

# Port Columbus International Airport Runway 10R/28L Replacement



IESALC | ILLUMINATING ENGINEERING SOCIETY OF NORTH AMERICA  
AVIATION LIGHTING COMMITTEE

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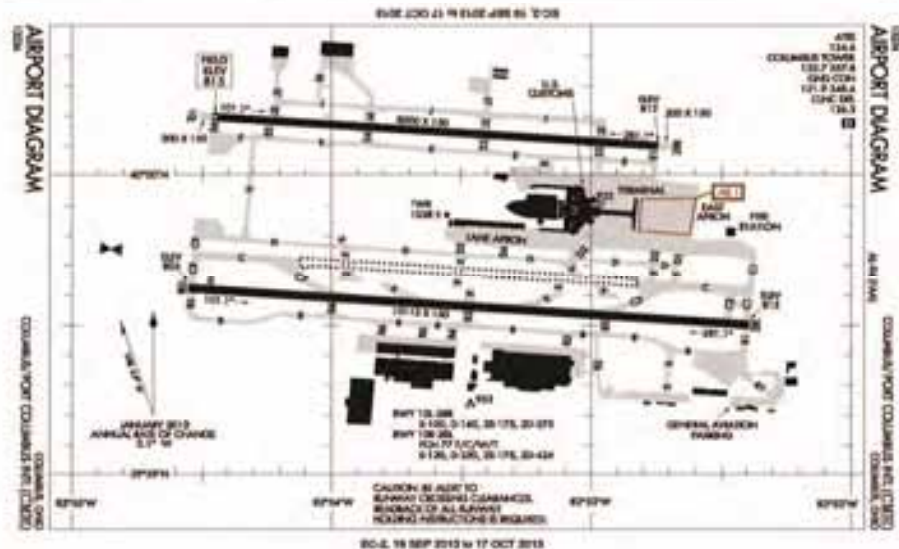
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# Port Columbus International Airport Runway 10R/28L Replacement

## Overview

- Introductions
- Project Overview
- Bid Package Phasing
- Electrical Design Elements
- Project Construction
- Concluding Remarks & Que





