ENGINEERING OPERATIONS COMMITTEE MEETING MINUTES
NOVEMBER 17, 2022, 9 A.M. TO 11 A.M.
MDOT LOBBY CONFERENCE ROOM
WITH TEAMS OPTION

Present:	Carol Aldrich	Ryan Mitchell	Kim Zimmer
	Mark Bott	Dee Parker	Hal Zweng
	Rebecca Curtis	Kristin Schuster	
	Mark Dionise	Will Thompson	
Absent:	Gregg Brunner	Brad Wieferich	
	Jason Gutting	Gorette Yung	
Guests:	Chris Brookes	Kevin Kennedy	Ashok Punjabi
	Sue Datta	Brooke Kita	James Ranger
	Imad Gedaoun	Ben Krom	Dale Spencley
	Art Green	Carlos Libiran	Dina Tarazi
	Amos Kamp	Nathan Miller	Carlos Torres

OLD BUSINESS

1. Approval of the August 18, 2022, meeting minutes – Dee Parker

   ACTION: Approved

NEW BUSINESS

1. Safety Topic: Slippery Surfaces, Slips, Trips, and Same Level Falls – Art Green

   ACTION: For information only

2. Adoption of the 7th Edition American Association of State Highway and Transportation Officials Geometric Design Guide for Highways and Streets and revisions to the Road Design Manual – Carlos Libiran and Imad Gedaoun

   Issue Statement - Adoption of the 7th Edition American Association of State Highway and Transportation Officials (AASHTO) Geometric Design Guide for Highways and Streets (a.k.a. The Greenbook).

   Major Issue(s) – Chapter 3 of the Michigan Department of Transportation (MDOT) Road Design Manual requires updating to adopt design standards required for National Highway System (NHS) projects as recently amended in the Federal Register.

Background/History – On 1/3/22, Title 23 CFR Part 625 was amended by Final Rule to adopt the 7th Edition of the Greenbook as the geometric design standards for NHS projects authorized to proceed with design activities on or after February 2, 2023.

The Design Standards Unit and the Geometric Design Unit combined efforts over a series of work sessions to review changes in the new Greenbook and identify changes needed in the MDOT design standards and manuals. The revisions in the 7th Edition Greenbook had little impact on current MDOT standards.

The most notable change is the introduction of new definitions of project types. What has been traditionally referred to as resurfacing, restoration, or rehabilitation (3R) projects is newly defined as "projects on existing roads." Additionally, this project type is further distinguished as those "that do not change the basic roadway type." By adopting the 7th Edition Green book, this unlocks a potential for more collaboration with Federal Highway Administration (FHWA) to revisit our application of current standards to allow more design flexibility. Throughout the 7th Edition Greenbook, language is added promoting performance based practical design. Although the standards themselves have not changed, there is stronger emphasis on a more risk-based practical application of standards for new construction/reconstruction.

While reviewing the Road Design Manual, some minor clarifications of current standards were also made and documented to preserve their historical progression.

National Network (NN) Lane Widths - While reviewing our design standards, the FHWA asked us to refine our policy for standard lane widths on the National Truck Network to better reflect the intent of 23CFR 658.9. A revised policy was drafted to implement a new process for consideration of lane widths less than standard (12 feet) on the NN. Our current policy casually calls for "high burden of justification" for not meeting this standard. The revised draft policy allows retention of existing substandard NN widths that otherwise meet MDOT 3R/4R standards. The reduction of existing NN lanes to widths below NN standards would require design exceptions. The burden of justification is defined as predictive crash analysis, mitigative measures, and analysis of truck turning radii to accommodate continued travel on the NN. The proposed policy has been vetted with the Region Bureau Management Team, Region System Managers, and the FHWA. Future discussions will follow to consider this topic again as an active MDOT research project investigates a corridor design approach in general.

Recommendation(s) – Approve all proposed revisions to the Road Design Manual (including National Network Lane Width Policy) and adopt the *AASHTO 7th Edition, A Policy on Geometric Design of Highways and Streets* as the basis for current MDOT geometric design standards and in the development of future geometric design policies.

ACTION: Approved

3. Guidance for Signing Emergency Medical Centers – Mark Bott

   Issue Statement – Guidance for signing emergency medical centers.

   Major Issue(s) – Traditionally, emergency medical centers were part of a hospital which MDOT has guidance to sign for. The business model has changed where more centers are not part of a hospital building or campus, but there is no clear guidance for staff to follow for sign requests.

   Background/History – A license for a hospital is defined in MCL 333.21511. Discussions with the Department of Health and Human Services, Emergency Medical Services (EMS) has clarified for MDOT administrative code that limits where EMS can transport. This code provides licensing requirements for these types of facilities, thus making it clearer to staff if a facility qualifies or not. The guidance mirrors that for hospital for consistency other than the symbol.

   Recommendation(s) – Approve the criteria for signing emergency medical centers to provide consistency in motorist services signing, and as Post-Crash Care is one of the five Safe System Approach elements.

   ACTION: Approved

4. Exception request for a Life Cycle Cost Analysis on the rehabilitation of M-102 from M-39 to M-53 in Oakland, Macomb, and Wayne Counties – Ashok Punjabi and Ben Krom

   Issue Statement – Exception request for a Life Cycle Cost Analysis (LCCA) on the rehabilitation of M-102 in Oakland, Macomb, and Wayne Counties.

   Route/Location: M-102 from M-39 to M-53
   Job Number: 210075, 214276
   Control Section: 82141, 82142, 82143, 82252
   Letting Date: January 2023
   Total Est. Const. Cost: $75 M

   Major Issue(s) – Reduce further delay of the project, additional consultant cost, and potential scope of work needed to update the design and plans.

