

"QuoteZone"

Construction Manual



AG & S Homes

Using quality products from the following suppliers.



INSTRUCTION MANUAL FOR AG&S KIT HOMES

This manual is a guide to the erecting of Steel Framed Homes clad with Stramit 'C' Clad and must be used in conjunction with the house plans and specifications supplied with the kit.

This unique construction combines the use of 'Portal Frames' along with Steel House Framing to offer an extremely strong, low cost home to suit all needs.

Stages of Construction in building this type of home is as follows:

'C' Clad:

1. Organise subcontractors	Page 2
2. Organise suppliers	Page 2
3. Arrange insurance	Page 3
4. Are you ready to start building	Page 3
5. Tools required	Page 3
6. Footings/foundations	Page 5
7. Concrete slab with all relevant draining and plumbing services installed beforehand	Page 7
8. Steel framed floor system	Page 8
9. Assemble and stand portal frames and temporarily brace	Page 9
10. Assemble and stand external side wall frames	Page 10
11. Complete the roof framing	Page 12
12. Install ceiling battens	Page 12
13. Assemble and stand external end wall frames	
14. Assemble and stand internal wall frames	Page 12
15. Install windows, sliding doors and external swinging doors	Page 13
16. Fix colorbond cladding	Page 14
17. Install apron flashing and fascia	Page 15
18. Install safety mesh and sisalation or foil adhered blanket to roof	Page 15
19. Fix colorbond roof, ridge cap	Page 16
20. Fit verandah attachment beams, posts and main beam	Page 17
21. Fit gutters to verandah beam	Page 18
22. Install verandah roof	Page 18
23. Fit gutters to main house roof	Page 18
24. Fit barges to main house roof	Page 18
25. Install bath and/or shower recess/base:	Page 19
26. Install electrical wiring, plumbing pipes, security, phones, heating/air conditioning	Page 20
27. Install insulation batts to walls/ceilings	Page 20
28. Install built in robes	Page 20
29. Line walls and ceilings with plasterboard	Page 21
30. Fit internal door jambs, doors, locks etc	Page 22
31. Ceramic tiling	Page 23
32. Install vanities, kitchen cupboards etc Fit all internal door jambs, doors, locks etc	Page 24
33. Fix all architrave's, skirting, mouldings etc	Page 25
34. Painting and decorating	Page 25
35. Sand joins in flooring	Page 26
<u>36.</u> Finish electrical work and plumbing	Page 26
37. Initial clean up	Page 26
<u>38.</u> Floor coverings, blinds and curtains	Page 26
<u>39.</u> Final clean up	Page 27
<u>40.</u> Final check	Page 27

Note:

Before commencing any earthworks it is advisable to have qualified surveyors peg out both the building site and the corners of the house to be sure that it is correctly positioned on the site.

Take your time and position your new house to receive maximum sunlight in winter and a cool breeze throughout summer.

It is also advisable to have a soil test carried out to make sure that the footings are designed to suit the subsoil on your building site. This will avoid future construction problems.

Also check with your local council for the wind category for your particular site and be sure that your new house is designed to these standards.

Owner/Builders requirements vary from state to state. Please check with your local council.

1. Organise Subcontractors:

Before commencing construction of your new home, you must decide on how much of the work you will do yourself and how much will be let out to subcontractors. Only licenced trades people can do jobs such as plumbing and electrical so do not attempt to do these jobs on your own.

Ample time will need to be given to arrange quotes and arrange commencement dates and materials required

The following trades people will need to be contacted:

1. Excavator: for bobcat, backhoe or bulldozer for leveling of site, footings, trenches etc.
2. Electrician: to hook up temporary power supply to site
3. Plumber/Drainer: Temporary toilet for trades people and water connection
4. Certified Pest Control Company: Spray under slab and around house for termite protection
5. Concreter: Place steel and pour footings and slab
6. Carpenter: Setout of building
7. Bricklayer: Lay bricks for foundations and house (brick veneer or cement block)
8. Plasterboard fixer
9. Roofer: May be the plumber or builder or a specialised roofing contractor
10. Waterproofing Contractor: shower recesses etc
11. Tiler: Bathroom, Kitchen, floors etc
12. Floor sander: to prepare timber floors for polishing, vinyl etc
13. Painter/decorator
14. Brick cleaner: acid wash bricks and blocks

2. Organise suppliers:

The following suppliers will need to be contacted to provide quotes and delivery dates for:

1. Sand and soil supplier: for filling sand, brickie's loam, cement, brick ties, bycol etc
2. Brick or cement block supplier
3. Hardware & building supplier: Doors, door furniture, fix out materials, timber flooring etc
4. Pre mixed concrete: Concrete for footings, house slab, verandah slab, paths and driveways
5. Phone provider, security systems etc
6. Plasterboard supplier: Internal linings for living and wet areas (Bathrooms, Laundry, W.C. etc)
7. Kitchen Manufacturer: Kitchen cupboards, vanities, wardrobes etc
8. Paint supplier: the painter in his quote may also supply this.

9. Electrical/lighting: Power points, light fittings, exhaust fans etc
10. Carpet store: All floor coverings
11. Interior decorating store: Blinds, curtains.
12. Cement sealer for 200mm block work if being used

3. Arrange Insurance:

Workers Compensation: Required if employing trades people on wages. If employing subcontractors, ensure they have their own policies and also make sure that you are covered.

Public Liability: Provides financial protection for any action brought against you as a result of accidents causing any injury, loss or damage to persons or property.

Contractors All Risk: Covers building against damage or loss while under construction, through storm wind or fire, collapse, theft, explosion, malicious damage, broken glass etc.

Please check all of the above with a reputable insurance agent, prior to commencement of any works.

4. Are you ready to start building?

1. Has the title on the property been cleared? This needs to be done before council will release plans.
2. Have all finances been cleared and approved in writing.
3. Have you organised your 'Owner-Builders Licence'
4. Have all approvals been received from council (Building and Development Applications etc)
5. Have you arranged all insurance's
6. Has temporary power been connected to site
7. Has a temporary toilet been provided
8. Has water been connected
9. Have you placed a sign on site showing your name, owner builders Licence number, Lot number and phone number (check with council for sign size & requirements)
10. Has the final kit payment been made to the supplier
11. Has the house kit been delivered to site and all materials thoroughly checked off

5. Tools required:

If you have answered yes to the above then let's start by checking the tools required:

- Claw Hammer and a lump hammer to drive in 'Mushroom Pins'
- Small Tape Measure
- Long Tape Measure
- Quick release clamps
- Tin snips
- Hacksaw
- 13mm, 15mm and 18mm Spanners
- Crayon or Felt Pen. Note: Aerogard will remove felt pen markings from framework.

- Pencil
- Score and Snap Knife
- Chalk line
- String line
- Plumb bob
- Water level or Auto Level
- Spirit level preferably 1200mm long
- Builders Square
- Screw Drivers
- 'Tekes' Screw Gun or Electric Drill with Clutch. A 5/16" Hex Head and a wafer tek's' bit to suit wafer screws. (If supplied in kit)
- Electric Drill (a battery drill will also be very handy)
- Nibbler to trim cladding on gable ends OR
- Angle Grinder – see warning over page
- Silicone and Silicone Gun or alternately 2 tubes of Gutter Silicone.
- Extension ladder
- 2 long step ladders
- Mailbag
- Multigrips or pliers
- Safety Goggles
- Ear Plugs
- Overalls
- 30+ Suntan lotion or blackout
- Work Boots for all groundwork
- Good quality non-slip shoes for roofing
- Gum Boots for concreting
- A couple of willing offsidiers.
- The above tools will allow for the erecting of all steel frame work. Other tools are also required for bricklaying, tiling, plastering etc. These tools can usually be hired from

reputable tool and equipment hire firms.

