CHAPTER 12

REHABILITATION PROJECTS

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For the purpose of this volume, the following definitions will be used:

Preventive maintenance work is defined as bridge activities that will repair and preserve the bridge. Projects where only this work is done do not have to include geometric enhancements. This is done with the understanding that future rehabilitation or reconstruction projects will contain appropriate safety and geometric enhancements, thus Design Exceptions / Variances are not required for preventive maintenance work. These activities include joint replacement, pin and hanger replacement, complete painting, zone painting, thin polymer overlays, deck patching, asphalt overlay, hot mix asphalt (HMA) cap and scour countermeasures.


Rehabilitation (3R) is defined as work undertaken to extend the service life of an existing bridge and to enhance highway safety. The intent of this work is to return a bridge to a condition of structural or functional adequacy. This work may include upgrading geometric features such as roadway (bridge) widening (no increase in number of through lanes), flattening curves, or improving sight distance. Examples of this work are shallow and deep concrete overlays, superstructure repairs, railing replacements, extensive substructure repair, and substructure replacement. (8-20-2009)

Reconstruction (4R) involves substantial changes to the existing structure such as bridge deck replacement or greater. See Chapter 7 for reconstruction (including deck replacements) projects requirements.

(3-26-2012)

Bridges to remain in place criteria occurs when a bridge carrying road project traffic falls within a road project and no work is planned for the bridge (see AASHTO publication, A Policy on Design Standards - Interstate System or A Policy on Geometric Design of Highways and Streets, 2011, 6th Edition). If the bridge does not meet the criteria to “remain in place” the Road Designer shall submit any necessary design exceptions or design variances for the bridge. (3-26-2012) (3-21-2016) (8-22-2016) (2-21-2017)

With structure resurfacing, railing upgrading and joint replacement projects the structural adequacy of the superstructure shall be evaluated.
SCAPE OF REHABILITATION PROJECTS (8-20-2009)

The scope for rehabilitation projects is created by the Region Bridge Engineer using the Bridge Deck Preservation Matrix (Section 12.09.02) and Steel Bridge Girder Coatings Repair Matrix (Section 12.07). As soon as possible after assignment, the bridge design engineer should schedule a scope verification meeting. At this meeting, the scope of the project will be reviewed. (10-23-2017)

If a project includes 3R and 4R (Chapter 7) work, the applicable standards are governed by the standards that correspond individually to each work type (3R or 4R). Work type overlap within a structure may cause a default to 4R standards within the overlap (entire structure). Identify each work type on the project information sheet to distinguish where 3R guidelines and 4R standards are separately applied.

When other work types are combined with 3R or 4R projects, they are also governed separately and identified as such on the project information sheet.

Projects categorized as CPM (preventive maintenance) projects are governed by guidelines that differ from 3R and 4R Guidelines. When CPM work types are packaged with a 3R or 4R project, the portion of the project that is outside the 3R or 4R work limits is governed by the guidelines that pertain to CPM work type. When describing the work type in the request for Plan Review Meeting, identify the work type separation so that the appropriate requirements are considered within each structure. Work type overlap within a structure may cause a default to 3R or 4R requirements.

Cross road over bridges shall be treated as individual segments regardless of project work type. (8-22-2016)
12.01 (continued)

**SCOPE OF REHABILITATION PROJECTS**

In addition to any concerns the designer may have over the project scope, the following design elements must be reviewed to determine conformance with both MDOT’s 3R criteria (see Road Design Manual Chapter 3) and AASHTO standards (see also Section 12.02). For specific controlling geometric design elements, a formal design exception must be submitted and approved when the standards cannot be met. Other specific elements and conditions will require a less formal design variance when standards cannot be met. These elements are listed below with their corresponding level of documentation and/or approval.

The Geometric Design Unit will review plans and identify the need for Design Exceptions (DE) or Design Variances (DV) when standards are not met for specified geometric design elements. See also Section 12.03.

<table>
<thead>
<tr>
<th>Non-Standard Design Element (NHS and Non-NHS)</th>
<th>Applicability of Design Exception (DE)</th>
<th>Design Variance (DV)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Design Speed &lt; Posted Speed</td>
<td>DE</td>
<td>DE</td>
</tr>
<tr>
<td>Lane Width*</td>
<td>DE</td>
<td>DV</td>
</tr>
<tr>
<td>Shoulder Width</td>
<td>DE</td>
<td>DV</td>
</tr>
<tr>
<td>Horizontal Curve Radius*</td>
<td>DE</td>
<td>DV</td>
</tr>
<tr>
<td>Superelevation Rate*</td>
<td>DE</td>
<td>DV</td>
</tr>
<tr>
<td>Superelevation Transition Length*</td>
<td>DV</td>
<td>DV</td>
</tr>
<tr>
<td>Maximum Grade*</td>
<td>DE</td>
<td>DV</td>
</tr>
<tr>
<td>Stopping Sight Distance (HSO and K-value Horizontal and Vertical)*</td>
<td>DE</td>
<td>DV</td>
</tr>
<tr>
<td>Cross Slope</td>
<td>DE</td>
<td>DV</td>
</tr>
<tr>
<td>Vertical Clearance</td>
<td>DE</td>
<td>DE</td>
</tr>
<tr>
<td>Design Loading Structural Capacity</td>
<td>DE</td>
<td>DE</td>
</tr>
<tr>
<td>Ramp Acceleration / Deceleration Lanes Length*</td>
<td>DV</td>
<td>DV</td>
</tr>
</tbody>
</table>

*Values based on design speeds less than posted.

For more detailed information/definitions of elements, see the Road Design Manual.

12.01.01  Structures Carrying Pedestrian Traffic

Where pedestrian traffic exists across a structure having sidewalks less than 4'-0" wide, an evaluation must be made to determine the hazard involved and to consider practical improvements.

All structures carrying pedestrians need to be evaluated for conformance with the Americans with Disabilities Act (ADA) requirements.

Regardess of project work type, expansion joints located on sidewalks shall be fitted with cover plates to eliminate vertical depressions caused by the joint. Cover plates may be galvanized steel (AASHTO M270, Grade 36) or steel encapsulated in EPDM rubber or neoprene (polychloroprene). Cover plates shall meet all the requirements set forth by ADA. See Section 7.02.27 & 12.06.01 and EJ3 & EJ4 Sheets. (8-20-2009) (3-26-2012)

Where recommended by the Region Project Development or Bridge Engineer, rehabilitation projects should include pedestrian fencing. In Metro Detroit, all rehabilitation projects, including painting projects, over freeways should include pedestrian fencing.

