TRADIES TOOLBOX GUIDE

EMPIRE BRICK & RAIL SG SYSTEM

Updated - May 2021

This Protective Equipment

MUST BE WORN

This document is designed to show Tradies the basics, but it is <u>not</u> designed to be an installation guide for every situation, as the "Empire Brick & Rail System" can be applied in so many different places that they cannot all be covered in a document such as this.

There are many circumstances where a number of possible solutions are applicable and the installer has to use his or her own judgement and/or Trade Training. We attempt in this guide to set out possible circumstances and solutions as best we can, but a manual such as this cannot cover all possibilities or the interaction with every possible other building component.

This manual is related, generally, to the installation of the Empire Brick System when attached to a metal frame, but can be adapted to installation of the Empire Brick System on timber or steel frames, masonry, top hats, precast concrete, permanent formwork or other cladding substrate systems.

The Empire Brick & Rail system supplied includes the brick facings & corner pieces plus the rails, with the mortar & rail fixings supplied by the installer to fix to the substrate wall.

The substrate wall is NOT part of the Empire Brick & Rail system.
This is the domain of the building designers / head contractors, **Empire Brick is a cladding ONLY**.

The Empire Brick & Rail system complies with the relevant requirements of Section B NCC volume 1 and Section 2 NCC volume 2.

The building design professionals are responsible for the design of the support structure, movement joint locations if deemed necessary, joint sealants, sarking, flashings and NCC compliance of the overall wall assembly for compliance.

Whilst there are certain fundamentals that apply to installing the Empire Brick System anywhere, for specific installation questions, please contact us on 1800 959 683.

… and remember

There is no substitute for common sense

Introduction

1. Purpose

The purpose of this document is to ensure people accurately and safely install this component.

2. Scope

This work instruction covers each step of installing the EMPIRE Brick & Rail System to the substrate safely and accurately.

3. Training

People installing this item should be trained & aware of these Work Instructions

	Hi-Visibility vest, Steel capped boots, Glasses / eye protection, Hearing protection		
	Ensure that correct manual handling techniques are used.		
	Must be trained or already deemed competent in the use of the brick-saw, collated nail gun, collated screw gun, gas-actuated fastening gun and ancillary power tools. Licence will be necessary if using a forklift, mobile platform or crane.		
	☐ Work at Heights	☐ Lifting Operations	☐ Hot Work
	☐ Excavations	☐ Confined Spaces	☐

Associated Hazard:	Key Risk Control:
When cutting metal or brick, the noise may cause hearing damage & the particles eye damage. If dry cutting bricks it may cause breathing difficulties. Steel of substrate &/or Brick Rails can be sharp and cause cuts or abrasions Muscular injuries when moving Brick Facings, Mortar ingredients and/or Brick Rails.	Mandatory wearing of hearing, breathing & eye protection when cutting / grinding bricks or cutting steel or mixing mortars. Use gloves when handling. Bring materials close to work area and use mechanical assistance to transport. Heavy items, mechanical or Two-person lift.

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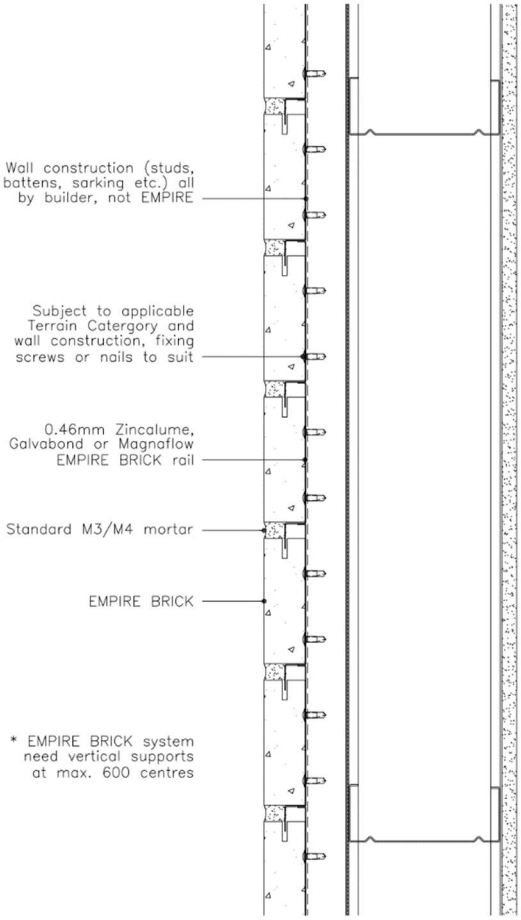
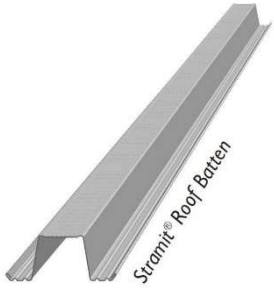
The Empire Brick & Rail System attached to vertical Top Hat Sections is shown here. Although shown as a 'billiard table' finish, all brickwork has variations in it, including Empire.
This is the SG (single groove) system of Empire Brick.



