PRIME MINISTER'S FIVE MILLION HOUSING PROGRAM

WAY FORWARD THROUGH ENERGY EFFICIENT DESIGN BUILDING

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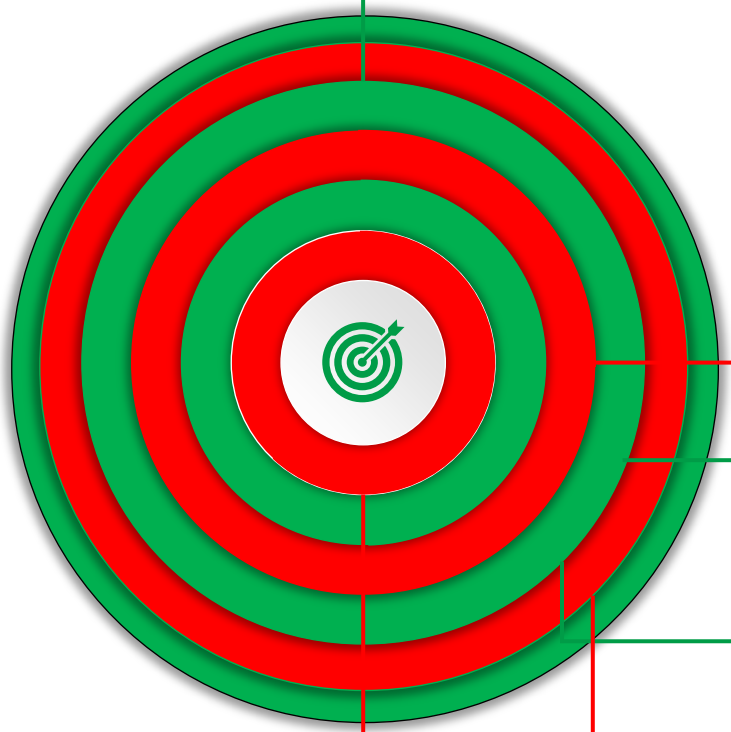
SECTIONS

5 MILLION HOUSING

5 MILLION HOUSING

SALIENT FEATURES



- *Increase buying power by providing loans of longer tenure fifteen to twenty years.*
- *Reduce cost by significantly cutting down the approval time.*
- *Develop new communities with access to infrastructure.*
- *Reduce cost by standardizing design and specifications.*
- *Reduce the upfront cost of builders by providing them land in installments and minimum time for approvals and infrastructure before start of construction.*
- *Provide project loans to builders so that they can complete housing project in the shortest possible time.*

5 MILLION HOUSING

TIMETABLE FOR THE PROJECT

DESCRIPTION	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5
ONE UNIT	200000	200000	200000	250000	250000
GROUND+3	100000	150000	200000	200000	200000
ADDITION TO EXITING	100000	225000	200000	200000	200000
HIGHRISE	50000	75000	100000	100000	100000
MIDRISE	100000	150000	150000	150000	200000
SELF CONSTRUCTION	100000	150000	150000	150000	200000
TOTAL	**650000**	**900000**	**1000000**	**1050000**	**1250000**
Subtotal of those which will be built under APNA Housing Authority	**150000**	**400000**	**500000**	**500000**	**500000**

OUR CHALLENGE

OUR CHALLENGE

CURRENTLY IN PAKISTAN THERE IS **23000 MW** ENERGY PRODUCTION AND **5000 MW** SHORTFALL OF ENERGY.WITH ADDITION OF 5 MILLION HOUSING UNITS MINIMUM **10,000 MEGA WATT** IS REQUIRED.

“PER UNIT COST OF ENERGY IS 10 CENT KWH

OUR CHALLENGE

IT COSTS NO MORE TO BUILD ZERO ENERGY PROJECTS!