For limits of the metropolitan area see Appendix 12.01.01. (8-6-92)

For information regarding MDOT fencing policy and design criteria see Section 7.02.29 and Section 7.05.

12.01.02  Historic Bridges

Consideration must be given to preserving structures designated as “historic bridges.” The project engineer can find a bridge’s historical significance from MIBRIDGE (web based structure management application). (5-28-2013) (2-21-2017)

Designers rehabilitating historically designated bridges shall contact the Cultural Resource Coordinator in the Environmental Services Section of the Bureau of Highway Development to determine what measures are practical and justified to preserve the historical value. Where projects are insufficiently scoped for the proposed work, adding significantly to the cost of the project, the designer shall request the Region Project Development Engineer to appropriate the additional funds from their bridge budget.
12.02

GEOMETRIC CRITERIA

(9-1-88) While it is desirable to improve all structures to current design standards, upgrading to this extent may not be considered cost effective where a project is otherwise programmed for only rehabilitation. Criteria for roadway widths and design loading structural capacity have been established in *A Policy on Design Standards - Interstate System*, 2005, and *A Policy on Geometric Design of Highways and Streets, 2011, 6th Edition*, published by AASHTO. These criteria are based on the type of roadway carried by the structure and are summarized in Appendix 12.02. Criteria for structures carrying interstate freeways are provided in AASHTO's 2005 edition of *A Policy On Design Standards - Interstate System*. The policy states: “The standards used for horizontal alignment, vertical alignment, and widths of median, traveled way, and shoulders for resurfacing, restoration and rehabilitation projects may be the AASHTO interstate standards that were in effect at the time of the original construction or inclusion into the interstate system.” Non Interstate structures shall adhere to *A Policy on Geometric Design of Highways and Streets, 2011, 6th Edition* design criteria (standards). Therefore, if a bridge on a road project is not altered it is subject to design exceptions or design variances for full new/reconstruction standards. (8-20-2009) (3-21-2016) (2-21-2017)

12.02.01

Vertical Clearance (5-1-2000)

For Design Exception Requirements for Vertical Clearance see Appendix 12.02.01.
12.03

DESIGN EXCEPTIONS / VARIANCES

Design Exceptions / Variances shall be identified and completed during the Scope Verification Process or at Project Scoping. Submittals of Design Exceptions / Variances on a timely basis are essential to maintain the project schedule and provide an approved design where conditions may inhibit designers from meeting the required design criteria. (8-20-2009)

Design Exception (DE) - Design Exception requests are submitted on Form DE26 and require approval by the Engineer of Design. With the exception of low speed (< 50 mph) vertical clearance DE’s, subsequent FHWA approval is required for DE elements specifically designated for federal approval in the Project Specific Oversight Agreement (PSOA).

Along with the justification for not meeting MDOT and/or AASHTO standards the design exception includes a crash analysis (if applicable) and the estimated total cost required to attain full standards compliance. See Road Design Manual Section 14.11 for design exception submittal procedures.

12.03 (continued)

Design Variance (DV) – Design Variances are submitted on Form DV26. The procedures and conditions of design variances are as follows:

- Crash analysis review on the element in question.
- Simple justification for not meeting standards (cost, ROW, environmental, etc.)
- If the DV involves a geometric element affected by a bridge, coordination with the Bridge Design Supervising Engineer is required.
- The DV is signed by the Associate Region Engineer of Development affirming that the DV is appropriate.
- The signed DV in ProjectWise completes the DV process.

During QA review of final plan package, if a DV is needed and not provided, the project will not proceed to letting until a DV is provided. If the DV is provided, then the project proceeds. Verification must be indicated on the Milestone Checklist and the Certification & Acceptance (CA) form.

See Road Design Manual Section 14.11 for additional information on design variances.

When a proposed road rehabilitation project contains a bridge not conforming to minimum standards, and no work is proposed for the bridge, AASHTO “bridges to remain in place” criteria apply to the bridges. See AASHTO publication, *A Policy on Design Standards- Interstate System*, 2005 or *A Policy on Geometric Design of Highways and Streets*, 2011 6th Edition. The road Design Engineer/Project Manager will prepare the design exception / variance request and shall be responsible for submitting any necessary design exceptions or design variances for the bridge. (8-20-2009) (2-21-2017)
12.03.01

Requests for Traffic Volumes and Crash Histories

(9-1-88) When requesting traffic volumes and crash histories, the Design Engineer should advise the appropriate Division or Support Area as to when the response is needed to meet the schedule for plan preparation. The request should also identify any other work included within the project limits, e.g., additional bridges or road construction.

A. Traffic Volumes (Traffic Analysis Request)

Send requests for traffic volumes to the Bureau of Transportation Planning, Project Planning Section using MDOT Form 1730.

(5-1-2000) (5-28-2013) (02-17-2014)

B. Crash Histories

Send requests for crash histories to the appropriate Region or Lansing Traffic and Safety personnel. (See sample submittal in Appendix 12.03.01 B.) (9-2-2003)

Where underclearance is the only design exception, however, the concern about crashes is limited to impacts from high loads. This history and the approximate traffic volume are most expeditiously obtained from the Bridge Management Unit of Design Division. (8-6-92) (3-26-2012)
12.04 STRUCTURE RESURFACING

(9-2-2003)

Where the scope of work indicates an overlay, it will be for one of the following types:

- Shallow concrete overlay
- Deep concrete overlay
- Hot mix asphalt (HMA) wearing course

Shallow concrete overlays are either latex or silica fume. Use this option when additional deck work is anticipated in 10 to 15 years.

Deep overlays are silica fume modified mixes or Grade D concrete with slag cement replacement. Use this option where the underside of the deck is sound and additional deck work is not anticipated for 25 to 30 years. See Section 12.04.06 B. (1-20-2015)

Use an HMA wearing course on a waterproofing barrier - where additional deck work is anticipated within 5 to 10 years. (12-5-2005)

With all types of overlays, an existing thrie beam retrofit height of 34” to top of rail shall be maintained. (12-5-2005)

See the Bridge Deck Preservation Matrix (Section 12.09.02) for further clarification.

12.04.03 Concrete Removal

(5-1-2000) Decks which are to be overlaid with a concrete surfacing mixture will be prepared by scarification followed by two passes of hydrodemolition.

