November 2025 Edition

Design Manual for REOLOK® Wall System

REOLOK

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ReoLok® Design Manual

Design Manual Editions

Current:

November 2025 Edition - ReoLok

Superceded:

September 2019 Edition - ReoLok System

September 2015 Edition - Vertical System

August 2015 Edition - Vertical System

August 2014 Edition - Vertical System

June 2014 Edition

March 2014 Edition

2013 Edition

Release N - Issued 1/3/2013

Release M - Issued1/6/2011

Older Editions

Please check www.formcraft.com.au regularly to ensure that you are using the most up-to-date edition.

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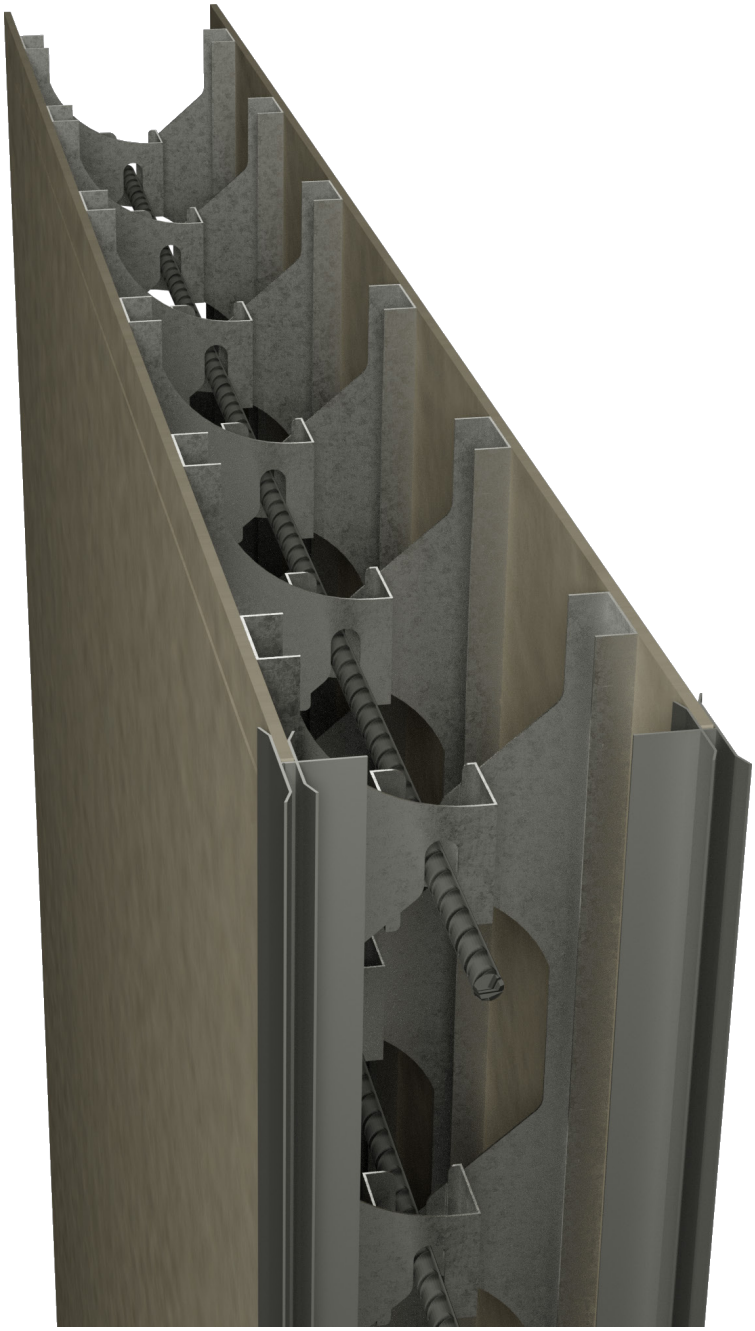
INTRODUCTION

INTRODUCTION

The Formcraft ReoLok® System is an Australian-engineered permanent formwork solution designed to simplify and accelerate the construction of reinforced concrete walls. The ReoLok® connector utilises the reinforcing bar itself to lock adjoining fibre-cement wall panels together, creating a self-aligning, rigid cavity that can be fully inspected before concrete placement.



RL162 Cassette
With Joining Truss

The system reduces labour requirements as panels are only half the weight of traditional cassette systems and improving construction safety. Panels are lighter, non-combustible, and faster to install than conventional systems. The result is a durable, high-performance structural wall with enhanced build efficiency and quality control. ReoLok® walls meet fire, acoustic, thermal and structural code requirements, while also offering a range of stylish finishes.

The structural capability of the product when filled with concrete makes it an ideal solution for the construction of buildings such as: commercial offices, mixed-use developments, multi-unit apartments, schools, shopping centres, housing and hotel applications.

This manual has been prepared to assist in the detailing of the ReoLok® walling system. It provides a basis from which to work, but does not replace the services of professional consultants on specific projects.

Formcraft provides technical support throughout the design and construction process to ensure quality project outcomes.

Advantages

ReoLok® is faster to construct and provides a high level of structural capacity. It is manufactured using fibre-cement panels and steel reinforcement, making it non-combustible and compliant with NCC fire-rating requirements. Because the wall remains open until reinforcement inspection, engineers can visually verify steel placement before closing the cavity.

Speed/Cost Savings

Formcraft's advanced concrete forming technology also delivers proven savings in labour costs through its rapid construction technique. Pre-fabricated panel packs are pre-cut according to an approved set of shop drawings and delivered to site timed to suit your construction program. ReoLok® connects panels together via the horizontal reinforcement bar itself, creating a very fast installation method. Panels are half the weight of traditional fibre-cement cassettes, making them safer and easier to handle on-site. The innovative joining truss means that no screws are required to join adjacent panels further increasing construction speed. The integrated truss design allows reduced freight volume by 40% from traditional cassette systems.

Strength

Nothing rivals steel-reinforced concrete for strength and stability. Reinforced concrete walls are known to withstand much stronger weather conditions than other construction systems. Use of the ReoLok® wall system results in a solid, stable and durable structure.

The high strength, thinner walls reduce the dead load on the structure. The walls act as deep beams and transfer walls, which reduce floor slab thickness and size of conventionally formed beams and columns.

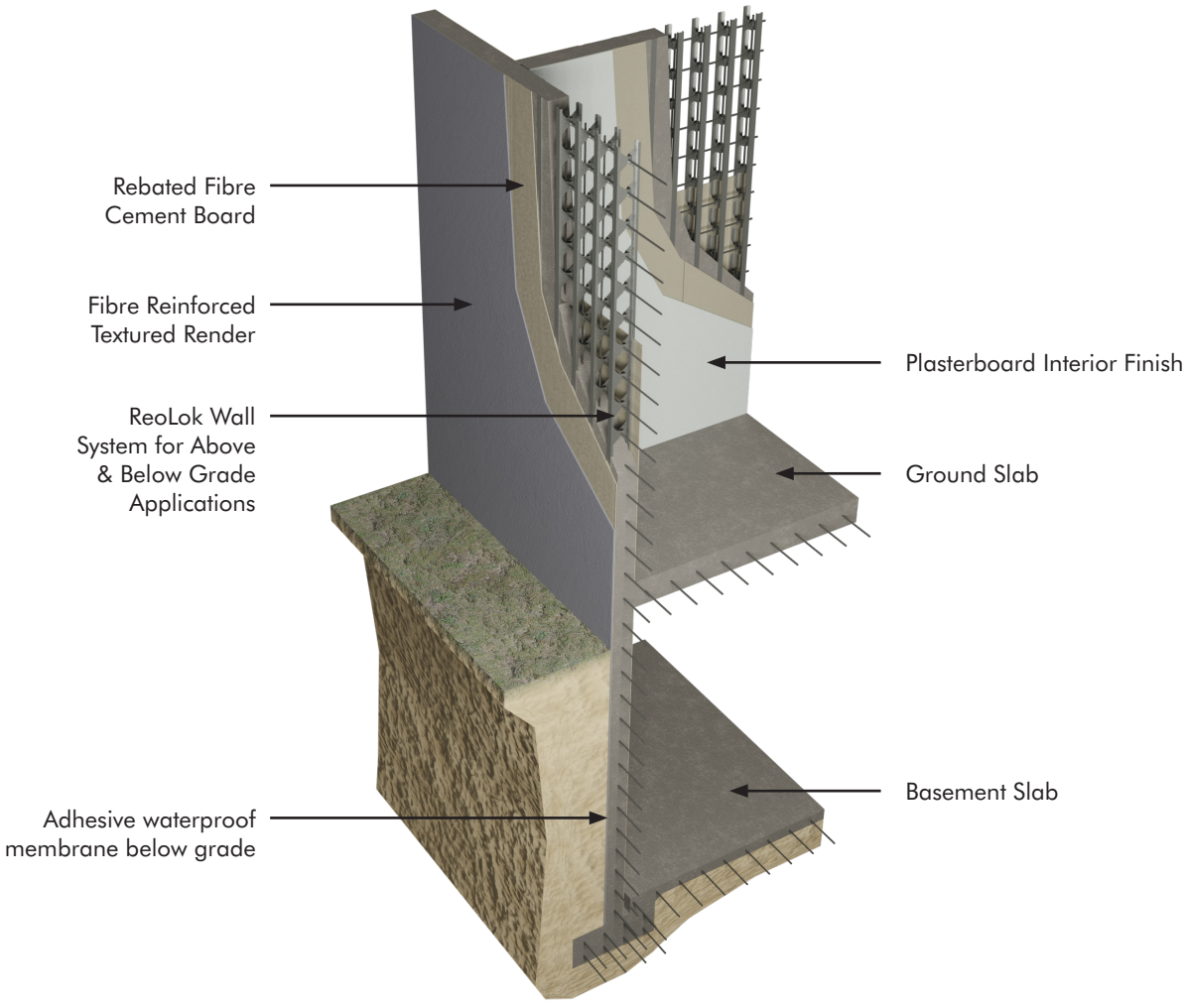
REOLOK® CHARACTERISTICS

The ReoLok® panels are designed to function as the permanent formwork for concrete walls. The formwork stays in place on the exterior and interior face of the wall assembly, and also serves as the substrate for exterior and interior finishing systems. When concrete is poured into the cavity between the formwork, a solid, flat, cast-in-place and steel-reinforced concrete wall is formed.

The ReoLok® range includes two core systems — RL162 and RL200 — engineered to meet the structural and architectural needs of medium and high-density construction.

ReoLok® walls are used in commercial and residential construction for external and internal, load bearing, above grade and below grade walls. Specific applications include basement and under-croft walls, insulated exterior walls, inter-tenancy/party walls, sheer walls, stem walls and lift shaft and stairwell applications.

Product literature, technical information, CAD/BIM details, specifications and product samples are available upon request.



