December 18, 2018

Mr. Craig Bessinger
City Manager
City of Ferrysburg
17290 Roosevelt Road
Ferrysburg MI 49409

Re: Detailed Bridge Inspection – October 2018
West Spring Lake Road over Smith’s Bayou (SN 8941)

Dear Craig:

We completed the detailed inspection of this structure on October 10, 2018. The inspection allowed for a hands-on inspection of the underside of the concrete box beams and pier caps. Sounding of the concrete and measurements were completed to more accurately determine the extent of the deterioration. The measurements included length and width of cracks and areas of delaminated or spalled concrete on both the beams and piers.

The most significant findings from the inspection include the following:

Prestressed Concrete Box Beams:

- There are several beams below the sidewalks that have large delaminated or spalled areas of concrete at the beam ends. These are located on the side of the beams over the pier caps and most of the deterioration is not visible during the annual inspections. The spalled concrete has, in most cases, exposed reinforcement and there is heavy debris on the pier caps. See Photograph #1 in the attached images.

- In addition to the spalled concrete on the inside face of the beams, there are several beam ends along each bridge fascia that are delaminated. Hairline map cracking is visible at these locations, but is was not known that the concrete is also delaminated until the detailed inspection and sounding of the concrete. See Photograph #2.

- Many beam ends at the piers and north abutment have corner cracks and spalled areas. There are exposed reinforced prestressing strands at most spalled areas. Moisture was also present at all piers due to leaking deck joints.

- There are also numerous beam ends that have hairline longitudinal cracks along the bottom flanges of the beams that are not all visible during a typical annual inspection. This likely indicates that there is water accumulating in the box beam and freezing and thawing. There was evidence of water is leaking from these cracks in only a few areas. Most of the cracks did not show moisture, but this should be monitored. See Photographs #3 and #4.

- As part of the inspection, we sounded areas of the beams with corner cracks at the beam ends and along the span length. We observed at least 1 corner crack location near midspan that began leaking water after sounding. This indicates that the cracked area is delaminated (or separated from the beam) and is holding water. It would also indicate that any steel
Reinforcement exposed by the delaminated concrete is corroded. Unfortunately, this will only expedite the deterioration of the beam at this location.

Reinforced Concrete Piers:
- Pier 1S cap has large spalled areas below beams 7W, 8W, and 9W with exposed position dowels at beams 8W and 9W. Sounding of the spalled areas indicated that the concrete beneath the spalled area is mostly sound. Pack rust on the position dowels was cleaned away and it appears that the section loss is minimum. However, nearly 50% of the bearing pad at Beam 9W is undermined. See Photograph #5.
- There is another large section of the pier cap at Pier 1S that is delaminated below beam 12W. This is delaminated and the bearing pad is undermined approximately 2 inches.
- Pier 2S cap has a large spalled area below beam 12W. The spall appears to extend approximately 2 inches under the bearing pad. See Photograph #6.
- Several of the pier caps have cracks that appear to be shear cracks extending diagonally from the pier columns. While these have been present, and observed, in previous inspections, it was noted that many of these were wet and/or leaching at the time of the detailed inspection. These cracks do not appear to be negatively impacting the load carrying capacity of the bridge at this time. See Photograph #7.

The detailed inspection did not indicate that a further reduction in load carrying capacity is necessary at this time. However, there are several repair items that should be considered if funding cannot be obtained for a superstructure or full structure replacement.

- The delaminated and spalled areas of the pier caps should be repaired to avoid further undermining if the beam bearing pads. This may likely require a temporary support at several locations due to undermining of the bearings.
- Clean and seal (epoxy injection) cracks of the pier caps and columns as needed.
- Loose concrete can be removed from the beams so that water would not be trapped between the delaminated concrete and the rest of the beam.
- The rehabilitation work listed above should be completed in conjunction with replacement of the HMA wearing surface and waterproofing membrane and expansion joint replacement at the piers.

Unfortunately, these repairs will not allow for the posted load limit to be raised on the structure and will only help to slow the deterioration. However, without doing some rehabilitation work, it is likely that further reduction in load posting, a single or total bridge closure will be required in the future.

If you should have any questions or require additional information please don't hesitate to call. We appreciate the opportunity to be of service to you and look forward to working with you in the future.

Respectfully submitted,

Williams & Works, Inc.

Susan Tebbe, P.E
Project Manager
Photograph #1 – Beam end over pier cap

Side of Beam with exposed reinforcement

Pier Cap
Photograph #2 – Fascia Beam end over pier cap with delaminated concrete
Photograph #3 – Longitudinal crack from bearing area of beam, some moisture noted.
Hairline Crack in bottom of beam

Photograph #4 – Longitudinal cracks from bearing area of beam.
Photograph #5 – Spalled concrete with exposed position dowels and bearing pads at Pier 1S, Span 1S, beams 8W & 9W.
Pier 2S, Span 2S, Beam 12W – spalled concrete with crack approx. 2" undermining bearing observed from top of pier cap.
Diagonal crack in pier cap adjacent to column. Similar cracks noted at several locations.
APPLICATION FOR LOCAL AGENCY BRIDGE PROGRAM FUNDING
FOR THE
REPLACEMENT OF THE
WEST SPRING LAKE ROAD BRIDGE
OVER
SMITHS BAYOU, SPRING LAKE
CITY OF FERRYSBURG, MICHIGAN

1. INTRODUCTION

The West Spring Lake Road Bridge over Smith's Bayou, in the City of Ferrysburg, was constructed in 1972. The bridge is an 8-span side-by-side prestressed concrete box superstructure with cap and column piers and reinforced concrete stub abutments. In 2008, the City completed preventative maintenance repairs including installing pier jackets on 12 piers, removing and replacing the existing HMA surface, installation of a water proofing membrane, and complete joint seal repairs at each pier. Since that time, the City has completed maintenance work on the bridge to seal cracks in the HMA wearing surface and patch the HMA wearing surface and concrete headers at the expansion joints as needed. All the preventative maintenance and deck maintenance work has been completed with the use of local funds.

The existing structure is forty-four feet (44') wide and four hundred and forty-seven nine feet ten inches (447.8) in total length. Each span is approximately fifty-six feet (56') long and consists of 13 – 21" deep x 36" wide prestressed concrete box beams. The bridge deck surface is a 1 ½" bituminous wearing course directly over top of the beams with five ft (5') concrete sidewalks on either side. The structure is also part of the Lakeside non-motorized Trail system providing non-motorized access across Smith's Bayou from P.J. Hoffmaster State Park, Ferrysburg, and Spring Lake to Fruitport and areas to the north.

The bridge railing is a non-crash rated three tube aluminum with cast aluminum posts measuring 40 inches above the sidewalk. The abutments are reinforced concrete curtainwall abutments on deep foundations. The piers/columns are HP 14x73 piles with a concrete jacket cast over the upper 10 feet supporting a reinforced concrete cap.

US-31 divides the City of Ferrysburg, Smith's Bayou further segments the community. West Spring Lake Road is the only City owned bridge over this watercourse. It is a primary north–south road for residents (pedestrian, non-motorized and vehicular traffic) and students of the West Michigan Academy of the Arts and Academics School serving grades K-8. West Spring Lake Road also provides the primary access route for emergency vehicles in the northeastern reaches of the City. Emergency Responders would require a detour of approximately 3.5 miles. This detour route includes more congested signalized
intersections and would require emergency responders to travel through the US-31/Van Wagoner interchange to respond to emergencies in the northeastern section of the City. The average daily traffic on West Spring Lake Road is approximately six thousand (6,000) vehicles per day. The bridge is posted limiting the weight of trucks to 35 tons. As a truck route serving the Harbor/Docks this directs some loaded truck traffic onto US-31. Completion of a replacement bridge that serves a "Complete Streets" criteria is a priority for the City. This will include adding a non-motorized pathway to connect the trails that terminate at each end of the existing bridge.

