JOE Green Presentation – English

The Future of Green Concrete Revolution

JOE just one earth®

Gramata
Lightweight Green Aggregates

LiGrA®
Lightweight Green Aggregates

The Art of Lightweight Technology

GREEN MANUFACTURER

ZERO WASTE MANUFACTURER

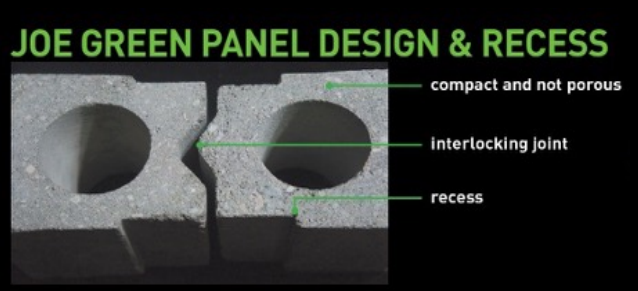
RECYCLED GREEN CONCRETE

QUALITY

SUPER LIGHT WEIGHT

SUPER FLAT SKIM COAT ONLY

8M CUSTOMIZED DESIGN & SIZES EASY HOUSEKEEPING



Pull-off test (Per Point Load):

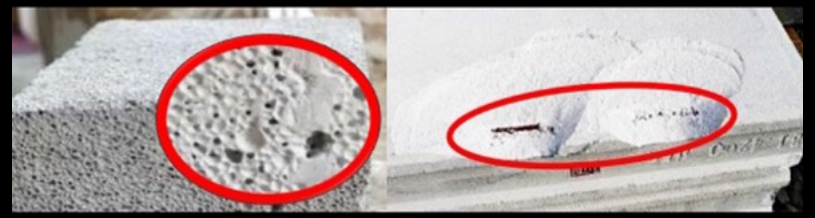
- Hollow 400 kg
- Solid 1.2 tones

Porous and wavy, design without recess

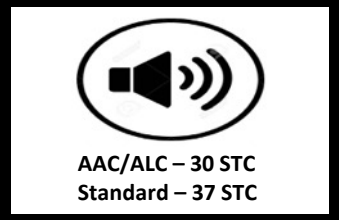
Other types of wall panels

Susceptible to Cracking (Vibration)

AAC Block



Porous, Corrodes BRC inside, Bending and No Strength

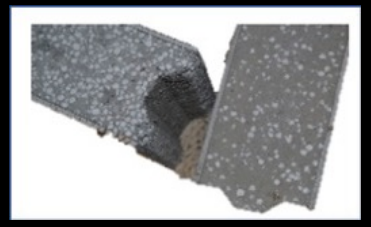


Inconsistent Sound Level

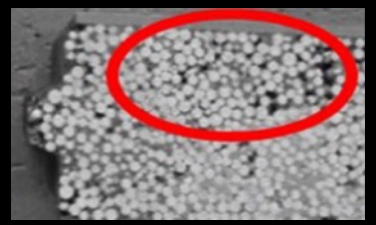
Water Mark

Moldy/fungus wall

External Cracking



Sandwich Panel/EPS Beads



Inconsistent Quality

Low Strength

Joint Crack and Peel Off

Debonding

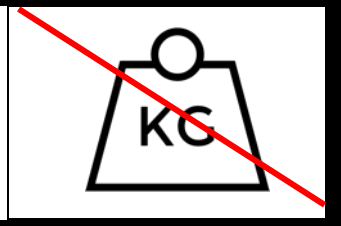
Flammable and Toxic Fumes

Gypsum Board

Water Seepage

Mold and Fungus

Low Strength



Low Sound Insulation

The risk of wall panels with materials shown above:

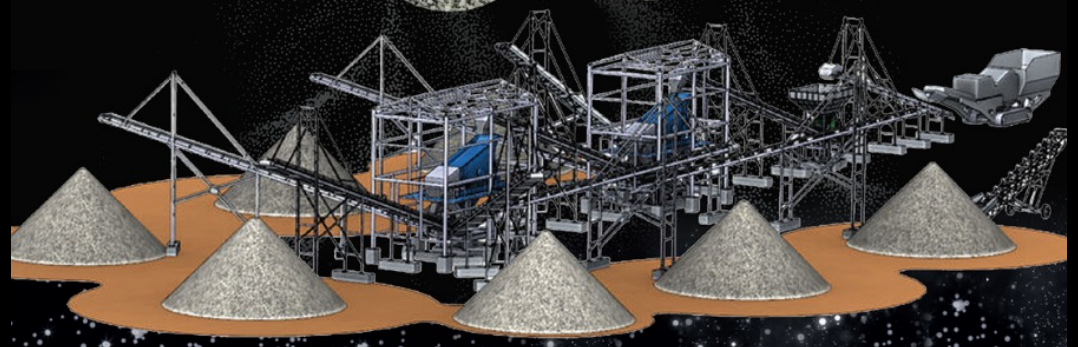
1. Spider & Joint Cracks
2. Water Absorption/Seepage
3. Fungus & Mold
4. High Risk of Flammable Materials
5. Low Heat & Sound Insulation
6. Toxic Fumes
7. Corrosive Materials
8. Debonding
9. Deflection/ Uneven Surface
10. Airborne Diseases

There are 2 Fire Resistance Requirements:

1. Integrity
   - Still Intact
   - Not Collapsed
   - Not Burned
2. Insulation
   - Time for heat to penetrate the wall

JOE | LiGrA

Various Industrial Wastes Recycling



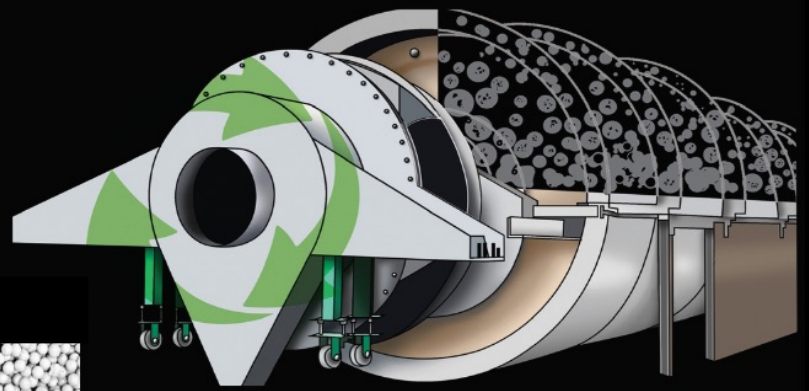
JOE | LiGrA

The Engineering of Lightweight Green Aggregates

Processing

We acquired state of the art technology from overseas experts and higher learning institutions to identify, calibrate and formulate lightweight green aggregates from various types of inorganic wastes.

The equipment has also been tailor-made for these specific purposes.



Lightweight Green Aggregates
Xtra Light, Solid, Strong
Lighter Than Other Aggregates
High Fire Resistance
Low Water Absorption
High Sound Insulation
Better Compressive Strength
Green & Environmentally Friendly
Economic & Competitive

JOE LiGrA R&D

We Are The Innovator

The technology of LiGrA are in consistent collaboration with the Institute of Higher Learnings from some reputable universities, professionals and industrial players into advance building material for the construction industry. Our new formulations and customisation yield many new products that offers cost-effective, high-quality solutions and to keep abreast of the technology and break new frontiers. Our advance R&D lab and dedicated professional scientists and engineers continuously keep developing new sustainable green products for the future. In line with the world GO GREEN PLAN.

Lightweight Green Aggregates Application

JOE LiGrA Lightweight Green Aggregates

LiGrA for Insulation

Thermal Insulation (Roofs, Floors, Fire Doors)

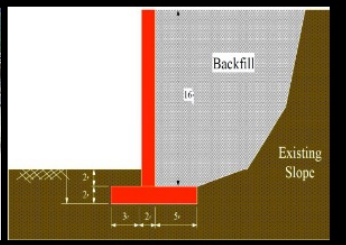
Heat Resistance Plaster and Dry Mortar

Loose Fill Roof Insulation

LiGrA for Geotechnical

Soil Treatment

Embankments



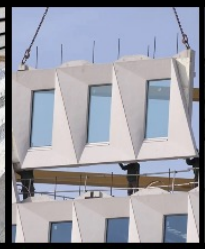
Retaining Wall

LiGrA for Concrete

Lightweight Ready-Mix Concrete

PPVC & PBU

Lightweight Precast Plank

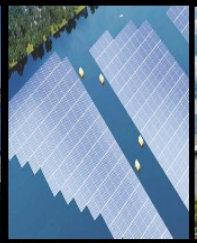


Lightweight Precast Facade

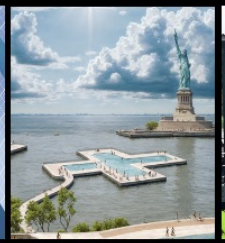
Lightweight Precast Wall Panels

LiGrA for Floating Structure

Floating Jetty



Floating Solar Panel



Floating Swimming Pool

Floating Cafe

Floating Apartment

JOE Revolution

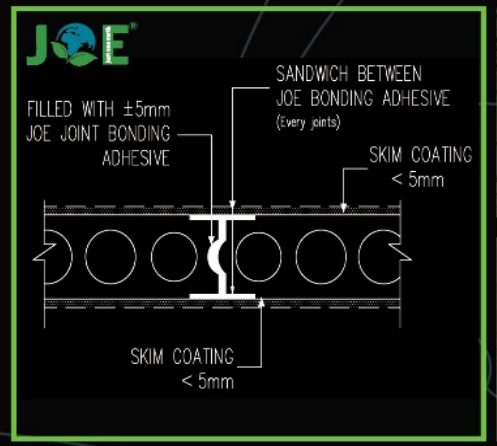
LiCrA Concrete Industry Revolutions


Waste Materials


Minimum 30% RCAs

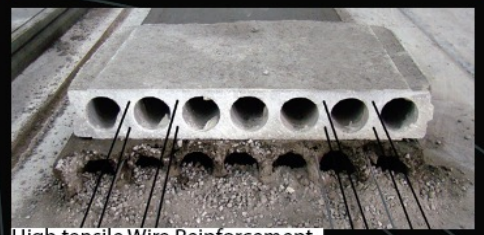

JOE Green Factory In Malaysia


JOE Green Factory In Indonesia




Vertical Installation


Horizontal Installation


High tensile Wire Reinforcement


Customized with Rebar & Grout

JOE GREEN PANEL DESIGN & RECESS

XS/X5

Thickness : 75 - 200mm
Nominal Weight : 128 - 281 kg/m²
Fire rating : 1 - 4 Hours
Sound Insulation : STC 47 - 58
Nominal Density : 2,200 kg/m³
Water Absorption : 6%
Compressive Strength : >40 MPa

X3

Thickness : 75 - 200mm
Nominal Weight : 93 - 204 kg/m²
Fire rating : 2 - 4 Hours
Sound Insulation : STC 47 - 55
Nominal Density : 1,600 kg/m³
Water Absorption : 11%
Compressive Strength : >25 MPa

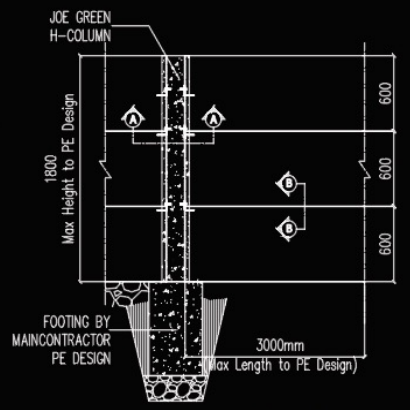
X2

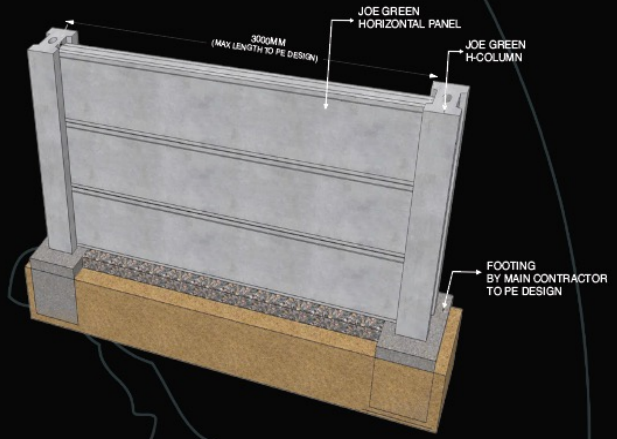
Thickness : 75 - 200mm
Nominal Weight : 84 - 166 kg/m²
Fire rating : 2 - 4 Hours
Sound Insulation : STC 46 - 55
Nominal Density : 1,300 kg/m³
Water Absorption : 14%
Compressive Strength : >15 MPa

