

# ECON WALL

CONSERVE ENERGY LIVE IN COMFORT



ECON WALL is an insulated concrete thermal mass wall system which places the insulation on the outside of the concrete walls. In doing so, the insides of the building are free of thermal insulation. This enables the concrete to absorb, store, and later release thermal energy to achieve significant energy savings whilst improving occupant comfort levels.

ECON WALL has been engineered as a versatile stay in place formwork. An outer layer of insulation is connected to an inner layer of fibre cement via a non-conductive polymer stud which also acts as a support for steel reinforcement bars.

Once braced, the resulting cavity is poured with concrete to form an insulated concrete

thermal mass structural wall.

Buildings constructed using ECON WALL can harness both passive and active energy. When combined with a passive solar design, the concrete thermal mass in ECON WALL will capture and store the thermal energy from sun light transferred into the building through windows and doors.

The thermal mass properties of ECON WALL can be extended by embedding hydronic pipes into the concrete walls and circulating hot water through them from a roof top hot water collector or a geothermal system. This active energy method provides comfortable heating at a low cost.



## INSULATED THERMAL MASS

The outside temperature of a house can fluctuate considerably during the course of a day. One way to avoid the corresponding fluctuations in the inside temperature is to use an insulated thermal mass in conjunction with the standard principles of passive solar design. Thermal mass is the ability of a material to absorb and store thermal energy. When combined with external insulation, the insulated thermal mass absorbs thermal energy when the surroundings are higher in temperature than the mass, and gives back when the surroundings are cooler.

In winter the insulated thermal mass is warmed during the day passively by the free solar energy from the sun. It can additionally be warmed passively by the free solar energy collected by a roof top solar hydronic heating system. Thermal energy stored in the mass is then released back into the interior during the night to achieve comfortable living temperatures at a very low operating cost.

In summer the thermal mass needs to be shaded from the higher angle summer sun to prevent over-heating the structure. Then, the insulated thermal mass absorbs the heat from within the house, and in doing so, moderates the interior temperatures to within acceptable levels for human thermal comfort. The lower surface of the thermal mass also helps it to absorb radiant heat directly from the occupants.

For further details on Thermal Mass visit [www.yourhome.gov.au](http://www.yourhome.gov.au)

### ECON WALL has the following key features:

- Stay in place insulated formwork system with insulation on the outside and cement sheet on the inside.
- Vertical system ready to install without the need for any site cutting or assembly.
- Choice of EPS, XPS, PIR or Phenolic rigid insulation.
- Insulation pre coated with advanced reinforced coating system to reduce site finishing costs.
- Provision of built in full services cavity for ease of installation of electrical and plumbing services. The services cavity can be placed inside, outside or on both sides of the concrete wall.
- Integrated window and door sub frames as well as wall starter channels.
- Integrated expansion joints with built in dowel and sleeve system.
- Facility to pour tall walls in multiple lifts from the inside.

### ECON WALL has the following outstanding advantages:

- Integrates the building design and site install processes to achieve significant cost savings.
- Inner cement sheet can be painted to achieve a high quality finish at a low cost.
- High strength system which requires less bracing and reduces the chances of blow outs.
- Modular design which allows the steel reinforcement to be easily placed and visually inspected.

### ECON WALL has the following additional capabilities:

- Insulation can be placed either outside, or inside or both sides of the concrete wall.
- Uninsulated structural concrete walls can be created with cement sheets on both sides.
- Optional hybrid polymer steel spacers to create fire rated walls.
- Insulated basement walls can be created with built in waterproof vinyl outer layer.

## WHY CONCRETE

ECON WALL is a reinforced concrete wall with the following attributes.

### Strength

ECON WALL has the high structural strength of reinforced concrete which results in a solid, strong and durable building structure which is better suited to withstand severe cyclonic weather conditions. Moreover, concrete is the preferred choice for construction in bush fire prone areas as it has a superior ability to withstand fire than other building materials.

### Insulated Thermal Mass and Energy Savings

ECON WALL combines the high thermal mass

of concrete with exceptionally superior insulation values to achieve significant energy savings in the cost of heating and cooling of buildings while maintaining a very comfortable and quite internal living environment.

### Fast and Economical

ECON WALL is an advanced insulated concrete formwork system which is very fast and economical to install on site and results in significant savings in the overall cost of design and construction of buildings.

### Environment Friendly and Sustainable

ECON WALL is environmentally friendly as it is produced using non-toxic and non-cfc/hcfc zero ozone depleting potential materials.

Moreover, the systems maximises the use of recycled materials in its components, and in doing so, supports green building and sustainable construction practices. For example, the ECON WALL can use a concrete mix with high recycled and fly ash content. The vertical pre-fabricated panels are made to the building plans with the aim of minimising construction waste. Moreover, the light weight design of the panels reduces the cost and environmental impact of transportation.

