

Hardin County

KY-251

Spot Subgrade Stabilization



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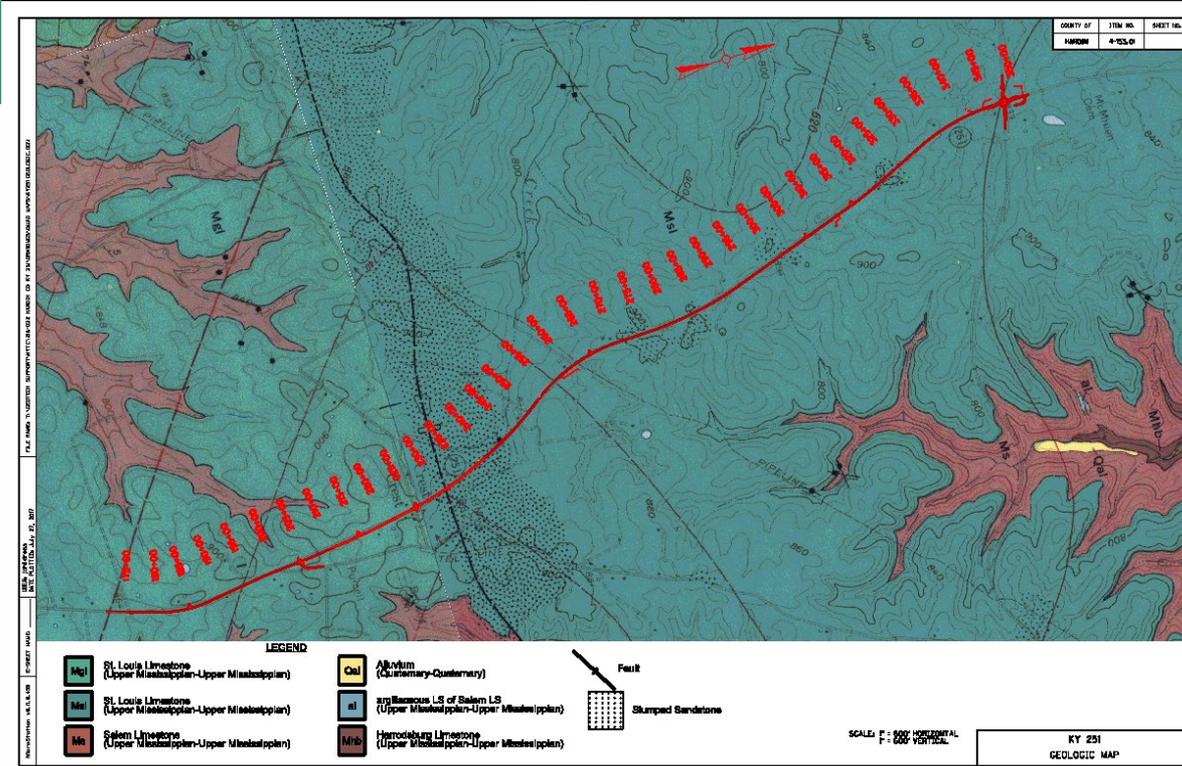


Project Highlights

- Karst, faulting and slumped sandstone
- Slope stability
- Subgrade stabilization



