Ritek®
XL WALL SYSTEMS

INSTALLATION MANUAL

***XL Wall** System & **XL Thermal Wall** System*

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Contents:

Manual Version 2010.01

1. Tools and Equipment

Tools and Equipment required by a 3-person installation crew:

- Rotary Hammer Drill with corresponding drill bits
- Dustless 5 in (125mm) angle grinder with diamond cutting blade.
- 9 in (230mm) angle grinder with metal cutting blade, Diamond grinding disc, and diamond cutting blade.
- Explosive tool for fixing to floor.
- Fibre shears
- Tool belt, hammer, chisel, all purpose tin snips, stanley knife, marking crayon, pencils, steel fixing nips, set square
- Circular saw suitable for cutting fibre cement / aluminium combination.
- Circular saw suited for timber.
- 3 impact screw battery drills (14 V+ preferably 18V).
- Chemset / epoxy equipment if starter bars not cast in place.
- Compressor with hose and air gun (to clear dust from starter bar holes if starters are chemset in place).
- Measuring tapes (8m and 30m)
- Chalk line and string line.
- Spirit Level (2m)
- 500 x 500 roofing square
- Step Ladders
- Junction box with earth leakage safety switch.
- 2 saw horses or a bench
- 4 extension leads
- Safety equipment – boots, hard hat, sun protection, eye protection, ear protection and dust masks
- Panel braces. Appropriately-engineered braces to support walls during construction and pouring.
- 4m Straight Edge
- Pinch Bar
- Finishing Trowel for window sills
- Sponge and bucket for wiping down door frames after pour
- A compound saw for cutting aluminium sections (mitre and 90 degrees)
- Dry Vacuum cleaner

Screws and Fixings Required and Supplied by Installer

- For fixing a certified panel brace to the panel use 3 off 14-10 x 42 mm HEX TEK screws (Fig A)
- For fixing a certified panel bracing to the slab use 1 off 10mm x 60mm concrete screw bolt (Fig B)
- For general panel fixings use 8-18 x 25 CSK SELF-EMBED TEK CLASS 3 GALV (Fig C) Ribbed Head or Winged Tip TEK point self tapping screws at 300 centres
- For fixing the Bottom Plate Assembly to the slab use 20mm collated masonry nails
- For packing between the XL Wall Rebated Top Track extrusion and Rebated Bottom Track extrusion use 5mm packers typically utilised in glazing (e.g. G. James 5mm packers)
- For fixing XL Thermal Wall Panel Joiner Insulation Inserts and Internal Corner Insulation Inserts use 100 x 3.75 GALV Flat Head Nails

Fig A

Fig B

Fig C

Standard Tools Required

GX 120 gas system with 40 nail magazine

The above tool or similar is suitable for fastening bottom track assembly to slab with masonry pins.

Makita 24v Cordless Rotary hammer drill

The above tool or similar is used to prepare holes ready for a 10mm x 60mm Concrete Screw Bolt.

SIW 144-A cordless impact wrench

The above tool or similar is used to secure the certified brace with an 10mm x 60mm Concrete Screw Bolt to the finished slab.

SID 144-A cordless impact screwdriver

The above tool or similar is used to fix the 8g x 25 CSK Ribbed Head (or Winged Tip) Tek Point Self Tapping Screws and the 6.5mm x 40 mm Tek screws.

DG 150 diamond grinder

The above tool or similar is used to grind out any imperfections after the installation is completed

VCD 50 dry vacuum cleaner

The unit above or similar is connected to the DG 150 Diamond Grinder to extract the dust whilst grinding.

7 Inch Angle Grinder

The above tool is used for cutting or grinding where needed. A diamond cutting blade can be incorporated for cutting a combination of fibre cement and aluminium.

5 Inch Angle Grinder

The above tool or similar is used for trimming and cutting panels if needed

Circular Saw

Circular saw is used to trip form ply if needed.

Compound Saw

The above tool is used for cutting the aluminium section (mitre and 90º).

Hand Tools Required

Roofing Square

2. Considerations Prior to Construction

1. A work method statement should be completed by the panel installation contractor and signed off prior to onsite work commencing.
2. An accurate **Layout grid** must be provided by the builder before wall bottom plate assembly are positioned. It is suggested that a surveyor mark out the slab to the architectural plans with surveying pins. It is imperative that there are pins at the start of wall, the end of wall, and at every directional change.
3. Set out the slab using a chalk line and workshop drawings supplied. Check set out with a string line to ensure the marked chalk line is correct. In this process it is also recommended that the distance between pins be measured and those measurements be checked with the workshop drawings.

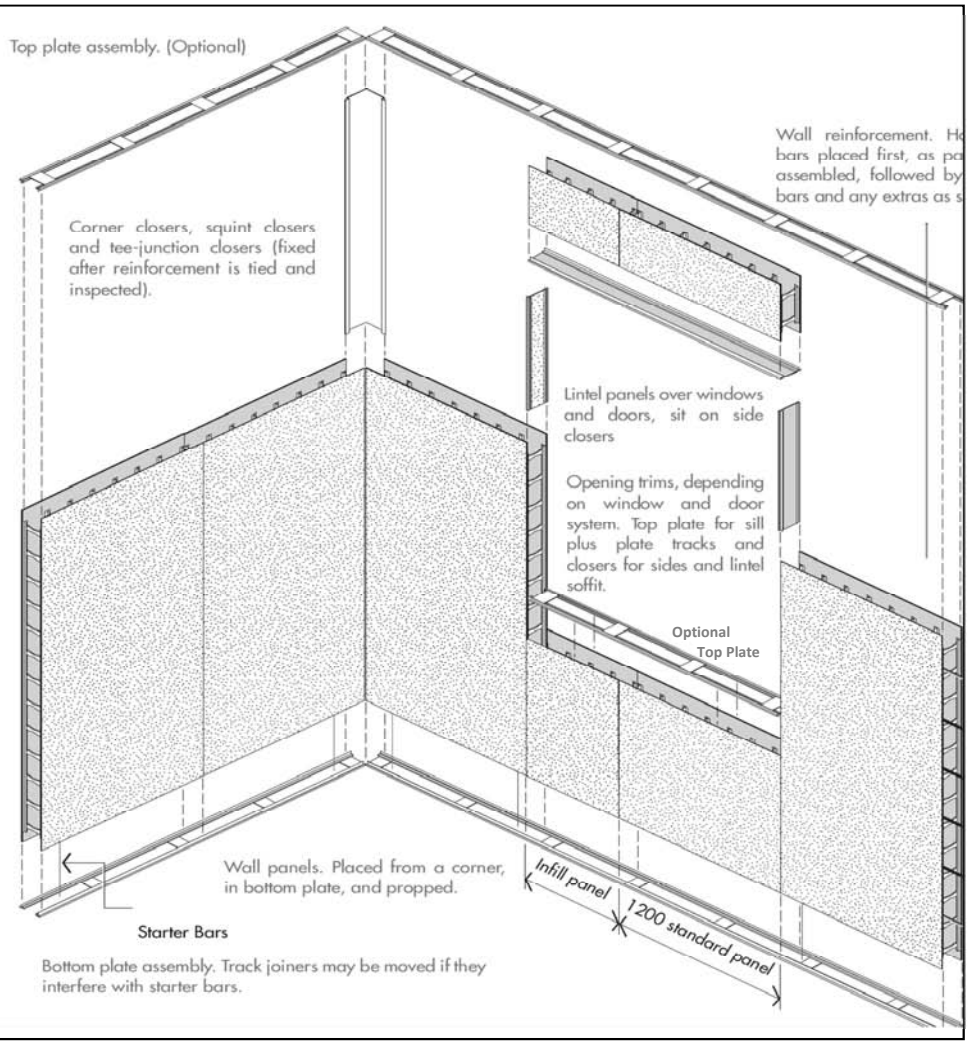
   For increase speed of erection - with the use of workshop drawings, mark out the slab with a marking crayon placing wall numbers and panel numbers with their coinciding walls.
4. It is recommended, as a minimum, that slab levels meet the following:
   - Generally, the floor is to be within + or – 10mm of level over the entire room and at all times within + or – 5mm of level over any 3m length
5. Check location of cast-in starter bars or marked position of starter bars are in accordance with the structural engineers specification.

   NOTE: For XL Thermal Wall – Starter bars to be positioned to suit the concrete core ensuring that sufficient concrete cover is achieved (bars may need to be offset from the insulation).
6. Check set downs for correct positions.
7. Ensure that all tools are tagged and tested and in good working order.
8. Provide installation crews with the following documentation
   - Program of works
   - Relevant architectural and structural drawings
   - Window / Reveal / Opening schedule
   - Workshop Drawings
9. Co-ordinate with other trades identifying work methods.

3. Acceptable Installation Tolerances

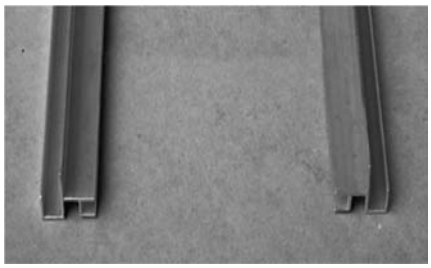
The Ritek ® XL Wall System, a versatile structural walling system, has been successfully used in a large number of building projects nationally. The system can be used for all internal and external walls or it can be used selectively for such areas as lift shafts, stairwell and party walls.