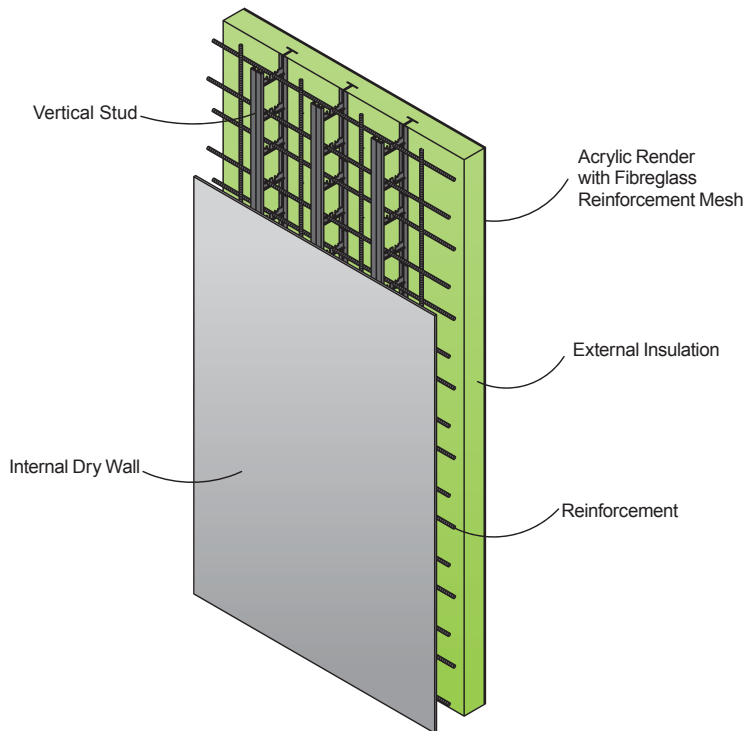
ECON WALL concrete structures are inherently durable and have a very high life span with low maintenance requirements. They provide continuous energy savings and comfort for generations to come.





# ECON WALL SYSTEM COMPONENTS

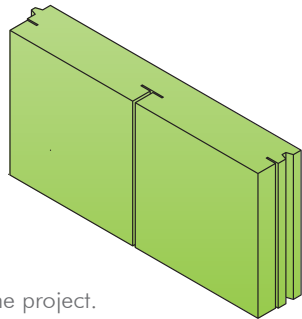
ECON WALL consists of a External Insulation Layer, Thermal Mass Concrete Core and an Inner Dry Wall Layer.



## EXTERNAL INSULATION LAYER

Since every project has different insulation R value performance and cost requirements, ECON WALL has been designed to use a variety of different external insulation sheets such as Expanded Polystyrene EPS, Extruded Polystyrene XPS, Polyisocyanurate PIR and Phenolic Foam.

The external insulation layer is also available in different thicknesses to further optimize it to the R value requirements of the project.



### Expanded Polystyrene EPS

Expanded Polystyrene EPS is a low cost and light weight closed cell rigid insulation board made from expanded polystyrene beads. It has a proven history of performance in building insulation. It is environmentally friendly, non toxic, does not contain any ozone depleting substances, and can be recycled.

EPS is manufactured to Australian Standard AS 1366.3 1992 Class H and contains a flame retardant additive to inhibit accidental ignition from small fire sources, it is also self extinguishing in that it self-extinguishes when the source of the flame is removed.

EPS insulation can confirm to the requirements of BAL 29 Bush Fire Attack Levels when combined with a suitable external render system.

EPS can also be provided with Perform Guard®, an exclusive termite resistant additive. Perform Guard® is made using an inorganic material that is a deterrent to termites and is incorporated into the EPS during manufacture. It is not just a surface additive, but provides fully integrated protection of the EPS for the life of the building. Whilst Perform Guard® EPS is termite resistant but should always be used as part of an overall termite treatment program.

Perform Guard® is exclusive to RMAX in Australia. For enhanced insulation performance BASF Neopor EPS can be used which contains minute particles of graphite that act as infrared reflectors that considerably reduce thermal conductivity and improve the overall performance of the insulation.

EPS outer insulation can be supplied in thicknesses of 100mm, 125mm and 150mm.

For further information on EPS insulation visit [www.rmax.com.au](http://www.rmax.com.au), and [www.foamex.com.au](http://www.foamex.com.au)

### Extruded Polystyrene XPS

Extruded Polystyrene XPS is a light weight high performance closed cell rigid insulation board made from extruded polystyrene. It is environmentally friendly, non toxic, does not contain any ozone depleting substances, and can be recycled. It also contains a flame retardant additive to inhibit accidental ignition from small fire sources, it is also self extinguishing in that it self-extinguishes when the source of the flame is removed.

XPS insulation can confirm to the requirements of BAL 29 Bush Fire Attack Levels when combined with a suitable external render system.

XPS outer insulation can be supplied in thicknesses of 75mm and 100mm.