12.04.01 Origin of Projects

Resurfacing projects usually originate from the bridge maintenance programs of the Region/TSC. They may also originate from a road resurfacing project, since the FHWA requires all structures within the limits of such projects be considered for upgrading if there is a need.

12.04.02 Bridges Within Road Project Limits

(9-2-2003) Concrete decks that are in good condition and that have no existing hot mix asphalt (HMA) overlay will be gapped out of road resurfacing projects. If the deck condition is poor or there is an HMA overlay, they shall be treated as follows:

A. If the deck is scheduled for a concrete overlay, it shall be included in the project as a concrete overlay.
B. If the deck is scheduled for replacement within two years, the deck may be overlaid with HMA. Any existing HMA shall be removed.
C. Gapping out the HMA overlay is not cost effective for very short structures. For these structures, the HMA overlay will be continued across the structure after placing a waterproofing barrier.

See section 7.02.19 G when superelevations and parabolic crowns are encountered on an overlay project. (12-5-2005) (3-26-2012)

If feasible overlays should be done to a 2 % cross slope, otherwise a 1.5 % slope is acceptable. A check of the structural adequacy of the superstructure shall be done and composite action of shallow and deep concrete overlays according to AASHTO Bridge Specifications shall also be considered. (8-20-2009)
Hydrodemolishing

Normally, the entire deck surface will be hydrodemolished regardless of the apparent extent of unsound concrete. This will assure removal of any undiscovered delaminations along with the layer of concrete having the highest chloride contamination. Any existing overlays or hot mix asphalt (HMA) patches must be removed, and the deck scarified, before beginning the first pass of hydrodemolishing. Calculate area with limits as reference lines and toes of barriers/curbs. Eliminate area of link slabs if they exist and add note 8.09.02 R. to plans. (12-5-2005)

Ideally, properly calibrated hydrodemolishing equipment will remove the specified depth of sound concrete and all unsound concrete. From experience, it is known that some unsound concrete will remain after one pass and the need for a second pass can be anticipated. The second pass area shall be estimated at 4% of the first pass. If the deck to be overlaid has an existing latex overlay, the second pass quantity will be estimated at 10% of the first pass. This is due to the greater difficulty in estimating the areas of unsound concrete. (5-1-2000)

Ensure that the structural capacity (design, legal and permit loading) for bridges during hydrodemolishing for rehabilitation/overlay projects will not be decreased. For further information regarding hydrodemolishing of variable depth concrete T-Beam bridges and precautions to take, please see the “Rehab Guidelines for T-Beam Structures” (http://www.michigan.gov/documents/mdot/Rehab_Guidelines_for_T-Beam_Structures_573338_7.pdf) reference document, located at the Bridge Operations, Bridge Management and Scoping website. (7-17-2017)

Hand Chipping

When it is necessary to remove unsound concrete by hand chipping, the removal of the concrete will be divided into two categories:

A. Hand Chipping - Shallow:
   Where concrete removal is not required to be deeper than the midpoint of the top reinforcement, the concrete removal shall be bid as "Hand Chipping, Shallow."

B. Hand Chipping - Deep:
   Where concrete removal is required to be below the midpoint of the top reinforcement, the concrete removal shall be bid as "Hand Chipping, Deep."

Where bridge decks require hand chipping, the areas requiring it shall be indicated in a diagram included on the plans. Normally, the Engineer should increase the total area of delaminations shown on the maintenance report by 50 percent to arrive at the plan quantity for hand chipping. However, if spalled or delaminated areas occur in clusters, each cluster should be enclosed in an assumed area to be hand chipped. The total of the assumed areas should be increased by 20 percent to arrive at the plan quantity. (9-1-88)
12.04 (continued)

12.04.06

Concrete Overlays (5-1-2000)

MDOT uses the following two strategies for concrete overlays (also see Section 12.09.02 and the Bridge Deck Preservation Matrix):

A. Shallow Overlays

Shallow overlays are a medium term fix. They are designed to last approximately 10 to 15 years.

Shallow overlays consist of a latex modified, or silica fume modified concrete overlay mixture placed a minimum of 1½" in thickness. This is placed after the existing deck has been scarified (¼") and hydrodemolished (¾").

B. Deep Overlays

Deep overlays are a long term fix. They are designed to last 20 to 30 years depending on the condition of the existing deck.

Deep overlays consist of a concrete overlay made of either silica fume modified concrete or Grade D concrete with slag cement replacement. It is placed on the existing deck after it has been scarified (¼") and hydrodemolished (¾").

12.04.06 B. (continued)

For decks 7½" or less in thickness, the deck is scarified ¼" and hydrodemolished 2¼" or to ¾" below the top mat of steel, whichever is less. The overlay is a minimum of 3" in thickness. (10-24-2001)

For decks greater than 7½" in thickness, the deck is scarified ¼" and hydrodemolished 3¼" or to ¾" below the top mat of steel, whichever is less. The standard concrete overlay should use silica fume modified concrete with a minimum thickness of 4". (10-24-2001) (1-20-2015)

Deep overlays for which 2/3 or more of the deck will be greater than 4" in thickness should use a Grade D concrete that replaces 25 to 40 percent of the required cement content with slag cement. These overlays shall not become shallower than 2". Additional chipping at the gutter line (toe of barrier or curb) may be detailed to accommodate this requirement. See the Special Provision for Deep Concrete Bridge Deck Overlays. (1-20-2015)

12.04.07

Hot Mix Asphalt (HMA) Overlays and Caps (12-5-2005)

In general, an HMA overlay or cap is not a preferred treatment for bridge decks. Where a bridge is scheduled for a deck replacement within two years, an HMA cap is an acceptable means of obtaining rideability.

Where HMA is used for a longer term overlay (five years or more) the designer must incorporate a waterproofing membrane in the design (see the Standard Specifications). Also see Section 12.04.

Where an HMA mix has not been specified as part of a road project, the project manager should consult the Construction Field Services Bituminous Pavement Unit for an acceptable HMA. (3-26-2012)
12.04 (continued)

12.04.08

Approaches (5-1-2000)

To eliminate approach pavement settlement, a concrete approach section will be used for all concrete overlays. For hot mix asphalt (HMA) deck overlays, a concrete approach is not necessary. (3-26-2012)

The details of the approach slab shall be as specified on Standard Plan R-45-Series except on existing structures where the grade will not be raised; the length of the approach slab shall match the existing approach slab joint.