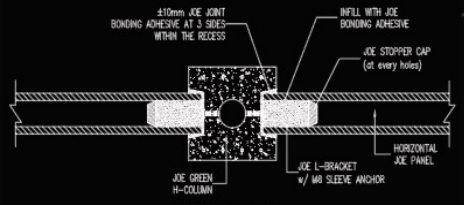
X1

Thickness : 75 - 200mm
Nominal Weight : 58 - 115 kg/m²
Fire rating : 2 - 4 Hours
Sound Insulation : STC 38 - 48
Nominal Density : 900 kg/m³
Water Absorption : 15%
Compressive Strength : >5 MPa

H-COLUMN FOR BOUNDARY WALL

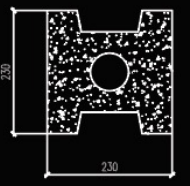






SECTION A-A

SECTION B-B

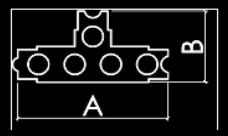


JOE GREEN H-COLUMN

Revolution
Specification & Benchmark

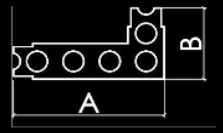
KÜLPanel

T-Joint



Thickness available		Dimension
75mm, Ø 40mm	:	A=290mm : B= 143mm
100mm, Ø 64mm	:	A=290mm : B= 195mm
150mm, Ø 40mm	:	A=290mm : B= 270mm
200mm, Ø 64mm	:	A=290mm : B= 350mm

L-Joint



Thickness available		Dimension
75mm, Ø 40mm	:	A=290mm : B= 143mm
100mm, Ø 64mm	:	A=290mm : B= 195mm
150mm, Ø 40mm	:	A=290mm : B= 270mm
200mm, Ø 64mm	:	A=290mm : B= 350mm

Other Special Customization Available

Width: 100mm, 200mm, and 300mm
Numbers of Tensile Wire : 8 - 12 nos
Solid Panels
M&E Recess
Groove Lines
Noise Barrier Panel
Anti Blast Design with Rebar and Grouting
Stiffener Panel with Rebar and Grouting

Customized

Width	:	600mm, 300mm, 200mm, 100mm
Thickness available	:	200mm, Ø 64mm 150mm, Ø 40mm 100mm, Ø 64mm 100mm, Ø 40mm 75mm, Ø 40mm 60mm, Ø 40mm

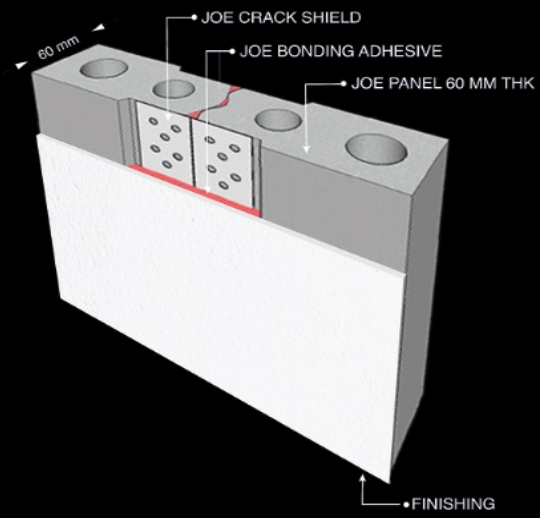
Note: Solid Panels Available (Except 75mm)Customized Panels Available

Standard (X5)		Max Panel Height
200mm Solid	:	max 6.0m (with wire)
150mm Solid	:	max 6.0m (with wire)
100mm Solid	:	max 6.0m (with wire)
200mm, Ø 64mm	:	max 6.0m (with wire)
150mm, Ø 40mm	:	max 6.0m (with wire)
100mm, Ø 64mm	:	max 5.2m (with wire)
100mm, Ø 40mm	:	max 6.0m (with wire)
75mm, Ø 40mm	:	max 3.3m
	:	Note: Panel above 3.3m will be wired for safety & impact strength

X1 & X2 & X3		Max Panel Height
X1 100mm, Ø 64mm	:	max 5.2m (with wire)
X1 100mm, Ø 40mm	:	max 6.0m (with wire)
X2 100mm, Ø 64mm	:	max 5.2m (with wire)
X2 100mm, Ø 40mm	:	max 6.0m (with wire)
X3 100mm, Ø 64mm	:	max 5.2m (with wire)
X3 100mm, Ø 40mm		max 6.0m (with wire)
Reinforcement Tensile Wire	:	Tensile Strength min. 600 MPa (Ø3, Ø4.5, Ø5)
Recess Design	:	depth 6mm width 40mm

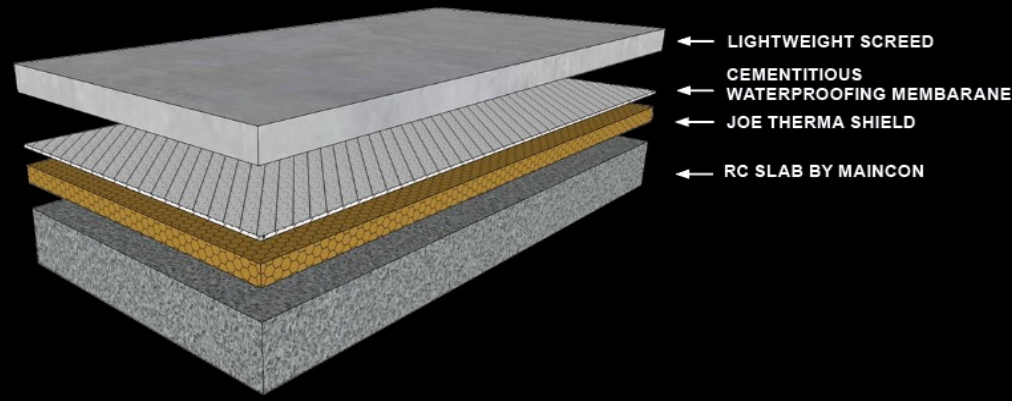
ULTRALIGHT SERIES PANEL

Made from recycled material, the ultra-lightweight (X-Light Series) panel weighs less than 40kg per m2 with a thickness of 60mm and modular width of 600mm. The height can be customised to the need.



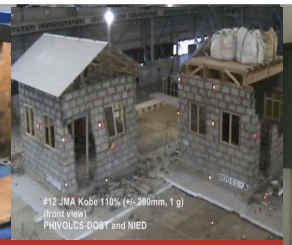
Ease of Installation	: Light and strong
Cost Effectiveness	: Faster installation, less labour and no wet works
Versatility	: Can be installed, removed and reinstalled
Soundproofing	: Able to absorb noise and reduce reverberation
Fire Resistance	: Very high fire rating even for thin sections
Thermal Insulation	: Reduce heat flow and condensation
Low Maintenance	: High durability
Energy Efficiency	: Create stable indoor environment
Eco-Friendly Option	: Use recycled materials

ROOF SLAB INSULATION



JOE | Proven to be The Best

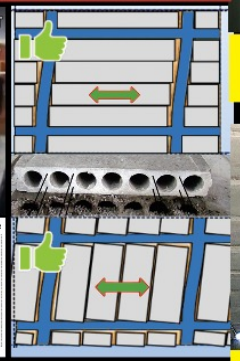
LiGrA Lightweight Green Aggregates | Seismic, Air & Water Tightness, Sound Insulation

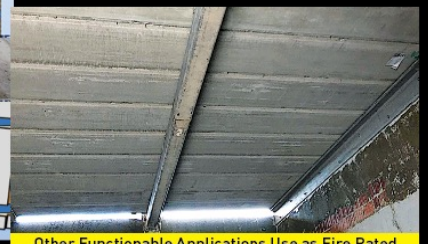


AAC Block / Red Brick Joints Weak Thin Layer
Seismic Loading create high shear forces that result in diagonal cracks and collapse of weak block walls.

Heavy-Load Mounting Capability
Normal Sleeve Anchor M8 Per Point up to 400KG (Hollow Section) & 1.2 Ton (Solid Section)

Wire Reinforced Panel Joints: Solid, Strong, Full Contact Minimize Seismic Impact, High shear strength coupled with strong end connection help to resist the high shear force of Seismic Loading





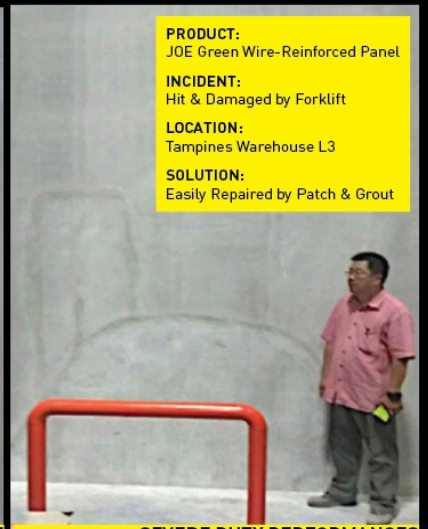
Other Functionable Applications Use as Fire Rated Strong Ceiling at Double Volume Area

Air Tightness Test for Hospital (NCID)

AIR TIGHTNESS TEST
Air Transmission = 0% TUV Certified

Water Tightness Test for External Wall

WATER TIGHTNESS TEST
Water Seepage = 0%



PRODUCT:
JOE Green Wire-Reinforced Panel

INCIDENT:
Hit & Damaged by Forklift

LOCATION:
Tampines Warehouse L3

SOLUTION:
Easily Repaired by Patch & Grout

SEVERE DUTY PERFORMANCES
Damaged Accidentally Hit by Forklift

Customization | JOE | LiGrA Lightweight Green Aggregates

Customized Design & Specification

To fit each unique project requirement and specification such as sound insulation for sound barrier and cinema, fire resistant, blasting walls as well as groove line pattern. We are able to modify number of hollows, different embedded tensile wire from 8 to 12 wires as well as solid panel. We also provide different kind of thickness, L and T Joint as well as accessories to prevent crack issues and ease of installation.

Efficient & Cost Effective Noise Barrier Walls

Project MRT - T205 - Woodlands South Station

Slab

Drainage

Balance cut to Block

JOE Beyond LiGrA Test Reports

*Skim Coat on Both Sides ** Thin Plasters on Both Sides *** Plaster on Both Sides
With M&E ^Without Wire ^^With Wire { } Acoustic Assessment

tested by:

Functional Requirements	JOE Green Standard Concrete Panel					
	75mm (Ø40mm)	90mm (Ø58mm)	100mm (Ø40mm)	100mm (Ø64mm)	150mm (Ø40mm)	200mm (Ø64mm)
ASTM - E90						
Sound Insulation (STC)	STC 47*	STC 48*	STC 52*	STC 49* {STC 50-51**}	{STC 55}	{STC 56-58}
ASTM C 518						
Thermal Conductivity (W/m^{o}K) K-value	0.526	0.582	1.194	0.665	Refer to Thermal Resistance Value	
Thermal Resistance (m^{2} ^{o}K/W) R-value	0.143	0.155	0.0832	0.1484		
BS 476: Part 22: 1987						
Fire Resistance (4 Hours, Single Wall)						
Integrity	132Mins*	68Mins*	120Mins#*	132Mins*	260Mins*	260Mins*
Insulation	125Mins*	68Mins*	120Mins#*	131Mins*	260Mins*	260Mins*
Deflection Test (mm)	33mm	65mm	24mm	25mm	35mm	19mm
Difference of Area Under Curve with Standard (%)	0.1	0.1	0.0	0.2	-0.1	0.1
BS EN 772						
Compressive Strength - Cube	57.90 N/mm^{2}					
Compressive Strength - Section	42.8 N/mm^{2}	43.1 N/mm^{2}	48.2 N/mm^{2}	37.0 N/mm^{2}	50.8 N/mm^{2}	34.8 N/mm^{2}
SS 271: 1983						
Water Absorption (24 hrs Immersion) - Setsco Labs (Should Not Exceed 23.5%)	3.70 %	5.95 %	5.77 %	5.00 %	5.32 %	5.03 %
Drying Shrinkage - Setsco Labs (Should Not Exceed 0.09%)	0.06 %					
SS 492: 2w001 / BS 5234 (Impact Tests)						
Determination of Partition Wall Stiffness	SD	SD	Refer to 100 - 64 dia	SD	Refer to 100 - 64 dia	Refer to 100 - 64 dia
Surface Damaged by Small Hard Body Impact	SD	SD		SD		
Perforation by Small Hard Body Impact	SD	SD		SD		
Damaged by Large Soft Body Impact	SD	SD		SD		
Structural Damaged by Large Soft Body Impact	SD	SD		SD		
Door Slamming	SD	SD		SD		
Lightweight Anchorage Pull-Out	Pass	Pass		Pass		
Lightweight Anchorage Pull-Down	Pass	Pass		Pass		
Heavyweight Anchorage Wash Basin (N)	1500	1500		1500		
Heavyweight Anchorage Wall Cupboard (N)	4000	4000		4000		
Horizontal Load/Crowd Pressure (3.0 kN/m)	Up to 3.0 kN/m	Up to 3.0 kN/m		Up to 3.0 kN/m		
1. Deflection (mm)	0.95	-0.06		-0.5		
2. Residual Deflection (mm)	0.03	0		-0.1		
Bending Strength (N/mm^{2})	10.80 N/mm^{2}					

