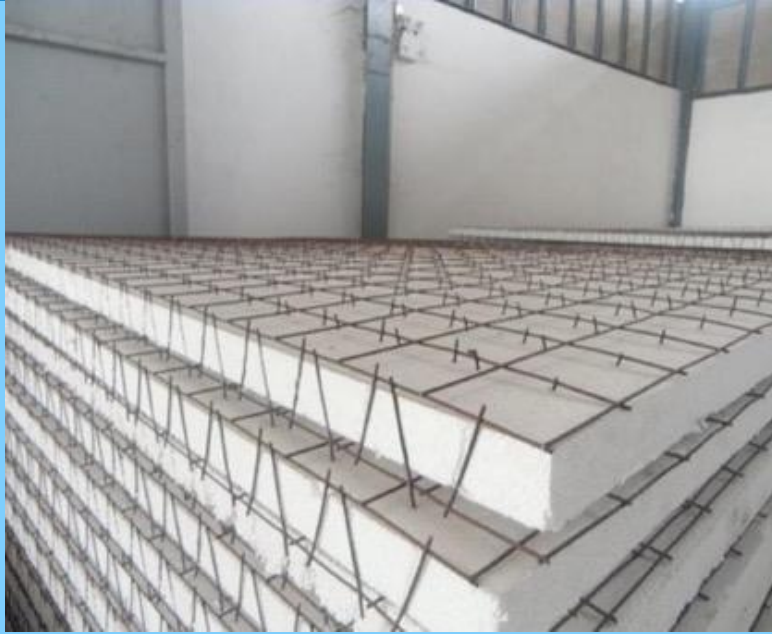


EASY PANEL OVERALL PRESENTATION

Product lines:

- **Easy Panel** construction material
- **LiteCast** Unique and Innovative precast panel



