

FRC COLUMN Technical Manual

June 2018



Fast. Smart. Proven. Strong.



THE AUSTRALIAN PIPE COMPANY

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FRC COLUMN

1.0 Introduction

FRC COLUMN by **RCPA** are a range of decorative architectural columns and accessories. An external or internal decorative column feature that can create classic or contemporary attractive focal points. Can be used as a feature around entrances, patios, pools and entertainment areas.

1.1 FRC COLUMN Key Features:

- A dense concrete composite material gives you the solid look and feel of traditional concrete.
- The smooth surface can be site-painted or rendered to create a wide range of looks from classical to contemporary.
- Available in a classic or tapered profile that can be coupled with various capitals and bases to give you design choice.
- The benefits of the hollow core enables services to be hidden, allows for installation over timber or steel structural posts and reduces the impact on traditional construction techniques.
- **FRC COLUMN** and accessories come in a range of sizes and profiles for maximum design flexibility and can be site-painted or rendered to create a variety of looks.
- **FRC COLUMN** can easily be retrofitting onto verandas and around existing structures.
- **FRC COLUMN** are very durable and resistant to damage from termites, rot and fire.

1.2 FRC COLUMN Classic Style

FRC COLUMN Classic is a straight column with a smooth surface which are available in 2750mm and 4000mm nominal lengths. External diameters available include 200, 250, 345 & 425mm. All **FRC COLUMN Classic** columns have square cut ends.

1.3 FRC COLUMN Tapered Style

FRC COLUMN Tapered is a range of columns which are tapered from the top of the column to 900mm from the column's base.

1.4 FRC COLUMN Accessories

RCPA has a range of **FRC COLUMN** accessories that can be used as bases, capitals or dress rings. They will fit anywhere on the **FRC COLUMN Classic** and on the very top and un-tapered bottom section of the **FRC COLUMN Tapered**.

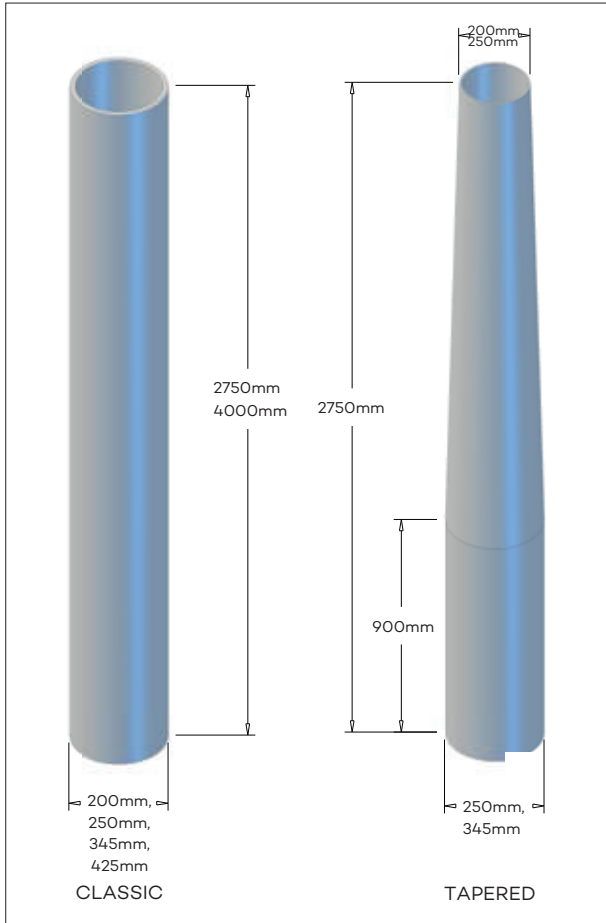
1.5 Contact us

For any type of product enquiry please contact **RCPA**

Phone: 1800 659 850
Email: sales@rcpa.com.au
Web: rcpa.com.au

FRC COLUMN

1.0 Introduction



FRC COLUMN CLASSIC				
Nominal overall dia (mm)	Nominal internal dia (mm)	Stock Lengths (m)	Mass approx.	
			kg/m	kg/each
200	174	2.75	9.3	25.6
		4.0	9.3	37.2
250	233	2.75	11.7	32.2
		4.0	11.7	46.8
345	302	2.75	32.1	88.3
		4.0	32.1	128.4
425	378	2.75	44	121
		4.0	44	176

FRC COLUMN TAPERED				
Nominal overall dia at base (mm)	Nominal internal dia at top (mm)	Nominal internal dia (mm)	Stock Lengths (m)	Mass approx. (kg)
250	200	174	2.75	82
345	250	233	2.75	155

Table 1 – FRC COLUMN Specifications

BASES AND CAPITALS OVERALL DIAMETER AND HEIGHTS (MM)													
Type		To suit column OD (mm)				Type		To suit column OD (mm)					
		200	250	345	425			200	250	345	425		
Bell		Outside dia	270	336			Twin		Outside dia	264	314		
		Height	35	43					Height	55	55		
Cove		Outside dia	281	356			Quad		Outside dia	264	314		
		Height	54	70					Height	30	30		
Pencil round		Outside dia	264	314	407	487	Ornate		Outside dia	359	431	521	602
		Height	60	60	60	60			Height	95	95	95	95

COMPONENTS NOT SUPPLIED BY RCPA
Megapoxy P1 or equivalent
1 to 1.6mm thick galvanised metal angles
Dynabolts
Non shrink grout
Pryda fixing bracket
Hoop iron
EPDM gasket
Concrete and steel reinforcement (rapid setting concrete or concrete accelerator admixture must not be used)

Table 2 – FRC COLUMN Accessories

FRC COLUMN

2.0 Design

2.1 Limitations & Compliance

This manual covers the use of **FRC COLUMN** and its accessories in non-load-bearing (decorative) applications. **FRC COLUMN** can be installed with internal structural supports for use in heavier load-bearing applications. Refer to your structural engineer for more information.