II. GENERAL CONDITION WEST SPRING LAKE ROAD BRIDGE

The structure is generally in fair to poor condition, the most recent inspection, completed in April 2018, reveals the deck deterioration is more prevalent and accelerating since the previous inspection in 2017. Areas of concern include the HMA wearing surface, the deck expansion joints, and areas of the side-by-side box beams and piers that have deteriorated due to leaking from the expansion joints and grouted joints between the beams. The box beams transverse tie rods are not post tensioned and movement between the box beams is causing the wearing surface to crack and delaminate.

The structure was built in 1972 with maintenance work completed in 2008. Bituminous patches on the deck surface and near the expansion joints and crack sealing has been completed by the City as needed since the 2008 preventative maintenance project. This application is being submitted for funding to completely remove and replace this structure.

The 2018 inspection findings are detailed below.

The most recent inspection (April 24, 2018) of the West Spring Lake Road structure revealed the following deficiencies:

- The HMA wearing surface has longitudinal cracks along the beam lines, with numerous spalled areas exposing the top of the prestressed concrete box beams, areas of map cracking, and locations that will pond water during rain events. The HMA wearing surface is in the worst condition in Spans 5s through 8s; although, there is also an area in Span 4s with severe deterioration of the HMA wearing surface and spalling to the top of the concrete box beam. There are large areas of deterioration in each of these spans that correspond directly with the location of the box beams below. Approximately 50% of the deck surface is cracked or patched. It is evident from the inspection photographs that the waterproofing membrane that was applied to the top of the box beams prior to placing the HMA overlay has failed and that water is actively leaking between the beams. The waterproofing membrane is torn in several locations and the top of the concrete box is exposed. Leaking was observed throughout each of
the eight spans and is not limited to the beam ends at the expansion joints. Efflorescence is present at many beam ends due to the continued leaking of water through the expansion joints.

- The railing, and sidewalk are in good to fair condition with hairline cracking of the sidewalk and spalled areas near the expansion joints. The expansion joint on the west side sidewalk, Pier 6S is missing grout and is a potential tripping hazard.

- The expansion joints (7 total) are leaking heavily onto the box beams and substructure units. The concrete header at each expansion joint device is cracked and/or spalled in many locations and bituminous patches and crack sealing have been completed along all joints. The concrete expansion joint header at Joint 6s within the east side sidewalk has cracked and missing concrete. The gland is exposed, and this is a tripping hazard.

- The side-by-side box beams are in poor condition. Water is leaching between many of the beams in each span, there is evidence of water leaking from weep holes and rust staining on the beams. The beam ends at each pier are wet with efflorescence forming due to continued leaking of the expansion joints. Numerous beams have corner cracks and/or spalls at the beam ends and/or near midspan due to water leaking. The most notable of which are:
  - Beam 4W, Span 3S has corner cracks near midspan and evidence of heavy water leaking from the weep hole in the bottom of the beam
  - Beam 11W Span 6s has a reinforcing tendon broken and visible with spalled concrete in 2 locations along the corner of the beam and cracking extending nearly full length. The longitudinal cracks on span 6 imply that beam deflection in the wheel line is occurring. However, the side by side box beam assembly detail limits the ability to inspect the beam sides and captures moisture. The state of deterioration of the top and sides of the box beams is unknown.
  - Span 7s beams 6W and 7W have longitudinal cracks indicating the presence of reinforcement corrosion.
  - Span 8s beams 3W, 6W, and 9W have spalled ends with reinforcing steel visible. The strand at beam 6W is broken.

- All of the piers have stains and evidence of heavy water leaking through the expansion joints. Pier caps are cracked with efflorescence present at many of the cracks. Pier 1S has delaminated concrete and a large spalled area in the pier cap below beams 9W and 10W. This spalled area has resulted in undermining the bearing and exposing the anchor bolts. The anchor bolts are corroded.
• Columns in piers 2S, 3S, 4S, 5S, and 6S have vertical cracks, some wet due to leaching water. The FRP jacket on the repaired section of Column 6W, Pier 6S is broken and loose, the grout beneath the jacket is also cracked.

• A load rating was completed on this structure in April 2018. This load rating was completed in accordance with the Michigan Department of Transportation’s Bridge Analysis Guide using AASHTOWare Virtis 6.3.1. Based on this rating of the existing prestressed box beams, considering the deterioration of the beams, the structure is posted for 35 tons. This is due the to capacity of the beams (designed per Allowable Stress Design in 1972), which are not composite with the deck. While the rating does account for deterioration or section loss of the beams, it does not account for any loss of bearing area due to deterioration of the substructure units or the condition of the substructure units themselves.

• The inspection frequency of this bridge has been reduced to 12 months from the standard 24-month frequency due to the deterioration of the box beams. However, due to the condition of the HMA wearing surface in Spans 4S through 8S, a special inspection frequency of 6 months has been established for the deck surface and beams in these spans. There is concern that the continued deterioration of the HMA wearing surface will result in failure of the top of the box beam(s). If this occurs prior to replacement of the structure, a steel plate may need to be installed in order to avoid closing the structure to traffic.

• It should also be noted that based on the latest inspection, completed in April 2018, a detailed inspection is recommended due to the extensive deterioration of the HMA wearing surface, box beams, and piers.

The load rating requires that heavy trucks be detoured off the structure. This requires that the trucks utilize US-31 or 3rd Street to reach northeast Ferrysburg.

III. MAINTENANCE HISTORY OF THE WEST SPRING LAKE ROAD BRIDGE

The West Spring Lake Road Bridge has been maintained by the City of Ferrysburg’s Department of Public Works. The bridge deck has been patched to repair the spalled concrete at the expansion joint devices numerous times. In 2008, the City completed extensive preventative maintenance work including:

• Removing the existing HMA wearing surface,
• Installing a waterproofing membrane over the top of the box beams between the sidewalks,
• Replacing the HMA wearing surface,
• Replacing the expansion joint sealing devices,
• Remove delaminated concrete on the pier caps and columns and patch,
And wrapped the pier columns with additional concrete to protect the HP sections from further deterioration.

Since these repairs, the City has continued to seal cracks and patch spalled areas of the HMA wearing surface as needed. The City is also actively seeking bids for repair of Column 6W at Pier 6S where the FRP jacket is broken and the concrete beneath it is cracked.

IV. ECONOMIC IMPORTANCE OF THE WEST SPRING LAKE ROAD BRIDGE

West Spring Lake Road serves approximately 6,000 vehicles per day. The alternate route around Spring Lake is approximately a 3-mile detour along 168th Avenue, Van Wagoner Road and Third Street. If the structure were closed to traffic, all residential, school, emergency, and business vehicular traffic that currently use the West Spring Lake Road Bridge would be subject to delays caused by the length of the detour. There are two separate interchanges for access to US-31 within the detour route located on Van Wagoner Road and Third Street that will further delay traffic. The increased traffic volume along these routes also creates a greater possibility of traffic incidents and possible impact to US-31 ramp traffic. Furthermore, pedestrian routes do not exist within the detour.

