



# RCC Pavements Field Trip

## NC2 Spring 2023 Meeting Savannah, GA

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### RCC PAVEMENTS

#### Presentation Outline

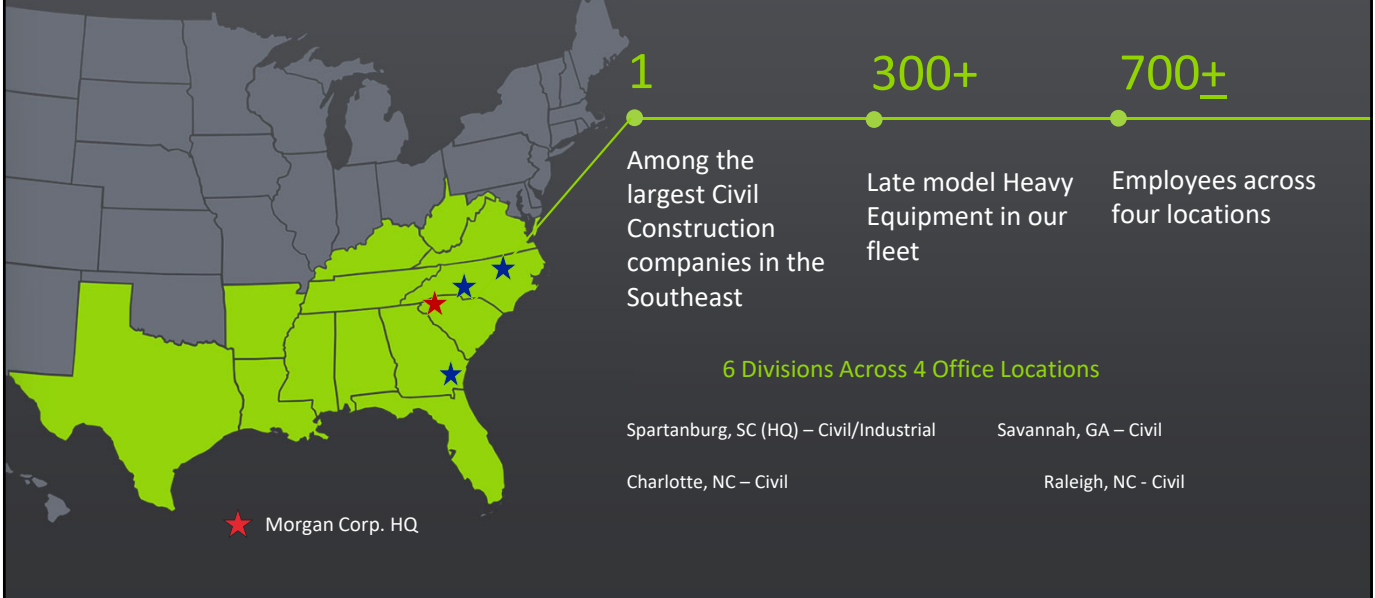
- About Morgan Corp.
- Morgan Corp. RCC Pavements Experience
- RCC Pavements at Ocean Terminal
  - ▶ Project Background
  - ▶ Field Trip General Information





ABOUT MORGAN CORP.

Quick Facts



ABOUT MORGAN CORP.

With reach across the entire Southeast region, we service projects where quality control and efficiency are a top priority.

# Markets We Lead



Power & Energy



Industrial & Commercial



Dams



Residential



Transportation



Landfills



SERVICES WE PROVIDE

## Heavy Civil

- ▶ Site Grading
- ▶ Landfill Construction
- ▶ Dam Construction
- ▶ Soil Cement Stabilization
- ▶ Roller Compacted Concrete (RCC)
- ▶ Site Utility Piping



SERVICES WE PROVIDE

# Industrial Construction

- ▶ Electrical
- ▶ Piping
- ▶ Lifting and Rigging
- ▶ Structural Concrete



## AUTOMOTIVE MANUFACTURING PLANTS

### BMW Automotive Plant, Greer, SC

- Completed in 2009
- 230k SY
- 6" & 8" RCC on 6" soil-cement



## STREETS AND ROADS

### Highway 78, Aiken, SC

- Completed in 2009
- 4 lanes, 2 miles
- 10" RCC on subgrade
- Diamond ground for high-speed smoothness



