


# Build Better with Benex





Benex is an innovative, cost effective, versatile wall construction system. Our mission is to be our Customer's first choice for high performing wall solutions. With our unrivalled technology, superior performance and a strong customer service culture, Benex works hard to make every project a success. **Build Better with Benex.**

**ARCHITECTS/DESIGNERS**

Design flexibility  
Documented design detailing  
Technical support

**BUILDERS**

Competitive on wall cost  
Typical construction details  
Speed of build

**ENGINEERS**

Construction & technical detail  
Technical support  
Product performance specifications

**DEVELOPERS**

Reduction in project costs  
Design flexibility  
Faster construction

Build Better.  
**BENEX**

Benex is a fully owned and operated Australian company.

Our patented interlocking design and product mix produce exceptional performance properties and will enhance any project.

This guide provides technical information and an understanding of how you can 'Build Better with Benex'.

For additional information visit  
[www.benex.com.au](http://www.benex.com.au)

# Benex Wall Solutions



The Benex Wall Construction System offers a wall solution for most masonry wall requirements in building today. Benex excels in retaining, basement, intertenancy and fire wall solutions, offering time savings and lower overall project costs.

## **BASEMENT WALL SYSTEM**

No need to waterproof, with reduced excavation costs.

## **FIRE WALL SYSTEM**

4 hour structural fire rating, without core-filling.

## **RETAINING WALL SYSTEM**

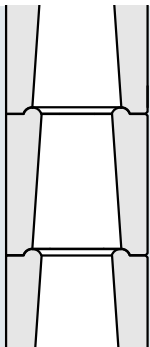
Quick to lay, no mold, mildew or rising damp.

## **INTERTENANCY WALL SYSTEM**

Great acoustic properties for shared or intertenancy walls or large acoustic fences that are 4 hour fire rated.

- ✓ 4 hour fire rating
- ✓ Impervious to water
- ✓ Reduced excavation costs
- ✓ Acoustic qualities
- ✓ Thermal excellence
- ✓ Resistance to salt attack
- ✓ No additional tanking/waterproofing
- ✓ No rising damp, mould or mildew
- ✓ Speed of construction
- ✓ Labour savings
- ✓ Ease of fixings & adding services

# Wall Types & Applications

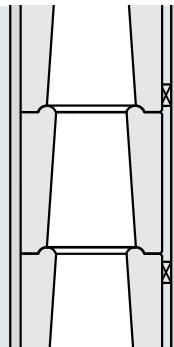


## STANDARD IMPERVIOUS WALL

Hollow wall  
4 hour fire rated  
Load bearing wall

### APPLICATION

Fire walls  
General structural walls  
Planter boxes (up to 800mm)

