

# **National Road Research Alliance Geotechnical Team September Meeting**

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# Agenda

1. Welcome and Introductions
  - New Members/New Attendees Introduction
2. General NRRRA Update
3. Update Ongoing Research Projects
4. State/Agency Member Topic for Discussion
  - MnDOT – RCA in Pavement Foundation
5. Questions/Requests

# General NRRA Update

## NRRA has canceled the 2021 Pavement Workshop

Please join us for [Research Pays Off](#) September through January 2022 to hear project updates from each team:

**September 21:** [Performance Benefits of Fiber-Reinforced Thin Concrete Pavement and Overlays](#) by Manik Barman, Rigid Team Project Update

**October 19:** [Developing Best Practices for Rehabilitation of Concrete with Hot Mix Asphalt \(HMA\) Overlays Related to Density and Reflective Cracking](#) by Eshan Dave and Katie Haslett, Flexible Team Project Update

**November 16:** [Improve Material Inputs into Mechanistic Design Properties for Reclaimed HMA Roadways](#) by Bora Cetin, Geotechnical Team Project Update

**December 21:** [Understanding and Improving Pavement Milling Operations](#) by Eshan Dave, ICT Team Project Update

**January 17:** [Spray on Rejuvenator Test Sections](#), Preventive Maintenance Team Project Update

# General NRRA Update

## Team Construction Needs

- September 3<sup>rd</sup> – Thickness Design
  - Individual Designs Questions –
    - Remaining Perpetual Pavement, HMA Recycling, Thinlays/Micro Use
    - Forensics Completed Cells 1 and 4 (HMA Recycling) and Cells 2 and 3 Surfacing for SFDR cells
- October 8<sup>th</sup> – Sensor Layouts Due
  - MnROAD Staff working on recommendations
  - Will need feedback
- December 5<sup>th</sup> – Special Provision Input
  - ICT Thoughts
  - Rigid and Flex team mixes

# General NRRA Update

## Phase-II Contracting Status

- RFP expected to be released in September
- 30 Day posting
- Contracts expected starting January 2022





# RCA in Pavement Foundation

## *RCA Main Environmental and Performance Issues*

- Environmental:
  - High pH
  - Leaching of heavy metals
- Performance (drainage):
  - Tufa formation (calcium carbonate)

