Road & Bridge Design Publications

Monthly Update – October 2026

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

Email road related questions to MDOT-Road-Design-Standards@Michigan.gov.
Email bridge related questions to MDOT-Bridge-Design-Standards@Michigan.gov.

Courtesy Announcements

There has been a recent update to the MDOT Drainage Manual. Due to its interactive use with other publications covered by this announcement it is recommended to access the Drainage Manual for up-to-date design and policy. References (links) within the Road and Bridge Design Manuals have been or are in the process of being updated.

A new website has been created for Ancillary Structures Design Guidelines. Due to its interactive use with other publications covered by this announcement it is recommended to access the new website for guidelines related to Culverts (Box, Three-Sided, and Arch), Noise Barrier Walls, Overhead Sign Structures, Traffic Signal Structures, Lighting Structures and ITS Structures.

Standard Plans

R-70-C: Low Tension 3-Cable Barrier:

Eliminated this standard for lack of use. (The better performing, high-tension systems have always been used on state trunklines.)

Road Design Manual

7.01.55: Median Barrier Types:

In the cable barrier subsection (C), removed information pertaining to low-tension cable barrier systems as these systems were eliminated because of lack of use. Also, reformatted the section. (Lists now employ bullets instead of numbering and information in subsections were re-ordered and labeled.)

14.04: Interstate Access Change Request (IACR):

Created a new section which discusses the IACR and its submission to FHWA when adding or modifying interchanges or access points on interstate freeways. It includes lists of common design scenarios where IACRs are required and where they are generally not applicable.

Road & Bridge Design Publications

14.40: Other State Agency Coordination:
Moved former information in this section (EGLE Permits for Sewer and Water Mains) to section 14.40.01 and created a new section (14.40.02) to discuss the permits and plan reviews required for building, electrical, mechanical, or plumbing work covered by the Bureau of Construction Codes.

Bridge Design Manual

7.02.32A: Beams:

Corrected numbering in section.

Bridge Design Guides

Please Note:

The Bridge Design Guides are currently being updated to use Arial font for compatibility with Bentley (GEOPAK) and Microsoft Office applications. In addition, sheet borders are being revised to align with current formatting standards. Titles that include symbols are also being revised to replace the symbols with words for increased accessibility. Reformatted guides are being issued as completed; however, they are not included in the Monthly Update publication unless substantive content changes are required. The original “Issued” and “Supersedes” dates are being retained for all reformatted guides in which the content has not changed.

5.22.02A: Pier Strut Retrofit:

Updated reference to Bridge Design Manual to new Section 6.08.08 in notes section of guide.

6.29.09A: Bridge Barrier Railing, Type 4 for Railing Repair:

Revised note callouts and updated reference to Bridge Design Manual to new Section 6.05.05 in notes section of guide.

8.11.03: Diaphragm and Connection Plate Details:
Updated table for recommended intermediate diaphragm depth based on beam or plate girder height for beam depths of 42 inches or less. Added note that for plate girder web depths of 24 in. and 27 in. the dimension from bottom of plate girder top flange to top of diaphragm is recommended to be 3 in. Added note with reference to guide 8.11.07 for cross frame details.

8.11.07: Diaphragm and Connection Plate Details:
Updated reference for connection plate details to guide 8.06.02A. Removed diaphragm depth information from note with reference to guide 8.11.03.

Road & Bridge Design Publications

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.

This document contains complex files, plans, and/or information. If you require assistance accessing this information or require it in an alternative format, contact the Michigan Department of Transportation's (MDOT) Americans with Disabilities Act (ADA) coordinator at www.Michigan.gov/MDOT-ADA.

7.01.55 (revised 10-26-2026)

Median Barrier Types

Median barriers, when used, are employed almost exclusively on controlled access highways. If the road is free access, openings would have to be provided at intersections and crossovers. This means that the barrier must be terminated at these points with a crash worthy end treatment. The lengths of the end treatments must be added to the length of the opening thus increasing the length of unprotected median, as the end treatments provide only marginal median crossover protection.

Generally, the initial installation cost of concrete median barrier is about 10-15% more than a double-sided metal guardrail. (However, this comparison does not include the possible additional cost of drainage alterations, etc., that might be required in conjunction with concrete barrier.) Advantages and disadvantages for the three barrier systems are as follows:

A. Concrete Median Barrier

Advantages

- Very low maintenance
- Relatively good visibility
- Less vehicle damage at low angles of impact
- Easier on which to affix glare screen (glare screen can be integrally cast)

Disadvantages:

- Greater “snow fence” effect (wind cannot pass through)
- Traps blowing paper and trash
- Usually requires some form of internal drainage
- May require extensive grading. In most cases, adjacent slopes should be 1:10 or flatter.

7.01.55 (continued)

B. Double Steel Beam Guardrail

Advantages

- May be used in the wider medians (median width not a factor)
- Less “snow fence” effect than concrete barrier
- Lateral drainage can flow under
- Performs better than concrete barrier for high angle impacts
- When placed along the top of a V-ditch, guardrail may be installed adjacent to a 1:6 or flatter backslope (Type TD) or 1:8 or flatter backslope (Type MGS-8D)

Disadvantages:

- Maintenance repair usually required after a hit
- Harder to install in rock
- No durable glare screen available for mounting on top

7.01.55 (continued)

Median Barrier Types

C. Cable Barrier

Advantages:

- Typically impact deflection is 10 feet or less
- High-tension cable barrier has a much higher probability of remaining operative after an impact

Disadvantages:

- Systems are proprietary
- System may be inoperative after an impact (i.e., usually requires immediate inspection and maintenance after an impact)
- System is limited to curved roadways with radii of 650 feet and greater

7.01.55C (continued)

DESIGN CRITERIA FOR HIGH-TENSION CABLE MEDIAN BARRIER		
Maximum Flare Rate	30:1	
Minimum Design Deflection Distance	12 feet	
Minimum Offset Between Median Ditch Line and Cable Barrier (Single Runs Only)	10 feet	
Maximum Length Between Terminals	10,560 feet (2 miles) *	
Post Spacing and Roadway Curvature Requirements	**RADIUS**	**POST SPACING**
	Less than 650 feet	**CABLE BARRIER NOT RECOMMENDED**
	650 feet and greater	See Manufacturer's Specifications

* 2 miles is a suggested operational value, but longer runs are possible if the local TSC deems it acceptable.

7.01.55C (continued)

Median Barrier Types

1. General Guidelines

- Cable median barrier is recommended on divided roadways where:
  - Median crossover crashes have been reported, and
  - Median barrier is not warranted based on Section 7.01.54 of the Michigan Road Design Manual.
- Median width should be a minimum of 30 feet.
- Median slopes shall be 1:4 or flatter.
- The cable barrier shall be placed at a location that permits the system to deflect unimpeded during a vehicular impact. The cable barrier shall not interfere with opposing traffic or other roadside objects during a vehicular impact. If a single run of cable barrier cannot satisfy the offset requirements, dual runs should be used.
- At locations where both NCHRP 350, TL-3 and TL-4 cable systems may be installed, NCHRP 350, TL-4 cable systems are preferred.
- The length of need (LON) for cable median barrier is based on engineering judgment. Consult with the Geometric Design Unit of the Design Division for additional information.

2. Approved Cable Median Barrier Systems

The following cable barrier systems are approved for use as median barrier. Questions regarding cable median barriers should be directed to the Geometric Design Unit of the Design Division.

7.01.55C (continued)

a. CASS Cable System

The CASS cable system is a proprietary, high-tension cable barrier manufactured by Trinity Industries, Inc. The system is available with I-shaped steel posts installed in concrete post foundations with a sleeve of steel, or a driven steel socket with a soil plate welded to the socket.

There are two versions of the CASS system in use on MDOT roadways.

The CASS 4:1 Slope cable barrier system is an NCHRP 350, TL-4 system when placed on 1:6 or flatter slopes. This system may also be placed on slopes steeper than 1:6, up to 1:4, and is NCHRP 350, TL-3 compliant under such conditions. This cable system consists of three 3/4" diameter pre-stretched cables, with the top and middle cables located in a slot in the middle of the post. The top and middle cables are separated by recycled plastic spaces. The bottom cable is placed on the side of the post and secured with J-hook fasteners. This is the most common version of the CASS system used on MDOT roadways.

The CASS TL-4 cable barrier system is an NCHRP 350, TL-4 compliant cable barrier system. This cable system consists of three 3/4" diameter pre-stretched cables, with all three cables located in a slot in the middle of the post and separated by recycled plastic spacers. This cable system can only be installed on 1:6 or flatter slopes. As a result of this limitation, it is used less often than the CASS 4:1 Slope cable barrier system.

In addition, the CASS cable terminal (CCT) is an NCHRP 350, TL-3 compliant end terminal for use with both CASS systems.

7.01.55C (continued)

Median Barrier Types

b. Gibraltar Cable System

The Gibraltar cable system is a proprietary, high-tension cable barrier manufactured by Gibraltar Global, LLC. The system consists of steel posts installed in concrete post foundations with a sleeve of steel or a driven steel socket with a soil plate welded to the socket. Even though Gibraltar manufactures several cable barrier systems, the three-cable, Gibraltar TL-4 cable barrier system is the system commonly used on MDOT roadways. It meets NCHRP 350, TL-4 when placed on 1:6 or flatter slopes, but also meets NCHRP 350, TL-3 on slopes steeper than 1:6, up to 1:4. Furthermore, the Gibraltar cable terminal is an NCHRP 350, TL-3 compliant end terminal for use with the Gibraltar cable system. ¾" diameter prestretched cables are attached to the posts and kept at the appropriate height by devices called "hairpins," which are unique to Gibraltar. The cables are tensioned according to cable temperature.

7.01.55C (continued)

c. Brifen Cable System

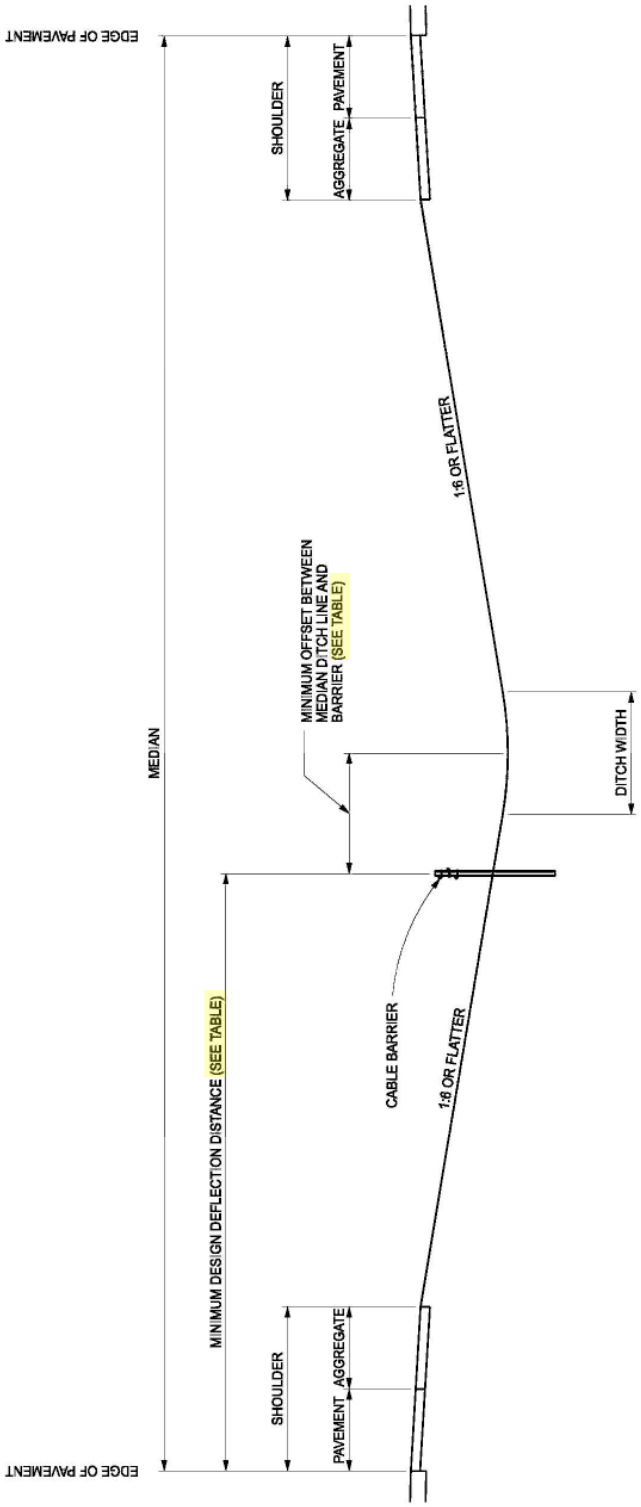
The Brifen cable system is a proprietary, high-tension cable barrier manufactured by Brifen USA, Inc. The system consists of steel posts installed in concrete post foundations with a sleeve of steel, or a driven steel socket with a soil plate welded to the socket, and four ¾" pre-stretched cables. Three of the four cables are woven on alternating sides of sequential posts over the entire segment length. The cables are tensioned according to cable temperature.

