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Welcome

providing advice, education & information vital for a professional concrete result ..

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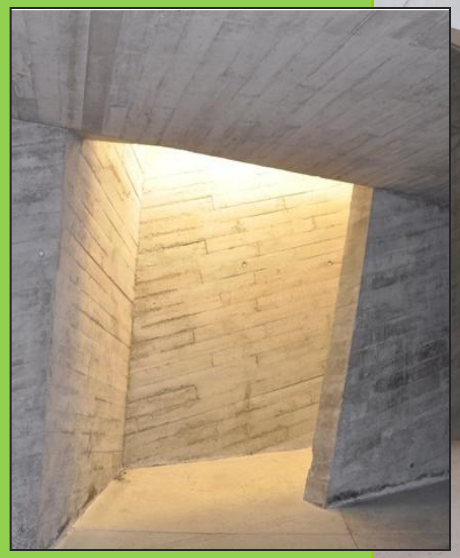

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Roller Compacted Concrete and Cement Grouted Macadam

Options for Low-Volume Roads

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Scope

- Roller Compacted Concrete (RCC)
  - Definitions
  - Research
  - Construction
- Cement Grouted Macadam (CGM)
  - Definition
  - Trial section
  - Performance

Roller Compacted Concrete

RCC

- Same basic ingredients as concrete but different mix proportions – higher fines
- Stiffer than zero-slump conventional concrete
- Compacted with vibrating rollers and pneumatic tired rollers
- Extensively used in port, intermodal, military facilities, highways and streets
- Very similar to our C2 but higher strength

Conventional Concrete Pavement

Asphalt Pavement

Shared materials characteristics:

- Same materials (different proportions)
- Similar curing requirements

Shared construction characteristics:

- Similar aggregate gradation
- Similar placement and compaction

RCC Pavement

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RCC

- Not same as RCC for dams
- Quick and easy to construct
- Often cheaper
- Less shrinkage and cracking
- Other benefits similar to conventional concrete pavements
- Can incorporate drainage into surface

Design

- Similar to conventional concrete pavements
- Joints
  - With joints – increased spacing
  - Without joints

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RCC in South Africa

- Research in 80's and early 90's and 2000's
  - CSIR with HVS
  - Umdloti also with HVS
- Projects
  - Durban
  - Honeydew
  - Letaba
  - Boipatong

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Issues

- Rapid drying
- Transport
- Compaction
- Curing
- Riding quality

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Cement Grouted Macadam

CGM

- Similar to Waterbound Macadam except a cement grout is vibrated in.
- Benefits
  - Labour intensive
  - No need for asphalt surfacing
  - Similar thickness
  - Increased service life
  - Reduced maintenance
  - No joints

CGM

- Place and compact single-sized stone with void content of 40 to 45% after compaction
- Place a flowable cementitious grout (slump around 200 mm) uniformly on the surface
- Vibratory rolling to achieve full penetration of the grout

CGM

- Trial section was placed in Pimville in 1992
- Full penetration of grout was achieved
- Some displacement of stone during rolling
- Cracks due to stone movement
- Riding quality reasonable
- Adequate strengths were achieved

Conclusion

Conclusions

Both RCC and CGM can provide additional cement based solutions to low-volume concrete road applications

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Thank you

… for listening!

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