

IC WORKSHOP AT TRB 2010

PANEL DISCUSSION

Note: All recorded discussion herein may be rephrased. Please contact info@intelligentcompaction.com if yours are misquoted.

Note: See how many times “standardization” has been mentioned!

January 10, 2010

Q: (Rita Leahy, APA CA) The IC roller measurement values (RMV) do not seem to correlate to density measurements well. Why's that?

A: (Panel) Yes, the poor correlation may be due to the facts that they measure different things. The measurement or influence depths of IC RMV are very different (deeper) from that of densities measurement (top bound layer). Therefore, it should be cautious when interpreting any correlation results between RMV and any other in-situ test results.

Q: (Erv Dukatz, Mathy Construction) (1) how much training is needed for a typical roller operator to operate an IC roller? (2) How reliable are IC rollers? Can they be ready to operate when the rest of the paving crew and equipment are ready? (3) Should IC roller avoid tender zone of Superpave mixture?

A: (Panel) (1) It usually takes a day or less to train rollers operators including learning the concept of IC and operation aspect of the machine/system. (2) IC rollers are proven to be fairly reliable during the FHWA/TPF IC demonstration projects – though there are still challenges such as setting/checking GPS measurements. (3) Most IC rollers operate the way similar to conventional rollers – you still have to avoid tender zones of Superpave mixes.

Q: (Jim Sherocman, asphalt consultant) The IC technology should not be oversold! The asphalt material properties are temperature-dependent. The uniformity of supplied mix and mixture segregation are tall challenges even for IC compaction.

A: (Panel) Agree. There are a lot of other factors governing the final compacted products. The IC technologies are still evolving. The FHWA/TPF project team has been very carefully to promote the IC technologies to State and contractors by informing them of known limitations. The temperature-dependency and mixture specific issues will definitely be tackled in the near the future by IC roller venders. It's just that the immediate benefits using IC technologies are so apparent (achieve and maintain consistent rolling patterns) and the implementation should be moved forward.

Q: (Becky McDanniel, Superpave Center at Purdue) Will the future IC-based QA spec to select samples in “bad areas” instead of random sampling as being done today?

A: (Panel) Yes, IC-based QA procedure will include sample selection based on IC “maps” – i.e. sampling at “bad areas” (or weak spots) identified by the IC maps. IC can be a very useful tool for QC – identify weak spots and apply just-in-time corrective actions!

Q: (???, NAPA) Based on past experiences, no vibratory rollers should be allowed for cohesive soils. But why did you use vibratory IC rollers on cohesive soils in your demonstration?

A: (Panel) To determine the use of vibratory rollers depends whether the groundwater level is high or not. From the FHWA/TPF IC demonstration projects, we have shown the vibratory IC rollers can be very effective on fine grained soils and produce good compaction curves (i.e. RMVs vs. roller passes) – which are likely the first published, successful examples.

Q: (???) Why do different IC rollers produce different measurements? Can they be standardized?

A: (Panel) All IC roller manufactures have patented compaction indices or roller measurement values (RMV) (see slide no. 5 of the Soils/Subbase IC presentation) These RMVs can be categorized into frequency-based and mechanical-model-based. Various RMVs have been validated via various independent in-situ measurements. The panel does agree that “standardization” of RMV is the right direction to go, but how to get there – including resolving patent issues – would require a lot of effort.

Comments: (???) In Vienna, Europe, we have demonstrated a reduction of 10 times in settlement using IC technologies!

Comments: (Arian de Bondt, Ooms, Nederland) We have increased 50% in production with IC technologies, esp. for larger PPP projects. IC is very powerful to identify weak soil support within 1 to 3 meters in our projects.

Comments: (Lee Gallivan, FHWA) FHWA has committed in IC technologies. In the coming year(s), FHWA will conduct regional IC workshops around the country, produce “best practices” documents as IC implementation guidelines, and define target values for HMA IC, etc.

Comments: (Glenn Engstrom, Mn/DOT, and Todd Mansell, Sakai) (1) IC technologies would change the density-based acceptance testing to modulus-based one. (2) We should use reliable parameters and use differences in those parameters to determine target compaction rolling patterns. (3) Conventional point test using nuclear gauge will be replaced by other devices such LWD. (4) Variability of foundation/granular materials can be reduced using IC technologies – therefore, the thickness of paved bound layers can be reduced. (5) Does IC work? Yes, but don’t oversell it. We would proceed with this technology with caution.

Comments: (Musharraf Zaman, U. of Oklahoma) (1) We should standardize RMV and define measured stiffness (or whatever the most important parameters that IC roller should measure) carefully. (2) We should link IC to design and performance. (3) We should relate lab compaction to field compaction. (3) We also need standardized statistic tool for IC data analysis and reporting.

Comments: (David White, ISU) We would need a committee (ETG?) to lead the standardization for field procedures and analysis methods/tools for IC implementation.