For further information on XPS insulation visit [www.austech.com.au](http://www.austech.com.au) and [www.foamex.com.au](http://www.foamex.com.au)

### Polyisocyanurate PIR

Polyisocyanurate Foam is a modified polyurethane foam which is used in applications where exceptional insulating values combined with higher service temperatures are required and fire safety is of the utmost importance.

Polyisocyanurate PIR is a light weight high performance thermoset closed cell rigid insulation board made from polyisocyanurate foam with fibre glass facings on both sides. It is non toxic and is produced using non cfc/non hfc zero ozone depleting potential blowing agent gases and is safe for the environment.

Combined with a low environmental impact, enhanced fire performance, structural strength and moisture resistance Polyisocyanurate PIR insulation will deliver a higher level of insulation performance to any building project.

PIR insulation can confirm to the requirements of BAL 40 Bush Fire Attack Levels (extreme fire resistance) when combined with a suitable external render system and can be used for construction of buildings in bush fire prone areas.

PIR outer insulation can be supplied in thicknesses of 75mm and 100mm.

For further information on PIR insulation visit [www.pirfoam.com.au](http://www.pirfoam.com.au)

### Phenolic Foam

Phenolic Foam is a light weight super high performance thermoset closed cell rigid insulation board made from phenolic foam with tissue based facings on both sides. It is non toxic and is produced using non cfc/non hfc zero ozone depleting potential blowing agent gases and is safe for the environment. The use of Phenolic Foam is growing world-wide in response to building code demands for superior thermal insulation and higher levels of fire capability and safety.

Phenolic Foam insulation can confirm to the requirements of BAL 40 Bush Fire Attack Levels (extreme fire resistance) when combined with a suitable external render system and can be used for construction of buildings in bush fire prone areas.

Phenolic outer insulation can be supplied in thickness of 80mm.

For further information on Phenolic insulation visit [www.kingspaninsulation.com.au](http://www.kingspaninsulation.com.au)

## CONCRETE THERMAL MASS CORE

ECON WALL has an inner core of in-situ poured reinforced concrete which has a very high thermal mass and enables the wall to absorb, store, and later release thermal energy to achieve significant energy savings whilst improving occupant comfort levels.

## INTERNAL DRY WALL LAYER

The internal drywall layer is made from highly durable smooth and impact resistant fibre cement sheets. These sheets are strong enough to withstand the substantial forces generated during the pouring and subsequent curing of concrete. The inner dry wall layer is thermally conductive and allows the flow of heat to the concrete core to enable it to perform as a thermal mass wall.

The internal drywall layer can also be made from MGO (magnesium oxide) sheets for superior fire, water, mould and vermin resistance.

The internal drywall layer is very smooth and is ready to accept high quality paint or applied finishes. The internal drywall layer is supplied in thicknesses of 9mm or 10mm.

For further information on Fibre Cement sheets visit [www.cemintel.com.au](http://www.cemintel.com.au), [www.bgc.com.au](http://www.bgc.com.au), [www.jameshardie.com.au](http://www.jameshardie.com.au), For MGO sheets visit [www.mgoboard.com.au](http://www.mgoboard.com.au)

## VERTICAL STUD



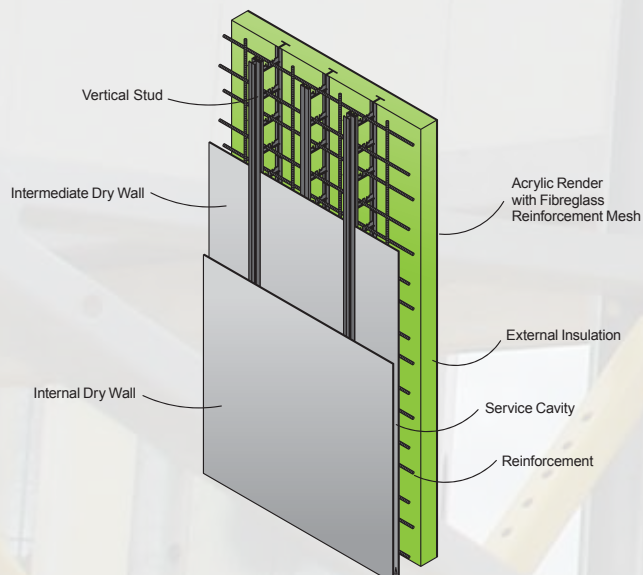
The vertical stud is a non conductive thermal break stud made from recycled polymers such as polypropylene or polyethylene, and has built in slots which act as supports for placement of the steel reinforcement bars.

The vertical stud is also available with a built in extended flange for the creation of a full service cavity which can be placed inside, outside or both sides of the concrete wall. The vertical stud extends between the outer insulation layer and the inner drywall layer and interlocks them in such a manner so as to create a stay in place insulated formwork system in which reinforcement is placed and uncured concrete is poured to form a insulated concrete thermal mass wall. The vertical stud is very strong and has been engineered to withstand the substantial forces that are generated during the pouring and subsequent curing of concrete.