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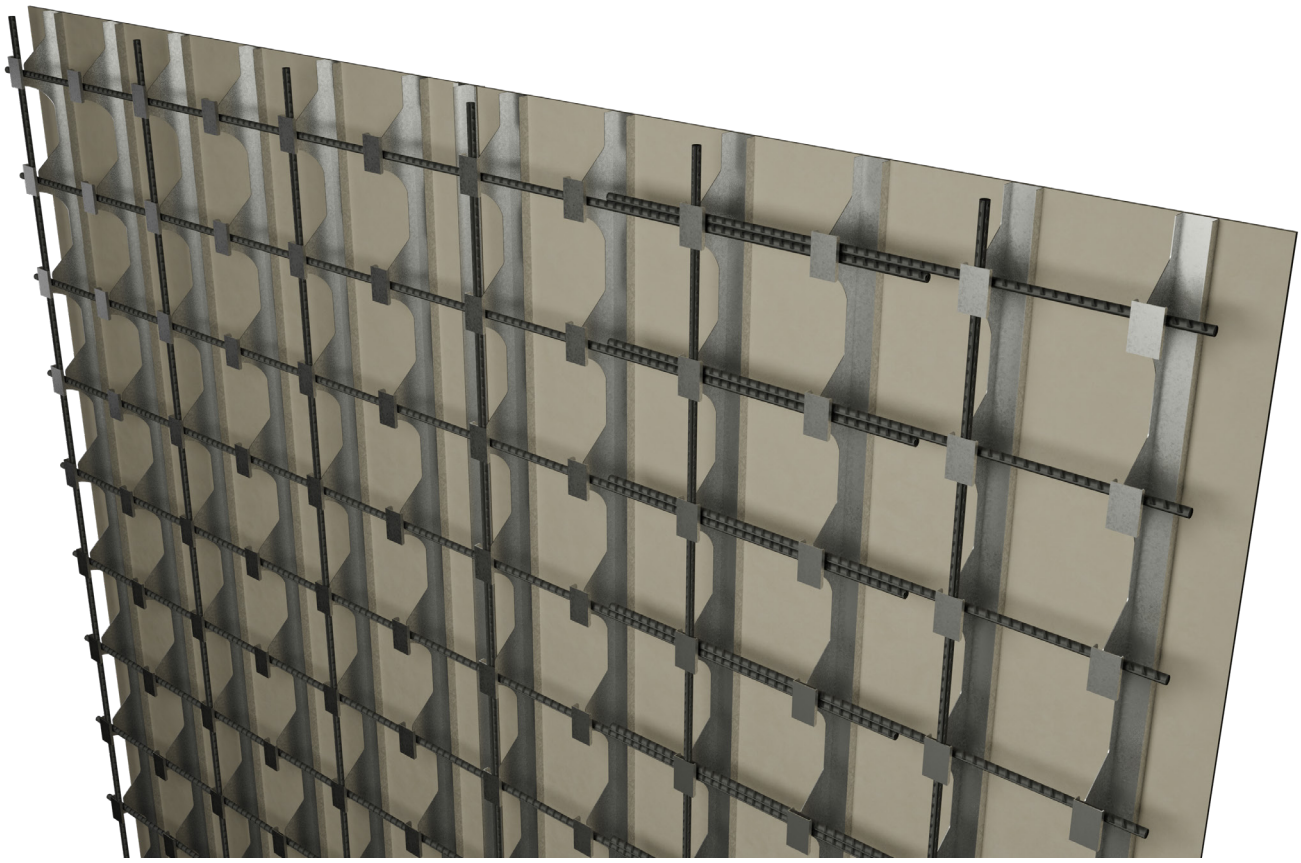
N12 bars required to lock panels

A central N12 horizontal reinforcement bar is required to lock opposing panels of both models at minimum 400mm centres.

The RL162 model can accommodate N12 or N16 bars at up to 200 centres both horizontally or vertically. Reinforcement is generally placed in the centre of the cavity.

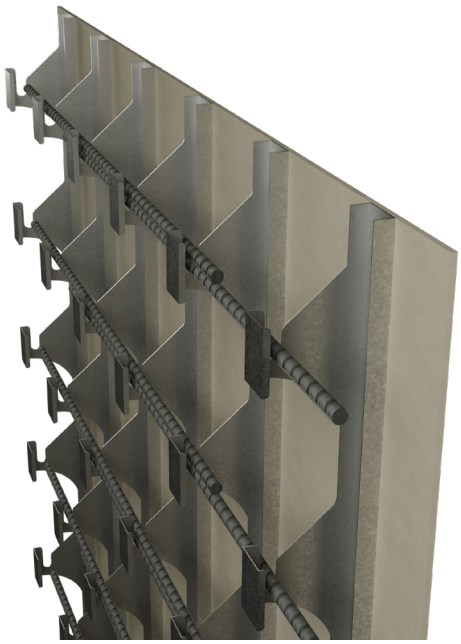
The RL200 model can accommodate between N12 and N20 bars at up to 200 centres either centrally or on both internal faces of the wall

The wall can remain open for reinforcement inspection, which is not possible with traditional cassette systems. Engineers can visually verify steel placement before the cavity in closed by adding the opposing panels.

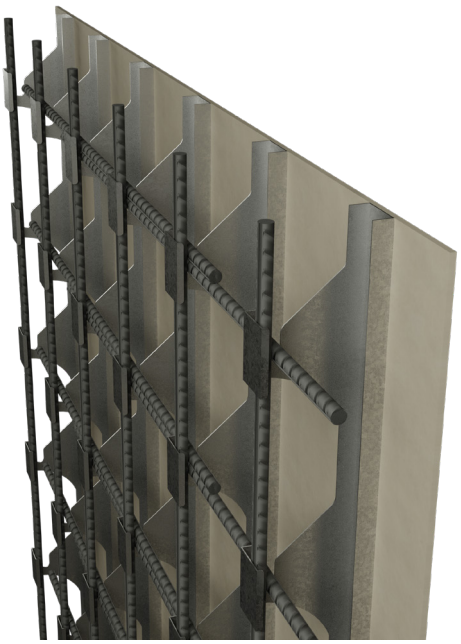


RL162 Wall Cavity For Inspection
Before Placement of Opposing Panels

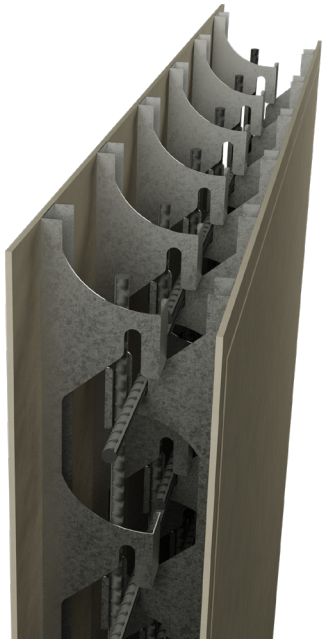
Placement of Rebar and Panel Installation



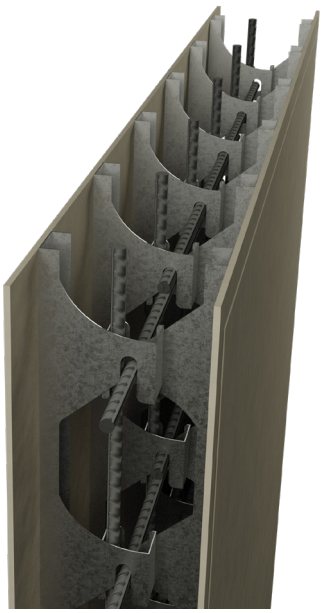
Horizontal Rebar Placement



Vertical Rebar Placement



Opposing Panel Lifted Over Horizontal Rebar



Opposing Panel Lowered Over Horizontal Rebar to Secure

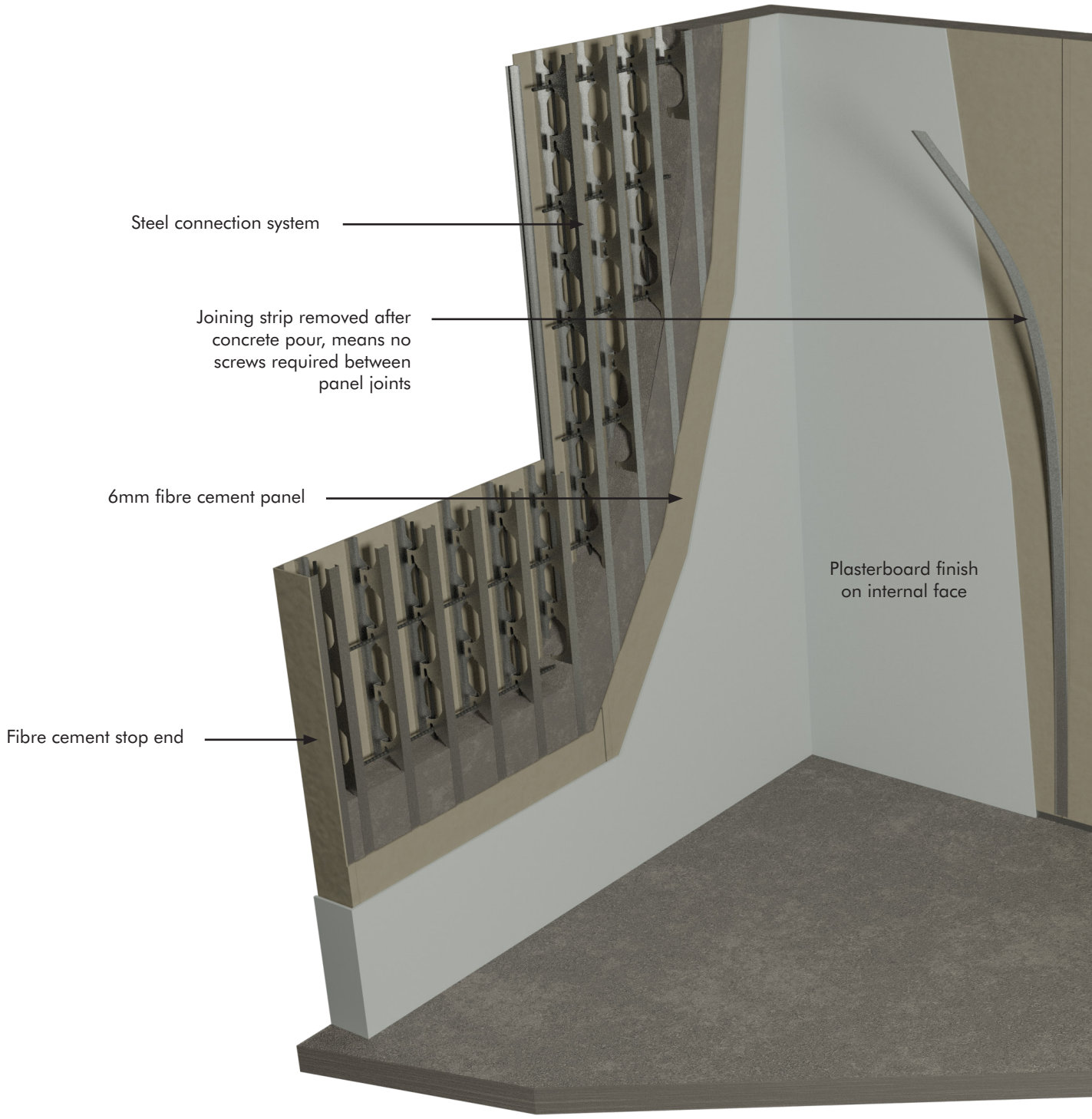
REOLOK® WALL SELECTION GUIDE

ReoLok® is a modular form that comprises 2 opposing compressed fibre cement panels with a metal connection system. The pre-fabricated panels arrive to site on pallets and are easily assembled into forms by hanging the panels on horizontal rebar and placing pre-fabricated stop end modules around openings. The system is particularly well suited to any exterior wall applications and meets the new NCC requirements for non-combustible wall systems.