Functional Requirements	JOE Green Standard Concrete Panel		JOE Green Light Panel				
	100mm Solid	150mm Solid	100mm (Ø64mm) X1	100mm X1 SOLID	100mm (Ø64mm) X2	100mm X2 SOLID	100mm (Ø64mm) X3
ASTM - E90							
Sound Insulation (STC)	{STC 54-55}	{STC 57-58}	STC 38*	Refer to Thermal Resistance Value	STC 46*	Refer to Thermal Resistance Value	STC 47*
ASTM C 518							
Thermal Conductivity (W/m^{o}K) K-value	0.587	Refer to Thermal Resistance Value	0.377	Refer to Thermal Resistance Value	0.421	Refer to Thermal Resistance Value	0.445
Thermal Resistance (m^{2} ^{o}K/W) R-value	0.17		0.263		0.237		0.225
BS 476: Part 22: 1987							
Fire Resistance (4 Hours, Single Wall)							
Integrity	260Mins*	260Mins*	196Mins*	240Mins*	132Mins*	240Mins*	120Mins*
Insulation	260Mins*	260Mins*	169Mins*	240Mins*	120Mins*	240Mins*	120Mins*
Deflection Test (mm)	5mm	23mm	-3mm	8mm	12mm	32mm	25mm
Difference of Area Under Curve with Standard (%)	0.0	0.0	0.0	0.0	0.1	0.0	0.0
BS EN 772							
Compressive Strength - Cube	57.90 N/mm^{2}		-	-	-	-	-
Compressive Strength - Section	40.90 N/mm^{2}	-	3.4 N/mm^{2}	7.1 N/mm^{2}	13.2 N/mm^{2}	17.5 N/mm^{2}	19.6 N/mm^{2}
SS 271: 1983							
Water Absorption (24 hrs Immersion) - Setsco Labs (Should Not Exceed 23.5%)	5.57 %		18 %	18.12 %	11.05 %	13.36 %	12.26 %
Drying Shrinkage - Setsco Labs (Should Not Exceed 0.09%)	0.06 %		0.07 %		0.08 %		0.07 %
SS 492: 2001 / BS 5234 (Impact Tests)							
Determination of Partition Wall Stiffness	Refer to 100 - 64 dia	Refer to 100 - 64 dia	SD	Refer to X1 100 - 64 dia	SD	Refer to X2 100 - 64 dia	SD
Surface Damaged by Small Hard Body Impact			SD		SD		SD
Perforation by Small Hard Body Impact			SD		SD		SD
Damaged by Large Soft Body Impact			SD		SD		SD
Structural Damaged by Large Soft Body Impact			SD		SD		SD
Door Slamming			SD		SD		SD
Lightweight Anchorage Pull-Out			Pass		Pass		Pass
Lightweight Anchorage Pull-Down			Pass		Pass		Pass
Heavyweight Anchorage Wash Basin (N)			1500		1500		1500
Heavyweight Anchorage Wall Cupboard (N)			4000		4000		4000
Horizontal Load/Crowd Pressure (3.0 kN/m)			Up to 3.0 kN/m		Up to 3.0 kN/m		Up to 3.0 kN/m
1. Deflection (mm)			2.3		2.74		0.90
2. Residual Deflection (mm)			0.6		0.4		0.06
Bending Strength (N/mm^{2})	10.80 N/mm^{2}		0.8 N/mm^{2}		3.5 N/mm^{2}		4.45 N/mm^{2}

JOE Quality

LiGrA We Are The Best

FOOTNOTE :
* - Varies as per thickness
# - Skimcoat Finishing
NA - Not Available

REFERENCES :
(1) Quoted the report by Lightweight Concrete Journal, that the moisture of AAC wall lab test at 45% moisture content when the wall is just built. In time to come, the moisture will drop to 3.5%. The ratio of 45% and 3.5% will result in what I said 11dB drop of sound insulation.
(2) Panels and other materials which show a water absorption test should directly be connected to the length of time the test sample was submersed under water.
The relationship between these two factors are important and directly related until maximum value is reached.
(3) Requires Plastering to achieve thickness to comply Code for electrical installation - 50mm cover to Electrical Conduits , without damaging the Steel Reinforcement of ALC Panel.

	PROPERTIES	COMPARISON FOR 100MM THICK WALL MATERIALS			COMPARISON FOR 100MM THICK WALL MATERIALS						
		JOE X5 (XS)	Other Panel	Red Brick	JOE X3	AAC Block Bata Ringan	ALC/GIP Panel Bata Ringan	SANDWICH PANEL (EPS)	JOE X2	Dry Wall / Gypsum Board	JOE X1
TEST REPORTS	Nominal Density (kg/m3)	2200	2200	1760	1600	550	800	720	1300	10	900
	Weight (kg/m2)- 100mm thickness	135	145	160	96	80	80	72	85	100 (Frame & Insulation)	65
	Maximum Height without lintel (mm)	8000*	3300	3000	6000*	3000	6000	3000	6000*	2400	6000*
	Compressive Strength (MPa) Cube	49	25	2 - 4	-	4.5	4.5	-	-	NA	-
	Compressive Strength (MPa) Section	42-59	15	2.5	20	2.5 - 5	5 - 7	4	11 - 17	NA	3 - 7
	Water Absorption (Percentage)	6% (24-hr immersed)	5% (30-min immersed)[2]	15 - 25%	11% (24-hr immersed)	35 - 60%	35 - 60%	20%	13% (24-hr immersed)	Not Usable (Dry Areas Only)	15% (24 -hr immersed)
	Water Absorption (Capillary) $g/m^2s^{0.5}$	24	NA	NA	NA	130	190	45	11 (WP-SPEC)	Not Usable (Dry Areas Only)	NA
	Air Tightness Certified	Yes	No	No	No	No	No	No	No	No	No
	Thermal Coductivity (W/K.m) - 100mm (Lower is Better)	0.74	NA	1.15	0.44	0.15 - 0.25	0.15 - 0.25	0.26	0.54	0.17	0.23
	Fire Rating (Hours)	1 - 4	1 - 2 (needs infill)	1 - 2	2 - 4	3 - 4	2 - 4	1 - 4	2 - 4	1 - 2 (needs infill)	2 - 4
	Sound Transmission Class (STC)	49 - 58	37 - 41	37 - 42	45 - 54	35 - 40 (11dB Drop after 3-6 Mos)[1]	40 - 46 (11dB Drop after 3-6 Mos.)[1]	41	41 -50	35 - 52 (Rock Wool) (Requires Insulation)	39 - 48
PERFORMANCES	Buildability (Labour Saving Index))	0.85#	0.85#	Demerits	0.85#	0.10	0.85#	0.85#	0.85#	1.00	0.85#
	Productivity (m^2/manday)	20	18	6	22	12	18	18	24	23	25
	Use of Green Recycled Material	Yes	No	No	Yes	No	No	No	Yes	No	Yes
	Use of Flammable Material	No	No	No	No	No	No	Yes	No	No	No
	Heavyweight Anchorage (4000N) Strength & Robustness	Severe Duty (Highest)	Severe Duty (Highest)	Pass (chemical & mechanical fixing)	Severe Duty (Highest)	Pass (chemical fixing)	Pass (chemical fixing)	Medium - Severe Duty	Severe Duty (Highest)	Pass (mechanical fixing-special bolt)	Severe Duty (Highest)
	Customised Height Available	Yes (8M)	No	No	Yes (6M)	No	Yes (3M or 6M only)	No	Yes (6M)	No	Yes (6M)
	Customised Thickness Available	75 - 200	75 - 200	100 - 230	75 - 200	100-200	75-200	100-200	75 - 200	75-150	75- 200
	Wire Reinforcement (safety & strength) (Earthquake, Vibration, Movement, Impact)	High tensile wire (600 Mpa) 3-5mm dia	No	No	High tensile wire (600 Mpa) 3-5mm dia	No	BRC Mesh	BRC Mesh	High tensile wire (600 Mpa) 3-5mm dia	Metal Stud	High tensile wire (600 Mpa) 3-5mm dia
	Crack Resistance Accessories	1. JOE UV Crackshield 2. JOE Bond Adhesive	Wire or Fiber Mesh	-	1. JOE Crackshield 2. JOE Bond Adhesive	Wire or Fiber Mesh	Wire or Fiber Mesh	Fiber Mesh	1. JOE Crackshield 2. JOE Bond Adhesive	-	1. JOE Crackshield 2. JOE Bond Adhesive
	Stopper Cap for Hollow Insert	Yes	No	No	Yes	No	No	No	Yes	No	Yes
	Joint Recess for Stronger Joints	Yes	No	No	Yes	No	No	No	Yes	No	Yes
	Product Structure	Strong & Compact	Low Strength, More Sand, Less Cement	Compact, Low Strength	Strong & Compact & Lightweight	Porous, Full of Capillary, Low Strength, Potential Fungus/Molding Growth	Porous, Full of Capillary, Low Strength, Potential Fungus/Molding Growth	Porous, Low Strength, Easy to Debond, Weak Glue Adhesive	Strong & Compact & Lightweight	Fragile, Easy to Break, Lowest Strength	Strong & Compact & Lightweight
	Production Process	Extrusion Flat Surface, Compact, Special Customised Machine	Extrusion on Conveyor, Potential Uneven Wavy Surface	Moulding, Potential Uneven Wavy Plate Surface	Extrusion Flat Surface, Compact, Special Customised Machine	Moulding, Potential Uneven Wavy Plate Surface	Moulding, Potential Uneven Wavy Plate Surface	Moulding, Potential Uneven Wavy Surface	Extrusion Flat Surface, Compact, Special Customised Machine	Extrusion on Metal Roller, Potential Uneven Surface, Thin & Brittle	Extrusion Flat Surface, Compact, Special Customised Machine
	Finishing Application (mm)	Thin Skimcoat	Plaster + Skimcoat	Plaster + Skimcoat	Thin Skimcoat	Plaster + Skimcoat	Plaster + Skimcoat	Plaster + Skimcoat	Thin Skimcoat	Putty	Thin Skimcoat
COST SAVINGS	Plaster Material & Labor Savings	-	15-25 mm (3 Layers)	15-25 mm (3 Layers)	-	15-25 mm (3 Layers)	-	15-25 mm (3 Layers)	-	-	-
	Skimcoat Material & Labor Savings (Due to Flatness & Waving)	1 - 5mm (1 Layer)	5 - 15mm (1 Layer)	5 - 20mm (1 - 2 Layer)	1 - 5mm (1 Layer)	5 - 10mm (1 -2 Layer)	5 - 10mm (1 - 2 Layer)	10 mm (2 - 3 Layers)	1 - 5mm (1 Layer)	Rockwool & Putty	1 - 5mm (1 Layer)
	Total Weight (kg/m2) (After Finishing)	155	185	260	115	140	140	122	105	105	85
	Lintel Savings	Up to 8M	Every 3M	Every 3M	Up to 6M	Every 3M	Every 3M	Every 3M	Up to 6M	Every 3M	Up to 6M
	Stiffener Savings	Up to 8M	Every 3M	Every 3M	Up to 6M	Every 3M	Every 3M	Every 3M	Up to 6M	Every 3M	Up to 6M
	M&E Services Savings (MEP - Indonesia)	Services can be run through hollow core with minimum opening	Services can be run through hollow core with minimum opening	Require surface hacking & trimming for recess	Services can be run through hollow core with minimum opening	Require surface hacking & trimming for recess	Require surface Cutting and Trimming for recess (Max. 30mm) No cutting to BRC reinforcement	Require surface Cutting and Trimming for recess (Max. 30mm) No cutting to BRC reinforcement	Services can be run through hollow core with minimum opening	By fitting services before closing up	Services can be run through hollow core with minimum opening
	Wall Fixing	L-bracket + Sleeve Anchor / H10 Dowel Bar	Bracket / H10 Dowel Bar	Wall Tie	L-bracket + Sleeve Anchor / H10 Dowel Bar	Wall Tie	Wall Panel Bracket	Wall Panel Bracket	L-bracket + Sleeve Anchor / H10 Dowel Bar	Metal Stud & Drive Pins	L-bracket + Sleeve Anchor / H10 Dowel Bar
	Site Houskeeeping & Wastage	Min. Wastage & Cutting due to Custom Length	More Wastage Higher Breakage	More Wet Works & High Wastage	Min. Wastage & Cutting due to Custom Length	More Wastage Higher Breakage	More patching material to M&E Works / More Debris to handle	More patching material to M&E Works / More Debris to handle	Min. Wastage & Cutting due to Custom Length	More Wastage (12 - 15%)	Min. Wastage & Cutting due to Custom Length
	External Waterproofing	Joints Only	Full Surface Waterproofing	Full Surface Waterproofing	Joints Only	Full Surface Waterproofing	Full Surface Waterproofing	Joints Only	Joints Only	Not Recommended (Indoor Only)	Joints Only
	Additional Scaffolding / Work Platform Savings Based on Single Tier @ 3.3M	-	-	Needs Scaffolding / Work Platform	-	Needs Scaffolding / Work Platform	Needs Scaffolding / Work Platform	-	-	Needs Scaffolding / Work Platform	-

