



Ground Floor Construction

Carpentry - Residential Construction

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GROUND FLOOR CONSTRUCTION OVERVIEW

This text introduces a variety of subject matter related to Building and Construction, at a trade level.

It outlines both traditional and alternate suspended timber flooring systems as well as upper floor construction methods for two storey work.

Calculation procedures relating to traditional floor frame member quantities, tongue and groove (strip) and sheet flooring and costs are clarified and examples provided.

Ground floor construction in domestic buildings can be broken up into three broad areas:

- Ground floor supporting systems for floor frames
- The flooring frame itself
- The flooring

GROUND FLOOR SUPPORTING SYSTEMS FOR FLOOR FRAMES

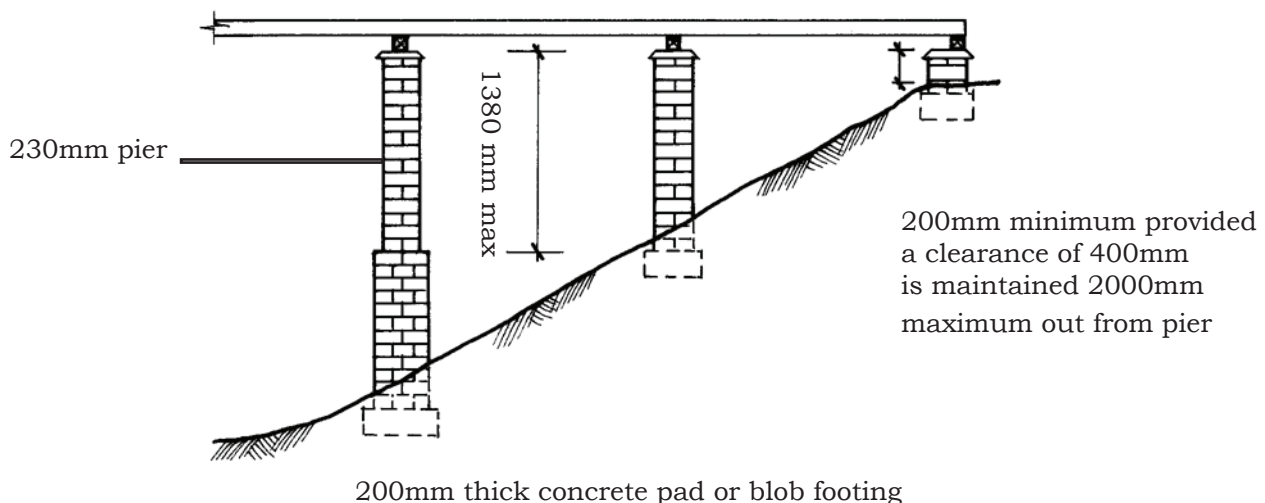
The isolated support system includes all isolated masonry piers (brick, block or stone), timber (stumps, posts or poles) and steel columns.

Masonry

This system consists of isolated brick, block or stone piers. Brick piers are generally 230mm square supported on concrete pad footings. This type of pier is seldom braced, as the accepted maximum height for a 230mm square pier is only 6 times the least base measurement, i.e. for a 230mm square pier = 1380mm.

Piers, which are increased in height, must be increased in overall base dimensions to compensate for the lack of stability and should not exceed 3.0m in height, without certification from a Structural Engineer.

The tops of all piers should be level and in-line to prevent unnecessary packing of bearers