   Background/History – This M-102 project consists of 10.09 miles of cold milling with a two-course hot mix asphalt (HMA) overlay of an existing composite pavement section, detail 7 and 8 joint repairs, concrete base repairs, concrete pavement repairs, drainage improvements, Americans with Disabilities Act upgrades, and signal modernizations. The project also includes the rehabilitation of S10 of 82252 which consists of deck patching, epoxy overlay, partial beam painting, steel beam repairs, concrete surface coating, pier 7 cap replacement, pier 10 replacement and substructure repairs and the rehabilitation of S25 of 82252 consisting of heat straightening and substructure repairs. The project was originally scheduled for a January 2022 letting. For reasons described below, the project letting date has been revised several times over the course of the project. As a result, the new project

letting date is January 2023, which now passes the threshold for needing a LCAA for this rehabilitation project.

The pavement cores obtained were evaluated during the preliminary design phase. The existing HMA surface overlying the concrete base varies from approximately 1.5" to 9" with much of the corridor ranging from approximately 3" to 5". In addition, the existing travel lane cross slopes vary from 0 to 6% throughout the project limits. Since multiple pavement cores throughout the project limits exhibited an HMA overlay less than 3.5" and the travel lane cross slopes do not meet current 3R design criteria, the designers were asked to evaluate options to mill and overlay the existing surface to provide a two course HMA overlay, minimize the volume of milling of the concrete base, and provide as much travel lane cross slope correction as possible while retaining the existing curb and gutter along both the median and outside edges. To accommodate this evaluation, the letting was changed from January 2022 to March 2022.

A solution for the pavement resurfacing and cross slope correction was approved in late June 2021 with the design team proceeding with final plan development phase. In November 2021, after the final plan completion meeting was held, the bridge scope of work was changed. The project originally included the deck replacements of S10, S10-7, and S10-8 of 82252 along with the heat straightening of S25 of 82252. The work on S10-7 and S10-8 was removed in its entirety with the work on S10 reduced to that mentioned above. With this change in scope the project letting was changed from March 2022 to June 2022. The letting was later changed to July 2022 to accommodate the approval for amending the Transportation Improvement Program.

The project was let on July 1, 2022. One bid was received at 57.67% over the engineer's estimate, which was subsequently rejected. The project is rescheduled for a January 2023 letting with plan completion date of November 21, 2022, to allow sufficient time for full and thorough review of all work items and project revisions.

The expansion of the LCCA program to include all 3R projects such as multiple course HMA overlays, Asphalt Stabilized Crack Relief Layer, crush and shapes, and concrete overlays is currently scheduled to be effective for projects with a let date of January 1, 2023, and after. The multi-course HMA overlay currently scoped for this project would be life-cycled against a concrete overlay. With this new LCCA requirement for 3R projects, the project delivery will get further delayed which may take a minimum of 12 to 18 months to revise the plans. We have held two meetings with the public communicating the construction anticipated to occur in 2022 and 2023. In addition, we have been coordinating with the local communities (including the city of Oak Park to include the intersection improvement of Hubbell Avenue at WB M-102), along with numerous utility companies.

In summary, due to major schedule impact, potential major changes to work scope if the project were to go through an LCCA process, potential right of way impacts, and potential additional cost increase of approximately 30% or so, we will not be able to meet the project delivery schedule and promises made to the communities and business groups along the corridor. By keeping the current work scope as a two-course HMA mill and resurface as designed, we will be able to deliver the project by January 2023 letting and keep the project within the programmed cost. Therefore, we respectfully request the Engineering Operations

(EOC) Committee for an LCCA waiver for the M-102 rehabilitation project to avoid further project delays and additional cost to our consultant contract to update the plans and construction costs and schedule.

Recommendation(s) – The Metro Region requests an exemption to the soon to be implemented LCCA requirements on this rehabilitation project.

ACTION: Approved

5. Exception request for a Life Cycle Cost Analysis on the rehabilitation of I-75 from M-15 to Genesee County line in Oakland County – Ashok Punjabi and Ben Krom

Issue Statement – Exception request for an LCCA on the rehabilitation of I-75 in Oakland County.

Route/Location: I-75 from M-15 to Genesee/Oakland County Line
Job Number: 210074
Control Section: 63173
Letting Date: January 2023
Total Est. Const. Cost: $130 M

Major Issue(s) – Reduce further delay of the project, additional consultant cost, increased environmental impacts, and potential scope of work needed to update the design and plans.

Background/History – This I-75 project consists of 15.042 miles of cold milling, placing an asphalt stabilized crack relief layer (ASCRL) and a two-course HMA overlay on an existing composite pavement section, performing detail 7 and 8 joint repairs, concrete base repairs, concrete pavement repairs, drainage improvements, guardrail upgrades and freeway signing upgrades. The project also includes capital preventative maintenance (CPM) repairs on nine structures (S01, B01, S02, S03, S06, S07, S08, S09 and S10 of 63173), including deck patching, shallow, deep and epoxy overlays, barrier rail replacement, and substructure patching. Two additional structures have deck replacements (S04 and S05 of 63173). The project was originally scheduled for a March 2021 letting. For reasons described below, the project letting date has been revised several times over the course of the project. As a result, the new project letting date is January 2023 which now passes the threshold for needing an LCAA for this rehabilitation project.

