

LIGHTHERM[®]

Superlight aggregates for the preparation of
lightweight insulation screed



A Singapore Product



PSB Singapore
Certified

VODAPRUF

KEY FEATURES



Ultra Lightweight, $\rho = 250\text{kg/m}^3$

Reduce structural weight and optimize design



High Thermal Insulation, $\lambda = 0.067\text{W/mK}$

Energy efficient and cost saving



Acoustic Insulation, 14dB reduction*

**with 50mm thickness application, 14dB impact sound reduction at 500Hz*

Increase comfort level



- Lightherm has acquired COC (Certificate of Conformity) issued by TÜV SÜD-PSB Singapore
- Listed in Singapore PSB Product Listing Scheme

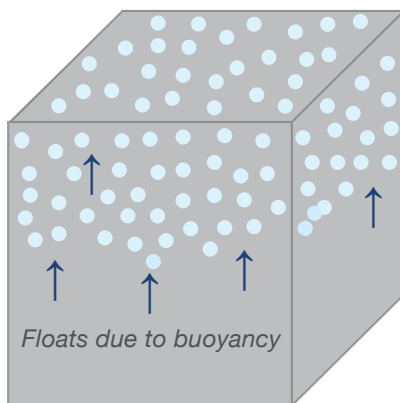
EN 13501-1
Fire Classification
A2-S1-D0

PRODUCTS DETAILS

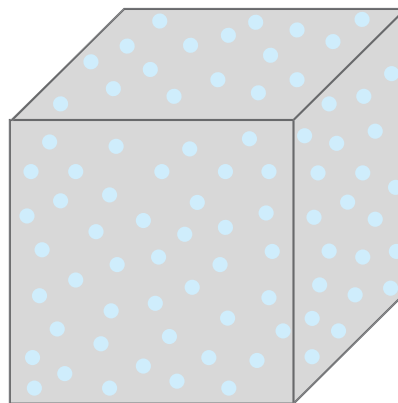
Lightherm is a lightweight aggregate specially treated with our patented VOD additives. Lightherm when mixed with cement, becomes a lightweight screed (Lightherm Screed) - density of only 250kg/m³. It achieved thermal conductivity - as low as 0.067 W/mk. Lightherm Screed has acquired COC (Certificate of Conformity) issued by TÜV SÜD PSB Singapore. Lightherm Screed is suitable for indoor and outdoor applications.



Normal lightweight aggregates



Lightherm aggregates



- ✓ No Floating
- ✓ Guarantee Blends Well
- ✓ No Additive Required

LIGHTHERM[®]



- granulometry **3-6mm**;

