

Section 033020
LIGHTWEIGHT CELLULAR CONCRETE FILL

PART 1 - GENERAL

1.1 Summary

Section 033020 includes specifications for constructing lightweight cellular concrete (LCC).

1.2 Definitions

Cast Density: Wet density of LCC at the point of placement.

1.3 Submittals

A. Mix Design: Submit a mix design that will produce a cast density at point of placement and a minimum compressive strength for the class described. Include laboratory data using the mix design verifying cast density and strength requirements. Field qualification test reports must be certified with a signature by an official in responsible charge of the laboratory performing the tests.

B. Submit a certificate of compliance for cementitious materials. Include the source name and location.

C. Submit certificate of compliance for proposed admixtures.

1.4 Quality Control and Placement Plan

A. Submit a quality control and placement plan. Include:

1. Construction sequence showing each lift and schedule
2. Type of equipment and tools to be used
3. Location of equipment and batching areas
4. List of materials
5. Manufacturer's specifications, including mixing, delivery, placement, finishing, and curing of LCC
6. Organization chart of names, contact information, certifications, roles, and responsibilities of those involved in the quality control program
7. Copy of AASHTO accreditation for the laboratory conducting compressive strength testing of LCC cylinders
8. Written evidence that cellular concrete installer is certified by and approved by the foam agent manufacturer

1.5 Mitigation Plan

A. If requested, submit mitigation plan for repair of damaged areas for review prior to repair work.

1.6 Personnel Requirements

A. The cellular concrete installer must be certified and approved in writing by the foam agent manufacturer. The installer's foreman must have a minimum of 5 years experience in this work of similar size and must have worked on at least three successful cellular concrete projects.

Submit documentation for the installer's foreman including:

1. Project name and location
2. Date of contract acceptance (month and year)
3. Manufacturer and material used
4. Project's owner and project owner contact person's name and telephone number

B. The installer must use adequate numbers of skilled workers who are thoroughly trained and experienced in the necessary crafts and who are familiar with the specified requirements and the methods needed for proper performance of the work.

C. The installer's foreman must be experienced in the placement of cellular concrete and must be on site full-time during placement.

1.7 Quality Control

- A. Each cast density test represents no more than 300 cu yd of LCC or 1 day's production, whichever is smaller.
- B. Remove and replace LCC that does not meet the cast density or the compressive strength requirements unless corrective measures are authorized for the LCC to remain in place.
- C. Cast density must be calculated under ASTM C796/C796M using the formula for design density.
- D. Prepare LCC test specimens and test compressive strength under ASTM C495/C495M as preformed foam

PART 2 - PROPERTIES

- A. LCC is designated as Class II through Class V as shown in the following table:

LCC class	Cast density (max, pcf)	Compressive strength at 28 days (min, psi)
II	30	40
III	36	80
IV	42	120
V	50	160

*Compressive strength is determined using ASTM C495/C495M.

- B. Materials used for LCC must be delivered, stored, and handled under the manufacturer's recommendations.

PART – 3 PRODUCTS

3.1 MATERIALS

A. Cement

Cement must comply with the specifications for Type IL or Type I/II Portland cement. Pozzolans and other cementitious materials may be used if recommended by the manufacturer of the foaming agent.

Fly ash and natural pozzolans must comply with AASHTO M 295.

GGBFS must comply with AASHTO M 302, Grade 100 or 120.

B. Water

Water must (1) comply with section 90-1.02D with water for mixing concrete (2) be potable and (3) be free of deleterious amounts of acids, alkali, salts, oils, organic materials, or other impurities that would affect the setting or strength of the LCC.

Non-potable water may be used if the mix design is prepared in the laboratory using the non-potable water on site.

C. Foaming Agent

Foaming agent must comply with ASTM C869/C869M and be tested under ASTM C796/C796M. Basis of design: Cell-Crete Corporation www.cell-crete.com info@cell-crete.com

D. Admixtures

- 1. Chemical admixtures must comply with ASTM C494/C494M.
- 2. Admixtures for accelerating set time may be used under the manufacturer's recommendations.

PART 4 – EXECUTION

4.1 Preparation

- A. Subgrade to receive LCC must be:
 - 1. Free of loose and extraneous material
 - 2. Uniformly moist but free of standing or flowing water
- B. Drainage installed through the LCC must be secured and have watertight joints.
- C. Remove foreign material that falls into placement areas.

4.2 Placement

- A. Cement and water may be premixed and delivered to the job site.
- B. Foaming agent must be mixed with cement and water at the job site using specialized equipment certified by the manufacturer of the LCC to produce a homogenous mixture.
- C. Complete each batch of LCC placement within 1 hour of mixing cement and water.
- D. Do not place LCC whenever the ambient air temperature is forecast by the National Weather Service to be less than 40 degrees F within 12 hours after placement. Unless approved by the manufacturer.
- E. Do not place LCC on frozen ground.
- F. Each lift must not exceed 3 feet in thickness unless authorized. Surface stepping to achieve grade and superelevation must be at least 6 inches thick.
- G. You may place LCC at grades up to 5 percent by adding a thickening agent to the mix under the manufacturer's instructions.
- H. Curing of LCC must follow the manufacturer's recommendation. A minimum of 12 hour curing period is required after placement. Do not disturb the newly placed LCC during this period.
- I. Before placing the next LCC lift, remove any debris and loose material from the receiving surface. The receiving surface must be free of soil, debris, and standing water.
- J. Do not operate construction equipment on LCC until it has attained the specified compressive strength.
- K. Remove all temporary forms and plastic sheet linings after LCC has cured.

4.3 Payment

- A. Cellular concrete will be measured by the cubic yard.