PRODUCT CODE	CONCRETE THICKNESS	WALL THICKNESS	FIRE	THERMAL	ACOUSTIC
			FRL	R-Value	$R_w + C_{tr}$
RL162	150mm	162mm	180/180/180	0.25m².K/W	50
RL200	188mm	200mm	240/240/240	0.25m².K/W	54

REOLOK® TYPICAL LAYOUT

Illustrative Features of the ReoLok® Wall System



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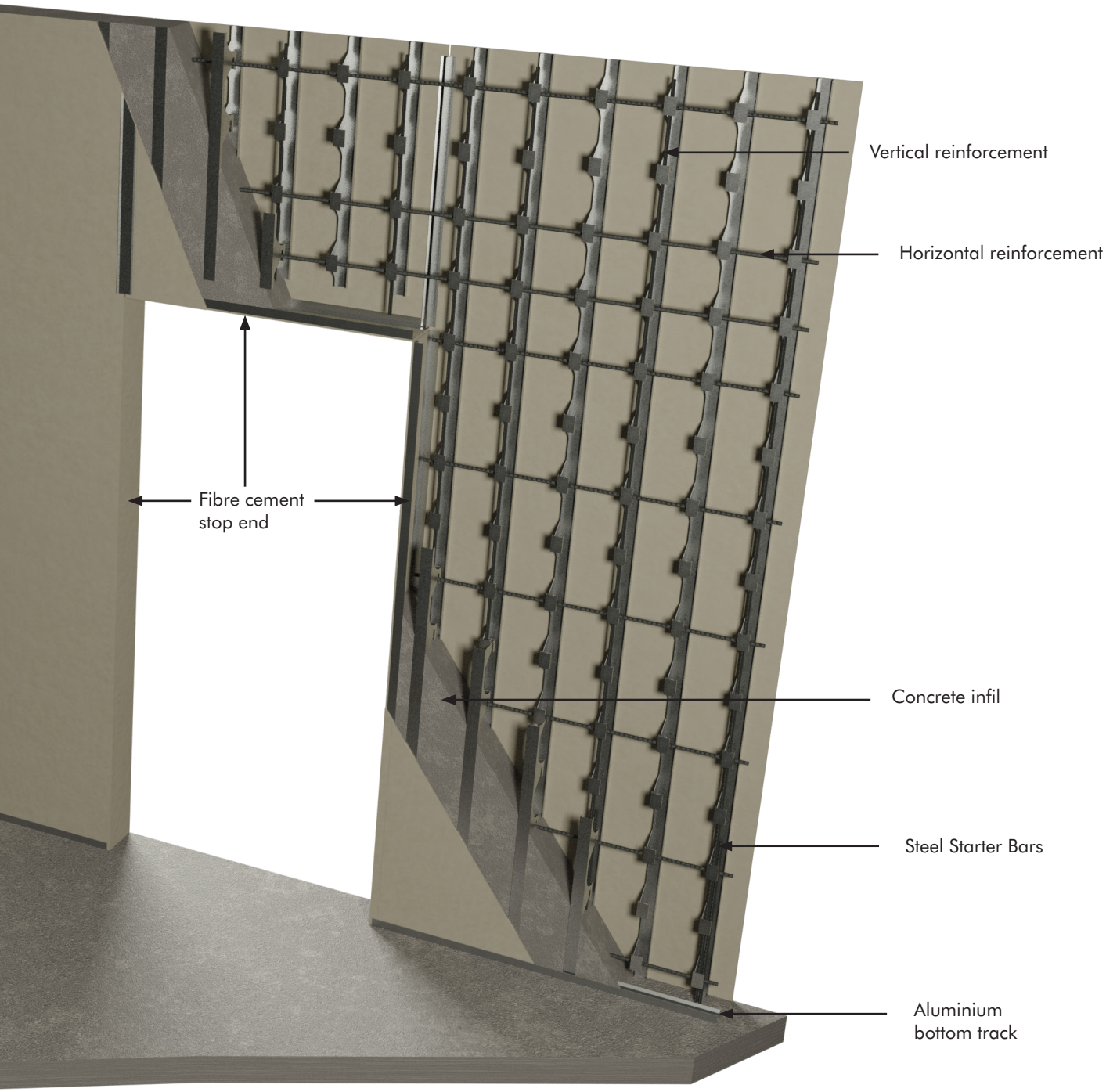


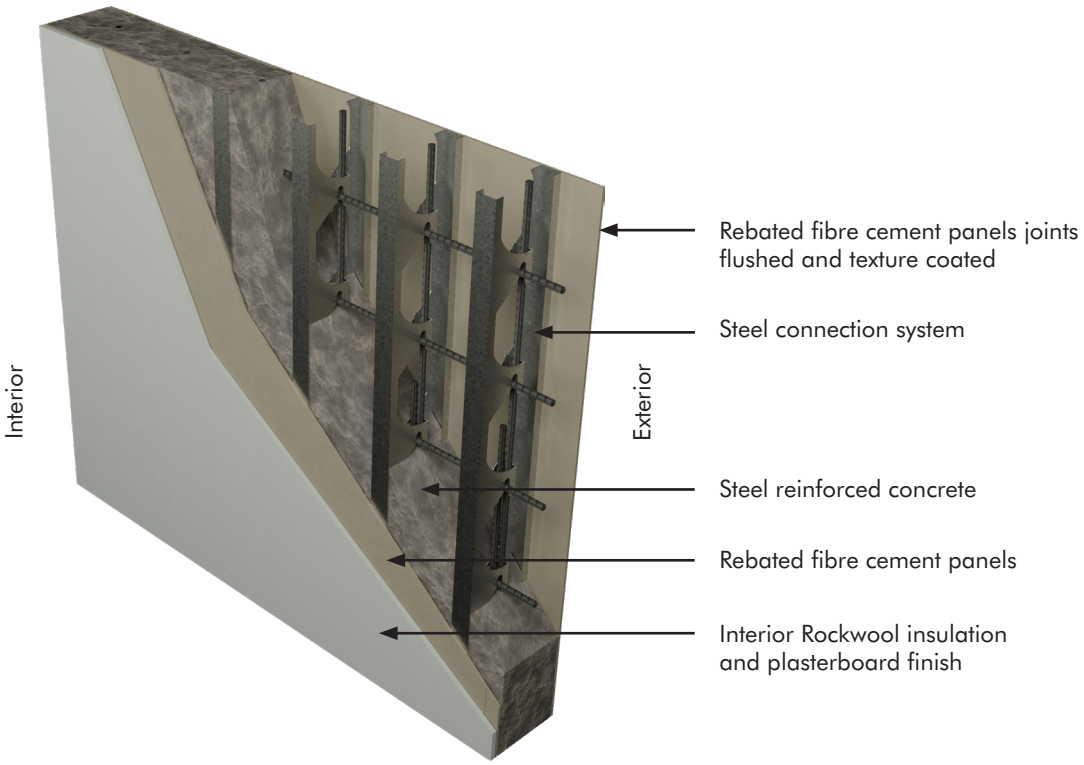
NOTES

APPLICATIONS

External Walls

BCA REQUIREMENTS

CLASS OF BUILDING	REQUIRED FRL	BUILDING'S CLIMATE ZONE	REQUIRED R-VALUE	RECOMMENDED PRODUCT TO MEET REQUIREMENTS
1	N/A	1, 2, 3 &5 4 & 6 7 & 8	1.4 1.7 2.3	RL162
2	90/90/90	1, 2, 3 &5 4 & 6 7 & 8	1.4 1.7 2.3	RL162
5,7a &9	120/120/120	1, 2, 3 &5 4 & 6 7 & 8	1.4 1.7 2.3	RL200
6	180/180/180	1, 2, 3 &5 4 & 6 7 & 8	1.4 1.7 2.3	RL200
7b & 8	240/240/240	1, 2, 3 &5 4 & 6 7 & 8	1.4 1.7 2.3	RL200



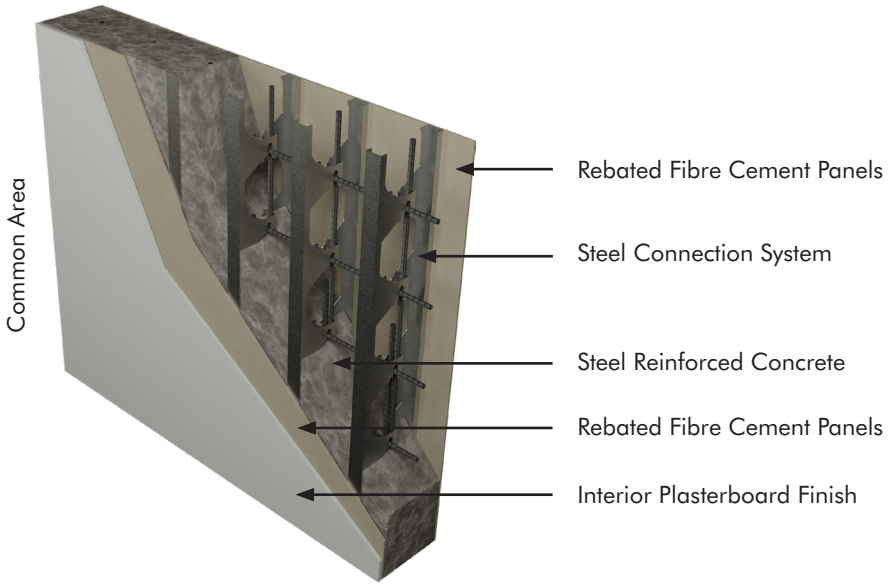
RL162 Wall Model

Lift, Stairwell & Service Shafts

Description: Walls separating shafts from common areas or sole occupancy units.