LIGHTHERM[®] MINI

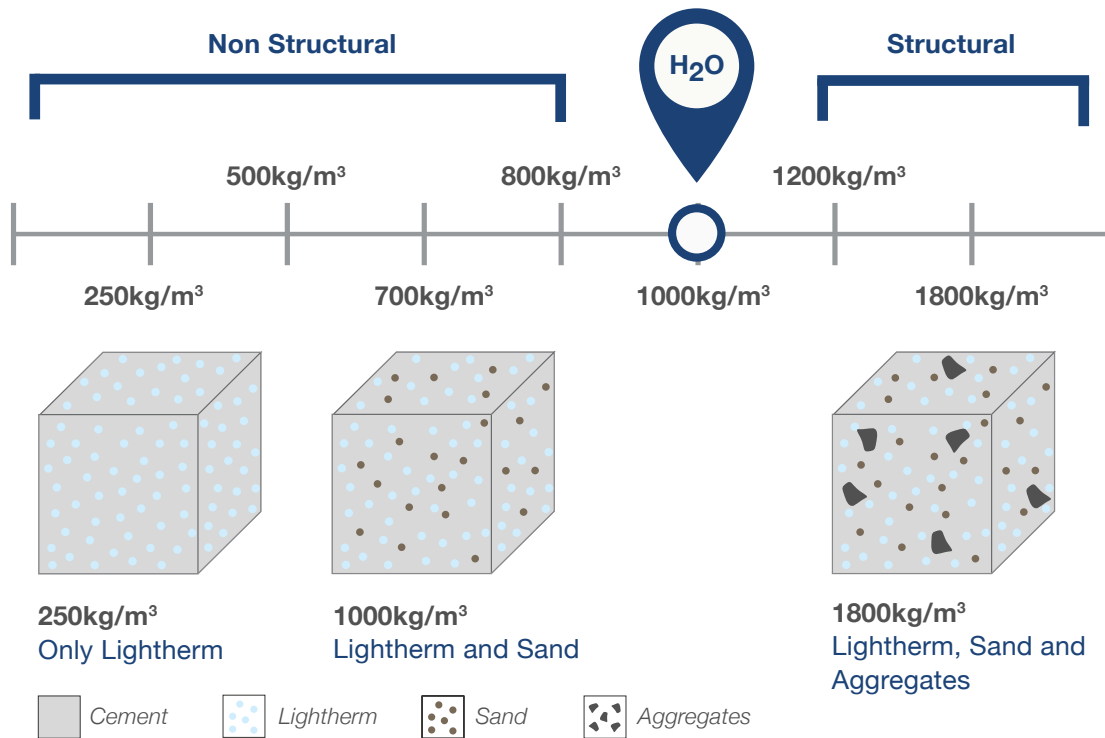


- granulometry **2mm**;

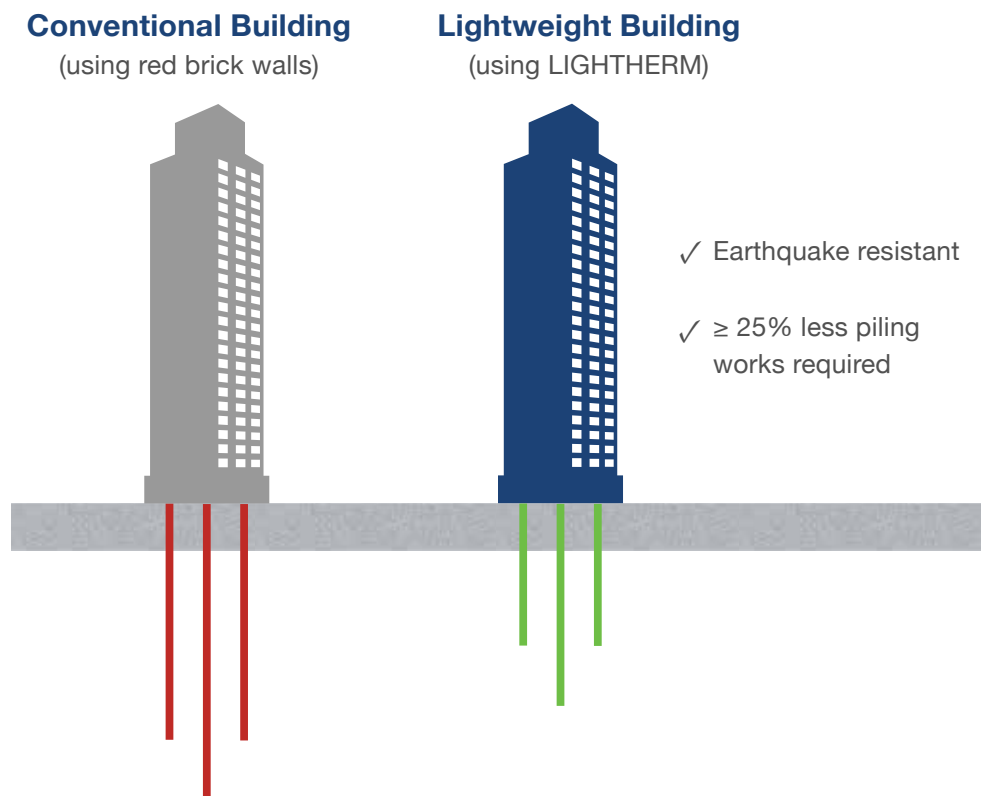
Refer to page 22 for mixing procedure

SOME EXAMPLES OF DIFFERENT LIGHTERM MIXTURE

As LIGHTERM blends well with no segregation, concrete/screed with all kinds of density can be made!