The original scope of work for the project defined in April 2020 included mill and overlay of existing composite pavement with joint and concrete base repairs, along with CPM work on eleven structures. Pavement cores were obtained and evaluated during the preliminary design phase. The existing HMA surface overlying the concrete base varies from approximately 5 to 9.5 inches thick over concrete 7.8 to 11 inches thick, resulting in overall pavement thickness ranging from 13.5 to 19.5 inches. Of the 86 pavement cores obtained, 97% of them revealed debonding or distress that raised concerns with the initial proposed fix strategy. In addition, severe joint failures throughout the project require continual maintenance. Because of the excessive debonding and failing joints, a separate log job for joint repairs was prepared for a February 2021 letting while a more comprehensive mill and HMA overlay including ASCRL could be designed and let in September 2021.

Due to construction industry demands and constraints, the pavement repair project to be let in February 2021 was cancelled. The Oakland Transportation Service Center proceeded to perform extensive joint repairs with MDOT Maintenance forces while the design continued for the 3R design plans. In May 2021, additional drainage improvements (culvert replacements) and environmental impacts, including wetlands and endangered species, were identified, resulting in the letting schedule being revised to October 2022 to allow for additional hydraulic analysis, drainage and road design, environmental field survey and permit coordination. All utility coordination and necessary relocations were completed during this time.

At the Final Plan Coordination meeting held May 23, 2022, it was agreed that the bridge decks of S04 and S05 of 63173 had deteriorated to an extent warranting potential deck replacement, beyond the planned CPM repairs initially scoped. Furthermore, the extent and complexity of the environmental review required additional effort, as the proposed drainage improvements resulted in more extensive wetland investigation and delineation as well as greater impacts to Eastern Mississauga Rattlesnake Tier 1 and Tier 2 habitats. Additional design modifications and supporting documentation was required for the Environment, Great Lakes, and Energy (EGLE) permit and U.S. Fish and Wild Life Service clearance to be obtained. The letting date was proposed to be extended to January 2023 to allow adequate time to obtain the EGLE permit as well as complete the design of the bridge deck replacements.

The expansion of the LCCA program to include all 3R projects such as multiple course HMA overlays, ASCRL, crush and shapes, and concrete overlays is currently scheduled to be effective for projects with a let date of January 1, 2023, and after. The multi-course HMA overlay with ASCRL currently scoped for this project would be life-cycled against a concrete overlay. With this new LCCA requirement for 3R projects, the project delivery will get further delayed which may take a minimum of 12 to 16 months to revise the plans. In addition, a concrete overlay will extend the construction schedule a minimum of one full construction season given the additional stage construction requirements with multiple interchanges and longer ramp closures. With the rapidly deteriorating joints, the further delay of the project will result in significant maintenance costs as well as impacts to the motoring public as lane closures are needed for frequent maintenance operations. Additional construction costs (based on inflationary trends) as well as increased design costs are estimated between 20 to 30 percent. In some areas where a concrete overlay results in a higher grade, additional earth disturbance may potentially result in further impacts to wetlands and habitat. Previous communication and coordination has taken place with local agencies affected by ramp closures and detour routes, including two (2) road commissions, five (5) townships and one village; extensive stakeholder re-engagement would be required for a significant change in schedule.

In summary, due to 1) major impacts to the design and construction timeline, 2) Maintenance of Traffic, 3) rapidly deteriorating existing joints, 4) anticipated environmental ramifications, 5) additional program costs of approximately 25%, and 6) greater impact to the local communities affected by this project, the Metro Region respectfully requests this LCCA waiver to keep the proposed HMA two-course overlay with ASCRL and avoid further project delays and cost increases.

Recommendation(s) – Metro Region requests an exemption to the soon to be implemented LCCA requirements on this rehabilitation project.

ACTION: Approved

6. Use of the Fixed Price/Variable Scope Type 3 contracting method on Richardson and Townline Road Local Agency Project – Dina Tarazi and Dale Spencley

Issue Statement – Request approval for the use of the Fixed Price/Variable Scope (FPVS) Type 3 contracting method on a Local Agency Project (LAP).

Route/Location: Crush and shape the existing HMA, place 3" of proposed HMA, shoulder material, permanent pavement markings, and permanent signing on:

- Richardson Road to Townline Road (Priority A)
- Townline Road to Ruth Road (Priority B)

Job Number: 205344
Control Section: STL 68000
Letting Date: TBD in accordance with the MDOT LAP Project Planning Guide
Total Est. Const. Cost: $683,900 (Priority A); $167,700 (Priority B)

Major Issue(s) – FPVS projects are intended to maximize the amount of work constructed within a pre-established budget. This method is most effective for projects where need far outweighs available funding. FPVS Type 3 projects receive bids through the traditional low bid process and allow for a contract modification with a comment/justification stating that it is a FPVS Type 3 project and limits are being extended into Priority B based on bid savings. These revised limits are also updated in JobNet to reflect the complete project limits.

Background/History – Priority B will be completed when Phase 5 of the project is completed during the 2024 construction season using a traditional bid process, however using the FPVS method allows to fully utilize any bid savings that are realized which could potentially complete the project sooner.

Recommendation(s) – The Innovative Contracting Committee (ICC) recommends approval to use the FPVS contracting method for this LAP project.

ACTION: Approved

7. Revised Design-Build Guidelines – Ryan Mitchell

Issue Statement – The Innovative Contracting Unit (ICU) requests approval of revised Design-Build (DB) Guidelines.

Major Issue(s) – Originally published August 6, 2014, and last updated March 3, 2015, the DB Guidelines have been extensively revised to reflect current Innovative Contracting business practices, state and federal requirements, and recognized DB best practices.