BCA REQUIREMENTS

WALL USE	REQUIRED FRL	REQUIRED $R_w + C_{tr}$	REQUIRED $D_{n,T,w} + C_{tr}$	RECOMMENDED PRODUCT
Lift Shaft	90/90/90	N/A	N/A	RL200
Stairwell Shaft	90/90/90	N/A	N/A	RL200
Service Shaft	90/90/90	25/40	N/A	RL200



RL200 Wall Model

REOLOK® WALL ALTERNATIVES

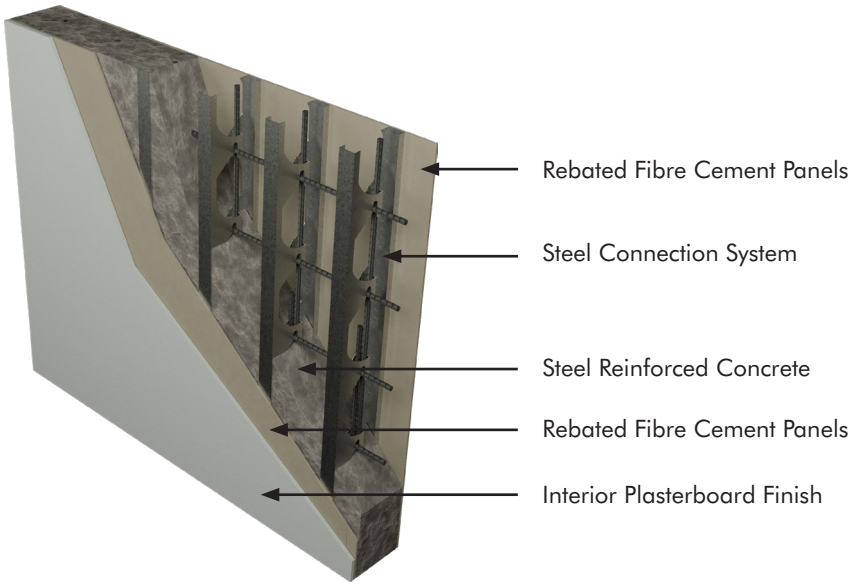
PRODUCT NUMBER	CONCRETE THICKNESS	WALL THICKNESS	FIRE	THERMAL	ACOUSTIC
			FRL	R-Value	$R_w + C_{tr}$
RL162	150mm	162mm	180/180/180	0.25m².K/W	50
RL200	188mm	200mm	240/240/240	0.25m².K/W	54

Inter-Tenancy Walls

Description: Walls separating sole occupancy units.

BCA REQUIREMENTS

WALL USE	REQUIRED FRL	REQUIRED $R_w + C_{tr}$	REQUIRED $D_{n,T,w} + C_{tr}$	RECOMMENDED PRODUCT
Habitable to Habitable	90/90/90	50	N/A	RL162
Habitable to Wet Area	90/90/90	50	45	RL162
Wet Area to Wet Area	90/90/90	50	45	RL162



RL162 Wall Model

REOLOK® WALL ALTERNATIVES

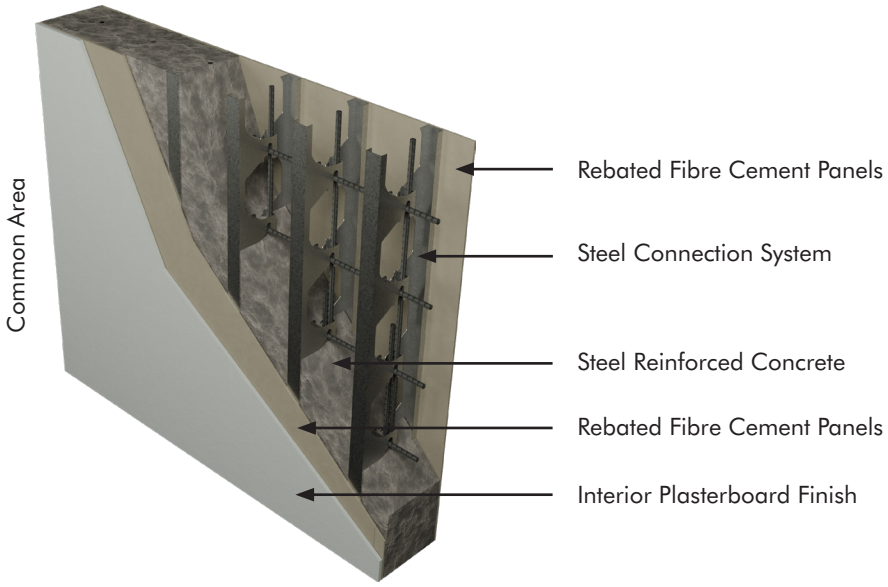
PRODUCT NUMBER	CONCRETE THICKNESS	WALL THICKNESS	FIRE	THERMAL	ACOUSTIC
			FRL	R-Value	$R_w + C_{tr}$
RL162	150mm	162mm	180/180/180	0.25m².K/W	50
RL200	188mm	200mm	240/240/240	0.25m².K/W	54

Retaining & Basement Walls

Description: Walls to retain earth or similar. eg Basements, etc.

BCA REQUIREMENTS

WALL USE	REQUIRED FRL	REQUIRED $R_w + C_{tr}$	REQUIRED $D_{n,T,w} + C_{tr}$	RECOMMENDED PRODUCT
Retaining Wall	Varied according to application	N/A	N/A	RL200



RL200 Wall Model

REOLOK® WALL ALTERNATIVES

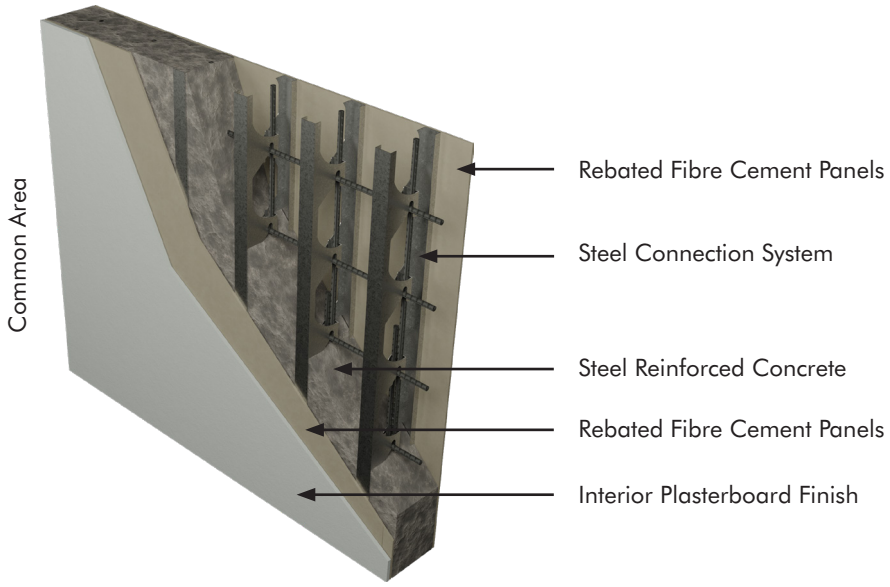
PRODUCT NUMBER	CONCRETE THICKNESS	WALL THICKNESS	FIRE	THERMAL	ACOUSTIC
			FRL	R-Value	$R_w + C_{tr}$
RL162	150mm	162mm	180/180/180	0.25m².K/W	50
RL200	188mm	200mm	240/240/240	0.25m².K/W	54

Corridor Walls

Description: Walls separating sole occupancy units from common areas and stair shafts.

BCA REQUIREMENTS

WALL USE	REQUIRED FRL	REQUIRED $R_w + C_{tr}$	REQUIRED $D_{n,T,w} + C_{tr}$	RECOMMENDED PRODUCT
Common Area Separation	90/90/90	N/A	N/A	RL162
Stair Shaft Separation	90/90/90	N/A	N/A	RL162



RL162 Wall Model

REOLOK® WALL ALTERNATIVES

PRODUCT NUMBER	CONCRETE THICKNESS	WALL THICKNESS	FIRE	THERMAL	ACOUSTIC
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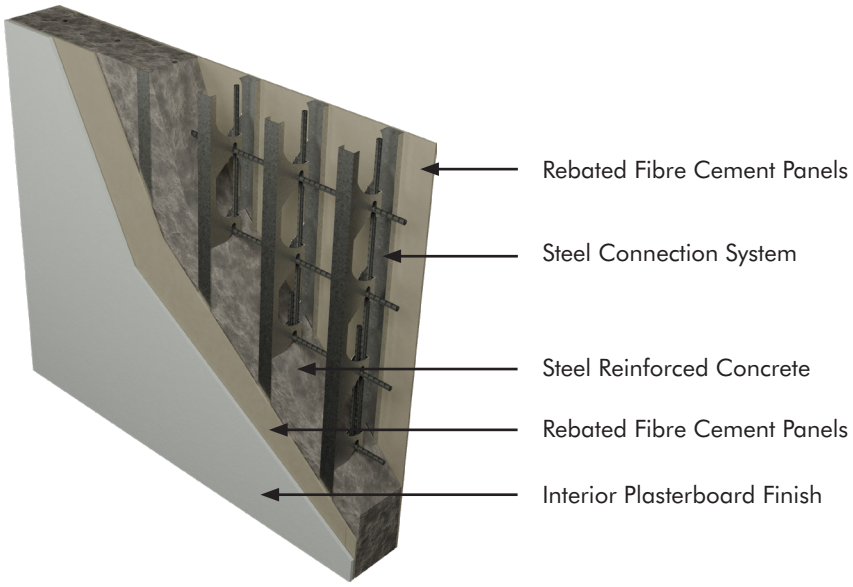
RL162	150mm	162mm	180/180/180	0.25m².K/W	50
RL200	188mm	200mm	240/240/240	0.25m².K/W	54

Blade Walls

Description: Independant wall typically of achitectural or structural significance.

BCA REQUIREMENTS

WALL USE	REQUIRED FRL	REQUIRED $R_w + C_{tr}$	REQUIRED $D_{n,T,w} + C_{tr}$	RECOMMENDED PRODUCT
Blade Wall	Varied according to application	N/A	N/A	RL162



RL162 Wall Model

REOLOK® WALL ALTERNATIVES

PRODUCT NUMBER	CONCRETE THICKNESS	WALL THICKNESS	FIRE	THERMAL	ACOUSTIC
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RL200	188mm	200mm	240/240/240	0.25m².K/W	54

NOTES

ARCHITECTURAL

ReoLok®

THE NEXT GENERATION SYSTEM FOR COMMERCIAL CONSTRUCTION

Panels used for the ReoLok® system are 6mm thick and a maximum of 3600mm high by 1200mm wide. Vertical Trusses are adhered inside the 6mm panels at 200mm centres and joined via a N12 horizontal reinforcement bar at maximum 400mm centers

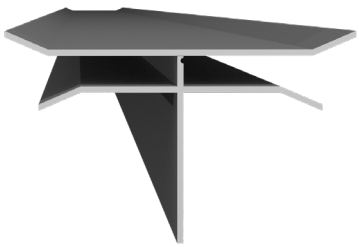
Corners are supported by a propriety corner brace during pouring. The ReoLok® system also uses an additional inter-panel Joining Truss connector to connect adjacent panels to prevent concrete leakage. The joining truss restrains the hydrostatic pressure of the concrete during the pour and eliminates the need for screw fixing which is required on other systems. The exterior part of Joining Strip is removed after the concrete pour and before flushing the rebated fibre cement panel joints by simply peeling off the external strip.