All design and construction must comply with the appropriate requirements of the current Building Code of Australia (BCA), regulations and standards.

The specifier or other party responsible for the project must ensure the details in this specification are appropriate for the intended application and that additional detailing is performed for specific design or any areas that fall outside the scope and specifications of this manual.

2.2 Decorative Columns

FRC COLUMN are used as a non-load-bearing architectural element for decorative purposes with or without internal load-bearing posts. **FRC COLUMN** are selected for its decorative finish. Any structural load is supported by the internal load-bearing (either steel or timber) post.

2.3 Load-Bearing Applications

FRC COLUMN can be used in load-bearing applications where the column is installed with suitably designed structural supports located inside the column. It is the responsibility of the structural engineer to design and certify the suitability and capacity of the structural supports for any given project.

Note: Concrete mix designs that undergo expansion during curing, such as rapid-set or accelerating admixtures, **MUST NOT** be used as they can lead to column cracking.



FRC COLUMN

2.0 Design

2.4 Specific Design & Detailing

For use of **FRC COLUMN** outside the scope of this documentation, the designer, architect or engineer must undertake specific design.

2.5 Material Properties

FRC COLUMN are a cellulose fibre reinforced cement building product. The basic composition is Portland cement, ground sand, cellulose fibre and water. Based on equilibrium moisture content the approximate mass of **FRC COLUMN** is referred to in Table 1.

For Safety Data Sheets (SDS) visit www.rcpa.com.au or call 1800 659 850.

2.6 Durability

2.6.1 Resistance to moisture/rotting

FRC COLUMN are manufactured with a fibre reinforced cement composite, which has demonstrated resistance to moisture induced deterioration through years of use in building construction across Australia.

2.6.2 Resistance to fire

FRC COLUMN are suitable for use where non-combustible non-combustible materials are required, as stated in section C1.9 of NCC 2016 Volume One Amdt 1.

2.6.3 Alpine Regions

In regions subject to freeze/thaw conditions, **FRC COLUMN** must be installed and painted in the warmer months of the year where the temperature does not create freeze and thaw conditions or paint issues.

The **FRC COLUMN** must be painted immediately after installation. In addition, **FRC COLUMN** must not be in direct contact with snow and/or ice build-up for extended periods, e.g. external applications in alpine regions subject to snow drifts over winter.

Furthermore, a reputable paint manufacturer must be consulted in regards to a suitable product, specifications and warranty. The paint application must not be carried out if the air temperature or the substrate temperature is outside the paint manufacturer's recommendation including the specified drying temperature range.

2.7 Framing

2.7.1 General

All framing and supports used in conjunction with **FRC COLUMN** must be in accordance with relevant standards, regulations and the manufacturer's specifications.

Note: Do not concrete encase timber posts.

2.7.2 Structural Grade.

Use only seasoned timber.

Unseasoned timber must not be used because it is prone to excessive shrinkage.

Steel framing must have the appropriate structural grade as per the structural engineer's specifications.

FRC COLUMN

3.0 Installation

3.1 Installation Options

FRC COLUMN can be installed in one of the following ways:

a) Method 1

Without an internal support with the option of using a Pryda fixing bracket. For details refer to Clause 3.2;

b) Method 2

Over a structural timber or steel post, refer to Clause 3.3; or

c) Method 3

As permanent formwork for a steel reinforced concrete column, refer to Clause 3.4.

In all applications FRC COLUMN must not be in contact with the ground nor free to fill up with water, to ensure durability.

Note: Concrete mix designs that undergo expansion during curing, such as rapid-set or accelerating admixtures, MUST NOT be used as they can lead to column cracking.

3.2 Installation Method 1 : No internal support

3.2.1 Simple Installation Method

FRC COLUMN can be installed by simply fixing the top and bottom of the column to the structure as shown in Figure 1.