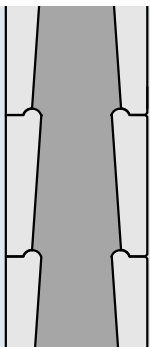


## SPANDREL WALL

Hollow wall  
4 hour fire rated  
Rondo battens  
Plasterboard

### APPLICATION

Fire walls  
Commercial constructions

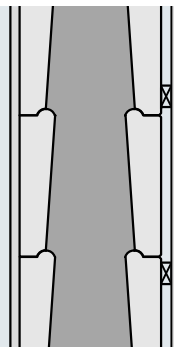


## ACOUSTIC WALL

Core-filled  
Rw + Ctr 50

### APPLICATION

Fire walls  
Intertenancy walls

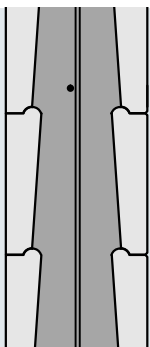


## COMPOSITE ACOUSTIC WALL

Core-filled  
Quietwave & plasterboard  
Rw + Ctr 57

### APPLICATION

Intertenancy walls  
Single occupancy units

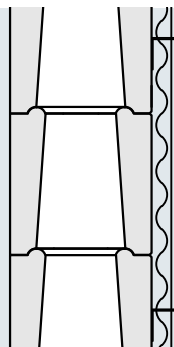


## REINFORCED WALL

Core-filled  
Reinforced

### APPLICATION

Retaining wall  
Basement wall  
Lift shafts



## COMPOSITE WALL

Hollow wall  
Aircell insulation  
Plasterboard

### APPLICATION

Fire walls  
Residential construction  
Thermal wall

# Installation Guidelines



**1** Clear base of all debris



**2** Use brickies mortar mix with waterproofing agent



**3** Ensure first course is level both directions



**4** Basements and retaining walls require reinforcing



**5** Use the Benex Adhesive Gun to apply Benex Adhesive



**6** Apply Benex Adhesive to horizontal and vertical ends



**7** Maximum span between control joints is 8m



**8** Use notched Benex for horizontal reinforcing



**9** Check blockwork for plumb and straight each course



**10** Can be core-filled for added strength where required



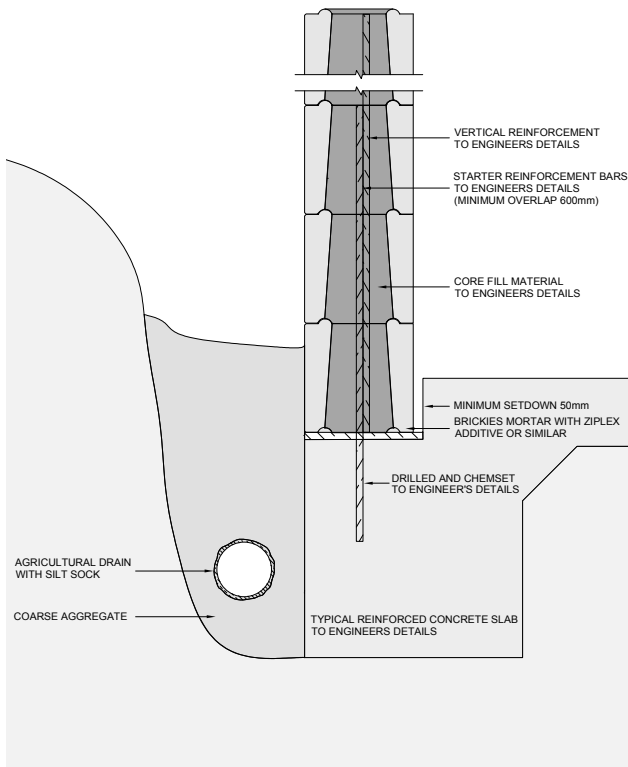
**11** Use type 17 wood screws for fixings



**12** Apply acrylic or cement renders as manufacturers specifications

## Basement Detail

TYPICAL BASEMENT BENEX WALL DETAIL

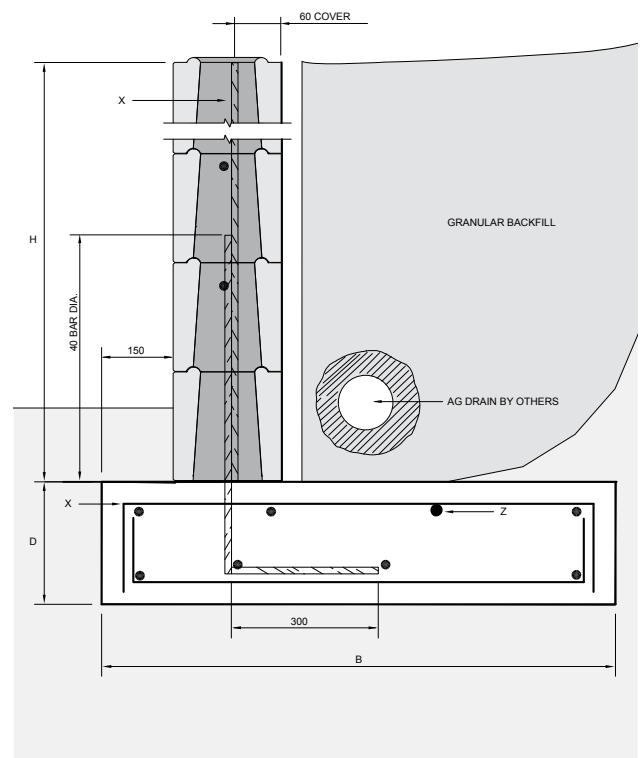


The Benex Wall Construction System being resistant to salt attack is the ideal solution for basement walls with reduced excavation required and no need to waterproof, Benex will save you both time and money on your next project.

Excavation can be reduced from 750mm to 150mm leaving enough room for ag pipe drainage and reducing the need for backfill.

