



STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

ROY COOPER
GOVERNOR

JAMES H. TROGDON, III
SECRETARY

DATE: February 12, 2019

FROM: Materials and Tests Unit, Field Services Group

SUBJECT: Rebound Hammer Calibration Procedure for use on Rapid Set Cement Latex Bridge Deck Overlays involving Multiple Bridges and/or Multiple Placement Days

For projects with multiple bridges using the same mix design, or bridge decks with time constraints that require more than one night for placement, a relationship between the compressive strength and rebound hammer readings may be developed and used to estimate the three-hour strength for opening to traffic in lieu of compressive strength testing. The Resident Engineer or his representative shall coordinate with the local Materials and Tests Unit ("testing facility") at least 48 hours prior to the mix design verification process, to ensure that they will have personnel available to test cylinders for three-hour strengths. Designate one rebound hammer for each mix design, and give the hammer to that project inspector. Be sure that the rebound hammer is within the standardized limits. If it is not within the standardized limits; contact the local testing facility for assistance. Keep on hand 4" x 8" and 6" x 12" cylinder molds for making test specimens.

During the mix design verification process, cast a minimum of six specimens (four- 4" x 8" cylinders and two- 6" x 12" cylinders) for testing. At approximately three hours, the project inspector shall deliver all samples to the testing facility and unmold all samples. Laboratory personnel will test all of the 4" x 8" cylinders for compressive strength in accordance with AASHTO T22. While the three-hour test is being conducted, obtain 10 rebound hammer readings on each of the 6" x 12" cylinders. For each cylinder, eliminate the highest and lowest values and take the average of the 8 remaining readings. Read the corresponding compressive strength from the chart on the rebound hammer and insert the reading into the Excel Spreadsheet provided to obtain the correction factor to be used with the designated rebound hammer. Document the correction factor and attach it to the designated rebound hammer or place it safely in the case for safe keeping. The rebound hammer may then be used to estimate the three-hour strength for opening to traffic by testing the deck. If a different rebound hammer is used, obtain a new calibration factor.

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Once the calibration factor is obtained, continue to make four 4" x 8" cylinders. Use the rebound hammer on the deck at 3 hours and follow the procedures above for obtaining the average value. Multiply that rebound value by the established correction factor to obtain the estimated strength of the deck. Record the value for the project records. Deliver the four 4" x 8" cylinders to the testing facility as soon as practicable. Designate two of the 4" x 8" cylinders for testing within 24 hours, and two for testing at 7 days with all pertinent information. This schedule needs to be prearranged and agreed upon by the field personnel and personnel at the testing facility.

Thank you for your time and attention in this matter. If you have questions or comments, please contact Jim Sawyer at (919) 329-4170.