The City of Ferrysburg has a population of approximately 3,100 and along with neighboring Spring Lake and Spring Lake Township is continually growing. The estimated cost of the bridge replacement work is $10.45M (See enclosed cost estimate). The City’s present Act 51 allotment is insufficient to meet all of it’s the transportation needs. Undertaking the West Spring Lake Road Bridge project without Federal and State assistance would be financially difficult for the City of Ferrysburg. In preparation for the submittal of this application, the City Council has approved a resolution committing to a 15% match for the funding required for the bridge replacement.

The bridge has been added to the West Michigan Shoreline Regional Development Commission’s (WMSRDC’s) West Michigan Metropolitan Transportation Planning Programs list of illustrative projects. The addition of this project highlights the significance of this project to the transportation plan of the MPO, the City of Ferrysburg, and the surrounding communities.

In summary, the West Spring Lake Road Bridge is the only crossing of Smith’s Bayou. The City if split by the Bayou and well as US-31 and is a vital connection to the City for public safety of people, schools, and businesses in the area. The existing bridge was built 44 years ago; however, continued accelerating deterioration of the HMA wearing surface and the side-by-side box beams restricts the use of the structure and the life of this structure is limited. The West Spring Lake Road bridge over Smith’s Bayou is the only City of Ferrysburg critical bridge application and critical bridge funds are needed to proceed with the project.
V. BREAKDOWN OF ESTIMATED COSTS

The proposed scope of work for this structure includes the full removal and replacement of the existing bridge. The proposed bridge will be approximately 450ft long and 50ft wide to accommodate 2 lanes of traffic with a pedestrian sidewalk on one side and a non-motorized pathway on the other. This pathway will serve to connect the existing non-motorized trails north and south of the existing structure. The existing approach roadways will be reconstructed as needed to transition the roadway to meet the proposed structure. The street lighting on the existing structure will be replaced as part of the proposed work.

The total estimated cost for the proposed structure replacement work, including design and construction engineering, is:

1. Design Engineering $ 626,800
2. Construction Engineering $ 1,044,800
   (Includes testing costs)

Total Engineering Costs $ 1,650,000

A. Approach Roadway Reconstruction $ 252,360
B. Bridge Replacement $ 7,669,904
C. Contingency $ 792,000
D. Mobilization $ 871,000
E. Inflation $ 863,000

Total Construction Costs $ 10,448,000

Total Project Costs $ 12,119,600

For additional information, please contact:

Craig Bessinger, Manager
City of Ferrysburg
17290 Roosevelt Road
Ferrysburg, MI 49409
616-842-5803
cbessinger@ferrysburg.org

Susan Tebbe, P.E.
Williams & Works, Inc.
549 Ottawa Ave, NW
Grand Rapids, MI 49503
616-224-1500
tebbe@williams-works.com
### Exhibit 4 - Cost Estimating Worksheets

**LAP - BRIDGE COST ESTIMATE WORKSHEET**

- **CPM, REHAB, REPLACE**

<table>
<thead>
<tr>
<th>REGION: Grand</th>
<th>FISCAL YEAR: 2021</th>
<th>STRUCTURE ID: 8541</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENGINEER: Williams &amp; Works, Inc.</td>
<td>DATE: 4/26/2018</td>
<td>BRIDGE ID: 704232160078801</td>
</tr>
<tr>
<td>LOCATION: West Spring Lake Road over Smiths Bayou, Ferrysburg, MI</td>
<td>DECK AREA: SFT</td>
<td>STR TYPE: Prest Conc Box</td>
</tr>
<tr>
<td>PRIMARY WORK ACTIVITY: Structure Replacement</td>
<td>DECK DIM: 50x448 (proposed)</td>
<td></td>
</tr>
</tbody>
</table>

#### NEW BRIDGE

<table>
<thead>
<tr>
<th>WORK ACTIVITY</th>
<th>QUANTITY</th>
<th>UNIT</th>
<th>UNIT COST</th>
<th>TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Concrete (add demo &amp; road approach &amp; MOT)</td>
<td>22,400.0</td>
<td>SFT</td>
<td>$305.00 /SFT</td>
<td>$6,822,000</td>
</tr>
<tr>
<td>Steel (as above)</td>
<td>SFT</td>
<td>$320.00 /SFT</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Prestressed 3-sided or 4-sided Culvert (add removal, roadway over, MOT)</td>
<td>SFT</td>
<td>$350.00 /SFT</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### NEW SUPERSTRUCTURE

<table>
<thead>
<tr>
<th>WORK ACTIVITY</th>
<th>QUANTITY</th>
<th>UNIT</th>
<th>UNIT COST</th>
<th>TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Concrete (incl. remove extant super, new railing, add MOT &amp; approach)</td>
<td>SFT</td>
<td>$140.00 /SFT</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Steel (as above)</td>
<td>SFT</td>
<td>$190.00 /SFT</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Over Water (add to new superstructure cost)</td>
<td>SFT</td>
<td>$40.00 /SFT</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### WIDENING

<table>
<thead>
<tr>
<th>WORK ACTIVITY</th>
<th>QUANTITY</th>
<th>UNIT</th>
<th>UNIT COST</th>
<th>TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Added portion only</td>
<td>[width]</td>
<td>(add road approach transition)</td>
<td>SFT</td>
<td>$270.00 /SFT</td>
</tr>
<tr>
<td>Other</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### NEW DECK

<table>
<thead>
<tr>
<th>WORK ACTIVITY</th>
<th>QUANTITY</th>
<th>UNIT</th>
<th>UNIT COST</th>
<th>TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Includes remove extant deck &amp; new railing (add traffic control &amp; approach)</td>
<td>SFT</td>
<td>$70.00 /SFT</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### DEMOLITION

<table>
<thead>
<tr>
<th>WORK ACTIVITY</th>
<th>QUANTITY</th>
<th>UNIT</th>
<th>UNIT COST</th>
<th>TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Entire bridge, grade separation</td>
<td>SFT</td>
<td>$32.00 /SFT</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Entire bridge, over water</td>
<td>19,712.0</td>
<td>SFT</td>
<td>$42.00 /SFT</td>
<td>$827,004</td>
</tr>
<tr>
<td>Other</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### SUPERSTRUCTURE REPAIR