The Brifen cable system used on MDOT roadways meets NCHRP 350, TL-4 when placed on 1:6 or flatter slopes, and also meets NCHRP 350, TL-3 when placed on slopes steeper than 1:6, up to 1:4. In addition, the Brifen WRGT end terminal is an NCHRP 350, TL-3 compliant end terminal for use with the Brifen cable system.

3. Cable Barrier Placement Examples

7.01.55C (continued)

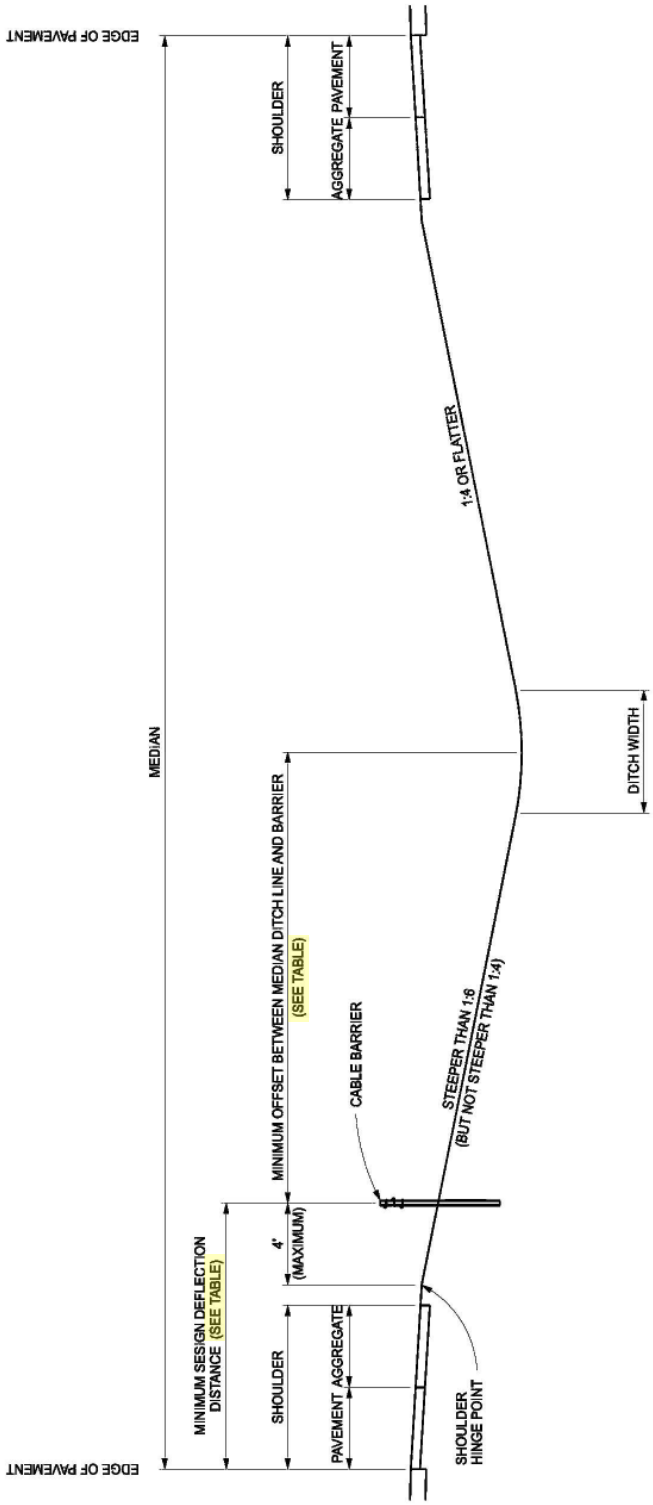
Median Barrier Types



MEDIAN SLOPES 1:6 OR FLATTER

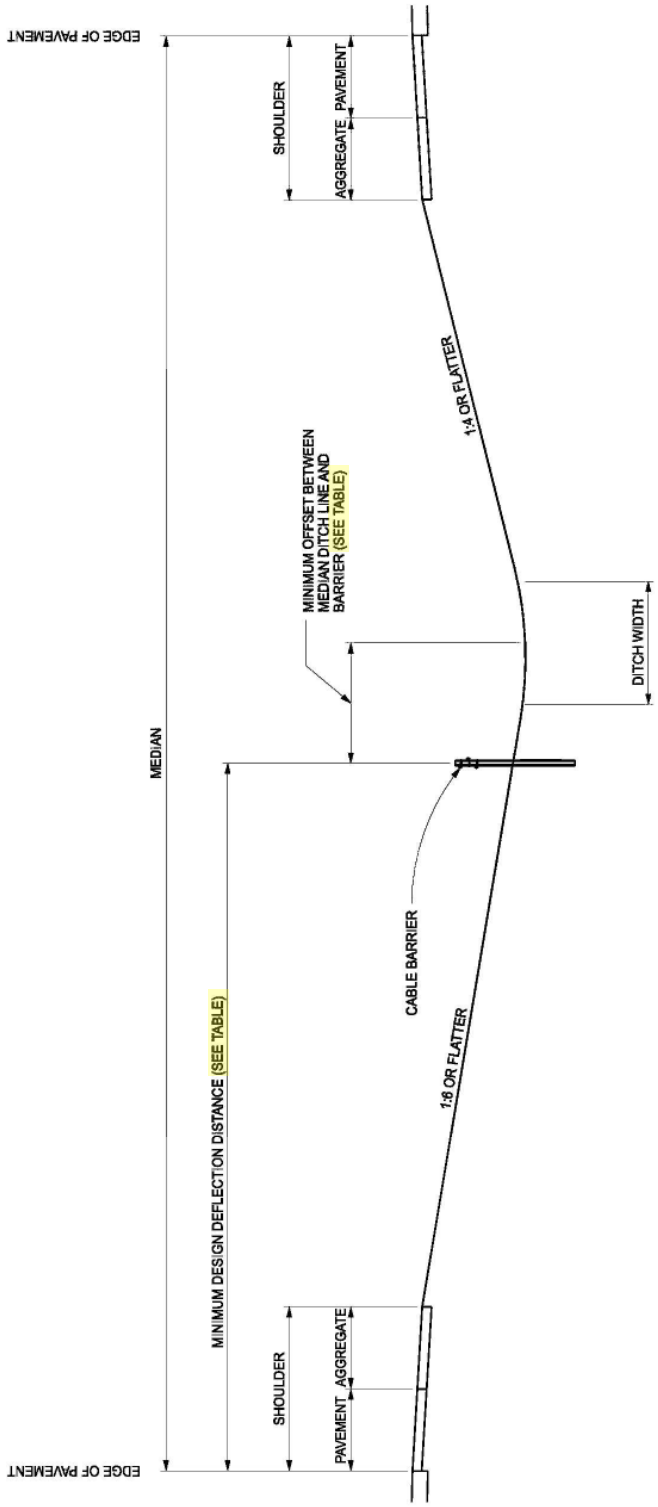
7.01.55C (continued)

Median Barrier Types



7.01.55C (continued)

