

LightBUILD Lightweight Cellular Insulating Concrete

As a choice for New Roof Decks Construction and Reroofing Applications



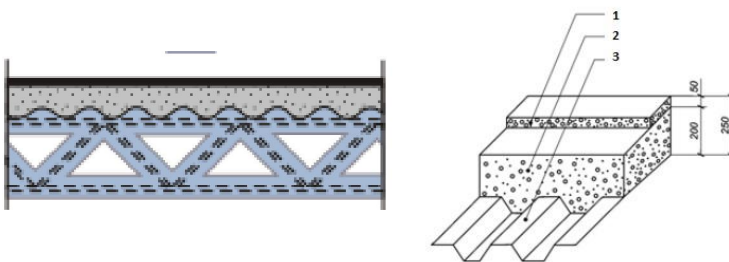
Slope-to-Drain
Lightweight
High R-Value
**Superior to
Insulation Board**
Low Cost

The lightweight insulating concrete roof installation system has a long and proud history of over 60 years that began in the northern United States. At that time, building codes required a fire resistant thermal barrier, which was successfully provided by lightweight insulating concrete roof decks. Today there are hundreds of thousands of successful lightweight insulating concrete decks installed around the world.

LightBUILD Cellular Concrete is 100% Portland Cement based and contains no water absorbing expanded fillers. LightBUILD concrete requires 1/4 the mix water of other concretes based on expanded fillers. Workability is obtained from discrete air-cells, not from excessive water.

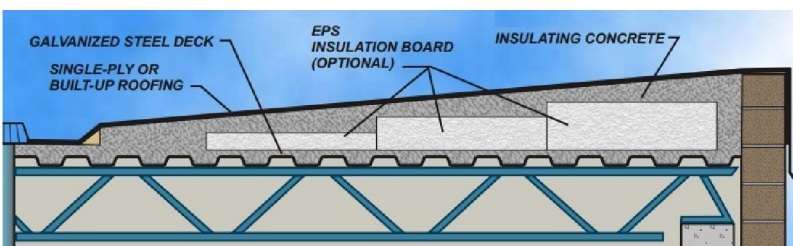
The following examples illustrate the use of cellular concrete for new roofing and reroofing applications.

1. New roof - The lightweight cellular concrete installed over roof deck system

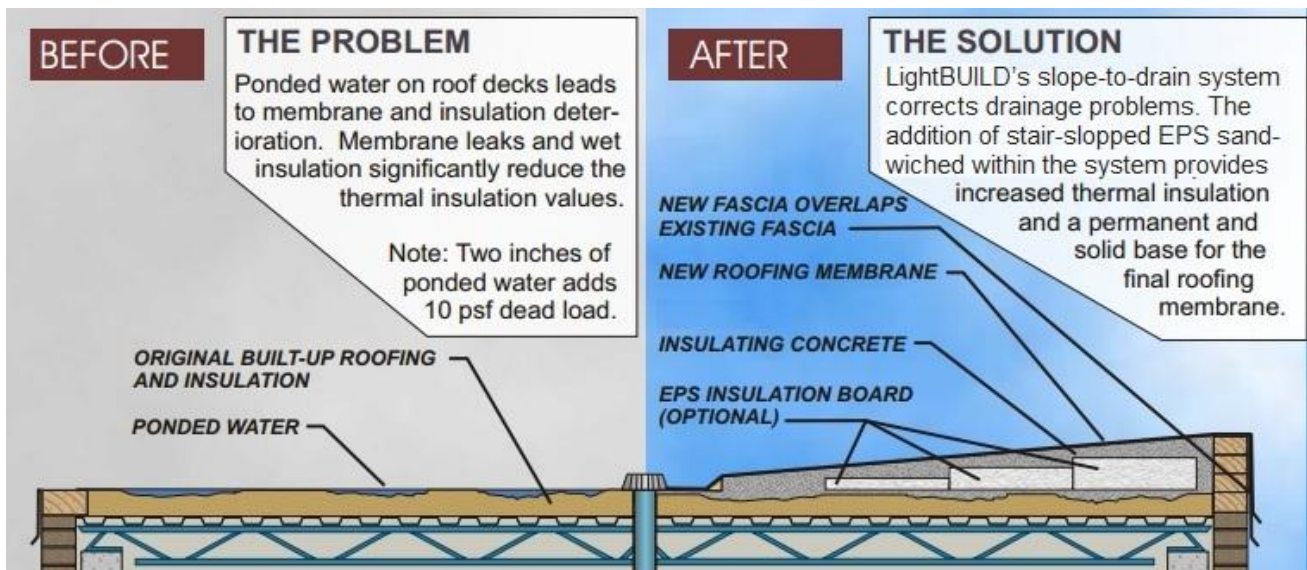


- 1 – Cellular Concrete, density 600 kg/m³, screeded to a smooth, planar, monolithic surface suitable for membrane application.
- 2 – Cellular Concrete, density 200 kg/m³
- 3 – Galvanised Roof Deck system