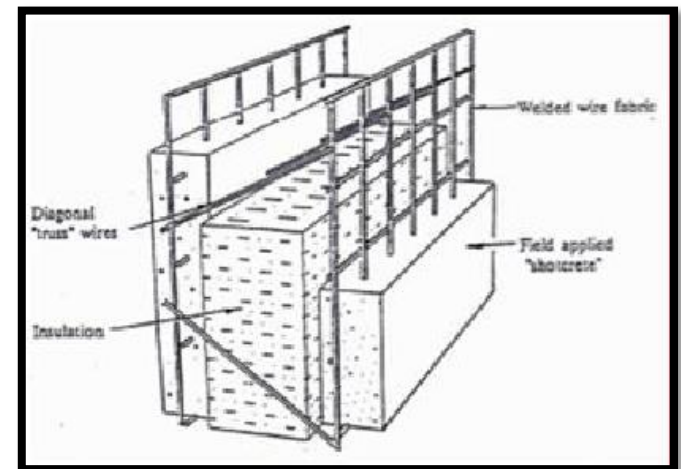


Easy Panel

Efficient and Effective

Easy Panel

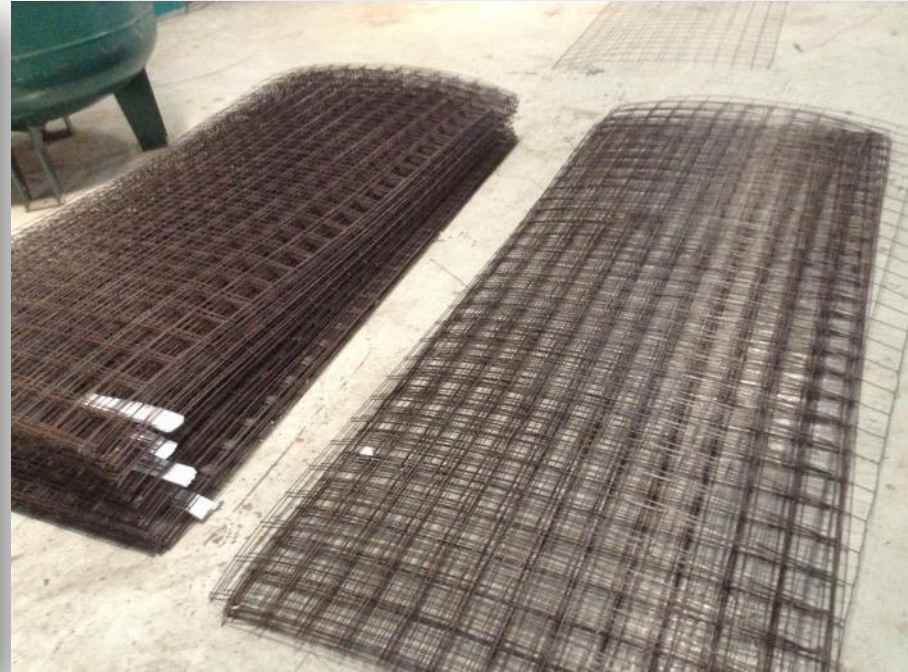
- Partially prefabricated construction material using sandwich panel technology
- **Tested** and **certified** to international construction standards
- **Patented** technology
- Product information:
 - A panel of 3D high tensile 3mm steel wire
 - Fire resistant expanded polystyrene (EPS) with field-applied concrete
 - Standard size: 3.0 m * 1.2 m
 - Weight: 16 Kg



Easy Panel: Raw Materials



EPS Polystyrene



High tensile steel wire

Easy Panel: EPC Production



Easy Panel: Production Facility



Easy Panel: Production Facility



Easy Panel: Technical Specifications

- **Fire resistance**
 - EPS Polystyrene core non-flammable and fire resistant
 - Tested by Branz Appraisal (similar product)
 - 50mm thick Easy Panel™ achieved up to 90 FRLs (*Fire Resistance Levels*)
- **Strength & durability**
 - High tensile steel wire core
 - Construction of houses up to 3 stories without supporting columns and beams
 - Lightweight material
 - Tested by the Burapha University, Chonburi, Thailand
 - Vertical load: over 100,000 N
 - Bending strength: over 8,000 N
- **Thermal & acoustic insulation**
 - Superior ability to retain cold or heat
 - Polystyrene core with double layer of concrete reduces outside noise and heat transfer
 - Tested by Branz Appraisal (similar product)
 - Potentially reach an R-value of 1.2 for a 50mm panel sample

Advantages

1. Standardisation

- Easier management and planning
- Higher level of building accuracy
- Ease of predicting construction delivery risks

2. Efficiency

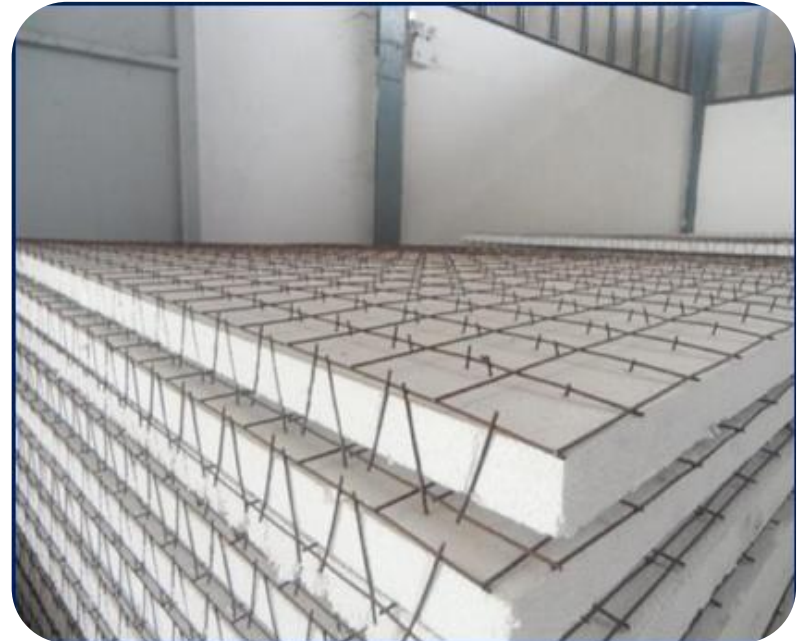
- Factory production is more efficient than standard on-site construction
- Less need for skilled labour
- Less waste of resources