HOLDING STRENGTH TEST

SS 492:2001/BS 5234

6m JOE Green Lightweight Concrete Panels Featuring Plant Boxes Weighing Approx. 200kg Each

5.4m JOE Green Concrete Panel With Skim Coat Loaded With 650kg on a Single Gravity Anchorage
















Singapore Green Mark

			Requirements	Higher Scoring X1	X2	X3	XS/X5
1	ENERGY EFFICIENCY		Reduced Heat Gain [ETTV]	✓	✓	✓	✓
2	HEALTH & WELLBEING	HW 1.2	HW 1.2 Material Emissions	✓	✓	✓	✓
		HW 2.3	Sound			✓	✓
3	RESILIENCE	RE 1.1 b	Resources	✓	✓	✓	✓
		RE 1.2b	Urban Heat Island Mitigation				
4	WHOLE LIFE CARBON	CN 1.1	Whole Life Carbon Calculation	✓	✓	✓	✓
		CN 1.2	Embodied Carbon	✓	✓	✓	✓
		CN 1.3	2030 Transition Plan	✓	✓	✓	✓
		CN 2.1	Sustainable Construction	✓	✓	✓	✓
		CN 2.2	Sustainable Products & Finishes	✓	✓	✓	✓
		CN 3.2	Fit out Products	✓	✓	✓	✓
5	MAINTAINABILITY	General	BIM model	✓	✓	✓	✓
		1.5	Design Factor - Masonry & Lightweight Concrete Panel	✓	✓	✓	✓
		1.5.1	Reduce risk of Water ingress and Efflorescence formation	✓	✓	✓	✓
		1.5.2	Reduce risk of façade flaking/peeling/cracking /blistering	✓	✓	✓	✓
		2.5	Basement and Car Park				

malaysia greenbuildingindex

	Applicable GBI Credits	Criteria	Higher Scoring X1	X2	X3	XS/X5
1	**Energy Efficiency**	EE	✓	✓	✓	✓
	Mininum Energy Efficiency Performance					
2	**Indoor Environmental Quality**	EQ	✓	✓	✓	✓
	Indoor Air Pollutants		✓	✓	✓	✓
	Mould Prevention		✓	✓	✓	✓
	Internal Noise Levels / Sound Insulation		✓	✓	✓	✓
	IQA Before & During Occupancy					
3	**Sustainable Planning & Management**	SM				
	Sustainable Construction		✓	✓	✓	✓
	Qlassic - Quality Assessment System for Building		✓	✓	✓	✓
	IBS - Industrialised Building System		✓	✓	✓	✓
4	**Materials & Resources**	MR				
	Material Reuse & Selection		✓	✓	✓	✓
	Recycled Content Materials		✓	✓	✓	✓
	Regional Materials		✓	✓	✓	✓
	Material Manufacture & Ingredients		✓	✓	✓	✓
	Storage & Collection of Recyclables		✓	✓	✓	✓
	Construction Waste Management		✓	✓	✓	✓

JOE green concrete panel
LiGrA Lightweight Green Aggregates
Superiority

Superior, Strong, Flat, & Wire Customization

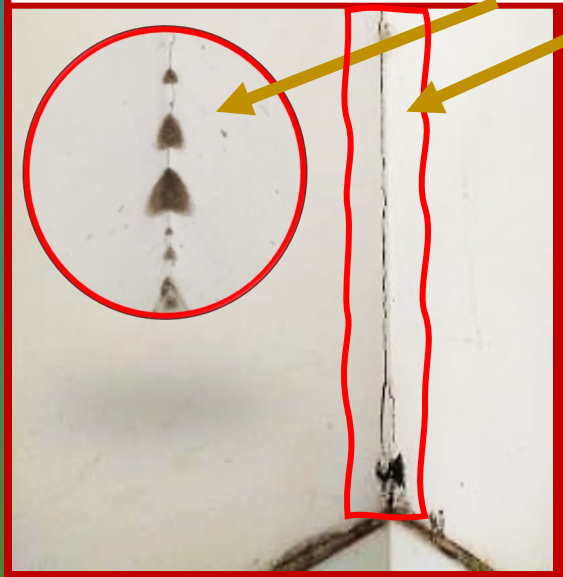
Tensile Wire 600 Mpa

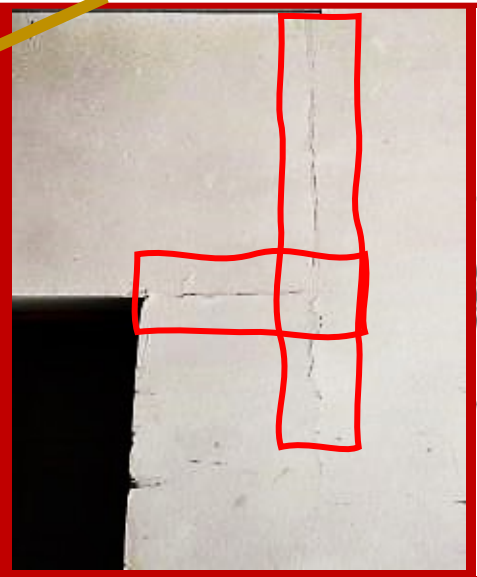
For Better Bending Strength & Safety

Minimize Lintel, Stiffener, & Column Usage

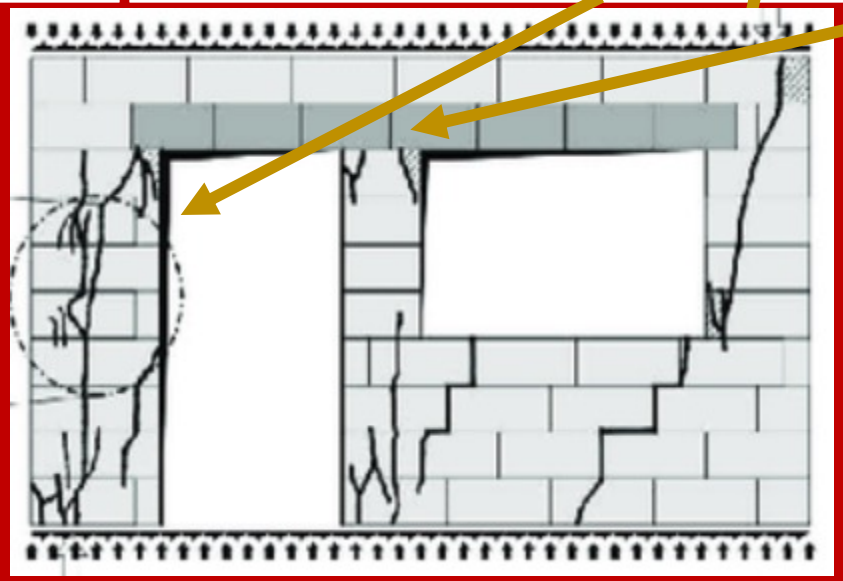
VS

Others : Corner Fungus & Cracking During Construction





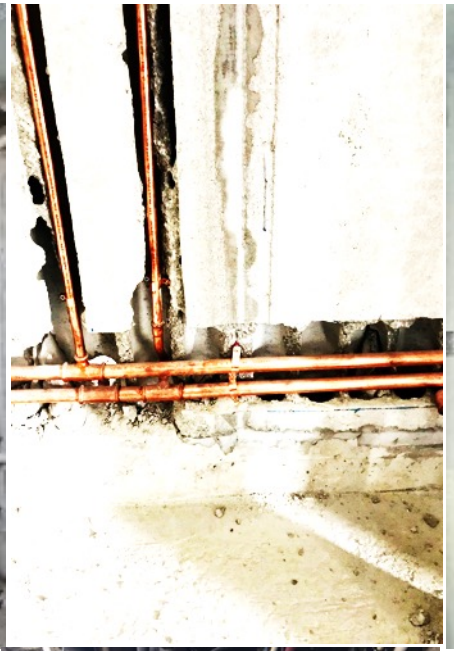
Others: Crack Due to Door-Slamming, Need Stiffener/Lintel Reinforcement



MECHANICAL & ELECTRICAL APPLICATIONS (M&E)

Fast & efficient wall chasing or hacking for flexible M&E workmanship

M&E conduit can slot into hollow-core without trimming recess to embed piping



Easy & Fast M&E wiring,
Best for Time & Cost Saving on metal conduits

Recessed cut for K.O. boxes

Hollow Core Design for Easy M&E

Direct Cut for Larger Piping

JOE GREEN – PPVC & IBS APPROVED

1 50 Cycle – Heat & Rain Test

2 Water Capillary Test

3 Fire Rating & Wall Integrity Test

PPVC, PBU , Bedroom, Toilet, & Service Duct Applications

PPVC Issues:

- Heavy Load (30 Ton+)
- Rain affects water absorption
- Need lightweight technology to avoid cracking/damage

LIGRA's Benefits (PPVC & IBS)

- Savings in Foundation
- Reduce & Save on Super Crane Heavy Lifting
- Lower Carbon Footprint & Less Material Usage
- Cost & Time Saving Benefits

MALAYSIA CIDB – TRAINING CENTRE FOR HOLLOW CORE WALL INSTALLATION

DOWEL BAR (EXTERNAL) METHOD

Use Trolley to Move Panel

Alignment & Adjustment

- Bottom Gap (± 25mm)
- Top Gap (± 25mm)
- Using Wooden Wedges

INSERTION T10 DOWEL BAR ON THE BEAM & SLAB

Easily cut by Makita to make any opening for M&E, etc.