OUR CHALLENGE

COST OF CONSTRUCTION

A CONVENTIONAL HOUSE (FINISHED)

AREA	COST
600 SQ FT	PKR 1080000
1000 SQ FT	PKR 1800000
1200 SQ FT	PKR 2,160,000

**WITH OUT THE COST OF ELECTRICITY, GRID, GENERATION FROM FOSSIL FUELS WHICH WOULD TAKE UP THE COST.*

AN ECO HOUSE (FINISHED)

AREA	COST
600 SQ FT	PKR 1440000
1000 SQ FT	PKR 2400000
1200 SQ FT	PKR 2,880,000

**USING ONLY SOLAR ENERGY AND SAVING ALL THE COST OF ENERGY REQUIREMENT.*

OUR CHALLENGE

TIME TAKEN FOR THE CONSTRUCTION

A CONVENTIONAL HOUSE (FINISHED)

36 WEEKS

AN ECO HOUSE (FINISHED)

4 WEEKS

OUR CHALLENGE

CARBON FOOTPRINT[1]

A CONVENTIONAL HOUSE (FINISHED)

CO_2

- 80 TONS OF CARBON DIOXIDE IS EMITTED ONLY DURING CONSTRUCTION PHASE.
- 80 TONS X 500000 HOUSES = 40000000 TONS OF CO_2 ONLY IN CONSTRUCTION PHASE

AN ECO HOUSE (FINISHED)

CO_2

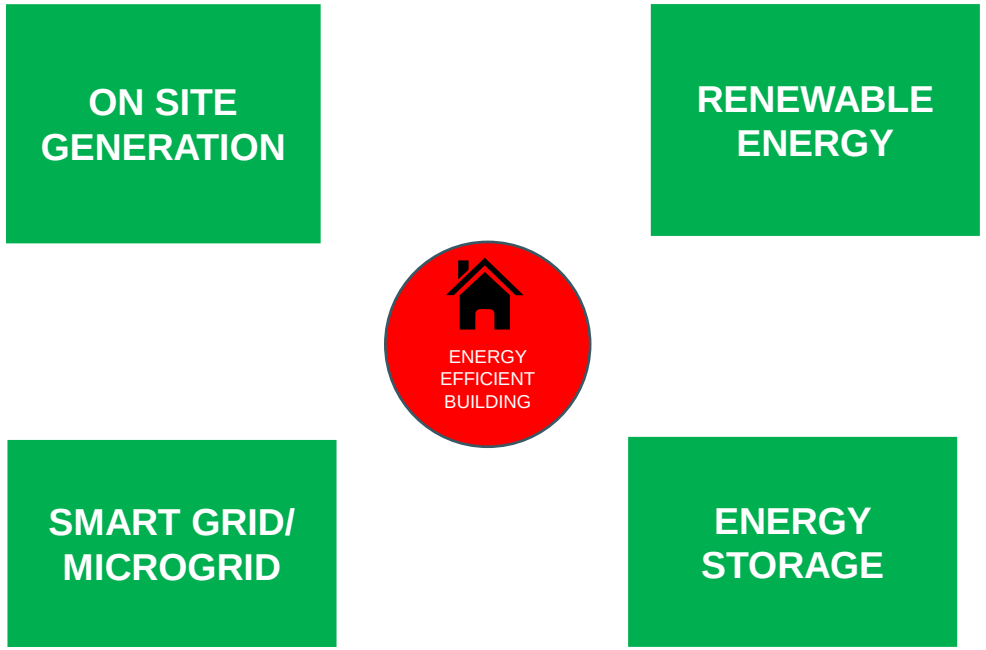
- 5 TONS OF CARBON DIOXIDE IS EMITTED DURING CONSTRUCTION PHASE AND ZERO AFTWARDS.
- 5 TONS X 500000 HOUSES=2500000 TONS OF CO_2 IN CONSTRUCTION PHASE AND ZERO AFTERWARDS

1"The amount of carbon dioxide released into the atmosphere as a result of the activities of a particular individual, organization, or community."