3. Speed

- Time of construction is greatly reduced
- Reduced labour costs
- Quicker return on investment for the builder and/or project developer

4. Green Material

- Thermal insulation
 - Reduces energy consumption
 - cost saving



Display wall



Utilities installed within the wall prior to rendering



Can make shelving, cupboards, wardrobes, etc., from off-cuts - nothing wasted!

Easy Panel: Diverse Applications

From **Low-cost** to **Mid-market**

- Residential development
- Government housing
 - Be competitive to be able to win tenders
- Town house and terraces
- Small retail shops



Low-cost Housing



Mid-market Housing

Easy Panel: Diverse Applications

High End

- **Luxury Housings**
- **Luxury Condos**
 - Acoustic insulation
 - Thermal insulation
- **Large Commercial Projects**
 - Hotels
 - Office buildings
 - Factories
 - Warehouses
 - Big box retail stores
 - Quickly built
 - Open for business sooner



Luxury Housing



Large Commercial Projects

“Bangkok, the Green City”

Under the initiative, the final draft of which was approved by the Cabinet, the goal is to promote environment-friendly buildings in line with the guidelines of the Thai Green Building Institute by permitting increased floor-area ratios beyond the level allowed for standard buildings.

While this will present a challenge for property developers, who ***will need to increase their budgets*** if they are going to put up green buildings, the aim is to save energy costs in the long term, said Panyapas Nopphan, deputy director-general of the Bangkok Metropolitan Administration’s City Planning Department.

Adopted from The Nation, May 03, 2013

**EASY PANEL™ IS AN ENERGY SAVING GREEN SOLUTION
AND COST EFFECTIVE BOTH IN TIME AND MONEY!**

Case Study 1

The Cube, Pattaya

Case Study: **The CUBE**



Case Study: **The CUBE**



With a build quality and the use of new and eco friendly buildings designed to insulate the units and save the owners running costs, something that Tudor Group prides itself on, combined with comfort and luxurious affordability, The Cube will undoubtedly be a success in every aspect.

- Abstracted from Pattaya™ Business Supplement (December 2013, pg 34)

Case Study 2

The Vineyard

Case Study: The Vineyard



Luxury Housing

The award winning, five star luxury residence, **The Vineyard**, uses the Easy Panel™ wall system for their premium '**green option**' which not only reduces living costs but also gives back to the environment.

The Easy Panel™ wall system offers greater thermal efficiency minimizing the cooling load which makes it at least **30% - 50% cheaper** to run as it consumes less power.

