

December 12, 2023

Mr. Doug Kadzban
Director of Public Works
City of Allegan
691 Airway Drive
Allegan, Michigan 49010

SUBJECT: Jaycee Park Pedestrian Bridge Inspection

Dear Mr. Kadzban:

A detailed inspection of the old railroad trestle in Jaycee Park over the Kalamazoo River in the City of Allegan was completed on December 8, 2023. Enclosed is a copy of the report and pictures for your bridge files, supplemented with the comments below.

The bridge originally built for a railroad crossing has 11 spans total, 9 spans utilize timber beams supported by timber pile bent piers. Each pier has 6 timber piles supporting a timber cap. Two longer spans near the north side of the river are riveted, steel plate girders supported by timber cribbing at the ends and steel caisson at the girder midspan. The construction date is unknown but estimated to be between 1906 and 1911 per the available Sanborn maps.

The 2x6 decking remains in fair condition. Top of the boards are weathered and checked with areas of section loss. The fasteners are rusting throughout the deck. The deck is supported by lumber runners attached to the original railroad ties below. Scattered ties have end splits with some rot.

Timber beams support the deck. Three – 8"x16" timbers are located under each rail location with one fascia beam to support each end of the ties. Only minor deficiencies were noted. At the far north span, beam 2E has splits along the bottom. West beams at pier are beginning to split due to beam wedging against the steel end cross frame. Steel girders in spans 8S and 9S remain in good condition, with light rust and little to no section loss.

Many deficiencies were found in the substructure units that support the beams and deck. Several of the timber caps have extensive rot leaving only a shell for load support or no support at all. Nearly all pier piles have some surface rot/section loss at the water surface. Further notes by location follow below.

South abutment: some rot along the top of cap, rot in the timber backing behind the piles.



South path approach, bridge closed to pedestrians



Decking is weathered and checked. Fasteners are rusting.



Pier 1S west end interior rotted with only an exterior shell left in place, tree growing in rotted interior



Pier 1S east end rotted



Pier 3S east end rotted interior



Pier 3S west end rotted with tree sapling growing



Pier 3S east end split, depressed section at beam, internal rot likely



Pier 4S split with vegetation growing in bolt hole



Pier 4S east end with internal rot with tree growth



Pier 6S west end split with internal rot likely



Pier 6S east end with internal rot



Pier 9S west end rotted with 4ft white pine



Pier 9S east end nearly rotted through



Pier 10S east end split with internal rot



North abutment west end vegetation growth on cap



North abutment east end



Erosion beginning to undermining approach path along east side



Scattered end split ties with some rot



North abutment elevation



Splitting along bottom of beam 2E at north abutment



North abutment cap internal rot extends at least 100 inches from west end



Internal rot to vertical supports at north abutment



North abutment east pile rot at ground line



South abutment elevation



Tie end rot at south abutment



Three timber beams under past rail locations



Center spacing between beams



Pier 1S elevation



Pier 1S west end of remaining cap is crushing, rot inside top of piles



Pier 1S west end crushing/buckling



Internal rot in pile 2W exposed, only outer shell remains



Interior view of Pile 1S west end



Pier 1S west end



Pier 1S east half rotted



Pier 1S internal rot in east half



Pier 2S pile 1W rot



Pier 2S surface rot to pile 1W



Pier 3S pile 1E split at cap



Pier 3S cap internal rot with fungus growth



Pier 4S surface to piles at waterline



Pier 4S pile 1W



Pier 4S pile 3W internal rot



Pier 5S pile 1W has fire damage



Pier 5S cap remains good



Pier 5S pile 1E bolted splice



Pier 5S pile 1E lower west half rotted



Pier 6S pile 3W has some internal rot



Pier 7S pile rot at water line



Pier 7S rot along the side 3" deep



Pier 7S pile 1E nearly rotted through



Pier 7S top of pile 1E



Steel beam cribbing split, vegetation growing out of upper timbers at pier 7S



Pier 7S cribbing split with rot



Pier 7S cribbing split with rot, west end



Pier 7S east end cribbing



Pier 8S center support for steel beam spans



Light rust to steel beams and bracing



Pier 8S steel beam center support



Pier 9S north end cribbing rotted



Gap between east bearing plates and cribbing at pier 9S



Pier 9S cribbing has settled and rotated north



West bearing at pier 9S cribbing rotated



Pier 9S pile rot at water line



Pier 10S pile rot at water line



Pier 9S west end of cap offset



Top of pier 9S rotted full width for length of the cap, no beam support remains



West end pier 9S cap



Pier 9S interior piles completely rotted through



Span 10S is being held up by west beams pressing against a steel cross brace angle



