



# RDU RUNWAY 5L/23 R PRESERVATION PROJECT

ZACHRY CONSTRUCTION  
Nate Burgei & John Romaine

# PROJECT TEAM

- Engineer: Jacobs
- Owner's Representative: Parsons
- Construction Manger: Balfour Beatty
- Contractor: Zachry Construction
- Electrical Subcontractor: Rifenburg
- QC: Insight Group
- Demo & Saw/Seal: Dan-Kel
- Striping: Hasco
- Friction Improvement: Skidabrader

# Zachry Team Members

- Director, Paving Operations: John Romaine
- PM: Nate Burgei
- Superintendent: Carlos Lomeli
- Foremen: Carlos Lomeli Sr, Ernesto Aguilera, David Martinez
- Batch Plant: DJ Thacker, Craig Christianson
- Equipment Manager: Ryan Kellish

# Project Scope

- Remove and replace 100 panels in the runway and taxiway: 100,695 sy
- Spall repairs: <1 SF (94 SF) 1-5 SF (287 SF) 5 SF+ (358 SF)
- Electrical improvements
- Runway friction improvement: 360,000 SF
- Saw/seal and joint replacement: 5,500 LF
- Permanent markings
- Removal and replacement of threshold bars

# PROJECT RESTRICTIONS

- 20-hour shift to remove, replace, and cure runway panels (runway open from 5:30 PM to 9:30 PM for international flights)
- Strength of 550 flex required for opening
- Taxiway B closed, but connector B1 and B9 followed runway schedule

# SITE OVERVIEW



# MIX DESIGN



Type 1L cement

Numerous admixtures (air entraining, water reducer, HRWR, accelerator, and hydration stabilizer)

