

# RUNWAY 15/33 RECONSTRUCTION

MILLER MUNICIPAL AIRPORT

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**Helms**  
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CITY OF  
**MILLER**  
South Dakota

# Overview

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# Design

## → Grading

- Line of Sight
- Primary Surface

## → Pavement Design

- Geotechnical Exploration
- Fleet Mix
- Portland Cement Concrete (PCC)



# Grading

## ✈️ **Line of Sight**

- ✈️ Any point 5 feet (1.5 m) above the runway centerline must be mutually visible with any other point 5 feet (1.5 m) above the runway centerline (AC 150/5300-13, Paragraph 305.b.1)
- ✈️ Existing Runway had a 0.2' (2.5") bust in the Line of Sight ("Hump")
- ✈️ Runway 15 Threshold was raised 0.75' and "Hump" lowered

## ✈️ **Primary Surface**

- ✈️ 4000' x 500'
- ✈️ Same as the elevation of the nearest point on the runway centerline
- ✈️ Grading needed to clear the Primary Surface



# Pavement Design

## → **Geotechnical Exploration**

- 10" Full Depth Reclamation (2.5" Asphalt, 7.5" Aggregate Base Course)
- Silty Lean Clay Subsurface Soils
- Subgrade California Bearing Ratios of 4.2-5.5

## → **Fleet Mix**

- Single Wheel 12,500 lbs

## → **Portland Cement Concrete (PCC)**

### → Pavement Section

6.0" – P-501 PCC Surface

6.0" – P-208 Aggregate Base Course

20" – P-154 Subbase Course (includes ±9" salvaged Asphalt/Base material)

Geotextile Fabric

# PCC Specifications

## → **Mix Properties**

- Min - 564 lb/CuYd of cementitious material
- Max – 0.45 Water to Cement ratio
- Slump (Slip Form) 1/2” – 1-1/2”
- Air – 6.0%
- 28-Day Flexural Strength – 600 psi (min)

# Bidding

## → **T & R Contracting, Inc – Sioux Falls, SD**

→ Submitted low bid at \$2,544,422.35

## → **Subcontractors**

→ Midland Contracting, Inc. – Huron, SD (Earthwork, Subbase, Aggregate Base, Piping)

→ Muth Electric, Inc – Mitchell, SD (Electrical)

→ Traffic Solutions, Inc – Sioux Falls, SD (CSPP & Pavement Marking)

→ Interstate Sealant & Concrete – Waukesha, WI (Joint Sealant)

→ Penhall Company - Abingdon, MD (Grooving)

→ Word Reclamation & Fencing – Pierre, SD (Erosion Control & Seeding)

# Construction

## ➤ **Milling & Excavation**

- 1/2 of the runway was milled at a time
- Excavated and conditioned subgrade
- Installed Geotextile Fabric and placed reclaimed material
- Repeated process for the other half of the runway

## ➤ **Subbase & Base Course**

- Placed Subbase Course
- Placed Aggregate Base Course

## ➤ **Machine Control Grading**

- Dozers and Graders were equipped with GPS Machine Controls
  - Subgrade, Subbase, & Aggregate Base Course were cut to Final Elevations
  - Minimal “Blue Tops” needed after checks of the grade



# PCC Mix Design

## → Mix Properties

- 600 lb/CuYd of cementitious material
  - 450 lbs Cement
  - 150 lbs Fly Ash
- 0.39 Water to Cement ratio
- Slump – 1-1/4”
- Air – 6.2%
- Unit Weight – 143.6 lbs/CuFt
- 28-Day Flexural Strength – 825 psi

