# **MSE WALL DESIGN REVIEW CHECKLIST**

**INSTRUCTIONS**

This checklist should be completed by the Engineer of Record (EOR) and submitted to the Geotechnical Services Division for review at MSEWallShopDrawings@indot.IN.gov, in accordance with IDM Chapter 14.

A link to frequently used abbreviations and acronyms is provided [here](#_ABBREVIATIONS_/_ACRONYMS).

The following tables should be filled out by the party listed in parenthesis.

**PROJECT INFORMATION (EOR)**

|  |  |
| --- | --- |
| Contract No. |  |
| Des. No. (associated with MSE wall details) |  |
| Route(s) |  |
| Feature Crossed (if applicable) |  |

**DESIGNER (EOR) and GEOTECHNICAL EOR INFORMATION**

|  |  |
| --- | --- |
| Name of EOR |  |
| EOR Consulting Firm or INDOT Location  |  |
| Name of Geotechnical EOR |  |
| Geotechnical EOR Consulting Firm or INDOT Location |  |

**INDOT GEOTECHNICAL REVIEWER INFORMATION**

**(Geotechnical Engineering Division)**

|  |  |
| --- | --- |
| Name |  |
| Date Received |  |
| Date Returned to EOR |  |
| Is a resubmittal required? |  |

**NOTES FOR CHECKLIST**

1. The following information/material should be referenced while completing the checklist:
	1. Project documents (final plan set, *Standard* *Specifications*, Standard Drawings, special provisions, project geotechnical report)
	2. FHWA/NHI manual ("Mechanically Stabilized Earth Walls and Reinforced Soil Slopes," Publications. FHWA NHI-10-024 Vol I and NHI-10-025 Vol II, December 2009; Authors: Ryan R. Berg, Barry R. Christopher and Naresh C. Samtani)
	3. Applicable version of AASHTO *LRFD Bridge Design Specifications*, including interims referenced on the plans.
2. Each question must have a "Yes", "No" or "N/A" box checked. Add any pertinent project specific questions to the checklist under “Place comments here. If NO or N/A is checked comments are required,” as necessary. Additional sheets may be used if more space is required.
3. The documents listed under the "Reference" column in the checklist are not intended to be a complete list of documents. Rather, the most common documents are listed where guidance/information related to the question in the checklist may be found. More stringent criteria may exist in other project documents (e.g., special provisions, etc.) that may be relevant to a given question. In such an event, the governing document should be noted in the "Comments/Action Required" column of the checklist.

# **CHECKLIST**

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| I. INITIAL FEASIBILITY REVIEW FOR PROJECT SITE |
| QUESTION | REFERENCE | YES | NO | N/A |
| 1. Has the MSE Wall been submitted to INDOT Geotechnical Services Division for evaluation of suitability? [place date of submittal in comments below] | IDM Ch. 14 | [ ]  | [ ]  | [ ]  |
| Place comments here. If NO or N/A is checked comments are required. |
| II. DESIGN CRITERIA |
| QUESTION | REFERENCE | YES | NO | N/A |
| 1. Are all acute angles greater than 70 degrees? | IDM 410-5.01(06) | [ ]  | [ ]  | [ ]  |
| Place comments here. If NO or N/A is checked comments are required. |
| 2. Are the radii of curves in the horizontal alignment of the wall greater than 100 ft for standard 10 ft wide panels, and greater than 50 ft for 5 ft wide panels? | IDM 410-5.01(06) | [ ]  | [ ]  | [ ]  |
| Place comments here. If NO or N/A is checked comments are required. |
| II. DESIGN CRITERIA (Continued) |
| QUESTION | REFERENCE | YES | NO | N/A |
| 3. Are utilities located within the reinforced zone? Where utility placement in the reinforced zone is unavoidable, future access must be provided to the utility without disrupting the reinforcement.  | IDM 410-5.01(06) | [ ]  | [ ]  | [ ]  |
| Place comments here. If NO or N/A is checked comments are required. |
| 4. Are utilities located under the wall? Where utility placement under the wall is unavoidable, they should be placed deep enough to minimize the effect of failure as per IDM. | IDM 410-5.01(06) | [ ]  | [ ]  | [ ]  |
| Place comments here. If NO or N/A is checked comments are required. |
| 5. Are culverts located within the reinforced zone? If so, slip joints should be provided. If the culvert is at skew, the skew should not affect the placement of reinforcement as per IDM. | IDM 410-5.01(06) | [ ]  | [ ]  | [ ]  |
| Place comments here. If NO or N/A is checked comments are required. |
| 6. Is the wall embedment per LRFD, but not less than 3 ft from final grade to top of leveling pad, unless founded on rock.? | LRFD 11.10.2.2, Spec 731.03IDM 410-5.01(05) | [ ]  | [ ]  | [ ]  |
| Place comments here. If NO or N/A is checked comments are required. |
| 7. Is the top of leveling pad at least 1 ft above ordinary high water and groundwater elevation? | IDM 410-5.01(05) | [ ]  | [ ]  | [ ]  |
| Place comments here. If NO or N/A is checked comments are required. |
| 8. Is coarse aggregate No. 8 used behind the wall instead of structure backfill up to the Q100 high-water elevation? | IDM 410-5.01(05) | [ ]  | [ ]  | [ ]  |
| Place comments here. If NO or N/A is checked comments are required. |
| 9. Has a horizontal bench with a min. width of 4 ft been provided in front of walls where the back slope is steeper than 4H:1V? | IDM 410-55.01(05), Spec 731.03 | [ ]  | [ ]  | [ ]  |
| Place comments here. If NO or N/A is checked comments are required. |