Fixing to **Timber frames** uses standard Gal nails usually supplied through coil nail guns.

Fixing to **Steel frames** is best done using collated self-drilling Flat Top screws as the screw head is specially designed to be very thin and not interfere with the brick placement on the rails.
PLEASE - DO NOT USE TEK SCREWS.

A fixing method for a vented cavity on **Masonry Walls** is the simple application of a **'Top Hat' (or other) series of battens** to a maximum 600mm centres.



The fixing instructions for the battens to the wall will be determined by the substrate characteristics and the building designer or engineer's guidance based on the weight of the Empire Brick System. (normally <52kg/m²)

Top Hat sections are available from many sources, usually from suppliers of metal roofing & cladding products. They are NOT part of the Empire Brick & Rail System, they should be supplied and fixed as part of the substrate installation.

We also manufacture a DG (double groove) system engaging both a Top & Bottom Groove. This is designed for unusual applications like Ceilings, Soffits and other unusual areas.

It has been determined by controlled and certified wind testing that BOTH the SG & DG system EXCEED the highest wind pressure that can be applied to the wall.
(Test Reports available on request)

In other words, a Double Grooved system is not 'better' than the Single Grooved system… they were designed for different applications.

If you want information on our Double Grooved system please contact us

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Set Up

It is advised to peruse the Empire Ceramics website or call them prior to a start to get some ideas
www.empirebrick.com.au

EMPIRE BRICK IS A CLADDING. IT FOLLOWS THE SHAPE OF THE SUBSTRATE.
IF THE SUBSTRATE IS NOT PLUMB AND LEVEL… THE BRICKWORK CANNOT BE RIGHT!

Rail Installation Summary

- Set Datum point and establish gauge to suit project.
- Install rails from the bottom up. (make sure they are NOT upside down)
- Use gauge & string lines or lasers to maintain / check level and gauge of the rails.
- Use level or straight edge to check the rails are plumb as you go
- Use two fixings at each stud on each rail, offset horizontally and vertically.
- Join adjacent lengths of rail at different studs so that the joins are not in a vertical line. This maximises the bracing effect of the steel rail.
- At a horizontal join of two rails at a stud, the two pieces of rail should be butted up to each other and should not overlap.
- At the corners, CHECK that your rail 'lines up' with the rail on the adjoining wall (You can use a corner brick to assist as a gauge)
- Set the rail back about 15-20mm from a corner to make installation of a corner brick easier.
- It is important to make sure the profile of the rail is not distorted during fixing.
- All fasteners must be "driven home" to ensure the brick has room to sit plumb on the rails
- When you need to **cut the rail** for any reason, it is **mandatory** to paint the cut area with a protective 'cold gal' paint.

PLEASE AVOID CUTTING RAILS WITH ANGLE GRINDER
THE HEAT OF THE SMALL SWARF PIECES THROWN OFF BURN
THE METAL COATINGS AND PROMOTE CORROSION - USE METAL SHEARS OR TIN SNIPS.