Key benefits of the Ritek® XL Wall System are its structural integrity, speed of installation, reduced on-site wastage, fire and acoustic ratings plus the confidence in dealing with more than 24 years of experience in supplying building systems into the residential & commercial construction sectors.

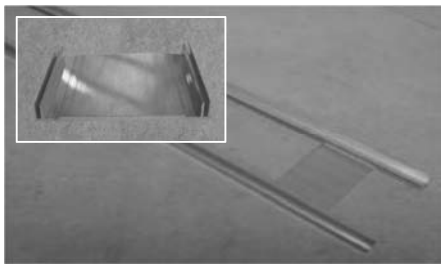


DESCRIPTION	TOLERANCE	
Concrete Blow Holes / Voids	NONE	
Flatness	Over 1.25m Grid	Within 5mm
	At 5m over 10m	Within 7mm
Out of Plumb	< 3m	Within 5mm
	> 3m	Within 8mm
Straightness	Wall Length / 1000mm	Within 3mm
Corner Details	Stated Angle	+ / - 2deg

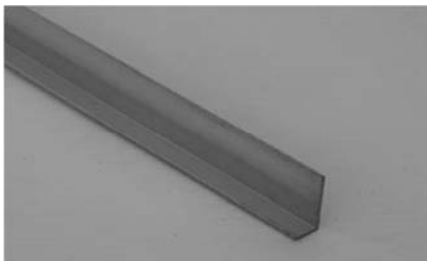
4. XL Wall & XL Thermal Wall (XL-T) System Components