## Block Retaining Detail

BLOCK RETAINING WALL RW2/SFC



### Retaining Wall Schedule - RW2/SFC 200 Thick Blockwork

All horizontal reinforcement to be N12-400. UNO

Height H	Breth B	Toe Depth D	Reinforcement X	Reinforcement Z	Design Bending Moment (kNm/M Run of Wall)
600 - 1000	800	300	N12-600 (450 LAP)	N12-300	3
1001 - 1500	1000	300	N12-600 (450 LAP)	N12-300	8.45
1501 - 2000	1400	300	N12-600 (450 LAP)	N12-300	18
2001 - 2400	1800	300	N16-300 (650 LAP)	N12-300	19.6

Provide N12 support bars in footing, same spacing as main footing reinforcement

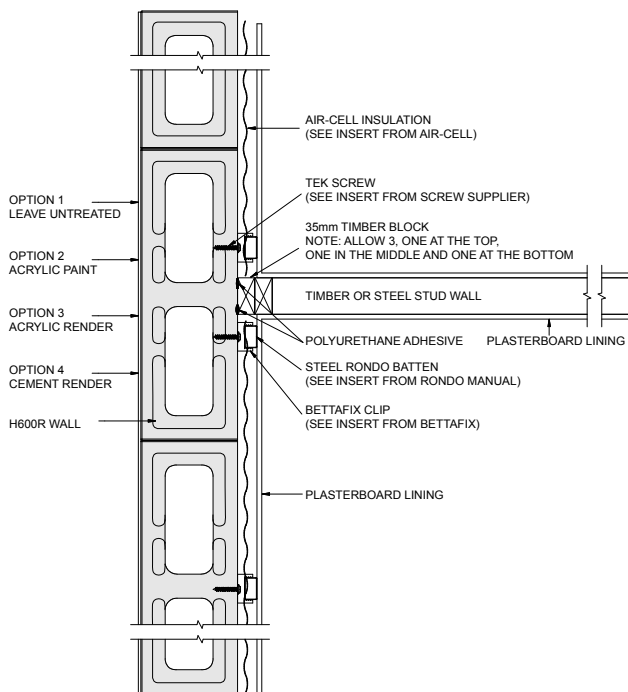
**Concrete F<sub>c</sub> = 25MPa in wall**

A Benex retaining wall is appropriate for low garden retaining walls up to higher engineered retaining walls. It can accept both horizontal and vertical reinforcing and can be core-filled to your engineers' requirements.

Dig Less, Build Faster with a Benex Retaining Wall System. Less Excavation, Less Back Fill, No Water Membranes & No Worksafe "Shoring". Reduces trade contractors required on site.

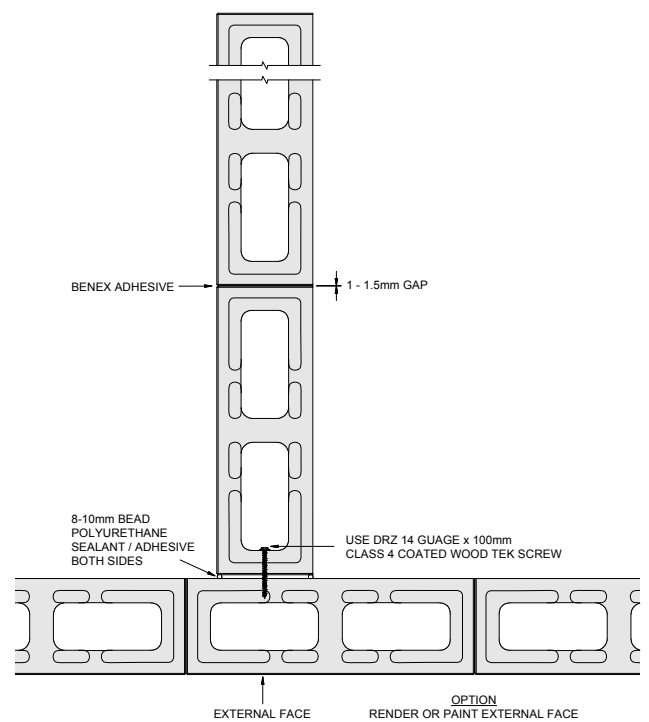
## Composite Wall Detail

BENEX COMPOSITE WALL DETAIL



## Intersecting Wall Detail

TYPICAL DETAIL FOR INTERSECTING WALLS INCLUDING INTERIOR LINING



Build the Wall you want with Benex using your selected composite materials.

Whether you want a “Cool Wall” for Summer or a “Warm Wall for the Winter, Benex composite solutions are almost endless.

Benex Walls can be arranged in many positions to suit your design.

