

# Island Creek Culvert Replacement



## Background

During storm events, Island Creek experienced significant flows resulting in damage to the box culvert carrying SR-213 over the creek. The existing structure exhibited slope failure, scour, washout behind wingwalls, concrete deterioration and separation of the wingwalls from the culvert structure. The winding stream, high velocities and downstream floodplain conditions created complex hydraulics, and variable rock elevations complicated accessibility.

## Challenge

The Ohio Department of Transportation (ODOT) District 11 needed a culvert structure study (to evaluate structural integrity) as well as complete engineering designs for replacing the existing 131-foot-long, 60-foot-span, three-cell, four-sided box culvert.

## Solution

Woolpert performed a structure type study, and based on ODOT's final decision, Woolpert then developed designs and plans for the recommended a 54-foot-span and 26.33-foot-rise, pre-cast concrete arch. proposed culvert, related roadway and embankment work, environmental documents and detour plans.

## Outcome

To increase the vertical opening, the new pre-cast sections stand on a cast-in-place pedestal foundation which includes tapered retaining walls rising as high as 38 feet. Piles prevent soil overstress, settlement and scour issues.



## CLIENT

Ohio Department of Transportation  
District 11

## LOCATION

Jefferson County, OH

**ODOT Consultant Evaluation Score**  
83%

## CHALLENGE

- Repair structural issues
- Alleviate poor drainage

## SOLUTION

- Tapered retaining walls
- Return to natural channel bottom

## SERVICES

- Survey, Right of Way
- Stormwater/Hydraulics
- Roadway Design, MOT Plans
- Bridge/Retaining Wall Design

## BENEFITS

- Improved drainage
- Reduced construction time

## Benefits

ODOT received final tracings for the new structure almost three months ahead of schedule. The single-span structure returned to a natural channel bottom, improved hydraulics and drainage and preventing debris build-up commonly seen in multi-cell culverts.