Background/History – To ensure current process guidance is in place and is available to MDOT staff and to our agency and industry partners, the ICU completed an extensive update to the DB Guidelines. The ICU collaborated on the update with representatives from several areas within MDOT, including Construction Field Services, Bureau of Bridges and Structures, Regions/Transportation Service Centers, and the FHWA Michigan Division. The ICU also worked with the Michigan Infrastructure and Transportation Association to solicit and address their feedback on MDOT's DB program and incorporate that into the updated DB Guidelines.

Recommendation(s) – Following inclusive outreach and buy in from within MDOT and from our agency and industry partners, the ICU recommends approval of the updated DB Guidelines.
Status – New

ACTION: Approved

8. Exception request for a Life Cycle Cost Analysis on M-51 from south of Chestnut Lane northerly to M-60BR (Oak Street) in Berrien County – Amos Kamp and Ben Krom

Issue Statement – Exception request for an LCCA.

Route/Location: M-51 in Berrien County
Job Number: 202003
Control Section: 11051
Letting Date: 07/07/2023
Total Est. Const. Cost: $20,662,000 (04/18/2022)

Major Issue(s) – Reduce further delay of the project and additional consultant cost needed to update the plans.

Background/History – The US-12/M-51 reconstruction and rehabilitation project has a new letting date of July 2023 which now passes the threshold for needing an LCCA on the mill and overlay sections along M-51. The work on M-51 consists of 1.41 miles of cold milling with a multiple course HMA overlay and joint repairs, 0.26 miles of reconstruction at the US-12 intersection, 0.47 miles of HMA inlay, and 0.47 miles of concrete pavement repairs. Additional work includes drainage repairs, traffic signal replacements, and new sidewalk.

Project Timeline
Post-Final Plan Completion (FPC) Submittal Date: October 28, 2022
Plan Completion Date (PCD): February 3, 2023
Letting: July 7, 2023

The US-12/M-51 project has moved from an original November 2022 letting to a July 2023 letting due to changes in the environmental clearance schedule, coordination with other projects in the region, and the need for a longer lead time on ordering some materials for the following construction season. An LCCA was previously developed for the reconstruction work on US-12 and M-51 at the intersection. Developing an LCCA for the work on M-51 would delay the project.

Existing M-51 has a mix of pavement types in varying condition:

1. From Sta 207+95 (POB) to Sta 259+33.09 (Sta 259+99.99 BK = Sta 160+00.00 AH), the roadway is a composite section with 2¼"-4" HMA over 8-9" concrete pavement. The underlying concrete was constructed as a 40' wide section and later widened to 60'. It is in generally good condition.
2. From Sta 160+38.50 to Sta 169+20.52, the roadway is a composite section with 2 ¼"-4" HMA over 8-9" concrete pavement. The underlying concrete was constructed as a 40' wide section and later widened to 60'. The outside lanes are failing along the curb.
3. From Sta 169+20.52 to Sta 185+03.12, the roadway is a 9" concrete pavement. The outside lanes are failing along the curb.
4. From Sta 185+03.12 to Sta 236+60.35, the roadway is a composite section with 2 ¼" HMA over 8-9" concrete pavement. The underlying concrete was constructed as a 40' wide section and later widened to 60'. It is in generally good condition.
5. From Sta 236+60.35 to Sta 245+05.16 (POE), the roadway is a 9" concrete pavement in generally good condition.

The proposed design is a mix of HMA overlay, HMA inlay, HMA reconstruction, and concrete pavement repairs as follows:

1. From Sta 207+95 (POB) to Sta 245+70.00, cold mill 3" or to the top of the existing concrete and install a 3" overlay.
2. From Sta 245+70.00 to Sta 259+33.09 (Sta 259+99.99 BK = Sta 160+00.00 AH), remove everything and reconstruct to replace the existing US-12 interchange with an intersection, using a three course (8") HMA pavement.
3. From Sta 160+38.50 to Sta 185+03.12, remove the existing pavement and install a three course (8") HMA inlay, retaining the existing curb and gutter.
4. From Sta 185+03.12 to Sta 236+60.35, cold mill 3" or to the top of the existing concrete and install a 3" overlay.
5. From Sta 236+60.35 to Sta 245+05.16 (POE), install concrete pavement repairs as needed.

The LCCA alternative to this would be a mix of concrete thin overlay, concrete inlay, concrete reconstruction, and concrete pavement repairs as follows:

1. From Sta 207+95 (POB) to Sta 245+70.00, cold mill 3" or to the top of the existing concrete and install an HMA separator with a 4" thin concrete overlay. Reconstruct the curb and gutter at the new elevation.
2. From Sta 245+70.00 to Sta 259+33.09 (Sta 259+99.99 BK = Sta 160+00.00 AH), remove everything and reconstruct to replace the existing US-12 interchange with an intersection, using an 8" concrete pavement.
3. From Sta 160+38.50 to Sta 185+03.12, remove the existing pavement and install an 8" concrete inlay, retaining the existing curb and gutter.
4. From Sta 185+03.12 to Sta 236+60.35, cold mill 3" or to the top of the existing concrete and install an HMA separator with a 4" thin concrete overlay. Reconstruct the curb and gutter at the new elevation.

