



ABN 12 115 961 487

PO Box 88

Bacchus Marsh Vic 3340

Phone: (03) 5366 6900

Email: [REDACTED]

Report By: [REDACTED]

[REDACTED]



Site Address:

Client Name:

Phone #:

Email:

Dwelling type:	House and Garage.
Dwelling configuration:	Double Storey
Nature of works:	New Building.
Stage of inspection:	Pre Plaster.
Construction Type:	Multiple Claddings.
Garage:	Attached.
Foundations:	Slab.
Builder:	

Client Brief

I was instructed to inspect the client's new home to write a report as to the overall installation of all items required to construct a new home to completion stage. Our role is to assist the clients in outlining any issues that may be identified as being within the scope of the builder to ensure that all construction items are correctly constructed and completed in a workman like manner and meet with all relevant codes and industry practises. As such the client has engaged our services to assist with this report.

Inspection and Report

Our Inspection is a visual inspection of the overall finishes and the quality of those finishes presented by the Builder. This Report is a list of items that in our judgement do not reach an acceptable standard of quality, level of building practice, or have not been built in a proper workmanlike manner, in relation to the Building Code of Australia, (BCA's) the Building Regulations, any relevant Australian Standards and the acceptable standards and tolerances as set down by the Building Commission.

Access

Access was gained to all required areas of the residence.

Report Conditions

The terms and conditions that our site inspection and this report are carried out and supplied under are listed on the last page of this report.

The building process is progressive and items in this report may or may not be covered during the build by materials installed over a documented defect. We recommend that all clients book a reinspection and state that the builder must present all defects rectified prior to moving forward with the build. All items that we are unable to look at from a previous report will not be included in any future reports. We will use all endeavours to ensure rectification, however we are limited to non-destructive method of detection.

Summary

The results of our inspection have been fully detailed in the attached schedule of Building Defects.

Should the reader of this report have any additional queries or questions in relation to the items set out within it, please do not hesitate to contact the writer via any of the methods detailed at the top of the cover page.

Please note: **A fee of \$350.00 per hour**, or part thereof, plus GST will be charged for any clarification required by the builder, or any of the builders' employees, and a purchase order for same will be required prior to any contact between Darbecca Pty Ltd and the builder.

An inspection was conducted at the above address on 08/04/2021 for the purpose of a general home inspection, requested by the 'client'.

The inspection was conducted with the 'client' present, and details exterior and interior.

The weather was fine at the time of the inspection.

Entry to site was obtained under the Building Act, 1993, section 240 and the Domestic Building Contracts Act, 1995, part 2, **section 17** and 19. We act and make limited representations under the direction of the dwellings owners under these two acts.

Schedule of Defects:

Defects, observations and other related comments from the Frame Inspection on the 08/02/2021:

1. This item has not been addressed as of the 08/04/2021.

Some of the installed bolts that do not extend 1 ½ turns beyond the face of the nut. The Builder needs to refer to AS 4100 clause 14.3.6.1 as this requires all bolts to extend beyond the nut as described above.

14.3.6 Bolting

14.3.6.1 General

All bolts and associated nuts and washers shall comply with the appropriate bolt material Standard specified in Clause 2.3.1. All material within the grip of the bolt shall be steel and no compressible material shall be permitted in the grip.

- The length of a bolt shall be such that at least one clear thread shows above the nut and at least one thread plus the thread run out is clear beneath the nut after tightening.

One washer shall be provided under the rotated part.

Where the slope of the surfaces of parts in contact with the bolt head or nut exceeds 1:20 with respect to a plane normal to the bolt axis, a suitably tapered washer shall be provided against the tapered surface and the non-rotating part shall be placed against the tapered washer.

The nuts used in a connection subject to vibration shall be secured to prevent loosening. (See Clause 9.1.6.)