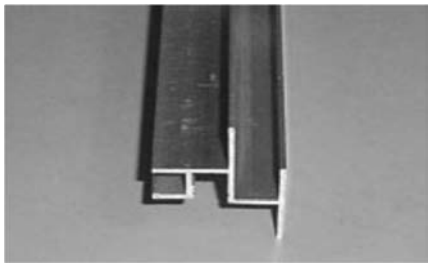
Standard Track



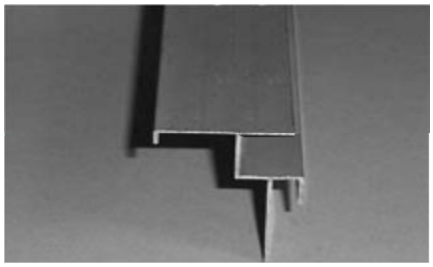
Track Joiner / Assembly



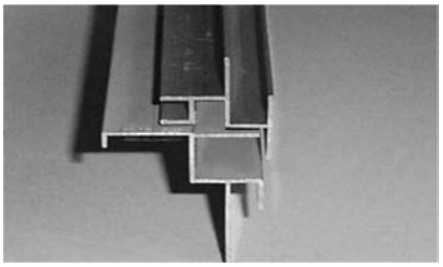
Panel Joiner



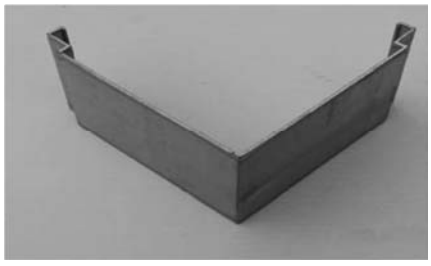
Rebated Bottom Track



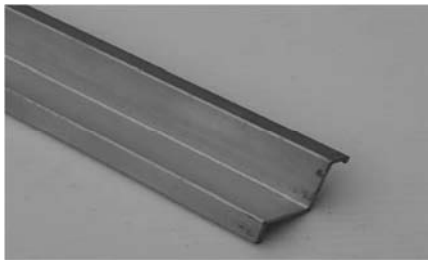
Rebated Top Track



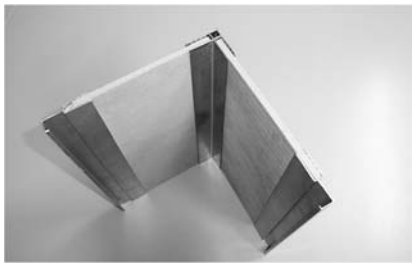
Rebated Track Assembly



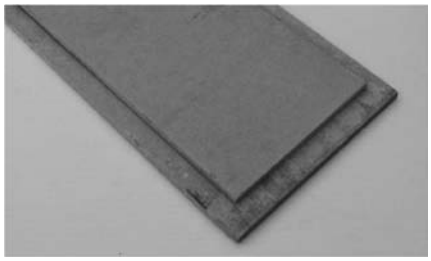
External Corner Closer



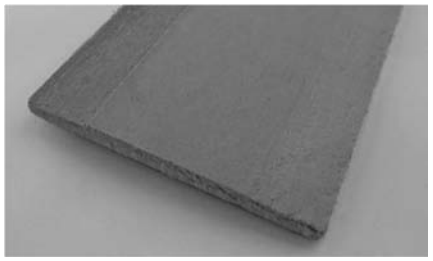
Internal Corner Closer



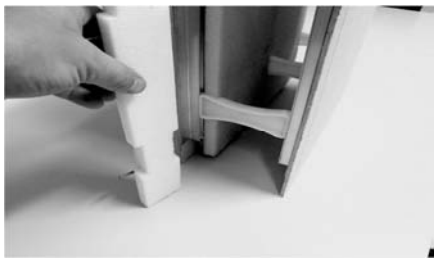
FC External Corner



Tee Closer



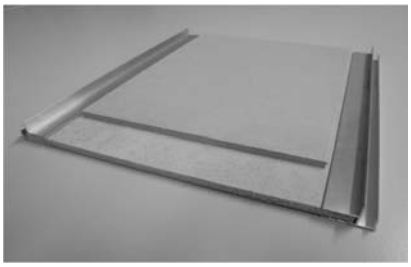
Nib End Closer



XL-T Joiner Insert

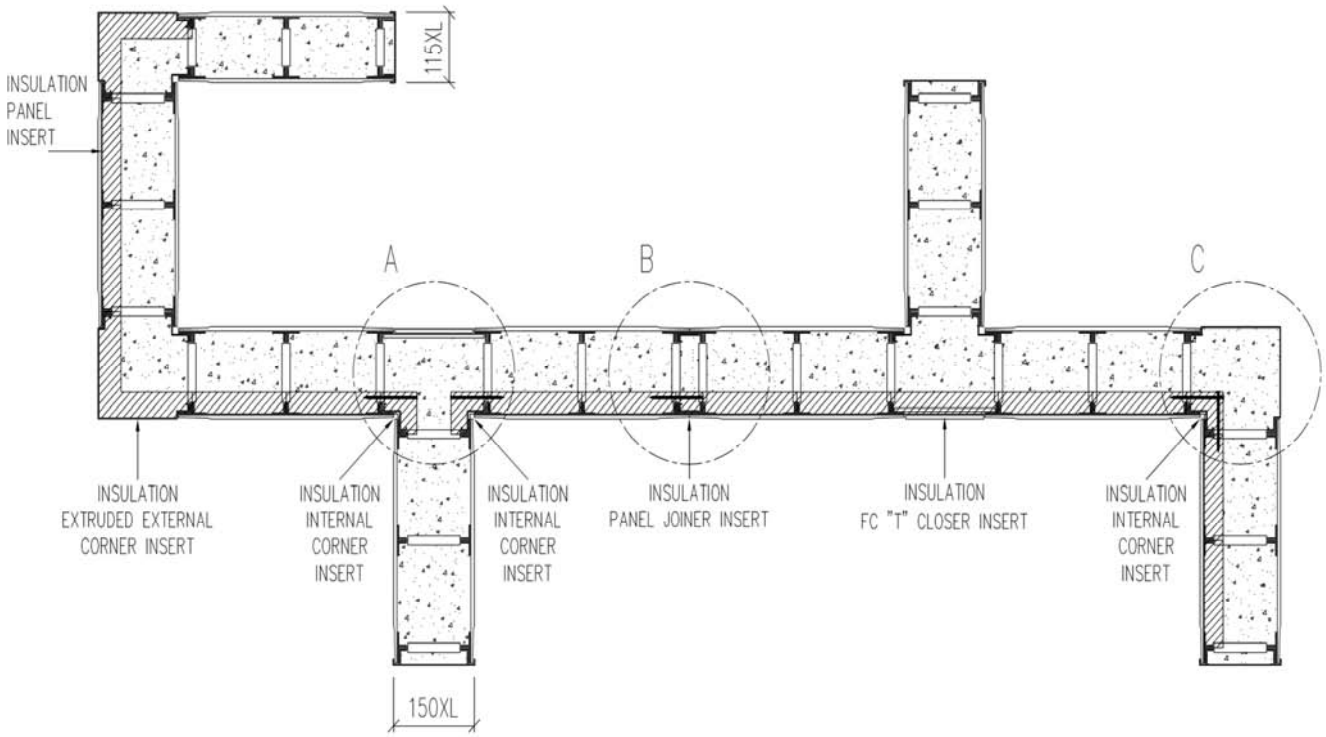
XL-T Tee Closer

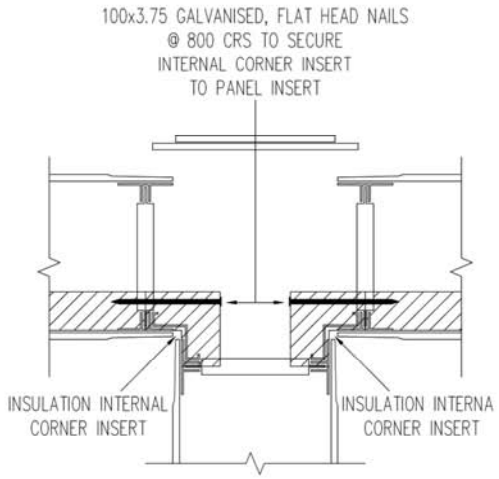
XL-T External Corner

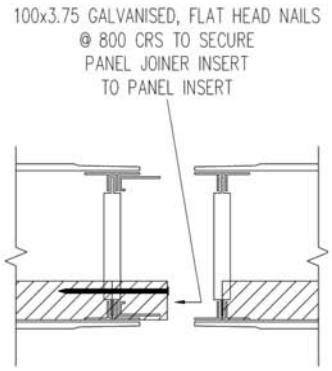


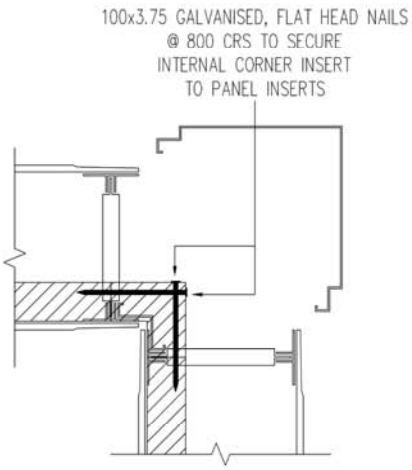
265 Nib End Closer

4.1 XL Thermal Wall (Xl-T) System Insulation Components









5. Handling of Panels

General

The panels will typically arrive on site on a flat bed semi-trailer.
The pallets will be labelled clearly for identification and to assist in the placement on slab.
A typical pallet of panels, say 2400 x 1200 x 1200 will weigh approximately 864 kg based on 25 kg/m^2.

Handling Manually

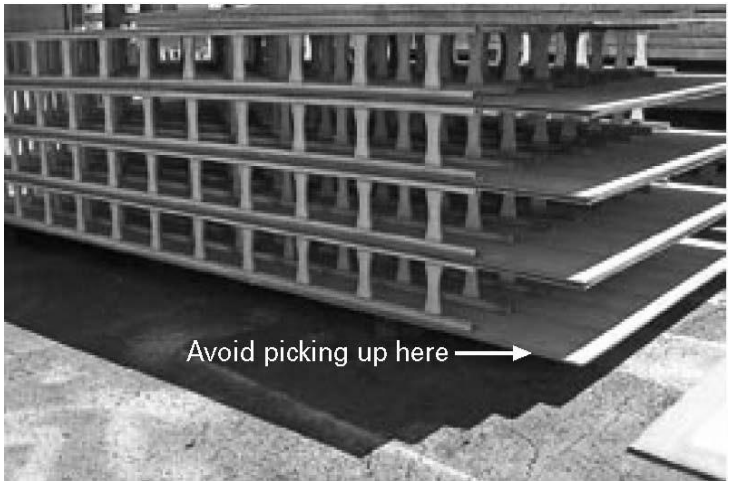
When carrying the panels manually, hold panel using one of the plastic stud joiners as a handle or hold underside of panel at stud-supported sides. It is essential that the panel is not picked up at the top or bottom corners or placed on the ground in any way that may weaken or break the sheet in that area.

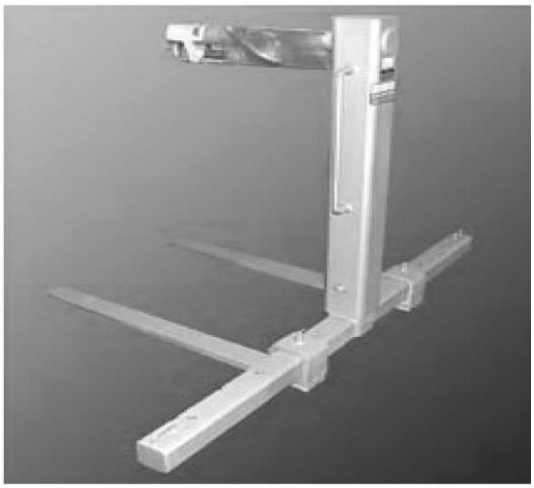
Handling Mechanically

Panels can be removed from the delivery vehicle by forklift or crane. If the crane is to be used it is at the crane drivers discretion whether the lifting method is acceptable.

Detailed are two recommended lifting methods that are used for unloading the Ritek® system.

In addition, approved and correctly-rated slings may be used to crane panels. Contact Ritek for further information on the lifting tynes.





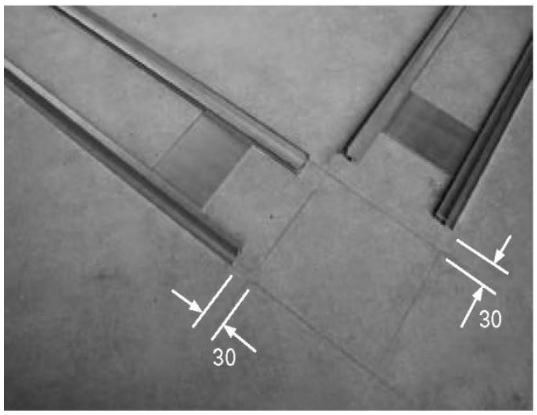
Avoid picking up panels by unprotected corners

6. Panel Installation

Set out wall positions from grid lines supplied by the head contractor. Mark locations of openings and individual panel positions ready for the bottom plate assembly.

Note: When positioning reinforcing starter bars for the XL Thermal Wall panels, the starter bars are offset from the centre of the wall panel due to the thickness of the panel insulation.

At corner intersections, position bottom plates so both track sections stop 30 mm short of the corner.

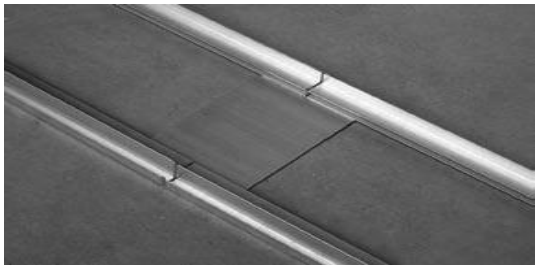


90º Corner Bottom Plate Set-out

T-Junction Bottom Plate Set-out

Fix Track Jointers down with masonry nails once the bottom plate is correctly positioned. Track joiners should be fixed at **600mm** centres. Masonry nails should be positioned close to each track rail. Track joiners can be slid sideways before fixing to slab to avoid metal-to-metal contact with steel starter bars.

For long wall runs which require Track Joiners to be end-joined, locate a Track Joiner to bridge the joint between the extrusions.



6. Panel Installation (continued)

The installation of the panels is undertaken in the following manner, care is to be taken when inserting the panels into the bottom track, and ensuring that the starter bars do not conflict with the studs, which can be done prior to installing the panel (ensure to keep starter bars at engineers specifications). Always be sure to start the installation process from a corner or end of wall where possible.

NOTE: When positioning reinforcing starter bars for XL Thermal Wall panels, the starter bars are offset from the centre of the wall panel due to the thickness of the panel insulation.

Create jig to ensure starter bars do not conflict with studs

For increased speed of panel installation fix the panel joiners to the panel before erecting.
NOTE: For XL Thermal Panel – fix the insulation infill and secure using the galv nails

Position first panel in line with surveyor's wall starting point.
Note: For XL Thermal Panel - ensure insulation is to correct facing side of the panel

Secure brace foot plate to slab with Excalibur bolt and brace to panel with self-tapping screws into panel stud. Proceed to plumb panel in all directions utilising the brace's push pull mechanisms and a level.

Standard panel requires three people to be placed into position.

Panel is lifted over starter bars, slid over the Panel Joiners of the fixed panel and then lowered into position

6. Panel Installation (continued)

Guide each face of the panel into bottom track when lowering

Panel is then checked for level and screwed off at **300mm** centers into the rebate of the adjoining panel.

Note: Panels over 4.2m are to be craned into position. Please adhere to the Ritek's XL Wall single panel lifting procedure and ensure that industry Workplace Health and Safety is followed.