The Vineyard: http://www.siamdevelopments.com/vineyard_home.php

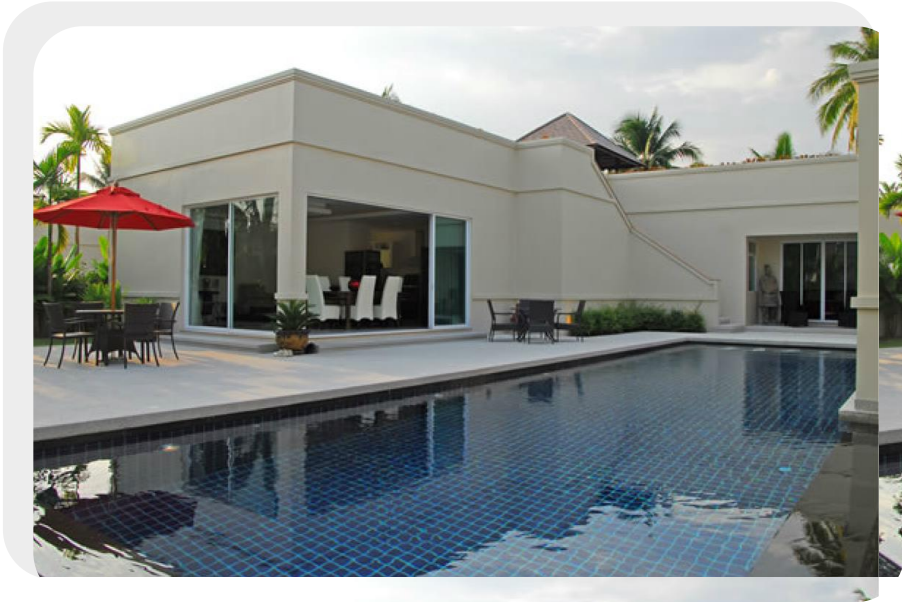
Case Study: **The Vineyard**



Case Study: **The Vineyard**



Case Study: **The Vineyard**



Case Study 3

Siam Global House

Case Study: Siam Global House

Location: Nakorn Panom

Efficiency:

- Each store generates > THB 2,000,000 / Day
- Easy Panel™ **shortened** construction by **90 days**
 - **Additional THB 180,000,000 revenue** generated



Siam Global House: <http://www.globalhouse.co.th/>

Case Study: **Siam Global House**



Case Study: **Siam Global House**



Case Study: **Siam Global House**



Case Study: Siam Global House



Case Study 4

Paradise Residence

Case Study: Paradise Residence



Case Study: Paradise Residence



The building will be in an L-shape just four floors high and a wall construction system called Easy Panel™ will be employed. Easy Panel™ is **quick to erect**, the walls will all be straight and the **acoustics will be good** with virtually **no noise** from neighbours. The Easy Panels™ also **keep the cool in and heat out**.

“It’s a product of the future that will allow us to erect **150sqm of walls in a day**,” said a spokesman for Blue Diamond.

- Abstracted from REm Thailand, Pattaya Edition (January 2015, pg 38)

Easy Panel™: Bottom Line

- ✓ **Less skilled** labour required
- ✓ **Fewer** workers needed
- ✓ No heavy lifting equipment
- ✓ No beams and columns required
- ✓ **Speed** of construction
- ✓ Energy efficient technology makes it a **premium** product

Comparison Chart

Easy Panel™	Precast Concrete Panels
✓ Cheaper manufacturing cost	✗ Expensive manufacturing cost
✓ Lightweight: <ul style="list-style-type: none"><li data-bbox="227 482 782 525">• Inexpensive delivery cost<li data-bbox="227 539 913 582">• No need for heavy lifting cranes	✗ Very heavy <ul style="list-style-type: none"><li data-bbox="1091 482 1609 525">• Expensive delivery cost<li data-bbox="1091 539 1590 582">• Heavy cranes required<li data-bbox="1091 596 1590 639">• Expensive plant rental
✓ Excellent insulation properties	✗ Poor insulation properties
✓ Curing of concrete on site <ul style="list-style-type: none"><li data-bbox="227 805 869 905">• Concrete applied after panels installed on-site	✗ Curing of concrete in the factory <ul style="list-style-type: none"><li data-bbox="1091 805 1493 848">• Takes a long time<li data-bbox="1091 862 1667 905">• Require large storage area<li data-bbox="1091 919 1705 962">• Can affect delivery schedule
✓ Panels can be prefabricated prior to installation <ul style="list-style-type: none"><li data-bbox="227 1110 869 1210">• Electrical wiring, outlets, switches, plumbing, tiles, etc.	