The transverse limits of the approach section shall extend to the concrete curb and gutter.
12.05

RAILING UPGRADEING

Bridge railings shall be upgraded where the existing facility is found to be inadequate, either because of crash experience or because it fails to meet current AASHTO static load strength requirements. Upgrading will be scheduled according to the following guidelines:

A. Railings shall be upgraded at any location where a revised railing can be expected to reduce the severity of crashes.

B. Railings shall be upgraded at any location within safety upgrading projects.

C. Railings shall be upgraded when bridge reconstruction of any nature is planned.

D. Railings shall be upgraded where pedestrian screening is added to a bridge.

The decision to retain, retrofit, or replace existing railing depends on the type and condition of the railing and the curb or sidewalk treatment.

Where replacement is required, the proposed railing must meet the AASHTO static load requirements and have passed full scale crash testing. (5-1-2000)

12.05.01

Approved MDOT Railings (5-1-2000)

All approved MDOT railings must meet the AASHTO static load requirements and have passed full scale crash testing. Current MDOT approved railings are:

A. Bridge Barrier Railing, Type 4
B. Bridge Barrier Railing, Type 5
C. Bridge Railing, Aesthetic Parapet Tube
D. Bridge Railing, 2 Tube
E. Bridge Railing, Thrie Beam Retrofit
F. Bridge Railing, 4 Tube (9-2-2003)
Existing Railings and Upgrading Options

Use the following table to determine railing treatment on projects. Table options are minimum railing upgrading criteria and when circumstances warrant the railing shall be replaced rather than retrofitted or retained.

<table>
<thead>
<tr>
<th>Offset</th>
<th>Posted Speed</th>
<th>R4 Railing (concrete posts)</th>
<th>R5 Railing (metal posts)</th>
<th>Concrete Parapet Railing</th>
<th>Aluminum Railings (2 &amp; 3 Tube)</th>
<th>R15 Railing (GM Shape)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reconstruction</td>
<td>All</td>
<td>All</td>
<td>Replace</td>
<td>Replace</td>
<td>Replace</td>
<td>Replace</td>
</tr>
<tr>
<td>Rehabilitation</td>
<td>Sidewalk/ Brushblock ≤ 2'-6&quot; (1)</td>
<td>All</td>
<td>Retrofit (Std B-22)</td>
<td>Replace</td>
<td>Retrofit (2) (Std B-23)</td>
<td>Replace</td>
</tr>
<tr>
<td></td>
<td>Sidewalk/ Brushblock &gt; 2'-6&quot; (1)</td>
<td>≤ 40 mph</td>
<td>Replace or Guardrail (3)</td>
<td>Replace</td>
<td>Retain</td>
<td>Replace</td>
</tr>
<tr>
<td></td>
<td>&gt; 40 mph</td>
<td>Replace</td>
<td>Replace</td>
<td>Replace</td>
<td>Replace</td>
<td>Replace</td>
</tr>
<tr>
<td>Preventive Maintenance</td>
<td>All</td>
<td>All</td>
<td>Retain</td>
<td>Retain</td>
<td>Retain</td>
<td>Retain</td>
</tr>
</tbody>
</table>

Replace = Replace railing with Standard MDOT bridge rail.
Retrofit = Retrofit with thrie beam guardrail per Standard Plans B-22 and B-23 Series.
Retain = Retain existing bridge rail.
Guardrail = Attach thrie beam guardrail directly to concrete posts.

1 Where sidewalks are required for pedestrian use, they shall be at least 4'-0" to the bevel point. (12-5-2005).
2 Normally, handrails should not be removed; however, if they are removed, anchor bolts should be left in place. This treatment is accepted as crash tested up to AASHTO performance level PL-2 (TL-4 equivalent) which is the highest level required in Michigan.

3 Replace railing if circumstances warrant, otherwise attach thrie beam guardrail to railing (concrete posts) with 3/8" diameter bolts. Wood blocks and blockouts shall not be used in guardrail attachment to posts. If approach guardrail is present or being installed, it shall be attached to thrie beam guardrail on bridge; use thrie beam transition and expansion sections as required. If no approach guardrail is present or being installed terminate thrie beam guardrail at end post of railing with thrie beam terminal connector.
4 Obsolete Standards R15 A - R15 N. Replace if warranted by the condition of the existing barrier and the crash history, retain otherwise.

While a thrie beam retrofit is an acceptable means of upgrading R4 or open parapet rail, there will be locations where shoulder widths will be less than the minimums recommended for minor bridge deck rehabilitation. In these situations, the project manager shall request a design exception or design variance for shoulder widths. (8-6-92)
12.05.03

Horizontal Curvature

Where a structure is on a horizontal curve with a radius less than or equal to 950 feet, consideration should be given for a special railing system to accommodate sight distance. This may require the complete removal and replacement of the existing railing system.

12.05.04

Revisions to Guardrails

When a bridge railing is replaced with a new railing, approach and trailing guardrails shall be changed to meet current standards. Guardrail having corrosion resistant (rusty steel) beam elements shall be replaced. Where obsolete guardrail extends a considerable distance from the structure, guardrail replacement should be limited to 200'-0" in each quadrant. See Road Design Manual Section 7.01.44 for guardrail upgrading on local roads.

(8-6-92) (3-26-2012) (6-25-2018)
12.06

JOINT REPLACEMENT

Deck joints of various types have proven ineffective and may require replacement on projects where other rehabilitation has been scheduled. Because of their poor performance, joints should be eliminated whenever possible. On painting contracts, leaking joints should be sealed. On overlay projects, even joints in good condition should be replaced to match the new deck grade.

A common treatment for the expansion joints at the abutments of continuous concrete T-Beam bridges built in the 1940s and 1950s was to support the sidewalk on a sliding steel plate over the independent backwall. On projects of this type, plans should call for removal of the plates at the independent backwall and the installation of the new expansion joint from fascia to fascia. Where existing railing is to remain in place, provision should be made for replacement of the end posts. (8-6-92)

Generally, joint replacement should include replacement of the deck from fascia to fascia (including portions of the barriers) to ensure consistent opening for the entire width of the bridge. If sufficient opening exists, and barrier ends and fascias are in good condition, joint replacement may be terminated at the barrier. (3-20-2017)

12.06.01 Expansion Joint Devices

(5-1-2000) Where expansion joints require replacement, the deck concrete should be removed and replaced for the full depth, 1'-6" either side of the joint. (See Bridge Detail EJ3)

Where expansion joint replacement is the only substantial work on the existing deck, and the deck concrete is sound, some proprietary joints can be replaced using the procedure shown on Bridge Detail EJ4. This replacement removes only enough concrete to remove the existing joint and to permit the casting of polymer or elastomeric concrete headers. Shallow depth strip seal anchorages are then embedded in the header material. This allows a fast joint replacement. (5-1-2000)

12.06.01 (continued)

The expansion device shall be replaced with a proprietary expansion joint currently approved by MDOT and having no single opening wider than 4". Where openings greater than 4" are required, a modular expansion joint may be used. (See the Special Provision for Modular Expansion Joints.)