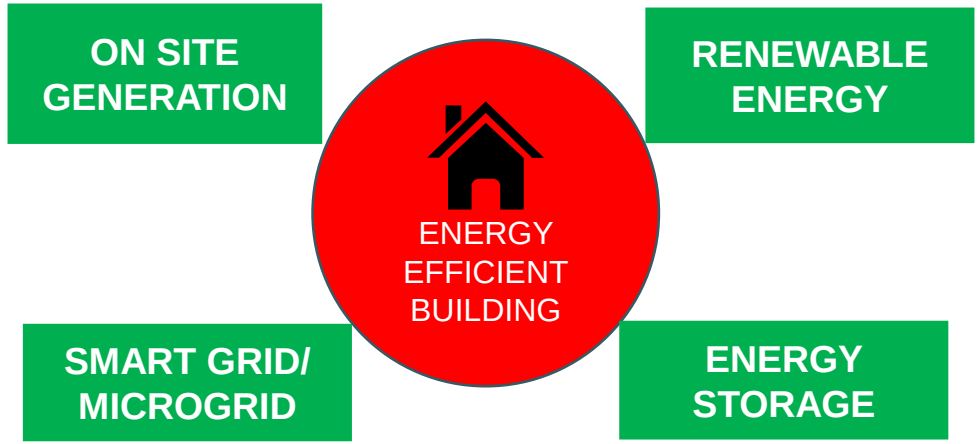
OUR CHALLENGE

PROVIDING ZERO ENERGY DESIGN SOLUTIONS

HIGH ENERGY ADVANCED TECH
= HIGH ADDITIONAL COST



HIGH EFFICIENCY ESTABLISHED
TECH = LOW OR NO ADDITIONAL
COST



SIZE OF RECTANGLES REPRESENT RELATIVE INVESTMENT COST

THE SOLUTION

THE SOLUTION

ECO GREEN ICF CONSTRUCTION SYSTEM

- ICFs (Insulated Concrete Forms) consist of two panels of EPS foam

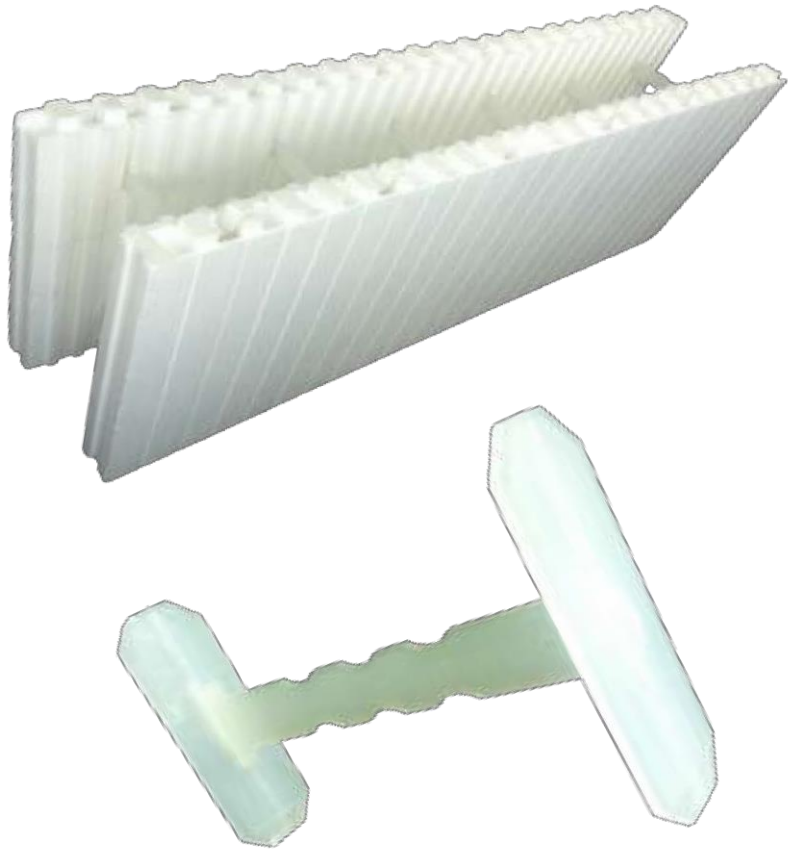
- Both layers of insulation are held together with cross ties or “webs” which creates a block.