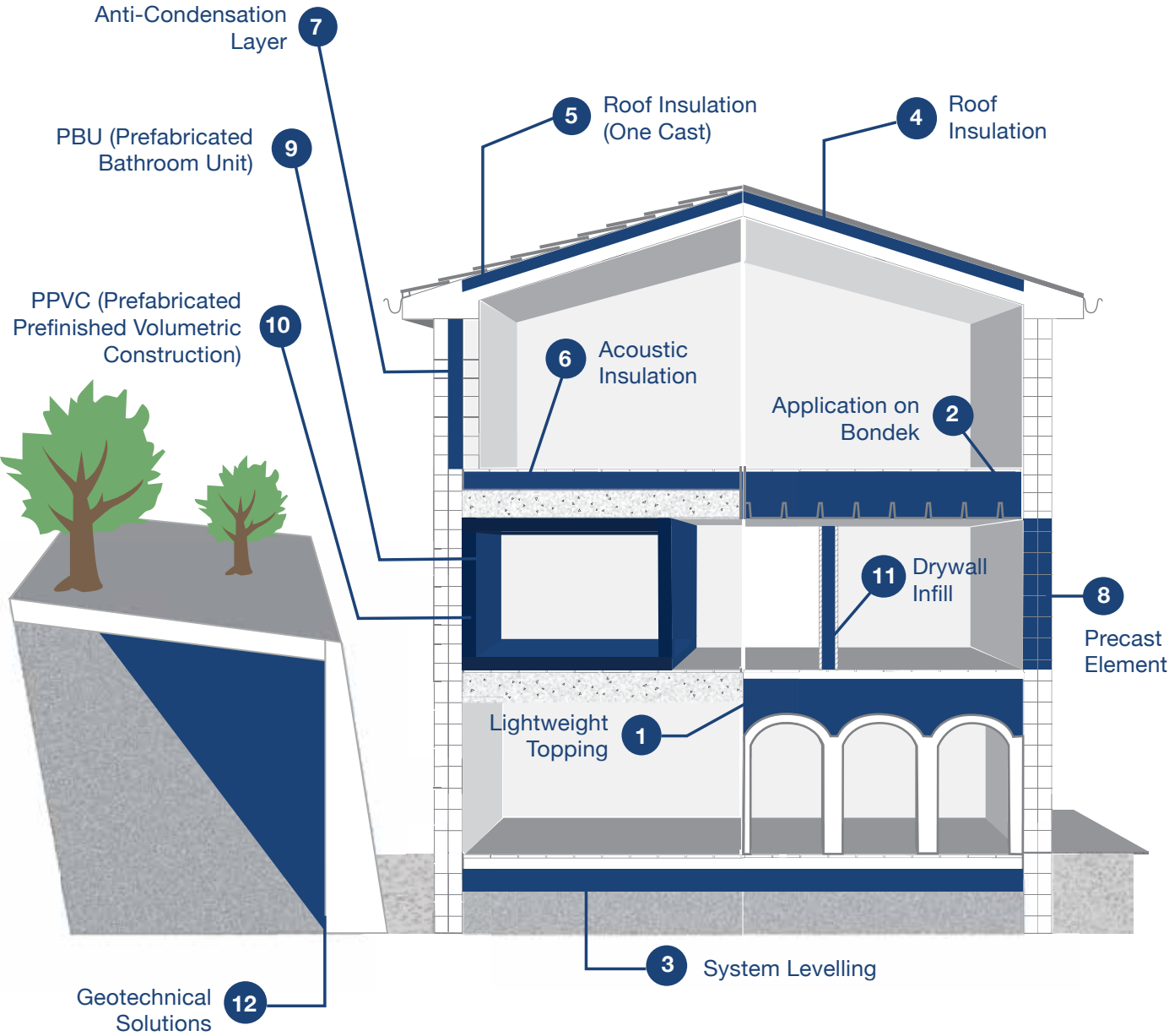


COMPARISON OF BUILDINGS



EXAMPLE OF APPLICATION

Lightherm Screed is used for its thermal insulation, acoustic insulation and lightweight properties.



01/ LIGHTWEIGHT TOPPING

Lightherm Screed 250kg/m³

Lightherm Screed is used as a lightweight topping screed to adjust floor level. In some projects there might be concerns with the usage of conventional cement sand screed, due to its high density of 2100kg/m³. Lightherm Screed is an ideal alternative.

