REDUCED DEAD LOAD

BETTER FIRE RESISTANCE

SUSTAINABLE CONSTRUCTION

ECONOMICAL

PROVEN PERFORMANCE

DESIGN FLEXIBILITY

STRUCTURAL LIGHTWEIGHT CONCRETE ON FIRE RATED STEEL DECK ASSEMBLIES

Higher Performance at Every Level

Pumping Structural Lightweight Concrete on Steel-Frame Construction

Structural Lightweight Concrete on Fire Rated Steel Deck Assemblies

When you consider all the factors, structural lightweight concrete (SLC) is the clear choice.

The importance of aesthetics cannot be denied; however, your building must do more than look good. The methods and materials specified play a major role in the success of every project.

After considering quality, energy efficiency, fire safety, and economy, the clear choice for sustainable steel-frame construction is SLC on fire-rated steel deck assemblies.

Jim Stephenson *(left) and* Michael E. Corrin *(right) (1982)*

Why SLC?

Structural lightweight concrete made with rotary-kiln produced expanded shale, clay or slate lightweight aggregate provides significantly greater economy than ordinary concrete when systems are designed with equal fire resistance ratings.

SLC offers considerable design flexibility and permits substantial steel and foundation cost savings. Its overall superior performance characteristics include the following:

- **Reduced Dead Load**
  - **smaller columns**
  - **smaller beams and girders**
  - **smaller foundations (less excavation)**
  - **less reinforcing steel**
- **Better Fire Resistance**
  - **thinner floor slabs for UL fire rating**
  - **no sprayed-on fireproofing under steel deck**
- **Economical**
  - **lower initial cost**
  - **lower life cycle cost**
- **Proven Performance**
  - **thousands of existing structures**
  - **record of customer satisfaction**
- **Design Flexibility**
  - **longer floor spans**
  - **less overall weight**
  - **structurally efficient**
- **Sustainable Construction**
  - **less material used (concrete, steel, fireproofing, etc.)**
  - **proven long term durability**

Look Beyond Initial Unit Cost

By specifying SLC in the design stage, you are ensuring superior performance and greater economy right from the start.

By providing better fire ratings, lower dead loads and long lasting durability, SLC provides design flexibility, customer satisfaction and sustainable construction.

As the material of choice for designers and building owners, SLC has been used successfully in thousands of completed projects.

"Using lightweight aggregate concrete on mid-rise steel frame structures is very cost effective for several reasons. It reduces the overall weight of the structure because the slabs are thinner, but still meets the specific Underwriters Laboratories fire rating. And if you reduce the weight of the concrete, then it requires less steel to support the structure – further savings. In many cases using lightweight concrete eliminates the need to spray fireproofing under steel decks, which would be an additional expense. Overall, lightweight aggregate concrete can mean 'heavy' savings!"

James M. Stephenson, PE
Structural Design Group, Nashville, Tennessee

Michael E. Corrin *(left)* and Jim Stephenson *(right) (2002)*

"After 20 plus years of designing mid-rise steel structures, lightweight aggregate concrete is still the preferred floor system. Millions of square feet and hundreds of projects have proven this to be the right choice for the job. Long term durability and owner-satisfied performance is critical in maintaining clients. Recent trends for long floor spans have once again pushed lightweight concrete to the forefront as it allows the minimal depth of structure, yet still provides damping resistance to minimize vibration. Lightweight concrete still means "heavy savings," but it also means long term dependability!"

Michael Corrin, PE,
Stanley D. Lindsey and Associates, Ltd.
Nashville, Tennessee

Rotary Kiln Lightweight Aggregate Concrete: Recommended Specifications

Division III. Section 03313

1. Lightweight aggregates for lightweight concrete shall be produced by the rotary kiln process, and shall conform to the requirements of ASTM C 330, (latest edition) *Specifications for Lightweight Aggregates for Structural Concrete*.
2. Materials shall be proportioned in accordance with ACI 211.2 so as to produce concrete with a minimum compressive strength of _____ psi (_____Mpa) at 28 days.
3. Materials shall be proportioned to produce concrete with a calculated equilibrium density of ____ lb/ft^3 ± 3 lb/ft^3 (____kg/m^3) as determined by ASTM C 567, Section 9.2
4. Samples of fresh concrete shall be obtained in accordance with ASTM C 172, and shall be transported to a place on the jobsite where tests can be made, and cylinders stored for 24 hours without being disturbed.
5. Density, slump, and air content of fresh concrete shall be determined from each batch of concrete sampled for compressive strength tests. Density, slump, and air shall be determined by ASTM C 138, C 143, and C 173, respectively.
6. Compressive strength test specimens shall be cured in accordance with ASTM C 330.

www.escsi.org

STRUCTURAL LIGHTWEIGHT CONCRETE
On Fire Rated Steel Deck Assemblies

Higher Performance at Every Level

Reference Material

ESCSI # 4001
Guide Specification for Structural Lightweight Concrete

ESCSI # 4770
Pumping Structural Lightweight Concrete "The Team Approach"

ESCSI # 4248
Specified Density Concrete

ESCSI # 4640
Finishing Lightweight Concrete Floors

ASTM 169
Chapter on Lightweight Concrete and Aggregate

ACI 213 R-03
Guide for Structural Lightweight Aggregate Concrete

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