- Insulation:

Expanded Polystyrene Sheet (EPS)

- Cross Ties or Webs:

High Density Polypropylene (HDPP)



THE CONSTRUCTION PROCESS

THE CONSTRUCTION PROCESS

1.STRIP FOOTING AND RAFT SLABS

Standard footings are installed according to applicable building codes and engineering requirements. Strip footings are easily accommodated with the flexibility of ICF construction.

THE CONSTRUCTION PROCESS

2. FROM UNITS ARE SETS

Form units are stacked similar to building blocks to the required building dimensions.

THE CONSTRUCTION PROCESS

3. REINFORCING STEEL AREADDED

Reinforcing steel is placed according to the design requirements into notches provided by the webbing.

THE CONSTRUCTION PROCESS

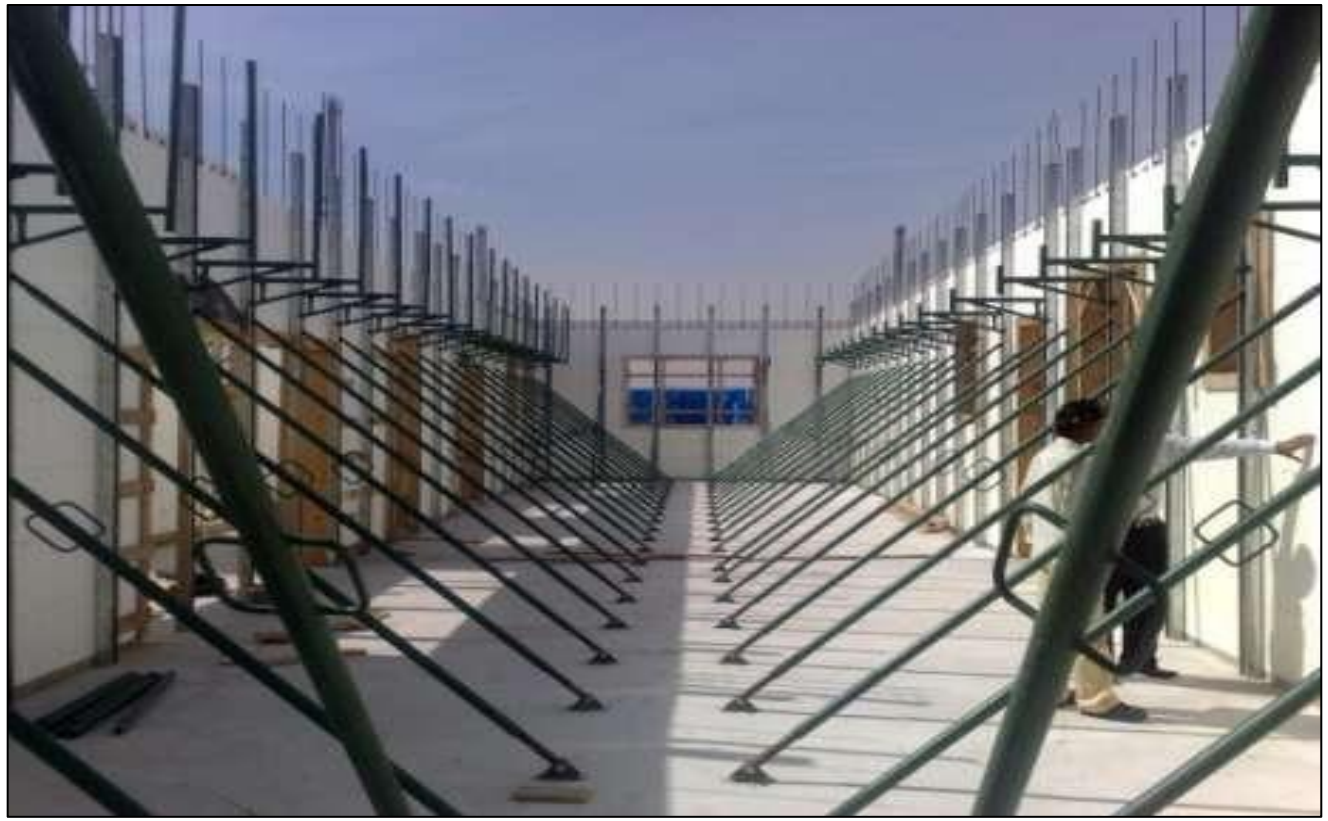
4. WALL OPENING INSTALLED

Window “Bucks” or frames are placed in the wall. “Bucks” can be created using several different material options.

THE CONSTRUCTION PROCESS

5. WALL ARE BRACED

Wall alignment systems and bracing is placed as the wall is stacked.



THE CONSTRUCTION PROCESS

6. CONCRETE IS POURED

Concrete is poured into the hollow cavity of the wall to create a solid concrete wall.

