Econ Wall Insulated Concrete Energy Efficient Affordable Housing Technology
Presentation by: Sanjiv Gosain, Ambe Engineering Pty Ltd, Australia

Thermal Energy Stored in Thick Walls and Floors
Water

Thermal Mass Cooled by flowing Yamuna

Thermal Mass needs to be insulated on the outside to achieve high energy efficiency
**Econ Wall** is a patented insulated concrete thermal mass wall system which combines the thermal mass properties of concrete with insulation to achieve exceptional energy savings.

(Most U Values are indicative only and depend upon the insulation material and thickness)

- **Uninsulated Thermal Mass Wall**
  - U Value 4 w/m² deg K
  - Does not retain stored energy

- **Econ Wall**
  - Insulated Concrete Thermal Mass Wall
  - U Value up to 0.2 w/m² deg K or better
  - Absorbs and retains stored energy
  - Releases back to the interior of the building

- **Double Insulated Concrete Wall**
  - U Value up to 0.09 w/m² deg K or better
  - Exceptional energy efficiency with moderated thermal mass

---

**Problems in the market**

- There are several key problems in the global market:
  - Increasing environmental impact due to growing demand and production of energy.
  - Increases in cost of energy consumption.
  - Mandatory compliance to new and tougher Building Energy Codes.
  - Cost of making energy efficient buildings is very high.
  - All the above are predicted to continue to grow into the future.
  - Additionally conventional building technologies are very slow and labour intensive and it is getting hard to find skilled brick layers.
There are several complex problems which limit the energy performance of buildings. The overall Building Envelope is the weakest energy link which limits performance; The ground slab and slab edges cause a majority of energy to leak to the earth. The walls have large area and absorb a lot of heat or cold to make the building uncomfortable. The windows are among the poorest performers and require improved frames and glazing. The roof has the largest direct exposed area and is the biggest contributor to heat gain or loss. The suspended slabs also leak energy between the various inter tenancy floors. The solution is to have a fully insulated building envelope in which all the walls, roof and slabs are fully insulated from the outside to prevent the ingress of heat or cold. But insulated concrete walls, roofs and slabs are very expensive to build because they require manual forming after which insulation is manually applied as a secondary trade. Building Codes have mandatory performance requirements such as fire rating, waterproofing and energy performance which are very difficult to achieve with conventional building technologies. There is no wall system or slab system which provides a fully integrated solution to these issues.

The Econ Wall and Econ Slab solution is to provide an in-situ integral layer of insulation around the entire building envelope to prevent the ingress of heat and cold in a building. Econ Wall and Econ Slab harnesses the thermal mass properties of insulated concrete and enables it to act as a thermal battery to absorb, store and later release thermal energy which helps to reduce the amount of energy used for the heating and cooling of buildings. Econ Wall and Econ Slab is a stay in place insulating concrete system which combines the structural strength of reinforced concrete along with the energy benefits of insulation into a single building system which helps to drastically reduce the time and labour cost of making high performance energy saving buildings. Econ Wall and Econ Slab further integrates structural reinforced concrete walls, columns, slabs and roofs with integral window and door openings, footings, edge beams, grid beams and insulation into a single one step process without the need for separate trade activities. Econ Wall and Econ Slab can achieve very high levels of energy performance and have the ability to use different types of insulation such as EPS, XPS and PIR etc as required.
Econ Wall & Econ Slab
Insulated Thermal Mass Technology

- Econ Wall and Econ Slab places the insulation on the outside of the concrete thermal mass which enables it to absorb, store and later release thermal energy to achieve exceptional savings in the cost of heating and cooling of buildings while improving comfort levels.

- This differentiates Econ Wall & Econ Slab from other building systems.