Student Service Centre @ Nanyang Technology University (NTU)



In partnership with a ready-mix company, material mixed in concrete plant



Subsequently sent down to site in the form of ready mix



Able to be used with concrete pump



Pouring of Lightherm Screed

HDB Block @ Jurong East Street 13



Lift Upgrading Programme, corridor floor level topping up

HDB Unit @ Whampoa Drive Block 68



Kitchen floor level topping up

SG Enable (Ministry of Social & Family Development) @ 141 Redhill Road



Walkway level topping up

02/ APPLICATION ON BONDEK

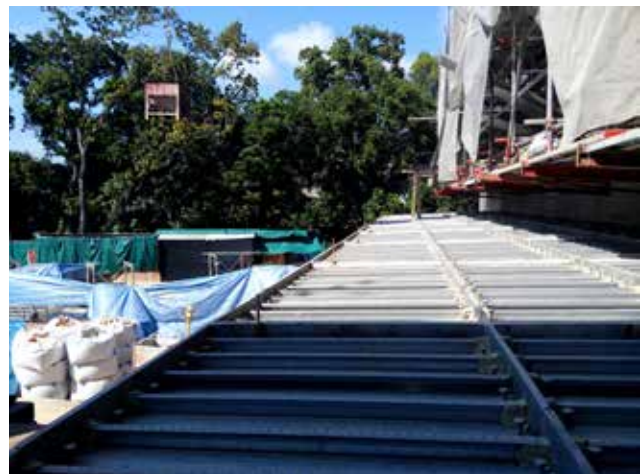
Lightherm Screed 250kg/m³

Lightherm Screed is used as a lightweight screed on Bondek.

Bungalow @ 56 Nassim Road, Singapore



Bondek (Steel Decking)



Bondek (Steel Decking)



Casting on site



Casting on site

03/ SYSTEM LEVELLING

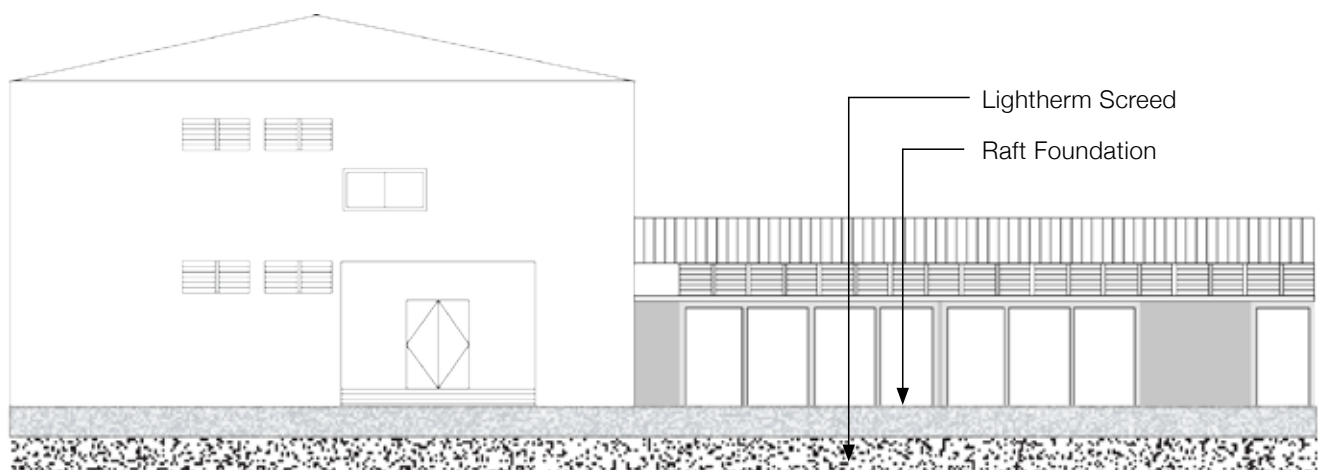
Lightherm Screed 250kg/m³

Lightherm is used as soil improvement material.

Bungalow @ 90 Meyer Road, Singapore



Excavated soil is backfilled with Lightherm Screed (400m³) for its lightweight property. This project utilized the load compensation technique on a soil with poor load bearing capacity. This also prevent potential structural settlement in the long run.



04/ ROOF INSULATION

Lightherm Screed 250kg/m³

A 50mm thick Lightherm Screed applied to the roof (inverted roof system) achieved BCA stipulated u-value requirement.*

