SUPERPAVE Trial Mixes – Superior Paving’s Experience

Dave Helmick
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Concern with Mix Durability

• 15 years ago, most work was private
  – Asphalt mixes were designed using Marshall Mix Design
  – Mixes used RAP
  – Mixes had AC, mixes had “life”
  – Density was easier to achieve

• Last 15 years, increase in VDOT work
  – Mixes designed using SUPERPAVE
  – Mixes designed with higher RAP percentages
  – Mixes are coarser and have lower asphalt contents
  – Mixes were drier, looked 5 years old after placement
  – Vibratory rollers required to achieve density
Actions Taken to Address Mix Durability

- Redesigns (add spec for no. 30 sieve)
- Addition of more liquid AC (50 gyrations)
- RAP adjustment for AC contribution
- Partnered with VDOT to improve mixes
2015 Pilot Study

• Superior Volunteered to design, produce and lay 3 mixes
  – SM-9.5 Bealeton Plant in Culpeper District
  – SM-9.5 Leesburg Plant in NOVA District
  – SM-12.5 Powell Lane Plant in Fredericksburg District
Fredericksburg Lab
2015 Pilot Study

Leesburg Plant
Fredericksburg Plant
Mix Design and Production Considerations

- Aggregate changes for each new mix to meet proposed gradation bands
- Impacts of Design Changes on Mix
  - Increase AC content by 0.1%
- No production challenges
NOVA Site  Potomac View Road
Mix Placement and Compaction Observations

- Surface appearance
- Crew said “it seems to come out from under the screed better”
- Less effort to get compaction
- One less roller pass
Dave Helmick’s Next Steps...

- Good first step in revising gradations, look to moving gradations to fine side of maximum density line for surface mixes
- VTTI work and test results based on regressing air voids, look at designing with VTM = 4% and adding binder to achieve VTM = 3.5% or 3.0%. Place sections at Accelerated Pavement Testing site in Blacksburg
Percent VTM vs. Asphalt Content

![Graph showing the relationship between Percent VTM and Asphalt Content with a linear trend line.](image-url)
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- Adjust SM-9.0 and IM-19.0 to increase AC content
- Adopt BM-25.0 HMHB as the only HMA base mix; higher AC content and lower in place air void
- Revise AC placement guidelines following NCAT recommendations in NCHRP Report 531 – right mix at the right thickness to maximize density

Quality is Top Priority

- Focus on high quality asphalt mixes
  - Proper mix design
  - Aggregate selection and gradations
  - Producing what is designed
- Focus on high quality laydown practices
  - Tack Coats
  - Shuttle Buggy
  - Maximum in place density
  - Smooth riding surfaces
Questions or Other Thoughts

AND YOU THINK YOU'RE HAVING A BAD DAY?