# Field Results

## ➤ **Acceptance Criteria**

- Average 28-Day Flexural Strength – 773 psi
- Average Thickness – 6.3 in

➤ **106% Pay Factor on ALL Lots for both Flexural Strength & Thickness**

➤ **Profilograph not required, but SD-DOT performed testing**

- 100% acceptable with no high or low spots identified

➤ **Grade met all tolerances**

➤ **Only 3 panels replaced (all in hand pour sections)**

# Placing & Compacting Millings



# Installing RCP Storm Sewer



# Storm Sewer, Drain Tile, & Geotextile Separator Fabric



# Compacting Base Course



# GCC Concrete Batch Plant



# Stringless Base Course Trimming



# Paver



# Stringless Paving Equipment



**Crew arrives for dry run**



# 1<sup>st</sup> Day of Paving –10 Trucks



05.27.2015 14:32

# Quality Control Tests





**Verifying width behind the screed**



# Robotic Total Stations



05.27.2015 14:40

# Finishers Behind the Paver



05.27.2015 14:58

# Carpet Drag Finish



# Cure Cart



**Saw Cutting Joints**



**End of 1<sup>st</sup> Pull**



# Paving 2<sup>nd</sup> Pass



2<sup>nd</sup> Pass



**Tie Bars placed at outside longitudinal joint**



**Trucks backing around the tie bars**

# Two Outside Passes Completed



# Paving Jug Handle



**Dowel bars 12" O.C.**





**Paving Center Pass**

**Paving Center Pass**





**Paving Center Pass**



**Grooving Machine**

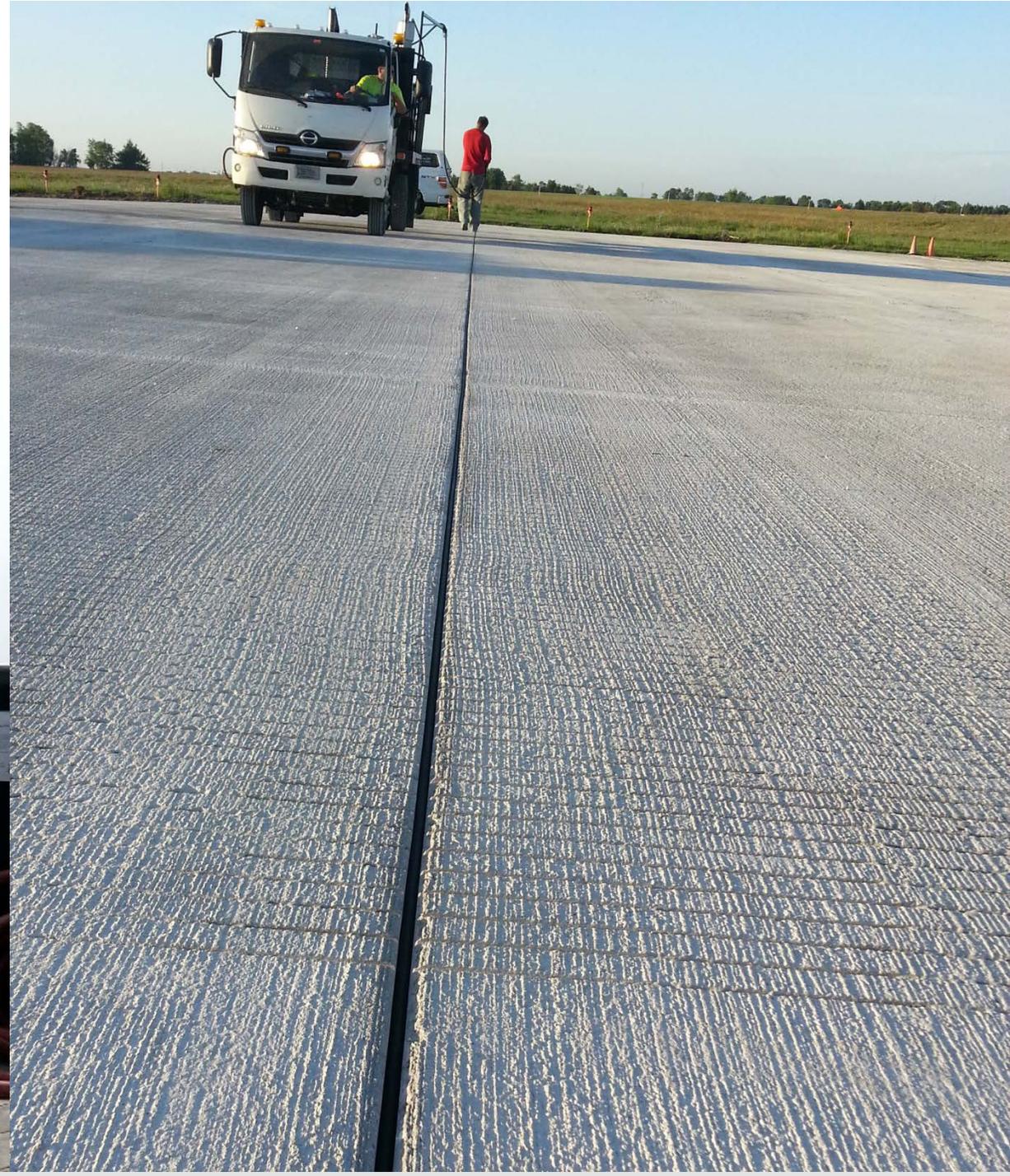


**Saw Cut Runway Grooving**



**Widening & Cleaning Joints**

# Sealing Joints





# Runway Marking

# Runway Marking





## Seeding & Erosion Control





**Runway Inspection**



# QUESTIONS