ReoLok® ReoLok Product Components

Joining Truss

Product Code:
JT

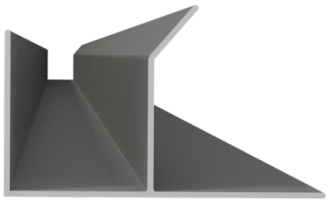
Material:
Aluminium

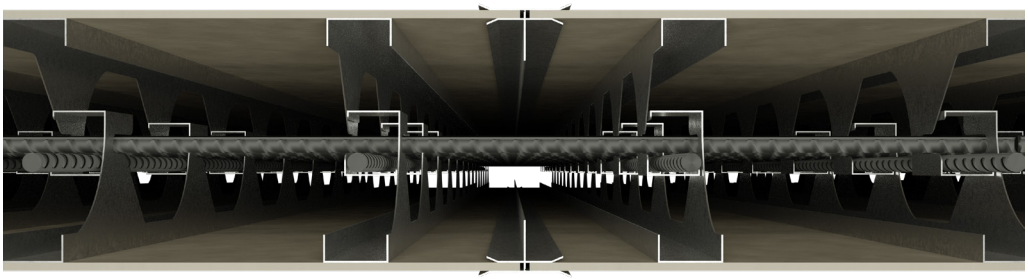


Bottom Track

Product Code:
BT

Material:
Aluminium





RL162 Cassettes with Joining Truss

Exterior Finishes

Typical exterior finishes are:

1. Rebated fibre cement panels with flushed joints and textured render
2. Cladding systems able to be fixed to concrete.

Rebated fibre cement flushed and beaded ready for rendering

Acrylic render system applied to panels

Interior Finishes

It is recommended that plasterboard is applied to internal ReoLok® fibre cement walls to give a high level of internal finish.

This can be achieved by one of three methods;

1. Direct stick plasterboard – is used internally to achieve a high level of finish.
2. Discontinuous stud wall – used when impact sound abatement is required for inter-tenancy walls.
3. Plasterboard on battens – is used when there is a high level of service reticulation or insulation is required in that section of walling.

Interior fibre cement panels with direct stick plasterboard

Level of Finish

The quality of the finish on walls depends on the straightness of walls, and the quality of the finishing system and the amount of glancing light projected on the wall surface. It is essential for designers and builders to determine the level of finish required before construction commences, otherwise it may not be possible to attain the desired finish level without extensive corrective measures. Generally ReoLok® walls achieve Level 4 finish (as determined by AS2589.1) which is +/- 6mm tolerance across an 1800mm plane.

Glancing light
Glancing light is where the light from an artificial or natural source is nearly parallel to the surface. This condition exaggerates vertical joints and other imperfections making them more obvious. It is recommended designers give consideration to the level of finish required and eliminate potential problems due to glancing light.

External coating for Rebated FC panels
It is recommended for external walls that an external textured render system be applied. It is important that the procedure from the chosen manufacturer must be followed. Good preparation of the panels using a skim coat over the entire wall surface by applicator is critical to achieving quality finishes.

The procedure is as follows;

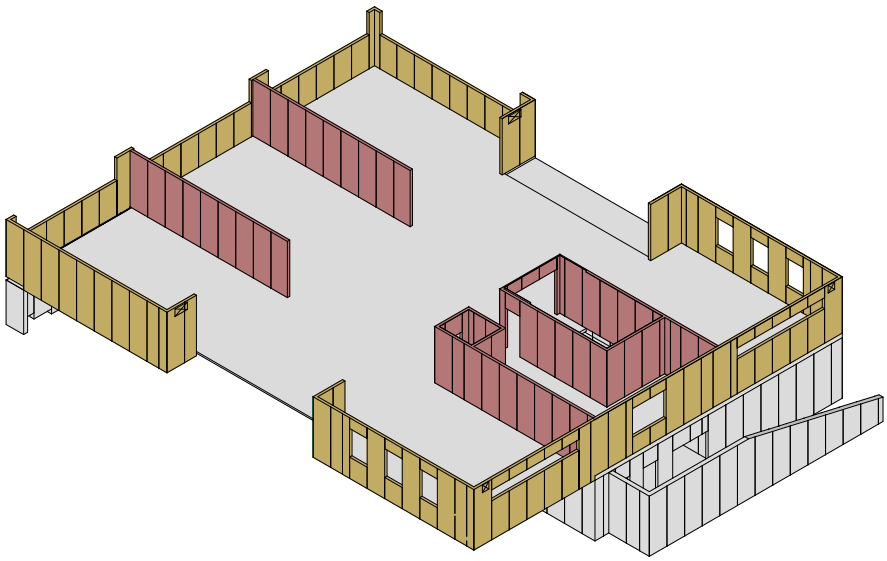
1. Screw holes or any other high points in the wall should be sanded or grinded back to provide a flat surface.
2. Panel joints should be primed and taped with a fibre glass mesh.
3. Jointing compound is applied by trowel to the panel joints.
4. Complete panel surface should be rendered with one or more coats to a thickness of 4-10mm to provide a flat surface.
5. The top coat should be a minimum be 2–3 mm thick trowel-on texture system and be designed to perform as a water resistant membrane.

Suppliers
The main suppliers of texture coating materials are;

Rockcote	Ph. 1800 267 737
Wattyl	Ph. 13 21 01
Dulux	Ph. 13 23 77
Taubmans	Ph. 13 16 86

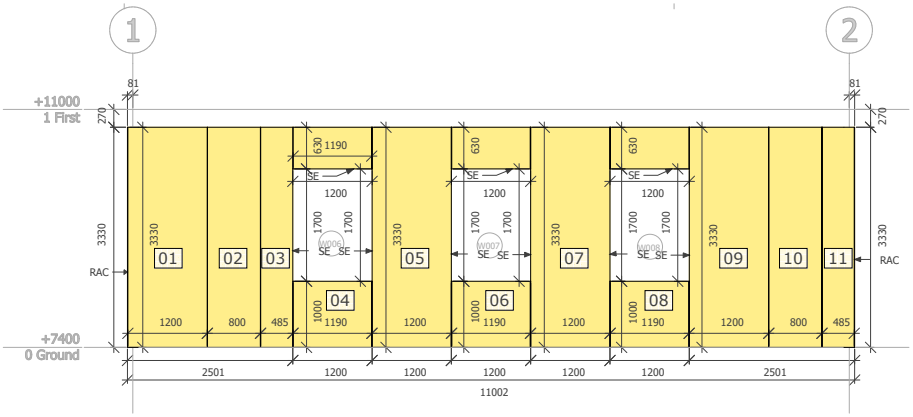
Panelisation for the ReoLok® Vertical System

A major feature of the ReoLok® system is the ability to pre-cut the fibre cement panels to dramatically reduce installation times. Each panel is shop drawn and labelled for easy onsite identification to assist installation.



Panelised Floor of Example Development

Formcraft produces detailed shop drawings for each project before customizing each wall so that it is precisely prepared ready for assembly before it arrives on site. Because of this on-site waste is dramatically reduced.



Shop drawing wall elevation example ready for production

Doors and Windows

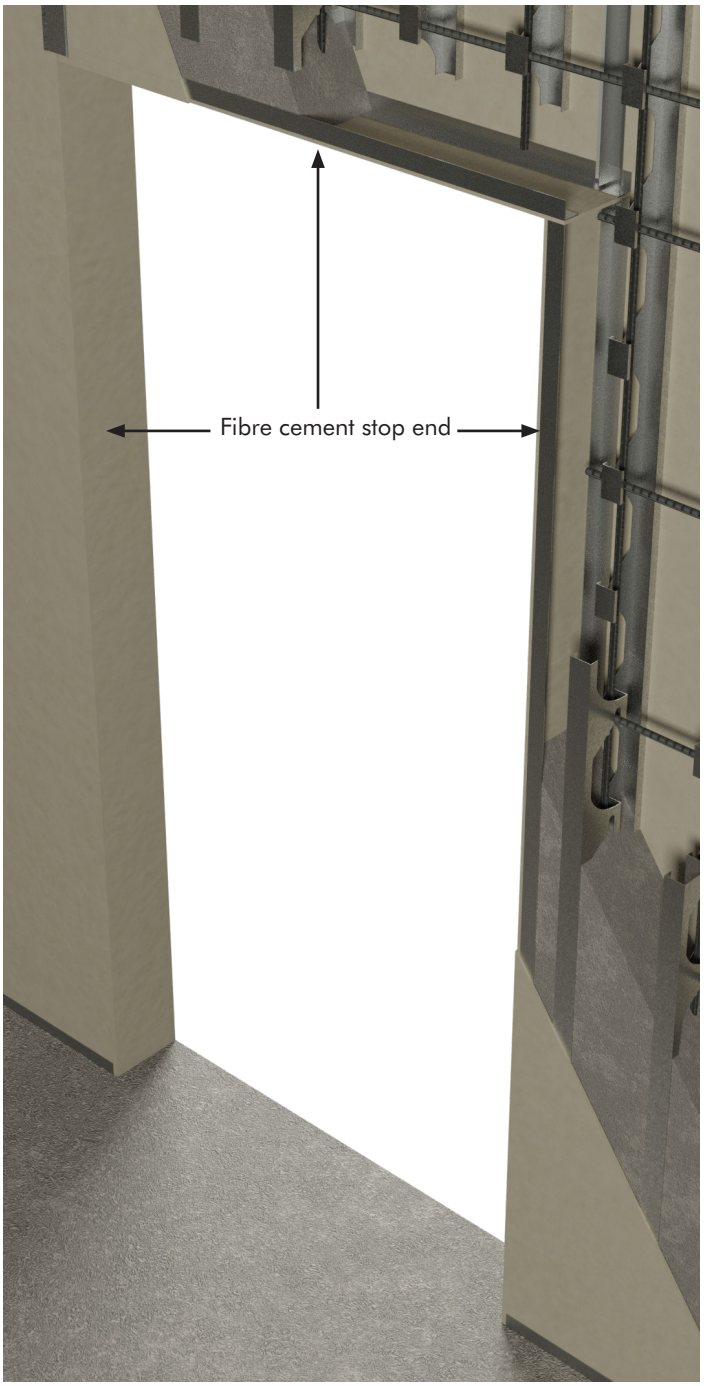
A minimum 400mm offset for Door and window frames from a corner is generally required. It is necessary to allow enough wall space for proper functioning of the door or window. The spacing between two or more doors or windows is determined by the need for the structural design to allow for adequate steel reinforcement placement.

Formcraft manufactures a fibre cement stop end solution that provides for an easy means of fixing doors and windows.

Most windows and door frames can be installed into the openings according to the design by utilising the ReoLok® stop end system to line the opening. The door and window frames are then trim fitted to the stop end which has concrete directly behind the 6mm fibre cement panel.

Fire door frames can also be incorporated so that the concrete goes all the way into door jam. The orientation of the hinge must be considered due to the thickness of the wall.

Exterior hinged doors that are hung to the ReoLok® wall should be installed so that the hinge is flush with the inside wall.



Stop Ends can be used to exclude concrete from door and window openings

Electrical, Mechanical and Plumbing

Since the ReoLok® wall ultimately becomes a solid concrete wall, the electrical, mechanical and plumbing runs is the wall must be carefully pre-planned. Electrical runs are easily accommodated before the exterior panel is placed by installing conduits in the wall cavity and an electrical box. If a battened wall is to be used of the inside a ReoLok® wall to accommodate insulation or services then the service runs should be put in the cavity between these walls.