When an expansion joint device is used on a sidewalk it shall be fitted with a cover plate as described and detailed in Section 7.02.27 and EJ3 and EJ4 Sheets. (8-20-2009)

12.06.02 Felt - Type Joints

Where felt - type joints ("Joint Filler") are to be removed, deck concrete should be removed and replaced for the full depth, 1'-6" either side of the joint. Replacement will be with an expansion joint device, or, where possible, the joint eliminated.

12.06.03 Revisions to Deck Joints (5-1-2000)

When removing curbs or sidewalks from decks, it will be necessary to rehabilitate the existing deck joints.

A. Metal Expansion Joints. Where it is necessary to extend an existing metal floor joint or an expansion joint device after removal of the curbs, the plans shall include a bid item for “Bridge Joint, Revise Expansion Device”.

B. Felt -Type Joints. Where it is necessary to extend a felt-type joint, either an expansion or a construction joint, after removal of the curb, the plans shall include a bid item for “Bridge Joint, Revise Compression Seal”.

12.06.01 (continued)
PAINTING

Projects for painting structural steel are requested by the Region/TSC. These projects may either be for the repainting of previously coated steel or the initial painting of A588 steel. For additional information, see Subsection 7.02.17. The Steel Bridge Girder Coatings Repair Matrix also provides guidance on paint defects and recommended repairs. (10-23-2017)

Blast Cleaning

A. In addition to the normal precautions required during blast cleaning of existing steel, provisions must be made to properly confine and dispose of abrasive material and residue. These provisions are required whether the entire structure is to be cleaned or only isolated portions. (8-6-92)

B. Some telephone ducts installed under bridges in the past have been Johns Manville Transite ducts, made in part of asbestos. These will have to be encased to prevent release of the asbestos into the atmosphere during blast cleaning for painting.

The bridge inspectors will identify ducts marked "Johns Manville" or "Transite" and record this information on their reports. If the telephone ducts are inaccessible and the material cannot be identified, this will be noted. We will then make the determination during a site visit. (5-1-2000)

These ducts and others not requiring painting should be encased in a protective shielding to prevent damage due to blast cleaning (see Note 8.09.04C).

Substructure Protection

The top surface of all substructure units under superstructure transverse joints shall be coated with "Concrete Pier Cap Sealer" as described in the Special Provision for Pier Cap Sealers. (5-1-2000)

Pins and Hangers

The pin and hanger assemblies of cantilever bridges are particularly susceptible to corrosion, and their replacement may have to be included in painting contracts. Region scoping engineers will designate which assemblies will have to be replaced. See Chapter 7 for details.

Where steel beams of adjacent spans are in contact at a closed expansion joint, plans should note whether or not the beam ends are to be "trimmed" to restore an expansion gap. The decision should be based on the maintenance report and/or observations made during field reviews. If the webs are buckling, they should be trimmed. If the there is no apparent distress, they can be left in contact since the pin replacement is made during the summer when expansion is maximum and no further forces should develop. If necessary detail the trimming of fascias and soffits of the bridge deck making sure not to expose deck steel. (5-1-2000) (6-16-2014)

New pins shall be stainless steel and used in conjunction with nylon washers and non-metallic bushings. New pin plates/link plates shall use an allowable bearing stress of 0.8 $F_y$. Non-redundant structures shall use a reduced allowable bearing stress of 0.4 $F_y$. (12-5-2005)
12.07.04

End Diaphragms

(8-6-92) On field inspections of structures scheduled for painting, the designer should consider accessibility behind end diaphragms for cleaning and painting. If the end diaphragms are within 1'-2" of an abutment backwall (or if the end diaphragms at a pier are too close) and the slab above the diaphragms is not to be removed, the diaphragms shall be removed to permit proper cleaning and coating.

Plans shall include an acceptable system for shoring the slab while the diaphragm is not in place. It should be noted that the contractor may use an alternate shoring system subject to the engineer's approval.

Where end diaphragms must be removed for cleaning and painting, note 8.09.04 I should be placed on the plans and the Special Provision for Removal and Replacement of End Diaphragms should be included in the contract proposal. (8-20-2009)

12.07.05

Cleaning and Coating Exposed Steel

(8-6-92) Where structural steel has been exposed by the removal of deck concrete, it shall be cleaned and coated. Cleaning and Coating shall be according to the Standard Specifications for Construction or Special Provisions.

Construction sequencing (painting after casting deck) of deck replacement projects with steel beams requires the use of the pay item, “Top Flanges and Beam Ends, Clean and Coat”, even if the project requires total beam painting. (8-20-2009)

12.07.06

Performance Warranties for Bridge Painting (5-1-2000)

Whenever possible, performance warranties shall be required on bridge painting contracts. On non-National Highway System bridges (NHS) the Design units shall include the performance specification in the contract. A trunkline project can be considered non-NHS, even though it may have NHS funding, if the facility carried is non-NHS.

If the facility carried is NHS traffic, the performance warrantee specification may still be applicable. The Design units shall contact the Construction Field Services Coatings Specialist, at the preliminary plan stage, to determine whether the bridge can be added to Special Experimental Projects list for warranty painting. (3-26-2012)

12.07.07

Paint Color (5-1-2000)

The standard color for MDOT bridges is Light Gray. The AMS-STD-595 number for this color is 16440. Previously, the MDOT standard color was Light Blue - number 15488. Other colors may be recommended by the Region.

(3-21-2016) (10-23-17) (12-26-2017)

12.07.08

MDEQ Hazardous Waste Number (5-1-2000) (3-26-2012)

All structures scheduled for painting need a Michigan Department of Environmental Quality (MDEQ) hazardous waste number (MIR number). These numbers are supplied by the Bridge Management Section of Design Division. See also Section 14.04.
12.07.09

A588 Steel Beams (9-2-2003)

The following rehabilitation situations exist for A588 beams:

1. Little or no section loss (< 20%), painting is not required.

2. Significant section loss (> 20%), the entire structure is painted. This includes projects with beam end repairs.

3. Pin and hanger projects where beams are otherwise in good condition (< 20% section loss), beams are zone painted (with the outside of the fascia beams top coated brown in the zone area).