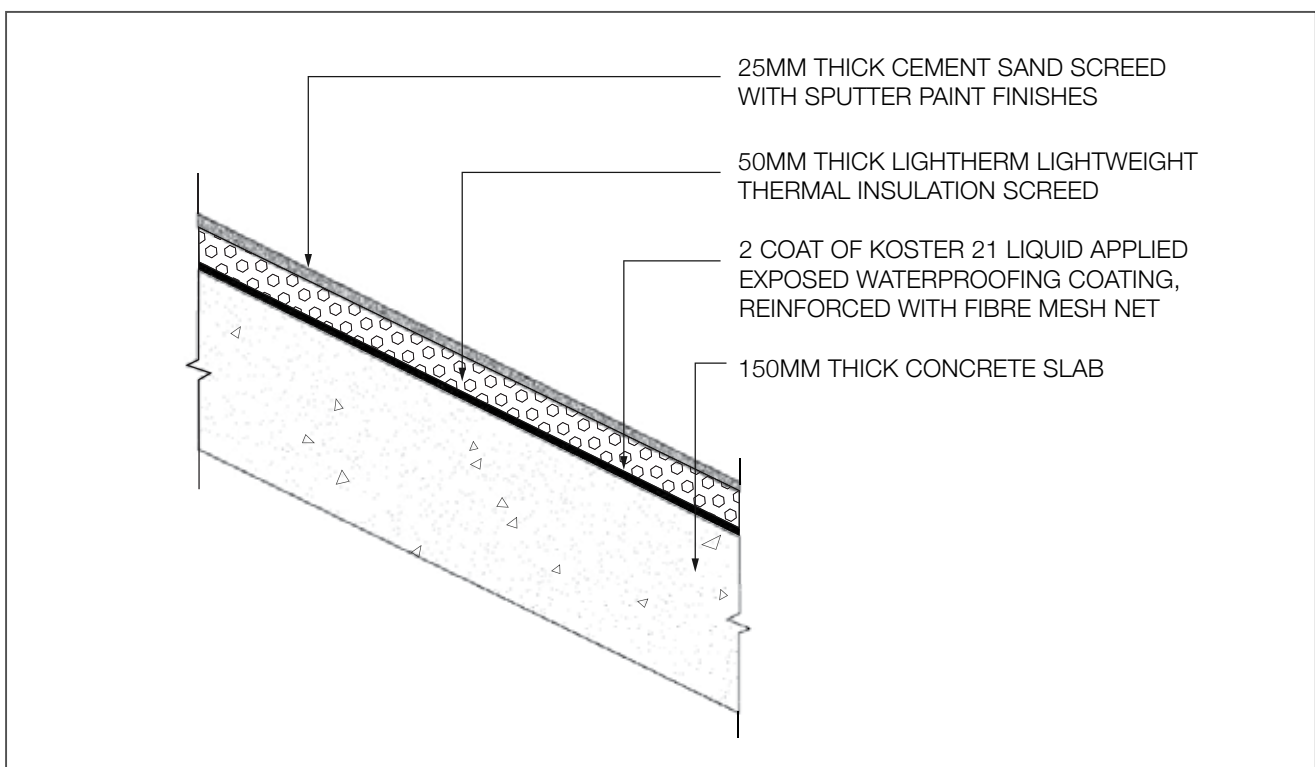
Layer	Thickness, b (m)	Conductivity, k (W/mK)	Resistance, R (m ² K/W)
Outside Surface, (R _o)	-	-	0.0550
25mm thick cement sand screed	0.025	0.5330	0.0469
50mm thick Lightherm Screed	0.050	0.0670	0.7463
1.2mm thick KOSTER 21 waterproofing membrane	0.001	0.0826	0.0145
150mm thick concrete slab	0.150	1.4420	0.1040
Inside Surface, (R _i)	-	-	0.1620
Total Resistance (R_T)			1.1287

Thermal Transmittance (U-value) of Roof, 1/R_T : 0.89 m²K/W

Maximum Allowable U-value of Roof : 1.20 m²K/W

0.89 < 1.20, Pass!

*Contact us for more information.



Terrace House @ 19 Buckley Road, Singapore



Lightherm Screed as roof insulation layer



After cement sand screed



After painting works. Final result.

05/ ACOUSTIC INSULATION

Lightherm Mini Screed 250kg/m³

Special application, contact us for more information.

Lightherm Screed is used to reduce airborne sound transmission and reduce impact sound transmissions.

Wangz Hotel @ 231 Outram Road, Singapore



Impact sound of attic level open bar causes disturbance to hotel guests room below



Lightherm Screed is applied to reduce impact sound transmissions

06/ ANTI-CONDENSATION LAYER

Lightherm Mini Screed 250kg/m³

Special application, contact us for more information.

Lightherm Screed can be used as an insulation layer to prevent condensation problem on the external side of building.