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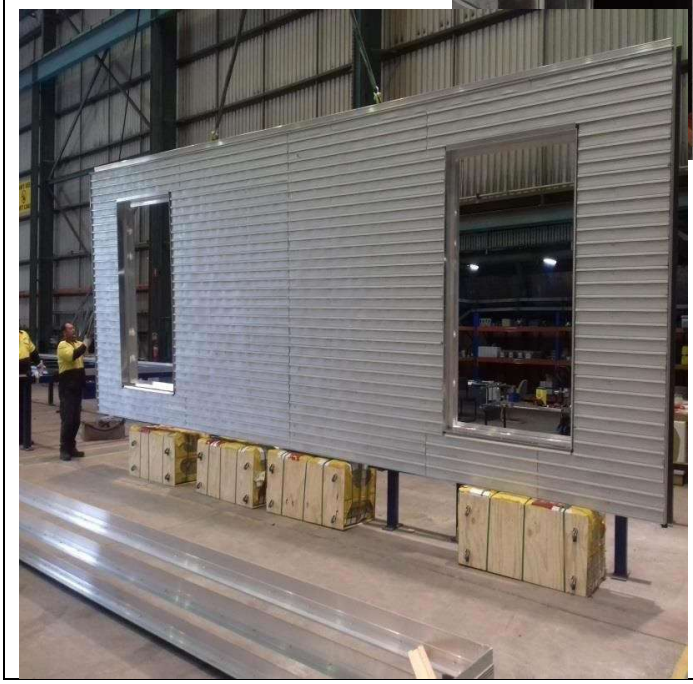
Fasten the rail system at each stud using 2 wafer head specified screws or nails for timber or pins for masonry in each rail, working from bottom to top.
Stagger and Butt the joints, don't overlap.
Ensure all rails are level and spaced to gauge.
Ensure fastener is finished flush with rail.

Use a string line to assist in setting the rails straight

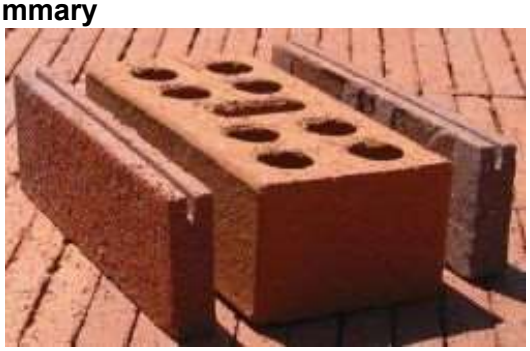
Ensure the rails are tight up against each other to give correct brick engagement.

Check there are no deformities in the rails



Clean up the rail area.
Ensure no steel shavings or other foreign matter is in the rails
Use a vacuum cleaner to pick up debris if need be.

Brick Installation Summary



- **Bricks do not have uniform dimensions.**
  DO NOT EXPECT THEM
  TO BE THE SAME SIZE!
  That is why you have variable mortar joints
- You should average the vertical joint spacing to achieve the specified brick layout.
- **Corners and window surrounds should be installed / set out first.**
- Corners and the Corner grooving are not EXACT! Because the bricks are not exact dimensions and the surface textures affect where the brick is held in the saws
  ALLOCATE EXTRA TIME TO INSTALL AND ADJUST THE CORNERS BRICKS... you cannot just click these in and forget them!
- Then install 2 courses of brickwork along a complete part of the wall.
- Corner bricks are produced as a left or right hand
- Install the brick facings in the field of the panel between the corners and openings averaging vertical joints as specified.
  If worried about how to set out go and look at a face brick building nearby to get some clues.

Installing Brick Facings

Once you have the corners in & squared up around the windows and corners, start installing the bricks from the bottom of the frame to the top.
You can use a plumb bob or 2 to guide the vertical alignment over a long wall.

Ensure there is proper brick engagement.
The aim is for a 3-4mm engagement but bricks **DO** vary in size so there **will be** variations.

Also, ensure the brickwork, like the rail, is plumb & level on the wall.

Some bricks, *particularly square edged bricks*, can have a tendency to move a few mm in the rails and become uneven when the mortaring nozzle is pressed against them.

So, check this and if there is too much movement use a small dab of a fire rated joint filler (*like Bostik "Fireban" or similar*), on the back of the brick and set it plumb & level.

(about a 10c piece size at the bottom of the brick back filling any space between the brick and the rail.)