Easy Panel™: Evidence

1. Fire resistance

- Tested by Branz Appraisal (similar product)
- 50mm thick Easy Panel™ achieved up to 90 FRLs (fire resistance levels)

2. Strength

- Tested by the Burapha University, Chonburi, Thailand
- Compressive strength: $\pm 37 \text{ Kg / cm}^2$
- Vertical load: over 100,000 N (10,400 kg)
- Bending strength: over 8,000 N (840 kg)

3. Thermal insulation

- Tested by Branz Appraisal (similar product)
- Potentially reach an R-value of 1.2 for a 50mm panel sample

Easy Panel™: Test Results

BURAPHA UNIVERSITY (BUU)
 100 Long-horn Road, Samut, Muang, Chonburi, 20111 Thailand
 Tel: +66 (0) 3819 2222 Ext. 3356; Fax: +66 (0) 3816 2122 Ext. 3255 Website: www.buu.ac.th

Material Testing Laboratory
 Department of Civil Engineering
 Faculty of Engineering

Test no.: CC-03-35-001
Test Type: Strength test of panel for building construction according to ASTM E72 (Transverse load test on wall specimen)

Date of Casting: 19 July 2012
Date of Test: 5 September 2012
Specimen: Sandwich concrete panel which 5-cm thickness of foam inside
Client: Easy Panel Construction Co., Ltd.
Project: อาคารสำนักงานอาคารพาณิชย์ 4 ชั้น

Test Results:

Specimen No.	1	2	3	Average
Width of specimen, W (cm)	32	32	32	
Height of specimen, H (cm)	10	10	10	
Length of specimen (cm)	122	122	122	
Clear span between supports, S (cm)	100	100	100	
Maximum load at mid-span (N)	1,397	8,275	8,581	8,220

Remark:
 1. All test results are based on tested samples only.
 2. Not valid until be signed and sealed.

Tested by:
 (Mr. Yingjai Samart) Civil Engineer
 (Mr. Jaturong Samrongsong) Civil Engineer

Approved by:
 (Dr. Taweesak Samrongsong) Civil Engineer

**Bending Strength
 8,220 N (840 kg)**

BURAPHA UNIVERSITY (BUU)
 100 Long-horn Road, Samut, Muang, Chonburi, 20111 Thailand
 Tel: +66 (0) 3819 2222 Ext. 3366; Fax: +66 (0) 3819 2222 Ext. 3255 Website: www.buu.ac.th

Material Testing Laboratory
 Department of Civil Engineering
 Faculty of Engineering

Test no.: CC-03-33-002
Test Type: Strength test of panel for building construction according to ASTM E72 (Compression load test on wall specimen)

Date of Casting: 19 July 2012
Date of Test: 5 September 2012
Specimen: Sandwich concrete panel which 5-cm thickness of foam inside
Client: Easy Panel Construction Co., Ltd.
Project: อาคารสำนักงานอาคารพาณิชย์ 4 ชั้น

Test Results:

Specimen No.	1	2	3	Average
Width of specimen, W (cm)	32	32	32	
Thickness of specimen, T (cm)	10	10	10	
Length of specimen, L (mm)	67	67	67	
Maximum load (N)	126,568	62,570	116,810	101,983

Remark:
 1. All test results are based on tested samples only.
 2. Not valid until be signed and sealed.

Tested by:
 (Mr. Yingjai Samart) Civil Engineer
 (Mr. Jaturong Samrongsong) Civil Engineer

Approved by:
 (Dr. Taweesak Samrongsong) Civil Engineer

**Vertical Load
 101,983 N (10,400 kg)**

BURAPHA UNIVERSITY (BUU)
 100 Long-horn Road, Samut, Muang, Chonburi 20111 THAILAND
 Tel: +66 (0) 3819 2222 Ext. 3366; Fax: +66 (0) 3819 2222 Ext. 3255 Website: www.buu.ac.th

Material Testing Laboratory
 Department of Civil Engineering
 Faculty of Engineering