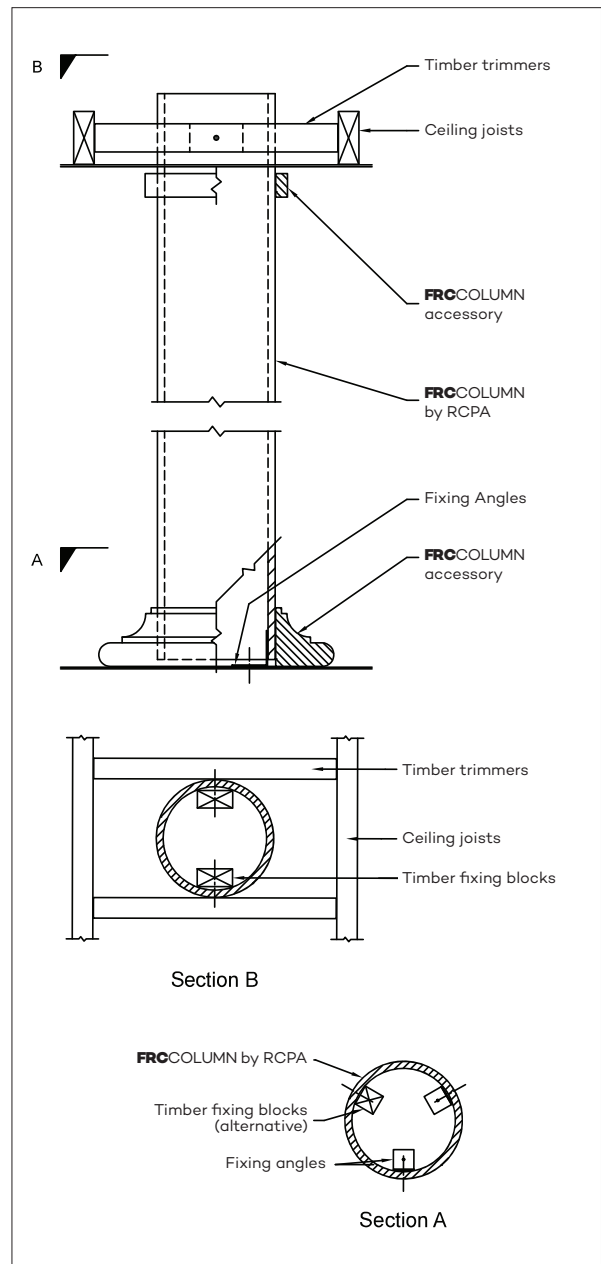


Figure 1 – Typical Fixing Detail

FRC COLUMN

3.0 Installation

3.2.2 Using Pryda Brackets

RCPA recommends the use of the purpose-designed centering brackets available from Pryda that can be used to retrofit **FRC COLUMN** onto verandahs. The process involves fixing the centering brackets to the floor and roof beam, then jacking the roof up by 30mm, inserting the column and lowering the roof onto the column.

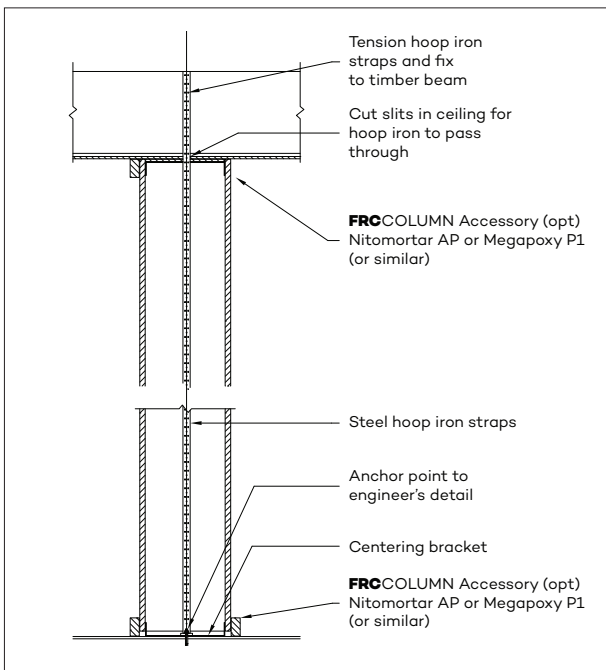


Figure 2 - Pryda Bracket Installation Detail

The Pryda column fixing brackets can be used with **FRC COLUMN Classic** up to OD 250mm and **FRC COLUMN Tapered** up to OD 345mm.

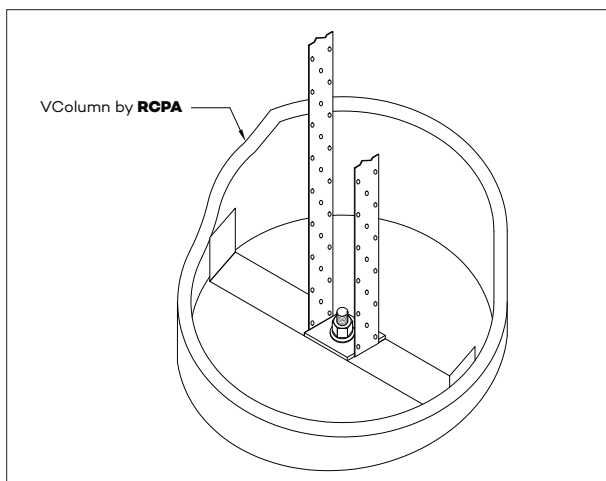


Figure 3 - Bracket at Base

Note: When ordering Pryda column fixing brackets for **FRC COLUMN Tapered**, the nominal overall diameter(OD) at the top must be used to select the bracket.

Pryda Bracket Installation – Step 1

Align and fix brackets to floor and under soffit prior to column installation. Provide oversize holes in brackets and oversized washers for ease of alignment. Align top and bottom brackets using a straight edge and tighten fasteners once aligned.

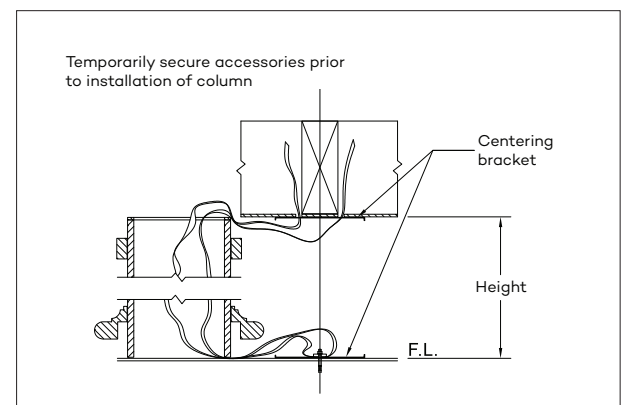


Figure 4 - Centre Bracket Top and Bottom

Pryda Bracket Installation – Step 2

Prop roof to provide required clearance for column installation. The propping of the roof must be carried out in accordance with the structural engineer's requirements.

