



Road & Bridge Design Publications

Monthly Update – February 2022

Revisions for the month of **February** are listed and displayed below and will be included in projects submitted for the **June** letting. The special detail index from January will remain in effect.

E-mail road related questions to MDOT-Road-Design-Standards@michigan.gov.

E-mail bridge related questions to MDOT-Bridge-Design-Standards@michigan.gov.

Road Design Manual

11.04.05: The Measurement and Payment Section: Made minor revisions to the section, including the addition to use the document outlined in subsection 11.04.01 if the special provision has more than one pay item.

13.04.04: Removing Miscellaneous Structures & Materials: Added the pay item, “Dr Structure, Rem” to the list of pay items in subsection “A” and eliminated subsection “C” which discussed drainage structure removal.

Bridge Design Manual

2.02.21 A.3. & B.4: For bridge project scoping, the cost estimating spreadsheet, spreadsheet key and life cycle cost analysis worksheet are available on the Bridge Management and Scoping [website](#), under the “Project Estimating” menu. The unit costs were changed to reflect recent cost increases based on actual lettings. Additional information can be found in the Bridge Cost Estimate Worksheet Key. Using the current spreadsheets from the website when scoping projects is critical.

7.02.30 E. (LFD & LRFD) & Chapter 7 Table of Contents: Updated section title and added criteria for the use of PVC (polyvinyl chloride) liner on culverts.

Updates to the MDOT Cell Library, Sample Plans, and other automated tools may be required in tandem with some of this month's updates. Until such updates can be made, it is the designer's/detailer's responsibility to manually incorporate any necessary revisions to notes and plan details to reflect these revisions.

MICHIGAN DESIGN MANUAL ROAD DESIGN

11.04.05 (revised 2-22-2022)

The Measurement and Payment Section

This section is used to establish any new pay items that will be used to pay for the work required, and state how the work required will be paid for.

Explain how each pay item will be measured if it is not apparent from the description of work and the pay unit. For example, "...along the centerline shown on the plans, from the top of the wall to the top of the footing..."

List pay items using the exact AASHTO Preconstruction wording and using the established abbreviations (see Pay Item Code Book). Follow the standard specification format of noun, adjective, modifier for all new pay items. See example at the bottom of this page. See [Section 11.05](#) for further discussion on pay items names and the use of *Modified* and *Special* with existing pay items.

If no new pay items were created and existing pay items will be used, it is not necessary to include a listing of pay items and pay units. Include a general statement such as "This work will be measured and paid for as specified in subsection ###.04 of the Standard Specifications for Construction."

Exceptions to this rule include instances when Department or a third party will furnish equipment, labor or materials to be used or installed by the contractor or if a unique piece of equipment or specific skilled labor (example: licensed electrician, certified pesticide applicator) is required to complete the work.

11.04.05 (continued)

Include the statement that "The completed work, as described, will be measured and paid for at the contract unit price using the following pay item(s)". When all significant aspects of the work have been included in the description section, and all acceptance requirements have been explained in the materials and construction sections, this statement eliminates the need to restate what is included in each pay item in the measurement and payment section. If a detailed pay item description is needed, include it after the list of pay items.

Do not state that "Payment for [item] includes all labor, equipment and materials required to complete the work as described." This fact is covered by every Proposal cover sheet: "The undersigned hereby proposes to furnish all necessary machinery, tools, apparatus, and other means of construction, do all the work, furnish all the materials except as otherwise specified and... to complete the work ... in strict conformity with the requirements of the [year] Standard Specifications for Construction..." and by the definition of "work" in subsection 101.03 of the Standard Specifications for Construction: "Work. The furnishing of all labor, materials, equipment, and other items necessary to complete the project in accordance with the contract. This includes all alterations, amendments or extensions thereto, made by work order or other written orders of the Engineer."

If the special provision has more than one pay item, ensure the document outline from subsection 11.04.01 is used.

