

# Texas Board of Professional Engineers

## Policy Advisory Opinion Regarding Construction Materials Engineering

August 20, 2009

**Executive Summary:** The assessment of a construction material for quality, appropriateness and acceptability is considered by the Board to be an engineering activity. These Construction Materials Engineering (CME) activities must be performed by licensed professional engineers. Construction materials testing (CMT), within the context of CME includes collecting samples, performing well-defined test procedures, and reporting of data. In certain situations, performing tests and construction materials sampling using well-defined engineering specifications may not be considered engineering activities.

**Discussion:** On construction projects, engineers are called upon to assess the quality, appropriateness and acceptability of the materials that are used. These assessments are known collectively as CME. The CME includes the determination of the scope and procedures of testing for the project, the supervision of testing, and the analysis of test results for construction material acceptance purposes or for use in engineering recommendations. Although we most commonly associate CME with the analysis of concrete and soil, CME is conducted on any material used in construction including but not limited to timber, asphaltic concrete, steel, selected fill materials, recycled materials, aggregates, epoxies, and polymers.

Because it is engineering, CME must be personally performed by a licensed engineer or be directly supervised by a licensed engineer, and can only be offered to the public in full conformance with the Texas Engineering Practice Act (Act). Any CME activities that are contracted by a political subdivision of the State of Texas or an agency of the state, or on the political subdivision or agency's behalf, must be acquired in conformance with the Professional Services Procurement Act, Article 2254.004 of the Texas Government Code.

The CMT, within the context of CME includes collecting samples, performing well-defined test procedures, and reporting of data. In certain situations, performing tests and sampling by using well-defined engineering specifications may not be considered engineering activities. However, if analysis of test data is done or a determination is made that a material is acceptable, these activities would be considered to be CME and require a licensed professional engineer. Because the engineer is responsible for accepting the public works project, acceptance or rejection of materials or work, the direct supervision by an engineer of CMT for those acceptance decisions is needed.

**Public Works:** When constructing public works, the state or political subdivision of the state must ensure that the engineering construction is performed under the direct supervision of a licensed engineer (Sec. 1001.407, Occupations Code). This supervision must include the direct supervision of materials testing and engineering necessary and appropriate for verification of compliance with construction plans and acceptance of the project by the public owner.

A licensed professional engineer must directly supervise any element of acceptance testing, from data collection to final determination. When engineers are hired for these services, they must be retained under the Professional Services Procurement Act (PSPA). The CMT services unrelated to acceptance testing might be acquired using other purchasing procedures provided the CMT services do not include any CME function. For public entities with staff engineers who make acceptance decisions, the engineers must be in a position to determine if the testing and inspection services are properly performed at a frequency that provides confidence that the materials and work meet (or reasonably conform in some cases) the contract requirements or standards of practice. This requires reviewing qualifications, monitoring inspection and testing services and review of test and inspection data.

The validity of an engineering judgment in the construction materials area is integrally tied to the validity of test data, which is in turn directly related to training of technical staff, performance of testing equipment, and other elements associated with an accredited engineering laboratory. Therefore, by the standard established by Sec. 1001.407, Occupations Code, CMT conducted for the purpose of verification and acceptance of a facility is considered a CME function.

The Board recognizes as a specific exception for CMT conducted under a federally approved quality assurance program (QA) specifically governing the Texas Department of Transportation, provided that alternate methods of ensuring appropriate engineering direct supervision are in place. In addition, CMT services used for a contractor's internal quality control purposes only and are not used by the owner for verification and/or acceptance purposes may not be considered engineering.