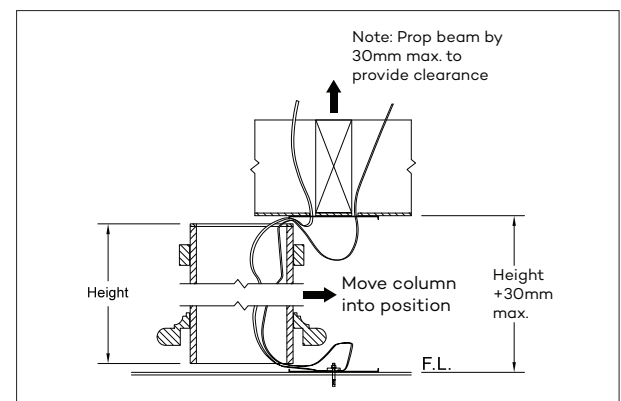


Figure 5 - Prop and Install

FRC COLUMN

3.0 Installation

Pryda Bracket Installation - Step 3

Insert neoprene rubber bearing material between beam underside and the top of the column walls. Slowly release propping once column is aligned.

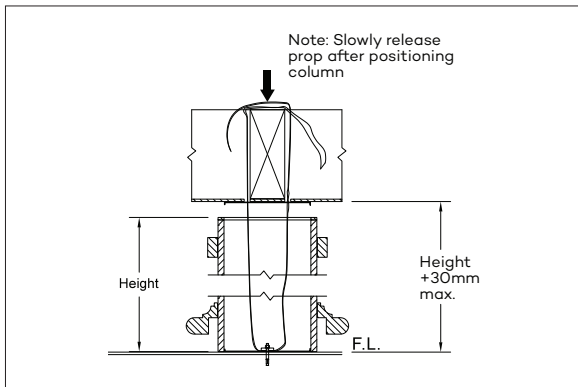


Figure 6 - Prop Removal

Pryda Bracket Installation - Step 4

Fix hoop strap, where required, to structural engineer's details.

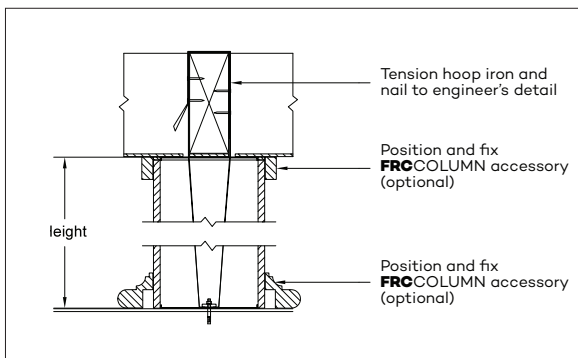


Figure 7 - Fixing Hoop Iron Strap

3.3 Installation Method 2 : Internal Post

In this application, the **FRC COLUMN** hides an internal steel or timber post and the internal post carries the load. It is the responsibility of the structural engineer to design the supporting timber or steel post. We recommend that the column is installed around the internal load-bearing post before erection of the structure above. Typical installation details are shown in Figures 8–12. Other methods may be used, provided columns are adequately secured at top and base.