- **If using an angle grinder BEWARE.**

Not only are these extremely dangerous to operate, they leave 'swarf' on zinc and colorbond cladding that can cause rusting and void any warranties. Be sure to thoroughly sweep any swarf off with a soft hair broom.

DO NOT USE NEAR ANY COLORBOND FENCING, MOTOR VEHICLES, GLASS OR OTHER PEOPLE.

If using an angle grinder, wear safety goggles, earplugs & safety boots. Do not wear loose clothing.

Follow all work cover regulations in relation to the use of power tools.

Time now to have a cuppa, throw the gear and the dog on the ute, go to site and start building.

6. Footings/foundations:

It is advisable to get a qualified surveyor to peg out the position of the house on the building site.

On sloping sites where excavation works are required, it may be easier to have this work carried out before survey pegs are placed into position.

The excavation is usually done larger than the proposed house to allow for landscaping, paths and driveways etc.

Set out the overall dimensions of the house to suit the floor plan provided.

If using a steel, timber or concrete suspended floor system, footings will need to be dug to the size as shown on the attached plan.

Set up profiles and measure diagonals to check that both measurements are exactly the same. This will ensure that the building is 'square'.

Setting up profiles:

Profiles allow the house to be accurately sited, squared and leveled on the building site, prior to the digging of footings. Profiles usually consist of 2/50x50 hardwood pegs and a 1m length of 75x25 green hardwood or softwood for the crosspiece. For tall profiles a diagonal brace (75 x 25) will also need to be nailed from the bottom of one peg to the top of the other. This keeps the profile rigid and helps to avoid costly mistakes being made.

A nail is driven into the top of each profile to indicate the position of the outside wall and the outside edges of the footing. (See diagram below)

To correctly position a house on site: (if not already done by surveyor)

- Attach a string line to the front and side boundaries of the building site.
- Measure back the required distance from both boundaries and place a peg in the ground to suit the outside dimensions of the house
- Using 2 tape measures, position the last corner peg.
- Now that the 4 corner pegs are in, profiles can be set up; these profiles need to be outside the corner pegs by 1.2m-1.5m to allow room for the earthmoving equipment to dig the footings. (If the site is not square or rectangular or the house is to be slightly rotated on the site, then work off one boundary only. This will usually be the front boundary.)
- Pull a string line over the front pegs and mark a line on the top of each profile at each end of the house. Do the same with one end of the house. Drive a nail into the cross bar where the marks are and attach a string line and tension
- Using a tape measure, mark a line at 3m on one string and 4m on the other, from where the 2 lines intersect. Check that the diagonal measures 5m. (6m, 8m 10m measure may also be used to check diagonals)
- Once these 2 are diagonally square, measure the length and width of the house and mark the position on the other profiles. Drive in a nail, attach and tension a string line and re-measure the overall diagonals.
- Once the outside wall is located on all profiles, measure the width of the footing and drive 2 more nails into each profile. Now attach a string line onto the outside nails on each profile and using hydrated lime, mark the position of footings on the ground for the excavator to follow. Remove string lines. (Lime is best used just prior to the beginning of excavation.)

Footings:

- Footings are best excavated using a backhoe to correspond to the sizes as per the plan.
- Keep topsoil to one side for use at a later stage when landscaping
- Subsoil's are best kept clear of the house site and clear of vehicular access
- Once the excavator has finished digging, trenches may have to be squared up and any loose fill shoveled out. Do not back fill trenches if they have been inadvertently dug too deep.
- Using lengths of steel rod, drive in concrete height pegs for Concreter to work levels to. This can be achieved by using a water level, a spirit level and long straightedge or a tripod type level. These height pegs need to be spaced at around 2.5m and stepped where necessary. For brickwork the steps need to be 75mm, for block work either 90mm or 190mm (depending upon size blocks being used) Steps can be in multiples of the above. Install boxing (same height as step) in front of each step.

Reinforcing:

- Trench Mesh -as per specifications on attached plan. Usually a 3 or 4 bar F8 Trench mesh is used. There are 2 layers of mesh held apart by stirrups usually placed at 1200mm centres

and lapped according to specifications.

- The mesh is kept off the bottom of the trench with bar chairs placed at 1.000mm centres. The mesh must be kept away from the sides and end of trenches. Concrete must completely cover all steelwork.
- **Brick Piers:**
- Set out Brick or Block piers as per plan.
- Depth of pier as per specifications
- Bricks are laid using a mortar joint, blocks can be either laid using mortar or dry laid using Bond Crete or similar. If using cement blocks for piers it is recommended to use a deformed starter bar in the concrete pier
- Dig pier holes using a footing shovel, keep holes square and clean loose fill from hole.
- Pour concrete to ground level (Pre cast concrete bases can also be used. These are bedded into filling sand and blocks glued directly to them)

7. Concrete Slab:

There are 2 main types of slab:

- Slab combined with brick or block work
- Raft Slab

Combined Slab:

- Brickwork is laid up to floor level (to suit council bylaws)
- The brickwork can be used as formwork or alternately timber formwork can be used to retain the slab until poured.
- Road Base or Crushed Granite or similar is used to level the site under the slab. This needs to be compacted.
- Install all drainage pipes, electrical conduits, ducting for gas or electric heating
- Arrange for a drainage inspection to be carried out by your local council prior to covering any pipes
- Usually a 50mm layer of filling sand is applied over the top of the compacted fill
- Treat area under slab and immediately around the perimeter of the house with termite protection. (This needs to be carried out by a qualified tradesperson and a certificate given to your local council as proof that the job has been completed by a licenced company)
- Place plastic membrane and tape all joints and seal around all drainage pipes etc.

- Place steel rod at approximately 3.000 centres to use as a height level when placing concrete. Again tape around these pegs.
- Place all reinforcement mesh and tie together using tie wire. Place bar chairs under so that the steel is in the top third of concrete.
- Arrange for a slab/steel inspection to be completed by your local council prior to pouring of the concrete.
- Pour concrete slab. Depending on floor coverings being used the slab is usually finished with a steel trowel finish to living areas and a wood float finish to wet areas or areas where tiles are going to be laid.

Raft Slab:

- A raft slab is formed up with timber or steel formwork and poured as one unit including the footings. The footing reinforcement mesh is tied to the main slab reinforcement mesh. Steps or rebates for brickwork etc are also formed up so that when the formwork is stripped after the concrete has cured the framework and brickwork can be commenced.
- Road Base or Crushed Granite or similar is used to level the site under the slab. This needs to be compacted.
- Install all drainage pipes, electrical conduits, ducting for gas or electric heating
- Arrange for a drainage inspection to be carried out by your local council prior to covering any pipes
- Usually a 50mm layer of filling sand is applied over the top of the compacted fill
- Treat area under slab and immediately around the perimeter of the house with termite protection. (This needs to be carried out by a qualified tradesperson)
- Place plastic membrane and tape all joints and seal around all drainage pipes etc.
- Place steel rod at approximately 3.000 centres to use as a height level when placing concrete. Again tape around these pegs.
- Place all reinforcement mesh and tie together using tie wire. Place bar chairs under so that the steel is in the top third of concrete. (Refer to plans)
- Arrange for a slab/steel inspection to be completed by your local council prior to pouring of the concrete.
- Pour concrete slab. Depending on floor coverings being used the slab is usually finished with a steel trowel finish to living areas and a wood float finish to wet areas or areas where tiles are going to be laid.
- If pouring a concrete slab, usually a 'raft slab' is the better and cheaper alternative as a 'raft slab' incorporates the slab and footings (edge beams) all in one and less trades' people are required to get the job to floor level.

