Low-Density Solutions for Roof Deck Systems

Over 45 Years of Successful Worldwide Roofing Projects
Used in Both New Roof Deck Systems Installations And Re-Roofing Projects with BUR And Single Ply Roofing Membranes

www.cellular-concrete.com
MEARLCRETE® Cellular Concrete is a lightweight cellular concrete, which is manufactured at the jobsite by mixing a portland cement-water slurry with a preformed foam produced from Mearlcrocrete Foam Liquid Concentrate. The high stability of the pre-generated foam enables MEARLCRETE Cellular Concrete to withstand mixing, pumping, finishing and permits precise control of the density.

The installation of MEARLCRETE Cellular Concrete is by factory trained applicators who have the specialized equipment and experienced personnel to install the low density MEARLCRETE Cellular Concrete decks. MEARLCRETE Cellular Concrete may be pumped up to 500 ft. vertically and over 1,000 ft. horizontally.

MEARLCRETE:

Low Water Content
Compared to low density aggregate concretes, MEARLCRETE Cellular Concrete uses 3 to 5 times less water by weight and about the same water as normal concrete. Slotted Steel Deck Not Required.

Positive Slope to Drain
Either stairstep polystyrene board method or screeing to slope.

High Insulating Value
When combined with expanded polystyrene board.

Low Cost
When compared to lightweight aggregate and other foaming agents.

Lightweight
As low as 4.5 pounds per square foot.

Rapid Installation
Up to 25,000 square feet per day.

Rot & Vermin Proof
Remains clean and safe indefinitely.

Nailable
MEARLCRETE Roof Decks accept most mechanical fasteners currently on the market.

Environmentally Safe
Non-hazardous and non-polluting.

Quality Controlled
Density easily adjusted for greater strengths or better R values.

Diaphragm Shear Value
Tables available upon request.

INSULATION VALUES FOR CORRUGATED STEEL AND CONCRETE SUBSTRATE DESIGNS

<table>
<thead>
<tr>
<th>Thickness of Expanded Polystyrene Board (Inches)</th>
<th>28 Ga. 9/16&quot; Corrugation</th>
<th>Structural Concrete Deck 4&quot; Thick</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>U-Factor No Ceiling</td>
<td>U-Factor No Ceiling</td>
</tr>
<tr>
<td>1</td>
<td>.123 .117</td>
<td>.119 .113 54.6 7.3</td>
</tr>
<tr>
<td>2</td>
<td>.081 .078</td>
<td>.079 .077 54.7 11.5</td>
</tr>
<tr>
<td>3</td>
<td>.060 .059</td>
<td>.060 .058 54.8 15.6</td>
</tr>
<tr>
<td>4</td>
<td>.048 .047</td>
<td>.048 .047 54.9 19.8</td>
</tr>
<tr>
<td>5</td>
<td>.040 .040</td>
<td>.040 .039 55.0 24.0</td>
</tr>
<tr>
<td>6</td>
<td>.034 .034</td>
<td>.034 .034 55.1 28.1</td>
</tr>
</tbody>
</table>

NOTES:
1. Weight of roofing not included.
2. Minimum 2" thickness of MEARLCRETE Cellular Concrete over EPS board at a cast density of 35pcf.
3. Includes both inside and outside air films and roofing membrane.
4. 4" structural concrete deck (440pcf) weight 50 psf.
5. Conventional 4 ply BUR add 6 psf, single ply add 2-7 psf. See steel deck table for additional information.
6. Weights and U-factors may vary depending on the steel used and structural concrete design.
7. The U-factors shown are for uniform thickness of insulation.

