

# Rehabilitation of Bridge 3-823

## Cave Neck Rd. over Beaverdam Creek

(DeIDOT Contract T202407902)



### Setting the Scene:

Bridge 3-823 is owned and maintained by DeIDOT and lies west of Red Mill Pond, spanning Beaverdam Creek. The existing structure consists of a combination of a concrete arch culvert and a concrete rigid frame. It has concrete wingwalls and headwalls which help retain fill dirt and the roadway paving.

The original 8 ft long, arched concrete culvert was constructed circa 1913 and was widened with the concrete rigid frame portion in 1948. The original structure is 112 years old making it one of the older bridges in our inventory. Aside from the maintenance issues discussed below, the structure is in surprisingly good shape and has served this area well for over a century. The bridge supports a timber stoplog dam at its south face which helps limit flows to Beaverdam Creek.



Location of Bridge 3-823

### Why is the bridge being worked on?

In 2000, the southwest wingwall broke free from the structure. The purpose of a wingwall is to retain the fill dirt and the roadway paving. This wingwall structure sits on its own foundation so the bridge itself was not at risk. The Department made temporary repairs, and they have held up very well over the years. In the past few years, the wingwall has begun to rotate further away from the structure and this is causing fill loss and settlement in the roadway and shoulder above it. Temporary patches and fill have been placed but continue to fail as the wingwall can no longer retain the material. This necessitates the need for corrective action as sink holes and roadway degradation pose unsafe driving conditions and the potential for scour issues to the bridge itself. The structure also has some concrete spalling and cracks which we will address as part of this effort.



SE wingwall broken free from the culvert (Top View)



SE wingwall broken free from the culvert (Front View)

See reverse side for additional information



## How do we stop the erosion?

Our plan here is to retrofit this old structure with a modern design utilizing 20 ft long by 15 feet wide, galvanized steel sheet piles. These sheet piles have been designed to fully support the loads of the fill dirt and roadway paving. These will be driven to the designed elevation using a large excavator or small crane. Installing these will remove the loads from the existing wingwalls. These sheet piles will then be capped with a concrete coping. Once the coping is installed, we will demo the south headwall and build what is known as a moment slab. The moment slab serves two functions here: the concrete deck portion will reduce the vehicular loading to the bridge in the area that it spans, and the concrete rail will provide a much safer railing, designed to withstand vehicular impacts and keep drivers from exiting the roadway. While the work is happening up top, crew members will be working underneath to patch concrete spalls and seal concrete cracks. We will also be replacing guardrail and guardrail end treatments then finishing the project by paving over the bridge to smooth out the dips formed from settlement.



## How will this impact my travel along Cave Neck Rd and when is this taking place?

This project will require a complete road closure at the bridge site due to the nature of the work and the large machinery necessary to complete it. We have studied the traffic volumes in the area, coordinated with the environmental agencies, taken into account our construction crews' availability, considered the temperature requirements for curing concrete properly, and planned around other large construction projects scheduled for this area for 2025/2026. With this concerted effort, we have found that the most viable time of the year to perform this work will be to start in May and anticipate the project to take 12 weeks, weather permitting. The temporary detour routes will be routing motorists traveling west on Cave Neck Rd to turn left on Hudson Rd, Right on Walker Rd and right on Diamond Rd which will return them to Cave Neck Rd. Motorists traveling east on Cave Neck Rd will turn right on Diamond Farm Rd, Left on Walked Rd, and left on Hudson Rd which will return them to Cave Neck Rd. The Detour is attached and will be clearly marked in the field once installed.

## Who can I contact with more questions, and how?

Any questions, comments or concerns should be directed to DeIDOT Community Relations at 302-760-2080 or you may contact us by e-mail at [dotpublic@delaware.gov](mailto:dotpublic@delaware.gov). Please include the project name or contract number when contacting us to expedite our response to any inquiry.