8. Steel floor systems:

Bearers & Joists:

- These are mainly used when the building site has too much fall, making the use of a concrete slab uneconomical. The advantage of this system is that the steel floors do have a little give or spring in them making them a little easier to walk on than a concrete slab. Different flooring timbers can be used giving a nice homely feel when treated with a timber stain, lacquered and polished.
- This system comprises of bearers, joists and either sheet flooring or strip flooring.
- Follow manufacturers specifications when installing these systems

Sheet Flooring:

Sheet flooring is the most popular alternative to concrete slabs, as it can be installed relatively quickly and make an excellent platform to work on for erecting of frames etc. Sheet flooring is laid prior to any portal frames or studwork being stood.

If used in wet conditions, holes will need to be drilled near wall plates to allow any water to escape. This will prevent pooling of water on sheets.

A single joist will need to be placed under all internal plates running parallel to the floor joists.

A double joist will need to be positioned under any external (load bearing) wall running parallel to the floor joists.

When the sheet flooring is delivered to site it is recommended that it be stacked on the floor joists ready for use. Do not allow it to sit on any uneven surfaces as this can damage or buckle the sheets. Keep all flooring out of dirt and mud as this can obstruct the 'groove' of the sheet and prevent tight joints.

- Measure in the width of one sheet from the end of the floor joists at both ends of the job. Sheets are usually 600mm and 900mm wide.
- Flick a chalk line between these marks and use this line to attach the first run of sheets to.
- It is recommended that a suitable glue such as Maxbond, Liquid Nails or similar is used. Run a bead of glue on each joist, prior to placing the flooring into position. (Only glue joists to suit one sheet at a time)
- Using long "teks" screws, "teks" screw the floor at approx 300mm centers (or as per the manufacturer's specifications) at each joist and along the edges of the sheet.
- Flooring should be staggered, so that the end joints don't line up. The off cut from one end will be used at the beginning of the next row.
- The ends of the sheet floor need to be joined on a floor joist
- Do not expose sheet flooring to weather for any longer period than that recommended by the manufacturer.

9. Portal Frames:

- Your new home is constructed using portal frames in conjunction with a steel stud frame system. The advantage of this includes strength, durability, low cost, low maintenance, and termite resistant framework with a lifetime guarantee.
- Each home comprises portal frames spaced at 4m centres. These form the main structural framework for the house. Portals are made from galvanised 'C' section purlin and associated brackets.
- Each 'portal' comprises:

2 columns, 2 rafters, 1 tie beam, 3 droppers, 2 haunch brackets, 1 apex bracket, 8 flat brackets and 2 base cleats to attach the column to the floor.

Note:

Portals can be assembled first as a complete unit then lifted into position with the help of a crane, hi-ab, scissor lift or similar and then bolted to slab/ floor or secondly:

Stand and bolt the columns to the slab and fix the cross beam into position. Stand and brace the sidewall (front and back) frames then build the rest of the portal by adding the rafters and droppers. See 10A.

Assembling the Portal Frames:

1. Mark the position of the portals on slab/floor by measuring in the distance as per the floor plans provided.
2. Using a chalk line, flick a line on the slab to suit the inside measurement of the external framework. This line should be in approx. 75mm from edge of slab.
3. Bolt a base cleat inside the 'C' of each column at the bottom
4. Lay 2 columns on the floor with the web (smooth face) up.
5. Bolt the left and right haunch brackets to the top of the columns (web face)
6. Using 2 flat plate brackets, connect each end of the tie beam to a column at a point just below the bottom of the rafter using 8 screws per flat bracket. (Check measurement off the attached section drawing)
7. Mark the position of the roof purlins on each rafter and use a 'teks' screw to the low side of each roof purlin. These screws act as a stop to prevent the roof purlins sliding down the rafters when being located prior to being screwed off.
8. Insert the 2 rafters into the rafter sleeve on the haunch brackets and then locate the apex bracket at the top where the 2 rafters meet. Insert bolts to both the haunch brackets and the apex bracket.
9. Install the centre dropper under the apex using a flat plate both top and bottom. Use flat plates to connect the dropper to the rafter and tie beam. Check that the dropper is at a right angle to the tie beam.
10. Insert the other 2 droppers at an equal spacing as per above.
11. Check all bolts have been tightened.

12. Lift the first portal into position, keeping the web (smooth face) of the 'C' section facing the inside of the house. The outside of the 'C' section will be flush with the end of the slab/floor. Drill holes and bolt to slab/floor using bolts provided.
13. Securely brace and plumb this portal using some of the roof purlins as braces.
14. Stand the next portal into position and join to the first portal with a roof purlin positioned near the column on each side. Then secure with a third roof purlin near the apex of the roof. Drill and bolt to slab/floor
15. Continue lifting the portals into position, staggering the apex roof purlin from one side of the apex to the other for each bay. This ties the framework together until all roof purlins are positioned.
16. Once all portals are positioned, place 2 more braces to the opposite end columns so that both sets of end wall braces are pushing towards each other.

10. Assemble and stand external steel wall frames:

1. Sort and put aside all external sidewall top and bottom plates, studs and jack studs, (Window and door over studs and under studs), door headers, window headers and sills.
2. Make up external sidewall frames as per measurements on the accompanying drawings.
3. Studs are connected to the top and bottom plates with a 1x10-16x16 square-headed ““teks”” screw either side.
4. All window and door trimmers and jack studs are also connected in this manner
5. An angle header beam is also required over larger openings to stiffen the framework. These are connected using 10-16x16 wafer head ““teks”” screws.
6. At the intersection of each internal wall frame, a stud must be placed to each side of the internal wall plus another rotated at 90 degrees so that it is running the same direction as the internal wall stud. This stud is then “teks” screwed through the end stud of the internal wall and also the stud either side. This locks the corner into position.

Note: If portal frames have not been previously assembled and erected then a gap of 152mm will need to be left on end walls from the inside of the side wall bottom plate to allow for column to be installed.

Strap Bracing:

Diagonal bracing must also be used wherever possible between window and door openings. These are to be placed at an approximate angle of 45 degrees or less and cross over each other as shown. They are connected to the top and bottom plates with 2 square headed ““teks”” screws and are tightened using special strap brace tensioners (supplied in kit). A minimum of 1 cross diagonal brace is required to each end wall and 2 cross diagonal braces to each side wall over 12m in length.

Wall sections are joined together using 5 x 10-16x16 wafer head ““teks”” screws.

The inside of these walls will sit on the chalk line as previously marked on the slab/floor for the portal frames and are fixed to the slab at maximum 1.5m centres using 1/ 50mm x 6.5mm ‘Mushroom Spike’ anchor. One ‘Mushroom spike’ must be inserted through the bottom plate into the slab to each side of a window or door opening.