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| II. DESIGN CRITERIA (Continued) |
| QUESTION | REFERENCE | YES | NO | N/A |
| 10. Is the embedment and bench day-lighted and riprapped?? | Spec 731.03 | [ ]  | [ ]  | [ ]  |
| Place comments here. If NO or N/A is checked comments are required. |
| 11. Does the MSE wall drainage system show the required drain outlets? | IDM 410-5.01(07) | [ ]  | [ ]  | [ ]  |
| Place comments here. If NO or N/A is checked comments are required. |
| 12. Has moment slab been placed adjacent to the MSE wall coping, and not on top of the coping? | Standard Drawings Series E 706-MSRW | [ ]  | [ ]  | [ ]  |
| Place comments here. If NO or N/A is checked comments are required. |
| 13. Has guardrail been located so that the posts will be located outside the limits of the MSE wall reinforced zone? | IDM 410-5.01(05) | [ ]  | [ ]  | [ ]  |
| Place comments here. If NO or N/A is checked comments are required. |
| 14. Have the piles been located a minimum of 4 times the diameter of pile between the back of the wall panels and the center of the piles? | IDM 402-6.02(02) | [ ]  | [ ]  | [ ]  |
| Place comments here. If NO or N/A is checked comments are required. |
| 15. Has a minimum of 6 in. been provided between the MSE coping and face of end bent.? | IDM Fig. 409-2G | [ ]  | [ ]  | [ ]  |
| Place comments here. If NO or N/A is checked comments are required. |
| 16. Have integral end bents and semi-integral end bent diaphragms been isolated from the MSE wall system for calculated thermal movements? | IDM Fig. 409-2G | [ ]  | [ ]  | [ ]  |
| Place comments here. If NO or N/A is checked comments are required. |

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| III. PLAN DETAILS |
| QUESTION | REFERENCE | YES | NO | N/A |
| 1. Have the following been shown in the Elevation View? |  |
| 1. Wall envelope including control lines 1, 2, and 3
 | IDM 410-5.01(07), PGR | [ ]  | [ ]  | [ ]  |
| 1. Minimum embedment from top of leveling pad to the final ground line
 | [ ]  | [ ]  | [ ]  |
| 1. Undercut and soil improvement requirements
 | [ ]  | [ ]  | [ ]  |
| 1. Leveling pad steps level and in 2.5 ft increments
 | [ ]  | [ ]  | [ ]  |
| 1. Obstructions that protrude through the wall face
 | [ ]  | [ ]  | [ ]  |
| 1. Obstruction, such as utilities, pipes, or culverts, placed below the leveling pad
 | [ ]  | [ ]  | [ ]  |
| 1. Factored bearing resistance from Geotechnical Report
 | [ ]  | [ ]  | [ ]  |
| Place comments here. If NO or N/A is checked comments are required. |
| 2. Have the following been shown in the Plan View? |  |
| 1. Obstructions within reinforced or retained backfill zones, including station and offset to the back of wall panel. [due diligence is expected to avoid placing obstructions within the reinforced backfill zone]
 | IDM 410-5.01(07), PGR | [ ]  | [ ]  | [ ]  |
| 1. Station and offset relative to survey centerline to the back of the wall panel and all such information for turn point locations
 | [ ]  | [ ]  | [ ]  |
| 1. Flow direction arrows for surface water coming from the bridge, ramp and/or road above the MSE wall and being directed away from the reinforced backfill area of the wall
 | [ ]  | [ ]  | [ ]  |
| 1. Wall construction limits relative to temporary and permanent ROW
 | [ ]  | [ ]  | [ ]  |
| 1. Internal wall drainage details with outlet locations
 | [ ]  | [ ]  | [ ]  |
| Place comments here. If NO or N/A is checked comments are required. |

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| III. PLAN DETAILS (Continued) |
| QUESTION | REFERENCE | YES | NO | N/A |
|  |  |
| 3. Have the following been shown in the Section Views? |  |
| 1. Estimated dimensions of reinforced and retained backfill
 | IDM 410-5.01(07), PGR | [ ]  | [ ]  | [ ]  |
| 1. Slope of ground above the top and in front of wall
 | [ ]  | [ ]  | [ ]  |
| 1. Distance between the back of the wall face and piles or pile sleeves
 | [ ]  | [ ]  | [ ]  |
| 1. Undercut and soil improvement details
 | [ ]  | [ ]  | [ ]  |
| Place comments here. If NO or N/A is checked comments are required. |
| 4. Have the following Special Wall Details been shown? |  |
| 1. Architectural treatments
 | IDM 410-5.01(07), PGR | [ ]  | [ ]  | [ ]  |
| 1. Special facing elements where connecting to existing wall systems
 | [ ]  | [ ]  | [ ]  |
| 1. Tiered walls detail in accordance with project criteria, including bench widths, aesthetics within benches, etc.
 | [ ]  | [ ]  | [ ]  |
| 1. Instrumentation details
 | [ ]  | [ ]  | [ ]  |
| Place comments here. If NO or N/A is checked comments are required. |

# **ABBREVIATIONS / ACRONYMS**

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| Construction Plans | Final plan set for the project as advertised, with all associated revisions. |
| EOR | Engineer of Record. Professional Engineer who stamped the construction plans |
| FHWA | Federal Highway Administration |
| Geotechnical EOR | Geotechnical engineer (in charge of the geotechnical investigation) |
| IDM | *Indiana Design Manual* <https://www.in.gov/indot/design_manual/design_manual_2013.htm> including INDOT Design Memorandum No. 17-03 available at https://www.in.gov/indot/files/17-03MSEwalls.pdf |
| LRFD | AASHTO *LRFD Bridge Design Specifications, including interims referenced on the plans.* |
| PGR | Project Geotechnical Report |
| Spec | INDOT *Standard Specifications* and any applicable special provisions (refer to contract documents for applicable spec year) |
| USP | Project specific unique special provision |