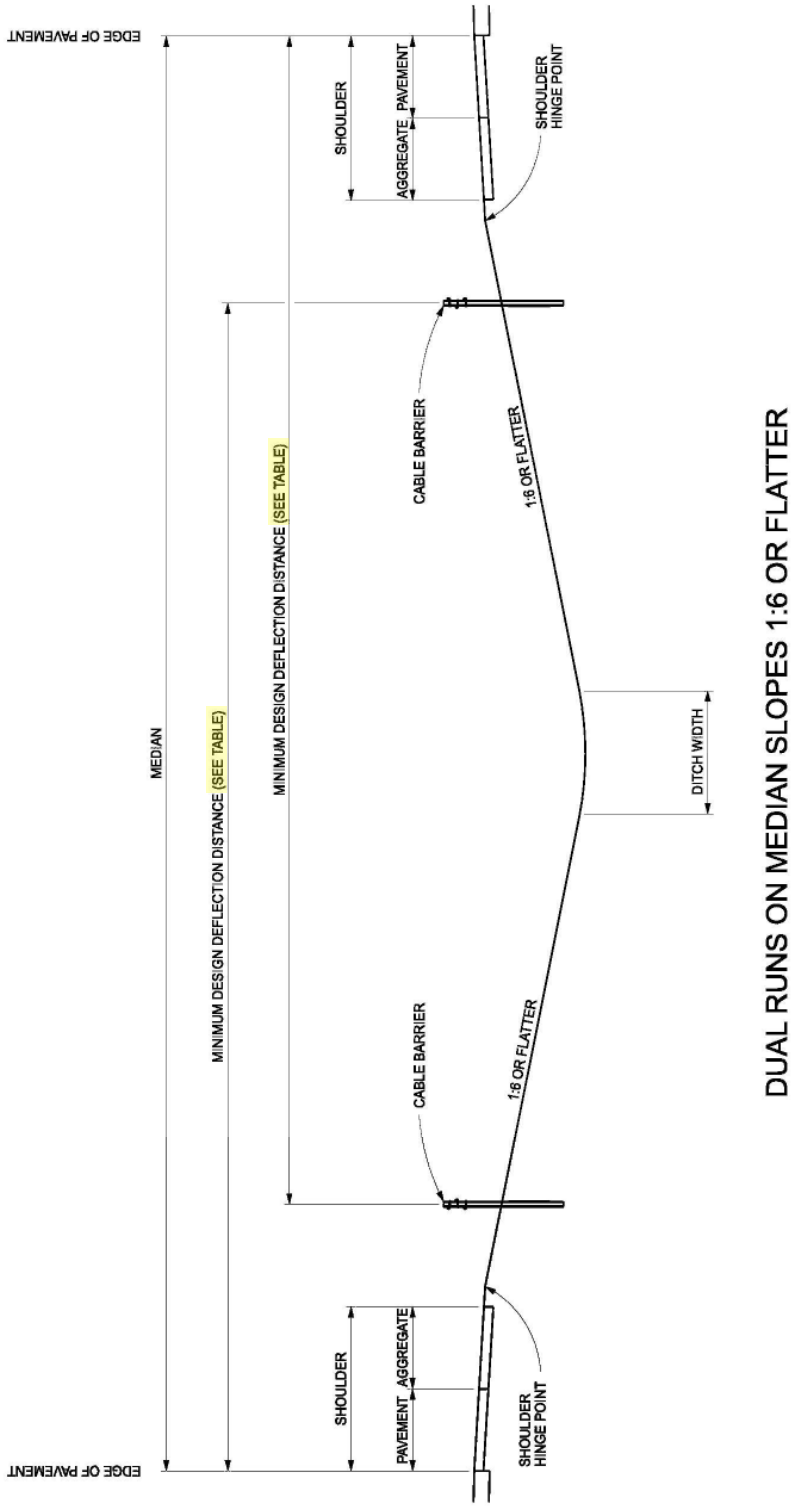
Median Barrier Types



MEDIAN SLOPES 1:6 OR FLATTER ON ONE SIDE AND STEEPER THAN 1:6 ON THE OTHER

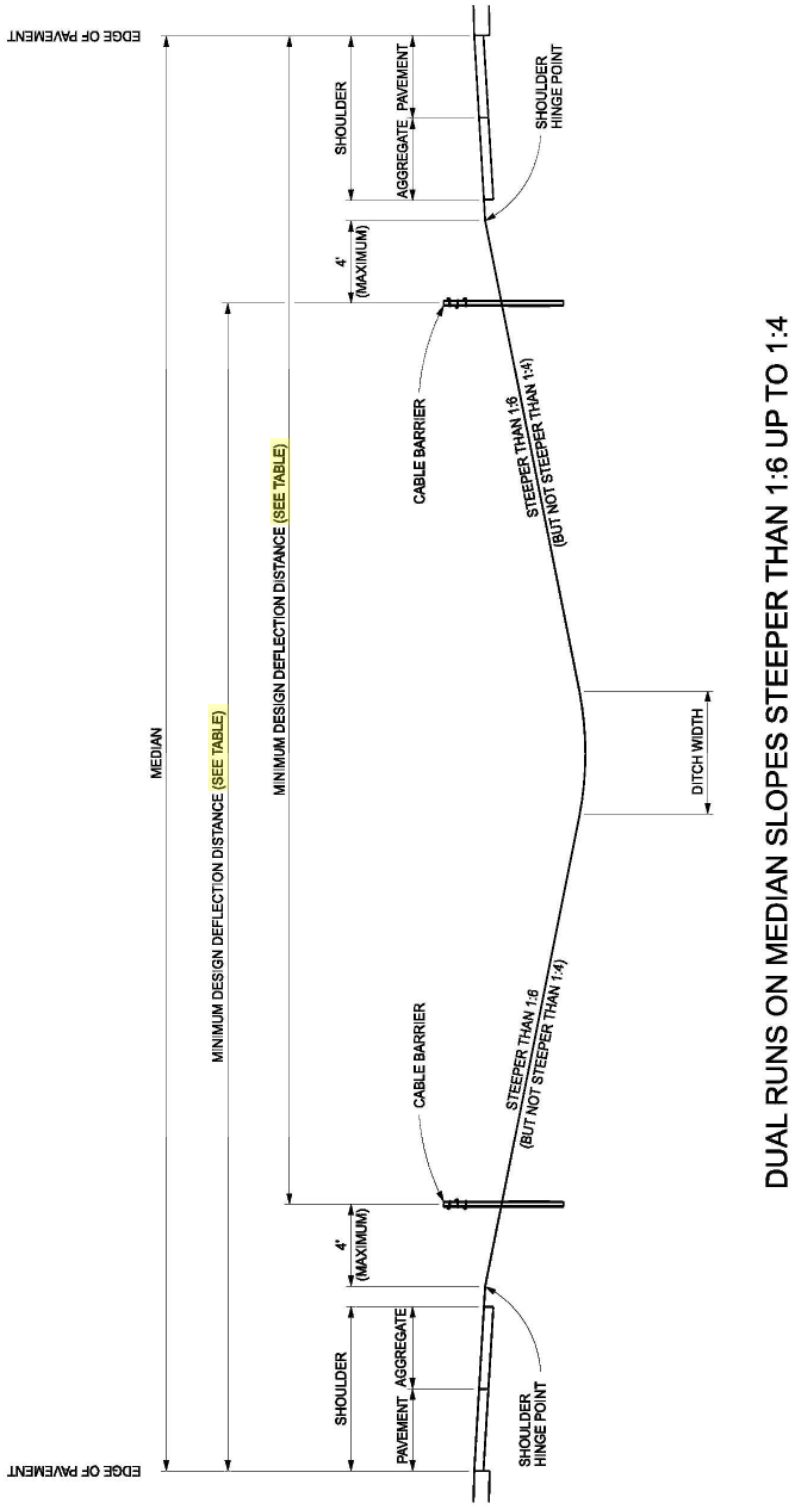
7.01.55C (continued)

Median Barrier Types



7.01.55C (continued)

Median Barrier Types

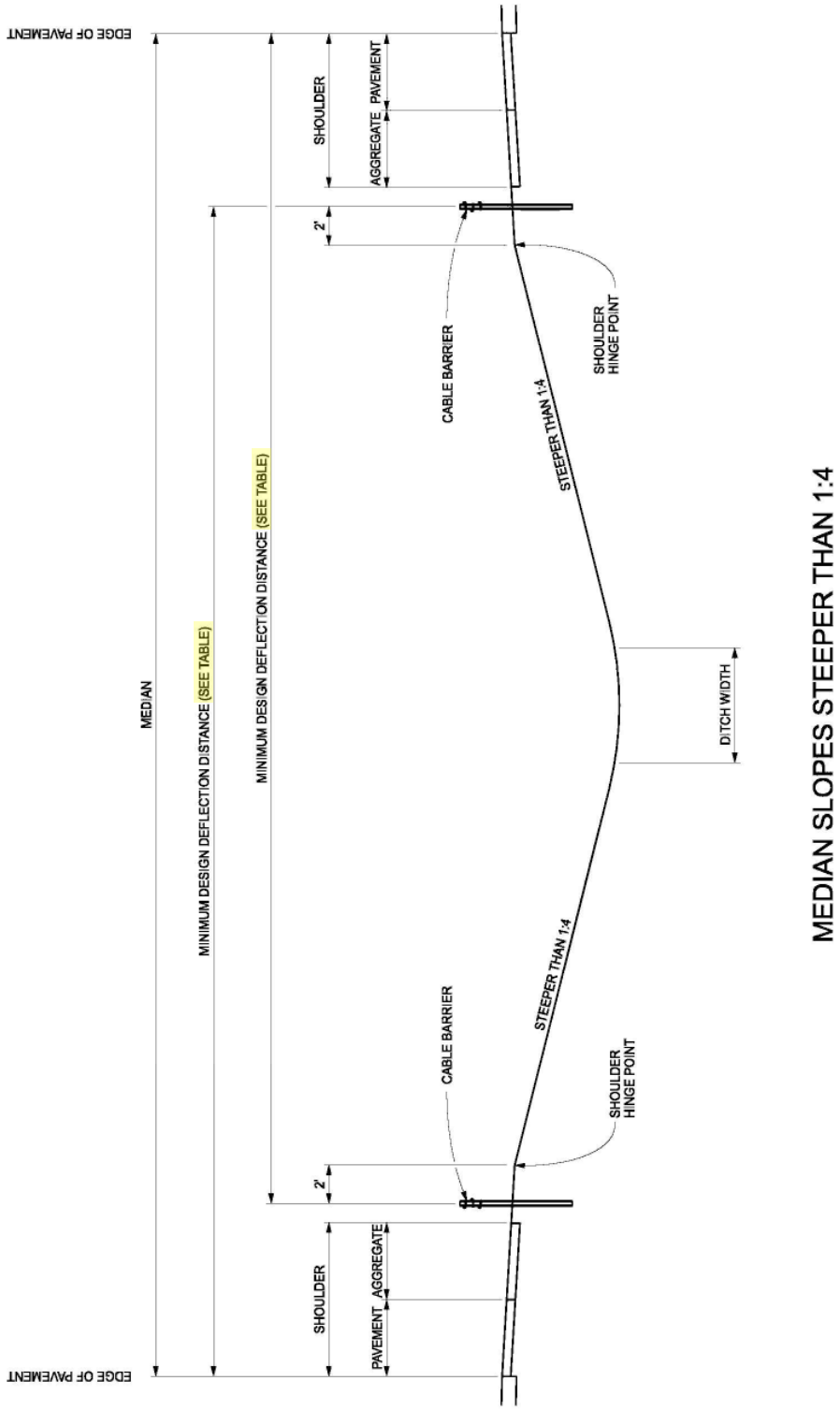


DUAL RUNS ON MEDIAN SLOPES STEEPER THAN 1:6 UP TO 1:4

FOR CABLE SYSTEMS RATED FOR INSTALLATION ON 1:4 SLOPES

7.01.55C (continued)

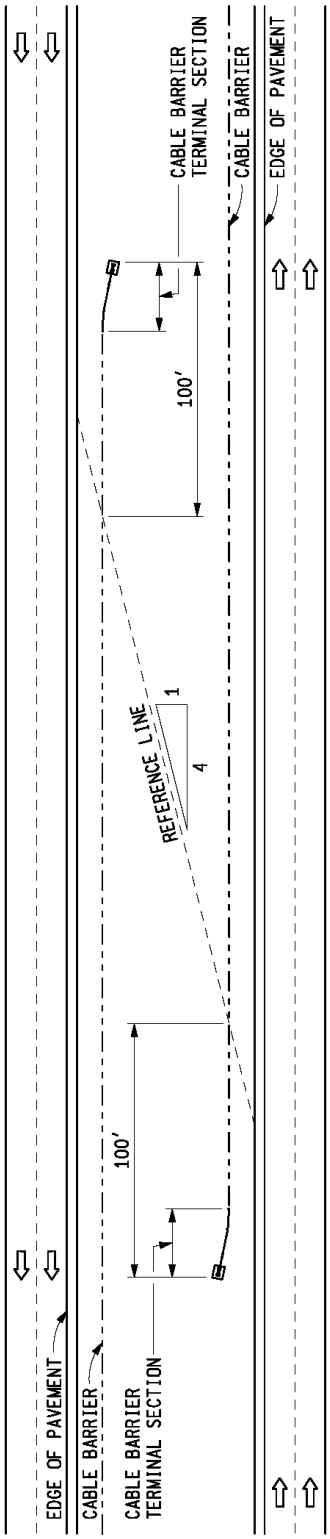
Median Barrier Types



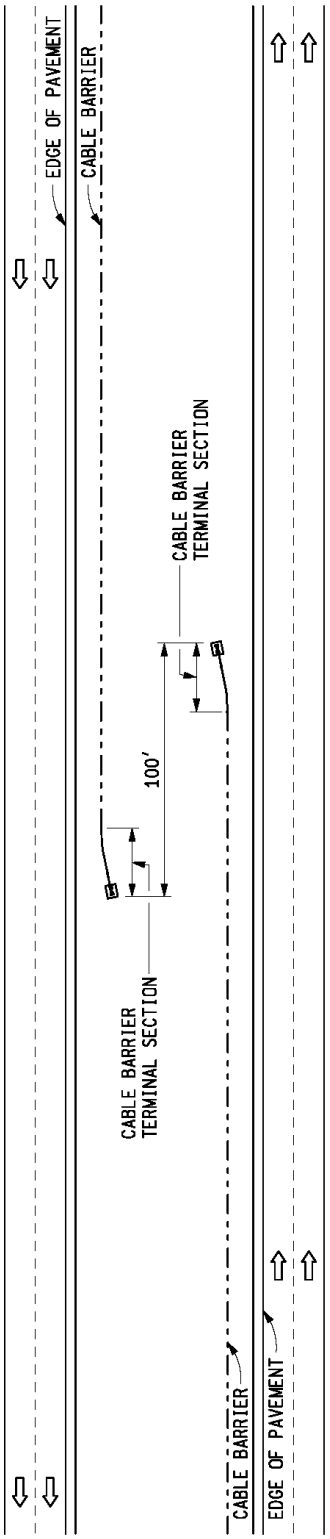
MEDIAN SLOPES STEEPER THAN 1:4

7.01.55C (continued)

