

NEW HAMPSHIRE STATE DEPARTMENT OF TRANSPORTATION SUPPLEMENTAL REQUIREMENTSⁱ

Introduction

The New Hampshire Department of Transportation (NHDOT) maintains a list of approved proprietary mechanically stabilized earth (MSE) retaining wall systems. This list is contained within the Special Provision Section 592 – Retaining Wall, Item 592.1 – Mechanically Stabilized Earth Walls. The submittal requirements for seeking approval of a wall system are listed in NHDOT Proprietary Retaining Wall System Pre-Approval Process document, available at www.nh.gov/dot/org/projectdevelopment/bridgedesign/documents/10_18_19proprietaryretainingwallapprovalprocess.pdf

As noted under 2.0 PRE-APPROVAL, in the Pre-Approval Process document, the criteria for acceptance are:

- 1) The supplier/fabricator's manufacturing facility shall be certified by the National Precast Concrete Association (NPCA) or Precast/Prestressed Concrete Institute (PCI).
- 2) The wall system shall be based on sound engineering theoretical and practical concepts, shown in a proposal subject to review by the Department.
- 3) Past experience in building and performance of the proposed system are required and must be provided.
- 4) Documentation and design calculations demonstrating the wall system's compliance with the following shall be included in the proposal:
 - a) Current AASHTO LRFD Bridge Design Specifications.
 - b) FHWA-NHI-10-024, Design and Construction of Mechanically Stabilized Earth Walls and Reinforced Soil Slopes – Volume I, November 2009.
 - c) FHWA-NHI-10-025, Design and Construction of Mechanically Stabilized Earth Walls and Reinforced Soil Slopes – Volume II, November 2009.
 - d) FHWA-NHI-09-087, Corrosion/Degradation of Soil Reinforcements for Mechanically Stabilized Earth Walls and Reinforced Soil Slopes, November 2009.
 - e) Current NHDOT Bridge Design Manual.
- 5) Report on the evaluation by FHWA's HITEC (Highway Innovative Technology Evaluation Center), shall be provided if available.ⁱⁱ

As noted under 3.0 PROCEDURE, in the Pre-Approval Process document, a pre-approval request requires submission of a written request and documentation on the wall system to NHDOT. Nineteen specific items must be included in the wall system documentation submission.

Many of the nineteen listed (under 3.0 PROCEDURE) documentation requirement items are contained in an IDEA report. However, there are some additional requested items, which are not listed (or specifically noted) on the IDEA protocols (available at <https://www.geoinstitute.org/special-projects/idea>). A retaining wall supplier with an IDEA report should supplement their IDEA report with the additional, specific items that NHDOT requires listed below. The items are listed following the numbering used in the NHDOT

Proprietary Retaining Wall System Pre-Approval Process document, under 3.0 PROCEDURE. The numbered items not listed below should be fully addressed in an IDEA Evaluation Report.

Information items that are identical to, and therefore redundant to, IDEA protocol listed items are not listed in this supplemental requirements report. However, items under a topic that the agency requests which are, or may be, more specific or detailed than the IDEA protocol are listed. The wall system supplier submittal may address this in their supplemental information or, if fully addressed in their IDEA submittal, refer to their IDEA report.

NHDOT should contact the IDEA webmaster and update this report if/when their policies, etc. change. This supplemental requirements report is readily updateable, and a revision number and new date should be noted when updated.

- 6) Specific heights, loads and loading conditions, surcharge depths, and backslope for which the supplier is seeking approval.
- 7) Details of wall elements, analysis of structural elements, special designs for traffic barriers or guardrail posts, drainage details, minimum embedment for frost protection, abutments, corners, and skew details.
- 8) Design calculations demonstrating the stability of the wall against sliding, overturning, eccentricity, bearing resistance, reinforcement pullout, reinforcement rupture, and reinforcement/facing connection failure, for all those wall heights and loading conditions (vehicle impact on guardrail, traffic surcharge) for which the designer-supplier requests preapproval by the Department, in accordance with the codes and documents listed in 2.0 PRE-APPROVAL of Pre-Approval Process document.
- 9) Design calculations that consist of computer program generated output shall be supplemented with at least one set of hand calculations and graphics that demonstrate the design methodology. Design calculations shall provide thorough documentation of the sources of equations used and material properties. The wall calculations shall be prepared and sealed by a Professional Engineer licensed in the State of New Hampshire.
- 17) Typical unit costs per square foot of vertical face area, supported by data from actual project.
- 18) Details of no-dig zones, warning markers, or other protective measures recommended.
- 19) Limitations of the system.

ⁱ Report Ver 1, June 2021.

ⁱⁱ Current (October 2019) NHDOT Pre-Approval Process document lists a HITEC evaluation report; that has now been replaced by IDEA evaluations and report.