Test no.: CC-03-35-003
Test type: Compressive strength

Date of casting: 19 July 2012
Date of test: 5 September 2012
Specimen: Sandwich concrete panel which 5-cm thickness of foam inside
Client: Easy Panel Construction Co., Ltd.
Project: อาคารสำนักงานอาคารพาณิชย์ 4 ชั้น

Test results:

Specimen no.	1	2	Average
Weight of specimen (kg)	5.96	5.96	
Gross sectional area (cm ²)	225.0	225.0	
Maximum load (kg)	8,551	8,306	
Compressive strength (kg/cm ²)	26	26	27

Remarks:
 1. All test results are based on tested samples only.
 2. Not valid until be signed and sealed.

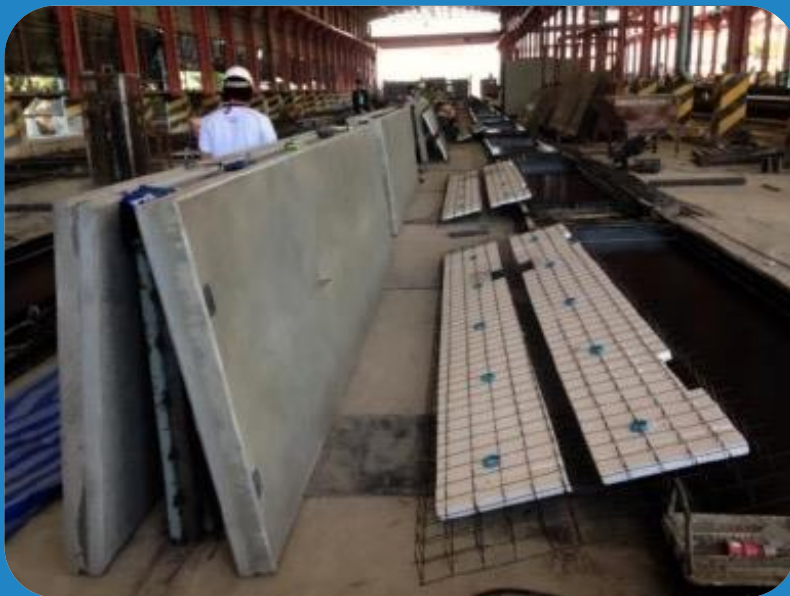
Tested by:
 (Mr. Yingjai Samart) Civil Engineer
 (Mr. Jaturong Samrongsong) Civil Engineer

Approved by:
 (Dr. Taweesak Samrongsong) Civil Engineer

**Compressive Strength
 37 Kg / cm²**

LiteCast Panel

Unique and Innovative



LiteCast Panel

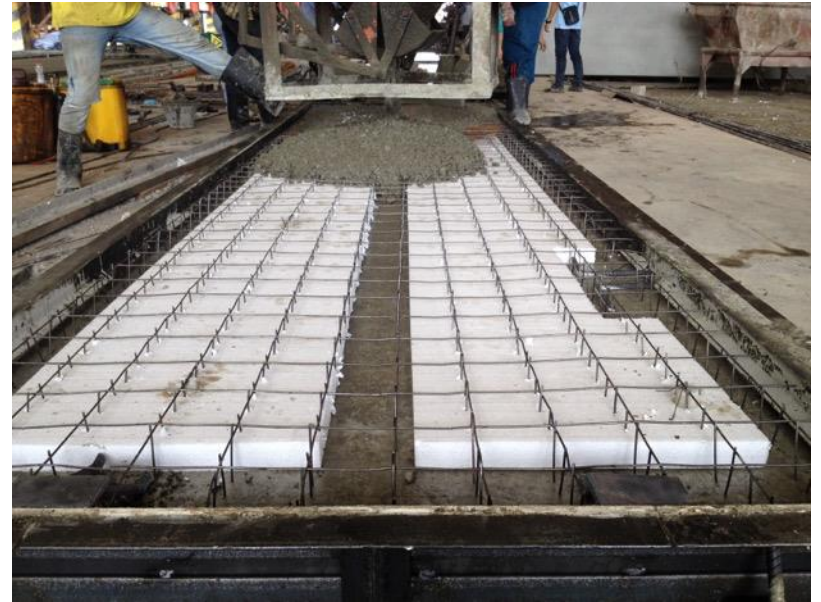
1. An innovative and unique building material
2. Hybrid Technology
 - Easy Panel™ sandwich panel & precast concrete panels
 - Same advantages as a precast concrete panel
 - Quick and easy
 - No need to change construction methods
 - Superior thermal and acoustic insulation
3. High quality: stronger & lighter
4. Similar cost alternative to standard precast concrete panels