Conservation unit @ 138 Neil Road, Singapore



Computer server room temperature might be as low as 15 degrees, application of 100mm thick Lightherm Screed insulate the slab from moisture condensation problem on the underside. Lightherm casted as a 100mm thick insulation layer.



Subsequently followed by the application of 50mm cement-sand screed

07/ PRECAST ELEMENT

Lightherm Screed 250kg/m^3 - 1900kg/m^3 *

**Various density available, contact us for more information.*

Lightherm is incorporated into precast elements to reduce the weight of the final product.

DSTA Project @ 1 Depot Road, Singapore



Architectural Panel made with Lightherm, weight reduction of more than 55%

Mosque project in Malaysia



Before the application of Lightherm, precast panel weight was 4kg



After the incorporation of Lightherm, the weight was reduced to 1.67kg

08/ PREFABRICATED BATHROOM UNIT (PBU)

Lightherm Screed 250kg/m³ - 1900kg/m³*

**Various density available, contact us for more information.*

Lightherm is incorporated into concrete to reduce the weight of Prefabricated Bathroom Unit.

Some other example of possible density and strength:

- 1000kg/m³, achieving 7N/mm²
- 1200kg/m³, achieving 10N/mm²
- 1400kg/m³, achieving 14N/mm²
- 1900kg/m³, achieving 30N/mm²

PBU Project, Singapore



Density 1000kg/m³, achieved compressive strength of 7N/mm²



Internal Finishing

09/ PREFABRICATED PREFINISHED VOLUMETRIC CONSTRUCTION (PPVC)

Lightherm Screed 250kg/m³

Special application, contact us for more information.

Lightherm Screed is used as a lightweight leveling material. It plays the role as an infill material. Lightherm Screed also provides good thermal-sound insulation properties.

Project @ Singapore



During fabrication



Lightherm

Section Detail



After fabrication

10/ DRYWALL INFILL

Lightherm Screed 800kg/m³

Specific design mix, contact us for more information.

Lightherm is used as an infill material for drywall system. Drywall installation is 35% faster than masonry work. Higher productivity saves construction time and labour cost. Drywall infilled with Lightherm Screed (thickness 87mm) increases room space as per compared to masonry wall (100mm). Its thermal insulation and sound insulation property provides a comfortable environment. Drywall infilled with Lightherm Screed provides solidness and eliminates hollowness.



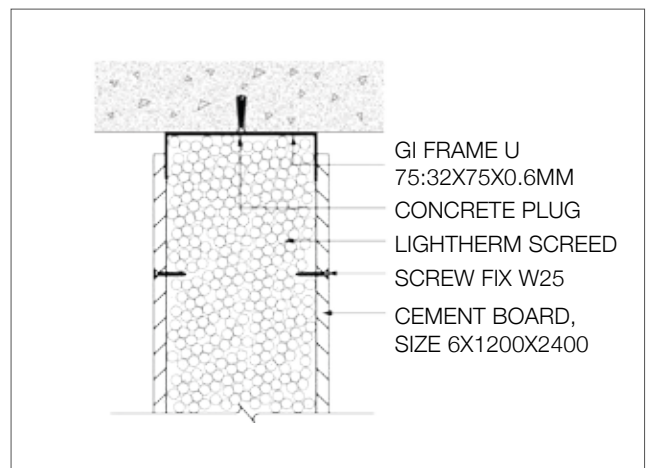
Installation of GI frame



Installation of cement board



Infill of Lightherm into hollow section



Concrete Slab

11/ STRUCTURAL APPLICATION

Lightherm Screed 1900kg/m³

**For specific design mix, please contact us for more information*

Lightherm is added into structural grade concrete at a very minimal dosage to reduce the weight of regular concrete while retaining the compressive strength.

Cantilever Roof for Temple Project



Lightweight concrete is pre-batched in ready mix plant before sending down to site

