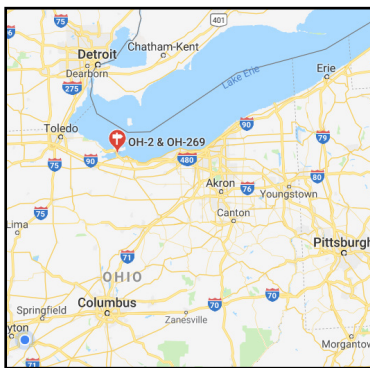


# Ohio DOT SR 2 Embankment Repair

## Construction - Case Study

### Background

In November 2017, ODOT crews noticed a crack in the pavement on the Ohio Westbound State Route (SR) 2 Ramp at SR 269 located in Northern Ohio near Sandusky. Further inspection revealed growth in the crack prompting ODOT to close the ramp's shoulder in late November. By early December, the crack expanded to a 1" difference in pavement height causing ODOT to shut down the ramp entirely. Shortly after the shutdown the pavement slid, or dropped down, leaving the ramp impassable. This caused ODOT to proactively close the right lane of Westbound SR 2. Although treating embankment failures is not new to ODOT, the Westbound SR 2 failure worsened much faster than others in the region, severely impacting the flow of traffic. ODOT targeted May 23rd for slip repair completion, in time for the Memorial Day Holiday, due to the exits importance to Lake Erie's summer tourism.



The slip occurred on SR 2 in Northern OH near Sandusky, a hub for local summer tourism

### Executive Summary

- > ODOT noticed a crack in the pavement on the Ohio Westbound SR 2 Ramp
- > The crack expanded 1 inch in just a month's time, which is much quicker than usual
- > ODOT had to close the right lane of SR 2 with a target date to complete repair by Memorial Day due to it being a high tourism area
- > Embankments were originally built directly on native soil. A method later abandoned due to the instability of the structure
- > Independence Excavating was awarded the contract to repair the slip in March 2018, leaving less than 3 months to complete the repair
- > ODOT determined that the native soil needed to be treated with a lime based reagent for better strength and compaction
- > Calciment was chosen due to it's proven ability to quickly dry and stabilize the soil
- > Calciment was applied at a 2-3% dose rate and within hours, the soil was in compliance with ODOT spec

# The Challenge

When superhighways like SR 2 were originally built, embankments were typically built directly on top of the native topsoil, a method later abandoned by ODOT due to the instability of the structure. This embankment soil included moisture sensitive native soils and local granular fill that tend to move more rapidly. Excessive amounts of water penetrated the sub-base and accelerated the decomposition process. ODOT monitored the slide over several months and conducted tests to determine its magnitude. Geotechnical results and repair recommendations were presented in January 2018, and plans were completed in February.

Independence Excavating was awarded the contract to repair the slip and get the ramp up and running ahead of the busy summer season. A leading contractor with over 60 years of experience, Independence Excavating specializes in site development, demolition, heavy industrial applications, environmental remediation, concrete construction, aggregate crushing and recycling. With offices in OH, PA, VA and CO; Independence has vast experience in projects ranging from large scale, public site development to private remediation and demolition nationwide. The project was awarded in March leaving less than three months to complete the repair.

**... The solution was clear - in order to dry and stabilize the soil, Calciment was needed!**

## Solution Definition

ODOT determined the best course of action was to rebuild the structure with a rock anchor at the base of the slope. The native soil was to be removed and treated with a lime-based chemical reagent to ensure optimum moisture and compaction in accordance with ODOT Specification 205 for Chemically Stabilized Embankment. Per ODOT spec, soils had to reach +/- 2% of optimum moisture and 98% compaction. Calciment, a chemical hybrid of Cement and Quicklime, was selected due to its field-proven ability to quickly dry the soil and provide the compaction required by ODOT.

## Implementation

Repair work began early Spring 2018, a season that experienced temperatures as low as 21°F and rarely rising to 50°F, as well as above average precipitation, leaving the soil wet and unworkable. Native soils were removed, treated with Calciment and returned in 8-inch lifts. Calciment was applied at a 2% - 3% dose rate and within hours, the previously wet, unworkable soils reached optimum moisture and were ready for compaction in compliance with ODOT specification.

**... Even with inclement weather conditions, the ramp was open prior to Memorial Day!**

## Lasting Success!

One lane of the repaired state route and ramp was completed by May 23rd, ahead of the busy Memorial Day weekend. The project was substantially completed on June 15th.



### BEFORE



Pavement Slip  
Westbound SR 2 Ramp at SR 269 Ramp

### DURING



Calciment Application  
2% - 3% Dose Rate

### AFTER



Final Repair  
June 15th, 2018