LiteCast Panel: Production Process



Easy Panel™ Core



Concrete Coating

LiteCast Panel: Production Process



LiteCast Panel: Production Process



LiteCast Panel: End Product

Advantage: Efficiency

Construction speed

- ✓ Similar construction speed as standard precast concrete panels
- ✓ Much quicker than block work or other in-fill methods



LiteCast Panel: Diverse Applications



- Large retail outlets / shopping malls
- High-rise condominiums
- Hotels and resorts
- Large retail outlets / shopping malls
- High-rise condominiums
- Hotels and resorts
- Prefabricated housing

Case Study 5

CentralPlaza, Salaya

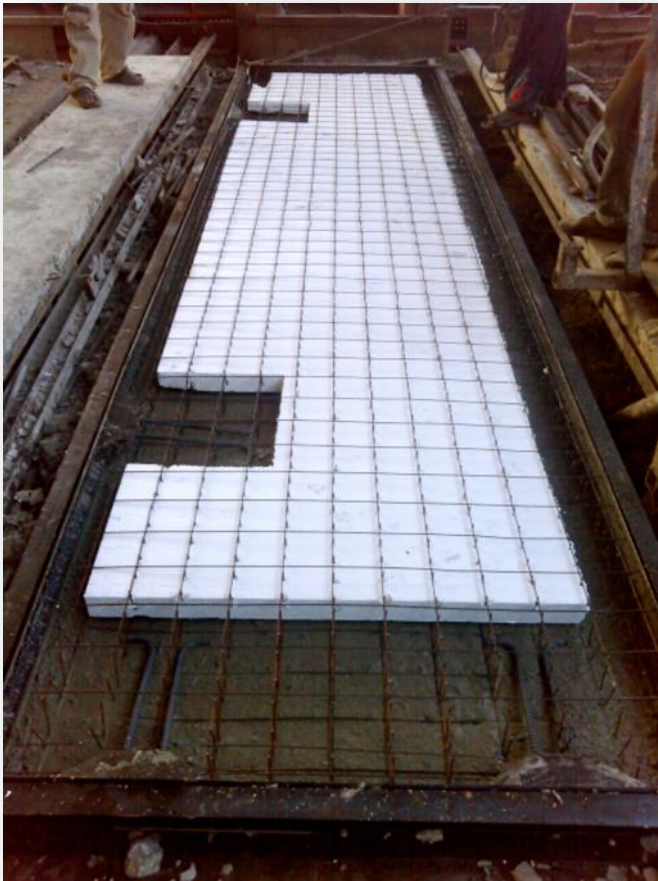
Case Study: CentralPlaza, Salaya

- ✓ **Large prestigious** shopping mall from Thailand's largest developer
- ✓ Central Pattana Group (CPN)
- ✓ Located in Salaya, 25km west from Bangkok
- ✓ **Project value \$120,000,000 USD**