2. **This item has not been fully addressed as of the 08/04/2021.**

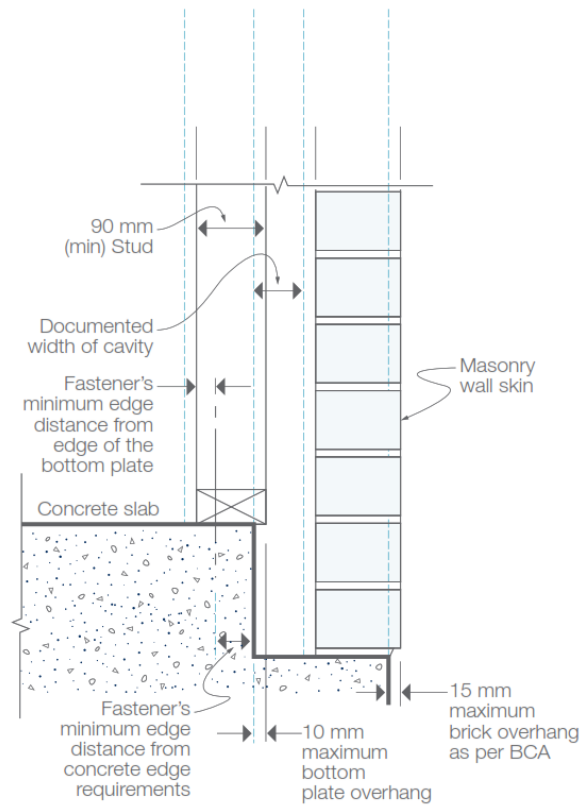
There is frame overhang to the slabs edge exceeding 10 mm noted to this dwelling. This defect has been highlighted with marking spray paint.

The Building Commission's Guide to Standards and Tolerances clause 4.08 Bottom Plates that Overhang Concrete Slabs, states '*Bottom plates that are at least 90mm*

wide and overhang concrete slabs are defective. An overhang of up to 10mm is permissible'.

This overhanging bottom plate will need to be supported by an appropriately designed and certified engineered system so that it complies with AS 1684.2, clause 6.3.3, and the BCA.

DIAGRAM 4.08 BOTTOM PLATES THAT OVERHANG CONCRETE SLABS





Gaps between frame and grout

3. This item has not been addressed as of the 08/04/2021.

AS 1684.2; Table 9.4: - Nominal fixing for bottom plates to joists shall be at 2 nails at 600mm max. centres.

Bottom plate fixing has not met this requirement.

**TABLE 9.4
NOMINAL FIXINGS FOR TIMBER MEMBERS**

Joint		Minimum fixing for each joint
Bottom plates to joists	Non-loadbearing and non-bracing walls	2/2.8 mm dia. nails at max. 600 mm centres
	Other walls	Plates up to 38 mm thick—2/75 × 3.05 mm nails at max.600 mm centres Plates 38 to 50 mm thick—2/90 × 3.05 mm nails at max.600 mm centres



examples



This item has not been addressed as of the 08/04/2021.

4. A rafter over the front of the garage presents as damaged. Reworking is required in accordance with AS1684.



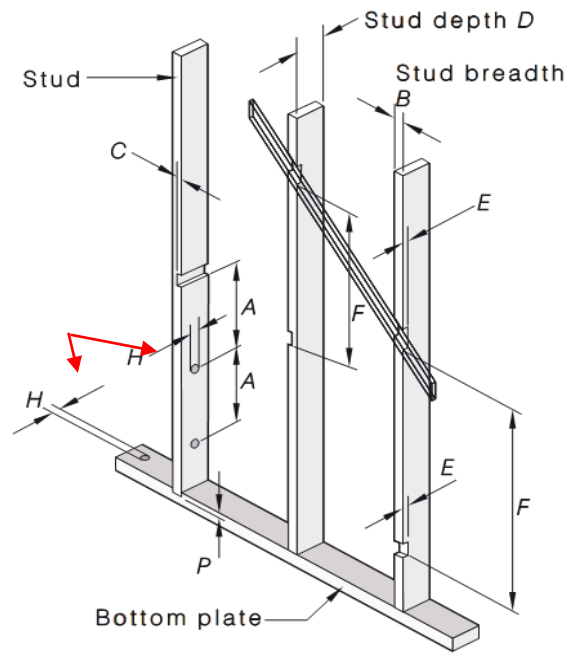
Defects, observations and other related comments from the Pre Plaster Inspection on the 08/04/2021:

5.
AS 1684.2; Table 6.1: - Holes in timber studs and plates shall not exceed 25mm.

This requirement has not met this requirement.