# POWER GENERATION PLANTS – HAUL ROADS, LAYDOWN & PARKING



## Plant Vogtle, Waynesboro, GA

- Completed in 2012
- 78 acres RCC
- 4", 6", 7", 10" and 18" RCC on soil-cement

# POWER GENERATION PLANTS

## Plant Vogtle, Waynesboro, GA

- 45 acres parking lot value engineered from 2" HMA over 6" aggregate base to 4" RCC over 6" soil-cement base



## INDUSTRIAL HAUL ROADS

### Duke Energy, Plant Mayo, Roxboro, NC

- Completed in 2014
- 3± miles haul road and maintenance building parking lot



## INDUSTRIAL MANUFACTURING FACILITIES

### Bridgestone Tire Plant, Trenton, SC

- Completed in 2014
- 40k SY, 7" and 10"



## INTERMODALS

### SC Inland Port, Greer, SC

- Completed in 2014
- 182k SY
- 13" dual lift RCC for loaded containers stacked 5 high
- 9.5" RCC for containers stacked 8 high



## INTERMODALS

### SC Inland Port, Greer, SC

- 9.5" RCC for access route
- All RCC is over soil-cement base





## DISTRIBUTION CENTERS

### Walmart DC, Mebane, NC

- Built in 2014-2015
- 84k SY of 10.5" RCC
- 17k SY 6" RCC
- 5k reinforced concrete dolly pads



## DISTRIBUTION CENTERS

### Walmart DC, Mobile, AL

- Built in 2017-2018
- 372k SY of 10" RCC
- 9k SY 5" RCC



## DISTRIBUTION CENTERS

### H.E.B. DC, San Antonio, TX

- ▶ 229,000 SY of 9" and 10" RCC
- ▶ 34,000 SY of 5.5" RCC



## DISTRIBUTION CENTERS

### Walmart DC, Ridgeville, SC

- ▶ 420,000 SY of 10" RCC
- ▶ Completed in 2022



## DISTRIBUTION CENTERS

### Walmart DC, Ridgeville, SC

- ▶ Entire pavement was trowelled RCC



## FIELD TRIP – OCEAN TERMINAL RCC PAVEMENTS



## OT PROJECT BACKGROUND

- Typical OT Flexible Pavement
  - 10" aggregate base
  - 5" HMA
- Purposes of proposed RCC alternate
  - Equal or higher structural capacity
  - No additional cost
- Considered
  - SNs
  - RCC Pave predictions
  - PCA Pave predictions
- Conclusion
  - 6" RCC over 6" CTB is structurally equivalent to 5" HMA over 10" aggregate base
- Morgan Corp. was the general contractor for the project



## OT PROJECT BACKGROUND

- Phase I
  - 48k SY constructed in 2012
  - Constructed CTB using onsite recycled asphalt mixed with in-situ sandy soil and cement
  - Moneys saved were reinvested to build a stronger pavement:
    - 7" RCC over 9" CTB
  - Completed project at 19% savings over typical 5" HMA over 10" aggregate base
  - The savings + additional funds were allocated to build Phase II – 31K SY, 6" RCC on 6" CTB, completed in early 2013
  - Zero maintenance as of today



## OT PROJECT DETAILS, PHASE I

- RCC Mix:
  - Granitic gneiss coarse aggregates
  - Natural sand
  - ASTM C1435 cylinders tested above 4500 psi at 28 days
- Mixing Plant: Rapidmix 600C
- Paver: Volvo 7820 with adjustable high-density screed
- Rollers: Vibratory, 10 tons and 6 tons
- Joints<sup>1</sup>: fresh and cold longitudinal joints with various spacing. Saw-cut transverse joints at about 25 to 30 ft. Joints were not sealed.
- Some cracks developed due to inadequate jointing layout and fresh longitudinal cold joints method of construction
- The RCC is performing better than expected given the method of construction in 2012, the improper jointing layout, and loads imposed on the RCC since 2012

1. RCC methods of design and construction improved significantly since 2012. Sealed joints spaced at about 15 ft or less are now recommended.



