Samples	PCI	PCI Category
North Apron	AP N	APRON	4205	211,940	P	AC	5	44	47	Poor
North Apron	AP N	APRON	4210	41,600	P	AC	0	9	100	Good
NW Apron	AP NW	APRON	4105	29,220	P	AC	1	8	47	Poor
NW Apron	AP NW	APRON	4110	23,760	P	AC	1	8	92	Good
Apron Turnaround RW 35	AP TA RW35	APRON	5105	30,355	P	AC	2	6	45	Poor
Runway 17-35	RW 17-35	RUNWAY	6105	100,000	P	AC	5	20	31	Very Poor
Runway 17-35	RW 17-35	RUNWAY	6110	300,000	P	AC	15	60	29	Very Poor
Runway 17-35	RW 17-35	RUNWAY	6115	100,000	P	AC	5	20	35	Very Poor
Connector Taxiway	TW CONN	TAXIWAY	105	7,880	P	PCC	1	1	21	Serious

Note: If a new construction, then survey date = last construction date and PCI is set to 100 by MicroPAVER.

Sections not surveyed due to reasons such as re-sectioning, no escort, not accessible at the time of survey.

APPENDIX C

BRANCH CONDITION REPORT
SECTION CONDITION REPORT

Date: 6 /15/2011

Branch Condition Report

Pavement Database: NetworkID: MKY

Branch ID	Number of Sections	Sum Section Length (Ft)	Avg Section Width (Ft)	True Area (SqFt)	Use	Average PCI	PCI Standard Deviation	Weighted Average PCI
AP N (NORTH APRON)	2	1,178.00	183.50	253,540.00	APRON	73.50	26.50	55.70
AP NW (NW APRON)	2	221.00	199.00	52,980.00	APRON	69.50	22.50	67.18
AP TA RW35 (APRON TURNAROUND RW 35)	1	176.00	150.00	30,355.00	APRON	45.00	0.00	45.00
RW 17-35 (RUNWAY 17-35)	3	5,000.00	100.00	500,000.00	RUNWAY	31.67	2.49	30.60
TW CONN (CONNECTOR TAXIWAY)	1	100.00	46.00	7,880.00	TAXIWAY	21.00	0.00	21.00

Branch Condition Report

Pavement Database:

Use Category	Number of Sections	Total Area (SqFt)	Arithmetic Average PCI	Average PCI STD.	Weighted Average PCI
APRON	5	336,875.00	66.20	24.47	56.54
RUNWAY	3	500,000.00	31.67	2.49	30.60
TAXIWAY	1	7,880.00	21.00	0.00	21.00
All	9	844,755.00	49.67	26.19	40.85

STD = Standard Deviation

Date: 6 /15/2011

Section Condition Report

Pavement Database: *NetworkID: MKY*

Branch ID	Section ID	Last Const. Date	Surface	Use	Rank	Lanes	True Area (SqFt)	Last Inspection Date	Age At Inspection	PCI
AP N (NORTH APRON)	4205	01/01/1975	AC	APRON	P	0	211,940.00	03/31/2011	36	47.00
AP N (NORTH APRON)	4210	01/01/2010	AC	APRON	P	0	41,600.00	01/01/2010	0	100.00
AP NW (NW APRON)	4105	01/01/1996	AC	APRON	P	0	29,220.00	03/31/2011	15	47.00
AP NW (NW APRON)	4110	01/01/1996	AC	APRON	P	0	23,760.00	03/31/2011	15	92.00
AP TA RW35 (APRON TURNAROUND RW 35)	5105	01/01/1976	AC	APRON	P	0	30,355.00	03/31/2011	35	45.00
RW 17-35 (RUNWAY 17-35)	6105	01/01/1976	AC	RUNWAY	P	0	100,000.00	03/31/2011	35	31.00
RW 17-35 (RUNWAY 17-35)	6110	01/01/1976	AC	RUNWAY	P	0	300,000.00	03/31/2011	35	29.00
RW 17-35 (RUNWAY 17-35)	6115	01/01/1976	AC	RUNWAY	P	0	100,000.00	03/31/2011	35	35.00
TW CONN (CONNECTOR TAXIWAY)	105	01/01/1960	PCC	TAXIWAY	P	0	7,880.00	03/31/2011	51	21.00

Section Condition Report

Pavement Database:

Age Category	Average Age At Inspection	Total Area (SqFt)	Number of Sections	Arithmetic Average PCI	PCI Standard Deviation	Weighted Average PCI
0-02	**0.00**	**41,600.00**	**1**	**100.00**	**0.00**	**100.00**
11-15	**15.00**	**52,980.00**	**2**	**69.50**	**22.50**	**67.18**
31-35	**35.00**	**530,355.00**	**4**	**35.00**	**6.16**	**31.42**
36-40	**36.00**	**211,940.00**	**1**	**47.00**	**0.00**	**47.00**
over 40	**51.00**	**7,880.00**	**1**	**21.00**	**0.00**	**21.00**
All	**28.56**	**844,755.00**	**9**	**49.67**	**26.19**	**40.85**