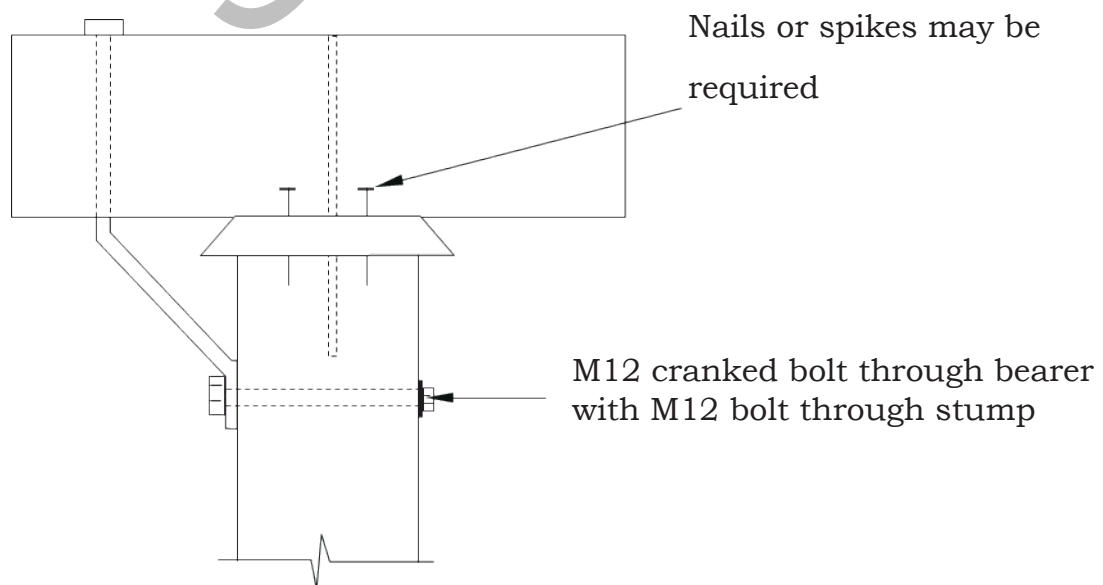


TIMBER

Traditionally, timber stumps are more commonly found in Victoria and Queensland. They are felled from class 1 durable timber such as Tallowwood, Turpentine and Ironbark. This style of sub-floor construction is still readily seen in Queensland today.



Poles or posts are normally round and made of durable Class 1 timbers or must be chemically treated to improve their durability. They should also comply with *AS1684.2 – Timber Framing Code* for minimum diameter and maximum height above ground level.



STEEL

Steel posts can be connected to the footing by the use of a steel bottom plate embedded into the concrete. Alternatively they may be bolted using masonry anchors. This product is normally galvanised to ensure its longevity and its choice may be an option for high termite prone areas.



Uni-Piers are available in two sizes:-
Builders Grade – (65 x 65 x 2mm SHS posts)
Heavy Grade – (75 x 75 x 2.5mm SHS posts)

Bearer Support
 Fixing Bracket (welded to bearer plate/antcap)

Bearer Plate
 (Loadbearing with integral antcap)

Fastenings
 Where loadbearing, use 8-14# 20x22 Buildex Metal Tek self drilling screws. Where non-loadbearing, use 4-14#20x22 Metal tek or use recommended fixing bolt for high wind categories.

Base Plate
 (welded to post) Bolt to concrete pad or cast into concrete, plate acts as anchor.

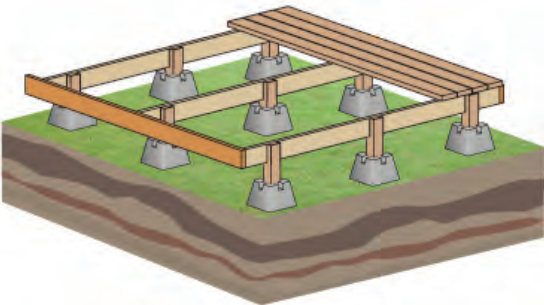
Uni-Piers are Hot Dipped Galvanised and are suitable for Timber or Steel bearers

An alternative adjustable pier system is known by its trade name of “Uni-Pier” It consists of a hollow square steel tube which has an adjustable telescopic shaft with a base plate at one end and a base plate at one end and a fixing bracket at the other, complete with it’s own built-in ant cap. It has a hot-dipped galvanised steel shaft with an adjustable top section, which is bolted through for load bearing applications. The base plate is welded to the shaft and may be masonry bolted to a concrete pad or be cast into the concrete pad to act as an anchor. The top or head section has a bearer fixing bracket welded to the bearer plate/ant cap, which in turn is welded to the head section. The head section has a self-drilling screw to allow fixing off to a level, straight height before the load-bearing bolt is drilled through and fixed.

FIBRE REINFORCED CONCRETE

As an alternative to conventional footing systems, advances in technology have seen the introduction of an ultra-lightweight proprietary blend, with fibre reinforcing adding strength and durability that is three times lighter than standard concrete.

This offers a foundation system in areas where ground movement is an issue, where shrinkage and expansion is common. In addition, this system allows a good alternative where bedrock or hard earth prevents ease of excavation for an in-ground concrete base.

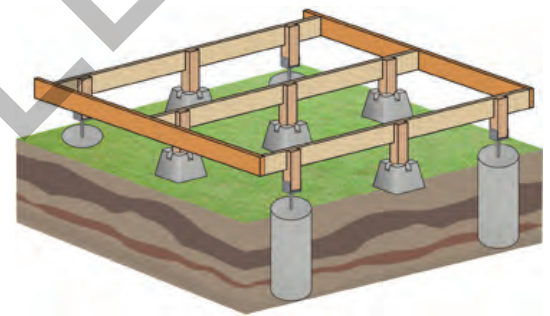


Typical Installation

Posts are only required on unlevelled ground or where an elevated platform is required. Typically joists can be installed directly on Handi Blocks for low level structures.

Tie down installation

Use Handi Blocks in conjunction with traditional concrete and steel support methods.



