NEWS RELEASE
For Immediate Release

SIGNIFICANTLY INCREASE CONCRETE DURABILITY AND SERVICE LIFE BY USING 100 YEAR OLD TECHNOLOGY

CHICAGO, September 11, 2018 – Owners and designers of many new structures currently specify a design life of 100 years or more to ensure durability and sustainability. Tourney Consulting Group, LLC (TCG) in Kalamazoo, MI, recently conducted a study to determine the effects of expanded shale, clay and slate (ESCS) aggregates on the transport properties and other durability related properties of concrete. Tourney Consulting Group is a globally recognized leader in quantifying concrete durability, service life prediction, and developing service life solutions. Transport properties are used in several service life programs including STADIUM®, Life 365™, and analysis according to fib Bulletin 34: Model Code for Service Life Design.

Using data from tests performed in the TCG lab, a bridge deck subjected to deicing salts in Detroit, MI, was modeled using Life 365™ and STADIUM® software. The STADIUM® software results showed that the concrete bridge deck service life would be increased compared to a normalweight concrete control mixture as follows:

- By approximately 22% for mixtures with lightweight coarse aggregate and normalweight sand (“sand lightweight concrete”)
- By approximately 88% for mixtures with normalweight coarse aggregate and lightweight fine aggregate (“inverted mixture”)
- By approximately 35% for mixtures with lightweight coarse aggregate and lightweight fine aggregate (“all lightweight concrete”)
- By approximately 32% for mixtures with normalweight coarse aggregate and a partial replacement of normalweight sand with lightweight fine aggregate (“internally cured mixture”)

While these results are encouraging, other studies have shown greater improvements in properties related to durability for different types of lightweight and internally cured concrete (See References below). Such results would indicate even greater increases in expected service life than are presented in the findings of this study.

For complete information on the tests performed by TCG to determine the transport and durability properties of concrete, as well as the assumptions used for the service life analyses, see the full report “Determination of Transport Properties of Lightweight Aggregate Concrete for Service Life Modeling.”
Lightweight aggregate concrete made with ESCS has been used in concrete structures for over 100 years, demonstrating its superior durability and service life. Structural lightweight concrete has compressive strengths comparable to normalweight concrete, yet it is typically 20% to 25% lighter (and in some cases up to 33% lighter), offering design flexibility and substantial cost savings by reducing dead load, improving seismic structural response, allowing longer spans, providing better fire ratings, and by permitting thinner sections, decreased story height, smaller size structural members, reduced reinforcing steel and lower foundation costs. The excellent durability performance of structural lightweight concrete and internally cured concrete is a result of a number of factors such as increased cement hydration (including supplementary cementitious materials reaction) and reduced permeability, autogenous shrinkage, early age cracking, modulus of elasticity, and coefficient of thermal expansion.

About ESCSI
ESCSI is the international trade association for manufacturers of rotary kiln-produced expanded shale, expanded clay and expanded slate lightweight aggregate. ESCSI promotes the extensive use of rotary kiln-produced lightweight aggregate in the lightweight concrete masonry and structural lightweight concrete markets, as well as use in asphalt, geotechnical and other applications. Based on research and development, educational material is disseminated to all phases of the building industry. The association works closely with other technical organizations, ACI, ASTM, etc. to maintain product quality, life-safety and professional integrity throughout the construction industry and related building code bodies. For more information, please visit www.escsi.org or call (801) 272-7070.

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