<table>
<thead>
<tr>
<th>WORK ACTIVITY</th>
<th>QUANTITY</th>
<th>UNIT</th>
<th>UNIT COST</th>
<th>TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Concrete Deck Patch (includes hand charming)</td>
<td>SFT</td>
<td>$36.00 /SFT</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Full Depth Patch</td>
<td>SFT</td>
<td>$100.00 /SFT</td>
<td></td>
<td></td>
</tr>
<tr>
<td>HMAC Cap (no membrane, add bridge rail if req'd)</td>
<td>SFT</td>
<td>$1.50 /SFT</td>
<td></td>
<td></td>
</tr>
<tr>
<td>HMAC Overlay w/ WP membrane (add bridge rail if req'd)</td>
<td>SFT</td>
<td>$5.50 /SFT</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Removal of Concrete Wearing Course (lateral), Epoxy Only, or HMAC Only</td>
<td>SFT</td>
<td>$2.00 /SFT</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Healer Sealer</td>
<td>SYD</td>
<td>$22.00 /SYD</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Epoxy Sealer</td>
<td>SYD</td>
<td>$32.00 /SYD</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Shallow Overlay (incl. joint repl &amp; hydro, add bridge rail)</td>
<td>SFT</td>
<td>$35.00 /SFT</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Deep Overlay (incl. joint repl &amp; hydro, add bridge rail)</td>
<td>SFT</td>
<td>$37.00 /SFT</td>
<td></td>
<td></td>
</tr>
<tr>
<td>High Load Hi Repair (PCI Beam)</td>
<td>SFT</td>
<td>$350.00 /SFT</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PCI Beam End Repair</td>
<td>EA</td>
<td>$4,600.00 /EA</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Repair Structural Steel ($4000 bolted, $7000 welded)</td>
<td>EA</td>
<td>$6,000.00 /EA</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Paint Structural Steel (incl. clean &amp; coat)</td>
<td>SFT</td>
<td>$30.00 /SFT</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Partial Painting (incl. clean &amp; coat)</td>
<td>SFT</td>
<td>$40.00 /SFT</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pin &amp; Hanger replacement (incl. temporary supports)</td>
<td>EA</td>
<td>$7,000.00 /EA</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other</td>
<td>1.0</td>
<td>Lsum</td>
<td>$10,000.00 /Lsum</td>
<td>$10,000</td>
</tr>
</tbody>
</table>

#### SUBSTRUCTURE REPAIR

<table>
<thead>
<tr>
<th>WORK ACTIVITY</th>
<th>QUANTITY</th>
<th>UNIT</th>
<th>UNIT COST</th>
<th>TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pier repair</td>
<td>(measured x 2). Replace if repair area &gt; 30%</td>
<td>CFT</td>
<td>$265.00 /CFT</td>
<td></td>
</tr>
<tr>
<td>Pier repair over water</td>
<td>(measured x 2)</td>
<td>CFT</td>
<td>$300.00 /CFT</td>
<td></td>
</tr>
<tr>
<td>Pier replacement</td>
<td>CFT</td>
<td>$85.00 /CFT</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Abutment repair</td>
<td>(measured x 2)</td>
<td>CFT</td>
<td>$265.00 /CFT</td>
<td></td>
</tr>
<tr>
<td>Temporary Supports for Substructure Repair</td>
<td>EA</td>
<td>$1,850.00 /EA</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Slope Protection repairs</td>
<td>SYD</td>
<td>$140.00 /SYD</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### MISCELLANEOUS

<table>
<thead>
<tr>
<th>WORK ACTIVITY</th>
<th>QUANTITY</th>
<th>UNIT</th>
<th>UNIT COST</th>
<th>TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Expansion or Construction Joints (includes removal)</td>
<td>FT</td>
<td>$650.00 /FT</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bridge Railing, remove and replace ($250 Type 4, $350 Aesthetic Parapet)</td>
<td>FT</td>
<td>$250.00 /FT</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Thrie Beam Railing retrofit</td>
<td>FT</td>
<td>$40.00 /FT</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Articulating Concrete Block System (ACB)</td>
<td>SYD</td>
<td>$120.00 /SYD</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Scour Countermeasures</td>
<td>LSUM</td>
<td>LSUM</td>
<td>LSUM</td>
<td></td>
</tr>
<tr>
<td>Other</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### STRUCTURE CONSTRUCTION BUDGET

$7,689,904

<table>
<thead>
<tr>
<th>WORK</th>
<th>QUANTITY</th>
<th>UNIT</th>
<th>UNIT COST</th>
<th>TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Approach Pavement, 12&quot; RC</td>
<td>2,560.0</td>
<td>SFT</td>
<td>$18.00 /SFT</td>
<td>$45,880</td>
</tr>
<tr>
<td>Approach Curbs &amp; Gutter</td>
<td>72.0</td>
<td>FT</td>
<td>$300.00 /FT</td>
<td>$3,000</td>
</tr>
<tr>
<td>Guardrail Anchorage to Bridge (-4&quot;)</td>
<td>4.0</td>
<td>Qads</td>
<td>$1,600.00 /Qads</td>
<td>$6,400</td>
</tr>
<tr>
<td>Guardrail, Type B or T</td>
<td>200.0</td>
<td>FT</td>
<td>$22.00 /FT</td>
<td>$4,400</td>
</tr>
<tr>
<td>Guardrail Endings (end section)</td>
<td>4.0</td>
<td>EA</td>
<td>$1,750.00 /EA</td>
<td>$7,000</td>
</tr>
<tr>
<td>Roadway Approach work (beyond approach pavement)</td>
<td>1.0</td>
<td>LSUM</td>
<td>$40,000.00 /LSUM</td>
<td>$40,000</td>
</tr>
<tr>
<td>Utilities</td>
<td>1.0</td>
<td>LSUM</td>
<td>$100,000.00 /LSUM</td>
<td>$100,000</td>
</tr>
</tbody>
</table>

#### TRAFFIC CONTROL

<table>
<thead>
<tr>
<th>WORK</th>
<th>QUANTITY</th>
<th>UNIT</th>
<th>UNIT COST</th>
<th>TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Part Width Construction</td>
<td>LSUM</td>
<td>LSUM</td>
<td>LSUM</td>
<td></td>
</tr>
<tr>
<td>Crossovers</td>
<td>EA</td>
<td>$300,000.00 /EA</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Temporary Traffic Signals</td>
<td>set</td>
<td>$20,000.00 /set</td>
<td></td>
<td></td>
</tr>
<tr>
<td>RR Flagging</td>
<td>LSUM</td>
<td>LSUM</td>
<td>LSUM</td>
<td></td>
</tr>
<tr>
<td>Delour</td>
<td>1.0</td>
<td>LSUM</td>
<td>$50,000.00 /LSUM</td>
<td>$50,000</td>
</tr>
</tbody>
</table>

#### RELATED ROAD/TRAFFIC CONSTRUCTION BUDGET

$252,360

| CONTINGENCY | 10% - 20% | $7,022,000.00 | $7,022,000 |
| MOBILIZATION | (estimate at 10%) | $8,714,000.00 | $8,714,000 |
| INFLATION | (assume 3% per year, beginning in 2018) | $9,856,000.00 | $9,856,000 |

#### TOTAL CONSTRUCTION BUDGET

$10,448,000

(DOES NOT INCLUDE PE & CE)
The bridge carries 2 lanes of traffic with sidewalks on each side of the bridge. Looking South.

North approach roadway – looking toward the bridge.
Structure is currently posted for 35-ton weight restriction.

Typical condition of HMA wearing surface – many, but not all, cracks have been sealed with hot poured rubber.
Typical condition of HMA wearing surface – cracks have been sealed with hot poured rubber.
Expansion Jt 6S at east sidewalk – spalled concrete, loose rubber gland, and gap in concrete walk is a potential tripping hazard. Joint has been sealed with hot poured rubber, but the sealant is below to top of concrete and could still pose a tripping hazard.
Condition of the HMA wearing surface in Span 8S – significant deterioration has occurred over 2 beam lines. The HMA has been sealed and patched. However, the HMA has deteriorated beyond repair. Areas of HMA are spalled to the top of concrete box and the waterproofing membrane in these areas is torn and missing.
Condition of the HMA wearing surface in Span 8S – significant deterioration has occurred over 2 beam lines. The HMA has been sealed and patched. However, the HMA has deteriorated beyond repair. Areas of HMA are spalled to the top of concrete box and the waterproofing membrane in these areas is torn and missing.
Area of the deck wearing surface in poor condition. HMA surface has deteriorated significantly and has been patched and sealed, but the HMA has deteriorated beyond repair. Deterioration extends into both lanes.
Condition of the HMA wearing surface in Span 7S - significant deterioration has occurred over 2 beam lines. The HMA has been sealed and patched. However, the HMA has deteriorated beyond repair.