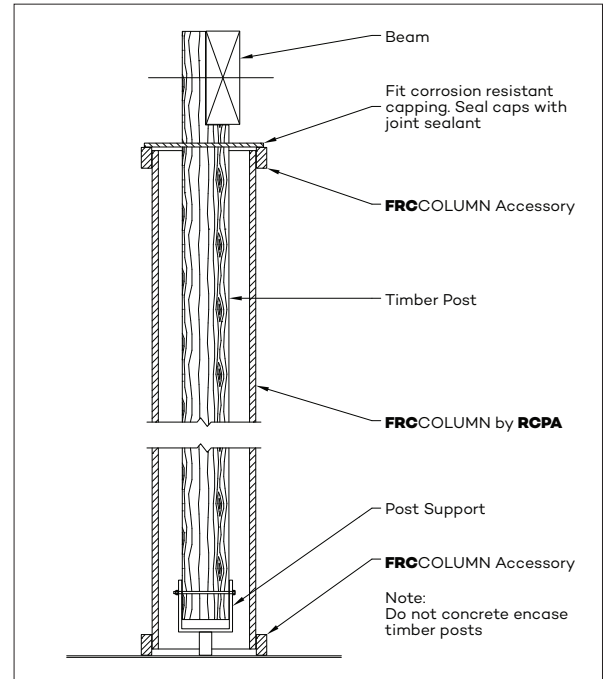


Figure 8 - Typical Timber Post Installation Detail

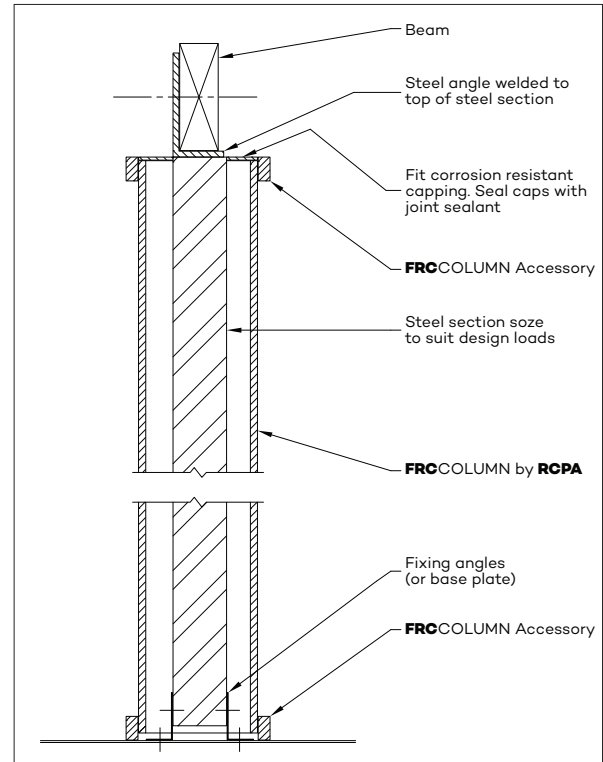


Figure 9 - Typical Steel Post Detail

FRC COLUMN

3.0 Installation

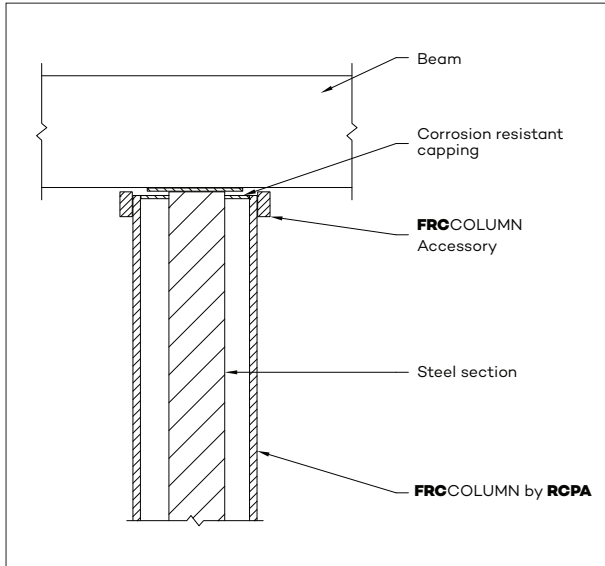


Figure 10 - Alternative Top Detail for Steel Post

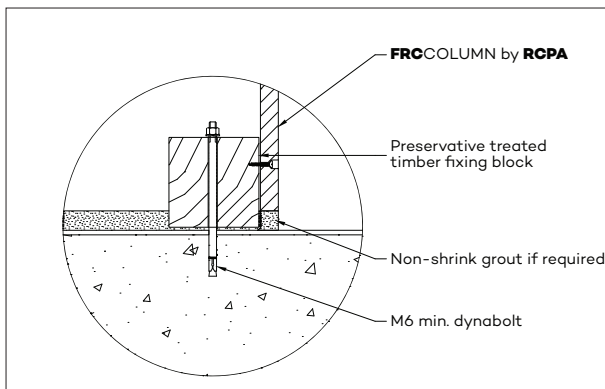


Figure 11 - Base Fixing Detail - Option 1

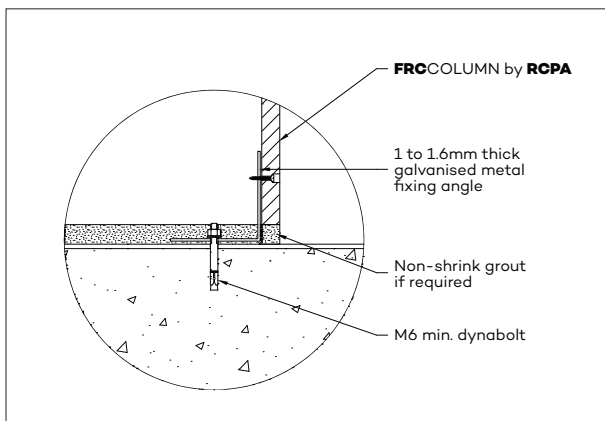


Figure 12 - Base Fixing Detail - Option 2

FRC COLUMN can be split to allow for half column installation against a wall or to install the column after the support posts and associated structure have been fixed in place. Refer to Figures 13 & 14.

To join columns, use Megapoxy P1 or equivalent epoxy. As the joint may be difficult to conceal, **RCPA** recommends the use of high-build texture coating to hide joints.

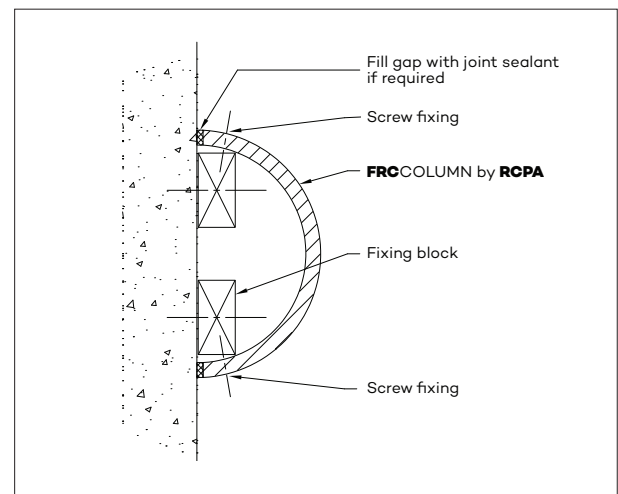


Figure 13 - Decorative Half Column to Wall Detail

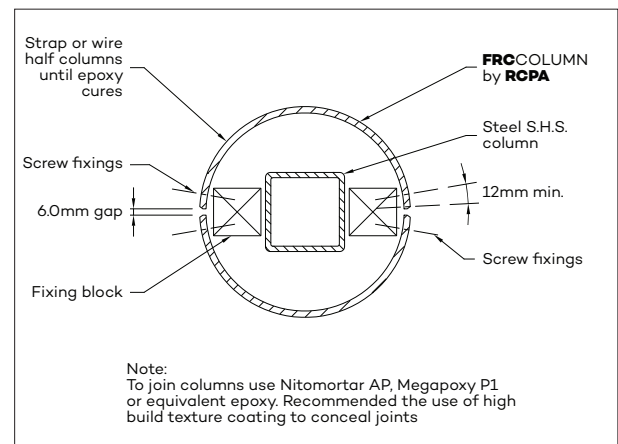


Figure 14 - Split Column Installation Detail

FRC COLUMN

3.0 Installation

3.4 Installation Method 3: Permanent Formwork

3.4.1 General

FRC COLUMN can be used as permanent formwork for steel reinforced concrete columns. You will need to consult the structural engineer for design, specifications and installation requirements.