5. From Sta 236+60.35 to Sta 245+05.16 (POE), install concrete pavement repairs as needed.

A change to a concrete pavement would require at least two months of design time after completion of the updated LCCA (three-month delay). The new LCCA would likely not be completed until after the currently scheduled plan completion. After the plan revisions are complete, a supplemental plan review would likely be needed to address the concrete alternative and the impacts associated with the change in pavement design and revised maintaining traffic (additional two months). The anticipated delay to the PCD is expected to be seven (7) to eight (8) months due to design changes.

The equivalent concrete pavement overlay section would be at least two (2) inches higher than the currently proposed HMA section and would require reconstructing the existing curb and gutter at least two (2) to three (3) inches higher, as well as all side street and driveway approaches, which was not part of the original project scope and is not currently included in the design for the project. Raising the pavement and associated curb and gutter will likely result in additional right-of-way impacts throughout the corridor. Additional design time would be needed to incorporate these changes into the roadway and drainage design, as well as the maintenance of traffic plan. There are also additional construction costs associated with this change. The additional cost for the curb and gutter with aggregate base and underdrain is estimated to be around $600,000. Given the increased scope of work and cost for this alternative, a full reconstruction of the pavement and storm sewer might be more appropriate.

Construction Impacts

An on-site batch plan would likely be needed for the concrete overlay, which would require an additional permit during the construction phase.

A concrete overlay requires the newly poured concrete to cure prior to running traffic on it. The maintenance of traffic would need to be revisited to determine how to maintain traffic along M-51 due to this requirement.

The current construction schedule is very tight for one season of work and the additional production and cure time would likely push this into a two-season construction project. This could potentially result in higher bids due to increased risk for the contractor and variability in pricing.

Summary

The expansion of the LCCA program to include multiple course HMA overlays and thin concrete overlays is currently scheduled for projects with a let date of July 7, 2023, and after. In summary, we are requesting an LCCA waiver for the work on M-51 to avoid further delays, additional costs to the consultant contract due to plan updates, and additional construction costs. The pavement type for the reconstruction areas has been determined by the results of the LCCA for those segments.

Recommendation(s) – The Southwest Region and Coloma Business Office request an exemption to the soon to be implemented LCCA requirements on this US-12/M-51 Design-Bid-Build project.

ACTION: Approved

9. Roadside Safety Hardware Assessment Plan for Work Zone Devices – Chris Brookes

Issue Statement – The acceptance of Work Zone Devices needs to have a separate plan for determining eligibility and crash worthiness due to the complex nature and multiple designs needed to field fit conditions. Under the National Cooperative Highway Research Program (NCHRP), 350 modifications and classes of devices were approved, and it is not practical to test every design and layout of work zone signs.

Major Issue(s) – MDOT needs to determine a process for accepting modifications to work zone devices. These devices are temporary in nature and are often field adjusted to fit conditions, so every design and layout cannot be tested. Under NCHRP 350 devices were allowed to be passed in groups based upon engineering analysis and similar tests. MDOT needs to determine and approve a plan for how to handle device modifications so that work zones are not limited in what can be utilized to increase motorist safety on the roadway.

Background/History – The Federal Highway Administration (FHWA) set a sunset date of December 31, 2019, to transition to the Manual for Assessing Safety Hardware (MASH) compliant temporary devices but allowed for the remaining service life of the devices to be used. The service life was never defined and was left up to each state department of transportation to determine a policy. MDOT provided guidance on August 8, 2019. This was discussed at the September EOC meeting and tabled until the Attorney General (AG) had a chance to review. The AG had two minor edit suggestions but supported the plan.

Recommendation(s) – The attached Roadside Safety Hardware Assessment Plan for Work Zone Devices is being submitted for approval by the EOC.

ACTION: Approved

10. ArmorGuard™ Temporary Steel Barrier and ArmorGuard™ Gate Modifications – Carlos Torres

Subject/Issue – ArmorGuard™ Temporary Steel Barrier and ArmorGuard™ Gate modifications.

Major Issue(s) - Request for approval of the ArmorGuard™ and ArmorGuard™ Gate made with panels fabricated with a different manufacturing process. This resulted in revisions to the manufacturing tolerances for the panels. Even though this is a minor (non-significant) modification, it is a modification that should be reviewed and approved by both the Barrier Advisory Committee (BAC) and the EOC.

The BAC reviewed the information provided by the manufacturer, including a professional opinion letter from an ISO 17025 certified crash testing facility, and recommends approval of

the ArmorGuard™ Barrier and ArmorGuard™ Gate constructed with the new manufacturing process.

Background/History – The ArmorGuard™ Barrier is an NCHRP 350, TL-3 temporary steel barrier system manufactured by Lindsay Transportation Solutions. The ArmorGuard™ Barrier System can be provided in 8.5-meter (center pin to center pin) segments. The segments can be attached to form a longitudinal barrier that can provide protection for both motorists and highway personnel in temporary work zones. The segments of the system can be disconnected and moved to reconfigure the system, to bring materials into the work zone, or to allow emergency vehicles access. The system provides positive barrier separation when in the attached and locked position.

The ArmorGuard™ Gate is a temporary barrier gate system, also manufactured by Lindsay Transportation Solutions, that is NCHRP 350, TL-3 compliant. The ArmorGuard™ Gate System provides a means to close 8-, 12-, and 16-meter openings in rigid longitudinal barrier systems. The system can be opened to allow emergency vehicle access and to be able to reroute traffic. The system provides positive separation when in the locked position.

Both the ArmorGuard™ Barrier and ArmorGuard™ Gate systems are eligible for Federal aid reimbursement as NCHRP 350 compliant devices per FHWA eligibility letters B-87, B-108, and B-173.