12.07.10

Partial Painting

Where structural steel cleaning and coating involves only partial sections of beams or diaphragms the entire perimeter of the beams or diaphragms, less any portions encased in concrete, shall be cleaned and coated. Cleaning and Coating shall be according to the Standard Specifications for Construction or Special Provisions. (3-26-2012)

12.08

MISCELLANEOUS REHABILITATION

Some miscellaneous rehabilitation is significant and is programmed for the specific purpose. More frequently, miscellaneous work is an adjunct to other work. As such, its nature and cost should be determined as early as possible so that the primary project programming can be adjusted.

Include saw cut depth dimensions when removing portions of abutments, piers and columns on the plans. (8-20-2009)

12.08.01

Field Inspections

THE Plan Review Meeting with a field inspection should be conducted on all rehabilitation projects. This inspection should be made within six months of the contract letting to most accurately determine the extent of deterioration. If a project is postponed, it may be necessary to conduct a second inspection.
Embedded Galvanic Anodes for Concrete Repairs

Galvanic anodes consist of a circular cylinder (approx. 1" thick and approx. 3" diameter) shaped cementitious shell encapsulating a zinc electrolyte. The embedded galvanic anodes serve to provide localized corrosion protection to existing uncoated steel reinforcement. Often, when new concrete is placed adjacent to old concrete, corrosion in the old concrete is accelerated. This is the result of a difference in the electrolytic potential between the new and old concrete. When placed at the specified spacing along the perimeter of concrete patches or along the interface between new/existing concrete, the anodes mitigate the formation of new corrosion sites in the existing concrete.

The embedded anodes have a life expectancy of 15 to 20 years, which is dependent on anode spacing and environmental exposure. Embedded anodes must be tied to uncoated steel reinforcement for proper function.

Suggested uses for the embedded galvanic anodes are as follows:

1. Bridge deck widening, where new concrete placed next to old.
2. Deck joint replacement, where new concrete placed next to old.
3. Substructure repairs, where new concrete placed next to old.
4. Deck repairs, where greater than ten years patch service life is required.
5. Substructure widening, where new concrete placed next to old.

For items 1 thru 5, placement of anodes will follow the Standard Specifications for Construction. (1-29-2018)

Substructure Repairs

A. Patching

This work generally includes the sealing of cracks and patching of spalled areas.

Designers should be aware that the cost of extensive substructure patching may be more than the cost of removal and replacement of a portion of the unit. Where removal of substructure portions is feasible it should be considered. A prime example of this is removing a portion of a pier cap on a project that includes superstructure replacement. (5-1-2000)

1. Removal of concrete shall be paid for as "Hand Chipping, Other Than Deck" and includes all areas excluding the top surface of the deck and sidewalk; i.e. all substructure units, the underside of the deck, and the barriers and fascias.

2. Patching mixtures include latex modified (LM) concrete as one of the choices. Since its bonding characteristics are superior to the others, LM concrete mixtures (Table 703-2 in the Standard Specifications) should be used for substructure repair where latex is relatively available. In the North and Superior Regions, this mixture should be used only where the project already includes LM concrete for a deck overlay. Otherwise, repairs should be made with a concrete patching mixture from Table 703-1. (5-1-2000)

3. When substructure units are patched, the entire surface of the substructure unit shall be coated with "Penetrating Water Repellent Treatment" to prevent further deterioration. As an alternative, where aesthetics are important, an elastomeric concrete sealer may be used. See Section 7.03.11. (5-1-2000)
12.08.03 (continued)

B. Column Wrapping (10-24-2001)  
(07-30-2012)

This work consists of repairing concrete pier columns by wrapping them with a fiber reinforced polymer (FRP) wrap (see the Special Provision for Column Wrapping with Fiber Reinforced Polymer (FRP) sheets and the Michigan Department of Transportation’s (MDOT) Research Report No. RC 1386, Repair of Corrosion-Damaged Columns using FRP Wraps for detailed information.)

Column wrapping should be considered as an alternate to the traditional chip, patch, and seal repair method for both square and round columns when only slight to moderate deterioration exists in the columns. Some concrete surface preparation is required prior to wrapping the column, but only to the extent necessary to obtain a flat surface. Blast cleaning, rounding corners, and patching spalls are all that is needed for the concrete surface preparation. Crack epoxy injection and concrete chipping behind steel reinforcement is not necessary. Criteria for using column wrapping in Capital Scheduled Maintenance (CSM) and Capital Preventive Maintenance (CPM) projects are as follows:

1. Column size

   No restrictions on column height. No restrictions on round column diameter. Width of rectangular columns must be limited to 3’ because the wrap is not as effective in confining the mid point of the side compared with a round column.

12.08.03 B. (continued)

Substructure Repairs

2. Filler walls

   The presence of filler walls adjacent to a column prevents wrapping that portion of the column. Replacement of the adjoining portion of the filler wall decreases the cost effectiveness of the column wrapping. Filler wall replacement in conjunction with column wrapping is cost effective when the cost to replace the filler wall is small compared with the cost of column wrapping and needs to be considered on a case by case basis. Deteriorated filler walls would be cause for replacement, which would then enable column wrapping.

3. Column deterioration

   In general, column wrapping is cost effective when the deteriorated areas are between 5% and 15% of the column area. When column deterioration exceeds 5% to 10% of the column area, column wrapping has a lower life cycle cost than the traditional chip, patch, and seal repair method. For practical considerations, column wrapping should not be used when the deterioration exceeds 15% of the column area because there is a concern that the deterioration has progressed too far for the wrapping to be effective. Deterioration in this case is considered to be delaminated areas, spalled areas, and incipient corner spalls. Corner cracks without delamination should not be considered deterioration for this case.