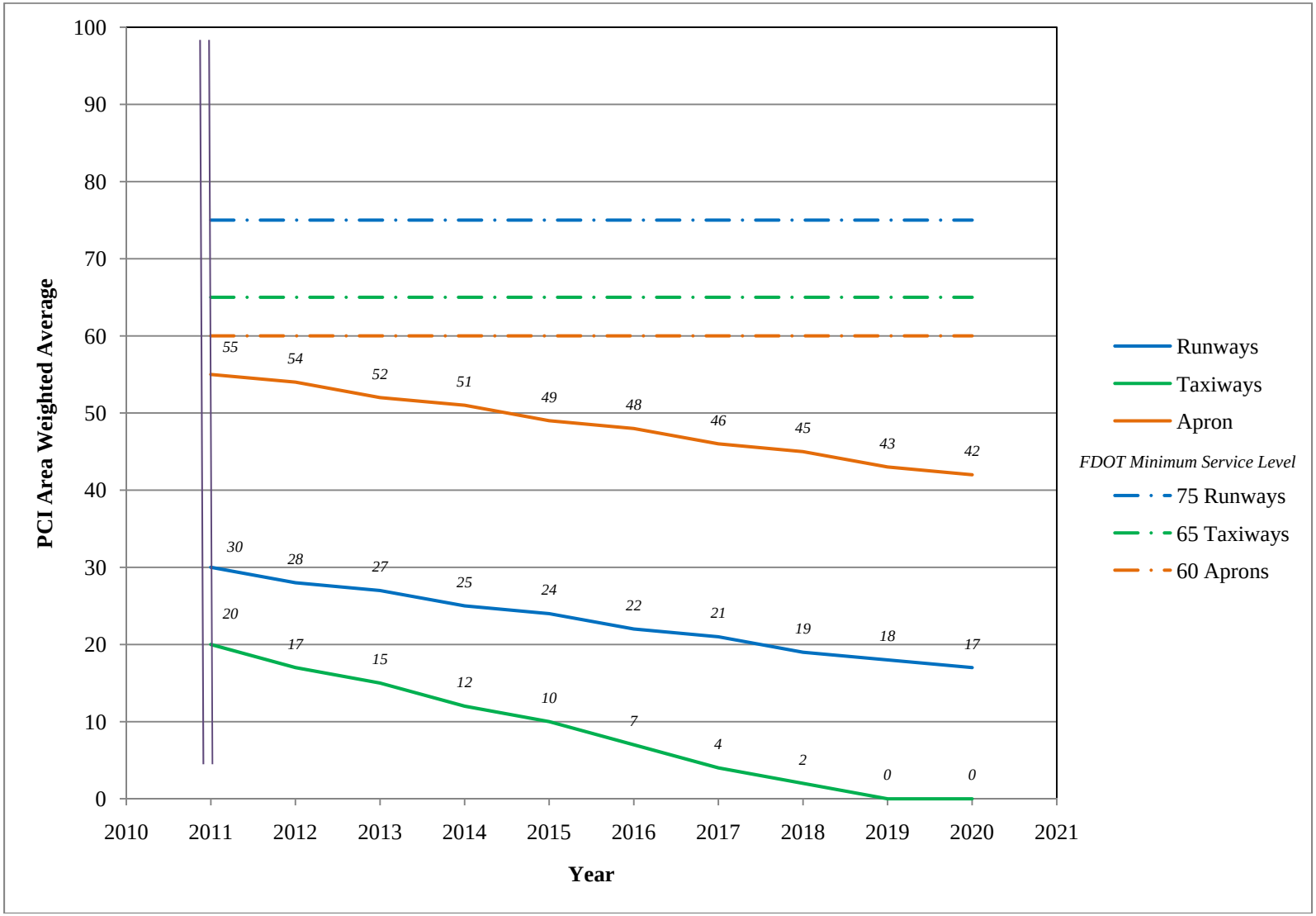
APPENDIX D

PAVEMENT CONDITION PREDICTION TABLE
PREDICTED PCI BY PAVEMENT USE GRAPH

Table D-1: Pavement Condition Prediction

Branch Name	Branch ID	Section ID	Current PCI	PCI Forecast									
				2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
North Apron	AP N	4205	47	47	45	44	42	41	39	38	36	35	34
North Apron	AP N	4210	100	98	96	95	93	92	91	89	88	86	85
NW Apron	AP NW	4105	47	47	45	44	42	41	39	38	36	35	34
NW Apron	AP NW	4110	92	92	90	89	87	86	84	83	81	80	79
Apron Turnaround RW 35	AP TA RW35	5105	45	45	43	42	40	39	37	36	34	33	32
Runway 17-35	RW 17-35	6105	31	31	29	28	26	25	23	22	20	19	17
Runway 17-35	RW 17-35	6110	29	29	27	26	24	23	21	20	18	17	15
Runway 17-35	RW 17-35	6115	35	35	33	32	30	29	27	26	24	23	21
Connector Taxiway	TW CONN	105	21	20	18	15	13	10	8	5	2	0	0