West beams splitting where bearing against the steel cross brace angle



Pier 9S east end cap rot



Pier 10S bottom of cap split



Pier 10S Pile 1W, 60-70% loss



North end elevation



South end elevation

Pier 1S (1st pier from south abutment): Complete interior rot of the cap with full section loss along the bottom and into the top at each end. Approximately, the outer ½"-1" of thickness remains intact. This equates to at least 85% section loss of the cap cross-sectional area. The west end of the cap is crushing (sides buckling). The timber piles have an outer loss at the water surface. Pile 2W has internal rot, only the outer 1" remains. Very little support strength is left in the cap.

Pier 2S: Cap is in fair condition, no rot found. Each end pile is rotted with vegetation growing out of the timber. The estimated section loss to pile 1W is 20%, outer 1-2" at pile 2E is rotting.

Pier 3S: Extensive interior rot of the cap with a shell remaining. The east end shows signs of crushing. Two piles have section loss of the outer 2" at the water surface, 1" or less of loss to the remaining piles. Pile 1E has split at the top.

Pier 4S: Some rotting of the pier cap ends indicated by vegetation growing. Some indication of crushing at the east end. Extensive interior section loss to pile 1W and 3W, about a 1/3 gone. The rest of the piles have up to 2" of outer surface loss at the water surface.

Pier 5S: Cap appears in good condition with the presence of creosote remaining. Previous fire damage was noted on Pile 1W with some grout patching at the cap, and internal rot at the water line. Pile 1E has a bolted splice, the lower west side portion is nearly rotted through. The main support for piles 2 & 3E are underwater and not visible.

Pier 6S: Cap ends are split with some vegetation growing. Pile 3W has some internal rot. All piles have an inch or less of surface loss to piles at the water elevation.

Pier 7S: Top portion of the cap is rotted along east half, about 3" deep. Pile 1E has 90% section loss to top portion with vegetation growing in the rotted section. Outer 2" or more loss to Piles 1W and 2E at the water surface, 1" to remaining piles. Adjacent timber cribbing holding the south end of the steel girders is rotting and split.

Pier 8S is a steel cofferdam with concrete supporting the center of the steel girders. The visible portion remains in good condition.

Pier 9S: The top half of the cap has rotted away. A 4ft white pine tree growing in the west end. There is no bearing support for the beams. The span is being held by west beam end pressure against the steel span cross bracing. The beams are beginning to split at the end bearing point. Extensive rot at the water surface to piles 3-5E. The adjacent cribbing supports the north end of the steel girders is rotting and has settled with rotation toward the north. The roller bears are offset from the girder bearing plates.

Pier 10S: East end of the cap has rotted, top and bottom of the cap are split. Estimated 60-70% loss to Pile 1W at the water surface, about 40% loss to Pile 2W & 5W. Three-inch deep rot to top of pile 5W.

North abutment: Rot to pile 1E at the groundline. The cap has internal rot, at least 100" deep from the west end. Vegetation is growing on each end of the cap.

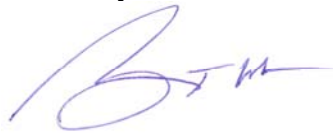
Pier conditions under the water surface were not evaluated. A special inspection is required for this work.

With the imminent failure of the pier caps 1S, 3S, and 9S, the bridge needs to remain closed.

Enclosed is a rating report of the bridge components per MDOT procedures, MDOT pier rating guidelines, and bridge photos.

On behalf of Scott Civil Engineering Company, I want to thank you for the opportunity to assist you with this project. If you have any questions or comments, please give me a call at 616-458-8792.

Sincerely,



Ryan Worden, P.E.
Project Engineer

Enclosures