# Port Columbus International Airport 2008

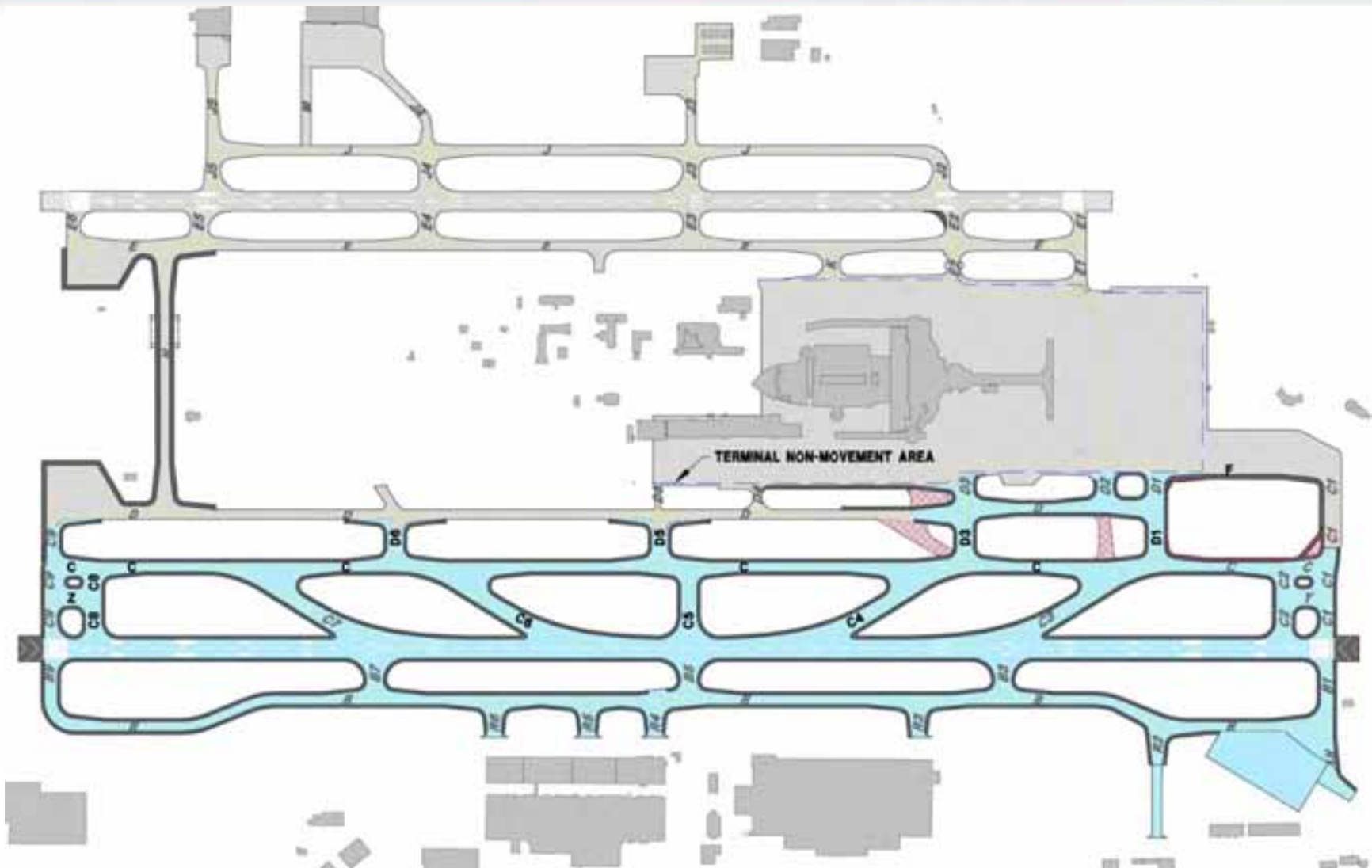




# Port Columbus International Airport 2013



# Port Columbus International Airport 2014 – Final Configuration

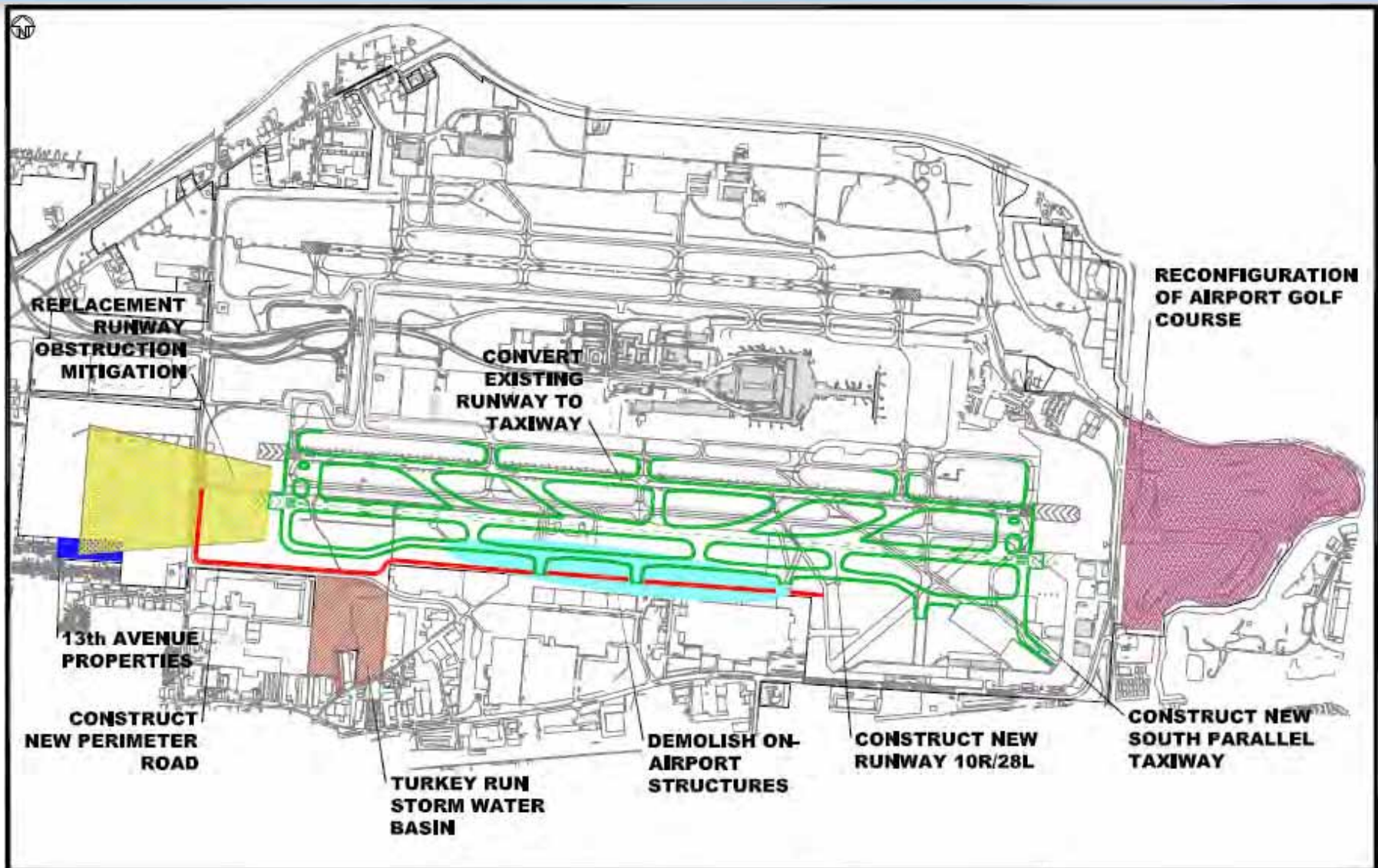


# Why Move the Runway?

- More room was needed for redesigned Terminal Building after 9/11 attacks
- Additional room between runways to allow simultaneous IFR approaches
- A team of consultants reviewed numerous options and held peer reviews
- Determined the best option was to move the south runway farther south



# Not just a Project – It's a Program



# Existing Runway 10R/28L

- Existing Runway 10R-28L
  - 10,125 feet bituminous pavement
  - Identified for rehabilitation in 2003
- Master Plan
  - Evaluated reconstruction vs. moving 702 ft
  - BCA outcome – More economic benefit to move 702 ft south
  - Runway separation increased to 3,500 ft



# Existing Runway 10R/28L

Existing Runway 10R/28L  
10,125 ft of Bituminous Pavement



Relocate Runway 702 ft south

# Earthwork & Utility Package

## Site Preparation

- Drainage, sanitary sewer and electrical duct features
- Temporary erosion and sediment control features
- Partial taxiway pavement for interim access
- Construction Cost - \$32 million



# Paving, Electrical & NAVAIDS Package

- Production paving operations
- R/W centerline, edge and touchdown zone lighting