THE CONSTRUCTION PROCESS

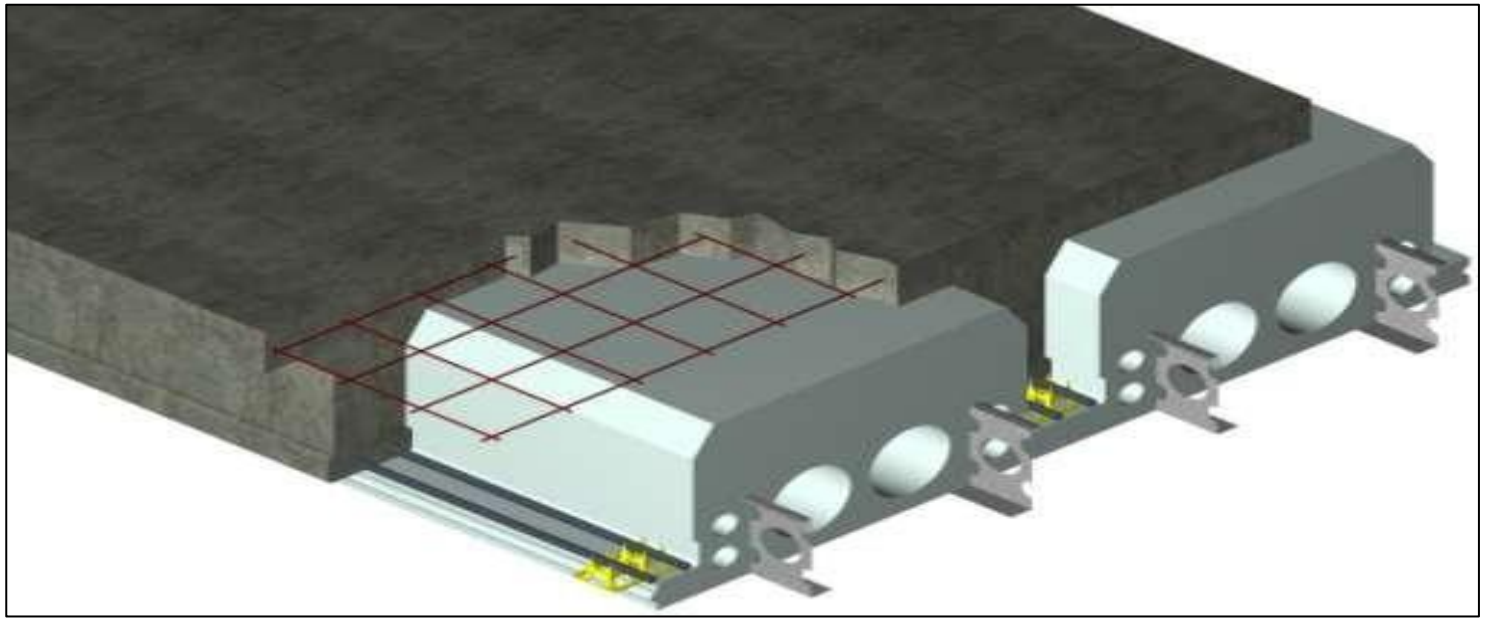
7. COMPLETED WALLS

The result is a solid insulated reinforced concrete wall assembly with excellent thermal resistance and sound transmission properties