IMPORTANT NOTES:

- Concrete mix designs that undergo expansion during curing, such as rapid-set or accelerating admixtures, must not be used as the column wall may crack.
- Ensure that columns are dry before pouring concrete otherwise the column wall may crack.
- **FRC COLUMN** are to be used as a decorative, non-load bearing product only and must not be relied upon to carry any structural load.

For typical steel reinforced concrete column details refer to Figures 15–19. You must always refer to project specific specifications provided by the structural engineer.

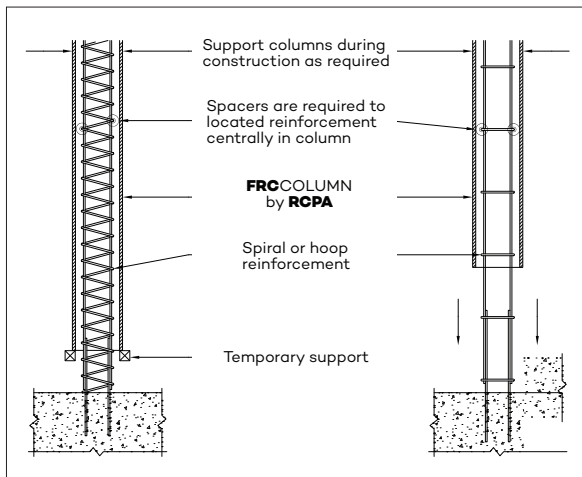


Figure 15 – **FRC COLUMN** Installation Detail

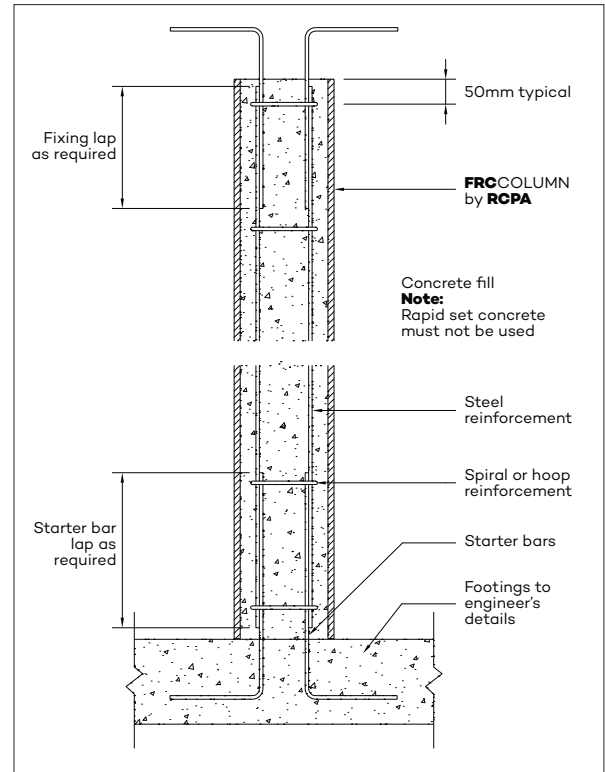


Figure 16 – Typical Steel Reinforced Column Detail

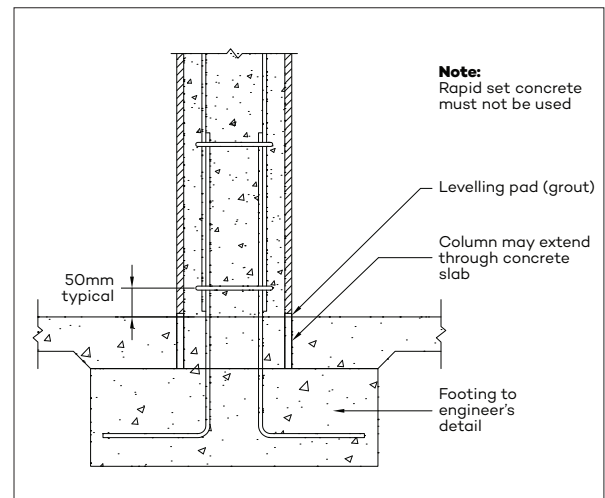


Figure 17 – Typical Pad Footing Detail

FRC COLUMN

3.0 Installation

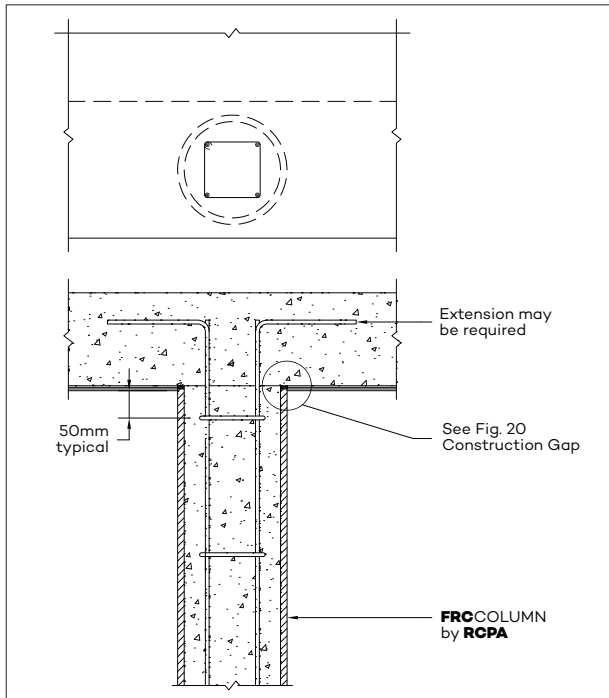


Figure 18 – Column Terminates at Floor Detail

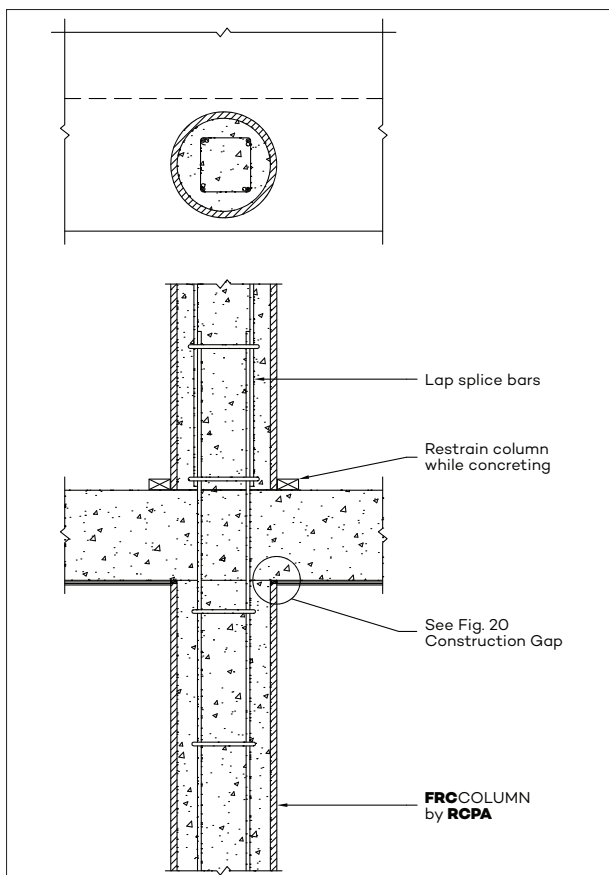


Figure 19 – Continuous Column Detail

3.4.2 Construction Gaps

An appropriate construction gap must be provided between the top of the column and the underside of the concrete slab (or the bottom of the column if the column is pinned) so that loads are not supported on column walls. One method of achieving this is to use a self-adhesive EPDM rubber gasket adhered to the top (or bottom) of the column.

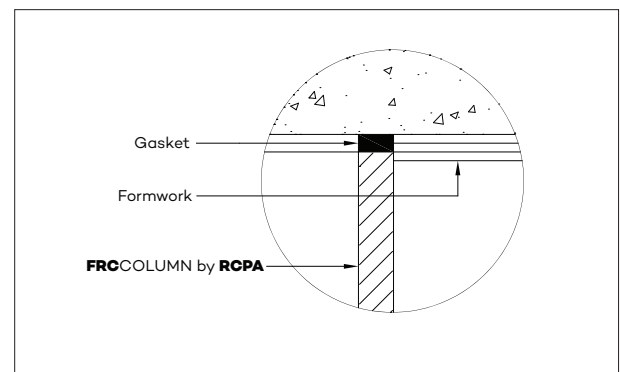


Figure 20 – Construction Gap

FRC COLUMN

4.0 General Construction Information

4.1 Accessories

4.1.1 General

FRC COLUMN accessories are an attractive, easy to install way of adding detail to your columns. These accessories can be fitted using the epoxy or dowel method described below.