Apply JOE JOINT BONDING Adhesive

JOE L-BRACKET (INTERNAL) METHOD

- Full contact Grouting @ Top Joint
- Protect against seepage during construction

L-BRACKET (TOP)

L-BRACKET (BOTTOM)

2 Brackets per panel
1 top & 1 bottom

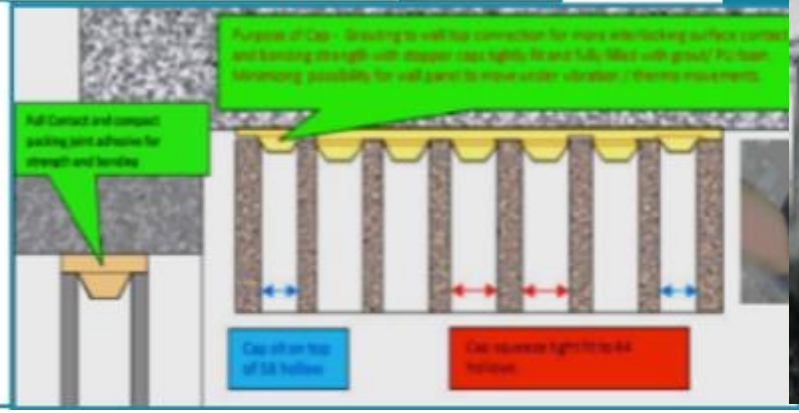
Very strong, No Cutting

Less Wastage & Manhour Labor

Cheaper Construction Cost

Grout/Adhesive Cost Savings

Safe, Consistent & Efficient



EASE OF INSTALLATION

JOE™ LiGrA™ Lightweight Green Aggregates

Manual Installation

2.8M High Wall

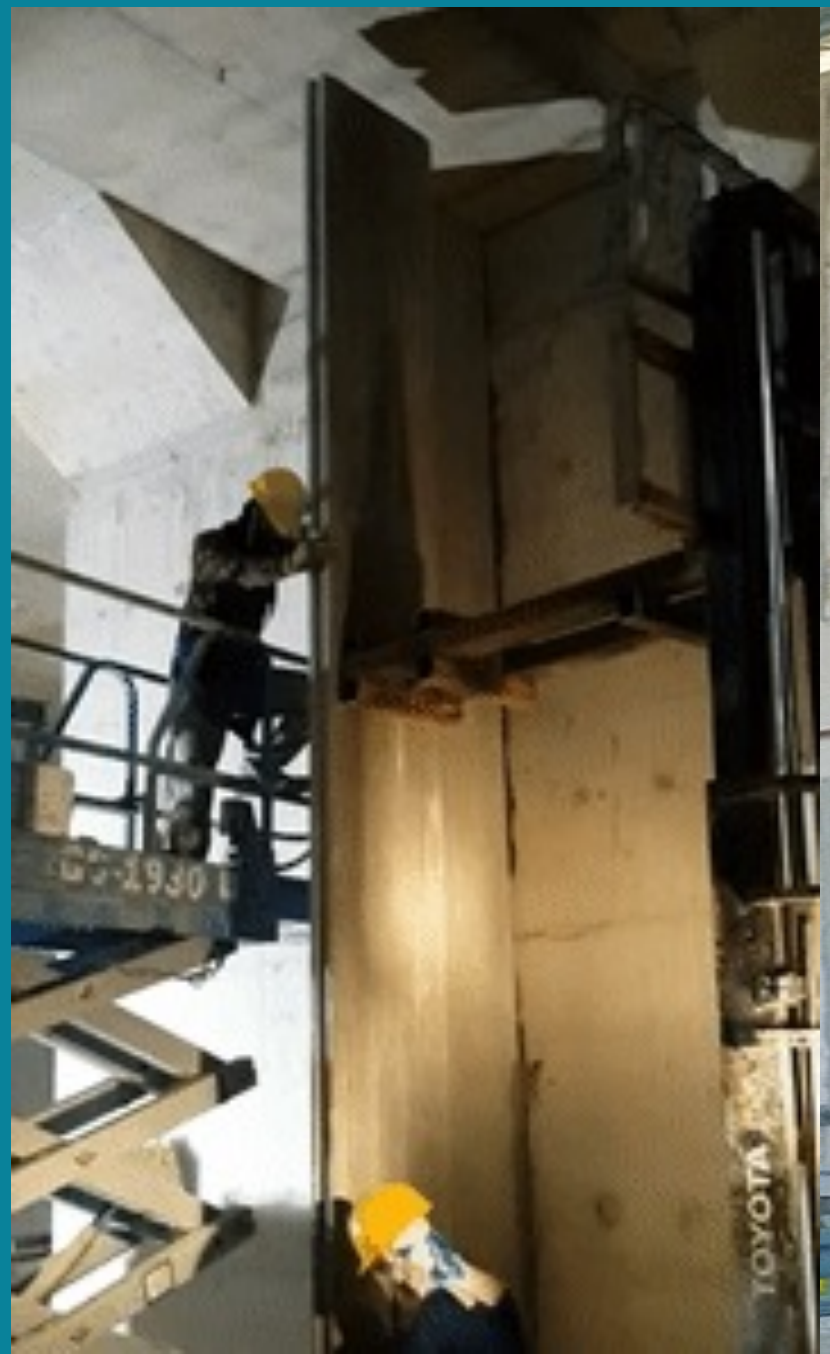
2-3 Man Installation

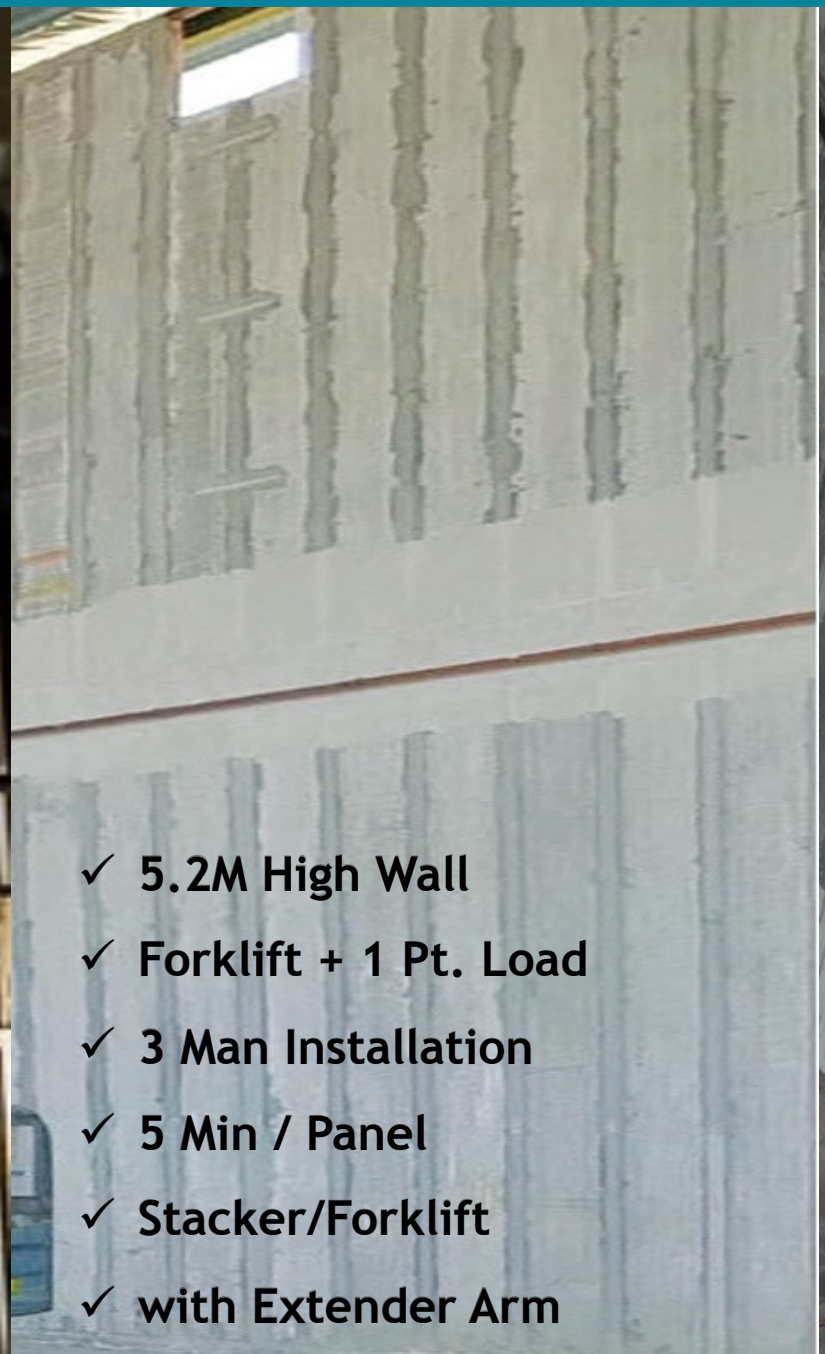
5 Min/Panel

Hand Trolley for

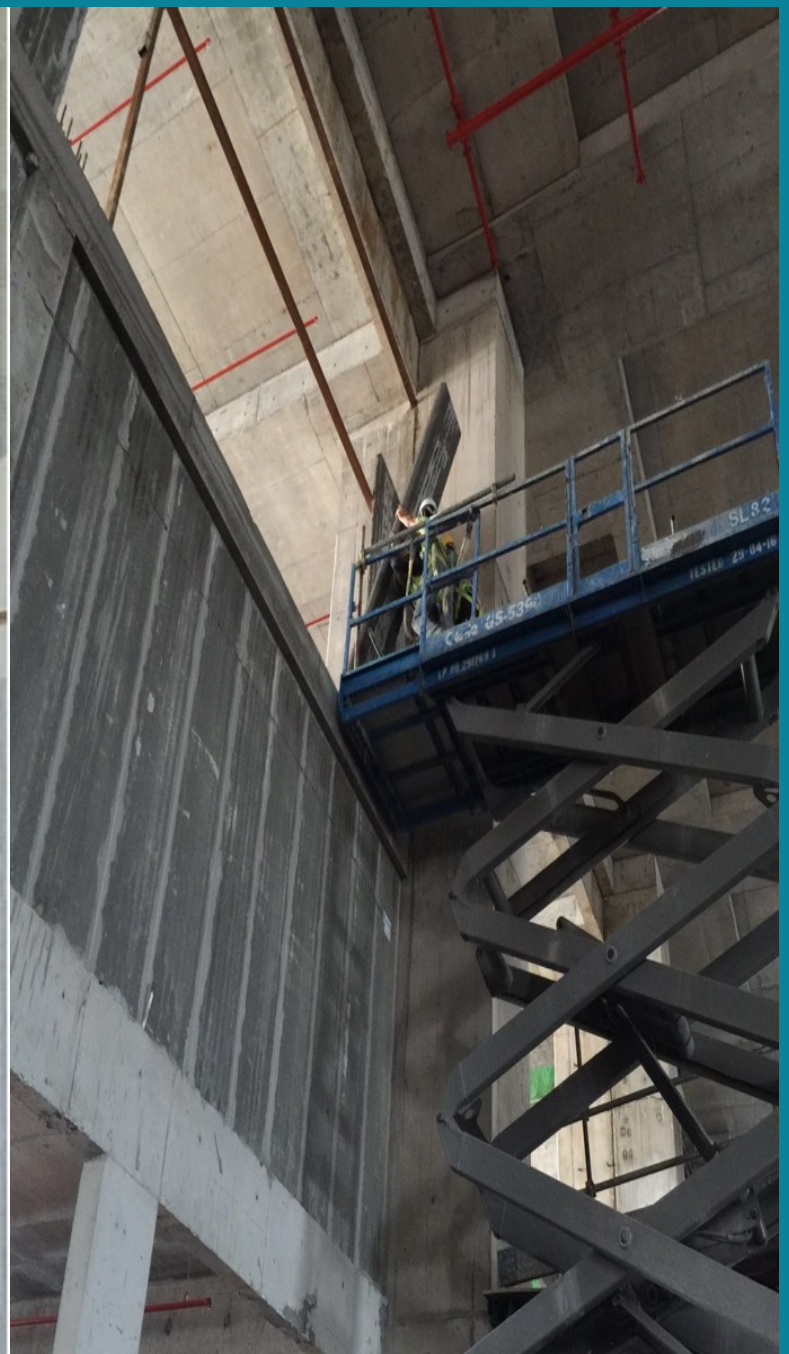
Easy to Maneuver

EASE OF INSTALLATION





- ✓ 5.2M High Wall
- ✓ Forklift + 1 Pt. Load
- ✓ 3 Man Installation
- ✓ 5 Min / Panel
- ✓ Stacker/Forklift
- ✓ with Extender Arm



JOE Accessories
LiGrA™ JOINT BONDING ADHESIVE

JOE Joint Bonding Adhesive

Is a pre-blend high polymer cement, specially sized inert aggregates and approved chemical additives. It is a cement based adhesive, specially designed for fixing panel and blocks. The formula has excellent workability to help minimize crack and shrinkage. By just adding in the required amount of water and mixing, it is ready for application.

Technical data (typical) :

Weight	: 40 kg/bag	Setting Time	: Initial - 5 hours
Density	: 1.4 gm/cm^3	Consumption (approximate)	:
Open Time	: 30 minutes	1 bag = 6 m^2 - 8 m^2	

Instructions for use :

1. Surface of application for the adhesive must be free from dust, oil and or any contamination. Moist surface with water spray before application.
2. Mix 26% to 28%, 10 - 11 litre of water by volume.
3. Adhesive must be added into water during mixing.
4. Must use an electric mixer to mix the adhesive for around 5 minutes. The mix must be homogenous.
5. The mix must be used within 30 minutes after mixing.
6. Application to big gap by handheld pump to ensure proper and sufficient infill and bonding contact.

JOE Accessories
LiGrA™ CRACKSHIELD

Lightweight Concrete Wall Panel Joint Tape

APPLICATION

- Internal & External Wall joints
- Inner and Outer Corner Beads
- Structural to Wall Connections.