   The life cycle cost for the column wrapping and traditional chip, patch, and seal repair methods used the following service lives; 10 to 15 years for patching, 3 to 5 years of sealing, and 30 years for column wrapping. Interest rates of 3% and 4% were used for the present value calculation.
Repair of Overhead Concrete Surfaces

Experience has shown we cannot patch overhead spalls that are deeper than 1". Any spalls on the underside of the deck that are deeper will have to be repaired by full depth patching. Where we do patch the shallow spalls, we should call for an overhead patching material from the qualified products list. (5-1-2000)

Expansion Anchored Bolts (5-1-2000)

In addition to field testing, we will ensure sound anchorage by reducing allowable design loads. The values to be used will vary with the application as show below:

<table>
<thead>
<tr>
<th>Application</th>
<th>Approx. Safety Factor</th>
<th>⅜&quot;</th>
<th>⅝&quot;</th>
<th>⅞&quot;</th>
<th>⅝&quot;</th>
</tr>
</thead>
<tbody>
<tr>
<td>Noncritical Design Loads (Including noncritical, static or shock loads)</td>
<td>4</td>
<td>875</td>
<td>1,620</td>
<td>2,565</td>
<td>3,775</td>
</tr>
<tr>
<td>Vibratory Loads (e.g., Sign Supports)</td>
<td>12</td>
<td>290</td>
<td>540</td>
<td>855</td>
<td>1,260</td>
</tr>
</tbody>
</table>

Design details should always call for two or more anchors for redundancy.

For additional information on other types of concrete anchors see Section 7.06.02.

Deck Patching (5-1-2000)

Delaminated portions of the deck that show signs of imminent spalling are to be hand-chipped. These areas and those that have already spalled are to be repaired with a latex-modified concrete mixture.

In the Upper Peninsula and areas of the Lower Peninsula where the cost of latex-modified concrete is high, bridges with traffic volumes less than 4000 ADT are to have decks repaired by applying a latex bonding slurry to the chipped areas followed by patching with a Concrete patching mixture.

Temporary Support Systems

(8-6-92) Plans for rehabilitation may require details of a construction scheme as described in Section 7.01.10. Without this concurrence, the contractor may attempt a procedure which would jeopardize the integrity of the structure during his/her operations.
12.08.08

Roadway Widening With Filler Walls

For rehabilitation projects with piers in the clear zone due to roadway widening; filler walls shall be used between columns and guardrail attached as detailed on Standard Plans R-55 & 67-Series. (3-26-2012)
**12.09**

**BRIDGE DECK REPAIR STRATEGY**  
(3-26-2012)

**12.09.01**

**Deck Restoration**

Restoration of deteriorated decks includes everything from crack sealing to complete replacement. The alternative selected will be influenced by the factors listed in the Bridge Deck Preservation Matrix (Section 12.09.02) and by judgment. The Construction Engineer should be consulted in most cases as he/she is aware of current costs, equipment, and contractor capability.

At locations where traffic volumes are high, the maintenance of traffic may influence the selection of the restoration treatment.

The Region Project Development Engineer will consider future work in the area. This may influence the repair strategy. It should be recognized that several years will elapse between the inspection/scoping and the work of rehabilitation. Allowance for additional deterioration during this period should be made when selecting an appropriate rehabilitation measure. (5-1-2000)

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**12.09.02**

**Bridge Deck Preservation Matrix**  
(5-1-2000)

The Bridge Deck Preservation Matrix (Uncoated Black Bar or Epoxy Coated Rebar), gives recommended repair methods for various deck conditions. The repair strategies are based on National Bridge Inventory ratings provided from bridge inspection and scoping documents.

In general, the condition of the underside of the deck is of primary concern. Deck with sound undersides can be rehabilitated to a nearly “new” condition. The repair strategies for these structures will vary from patching and crack sealing for decks with good top surfaces, to deep overlays for decks with poor top surfaces.

Decks with undersides in poor conditions are either replaced, or repaired with a shorter term “fix.” This fix varies from a shallow concrete overlay to a hot mix asphalt (HMA) cap. (9-2-2003)
DETROIT METROPOLITAN AREA
### CLEAR ROADWAY WIDTHS AND DESIGN LOADING FOR BRIDGES BEING REHABILITATED (3-26-2012)

<table>
<thead>
<tr>
<th>Type of Roadway</th>
<th>Minimum Clear Roadway Width</th>
<th>Minimum Design Loading</th>
</tr>
</thead>
<tbody>
<tr>
<td>Non-Interstate Freeway</td>
<td>A, B</td>
<td>HS-20</td>
</tr>
<tr>
<td>Interstate Freeway</td>
<td>A, B</td>
<td>HS-20</td>
</tr>
<tr>
<td>Arterial (Non-Freeway Trunkline)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rural</td>
<td>C</td>
<td>HS-20</td>
</tr>
<tr>
<td>Urban</td>
<td>D</td>
<td>HS-20</td>
</tr>
<tr>
<td>Collector (Non-Trunkline)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rural</td>
<td>Exhibit 6-7.</td>
<td>H 15</td>
</tr>
<tr>
<td>Urban</td>
<td>Exhibit 6-5., E</td>
<td>H 15</td>
</tr>
<tr>
<td>Local (Non-Trunkline)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rural</td>
<td>Exhibit 5-7.</td>
<td>ADT≤50: H 10</td>
</tr>
<tr>
<td>Urban</td>
<td>Exhibit 5-5., E</td>
<td>ADT&gt;50: H 15</td>
</tr>
</tbody>
</table>

(A) As constructed.

(B) Consideration should be given to carrying the full shoulders of the approach roadway across the structure if it is cost effective to do so.

(C) The minimum clear roadway should accommodate the traveled way plus 2'-0" on each side. (12-5-2005)

(D) The minimum clear width on the bridge shall be the same as the curb-to-curb width of the street.

(E) The minimum clear roadway shall be the traveled way plus 1'-0" to each curb face. However, consideration should be given to providing the same width as the curb-to-curb approach width if it is cost effective to do so.
The tables shown in this appendix are derived from *A Policy on Geometric Design of Highways and Streets*, 2011, 6th Edition, published by AASHTO and do not include clearances for bridge rail offset. See the Bridge Design Guides for MDOT offset criteria. (3-26-2012) (7-20-2015) (3-21-2016)

### Exhibit 6-7. STRUCTURAL CAPACITIES AND MINIMUM ROADWAY WIDTHS FOR BRIDGES BEING REHABILITATED CARRYING RURAL COLLECTOR ROADS

<table>
<thead>
<tr>
<th>Design Traffic Volume (veh/day)</th>
<th>Design Loading</th>
<th>Structural Capacity</th>
<th>Minimum Clear Roadway Width (ft)(^{(a)})</th>
</tr>
</thead>
<tbody>
<tr>
<td>Under 400</td>
<td>H 15</td>
<td>22</td>
<td></td>
</tr>
<tr>
<td>400 to 1500</td>
<td>H 15</td>
<td>22</td>
<td></td>
</tr>
<tr>
<td>1500 to 2000</td>
<td>H 15</td>
<td>24</td>
<td></td>
</tr>
<tr>
<td>over 2000</td>
<td>H 15</td>
<td>28</td>
<td></td>
</tr>
</tbody>
</table>

\(^{(a)}\) Clear width between curbs or railings, whichever is the lesser, shall be equal to or greater than the approach traveled way width, wherever practical.