- Navigational Aids
- Taxiway centerline & edge lighting
- Airfield signage
- Field Lighting Vault modifications
- Construction Cost: \$ 44.1 million





# Paving Operations

- 400,000 Tons of Asphalt
- Runway Pavement Section



# Airfield Work and Vault Modifications

- 670,600 LF of Electrical Cable
- 1300 Lights
- 189 New Airfield Signs



# NAVAIDS



Full Systems – ILS / MALSR / PAPI / ASOS



# Major Challenge – Adjacent to Active Runway

Maximize Runway Closure Devices



# Electrical Construction Work Phasing



Existing Runway 10R Threshold  
Relocated – West End



Existing Runway 28L Threshold  
Relocated – East End

# Electrical Construction Work Phasing

- Lighted X Runway closure markers used for each runway end
- Connected Lighted X's to Existing Utility Power Transformers for Continuous Operations





# Electrical Construction Work Phasing



- Each runway end displaced once
- Temporary PAPI and REILS installed for each displacement
- REILS installed on existing runway for duration of construction

# Electrical Construction Work Phasing



- CAT I Approaches Maintained on Existing Runway for Both Ends

# Future SA CAT II Approaches

- Approaches currently Category I (CATI)
- Configured for Special Authorization (SA) CAT II
- MALSR
- Localizer needs to be expanded to 20-element array
- Foundations in place, awaiting equipment from FAA





