

KENTUCKY TRANSPORTATION CABINET SUPPLEMENTAL REQUIREMENTSⁱ

Introduction

The Kentucky Transportation Cabinet (KYTC) maintains a list of pre-approved mechanically stabilized earth (MSE) Wall Systems. This list is available in the KYTC Special Note for Mechanically Stabilized Earth Retaining Walls, see <https://transportation.ky.gov/StructuralDesign/Special%20Notes%20and%20Guidance/Special%20Note%20for%20MSE%20Retaining%20Walls.docx>.

Retaining wall vendor submittal requirements for requesting approval are stated in KYTC MSE Wall Review: Vendor Submittal Guidelines. A wall system supplier must submit a request for review and approval with a package which satisfactorily addresses the items listed in these guidelines to KYTC Division of Materials. Note that an IDEA evaluation report (or predecessor HITEC evaluation report) does factor into the review and approval process. Also note that KYTC current policy is to utilize only metallic reinforced MSE wall systems.

Many of the items listed in the KYTC Vendor Submittal Guidelines 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 KYTC requires listed below. The items are organized under categories of: Materials and Material Properties; Design; Quality Control/Quality Assurance Systems; and Performance.

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.

KYTC 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.

Supplement Items

- 1) Materials and Material Properties – provide specifications for
 - a) Leveling Pad
 - cast-in-place
- 2) Design
 - a) External Stability – Provide design assumptions and procedures with specific references (e.g., design code section) for each of the following items. Clearly show any deviations

from the current edition of the AASHTO *LRFD Bridge Design Specifications*, along with theoretical or empirical information which support such deviations.

- sliding
- overturning (including traffic impact)
- bearing capacity (overall and local)
- seismic
- settlement (total and differential)
- recommended wall embedment

b) Internal Stability – Provide design assumptions and procedures with specific references (e.g., design code section) for each of the following items. Clearly show any deviations from the current edition of the AASHTO *LRFD Bridge Design Specifications*, along with theoretical or empirical information which support such deviations.

- assumed failure surface
- distribution of horizontal stress
- surcharge
 - concentrated dead load
 - sloped surcharge
 - broken-back surcharge
 - live load
 - traffic impact
 - lateral loads from piles, drilled shafts within reinforced backfill
- allowable tensile strength of the reinforcement
- pullout
- facing connections
- vertical and horizontal spacing (including traffic impact requirements)
- facing design
 - connections
 - concrete strength requirements
- effective face batter
- compound/global stability
- seismic considerations
- design modification for tiered structures and acute corners
- full design details to overcome obstructions in reinforced zones (e.g., drainage structures, deep foundations, etc.)

c) Plan Sheets – Provide representative plan sheets showing all standard details along with any alternate details, including the following:

- details for wall elements
- connection details
- appurtenance connection details
- obstruction detail
- corrosion/durability protection details

- construction details
 - optional details
 - details for wall interface with other structures (abutment or different wall type)
 - coping details
 - barrier wall details
- d) Limitations – List any and all design limitations, including:
- seismic loading
 - environmental restraints
 - wall height, external loading
 - other (differential settlement, etc.)
- e) Example Calculations – Provide detailed (hand) design calculations for the three problems shown in the attached figure.
- f) Computer Support – If a computer program is used for design or distributed to customers, provide representative computer printouts of design calculations for the above typical applications demonstrating the reasonableness of computer results.
- 3) Construction
- a) Contractor or Subcontractor Prequalification Requirements
- List any contractor or subcontractor prequalifications.
- b) List of Contractors and Subcontractors
- Provide a list of installation contractors who have constructed this system, including contact persons, addresses and telephone numbers. Provide a list of precasters.
- 4) Performance
- a) Warranties
- Provide a copy of any system warranties.
- b) Designated Responsible Party
- system performance
 - material performance
 - project-specific design (in-house, consultant)
- c) Insurance Coverage for Responsible Party – List insurance coverage types (e.g., professional liability, product liability, performance) limits, basis (i.e., per occurrence, claims made) provided by each responsible party.
- d) Project Performance History; 5 total: preferred minimum 3 DOT – Provide a well-documented history of performance (with photos, where available), including
- oldest
 - highest
 - projects experiencing maximum measured settlement (total and differential)
 - measurements of lateral movement/tilt

- demonstrated aesthetics
 - project photos
 - maintenance history
- e) Numerical Model Studies
- Provide case histories on numerical model studies.
- f) Instrumented Structures
- Provide case histories of instrumented structures.
- g) Field Tests
- construction testing
 - pullout testing
 - crash-barrier testing
 - seismic load test
- h) Construction/In-Service Structure Problems
- Provide case histories of structures where problems have been encountered, including an explanation of the problems and methods of repair.
- i) Unit Costs
- Provide typical unit costs in \$/ft² of vertical face, supported by data from projects.
- j) Maintenance
- Provide a listing of maintenance requirements to maintain performance and repair damage. If available, provide a maintenance manual.
- k) Quality Control History
- Provide the history for the system and material quality along with improvements that have been made based on the experience with the system.