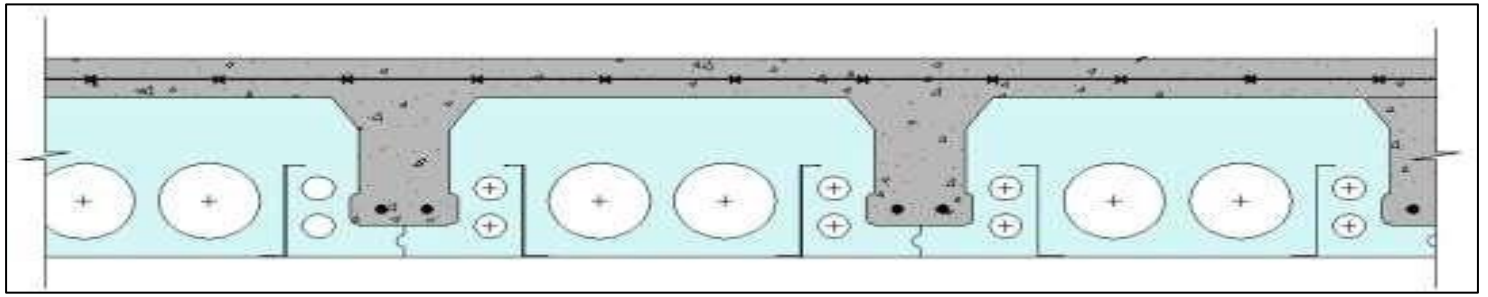
THE CONSTRUCTION PROCESS

8. WALL TO FLOOR CONNECTIONS

Rafters or Steel Struces



Hollow Core Slabs

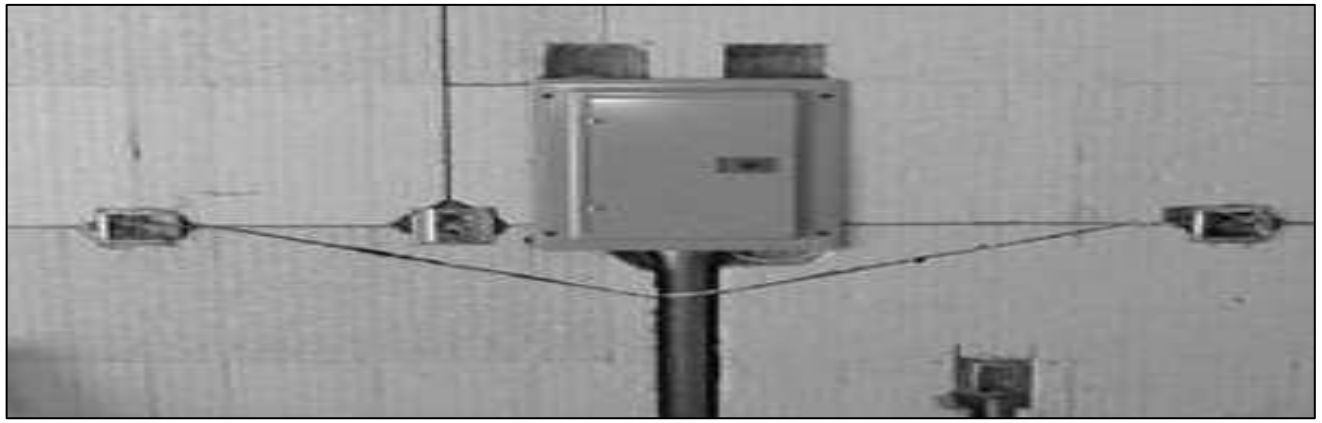


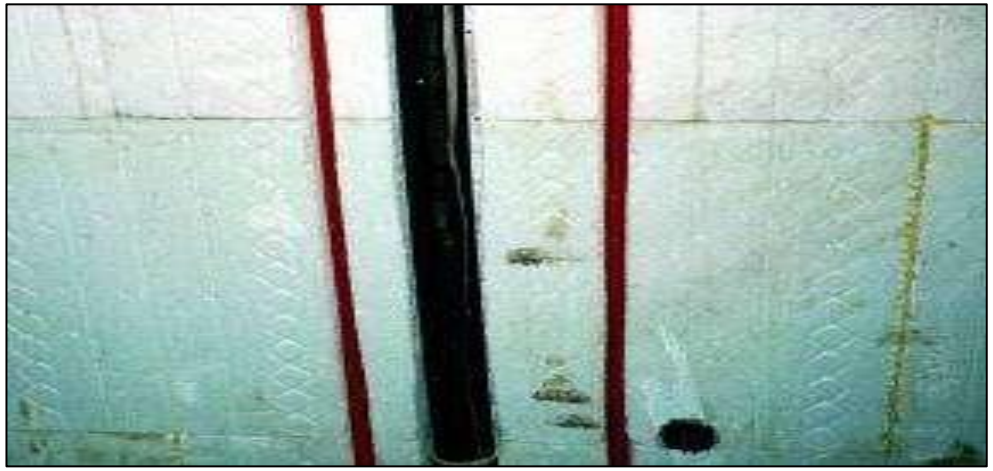
ICF Rib Slabs

THE CONSTRUCTION PROCESS

9. MEP INSTALLATIONS

MEP work is accomplished in various ways





THE CONSTRUCTION PROCESS

10. INTERIOR PARTITIONS

AAC Light Weight Blocks

Light-gauge Metal Framing

THE CONSTRUCTION PROCESS

11. INTERIOR FINISHES

Polymer Plaster

Gypsum Boards

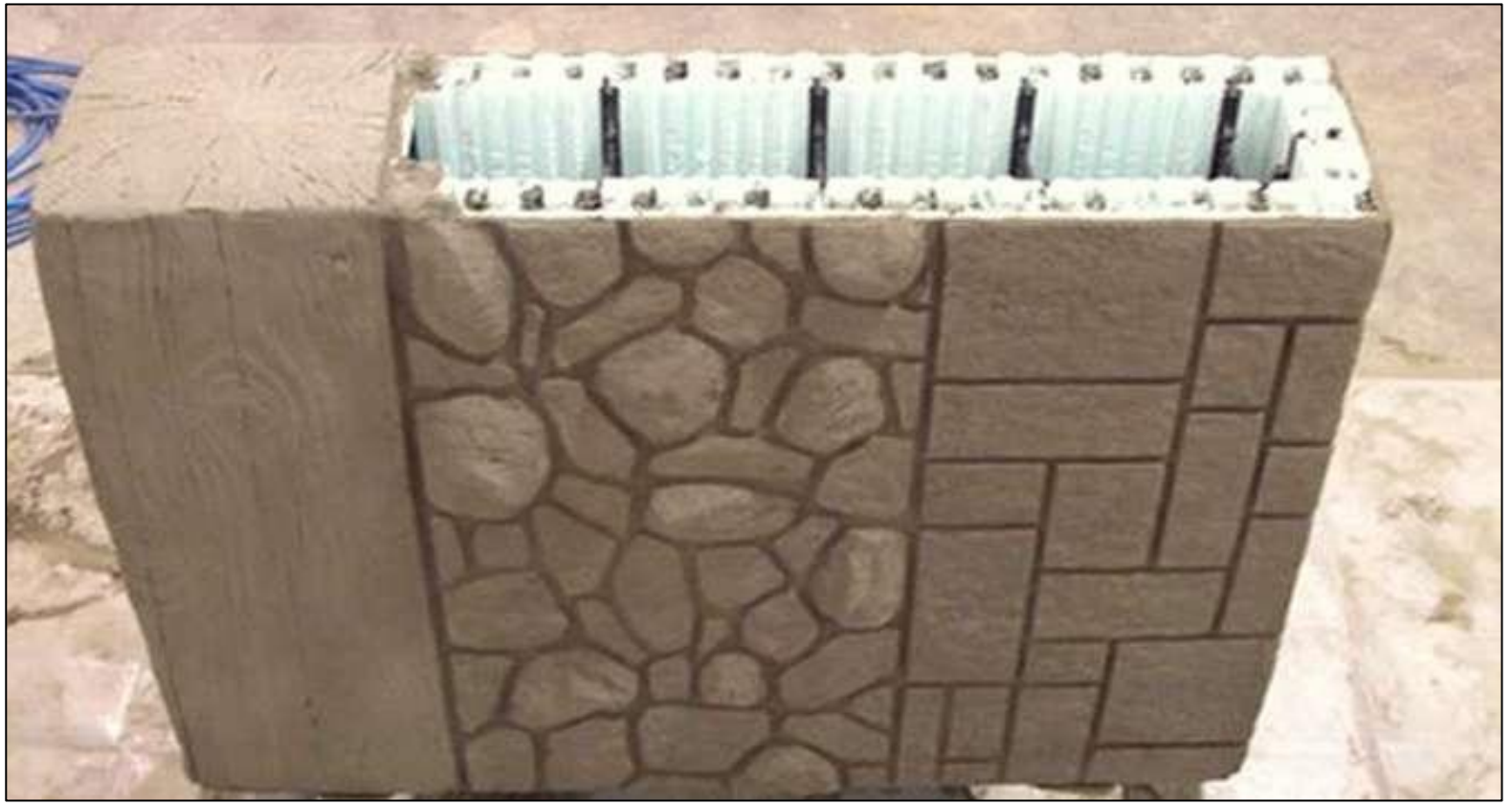
THE CONSTRUCTION PROCESS

12. EXTERIOR WALLS

EIFS or Polymer modified plaster

THE CONSTRUCTION PROCESS

