



Texas Aggregate and Concrete Association

Position Statement #8

Pervious

“For pervious concrete pavements, don’t forget to mock it up.”

According to ACI 522, pervious concrete is defined as “a near zero-slump, open-graded material consisting of portland cement, coarse aggregate, little or no fine aggregate, admixtures, and water. Pervious concrete used for pavements is receiving increased levels of interest and consideration from owners and designers. Due to the potential improvement in stormwater quality, more natural movement of stormwater, and other environmental benefits, pervious concrete has become a material of choice and a key element of the EPA’s Stormwater Best Management Practices and other municipal green building approaches. However, the successful construction of pervious concrete pavements is dependent on the ability of the Contractor in partnership with the Producer to meet exacting design performance requirements.

The high quality and unique performance characteristics of pervious concrete are highly dependent on the placement and finishing methods employed. For example, the effective air void content for a given set of materials and mix proportions may vary from as much as 30 percent to as little as 5 percent, depending on what type of compaction equipment is used. Due to this circumstance, both the expected infiltration rate and the in-place concrete strength may vary widely. It does a designer little good to anticipate in-place properties of such a material, and risks under-design of the drainage or structural capacity. In addition, future assessments of the pavement performance, and development of appropriate maintenance activity schedules require a more accurate knowledge of the original constructed condition.

ASTM Committee C09 has begun an ambitious initiative to develop a standard covering the testing and control of pervious concrete. Among the available methods, ASTM C1688 *Standard Test Method for Density and Void Content of*

Freshly Mixed Pervious Concrete addresses the determination of plastic unit weight of pervious concrete, primarily as a method of ensuring conformance of supplied materials to the submitted mix design. While this measure is considered an important step in controlling production, it does not ensure that the originally designed mixture is appropriate for the actual placement methods.

Therefore, it is recommended that the specifier of pervious concrete placements require the successful completion of a pervious concrete demonstration pavement using the anticipated placement techniques with the selected concrete mix design. Part of the successful design of the pervious concrete relies on the ability of the supplier to select materials that are most appropriate and readily available for the project. Prescriptive elements within the mix design and fixed material proportions could lead to unanticipated results. If acceptable in-place properties (i.e. void content, infiltration rate, strength) are not obtained, the mixture should be adjusted and/or the placement procedures adjusted to achieve satisfactory results. Using a prescriptive approach to the mix design limits this type of adjustability. The mix which is used successfully in the mock-up should be tested for fresh density in accordance with ASTM C1688, and this density should be used for control purposes. If multiple pervious performance levels are desired, or if project logistics require multiple placement procedures, corresponding mock-ups should be performed, and concrete mixtures should be designed accordingly.

This position statement from the Texas Aggregate and Concrete Association is presented for reader interest by the editors. The opinions expressed are not necessarily those of the “magazine”. Reader comment is invited.

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