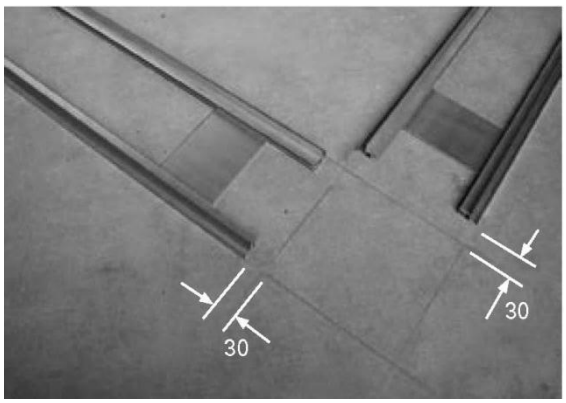
7. Wall Straightening

NOTE: Be sure to plumb and straighten every wall before any directional change occurs.

Secure Tek screws at either end of wall and fix a string line between the two. Cut three lengths of electrical conduit at the same diameter and length and place one at either end of the wall.

Ensure that both ends of the wall are plumb with a level, then move along to each panel join placing the conduit on the face of the panel beside the rebate. Adjust the brace until the string line touches the conduit to ensure a straight surface is achieved.

8. Corner Installation



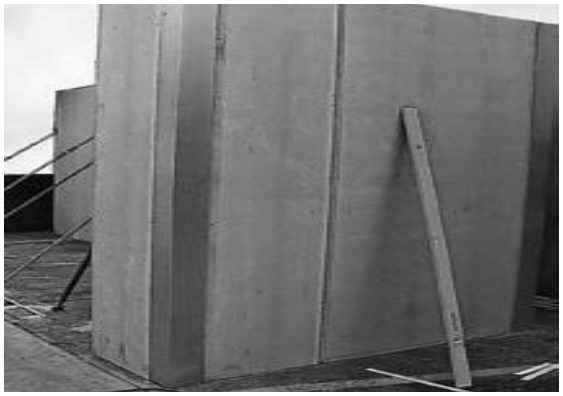
Set bottom plate assembly 30mm back from internal corner to allow the corner extrusion to be flush with the slab.

Check corner panel positioning, insuring that internal sheets are flush but allow 2mm in each direction for external corner to be fitted.

Install panels at corner ensuring they are levelled in both directions before fixing off internal corner.

Proceed to fix internal corner extrusion at 450mm centres to the stud as shown above. Ensure that all cogged bars are inserted and all horizontal steel is in place. At this stage the structural engineer is able to inspect the structural steel and sign off on it

NOTE: For XL Thermal Wall – Install internal corner insert and secure using the galv nails. Reinforcing spacer wheels may be required to centralise the horizontal reinforcement.



Insert corner extrusion and fix off at **300mm** centres ensuring the corner is plumb and square.

NOTE: Allow corner extrusion to run 150mm past the Finished Floor Level (FFL) on all exterior walls that are consecutive. Use this same process on nib end closures and tee junctions that are on the exterior of the building.

9. Tee Junction Installation

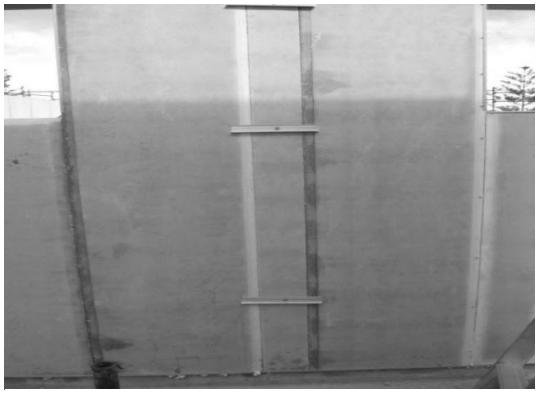
Set out the Tee Junction to surveyors pins

Fix bottom plate assembly to set out on slab with **20mm** masonry pins.

Ensure panels are plumb in all directions and screw off internal corners. Ensure that all horizontal and vertical reinforcement has been fixed to engineers specifications.

Place Tee Closure into position ready for closing off

Fix a toggle (ply wood or aluminium angle) to the tee junction bringing it flush with adjacent panels.



Fix toggles vertically up the tee junction to keep it in position during the pour process

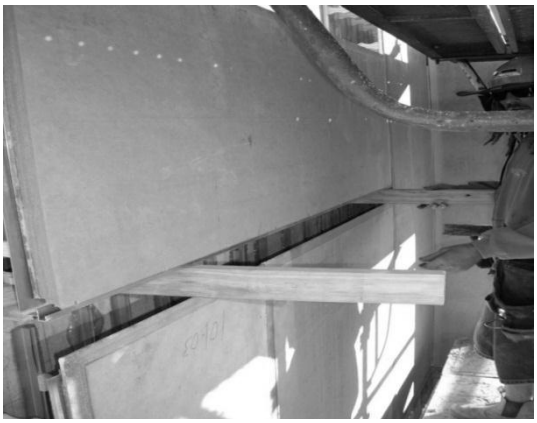
10. Closing Wall Ends

Once reinforcement has been inspected and signed off, the ends are closed.

Wall and Blade Wall Ends
An end closer section is placed over the end of the open wall and tapped into position. Screws are then fixed at 300-mm centres through the sheeting and into stud extrusion. For 200XL, 265XL, 200XL-T and 265XL-T walls, it is recommended that hex-head screws are fixed through the aluminium end closer into the studs.

11. Fixing Sill and Lintel Panels

Screw-fix panel joiners to either side of the lintel and the end closure to the underside.



Place sill panels into position checking for level in all directions. Screw in place the lintel section into the adjacent panel on some timber packers ready for positioning.

Install adjacent panel to window opening and fix the lintel into position utilising a Level for precision. Screw-fix the lintel at 300mm centres to the adjacent panels ensuring the bottom of lintel is level.

Prop Lintel sections with timbers and/or acrow-props prior to core-fill being placed to avoid any deviation.

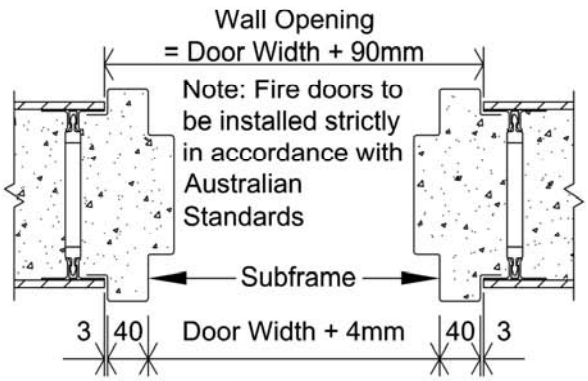
12. Fire Door Installation

Install door frame, fixing it off at 300mm centres around the frame to the specification below.

Ensure the fire door frame is level in all directions then prop prior to pouring to digress from any deviation occurring.

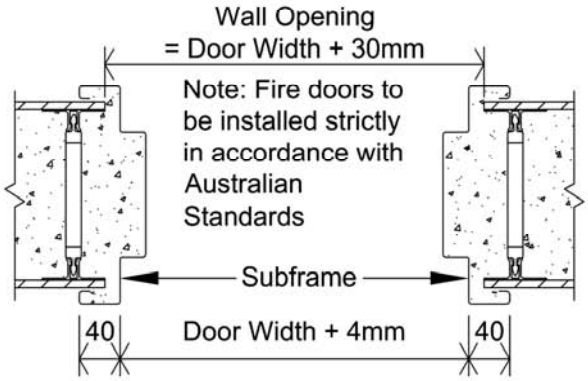
Fire Door Connection Detail

Fire Rated Frame is designed specifically for the XL wall and XL Thermal wall system. Recommended detail shown below. Manufacturing drawings for the subframe detail are available on request. Fire Certification is the responsibility of the fire door & frame manufacturer.



FIRE DOOR SUBFRAME (INTERNAL FIT)

Ritek recommend the use of internal fit door subframe systems



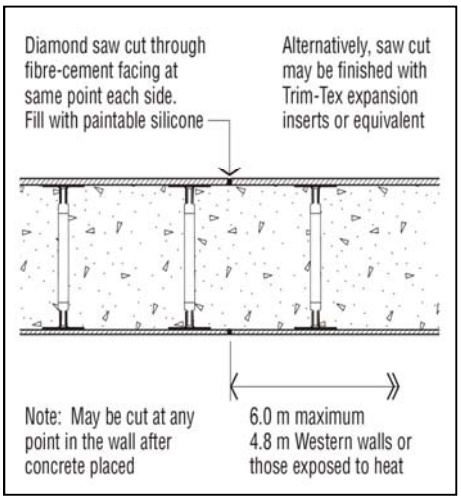
FIRE DOOR SUBFRAME (EXTERNAL FIT)

Additional formwork / bracing may be required with external fit door subframes

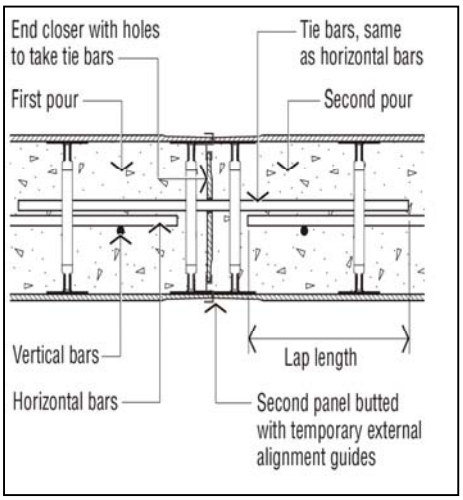
13. Control & Construction Joint Installation

The construction documentation nominates locations for control joints. Refer to construction detail to determine the correct type of control joint required.