Pay Items

Pay Unit

1 st pay item name	1 st pay unit
2 nd pay item name	2 nd pay unit
Conc, Reinf, 12 inch	Square Yard
Conc, Nonreinf, 12 inch, Spec	Square Yard

MICHIGAN DESIGN MANUAL

ROAD DESIGN

CHAPTER 13 MISCELLANEOUS PAY ITEMS (continued)

- 13.04.03 Removing Culverts and Sewers
 - A. Removing Pipe Culverts
 - B. Removing Culverts Other Than Pipe
 - C. Removing Culvert Ends
 - D. Removing Sewers
 - E. Salvaging Culvert End Sections

- 13.04.04 Removing Miscellaneous Structures & Materials
 - A. Pay Items
 - B. Removing Pavement

- 13.05 OTHER COMMONLY USED MISCELLANEOUS ITEMS**

- 13.05.01 Obliterating Roadway
- 13.05.02 Project Cleanup
- 13.05.03 Field Offices and Laboratories
- 13.05.04 Transporting Salvaged MDOT Material
- 13.05.05 Mobilization
- 13.05.06 Escalator Clauses - Fuel, Asphalt, Cement, and Steel
- 13.05.07 Section deleted

MICHIGAN DESIGN MANUAL ROAD DESIGN

13.04.04 (revised 2-22-2022)

Removing Miscellaneous Structures & Materials


A. Pay Items

Pay items for removing miscellaneous structures include the following:

- Pavt, Rem
- Curb, Rem
- Gutter, Rem
- Curb and Gutter, Rem
- Sidewalk, Rem
- Basement Cleanout
- Track, Rem
- Utility Pole, Rem
- Structures, Rem
- Structures, Rem Portions
- Culv, Other than Pipe, Rem
- Masonry and Conc Structure, Rem
- Guardrail, Rem
- Fence, Rem
- Concrete Barrier, Rem
- Glare Screen, Rem
- Dr Structure, Rem

B. Removing Pavement

Removal of HMA pavements and concrete or masonry pavements is covered in the **Standard Specifications for Construction**. The specifications for HMA pavements are somewhat confusing as they include both removing pavement and removing HMA surface items. The table in [Section 6.03.04B\(6\)](#) shows clearly the proper pay items for different situations.



13.05

OTHER COMMONLY USED MISCELLANEOUS ITEMS

13.05.01 (revised 4-20-2015)

Obliterating Roadway

Obliterating Roadway is completely eliminating old roads or temporary roads that are no longer needed. It shall apply only to those portions of the existing or temporary road outside the limits of the new roadway. The old road to be obliterated shall be graded to provide suitable drainage and produce an appearance of blending into the adjacent terrain. During The Plan Review, it should be discussed whether to bury the road surface or remove the road surface. When burying the road is not a viable option, the road surface should be set up for removal and paid for separately before obliteration begins. Ditches should be filled or graded to give a natural appearance. Old Structures should be broken down and buried or removed. The removal of large structures may be paid for separately. Obliterated areas shall be topsoiled, seeded, fertilized and mulched which will be measured and paid for separately. Obliteration may be accomplished by breaking the pavement surface to provide drainage and covering the roadway to a depth of at least 12 inches with suitable material.

13.05.02

Project Cleanup

"Project Cleanup" consists of cleaning up the project, including roadsides, prior to final acceptance. Project Cleanup provides for the removal of all debris, including old fences, fallen timber, logs and rubbish, within the right-of-way up to 50' beyond the grading limits. This work also includes the clean out of all culverts, sewers, and drainage structures that contain sediments from the contractors operations.

Project Cleanup should be included as a pay item on most projects.

MICHIGAN DESIGN MANUAL

BRIDGE DESIGN

2.02.19 (12-17-2018)

Final Project Coordination Meeting

The review of final plans and proposal and project coordination is completed through Final Project Coordination (FPC) meeting. The comments and information gathered at this meeting are used to complete the project and bring plans to 100% final stages in preparation for the Omissions/Errors Check (OEC). For more information regarding the FPC see Section [3.03](#).

2.02.20 (12-17-2018)

Omissions / Errors Check (OEC)

The sign off for 100% completed final plans and proposal is done through an Omissions / Errors Check (OEC) Review. For more information regarding OEC sign off see Section [3.04](#). (11-19-99)

2.02.21 (12-17-2018)

Rehabilitation Project Scoping (11-19-99)

Project Scoping Documents will be provided for all bridge rehabilitation projects and submitted to the Bridge Systems Manager. The document package will contain different items depending on if the scoping work is done by consultants or MDOT.