Optionally the vertical stud can be made from a hybrid of steel and polymers for the construction of fire rated concrete walls without any thermal bridging.

The vertical stud is modular in design and is available in various formats which allow the insulation to be placed outside, inside or both sides of the concrete wall. It can also be used to build uninsulated concrete walls with only fibre cement sheets on both sides.

## ECON WALL SC WITH BUILT IN SERVICES CAVITY



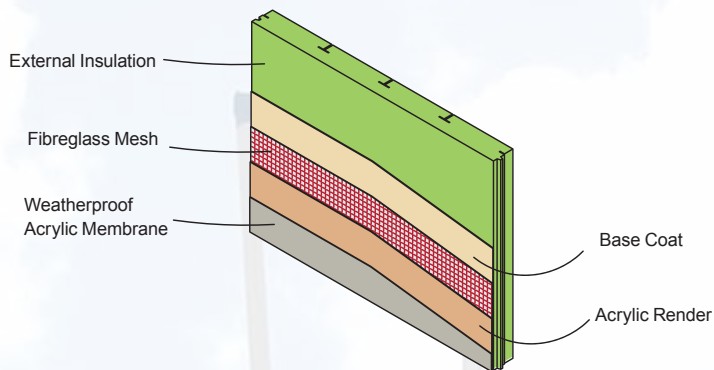
ECON WALL SC has a special modular vertical stud with a built in extended flange for the creation of a full service cavity which can be placed inside, outside or on both sides of the concrete walls. The built in full services cavity allows for easy installation of electrical, communications, plumbing and other services without the need to put cast in conduits.

The service cavity can be covered with gypsum, fibre cement or magnesium oxide sheets to provide a smooth surface over which standard paint and applied finishes can be applied.

## EXTERNAL FINISHING

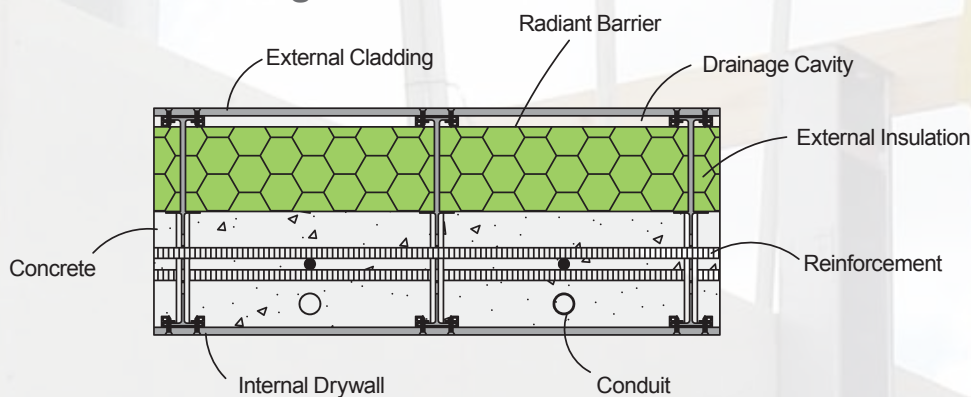
ECON WALL can be finished in various options depending upon the aesthetic and protection levels required for the project.

### External Insulation Finish Systems (EIFS)



External Insulation Finish Systems or Acrylic Render Systems as they are commonly called are very popular because they create a durable and stylish exterior finish that is very cost effective and low maintenance. High Build Acrylic Render Systems utilize fibreglass mesh for reinforcement to provide additional strength, flexibility, impact resistance and durability to the exterior finish. The outer insulation can optionally be supplied pre finished with an enhanced coating system and reinforced with fibreglass mesh for strength and easy application of renders and outer finishes. For further information on Acrylic Render Systems visit [www.acratex.com.au](http://www.acratex.com.au), [www.granosite.com.au](http://www.granosite.com.au), [www.rockcote.com.au](http://www.rockcote.com.au), and [www.rendersystemsaustralia.com.au](http://www.rendersystemsaustralia.com.au)

### External Cladding



ECON WALL has a unique vertical stud design which has built in external furring channels made of extruded aluminium or sheet steel which provide a highly durable surface for easy attachment of various external cladding materials such as fibre cement sheets, panels or siding, aluminium composite panels, colour bond corrugated sheet steel etc.

The vertical stud with the built in external furring channels also creates a cavity between the insulation and the external cladding. This cavity provides effective drainage for water, moisture and condensation and also allows air to circulate to keep the external cladding cool and dry.

The unique design of the external furring channels and the resulting air space also allow for additional radiant barriers or insulation pre laminated with radiant barriers to be easily installed on the exterior walls of the house. This will further inhibit heat transfer by thermal radiation.

Insulated Vinyl Cladding can also be easily attached to the vertical studs to provide enhanced insulation and weather protection to the building. For further information on vinyl cladding visit [www.mittenvinyl.com.au](http://www.mittenvinyl.com.au), and [www.austech.com.au](http://www.austech.com.au),

### Stone Veneer & Tiles

Light weight thin stone veneer and thin tiles can also be attached directly to the insulation using suitable flexible adhesives.