Installation of wall box in fibre cement panels

Other Floor Systems

ReoLok® walls are versatile and are fully capable of being integrated with a variety of other floor systems including the following;

- Conventional Slab
- Bondek Slab
- Post Tension Slab
- Light Frame Floor

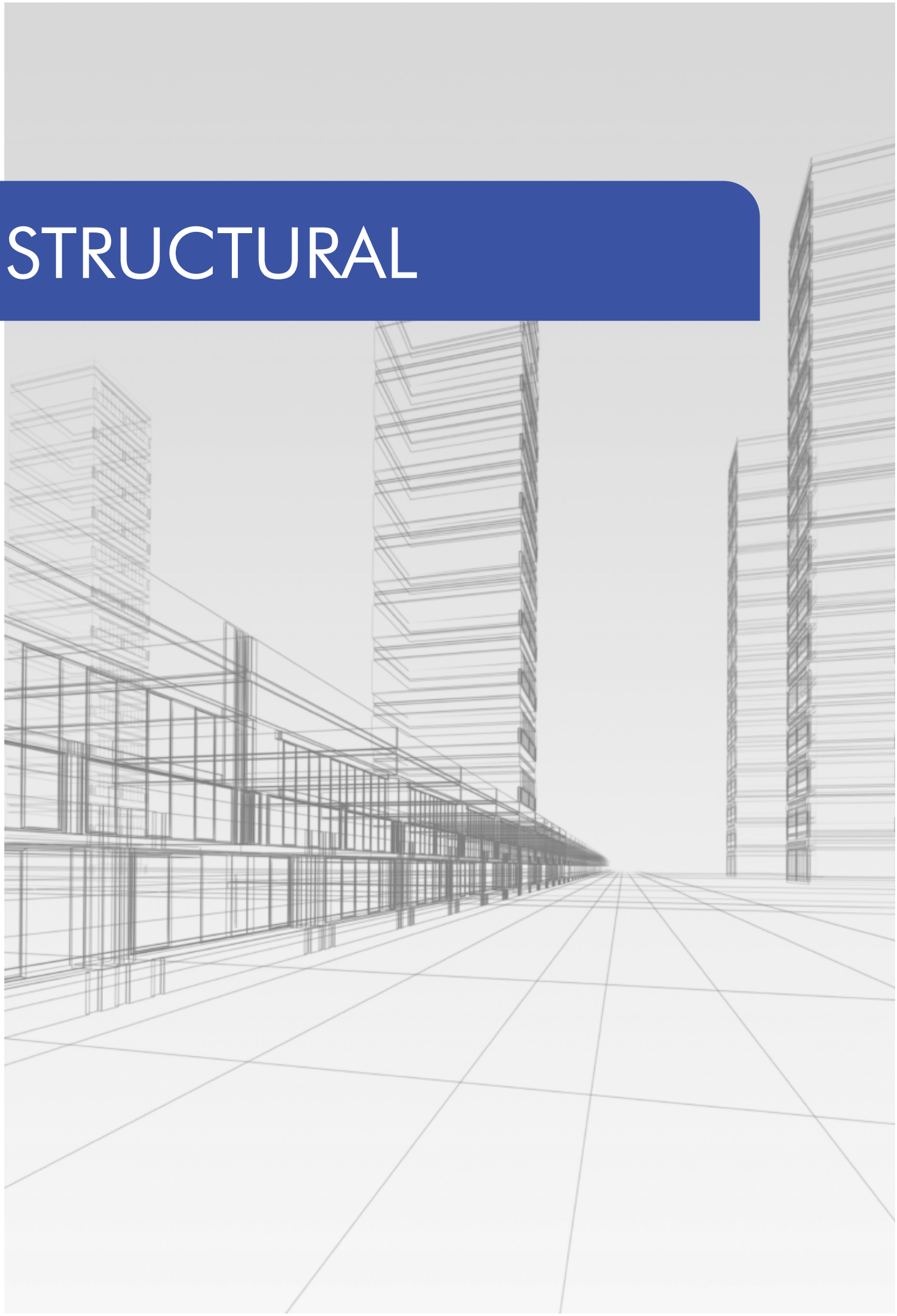
BIM Software

Formcraft realises the importance of software in the design of buildings and so can provide product details and models in the following formats;

- AutoCAD
- DWG or DXF
- PDF

NOTES

STRUCTURAL



Vertical Load Capacity

The vertical load design capacit y (ϕN_u) for the various wall thicknesses, wall heights and support conditions are shown in the following Charts.

The design capacities have been calculated in accordance with AS 3600 Clause 11.4 SIMPLIFIED DESIGN METHOD FOR BRACED WALLS SUBJECT TO VERTICAL FORCES ONLY, as follows:

Design axial compressive strength = ϕN_u (kN/m)

where:

ϕ = 0.6

N_u = the ultimate strength (kN/m)
= $(tw - 1.2e - 2e_a)0.6\, f'_c\, 10^3$

t_w = Wall concrete thickness (m)
= overall thickness – 0.012

e = the eccentricity of the load (m)
= 0 for continuous floor slab
(adopt 0.05 t_w as minimum)
= 0.166 t_w for discontinuous floor slab

e_a = additional eccentricity (m)
= $H^2_{we}/(2500\, t_w)$

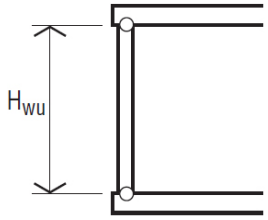
H_{we} = the effective height of wall (m)
= 0.75 H_{wu} where wall restrained against rotation top and bottom by floors
= 1.0 H_{wu} where wall not rotationally restrained top and bottom

H_{we}/t_w = 30 max. when $N^* > 0.03\, f'_c\, Ag$
= 50 max. when $N^* \leq 0.03\, f'_c\, Ag$

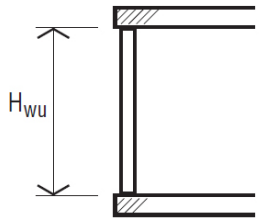
H_{wu} = Unsupported height of wall (m)

f'_c = Concrete compressive strength (MPa)

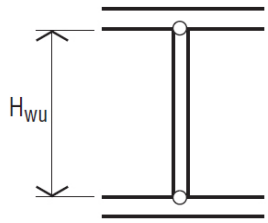
NOTE: Charts have been calculated for infill concrete strengths of 25 MPa and 32 MPa. Where other concrete strengths are used, the capacities will change proportionally.



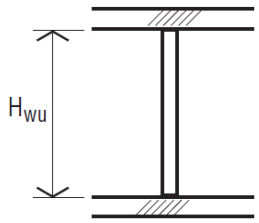
Floor Continuous
Wall Rotationally Restrained



Floor Continuous
Wall Rotationally Unrestrained



Floor Discontinuous
Wall Rotationally Restrained



Floor Discontinuous
Wall Rotationally Unrestrained

Lateral Load Capacity

The capacity of a wall subjected to a lateral load (wind or earthquake) is given in the chart on the following page.

It has been calculated on the basis of a simply-supported beam spanning vertically between floor supports, with central reinforcement @ 400 mm centres and concrete strength 25 MPa, refer chart on following page. Capacities are given for N12 and N16 vertical reinforcement. Higher capacities can be achieved by increasing the size of the vertical reinforcement.

The capacity is given by the formula:

Design Capacity, $w = 8\phi M_u / L^2$ (kPa)

where:

$M_u = f_{sy}\, d\, A_{st} \left[1 - \dfrac{0.6\, A_{st}\, f_{sy}\, 10^{-6}}{f'_c\, b\, d} \right] 10^{-3}$ (kN.m/m)

ϕ = 0.8

L = Design span for bending (m)
= Height between floors

b = Design width (m)
= 1.0

d = Depth to tensile reinf orcement (m)
= $t_w/2$

t_w = Wall concrete thickness (m)
= Overall wall thickness - 0.012

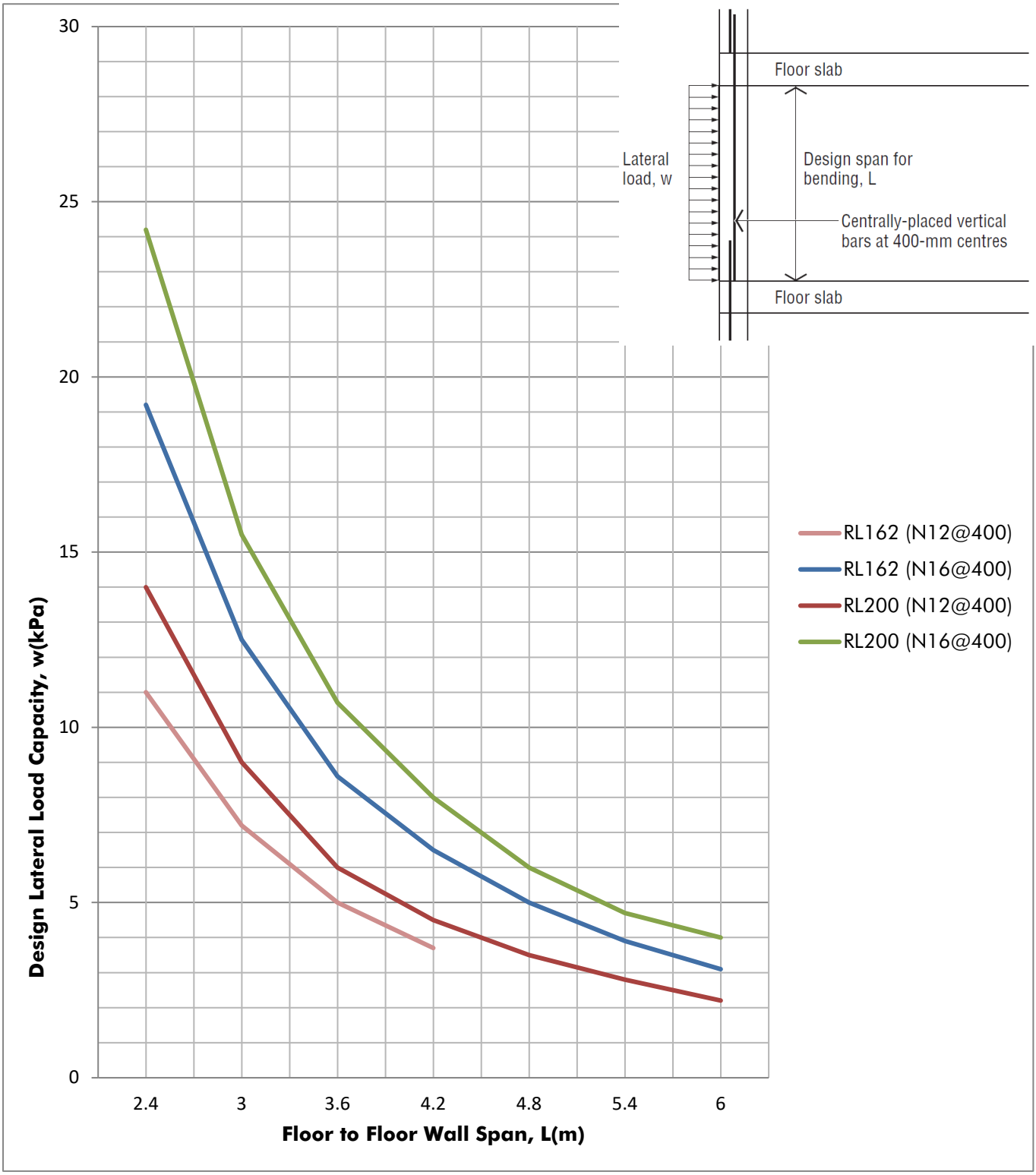
A_{st} = Area of vertical reinforcement (mm^2)

f'_c = Concrete compressive strength (MPa)

f_{sy} = Yield strength of reinforcement (MPa)

LATERAL LOAD CAPACITY

Design Lateral Load Capacity
Vertical Reinforcement



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Racking Resitance

When a wall is subjected to racking forces, it can fail by either overturning of the wall or shear through the length of the wall. The wall capacity is therefore limited by the lesser value of overturning or shear.

