

Engineering Manual Preamble

This manual provides guidance to administrative, engineering, and technical staff. Engineering practice requires that professionals use a combination of technical skills and judgment in decision making. Engineering judgment is necessary to allow decisions to account for unique site-specific conditions and considerations to provide high quality products, within budget, and to protect the public health, safety, and welfare. This manual provides the general operational guidelines; however, it is understood that adaptation, adjustments, and deviations are sometimes necessary. Innovation is a key foundational element to advance the state of engineering practice and develop more effective and efficient engineering solutions and materials. As such, it is essential that our engineering manuals provide a vehicle to promote, pilot, or implement technologies or practices that provide efficiencies and quality products, while maintaining the safety, health, and welfare of the public. It is expected when making significant or impactful deviations from the technical information from these guidance materials, that reasonable consultations with experts, technical committees, and/or policy setting bodies occur prior to actions within the timeframes allowed. It is also expected that these consultations will eliminate any potential conflicts of interest, perceived or otherwise. MDOT Leadership is committed to a culture of innovation to optimize engineering solutions.

The National Society of Professional Engineers Code of Ethics for Engineering is founded on six fundamental canons. Those canons are provided below.

Engineers, in the fulfillment of their professional duties, shall:

1. Hold paramount the safety, health, and welfare of the public.
2. Perform Services only in areas of their competence.
3. Issue public statement only in an objective and truthful manner.
4. Act for each employer or client as faithful agents or trustees.
5. Avoid deceptive acts.
6. Conduct themselves honorably, reasonably, ethically and lawfully so as to enhance the honor, reputation, and usefulness of the profession.

MDOT Bridge RFA Coordination Committee
11/28/2017

DRAFT

Purpose

The MDOT Bridge Request for Action (RFA) Coordination Committee is intended to be a sub-committee of the MDOT Statewide Bridge Alignment Team, and will manage and report on RFA matters to the MDOT Statewide Bridge Alignment Team as a standing agenda item each month.

The MDOT RFA Coordination Committee is responsible for reviewing, prioritizing, initiating action, monitoring, and ensuring resolution and/or following up all on bridge RFA's statewide for MDOT owned structures. The committee will also set goals and timeframes and identify resources for addressing RFA's based on the Priority Levels listed below, which may involve recommendations for partial or full bridge closure, emergency repairs, or contracting of work depending on current Bridge Repair Crew backlog and situational urgency.

Regions submit RFA's based on what is found during various inspections such as routine, damaged, special, fracture critical or detailed inspections. RFAs have varying degrees of urgency requiring ongoing prioritization and monitoring of implementation. The Region where the RFA originates from will determine the initial priority level. The goal of this committee is to manage the active RFA's, review the priority level set, and work towards addressing the RFA within the timeframes prescribed based on their priority level.

The MDOT RFA Coordination Committee will assess and prioritize on matters such as:

- Temporary support installations
- Structural repairs/retrofit
- Diaphragm or cross frame repairs
- Substructure repairs
- High load hit repairs/retrofit
- Load capacity evaluation
- Structural strengthening
- Detailed inspection
- Structural monitoring
- Scour assessment

Temporary support installations or structural repairs resulting from unsatisfactory load capacity evaluations that are prioritized at level 2 or 3 may require to be done under contract to ensure timely completion.

The MDOT Bridge RFA Coordination Committee will also serve as the technical expertise for the development of the RFA Dashboard in MiBRIDGE, and provide input to developers as to the functionality and use to ensure timeframe goals are met for each priority level. For non-emergency priority levels, acceptable action can be decreasing the inspection frequency, or scheduling special inspections on short frequencies until repairs are made.

Priority Levels

The following priority levels describe the deficiencies common to each level, and the timeframe upon which the deficiency should be addressed. Deficiencies not addressed within the prescribed timeframes are to be further discussed at MDOT Statewide Bridge Alignment Team meetings. Additional monitoring may be required until the deficiencies can be addressed. **The final schedule for repairs will be reviewed and determined by the RFA committee.**

Priority Level 1, Emergency – to be completed as soon as possible, either by the Statewide Bridge Repair Crew or emergency contract. Priority Level 1 often involves a critical finding requiring partial or full bridge closure and reporting to FHWA (see Chapter 10 of the [Michigan Structure Inspection Manual](#), MiSIM).

Examples of Priority Level 1 items are as follows:

- Severe section loss, holes, or buckling in webs or flanges of curved steel girders
- Severe section loss, holes, or buckling in web or flanges of fracture critical members
- Fracture, crack, or concrete spalling under bearings supporting non-redundant members
- Severe section loss, holes, or buckling in webs or flanges on 50% or more of the beams, or H-bearings of redundant bridges
- Severe section loss, holes, or buckling in webs or flanges on multiple adjacent beams or H-bearings of redundant and non-redundant bridges
- Active or New Structural crack(s) in primary load carrying members of redundant and non-redundant bridges
- Severe section loss in pin and hanger link plates
- Evidence of excessive deflection, or buckling followed by unsatisfactory load capacity evaluation
- Fracture, crack, or concrete spalling under bearings past position dowels at pier bearings
- Fracture, crack, or concrete spalling under bearings past position dowels on abutments with independent backwalls
- Incident resulting in moderate to severe structural damage (See [MiSIM Chapter 9](#))
- Lateral torsional buckling at beam ends due to insufficient joint travel or pavement growth
- Concrete spalling resulting in exposed strands on multiple adjacent prestressed beams
- Bridge sign connection failure resulting in possible instability to the support
- Significant scour holes or undermining of the footing resulting in potential instability of the bridge
- Scaling Concrete over Roadway

Priority Level 2, Critical – to be scheduled within 90 days, either by Statewide Bridge Crew or contract.

This priority level requires constant review and assessment of the active RFA list to ensure the items are addressed within 90 days. These items should be prioritized for contracting when other Priority Level 1 items take precedence.

Examples of Priority Level 2 items are as follows:

- Severe section loss, or holes in webs and flanges of moderately skewed steel girders
- Severe section loss or buckling of single or non-adjacent beams of redundant bridges
- Structural cracks in welded connections that could propagate into primary members of redundant bridges
- Severe section loss or cracks in H-bearing assemblies
- Required structural strengthening resulting from unsatisfactory load carrying capacity evaluation
- Fracture, crack, or concrete spalling under bearings at piers, no position dowels exposed
- Fracture, crack, or concrete spalling under bearings past position dowels on abutments with dependent backwalls
- Incident resulting in moderate structural damage (See [MiSIM Chapter 9](#))
- Concrete spalling resulting in exposed strands on non-adjacent prestressed beams
- Prestressed beam end block cracking and spalling resulting in exposed strands
- Scour holes or undermining of the footing
- Excessive bearing tilt with outer quarter of element in contact with masonry plate

Priority Level 3, Primary – to be completed within 12 to 18 months.

This priority level is also subject to prioritization to ensure deficiencies are addressed within the 12 month time frame. The fixes for these deficiencies can be performed by the Statewide Bridge Repair Crew, the Special Structures Unit, or a production bridge design unit.

- Cracks in Diaphragm Connections that are not active
- Evidence of scour holes, footing undermining, or significant damage to required scour countermeasures
- Fracture, crack, or concrete spalling under bearings at abutments, no position dowels exposed
- Required cross frame or diaphragm additions from unsatisfactory load carrying capacity evaluation (Structure exhibits no signs of distress, continue to monitor until repairs are made)
- Missing bolts or damage to cross frames and diaphragms
- Bearing stiffener section loss in excess of 50%
- Beam End with active corrosion and 10% section loss

Priority Level 4, Non-Critical - the Bridge RFA committee determines the distress is non-critical and repairs should be programmed through the normal Call for Projects process, or repairs made by routine maintenance.

Meetings

RFA Coordination Committee meetings are scheduled monthly.

The monthly meetings will consist of reviewing and prioritizing the current RFA list, confirmation of resource availability, monitoring implementation, and ensuring follow up on action items has occurred for critical findings

Timeframes for completion of work given the priority levels, and progress on reducing the overall number of active RFA's will be recorded, and reported out to the MDOT Statewide Bridge Alignment Team.

RFA's considered to be Priority Level 1 (Emergency) or Priority Level 2 (Critical) will be reviewed when submitted and are not dependent upon the RFA monthly meeting schedule. The RFA Coordination Committee will develop an electronic review system to aid in this process.

Timeframes for additional structural monitoring will be reviewed and agreed upon by the RFA committee.

Members

The following MDOT staff comprises the RFA Coordination Committee:

Beckie Curtis	Bridge Management Engineer
Eric Burns	Structural Maintenance Engineer
Melissa Knauff	Bridge Engineer
Creightyn McMunn	Load Rating Program Manager
Rich Kathrens	Bridge Safety Inspection Engineer
Jose Garcia	Special Structures Design Squad Leader
Christopher Idusuyi	Statewide Bridge Repair Crew Structural Engineer
Andrew Bouvy	Bridge Safety Inspection Engineer

Region Bridge Engineers will have standing invites to participate in the RFA Coordination Committee meetings via conference call, or in person, and will be solicited for agenda items as well. MDOT's Hydraulics and Geotechnical Services areas will also participate as needed.

Sponsors of the RFA Coordination Committee:

David Juntunen	Bridge Development Engineer
Corey Rogers	Bridge Field Services Engineer

Procedure

<u>Responsibility</u>	<u>Action</u>
Idusuyi	1. Present current RFA list requiring installation of temporary supports or structural repairs, and facilitate discussion for priority levels
McMunn	2. Present current RFA list requiring load capacity analysis, and communicate needs regarding steel beam thickness measurements, structural strengthening, etc.
Region Bridge Engineers	3. Report on Region RFA status with respect to deck patching, joints and railing repairs, etc.
Bouvy	4. Report on follow up action items to critical findings. Provide oversight for ensuring the Local Agencies are following up with active RFA's
Garcia	5. Report on capacity to provide assistance via contracting
Committee	6. Discuss prioritization based on defect severity or situational urgency. Decide on actions to be taken to meet the requirements of the priority levels.
Kathrens	7. Facilitate discussion on increasing inspection frequency, or performing Special or Other inspections to monitor reported deficiencies. Provide oversight for ensuring the Local Agencies are following up with active RFA's
Curtis/Burns	8. Record progress on addressing priority levels with prescribed timeframes and progress towards reducing the number of active RFA's for reporting to MDOT Statewide Bridge Alignment Team. Record notes for issues that need to be brought to MDOT Bridge Committee for further guidance.