According to Lindsay, the existing supplier can no longer accommodate the manufacturing requirements of the ArmorGuard™ panels. As a result, Lindsay was forced to look for alternative sources. In doing so, a manufacturing process change was necessary and is affecting some of the design tolerances of the panels, as follows:

A. Overall Cut Length: was ±0.063”, now ±0.250”
B. Hole to Hole Dimensions: were ±0.063”, now ±0.125”
C. Cross-Section Profile Dimensions: were ±0.063”, now ±0.188”
D. Bend Angles: were ±0.50 deg., now ±1.00 deg.

However, the material will remain the same, and the minor tolerance alterations and manufacturing process change will not affect the assembly, appearance, system performance, or crashworthiness of the ArmorGuard™.

Lindsay Transportation Solutions reached out to Scienze e Tecnologie Aerospaziale, a crash testing laboratory based in Milan, Italy, and Safe Technologies, LLC, an ISO 17025 certified crash testing facility located in Rio Vista, California. Both parties issued professional opinion letters indicating that the adjusted tolerances for fabricating the ArmorGuard™ systems will not affect assembly, appearance, system performance, or crashworthiness.

Recommendation(s) – Approval of the ArmorGuard™ Barrier and ArmorGuard™ Gate systems fabricated with panels manufactured with a new process and larger tolerances. EOC review and approval is recommended in this case, since the manufacturer cannot obtain a revised eligibility letter from FHWA due to federal guidelines concerning product modifications after issuance of an eligibility letter.

Status – New submittal.

ACTION: Approved

11. Revisions to MDOT's Breakaway Cable Terminal Replacement Policy – Carlos Torres

Subject/Issue – Revisions to MDOT's Breakaway Cable Terminal (BCT) Replacement Policy

Major Issue(s) - Request to revise MDOT's current BCT replacement policy, as described in subsection 7.01.41.B of the Michigan Road Design Manual (RDM). The BCT is an NCHRP 230 compliant guardrail terminal that was used extensively by MDOT prior to the adoption of NCHRP 350. MDOT still has many BCTs on trunkline roadways. The current BCT replacement policy allows for BCTs to remain in place on certain projects depending on the type of project (3R or 4R), roadway type (NHS or non-NHS), whether the guardrail installation is flared or non-flared, and whether there is guardrail work associated with the project or not.

In the interest of improving safety and upgrading MDOT's current guardrail inventory to meet current MASH crash testing criteria, BAC recommends revising MDOT's BCT replacement policy to require upgrading all BCTs encountered on all trunkline projects, including both 3R and 4R projects, NHS and non-NHS routes, all guardrail runs within the projects limits, and regardless of whether guardrail work is included as part of the project. However, this would not apply to CPM projects.

It should be noted that MDOT Maintenance is currently required to upgrade BCTs, regardless of the extent of damages. BCT repairs are prohibited. Revising MDOT's policy in subsection 7.01.41.B of the RDM will bring it more in line with MDOT's BCT maintenance policy and enhance safety on MDOT's roadways by accelerating the removal of devices that meet obsolete crash testing criteria.

Background/History – Refer to subsection 7.01.41.B of the Michigan RDM.

Recommendation(s) – Revise MDOT's BCT replacement policy to require upgrading all BCTs encountered on all trunkline projects, including both 3R and 4R projects, NHS and non-NHS routes, all guardrail runs within the projects limits (both flared and non-flared), and regardless of whether guardrail work is included as part of the project.

This would not apply to CPM projects.

Status – New submittal.

ACTION: Approved

12. Adoption of MDOT Roadside Safety Hardware Assessment and Implementation Plan – Carlos Torres

Subject/Issue – Adoption of MDOT Roadside Safety Hardware Assessment and Implementation Plan

Major Issue(s) – A general plan is needed to address the assessment and implementation of roadside safety devices. The plan defines the groups or areas within MDOT responsible for evaluating different roadside safety hardware categories. Furthermore, the plan contains guidelines for addressing different scenarios that may be encountered during the evaluation of roadside safety devices, such as evaluating proprietary and non-proprietary devices, devices that do not have FHWA eligibility letters, and device modifications. This plan will aid in and, hopefully, expedite MDOT's transition to MASH-compliant roadside safety devices.

It should be noted that the general MDOT Roadside Safety Hardware Assessment and Implementation Plan presented as part of this EOC item will not cover most work zone devices. Most work zone devices will be covered under a separate assessment and implementation plan, developed by the Construction Field Services (CFS) Division, Field Operations Section, Work Zone Management Unit.

Background/History – As presented during the 6/2/16 EOC meeting, FHWA and AASHTO agreed to the implementation of the following sunset dates for NCHRP 350 and MASH 2009 roadside safety devices:

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

However, with some device categories and sub-categories, there have been difficulties trying to meet the sunset dates that were implemented in 2015. Some of these difficulties include:

- Lack of FHWA eligibility letters for certain devices
- Modifications made during the course of crash testing
- Modifications made after a device was successfully crash tested and received an FHWA eligibility letter
- Devices developed based on partial crash testing (i.e., not running the full suite of crash testing recommended under MASH)
- Evaluations not based on crash testing (e.g., computer simulations, pendulum testing, bogie vehicle testing, in-service performance evaluations, etc.)
- Evaluations based on professional opinions or other types of research
- Lack of research in certain areas
- Lack of MASH-compliant devices

- Lack of devices deemed adequate by MDOT
- Possible issues when there is only one proprietary MASH-compliant option

As a result, state transportation agencies have developed state-specific assessment and implementation plans to address these issues. Currently, MDOT has several new product evaluations on hold pending approval of a roadside safety hardware assessment and implementation plan. Therefore, having a roadside safety hardware assessment plan will establish guidelines for evaluating roadside safety devices, expedite the review of new and modified roadside safety devices, and aid in MDOT's transition to MASH-compliant devices.