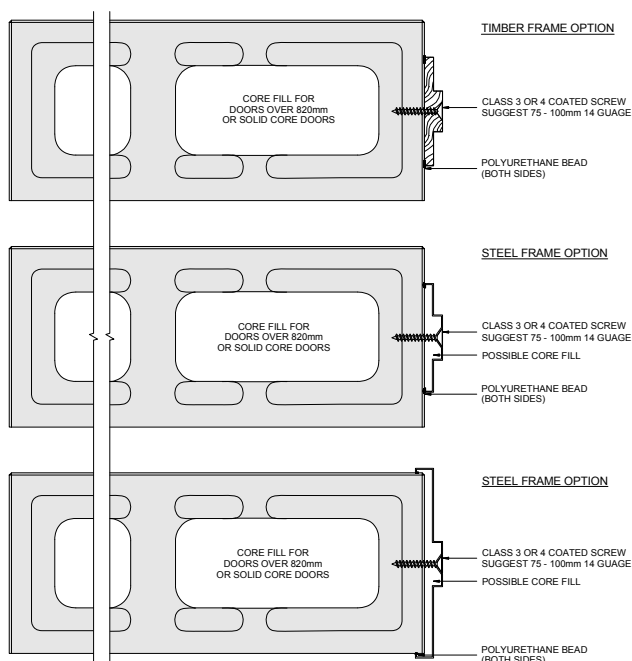
Intersecting Benex Walls are simply erected & mechanically fixed during the installation with “Bugle Head” or Batten Screws. Concrete “Core-filling” at intersecting walls is normally advised to add strength to the joint.





## Frame Door Fixings

TYPICAL DOOR FRAME CONNECTION DETAILS

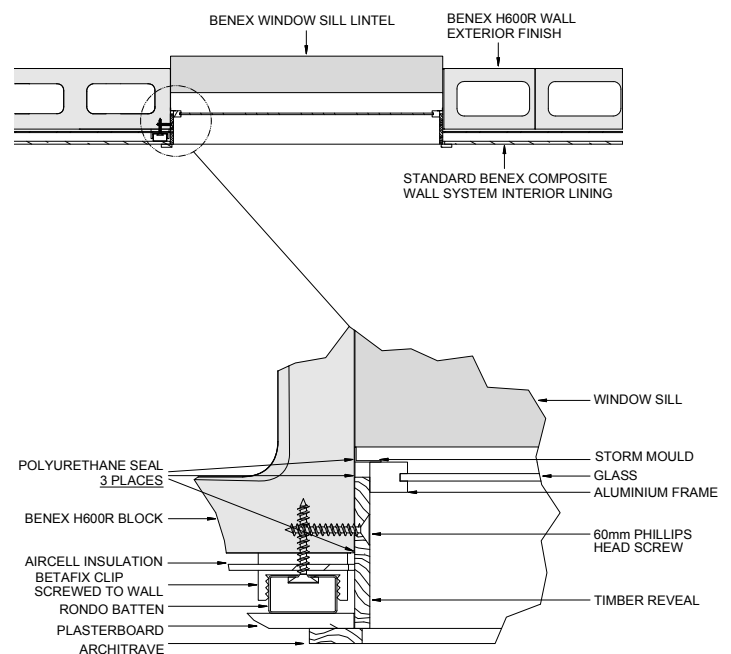


Aluminium & Timber Door Frames can be fitted simply by screw fixing directly into Benex.

Steel Fire Door Frames are fitted within the Benex Wall during the Wall installation.

## Window Fixings

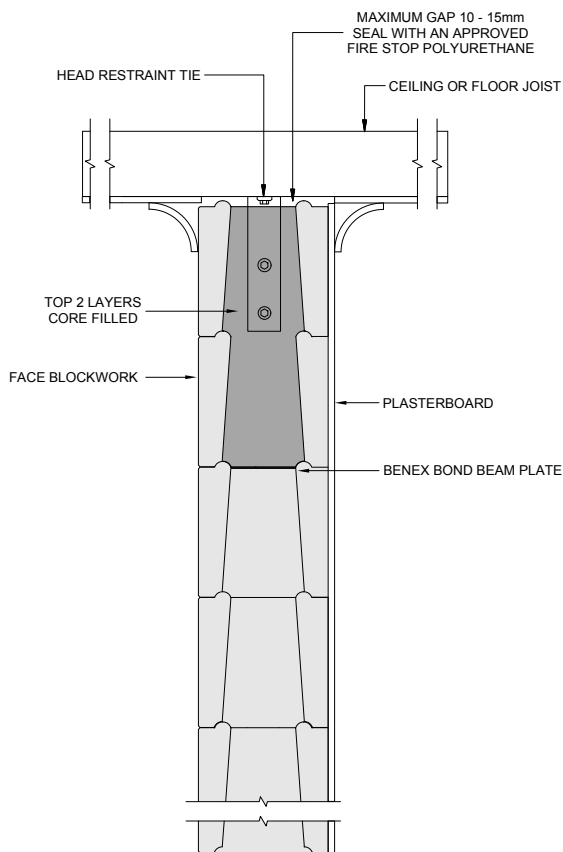
ALUMINIUM WINDOW FRAME DETAILS



Fixing Windows to Benex is faster than other wall systems as frames are directly screw fixed into the Benex Opening with standard & appropriate Class 3 External Grade screws. No "Wall Plugs" required.