Condition of the HMA wearing surface in Span 5S - significant deterioration has occurred over 2 beam lines. The HMA has been sealed and patched. However, the HMA has deteriorated beyond repair.
Condition of deck joint 6S. Significant cracking, spalled concrete.
Typical condition of deck joints. Significant cracking, spalled concrete. Map cracked HMA wearing surface adjacent to the joint.
Evidence of water leakage between beams (typical throughout length of the structure). This is Span 6S that shows significant cracking along the edge of beams 10W and 11W with exposed strands.

Span 6S, Beam 11W – corner of concrete box spalled near midspan.
Spalled corner of box beam 6W at Pier 7S, exposed and broken prestressing strands.

Typical water leaking at beam ends and efflorescence forming at piers.
Heavy leaking water through joint between beams 7W and 8W, Span 8S. Concrete at corner of box beams is cracked nearly full length.
Evidence of water leakage between beams and at weep holes.

Water staining, delaminated and spalled concrete on pier cap due to leaking expansion joints, Pier 1S.
Cracks in concrete cap and water leakage from expansion joint—Pier 75

Cracks in concrete cap and water leakage from expansion joint—Pier 65
Spalled concrete has exposed the anchor bolts at beams 9W and 10W, Span 1., Pier 1S
Crack in pier column.
Pier columns have been patched and jacketed. Evidence of continued water leaking onto piers from deck expansion joints, cracking and delaminations.

Column 6W, Pier 6S, FRP jacket cracked and loose. Concrete beneath jacket also cracked.
GENERAL NOTES
The bridge is currently posted for 35 tons due to failure of at least one precast tendon in Span 6s, beam 3 directly below the wheel line and extensive deterioration of the HMA wearing surface in Spans 4S thru 8S. The HMA wearing surface is in poor condition and continues to deteriorate. Regular maintenance to seal cracks and patch the deck has been completed.

Posting Signs in Place
YES

DECK

1. Surface (SIA-58A)

<table>
<thead>
<tr>
<th>04/16</th>
<th>04/17</th>
<th>04/18</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>4</td>
<td>3</td>
</tr>
<tr>
<td>There is substantial cracking within the wheel lines. Delamination of the HMA surface in several locations has occurred. Large areas of HMA pavement distress are present in Spans 6S, 7S, and 8S in the northbound lane with ponding water. Cracks have been sealed. The waterproof membrane placed below the HMA wearing surface is performing no useful function. It is recommended that the deck/beams in Spans 7S and 8S be monitored on a 6 month inspection frequency due to concern of failure of the top of the beam box. Heavy debris, mostly sand, along the toe of sidewalks. (04/18) There is substantial cracking within the wheel lines. Delamination of the HMA surface in several locations has occurred. Large areas of HMA pavement distress are present in Spans 6S, 7S, and 8S in the northbound lane with ponding water. Cracks have been sealed. The waterproof membrane placed below the HMA wearing surface is performing no useful function. It is recommended that the deck/beams in Spans 7S and 8S be monitored on a 6 month inspection frequency due to concern of failure of the top of the beam box. Heavy debris, mostly sand, along the toe of sidewalks. (04/17) There is substantial cracking within the wheel lines. Delamination of the HMA surface in several locations has occurred. The waterproof membrane placed below the HMA wearing surface is performing no useful function. (04/16)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

2. Expansion Joints

<table>
<thead>
<tr>
<th>04/16</th>
<th>04/17</th>
<th>04/18</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>The expansion joint headers are cracked coincident with the beam edges, the joint seal is not functioning. All joints leak. (04/18) The expansion joint headers are cracked coincident with the beam edges, the joint seal is not functioning. All joints leak. (04/17) The expansion joint headers are cracked coincident with the beam edges, the joint seal is not functioning. All joints leak. (04/16)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

3. Other Joints

<table>
<thead>
<tr>
<th>04/16</th>
<th>04/17</th>
<th>04/18</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>Expansion joints on the sidewalk are less severe than the traveled way, however joint 6 over beam 2 is deteriorating to a level that is a trip hazard with cracked and missing concrete around the joint gland. The gland is loose in these areas. Joint 2, at the southern fascia is spalled. (04/18) Expansion joints on the sidewalk are less severe than the traveled way, however joint 6 over beam 2 is deteriorating to a level that is a trip hazard with cracked and missing concrete around the joint gland. The gland is loose in these areas. Joint 2, at the southern fascia is spalled. (04/17) Expansion joints on the sidewalk are less severe than the traveled way, however joint 6 over beam 2 is deteriorating to a level that is a trip hazard. Joint 2, at the southern fascia is spalled. (04/16)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

4. Railings

<table>
<thead>
<tr>
<th>04/16</th>
<th>04/17</th>
<th>04/18</th>
</tr>
</thead>
<tbody>
<tr>
<td>6</td>
<td>6</td>
<td>6</td>
</tr>
<tr>
<td>The three tube railing height measured at 40 inches by joint 1. non-crash rated. No damage noted; only light rust at the base plates. Anchor bolt nuts missing at 1 post (west railing, north end). (04/18) The three tube railing height measured at 40 inches by joint 1. non-crash rated. No damage noted; only light rust at the base plates. Anchor bolt nuts missing at 1 post (west railing, north end). (04/17) The three tube railing height measured at 40 inches by joint 1. non-crash rated. (04/16)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Form P2502
Printed on 04/30/2018
### BRIDGE SAFETY INSPECTION REPORT

<table>
<thead>
<tr>
<th>Facility</th>
<th>Latitude / Longitude</th>
<th>MDOT Structure ID</th>
<th>Structure Condition</th>
</tr>
</thead>
<tbody>
<tr>
<td>WEST SPRING LAKE R</td>
<td>43.063 / -86.2069</td>
<td>704232600078801</td>
<td>Serious Condition(3)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Feature</th>
<th>Length / Width / Spans</th>
<th>Owner</th>
<th>Get:</th>
<th>City:</th>
</tr>
</thead>
<tbody>
<tr>
<td>SMITH BAYOU</td>
<td>447.8 / 44 / 8</td>
<td>Owner</td>
<td></td>
<td>FERRYSBURG(2326)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Location</th>
<th>Built / Recon. / Paint / Ovly.</th>
<th>TSC</th>
<th>Operational Status</th>
<th>P Posted for load(35N7N)</th>
</tr>
</thead>
<tbody>
<tr>
<td>AT 168TH AVENUE</td>
<td>1972 / / 2008</td>
<td>Muskegon(21)</td>
<td>Scour Evaluation</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Region / County</th>
<th>Material / Design</th>
<th>Last NBI Inspection</th>
<th>Scour Evaluation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grand(3) / Ottawa(70)</td>
<td>5 Prestressed Concrete / 05 Box Bm/Gird- Multiple</td>
<td>04/24/2018 / ATCD</td>
<td>5 Stable w/in footing</td>
</tr>
</tbody>
</table>