The values in Exhibit 6-7. do not apply to structures with a total length greater than 100 ft. These structures should be analyzed individually by taking into consideration the clear width provided, safety, traffic volumes, remaining life of the structure, design speed, and other pertinent factors.

### Exhibit 6-5. MINIMUM WIDTH OF TRAVELED WAY FOR COLLECTOR ROADS

<table>
<thead>
<tr>
<th>Design Speed (mph)</th>
<th>Design Traffic Volumes (veh/day)</th>
<th>Width of Traveled Way (ft)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Under 400 400-1500 1500-2000 over 2000</td>
<td></td>
</tr>
<tr>
<td>20-30</td>
<td>20(^{(a)}) 20 22 24</td>
<td></td>
</tr>
<tr>
<td>35-40</td>
<td>20(^{(a)}) 22 22 24</td>
<td></td>
</tr>
<tr>
<td>45-50</td>
<td>20 22 22 24</td>
<td></td>
</tr>
<tr>
<td>55-60</td>
<td>22 22 24 24</td>
<td></td>
</tr>
</tbody>
</table>

\(^{(a)}\) A 18 ft minimum width may be used for roadways with design volumes under 250 veh/day.

On roadways to be reconstructed, a 22 ft traveled way may be retained where the alignment and safety records are satisfactory.
Exhibit 5-7. Minimum Structural Capacities and Minimum Clear Roadway Widths for Bridges Being Rehabilitated Carrying Rural Local Roads

<table>
<thead>
<tr>
<th>Design Traffic Volume (veh/day)</th>
<th>Design Loading Structural Capacity</th>
<th>Minimum Clear Roadway Width (ft)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-50</td>
<td>H 10</td>
<td>20&lt;sup&gt;(c)&lt;/sup&gt;</td>
</tr>
<tr>
<td>51-250</td>
<td>H 15</td>
<td>20</td>
</tr>
<tr>
<td>250-1500</td>
<td>H 15</td>
<td>22</td>
</tr>
<tr>
<td>1500-2000</td>
<td>H 15</td>
<td>24</td>
</tr>
<tr>
<td>over 2000</td>
<td>H 15</td>
<td>28</td>
</tr>
</tbody>
</table>

<sup>(a)</sup> Clear width between curbs or railings, whichever is the lesser.

<sup>(b)</sup> Minimum clear widths that are 2 ft narrower may be less than the approach traveled way width.

<sup>(c)</sup> For one-lane bridges use 18 ft.

The values in Exhibit 5-7 do not apply to structures with total length greater than 100 ft. These structures should be analyzed individually, taking into consideration the clear width provided, traffic volumes, remaining life of the structure, pedestrian volumes, snow storage, design speed, crash record, and other pertinent factors.

Exhibit 5-5. Minimum Width of Traveled Way for Local Roads

<table>
<thead>
<tr>
<th>Design Speed (mph)</th>
<th>Design Traffic Volumes (veh/day)</th>
<th>Under 400</th>
<th>400-1500</th>
<th>1500 -2000</th>
<th>over 2000</th>
</tr>
</thead>
<tbody>
<tr>
<td>15</td>
<td></td>
<td>18</td>
<td>20</td>
<td>20</td>
<td>22</td>
</tr>
<tr>
<td>20-40</td>
<td></td>
<td>18</td>
<td>20</td>
<td>22</td>
<td>24</td>
</tr>
<tr>
<td>45-50</td>
<td></td>
<td>20</td>
<td>22</td>
<td>22</td>
<td>24</td>
</tr>
<tr>
<td>55-60</td>
<td></td>
<td>22</td>
<td>22</td>
<td>24</td>
<td>24</td>
</tr>
</tbody>
</table>

Where the width of traveled way is shown as 24 ft, the width may remain 22 ft on reconstructed bridges where alignment and safety records are satisfactory.
Design Exception Requirements - Vertical Clearance (8-20-2009) (1-14-2013)

Design Exceptions are needed where proposed vertical clearance does not meet the minimum clearance requirements provided in Section 7.01.08.

<table>
<thead>
<tr>
<th>Type of Project</th>
<th>Design Exception Required</th>
<th>Coordination with SDDCTEA Required</th>
<th>MDOT approval required by Engineer of Design Programs</th>
<th>FHWA Approval Required</th>
</tr>
</thead>
<tbody>
<tr>
<td>New and 4R reconstruction work on Interstate greater than $1,000,000</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>New and 4R reconstruction work on Interstate less than $1,000,000</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>New and 4R reconstruction work on Non Interstate Freeways greater than $1,000,000</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>New and 4R reconstruction work on Non Interstate Freeways less than $1,000,000</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>New and 4R reconstruction work on NHS Routes other than Freeways greater than $1,000,000</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>New and 4R reconstruction work on NHS Routes other than Freeways less than $1,000,000</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>New and 4R Reconstruction on Non-NHS Routes</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>3R Work on Interstate System</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Only if negotiated oversight is assigned to FHWA on NHS projects &gt; $5 million.</td>
</tr>
<tr>
<td>3R Work on Non Interstate Freeways</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>3R Work on Non-Freeway Routes</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>Preventative Maintenance Work</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
</tr>
</tbody>
</table>
DATE: [Enter Date]

TO: [Enter name and title of Region or Lansing Traffic and Safety personnel]

FROM: [Enter requestor name and title]

SUBJECT: Accident Analysis and Safety Review

Location: __________________________________________________
Control Section:___________ Job Number:_______ Finance Code:_____
Begin Milepoint _________________ End Milepoint _________________
Schedule Plan Completion Date _________________________________

Clear Description of Project Scope (Attach PCS if available):

__________________________________________________________________
__________________________________________________________________

This is a ____ Improve/Expand, ____ Preserve, ____ Preservation project.

Particular items special attention should be given to:

__________________________________________________________________
__________________________________________________________________

Design Exceptions / Variances to be requested from FHWA/MDOT include: __________

__________________________________________________________________

Completed analysis needed on or before: ____________________________________
For questions pertaining to this project, please contact ___________ at ____________
or me at ____________.

cc: [Requestor Signature]  
[Enter requestor name]