Figure D-1: Predicted PCI by Pavement Use



APPENDIX E

YEAR 1 MAINTENANCE ACTIVITIES TABLE

Table E-1: Year 1 Maintenance Activities

Branch Name	Branch ID	Section ID	Distress Description	Distress Severity	Work Description	Work Quantity	Work Unit	Unit Cost	Work Cost
NW Apron	AP NW	4110	WEATH/RAVEL	L	Surface Seal - Rejuvenating	1,416.90	SqFt	$0.40	$566.78
								Total =	$566.78

APPENDIX F

MAJOR M&R PLAN BY YEAR UNDER UNLIMITED FUNDING SCENARIO TABLE

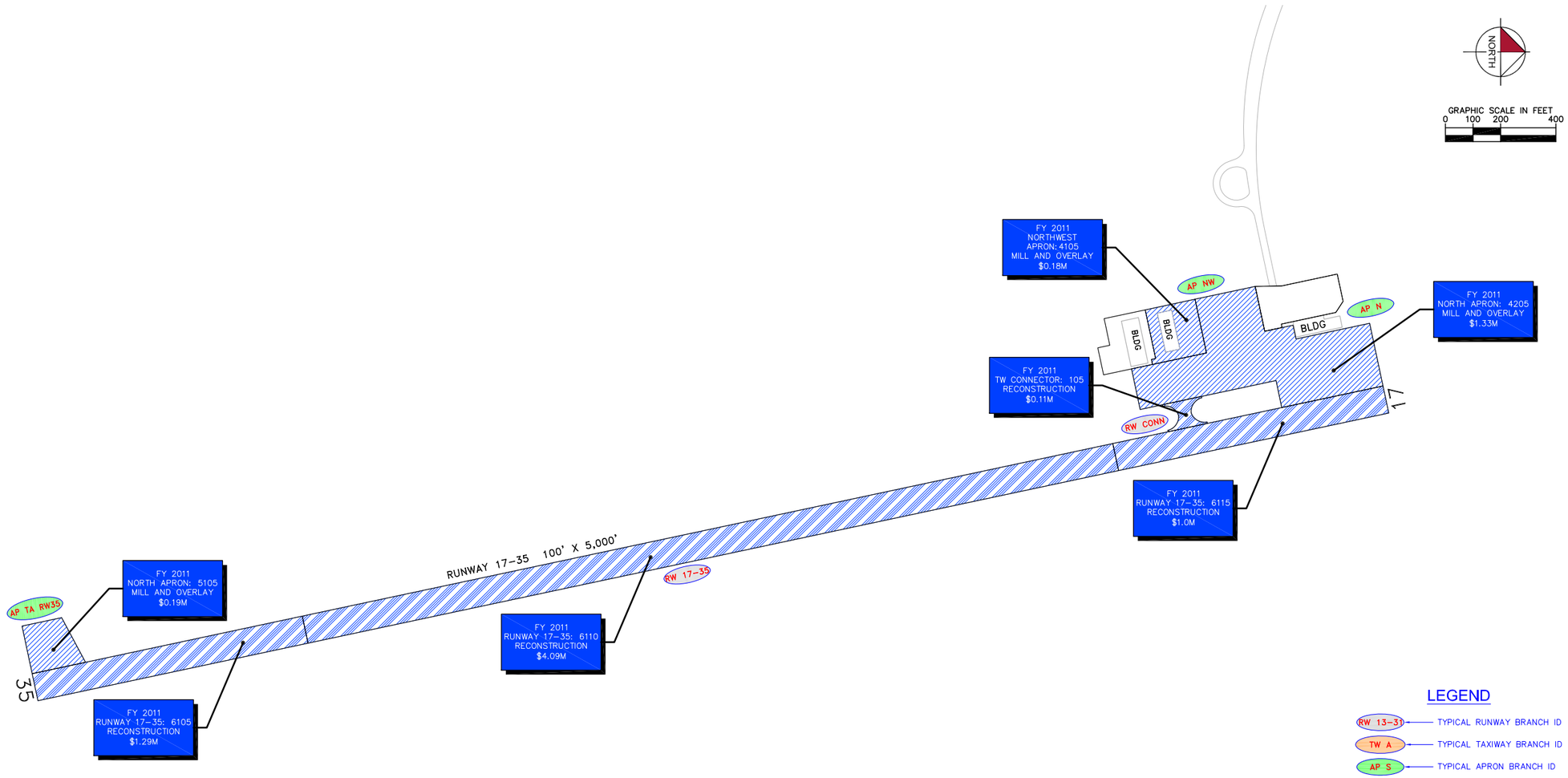
Table F-1: Major M&R Plan by Year under Unlimited Funding Scenario