# Runway Commissioned August 22, 2013



Southwest Flight 3740 – MDW to CMH  
First aircraft operation on new 10R/28L

08.22.2013

# Runway Conversion Package



Convert “Old” Runway to Taxiway

# Electrical Design Elements

- New Runway & Taxiway Lighting / Series Circuit Distribution
- NAVAIDS
- FAA Power and Communications, Utility Power (AEP)
- Security System Modifications
- Airfield Lighting Vault Modifications and Upgrades
- Weather Equipment





# CMH Runway 10R-28L : First all LED Runway in the United States



# LED Runway Lights

- In-pavement Runway Edge Lights
- Elevated Runway Edge Lights
- Elevated Threshold Light
- Runway Centerline Lights
- Runway TDZ Lights



# LED Taxiway Centerline / Edge & Runway Guard Lights

- Designed for Hi-Speed Exit Taxiways Only
- Extend to tangent point on parallel taxiway
- Circuited for east versus west flow
- Over 550 Taxiway Edge Lights
- Number of Circuits
- Circuits shared with Taxi Guidance Signs
- Dedicated RGL Circuit





# LED Guidance Signs



- 189 New Signs
- Originally considered dedicated sign circuits
  - Benefit negated with use of LED components

# New Runway Thresholds



## ■ New Runway 10R



# New and Old Runway 10R/28L





# Airfield Lighting Vault Upgrades

- 16 New Regulators with Stacking Kits
- New Emergency Diesel Generator
- Airfield Lighting Control System (ALCMS) Upgrades
- All Existing Circuits
  - Active During Construction



# Emergency Generator

- New 350 kW Diesel Generator
  - Up-sized to accommodate additional lighting
  - Backs up entire airfield lighting system
- Louvers added to meet higher air flow requirements
- Re-used existing fuel storage tank



# ALCMS Modifications

- Multiple System Modifications to accommodate phasing
- Regulators purchased together, but installed under three different packages
- Standardized on equipment





# New Weather Equipment



- Pavement Surface Sensor
- Two new RPU's
- Radio Replacement
- New Server



- Reinstallation of ASOS system
- Coordination with National Weather Service

# Security System Modifications

- Access Point Replacements
  - Through-the-Fence operations
  - FBO Apron connected to Taxiway B
  - Microwave Sensors
  - Fiber Optic Control Cable to Airport Operations Center
  - PTZ Camera



# NAVAIDS – Instrument Landing Systems

- Two full systems
  - Glide Slope Antenna
  - Localizer Antenna Array
  - New shelters
  - Power and communications / control services
- Extensive FAA Coordination
- Multiple Reimbursable Agreements
- FAA provided equipment





# NAVAIDS – PAPI Systems

- Two PAPI Installations
- New PAPI for Runway 10R
- Relocated PAPI for Runway 28L
- Two different manufacturers, i.e. two different system designs