A. Scoping by MDOT

Provide the following when scoping work is done by MDOT:

1. Program Revision Request (within JobNet) (5-28-2013) (3-26-2018)
2. Project Concept Statement (from JobNet) (3-26-2018)
3. **Bridge Cost Estimating Worksheet**

For worksheet and key see Bridge Management and Scoping [website](#), under the "Project Estimating" menu. (2-22-2022)

4. Latest Bridge Inspection Report
5. Project Photos

Provide additional information if available, such as:

6. Detailed Inspection Report
7. Underclearance waiver information
8. Diver Inspection Report
9. Load Posting Form
10. Delamination Survey (10-22-2012)
11. Other pertinent information which will assist in the design

MICHIGAN DESIGN MANUAL BRIDGE DESIGN

2.02.21 (continued)

B. Scoping by Consultant

In addition to the above, provide the following when scoping work is done by consultant:

1. Field Inspection Findings, describing all site issues
2. Recommended repair alternative
3. At least three rehabilitation options with cost estimates
4. Life Cycle Cost Analysis

For worksheet see Bridge Management and Scoping [website](#), under the "Project Estimating" menu. (2-22-2022)

The proponent Region has the responsibility for entering the project in JobNet (internal information system) and for submitting the Project Scoping Document Package to the Bridge Systems Manager. The project must also have the approval of the Regional Systems Manager/Associate Region Engineer of Development. (3-26-2018) (12-17-2018)

MICHIGAN DESIGN MANUAL

BRIDGE DESIGN

CHAPTER 7 DESIGN CRITERIA-NEW AND RECONSTRUCTION PROJECTS INDEX (continued)

- 7.02.25 Pavement Seats
- 7.02.26 Drain Castings
- 7.02.27 Sidewalks
- 7.02.28 Railing
- 7.02.29 Fencing
- 7.02.30 Precast **Box**/Three Sided/Arch Culverts (**2-22-2022**)
- 7.02.31 Deck Replacements (11-28-2011)
- 7.02.32 Ride Quality (8-20-2012)

7.03 SUBSTRUCTURE

- 7.03.01 Abutment Design
- 7.03.02 Footing Design
- 7.03.03 Pier Design
- 7.03.04 Cofferdams
- 7.03.05 Subfootings
- 7.03.06 Tremie Seal Design
- 7.03.07 Excavation
- 7.03.08 Steel Sheet Piling
- 7.03.09 Piles
- 7.03.10 Slope Treatment Under End Spans
- 7.03.11 Concrete Sealers (5-1-2000)
- 7.03.12 Mechanically Stabilized Earth (MSE) Wall Requirements (11-28-2011)
- 7.03.13 Drilled Shafts (3-26-2018)

7.04 STEEL REINFORCEMENT (11-28-2011)

- 7.04.01 Steel Reinforcement
- 7.04.02 Stainless Steel Reinforcement

MICHIGAN DESIGN MANUAL BRIDGE DESIGN

7.02.30 (8-23-2021)

Precast **Box/Three Sided/Arch Culverts**

Design criteria and considerations:

- A. Verify with manufacturers the maximum span length available.
- B. The number of manufacturers of the specified span length needs to be at least two.
- C. When selecting culvert rise, consider all users of the waterway, along with normal water surface under clearance and freeboard at high water.
- D. For structure (culvert) lengths that can accommodate a clear span between guardrail posts of 25'-0" or less use "Guardrail Long Span, Detail MGS-1, MGS-2 or MGS-3" (Standard Plan R-72-Series) to span the culvert. Ensure that the requirements of Standard Plan R-72-Series (e.g., headwall location and size, guardrail post locations, etc.) are met prior to specifying the use of the standard. Otherwise, extend height of headwalls to 36" above plan grade elevation and attach guardrail to headwall as detailed on the plans.
- E. Add a PVC (polyvinyl chloride) liner that covers entire top and sides of all buried culverts. For precast boxes, extend the liner 3" into culvert bedding and turn out 6" horizontally. For three sided and arch culverts, extend the liner 3" below the top of footing and turn out 6" horizontally. Extend the liner a minimum of 3 feet beyond the construction joint between culvert and wingwalls and turn up at back side of headwalls. At the ends of the culvert, adhere the perimeter of the liner with an adhesive as recommended by the PVC liner manufacturer.

Include Special Provision for Polyvinyl Chloride Liner in proposal.

(2-22-2022)

Additional information and criteria is included in the current Standard Specifications.

MICHIGAN DESIGN MANUAL BRIDGE DESIGN - CHAPTER 7: LRFD

CHAPTER 7 DESIGN CRITERIA-NEW AND RECONSTRUCTION PROJECTS INDEX (continued)

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