Wall Overturning

The resistance to overturning of the wall is controlled by wall thickness and length, concrete strength and the amount and strength of tiedown reinforcement. In addition, weight of the wall as well as any other applied loads will help to resist overturning. The overturning is calculated in accordance with the assumptions contained in AS 3600 Clause 8.1.2.1 Combined bending and axial force. The following formula has been used:

$$V=\phi\left[\frac{(f_{sy}\,A_{st}\,10^{-3}+w\,L_w)d\left\{1-\frac{0.6(f_{sy}\,A_{st}\,10^{-3}+w\,L^w)}{t_w\,d\,f'_c\,10^3}\right\}-w\,L_w\left\{d-\frac{L_w}{2}\right\}}{H_w}\right]$$

where:

V	= Design overturning resistance	(kN)
ϕ	= Strength reduction factor for shear	
	= 0.7 (adopt shear value)	
f_{sy}	= Yield strength of reinforcement	(MPa)
f'_c	= Concrete compressive strength	(MPa)
A_{st}	= Area of tiedown reinf. in tension	(mm^2)
	= Reinf. area over half wall length	
w	= Total Vertical load on wall	(kN/m)
	= $w_s + w_{sw}$	
w_s	= Superimposed permanent load (PL)	(kN/m)
w_{sw}	= Self-weight of wall (SW)	(kN/m)
d	= Distance from the compression face (end of wall) to the centroid of tensile reinforcement	(m)
H_w	= Wall height	(m)
L_w	= Wall length	(m)
t_w	= Concrete thickness	(m)
	= Overall wall thickness – 0.012	

The overturning capacities shown in the Racking Resistance chart have been calculated for the ET178 walls with concrete strength 25 MPa and tiedown rods N12@ 400 mm centres. Two sets of design curves are given covering two load cases. One set of curves is for a UPL of 0 kN/m and the second set is for a UPL of 100 kN/m. Where a UPL is between these values, the overturning capacity can be obtained by interpolation. Increases in wall size or concrete strength will only give marginally higher strength.

Wall Shear

The shear strength through the wall is controlled by wall thickness and length, concrete strength and amount and strength of reinforcement. The shear capacity is calculated in accordance with AS 3600 Clause 11.5.3. Strength in shear, as follows:

$$\mathbf{V_u = \phi(V_{uc} + V_{us})}$$

When $H_w/L_w < 1.3$

$$V_{uc} = \left[0.66 \sqrt{f'_c} - 0.21 \frac{H_w}{L_w} \sqrt{f'_c} \right] 0.8\, L_w\, t_w\, 10^3$$

When $1.3 \le H_w/L_w < 1.83$

$$V_{uc} = \left[0.05 \sqrt{f'_c} + \frac{0.1 \sqrt{f'_c}}{\left[\frac{H_w}{L_w} - 1 \right]} \right] 0.8\, L_w\, t_w\, 10^3$$

When $H_w/L_w \ge 1.83$

$$V_{uc} = [0.17 \sqrt{f'_c}]0.8\, L_w\, t_w\, 10^3$$

$$V_{us} = \frac{A_s}{s} f_{sy}\, 0.8\, L_w\, 10^3$$

where:

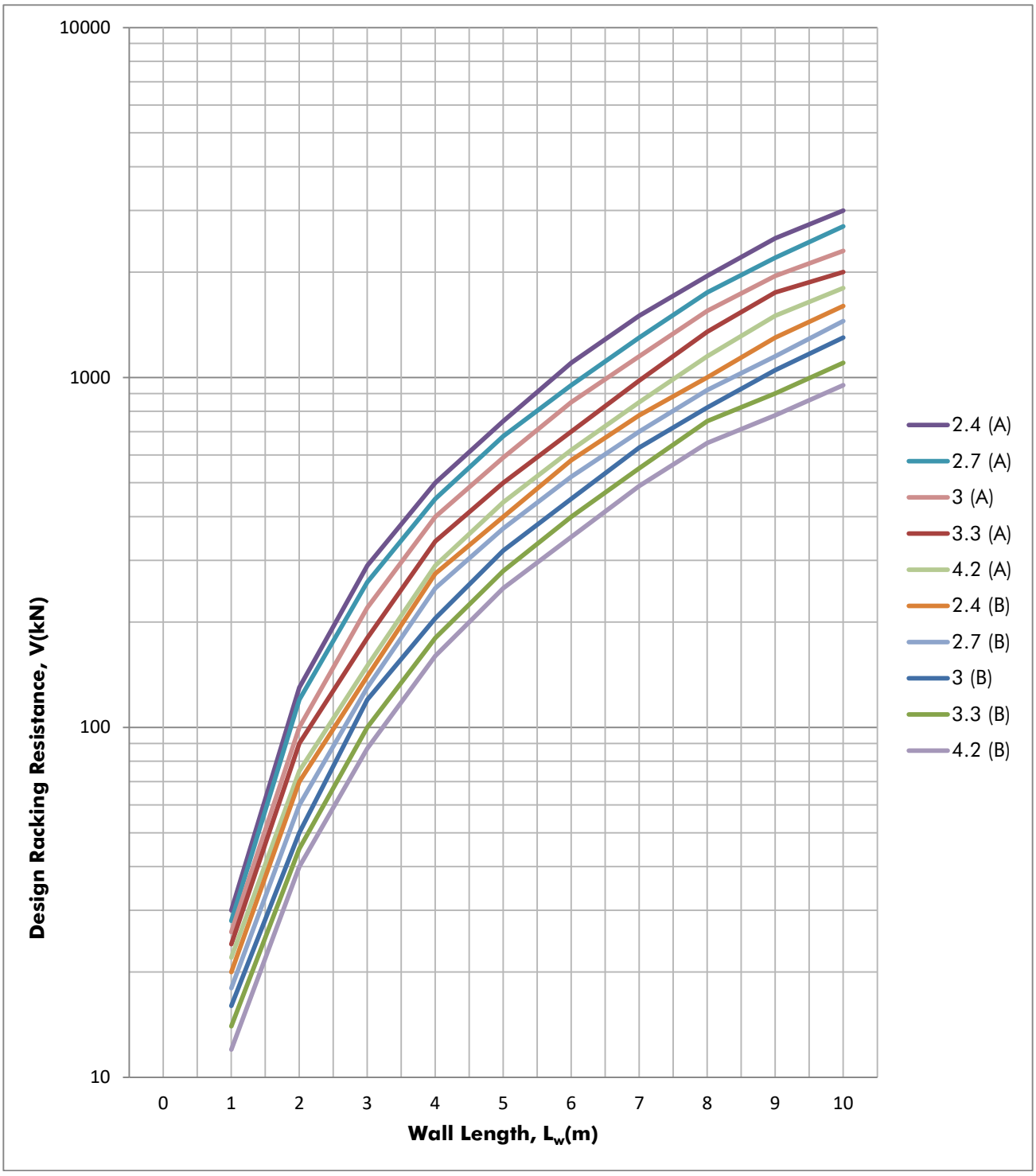
V_u	= Design strength in shear	(kN)
V_{uc}	= Shear strength without reinf.	(kN)
V_{us}	= Contribution to shear strength by reinforcement	(kN)
ϕ	= Strength reduction factor for shear	
	= 0.7	
f'_c	= Concrete compressive strength	(MPa)
f_{sy}	= Yield strength of reinforcement	(MPa)
A_s	= Area of vertical and horizontal reinforcing bars	(mm^2)
s	= Spacing of vertical and horizontal reinforcing bars	(mm)
H_w	= Wall height	(m)
L_w	= Wall length	(m)
t_w	= Wall concrete thickness	(m)
	= Overall thickness – 0.012	

The shear capacity given in the following chart have been calculated for the ET178 wall with concrete strength 25 MPa and N12 bars @ 400 mm centres. Increases in wall size, concrete strength or einforcement will give proportionally higher shear strength.

Racking Resistance

The racking resistance given in the following chart is the lesser of the shear and overturning values. Except for long and heavily-loaded walls, the value of racking resistance is limited by overturning.

Wall Overturning use AS3600 clause 8.1.2.1 - Combined Bending and Axial Force
Wall Shear use AS3600 clause 11.5.3 - Strength in Shear



Lintel Capacity

The design lintel capacity is the lesser of the strength in flexure or in shear. Deflection must also be checked to ensure that serviceability limits are not exceeded.

The design capacities given have been calculated on the basis of simply supported beams using concrete strength of 25 MPa and the details shown in the image below.

Flexural Capacity
The capacity in flexure is calculated for a simply-supported beam using the following formula:

Design Capacity, $w = 8 \phi M_u / L^2$ (kN/m)

where:

$$M_u = f_{sy}\, d\, A_{st} \left[1 - \frac{0.6\, A_{st}\, f_{sy}\, 10^{-6}}{f'_c\, b\, d} \right] 10^{-3} \quad \text{(kN.m)}$$

ϕ = 0.8

L = Design span for flexure (m)
= L_o + 0.35

L_o = Opening width (m)

b = Thickness (m)
= Overall wall thickness – 0.012

d = Depth to tensile reinf orcement (m)

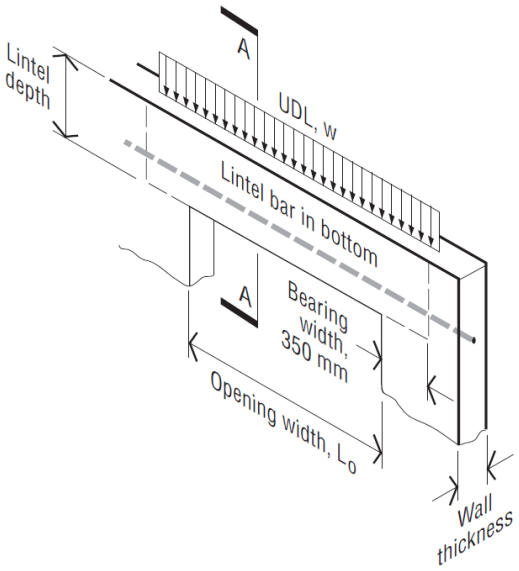
A_{st} = Area of tensile reinforcement (mm^2)

$$\geq 0.22\, b\, d \left[\frac{d + 50}{d} \right]^2 \frac{f'_{ct}}{f_{sy}}$$

f'_c = Concrete compressive strength (MPa)

f'_{ct} = Concrete flexural tensile strength
= $0.6\sqrt{f'_c}$ (MPa)

f_{sy} = Yield strength of reinforcement (MPa)