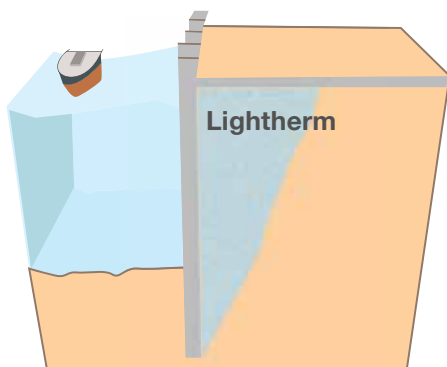


Density 1900kg/m³ while achieving Grade 40

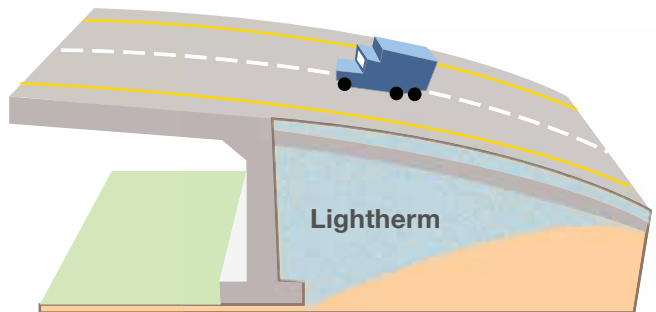
12/ GEOTECHNICAL SOLUTIONS

Lightherm Screed 250kg/m^3

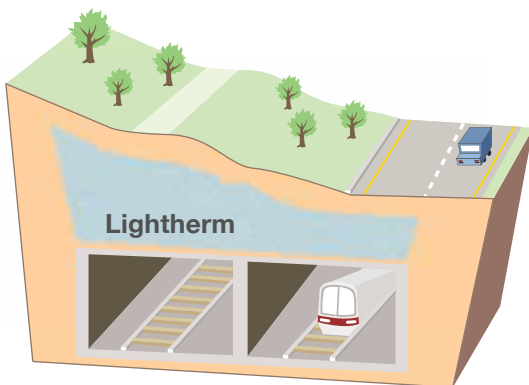
Special application, contact us for more information.



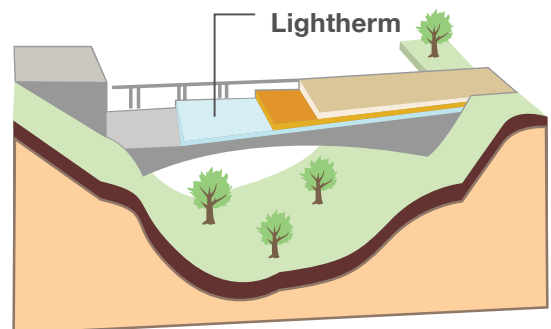
Sheet Piles Wall



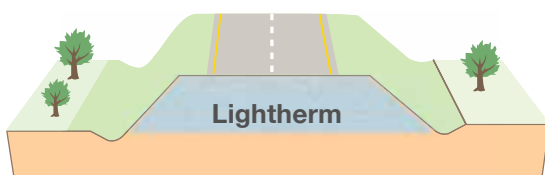
Alignment Ramp



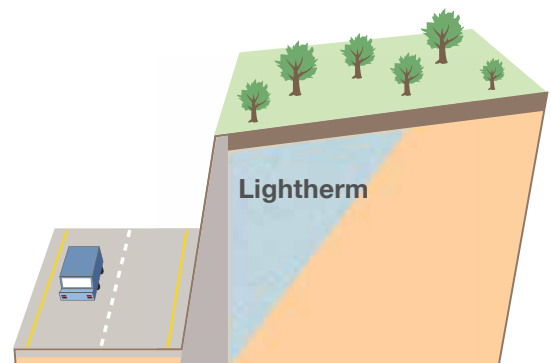
Backfilling on Structures



Roads & Highways



Road Embankment



Supporting walls

13/ OTHER APPLICATIONS

Special application, contact us for more information.



Application on wall



Lightweight house



Lightweight insulation bricks



Leveling MRT train track



Elevating swimming pool level



Lightweight precast window



Waterproofing membrane application
on Lightherm Screed



Lightweight R.C ledge



Lightweight R.C cantilever

TECHNICAL CHARACTERISTICS

Lightherm Screed prepared with Lightherm/Lightherm Mini.

DENSITY Kg/m ³	250
Mass after 28 days Kg/m ³	~265
Thermal conductivity - λ W/mk	0.067
Compressive resistance N/mm ² (UNI EN 1015-11:2007)	0.83
Flexural strength N/mm ² (UNI EN 1015-11:2007)	0.46
Cohesion kPa	82.62
Hot-sealed membrane rupture N/50mm	57.00
Cold-sealed membrane rupture N/50mm	35.00
Elasticity module N/mm ²	235.80
Permeability to water vapour - μ	11.50
Shrinkage (NBN) - mm/m	0.427
Specific heat - kj/kgK	1.40
Impact sound reduction at 500Hz - ΔL	14 dB thickness 5cm
Impact sound pressure level measure in situ UNI EN ISO 717-2 - $L'_{nTW}(C_1)$	61 dB
Fire reactivity class	A2 (UNI EN 13501-1)
Smoke production class	S1 (UNI EN 13501-1)
Observations of drops or inflamed particles	D0 (UNI EN 13501-1)

PREPARATION OF LIGHTHERM SCREED 250KG/M³

**No sand required!*



* Cement Portland 32.5 Cem I or Cem II limestone. Any brand of Ordinary Portland Cement is possible.