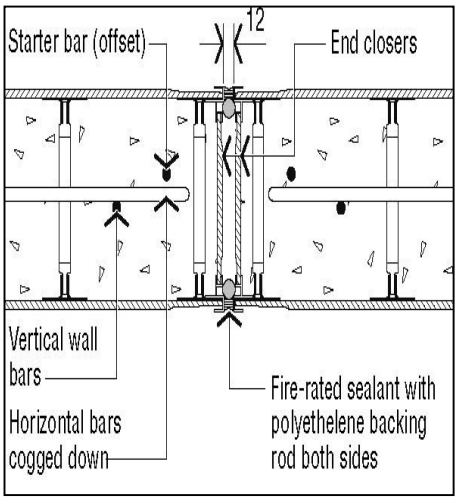
NOTE: For XL Thermal Panel – facing sheet movement joints must be installed between insulated and non-insulated panels to accommodate thermal expansion/contraction of the fibre cement sheeting.



Typical Facing Sheet
Movement Joint Detail



Typical Wall
Construction Joint Detail



Typical Wall
Control Joint Detail

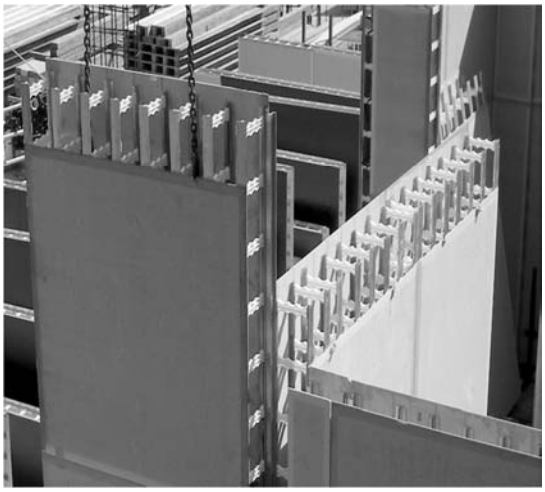
Typical installation method for a wall control joint detail shown below:

Ensure that all horizontal steel is installed and close off with an End Closure at 300mm centres
Close off panel adjacent to the control joint prior to positioning. Place timber packer for easier installation.

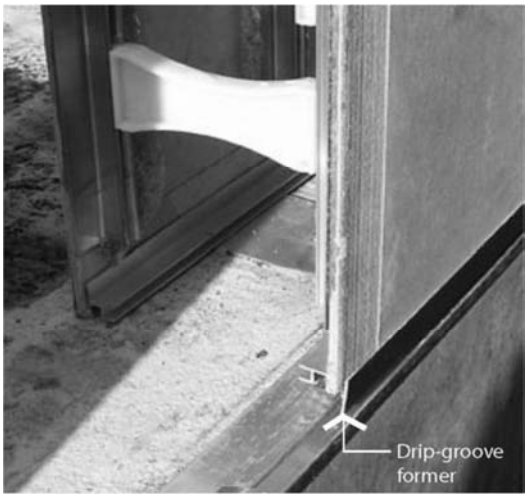
Lower panel into position placing on timber packer, then remove hammers. Remove timber and lower panel into bottom track. Fix bracing and plumb the panels. Ensure that engineers detailing is adhered to.

14. External Wall & Slab Detail

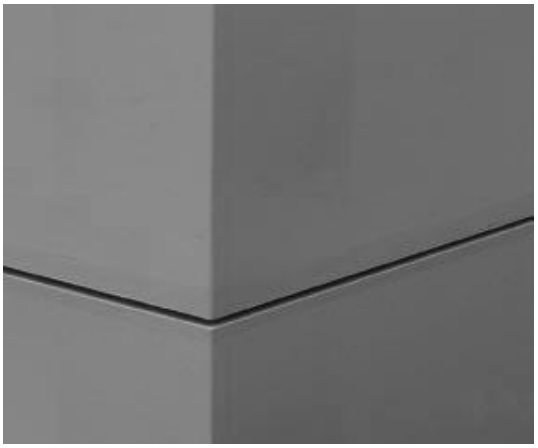
The External slab edge detail is completed with a drip groove former. This section replaces the standard bottom track on the external face of the wall sitting on the slab.



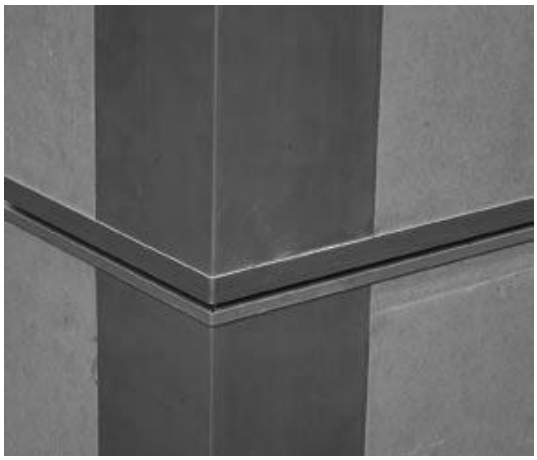
Install rebated top track on top of the edge form utilising a string line or a Dumpy level, ensure that the rebated top track is fixed to the correct finished floor level. Heights can vary in the edge form fibre cement due to inconsistent slab levels; alteration may be required. Utilising a chalk line and diamond cutting disc. For edge form above **300mm** high additional site formwork is required.



Sikaflex sealant is applied between the rebated top track and the rebated bottom track for water proofing. Refer to Design & Detailing Manual

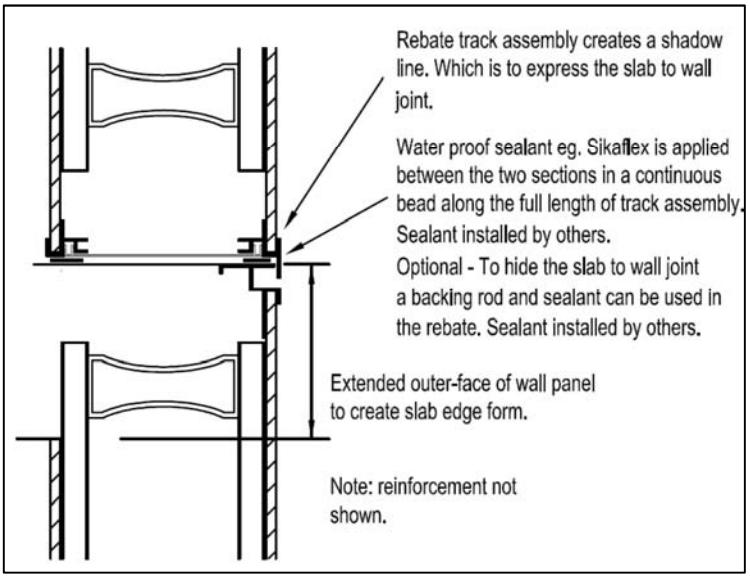


Silicon sealant can be applied to rebate at external wall finishing stage. Joint can be vee-joint detailed or set over as required by head contractor.



Finished external wall / slab Junction detail. Ensure to mitre the corners of the Rebated top/bottom extrusion if the expressed joint is required through to the corner. Ensure to use packers where required to provide an even expressed joint to finish to.

Note: If there is no express joint required through to corner, run corner extrusion 150mm past the R.L level of the finished slab and but join the coinciding corner. Terminate the rebated top/bottom track inline with the edge of the corner.



15. Concrete Filling

Before commencing concrete filling, complete a "Pre Pouring Check List". Ensure that all PPE is adhered to and complies with the site Workplace Health and Safety requirements. To calculate quantities see table below and add waste allowance.

Typical Concrete Quantities: Ritek XL Wall , XL Thermal Wall System			
XL Wall Type	**Concrete (m^3) per m^2 of wall panel**	**XL Thermal Wall Type 35mm Insulation**	**Concrete (m^3) per m^2 of wall panel**
115 XL	0.103	150 XL-T	0.103
135 XL	0.123	165 XL-T	0.118
150 XL	0.138	200 XL-T	0.153
165 XL	0.152	265 XL-T	0.218
200 XL	0.188		
265 XL	0.252	**XL Thermal Wall Type 50mm Insulation**	
265 XL	0.252	165 XL-T	0.103
265 XL	0.252	200 XL-T	0.138
265 XL	0.252	265 XL-T	0.203

16. Concrete Pump Equipment

Concrete is recommended to be placed using a concrete boom pump or line pump. The boom pump or line pump delivers the concrete in a continuous stream. For maximum efficiency when pouring, schedule the concrete trucks approximately 30 minutes apart to provide continuous supply of concrete to the pump with minimal idle times. Be sure to employ 2.5" reducers and flexible hose at the end of the pipeline.