2. New roof. The Composite Insulating Roof Deck system, incorporating the EPS insulation board (optional).



3. Reroofing system using cellular concrete and (optional) EPS insulation board.



Benefits of composite roof deck system using LightBUILD cellular concrete:

- Positive drainage - System provides excellent slope-to-drain over flat or irregular substrates.
- Excellent wind and fire resistance properties.
- Seismic values.
- Thermal insulation.
- Sound attenuation.
- A solid base for built-up and single-ply roofing membranes for both new construction and reroofing applications.
- System is more economical than installing tapered, rigid board systems or sloping the structural concrete.
- LightBUILD cellular concrete can be cast over concrete (precast or cast-in-place), galvanized steel and wood deck substrates.
- Cellular concrete is poured over a flat roof to form a seamless layer that insulates the roof while improving its resistance to shear forces.
- High moisture resistance and compressive strength.
- Dimensional stability and the ability to mechanically fasten the roofing membrane to the insulation.
- Eliminates low spots on existing roof decks.
- Achieves long-term insulating values.
- Depending on the condition of the existing roof system, the new system can also eliminate the need for costly tear-off due to industry restrictions and simplifies surface preparation.

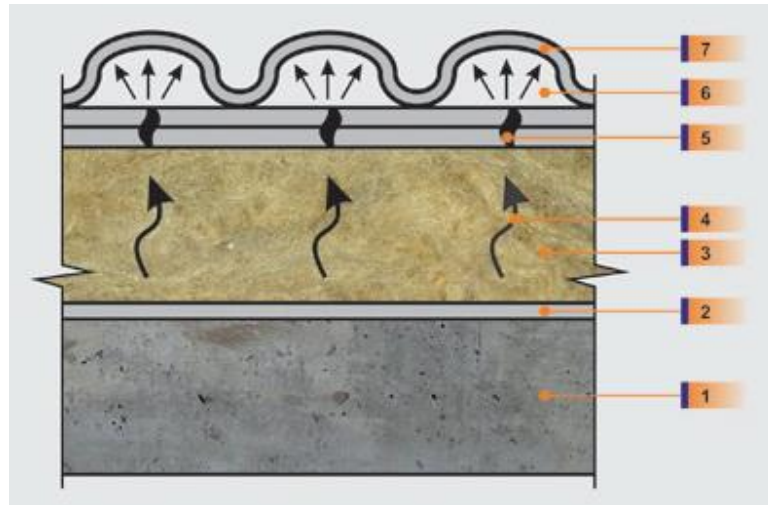
The typical range of densities for lightweight cellular concrete used for roofing applications is 250 – 600 kg/m³.

Table 1 shows the typical range of physical properties for cellular concrete used in insulated concrete systems.

LightBUILD Concrete Density, kg/m ³	Compressive Strength, MPa	Thermal Conductivity, W/m°C	R-value for 100 mm concrete thickness	Weight of 1 m ² of LightBUILD concrete of 100 mm thick, kg	The use of concrete in Roof Deck insulating system
250	0.8 - 1.0	0.07	1.43	26	Used as an insulating material only and for the cavities infill
300	1.2	0.08	1.25	31	
400	1.6	0.09	1.11	42	Can be used both for insulation and as a base for the waterproof membrane application
500	2.0	0.10	1.00	52	
600	2.8	0.13	0.77	63	

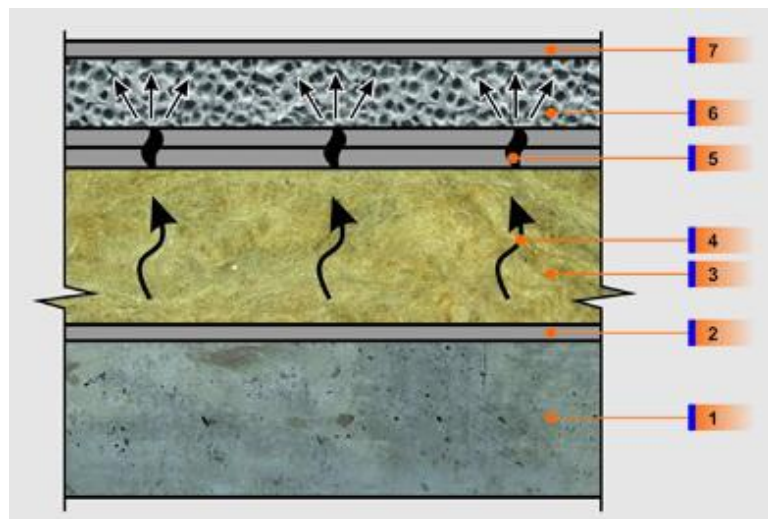
Repairing of an existing roof?