Diagonally measure and 'square' each frame prior to installing strap brace. This way the walls should be plumb once stood, if not re-tension the strap brace tensioners.

If portal frames have been assembled and erected please go on to 'Complete Roof Framing'.

10A: If portal frames have not previously been erected..

1. If the portal frames have not been previously assembled and erected then set out the position of each column.
2. Bolt a haunch bracket to the top of each column and a base cleat to the bottom of each column. Haunch brackets must be attached to the web face of the column. Base Cleats are attached inside the 'C' of the column.
3. Install the 4 corner columns with the web (smooth face) facing the interior of the house.
4. Install the remainder of the columns (check measurements off the plans provided) and check for plumb. At this stage the columns may lean in or out a little, however they must be plumb along the length of the house.
5. Attach the tie beam using flat connection plates.
6. Connect 2 rafters together using an apex bracket on the web face and tighten bolts.
7. Set out the position of the roof purlins on each rafter and locate a ""teks"" screw in each.
8. Lift the rafters into position and bolt into the rafter connection sleeve on the haunch brackets.
9. Install centre dropper
10. Install the other 2 droppers
11. Work along the length of the building
12. After the second portal is complete ""teks"" screw a roof purlin near the apex between the 2 portal frames
13. Continue this for the remainder of the portal frames
14. Check the overall length of the portals at the apex of the house. This measurement must be the same as the overall measurement from outside to outside of column along the length of the house.
15. Fix the remainder of the roof purlins into position and plumb both ends prior to bracing the roof.

11. Complete the roof framing:

1. Before internal walls and external end walls are assembled and stood into position, the remaining roof purlins need to be screwed into position. Roof purlins can be rested on the previously placed ""teks"" screws for ease of handling. Roof purlins are overlapped and screwed to each portal using 4 x 14-25 x12 ""teks"" screws with a further 2 ""teks"" placed through the lip of the roof purlins approximately 25mm from the end of each overlap. On 'C' clad homes or any clad homes the roof purlins will finish flush to the outside of the rafters at each end of the house.

Strap Bracing:

1. Galvanised cross strap bracing needs to be installed to each end bay on either side of the building and then every 3rd bay. Place 2 ““teks”” screws through the bracing into the bottom end of the rafter (near column) and 2 into the top end of the next rafter (apex end). Use a brace strap tensioner to tension the diagonal brace. Place 2 ““teks”” screws through the galvanised strap into the top of each roof purlin that it passes over.

12. Install ceiling battens:

1. Install a run of ceiling battens parallel to the side walls and hard up to the columns
2. At each portal frame measure 600mm increments across the bottom of the tie beam
3. Ceiling battens are to be spaced @ 600mm centre to centre (into-over)
4. Fix the remainder of the ceiling battens into position using 4 screws per purlin per beam
5. Using a long straightedge across the underside of the ceiling battens, mark a line on the inside face of an external stud towards the end of each bay (near columns).
6. Fix a length of Plate material (78 x 28) x 4m length to each bay, with the bottom of the plate being on the line previously marked. Fix to each stud, using framing teks. This will allow the ceiling to be screwed to the underside of this batten.

13. Assemble and stand external end wall frames:

1. Sort and put aside all external end wall top and bottom plates, studs and jack studs, (Window and door over studs and under studs), door headers, window headers and sills.
2. Make up external end wall frames as per measurements on the accompanying drawings.
3. Studs are connected to the top and bottom plates with a 1x10-16x16 square-headed ““teks”” screw either side.
4. All window and door trimmers and jack studs are also connected in this manner
5. No angle header beam is required over openings to the end wall framework. Once the end wall framework is stood and plumbed, place one framing ‘teks’ screw through the top plate and into every 2nd ceiling batten
6. At the intersection of each internal wall frame, a stud must be placed to each side of the internal wall plus another rotated at 90 degrees so that it is running the same direction as the internal wall stud. This stud is then ““teks”” screwed through the end stud of the internal wall and also the stud either side. This locks the corner into position.

Note: If portal frames have not been previously assembled and erected then a gap of 152mm will need to be left on end walls from the inside of the side wall bottom plate to allow for column to be installed.

Strap Bracing:

Diagonal bracing must also be used wherever possible between window and door openings. These are to be placed at an approximate angle of 45 degrees or less and cross over each other as shown. They are connected to the top and bottom plates with 2 square headed ““teks”” screws and are tightened using special strap brace tensioners (supplied in kit). A minimum of 1 cross

diagonal brace is required to each end wall and 2 cross diagonal braces to each side wall over 12m in length.

Wall sections are joined together using 5 x 10-16x16 wafer head ““teks”” screws.

The inside of these walls will sit on the chalk line as previously marked on the slab/floor for the portal frames and are fixed to the slab at maximum 1.5m centres using 1/ 50mm x 6.5mm ‘Mushroom Spike’ anchor. One ‘Mushroom spike’ must be inserted through the bottom plate into the slab to each side of a window or door opening.

Diagonally measure and ‘square’ each frame prior to installing strap brace. This way the walls should be plumb once stood, if not re-tension the strap brace tensioners.

14. Assemble and stand internal wall frames:

1. Sort all internal wall plates (according to their length) into pairs, and place in their approximate position on the slab/floor.
2. Using either a fine felt pen or soft pencil, mark the position of each stud (as per plans) and also mark any door openings etc so that studs are not inadvertently screwed in the wrong place.
3. Once the position of the studs have been set out on both the top and bottom plates of each wall frame, the plates can be set aside until required.
4. Starting from one internal corner of the house, (usually where the most internal wall frames are positioned) start assembling the internal wall frames, following the plans for guidance.
5. Once all the studs have been screwed into position, each frame must be diagonally ‘squared’ and a diagonal cross brace installed.
6. Stand the wall into position and place several ““teks”” screws through the end stud of this wall into the adjoining stud on the previously stood wall. Check for plumb.

15. Install windows, sliding doors and external swinging doors

The windows and sliding doors are supplied with pre fitted timber reveals and are ready to install.

It is advisable to plane about 1mm off the back edge of the reveal. This will enable the architrave to fit tight against the reveal. Alternately the leading edge of the back of the architrave can be planed back a little, however this is more difficult and requires either a rebate plane or electric planer.

Windows:

Start installing the windows from one end of the house as the distance between the corner of the house to the first window and each other window and door opening must be precisely measured to allow for the pre-cut wall cladding.

1. Place packing pieces (Either thin ply or masonite) on the windowsill and check for level. This allows for adjustment of other windows should there be any variation in the slab/floor. Packing needs to be placed under the stiles of the window.
2. Sit the window in the opening.
3. The inside edge of the reveal will need to protrude 10mm internally past the steel frame.

This allows for a thickness of standard plasterboard. (If different thickness wall linings are used then some material may need to be planed off these reveals.) It is very helpful to have a piece of the lining being used. This is then used as a gauge to ensure the correct offset from the stud.

4. Adjust the window in the opening to suit cladding. The cladding will fit behind the window flange approximately 10mm. (If the cladding length between windows is 4.000 then the measurement between the window flanges will be 3.980 allowing 10mm either side = 20mm total)
5. Place packing between the window stud and reveal (near the top) and place a wafer screw through the reveal and into the stud.
6. Repeat this procedure for the other side.
7. Check both sides for plumb, fit remainder of packing to each side and fix into position (windows 600mm high 2 screws each side, 1000mm high 3 screws per side, 1500mm high 4 screws per side, 1800mm high and sliding doors 5 screws per side)
8. Fix the bottom sill in the same manner, placing screws next to the packing.
9. Do not pack or screw the top reveal. If a bow is encountered in the top reveal, this can be straightened with an architrave later.
10. Fit the remainder of the windows as per above checking that the distance between the windows suits the cladding lengths provided.
11. **Check that all windows are level.** The easiest way to do this is to use the same height packers on each windowsill. Once the window is placed in the opening, place a straightedge and level on the external flanges of the window and pack to suit.

Sliding Doors:

Sliding doors are installed in the same way, however the height is governed by the slab/floor that it sits on. Check for plumb. If the slab/floor is out of level the sill will need to be packed.

External Door Jambs:

External doorjambs are installed in a similar manner, allowing for the thickness of wall linings when installing.

2 standard size doors are usually used these being 770mm and 820mm wide.

The doorjambs measured inside the rebate are usually 5mm bigger to allow clearance either side.

Opening sizes required to allow the installation of these doorjambs in studwork is: 770
wide door = 820mm opening, 820 wide door = 870 opening.

1. Make up the door jamb to the size required and nail a temporary cross brace from rebate to rebate approximately 200mm from the bottom
2. Stand the doorjamb into position and check the top for level. Either pack the short stile or cut the required amount off the long stile.
3. Measure distance from the last opening for cladding length, then pack and screw the doorjamb into place.
4. Allow for thickness of interior lining

5. Check both stiles for plumb and pack where required.
6. Check stiles for wind by standing back and looking side on at the 2 stiles. The 2 stiles must be parallel to each other.
7. Finish screwing into position.

16. **Fix colorbond cladding:**

Prior to installing the external cladding, fix sisalation paper to walls using a good quality adhesive tape or alternately some small screws and 25mm x 25mm squares of malthoid, dampcourse etc. On windy days it is advisable to only fit the sisalation paper to the walls that can be clad straight away. Make sure that the sisalation paper is lapped a minimum of 150mm and that the sisalation is tucked into the framework around all window and door openings prior to fitting the colorbond architraves into position.

Colorbond Arhitrave Flashings:

Cut and fit colorbond architrave flashing around each door and window opening, 3 per door, 4 per window.

On windows, cut and fit the bottom flashing first, followed by the 2 side flashings then the top flashing.

On Aluminium sliding doors and external doors fit the 2 side flashings first, then the top flashing.

The longest edge of the flashing goes to the back to act as a lead in for the cladding.

The over architrave/flashing can be cut at a 45 degree angle to give a mitred appearance.

Fix each arhitrave/flashing to studs & trimmers using pop rivets placed at approximately 600mm centres.

Cladding:

1. Sort cladding into lengths
2. Working off the plans provided, place the various lengths of cladding in the appropriate positions around the job.
3. Fit the bottom run of cladding using the starter trim provided. (Ensure that the sisalation paper has been installed)

4. Continue installing all boards, fixing just above the top lip with one hex headed “teks” screw per board per stud. (Screws must be concealed)
5. Check each board for level using a spirit level
6. To check height of other boards being installed measure the distance from the top of the window to the top of the cladding.
7. Top board above doors will have to be trimmed to fit.
- 8. If a verandah is being installed do not install the top 2 rows of cladding until the verandah attachment beam is installed.**

17. Install apron flashing and fascia:

Fascia:

1. Install colorbond steel fascia directly to stud framework over the top of the sisalation.
2. Keep top of fascia ??mm below the top plate for 22 degree roof and ??mm below the top plate for 30-degree roof pitch.
3. Slide the apron flashing up behind the fascia
4. “Tekes” screw through the fascia and apron flashing and into a stud at approximately 1.200mm centers (every second stud) using 65mm ““teks”” screws.
5. Fascia is to finish flush to the outside of the wall cladding at both ends of the wall.

Gutter:

1. Fit gutter stop ends to the 4 end gutters (1 pair to each side) of house.
2. Cut a hole and fit nozzles where required
3. Install gutter brackets to fascia, allowing a slight fall to down pipes, using 10-16x16 wafer “teks” or pop rivets.
4. Fit gutter over gutter brackets
5. Silicone seal all joints, gutter stop ends and nozzles.

18. Install safety mesh and foil adhered blanket to roof:

Safety Mesh:

1. Roll out, measure and cut the lengths of roof mesh required to reach from gutter to gutter plus wastage of approximately 600mm.
2. Tie a rope to the wire at the end of the roll.
3. Have an assistant hold the roll on one side of the house to gradually unroll the wire while it is pulled over the house with the rope.
4. “Tekes” screw the wire to the top of the external wall frame on one side then stretch the wire and “teks” screw to the other side.

Foil Adhered Blanket:

1. Have the first two roof sheets (one for each side of roof) ready to be passed up.
2. Roll out the foil adhered blanket on top of the roof mesh. Due to the short lengths of rolls, some will have to be joined together on the roof and taped together with duct tape.
3. Place roof sheets into position and temporarily “teks” through into position.
4. Repeat the above steps for the remainder of the roof.

19. Fix colorbond roof, ridge cap**Roof:**

Note: Install roof safety mesh and foil adhered blanket prior to or in conjunction with the roof cladding.

Check that both ends of the roof are plumb by placing a long spirit level on the centre gable dropper.

1. Start sheeting from one end of the house and work through to the other end of the house. (Face laps away from prevailing weather.)
2. Check that one ‘edge’ of the roof sheeting runs parallel to the end of the roof purlins
3. Check that one ‘end’ of the roof sheet runs parallel to the gutter. This end of the roof sheet should protrude 50mm into the gutter.
4. Temporarily fix the first sheet into position. (Do not fix into the top roof purlin)
5. Install the next roof sheet, check for parallel with the gutter and ends of roof purlins and temporarily fix.
6. Repeat step 5 for the remainder of the roof.
7. Check the measurement of every third or so sheet laid. Measure from the end of the roof purlin to the edge of the last roof sheet at both the apex and gutter ends. This measurement must always be the same to avoid ‘creeping’ of sheets.
8. Using pliers or Multigrips, turn up the apex ends of the roofing prior to installing ridge cap.

Ridge Cap:

1. Start installing the ridge cap keeping the end of the ridge flush to the end of the roof purlins.
2. Keep the joins facing away from prevailing weather.
3. Allow overlaps of 150mm.
4. “Tek” screw through the ridge cap into each overlap of roof sheet and into the top roof purlin using the 12-14 x 35 Neoprene ““teks”” provided. Then place another ““teks”” screw between these screws. (Every 5th rib)

20. Fit verandah attachment beams, posts and main beam:

Verandahs may be supplied as front only, front and rear or verandahs all around. Check your plans and specifications before setting out verandahs.

Sort verandah beams:

- ❑ Verandah attachment beam – C10010 for attachment to house wall to support roof
- ❑ Main verandah beam – C10019 for main support between verandah posts

Attachment Beam:

1. “Tekes” screw the attachment beam to the stud framework.
2. Allow a gap of 20mm between the bottom of the fascia (Corrugated Roofing), 35mm (Monoclad) and the top of the attachment beam and screw to every second stud using 12-14x20 framing “tekas”.
3. If end verandahs are used, the end attachment beams will pass the front and rear verandah beams.
4. Fix the colorbond flashing provided over the attachment beam to cover the open side of the beam. Attach with pop rivets @ 1.000 centres (Top and bottom)

Posts:

For front and rear verandahs, the end posts will be flush to the outside of the framework i.e. the overall measurement from outside to outside of the post is the same as the overall measurement of the framework.

If end verandahs are used then a further two posts (one per end) are required. These are positioned 1.8m from outside to outside of the existing end posts.

Intermediate posts are to be positioned in line with the existing portal frames.

1. Measure 1.8m from the outside of the framework to the outside of the columns.
2. Flick a chalk line from one end of the house to the other to enable all posts to be located in a straight line.
3. Set out the position of the two end posts, position the base plate and drill the 4 holes required.
4. Bolt the 75 x 75 SHS posts to the verandah slab/footings using 12mm masonry anchors
5. Measure the length of the C10019 main verandah beams and transfer this measurement between the posts.
6. Set out all intermediate posts and drill and bolt into position.

Main Beam:

1. Attach main beams between columns using small angle brackets (100 x 50 x 50).
2. Place 2 x 12x14-20 “tekas” screw through the bracket into the post
3. Place 2 x 12x14-20 “tekas” screws through the beam into the bracket.
4. The web (smooth face) of the C100 is to be flush with the outside face of the post.
5. The top of the main beam is to finish flush to the top of the post.

6. Fix the colorbond flashing provided over the main beam to cover the open side of the beam. Attach with pop rivets @ 1.000 centres (Top and bottom)

21. Fit gutters to verandah beam:

1. Install gutter brackets allowing a slight fall to down pipes.
2. Fit gutter stop ends
3. Fit nozzles into gutter
4. Install gutters

22. Install verandah roof:

1. Start sheeting the verandah roof from the same end as the main roof.
2. If a front and rear verandah are included sheet both verandahs as per above.
3. Plumb a line down from the edge of the main roof sheet. This insures that all crests and valleys between the main roof sheets and verandah sheets line up.
4. If end verandahs are included sheet from outside of framework/brickwork to outside of framework/brickwork across the ends of the house. (I.e. do not sheet past the ends of the main house)
5. Once all sides of the verandah roof have been clad, the corners can now be done.
6. Sheets have to be mitred for corners (I.e. cut at a 45 degree angle). The off cut from one sheet will fit one of the other corners.
7. Fit end cappings (front and rear verandahs) or ridge cap and hip caps (verandahs all around)

23. Fit gutters to main house roof:

1. Fit gutters to the previously installed gutter brackets.
2. Silicone seal all overlaps and joins etc

24. Fit barges to main house roof:

1. Cut and fit barge caps to both gable ends.
2. Keep the outer end of the barge flush with the outside edge of the gutter.
3. Sit one barge into position and mark the centre line of the ridge cap.
4. Square a line onto both faces of the barge and cut to length.
5. Fit the barge cap, using wall “teks” through the face of the barge into the cladding and roof “teks” into each roof purlin.
6. Sit the other barge into position and again mark the centre ridgeline.

7. Square a line across the top of the barge only and using a spirit level plumb a line down the face of the barge.
8. Cut the barge.
9. Run a bead of Silicone seal on the top and down the front of the first barge cap.
10. Sit the second barge cap into position and place screws as per (5) above
11. Clean off excess silicone
12. Repeat 1-11 for the other end of building.

25. Install bath and/or shower recess/base:

A lot of modern homes no longer have bathtubs, instead using showers only. Others have spa baths or tubs. (Follow manufacturers recommendations to install these)

Bath:

1. Decide on the height of the bath. This is usually between 400 and 600mm depending on the tiles used. It is better to work to tile height to save unsightly cuts around the bath.
2. Make sure to check that the bath outlet lines up with the previously installed floor waste (concrete slabs)
3. Mark a level line using a spirit level and straightedge across the studs to show the height of the bath edge. Usually one side and one end.
4. Attach a 75 x 35 radiata timber batten to this line and into the studs using 2 long “teks” screws per stud.
5. Place a row of nogging (timber or steel) between the studs just above the bath height to support the wall lining.
6. Sit the bath onto this timber batten
7. Construct supporting walls to the other 2 sides of the bath using 75 x 35 radiata timber on edge. The timber must be kept back from the outside lip of the bath to allow for the depth of the lining board and tiles. (Usually 6mm Villaboard or 10mm wet area plasterboard plus tiles)
8. Connect the bath waste
9. If the bath hasn't been supplied with underneath supports, a bed of sand-cement (4 parts sand to one part of cement) will need to be mixed and packed underneath the bath to support it.
10. Once the lining board has been installed, silicone along the edge of the bath between the lining board and bathtub, then after tiling, seal between the tiles and bathtub using the same colour silicone as the tile grout.

Shower Recess:

1. To prepare a shower recess for tiling after the lining board has been installed; call in a professional licenced waterproofing tradesperson.
2. The majority of leakage problems in new homes are mainly due to faulty shower recesses.

3. A professional waterproofer will seal the gap between the floor and lining boards, the join at the intersection of the walls and the floor that forms the shower base.

Shower bases and shower cabinets:

These are available in a range of finishes including polymarble, acrylic and stainless steel.

Follow the manufacturers specifications when installing these.

26. Install electrical wiring, plumbing pipes, security, phones, heating/air conditioning:

Licensed trades people can now install all electrical wiring and internal plumbing.

Also arrange installation of phone connections, security systems, heating/air conditioning etc.

27. Install insulation batts to walls/ceilings:

Note: Wear overalls, gloves, goggles and a dust mask when installing insulation batts

1. Install insulation batts to external walls, ensuring they are a snug fit between the wall studs.
2. Batt's can easily cut to size with a sharp 'Stanley' knife or an old fine-toothed saw.
3. Place bags of insulation batts at random throughout the ceiling. These are positioned after the ceilings are installed.

28. Install built in robes:

Several different types of built in robes are available.

You may decide to build your own robes or have a wardrobe company supply and install for you. A lot of companies will also supply kit wardrobes, where they come and measure the job, supply the material and then you install it.

1. A wardrobe header will need to be constructed out of stud framework material and a couple of studs to each side of opening will also be required. (Usually 2100mm from floor to under header and 600mm min from wall). You will need enough room for a coat hanger with clothing to be able to sit straight inside the robe
2. A timber reveal is then located at the top of the opening and the two sides. This allows for architraves to be installed.
3. When installing the reveals check that they are the thickness of the lining out from the front edge of the stud.
4. Check top reveal is level.
5. Check that the side reveals are plumb
6. Check opening is diagonally square.
7. Once linings are installed fit architraves
8. The robe is now ready to be fitted out with the appropriate shelves, drawer units, hanging rails etc

Note: Some companies will also require a timber reveal to the floor to attach the bottom runner to. Check that this is level and pack where necessary.

Before commencing the next step mark the position of the centre of each stud onto the floor. This saves a lot of time later when skirting, cupboards and other items are being installed

29. Line walls and ceilings with plasterboard:

This job is best carried out by a qualified tradesperson especially the taping and setting. If the taping, setting and sanding are not done in a professional manner, the joins can 'peak'. These joins are clearly visible especially at night with lights turned on.