17. Concrete Quality Control

It is recommended to perform a field slump test on the first batch of concrete that arrives on the jobsite. If the slump is too low or too high, then you can immediately inform the concrete supplier to adjust the concrete mix appropriately for the subsequent batches. This will also give a good feel for what the consistency of a proper concrete mix should be like using the specified concrete mix design for the Ritek wall systems.

18. Ritek Concrete Mix Design (see also Appendix A)

Concrete Slump - It is recommended that the Ritek specified mix design be placed at **180mm +/- 20mm** slump. A super-plasticizer can be added on site for greater flowing capabilities. When adding super-plasticizer on site ensure that the concrete load arrives to site at a slump of **140mm**. Ensure that approximately **1L** of super-plasticizer is added for every **m^3** of concrete to bring the concrete mix to the desired slump of **180mm +/-20mm**. Concrete slump higher than **200mm** or lower than **160mm** is not recommended.
Concrete Aggregate - it is recommended that the Ritek specified mix design includes aggregate size of **7-10mm** to ensure correct flow properties

19. Crew Size

On a pour day a crew of 3 is the minimum to work with, 2 men required at the base, one either side of the wall and 1 man required to supervise the line hand and pump operator, plus the pump operator and his line hand. The crew members are required to assist in finishing off window sills, cleaning any excess concrete from finished walls, door frames, formwork and to also provide supervision of the line operators to ensure the correct fill heights of 1.5m lifts are adhered to.

20. Concrete Pour - Fill Height (see also Appendix A)

Maximum concrete fill height is 1.5m, wait a minimum of 15 minutes before filling more concrete into the panel.

Important Note: Concrete fill height to be reduced if the base of panel is wet. Pour should be avoided if the panels or panel closures are heavily saturated. (e.g. after heavy downpour of rain)

21. Pre-Pouring Checklist

Checking walls

- Make sure walls are straight, plumb, square and level – within specified standards
- Check corners are square and plumb

Checking Openings

- Check door frames are plumb and adequately propped
- Check window and door openings are located correctly and if openings are plumb and square

Checking Reinforcing Steel

- Check vertical and horizontal reinforcing steel comply with the engineers specifications
- Check reinforcing steel bars around window openings are installed
- Check reinforcing steel bars for lintels (window/door headers) are installed and as per the engineers specifications

Checking Bracing & Alignment

- Check alignment and bracing is properly applied to keep panels plumb in the pouring process
- Check all Tee Junctions are braced adequately
- Check corners, joints, end closures are installed square and screwed off at 300mm centres
- Ensure that any variances in slab levels under standard bottom track are sealed
- Ensure any deviation at joints of panels are brought flush with cleat where necessary
- Ensure any broken edges are adequately patched and braced
- Ensure packers are placed between the Rebated Top Track and Rebated Bottom Track to provide an even expressed line of 5mm

Checking Wall Penetrations

- Check all penetrations (Electric, plumbing, mechanical.) have been accommodated and all form support has been installed

Checking Tool, Equipment and Materials

- Make sure you have steel trowels for finishing window sills.
- Make sure you have sponge and bucket for wiping any concrete spills on the XL wall panel
- Make sure you have adequate materials to form up in the case of a blow-out or concrete spill.
- Ensure there is two shovels and a broom to clean up any concrete spill on formed deck
- Make sure the specified Ritek Concrete Mix Design is ordered and is acceptable for the method of placement and engineering requirements.
- A concrete slump test is recommended with the first concrete delivery to ensure the correct slump of 180mm is being applied
- Make sure that you have coordinated and confirmed the delivery times for both the boom pump and the concrete.
- Make sure there is enough man power to supervise the pour. 2 men required at the base, one either side of the wall and 1 man required to supervise the line hand and pump operator.

Checking Jobsite

- Check that the site is clean and there is enough room for trucks, workers etc

22. Concrete Filling

Initiate the Pouring process at the window openings by pouring the window sills first.

Finish off window sills with a steel trowel providing an even finished surface. When concrete starts to set it may slump a little, ensure to top up the sills and provide a steel trowel finish to the concrete surface in accordance with the AS3610 for proceeding contractors.

Clean off any excess concrete with a wet rag before it sets and continue the pour around the rest of the building filling in 1.5m increments until the top of the panel is flush with the underside of the slab.

NOTE: Ensure concrete fill heights are kept to 1.5m lifts during the pouring process
If panels are wet then pour height is reduced.

<u>Important Note</u>: Fill height to be reduced if the base of panel is wet. Pour should be avoided if the panels or panel closures are heavily saturated. (e.g. after heavy downpour of rain)

23. Post-Pouring Checklist

Checking walls

- Make sure walls are straight, plumb, square and level.
- Ensure all concrete leaks are cleaned off finished walls and door frames.

Checking Openings

- Check if door frames have remained plumb through the poor process.
- Check that window sills have been topped up and a steel trowel finish has been applied to concrete surface
- Ensure that window sill finish is plumb and straight in accordance with the AS3610 (Australian Standard; Formwork for Concrete).

Checking Reinforcing Steel

- Check if vertical reinforcing steel and cogged bars are inserted to engineers specifications

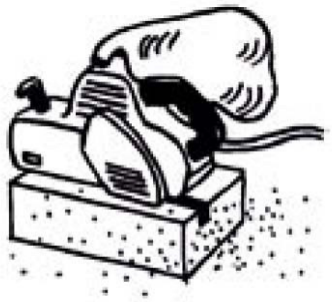
Strip Bracing and Patches

- Ensure props remain fixed until the concrete slab above is poured in-situ.
- Ensure any pre-pour patching is stripped and prepared for following trades

Preparation Work

- Ensure that all walls that have been core filled are finished in accordance with the AS3610
- Ensure all patching is removed and areas are prepared for following trades.
- Ensure that any Tek screws protruding are removed before finishing trades begin.
- Ensure all screw heads are flush on recesses to allow following trades to apply finishes.
- Ensure any peaks on panel joins are ground out and are left in an acceptable standard for finishing trades to apply a coating of up to a **400mm** trowel width.
- Ensure all walls are straight and plumb in accordance with the AS3610 and acceptable installation tolerances.
- Ensure all packers in between the Rebated Bottom Track and Rebated Top Track are removed.

24. Health and Safety

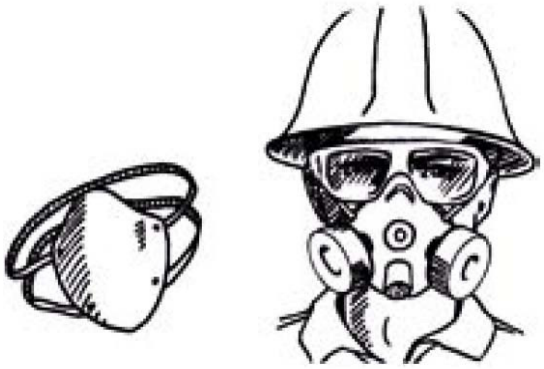


Minimise dust when cutting

All installers have a general responsibility, under Government Legislation, for the health, safety and welfare of themselves and their fellow workers**.** You should also become familiar with and comply with Federal and State Legislation specific to the building industry. Each building site may have its own specific rules for contractors and these must also be complied with.

As a guide only, these are some areas that need attention when installing the Ritek Wall System:

- Ultraviolet radiation
- Manual handling (lifting of panels)
- Scaffolding
- Working at height
- Exposed reinforcing steel
- Personal protective equipment
- Housekeeping
- Electrical safety
- Cranes and slings
- Power tools



Wear P1 or P2 dust mask + safety goggles

NOTE: For XL Thermal Wall – PUR or PIR insulation is used therefore eye protection and dust masks must be worn.

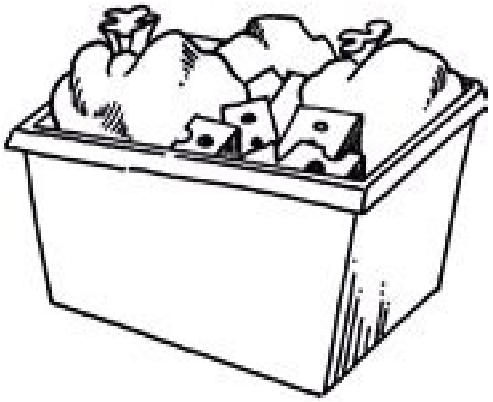
For further information, contact Worksafe Australia or the safety authority in your State.

Recommended Safe Working Practices

Breathing in fine silica dust liberated when working with products such as fibre-cement, clay and concrete is hazardous. Over time, usually a number of years, this may result in bronchitis, silicosis or lung cancer.

Work safely with fibre-cement sheets by following the precautions described below.

- Minimise dust when cutting sheets, by using either Score and Snap knife, Kwikrip™ hand guillotine, Toolex Fibre Shears or Makita Wet Saw (Models 4101R and 4107R).