Year	Branch Name	Section ID	Surface Type	Section Area (ft^2)	Major M&R Costs*	PCI Before M&R	M&R Activity	PCI After M&R
2011	North Apron	4205	AC	211,940	$ 1,333,102.70	47	Mill and Overlay	100
2011	Northwest Apron	4105	AC	29,220	$ 183,793.81	47	Mill and Overlay	100
2011	Apron Turnaround at RW 35	5105	AC	30,355	$ 190,932.97	45	Mill and Overlay	100
2011	Runway 17-35	6105	AC	100,000	$ 1,288,700.37	31	Reconstruction	100
2011	Runway 17-35	6110	AC	300,000	$ 4,086,001.33	29	Reconstruction	100
2011	Runway 17-35	6115	AC	100,000	$ 995,500.25	35	Reconstruction	100
2011	Taxiway Connector	105	PCC	7,880	$ 107,325.63	20	Reconstruction	100
				Total	**$8,185,357.06**	**36**		**100**

* Costs are adjusted for inflation.

APPENDIX G

10-YEAR M&R MAP



LEGEND

RW 13-31 — TYPICAL RUNWAY BRANCH ID

TW A — TYPICAL TAXIWAY BRANCH ID

AP S — TYPICAL APRON BRANCH ID

YEAR		ACTIVITY	
	2011		MICROSURFACING
	2012		MILL AND OVERLAY
	2013		RECONSTRUCTION
	2014		CONCRETE PAVEMENT RESTORATION
	2015		
	2016		
	2017		
	2018		
	2019		
	2020		

"PLAN YEAR"
"BRANCH"; "SECTION"
"M AND R ACTIVITY"
"EST. COST"

RUNWAY LENGTHS DEPICTED IN THIS DRAWING ARE FOR PAVEMENT MANAGEMENT PURPOSES ONLY AND MAY NOT MATCH PUBLISHED RUNWAY LENGTHS.

NUMBER	DATE	REVISIONS

DESIGNED: ELT | DRAWN: ALB | CHECKED: DRB | DATE:

K:\SPR_Aviation\140770001\CAD\PLANSHEETS\MKY\EXHIBIT\004-MKY-MAINTENANCE.dwg PLOTTED: July 13, 2011 - 7:23 AM, BY: Stanford, Rex

10 - YEAR M & R MAP

MARCO ISLAND EXECUTIVE AIRPORT
COLLIER COUNTY, FLORIDA

FLORIDA DEPARTMENT OF TRANSPORTATION - AVIATION OFFICE

IDENTIFIER: MKY

FDOT DISTRICT 1

APPENDIX H

PHOTOGRAPHS

AP TA RW 35, Section 5105, Sample Unit 300 – Low and medium severity (43) Block Cracking, low severity (52) Weathering and Raveling

AP TA RW 35, Section 5105, Sample Unit 300 – Low and medium severity (43) Block Cracking, low severity (52) Weathering and Raveling

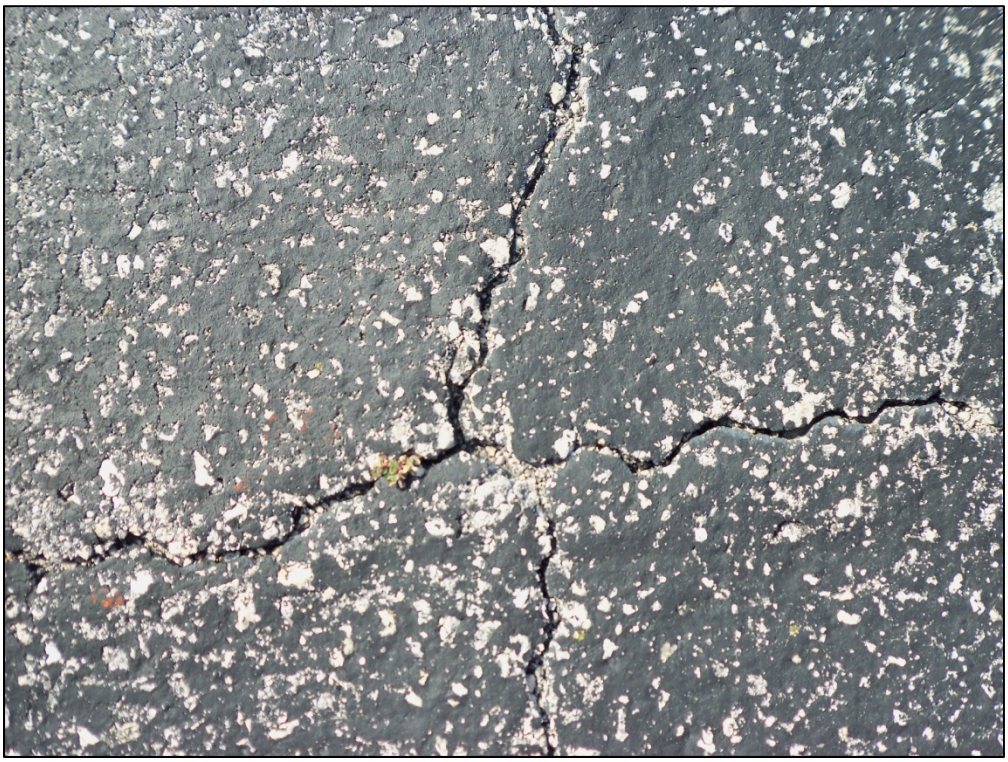
Runway 17-35, Section 6110, Sample Unit 130 – Medium severity (43) Block Cracking, medium severity (52) Weathering and Raveling

