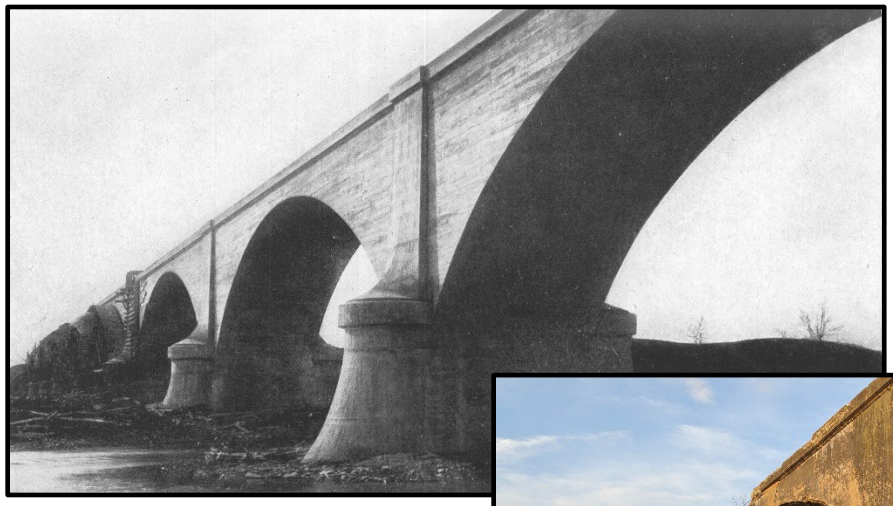
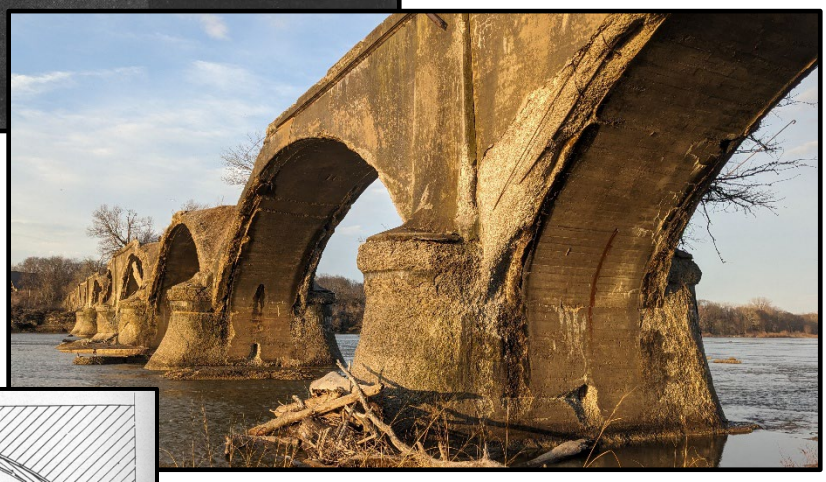
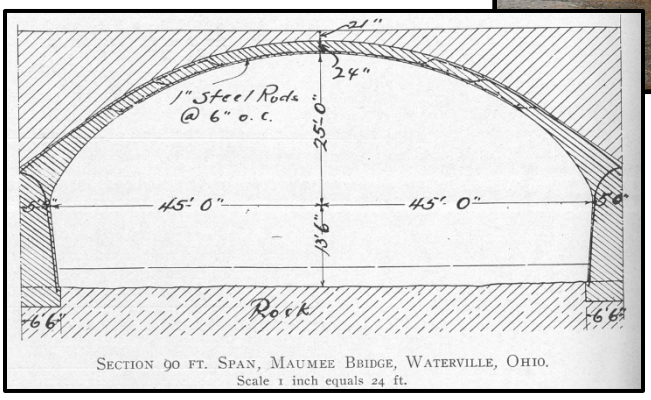
Draft

ROCHE DE BOEUF BRIDGE COMMITTEE
INSPECTION, MAINTENANCE &
FUTURE REHABILITATION REPORT







Section 90 ft. Span, Maumee Bridge, Waterville, Ohio.
Scale 1 inch equals 24 ft.