**TABLE 6.1
HOLES AND NOTCHES IN STUDS AND PLATES**

Symbol	Description	Limits	
		Notched	Not notched
<i>A</i>	Distance between holes and/or notches in stud breadth	Min. 3 <i>D</i>	Min. 3 <i>D</i>
<i>H</i>	Hole diameter (studs and plates)	Max. 25 mm (wide face only)	Max. 25 mm (wide face only)
<i>C</i>	Notch into stud breadth	Max. 10 mm	Max. 10 mm
<i>E</i>	Notch into stud depth	Max. 20 mm (for diagonal cut in bracing only) (see Notes 1 and 2)	Not permitted (see Note 1)
<i>F</i>	Distance between notches in stud depth	Min. 12 <i>B</i>	N/A
<i>P</i>	Trenches in plates	3 mm max.	



6.

Australian Glass and Window Association (AGWA): - Windows shall be packed plumb and square including under the sill.

The window reveals and door frames around the dwelling have not been installed in accordance with the AGWA installation instructions or the manufacturer's installation instructions.

CORRECT INSTALLATION OF FRAMES

1. Fit flashing to window surround as required.
2. Measure the frame opening to ensure that there is sufficient room for the product and additional packing.

Stud Opening

Height = O/A reveal size + adequate clearance

Width = O/A reveal size + adequate clearance

Clearance dimensions vary between manufacturer's products. For adequate clearance, refer to instructions.

3. Frame must be packed plumb, square and not twisted between the openings. Ensure the sill is fully supported. Failure to do so may result in sill roll on sliding windows.

Sills on all windows and doors must be straight and level and should be packed and secured.

To ensure the satisfactory long term performance of sliding doors, the sill should be fully supported. Where the sill projects during construction the sill should be fully supported.

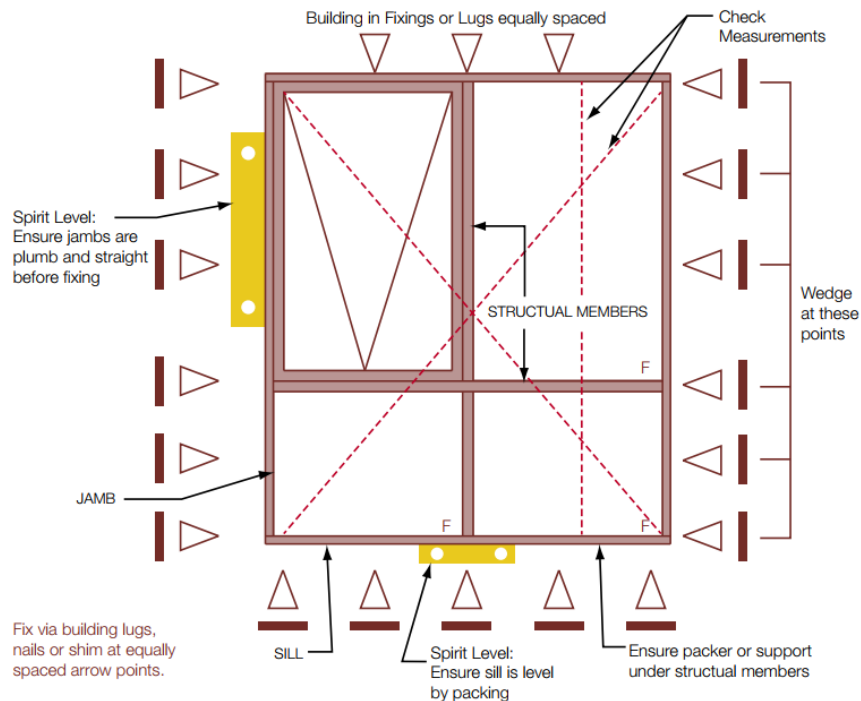
Keep sashes closed whilst installing frames.