Runway 17-35, Section 6110, Sample Unit 130 – Medium severity (43) Block Cracking, medium severity (52) Weathering and Raveling

Runway 17-35, Section 6110, Sample Unit 145 – Medium severity (43) Block Cracking, medium severity (52) Weathering and Raveling

Runway 17-35, Section 6110, Sample Unit 145 – Medium severity (43) Block Cracking, medium severity (52) Weathering and Raveling

Apron, Section 4205, Sample Unit 455 – Low and medium severity (43) Block Cracking, low severity (52) Weathering and Raveling



Apron, Section 4205, Sample Unit 455 – Low and medium severity (43) Block Cracking, low severity (52) Weathering and Raveling

Apron, Section 4205, Sample Unit 257 – Low and medium severity (43) Block Cracking, low severity (52) Weathering and Raveling

Taxiway Connector, Section 105, Sample Unit 100 – Low severity (63) LTD Cracking, medium severity (66) Patch, low severity (70) Scaling/Map Cracking, medium severity (72) Shattered Slabs, (73) Shrinkage Cracks, low severity (74) Joint Spalling

APPENDIX I

PCI RE-INSPECTION REPORT

Re-inspection Report

FDOT
Report Generated Date: 6/15/2011
Site Name:

Network: MKY Name: MARCO ISLAND AIRPORT

Branch: AP N Name: NORTH APRON Use: APRON Area: 253,540.00SqFt

Section: 4205 of 2 From: - To: - Last Const.: 1/1/1975
Surface: AC Family: FDOT-GA-AP-AC Zone: Category: Rank: P
Area: 211,940.00SqFt Length: 878.00Ft Width: 232.00Ft
Shoulder: Street Type: Grade: 0.00 Lanes: 0
Section Comments:

Last Insp. Date3/31/2011 Total Samples: 44 Surveyed: 5
Conditions: PCI:47.00 |
Inspection Comments:

Sample Number: 100 Type: R Area: 5,000.00SqFt PCI = 43
Sample Comments:

43 BLOCK CRACKING	L	2,499.98 SqFt	Comments:
43 BLOCK CRACKING	M	1,999.98 SqFt	Comments:
52 WEATHERING/RAVELING	L	3,999.97 SqFt	Comments:

Sample Number: 152 Type: R Area: 5,000.00SqFt PCI = 49
Sample Comments:

43 BLOCK CRACKING	L	3,999.97 SqFt	Comments:
43 BLOCK CRACKING	M	500.00 SqFt	Comments:
52 WEATHERING/RAVELING	L	3,999.97 SqFt	Comments:

Sample Number: 257 Type: R Area: 5,000.00SqFt PCI = 48
Sample Comments:

43 BLOCK CRACKING	M	500.00 SqFt	Comments:
43 BLOCK CRACKING	L	4,499.96 SqFt	Comments:
52 WEATHERING/RAVELING	L	4,499.96 SqFt	Comments:

Sample Number: 303 Type: R Area: 5,000.00SqFt PCI = 47
Sample Comments:

43 BLOCK CRACKING	L	2,999.98 SqFt	Comments:
43 BLOCK CRACKING	M	999.99 SqFt	Comments:
52 WEATHERING/RAVELING	L	3,999.97 SqFt	Comments:

Sample Number: 455 Type: R Area: 5,000.00SqFt PCI = 49
Sample Comments:

43 BLOCK CRACKING	L	3,999.97 SqFt	Comments:
43 BLOCK CRACKING	M	500.00 SqFt	Comments:
52 WEATHERING/RAVELING	L	3,999.97 SqFt	Comments:

Re-inspection Report

FDOT
Report Generated Date: 6/15/2011
Site Name:

Network: MKY Name: MARCO ISLAND AIRPORT

Branch: AP N Name: NORTH APRON Use: APRON Area: 253,540.00SqFt

---

Section: 4210 of 2 From: - To: - Last Const.: 1/1/2010
Surface: AC Family: FDOT-GA-AP-AC Zone: Category: Rank: P
Area: 41,600.00SqFt Length: 300.00Ft Width: 135.00Ft
Shoulder: Street Type: Grade: 0.00 Lanes: 0
Section Comments:

Last Insp. Date1/1/2010 Total Samples: 0 Surveyed: 0
Conditions: PCI:100.00 |
Inspection Comments: Construction/Major M&R inspection record.

