STRUCTURE BULLETIN

NCDOT Construction Unit

Website email

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Current Issues: Rebound or "Swiss" Hammers

When Can I Use a Swiss Hammer to Test Concrete Strength?

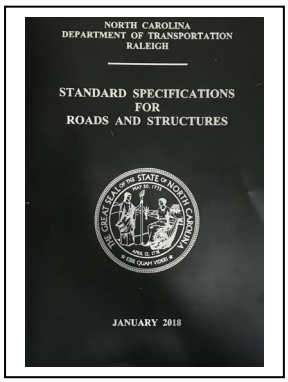
Whether you call it a Swiss Hammer, Schmidt Hammer, or Rebound Hammer, it is a device that measures the in place compressive strength of concrete. The hammer measures the rebound of a spring-loaded mass that impacts against the surface of the concrete. Using a conversion chart, the user can get an estimate of the compressive strength of the concrete. Many factors, including the orientation, rebar location, concrete finish, temperature, and if the surface is wet or dry, can affect the results of the test. For this reason, it is important that ASTM C805 and the manufacturer's directions be followed while performing the test. So with so many variables, can the results be trusted? As stated in ASTM C805, "this test method is not suitable as the basis for acceptance or rejection of concrete". NCDOT concurs. However, there are still many valuable uses of the rebound hammer, including:

- Knowing when falsework can be wrecked
- Determining when the screed can be rolled back over a previously poured deck and when you can pour the next adjacent span
- When traffic can placed on a LMC-VES Overlay (Procedure)
- Any other instances when estimating the in-place strength of the concrete is required.

Utilizing the Swiss Hammer is not a replacement for making early break cylinders but can be a useful tool when used properly and for the right applications.

Subject: Shaft Spiral Steel

Normally drilled shaft reinforcing steel is designed with an additional 3' of length at the bottom of the shaft, which should be noted on the plans. This extra length allows for deviations in the shaft tip elevation without having to splice additional legs onto the cage. Extending the shaft 3' or less does not require adding spiral steel at the bottom of the cage. This area should be well below the elevation at which the shaft could flex, and therefore does not require spiral. For shafts designed with the extra length make sure the bottom 3' of the cage is tied with no spiral. Not doing so can cause you to not have enough spiral on top if you end up below plan tip elevation and don't cut the extra steel off.



Standard Specification Questions:

How do I tell the difference in types of Geotextiles and Geogrids?

Geotextiles and Geogrids (geosynthetics on Wikipedia) have road construction applications from undercut to paving, from bridge approaches to retaining walls. At times these can be hard to distinguish from one another if you are not familiar with them. The links below and attached files should make this easier for all of us.

1. Attachment 1: Appendix A to the xxxxxxxxx. Section A1 of this document describes the various types of geotextiles.
2. Attachment 2: Samples of the five types of geotextiles covered in Table 1056-1 of the Standard Specifications
3. Attachment 3: Pictures of non-woven geotextiles, woven geotextiles, geogrids and geostrips.

Section 1056 of the Standard Specifications calls for all geotextiles, geocompsite drains and geocells to be on the Approved Products List. Make sure to check this before installing the materials. If you can't find it there contact the engineer before allowing materials to be installed.

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Videos:

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.

Merry Christmas and Happy New Year!

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 or aearwood@ncdot.gov