5. Sidewalks or Curbs

<table>
<thead>
<tr>
<th>No.</th>
<th>Width</th>
<th>Length</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>6</td>
<td>6</td>
<td>6</td>
<td>Hairline transverse cracks in sidewalk, no unsound concrete and only small spalled areas on fascia. Sidewalks still serve a substantial pedestrian component, multiple walkers and runners were present during the inspection. (04/16) Sidewalks still serve a substantial pedestrian component, multiple walkers and runners were present during the inspection. (04/17) Sidewalks still serve a substantial pedestrian component, multiple walkers and runners were present during the inspection. Down graded to joint at 2 and 6 becoming more distressed. (04/16)</td>
</tr>
</tbody>
</table>

6. Deck Bottom Surface (SIA-58B)

<table>
<thead>
<tr>
<th>No.</th>
<th>Width</th>
<th>Length</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>5</td>
<td>N</td>
<td>Distresses noted during previous inspections are visibly more severe. Broken tension members are present and concrete is showing signs of more corrosion along the box beam edges. Several beams in Spans 6s and 7s have longitudinal cracks along the corner of the beams that may indicate corrosion of the reinforcement in the beams. (04/17) Distresses noted earlier are visibly more severe. Broken tension members are present and concrete is showing signs of more corrosion within the box beam edges. (04/16)</td>
</tr>
</tbody>
</table>

7. Deck (SIA-58)

<table>
<thead>
<tr>
<th>No.</th>
<th>Width</th>
<th>Length</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>3</td>
<td>3</td>
<td>There is substantial cracking within the wheel lines. Delamination of the HMA surface in several locations has occurred. Large areas of HMA pavement distress are present in Spans 6S, 7S, and 8S in the northbound lane with ponding water. Cracks have been sealed. The waterproof membrane placed below the HMA wearing surface is performing no useful function. It is recommended that the deck/beams in Spans 7S and 8S be monitored on a 6 month inspection frequency due to concern of failure of the top of the box beams. Heavy debris, mostly sand, along the toe of sidewalks. (04/18) Nearly all spans have pavement distresses and indications of beam movement under wheel loading. Approximately 2500 feet of longitudinal cracks and several alligator cracked areas indicate water penetrating the HMA surface to the side by side box beams. Large areas of HMA pavement distress are present in Spans 7S and 8S in the northbound lane with ponding water. Cracks have been sealed. (04/17) Nearly all spans have pavement distresses and indications of beam movement under wheel loading. Approximately 2500 feet of longitudinal cracks and several alligator cracked areas indicate water penetrating the HMA surface to the side by side box beams. (04/16)</td>
</tr>
</tbody>
</table>

8. Drainage

<table>
<thead>
<tr>
<th>No.</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No deck drainage on the bridge. (04/18) No deck drainage on the bridge. (04/17) No provisions on deck for drainage. (04/16)</td>
</tr>
</tbody>
</table>

### SUPERSTRUCTURE

9. Stringer (SIA-59)

<table>
<thead>
<tr>
<th>No.</th>
<th>Width</th>
<th>Length</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>5</td>
<td>4</td>
<td>Distresses noted during previous inspections are visibly more severe. Broken tension members are present and concrete is showing signs of more corrosion along the box beam edges. Several beams in Spans 4S thru 8S have longitudinal cracks along the corner of the beams that may indicate corrosion of the reinforcement in the beams. Leaking expansion joints observed on delaminated and/or spalled corners on several box beams at the piers. Evidence of water leakage between the beams (away from the expansion joints) was observed by wet and stained areas of concrete along the beams in each span. It is recommended that the deck/beams in Spans 4S thru 8S be monitored on a 6 month inspection frequency due to concern of failure of the top of the box beams. (04/19) Broken tension members are present and concrete is showing signs of more corrosion along the box beam edges. Several beams in Spans 6S and 7S have longitudinal cracks along the corner of the beams that may indicate corrosion of the reinforcement in the beams. Leaking expansion joints have resulted in delaminated and/or spalled corners of several box beams at the piers. Evidence of water leakage between the beams (away from the expansion joints) was observed by wet and stained areas of concrete along the beams in each span. It is recommended that the deck/beams in Spans 7S and 8S be monitored on a 6 month inspection frequency due to concern of failure of the top of the box beams. (04/17) Down graded one step as a result of span 6 reinforcing steel failure. Delaminations noted in span 6 are cause for degrading to Fair. (04/16)</td>
</tr>
</tbody>
</table>

10. Paint (SIA-59A)

<table>
<thead>
<tr>
<th>No.</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(04/18) (04/17) (04/16)</td>
</tr>
</tbody>
</table>

Form P2502 Printed on 04/30/2018 Page 2 of 4
11. Section Loss
N N (04/18) (04/17) (04/16)

12. Bearings 7 7 6 elastomeric bearing pads not visible. No tell-tale evidence indicating a problem. (stains, compressed material leaking out or settlement above). Monitor bearings at beams 9W and 10W, Span 1s, Pier 1s where the bearings are undermined. Continue to monitor Abutment A south End as open wing wall joint may allow approach backfill to ex filtrate. (04/18) elastomeric bearing pads not visible. No tell-tale evidence indicating a problem. (stains, compressed material leaking out or settlement above) Continue to monitor Abutment A south End as open wing wall joint may allow approach backfill to ex filtrate. (04/17) elastomeric bearing pads not visible. No tell-tale evidence indicating a problem. (stains, compressed material leaking out or settlement above) Continue to monitor Abutment A south End as open wing wall joint may allow approach backfill to ex filtrate. (04/16)

SUBSTRUCTURE


14. Piers (SIA-60) 5 5 4 Horizontal and vertical cracks in pier caps are becoming more prevalent than previous inspection in 2017 with efflorescence noted at many of them. Crack in Fiberglass wrap on pier 6A is open on leading edge and concrete beneath it is cracked. Wrap will likely fail in subsequent freeze cycles. Cracks in several pier caps below beams. Vertical cracks in columns at piers 2S thru 8S. Not able to determine if the unsound concrete extends below the bearings due to structural configuration. Spall in Pier 1S cap below beams 9W & 10W spalled with exposed position dowels. (04/18) Pier cracks are becoming more prevalent. Crack in Fiberglass wrap on pier 6A is open on leading edge. Wrap will likely fail in subsequent freeze cycles. Cracks in several pier caps below beams. Not able to determine if the unsound concrete extends below the bearings due to structural configuration. Efflorescence present at several pier cap cracks. Spall in Pier 1S cap below beams 8S & 9S spalled with exposed position dowels. (04/17) Pier cracks are becoming more prevalent. Crack in Fiberglass wrap on pier 6A is open on leading edge. Wrap will likely fail in subsequent freeze cycles. (04/16)

15. Slope Protection 7 7 N (04/18) Riprap present and performing well. Some sand aggregation on top of the riprap at Abutment A (south). (04/17) Riprap present and performing well. (04/16)

16. Channel (SIA-61) 7 7 7 No observed change in channel condition. Underwater inspection completed in August 2017. (04/18) No observed change in channel condition. Underwater inspection scheduled for August 2017. (04/17) Soundings completed and compared to 2012, 2014, no change. (04/16)

17. Scour Inspection 7 7 7 No scour noted during the inspection. The plan of action is to monitor the bridge in the event of a flood flow. Underwater inspection completed in August 2017 did not indicate any concerns. (04/18) No scour noted during the inspection. The plan of action is to monitor the bridge in the event of a flood flow. Underwater inspection scheduled for August 2017. (04/17) Soundings and stream/的做法 characteristics indicate no scour has occurred. The plan of action is to monitor the bridge in the event of a flood flow. (04/16)