Secure frames with a fixing of a gauge and spacing appropriate for the wind load.

In brick veneer constructions, aluminium frames should be secured by nailing or screwing through reveal into stud work.

INSTALLATION

Figure 11 Installation Summary





7.

The top plates have been cut or drilled more than the allowance of AS 1684. Additional studs will need to be installed below the roof truss or floor joists to transfer the loading directly to the slab. Alternatively, the top plate could be stiffened as per the detail below.

6.2.2.3 Stiffening of top plates

For supported roof area up to 10 m² and where a concentration of load (from roof beams, struts, strutting beams, hanging beams or counter beams 3000 mm or more in length, combined strutting/hanging beams, combined strutting/counter beams, or similar members) occurs between studs (that is, studs supporting concentrations of load not provided), top plates shall be stiffened in accordance with Figure 6.8, or by placing the block on edge on top of the top plate from stud to stud.

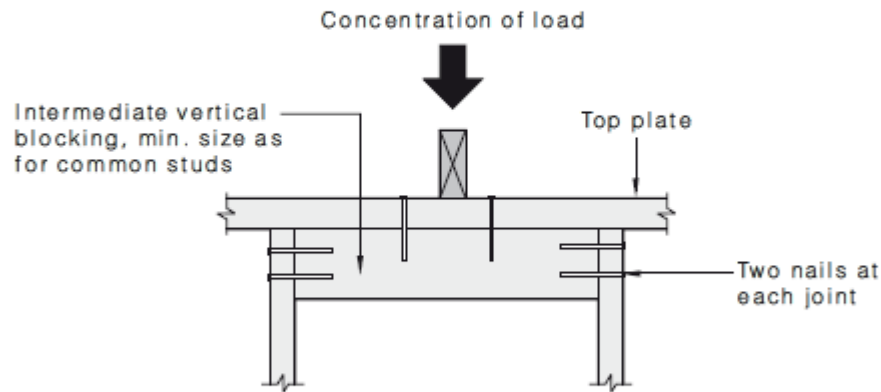


FIGURE 6.8 TOP PLATE STIFFENING

For supported roof area between 10 m² and 20 m², metal nailplate connectors shall be used for the fixing of blocking to studs. Alternatively, double blocking shall be used and be provided with 3 nails at each end of blocking (total 6 nails at each stud).



8.

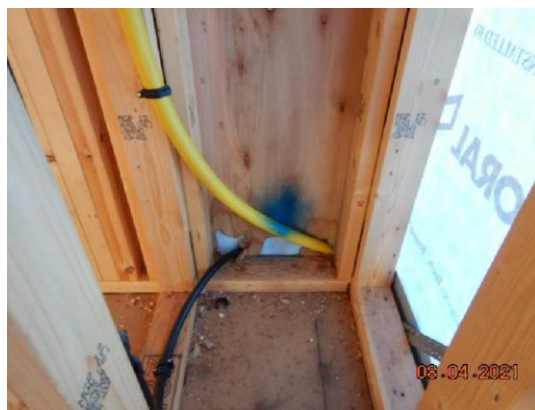
AS1684.2 'Residential Timber-Framed Construction' states:

“Permanent bracing shall be provided to enable the roof, wall and floor framework to resist horizontal forces (racking forces) applied to the building. Appropriate connection shall also be provided to transfer these forces through the framework structure to the building's foundation.”

During construction, for various reasons, tradespeople often wish to make penetrations through structural plywood bracing panels. A neat hole (i.e., not over cut) of up to 100mm x 100mm within an envelope of 100mm from the vertical and top edges and 200mm of the bottom edge of the bracing pane will have no significant effect on the bracing capacity. Multiple 100mm x 100mm holes are allowable within the envelope but their centres must be no closer than 600mm.