Median Barrier Types



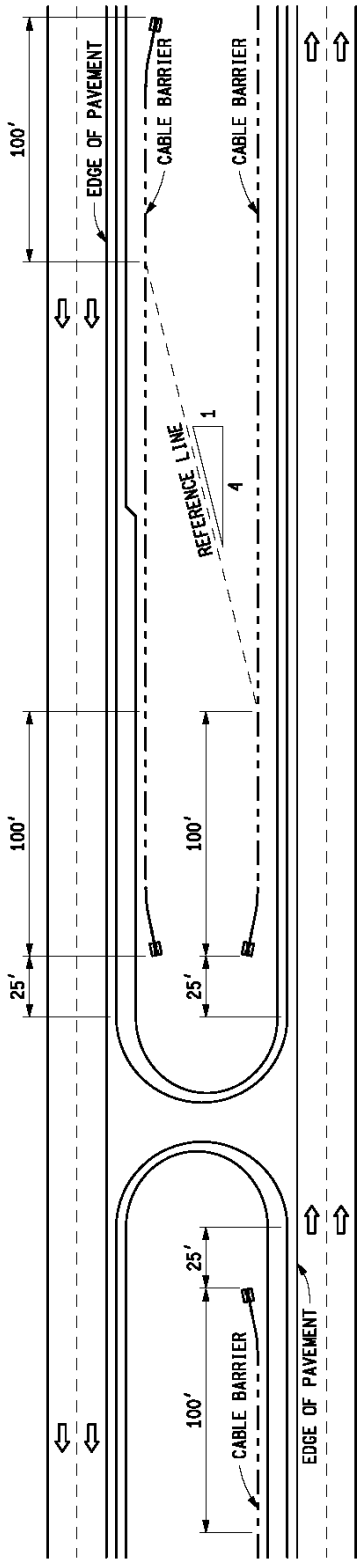
CABLE BARRIER SHIFT - APPROACH END



CABLE BARRIER SHIFT - DEPARTING END

7.01.55C (continued)

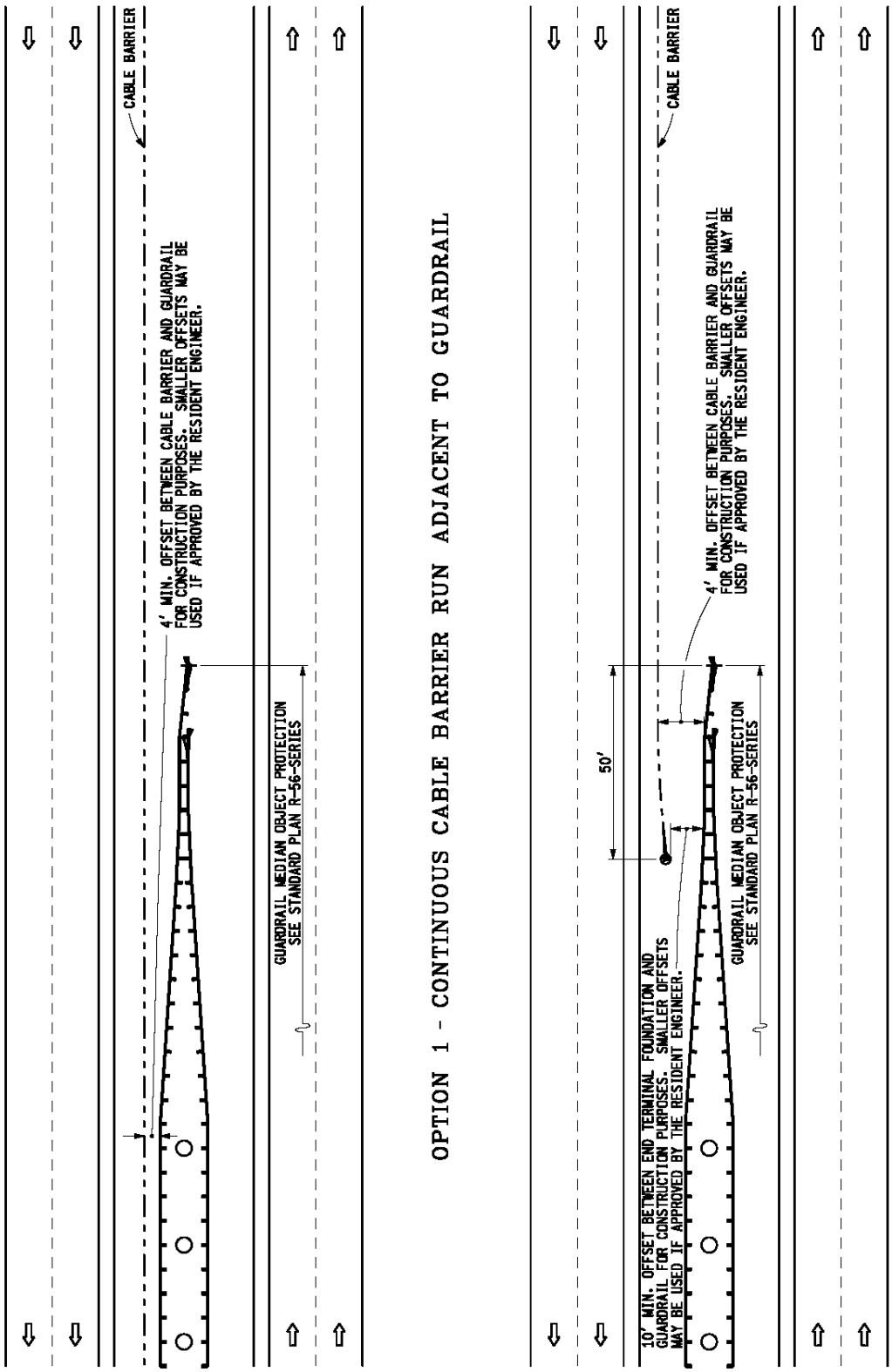
Median Barrier Types



MAINTENANCE CROSSOVER LAYOUT

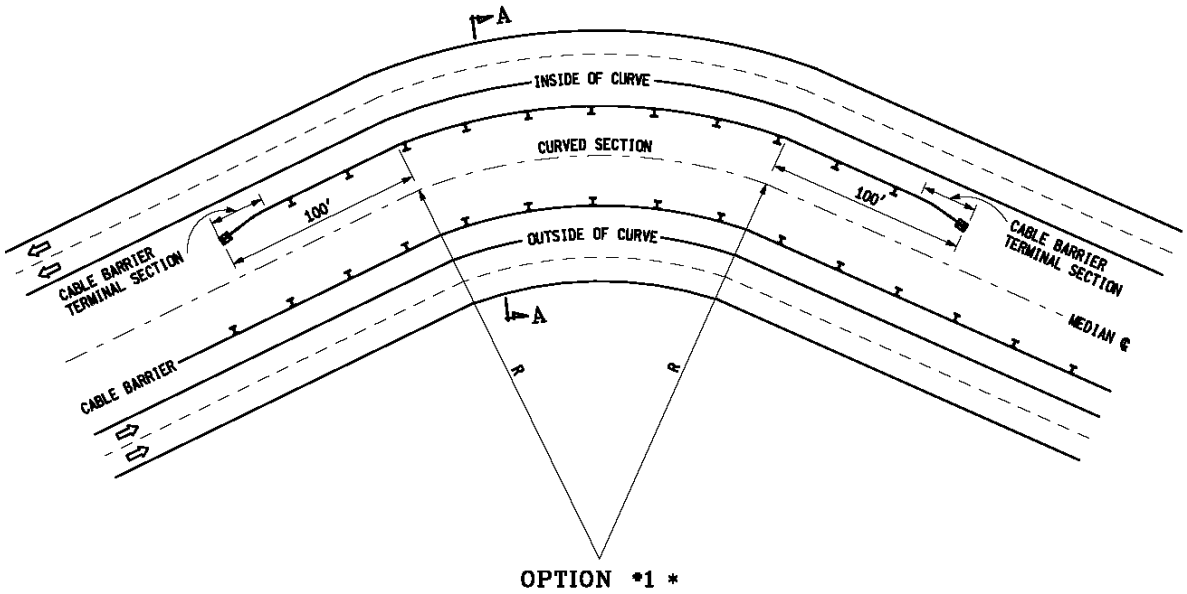
7.01.55C (continued)

Median Barrier Types

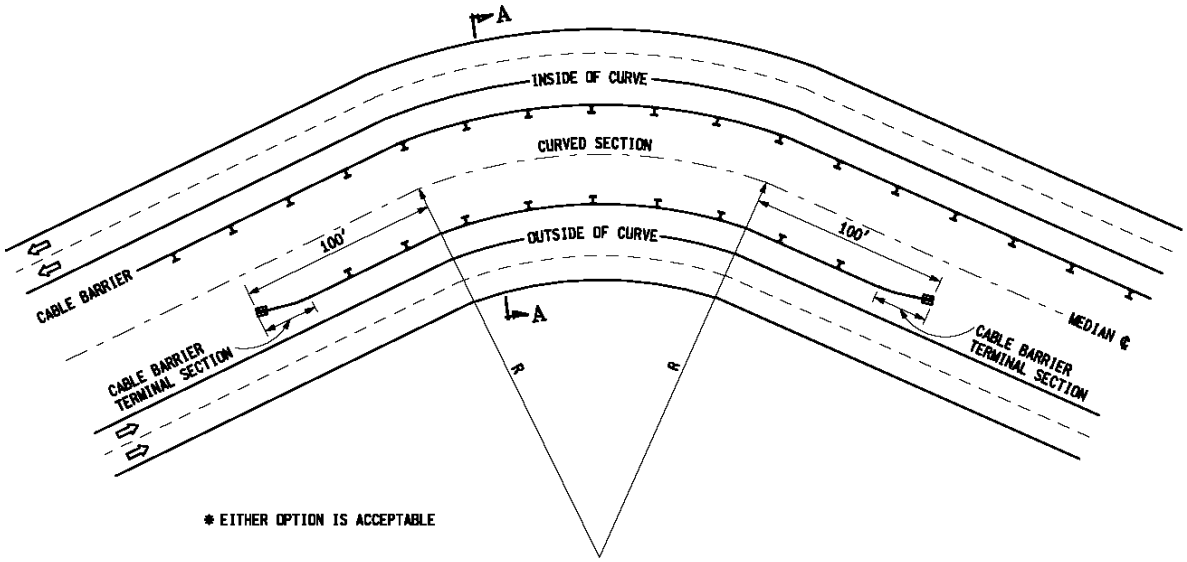


7.01.55C (continued)