APPROACH

04/16 04/17 04/18
## BRIDGE SAFETY INSPECTION REPORT

<table>
<thead>
<tr>
<th>Facility</th>
<th>Latitude / Longitude</th>
<th>MDOT Structure ID</th>
<th>Structure Condition</th>
<th>Owner</th>
<th>City:</th>
</tr>
</thead>
<tbody>
<tr>
<td>WEST SPRING LAKE R</td>
<td>43.0863 / -86.2069</td>
<td>704232600078B01</td>
<td>Serious Condition(3)</td>
<td>FERRYSBURG(2326)</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Feature</th>
<th>Length / Width / Spans</th>
<th>Location</th>
<th>Built / Recon. / Paint / Ovly.</th>
<th>Region / County</th>
<th>Grand(3) / Ottawa(70)</th>
</tr>
</thead>
<tbody>
<tr>
<td>SMITH BAYOU</td>
<td>447.8 / 44 / 8</td>
<td>AT 168TH AVENUE</td>
<td>1972 / / / 2008</td>
<td>Muskegon(21)</td>
<td>5 Prestressed Concrete / 05 Box Bm/Gird- Multiple</td>
</tr>
</tbody>
</table>

| 18. Approach Pavement             | 7 7 7                  | Overall good condition. Some map cracking observed. Sealing of cracks is recommended. (04/16) | Overall good condition. Some map cracking observed. Sealing of cracks is recommended. (04/17) |
|                                  |                       | Sidewalks on north side are not connected to the sidewalk in the approaches. (04/18) | Sidewalks on north side are not connected to the sidewalk in the approaches. (04/17) |

| 19. Approach Shoulders Sidewalks | 7 7 7                  | Stable and vegetated. (04/18) | Stable and vegetated. (04/16) |

| 20. Approach Slopes               |                       | Existing telephone and gas lines attached to the bridge between beams 1W and 2W, and 12W and 13W. (04/16) |
|                                  |                       | Existing telephone and gas lines attached to the bridge between beams 1W and 2W, and 12W and 13W. (04/17) |

| 21. Utilities                     |                       | (04/18) |
|                                  |                       | (04/17) |
|                                  |                       | (04/16) |

| MISCELLANEOUS                     |                       |                       |
| Guard Rail                        | Item                  | Rating | Other Items          | Item                  | Rating |
| Item                              | Rating                |        | Item                  | Rating                |        |
| 36A. Bridge Railings              | 0                     |        | 71. Water Adequacy   | 9                     |        |
| 36B. Transitions                  | 1                     |        | 72. Approach Alignment| 8                    |        |
| 36C. Approach Guardrail           | 1                     |        | Temporary Support     | 0 No Temporary Supports |
| 36D. Approach Guardrail Ends      | 1                     |        | High Load Hit (M)     | No                   |
|                                   |                       |        | Special Insp. Equipment| 1                   |
|                                   |                       |        | Underwater Insp. Method| 3                   |

**False Decking (Timber) Removed to Complete Inspection**

**Critical Feature Inspections (SIA-92)**

<table>
<thead>
<tr>
<th>Freq</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>60</td>
<td>08/30/2017</td>
</tr>
</tbody>
</table>

Form P2502 Printed on 04/30/2018 Page 4 of 4
MICHIGAN DEPARTMENT OF TRANSPORTATION

STR 8941

STRUCTURE INVENTORY AND APPRAISAL

Facility
WEST SPRING LAKE R
Feature
SMITH BAYOU
Location
AT 16TH AVENUE
Region / County
Grand(3) / Ottawa(70)

Latitude / Longitude
43.0865 / -86.2069
City:
FERRYSBURG(2326)
Owner
Muskegon(21)

MDOT Structure ID
7042326000788001
Structure Condition
Serious Condition(3)

Built / Recon. / Paint / Ovly.
1972 / / / 2008
Operational Status
P Posted for load(35NNNN)

TSC
Material / Design
Last NBI Inspection
Scour Evaluation
04/24/2018 / ATCD
5 Stable w/in footing

MATERIAL HISTORY

Bridge History, Type, Materials
27 - Year Built
1972
106 - Year Reconstructed

202 - Year Painted
2008
43 - Main Span Bridge Type
5 / 05
44 - Appr Span Bridge Type
77 - Steel Type
78 - Paint Type
79 - Rail Type
80 - Post Type
107 - Deck Type
108A - Wearing Surface
108B - Membrane
108C - Deck Protection

Structure Dimensions
34 - Skew
0
35 - Struct Flared
0
45 - Num Main Spans
8
46 - Num Apprs Spans
0
48 - Max Span Length
65.8
49 - Structure Length
447.8
50A - Width Left Curb/SW
4.9
50B - Width Right Curb/SW
4.9
51, 52 - Median
0, 0
53 - Median

112 - NBIS Length
Structure Apraisal
36A - Bridge Rating
36B - Rail Transition
36C - Approach Rail
36D - Rail Terminal
67 - Structure Evaluation
68 - Deck Geometry
69 - Underclearance
71 - Waterway Adequacy
72 - Approach Alignment
103 - Temporary Structure
113 - Scout Criticality

37 - Historical Significance
98A - Border Bridge Status
98B - Border Bridge %
101 - Parallel Structure

Miscellaneous
38 - Navigation Control
39 - Vertical Clearance
40 - Horizontal Clearance
111 - Pier Protection
115 - Lift Brdg Vert Clear

Route Carried By Structure(ON Record)
5A - Record Type
5B - Route Signing
5C - Level of Service
5D - Route Number
5E - Direction Suffix
10L - Best 3m Undr-Lt
10R - Best 3m Undr-Rt

PR Number
Control Section
11 - Mile Point
12 - Base Highway Network
13 - LRS Route-Subroute
19 - Detour Length
20 - Toll Facility
26 - Functional Class
29A - Lanes On
29 - ADT
30 - Year of ADT
32A/B - Ap Ptv Type/Width
42A - Service Type On
47L - Left Horizontal Clear
47R - Right Horizontal Clear
53 - Min Vert Cir Ov Deck
100 - STRAIGHTEN
102 - Traffic Direct
109 - Truck %
110 - Truck Network
115 - Year Future ADT Freeway

Route Under Structure (UNDER Record)
5A - Record Type
5B - Route Signing
5C - Level of Service
5D - Route Number
5E - Direction Suffix
10L - Best 3m Undr-Lt
10R - Best 3m Undr-Rt

PR Number
Control Section
11 - Mile Point
12 - Base Highway Network
13 - LRS Route-Subroute
19 - Detour Length
20 - Toll Facility
26 - Functional Class
23B - Lanes Under
29A - Lanes On
29 - ADT
30 - Year of ADT
42B - Service Type Under
47L - Left Horizontal Clear
47R - Right Horizontal Clear
54A - Left Feature
54B - Left Underclearance
54C - Right Feature
54D - Right Clearance

Under Clearance Year
55A - Reference Feature
55B - Right Horiz Clearance
100 - STRAIGHTEN
102 - Traffic Direct
109 - Truck %
110 - Truck Network
114 - Future ADT
115 - Year Future ADT Freeway

Proposed Improvements
75 - Type of Work
76 - Length of Improvement
94 - Bridge Cost
95 - Roadway Cost
96 - Total Cost
97 - Year of Cost Estimate

Load Rating and Posting
31 - Design Load
41 - Open, Posted, Closed
63 - Fed Oper Rtg Method
64F - Fed Oper Rtg Load
64MA - Mich Oper Rtg Method
64MB - Mich Oper Rtg
64MC - Mich Oper Truck
65 - Inv Rtg Method
66 - Inventory Load
70 - Posting
141 - Posted Loading
193 - Overload Class

Form 1717A (01/2002) Printed on 04/30/2018 Page 1 of 1
City of Ferrysburg
RESOLUTION
Smith’s Bridge

WHEREAS, the City of Ferrysburg owns and maintains the West Spring Lake Road Bridge over Smith’s Bayou, and

WHEREAS, the City of Ferrysburg intends to perpetuate a bridge that will support all legal truck loads, and

WHEREAS, the existing bridge continues to deteriorate despite work to maintain the bridge.

