

Cement Stabilization: A County Perspective

Chuck Cox, GCC



Dan Schellhammer PE,
Midstate Reclamation



Dirk Rogers, Brown County



33rd Annual North Central Local Roads Conference
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Local Stabilization in 2018



Overview - Cement Stabilization

- Construction Process
- Quality Control and Project Evaluation
- Costs
- County Perspective



Construction Process



Modern Cement Vane Spreader



- Material application rate controlled by onboard computer that is constantly collecting GPS and ground radar data to apply the proper amount of Portland cement regardless of conditions or the ground speed of the spreader

Modern Reclaimer



- Mass flow meter tied to centralized computer that controls the incorporation rate of water, leading to proper hydration of the cement throughout the stabilized layer

Modern Reclaimer Drum



- Substantial advances in drum and housing design to maximize the mixing action of the reclaimer

Initial Compaction

- Initial Compaction should be completed with a large pad foot roller
 - Modern 84 inch pad foot roller with cab preferred
 - Walk back and forth until pad foot starts to walk itself up out of pad marks
 - Contractor should attempt to keep the pad foot roller within 75 feet of the reclaimer



Layback



- Use the Blade to remove the pad marks from initial compaction and re-establish grade/profile
 - Blade needs to reach bottom of pad indentations
 - Ensure blade lags no longer than 1.5 hours behind the reclaimer

Final Compaction



- Utilize Smooth Drum or Rubber Tire Roller
- Finish Rolling needs to be completed within 2 hours of mixing. Allows stabilized layer to get it's initial set and meet strength requirements

Quality Control

- Proctor Results
- Nuclear Density Gauge
 - Monitor Moisture
 - Establish Rolling Pattern
 - Ensure Rolling Pattern is maintained
- Gradations
 - Correlate to Mix Design
- DCPs



Project Evaluation

- Cores
 - Check Pavement Depth
 - Identify Base/Subgrade for Pavement Design
 - Collect Samples for Mix Design
- GPR (Ground Penetrating Radar)
- FWD (Falling Weight Deflectometer)
- Mix Design
 - $GE = 1.5$
 - 12 inches cement treated subgrade = 18 inches of compacted gravel

Cost Variables

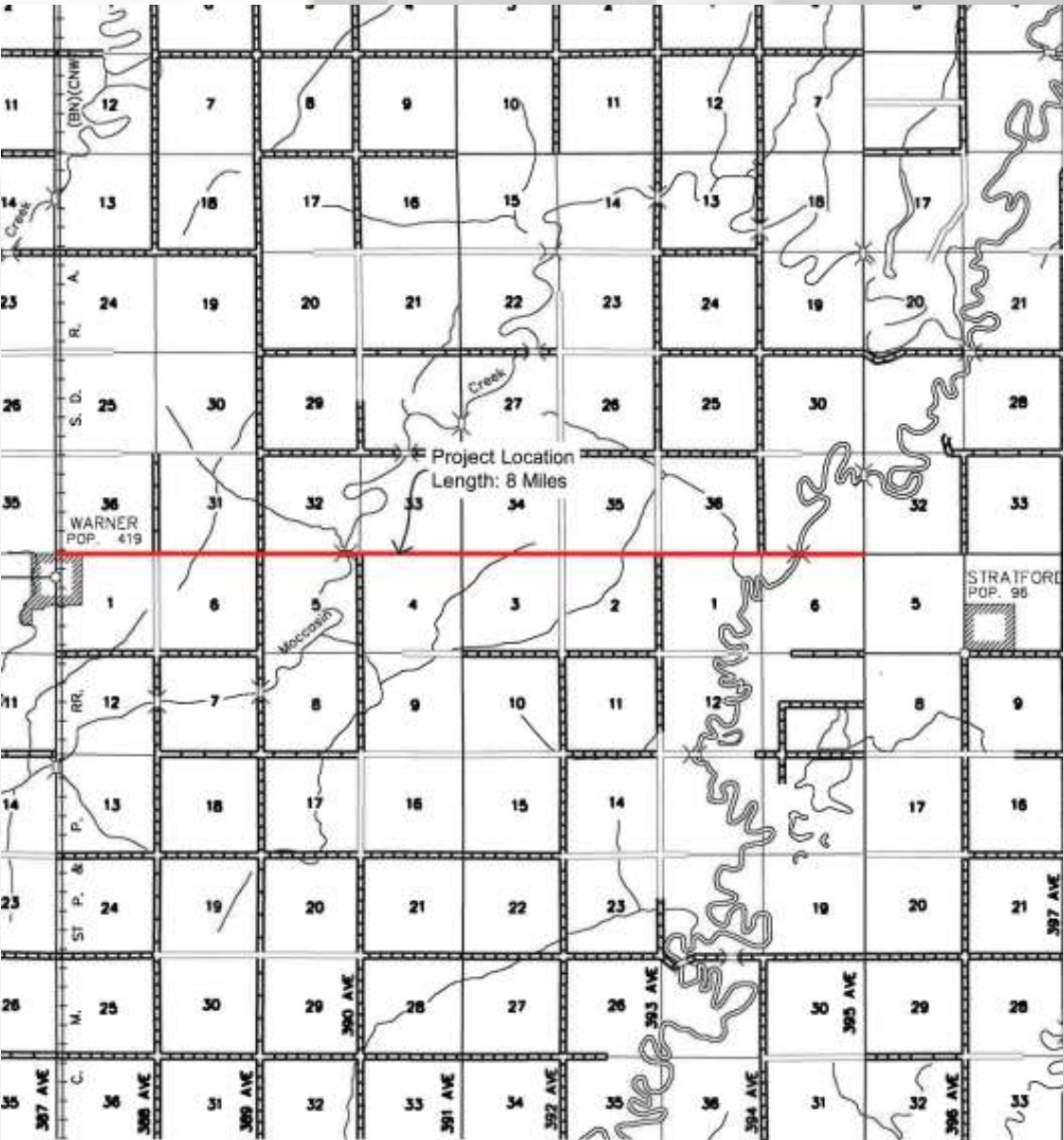


- Size of Project
- Amount of Cement Needed to Achieve Stabilization
- Unit Weight of the Soil to be Stabilized
- Distance from Cement Terminal
- Depth of Stabilized Layer

Costs

- One Centerlane Mile (5,280 ft x 24 ft)
- 5% Cement at 110 pcf, 12 inches deep
 - 348 TN Type I/II Portland Cement
 - \$185.00 per TN x 348 TN = \$64,380.00
- Stabilize 14,080 SY per Mile
 - 14,080 SY x \$1.65/SY = \$23,232.00
- Total Centerlane Mile Cost = \$87,612.00

County Perspective



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Chuck Cox, ccox@gcc.com

Dan Schellhammer PE, dans@midstatecompanies.com

Dirk Rogers, Dirk.Rogers@browncounty.sd.gov

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