Recommendation(s) – Adopt the Michigan Department of Transportation Roadside Safety Hardware Assessment and Implementation Plan, dated October 2022.

As indicated previously, this plan will not cover most work zone devices. Most work zone devices will be covered under a separate plan developed by the CFS Division, Field Operations Section, Work Zone Management Unit.

Status – New submittal.

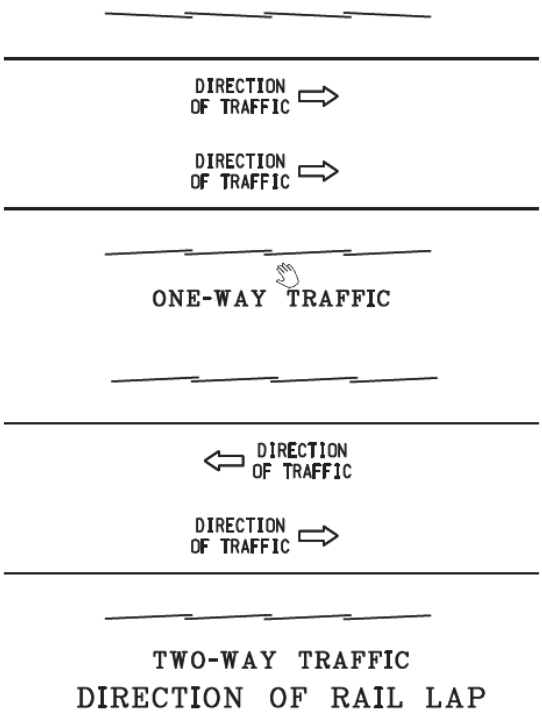
ACTION: Approved

13. Development of Guardrail Re-lapping Guidelines for Temporary Traffic Conditions – Carlos Torres

Subject/Issue – Development of Guardrail Re-lapping Guidelines for Temporary Traffic Conditions

Major Issue(s) – MDOT does not have official guidelines pertaining to guardrail re-lapping due to temporary traffic conditions (e.g., traffic shifts due to construction). The need to re-lap guardrail has always been handled on a project-by-project basis using rules of thumb or engineering judgment. Developing official guidelines to address this topic will provide direction for construction staff and greater consistency on construction projects.

Background/History – As shown below, Standard Plan R-60 Series depicts how guardrail beam elements should be lapped based on the direction of the nearest direction of traffic. Beam elements are lapped in a manner that will reduce the likelihood of snagging during a collision with guardrail. But this is based on the permanent direction of traffic. At times, temporary traffic shifts result in traffic flowing in the opposite direction.



In years past, different rules of thumb were used to determine when re-lapping was deemed worthwhile during temporary traffic conditions. This has led to inconsistencies in the practice of guardrail re-lapping during temporary traffic conditions.

BAC did an inquiry to see how other states are handling guardrail re-lapping. A total of 17 responses were received:

- 13 agencies do not require re-lapping due to construction/work zone activities, regardless of temporary traffic duration or other conditions: CO, CT, DE, FL, IA, MD, MA, MT, OH, TN, TX, UT, WI
- One agency has no formal guidelines, but typically re-laps guardrail on interstate projects: IL
- One agency has no formal guidelines, but follows "best practices" (e.g., for long-duration high-speed traffic shifts, particularly on freeways where the normal traffic flow is reversed, the rail splices do typically get re-lapped.): ON
- One agency may require re-lapping, but this is as determined by the Engineer: OK
- Only one agency (NC) requires guardrail to be re-lapped in all cases and has specifications and a pay item for re-lapping guardrail

In summary, guardrail re-lapping due to construction/work zone activities does not appear to be a common practice by other state transportation agencies.

Due to the time and costs associated with re-lapping guardrail, BAC does not recommend requiring guardrail re-lapping for construction/work zone activities, regardless of traffic shift duration or other conditions. However, the guidelines should indicate that guardrail re-lapping *may* be considered, as determined by others, if deemed beneficial. This would

include cases such as projects with a traffic shift having a long duration (e.g., over one year), or if there are other site-specific conditions where temporary re-lapping is deemed beneficial. Also, guidelines should indicate that re-lapping should be paid for separately with a special pay item and special provision. However, the condition of the existing guardrail should be evaluated before considering re-lapping. In cases where existing guardrail is not in good condition, additional work and materials may be required to replace components that are not reusable. This may include complete guardrail replacement if the guardrail is in poor condition.

Recommendation(s) – Develop guidelines in MDOT's Construction Manual indicating that guardrail re-lapping is not required due to temporary traffic shifts or other construction-related activities. However, guardrail re-lapping *may* be considered on a case-by-case basis when deemed beneficial. When considering guardrail re-lapping, the condition of the existing guardrail should be evaluated to determine if portions of the guardrail are not reusable. Also, work associated with guardrail re-lapping should be handled using special provisions and special pay items, as necessary.

Status – New submittal.

ACTION: Approved

14. Revisions to Section 4.03 of the Materials Quality Assurance Procedures Manual and corresponding changes to Chapter 3 of the Procedures for Aggregate Inspection – Kevin Kennedy

Subject/Issue – Revisions to Section 4.03 of the Materials Quality Assurance Procedures (MQAP) Manual and corresponding changes to Chapter 3 of the Procedures for Aggregate Inspection.