Sample Number: Type: Area: 0.00
<NO SAMPLE RECORDS>

Re-inspection Report

FDOT
Report Generated Date: 6/15/2011
Site Name:

Network: MKY Name: MARCO ISLAND AIRPORT

Branch: AP NW Name: NW APRON Use: APRON Area: 52,980.00SqFt

Section: 4105 of 2 From: - To: - Last Const.: 1/1/1996
Surface: AC Family: FDOT-GA-AP-AC Zone: Category: Rank: P
Area: 29,220.00SqFt Length: 131.00Ft Width: 199.00Ft
Shoulder: Street Type: Grade: 0.00 Lanes: 0
Section Comments:

Last Insp. Date3/31/2011 Total Samples: 8 Surveyed: 1
Conditions: PCI:47.00 |
Inspection Comments:

Sample Number: 356 Type: R Area: 4,852.00SqFt PCI = 47
Sample Comments:

43	BLOCK CRACKING	M	1,905.98 SqFt	Comments:
52	WEATHERING/RAVELING	L	1,735.99 SqFt	Comments:
48	LONGITUDINAL/TRANSVERSE CRACKING	L	18.00 Ft	Comments:
50	PATCHING	L	8.00 SqFt	Comments:
48	LONGITUDINAL/TRANSVERSE CRACKING	M	34.01 Ft	Comments:

Re-inspection Report

FDOT
Report Generated Date: 6/15/2011
Site Name:

Network: MKY Name: MARCO ISLAND AIRPORT

Branch: AP NW Name: NW APRON Use: APRON Area: 52,980.00SqFt

Section: 4110 of 2 From: - To: - Last Const.: 1/1/1996
Surface: AC Family: FDOT-GA-AP-AC Zone: Category: Rank: P
Area: 23,760.00SqFt Length: 90.00Ft Width: 199.00Ft
Shoulder: Street Type: Grade: 0.00 Lanes: 0
Section Comments:

Last Insp. Date3/31/2011 Total Samples: 8 Surveyed: 1
Conditions: PCI:92.00 |
Inspection Comments:

Sample Number: 102 Type: R Area: 5,171.00SqFt PCI = 92
Sample Comments:

48 LONGITUDINAL/TRANSVERSE CRACKING	L	3.00 Ft	Comments:
52 WEATHERING/RAVELING	L	200.00 SqFt	Comments:

Re-inspection Report

FDOT
Report Generated Date: 6/15/2011
Site Name:

Network: MKY Name: MARCO ISLAND AIRPORT

Branch: AP TA RW35 Name: APRON TURNAROUND RW 35 Use: APRON Area: 30,355.00SqFt

---

Section: 5105 of 1 From: - To: - Last Const.: 1/1/1976
Surface: AC Family: FDOT-GA-AP-AC Zone: Category: Rank: P
Area: 30,355.00SqFt Length: 176.00Ft Width: 150.00Ft
Shoulder: Street Type: Grade: 0.00 Lanes: 0
Section Comments:

Last Insp. Date3/31/2011 Total Samples: 6 Surveyed: 2
Conditions: PCI:45.00 |
Inspection Comments:

Sample Number: 100 Type: R Area: 5,000.00SqFt PCI = 48
Sample Comments:

43 BLOCK CRACKING	M	500.00 SqFt	Comments:
43 BLOCK CRACKING	L	4,499.96 SqFt	Comments:
52 WEATHERING/RAVELING	L	4,499.96 SqFt	Comments:

Sample Number: 300 Type: R Area: 5,000.00SqFt PCI = 43
Sample Comments:

43 BLOCK CRACKING	M	1,249.99 SqFt	Comments:
43 BLOCK CRACKING	L	3,749.97 SqFt	Comments:
52 WEATHERING/RAVELING	L	4,499.96 SqFt	Comments:

Re-inspection Report

FDOT
Report Generated Date: 6/15/2011
Site Name:

Network: MKY Name: MARCO ISLAND AIRPORT

Branch: RW 17-35 Name: RUNWAY 17-35 Use: RUNWAY Area: 500,000.00SqFt

Section: 6105 of 3 From: - To: - Last Const.: 1/1/1976
Surface: AC Family: FDOT-GA-RW-AC Zone: Category: Rank: P
Area: 100,000.00SqFt Length: 1,000.00Ft Width: 100.00Ft
Shoulder: Street Type: Grade: 0.00 Lanes: 0
Section Comments:

Last Insp. Date3/31/2011 Total Samples: 20 Surveyed: 5
Conditions: PCI:31.00 |
Inspection Comments:

Sample Number: 103 Type: R Area: 5,000.00SqFt PCI = 44
Sample Comments:

43 BLOCK CRACKING	L	80.00	SqFt	Comments:
48 LONGITUDINAL/TRANSVERSE CRACKING	M	76.02	Ft	Comments:
43 BLOCK CRACKING	L	1,949.98	SqFt	Comments:
52 WEATHERING/RAVELING	M	2,999.98	SqFt	Comments:

Sample Number: 107 Type: R Area: 5,000.00SqFt PCI = 27
Sample Comments:

43 BLOCK CRACKING	M	3,499.97	SqFt	Comments:
52 WEATHERING/RAVELING	M	2,999.98	SqFt	Comments:
48 LONGITUDINAL/TRANSVERSE CRACKING	L	50.01	Ft	Comments:
48 LONGITUDINAL/TRANSVERSE CRACKING	M	171.04	Ft	Comments:

Sample Number: 113 Type: R Area: 5,000.00SqFt PCI = 29
Sample Comments:

43 BLOCK CRACKING	M	3,999.97	SqFt	Comments:
52 WEATHERING/RAVELING	M	2,999.98	SqFt	Comments:
48 LONGITUDINAL/TRANSVERSE CRACKING	M	104.03	Ft	Comments:
48 LONGITUDINAL/TRANSVERSE CRACKING	L	100.03	Ft	Comments:

Sample Number: 116 Type: R Area: 5,000.00SqFt PCI = 27
Sample Comments:

43 BLOCK CRACKING	M	4,499.96	SqFt	Comments:
52 WEATHERING/RAVELING	M	2,999.98	SqFt	Comments:
48 LONGITUDINAL/TRANSVERSE CRACKING	L	56.01	Ft	Comments:
48 LONGITUDINAL/TRANSVERSE CRACKING	M	50.01	Ft	Comments:

Sample Number: 119 Type: R Area: 5,000.00SqFt PCI = 27
Sample Comments:

43 BLOCK CRACKING	L	1,499.99	SqFt	Comments:
43 BLOCK CRACKING	M	2,999.98	SqFt	Comments:
48 LONGITUDINAL/TRANSVERSE CRACKING	L	86.02	Ft	Comments:
52 WEATHERING/RAVELING	M	2,999.98	SqFt	Comments:

Re-inspection Report

FDOT
Report Generated Date: 6/15/2011
Site Name:

Network: MKY Name: MARCO ISLAND AIRPORT

Branch: RW 17-35 Name: RUNWAY 17-35 Use: RUNWAY Area: 500,000.00SqFt

Section: 6110 of 3 From: - To: - Last Const.: 1/1/1976
Surface: AC Family: FDOT-GA-RW-AC Zone: Category: Rank: P
Area: 300,000.00SqFt Length: 3,000.00Ft Width: 100.00Ft
Shoulder: Street Type: Grade: 0.00 Lanes: 0
Section Comments:

Last Insp. Date3/31/2011 Total Samples: 60 Surveyed: 15
Conditions: PCI:29.00 |
Inspection Comments:

Sample Number: 122 Type: R Area: 5,000.00SqFt PCI = 28
Sample Comments:
43 BLOCK CRACKING M 4,999.96 SqFt Comments:
52 WEATHERING/RAVELING M 3,999.97 SqFt Comments:

Sample Number: 130 Type: R Area: 5,000.00SqFt PCI = 28
Sample Comments:
43 BLOCK CRACKING M 4,999.96 SqFt Comments:
52 WEATHERING/RAVELING M 3,999.97 SqFt Comments:

Sample Number: 131 Type: R Area: 5,000.00SqFt PCI = 28
Sample Comments:
43 BLOCK CRACKING M 4,999.96 SqFt Comments:
52 WEATHERING/RAVELING M 3,999.97 SqFt Comments:

Sample Number: 136 Type: R Area: 5,000.00SqFt PCI = 28
Sample Comments:
43 BLOCK CRACKING M 4,999.96 SqFt Comments:
52 WEATHERING/RAVELING M 3,999.97 SqFt Comments:

Sample Number: 141 Type: R Area: 5,000.00SqFt PCI = 28
Sample Comments:
43 BLOCK CRACKING M 4,999.96 SqFt Comments:
52 WEATHERING/RAVELING M 3,999.97 SqFt Comments:

Sample Number: 145 Type: R Area: 5,000.00SqFt PCI = 28
Sample Comments:
43 BLOCK CRACKING M 4,999.96 SqFt Comments:
52 WEATHERING/RAVELING M 3,999.97 SqFt Comments:

Sample Number: 146 Type: R Area: 5,000.00SqFt PCI = 28
Sample Comments:
43 BLOCK CRACKING M 4,999.96 SqFt Comments:
52 WEATHERING/RAVELING M 3,999.97 SqFt Comments:

Sample Number: 149 Type: R Area: 5,000.00SqFt PCI = 28
Sample Comments:
43 BLOCK CRACKING M 4,999.96 SqFt Comments:
52 WEATHERING/RAVELING M 3,999.97 SqFt Comments:

Sample Number: 150 Type: R Area: 5,000.00SqFt PCI = 28
Sample Comments:
43 BLOCK CRACKING M 4,999.96 SqFt Comments:
52 WEATHERING/RAVELING M 3,999.97 SqFt Comments:

Re-inspection Report

FDOT
Report Generated Date: 6/15/2011
Site Name:

Sample Number: 155 Type: R Area: 5,000.00SqFt PCI = 28
Sample Comments:

43 BLOCK CRACKING	M	4,999.96 SqFt	Comments:
52 WEATHERING/RAVELING	M	3,999.97 SqFt	Comments:

Sample Number: 156 Type: R Area: 5,000.00SqFt PCI = 28
Sample Comments:

43 BLOCK CRACKING	M	4,999.96 SqFt	Comments:
52 WEATHERING/RAVELING	M	3,999.97 SqFt	Comments:

Sample Number: 160 Type: R Area: 5,000.00SqFt PCI = 32
Sample Comments:

52 WEATHERING/RAVELING	M	2,999.98 SqFt	Comments:
43 BLOCK CRACKING	M	4,999.96 SqFt	Comments:

Sample Number: 165 Type: R Area: 5,000.00SqFt PCI = 32
Sample Comments:

43 BLOCK CRACKING	M	4,999.96 SqFt	Comments:
52 WEATHERING/RAVELING	M	2,999.98 SqFt	Comments:

Sample Number: 170 Type: R Area: 5,000.00SqFt PCI = 28
Sample Comments:

43 BLOCK CRACKING	M	4,999.96 SqFt	Comments:
52 WEATHERING/RAVELING	M	3,999.97 SqFt	Comments:

Sample Number: 175 Type: R Area: 5,000.00SqFt PCI = 28
Sample Comments:

43 BLOCK CRACKING	M	4,999.96 SqFt	Comments:
52 WEATHERING/RAVELING	M	3,999.97 SqFt	Comments:

Re-inspection Report

FDOT
Report Generated Date: 6/15/2011
Site Name:

Network: MKY Name: MARCO ISLAND AIRPORT

Branch: RW 17-35 Name: RUNWAY 17-35 Use: RUNWAY Area: 500,000.00SqFt

Section: 6115 of 3 From: - To: - Last Const.: 1/1/1976
Surface: AC Family: FDOT-GA-RW-AC Zone: Category: Rank: P
Area: 100,000.00SqFt Length: 1,000.00Ft Width: 100.00Ft
Shoulder: Street Type: Grade: 0.00 Lanes: 0
Section Comments:

Last Insp. Date3/31/2011 Total Samples: 20 Surveyed: 5
Conditions: PCI:35.00 |
Inspection Comments:

Sample Number: 182 Type: R Area: 5,000.00SqFt PCI = 28
Sample Comments:

43 BLOCK CRACKING	M	4,999.96 SqFt	Comments:
52 WEATHERING/RAVELING	M	3,999.97 SqFt	Comments:

Sample Number: 186 Type: R Area: 5,000.00SqFt PCI = 28
Sample Comments:

43 BLOCK CRACKING	M	4,999.96 SqFt	Comments:
52 WEATHERING/RAVELING	M	3,999.97 SqFt	Comments:

Sample Number: 190 Type: R Area: 5,000.00SqFt PCI = 28
Sample Comments:

43 BLOCK CRACKING	M	4,999.96 SqFt	Comments:
52 WEATHERING/RAVELING	M	3,999.97 SqFt	Comments:

Sample Number: 194 Type: R Area: 5,000.00SqFt PCI = 49
Sample Comments:

43 BLOCK CRACKING	M	500.00 SqFt	Comments:
43 BLOCK CRACKING	L	4,499.96 SqFt	Comments:
52 WEATHERING/RAVELING	L	3,999.97 SqFt	Comments:

Sample Number: 198 Type: R Area: 5,000.00SqFt PCI = 42
Sample Comments:

43 BLOCK CRACKING	M	2,499.98 SqFt	Comments:
43 BLOCK CRACKING	L	1,999.98 SqFt	Comments:
52 WEATHERING/RAVELING	L	3,999.97 SqFt	Comments:

Re-inspection Report

FDOT
Report Generated Date: 6/15/2011
Site Name:

Network: MKY Name: MARCO ISLAND AIRPORT

Branch: TW CONN Name: CONNECTOR TAXIWAY Use: TAXIWAY Area: 7,880.00SqFt

Section: 105 of 1 From: - To: - Last Const.: 1/1/1960
Surface: PCC Family: FDOT-GA-PCC Zone: Category: Rank: P
Area: 7,880.00SqFt Length: 100.00Ft Width: 46.00Ft
Shoulder: Street Type: Grade: 0.00 Lanes: 0
Section Comments:

Last Insp. Date3/31/2011 Total Samples: 1 Surveyed: 1
Conditions: PCI:21.00 |
Inspection Comments:

Sample Number: 100 Type: R Area: 4.00Slabs PCI = 21
Sample Comments:

70 SCALING/CRAZING	L	4.00 Slabs	Comments:
73 SHRINKAGE CRACKING	N	3.00 Slabs	Comments:
63 LINEAR CRACKING	L	1.00 Slabs	Comments:
74 JOINT SPALLING	L	1.00 Slabs	Comments:
72 SHATTERED SLAB	M	2.00 Slabs	Comments:
66 SMALL PATCH	M	1.00 Slabs	Comments: