MASTER BUILDERS SA
Built on Strength

CONSTRUCTION METHODS

There has been a real revolution in the styles and fabrics of homes available in South Australia. The past ten years have seen the advent of SIP (Structural Insulated Panels), more precast tilt up slab designs, and rendered AAC/ Foam designs.

It is fair to say that the majority of homes being built in SA are larger homes on smaller blocks of land, with an increase in two-storey medium density living.

The availability of new materials and the acceptance of new designs have radically changed the appearance of new homes being built. Whilst many of these new homes embrace the features of past classical designs, the changes have brought new possibilities and choices to clients building homes.

Nonetheless, the traditional South Australian architecture captured by the return veranda federation villa remains popular even today.

Brick Veneer

The majority of homes built are brick veneer with a wooden or steel frame on a slab foundation. The brickwork is the external cladding and is tied to the internal frame that the internal linings are fixed to. There is a cavity between brick and frame where services can be run and the cavity and frame allow the fitting of insulation.

The cavity helps provide a thermal gap between the outside and inside of the home.

Double Brick

Also known as 'cavity brick' this method was widely used up until the 1960s where a second layer of bricks replace the frame. In most cases the internal brick wall was hard plastered.

Stone and Block

In the case of the gracious bluestone and sandstone villas and cottages many of the front and side walls of a home were constructed of stone. The stone was often pointed and hard plastered internally to provide a smooth finish, or used in conjunction with clay red bricks.

Insulated Concrete Form (ICF)

ICF is something relatively new to SA residential construction but has its roots in WWII Europe. It is essentially a click-together system of externally insulated blocks (normally foam) into which reinforcement is fed and high-slump concrete poured on site. The advantages of this construction are its versatility, stability and reduction in number of trades required with no required framing. It also provides excellent thermal properties that increase the energy efficiency of your home. The external finish can be altered to suit most styles, with capacity to directly fix almost any cladding system, or you can simply render and paint.

Alternative Construction Methods

There are many other methods of construction including, Hebel Power Panels, mud brick, pole frame, straw bale, rammed earth, modular building systems and many

cladding manufactured board systems (such as marine ply or CFC) on timber and steel frame. These are usually stained or rendered.

Before building you should do extensive research on the advantages that each system will provide. Make sure that the features of the method suit your environment, climate and your living requirements. Thermal comfort, good natural light and ventilation and energy efficiency are important issues in deciding your building system and floor plan.

Foundations and Footings

Often wrongly referred to as the foundation of the house, the footing is the reinforced concrete structure that is constructed in preparation for the building of the home. The foundation is the soil strata upon which the footings for the house are constructed.

The foundation supports the footing that in turn supports the superstructure of the house.

The majority of homes are built on a raft slab but there are other sub floor systems that are particularly suited to sloping sites.

All the preparation and planning in building your home starts to take shape with construction of the footing system. The most common method in South Australia is excavation for "raft" footings that then support a concrete slab. However, there are advantages in every system of construction available. Therefore, it is important to choose a designer or architect and a builder that has experience in the method of construction that you have decided on. Your structural engineer will assist in the decision.

The site is prepared by digging trenches for the footings, a plastic vapour barrier membrane is then fitted to the trenches. The steel reinforcing is added and formwork installed before pouring the concrete slab and footings.

The slab with vapour membrane provides a moisture barrier, termite protection and is the foundation for the home. There are variations to slab design such as Waffle Pod method that was developed to compensate for South Australia's very reactive soils.

If you have a sloping site there are methods and systems to build without changing the natural contour of the land. Traditionally, homes in South Australia used the dwarf wall method as the sub floor system. On steeply undulating terrain or in flood prone environments pole frame construction with pier footings is common. There are special construction requirements in bushfire prone environments and these greatly affect the cost of construction and may influence your footing system. Naturally, such areas are often in undulating and vegetated terrain, so due diligence is required in these areas.

Frame

Traditionally, timber has been used for framing in SA house construction. However, steel framing is reaching a growing market share, compounded by recent timber shortages. Both systems have pros and cons. Timber is readily available in all common sizes and all trained carpenters can use the product expertly. It has a proven record and if the frame is to be exposed, then it can be aesthetically pleasing. Timber can be treated to prevent termite attack. Timber is versatile and snap design changes can be accommodated more readily.

Steel is termite resistant, lightweight, delivered on site in modules, quick and easy to fabricate and erect and there is a growing number of carpenters being trained to build with the material. There is also no warping or twisting = dead straight walls!

Cladding

There are many types of external cladding, such as the use of compressed fibre cement boards in a large range of styles, timber, such as blackbutt or western red cedar, Colorbond or other coated steel sheets.

Roofing

Rooves come in all different shapes and sizes but the majority of rooves are either masonry tile or steel sheet material clad. The building code divides rooves into two main categories, flat or pitched - with the pitch determining a number of factors, such as bracing and sarking. Sarking is a thin material that often appears with a silver side, sits beneath your battens or purlins and provides an insulation and moisture barrier. Sarking is often required in higher wind speed environments, for lower pitched rooves or in bushfire prone areas.

The roof frame is generally constructed from a timber or steel frame. The conventional roof is built on site, however, regularly a roof structure comprises prefabricated trusses delivered and fixed on site.

The structure of the roof is mostly determined by the design of the home, although modern truss software enables truss construction even with complicated roof forms. There are designs that are particularly suited to flat rooves and most people are familiar with the pitched roof with classic gables, hips and valleys.

The choice that the homebuilder has to make is whether to have a masonry tiled roof or a sheet metal roof. There are advantages to each approach.

Metal Roofing

There is nothing like the sound of rain on a tin roof on a cold night. Tin is not quite the correct terminology, but it's a term we have used for many years. Sheet metal roofs are made from either steel that is coated to withstand the elements, or from metal that is highly

corrosion resistant like copper or zinc. However, these materials are expensive and the majority of metal rooves are made of steel that is coated, which is available in many colours and profiles, and continuous lengths. Metal roofing provides for cleaner water for rainwater harvesting.

Tiled Roofing

Tiled Rooves can be constructed from terracotta or concrete roof tiles. The look is classic and suits many of the popular styles of homes built today. Masonry tiles are available in many colours and profiles. Tiles are also available in other traditional materials like slate and shingles.

Windows, Eaves etc.

Some other decisions that need to be made aside from colour and material selections, include whether or not your home has eaves.

There are some homes built today that replicate the Georgian style that did not use eaves. Think about the eaves before deciding not to have them on your home as they provide protection from the sun in summer and help keep rain away from openings and potential 'weak' points.

Whether to have aluminium, timber or even UPVC framed windows is another decision that needs to be resolved.

Consideration needs to be given to location and environment, maintenance and aesthetics when choosing your windows. Furthermore, the energy efficiency of windows is dependent on factors like thermally broken windows, double-glazed or improved glass as well as the framing.

Making the decision on window type to use should be done carefully because window selection is one of the more cost sensitive parts of a building, but glazing is also the 'weakest' point for building heat loss and gain. Double or even triple glazing may give you a return on investment sooner than you may think, especially with ever increasing energy prices.