RCC Pavement Construction and Project Case Histories

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Utilization of RCC for Roadways

Who & Where? Introduction to AG Peltz Group, LLC

- Started in RCC in 1999
- Managing partner very active in the field
- Most of key employees have 10+ years RCC experience
- Based in Birmingham, AL – less than 20% of work in Alabama
- Over 10M Square Yards of RCC Placed
  - Manufacturing, Distribution, Port & Intermodal, Dam, Roadway, Military

RCC Pavement Why are DOT/Agencies interested?

- Improve Structural Capacity of Existing Roadways
- Urban/fast-track construction
  - Lift thickness limitations
  - Drop-off limitations
  - Maintenance of cross-traffic
  - Construction speed
- Use RCC as base under asphalt
  - Success with Cement Stabilized Aggregate Bases
- Stimulation of competition
  - Lowers cost to the taxpayer
- Expand the portfolio of pavement types available
  - Price run-up of asphalt binder
  - Uncertain petroleum supply in future
- Concrete pavement at an initial price competitive with HMA

I-285 Shoulder Replacement
Atlanta, GA

- Owner: Georgia DOT
- Use Type: State Route shoulder
- Year Built: 2006
- Thickness: 6 & 8” RCC
- Quantity: 35 lane miles 38,500 CY

- 2006 SCAN Innovation Award
- Material placed on weekends only
- Removal of shoulders on Friday night starting 9:00 PM
- Had to be off the road by 5:00 AM Monday morning (15,000 per hour fine)
- Typically 1.5-2 miles per weekend

Roller Compacted Concrete Shoulders on I-59 in Birmingham
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**I-285 Shoulder Replacement: Completed Shoulder**

- Location: Atlanta, GA
- GDOT 2004 & 2005
- 17.3 mile stretch of I-285 between I-85 and SR 8
- Pavement Area - 14.5 Acres
- RCC Thickness - 7.5-8 inches

**RCC Pavements Durability & Life Cycle**

- Location: Austin, Texas
- Pavement Area - 14.5 Acres
- RCC Thickness - 7.5-8 inches
- Initial Construction - 1986


- I-285 Atlanta
  - 17.3 lane miles of 6" and 8" RCC shoulders constructed in 2004
  - ADT of 116,000 with close to 24,000 trucks per day
  - No spalling, faulting, or pumping noted after 13 years of service
  - No maintenance expenditures at all (still true through October 2021)
  - Some aesthetics issues with minor surface blemishes, some attributed to coarser rock gradation (#3/4 top size)

- SR 6 Powder Springs
  - 6.4 miles of 8" RCC shoulders and center turn lane constructed in 2005
  - ADT of 61,000 with 7% trucks
  - No spalling, faulting, or pumping noted after 12 years of service
  - No maintenance expenditures at all (still true through Oct 2021)
  - Finer aggregate top size (1/2") resulted in tighter surface texture compared to I-285
  - Slight surface tearing on edges – aesthetic issue

**I-285 RCC & SR 6 2017 Pavement Review Summary**

- I-285 Atlanta
  - Owner: ALDOT
  - Use Type: Interstate shoulder & ramps, ADT 72,000, 14% trucks
  - Year Built: 2021
  - Project Scope: $13M project consisting of pavement rehab, shoulder reconstruction, sawcutting, sealing, diamond grinding, OGFC overlay, and various safety improvements.

- SR 6 Powder Springs
  - Owner: ALDOT
  - Use Type: Interstate shoulder & ramps, ADT 72,000, 14% trucks
  - Thickness: 6" RCC
  - Mainline is 5' & 10' shoulders – Ramps with 5-16' paving
  - Quantity: 128,686 SY

**Additional Details**

- Material placement split between night time and daytime depending on primary traffic flow.
- Night work from 7:00 PM to 4:00 AM and day work from 10:00 AM to 6:00 AM. $ time penalties.
- Existing mainline milled and rehabbed. RCC shoulder used as travel lane during construction.
- Typically 2,500-2,800 LF placed per shift.
Roller Compacted Concrete Shoulders on I-59 in Birmingham

Portland Limestone Cement

- EcoCemPLC™
  - Produced by Lehigh Hanson in Leeds, Alabama
  - Meets AASHTO M-240 and ASTM C595 as Type IL
  - Contains up to 10% more limestone using the same components and yields
  - Ancillary benefits include improved particle packing, better particle size distribution and reduced porosity
  - Decreases the amount of cement clinker required subsequently reducing the energy needed to produce the cement and associated emissions
  - Approved by ALDOT via testing against conventional Type I/II cements
    - No difference noted in strength
    - Some issues with sticking on rubber belts

Plant Site Aerial.pdf

Project covers 7.93 miles of I-59 with the plant site near the midpoint. Portland Limestone Cement (EcoCem) from Lehigh was utilized on the project. Pilot project for ALDOT and AGP.

- 3 aggregate blend used on project with limestone #67, man sand, and C-33 concrete sand feeding an ARAN 280C continuous flow pugmill.

- Typical schedule for night paving: Traffic Control at 7:00 PM, Milling 8:00 PM, RCC 10:00 PM. All milled areas must be filled with RCC prior to opening to traffic (i.e., interstate drop-off requirements)

- Typical lane closure showing traffic control in the late afternoon heading back towards downtown Birmingham as well proximity to milling operation.
Roller Compacted Concrete Shoulders on I-59 in Birmingham

Outside shoulder paved at 10’ width with sawn joints every 10’ feet. 95% density achieved through paver. RCC used for longevity and to provide adequate structural value without getting into edge drains.

The outside RCC shoulder was utilized a temporary lane for construction traffic (passenger tires only) during the pavement rehab process. No issues noted.

Paver modified by AGP to place inside shoulder at a 5’ width. Daytime work allowed based on traffic flow. Start 10:00 AM and usually done with RCC paving by 7:00 PM. Road opened by 6:00 AM.

Questions?

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