TYPE	WIDTH/THICKNESS	LENGTH	UNIT/CARTON
ROLL	50 mm/0.5 mm	40 M	10 Rolls

DESCRIPTION

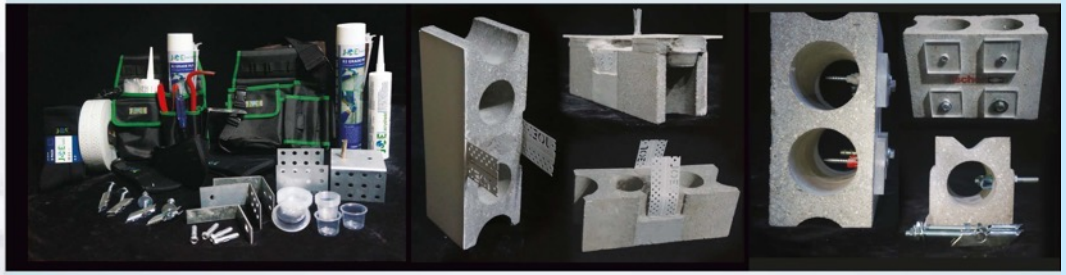
JOE Crackshield is manufactured from special formulated UPVC as a joint reinforcement tape with high tensile strength to resist tearing, stretching and distortion. It is a flexible–centered joint to allow for movements and designed for usage with JOE Joint Bonding Adhesive for :

1. Reinforcing joints at inner corner, outer corner, structural joints between column, beam and ceiling.
2. Better performance in resisting crack due to thermal, stretching and other distortions compared to other fibre & wire meshes.
3. Improving water resistant and minimize water seepage through the joint when used at external and wet area.
4. Designed with perforations to provide a superior key grip for bonding between substrate.
5. Designed with flexible center creasing and uniform winding promote accurate and easy application to angles (corner treatment) and angle beading as well as flat joints with length of 40 metre per roll.

JOE Accessories
LiGrA™ STOPPERCAP

- Specially designed for capping off to fit to hollow core opening at top of JOE Green Concrete Wall Panels for size 40mm and 58/64mm diameter hollows.
- Easy handling and application compared to using backer rod, sponge and other infill material as stopper.
- Prevent water ingress and logging within hollow cores at external wall during in process work.
- Help prevent wastage of bonding adhesive dropping into hollows and ensure compactness of grouting.
- Improve panel grid at top joints as stopper form a key profile, enhance contact surface thus minimizing any potential movements due to insufficient grip and bonding contact surfaces.

TYPE	DEPTH	DIAMETER	UNIT/CARTON	APPLICATION
Capping	30mm	40mm	500 Pieces	To all TOP hollow cores of wall when installing vertically or to both sides of wall when installing horizontally
(PP)	20mm	58/64mm	500 Pieces	



JOE BOND
JOINT BONDING ADHESIVE

JOE ACCESSORIES
GAP PUMP

JOE ACCESSORIES
CRACKSHIELD

JOE ACCESSORIES
STOPPERCAP

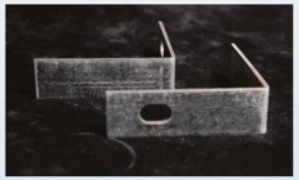
JOE SAFETY EQUIPMENT
SAFETY SHOES

JOE SAFETY EQUIPMENT
SOCKS

JOE SAFETY EQUIPMENT
TOOLS BAG

JOE SAFETY EQUIPMENT
MASKER

JOE ACCESSORIES
GRAVITY ANCHOR



JOE ACCESSORIES
L BRACKET

JOE ACCESSORIES
SLEEVE ANC

JOE LiGrA Honourable Partners

17 YEARS ++
More Than 1,000 Projects

PUBLIC DEVELOPERS

Building and Construction Authority
HOUSING & DEVELOPMENT BOARD
Land Transport Authority — We Keep Your World Moving
People's Association
Ministry of Education SINGAPORE
NUH National University Hospital
NUS National University of Singapore
NANYANG TECHNOLOGICAL UNIVERSITY SINGAPORE
TEMASEK HOLDINGS
PSA The World's Port of Call
sembcorp
MINISTRY OF HEALTH SINGAPORE
MINDEF SINGAPORE
MINISTRY OF HOME AFFAIRS
jtc Breaking New Ground
ntuc National Trades Union Congress
CIDB MALAYSIA
SAFRA
CHANGI airport singapore
URA Urban Redevelopment Authority
RafflesMedicalGroup
mapletree
Sentosa Sentosa Development Corporation
JKR

DEVELOPERS

SKS GROUP
ascendas Reit
Far East Organization INSPIRING BETTER LIVES
SGM SOKA GAKKAI MALAYSIA Creating Value, Empowering Lives
PERENNIAL PERENNIAL REAL ESTATE HOLDINGS LIMITED
Aurum
GSH
CHIU TENG GROUP 九鼎集团
CAMHOMES
CapitaLand
FRASERS CENTREPOINT
FOREST CITY
IHG
lendlease
exyte
ROXY-PACIFIC HOLDINGS LIMITED
COUNTRY GARDEN
Microsoft
TASEK MAJU
OKH
NVIDIA
YTL SINCE 1955
MCL Land A member of the Hongkong Land Group
Oxley OXLEY HOLDINGS LIMITED
OUE
POLLUX PROPERTIES
Keppel Land
PETRONAS
NBW
Setia
Marriott
MahSing Reinvent Spaces. Enhance Life.
GuocoLand
UOL Group Limited 华业集团有限公司
HIGHSCOPE INDONESIA

ARCHITECTS

architects61 singapore · shanghai
ADDP ARCHITECTS LLP
aesler
GDP
CIAP
DPA DP ARCHITECTS
ARUP
ONG&ONG
CPG CONSULTANTS
AKIPRO Chartered Architect
RSP RSP ARCHITECTS PLANNERS & ENGINEERS
WOHA
RONNY CHIN ARCHITECTS
P&T GROUP
kyooba
ARKITEK REKACIPTA
KAJIMA DESIGN
swan & maclaren
SURBANA JURONG

MAIN CONTRACTORS

BHCC CONSTRUCTION PTE LTD 新建工程私人有限公司
BOUSTEAD Projects
DAEWOO E&C
Dragages Singapore
HPC BUILDERS PTE LTD 上海黄浦建筑有限公司
Gammon
CHAN RONG FEN BUILDING CONSTRUCTION PTE LTD 長龍峰建築工程有限公司
DMC
DUA MEDAN CONSTRUCTION SDN BHD
CNQC 青建国际
LIAN HO LEE CONSTRUCTION
GIANT LEAP
China Construction (South Pacific) Development Co Pte Ltd 中国建筑(南洋)发展有限公司
CHIP ENG SENG CORPORATION LTD 集永成机构有限公司
GENNAL
HYUNDAI ENGINEERING & CONSTRUCTION
PAMIR
KEONG HONG CONSTRUCTION PTE LTD 强枫建筑私人有限公司
LUM CHANG
Sembawang
SoilBuild CONSTRUCTION GROUP LTD
SQA Builders Sdn Bhd
KSH HOLDINGS LIMITED
KIMLY CONSTRUCTION
PRECISE DEVELOPMENT PTE LTD
KAJIMA OVERSEAS ASIA
LIAN BENG GROUP LTD 联明集团有限公司
Ho Lee Group
SSANGYONG Engineering & Construction Co., Ltd.
SHIMZU CORPORATION
Straits Construction Higher Further Together
NAKANO SINGAPORE
SPACIOUS STRUCTURE SDN. BHD.
NEWCON BUILDERS PTE LTD
MCC SHANGHAI BAOYE GROUP CORP., LTD.
Sigb
TEAMBUILD BUILDING ASPIRATIONS
SUMITOMO MITSUI CONSTRUCTION CO.,LTD.
SATO KOGYO
PSYCON SDN BHD
Lian Soon Construction Pte Ltd
MRCB
PENTA-OCEAN CONSTRUCTION CO., LTD.
OBAYASHI
TAY HUP BROTHERS CONSTRUCTION SDN BHD
ZHENG KENG
TIONG AIK CONSTRUCTION PTE LTD (A Subsidiary of TA CORPORATION LTD)
TIONGSENG GROUP 长成控股
TAKENAKA
SAMSUNG
SAMSUNG C&T
WOH HUP BUILDING WITH INTEGRITY INDONESIA
PM PESONA METRO
TOTAL BANGUN PERSADA
TATA
NRC NUSA RAYA CIPTA
PP PROPERTI
SHIMZU CORPORATION SHMZ INDONESIA

Beyond Others — JOE LiGrA

JOE™ Singapore

LiGrA™ Lightweight Green Aggregates Mixed Development

STARS OF KOVAN

ROYAL SQUARE AT NOVENA

Hillion

MARINA ONE
Residences | Offices | Retail

Northpoint City

NORTH PARK Residences

JOE Singapore

LIGrA Mixed Development

THE WOODLEIGH RESIDENCES

THE WOODLEIGH MALL

SOUTH BEACH

EON SHENTON

ON SHENTON

DUO RESIDENCES OFFICES RETAIL HOTEL

Funan - CapitaLand

Paya Lebar Quarter

King Albert Park (KAP)

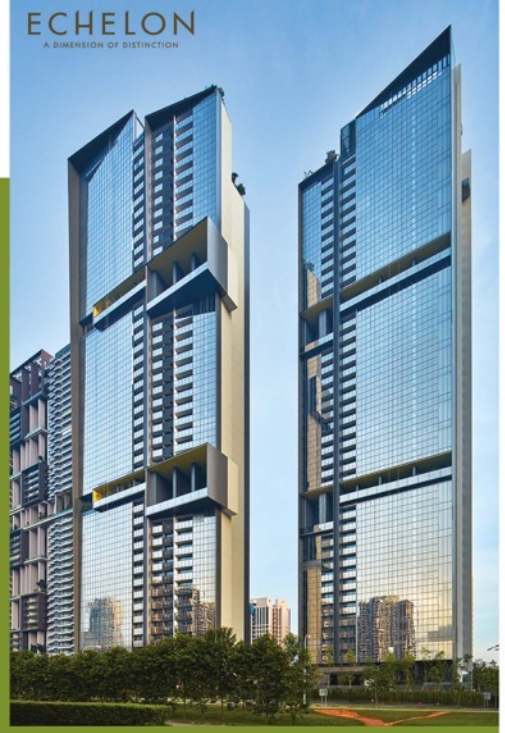
Le Quest @ Bukit Batok West Avenue 6

SENGKANG GRAND RESIDENCES

ONE Holland Village. An integrated mixed-used development located at 7 Holland Village Way

JOE Singapore Residential

LiGrA Lightweight Green Aggregates



JOE Singapore Residential

LiGrA Lightweight Green Aggregates

Coco Palms Condominium


Seven Palms Sentosa Cove


Ripple Bay Condominium at 2 Pasir Ris Link


The Greenwich Residential


Forest Woods Residences


The Amore EC at Edgedale Plains


THE TOPIARY Executive Condominium


THE LAKEFRONT RESIDENCES Condominium


Ecopolitan EC at Punggol Walk


The Tapestry Condominium


Sky Park Residences Executive Condominium


Thomson Impressions Condominium


Bartley Ridge Condominium


Sea Esta Condominium


KOVAN REGENCY Condominium


Waterfront Gold Condo at Bedok Reservoir Rd


THE INFLORA Condominium

euHabitat Condominium


SKY GREEN Condominium


WILSHIRE RESIDENCES

SIGNATURE AT YISHUN
Executive Condominium


PARC Life Condominium


ROYALGREEN Condominium @ Bukit Timah


15 Holland Hill


Grandeur Park Residences Condominium


Victoria Park Villas, Coronation Rd

JOE Singapore
LiGrA Residential

HOUSING & DEVELOPMENT BOARD


JOE Singapore
LiGrA Residential
HOUSING & DEVELOPMENT BOARD
Park Colonial Condo
18 Woodsville Condo
HDB Bidadari (Alkaff Courtview)
Upp Serangoon Rd
HDB Bidadari (Alkaff Lakeview)
PIE
Sant Ritz Condominium
The Woodleigh Residences
Sennett Residence
HDB Bidadari (Alkaff Oasis)
Alkaff OASIS
BIDADARI ESTATE
Alkaff LAKEVIEW
Alkaff COURTVIEW

JOE Singapore Residential

LiGrA Lightweight Green Aggregates

HOUSING & DEVELOPMENT BOARD

JOE Singapore LiGrA Institutions

Integrated Care Hub (ICH)