This Old Bridge, LLC
Strongsville, Ohio

May 31, 2026

1. Bridge Inspection

The Roche de Boeuf is not an active vehicular bridge (nor will it ever be) and thus is not directly subject to the ORC and federal bridge inspection guidelines. However, it is recommended that the retained portions of the bridge be inspected toward most aspects of bridge inspection practice prescribed by the Ohio Department of Transportation (ODOT).

Standard Bridge Inventory Practice

All vehicular bridges in Ohio are assigned a structure file number (SFN) with its record of inspection and inventory of location and standard physical dimensions and functions (span length, width, purpose, functions, etc.) stored online in ODOT's AssetWise database. As a non-vehicular structure, the Roche de Boeuf Bridge will not have a standard SFN nor have its inventory data contained within AssetWise. However, as a historic bridge, ODOT Environmental Services has established a practice assigning SFN's to non-vehicular historic bridges. A historic bridge SFN has not been assigned to the Roche de Boeuf Bridge, but following Environmental Services convention, it would be 48XXXX1. The future owner, presumably the City of Waterville, will maintain the inventory data of the bridge with either digital or hard copies.

Inspection Frequency

Inspection frequencies for vehicular bridges in Ohio varies from one to two-year cycles. For pedestrian bridges, owners may select inspection cycles of one to five years. Without either vehicle or pedestrian traffic the Roche de Boeuf Bridge will be considered as an abandoned bridge, and the owner with ODOT's input, will select the inspection cycle that satisfies their needs best. Due to the age and anticipated condition of the retained structure, it is recommended that the inspection cycle initially be one year and possibly extended to two years.

Inspection Types

There are several types of bridge inspection that can be performed. They are as follows:

- Initial inspection: An initial inspection is the first inspection of a new structure, a structure that has changed ownership or a reconstructed structure. It is a close-up, hands-on inspection of the structure to document its baseline condition.
- Routine Inspection: Routine inspections provide documentation of the existing physical and functional conditions of the structure. All changes to the inventory since the previous inspection are to be documented and updated. The written report will include appropriate photographs and recommendations for major improvements, maintenance needs (preservation, preventative maintenance or on-demand repairs), and follow-up inspections.
- In-Depth Inspection: An in-depth inspection is a close-up, hands-on inspection of one or more members and a close visual of all members above or below the water level to identify any deficiency not readily detectable using routine inspection procedures.

An underwater inspection is not recommended since summer and autumn water levels and stream velocities should be low enough that probing and visual inspection for scour can be performed around Pier 2 through 11. (Note: While scour around the piers is not anticipated due to the rock stream bed, scour inspection, in this case a probe inspection, is routinely performed.)

Inspection Cost Ranges

Consultant fees for bridge inspections may come in a wide range. For example, one consultant may submit a cost proposal for an in-depth annual inspection at $6,000 while another may propose $20,000 or $30,000. The difference in these two theoretical proposals lies in the scope of work. The higher cost consultant may include a larger inspection crew, greater transportation and overnight accommodation costs, inspection equipment, and/or a higher level of inspection documentation. To maintain inspection costs, development of a concise scope by the owner is necessary.

Mechanical inspection equipment such as manlifts or shallow-draft boats should not be necessary. Drone inspection of the top surface of the exposed arch ribs is acceptable. Additionally, any in-river access should be performed when the Waterville USGS gauge station for the Maumee River is at gauge height of 2.5 feet or less.

The following is a potential range of annual inspection costs:

- Initial inspection: $1,500 to $2,500
- Routine Inspection: $1,000 to 1,500
- In-Depth Inspection: $5,000 to $8,000

Bridge owners can alternate types of bridge inspection over multiple years. For example, an owner may require that a bridge receive an in-depth inspection once every five years. Also, an in-depth inspection may be performed for use in the Phase 2 plan development.