4.1.2 Epoxy Method

Apply sufficient masonry compatible epoxy adhesive (for use with cement based products) around the column where the accessory is to be fixed. Place accessory in position and remove excess epoxy from around joint. Support accessory in position using wedges or temporary screws while epoxy cures.

If required, seal any gap between accessory and column with a paintable grade polyurethane joint sealant.

4.1.3 Dowel Method

Place the accessory in position and support using wedges. Drill two 7mm holes through accessory and column with masonry drill bit. Do not use hammer drill. Insert 6mm dowels, leaving ends 3mm under external surface.

Fill over dowel holes in accessory ring with a suitable filler.

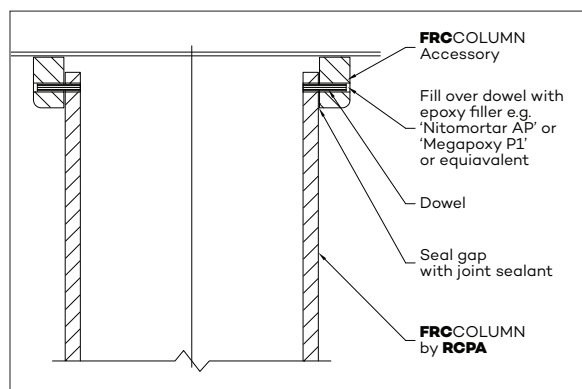


Figure 21 – Accessory Fixing Detail Using Dowels

4.1.4 Combining Accessories

Multiple accessories can be combined at the top or base of a column to develop an individual and distinctive design.

4.1.5 FRC COLUMN Tapered Accessories

If you are fitting an accessory at the top of a FRC COLUMN Tapered, note that it is not possible to slide the accessory down the column while the column is being installed. Also note that only a single accessory can be fitted to the top of a FRC COLUMN Tapered column.

You will have to either:

- Install the column before the roofing; or
- Split the accessory, and re-fit it after the installation.

4.2 Cut-outs

Cutting holes or opening in FRC COLUMN must be done using appropriate safe cutting methods, refer to Section 5 for Safe Working Practices. All cut-outs must have radius corners.