NOW, THEREFORE, BE IT RESOLVED the Ferrysburg City Council approves the submittal of an application for local bridge funds to replace/reconstruct the West Spring Lake Road Bridge over Smith’s Bayou, and

BE IT FURTHER RESOLVED the Ferrysburg City Council approves filing an application with the Michigan Department of Transportation for the Local Bridge Program and if the grant application is successful, will commit to a 15% local match for the project in the 2021 fiscal year.

Offered by Council Member Kennedy.
Seconded by Council Member Twa.

Yeas: 6
Nays: 0
Absent: 1
Resolution: Adopted

I, Debbie Wierenga, duly appointed Clerk of the City of Ferrysburg, do hereby certify that the above resolution was adopted by the Ferrysburg City Council at its regular meeting held on Monday, April 16, 2018, at or after 7:00 p.m.

Debbie Wierenga, City Clerk
April 4, 2018

Re: Replacement of Smith’s Bridge

To Whom It May Concern:

It has come to our attention that the Smith’s Bridge in the City of Ferrysburg has recently been inspected by Williams and Works and due to its rapid deterioration; the recommendation was made to replace the bridge in the near future.

Smith’s Bridge is a major traffic artery and it is critical to our agency to provide essential emergency services to the citizens of the City of Ferrysburg.

As the primary Law Enforcement Agency in Ottawa County, we are writing to support the replacement of Smith’s Bridge in the City of Ferrysburg.

Sincerely,

Steve A. Kempker
Sheriff

Valerie Weiss
Undersheriff
April 6, 2018

City of Ferrysburg
17290 Roosevelt Road P.O. Box 38
Ferrysburg, MI 49409-0038

To Whom It May Concern:

The Board of Directors of Leppinks Food Centers resolves to state their support for the replacement of Smith’s Bridge in Ferrysburg. We feel that the flow of customers to our food store would be seriously impeded if the bridge were to fail. This could a significant negative impact to our business as well as make it more difficult for our 75 employees to make their way to work. We encourage the City of Ferrysburg to replace the bridge rather than just repair it.

Sincerely,

[Signature]

Richard A. Cole
Vice President, Secretary/Treasurer
Leppinks Incorporated
dba Leppinks Food Centers
Craig Bessinger  
City Manager  
City of Ferrysburg  
17290 Roosevelt Rd.  
Ferrysburg, MI 49409

Re: Support for Replacement of Smith’s Bridge Grant Request

Dear Mr. Bessinger;

Harbor Transit strongly supports the grant request for the replacement of Smith’s Bridge. As the public transit service provider for the City of Ferrysburg our buses cross the bridge hundreds of times a day as we transport people to work, school, medical appointments and other needed locations in the community.

The bridge is essential to reaching destinations in the City of Ferrysburg and the surrounding area. The Smith’s Bridge provides a critical passage along West Spring Lake Road and does not have easily accessible alternative routes. Engineering studies have determined the bridge needs replacement and was built in 1972. We believe replacing the bridge would mean safer transportation for our passengers and the citizens who rely on the bridge daily in our community.

Sincerely,

Tiffany Bowman  
Transportation Director  
Harbor Transit

440 North Ferry - Grand Haven, MI 49417 - 616-842-3200 - harbortransit.org
April 9, 2018

To Whom It May Concern:

As the Superintendent of Spring Lake Public Schools, I am writing this letter of support for the City of Ferrysburg's grant application seeking funding for the replacement of Smith's Bridge.

I am aware that Williams and Works Engineering have cited rapid deterioration of the bridge and have recommended it be replaced in the near future. Smith's Bridge is important to the transportation of a significant number of our students to and from school. Keeping Smith's Bridge safe and available to our community is critical to the efficient movement of community members, parents, and students to and from the western area of Spring Lake Public Schools.

Please consider the grant request at your soonest convenience.

Regards,

SPRING LAKE PUBLIC SCHOOLS

Dennis M. Furton

DMF/kc
April 9, 2018

To Whom It May Concern:

Grand Haven Area Public Schools (GHAPS) considers safety as a top priority for its students, not only during school hours but also while being transported to and from school buildings. For this reason, I support the grant application by the city of Ferrysburg for the replacement of the Smith’s Bridge in Ferrysburg.

The 427-foot-long bridge was constructed in 1972 and has served the community well, connecting Ferrysburg and Northern Ottawa County. Our transportation department uses the bridge daily to transport our students to and from school. A recent inspection by Williams and Works finds that the bridge is deteriorating rapidly and has recommended the bridge be replaced in the near future. If this bridge were to become unusable or otherwise made unsafe for traffic, bus routes would need to be rerouted and would add thousands of extra miles during the course of the school year.

I endorse the efforts of the city of Ferrysburg to seek available grant money to replace the Smith Bridge and would ask for your careful consideration and support for the request.

Sincerely,

Andrew Ingall
Superintendent of Schools
Grand Haven Area Public Schools
April 13, 2018

City of Ferrysburg
17290 Roosevelt Road
P.O. Box 38
Ferrysburg, MI. 49409

Re: Smith’s Bayou Bridge Replacement

To whom it may concern.

As the Fire Chief of the City of Ferrysburg Michigan, I am writing to urge that the Smith’s Bayou Bridge on West Spring Lake Road in Ferrysburg Michigan have its maintenance status changed to replacement status with the Michigan Department of Transportation.

The Smith’s Bayou Bridge is a vital route for our fire department to respond to emergencies in the east and northeast areas of our fire and medical protection area. This bridge also allows our neighboring municipality (Spring Lake Township Fire Department) to access its residents in its northwest areas of their township. It is vital to the safety of citizens and their property that this bridge is replaced to allow the ability of fire apparatus weighing up to 65,000 pounds to safely cross in a timely and safe manner. The closer or further reduced weight limit of this vital community link could result in a response time increase of 5-10 minutes to our residents in the northeast section of our response jurisdiction. In today’s modern residential homes fire doubles in size every minute. Further the Smith’s Bayou Bridge is a vital secondary north/south route in the event of an emergency on U.S. Highway 31 or some type of malfunction with the U.S. 31 bascule bridge crossing the Grand River.

Per the advice of the engineering firm Williams and Works and its condition report of the Smith’s Bayou Bridge, I urge immediate consideration and action on this request as closer of this vital section of our community’s road system is not an option.

I Thank you for your consideration of this request.

Sincerely,

Michael L. Olthof, Fire Chief
City of Ferrysburg Fire Department