

# **GRAND JUNCTION GEOLOGICAL SOCIETY**

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## **MARCH MEETING**

**Joint meeting with the CMU geology students**

**Wednesday March 16, 2016**

**7:30 PM**

**SACCOMANNO LECTURE HALL**

**(In the Wubben Science Building)**

**Justin Peterson, PE, Regional Engineer  
Intermountain West GeoStabilization International**

**Will Speak On**

**“Emergency Repair of a Failing Mechanically  
Stabilized Earth Wall Utilizing Hollow Bar Soil Nails  
and Compaction Grouting”  
(38 Road Slope Failure)**

**Abstract On The Reverse Side**

**Guests Are Always Welcome**

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**Your 2016 dues are due now. If you haven't paid make your check to the GJGS  
Foundation, a non profit organization. Bring to this meeting or mail to  
GJGS, PO Box Grand Junction, CO 81502.**

## **Abstract:**

This technical paper summarizes the emergency stabilization and repair of a newly constructed roadway section originally designed and constructed using a Mechanically Stabilized Earth (MSE) wall to create 40-ft of additional roadway width - including a bike lane and pedestrian walkway. The new roadway section, located on 38 Road, near Palisade, Colorado, began to show signs of movement just days before the ribbon cutting ceremony was marked on the calendar. The movement accelerated rapidly over the next few days and became an emergency situation as the tension cracks in the roadway created hazards to motorists and cyclists.

The approach to mitigate the movement of the existing retaining wall consisted of designing and installing a pattern of hollow bar soil nails, up to 50-ft in length, through the existing wall face and reinforced fill, into the shale bedrock. Additionally, the design included reshaping the fill previously placed in front of the newly constructed wall. Reshaping consisted of regrading the mass of the previous over-steepened "soil buttress" downhill, to a more suitable configuration making the mass more useful to resist the movement.

During the drilling process, the wall continued to move until the installed soil nails began to catch the wall's movement. Once the combined resistive forces in the soil nails as well as the fill below the wall were at or above equilibrium with the driving forces of the failure, the wall movement quickly reduced to almost zero. Since the wall experienced significant movement for approximately one (1) week, as well as being purportedly founded on less than suitable foundation material, it was then decided to implement a more comprehensive solution and improve the foundation materials as well as increase the density of the sub-grade materials in the previously failed roadway using compaction grouting methods.