One hole of up to 400mm x 400mm located between the studs and within the envelope defined above, with nogging framing the hole and fixing of the plywood to the framing as per the requirements for the top and bottom plate is acceptable.

All sheets failing the guidelines will need to be rework or replaced accordingly.



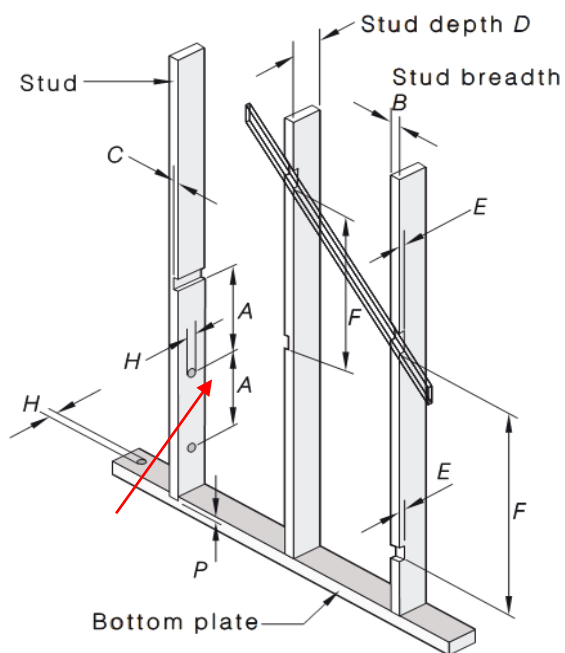
9.

AS 1684.2; Table 6.1: - Holes and / or notches in studs shall be spaced minimum 3 x D apart.

This requirement has not met this requirement.

TABLE 6.1
HOLES AND NOTCHES IN STUDS AND PLATES

Symbol	Description	Limits	
		Notched	Not notched
A	Distance between holes and/or notches in stud breadth	Min. $3D$	Min. $3D$
H	Hole diameter (studs and plates)	Max. 25 mm (wide face only)	Max. 25 mm (wide face only)
C	Notch into stud breadth	Max. 10 mm	Max. 10 mm
E	Notch into stud depth	Max. 20 mm (for diagonal cut in bracing only) (see Notes 1 and 2)	Not permitted (see Note 1)
F	Distance between notches in stud depth	Min. $12B$	N/A
P	Trenches in plates	3 mm max.	





10.

AS 1860.2; 10.4: - Particleboard sheet flooring shall be screwed (not nailed) to I-beam and truss joists.

Fixing of particle board sheet flooring has not met this requirement.

Note: 'Struct-a-floor' sheet flooring may be nailed to Carter Holt Harvey I-beams in accordance with the manufacturer's installation requirements.

10.4 Screws

Selection of screws for use with particleboard flooring sheets shall be in accordance with Table 2.

NOTE: If particleboard flooring is fixed to I-beam and truss joists, screws (not nails) should be used. The flanges may be only 35 mm thick and nails will penetrate through and may not have sufficient holding strength.

TABLE 2
MINIMUM SCREW SIZE/LENGTH COMBINATIONS

Joist material	Flooring thickness, mm	Screw type and size
Timber	19 and 22	No. 10 × 50 mm twin-thread, self-drilling wood screw
	25	No. 14 × 65 mm twin-thread, self-drilling wood screw
Steel	19, 22, 25	No. 9 ×, or 10 × 45 mm countersunk self-embedding head, self-drilling

NOTES:

- 1 Proprietary screws with self-breaking cutter nibs, to provide clearance in timber that is fixed to metal, are available and are preferred for particleboard flooring (see AS 3566.1 and AS 3566.2). Further advice should be obtained from the screw manufacturer.
- 2 Some heavier gauge steel sections may require a No. 12 or No. 14 size screw.
- 3 The screw-driving unit should be adjusted to drive the screw head 2 mm to 3 mm below the panel surface to allow for later sanding. Screws should not be driven more than 3 mm below the panel surface.



11.

AS 4254.1; 2.5.3 (i): - