State DOT: UTAH

State Report Questions on NDT Testing

1. What NDT testing methods for concrete materials, concrete pavements, and overlays are you trying?

Pre-cast: Currently using a rebound hammer for informational/comparison purposes. Not accurate enough to use for acceptance purposes, but rather gives some quick easy information to use to determine whether further investigations may be warranted. We believe concrete cylinders are much more accurate when made and handled properly.

Northern Region: We use the information collected by our asset management group, cracking indices, smoothness, etc. We also use the FWD for pavement and subgrade modulus, and for load transfer evaluation, though I'm not sure those measures are entirely non-destructive. We use maturity meters to approximate strength for opening to traffic, and have a ferroscanner for checking rebar in concrete structures or pavement.

I-15 Core (South): We are doing a lot of maturity work on the CORE project.

PCCP thickness is being determined with probes/stabs, with one thickness core per day for ongoing correlation. The stabs correlated with the cores reasonably well, but not perfectly (depending on the precision applied to the correlation analysis). It's important to note that we have moved to this process strictly due to the fact that we are placing PCCP on a treated based (HMA).

Research: NDT methods being investigated include: Visual distress mapping, Pachometer testing, Resistivity testing, Dielectric measurements, Half-cell potential testing, Electrochemical impedance spectroscopy, Ground-penetrating radar imaging, Infrared thermography, Impact-echo testing, Schmidt rebound hammer testing, Acoustic sounding, Chloride concentration testing.

Regarding cover depth, however, we have directly compared pachometer readings with actual cover depth in one recent study, and I (Spencer Guthrie, BYU) am in the process of evaluating the accuracy of ground-penetrating radar measurements of cover depth. In addition, I have related Schmidt rebound numbers to measured compressive strength. Overall, the NDT techniques can provide a wealth of information about a structure without requiring significant material sampling and/or patching of the structure afterwards.

2. In your experience, how does the reliability of NDT testing methods compare to traditional testing methods?

We still rely on cylinder or core testing data for acceptance, anything else is supplementary or preliminary. Acceptance is still based on 28 day lab cured breaks.
Regarding issues of ruggedness, repeatability and reliability, we have not in most cases directly compared NDT techniques with traditional testing methods because equivalent tests do not typically exist.