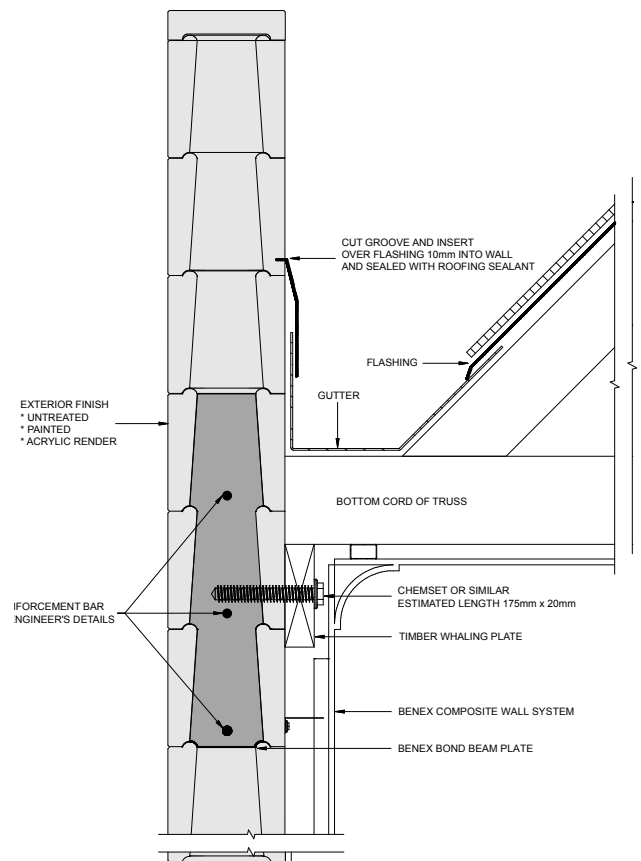
## Intertenancy Wall Detail

TYPICAL INTERTENANCY WALL DETAIL  
 Rw 37 - NOT CORE-FILLED/NO PLASTERBOARD  
 Rw 50 - CORE-FILLED/PLASTERBOARD



## Typical Connection Detail

TYPICAL BENEX CONNECTION DETAIL FOR BOTTOM CORD CONNECTION TO REINFORCED PARAPET WALL



NOTE: THIS IS A PRELIMINARY DESIGN THAT HAS NOT BEEN APPROVED BY A STRUCTURAL ENGINEER. ESTIMATED MAXIMUM OF 3 COARSE TO BE REINFORCED AND CORE FILLED.

When privacy and safety is paramount, building with a Benex Intertenancy Wall System will ensure the noise is significantly reduced and will control the spread of fire.

Benex can deliver high level acoustic and 4 hour fire rated solutions.

There are no limits to what & where you can fix a structural element to a Benex Wall.

Simply by strengthening the appropriate area of Benex Wall with Concrete Core-fill, you can fix any building element to support Roof, Floor, Wall & other structural components. Always consult your Structural Engineer for specific details.

# Exterior Finishes



You can choose a finish to match your design requirements when using Benex.

**Raw** - Benex has a raw finish offering the choice of a smooth surface or when the product is reversed a unique rough architectural finish. Either face of the Benex Wall System can be used as a finished wall without any additional paints or renders.

**Render** - Alternately, you can change the exterior look of Benex by simply applying approved Render Finishes or Texture Coatings to match your design requirements. Pre Mixed Acrylic Coatings are ideal for adding your individual touch to a Benex project.

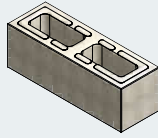
**Paint** - Benex does not absorb moisture making painting a viable option. Many traditional masonry products absorb moisture making it difficult to paint as moisture can act as a bond breaker over time enabling paint to simply flake off. Issues such as rising damp and mould forming are also alleviated for this reason.

