Geopier SRT (Plate Piles), Case Study

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- Interchange with US 30 - constructed in 2001
- Ramp B
  - Westbound US 30 to Southbound US 23
- 3 landslide locations
  - Last officially inventoried in 2014 – low to moderate risk of reaching the travel lane
  - No easy method for District 1 to perform maintenance
  - Awarded Geologic Site Management funds to repair
2014 Photo of Slide 2
Design

- District had planned to flatten existing 2:1 slopes to approximately 2.5:1
- OGE recommended adding alternate repair methods to construction plans (“surgical” options)
  - Soil nails
  - Plate Piles (selected option after bids were reviewed)
SRT System

- Piles can be galvanized or black steel
- Can be angles or S-shaped
- Lengths can vary from 6 to 16 feet
- Installed in staggered grid pattern
SRT System Concept

- Mobilize the strength of the soil through arching and transmit slide forces to the underlying stiffer soil
- Downslope force on each pile is resisted by the bending strength of the pile shaft in combination with the passive resistance of the soil behind the plate
SRT Plate Piles

Unstable Layer

Competent Layer

Slope increment supported by SRT Plate Pile
Current Status of Project

- Slide limits expanded over past year
- Regrading of slope prior to SRT installation has occurred
- Installation expected to begin this week
Final Design

- Failure Depths estimated to be 3.5-6.5 feet deep
- Pile lengths 12-15 feet (lengthened by ODOT)
- 4 feet on center in horizontal direction
- 5-8 feet upslope spacing
- Plate varies in height from 36-66 inches (H x 12” x ¼”)

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Challenges

- New technology – limited number of licensed installers (1?) that are also ODOT prequalified
- Cost savings uncertain