Project Setting



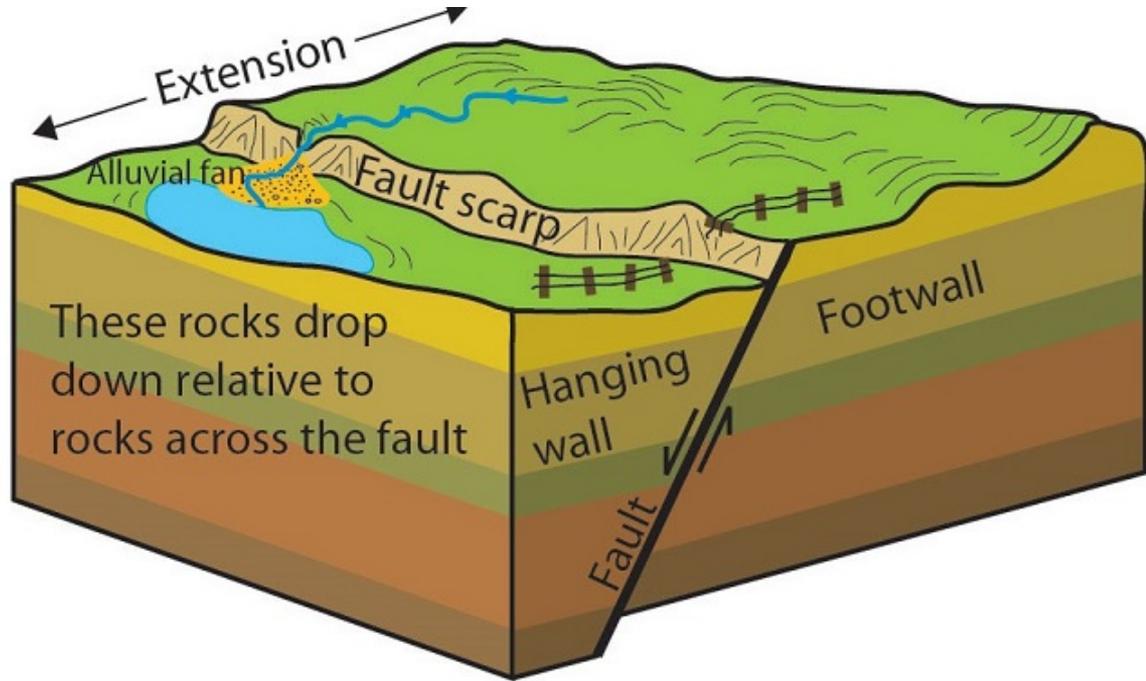
Karst

- Caves
- Sinkholes
- Karst ponds
- Slumped sandstone



Fault

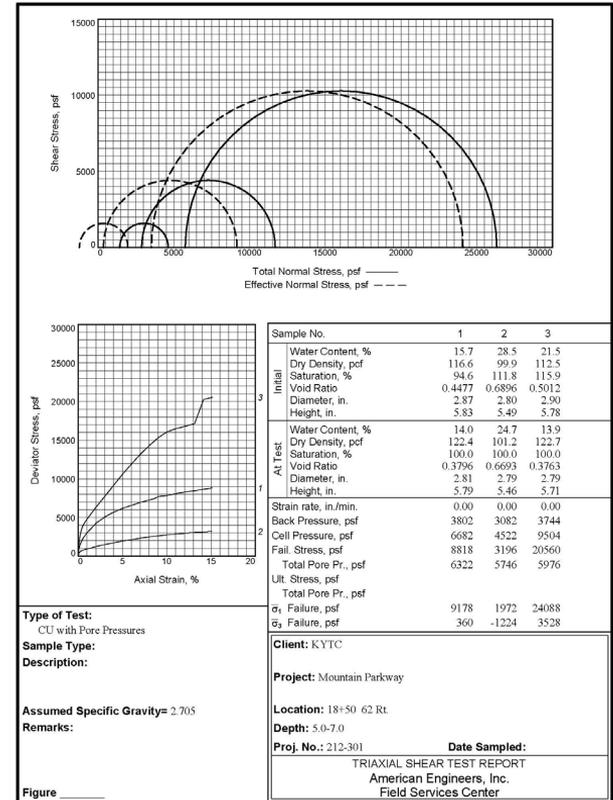
- Slumped sandstone
- Deep overburden
- Fractured rock
- Seismic potential



Slope Stability

Typical soil strength parameters

- NAVFAC 7.02
- Long-term (effective)
- Intermediate-term (effective)
- Short-term (undrained)



Slope Stability



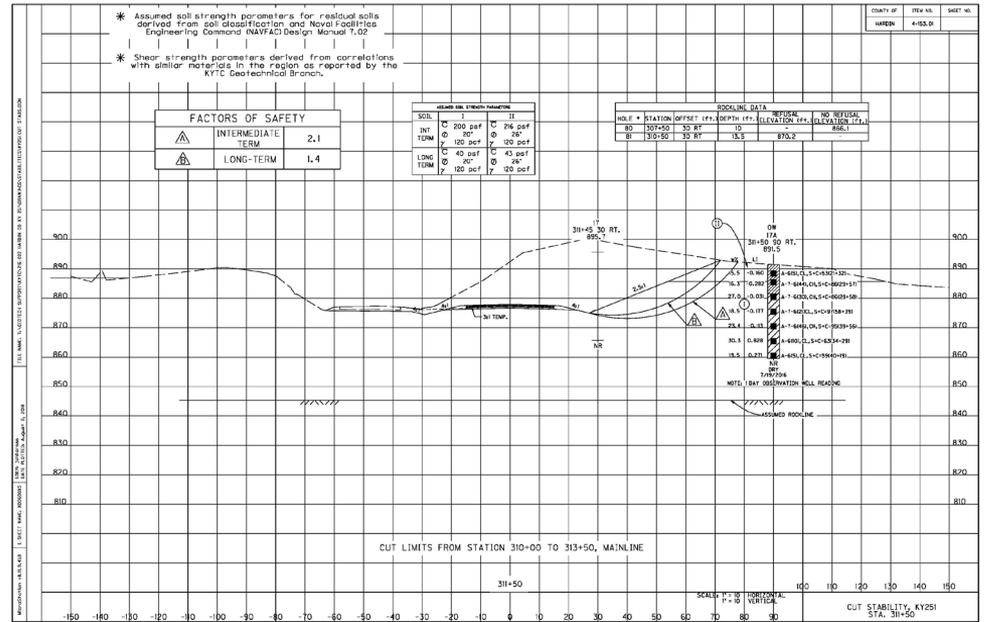
Slope Stability

- Triaxial Test
 - Shear and saturation
 - Pore pressure dissipation
 - Predisposed failure plane (chert nodules)
 - Lake Barkley