## Product Range

### BENEX H600R

Length – 600mm  
Height – 200mm  
Width – 200mm

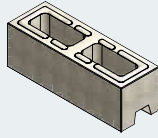
Items per pallet – 84  
Weight – 13kg



### BENEX H600KO

Length – 600mm  
Height – 200mm  
Width – 200mm

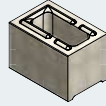
Items per pallet – 84  
Weight – 13kg



### BENEX H300R (Half Block)

Length – 300mm  
Height – 200mm  
Width – 200mm

Items per pallet – 120  
Weight – 6.5kg



### BENEX H600I (100mm Infills)

Length – 200mm  
Height – 200mm  
Width – 97.5mm

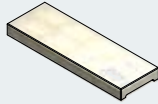
Items per pallet – 216  
Weight – 3.66kg



### BENEX Capping Blocks

Length – 600mm  
Height – 50mm  
Width – 200mm

Items per pallet – 120  
Weight – 4.75kg



### BENEX Bond Beam Plate

To suit H600 Block

### BENEX MIX Adhesive (20kg bag)

1 x 20kg bag will bond approximately 70 Benex H600R blocks or 8m<sup>2</sup>

### BENEX MIX Adhesive Gun

To apply BenexMix adhesive

## Environmental Declaration

The standard Benex composite wall system was evaluated on a whole of lifecycle\* basis against what was assessed by the BCA as standard wall construction method for a range of standard building types as shown in the table below.

Benex as a composite wall system comprising of the Benex H600R + Aircell Insulbreak 80 insulation + 10mm plasterboard in almost all cases outperformed the benchmark building method in the Sole-Occupancy Unit, Single Storey Dwelling and Low-rise Warehouse. The percentage improvements reflect the compounded emissions of the constructed wall systems taking into account both the embodied energy and the superior thermal operational performance of the Benex wall system.

Increasing the added insulation will further improve the environmental performance of the Benex wall systems.

### Building Type

Climate Zone	Sole-Occupancy Unit Building Dwelling	Single-storey Detached	Low-rise Warehouse
1	2.0%	0.0%	2.8%
2	6.0%	1.8%	3.4%
5	5.9%	1.3%	4.4%
6	2.7%	-1.6%	2.8%

\*Environmental declaration: Whole-of-building, Whole-of-Life, Cradle-to-Grave, Benchmarked Life Cycle Assessment Method; Conducted by Quasar Management Services Pty Ltd 2010.

## Technical Specifications

		Test Method
Acoustic Rating	Hollow – Rw + Ctr 37 Core-filled – Rw50 Composite Wall – Rw 57	CSIRO – TL474
Thermal Rating	Benex wall – R Value = 0.52 Composite Wall – R Value = 2.5+ Acrylic Rendered Composite Wall – R Value = 5.5	BRANZ – EC1310
Fire Rating Benex Hollow Wall	240/240/180	CSIRO - 2042
Compressive Strength	4.92Mpa	Tested By CSIRO to AS – 3700-2001
Salt Attack	Resistant	Tested By CSIRO to AS-NZS/4456.10:2003
Mortar additive for BASE course	Required if wall is to be water impervious	Krytol by Kryton Int.
Water Resistance Rating	Impervious	ASTM – 51406 – CSIRO
Additional Tanking Required	Nil	
Waterproof Render	Not Required	
Minimum Excavation Clearance Required	100mm at the rear of retaining wall	
Control Joints	8M Max - Recommend using high grade polyurethane expansion adhesive	
Built Wall Heights	10M Max	
Wash Out	Not Required	
Load Bearing	Yes	
Architectural Finish	Yes	
Render Finish	Not required	
Weight/m <sup>2</sup> of wall	Hollow: 109kg Core-filled: 355kg	
Number of trades required to build wall	One	
Fixings	Minimum requirement for fixing direct to Benex is a type 17/14 gauge screw with a minimum class 3 or 4 coating	CHLE – Test Certificate 3243

## Wall Type Selector

Application	Hollow	Grid	Full
Basement			●
Retaining Wall			●
Fire Wall	●		●
Intertency wall			●
Residential	●	●	●
Commercial	●	●	●

## Thermal Performance

The better the thermal performance of the building components in your building, the more energy efficient it will be to heat and or cool your building. As we move into a world where energy costs are set to increase this is an important consideration in choosing your building materials.

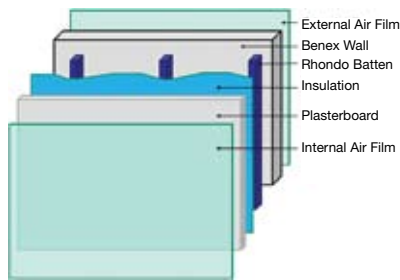
As a standalone masonry product, Benex has a superior thermal performance to standard concrete blocks and brick veneer construction.