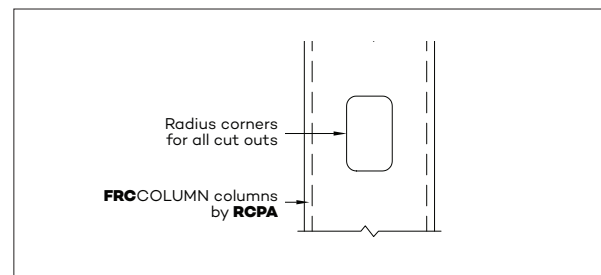


Figure 22 – Cut-Out Detail

4.3 Coatings & Sealants

4.3.1 Preparation

FRC COLUMN must be dry before painting. When applying semi-gloss or gloss finishes it is recommended that the columns be skim-coated with a suitable filler to conceal any minor surface variations.

4.3.2 Sealants

Application and use of sealants must comply with manufacturers' instructions. Sealants, if coated, must be compatible with the paint system.

FRC COLUMN

4.0 General Construction Information

4.3.3 Painting

To ensure the durability of **FRC COLUMN**, the columns must be finished with a suitable paint or texture system within 3 months of installation.

RCPA recommends the application of two coats minimum of a quality acrylic paint to be used in accordance with the paint manufacturer's specifications.

Painting specifications and products depend on the paint company chosen. Refer to your paint manufacturer.

RCPA does not recommend tiling to **FRC COLUMN** in an external application.

4.4 Maintenance

It is the responsibility of the specifier to determine normal maintenance requirements. The extent and nature of maintenance will depend on the geographical location and exposure of the building.

As a guide, it is recommended that basic normal maintenance tasks shall include but not be limited to:

- Washing down exterior surfaces every 6–12 months*
- Re-coating exterior protective finishes*
- Cleaning out gutters, blocked pipes and overflows as required.
- Pruning back vegetation which is close to or touching the columns.

* Refer to your paint manufacturer for washing down and recoating requirements related to paint performance.

4.5 Quality

RCPA conducts stringent quality checks to ensure any product manufactured falls within our quality spectrum. It is the responsibility of the builder to ensure the product meets aesthetic requirements before installation. **RCPA** will not be responsible for rectifying obvious aesthetic surface variations following installation.

FRC COLUMN

5.0 Working with Silica

5.1 Working with Silica

5.1.1 Silica Warning

Note: Do not breathe dust and cut only in a well ventilated area.

FRC COLUMN contain sand, a source of respirable crystalline silica which is considered by some international authorities to be a cause of cancer from some occupational sources. Breathing excessive amounts of respirable silica dust can also cause a disabling and potentially fatal lung disease called silicosis, and has been linked with other diseases. Some studies suggest smoking may increase these risks.

During installation or handling:

- Work in outdoor areas with ample ventilation;
- Minimise dust when cutting by using either:
 - i. a HardieBlade Saw Blade and dust-reducing circular saw attached to a HEPA vacuum; or
 - ii. a wet cut demolition saw.
- Warn others in the immediate area to avoid breathing dust;
- Wear a properly-fitted, approved dust mask or respirator (e.g. P1 or P2) in accordance with applicable government regulations and manufacturer instructions to further limit respirable silica exposures.

During clean-up, use HEPA vacuums or wet cleanup methods – never dry sweep. For further information, refer to our installation instructions and Safety Data Sheets available at www.rcpa.com.au.

NOTE: FAILURE TO ADHERE TO OUR WARNINGS, SAFETY DATA SHEETS AND INSTALLATION INSTRUCTIONS MAY LEAD TO SERIOUS PERSONAL INJURY OR DEATH.

5.1.2 Cutting

When cutting:

- Use a suitable wet saw typically used to cut concrete products; or
- If dry cutting position cutting station so wind will blow dust away from the user or others in working area and only use a dust reducing circular saw equipped with HardieBlade™ Saw Blade and HEPA vacuum extraction.

5.1.3 Drilling or other Machining

When drilling or machining you should always wear a P1 or P2 dust mask and warn others in the immediate area.

5.1.4 IMPORTANT NOTES

- NEVER cut indoors.
- NEVER use a dry circular saw blade that does not carry the HardieBlade logo.
- NEVER dry sweep – Use wet suppression or HEPA vacuum.
- NEVER use grinders.
- ALWAYS follow tool manufacturers' safety recommendations.

P1 or P2 respirators should be used in conjunction with above cutting practices to further reduce dust exposures. If concern still exists about exposure levels or you do not comply with the above practices, you should always consult a qualified industrial hygienist or contact **RCPA** for further information.

FRC COLUMN

5.0 Safe Working Practices

5.2 Working Instructions

5.2.1 Wet Saws

Ensure that an appropriate wet saw is used. Wet saws can dramatically reduce the dust exposure when cutting. Ensure safe operation is maintained and that any risks associated with water on the construction site is adequately managed.

5.2.2 HardieBlade Saw Blade

The HardieBlade Saw Blade used with a dust, reducing saw and HEPA vacuum extraction allows for fast, clean cutting of **FRC COLUMN**. A dust-reducing saw uses a dust deflector or a dust collector which can be connected to a vacuum system.

Note: HardieBlade is a trademark owned by James Hardie Technology Limited.

5.2.3 Cutting VColumn Tapered to length

If you are cutting a tapered column to suit a particular roof height, and you plan to fit accessories at the top, you must only cut from the base (i.e. the un-tapered area) of the column. This will ensure that the top and base diameters of the reduced length column remain unchanged so accessories will still fit.

5.2.4 Storage and Handling

To avoid damage, all **RCPA** products should be stored with edges protected from accidental contact.

FRC COLUMN and accessories must be installed in a dry state and protected from rain during transport and storage. The products must be stored under cover on a smooth level surface clear of the ground to avoid exposure to water, moisture, etc.



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