Handi Blocks are designed to accept standard nominal timber. The most common timber dimensions used are 90mm X 90mm treated pine posts and 35mm X 140/190mm treated pine joists or bearers. Because the Handi Blocks are a composite material, modification can be carried out using a normal timber handsaw.



90mm x 90mm post



35mm x 140/190mm Bearers

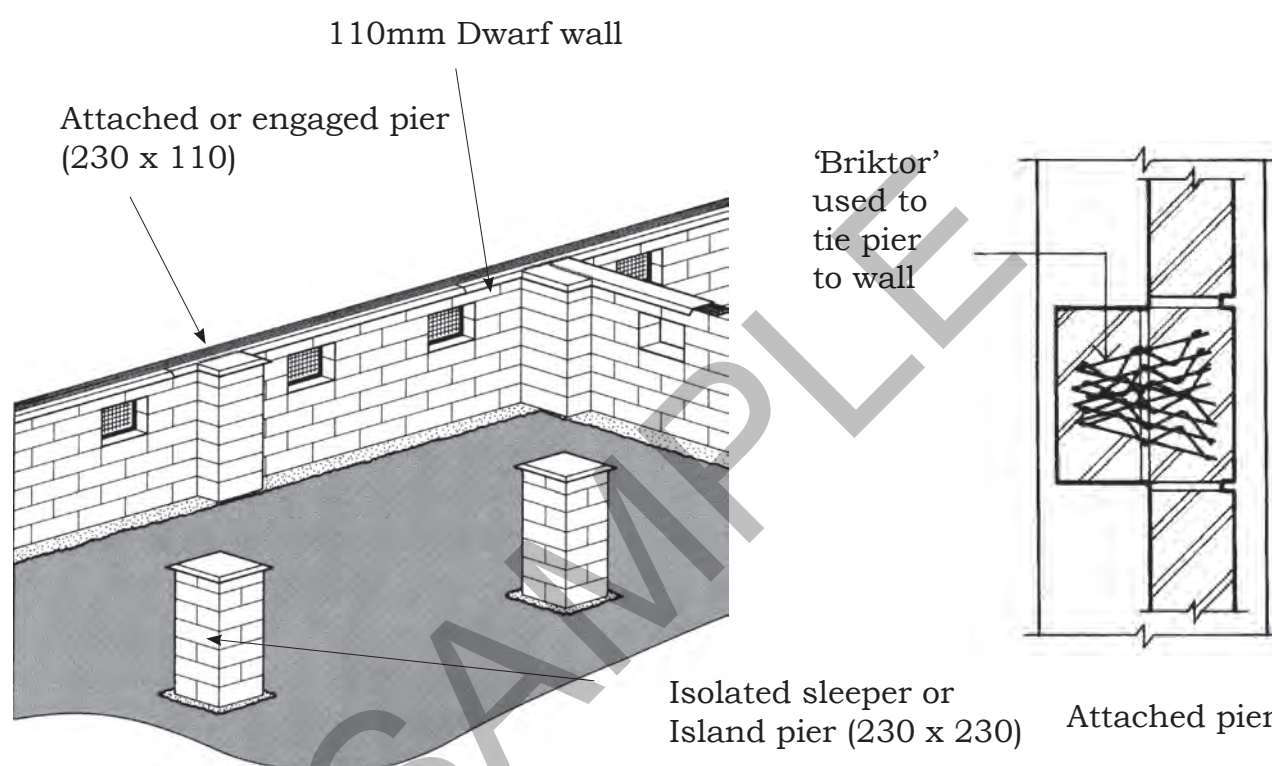


Modifying block to accept 45mm wide timber

CONTINUOUS SUPPORT SYSTEMS

Common Support System for Residential Structures

Foundation or 'Dwarf' walls for timber frame, brick veneer and cavity brick construction are usually 110 mm thick and are strengthened by engaged or attached piers, 230 mm x 110 mm, bonded or tied to them at designated centres to suit the size and stress grade of bearers. Generally the internal area of the floor frame is supported on 230 x 230mm isolated brick piers.



Timber Framed Structures

This system may be constructed of external dwarf walls, engaged piers and isolated 230 x 230mm mid floor supports or simply have 230 x 230mm isolated piers around the perimeter and supporting the mid floor area.

Brick Veneer Structures

This is the most common type of residential construction design with the external 110mm skin being built from the top of the footing to the underside of the eaves. The sub-floor area consists of the 110mm external skin with brick piers being attached to it, usually by building in brick ties or reinforcing wire (Briktor), at centres to suit the size and stress grade of the bearers. The tops of the piers are capped with termite shields (half caps) and the external walls have continuous termite shields built-in for the full length between piers. A damp-proof course (DPC) is usually placed directly under the termite shields.