\*ASTM C1363-97 Standard Test Method for the Thermal Performance of Building Assemblies by Means of a Hot Box Apparatus

### Hollow wall - Thermal Performance (R-value)

Approx. Mean sample temp (°C)	23
Approx. Cold side air temp (°C)	18
Approx. Warm side air temp (°C)	28
Air-to-air temp. Difference (K)	9.6
Heat Flux (W/m <sup>2</sup> )	20.78
Surface-to-surface temp diff. (K)	7.55
Total air-to-surface temp diff (K)	2.05
Total surface resistance (m <sup>2</sup> °C/W)	0.1
Measured air-to-air thermal resistance (R-value) m <sup>2</sup> °C/W +/-10%	0.46
<b>Total air-to-air Thermal Resistance (R-value)*</b>	<b>0.52 +/-10%</b>
when corrected to a total surface resistance of 0.16m <sup>2</sup> °C/W	

Benex as a flexible wall system can be tailored to meet your thermal insulation needs when designed as a composite wall.



	Hollow Wall	Composite Wall 1	Composite Wall 2	Composite Wall 3	Composite Wall 4
External Air Film	Yes	Yes	Yes	Yes	Yes
200mm Benex Wall	Yes	Yes	Yes	Yes	Yes
Insulation		Aircell Retrosield	R 2.0 Glass Insulation batt	Kooltherm 55	Kooltherm 100
Plasterboard		10mm	10mm	10mm	10mm
Internal Air Film	Yes	es	Yes	Yes	Yes
R Value	0.52	2.5	2.5	3.1	5.3

## Acoustic Performance

Benex's unique mix which incorporates expanded polystyrene beads has been shown to deliver superior performance when compared to other masonry products.

In 2004, the Building Code of Australia adopted higher standards for sound insulation in buildings. Benex has designed specific wall solutions to meet these standards particularly for sole-occupancy units (class 2) and residences in public buildings (class 3).

Benex wall systems have been independently evaluated in accordance with ISO 140-5 and ISO 717-1 for the measurement of sound insulation and airborne noise in buildings.

Acoustic performance is measured by a rating  $R_w + C_{tr}$  which is used to describe the sound insulation performance, where  $R_w$  = The Weighted Sound Reduction Index and  $C_{tr}$  = A correction factor (and is a negative number).

So if a building element has  $R_w$  of 55 and a  $C_{tr}$  of -5, its  $R_w + C_{tr}$  will equal 50. The higher the number, the better the performance.

### Wall Detail

Type	Cavity	Plasterboard	Quietwave*	Acoustic Performance
				$R_w + C_{tr}$
200mm Benex Hollow wall system	Yes	No	No	37
200mm Benex Corefilled wall system	No	No	No	50
200mm Benex Corefilled composite wall system	No	2 x 10mm	Yes	57
200mm Benex Corefilled composite wall system	No	2 x 13mm	Yes	58

## Typical Lateral Load Capacities & Bending Moments

As every project has its own special requirements you should always consult a structural engineer with respect to wall design. These tables however can be used as a guide to assist design.

### Unreinforced Benex wall - Lateral Load Capacity (kPa)

Wall Height (m)	Length between vertical supports (m)				Bending Moment		
	2.4	4.2	6.0	9.0			
10.0	0.81				Vertical	0.580	kN.m/m
8.0	0.81						
6.0	0.96	0.80	0.58		Horizontal	0.815	kN.m/m
4.0	1.32	1.18	0.59				
2.4	3.63	1.26	0.81	0.81			

### Benex Grid Core-filled wall reinforced with N16 @2.4m - Lateral Load Capacity (kPa)

Wall Height (m)	Length between vertical supports (m)				Bending Moment		
	2.4	4.2	6.0	9.0			
10.0	2.26	0.74			Vertical	1.630	kN.m/m
8.0	2.26	0.74					
6.0	2.26	0.88	0.58		Horizontal	1.220	kN.m/m
4.0	2.46	1.24	0.94	0.81			
2.4	3.61	2.40	2.26	2.26			

### Benex Grid Core-filled Wall reinforced with N16 @ 1.2m - Lateral Load Capacity (kPa)

Wall Height (m)	Length between vertical supports (m)				Bending Moment		
	2.4	4.2	6.0	9.0			
10.0	4.52	1.47	0.72		Vertical	3.250	kN.m/m
8.0	4.52	1.47	0.72				
6.0	4.52	1.76	1.16	0.84	Horizontal	2.440	kN.m/m
4.0	4.91	2.48	1.88	1.63			
2.4	7.23	4.79	4.52	4.52			