## INTERNAL FINISHING

ECON WALL has a highly smooth internal drywall layer which can be easily finished by joint setting and skim coating. The surface can then be directly painted using standard paint and applied finishes to achieve a high quality smooth interior finish.

For further information on internal finishing of Fibre Cement sheets visit [www.cemintel.com.au](http://www.cemintel.com.au), [www.bgc.com.au](http://www.bgc.com.au), [www.jameshardie.com.au](http://www.jameshardie.com.au), For MGO sheets visit [www.mgoboard.com.au](http://www.mgoboard.com.au)





# ECON WALL SPECIFICATIONS

## ECON WALL with EPS Expanded Polystyrene Outer Insulation

Model No	External Insulation Thickness mm	Concrete Core Thickness mm	Internal Dry Wall Thickness mm	Total Wall Thickness mm*	Concrete Usage m <sup>3</sup> /m <sup>2</sup>	EPS Insulation H Grade R-Value**
EW-EPS-100-100	100	100	10	210	0.10 m <sup>3</sup> /m <sup>2</sup>	2.8
EW-EPS-125-100	125	100	10	235	0.10 m <sup>3</sup> /m <sup>2</sup>	3.5
EW-EPS-150-100	150	100	10	260	0.10 m <sup>3</sup> /m <sup>2</sup>	4.2
EW-EPS-100-150	100	150	10	260	0.15 m <sup>3</sup> /m <sup>2</sup>	2.8
EW-EPS-125-150	125	150	10	285	0.15 m <sup>3</sup> /m <sup>2</sup>	3.5
EW-EPS-150-150	150	150	10	310	0.15 m <sup>3</sup> /m <sup>2</sup>	4.2
EW-EPS-100-200	100	200	10	310	0.20 m <sup>3</sup> /m <sup>2</sup>	2.8
EW-EPS-125-200	125	200	10	325	0.20 m <sup>3</sup> /m <sup>2</sup>	3.5
EW-EPS-150-200	150	200	10	350	0.20 m <sup>3</sup> /m <sup>2</sup>	4.2

Width of Panels: 1200mm, 600mm, 450mm, 300mm, 150mm (custom widths panels also available)  
 Height of Panels: 2500mm, 2800mm, 3100mm (custom heights panels are also available)  
 \* for ECON WALL SC with built in services cavity add 40mm to the overall wall thickness  
 \*\* Estimated R Value (final R Value would depend upon grade and brand of material selected)

## ECON WALL with XPS Extruded Polystyrene Outer Insulation

Model No	External Insulation Thickness mm	Concrete Core Thickness mm	Internal Dry Wall Thickness mm	Total Wall Thickness mm*	Concrete Usage m <sup>3</sup> /m <sup>2</sup>	XPS Insulation R-Value**
EW-XPS-75-100	75	100	10	185	0.10 m <sup>3</sup> /m <sup>2</sup>	2.7
EW-XPS-100-100	100	100	10	210	0.10 m <sup>3</sup> /m <sup>2</sup>	3.6
EW-XPS-100-150	100	150	10	260	0.15 m <sup>3</sup> /m <sup>2</sup>	2.7
EW-XPS-125-150	125	150	10	285	0.15 m <sup>3</sup> /m <sup>2</sup>	3.6
EW-XPS-100-200	100	200	10	310	0.20 m <sup>3</sup> /m <sup>2</sup>	2.7
EW-XPS-125-200	125	200	10	325	0.20 m <sup>3</sup> /m <sup>2</sup>	3.6

Width of Panels: 1200mm, 600mm, 450mm, 300mm, 150mm (custom widths panels also available)  
 Height of Panels: 2500mm, 2800mm, 3100mm (custom heights panels are also available)  
 \* for ECON WALL SC with built in services cavity add 40mm to the overall wall thickness  
 \*\* Estimated R Value (final R Value would depend upon grade and brand of material selected)

## ECON WALL with Phenolic Foam Outer Insulation

Model No	External Insulation Thickness mm	Concrete Core Thickness mm	Internal Dry Wall Thickness mm	Total Wall Thickness mm*	Concrete Usage m <sup>3</sup> /m <sup>2</sup>	Phenolic Insulation R-Value**
EW-PH-80-100	80	100	10	185	0.10 m <sup>3</sup> /m <sup>2</sup>	4.2
EW-PH-100-150	80	150	10	260	0.15 m <sup>3</sup> /m <sup>2</sup>	4.2
EW-PH-100-200	80	200	10	310	0.20 m <sup>3</sup> /m <sup>2</sup>	4.2

