



**ENGINEERING OPERATIONS COMMITTEE
MEETING MINUTES
AUGUST 8, 2019, 9:00 A.M. – 11:00 A.M.
MULTI-MODAL CONFERENCE ROOMS**

Present: Carol Aldrich Jason Gutting Will Thompson
 Mark Bott Tony Kratofil Brad Wieferich
 Gregg Brunner Ryan Mitchell Gorette Yung (phone)
 Matt Chynoweth Kristin Schuster
 Mark Geib Brandy Solak

Absent: Ted Burch Rebecca Curtis Hal Zweng

Guests: Jim Hartman (phone) Mark Shulick
 Dan Lund (phone) Carlos Torres

OLD BUSINESS

1. Approval of the July 11, 2019, Meeting Minutes – Tony Kratofil - *Approved*
2. Statewide Maintenance and Operations Alignment Team Guidance Document – Mark Geib
ACTION: Information only – for Tony’s signature
3. Michigan Department of Transportation (MDOT) New Materials and Products – Jason Gutting - *Information only*

NEW BUSINESS

1. Michigan Test Methods “Procedures for Writing and Adopting Test Methods” – Jason Gutting

Issue Statement – The Construction Field Services (CFS) Division has drafted revisions to the section titled “Procedures for Writing and Adopting Test Methods” in the Manual for the Michigan Test Methods (MTM).

Major Issue(s) – The current section is outdated and doesn’t document specific engagement with the Engineering Operations Committee (EOC). The draft revised text is being provided separately.

Background/History – MTMs have typically been drafted by subject matter experts with little engagement across the Department.

Recommendation(s) – CFS is requesting that the EOC review and approve the documented revisions to the section titled “Procedures for Writing and Adopting Test Methods” in the MTM.

Status – New submittal.

ACTION: Approved

2. Michigan Test Method MTM-114 Revision – Jason Gutting

Issue Statement – Revise cement requirements for Michigan Test Method MTM-114; “Making Concrete Specimens for Freeze-Thaw Testing of Concrete Coarse Aggregate.”

Major Issue(s) – Changes in today’s cement producer supply chain management have made it very difficult, as well as impractical, for the CFS Concrete Laboratory to attain Portland Cement from three independent sources, as required in MTM-114. It is proposed to amend MTM-114 to permit the use of a single, locally available, producer of Portland cement in all laboratory freeze-thaw concrete mixtures.

Background/History - Subsection 3.2.1 of the Michigan Test Method MTM-114 requires that three sources of Portland cement be blended when making the laboratory concrete freeze-thaw test specimens used to evaluate concrete coarse aggregates. This test method also requires that the laboratory, ongoingly, monitor the alkali contents of the three sources using the producer’s mill test reports, which are submitted to the CFS laboratory biannually. Over the years, it has been increasingly more difficult to attain three locally produced cements because (1) some of the local producers no longer manufacture their own cement, rather, they receive bulk product from numerous distant manufacturers/suppliers (often foreign) and relabel it as their own, (2) some producers occasionally sell their cement to other competing facilities in efforts to normalize the regional market, and (3) some of the local producers no longer sell their product in (typical) 94 pound bags...only supplying it in large bulk containers. This compels the CFS laboratory to request that the cement producer interrupt its bulk packaging operation and manually fill a few 5-gallon plastic pails for MDOT laboratory use (there is always a level of uncertainty that this request will be honored).

The CFS Concrete Laboratory has reviewed archives of cement mill test reports from the three local cement sources historically used in MDOT’s laboratory freeze-thaw testing program. These data show that the LaFarge-Alpena cement production facility has historically manufactured the most consistent product in the Great Lakes region...considerably more reliable in comparison to other locally available sources. Further, the LaFarge-Alpena cement producer sells its product in 94-pound bags, which is readily available locally in the Lansing area.

Finally, a laboratory test was conducted to determine whether there is a difference in test results between specimens cast using a blend of the three locally available cement sources and ones representing a single cement source (LaFarge-Alpena). The comparison reported no significant difference between the two freeze-thaw test data sets.