# NAVAIDS – MALSR Systems



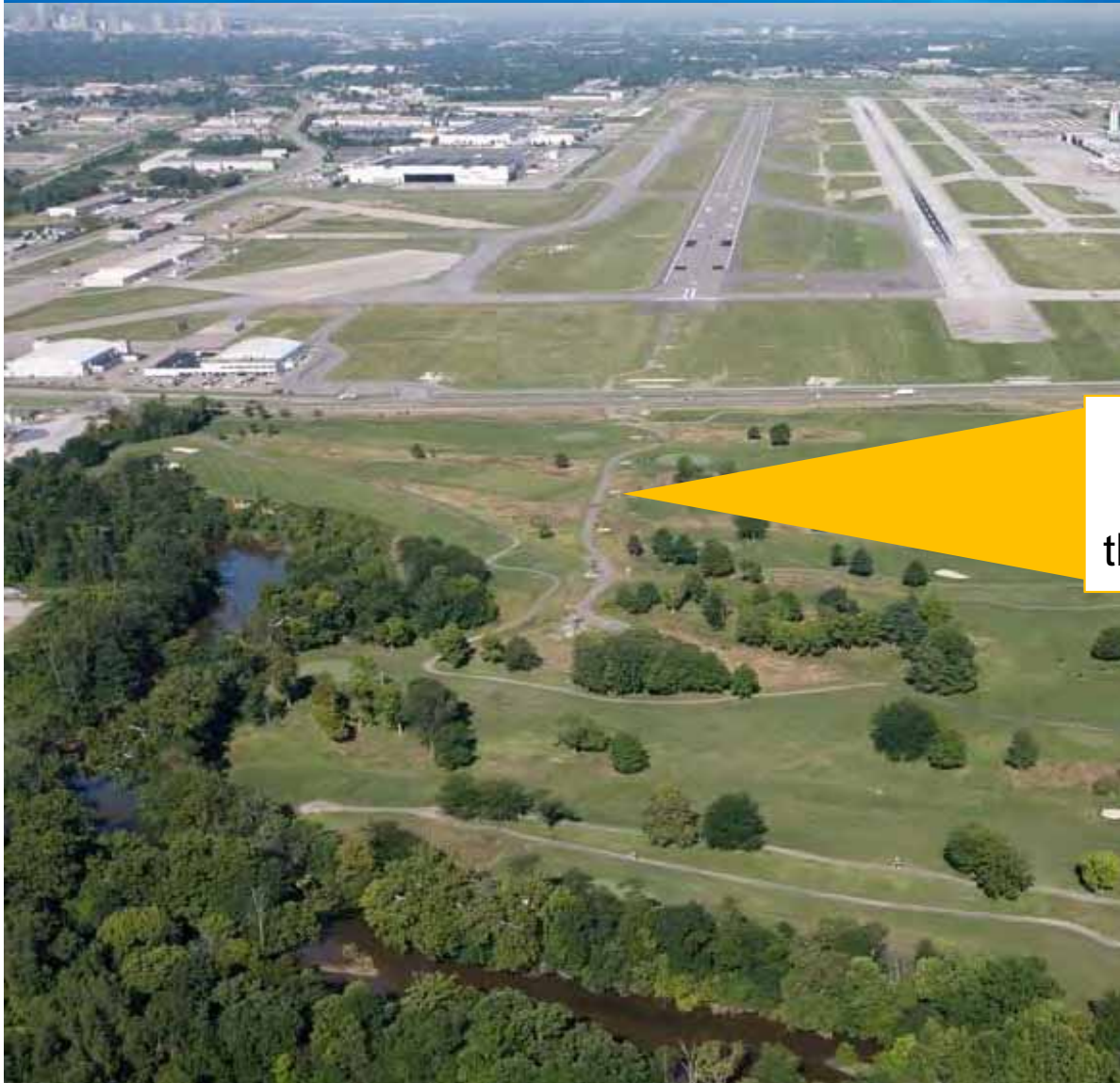
- Two MALSR Installations
- New 10R MALSR
- Relocated MALSR for Runway 28L
- New equipment provided by FAA
- Power and communications / control services