Optimized aggregate gradation using tarantula curve

Marsh cone test utilized to optimize the superplasticizer dosage

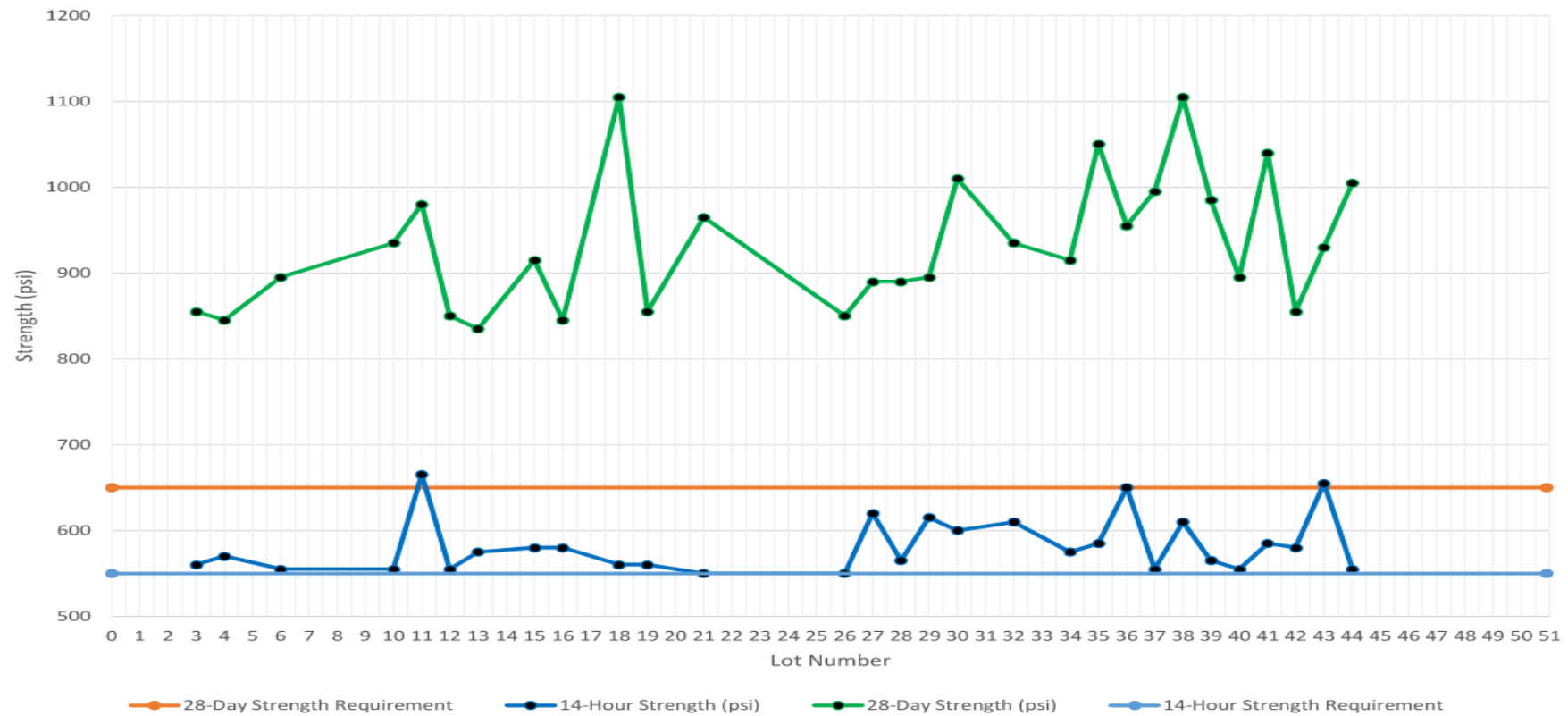
# QUALITY CONTROL

- Instituted CQCP, as well as internal testing and self inspection
- Mixer uniformity test performed
- Tested first load each night at the batch plant before sending to runway, made adjustments as needed
- Maturity meters not required, but Zachry insisted on use of them to verify beam breaks, as well as act as a “referee test”
- Smoothness specification of  $\frac{1}{4}$ ” in 12’, no deficiencies