Width of Panels: 1200mm, 600mm, 450mm, 300mm, 150mm (custom widths panels also available)  
 Height of Panels: 2500mm, 2800mm, 3100mm (custom heights panels are also available)  
 \* for ECON WALL SC with built in services cavity add 40mm to the overall wall thickness  
 \*\* Estimated R Value (final R Value would depend upon grade and brand of material selected)

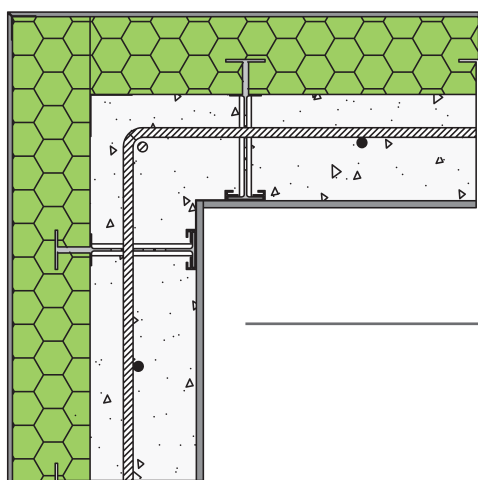
## ECON WALL with PIR Polyisocyanurate Outer Insulation

Model No	External Insulation Thickness mm	Concrete Core Thickness mm	Internal Dry Wall Thickness mm	Total Wall Thickness mm*	Concrete Usage m <sup>3</sup> /m <sup>2</sup>	PIR Insulation R-Value**
EW-PIR-75-100	75	100	10	185	0.10 m <sup>3</sup> /m <sup>2</sup>	3.3
EW-PIR-100-100	100	100	10	210	0.10 m <sup>3</sup> /m <sup>2</sup>	4.4
EW-PIR-100-150	100	150	10	260	0.15 m <sup>3</sup> /m <sup>2</sup>	3.3
EW-PIR-125-150	125	150	10	285	0.15 m <sup>3</sup> /m <sup>2</sup>	4.4
EW-PIR-100-200	100	200	10	310	0.20 m <sup>3</sup> /m <sup>2</sup>	3.3
EW-PIR-125-200	125	200	10	325	0.20 m <sup>3</sup> /m <sup>2</sup>	4.4

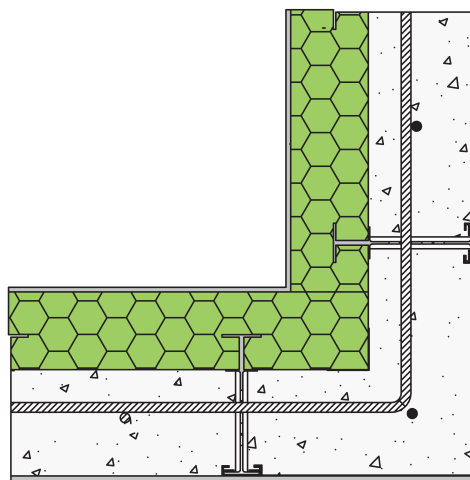
Width of Panels: 1200mm, 600mm, 450mm, 300mm, 150mm (custom widths panels also available)  
 Height of Panels: 2500mm, 2800mm, 3100mm (custom heights panels are also available)  
 \* for ECON WALL SC with built in services cavity add 40mm to the overall wall thickness  
 \*\* Estimated R Value (final R Value would depend upon grade and brand of material selected)

# COMPLETE SYSTEM

ECON WALL is a fully integrated system with several accessories to help complete the project.



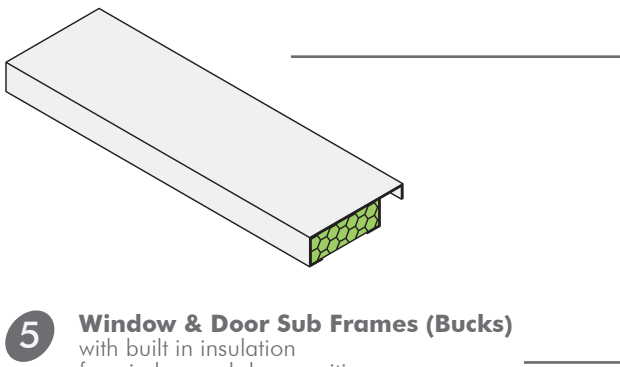
**1 External Corner Modules**  
for building external corners.



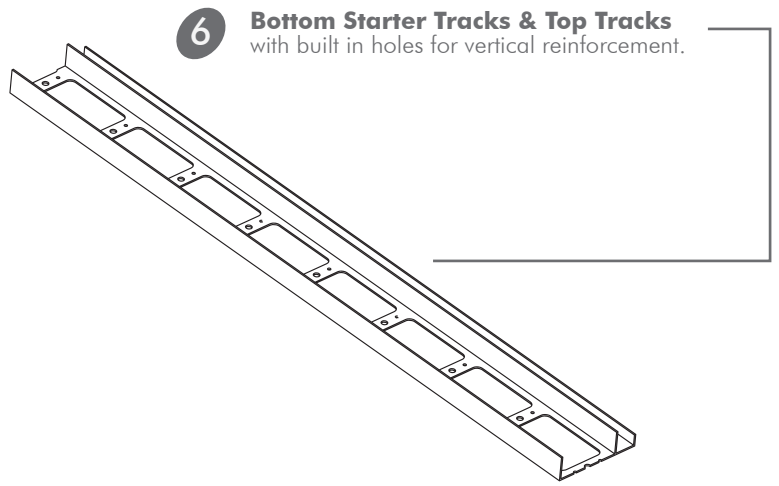
**2 Internal Corner Modules**  
for building internal corners.

