

ECOLIT[®]

ECOLIT BUILDING CONTRACTING L.L.C

**DESCRIPTION
OF ECOLIT CONSTRUCTION
SYSTEM**



**New construction method:
Application of lost shattering and filling material
using non-autoclave aerated nanocrete and light gauge steel (LGS) framing.**

1.0 BACKGROUND OF THE INNOVATION

At present time the light steel frame construction is recognised worldwide as one an advanced construction system reducing the building period and material costs.

The disadvantages related to use of light steel frames for construction are in association with other materials typically used in the final structures and result in poor fire performance, including potential structural weakening at high temperature, low acoustic proofing and higher costs of thermic insulation due to multi-layerer materials requirements.

The core of the innovative ECOLIT Construction System is related to the combination and application of aerated lightweight concrete (nanocrete) as the single monolithic material to the building steel frame; resulting into a new, affordable, unique and practically tested construction model. The light steel profiles used this way constitute the bone structure reinforcing even further the lightweight cellular concrete building walls envelope.

Maintaining all the benefits and advantages of light steel frame construction system (low construction time, low cost) the new model adds such additional benefits as low cost, high thermo-insulation properties, long period durability, high structural strength, intense fire resistance and high acoustic proofing.

Many market surveys found that the main buyer's motivation not to go for light steel frame housing, is what is referred to as the "empty wall" effect, not only for its acoustic flaws, but its perception as a "knock-through" main wall. Our developed usage of light concrete provides property developers with a low cost new opportunity to secure their buyers looking for "strong concrete walls" and tap new market segments.

The new system generates a direct financial impact since avoiding the use of expensive cement-fibre, calcium-silicate or wooden boards, used for siding; low cost aerated light concrete panels playering both the role of siding panels, lost shattering and structural material.

ECOLIT Company did carry out a substantial work with regards to engineering calculations, practical construction approach and complete application of the new construction model.

The implemented construction projects generated practical results and have confirmed all the initial model calculations and expectations and obtained positive response from industry specialists, experts and potential customers.



Photo 1 photo of ready project in Abu Dhabi (UAE)

The new system can be used for mass construction of private, civil and industrial buildings with height up to four levels (floors), without use of additional reinforcing structure. It can also be used in high-rise buildings construction in combination with dense concrete structure; for non-bearing items like separation walls, outside walls, and other similar purposes.

Creators of the system consider that it will have a wide range of applications and will be in high demand among consultancies and construction companies, which already work in the segment of light steel frame construction.

2.0 DETAILED DESCRIPTION OF THE SYSTEM

The core element of the new system is with the creation of a bearing structure (walls, slabs and other building elements) by the use of customized light steel galvanized profiles frame (0.8 – 2 mm thickness), which is then “clustered” inside monolithic lightweight cellular concrete walls

The specs and design of the light steel frame makes it to project, the steel frame is carrying out the bearing role alone and calculated for bearing all spectre of loads, which appear during the building life. Creation of nanocrete structure alongside with steel frame (when steel frame is completely inside the structure) improves the strength and rigidity of the building, increases steel frame durability, adds many advantages.

Cement fiber, calcium, magnesium boards or other similar (see Drawing 1 below) are fixed to the assembled light steel frame with screws or tie roads from both sides. The boards can be made in width or dry density (from 1 100 to 1600 kg/m³) to fit general building requirements (thermo insulation, acoustic proofing, etc.). Vertical and horizontal lines of boards connection are rapidly filled with any regular silicone, gypsum powder for making connection hermetic and prevent any potential thermic bridges. The gap between inside and outside boards is then filled with lightweight cellular concrete, with typical dry density in the 400– 600 kg/m³ range (higher if required) after curing.

ECOLIT SOLID WALL SYSTEM SUBMITTAL

ECOLIT Lightweight concrete, being non-autoclave aerated lightweight cellular concrete has the unique capacity to be produced as dry mix and delivered and mixed with water on construction location. The resulting mix is then simply pumped to place in heavy liquid form, in the same then any other semi-liquid concrete, to fill the space in between the boards. It fills the space penetrating into all small gaps, cracks.

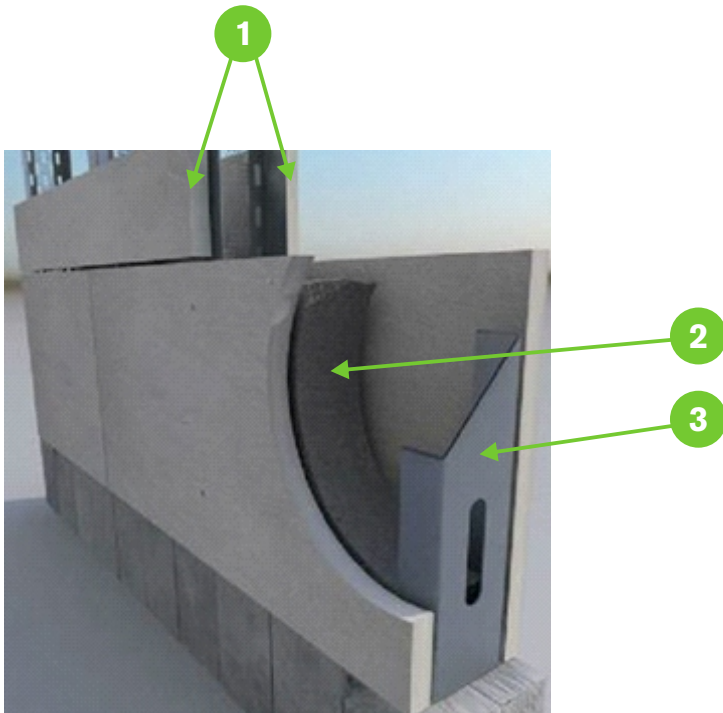


Photo 2: Section view of the construction built with light steel frame and ECOLIT Lightweight concrete.

In order to give outside walls, the necessary hardness and resistance, the boards are covered with a reinforcing layer, providing also for finishing.

3.0 APPLICABLE MATERIALS

3.1 ECOLIT Lightweight Dry Mix

ECOLIT Lightweight Concrete, is a unique lightweight cellular concrete construction material, which allows for practical construction implementation of the new system.

When ECOLIT lightweight concrete is poured into the support structure made of cement boards, reinforced with light steel profiles, it fills the space homogeneously and at the end provides for equal dry density, strength and properties throughout; naturally integrating itself at the micro level with the cement boards material of same nature, resulting into a dead weight reduced, monolithic and uniform concrete construction.

ECOLIT Lightweight DRY MIX is a unique powder to make lightweight cellular concrete in-situ. The mortar is made from a set of components on-site, which when mixed with water, becomes monolithic cellular concrete. It has a wide range of application:

- filling of apertures and overlapping in light-gauge steel structure erection
- floor screeds, flat roofing
- road and pipe carpeting
- thermal and sound insulation elements

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