# Runway 10R MALSR





# Runway 28L MALSR



Runway 28L MALSR with  
7 Light Stations located  
through Public Golf Course



# New MALSR Installations



*Runway 28L MALSR at Dusk*

# Custom-Built Core Drill





# Jig for Three-Section Light Bases



# Jig for Three-Section Light Bases





# Cores for 200 Runway Centerline Lights



# Cores for Runway Light Bases



# Jig for Three-section Light Bases



# Touchdown Zone Light Cores





# Conduit Trenching – More than 100,000 Feet



# Conduit Trenching





# Cabling Installation – More than 440,000 Feet



# Concrete-Encased Ductbank – More than 47,500 Feet





# Directional Boring Under Active Runways and Taxiways



# GP-1 MALSR Towers in Golf Course





# GP-1 MALSR Towers in Golf Course



# MALSR – Station 10+00





# Localizer Antenna Array Installation



# Frangible Bolts

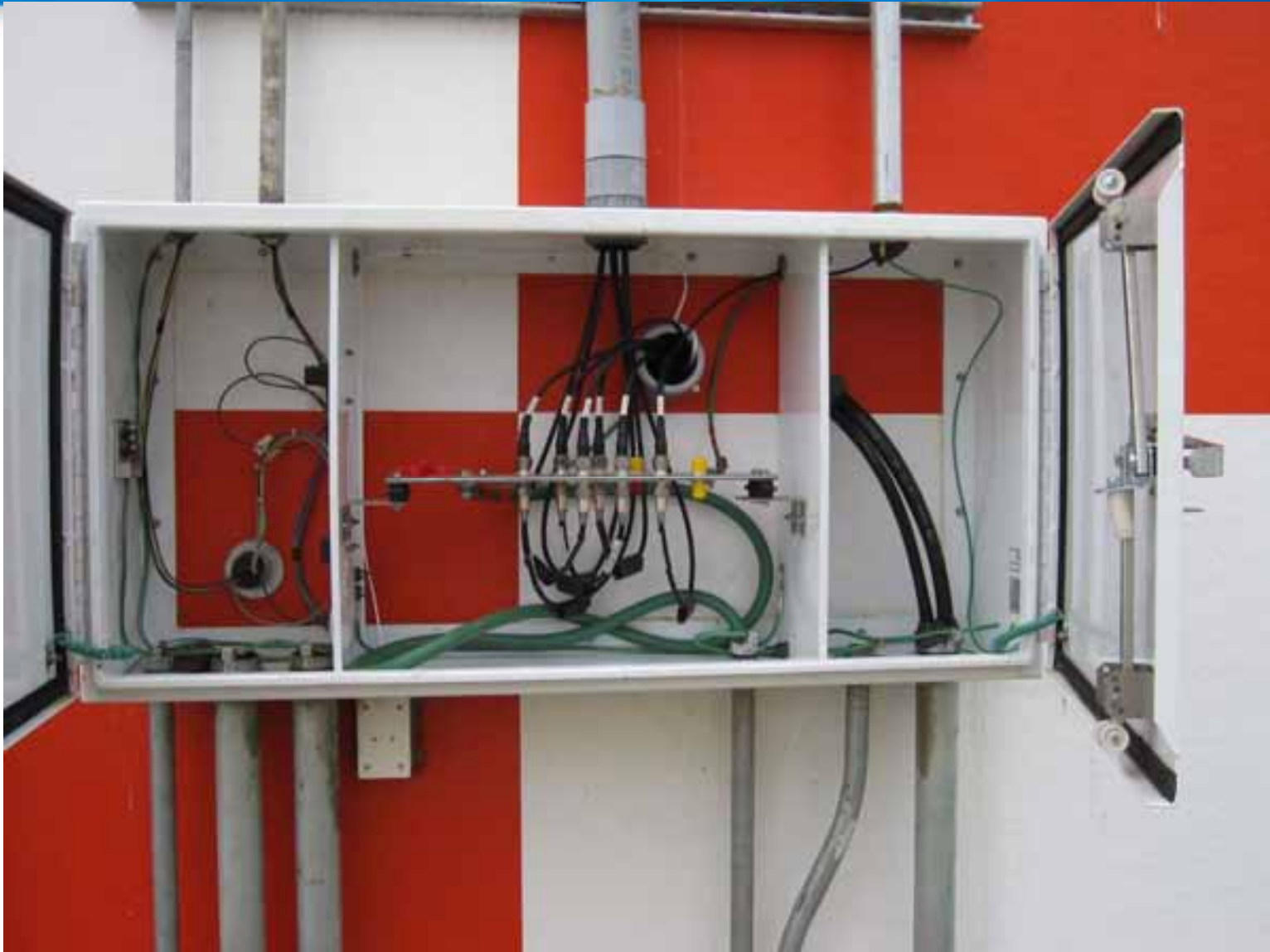




# Localizer Shelter



# Localizer Shelter – Interface Box





# Localizer – Distribution Box



# Localizer – Distribution Box



# Glide Slope Shelter





# Glide Slope Shelter and Antenna





# Historic Coring Operation!!



# The Night Before Runway Opening!

# Port Columbus Runway 10R/28L Replacement



**CH2MHILL**



**COLUMBUS**  
REGIONAL AIRPORT AUTHORITY



## Questions and Answers