### Benex Core-filled Wall reinforced with N16 @ 0.6m - Lateral Load Capacity (kPa)

Wall Height (m)	Length between vertical supports (m)				Bending Moment		
	2.4	4.2	6.0	9.0			
10.0	6.70	2.21	1.08		Vertical	4.880	kN.m/m
8.0	6.70	2.21	1.08				
6.0	6.77	2.64	1.73	1.25	Horizontal	4.880	kN.m/m
4.0	7.37	3.72	2.82	2.44			
2.4	10.84	7.19	6.77	6.77			

Note: Reinforcing is installed both vertically and horizontally at the specified distances

## Working with Benex

- Benex is a structural solution when not core-filled. Benex can be core-filled and reinforced should your project require addition strength. Check with your project engineer.
- Benex recommends waiting approximately 48 hours after the wall has been installed before core filling the Benex Wall.
- When core filling is required, Benex walls should be core-filled in 3 metre increments.
- Benex recommends allowing 10 days for a Benex retaining/basement wall to cure before back filling. This timing is dependent on the curing time of the core-fill mixture and should always be checked with your project engineer.
- Benex recommends that you do not install the product if it is wet after rain. However, unlike traditional concrete products, Benex being impervious to water dries quickly and can be installed soon after the rain stops.
- Benex is a hollow building unit and can also be supplied with a notched base to accept horizontal reinforcement. The workability and texture of Benex ensures this can be completed much more efficiently than traditional concrete methods.
- Benex does not require additional waterproofing if installed correctly. However, if you are unsure of the quality of the foundations then a membrane can be installed as added insurance. Mortar bed requires either a waterproofing additive or waterproofing for first course only.
- Benex can be directly drilled into without cracking.
- A 210mm – 220mm wet-saw is the best to cut Benex. A Tungsten Carbide Tipped hand saw can also be used.
- For smooth clean cut circular holes pre-drill the pilot as a guide (this is not required, most hole saws have a drill bit in them), use a hole saw to cut the appropriate diameter. Small rectangular or circular holes can be cut by drilling a series of small holes around the perimeter then tapping out the wasted piece. Tap carefully.
- To patch a Benex Wall, mix the BenexMix Adhesive into a thick paste and apply using a broad knife or similar. Once the BenexMix in the damaged area starts to dry, sponge the area and the adhesive will cure to a similar colour of the block. It may be necessary to reapply for larger damaged areas.

### BenexMix Adhesive

- You cannot substitute mortar for BenexMix Adhesive on all of the courses. Brickies Mortar is used ONLY to bed the first course of the Benex Wall.
- Benex recommends the Benex Glue Guns to apply the BenexMix Adhesive. The use of a Brickies Trowel is not recommended.

### Render

- You do not need to render a Benex Wall as the wall provides an aesthetic face finish. Personal preference will influence how the client chooses to complete the finished wall.
- You can render on either the smooth or the rough side of the block.
- The most appropriate render to use on a Benex Wall is either an acrylic or cement based render. Please see website for further details.

## Material Data Safety Sheets (MSDS)

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As is the case with all cementitious products, installers should exercise caution and take the appropriate safety measures to eliminate risk.

Please refer to the Material Safety Data Sheets (MSDS) located within the Technical Data section of our website. Material Data Safety Sheets (MSDS) can be downloaded directed from our website [www.benex.com.au](http://www.benex.com.au).

## Product Warranty

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Benex provides a 7 year warranty, from date of purchase, for its wall systems when the product is used in accordance with our technical manual and installation guide. Benex has tested its wall system to comply with the Building Code of Australia and relevant Australian Standards.

## Installation Assistance

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Benex offers a Technical Officer on site, for your initial projects that require over 200m<sup>2</sup> of product, to establish the works and conduct initial training as required. This service will ensure that our product is installed as per our specifications. If you require a Benex Installer for your project then Benex will pass your information onto an Installer in your area, who will then quote on the project and deal with you directly.

If you require the service of a Technical Officer on site then please inform the Benex Sales Manager when you submit your order.

Build Better.

# BENEX

For complete product specifications and construction demonstration call 1300 930 133  
[www.benex.com.au](http://www.benex.com.au)



This document is a guide only. Laws, regulations and industry standards can vary between States and Territories. This guide must be read in conjunction with, and subject to, all laws, regulations and industry standards applicable in the State or Territory in which the products are installed. You must ensure that the installation of the products will comply with those laws, regulations and standards, that the products recommended to customers are fit for the purpose for which they are intended and that professional advice is sought where appropriate. The information provided in this document is the most recent as at the time of publication. Some information provided in this document may vary or not be applicable at the time of installation. Please check [www.benex.com.au](http://www.benex.com.au) for the most recent published technical data prior to installation.

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For a better solution visit

[www.benex.com.au](http://www.benex.com.au)

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