---

Econ Wall Technology Drawing

- External Fibre Cement Sheet or Acrylic Render
- External Insulation
- Core-Filled Concrete with Steel Reinforcement
- Internal Fibre Cement Sheet
- Thermal Break Vertical Stud
ECONWALL AFFORDABLE PASSIVE HOUSE - 4 STARS or 5+ STARS
LOW BUILD COST + ULTRA LOW ENERGY CONSUMPTION +
SOLAR PV + BATTERY STORAGE =
SIGNIFICANT & COST SAVINGS WHICH CAN HELP PAY THE MORTGAGE
Australia, USA & China Patents granted, Canada and India in process

Econ Wall Australia Patent
Econ Slab Australia Patent
Econ Wall USA Patent
Econ Wall China Patent

Econ Wall wins MBA National & ACT Awards
Finalist in HIA National Green Smart Product of the Year Award
Finalist in Engineers Australia Engineering Excellence Award

Telstra / Master Builders National Environment / Energy Efficiency Award
Master Builders ACT Sustainable Construction Award
Engineers Australia ACT Engineering Excellence Award Finalist
HIA National Green Smart Product of the Year Finalist
Affordable Housing refers to housing units that are affordable by a section of the society.

Budget 2016 gives massive push to affordable housing and there is huge demand in this sector.

Econ Wall and Econ Slab offer a unique Affordable Energy Efficient Mass Housing technology.

Affordable Energy Efficient Houses with lower build cost means smaller mortgages for owners.

Energy Efficient Homes with very low energy bills with savings that help pay the mortgage.

Plus the added benefit of structurally strong houses with long life and low maintenance.

Occupants live in comfort without the need for air conditioning.

**Econ Wall & Econ Slab for Affordable Energy Efficient Mass Housing**

---

**Typical 2 BHK Affordable Housing Floor Plan**

Range 700 to 900 sq feet [Source: www.affordablehomeindia.com]
Typical 2 BHK Multi Residential Floor Plan
Source: www.dharohar.in

Typical 2 BHK Multi Residential Elevation
Source: www.urbannewsdigest.in
Econ Wall & Econ Slab offer the following unique advantages:

- Stay in place low cost Insulating Concrete Formwork which combines the structural strength of reinforced concrete with the energy savings benefits of insulation in a single integral system.
- Designed to ‘Maximize Energy Performance at Low Initial Capital Cost’
- Builds houses faster with substantial savings in time, labour and interest costs.
- Vertical format for speedy site erection with minimal material wastage.
- Integral CAD CAM technology which links AutoCAD Architect designing with CNC production.
- Modular format with convenient 300 mm modules for low costs with no site wastage.
- Large full height panels which help to deliver mega housing projects in short time.
- Fully integrated system with built in corners, t-walls, windows and door openings.
- Does not require any special skills for installation and general concrete labour can be trained.
- Internal fibre cement layer can be directly painted for a high class finish at low costs.
- EIFS acrylic render systems can be used directly over the external insulation or the external fibre cement layer can be directly texture coated for a high class weather proof finish at low costs.

Econ Wall & Econ Slab – for Affordable High Performance Schools, Colleges, Hospitals, Nursing Homes and other Institutional Buildings.

- Econ Wall & Econ Slab Insulated Concrete Technology provide unique benefits for Institutions;
  - Energy Efficient: High performance buildings with huge savings in ongoing energy costs.
  - Net Zero: Low energy consumption combined with Solar PV can lead to Net Zero Buildings.
  - Stable Temperature: Thermal Mass provides a stable interior temperature for improved comfort levels.
  - Safe & Durable: Structural Concrete provides improved protection against fires and natural disasters.
  - Healthy: Insulated Concrete does not promote mould or mildew which is better for long term health.
  - Air Quality: Insulated Concrete has low air infiltration which leads to improved indoor air quality.
  - Quiet: Insulated Concrete provides better sound insulation and maintains quiet interiors.
  - Lower Initial Cost: Well integrated cost effective technology with huge savings in initial build costs.
  - Speed: Very fast installation which help to save time and labour cost and deliver projects in time.
  - Longevity: The outer insulation layer protects the concrete from the elements for longer building life.
  - Low Maintenance: Insulated Concrete is strong and durable and requires very low maintenance.
  - Fast Deployment: Stay in Place Insulated Concrete Formwork can be deployed fast for large projects.
  - Low Level of Skills: Trade persons with average skills can be easily trained to install the system.

Thank You