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GOAA Sustainability Speaker Series ANATOMY OF A RUNWAY REHABILITATION



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KIMLEY-HORN OFFICE WITH AVIATION Airports We'll Be Discussing Today



Julia Focaracci, P.E.













个 **RSW** Pavement Condition Index Map þ 815 54 655- 750-L6105 L61 1 - 950 421 LEGEND PCI 71-85 SATISF PCI 56-70 FAIR PO 41-55 POOR PCI 28-40 VERY PC OTHERS PCI 11-25 SERV 4320 PCI - 29 4330 4340 PCI-22 PCI-73 RUNHAY LENGTHS DEPICTED IN THIS DRAWING ARE FOR PAVEMENT MANAGEMENT PURPOSES ONLY AND MAY NO MATCH PUBLISHED RUNWAY LENGTHS.







Nondestructive Testing (NDT)

Ground Penetrating Radar





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Additional Subsurface Investigation

In areas where karst features may be present, additional destructive testing is required to confirm.

- Deep soil boring
- Electrical Resistivity Imaging (ERI)









LAST MAJOR REHAB IN 2004

SOUTH RUNWAY PCCC Portland Cement Concrete

LENGTHENED AND RECONSTRUCTED IN PCC IN 2014

Rehabilitation of North Airfield Pavement & EMAS Beds



Runway Rehabilitation Taxiway Rehabilitation Demolition of old RW 13-31 New Taxiway Geometry Hot Spot Mitigation Electrical and Signage Improvements Updated Navigational Aids and Runway Status Lights Drainage Improvements EMAS Replacements Extension of EMAS on East End \$64.4 MILLION in overall project construction costs

15 subcontractors & 150-200 workers during runway construction

up to 4 MONTHS of runway closure

Engineering Material Arresting Systems (EMAS)



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- The EMAS technology improves safety benefits in cases where land is not available, or it's not possible to have the standard 1,000-ft overrun.
- An EMAS arrestor bed can help slow or stop an aircraft that overruns the runway.





Runway 10L-28R

Why is it being rehabilitated?

- 15 years since any major rehabilitation
- North Runway (10L-28R) was the only active runway for 18 months during construction of the South Runway (10R-28L) and experienced heavy usage
- North Runway is in need structural, drainage, safety, lighting, and signage upgrades
- Improvements will increase rehabilitation cycle to 30 years







Overall Project Substantial Completion

March 2020

















Typical Design Process

Record Information

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- PCI (Pavement Condition Index) – FDOT SAPMP
- Published PCN vs. Anticipated ACN
- Record Drawings/As-Built Data
- Master Plan Data
- Geotech/Survey/NDT
- NO SUCH THING AS "ENOUGH"
 - Relatively inexpensive compared to "contractor discovered" issues
- Review Strategy With Potential Contractors





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	Network ID	PIE	
	Branch ID	RW 18-36	
C. / J. P.	Branch Name	RUNWAY 18-36	ALL AND ALL AN
	Branch Use	RUNWAY	The states of
	Section ID	6197	
	Section Area (SF)	92,900	
	Surface Type	AC	
	Last Major Work Date	1/1/2006	
	Years Since Major Work	12.2	
	Last Inspection Date	1/30/2015	
	PCI (2014)	52	Charles Mars
	PCI Category (2014)	Poor	
	PCI % Climate	23	a long and the
	PCI % Load	0	
	PCI % Other	77	
	2014 Distresses Observed	Bleeding, Longitudinal & Transverse Cracking and Weathering	· ····································
	Predicted PCI (2019)	45	
	Predicted PCI Category (2019)	Poor	

Typical Design Process

- Pavement Rehabilitation Strategies should be determined through a combination of Factors:
 - Pavement Cores
 - Non-Destructive Testing Falling Weight Deflectometer
 - Soils Penetration Tests





No Runway, No Airplanes, No Airport!

- Challenge #1 Maintaining Critical Operations
 During Construction
 - Air Carrier and Cargo Operator Needs
 - (Flight Schedule, Seasonal Variations, Length of Runway Required)
 - DoD/USCG/FEMA Disaster Preparedness
 - On-Airport Businesses
 - (Flight Schools, Skydiving)
 - General Aviation

Airport Operators (YOU) Are Stuck With The Results!

- Challenge #2 Balancing Airport Operational Needs
 with Construction Cost, Efficiency, and Quality
 - Larger work areas are typically better for construction
 - Haul route distances
 - Work hours Night-time only? Re-open runway after shift?
 - Weather Not just a local factor
 - Air shows, fly-ins, peaks in operations

Expect The Un-Expected!

- Challenge #3 Planning for Unforeseen Circumstances in Construction
 - Unsuitable subgrade materials
 - Asphalt delamination/scabbing
 - Schedule difficulties
 - Failed test sections or Quality Assurance (QA) tests
 - Material Availability Issues/Equipment Procurement Lead-Time
 - Poor contractor performance
 - Commissioning of Navigational Aids (NAVAIDs) and/or flight procedures – FAA dependent



Best Practices

- Coordination & Communication
 - Early & Often
 - Program Validation What do we need to achieve?
 - Agency Coordination
 - FDOT
 - FAA
 - ADO, FAA Flight Procedures, FAA Flight Standards, FAA Technical Operations/Engineering, FAA Flight Inspections, etc. – Many lines of business
 - SRM Panel ATCT, FAA Facilitators/Stakeholders
 - Permitting (FDEP Water Management District, ACOE, Local, etc.)



Opportunities for Sustainability

- Use of Recycled Concrete Base Course (FAA Specification P-219)
- In-place pulverization

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Opportunities for Sustainability

- Asphalt Millings High Value
 - Saleable Material possibly better asphalt prices
 - Armoring of vehicle service roads/contractor laydown areas
 - Recycled Asphalt Pavement (RAP)
 - 30% RAP Content or Less for FAA P-401 HMA
 - Not used in surface course unless on paved shoulders

Opportunities for Sustainability

- Full-Depth Reclamation
 - Reconstruction method that pulverizes asphalt surface and combines with underlying aggregate base
 - 60,000 lbs or less ⊗







Sustainability in Stormwater

- Reducing impacts downstream and improving stormwater quality
- Low Impact Development (LID)
 - Reduce pollutants in stormwater by natural processes
 - Infield areas, swales, permeable pavements

tormwater Management ortant division and the second

Master Stormwater Planning

- Having foresight to develop stormwater facilities for future buildout
- GOAA has shown long history of planning for the future



"Satisfying today's needs without compromising the needs of future generations."

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Asset Management & Proactive Maintenance

- Pond & Stormwater Infrastructure maintenance is crucial to preventing flooding
- Siltation is large contributor to ponds performing poorly
- Dredging Efficient, cost-effective, low-impact to airport operations
- Take advantage of R/W Rehabilitation projects to replace pipes

Design Aides

- Drainage Atlas
- Flood Control Manual & Pump Plan
- Impervious Area Matrix



QUESTIONS?



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