Recommendation(s) – Revise MTM-114 to allow the CFS Concrete Laboratory to acquire Portland cement from a single, locally available producer, provided the Equivalent Alkali Content of the selected source is documented to be reasonably consistent and does not exceed 0.60 percent, as reported by the producer's (biannually submitted) cement mill test reports.

Status – New submittal.

ACTION: Approved

3. Performance Based Practical Design (PBPD) – Mark Shulick/Mark Bott

Issue(s) – The purpose of the technical agenda is to establish protocols and procedures for the development of projects that utilize PBPD. Eight major tasks were identified:

- a. Review of Design Exception (DE)/Design Variance (DV) procedures, including safety analysis requirements and submittal schedule
- b. How PBPD can be utilized on a corridor or system approach
- c. Review of tools needed for analysis associated with PBPD
- d. Consideration of performance standards for evaluation of PBPD options
- e. Recommendation of applicable projects and development process impacts
- f. Recommend contract language for consultant contracts, if needed
- g. Identification of documents requiring modifications and training needs
- h. Quantify the system benefits of PBPD

Background – It is understood the Federal Highway Administration (FHWA) has supported opportunities within project development to incorporate a decision-making approach. This approach helps agencies better manage transportation investments and serve system level needs and performance priorities with limited resources. MDOT traditionally has considered a DE and/or DV as needed with a project, however, DE/DV reflect spot locations rather than project based.

Recommendation(s) – Approved the recommendations as outlined in the eight tasks of the Technical Agenda to implement PBPD in the project development process.

ACTION: Approved with request to add a process timeline.

4. Mill and Overlay Road Diet on M-199 – Jim Hartman

Project Information (if applicable): Mill and Overlay on M-199 (Michigan Ave.) 25.5 Mile Road to Superior Street

Route/Location: M-199 (Michigan Ave.) in Albion Michigan

Job Number: 200711

Control Section: 13093, 13043

Letting Date: 12-6-19

Issue(s) – None, low volume <5,000 ADT

Background – East /West route possibly Old US-12 prior to I-94, and Calhoun County Road Commission prior to coming back to Marshal TSC. The road “rubber bands” currently to two, three, and four lane sections with less than 5,000 ADT

Recommendation(s) – Four (4) to three (3) lane road diet from 27 Mile Road to Superior Street.

ACTION: Information only

5. Alternative Technical Concepts (ATC) I-96 Inlay Design-Bid-Build Project – Ryan Mitchell

Issue Statement - Use of Alternative Technical Concepts for Maintaining Traffic and Staging on the I-96 Inlay (Thornapple to Whitneyville) Design-Bid-Build project.

Major Issue(s) – A preliminary maintenance of traffic scheme was developed. Due to the number of ramps and lane restrictions on the bridges over the Thornapple River; providing flexibility for staging, lane closures and ramp closures will encourage efficiency and innovation, potentially resulting in cost savings to MDOT, along with improved mobility and safety for the contractor and the public.

Background/History - The project involves the intersection of M-6 freeway with I-96 freeway. An ATC for the Maintenance of Traffic is proposed to be used on the bidding of this project. A base Maintenance of Traffic (MOT) scheme has been developed but there may be advantages for the contractor and motoring public to provide alternate stages of ramp construction on the M-6 Ramps and I-96 freeway lanes. This also impacts the location and quantity of temporary pavement required for the project.

With the possibility of Alternate Pavement Bidding being used on this project, differing MOT schemes could prove beneficial to the construction work involved with different pavement types and provide cost savings to the project.

Initial schemes require two lanes of westbound I-96 to be maintained and two lanes in combination of eastbound I-96 and M-6 must be maintained (two lanes on I-96 or one lane I-

96 with one lane on M-6). Partial width construction of the M-6 ramps would not be preferred due to safety concerns with the geometry of the ramps. Construction of the project could be progressed over two seasons using a 2021 Summer/Fall construction and 2022 construction season, but ramp closures and impacts to eastbound I-96 shall not conflict with two other major construction projects in the Grand Rapids area (131483 I-196 over the Grand River and 206976 I 196 reconstruction between Fuller Avenue and Maryland Avenue).