CENTRE FOR HEALTHCARE INNOVATION

National Centre for Infectious Diseases

RafflesHospital

Sengkang General Hospital SingHealth

NUH National University Hospital

MINISTRY OF HEALTH SINGAPORE

NTUC Health Nursing Home (Chai Chee)

St. Andrew's Nursing Home at Jalan Penjara

Ren Ci @ Ang Mo Kio (Nursing Home)

National Cancer Centre Singapore

NATIONAL SKIN CENTRE (NSC) Singapore

JOE Singapore Institution

LiGrA Lightweight Green Aggregates

BCA ACADEMY
of the built environment

MINISTRY OF EDUCATION SINGAPORE

LEE KONG CHIAN SCHOOL OF MEDICINE

NTU Yunnan Garden Campus

SUTD SINGAPORE UNIVERSITY OF TECHNOLOGY AND DESIGN

NUS National University of Singapore

YaleNUSCollege

NUS National University of Singapore

More Than Hundred Schools Projects in Singapore

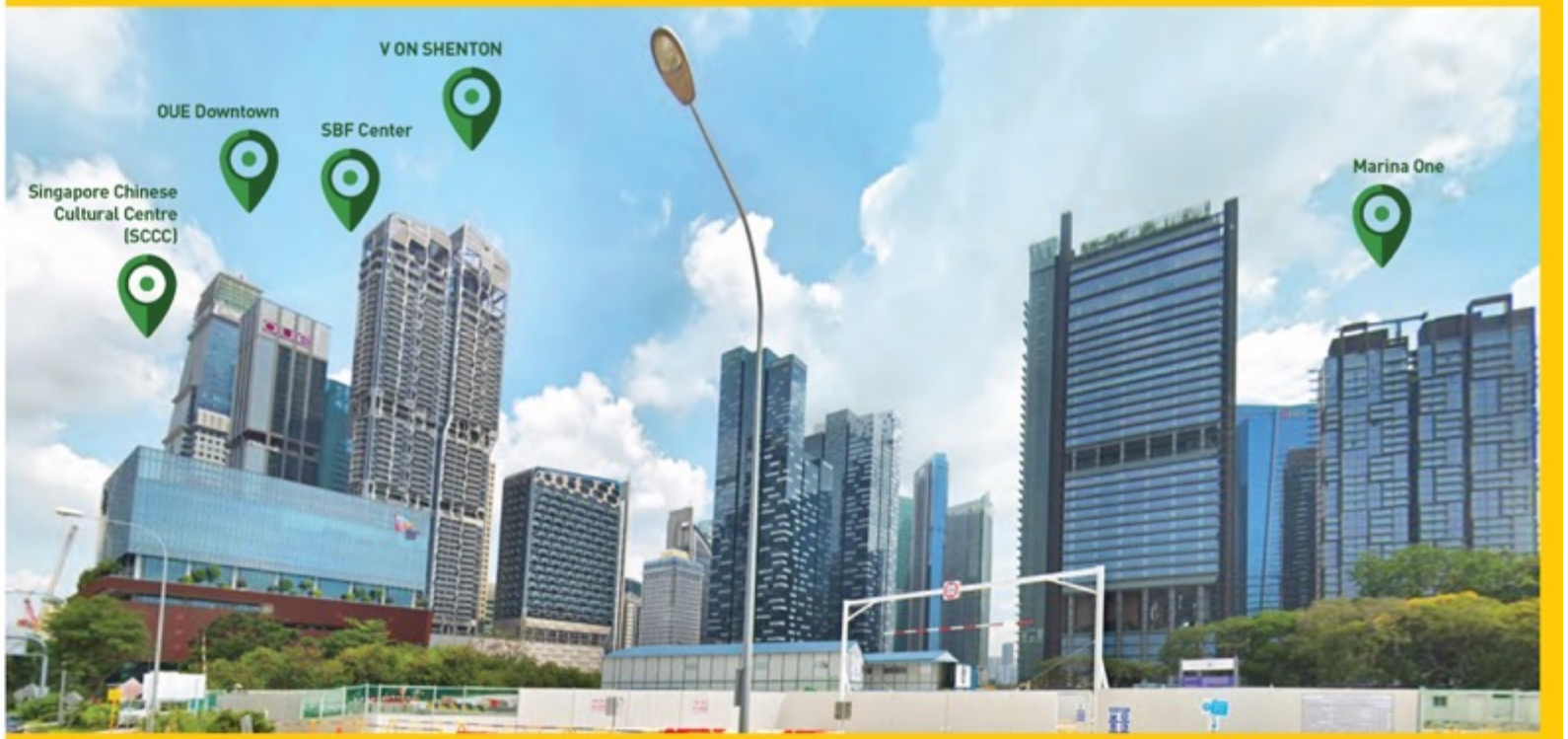
Temasek POLYTECHNIC

Overseas Family School

JOE Singapore Commercial

LiGrA Lightweight Green Aggregates

Professional Choice



Singapore Chinese Cultural Centre (SCCC)

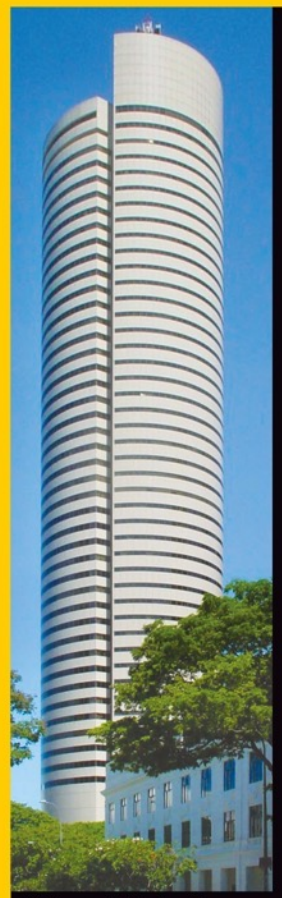
OUE Downtown

SBF Center

JOE Singapore Commercial

LiGrA Lightweight Green Aggregates

Hotel Boss



AXA Tower at 8 Shenton Way

Robinson Tower Redevelopment

Guoco Tower at Tanjong Pagar Centre

CapitaSpring at 88 Market St

New PSA Corporate HQ

InterContinental Singapore Robertson Quay

Orchard Hotel Singapore

JOE Singapore LiGrA Industrial

High-Tech Industrial Buildings

Industrial Development at Ang Mo Kio Street 65 for ST Electronics

JTC MedTech Hub @ MedTech Park

JTC Furniture Hub @ Sungei Kadut

THE WESTCOM at 1 Tuas South Avenue 6

Mandai Foodlink at 5 Mandai Link

Micron 300mm NAND Facility at 1 North Coast Drive

NORDCOM I

NORDCOM II

proxima

T-SPACE

JTC Business Aviation Complex at Seletar

Tagore 8 at 421 Tagore Industrial Avenue

JTC Chemicals Hub @ Tuas South

The InDex @ Tuas South Ave 3

Data Center at Loyang Drive

6 Storey Warehouse at 47 Jln Buroh

COSL (Singapore) at 3 Benoi Rd

Industrial Building With Ancillary Office at Tuas South Link

Mandai Link Logistics' Warehouses-Cold Storage at Mandai Link

STTelemedia Global Data Centres at 51 Defu Lane 10

Jurong Shipyard Office at Tuas South Boulevard / Tuas View Extension

Using panel 5.2m height for external wall and window opening

JOE International
LiGrA Malaysia

EATON RESIDENCES at Kuala Lumpur, Malaysia

FOREST CITY Projects (Plot 4 - Phase 1, Plot 26 - Phase 2, Plot 26 - Phase 4), Johor Bahru, Malaysia

MERIDIN EAST

THE AMERALD Resort Hotel at Pengerang, Johor, Malaysia

Sky Habitat @ Meldrum Hills, Johor Bahru, Malaysia

Taman Pelangi Indah Sales Gallery by SP Setia

JOE International
LiGrA Malaysia

Aliff Heights, Johor Bahru

Sierra Perdana - Johor Bahru

Kompleks Penyayang Kempas - Johor Bahru

Tiger Balm Factory

Larkin - Johor Bahru

SOKA International School - Negeri Sembilan


Marlborough College Malaysia, Johor

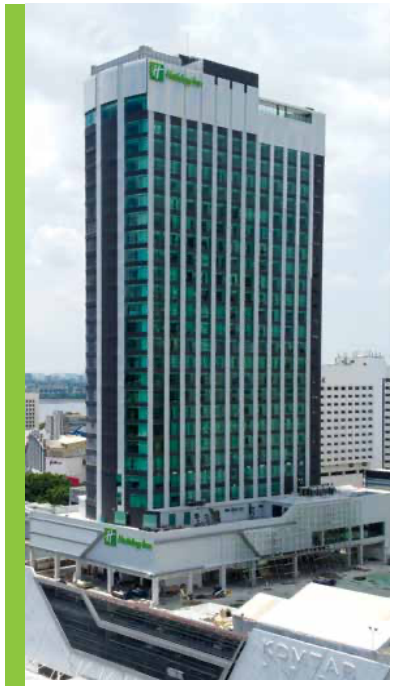
Ecoworld Business Park - Johor Bahru

JOE International

LiGrA Malaysia

Lightweight Green Aggregates

BRDB



Holiday Inn Johor Bahru City Centre

Permas Jaya - Johor Bahru

exyte

Intel Exyte, Penang

SANKYU TECHNICAL ACADEMY, Iskandar Puteri, Johor

KAJIMA

Kulai Green - Data Center, Johor

Sheraton Hotel, Johor Bahru

Shell at Rimbayu

Langkah Satria, Semenyih

JOE International LiGrA Malaysia

CIDB MALAYSIA

Nilai District Police Headquarters, Malaysia

CIDB Complex at Jalan Tampoi, Johor Bahru

ISKANDAR Residences Medini @ Nusajaya, Johor Bahru

PS Jalan Reko Kajang for Petronas

Warehouse, Chemical and Paint Store for Malaysia Marine and Heavy Engineering Sdn Bhd, Johor, Malaysia

GRANDVIEW 360° Condominium, Johor Bahru, Malaysia

SIHANOUKVILLE, CAMBODIA
D'Seaview

CAMHOMES

International JOE Cambodia LiGrA

JOE International LiGrA Indonesia

Meisterstadt BATAM

POLLUX HABIBIE INTERNATIONAL

Hotel Santika, Batam, Indonesia

Gereja Reformed Injil Indonesia (GRII) Batam, Indonesia

Fairfield BY MARRIOTT

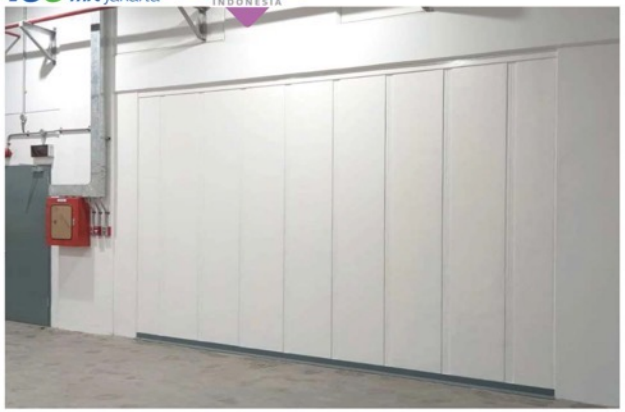
NRC NUSA RAYA CIPTA

POIN PUSAT OTOMOTIF INDONESIA

POIN - Pusat Otomotif Indonesia, PIK 2, Jakarta, Indonesia

mrt jakarta

SHIMIZU CORPORATION SHMZ INDONESIA



JOE International LiGrA Indonesia

HIGHSCOPE INDONESIA

Hotel Moxy, Indonesia

Museum Tiong Hoa, Bandung, Indonesia

Gramercy Cluster Fencing, Alam Sutera

JOE LiGrA Low Cost Housing

Mockup Citra Maja, Banten, Indonesia

CINITY (Cikarang International City), Indonesia

Griya Sajira Indah Residence, Banten, Indonesia

Cluster Elston-Millennium City, Parung Panjang, Indonesia

Desa Gunung Geulis, kec. Sukaraja, kab.Bogor, Indonesia

JOE Green Wall Panel System for Affordable housing / Worker Dormitory / Etc.

JOE® just one earth
green concrete panel

We Are Honoured
Achievements

JOE Green was awarded in the Responsible Consumption & Production Category for ESG Positive Impact Awards 2024 organised by The Star Media Group-Malaysia.