**3 Window Sill Modules**  
for building the bottom sills of windows

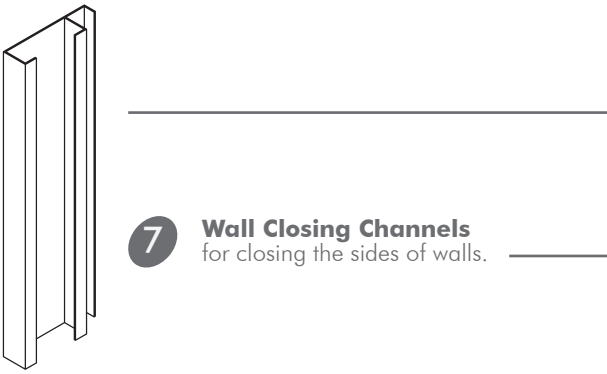
**4 Window & Door Lintel Modules**  
for building the top lintels of windows and doors



**5 Window & Door Sub Frames (Bucks)**  
with built in insulation  
for window and door cavities.



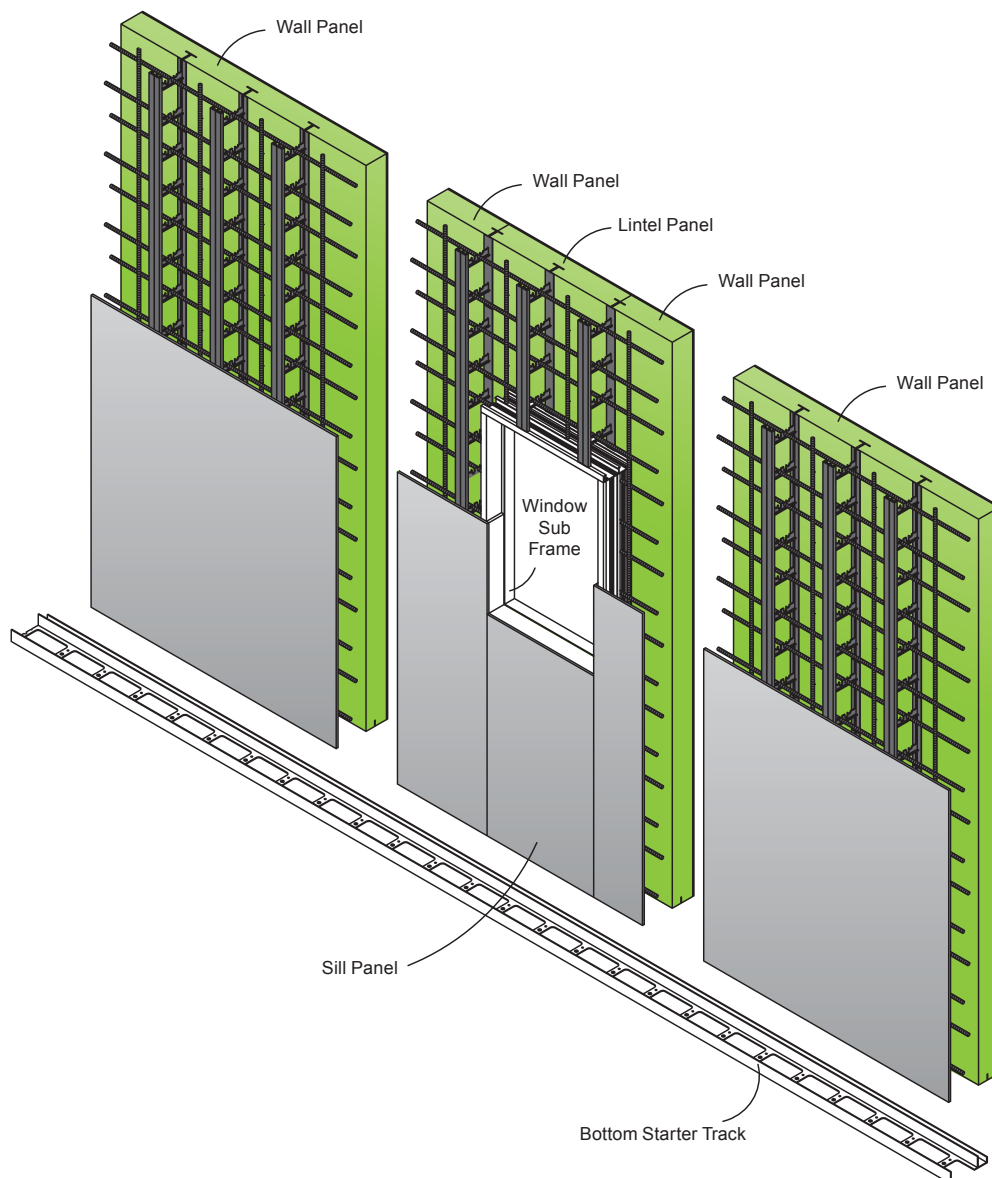
**6 Bottom Starter Tracks & Top Tracks**  
with built in holes for vertical reinforcement.