CentralPlaza, Salaya: <http://www.centralplaza.co.th/salaya/>

Case Study: Central Plaza, Salaya

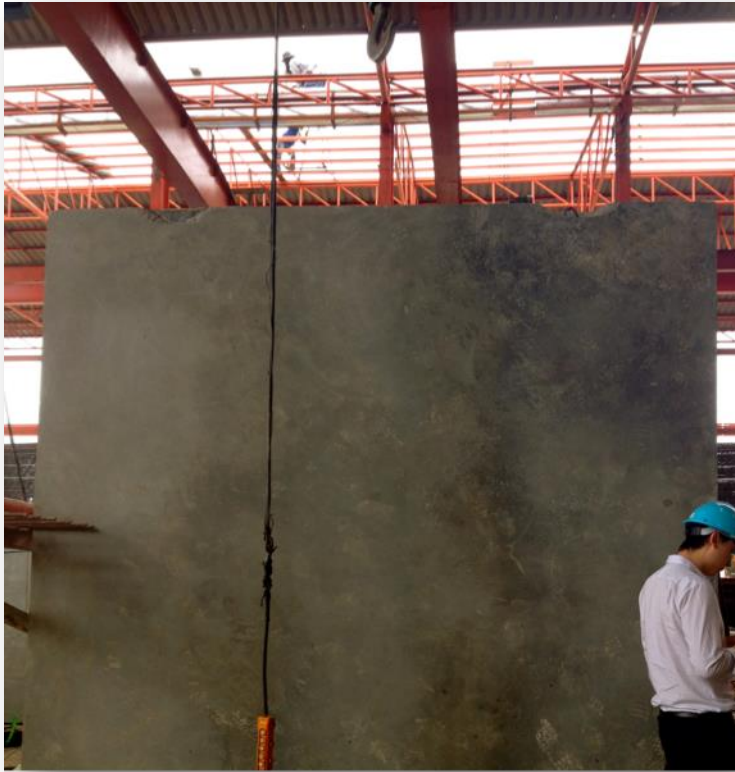


Phase 1: Production of LiteCast



Phase 2: Production of LiteCast

Case Study: CentralPlaza, Salaya



Front View: Completed LiteCast Panel



Side View: Completed LiteCast Panel

Case Study: CentralPlaza, Salaya



CentralPlaza Construction Site (Overview)



CentralPlaza Construction Site (Pillars)

Case Study: Central Plaza, Salaya



Installation Process: 1st LiteCast Panel
(During)



Installation Process: 1st LiteCast Panel
(Completed)

Case Study: Central Plaza, Salaya



Installation Process: Series of LiteCast Panel



Installation Process: Series of LiteCast Panel

Case Study: Central Plaza, Salaya



Case Study: Central Plaza, Salaya



Case Study: CentralPlaza, Salaya



LiteCast Panel: Evidence

Test:	Conducted by:	Date of testing:	Date of Certification:	Result:
Impact Test: <ul style="list-style-type: none"> Determination of Partition stiffness Determination of surface damage by small hard body impact Determination of resistance to damage by impact from a large soft body Determination of resistance to structural damage by multiple impact from a large soft body Determination of resistance to crowd pressure Lightweight anchorage pull-out test Lightweight anchorage pull-down test Heavyweight anchorage (wash basin) eccentric downward loading test Heavyweight anchorage (High level wall cupboard) eccentric downward loading test 	AIT	10 th July 2013 – 13 th July 2013	8 th August 2013	Passed
Compression Test	AIT	29 th July 2013	11 th August 2013	Passed
Water Absorption	AIT	29 th July 2013	8 th August 2013	Passed
Dry Density	AIT	29 th July 2013	8 th August 2013	Passed
Acoustic	Kasersat University	8 th August 2013	21 st August 2013	Passed
Thermal	Kasersat University	7 th August 2013	21 st August 2013	Passed
Fire Test (BS 476) 3 Hours Completed	Chula University	24 th September 2013	30 th September 2013	Passed

The evolution of construction

THANK YOU!



Mud



Stone



Wood



Brick



PreCast



1. 50% Lighter
2. Superior Thermal Insulation
3. Manufactured to ISO 9001 Standards

Make your next project **Sustainable** with

Lite
Cast