## OT RECENT PHOTOS (2022) AND PERFORMANCE OBSERVATIONS

May 2022



### OT RECENT PHOTOS (2022)



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May 2022



## OT RECENT PHOTOS (2022) AND PERFORMANCE OBSERVATIONS



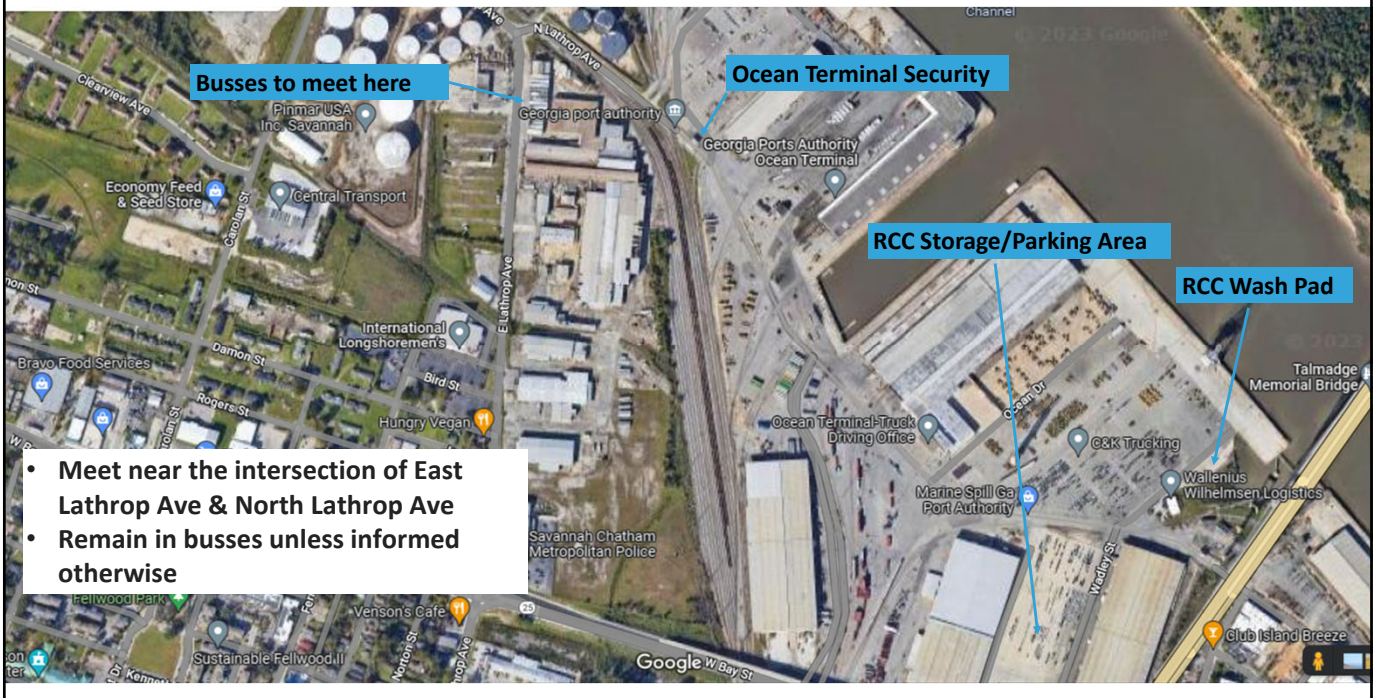
## OT RECENT PHOTOS (2022) AND PERFORMANCE OBSERVATIONS



## OT RECENT PHOTOS (2022) AND PERFORMANCE OBSERVATIONS



## FIELD TOUR MEETING LOCATION





**morgan corp.**

**Thank you!**

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