

# STRUCTURE BULLETIN

## NCDOT Construction Unit

[Website email](#)



### Current Issues: Pile Sleeves in MSE Walls

If you have built an MSE wall, then you have probably seen pile sleeves as shown in the picture above; but have you ever wondered what they were for? The sleeves are typically a corrugated metal pipe and are filled with loose sand around the piles. There are two primary reasons for the pile sleeves, downdrag and/or lateral forces due to integral end bents. Downdrag is pile settlement in response to settlement of the surrounding soil. When an MSE wall is built, the weight of the MSE backfill places a surcharge on the ground below the wall which can cause this material to consolidate and settle over a period of time, depending on the type of material. If this happens, the settlement can pull the pile downward with it through friction. This can affect the geotechnical design of the pile if either not accounted for in the design, or if mitigation techniques such as pile sleeves are not taken to limit the downdrag effect on the pile. One important factor is the order of installation. This critical information can be found in the MSE wall plan notes. If the pile sleeves are being used to offset downdrag, the plan notes will typically require that the sleeves be placed, the MSE wall constructed, and then the piles driven (after a specified waiting period, if required). This allows settlement to occur prior to driving the pile. If the plan notes specify a certain order, this should not be changed without approval from the Geotechnical Operations Engineer. Because this note is located on the MSE wall (cont.)

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### As-Constructed Plans:

The value of an accurate and thorough set of structure As-Constructed Plans can not be overstated. After a project is completed, the Structures Management Unit uses the As-Constructed plans for inspections and analysis throughout the life of the structure. Without accurate As-Constructed Plans, assumptions such as pile or drilled shaft depth are just guesses based on the original plans. A recent review of several As-Constructed Plans revealed some of the following issues: no pile length data, missing drilled shaft TIP elevations, illegible notations, incomplete plans (only some of the plan sheets included). The [Construction Manual](#) gives guidance on As-Constructed Plans. Currently, electronic markups are not required, but if possible, it is preferred due to the quality of the As-Constructed Plans. If ink is used, ensure that markups are visible when scanned into an electronic format. Ensure pile lengths are noted for each pile, and all elevations and dimensions are confirmed.

## Pile Sleeves in MSE Walls (cont.):



plans, it often gets overlooked. On future projects, the note will hopefully start showing up on the structure plans, so it is less likely to be missed.

Occasionally, a Contractor will propose using a “Yellow Jacket” as shown above instead of a pile sleeve. This reduces, rather than eliminates the friction on the pile and therefore reduces the downdrag on the pile. Because this only partially reduces downdrag, they should not be used unless Geotech has approved them.

If pile sleeves are required only due to movement associated with integral end bents on MSE walls, the plan notes may not require a specified order of installation of the pile and sleeve. The inspector should always check the MSE wall notes as well as the structure plan notes for any specific requirements.

Regardless of which gets installed first, the pile or the sleeve, the Contractor should take care to ensure that the layout is correct and that the MSE wall construction does not move the piles or sleeves out of alignment.

If there are any questions related to the installation of pile sleeves or “Yellow Jackets” for MSE Walls, please contact your Area Construction Engineer or Geotechnical Operations Engineer.

### Area Construction Engineers:

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### Videos:

New video available:  
The [Bridge Deck Overhangs](#) video is now available on the [NCDOT Communications YouTube Channel](#).

Inspection training videos can be found on the [Construction Unit YouTube playlist](#).

### Training:

**Structure Bulletins** are now archived on the [Construction Unit](#) website under [Construction Resources](#).

**Contents of the Structure Bulletins now show up under the file link, so you no longer need to look through the index spreadsheet to look up a previous topic.**

If you have a topic you would like to see addressed in a future edition of the Structure Bulletin, please [email](#) us at either [acochran@ncdot.gov](mailto:acochran@ncdot.gov) or [aeerwood@ncdot.gov](mailto:aeerwood@ncdot.gov)