



Malas Engineering LLC

Integrated Innovative Solutions and Excellence in Engineering

July 31, 2017

Karl Stave, PE
Architecture, Engineering & Environmental Services
DAS - Facilities Management Division
633 W. Wisconsin Ave., Suite 1000
Milwaukee, WI 53203

Ref.: Inspection Findings-Lyons Park Pedestrian Bridges over Lyons Creek

Dear Mr. Stave,

Please find attached the inspection findings/reports of the three subject pedestrian bridges in Lyons Park over the Lyons Park Creek, a tributary to the KK River. I have numbered the bridges from the south to the north. Bridge #1 is the southerly bridge, bridge # 2 is the middle bridge, and bridge #3 is the northerly bridge.

Bridge #1 is relatively in good condition. The wood railing and decking require some care/preventative maintenance, such as cleaning and staining. In addition, the structural steel require cleaning and painting. Bridges #2 and #3 require major rehabilitation or replacement. Bridge #2 is presently closed to the public. Bridge #3 will be recommended to be closed to the public after this year unless major repairs including the replacement of the wooden railing and deck is performed.

Karl, I will soon provide separate cost estimates for the rehabilitation and replacement of these bridges. The following alternatives will be estimated:

- Repair and paint the existing steel and replace the wooden railing and deck
- Replace the bridge superstructure (wooden railing, deck, and steel beams)
- Complete replacement in kind with slightly longer bridge and with wing walls
- Replace with a culver

If you have any questions, please feel free to call me. We very much appreciate this opportunity and look forward to continue working with you. Thank you.

Sincerely,

Mahmoud (Mac) N. Malas, PE



Malas Engineering LLC

Integrated Innovative Solutions and Excellence in Engineering

Structure Inspection Report

Inspector: Mahmoud N. Malas, PE

Inspection Date: 6/28/2017 & 7/5/2017

Structure Number: #1 (Southerly Bridge)

Location: Lyons Park Pedestrian Bridge over the Lyons Park Creek
(Tributary to the KK River)

Maintainer: Milwaukee County Parks

Structure Type: 40'-8" long, 5'-10" clear width, single span, wood deck and railing supported on two 12.5" painted steel I-Beams. Super structure sits on two reinforced concrete abutment without wing walls.

Structure Elements	Condition	Description
Superstructure	3	Good to fair condition with moderate steel corrosion and localized surface softening/rotting of wood decking.
Girder/Stringer	3	Painted steel I-beam are corroded with localized minor loss of section. Paint system has failed. No sign of distress.
Floor Beams	N/A	
Diaphragm & Bracing	3	10" I-Beams
Slab / Deck	4	Wood planks
Substructure	4	Generally in good to fair condition.
Column	N/A	
Bracing	N/A	
Footing	N/A	
Abutment	4	
Wing Wall	N/A	
Retaining Wall	N/A	
Railing	3 NTS	Generally in good to fair condition. Not to Standard.
Riding Surface	N/A	
Approaches	3	Asphaltic approach pavement in fair condition with scattered cracks and localized rutting
Geometry	4	Bridge abutment in water during heavy rain events
Waterway	Adequate	No sign of erosion, scour, and/or bank stability
Utility	N/A	

Condition Rating Code:

5 = Good condition like new. No structure deficiencies or degradation.

4 = Good condition. Minor deficiencies and degradation. No need for repair.

3 = Fair Condition. Minor deficiencies and degradation. Require Repair.

2 = Poor Condition. Major deficiencies and degradation. Immediate repair required.

1 = Poor Condition. Major deficiencies and degradation undermining the structure integrity and public safety. Require closing.

NTS = Not To Standard

Waterway:

Adequate = No sign of scour or banks erosion or washout.

Inadequate = Sign of scour and/or banks erosion and washout.

Description of Findings:

The bridge is generally in good to fair condition with the following deficiencies:

- 1. Opening in railing is in excess of 4 inches.**
- 2. Steel is corroded with minimal localized loss of section.**
- 3. Wood railing and decking surfaces are softening.**

Recommendations:

- 1. Clean wood railing and decking and apply preservatives and staining.**
- 2. Clean and paint the structural steel.**



Plan View Looking South



Partial Elevation View Looking Southeast



Underside & North Abutment View



Underside & South Abutment View



Malas Engineering LLC

Integrated Innovative Solutions and Excellence in Engineering

Structure Inspection Report

Inspector: Mahmoud N. Malas, PE

Inspection Date: 6/28/2017 & 7/5/2017

Structure Number: #2 (Middle Bridge)

Location: Lyons Park Pedestrian Bridge over the Lyons Park Creek
(Tributary to the KK River)

Maintainer: Milwaukee County Parks

Structure Type: 40'-6" long, 5'-6" clear width, single span, wood deck and railing supported on two 12.5" painted steel I-Beams. Super structure sits on two reinforced concrete abutment without wing walls.

Structure Elements	Condition	Description
Superstructure	2	Poor condition with moderate to heavy steel corrosion and localized rotting, missing sections, and cracking of wood decking.
Girder/Stringer	2	Painted steel I-beam are corroded with localized minor to moderate loss of section. Paint system has failed. No sign of distress.
Floor Beams	N/A	
Diaphragm & Bracing	2	10" I-Beams
Slab / Deck	2	Wood planks
Substructure	4	Generally in good to fair condition.
Column	N/A	
Bracing	N/A	
Footing	N/A	
Abutment	4	
Wing Wall	N/A	
Retaining Wall	N/A	
Railing	1 NTS	Poor and failed condition. Not to Standard.
Riding Surface	N/A	
Approaches	3	Asphaltic approach pavement in fair condition with scattered cracks and localized rutting
Geometry	3	Bridge abutment in water during heavy rain events
Waterway	Adequate	No sign of erosion, scour, and/or bank stability
Utility	4	Two 2" metal conduits hung on the underside

Condition Rating Code:

5 = Good condition like new. No structure deficiencies or degradation.

4 = Good condition. Minor deficiencies and degradation. No need for repair.

3 = Fair Condition. Minor deficiencies and degradation. Require Repair.

2 = Poor Condition. Major deficiencies and degradation. Immediate repair required.

1 = Poor Condition. Major deficiencies and degradation undermining the structure integrity and public safety. Require closing.

NTS = Not To Standard

Waterway:

Adequate = No sign of scour or banks erosion or washout.

Inadequate = Sign of scour and/or banks erosion and washout.

Description of Findings:

The bridge is closed to the public and is in poor unsafe condition. The bridge require major rehabilitation or replacement.

Recommendations:

Rehabilitate or replace.



Plan View & Missing Approach Railing Looking South



Elevation View



Existing Abutment & Slope Protection & Missing Approach Railing



Underside showing the General Rotted Wood Deck and Corroded Supporting Structural Steel



Underside View



Rotted and Failed Railing, Wood Deck, and Fascia Beam



Malas Engineering LLC

Integrated Innovative Solutions and Excellence in Engineering

Structure Inspection Report

Inspector: Mahmoud N. Malas, PE

Inspection Date: 6/28/2017 & 7/5/2017

Structure Number: #3 (Northerly Bridge)

Location: Lyons Park Pedestrian Bridge over the Lyons Park Creek
(Tributary to the KK River)

Maintainer: Milwaukee County Parks

Structure Type: 40'-6" long, 6'-6" clear width, single span, wood deck and railing supported on two 12.5" painted steel I-Beams. Super structure sits on two reinforced concrete abutment without wing walls.

Structure Elements	Condition	Description
Superstructure	2	Poor condition with moderate to heavy steel corrosion and localized rotting, missing sections, and cracking of wood decking.
Girder/Stringer	2	Painted steel I-beam are corroded with localized minor to moderate loss of section. Paint system has failed. No sign of distress.
Floor Beams	N/A	
Diaphragm & Bracing	2	10" I-Beams
Slab / Deck	2	Wood planks
Substructure	4	Generally in good to fair condition.
Column	N/A	
Bracing	N/A	
Footing	N/A	
Abutment	4	
Wing Wall	N/A	
Retaining Wall	N/A	
Railing	2 NTS	Poor condition. Not to Standard.
Riding Surface	N/A	
Approaches	3	Asphaltic approach pavement in fair condition with scattered cracks and localized rutting
Geometry	3	Bridge abutment in water during heavy rain events
Waterway	Adequate	No sign of erosion, scour, and/or bank stability
Utility	3	Corroded 2" metal conduits hung on the underside

Condition Rating Code:

5 = Good condition like new. No structure deficiencies or degradation.

4 = Good condition. Minor deficiencies and degradation. No need for repair.

3 = Fair Condition. Minor deficiencies and degradation. Require Repair.

2 = Poor Condition. Major deficiencies and degradation. Immediate repair required.

1 = Poor Condition. Major deficiencies and degradation undermining the structure integrity and public safety. Require closing.

NTS = Not To Standard

Waterway:

Adequate = No sign of scour or banks erosion or washout.

Inadequate = Sign of scour and/or banks erosion and washout.

Description of Findings:

The bridge is poor condition. The bridge require major rehabilitation or replacement.

Recommendations:

Rehabilitate or replace. Most likely, this is the last year to remain open to the public without major repairs.



Plan View Looking North



Plan View Looking North



Plan View Looking South



Underside of Deck showing corroded steel and rotted wood decking



Underside



Rotted wood decking and wood fascia beam