If the brick is securely engaged prior to mortar installation, all will be OK.

IF SOMETHING IS NOT RIGHT… FIX IT NOW!
IT IS IMPOSSIBLE TO FIX ONCE THE MORTAR IS INSTALLED!

Installing Mortar

Recommended Mortar Type is M3 GP 1:0:5 or M4 EXP – 1:0:4

Table 11. Typical Mortar Mixes

Mortar Type	Durability Class	Mix proportions by volume			
		Portland or Blended Cement	Hydrated Lime	Sand	Water Thickener*
M1	PRO	0	1	3	No
M2	PRO	1	2	9	No
M3	GP	1	1	6	No
M3	GP	1	0	5	Yes
M4	EXP	1	½	4½	No
M4	EXP	1	0	4	Yes

Refer to page 1.104 for description of Durability Class. *Methylcellulose type, not air entrainers such as detergent.

Recommended M4 mix quantities are:

4 Part 'Brickies Mix' Sand as available
1 Part Cement as specified (Grey or White Cement)
15 grams (2 dessertspoons) of Empire 'Slick' Mortar Additive to 4.5kg cement

This is the theoretical additive rate, you may need more depending on atmospheric conditions. You cannot 'overdose' this additive.

Mix dry ingredients thoroughly before adding water using a multi-purpose drill mixer or similar.

NOTE: The water addition rate is sensitive to the climate

Slowly add enough water to create a mix that will pass through a mortar gun/ bag without dripping – firm but fluid.

Continue to mix thoroughly using the multi-purpose drill mixer or similar.

Using the appropriate mortar gun, bag or pump, inject each joint with mortar mix ensuring the mortar is pushed to the back of the brick facing and proud of the brick face.

The steps for mortaring are:

1. Fill all joints to back of the rails
2. Do all vertical joints (perps) first filling from the bottom up
3. Do Horizontal (bed) joints

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4. Mortar should be left to dry out prior to tooling... but not completely dry!
(this **WILL** vary with climate, check this often.)

5. Tool the horizontal & vertical joints

6. Brush off excess mortar when starting to cure (weather dependent)

7. Clean off any excess mortar or mortar smears from bricks with a vinegar solution

IMPORTANT NOTE:
When mortaring a brick into place, look at the bricks as you go. If one is "sticking out" or “sticking in” too much or just not straight. This means it is WRONG...
Even ‘following trades’ have a responsibility for the job...
ADJUST IT NOW.

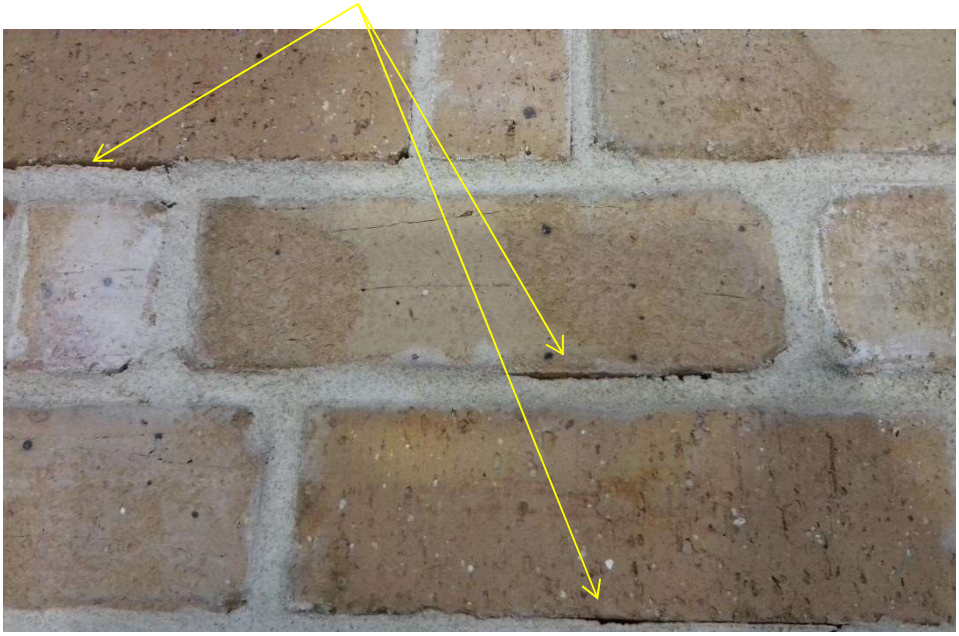
Mortar joints should be tooled to push the mortar into the joint to completely fill it and then finish off as instructed.