- When using other power tools or abrasive hand tools on sheets, wear approved personal protective equipment, ie P1 or P2 dust mask and safety goggles.

Ensure containment of dust during clean-up and disposal.

These precautions are not necessary when stacking, unloading or handling fibre-cement products.

25. Certified Panel Brace

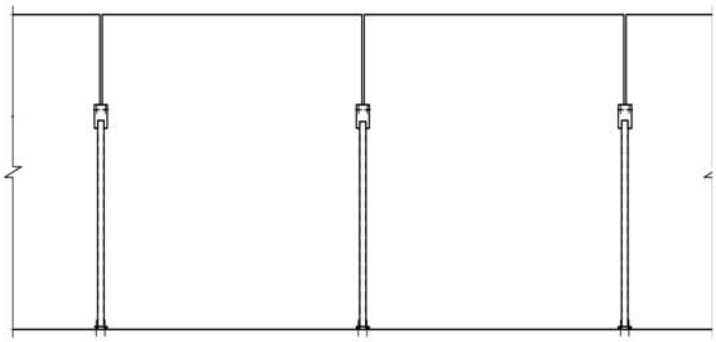
XL WALL SYSTEM - PANEL BRACING

PANEL DETAIL						BRACE DETAIL		
Number of Stories	Height Above Ground	Panel Width	Max Ultimate Wind Pressure	Limit State Line Load Per Panel	Max Panel Height	Brace Design Type	Number of Braces per Panel	Installed Brace Angle (α)
-	(m)	(m)	(kPa)	(kN/m)	(m)		-	(Deg.)
2	6	1.2	0.80	0.96	3.0	STD	1	45 / 60
					3.5	STD	1	45 / 60
					4.5	HD	1	45 / 60
					5.0	HD	1	45 / 60
					5.5	HD	1	45 / 60
7	21	1.2	1.14	1.37	3.0	STD	1	45 / 60
					3.5	STD	1	45 / 60
					4.5	HD	1	45 / 60
					5.0	HD	2	45 / 60
					5.5	HD	2	45 / 60
10	30	1.2	1.21	1.45	3.0	STD	1	45 / 60
					3.5	STD	1	45 / 60
					4.5	HD	1	45 / 60
					5.0	HD	2	45 / 60
					5.5	HD	2	45 / 60
20	60	1.2	1.40	1.67	3.0	STD	1	45 / 60
					3.5	STD	1	45 / 60
					4.5	HD	2	45 / 60
					5.0	HD	2	45 / 60
					5.5	HD	2	45 / 60

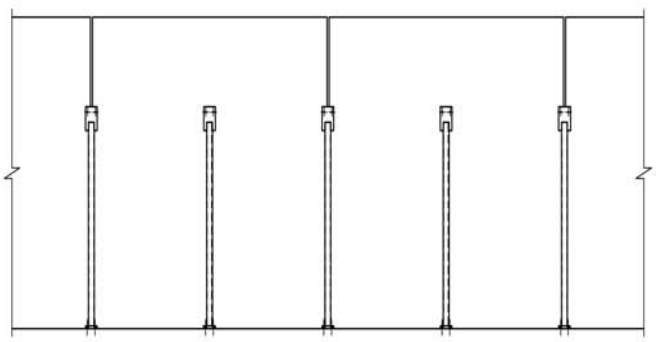
Notes

Brace Design:
Standard Brace (STD) height connection to panel = 2.0m, Effective brace length = 2.8m
Heavy Duty Brace (HD) height connection to panel = 3.5m, Effective brace length = 4.0m

Fixing Details:
Fixing to slab: Use 1 x 10mm x 60mm Excalibur Concrete Screw
Fixing to panel: Use 3 x 6.35mm x 40mm TEX Screws
Max brace load = 9kN (limit state)
Vp = 30m/s, Vu = 36m/s - for temporary short term installation



1 BRACE PER PANEL



2 BRACES PER PANEL

Certified Ritek XL Wall brace manufacturing drawings are available on request.

25. Certified Panel Brace (continued)

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BG:AS 06665-27
17 November 2008

The Manager
Ritek Building Solutions
PO Box 730
COOROY QLD 4563

Dear Sir

RE: TEMPORARY WALL PROPS CERTIFICATION

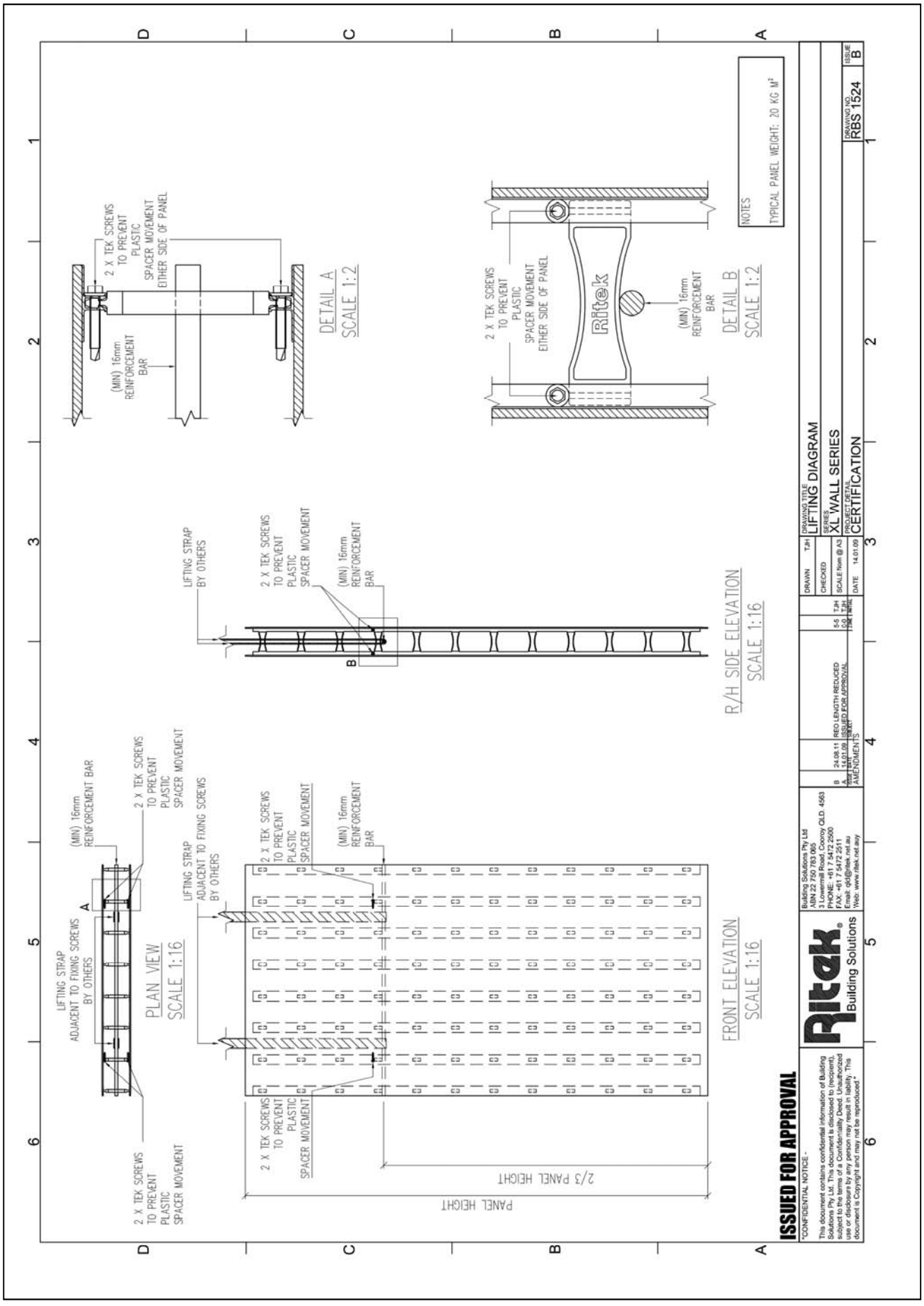
This letter confirms that we have checked the "Heavy Duty" and "Standard Duty" prop details shown on the attached Ritek drawings RBS 1476-D & RBS 1477-D and XL Wall System Panel Bracing Table for structural adequacy and confirm they comply with all the relevant Australian Standards for the following conditions:--

- Design Wind speed for temporary short term condition Vu = 36 m/s
- Minimum fixing to panel 3 x 6.35mm shank Tek Screws
- Minimum fixing to concrete floor 1 x 10mm Excalibur Screw
- Props at 90 degrees to line of wall
- Props not designed to withstand impact from construction equipment
- Maximum Safe Working Load of Prop – 6 kN

Yours faithfully

BARRY GEORGE RPEQ 1924
TOD CONSULTING

26. Certified Single Panel Lifting



26. Certified Single Panel Lifting (continued)

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BG:AS 06665-29
19 January 2009