Recommendation(s) – The Innovative Contracting Committee recommends approval of the use of ATCs for MOT. The project team has been trained on the ATC process and understands the attending schedule and confidentiality implications, as well as the additional ATC review effort.

ACTION: Approved

6. Roadside Safety Devices – Carlos Torres

Subject/Issue – Action plan for selection of the following roadside safety devices on projects let after 12/31/19:

- Buried-in-Backslope (BIB) Guardrail Terminals (MDOT Special Detail 24)
- Guardrail Over Box/Slab Culverts (MDOT Standard Plan R-73-Series)
- Delineator Posts (MDOT Standard Plan R-127-Series)

Major Issue(s)/Potential Complication(s) – Manual for Assessing Safety Hardware (MASH)-compliant versions of the roadside safety devices identified above must be used for new installations on the National Highway System (NHS) on construction projects let after 12/31/19. To date, FHWA and American Association of State Highway and Transportation Officials (AASHTO) have not granted an extension to the 12/31/19 sunset date for any of these devices.

The potential issues are:

a. BIB Guardrail Terminals

As part of the Roadside Pooled Fund Group, the Texas A&M Transportation Institute (TTI) developed a BIB terminal that was successfully crash tested under MASH, TL-3 criteria. However, there are potential concerns with this design:

- i. Overall length is somewhat large.
- ii. Uses multiple flare rates throughout the length of the terminal.
- iii. Requires a top-of-rail height drop beginning at the backslope.

While the BIB design was subjected to the full suite of MASH tests, neither TTI nor any members of the Pooled Fund Group have requested an FHWA eligibility letter for this design.

b. Guardrail over Box/Slab Culverts

TTI performed a successful crash test with a pickup truck under MASH, TL-3 criteria (test 3-31) on 31" tall w-beam guardrail with 8" offset blocks and posts attached to a low-fill box culvert. The design tested by TTI is advantageous since it uses a 6'-3" post spacing, whereas MDOT's current National Cooperative Highway Research Program (NCHRP) 350 alternative requires posts to be spaced at 3'-1½". However, TTI did not conduct the full suite of MASH crash tests, so the tested design is not eligible for a federal aid eligibility letter.

c. Delineator Posts

MDOT staff received information that the current steel delineator post depicted in MDOT Standard Plan R-127-Series was subjected to a successful MASH, TL-3 test (test 3-61) with a 12" x 36" aluminum object marker sign mounted 4' from ground level. This test was performed by the Midwest Roadside Safety Facility through the Midwest Pooled Fund Group as part of a current project (RPF-18-SIGN-1: MASH Testing of Single-Post, U-Channel Sign Supports). Unfortunately, it is unclear when the project will be finalized, so it may be some time before a report is published for this study.

Background – The MASH was published in 2009 as an updated crash testing standard to supersede NCHRP 350. In addition, MASH crash testing was required for new or revised roadside safety devices tested after January 1, 2011. In 2016, AASHTO adopted an updated version of MASH, called MASH 2016, and MASH 2016 crash testing will be required for new or revised roadside safety devices tested after December 31, 2016. To avoid any confusion, the original version of MASH, published in 2009, will be known as MASH 2009. The biggest change between MASH 2009 and MASH 2016 involves the addition of several test matrices for cable barrier systems. As a result, most roadside safety devices, with the exception of cable barrier systems, that successfully passed MASH 2009 crash testing will be grandfathered into MASH 2016 without further testing.

The current FHWA-AASHTO joint implementation agreement requires MASH 2016-compliant devices to be used for new installations on contracts involving NHS roadways with a letting date after the dates below:

- December 31, 2017: guardrail systems and cast-in-place concrete barriers
- June 30, 2018: tangent, single-sided guardrail terminals
- December 31, 2018: crash cushions (impact attenuators)
- December 31, 2019: cable barriers and cable terminals, double-sided guardrail terminals, flared guardrail terminals, bridge railings, transitions, temporary work zone devices, all other longitudinal barriers (including portable barriers installed permanently), all other terminals, sign supports, and all other breakaway hardware