13. EXTERIOR WALLS



Various types of finished can be achieved

ZED BENEFITS

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LEED & ESTIDAMA Green Certified Building System Without Extra investment.

High Insulation Effective Value Of R-55 To R-60

A/C Tonnage Savings Up To 60% to 80%

Highly Insulated Roofs

High Sound Insulation Value Of Up-To 52

Air Tight Construction System

Cracks Free Internal & External Surfaces- 10 Years

Early Return Of Property Investments

Seismic Resistant Construction.

The Project Shall Be Completed 60% Faster

150 Years Life Span Of ICF Building (Minimum)

Extension Friendly Structure.

40% Less Building Dead Load

Economical Construction System

Economical Basement Provision.

ZED BENEFITS

- Alteration Friendly Construction.
- Enables Increase Of Daylight In Building Without Extra Reinforcement.
- Tornado Resistant
- Higher Sales Price
- Lower Design and Construction Costs
- Quicker Sales (Less Marketing Budgets)
- Lower Refurbishment Costs
- Corporate image and Prestige value Branding
- Compliance with legislation and CSR requirements
- Lower transaction fees
- Ability to secure finance
- Increased market value of Development
- Reduced vacancies
- Slower depreciation
- Occupancy rates

ICF CONSTRUCTION VIDEOS

- ICF Construction Videos
- Beam Sustainability

FEEDBACK & DISCUSSION