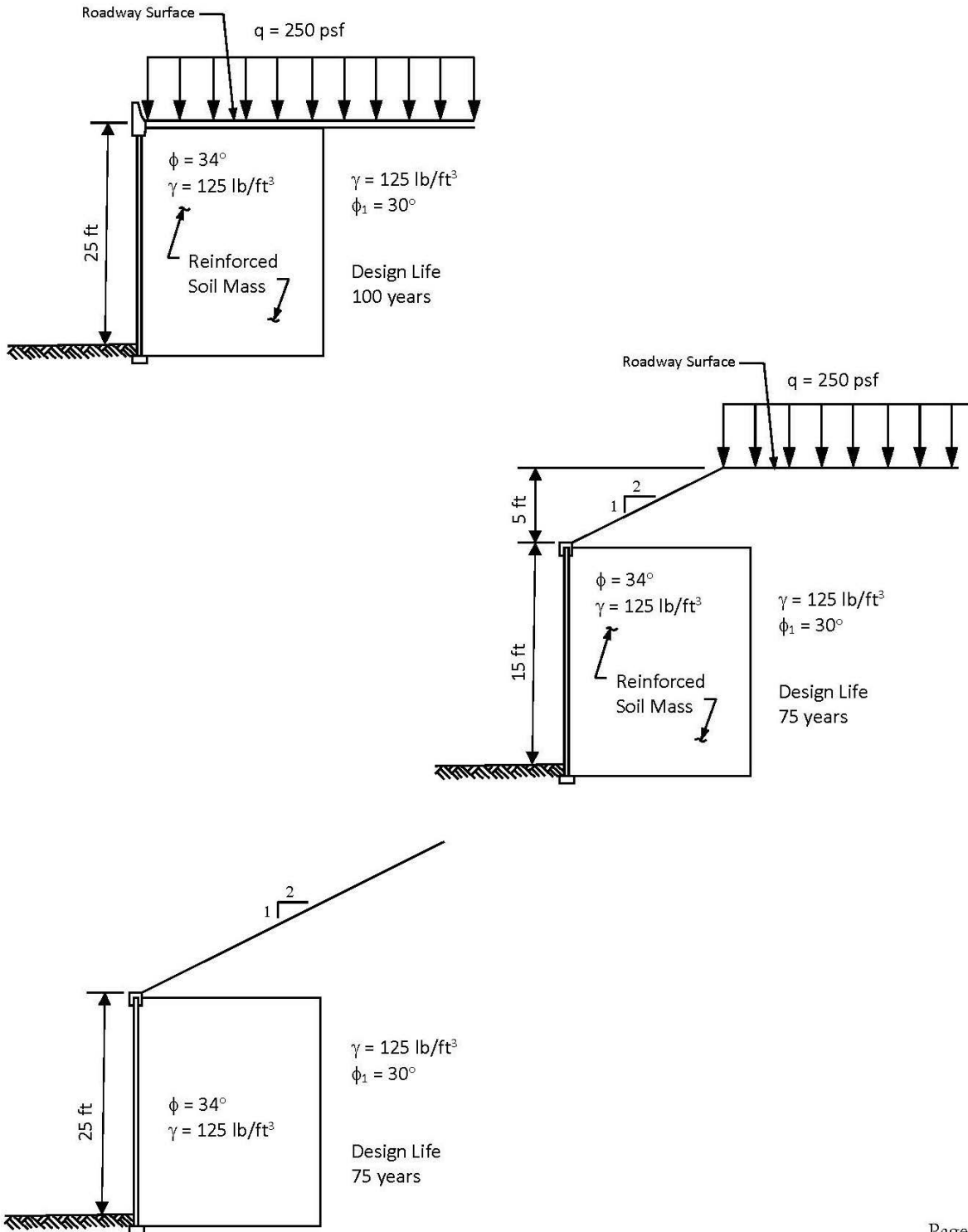


Figure. KYTC three MSE wall example problems.

ⁱ Report Ver 1, June 2021.