Median Barrier Types

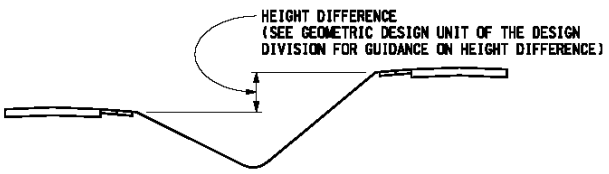


OPTION *1 *



* EITHER OPTION IS ACCEPTABLE

OPTION *2 *



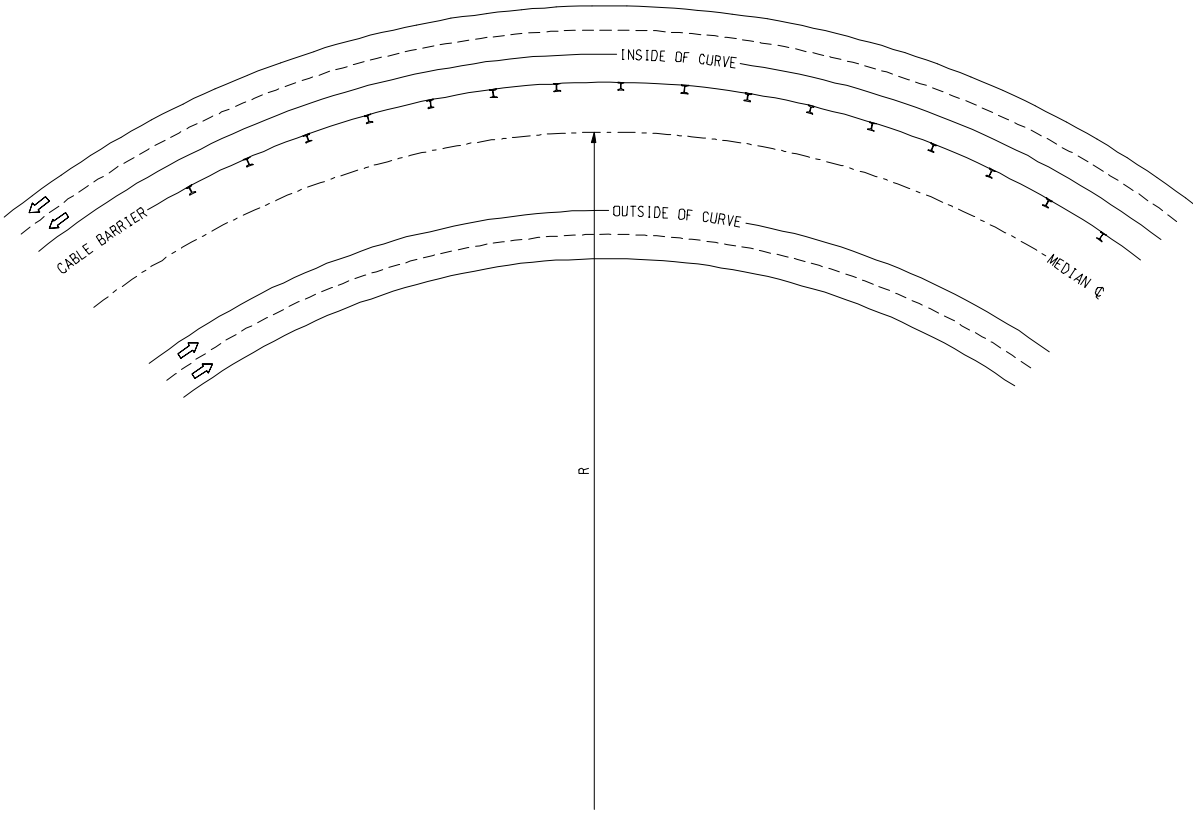
SECTION A-A

RECOMMENDED CABLE BARRIER PLACEMENT ON CURVED ROADWAYS

R < 5,730' WITH UNEQUAL EMBANKMENT HEIGHT OR MEDIAN SLOPES STEEPER THAN 1:4

7.01.55C (continued)

Median Barrier Types



RECOMMENDED CABLE BARRIER PLACEMENT ON CURVED ROADWAYS

$5{,}730' \leq R \leq 11{,}460'$

$R < 5{,}730'$ WITH EQUAL EMBANKMENT HEIGHT AND 1:4 OR FLATTER MEDIAN SLOPES

CHAPTER 14 • PROCEDURES FOR PLAN PREPARATION

14.01 GENERAL
14.02 DESIGN PACKAGE EVALUATIONS
14.03 ESTIMATES
14.03.01 Definitions
14.03.02 Program Estimates
14.03.03 Preliminary Estimates
14.03.04 Engineer's Preliminary Estimates
14.04 INTERSTATE ACCESS CHANGE REQUEST (IACR)
14.04.01 General
14.05 PROJECT STUDY TEAM
14.06 PROJECT ASSIGNMENT
14.07 PROJECT NUMBERS
14.07.01 Work Type Codes and Descriptions
14.08 ACTIVATION OF "PE" / "PE-S" PHASE
14.09 RISK BASED PROJECT INVOLVEMENT (RBPI)
14.10 SCOPE VERIFICATION MEETING
14.11 DESIGN EXCEPTIONS / DESIGN VARIANCES
14.12 REQUEST FOR SURVEY / MAPPING
14.12.01 Road
14.12.02 Bridge
14.13 PROJECT AREA CONTAMINATION SURVEY
14.14 REVIEW / REVISE PLANISWARE NETWORK
14.15 CHANGE REQUEST (REVIEW OF PROJECT SCOPE, COST AND SCHEDULE)
14.16 REQUEST FOR UTILITY INFORMATION
14.17 FAA OBSTRUCTION EVALUATION
14.18 PAVEMENT DESIGN
14.19 REQUEST FOR PAVEMENT CORES / SOIL BORINGS
14.20 RECEIPT OF SURVEY / MAPPING DATA
14.21 BRIDGE REVIEW
14.21.01 Review by Bridge Design

14.36.01 Requirements
14.36.02 Procedure
14.37 REVIEW OF PROJECT SCOPE, COST AND SCHEDULE
14.38 ROW REVISIONS
14.39 UTILITY STATUS REPORT CERTIFICATION
14.40 OTHER STATE AGENCY COORDINATION
14.40.01 EGLE Permits for Sewer and Water Mains
14.40.02 Bureau of Construction Code Permits and Plan Reviews
14.40.02A Applicability
14.40.02B References
14.40.02C General
14.40.02D Definition of Terms
14.40.02E Codes
14.40.02E1 Building
14.40.02E2 Electrical
14.40.02E3 Mechanical
14.40.02E4 Plumbing
14.40.02F Plan Review Submission
14.40.02G Waivers
14.41 PARTICIPATION AGREEMENTS
14.41.01 General
14.41.02 Estimates
14.41.03 Act 51 Participation
14.41.03A Participation Items
14.41.03B Non-Participation Items
14.41.04 Deleted
14.41.05 Extra Width Construction or Resurfacing
14.41.06 100% Betterment for Local Party (non-trunkline work)
14.41.07 Municipal Utilities
14.41.08 Bicycle Paths
14.41.09 Turnbacks
14.41.10 Parking
14.41.11 Special Maintenance and Operational Obligations

14.04 INTERSTATE ACCESS CHANGE REQUEST (IACR)

(PPD Task Description 1350 &1555)

14.04.01 General

(revised 10-26-2026)

To maintain the highest level of safety and mobility on the Interstate System, the Federal Highway Administration (FHWA) established 23 CFR Part 624 to define the requirements for adding or modifying interstate interchanges or access points. This rule outlines the justification and documentation the Department must submit to FHWA when proposing access changes. This submission is called an Interstate Access Change Request (IACR). Protecting and enhancing the Interstate System is a national priority. Any proposed access change must not significantly impact interstate traffic operations or user safety within the project's area of influence.

Identify during project planning or scoping if an IACR is required. It is important to account for IACR development early in the project because of the potential for additional time and requirements not typically addressed during design.

FHWA retains full approval authority over interstate access to safeguard the system's integrity and the substantial national investment it represents. MDOT must submit all access requests to the FHWA Michigan Division office regardless of the initiating agency.

Contact the Statewide and Urban Travel Analysis (SUTA) Section for assistance in determining if an IACR is required and for assistance in completing it. Refer to MDOT Process Map Guidance Document for additional information.

The following examples of when an IACR is or is not required are for quick reference only; refer to Appendix B Process Map Guidance Document for the final determination in addition to any input from MDOT's SUTA team.

The most common instances where an IACR is required include:

- Changing the interchange configuration.
- Constructing a new freeway-to-freeway interchange.
- Constructing a new freeway-to-crossroad interchange.
- Modifying freeway-to-freeway interchange configuration, adding new ramp(s), abandoning or removing ramp(s), completing basic movements, and reconstructing structures within the interchange.
- Constructing a new partial interchange or adding/removing ramps creating a partial interchange.
- Constructing new ramps to/from continuous frontage roads.
- Reconfiguring an existing freeway-to-crossroad interchange (i.e., adding a loop to a diamond interchange).

- Completing basic movements at a partial interchange (i.e., completing a partial diamond interchange by adding a ramp).
- Abandoning ramps or interchanges.
- Relocating a terminal of a ramp to a different local road.

Notwithstanding an FHWA request to determine that the design will not have an adverse effect, the IACR process is generally not applicable to the following scenarios:

- Shifting a ramp's location within the same interchange configuration resulting in ramp spacing that meets FHWA's design criteria.
- Adding lanes to an on-ramp.
- Changing the operational configuration of a ramp terminal intersection.
- Adding left-turn storage lanes, right-turn storage lanes, and through-lanes at the terminus of existing ramps.
- Relocating or shifting existing on-ramp or off-ramp termini along the same roadway.
- Adding a single auxiliary lane between two adjacent interchange ramps where the single auxiliary lane does not function as a mainline travel lane.
- Increasing the length of acceleration or deceleration lanes involved with any ramp.
- Improving traffic signals at ramp termini with local roads.
- Constructing new signing, striping, and/or resurfacing of an Interstate on-ramp or off-ramp.
- Constructing overpasses or grade separation structures without ramps along Interstate facilities.
- Modifying ramps providing access to safety rest areas, maintenance facilities, information centers, and/or weigh stations located within the Interstate ROW.

14.40 OTHER STATE AGENCY COORDINATION

(PPD Task Description 3680)
(revised 10-26-2026)

14.40.01 EGLE Permits for Sewer and Water Mains

Plans that include additions or changes to water mains, sanitary sewers or combination storm and sanitary sewers require a Michigan Department of Environment, Great Lakes, and Energy (EGLE) permit. The Project Manager should contact the Design Engineer-Municipal Utilities as early as possible in the scope verification/plan development process when water mains or sanitary sewers are involved. The Municipal Utilities Unit will complete the required plan sheets and specifications, seal the plans (Licensed Professional Engineer) and make the distribution to any municipalities involved. The municipalities will request the permit from the EGLE and return an approved copy to MDOT. If possible, a copy of the permit should be included in the proposal. For additional information see Section 9.04.07.

14.40.02 Bureau of Construction Code Permits and Plan Reviews

14.40.02A Applicability

This section applies to all projects that require the issuance of a permit from the Bureau of Construction Codes for building, electrical, mechanical, or plumbing work. Projects not requiring permits are excluded from the plan review requirements of this section but not from any applicable provisions of their respective codes. Permit exclusions are identified within each code.

14.40.02B References

A. Michigan Compiled Laws. *Stille-DeRossett-Hale Single State Construction Code Act*, Mich. Comp. Laws § 125.1501 et seq. (Act 230 of 1972).

B. Michigan Administrative Code. *Michigan Building Code* (2021 ed.), adopted by Mich. Admin. Code R 408.30401 et seq.

C. Michigan Administrative Code. *Michigan Rehabilitation Code* (2021 ed.), adopted by Mich. Admin. Code R 408.30551 et seq.

D. Michigan Administrative Code. *Michigan Mechanical Code* (2021 ed.), adopted by Mich. Admin. Code R 408.30901 et seq.

E. Michigan Administrative Code. *Michigan Plumbing Code* (2021 ed.), adopted by Mich. Admin. Code R 408.30701 et seq.

F. Michigan Administrative Code. *Michigan Energy Code* (2021 ed.), adopted by Mich. Admin. Code R 408.31087 et seq.

G. Michigan Administrative Code. *Michigan Electrical Code* (2023 ed.), adopted by Mich. Admin. Code R 408.30801 et seq

14.40.02C General

The Stille-DeRossett-Hale Single State Construction Code Act (Construction Code) establishes a uniform statewide construction code for Michigan. The Michigan Bureau of Construction Codes (BCC), within the Department of Licensing and Regulatory Affairs (LARA), is responsible for promulgating and enforcing the Construction Code for MDOT-owned buildings. The Construction Code incorporates the Michigan Building Code, Michigan Rehabilitation Code, Michigan Energy Code, Michigan Electrical Code, Michigan Mechanical Code, and Michigan Plumbing Code.