Slope Stability

- Future projects
- Reduce slopes
- Limit shear strength parameters



Subgrade Stabilization

- Chemical
- Stone
- Geogrid



Subgrade Stabilization

- Chemical
 - Cement
 - Lime

<https://www.youtube.com/watch?v=V5B5dv9B3KE>



Subgrade Stabilization

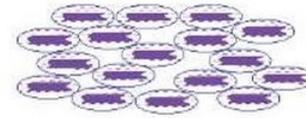
- Selecting the appropriate method
 - Fines content
 - Silts and sands vs. clays



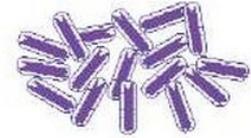
Subgrade Stabilization

■ Lime

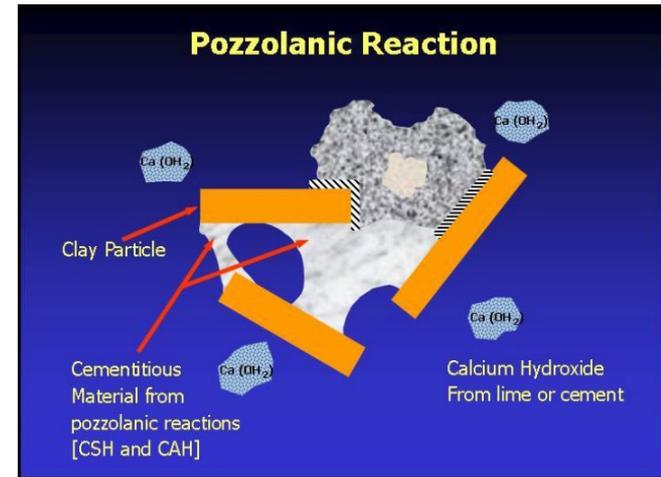
- Calcium cation exchange
- Flocculation-agglomeration
- Pozzolanic reaction
- $\text{pH} \geq 12.4$



(a) clay particles
before adding lime

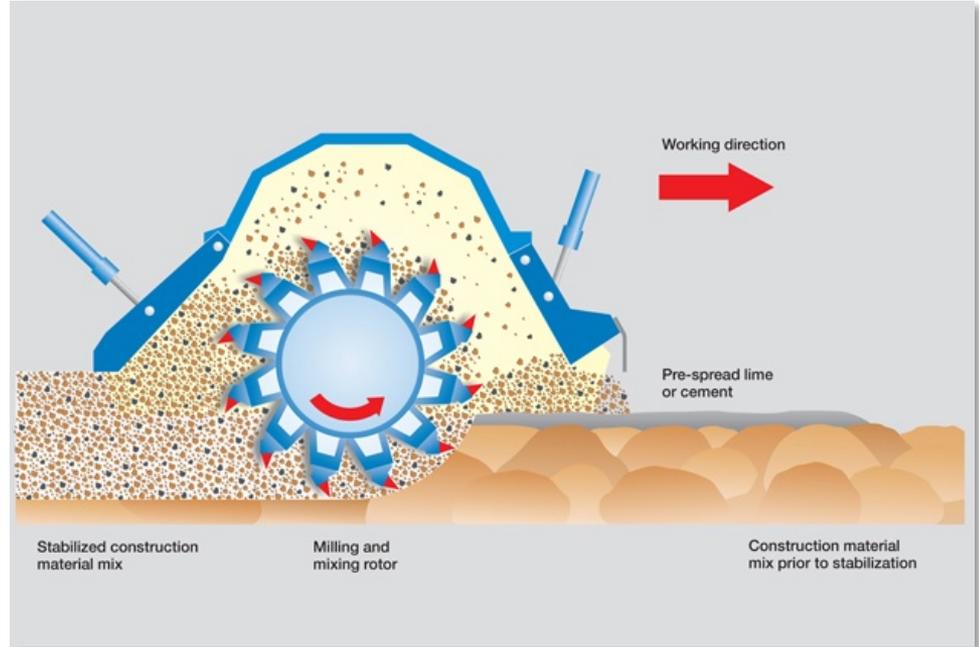


(b) clay particles
after adding lime



Subgrade Stabilization

- Cement
- Soil-cement
- Cement modified soil
- Hydration



Subgrade Stabilization

- Special Note
 - Selection during bidding
 - Multiple stabilization options
 - Station limits indicated in report



Questions

Thanks for participating!

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