Recommendations:

a. BIB Guardrail Terminal

Continue to use MDOT's current BIB design depicted in Special Detail 24. The Barrier Advisory Committee believes the current BIB design is crashworthy because

- (1) the terminal ending is buried, so spearing is not an issue, (2) the slopes leading up to the guardrail meet the same requirements as MASH-compliant Type MGS-8 guardrail (i.e., 1:10 slopes or flatter), and (3) the guardrail flare rates are the same as the recommended flare rates in the 2011 AASHTO Roadside Design Guide.
- b. Guardrail Over Box/Slab Culverts
Revise MDOT Standard Plan R-73 to reflect the design that was successfully crash tested by TTI under MASH, TL-3 criteria.
 - c. Delineator Posts
Continue to use the current steel delineator post depicted in MDOT Standard Plan R-127-Series.

ACTION: Approved

7. MDOT MiBridge Inspection and Management Software – Matt Chynoweth

Subject/Issue – Sunsetting of the current proprietary MDOT MiBridge bridge inspection and management software, replacing with AASHTO BrM, which is a commercial, off-the-shelf software.

Major Issue(s) – As part of the Information Technology Call for Projects, MiBridge functionality updates and advancements are typically proposed on an annual basis to ensure compliance with the Code of Federal Regulations (23 CFR part 650). Despite the major organizational risks to compliance, the MiBridge upgrades are not selected for funding out of the Interdepartmental Grant on a regular basis. To ensure continued MiBridge functionality, bridge capital and operational funds are used to fund Department of Technology, Management and Budget (DTMB) developers and project managers.

Background/History – Proposed federal changes to the federally mandated bridge inventory coding are anticipated in 2019 as a notice of proposed rulemaking. The changes are expected to be significant enough that the underlying bridge database, the behind the scenes checking and logic, as well as most if not every page of the MiBridge system will need to be revised. Approximately \$1,000,000.00 over the course of a year will be required to solely address the changes to the inventory, without addressing any enhancements to address plans of corrective actions or to reduce the risk of future non-compliance.

MiBridge currently has a yearly enhancement cost of \$800,000

Recommendation(s) – Switching to AASHTO BrM for inspection would reduce the risk of non-compliance due to not completing the required software changes for the upcoming changes to the National Bridge Inventory Coding Guide. As AASHTO BrM is used by a majority of the states; the expectation is that the federal timeline will match the AASHTO BrM development timeline. If MDOT continues with MiBridge, we would be at risk of development timeframes being affected by DTMB staffing and MDOT subject matter expert

resource limitation. Additionally, inspection personnel around the state will require training to understand and implement the new Federal Requirements. This would be an opportune time to also train inspectors and bridge owners on the use of a new inspection system. This cost is estimated at \$1,500,000 initial development, with a \$53,000 per year maintenance and license fee.

Status - Final actual cost estimates and schedules can be developed once the Notice of Proposed Rule Making is released, however the Bridge Management Section recommends that MDOT shift our resources to implementing AASHTO BrM for all Bridge Management functions in coordination with the new Federal requirements. Separate implementation time frames are proposed for trunk line and local agency bridges.

ACTION: Information only

8. Construction Field Services Manual for Assessing Safety Hardware Compliance for Temporary Traffic Control Devices in Work Zones – Jason Gutting

AASHTO and the FHWA agreed in 2016 to the following requirements for temporary traffic control devices used in work zones on state highways and roadways on the National Highway System.

Temporary work zone devices, including portable barriers, manufactured after December 31, 2019, must have been successfully tested to the 2016 edition of MASH. Such devices manufactured on or before this date, and successfully tested to NCHRP Report 350 or the 2009 edition of MASH, may continue to be used throughout their normal service lives.

MDOT recognizes and adopts the current categorization of temporary traffic control devices used in work zones as developed by FHWA after the publication of NCHRP Report 350. These categories are as follows:

Category I	Lightweight devices (such as cones, barrels, delineators) which could be self-certified by the vendor.
Category II	Lightweight devices which needed individual crash testing.
Category III	Barriers and other fixed or massive devices also needing crash testing.
Category IV	Trailer mounted lighted signs, arrow panels, etc.