Department facilities subject to the Act include administrative offices, maintenance garages, rest areas, salt sheds, storage buildings, toll booths, warehouses, welcome centers, pump houses, and other buildings and structures covered in this section.

14.40.02D Definition of Terms

Building: a combination of materials, whether portable or fixed, forming a structure affording a facility or shelter for use or occupancy by individuals, animals, or property. *(Act 230 of 1972, §125.1502a(1)(g))*.

Structure: that which is built or constructed, an edifice or building of any kind, or a piece of work artificially built up or composed of parts joined together in some definite manner. Structure does not include works of heavy civil construction including, but not limited to, highways and bridges. *(Act 230 of 1972, §125.1502a(1)(bb))*.

Code: the state construction code or a part of that code of limited application and includes a modification of or amendment to the code. *(Act 230 of 1972, §125.1502a(1)(l))*.

The code shall consist of the international residential code, the international building code, the international mechanical code, the international plumbing code, the international existing building code, and the international energy conservation code published by the international code council and the national electrical code published by the national fire prevention association, with amendments, additions, or deletions. *(Act 230 of 1972, §125.1504(2))*.

Construction: means the construction, erection, reconstruction, alteration, conversion, demolition, repair, moving, or equipping of buildings or structures. *(Act 230 of 1972, §125.1502a(1)(n))*.

Equipment: plumbing, heating, electrical, ventilating, air conditioning, and refrigerating equipment. *(Act 230 of 1972, §125.1502a(1)(u))*.

14.40.02E Codes

14.40.02E1 Building

There are two distinct building codes that may apply based on whether a building or structure has been previously occupied or used for its intended purpose. Permit and plan review requirements differ based on whether the Michigan Building Code or the Michigan Rehabilitation Code applies. The Michigan Building Code applies to new buildings, additions, and structures. The Michigan Rehabilitation applies to existing buildings and structures only. *(Michigan Rehabilitation Code §101.2. (2021))*.

Michigan Building Code: Permits required to construct, enlarge, alter, repair, relocate, demolish, or change the occupancy of a building or structure; or erect, install, enlarge, alter, repair, remove, convert, or replace any regulated electrical, gas, mechanical, plumbing, or solar panel systems. *(Michigan Building Code §105.1. (2021))*.

- Permits are not required for work meeting the requirements of Section 105.2 in the Michigan Building Code. *(Michigan Building Code §105.2. (2021))*.

Michigan Rehabilitation Code for Existing Buildings: Permits required to construct, enlarge, alter, repair, relocate, demolish, or change the occupancy of a building or structure; or erect, install, enlarge, alter, repair, remove, convert, or replace any regulated electrical, gas, mechanical, plumbing, or solar panel systems. *(Michigan Rehabilitation Code §105.1. (2021))*.

- Permits are not required for work meeting the requirements of:
  - Section 105.2 *(Michigan Rehabilitation Code §105.2. (2021))*.
  - Section 105.2.2. *(Michigan Rehabilitation Code §105.2.2. (2021))*.

14.40.02E2 Electrical

Michigan Electrical Code: Permits required to install, replace, alter, or relocate electrical systems or material.

- Permits are not required for work meeting the requirements of Section 80.19(c) in the Michigan Electrical Code. *(Michigan Admin. Code R. 408.30818)*.

14.40.02E3 Mechanical

Michigan Mechanical Code: Permits required to erect, install, enlarge, alter, repair, remove, convert, or replace a mechanical system regulated by this code. *(Michigan Mechanical Code §106.1. (2021))*.

- Permits are not required for work meeting the requirements of Section 106.2 in the Michigan Mechanical Code. *(Michigan Mechanical Code §106.2. (2021))*.

14.40.02E4 Plumbing

Michigan Plumbing Code: Permits required to erect, install, enlarge, alter, repair, remove, convert, or replace any plumbing system regulated by this code. *(Michigan Plumbing Code §106.1. (2021))*.

- Permits are not required for work meeting the requirements of Section 106.2 in the Michigan Plumbing Code. *(Michigan Plumbing Code §106.2. (2021))*.

14.40.02F Plan Review Submission

The Construction Code states in part that “A building or structure owned by the state shall not be erected, remodeled, or reconstructed in the state … until written approval of the plans and specifications has been obtained from the bureau of construction codes … indicating that the state-owned facilities shall be designed and constructed in conformance with the state construction code.” *(Act 230 of 1972, §125.1508b(8))*.

Submit all plans that require the issuance of a permit as determined by the Construction Code to the BCC for review through their online portal as soon as the relevant design features are complete. Comply with all accessibility and barrier-free requirements; when full compliance is technically infeasible, provide access to the maximum extent technically feasible. Plan reviews may take several weeks, and multiple submissions may be required to resolve deficiencies. Obtain BCC plan review approval before project turn-in to avoid addenda or revisions after letting. Refer to Plan Review Information for additional information.

14.40.02G Waivers

The BCC can provide code-specific waivers to the plan review process provided any of the following conditions are met:

- Building
  - For repair work determined by the building official to be of a minor nature.
  - For utility vaults that are 120 square feet or less.
- Electrical
  - For electrical system ratings that do not exceed 400 amps and the building is not over 3,500 square feet in area.
- Mechanical
  - For alterations and repair work determined by the mechanical official to be of a minor nature.
  - For business, mercantile, and storage buildings having HVAC equipment only, with one fire area and not more than 3,500 square feet.
  - For mechanical work that costs less than $15,000.00.
- Plumbing
  - For alterations and repair work determined by the plumbing official to be of a minor nature.
  - For assembly, business, mercantile, and storage buildings with a required plumbing fixture count less than 12.
  - For plumbing work that costs less than $15,000.00.

If any of the aforementioned conditions apply, submit an email to BCCPermits@michigan.gov requesting a plan review waiver of the specific code. Include a detailed description of the project and any relevant drawings that will assist the BCC in making their determination. If the waiver is granted, include a copy of the email in the Reference Information Documents in ProjectWise. This does not waive any permitting or compliance with applicable code requirements.

A waiver from one code does not constitute a waiver from all codes and may still require a plan review to be performed for the applicable portions.

For structure (culvert) lengths that can accommodate a clear span between guardrail posts of 25 ft.-0 in. 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 in. above plan grade elevation and attach guardrail to headwall as detailed on the plans.

Add a PVC (polyvinyl chloride) liner that covers entire top and sides of all buried culverts. For precast boxes, extend the liner to the top of the culvert bedding and turn out 6 in. horizontally across the top of the culvert bedding. For three sided and arch culverts, extend the liner down the leg of the culvert, horizontally across the top of the pedestal wall, and down the vertical face of the pedestal wall 18 in. or to the top of the footing, whichever is less. 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.

- Where staged construction is used to install the culvert and a temporary MSE wall is required at the stage line, stop the PVC liner a horizontal distance equal to the temporary MSE wall height away from the temporary MSE wall face and adhere the perimeter of the liner with an adhesive as recommended by the PVC liner manufacturer. If a temporary MSE wall is not required at the stage line, the PVC liner may be installed across the stage line joint, or two pieces of PVC liner may be welded together as recommended by the PVC liner manufacturer.

- Include Special Provision for Polyvinyl Chloride Liner in proposal.

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

7.02.32 Deck Replacements

(revised 12-16-2019)

Evaluate the structural adequacy of the entire structure when deck replacements, widening projects, or reconstruction projects are planned. In addition to the criteria listed below, ensure that deck replacements comply with all requirements in this chapter, including slopes, shoulder width, stay-in-place deck forms, and approach items. Consider all modes of transportation and determine whether the deck replacement or widening can accommodate all users.

7.02.32A Beams

(revised 6-27-2022)

1. On concrete T-Beam bridges the deck slab is an integral part of the support system and cannot be removed without dismantling the entire superstructure. The cost of deep chipping (or hydrodemolishing) combined with the installation of a cathodic protection system should be weighed against the cost of complete superstructure replacement.

2. On steel stringer bridges, blast clean the tops of beams and coat them with an organic zinc-rich primer. Place shear connectors as needed to upgrade the capacity of existing non-composite decks.

3. On prestressed concrete side by side box beam decks, the existing wearing course is replaced with a 6 in. reinforced deck.

4. On older steel stringer bridges, lateral bracing was often added as a part of the original construction. If lateral bracing was removed subsequent to the original construction, consider whether the beams require temporary lateral bracing during the deck replacement.

7.02.32B Railings

Upgrade railings when bridge deck replacements are planned. See BDM Section 7.02.28.

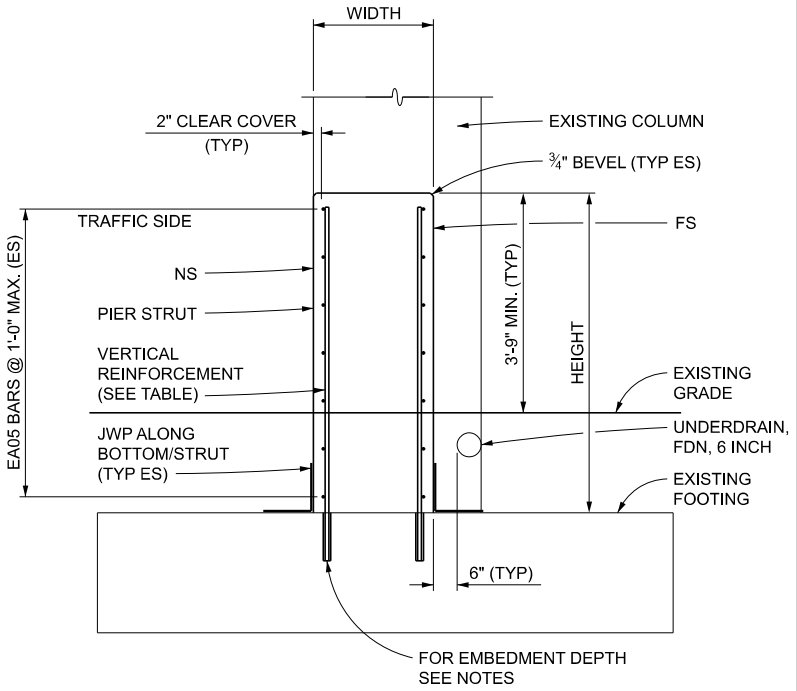
7.02.32C Geometrics

(revised 9-28-2026)

Criteria for roadway widths and design loading are established in ***A Policy on Design Standards - Interstate System***, 2016, and the 7th Edition of AASHTO's Policy on Geometric Design of Highways and Streets ("Green Book" or "GB7"). These criteria are based on the type of roadway carried by the structure and are summarized in this section. Non Interstate structures with deck replacements or widening projects (or reconstruction projects) must adhere to ***GB7*** design criteria (standards). Interstate structures must adhere to ***A Policy on Design Standards - Interstate System***, 2016. MDOT policy has set bridge (shoulder) widths 2 ft. (offset) greater than AASHTO widths for safety considerations of the traveling public. See Bridge Design Guides 6.05 Series & 6.06 Series.

DRAWN BY: BLT	MICHIGAN DEPARTMENT OF TRANSPORTATION BUREAU OF DEVELOPMENT	ISSUED: 10/26/26
CHECKED BY: CWC	PIER STRUT RETROFIT	SUPERSEDES: 08/25/25
APPROVED BY: BMW		

PIER STRUT RETROFIT REINFORCED CONCRETE DESIGN			
HEIGHT (FT)	WIDTH (FT)	VERTICAL REINFORCEMENT (IN^2/FT)	APPLIED TENSION LOAD (KIP/FT)
5.0	1.5	1.11	60
6.0	2.0	0.90	52
7.0	2.0	1.11	61
8.0	2.5	0.94	54
9.0	2.5	1.11	61
10.0	3.0	0.95	56
11.0	3.0	1.05	61
12.0	3.0	1.18	67



PIER STRUT SECTION

NOTES:

NS DENOTES NEAR SIDE, FS DENOTES FAR SIDE, AND ES DENOTES EACH SIDE.