The following illustration demonstrates what will happen if a new waterproofing membrane is placed over the old one.



1. Base of the roof - For example, reinforced concrete slab.
2. Vapour sealing.
3. Thermal isolation (mineral wool, expanded clay, etc.) saturated with water due to leaks.
4. Migration of vapour in thermal isolation layer due to sun heating the roof.
5. Defects in old waterproofing mat.
6. Excess pressure caused by the migrating vapours.
7. Surface bulging of the new waterproofing placed during a repair of the roof.

Advantage of using lightweight cellular concrete in roof repairs can be seen from the two illustrations shown below.



Old roof repaired with LightBUILD cellular concrete

1. Base of the roof.
2. Vapour sealing.
3. Thermal isolation (mineral wool, expanded clay, etc.) saturated with water due to leaks.
4. Migration of vapour in thermal isolation layer due to sun heating of the roof.

5. Defects in old waterproofing mat.
6. Dissipation of the migrating vapours in pore structure of LightBUILD cellular concrete
7. New waterproofing layer

As can be seen, the monolithic layer of lightweight cellular concrete acts as a buffer for the migrating vapours. Excess pressure caused by the vapours, dissipates in the vast pore structure of cellular concrete and does not damage the new waterproofing layer. This buffer action of LightBUILD cellular concrete explains why our system is repair free for 10 and more years.

Once a lightweight, insulating concrete roof installation system is installed, building owners will never have to replace their roof insulation again and building occupants will enjoy the comforts of the construction industry's most progressive roofing underlay system.

FAQ

Installation

Lightweight insulating concrete roofing system (LICRS) can be installed over non-slotted or slotted galvanized corrugated metal decks, structural concrete substrates and, where appropriate, over existing roofs in recover applications. LICRS excellent fire resistance properties make it cost effective versus the more expensive alternative of adding a fireproof coating to the deck's underside, as required by most systems incorporating conventional rigid insulation board. The lightweight concrete is placed at a minimum 50mm thickness over the surface.

How much does LICRS cost?

Cost-effective Lightweight Insulating Concrete Systems varies in price by geographical area and by application requirements. Our sales representative will be glad to assist with budget numbers and quotations for our products and services.

How do you increase the R-value of LICRS?

The R-value of LightBUILD cellular concrete is increased by using the light densities of material and by increasing the layer thickness. It can be further increased by adding expanded polystyrene insulation board during application of the lightweight cellular concrete. LICRS incorporating EPS insulation can easily achieve 50 R's for the installation.

What is the equilibrium moisture content of cellular concrete?

The equilibrium moisture content of cellular concrete is typically 14-18 % by weight.

When can cellular concrete system be roofed?

Roofing may begin 2-4 days after placement.

How is lightweight cellular concrete resistant to weather?

After a LICRS deck is roofed, it is highly resistant to weather conditions as has been demonstrated for over 60 years of continuous applications in all geographic areas of the world.

If EPS is in place and a threat of rain exists, what is the best procedure to follow?

Place the lightweight slurry coat so that the bond holes are full of material. It is not necessary to slurry coat the board surfaces. A slurry coat on the board is acceptable for next day topping without any special treatment such as a bonding agent.

What types of roof membranes can be installed over Lightweight Insulating Concrete?

Built-up Roofing, Modified Bitumen, and Single Ply Membranes of various approved compositions have been successfully installed over lightweight cellular concrete.

How far can cellular concrete be pumped?

Cellular concrete is a very easily pumped, highly fluid mixture. The bulk of cellular concrete is placed by pumping. Cellular concrete will typically move through the pump lines using less pressure than typical heavier grout mixes. Documentation of cellular concrete being pumped up to and exceeding 150 m vertically and 3000 m horizontally is commonly available. This is also dependent on the equipment capability.

Are control joints needed for thermal movement in a lightweight insulating concrete roofing system (LICRS)?

No.

What is an acceptable finish for LICRS?

A surface finish free of ridges and protrusions is an acceptable finish for roofing application. Most LICRS is left to self-seek a level and not surface finished in the traditional sense. Much cellular concrete is covered by another material. A floor leveling type smoother tool can be used simply to break the surface air cells and create a more uniform and polished look to the surface in the rare case when a more uniform surface appearance is desired.