Emergency Railroad Track Stabilization
Mile Post 206.8 – San Clemente, CA
Overview of LOSSAN (Los Angeles – San Diego – San Luis Obispo Rail Corridor)

- 351-mile rail corridor running through six counties
- Second busiest intercity passenger rail corridor in the U.S.
- More than 150 daily passenger trains
- Carries more than 8.3 million passengers annually (pre-COVID-19 pandemic)
- More than 70 freight trains per day in some areas
- Designated national defense rail corridor as part of the Strategic Rail Corridor Network by the Department of Defense
- Critical single-track section along the beach through the cities of Dana Point, San Clemente, and northern San Diego County
Overview of Project Area

Historical Beach Condition

2/5/2022 Near Low Tide

9/8/2022 Just Prior to Hurricane Kay – Near Low Tide
Landslide Background

- September 2021
  - Significant beach erosion activated historical landslide
  - Tracks moved +28-inches laterally toward ocean
  - Train service suspended to stabilize tracks
  - Placed +18,000 tons of riprap along 700 feet of track (counteracts mass of slide)
  - Monitoring track and slope movement

- September 2022
  - Additional slope movement due to high tides, waves, and storm surge
  - Placed more riprap
  - Operating speed reductions
  - Assessment of slope movement indicates larger mass of historic slide is beginning to move
  - Train service suspended due to continued incremental movement
  - Assessed alternatives to stop slide movement
Proposed Work

- Assessed slope flattening, ground improvement, sea wall, pile improvements, and ground anchors
- Ground anchors (green) placed into bedrock through the slide planes; designed to hold back the larger slide; will stabilize the movement and provide a satisfactory factor of safety
- Can be rapidly constructed with material available
Ground Anchor Area
<table>
<thead>
<tr>
<th>Milestone</th>
<th>Estimated</th>
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<tbody>
<tr>
<td>Begin contractor mobilization</td>
<td>October 4, 2022</td>
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<tr>
<td>Design and review</td>
<td>October 6, 2022</td>
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<tr>
<td>Construct Phase 1 – corrodible ground anchors (readily available material)</td>
<td>October to early November 2022</td>
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<tr>
<td>Assess slope movement data – reopen for train service</td>
<td>Early to mid-November 2022</td>
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<tr>
<td>Construct Phase 2 – permanent corrosion-resistant ground anchors</td>
<td>January 2023</td>
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<td>(material production and availability lead time required)</td>
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<td>Construction closeout</td>
<td>March to July 2023</td>
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<tr>
<td>Regulatory permitting</td>
<td>Ongoing</td>
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</tbody>
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Cost

• Estimated cost is approximately $12 million*
  • Construction
  • Construction contingency
  • Construction management
  • Railroad flagging
  • ROW support services
  • Public outreach effort
  • Environmental clearance and emergency permitting

*Costs are preliminary estimates based on 5% concept design, are subject to change, and do not include previously approved federal funds used toward engineering.
• Constructing the ground anchors will arrest this inland rail slide movement and protect the immediate integrity of a critical transportation corridor that serves passengers, goods movement, and national security.

• Ocean intrusion into the railroad ROW along the cities of Dana Point and San Clemente will continue to be a threat to keeping the railroad moving.

• Long-term alternatives for protection of this railroad corridor need to be developed.