DETAILS INCLUDED IN THIS GUIDE MAY BE USED TO RETROFIT EXISTING BRIDGE PIERS THAT MEET ONE OF THE CONDITIONS OUTLINED IN BRIDGE DESIGN MANUAL SECTION 6.08.08.

INFORMATION PROVIDED IN THE TABLE APPLIES WHEN THE LENGTH OF THE PIER STRUT IS LESS THAN THE CRITICAL WALL LENGTH OVER WHICH THE YIELD LINE MECHANISM OCCURS (Lc). IF THE LENGTH OF THE PIER STRUT EXCEEDS Lc, DESIGN THE REINFORCEMENT IN ACCORDANCE WITH AASHTO LRFD SECTION A13.3.1. FOR DEFINITIONS OF YIELD LINE MECHANISM AND Lc SEE AASHTO LRFD A13.3.1.

AT MEDIAN PIERS, PLACE VERTICAL REINFORCEMENT, SPECIFIED IN THE TABLE, IN BOTH FACES OF THE PIER STRUT. THE WIDTH OF THE STRUT AT MEDIAN PIERS SHOULD MATCH THE WIDTH/DIAMETER OF THE EXISTING PIER COLUMNS.

VERTICAL ADHESIVE ANCHORS IN THE PIER FOOTING MUST BE DESIGNED FOR THE APPLIED TENSION (SEE TABLE) AND SHEAR LOADS USING THE DESIGN STRENGTH OF THE CONCRETE IN THE PIER FOOTING AND ASSUMING A CRACKED SECTION. THE ADHESIVE SYSTEM AND MINIMUM EMBEDMENT DEPTH OF THE VERTICAL REINFORCING ANCHORED INTO THE FOOTING IS REQUIRED TO MEET THE PROVISIONS OF BRIDGE DESIGN MANUAL SECTION 7.06.02.B.

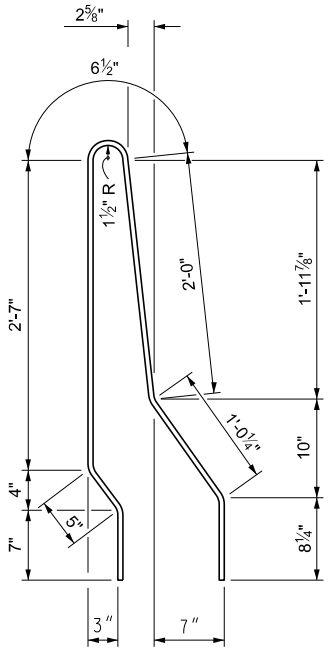
PIER STRUTS WITH HEIGHTS AND WIDTHS OTHER THAN THOSE LISTED IN THE PIER STRUT RETROFIT REINFORCED CONCRETE DESIGN TABLE SHALL BE DESIGNED IN ACCORDANCE WITH AASHTO LRFD SECTION 3.6.5.

PLACE ½" JOINT FILLER BETWEEN PIER COLUMNS OR STRUTS AND SLOPE PAVING OR HEADER. FOR SLOPE PAVING DETAILS AT THE INTERFACE WITH PIER COLUMNS OR STRUTS, SEE STANDARD PLAN B-102-SERIES.

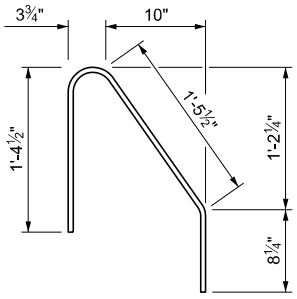
INCLUDE PAY ITEMS FOR UNDERDRAIN OUTLET AND UNDERDRAIN OUTLET ENDINGS. FOR UNDERDRAIN AND OUTLET ENDING DETAILS SEE STANDARD PLAN R-80-SERIES.

PREPARED BY DESIGN DIVISION	5.22.02A

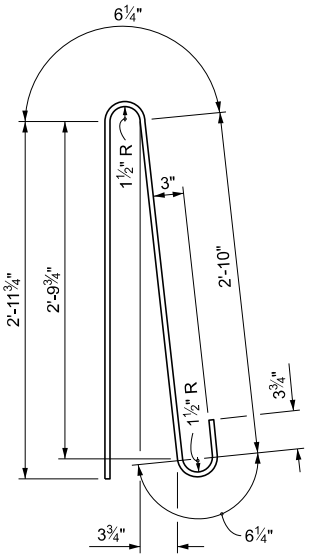
DRAWN BY: BLT CHECKED BY: CWC APPROVED BY: BMW	MICHIGAN DEPARTMENT OF TRANSPORTATION BUREAU OF DEVELOPMENT BRIDGE BARRIER RAILING, TYPE 4 FOR RAILING REPAIR	ISSUED: 10/26/26 SUPERSEDES: 01/27/25



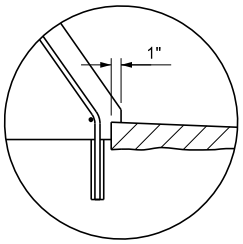
EG040710



EZ040310



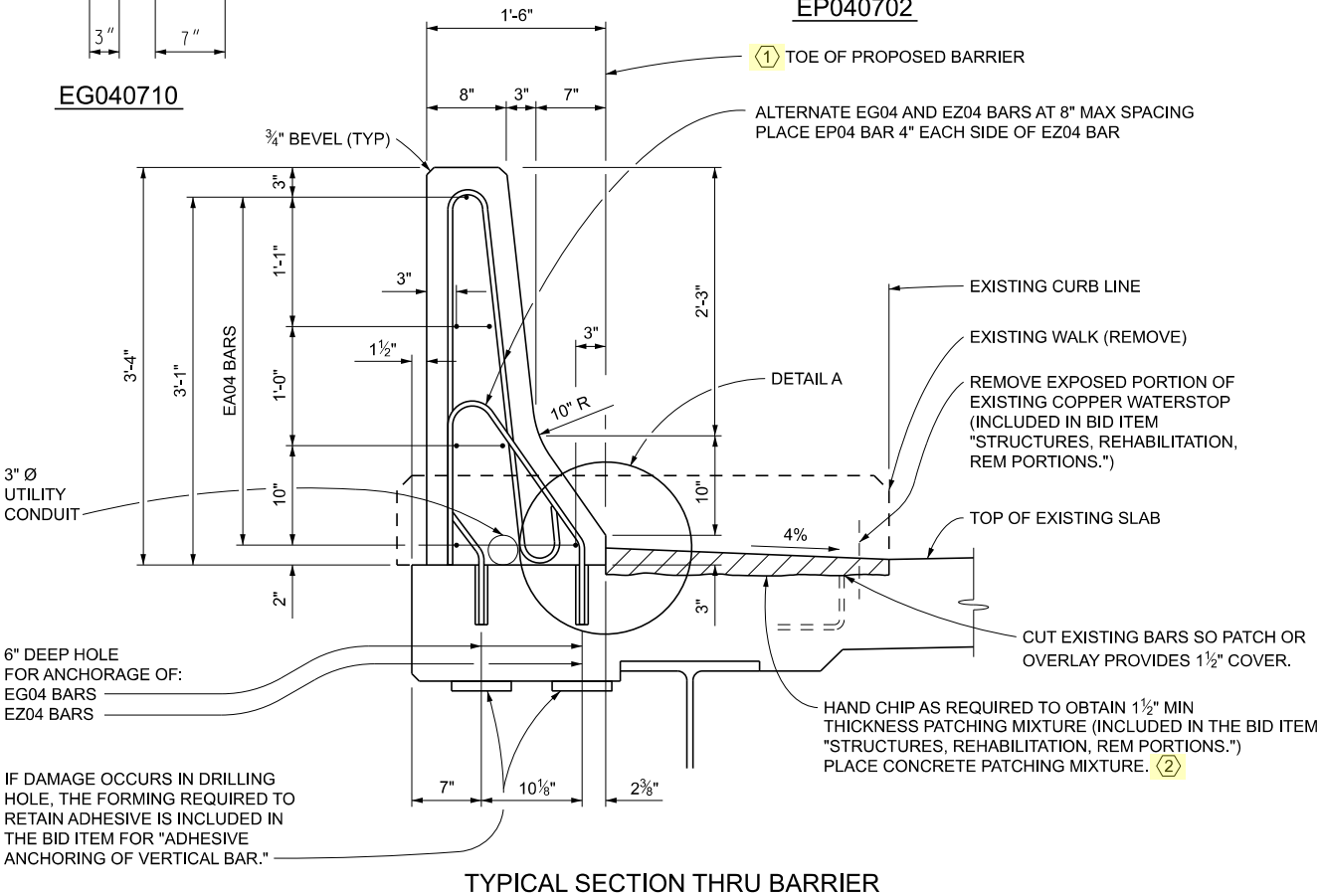
EP040702



DETAIL A

(OPTIONAL)

CONTRACTOR MAY PLACE OVERLAY PRIOR TO PLACEMENT OF BARRIER. ADDITIONAL OVERLAY MATERIAL NEEDED SHALL BE AT CONTRACTOR'S EXPENSE.



TYPICAL SECTION THRU BARRIER

DO NOT PLACE MORE THAN ONE 3" Ø UTILITY CONDUIT IN THE BARRIER.

HAND CHIPPING IN FRONT OF BARRIER IS NOT REQUIRED WHEN PROJECT INCLUDES CONCRETE OVERLAY.

1 PERPENDICULAR TO PLANE OF SLAB - NORMAL CROWN SECTIONS AND HIGH SIDE OF SUPERELEVATED SECTIONS.
VERTICAL - LOW SIDE OF SUPERELEVATED SECTIONS.

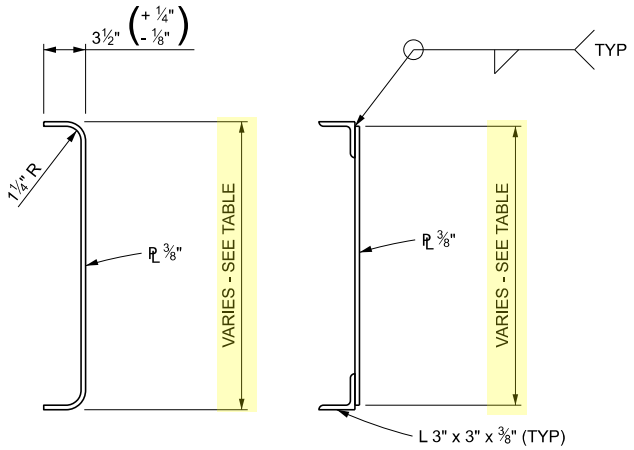
2 PLAN QUANTITIES SHOULD SHOW PATCHING MIXTURE TO BE "PATCHING MORTAR OR CONCRETE."

NOTE:
DO NOT USE THIS GUIDE FOR FULL BRIDGE BARRIER REPLACEMENT.

FOR PERMISSIBLE USES OF BRIDGE BARRIER RAILING REPAIRS SEE BRIDGE DESIGN MANUAL SECTION 6.05.05.