Cutting Plasterboard:

1. Mark the sheet to the length required.
2. This is done by measuring both sides of the sheet and placing a mark. (Plasterboard squares are available from plasterboard outlets. These are 1200mm long and offer a lot quicker way of marking and cutting sheets)
3. Hold a straight edge across these marks and using a utility knife, score a line through the face of the material.
4. Lift the sheet and snap the sheet away from the scored mark.
5. Score the back of the sheet on the crease and separate the 2 sections.
6. For cutting sheets over door openings etc use a handsaw to make the vertical cuts to the door head and then score and snap across the top of the opening.

Ceilings:

1. Apply daubs of stud adhesive (size of 20 cent coin) at maximum of 230mm centers and 200mm away from the edges of the sheet.
2. Attach the plasterboard with the recessed edge at right angles to the ceiling battens
3. Screw through the recessed edge at each batten and keep screws 200mm clear of any adhesive.
4. Screw the butt joint ends of sheets at 150mm centers.
5. Ends of sheets are usually joined between ceiling battens and back blocked.
6. Screw around any openings at 150mm centers
7. Place 2 screws at 50mm apart at the center of each sheet at each batten.
8. Back blocking of longitudinal joints is recommended as a precaution against cracking
9. Cut plasterboard blocks 200mm wide and long enough to loosely fit between the ceiling battens.
10. Apply Basecoat or cornice cement to these backing blocks with a notched spreader.

Walls:

Studs are usually checked for straight using a straightedge or string line and spacer blocks, however with steel construction this is not necessary. Check however that there are no damaged studs i.e. bent or twisted before commencing the sheeting of walls.

1. Cut the sheet to fit the framework from wall to wall. Start with the top sheet first.

2. Apply plasterboard stud adhesive blobs at 300mm centres, ensuring that these blobs are 200mm from the edge of the sheet. Also keep these blobs away from the centre of the sheet to allow for temporary blocks.
3. Press the sheet firmly into position and screw all butt end joins and openings at 150mm centres.
4. Screw around window and door openings at 300mm centres.
5. The head of the screw needs to be just below the surface
6. Temporary blocks are then positioned at around 1/2 height of the sheet. Keep these screws away from the adhesive points.
7. Keep a gap of 10mm off the floor.

Cornice:

1. Measure, mark and cut cornices. A special mitre box will need to be made or purchased to allow the cornices to be correctly cut.
2. Measure down the distance from the ceiling and place a mark on the wall lining (usually 90mm)
3. Place 2 or 3 nails into the wall lining to help correctly position the cornice.
4. Place a bead of cornice cement along each edge of the cornice and push cornice into place.
5. Wipe excess cement off with a damp sponge.
6. Once cornices are set, all joints can be filled and excess cement cleaned off.

If ceiling height cupboards are being installed do not fit cornices until cupboards are fixed into position.

It is recommended that more detailed information be obtained from your plasterboard supplier prior to commencement of works.

30. Fit all internal door jambs, doors, locks etc:

Several types of door units are available. Check with your hardware or building supply centre. Some manufacturers provide a ready made up doorjamb with the door already pre-hung. Others manufacture adjustable width doorjambs with the door pre-hung as well as architraves fitted. These are usually far more expensive than making up the jamb and fitting the door yourself.

2 standard size internal doors are usually used, these being 770mm and 820mm wide.

Other doors are also available for narrow openings.

The doorjamb head width measured inside the rebate is usually the exact door size plus 5mm to allow clearance either side.

Opening sizes required to allow the installation of these doorjambs in studwork is: 770 wide door = 820mm opening, 820 wide door = 870 opening.

Standard doorjamb with separate door.

Make and install doorjamb:

1. Measure the width of the stud complete with the wall linings and purchase the closest size door jamb (larger)
2. These jambs may have to be ripped or planed to the correct width (do not cut or plane the rebate side of the jamb).
3. Cut the 2 stiles to the length required. (2040mm + 5mm clearance + 20mm floor coverings)
4. Set out the door jamb head allowing the width of the door plus clearance (5mm)
5. Square marks across the top jamb and using a fine tooth saw cut to the depth of the rebate.
6. Chisel out the timber between the saw cuts

7. Fit stiles into the head and glue and nail
8. Nail a temporary cross brace about 200mm from the bottom. This allows the unit to be easily carried
9. Check floor across the doorway for level and pack if necessary
10. Check studs for plumb and pack if necessary
11. Fit the 'unit' into the opening.
12. Check head for level
13. Add extra packing between the stiles and studs if required.
14. Check stiles for wind by standing back and looking side on at the 2 stiles. The 2 stiles must be parallel to each other.
15. Screw into position using one screw per side top and bottom
 Note: For doors in hallways etc, measure the distance from the inside edge of the doorjamb to the wall lining allowing a 5mm quirk. Try to position the jamb in the opening so that minimal fitting of the architraves is required.

Fit and hinge door to jamb:

1. The door may need to be planed to the required size so that there is an even gap at both sides and at the top of the door. (Usually 3mm)
2. With a hand plane or an electric planer set fine, take the back edge off the lock side only so that it doesn't bind in the jamb when being closed.
3. Using 2 flush hinges (non rebate type), screw these to the door, the top one down 150mm from the top of the door and the bottom one up 200mm from the bottom of the door.
4. Sit the door in the opening and check that there is 3mm gap between the top of the door and the jamb.
5. Transfer the top and bottom mark for each hinge onto the jamb.
6. Now open the door out and place a wedge under the door until the hinges line up with the marks.
7. Screw the hinges to the jamb

Locks:

To install Lock and Latch sets:

1. Place a wedge under the door to keep it steady
2. Using a small square, square a line across the edge of the door at the desired height (usually 1200mm from floor) and onto both faces of the door
3. Using the cardboard template supplied with the door set, mark the position of the hole centres for the latch and the spindle.
4. Using the correct size hole saw, drill a hole for the spindle. (Drill in from both sides of the door as this will prevent any splintering of the ply)
5. Using a fast cut bit or similar, drill through the edge of the door for the latch being extremely careful to hold the drill parallel to the face of the door at all times.
6. Install the latch and carefully mark around the latch face ensuring it is centrally located.
7. Using a sharp chisel, gradually chisel out the timber to the depth of the latch face.
8. Screw the latch into position
9. Insert the spindle and connect face plate (follow manufacturers instructions)
10. Close the door and mark the top and bottom of the latch position onto the jamb
11. Place the striker plate onto the rebate and mark around the outside of the plate.
12. With a sharp chisel, gradually chisel to the depth of the striker plate, checking regularly.
13. Once the correct depth has been achieved, screw the plate into position
14. Using a very small, sharp chisel, chisel out the centre section of the striker plate to a depth of approximately 10mm.
15. Close door and check that the latch is a firm fit and door doesn't 'rattle' in the rebate.

31. Ceramic tiling:

Tiling over timber floors:

Timber, ply and particleboard floors should have a Ceramic Tile Underlay laid across the surface of the existing floor, making sure that the ends of the sheets do not coincide with the joins in the flooring. (Follow manufacturers recommendations)

Cutting tiles:

A tile cutter can be hired from most reputable tile suppliers. A tile scorer, a small straightedge, a Parting Tool and a pair of tile nippers will also be required.