The Manager
Ritek Building Solutions
PO Box 730
COOROY QLD 4563

Dear Sir

RE: TEMPORARY LIFTING POINTS CERTIFICATION

This letter confirms that we have checked the Lifting Point Location and details shown on the attached Ritek drawings RBS 1524 for the XL Wall System for structural adequacy and confirm they comply with all the relevant Australian Standards for the following conditions:--

- Impact (bounce) factor of 1.3
- No additional weight fixed or hung from panel
- No additional reinforcement placed within wall form, except the 1 x 16mm diameter lifting anchor bar

Yours faithfully

BARRY GEORGE
TOD CONSULTING

27. Appendix A – Concrete Mix, Slump & Fill Height

RITEK XL WALL SYSTEM

TYPICAL CONCRETE MIX SPECIFICATION

Ritek - Typical Concrete Mix Specification							
Mix Description		25/10/180 Ritek	32/7/180 Ritek	40/7/180 Ritek	50/7/180 Ritek		
		Base Specification					
Grade (f'_c)- MPa		25	32	40	50		
Max Agg Size (mm)		10	7	7	7		
Slump (mm)		180	180	180	180		
Material	**Ref Std**	**Mix Design Proportions (kg/m³)**					
GP Cement	AS3972	270	280	340	412		
Fly Ash	AS3582	90	95	130	138		
10mm Agg	AS2758.1	628	~	~	~		
7/5mm Agg	AS2758.1	~	630	675	750		
Coarse Sand	AS2758.1	610	570	490	400		
Fine Sand	AS2758.1	610	570	490	400		
Re Admix	AS1478	0 - 1000	0 - 1000	0 - 1200	0 - 1750		
HRWR Admix	AS1478	800 - 1200	800 - 1200	1000 - 1400	1200 - 2000		
Design total free water (L)		165	190	200	210		
Approx Supplementary Cem Content (%)		25%	25%	28%	25%		
Typical W/C ratio		0.46	0.51	0.43	0.38		

CONCRETE SUPER-PLASTICIZER

A super-plasticizer can be added on site for greater flowing capabilities. When adding super-plasticizer on site ensure that the concrete load arrives to site at a slump of **140mm**. Ensure that approximately **1lt** of super-plasticizer is added for every **m³** of concrete to bring the concrete mix to the desired slump of **180mm +/-20mm**. Concrete slump higher than **200mm** or lower than **160mm** is not recommended.

CONCRETE AGGREGATE

It is recommended that the Ritek specified mix design includes aggregate size of 7-10mm to ensure correct flow properties.

27. Appendix A – Concrete Mix, Slump & Fill Height (continued)

RITEK XL WALL SYSTEM

INDUSTRY STANDARD PROCEDURE FOR SLUMP MEASUREMENT

Concrete Slump

"Slump" is simply a term coined to describe how consistent a concrete sample is, rather than using obscure descriptions such as "wet", “dry” or "runny" etc. The slump height of the concrete mix (as shown in the step by step procedure) differs from one sample to another.

Purpose

The purpose of the slump test is to measure the consistency of concrete. Many factors are taken into account when satisfying requirements of concrete strength, and to make sure that a consistent mixture of cement is being used during the process of construction. The test also further determines the "workability" of concrete, and provides a scale on how it flows, how easy is it to handle, compact, and cure concrete. Engineers use the results to then alter the concrete mix by adjusting the cement-water ratio or adding plasticizers to increase the slump of the concrete mix.

Slump Test Apparatus

- Large pan
- Trowel to mix concrete mixture
- Steel tamping rod
- Slump cone (300mm high, 200mm bottom dia, 100mm top dia)
- Ruler
- Concrete (Cement, water, sand & aggregates).

27. Appendix A – Concrete Mix, Slump & Fill Height (continued)

Step by Step Procedure

1. Place the mixing pan on the floor and moisten it with some water. Make sure it is damp but no free water is left.
2. Firmly hold the slump cone in place using the 2 foot holds.
3. Fill one-third of the cone with the concrete mixture. Then tamp the layer 25 times using the steel rod in a circular motion, making sure not to stir.
4. Add more concrete mixture to the two-thirds mark. Repeat tamping for 25 times again. Tamp just barely into the previous layer.
5. Fill up the whole cone up to the top with some excess concrete coming out of top, then repeat tamping 25 times. (If there is not enough concrete from tamping compression, stop tamping, add more, then continue tamping at previous number)
6. Remove excess concrete from the opening of the slump cone by using tamping rod in a rolling motion until flat.
7. Slowly and carefully remove the cone by lifting it vertically (5 seconds +/- 2 seconds), making sure that the concrete sample does not move.
8. Wait for the concrete mixture as it slowly slumps.
9. After the concrete stabilizes, measure the slump-height by turning the slump cone upside down next to the sample, placing the tamping rod on the slump cone and measuring the distance from the rod to the ORIGINAL DISPLACED CENTER.


Slump Cone

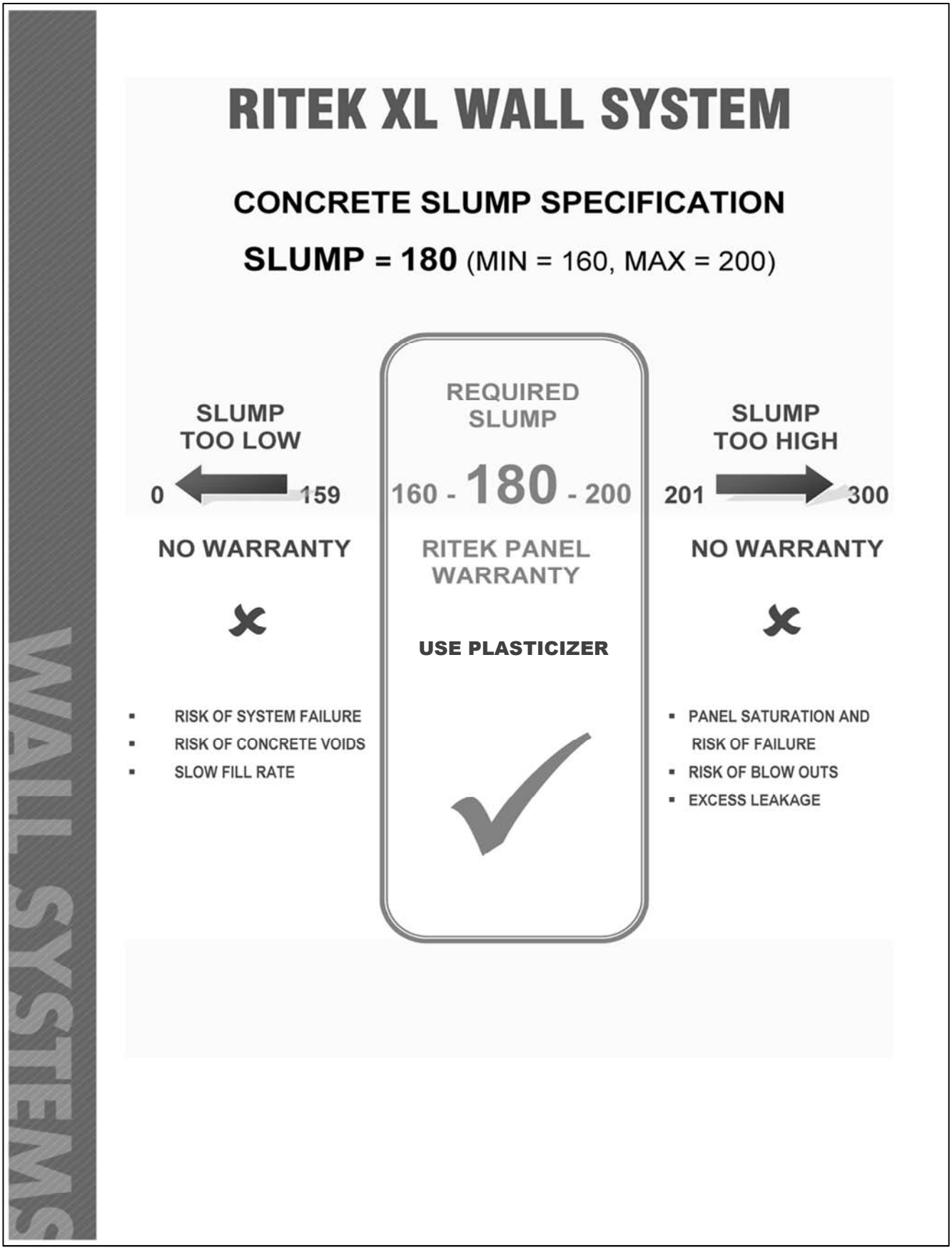

Tamping Procedure


Removing Cone


Height Measurement

THE AMOUNT THE CONCRETE DROPS IS THE SLUMP MEASUREMENT

27. Appendix A – Concrete Mix, Slump & Fill Height (continued)



27. Appendix A – Concrete Mix, Slump & Fill Height (continued)

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Ritek© Building Solutions would like to acknowledge the following for photographic contributions to this brochure; Architect Scott Carpenter - Brent Middleton Photography; Tony Trobe - TT Architecture; Allen Jack+Cottier - Nic Bailey Photography