# Strength Control Chart

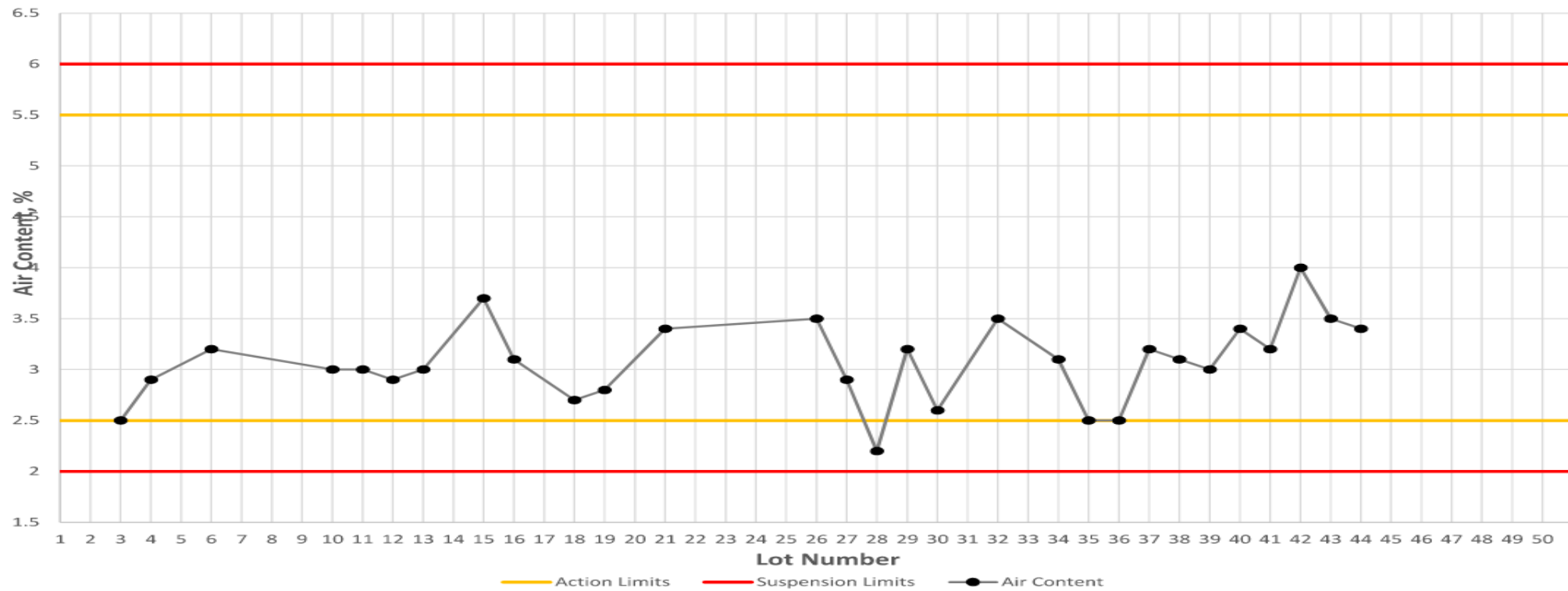


RDU Runway 05L-23R Preservation & TW Bravo Rehabilitation P-501 Strength Control Chart



# Air Content Control Chart

RDU Runway 05L-23R Preservation & Taxiway Bravo Rehabilitation - Air Content Control Chart



# SUSTAINABILITY

- Type 1L Cement
- Existing pavement hauled to onsite yard to be crushed and recycled for an upcoming project at RDU
- During demo process, a large amount of slurry was generated by sawcutting. The slurry was captured via a vacuum and placed in a slurry pit. The slurry was dried and then placed into recycled concrete pile, eliminating haul-off and disposal into a landfill. The same process was utilized for the batch plant washout
- Team worked with engineer to design a SWPP for the batch plant, ensuring no contaminated water left the site. Water sampling was performed to verify
- Contracted with a hauler that was willing to haul wet batch, as well as demo concrete, reducing number of trucks needed

# DEMO

- Full-depth sawcut of slabs
- Pre-cut 3 slabs per night
- Cut slabs into approx. 4'x4' pieces
- Extra precaution taken around light cans
- Loaded out slabs each night and hauled to onsite crushing yard



# PRE-POUR PREP

- Dowel bars required around perimeter of new slab
- Asphalt subbase repair as needed (used paving mix)
- Installation of bond breaker (10 mil poly sheeting)
- Dowel baskets as necessary
- Installation of wire mesh



# CONCRETE PLACEMENT & FINISH

- Approx 35 cy per panel
- RTP 500 utilized for placement
- Allen 150B triple tube screed for finish
- Burlap drag required
- Hand-tined panels on the runway
- Mechanical hand-sprayer for cure





FINISING OPERATION



FINISHED  
TAXIWAY SLAB

COMPLETED  
TAXIWAY



COMPLETED  
RUNWAY



# Risk Mitigation

- Requirement per the specification to have means to open the runway if a catastrophic breakdown occurred and the panels could not be poured back in time for runway opening
- Built precast panels with lifters that could be placed in open holes



# PROJECT OBSTACLES

- Limited work hours per shift
- Achieving strength for opening with substantial penalties
- Coordination between numerous subs
- Cold temperatures settled in during last week of placement, delaying batch start times
- Substantial completion date changed due to FAA
- Change of work hours after Thanksgiving (8 hrs per day)



# PUBLIC RELATIONS

Zachry worked with RDU to produce a time-lapse video highlighting the project

[Time Lapse Video: Maintaining RDU's Primary Runway - Raleigh-Durham International Airport](#)

A perspective view of a runway, looking down the center line towards the horizon. The runway is paved with light-colored concrete or asphalt, featuring a central dashed white line and side lines. In the distance, there are airport buildings, trees, and a few aircraft parked on the tarmac. The sky is overcast and grey. The word "Questions?" is overlaid in the center of the image in a large, black, sans-serif font.

Questions?

2023 Fall Concrete Pavement Conference  
Attendance Log  
Day 2 – Airport Technology AM Session

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Please scan the QR code and sign in so your attendance is documented