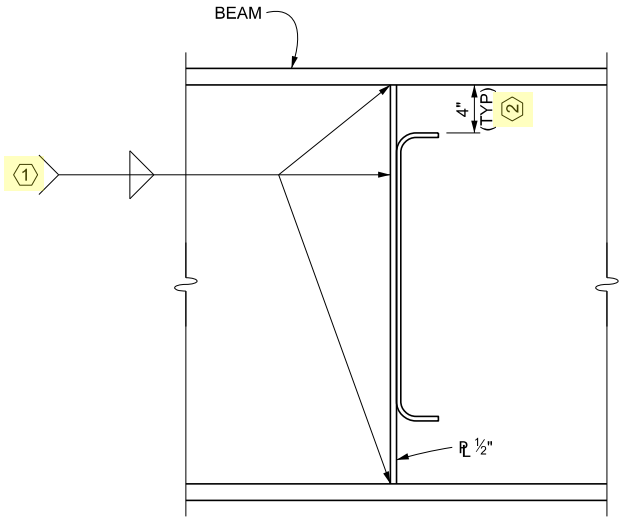
PREPARED BY DESIGN DIVISION	6.29.09A

DRAWN BY: BLT CHECKED BY: CWC APPROVED BY: BMW	MICHIGAN DEPARTMENT OF TRANSPORTATION BUREAU OF DEVELOPMENT DIAPHRAGM AND CONNECTION PLATE DETAILS	ISSUED: 10/26/26 SUPERSEDES: 11/27/01



ALTERNATE

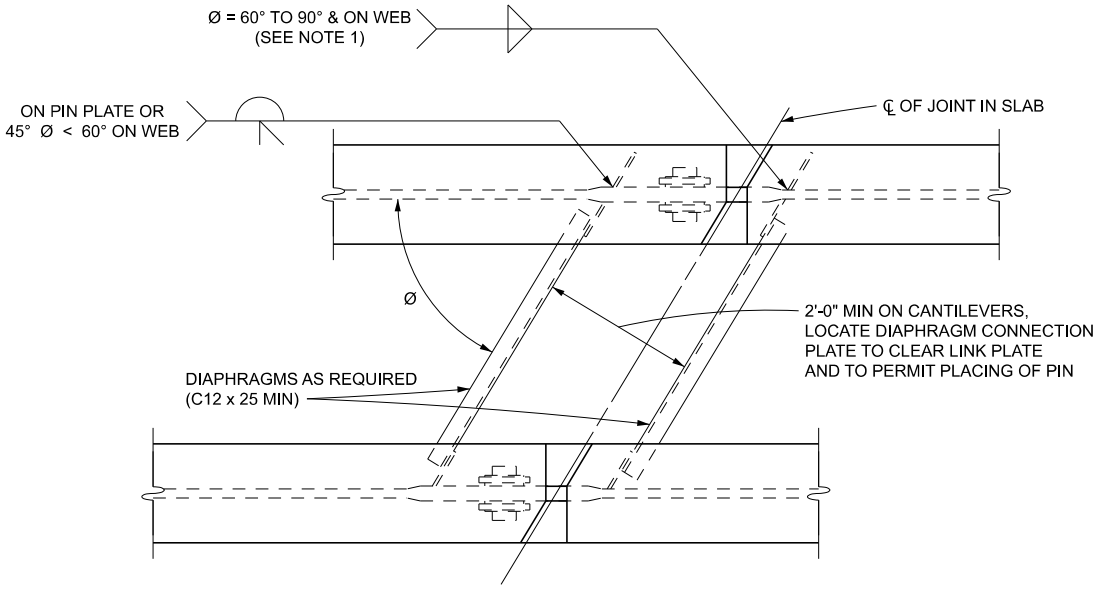
INTERMEDIATE DIAPHRAGM



WELDED DIAPHRAGM CONNECTION PLATE DETAIL

1. WRAP WELD AROUND OUTSIDE EDGE. STOP ALL WELDS ¼" SHORT OF CORNER CLIPS.
2. 3" FOR PLATE GIRDERS WITH WEB DEPTHS OF 24" AND 27".

INTERMEDIATE DIAPHRAGMS							
BEAM DEPTH/PLATE GIRDER WEB DEPTH	21"	24"	27"	30"	33"	36"	42"
DIAPHRAGM DEPTH WITH ROLLED BEAMS	11"	12"	16"	18"	22"	24"	30"
DIAPHRAGM DEPTH WITH PLATE GIRDERS	N/A	18"	21"	23"	25"	27"	32"



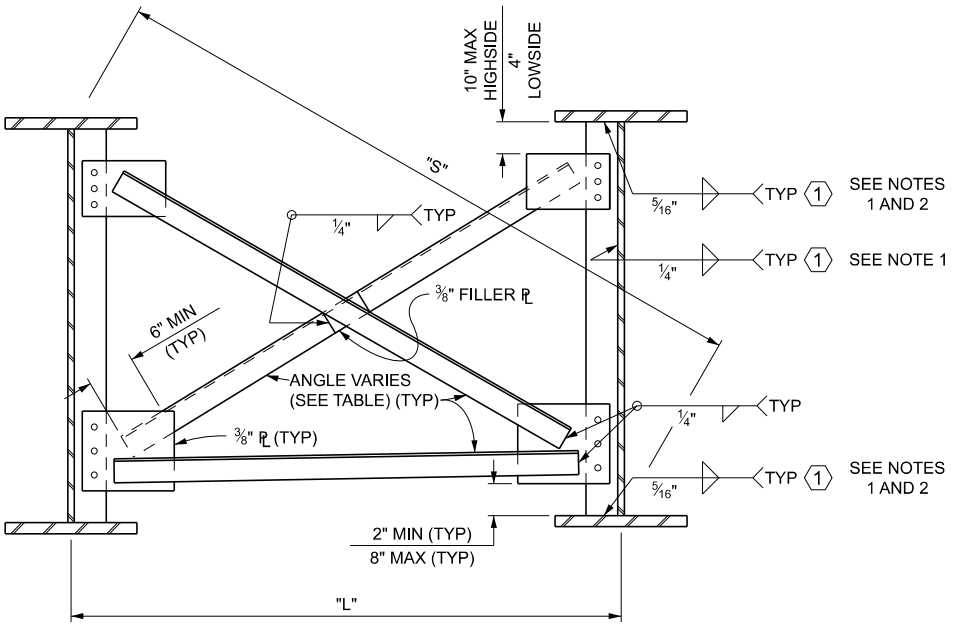
END DIAPHRAGM

NOTES:

1. IF WELDS ARE DISALLOWED BY FATIGUE, USE GUIDE 8.11.08.
2. FOR ADDITIONAL END DIAPHRAGM DETAILS SEE GUIDE 8.11.04.
3. FOR CROSS FRAME DETAILS SEE GUIDE 8.11.07.

PREPARED BY DESIGN DIVISION	8.11.03

DRAWN BY: BLT	MICHIGAN DEPARTMENT OF TRANSPORTATION BUREAU OF DEVELOPMENT	ISSUED: 10/26/26
CHECKED BY: CWC	INTERMEDIATE AND PIER CROSS FRAMES	SUPERSEDES: 11/27/17
APPROVED BY: BMW		



PIER AND INTERMEDIATE CROSS FRAMES

NOTES:

USE FULL DEPTH STIFFENERS OR ½" CONNECTION PLATES.

FOR ANGLES OF CROSSING > 70°, SET CONNECTION PLATE AND BEARING STIFFENER TO ANGLE OF CROSSING. FOR ANGLE OF CROSSING < 70°, SET CONNECTION PLATE AND BEARING STIFFENER NORMAL TO WEB. USE BENT GUSSET PLATES ON PIER CROSSFRAMES.

USE DETAIL A, GUIDE 8.06.02A IF CONNECTION PLATE EXTENDS BEYOND FLANGE.

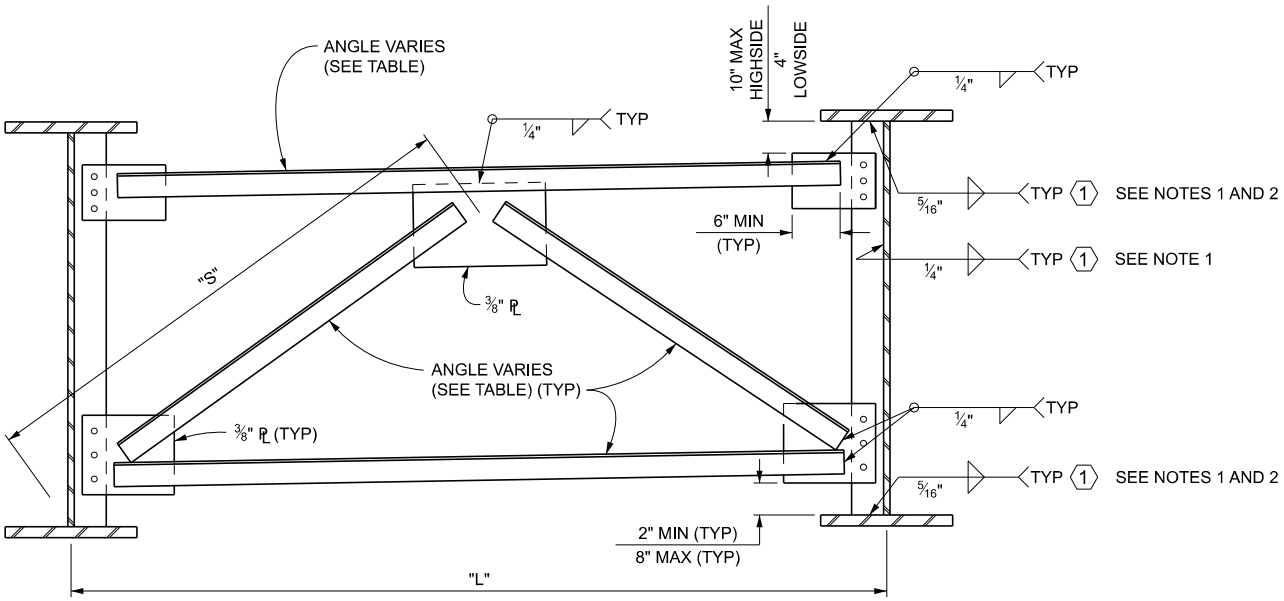
INTERMEDIATE CROSS FRAMES TO BE IN LINE.

ANGLE SIZE BASED ON L/R RATIO. STRESSES MAY REQUIRE USE OF LARGER ANGLES.

USE DIAPHRAGMS FOR WEB DEPTHS < 48". SEE GUIDE 8.11.03 FOR DETAILS.

(1) WELD TOP AND BOTTOM UNLESS FATIGUE LIMITATIONS CONTROL. CONNECTION PLATE WELDING SHOWN HERE. SEE GUIDE 8.06.02 FOR STIFFENER WELDING DETAILS. SEE GUIDE 8.11.08 FOR CONNECTION PLATE DETAILS IF FATIGUE LIMITATIONS CONTROL.

NOTE 1: STOP WELD ¼" SHORT OF CORNER CLIPS
NOTE 2: WRAP WELD AROUND OUTSIDE EDGE



PIER CROSS FRAMES

BEAM SPACING > 12'-6"

STRAIGHT GIRDERS	
"L" OR "S"	MINIMUM ANGLE SIZE
LESS THAN 6'-9"	3" x 3" x 5/16"
6'-9" TO 9'-3"	4" x 4" x 5/16"
9'-3" TO 11'-6"	5" x 5" x 3/8"
11'-6" TO 13'-9"	6" x 6" x 3/8"
13'-9" TO 18'-6"	8" x 8" x ½"
CURVED GIRDERS	
LESS THAN 5'-9"	3" x 3" x 5/16"
5'-9" TO 7'-9"	4" x 4" x 5/16"
7'-9" TO 9'-9"	5" x 5" x 3/8"
9'-9" TO 11'-9"	6" x 6" x ½"
11'-9" TO 15'-9"	8" x 8" x 5/8"

PREPARED BY DESIGN DIVISION	8.11.07