BEI Asia Awards 2017

Excellent rating certification mark from SGBC and TÜV SÜD PSB at SGBC-BCA Sustainable Leadership Awards.

Singapore Brands 2012.

BEI Asia Awards 2015/16

What a News !

THE STRAITS TIMES | SATURDAY, SEPTEMBER 10, 2022

Joe Green's Lightweight Green Aggregates (LiGrA) building materials (above) are made from recycled waste. PHOTO: JOE GREEN

Smarter recycling, greener concrete

Joe Green

Concrete is the most widely used commodity in the world and supports the growth of cities through housing and infrastructure.

But it is bad for the built environment. According to German news agency Deutsche Welle, the manufacturing of more than four billion tonnes of cement is responsible for about 8 per cent of global carbon dioxide emissions – more than double the numbers notched up by global flying or shipping.

But what if there were greener ways to make concrete? That was the mission of Mr Boediman Widjaja, chairman and founder of Joe Green, a global group based in Singapore which manufactures innovative building materials for the precast wall business, the built environment and industrial applications.

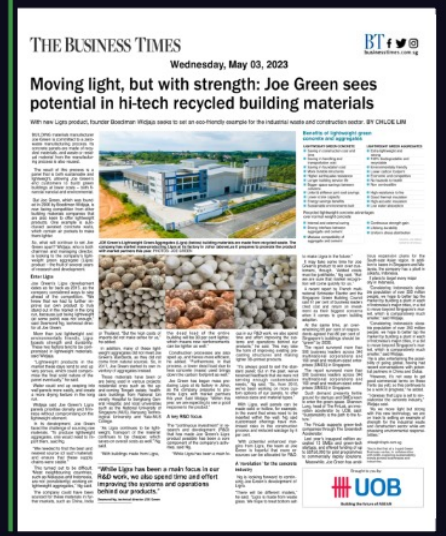
One of its top-selling ranges is the Lightweight Green Aggregates (LiGrA) line of building materials such as panels and precast concrete. It is made from recycling waste materials such as ceramics, ash, sludge and glass – which, according to the latest report by Singapore's National Environment Agency, form only between 8 and 13 per cent of all waste recycled.

Research and development for the manufacture of LiGrA started in 2015, with Joe Green staff collaborating with industrial and academic experts from countries including Japan, China, Russia and in Europe. The final product was ready in 2020. Joe Green now produces about 60,000 cubic metres per annum of LiGrA in the form of lightweight concrete aggregates.

The company displayed lightweight wall panels and structural and non-structural LiGrA products at BEX Asia.

Mr Widjaja, 60, graduated with a master's degree in business administration in 1989 from the Florida Institute of Technology in the United States, and has more than 20 years of experience in distribution and trading in South-east Asia, Europe and the US.

"The building materials available in the market today are manufactured from precious natural minerals such as clay, gravel, sand and shale, and imported from overseas. In producing LiGrA from waste, we not only solve the waste disposal problem, but also reduce the exploitation of natural minerals such as granite and sand," he says, adding that Singapore is one of the biggest importers of such natural resources to cater to the demands of the built environment.



THE BUSINESS TIMES | BT | businesstimes.com.sg

Wednesday, May 03, 2023

Moving light, but with strength: Joe Green sees potential in hi-tech recycled building materials

With new Ligra product, founder Boediman Widjaja seeks to set an eco-friendly example for the industrial waste and construction sector. BY CHLOE LIM

JOE LiGrA Lightweight Green Aggregates

Seeing Is Believing

We had honorary guests visiting JOE's plant, HQ and project sites to observe our usage of recycle concrete aggregates and waste materials for eco-friendly green products, to make our earth more sustainable.

Woh Hup Construction Pte ltd visit JOE Green factory in Senai, Johor, Malaysia

Mr. Tubagus Nouvak Haedar, Director Daiwa House Indonesia and Mr. Agus Supriadi - CEO Cinity

Ismet Natakarmana-Synergy @ JOE Green Factory Cikande, Serang, Indonesia

Mr,John, Elizabeth and Jason visit Gramata Factory in Seelong, Johor Bahru, Malaysia

An honour to have the Ambassador of the Republic of Indonesia H.E. Suryo Pratomo visit JOE Green HQ and Lab at Amazana Building Singapore

An honour to have the Ambassador of the Republic of Indonesia H.E. I Gede Ngurah Swajaya visit JOE Green HQ at Amazana Building Singapore

Petronas and Dua Medan Construction Sdn Bhd Team

Construction Industry Development Board Malaysia (CIDB) with 40 PKMM (Persatuan Kontraktor Melayu Malaysia)

China Communications Construction

Sunway Construction Sdn Bhd visited Tiong Woon Corporation's Warehouse project site

BCA's Super Low Energy Buildings Department

SKS Group and Atria Architects visit JOE Green's project site Holiday Inn JBCC

Mr. Faried Amir, Mdm. Antarina S.F Amir-HighScope Indonesia
Mr. Agus Supriadi, Sun Ming Liang-Cinity

CEO of Housing and Development Board (HDB), Dr Cheong Koon Hean, visit HDB project site at Sengkang East Road

Ir. Denny Gondojatmiko, Architect - PT Studio Air Putih

JOE Green's prestigious project Pollux Habibie Meisterstadt Batam residential towers topping-out ceremony on April 2019

ECOWORLD Development Group

Penang Master Builder president visit JOE Green Booth Expo in Penang Buildex

Mr. Kho Ing Tjiok - PoJ City & Mr. David Hidayat-Tentrem

PT PP Tbk visit JOE Green HQ in Singapore for their Indonesia construction projects

Museum Tiong Hoa, Bandung, Indonesia

Ir. Darius Riyadi. MM-Dir. Tatamulia Nusantara Indah
Mr.Sun Ming Liang-CEO Cinity

Mr. Okie Imanto-CEO Greenwoods
Mr. Ismet Natakarmana-Synergy

Mr. Jason Tan
Pacific Millennium Land

TJS Development visit JOE Green Factory in Cikande, Indonesia

Mr. Joseph S. Tjong-Alam Sutra & Mr. Agus Supriadi
Cinity (Cikarang Intrl. City)

Mr. Eddy Sindoro, CEO - Sentul City

Ciputra Group Visited JOE Green Factory in Cikande

Mr. Hendro Setyadji-Graha Padma Developer, Semarang, Indonesia

Mr. Doly - Tunas Group - Batam & Mr. Joseph H Harsono, BPS Capital - Singapore

Honorary Guests
Hearing is Believing

Teambuild Singapore

Straits Construction Pte Ltd

Daewoo Engineering & Construction Co. Ltd.

Obayashi Corporation visited Ripple Bay Condominium

MCL Land Ltd, Lum Chang Building Contractors Pte Ltd, P&T Architects & Engineers Ltd

Lum Chang Building Contractors Pte Ltd

Woh Hup, construction and civil engineering specialist

Mr. Gregg Jaclin & Mr. Peter Goldstein-Exhange Listing, USA

Toda Corporation visit JOE Green HQ in Singapore

Shimizu Corporation and ExxonMobil Asia Pacific Pte Ltd

Globally Recognized
Patent, Registered Design & Trademark

Singapore




Malaysia

Malaysia


Indonesia




India


China



Hong Kong


Hong Kong

Australia



New Zealand

USA

Cambodia

European Union



USA

Testimonials

Hearing is Believing

Professional Verdicts :

"The Right Wall Panel for Every Construction"

Cinity – Cikarang International City is a 500Ha mixed development with development plans encompassing institutional, commercial, and residential sectors.

Our project demands stringent timelines and specifications, particularly for high-performance wall panels and acoustic solutions. The installation speed far exceeds that of traditional methods while offering superior acoustic performance, minimal water absorption, and exceptional concrete strength. JOE Green matches our needs and specifications with their green products.

Moreover, JOE Green products offer a cost-saving advantage.

Agus Supriadi
CEO
CINITY - Cikarang International City

"Our project hotel Santika Batam had completed in December 2019. We would like to thank JOE Green Team for the full support. We have been satisfied using your products, in terms of cost savings, time and quality of products. We have other projects that may need your support again. We will contact you soon. Thank you very much."

Frans Bambang
Manager
CV. MEGA CONTRACTOR INDONESIA

"Compare to other precast wall panels, we definitely can see the quality and precission of JOE Green panel far more better for INOAC Project."

Tipluk Jati
Director
PT. AGNI SATYA PERSADA INDONESIA

"JOE Green products e.g. panels, brackets and accessories are found to be in high quality standard. JOE Green wall panel system is easy to install & hence can improve productivity. JOE Green's technical support i.e. submission of shopdrawings & details is also excellent. The technical personnel is found to be knowledgeable, responsive. JOE Green panel can be further improved if the panel use in the residential dwelling unit can be lighter in weight, currently need 3 - 4 workers to erect 1 panel"

Lim Jit Heng
Project Manager
長龍峰建築工程有限公司
CHAN RONG FEN BUILDING CONSTRUCTION PTE LTD

"Good material. It would be important to brief customers every construction details shown in the catalogue, especially to the worker of the erector on the dos and don'ts"

Mdm Eng Y H
Project Manager
三達利建設私人有限公司
SANTARLI CONSTRUCTION PTE LTD

"We have been with JOE Green for many years. Their product quality is good & have a broad product range."

Ivy Toh
Contract Manager
WOH HUP
BUILDING WITH INTEGRITY

"We are the 1st time work with JOE Green and very satisfy with JOE Green product quality."

Tan Teck Chong
Senior Project Manager
PSYCON SDN BHD

"The product is good. However the product delivery process need to be improved. Moving forward the contractor's installer need to familiarize with JOE product and take advantage of the speed and quality of JOE product offering for elevating construction industry standard."

Ar. Selamat
Director, JYP Architects Sdn Bhd
Principal, Arkitek Selamat Sdn Bhd
Arkitek Selamat

For the Pegaunihan Batam Project 4 storeys Office cum Factory and Warehouse, using JOE Green wall panel was the right choice. JOE Green is a concrete precast wall and the installation is fast and clean. There is no wet works like plastering.

Besides that, the installation requires no columns/ stiffener or beams/lintel. The bottom line is Joe Green panel is strong, more durable, easy to install and saves cost, hence profitable - "no regret".

Yohandoko
Project Manager
TOTAL BANGUN PERSADA

"Overall service is excellent"

Marvin Laxamana
Quantity Surveyor
建築私人有限公司
YES Construction Pte Ltd

"JOE Green's service is good"

Jackson Tiong
Contract Manager
聯明集團有限公司
LIAN BENG GROUP LTD

"Dear JOE Green, we are very impressed with the strong technical knowledge and fast support of the team. Overall we are very satisfied with your commitment and service"

Soh Lip Hong
Project Manager
新建工程私人有限公司
BHCC CONSTRUCTION PTE LTD

"Quality products, prompt delivery and great support !"

Johnny Xu
Director
CHIAN TECK
PEOPLE FOREMOST ADVANCE WITH TIMES
以人为本与时俱进

"Service and product quality from JOE Green is good"

May Beh
Purchaser

"JOE Green offers wide range of solid and reliable products that not only improve work productivity. It also stands out in term of value proposition that we can offer to our clients"

Wayne Fu Cheng
Director
FU CHENG BUILDING CONSTRUCTION PTE LTD

I would like to create a school that has a strong environmental perspective, contributes to sustainable development.

We finally found and installed the JOE Green Concrete Panel, a product that is reliable, with HIGH sound insulation, cost saving, and uses recycled waste and raw materials. The product matches with our needs and vision.

I am proud that I made a good choice, as I want HighScope Indonesia to be the best Eco-Socio-Tech Learning Center in Indonesia.

Antarina S.F. Amir
Founder & CEO of HighScope Indonesia
HIGHSCOPE INDONESIA

JOE® just one earth
green concrete panel

LiGrA®
Lightweight Green Aggregates

Worldwide, Buildings Account for 40% of Global Energy Consumption and 33% of Greenhouse Gas Emission

JOE Green has a Plan to Decarbonise the Industry, With a focus of Sustainability

Lightweight Green Aggregate (LiGrA) is Made from Recycled Waste, Help to reduce CO2 Emissions, Resource use and Construction costs.

JOE Green is Continuously Developing other products, with the aim of **Reducing Emissions, Manpower, Resource use and Energy Inefficiency.**

JOE® just one earth

Gramata
Lightweight Green Aggregates

LiGrA®
Lightweight Green Aggregates

The Art of Lightweight Technology

Contact Us :

E-Catalogue :

Thank You

www.joegreenpanel.com

+65 9760 5272