IMPORTANT NOTE:
Try not to smear any mortar over the face of the bricks.

- if mortar stains the brick face, clean it off with a vinegar solution.

Check that all joints are fully filled.
Mortar joints that are not filled correctly should be reworked by filling before the mortar sets

Insufficient mortar



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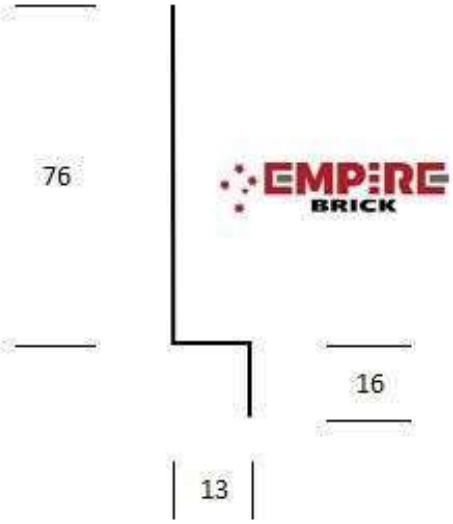
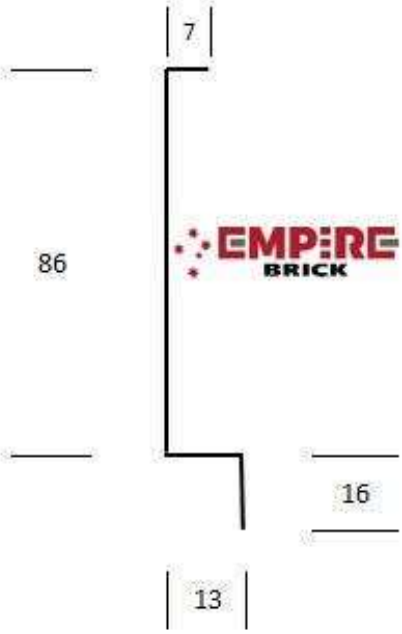
Finished brickwork should have all joints fully filled, tooled and clean.
(seen here in a special decorative bond)

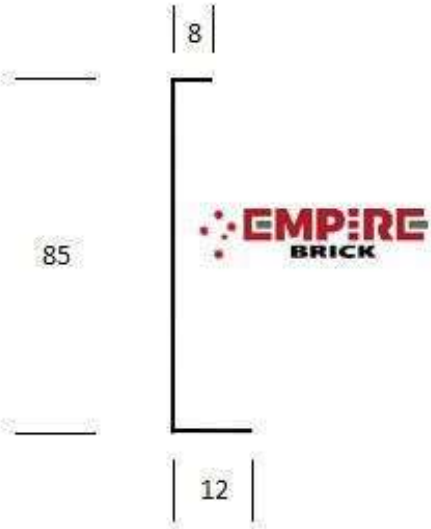
APPENDICES:



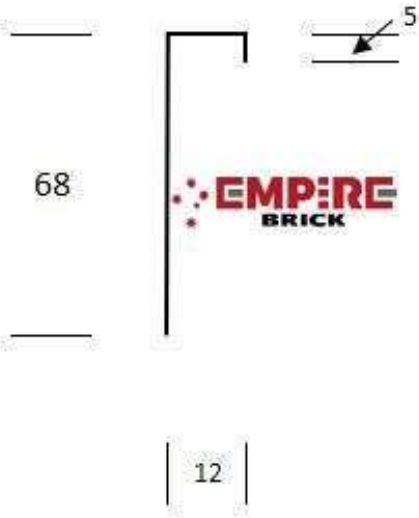
105 Short Course Rail



120 Course Rail



105 Starter Rail



85 Top Rail

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EMPIRE BRICK Façade System