Consult Cellular Concrete LLC for additional UL listed designs.
**MEARLCRETE**® Roof Deck - Physical Properties

<table>
<thead>
<tr>
<th>Wet Density lbs/ft^2 (1)</th>
<th>Dry Density lbs/ft^3</th>
<th>Compressive Strength lbs/in^2 (2)</th>
<th>R-Factor °F/(BTU/hr./sq.ft.) per in. Thick</th>
</tr>
</thead>
<tbody>
<tr>
<td>30</td>
<td>25</td>
<td>140</td>
<td>1.49</td>
</tr>
<tr>
<td>35</td>
<td>29</td>
<td>210</td>
<td>1.32</td>
</tr>
<tr>
<td>40</td>
<td>34</td>
<td>330</td>
<td>1.15</td>
</tr>
<tr>
<td>45</td>
<td>38</td>
<td>450</td>
<td>1.02</td>
</tr>
</tbody>
</table>

(1) Water/Cement Ratio 0.50
(2) Method of ASTM C-495

Actual properties will depend on cement used, curing conditions and other variables dictated by job conditions.

**Approvals & Guides:**
Factory Mutual Approved
Dade County, Florida – #96-0919.01
New York City Board of Standard/Appeals (Docket 680-58-SM)
U.S. Army Corps of Engineers – CEGS-03510
Roof Decking, Cast-In-Place Low Density Concrete

**Technical Staff Membership Representation:**
American Concrete Institute
American Society for Testing and Materials
National Roof Deck Contractors Association
South Florida Root Deck Association
Roof Consultants Institute

---

**TYPICAL SLOPED ROOF INSULATION CONSTRUCTION FOR NEW OR REROOFING PROJECTS**

New Slope-To-Drain Surface

Roofing Membrane

Drain

Existing Roof Membrane and Insulation Can Remain in Place

New Slope-To-Drain Surface

Roofing Membrane

Polystyrene Board (optional)

Drain

Existing Roof Membrane and Insulation Can Remain in Place
Specifications

1.00 General
1.1 Scope of Work. The factory trained MEARLCRETE® applicator shall furnish labor, material equipment and supervision for the installation of the MEARLCRETE Cellular Concrete in accordance with the drawings and specifications.

1.2 Work by Others. All framing, wood nailers and structural expansion joints shall be provided by others unless specifically stated.

2.00 Materials
2.1 MEARLCRETE Cellular Concrete shall consist of portland cement, water, MEARLCRETE FOAM LIQUID CONCENTRATE and other materials as recommended by CELLULAR CONCRETE LLC™, all thoroughly and uniformly blended and pumped.

b. MEARLCRETE FOAM LIQUID CONCENTRATES shall be supplied by CELLULAR CONCRETE LLC™. MEARLCRETE FOAM LIQUID CONCENTRATE shall comply with the standard specifications of ASTM C869 when tested in accordance with ASTM C796.

c. Portland cement shall comply with ASTM C 150, Type I, II, or III.

d. Mixing water shall be a maximum of 6 gallons per sack of cement and be potable, free from deleterious amounts of acid, alkali, salts, oils and organic materials which would adversely affect the setting or strength of the cellular concrete.

e. Admixtures for reducing water, accelerating set, etc., may be used when specifically approved by CELLULAR CONCRETE LLC™ and in accordance with the admixture manufacturer’s recommendations.

2.2 Expanded polystyrene insulating board shall be in the form of rigid boards or formed unit with a minimum density of 1 lb. The EPS board shall include venting holes which approximate 3% of the board surface area. Thickness may be from 1” to 6”.

2.3 Corrugated Steel Deck shall be galvanized high tensile corrugated steel deck meeting ASTM A525, G 60 minimum with vented side lap openings. Slotted steel decks are not required. The corrugated deck shall be type and gauge, capable of carrying live and dead loads per load table and recommendations prepared by the corrugated steel deck manufacturer. Welding patterns shall be those recommended by the deck manufacturer. Consult CELLULAR CONCRETE LLC™ for diaphragm shear tables and welding information.