Category I

MDOT recognizes that the crashworthiness and MASH compliance of Category I devices may be established by way of certification letters from the respective manufacturers, and no testing of these devices is required to meet MASH-16 requirements.

Category II

All Category II temporary traffic control devices manufactured after December 31, 2019, that are NCHRP 350 or MASH-09 compliant will continue to be allowed until MASH-16 compliant devices are available and reviewed by MDOT. These devices may be used for five

(5) years after MASH-16 compliant devices are approved, provided the device meets the requirements of the Standard Specifications for Construction and any applicable special provisions.

Category III

All mobile attenuators (i.e., truck mounted attenuators and trailer mounted attenuators; also known as TMAs) and temporary impact attenuators manufactured after December 31, 2019, that are NCHRP 350 or MASH-09 compliant will continue to be allowed until MASH-16 compliant devices are available and reviewed by MDOT.

All portable temporary concrete barriers and steel barriers manufactured after December 31, 2019, that are NCHRP 350 or MASH-09 compliant will continue to be allowed until MASH-16 compliant devices are available and reviewed by MDOT.

These devices may be used for ten (10) years after MASH-16 compliant devices are approved, provided the device meets the requirements of the Standard Specifications for Construction and any applicable special provisions.

Category IV

Category IV devices are currently not required to be NCHRP 350 crash tested by the FHWA. The benefit of Category IV devices was determined greater than the exposure of the device on the roadway shoulder. MDOT encourages manufacturers to seek compliance with MASH-16 for Category IV devices, ~~however, due to the lack of available compliant Category IV devices, crash testing requirements will be waived.~~ MDOT will continually research and evaluate Category IV products coming to the marketplace. MDOT will update the guidance for Category IV work zone devices based of the availability of MASH-16 compliant devices and the acceptability of these devices to MDOT.

ACTION: Approved with removal of Category IV clause, “however, due to the lack of available compliant Category IV devices, crash testing requirements will be waived.”

9. Newaygo Road Diet – Dan Lund

Project Information: Pavement marking changes in bridge project

Route/Location: M-37 from Quarterline Street north to north of M-82/Croton Dr, City of Newaygo, Newaygo County

Job Number: 204754

Control Section: 62031

Letting Date: 3/15/19

Issue(s) – Current four-lane section does not allow for sheltered left turns and promotes higher speeds within the city.

Background – M-37 through the City of Newaygo is the only non-freeway multi-lane

highway crossing the Muskegon River between US-31 and US-131 in West Michigan. This river crossing provides critical access to northern Michigan for commuter, tourism, agricultural, over-width and other commercial traffic. The downtown Business District commissioned a walkability study. MDOT worked with the City to refine these results into a win for all stakeholders.

Recommendation(s) –

- Reduce number of lanes from four (4) to three (3) to calm traffic as well as increase parking and pedestrian friendly crossings without compromising traffic flow.
- Improve function of the M-82 (Croton Road) intersection for increased safety.
- Calm traffic by eliminating a passing relief lane coming into the city.

A bridge project in 2019 incorporates the Quarterline Street to M-82/Croton Dr changes. A road diet will convert a four-lane section into three lanes with parking improvements to calm traffic and create parking while maintaining traffic flow. The piloted road diet and pavement marking configuration changes will be evaluated and finalized with public input in 2020. A bridge project on M-82 in 2020 and reconstruction of M-37 through Newaygo's downtown in 2021 will incorporate any desirable changes.

ACTION: Information only

Carol Aldrich, Secretary
Engineering Operations Committee

RA:lrb

cc: EOC Members	M. DeLong	J. Becsey (APAM)
Meeting Guests	D. Jones	D. Needham (MAA)
P. Ajegba	C. Libiran	M. Ackerson-Ware (MRPA)
L. Mester	R. Jorgenson (FHWA)	
Region Engineers	R. Brenke (ACEC Michigan)	
Assoc. Region Engineers	G. Bukoski (MITA)	
TSC Managers	D. DeGraaf (MCA)	