To**: Erika Kenzig, PE, ODOT District 12 Project Manager**

From: **Shelby Thomas, PE**

Date: **December 18, 2025**

Regarding: **CUY-480-16.56 Slide, PID 124096 – Drainage**

**Background**

This project consists of the repair of a failed slope with benched excavation and embankment construction. The project is located approximately 500’ east of the SR 17 (Granger Road) along the West Bound Outer Lanes Ramp (W.B.O.L.) on Interstate Route (IR) 480. The geotechnical recommendation for the reconstruction of the slope to between the culvert and the eastern end of the project conflicts with the existing conduit and ditch, resulting in an alternative scheme to maintain the existing drainage pattern.

#### Existing Conditions

The existing drainage system consists of both ditches and a 24” conduit which outlets into West Creek at the northern and southern extents of IR 480.

An approximately 3.65 acre drainage area is captured by the catch basin at IR 480 STA. 902+36 which flows north in an 18-inch concrete conduit to a manhole at W.B.O.L. STA. 901+75. From the manhole the conduit increases in size to a 24” concrete conduit that flows west, outletting into West Creek. Based on the available survey information and record plans, the existing 24” conduit, which currently has limited cover, is depicted in the Cross Sections.

The impacted ditch is 2’ wide and runs east to west along and down the slope and discharges into West Creek. The ditch captures approximately 1.17 acres of flow from the West Bound Outer Lanes and surrounding grading. Proposed grading which provides a 2.5:1 slope rather than the current 2:1 slope fills in the existing ditch.

#### Proposed Conditions

To maintain the drainage pattern and provide an outlet for the water currently draining to the West Creek, a combination of improvements is proposed with the intent to provide a practical solution. Conduit that currently extends to the culvert headwall will be removed to STA. 899+88.55 where a half-height headwall will be constructed to intercept the existing 24” conduit and outlet into a proposed ditch at the toe of the slope.

Based on approximate areas and calculations in CDSS, the estimated flow of water coming from the 24” conduit at maximum capacity will be around 18.1 cfs so riprap and rock channel protection are proposed to dissipate the velocity of the water and prevent erosion of the ditch bottom. The riprap is 5’ by 4’ and the rock channel protection is 30” deep, 16’ long with variable width consisting of 12” rock, Type B. The proposed ditch width is 2’ with a foreslope of 2.5:1 and a backslope of 2:1. Due to the increase in flow from the proposed 24” conduit, a Type 1 Permanent Turf Mat is proposed within the ditch to prevent erosion from CDSS checks. Where the proposed ditch meets existing rock protecting the swale at West Creek, the Northeast Ohio Regional Sewer District requires a rock mixture of 40% Type B and 60% Type C with choking stones.

#### Conclusion

The proposed closed and open drainage improvements resolve the conflicts created by the grading identified in the geotechnical recommendations and maintain drainage outletting. The realigned ditch with turf mat, riprap, and rock channel protection minimizes erosion.