Material testing is typically not performed in a bridge inspection contract, but it can be included as an if-authorized item if the owner chooses.

2. Bridge Maintenance

Following the revised selective demolition Roche de Boeuf Bridge, limited maintenance, if any, for the bridge will be required. The bridge will consist of its 12 arch barrels, 11 piers and the North and South Abutments. No maintenance will be required as the now-exposed concrete arch will withstand snow and rain accumulation unless the drains at the piers are not cleared during the selective demolition activity. The piers and abutments will continue to withstand elements as they have for over 100 years.

Maintenance activities will be necessary for a rehabilitated structure. However, these activities will not depend on the eventual chosen rehabilitation strategy.

Bridge-over-Bridge

The Bridge-over-Bridge concept consists of placing prefabricated pedestrian bridges on top of pedestals secured to the existing piers and/or arches. Maintenance will include replacement of damaged deck boards and touch-up to weathered painted steel surfaces.

Spandrel Wall Replacement with Fill

This alternate consists of the near-exact restoration of the concrete spandrel walls with the placement of a paved concrete or asphalt deck on top of the added fill. A pedestrian fence will be placed on top or inside the spandrel walls. Maintenance activities will generally include clearing of the surface drainage system, and local repairs to trail surface and fencing.

Both alternatives will require trash receptacle maintenance and periodic repair of added signage on the bridges and their approaches.

3. Future Bridge Rehabilitations

It is difficult to project anticipated rehabilitation costs for the restored Roche de Boeuf Bridge. Instead, currently, it is best to discuss future rehabilitations in terms of time.

Arches

It is anticipated that carbonation is the most likely attack on the condition of the arches. For estimation purposes, carbonation penetration is the most likely deterioration mechanism that will affect the arches. Carbonation lowers the pH of the concrete, which is detrimental where and when it reaches the encased steel reinforcement. The arches of the Roche de Boeuf Bridge only contain steel reinforcement in the lower surface midspan and the upper surface at the end quarters. Only when carbonation reaches the steel reinforcing areas may corrosion begins, thus added time is provided before repairs become necessary.

Carbonation is considered to occur linearly over time, and based on the carbonation tests performed in 2019, the carbonation penetration is approximately half of the concrete cover over the steel reinforcement.

With the arches being nearly 120 years old, it is estimated that the arches will not require substantial repair for 75 to 100 years provided deicing salts are not placed on the deck.

*(*Note: The historic Stone Arch Bridge, opened in 1883 in Minneapolis, Minnesota over the Mississippi River, was converted to a pedestrian bridge in 1994. In 2024, the concrete walkway and drainage system was undergoing a phased rehabilitation. The performance of this pedestrian walkway and recent rehabilitation can be used to refine a Spandrel Wall Replacement alternative.)

Piers

Following Phase 2 Rehabilitation, the piers will have a service life of at least 50 years following their repair.

Spandrel walls (Alternative 2 only)

The recreated spandrel walls will have a service life of at least 75 years.

Prefabricated Pedestrian Trusses (Alternative 1 only)

The steel truss pedestrian bridges should have a minimum service life before rehabilitation of at least 50 years, and perhaps 75 to 100 years. Pedestrian trusses have been made of weathering steel over the last 40 years with generally good performance. However, when placed in damp and/or shaded areas, there have been cases where weathering steel floor systems have experienced premature corrosion perforations. The Roache de Boeuf Bridge is in an open area with ample air flow and should be a good location for long-lasting weathering steel pedestrian bridge.

The treated wooden deck should have a service life of 30 to 50 years. At this time, application of a protective coating system, typically a three-coat paint system, would also be applied to maintain the steel structures' longevity. (Note: Composite plank deck can be used in place of treated wood decks, and will provide longer, maintenance-free service, however this added service currently comes with an added cost. A cost analysis would be performed to determine the preferred decking.)

Summary: Both Bridge-on-Bridge and Spandrel Wall alternatives as described above in a Phase 2 Rehabilitation will provide a minimum 50-year service life before rehabilitation or replacement is necessary.