Issue Statement – The existing Aggregate QC Program is being revised based on changes agreed to by the QC Lab Requirements for Aggregates Committee (consisting of staff from MDOT CFS, MDOT Regions, FHWA, and Michigan Aggregates Association).

Major Issue(s) – Revisions to update MDOT's MQAP and PAI to reflect changes to MDOT's Aggregate QC requirements.

Background/History – The QC Lab Requirements for Aggregates Committee has been meeting for over a year to address changes to the aggregate program. Agreed upon changes include: no requirement for IATs on QC Technicians, no biennial lab inspections, initial lab inspection not required, and participation in AASHTO Proficiency required.

Recommendation(s) – Approve revisions to the MQAP Manual and PAI.

Status – New Submittal

ACTION: Approved

15. Pavement Type Selection: I-75 BL from M-1 to west of I-75, Oakland County – Ben Krom

Issue Statement – Pavement Type Selection

Route/Location: I-75 BL: from M-1 to west of I-75, Oakland County
Job Number: 208228
Control Section: 63111
Letting Date: 10/6/2023
Total Est. Const. Cost: $21.75M

Department policy requires that a LCCA be used to determine the most cost-effective pavement design.

Major Issue(s) – MCA pointed out a discrepancy in the LCCA methodology/calculations, which was corrected and re-sent for industry review. No additional comments were received.

Background/History – Pavement selection was determined using the procedures outlined in the MDOT Pavement Selection Manual. Department Policy requires that the pavement alternate with the lowest EUAC be selected. Final pavement selection requires approval by the EOC.

Recommendation(s) – Approve the HMA pavement alternate, which has the lowest EUAC.

ACTION: Approved

16. Approval for the use of the Design-Build delivery method for Phase II of the Local Agency Bridge Bundling Program – James Ranger and Sue Datta

Issue Statement – Request approval for the use of the DB delivery method for Phase II of the Local Agency Bridge Bundling Program, which will include replacement of approximately 40 local agency-owned bridges via four DB letting packages.

Major Issue(s) – The use of the DB delivery method is being requested due to the expedited nature of the schedule. Phase II of the Local Agency Bridge Bundling Program will follow the lessons learned from Phase I of the program (Local Agency Bridge Bundling Pilot Project).

The risks associated with bridges in Phase II will be mitigated, in part, by splitting this phase of the program into four letting packages. Higher risk bridges may be delivered in later packages to allow time to mitigate issues prior to award of the DB contract. The following risks will be evaluated and addressed during the development phase (see attachment for additional in-progress information).

Environmental risks include:

- EGLE permits at all bridges and DNR permits at several locations.
- Potential for mussels at several locations.
- Multiple historic bridges.

Right of Way risks include possible impacts due to large grade raises.

Various utility impacts are possible at multiple locations.

Coordination with local agencies will be significant, including Local Agency Champions.

Background/History – Phase II of this project will include the replacement of 39 local agency-owned bridges, one superstructure replacement, and approach reconstruction.

Phase II will be split into the following letting packages:

- Upper Bridges
- Lower-Risk Lower East Bridges
- Lower West Bridges
- Medium and High-Risk Lower East Bridges

Phase II Overview
Phase II Total Cost: $87M
Work Description: 39 bridge replacements, 1 superstructure replacement, and approaches

Upper Bridges
Job Number: 217023
Work Description: 8 bridge replacements and approaches
Counties: Alcona, Alger, Benzie, Missaukee, Luce, Marquette, Presque Isle
Project Cost: $12.9M
Letting Date: July 2023

Lower-Risk Lower East Bridges
Job Number: 217026, 217033, 217031
Work Description: 12 bridge replacements and approaches
Counties: Arenac, Lapeer, Lenawee, Livingston, Macomb, Monroe, Saginaw, Tuscola
Project Cost: $18.9M
Letting Date: November 2023

Lower West Bridges
Job Number: 217022, 217024, 217025, 215209
Work Description: 7 bridge replacements, 1 superstructure replacement, and approaches
Counties: Allegan, Branch, Calhoun, Jackson, Ottawa
Cities: Coopersville, Ferrysburg
Project Cost: $25.3M
Letting Date: March 2024

Medium and High-Risk Lower East Bridges
Job Number: 217034, 217035, 217036, 217038, 217039
Work Description: 13 bridge replacements and approaches
Counties: Bay, Genesee, Huron, Lapeer, Lenawee, Livingston, Monroe Oakland, Saginaw, Wayne
Cities: Flint

Project Cost: $30.2M
Letting Date: August 2024

Recommendation(s) – The ICC has approved the use of DB contracting method.

ACTION: Approved

17. Changes to the EOC Charter Updates – All EOC members

ACTION: Charter under review by EOC members

Michael Townley

Digitally signed by: Michael Townley
DN: CN = Michael Townley email = townleym@michigan.gov C = US O = State of Michigan
Date: 2022.12.20 15:09:28 -05'00'

Michael Townley, Secretary
Engineering Operations Committee

RA:lrb

cc: EOC Members
Meeting Guests
Region Engineers (MDOT)
Assoc. Region Engineers (MDOT)
TSC Managers (MDOT)
L. Doyle (MDOT)
C. Libiran (MDOT)
L. Mester (MDOT)
C. Newell (MDOT)
M. Ackerson-Ware (MRPA)
T. Burch (FHWA)
R. Brenke (ACEC)
D. DeGraaf (MCA)
C. Mills (APAM)
D. Needham (MAA)
R. Vandeventer (MITA)