1. Using a tile scorer and a straightedge, score through the glazed surface of the tile OR using a tile cutter score a line through the glazed surface of the tile.
2. Snap the tile by using: A parting tool, slight pressure with your fingers, by placing a matchstick under each end of the cut and pressing down or if using a tile cutter, slight pressure on the scored line until the tile separates.

Drilling holes:

1. Holes can be made by drawing the hole and then carefully drilling around the perimeter of the hole with a masonry drill bit
2. Cutting a hole using a diamond tip or tungsten tip hole saw.

Where to begin:

- Wall tiles are laid prior to the floors.
- Leave off the bottom row of wall tiles until the floor tiles are laid then install the bottom row.
- Take time to plan the layout of the tiling and avoid cut tiles in positions where they are easily seen. It is better to sometimes cut some off the first corner tile, rather than starting with a full tile and finishing with a 10mm piece at the other end.
- Wall board will need to be sealed with an appropriate tile /wall sealer
- Apply tile adhesive to the back of each tile using a notched trowel or alternately, directly to the walls or floor, an area of around 1m square at a time.

32: Install vanities, Laundry tubs, kitchen cupboards etc:

Vanities and Laundry Tubs:

1. Depending on the floor tiles used, a section of the floor is usually left near level to help with the installation of vanities and laundry tubs.
2. The base of some vanities can be planed to assist in fitting
3. Always use a spacer to keep the vanity off the floor so that moisture does not penetrate the bottom of the unit and swell the timber.
4. Laundry tubs are usually manufactured from steel and therefore cannot be fitted hard to the floor on all sides. These will need to be packed and leveled
5. Vanities and laundry tubs will need to be level across the top and then attached to the wall using screws into the studs (previously marked)

Kitchen Cupboards:

The kitchen manufacturer best installs these.

If installing a Complete Knock Down (CKD) kitchen follow instructions provided.

1. Kitchens' are usually supplied with a separate base
2. Fit the base to the floor and check both lengthways and across the base to ensure it is level.
3. Either plane or pack the bases to bring level
4. Sit cupboards into position, usually starting with the bottom cupboards first and work away from corners.
5. Check that each unit is both level and plumb
6. Screw through the back of cupboards and into studs
7. Screw cupboards together using the correct length screw.

33. Fix all architrave's, skirting, mouldings etc:

Fit all window and door architraves in the following manner keeping in mind that there is usually 3 architraves to each side of a door and 4 architraves around a window:

Door Architraves:

1. Cut one architrave for each side of the doorframe square at one end.
2. Place in position and place a mark 5mm above the intersection of the architrave and door head. (This allows a 5mm quirk)
3. Using either an electric drop saw set at 45 degrees or a very sharp panel saw, cut a mitre away from the mark I.e. longer)
4. Using a hand plane trim the mitre
5. Fix both stiles to the jamb using 40mm fine bullet head nails.
6. Cut a mitre at one end of the top architrave, place in position and mark the leading edge of the other architrave.
7. Mitre cut to suit and plane if necessary.
8. Glue the mitres and fix into position
9. Using fine nails, nail the mitres together through the edge of the architrave.
10. Wafer screw the architraves into the stud using 5 screws per side and 3 to the top, making sure the screws finish just below the surface too allow for putty/filler.

Window Architraves:

As per above.

It is usually easier to fit the bottom architrave first, then the 2 sides and the top.

Skirtings:

Use a tape measure to obtain correct lengths.

Start at the wall directly opposite an opening and work around the room to the doorway

1. The first length of skirting is square cut at both ends
2. Using a length of timber around 75mm x 35mm or larger x around 700mm long, place this timber on top of the skirting and back onto the floor and kneel on it. This ensures that the skirting is pushed down hard against the floor.
3. Place a screw through the skirting (above the stud marks) and into the stud
4. The second skirting is cut to the profile of the first length of skirting by cutting a mitre. Using a coping saw remove all of the end grain timber while undercutting the timber.
5. Cut the timber to length by cutting a square cut at the other end.
6. Continue fitting the remaining skirting
7. External joints are mitred, as are long lengths where material has to be joined.

34. Painting and decorating:

Check with your local paint retailer to check what paint is most suitable for your new house.

This will depend on things such as climate, materials used etc.

As a rule of thumb, flat paints are used for ceilings (except wet areas), washable vinyl paint for walls and Oil based gloss enamel for doors, architraves and skirting.

1. Prepare all surfaces for painting by lightly sanding and removing all dust, grease etc.
2. Apply a coat of wallboard sealer to all taped and set joints then
3. Apply a coat of wallboard sealer to all plasterboard, villaboard etc.
4. Undercoat or stain all timber finishes
5. Apply 2 coats of ceiling paint (usually flat)
6. Apply 2 coats of wall paint (washable vinyl)
7. Apply oil-based gloss to timberwork or polyurethane if stained.
8. Externally, water based paints are becoming increasingly popular for most applications.

35. Sand joins in flooring (timber):

Sheet flooring:

If the flooring has been in place for any length of time, the edges may rise a little and require sanding prior to floor coverings being laid.

This is best done using an electric sander, such as a belt sander.

Strip Flooring: (Tongue & Groove)

Strip flooring is usually used only when a polished floor is required as a feature in the house.

These boards have to be sanded starting with a coarser grade paper and ending with a very fine paper.

Special floor sanders can be hired from some hire equipment firms, however it is advisable to hire a specialised floor sanding tradesperson to complete the job for you.

Special polyurethane's and oils are used to treat the floor to give it a durable surface.

36. Finish electrical work and plumbing and others:

The electrician and plumber can now finish off their respective work:

Electrical:

Install all light fittings, light switches, power points, ceiling fans, appliances, external lights etc

Plumbing:

Install toilet suites, taps to bath, sink, vanities, laundry tubs etc

Others:

Install telephones, security systems, air conditioning, heating, shower screens etc

37. Initial Clean up:

The job should be kept clean and tidy during all the above stages.

Prior to floor coverings being installed, the floors will need a thorough sweeping and vacuuming.

Vacuum inside all cupboards, robes and vanities and clean all bench tops, vanities etc

Thoroughly clean all windows inside and out, removing labels etc.

38. Floor coverings, blinds and curtains:

All floor coverings, their respective trades people can now install blinds and curtains.

39. Final cleanup:

Now that the floor coverings have been laid, clean floors (some carpets can't be vacuumed until they settle, check with supplier) again to pick up any loose fragments etc.

40. Final Check:

Check the following:

1. Taps- check for leaks and ease of turning on and off
2. Lights- check that all lights work, check all two way switches etc
3. Power Points- using a hairdryer or radio or similar check that each power point is working
4. Appliances- check stove, range hood, dishwasher etc
5. Shower Screen- turn shower water on and check that screen doesn't leak at joins to floor and wall
6. Doors- check that internal and external doors don't bind when being closed. Doors may need planing at the bottom depending on thickness of carpet and under felt used.
7. Windows and sliding doors- check that each sash slides easily and doesn't bind in the runners
8. Keep all instruction manuals for appliances in a safe place and fill out and send warranty forms.
9. Make a list of the brand and type of paint used (flat, washable vinyl, plastic gloss, gloss enamel etc), colour used and where it was used for future reference.
10. Write down the type and colour of ceramic tiles used, colors of roof, gutters, cladding etc.
11. Keep a list of the various sub contractors names, addresses and phone numbers