Note: 1) Always quantify Lightherm by volume, not by weight

2) Water over dosage will cause segregation



Preparation with cement mixer.
Mix for 5 minutes.



Preparation with Lightherm
machine. Mix for 5 minutes.



Purchase Lightherm Screed in
the form of ready mix. Mix for 5
minutes.

PROJECT REFERENCE

A: Architect SC: Structural Consultant

LIGHTWEIGHT TOPPING

**Refurbishment Work @ Marina Bay Sands
Intergrated Resort (900m²)**
A: Aedas Pte Ltd

**SG Enable (Ministry of Social & Family
Development) @ 141 Redhill Road (120m³)**
A: WOHA Architect | SC: Ronnie & Koh Consultant
Pte Ltd

**Lift Upgrading Works for HDB @ Jurong East
Street 13 (1500m²)**
A: 3P Ecotecture | SC: Lim Kim Cheong Consultant

NTU, Student Service Centre (700m²)
A: Chung Architect | SC: Fong Consult Pte Ltd

Harry's Bar @ Marina bay Link Mall (200m²)
SC: Macrobuild Consultants

**Lift Upgrading Works @ Chua Chu Kang
Central (2200m²)**
SC: Lim Kim Cheong Consultant

Bukit Panjang Community Centre (300m²)
A: Hiladt Architects LLP

**Institutional Building for Ministry of Social and
Family Development @ 11 Jalan Ubi (150m²)**
A: SQFT Architect

Senoko Road Project (1200m²)

4 Storey Shop @ 284 River Valley Road (150m³)
A: RT+Q Architects | SC: JS Tan & Associate

**8 Storey Industrial @ 23 Senoko South Road
(1200m²)**
A: Kay Ngee Tan Architect | SC: Ronnie & Koh
Consultants Pte Ltd

APPLICATION ON BONDEK

Bungalow 56 Nassim Road (170m²)

SYSTEM LEVELLING

Bungalow @ 90 Meyer Road (400m³)
A: Formwerkz Architects | SC: Portwood &
Associates

ROOF INSULATION

**NTU, Childcare Centre @ Nanyang Technological
University (320m²)**
A: Thymn Pte Ltd | SC: Thymn Pte Ltd

**Renovation Works @ NEX Serangoon Mall
(1200m²)**
A: SAA Architects | SC: Aecom Singapore Pte Ltd

Lakeville Condo @ Jurong West (4000m²)
A: Architect 61

Bungalow @ 6 Ewart Park (1300m²)
A: E9AP Architect | SC: Mega Consultant

Terrace House @ 19 Buckley Road (450m²)
A: Ip-li Architects | SC: JS Tan & Associate

Residential Flat @ 60 Somme Road (400m²)
A: Seeds Architect | SC: Longrove & Associates

Semi Detached @ 7 Namly Hill (240m²)
A: Ip-li Architects

10A Bedok Avenue (Approx 200m²)
A: RSWA Architects | SC: P&T Consultants Pte Ltd

ACOUSTIC INSULATION

Wangz Hotel @ 231 Outram Road (50m²)
A: Beltiston Ventures (Acoustic Consultant)

ANTI-CONDENSATION LAYER

**NTU, School of Physical & Mathematical
Sciences (3000m²)**
A: Chung Architect | SC: Fong Consult Pte Ltd

Conservation Unit @ 136 & 138 Neil Road (40m²)

PRECAST ELEMENT

DSTA @ 1 Deport Road (1200m²)
A: HCFA Architect

Bungalow @ 22 Mount Sinai Lane (200m²)
SC: LC Chua Consulting Engineers

Mosque Project @ Malaysia (500m²)

VODAPRUF

Vodapruf Pte Ltd specializes in supplying high quality construction material in Singapore and Malaysia. We deliver product solution for waterproofing products and lightweight insulation screed (LIGHTHERM).

Our Mission

To provide innovative product solutions for the construction industry

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