**7 Wall Closing Channels**  
for closing the sides of walls.

**8 Integrated Expansion Joints**  
with built in dowel and sleeve system  
for creating construction joints.

**9 Pouring Ports**  
for pouring tall walls in multiple lifts.



## EASY INSTALLATION

ECON WALL is a fully integrated vertical system which is very easy to install on site.

1. Install Starter Track on the perimeter of the concrete slab and install the starter bars.
2. Install the first vertical module on the starter track followed by the adjoining modules.
3. Install the external corner and internal corner modules.
4. Install the Position the windows and doors sill and lintel modules along with their sub frames.
5. Place the reinforcement in the cavity and brace the formwork.
6. Pour concrete into the cavity with a concrete pump.

It is also very easy to integrate ECON WALL into the overall building construction.

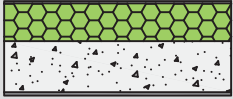
## CONCRETE SPECIFICATIONS

Concrete is to be specified by structural engineer and the following is only a general guide;

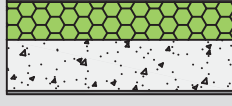
- Aggregate Size : 7mm to 10mm (maximum)
- MPa : 20 to 30 MPa
- Sump: 100 to 120
- Water/Cement Ratio : < 0.60
- Plasticizers and additives to be added to improve the concrete flow and self consolidation.

# MODULAR WALL CONFIGURATIONS

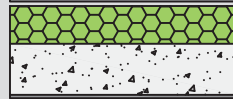
ECON WALL is a modular system which allows a vast range of wall configurations to be built to suit the specific requirements and geographic location of the project.



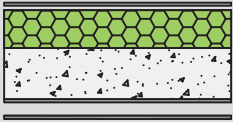
**Wall 1**  
External Insulation  
Internal Dry Wall



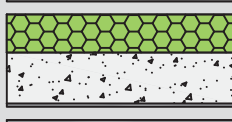
**Wall 2**  
External Insulation  
Internal Dry Wall  
Internal Service Cavity



**Wall 3**  
External Cladding  
External Drainage Cavity  
External Insulation  
Internal Dry Wall



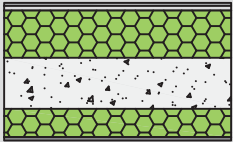
**Wall 4**  
External Cladding  
External Drainage Cavity  
External Insulation  
Internal Dry Wall  
Internal Service Cavity



**Wall 5**  
External Cladding  
External Service Cavity  
External Insulation  
Internal Dry Wall  
Internal Service Cavity



**Wall 6**  
External Insulation  
Internal Insulation  
Internal Dry Wall



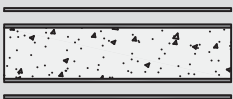
**Wall 7**  
External Cladding  
External Drainage Cavity  
External Insulation  
Internal Dry Wall



**Wall 8**  
No Insulation  
External Dry Wall  
Internal Dry Wall



**Wall 9**  
No Insulation  
External Dry Wall  
Internal Dry Wall  
Internal Service Cavity



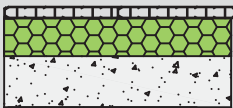
**Wall 10**  
No Insulation  
External Service Cavity  
External Dry Wall  
Internal Dry Wall  
Internal Service Cavity



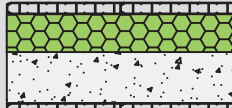
**Wall 11**  
External Insulation  
Internal Polymer Timber  
built-in Service Cavity



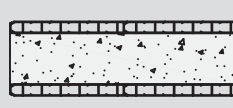
**Wall 12**  
External Cladding  
External Drainage Cavity  
External Insulation  
Internal Polymer Timber  
built-in Service Cavity



**Wall 13**  
External Polymer Cladding  
built-in Drainage Channels  
External Insulation  
Internal Dry Wall  
(for basements)



**Wall 14**  
External Polymer Cladding  
built-in Drainage Channels  
External Insulation  
Internal Polymer Timber  
built-in Service Cavity  
(for basements)



**Wall 15**  
No Insulation  
External Polymer Cladding  
built-in Drainage Channels  
Internal Polymer Timber  
built-in Service Cavity  
(for carports)