2.4 Reinforcing Mesh for fire-rated assemblies over steel deck and as an option for seismic diaphragm designs. The mesh shall be Keydeck style 2160-2-1619 galvanized mesh, or equal. For structural concrete decks and over precast concrete, reinforcing mesh is not required.

2.5 Expansion Joints. MEARLCRETE Cellular Concrete roof decks require only those expansion joints normally used for sound building design.

2.6 Slope Design is recommended so that drainage is provided by sloping the roof deck system. This is accomplished by using either the stair-step method or screeding and darbying the slope to the drains.

3.00 Installation
3.1 Worksite Preparation. The corrugated steel deck surface or the concrete substrate surface shall be clear of standing water, dirt, debris, ice and other foreign materials.

3.2 Weather. MEARLCRETE Cellular Concrete shall only be placed when the temperature is at least 40 F and rising.

3.3 Mixing and placing. MEARLCRETE Cellular Concrete shall be blended in mixing equipment as approved by CELLULAR CONCRETE LLC™. A CELLULAR CONCRETE LLC™ Foam Generator shall be used to convert MEARLCRETE FOAM LIQUID CONCENTRATE to a stable foam at the time of mixing. MEARLCRETE cellular concrete shall be pumped to point of finishing using approved equipment.

A. Application

Before the expanded polystyrene insulation board is installed over the corrugated steel deck, the corrugations shall first be filled with MEARLCRETE Cellular Concrete to a minimum of 1/8” over the top of the deck. The board shall be placed in the concrete and tightly butted together with staggered joints and placed in a manner that provides full contact of concrete to board. A minimum thickness of 2” MEARLCRETE Cellular Concrete shall be immediately placed over the board and screeded to a smooth surface to receive the roofing.

3.4 Testing: The wet density of the MEARLCRETE Cellular Concrete shall be checked at the point of placement and the mix adjusted to obtain the required wet density. At least 4 test cylinders shall be taken at the point of placement for each day’s pour or every 100 cubic yards of MEARLCRETE Cellular Concrete installed. The 3” x 6” cylinders shall be protected from damage and temperature extremes and shall be tested in accordance with ASTM C495.

3.5 Curing. MEARLCRETE Cellular Concrete shall be protected from foot traffic for at least 24 hours or until such time as the material is strong enough so that no visible impression is made in the surface material.

4.0 Roofing

Roofing material may be applied to the MEARLCRETE Cellular Concrete after 3 days providing the surface is dry and hard. Almost all built-up roofing manufacturers recommend the use of 40 pound base sheet on all cast-in-place decks including MEARLCRETE Cellular Concrete. Where such a base sheet is used, one mopping to allow vapors entrapped beneath the roofing felts to have free access to the perimeter of the deck to the atmosphere through the perimeter flashing. Consult CELLULAR CONCRETE LLC™ for single ply roofing application guidelines.

CELLULAR CONCRETE LLC™ seeks to present reliable information concerning the composition, properties and use of its products, however: (1) All advice concerning selection and use of any product is provided AT NO CHARGE AND WITH NO WARRANTY (2) No warranty is made hereby. Products described herein are warranted to conform to CELLULAR CONCRETE LLC’s specifications only at the time of sale. All sales are subject to CELLULAR CONCRETE LLC’s standard terms and conditions, which are reproduced on the reverse side of each invoice. ALL WARRANTIES OF MERCHANTABILITY AND FITNESS OF PURPOSE ARE DISCLAIMED. (3) CELLULAR CONCRETE LLC™ assumes no responsibility for any patent liability arising from the use of any product in a process, manner or formula not designed by CELLULAR CONCRETE LLC™. Nothing in the listed information shall be construed as an inducement or recommendation to use any process or to produce or use any product in conflict with existing or future patents.

CELLULAR CONCRETE LLC™
MEARLCRETE® DIVISION
421 Schantz Road
Allentown, PA 18104
Ph: (610) 398-7833
Fax: (610) 398-7050
info@cellular-concrete.com
www.cellular-concrete.com