Assumptions

- Simply-supported beam
- Bearing width = 350mm
- Design span for flexure,
  L = Opening width + 0.35 (m)
- Design span for shear,
  L = Opening width - 2d (m)
- No vertical shear reinforcement

NOTES

NOTES

PERFORMANCE

PERFORMANCE & BCA COMPLIANCE

ReoLok® walls have been evaluated for compliance with the following Australian Standards and BCA codes

Australian Standards

- AS.3600 Concrete structures
- AS.3610 Formwork for concrete
- AS.3700 Masonry structures

BCA Requirements

- Volume 1 - Class 2 to 9 Buildings
- Volume 2 - Class 1 & Class 10 Buildings - Housing Provisions
- Part 1.1.1.2 Alpine Areas
- Part 3.1.3 Termite Risk Management
- Part 3.3.2 Reinforced Masonry
- Part 3.3.4 Weatherproofing of Masonry
- Part 3.6.2 Glazing Sizes & Installation
- Part 3.7 Fire Safety
- Part 3.8.1.5 Protection of walls in wet areas
- Part 3.8.6 Sound Insulation
- Part 3.10.1 Cyclonic Areas
- Part 3.10.1 High Wind Areas

ReoLok® Model Performance

MODEL NO.	WALL THICKNESS	CONC. THICKNESS	FORMWORK MATERIAL	FIRE	THERMAL	ACOUSTICS	
				FRL	R-Value	$R_w + C_{tr}$	$D_{nT,w} + C_{tr}$
RL162	162mm	150mm	6mm FC/6mm FC	180/180/180	0.25m².K/W	50	46
RL200	200mm	188mm	6mm FC/6mm FC	240/240/240	0.25m².K/W	54	48

Tests Conducted on FC Material as per AS2908

Test Description	**Value**
Water Absorption	16.22%
Flexural Strength	16Mp
Dimensional Stability – Thermal & Humid Aging	0.52%
Density	1613kg/m^3
Dimensions	+- 2mm
Flame Test to AS1530.2	Pass
Flame Test to AS1530.3	
- Structural Adequacy	219 minutes
- Integrity	219 minutes
- Insulation	149 minutes

Tests Conducted on Galvanised Truss

Test Description	Value
Flammability	Flame Front Distance = 100mm Avg. Linear Burn Rate = 17.9mm/min
Average Lateral Fastener Resistance	1.63kN
Average Withdrawal Fastener Resistance	0.75kN
Shear Strength	26.1MPa
Average Tensile Strength	3.75kN

Fire Assessment Report - BRANZ Fire Test FAR4359

Assessment report on ReoLok® walls to AS: 3600:2001. Walls were found to be compliant.

Model	Wall Thickness	Concrete	External Material	FRL
RL162	162mm	150mm	0.104	180/180/180
RL200	200mm	188mm	0.120	240/240/240

Thermal Performance Calculations (R-Value)

General assumptions:

- Thermal conductivity for Concrete at density 2850 Kg/m3 = 1.44 W/mK
- Thermal conductivity of Plasterboard = 0.173 W/mK
- 3.4m/s wind and surface emittance = 0.9

Non-Concrete R-value contribution - (thickness (m)/k)

Outside air		= 0.044
6mm Fibre Cement	= 0.006 / 0.173	= 0.034
10mm Plasterboard	= 0.010 / 0.173	= 0.057
Inside air		= 0.12
RL Wall Non-Concrete Contribution (Total)		= 0.260

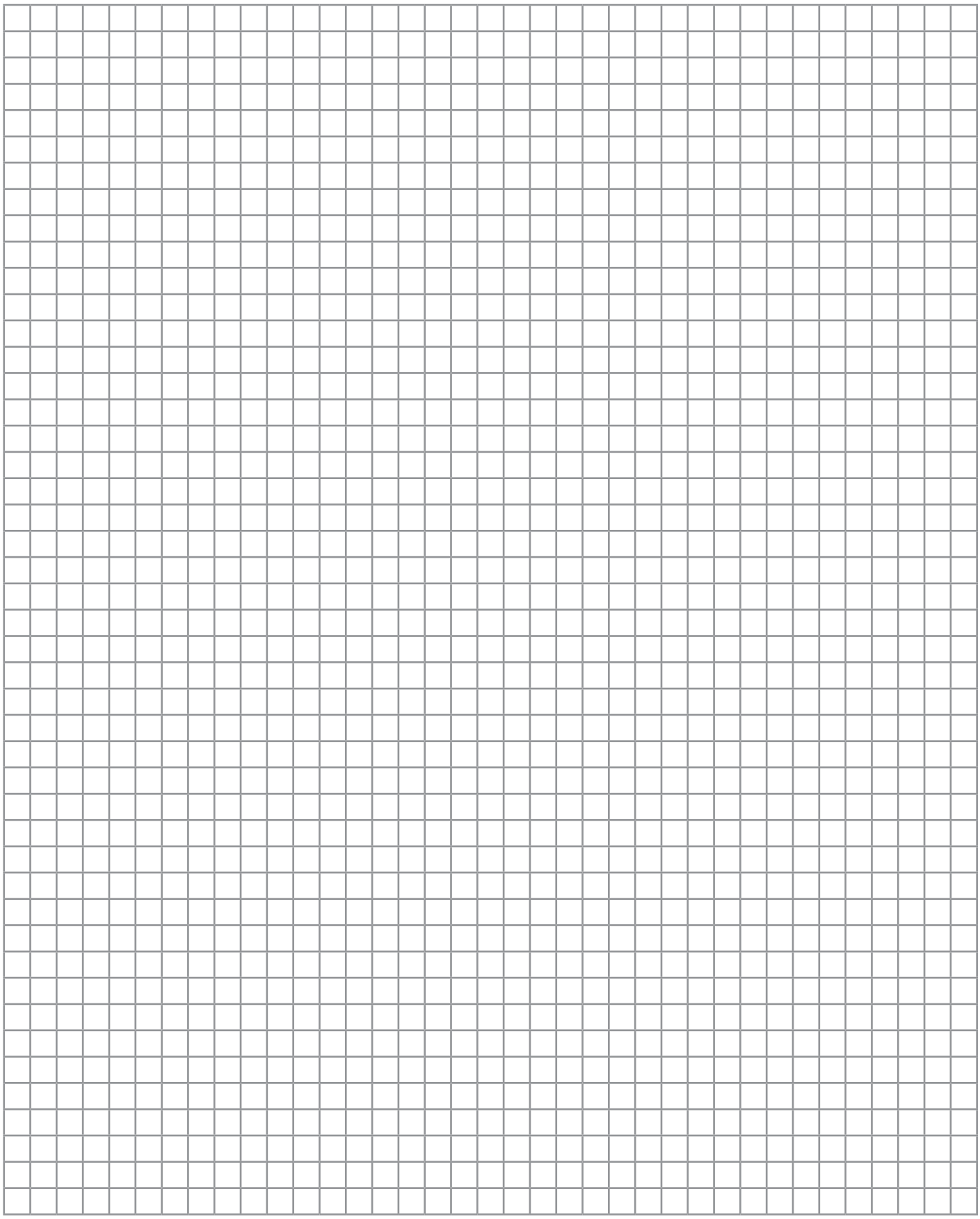
Concrete R-value contribution - (thickness (m)/k)

RL162 (150mm conc.)	= 0.150 / 1.44	= 0.104
RL200 (188mm conc.)	= 0.188 / 1.44	= 0.130

Thermal Performance Values

Product Line	Wall Model	Total Wall Thickness	Concrete Thickness	Concrete R–value	Total R-Value
ReoLok®	RL162	162mm	150mm	0.104	0.360
ReoLok®	RL200	200mm	188mm	0.120	0.376

NOTES



FAQ

FREQUENTLY ASKED QUESTIONS

What can I build with ReoLok®?

ReoLok® is a permanent formwork for walls. Typical applications are residential buildings, commercial buildings, factories, warehouses, shopping centres, basement walls, apartments, party walls and retaining walls.

Does ReoLok® comply with the requirements of the NCC?

Yes. The system complies with all structural engineering, fire rating, acoustic and energy efficiency requirements and has been tested by NATA accredited laboratories.

What are the standard module dimensions?

ReoLok® forms are generally a maximum of 3.6m high and 1.2m wide although taller panels can be fabricated on request. ReoLok® forms are available in a variety of wall thicknesses and configurations. Please refer to product selection guide.

Is ReoLok® safer to build with than other wall systems?

Panels are half the weight of traditional fibre-cement cassettes, making them safer and easier to handle on-site

Is ReoLok® faster to build with than other wall systems?

Formcraft's advanced concrete forming technology also delivers proven savings in labour costs through its rapid construction technique. Pre-fabricated panel packs are pre-cut according to an approved set of shop drawings and delivered to site timed to suit your construction program. ReoLok® connects panels together via the horizontal reinforcement bar itself, creating a very fast installation method. Panels are half the weight of traditional fibre-cement cassettes, making them safer and easier to handle on-site. The innovative joining truss means that no screws are required to join adjacent panels further increasing construction speed.

How do I brace the ReoLok® walls?

The base of the forms are restrained by an aluminum bottom track which also establish the location of the walls. We recommend using a proprietary bracing system which are screw fixed into the trusses at min 1200mm centres. See ReoLok® Construction Manual.

What is the concrete mix used?

The minimum 20 MPa for normal grade concrete with compressive strength at 28 days is recommended with 140mm slump and 7mm aggregate sizes. Higher MPa concrete is sometimes specified for high strength applications.

FREQUENTLY ASKED QUESTIONS

What kind of concrete pump should be used?

The use of boom pump with a reduction to a 50mm hose is especially recommended.

How are windows installed?

Any type of window system can be installed into the opening that is formed by our stop ends. They are just trim fitted in a very similar way to the windows and doors in a tilt panel building.

Does Formcraft provide technical assistance?

Yes. Comprehensive technical backup is available for architects, engineers, and construction workers. Please see Support.

- This Design Manual has been prepared to assist Architects & Engineers designing with the ReoLok® wall system. Although every care has been taken in developing this manual, it is the responsibility of the user to ensure that its use is appropriate and exercise their own judgement in applying the information.
- The engineering of the structure of any building using ReoLok® walls should only be undertaken by suitably qualified and experienced engineers/consultants. The full responsibility for the engineering and structural design, Certification of Compliance with all relevant Australian Standards, BCA and any other statutory requirements at Local, State and Federal levels rest with the project engineer/project consultants.
- Similarly, provisions and detail for installation of, including but not limited to; services; waterproofing; glazing; flashing; fixings or other, are to the builder's specification and/or relative project consultant. Formcraft has provided generic detail throughout this manual for illustrative purposes only. Formcraft does not warrant the adequacy of this detail or accept liability for any loss incurred should the user adopt these details without review or consultation with a appropriate industry consultant.
- Please check with Formcraft that you have the latest version as the manual may be updated from time to time and certain details may change.
- Formcraft reserves the right to change specifications without notice.
- Design Manual is a guide only. The project Engineer must be consulted for all final requirements.

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