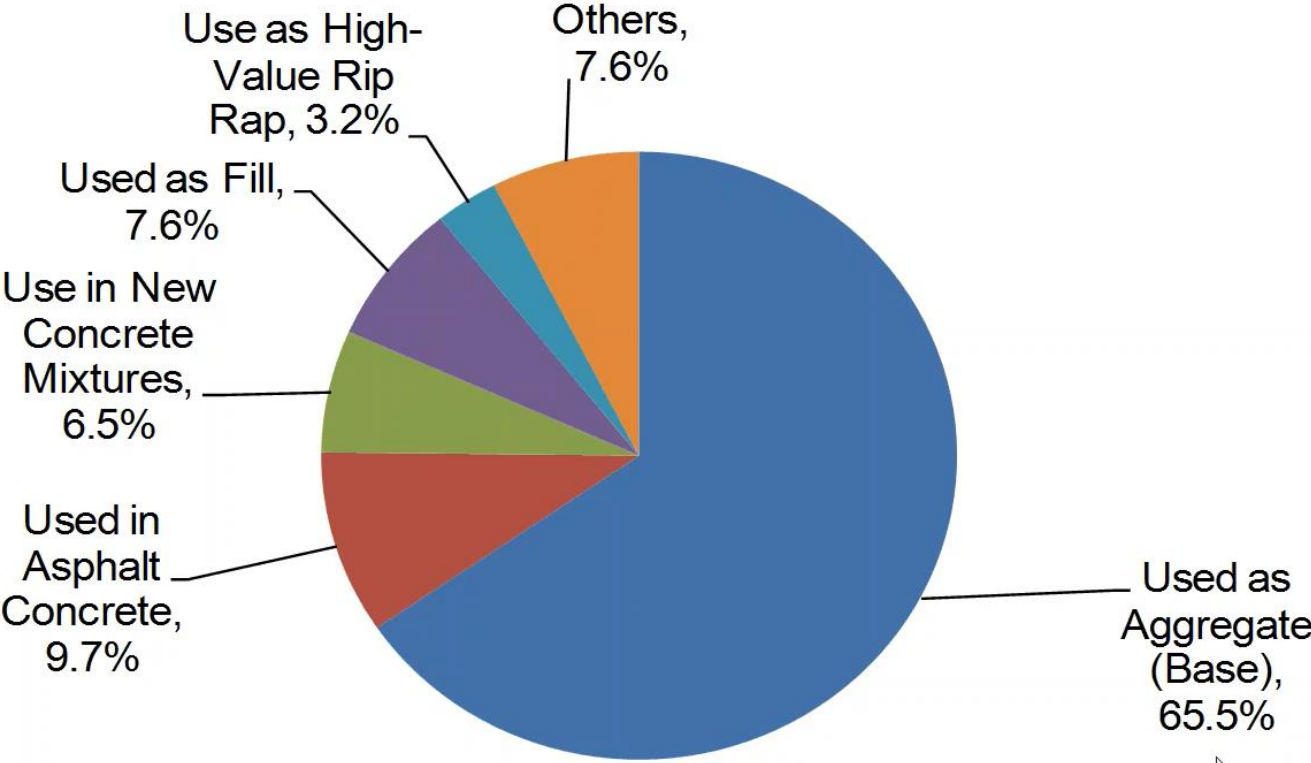




# RCA use as base in other DOTs *(from CP-Tech Center Resources)*

- 38 of 41 states indicated use of RCA as base/subbase (FHWA, 2004)
- Most common application of RCA in US
- Ease of on-site reuse
- Some level of contaminant material is tolerable

# RCA Usage

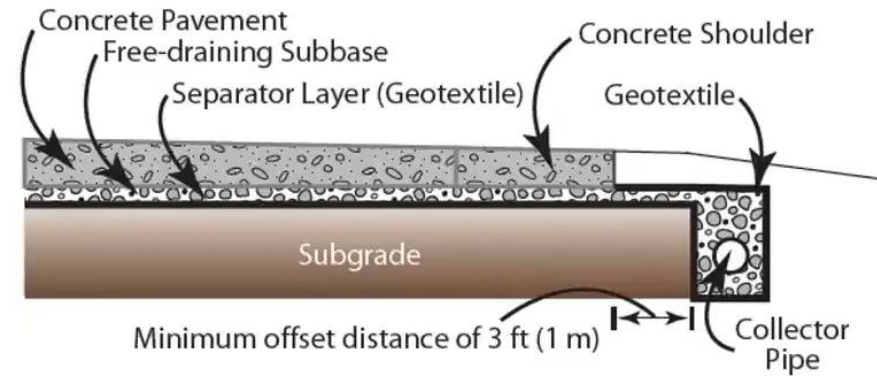


Source: Van Dam et al. 2015, from C&D Debris Recycling Magazine, 1998

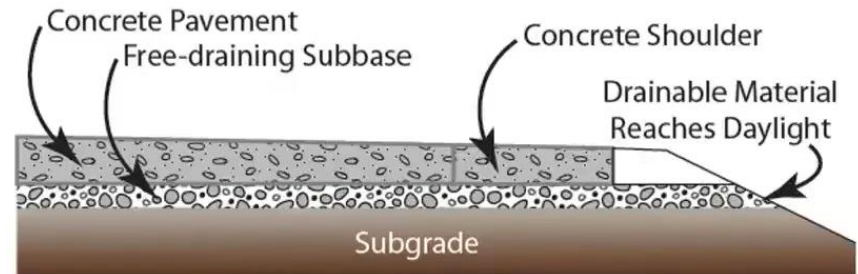
# Strategies to Reduce RCA Issues

(CP Tech Center)

- Minimize use of RCA Fines
- Blend RCA and VA
- Wash RCA
  - Stockpile management
- Use largest practical RCA particle size
- Use high-permittivity fabric
- Warp trench (not pipe)
- Daylighted subbase
- Stabilize base
  - cement-stabilized can mitigate high pH runoff



Typical edge drain piping (ACPA 2009)



Typical daylighted subbase (ACPA 2009)

# Proposed Changes to Base/Subbase Specs related to RCA

1. Modify 3138 to 75% maximum concrete.
2. Where there are no drain tile, leave specification as is for base and subbase (both at 75% maximum)
3. Where there is drain tile and where base contains concrete, require that subbase be virgin only, and possibly require a non-woven geotextile (type 4) on top of subbase
4. Require Virgin only for bedding of open culverts
5. Do not use in contact with or where leachate will pond on polyester geosynthetics. Hydrolysis of the polymer may occur and degrade the material. This is more critical for retaining wall and reinforced steepened slope applications.
6. When using a drainable base, such as OGAB or DSB, need to limit or prohibit recycled concrete in base or subbase.
7. No RCA in Select Grading

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