STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

ROY COOPER
GOVERNOR

JOEY R. HOPKINS
SECRETARY

July 1, 2024

MEMORANDUM TO: Gichuru Muchane, P.E.
Assistant State Structures Engineer

Thomas G. Santee, P.E.
Assistant State Geotechnical Engineer – Eastern Region

Eric Williams, P.E.
Assistant State Geotechnical Engineer – Western Region

Chris Chen, Ph.D., P.E.
Geotechnical Design Supervisor

FROM: Matthew J. Alexander, P.E.
State Geotechnical Engineer

SUBJECT: Standard Sound Barrier Wall Foundations

The Support Services Section of the Geotechnical Engineering Unit (GEU) has updated the standard sound barrier wall foundations for the latest standard sound barrier wall plans from the Structures Management Unit (SMU). Per SMU, the updated standard sound barrier wall foundation tables are based on the following:

- Wind load = 27 psf, 51 psf or 68 psf,
- Wall height ≤ 30 ft,
- Steel or concrete pile spacing ≤ 20 ft and
- Pile excavation hole diameter = 36" or 30".

The updated standard sound barrier wall foundation tables consist of 7 tables with varying soil parameters, groundwater elevations and front slope/finished grade angles. The updated standard foundation tables include a new table for very poor soil conditions and are based on the following:

- Friction angle (ϕ) = 27°, 30° or 34°,
- Cohesion (c) = 0 psf,
- Unit weight (γ) = 105 pcf or 120 pcf,
- Groundwater elevation within pile excavation depth or below bottom of hole and
- Front slope/finished grade 6:1 (H:V) or flatter, steeper than 6:1 and 3:1 or flatter (with a 4 ft wide bench), or steeper than 3:1 and 2:1 or flatter (with a 4 ft wide bench).

The standard sound barrier wall foundations are designed for a maximum deflection at the groundline of 3" or 1.25% of the wall height, whichever is less. Due to this criterion and as shown in the attached updated standard foundation tables, Sound Barrier Wall Foundation Table Nos. 68-

Mailing Address:
NC DEPARTMENT OF TRANSPORTATION
GEOTECHNICAL ENGINEERING UNIT
1589 MAIL SERVICE CENTER
RALEIGH NC 27699-1589

Telephone: 919-707-6850
Fax: 919-250-4237
Customer Service: 1-877-368-4968

Website: www.ncdot.gov

Location:
CENTURY CENTER COMPLEX
ENTRANCE B-2
1020 BIRCH RIDGE DRIVE
RALEIGH NC

1 and 68-2 are not applicable for both wall height greater than 25 ft and pile spacing greater than 15 ft.

The SMU should incorporate the updated standard foundation tables into sound barrier wall plans as recommended by the GEU unless the standard sound barrier wall foundations are not applicable, and a site-specific foundation design is required. The updated standard sound barrier wall foundation tables and revised sound barrier wall foundation recommendations form memo are attached to this memorandum for your reference. If there are any questions, please contact Scott Hidden at (919) 707-6856.

Attachments: Updated Standard Sound Barrier Wall Foundation Tables
Revised Sound Barrier Wall Foundation Recommendations Form Memo

cc: Tracy E. Roberts, AICP, Traffic Noise & Air Quality Group Leader
Timothy T McFadden, Alternative Delivery Manager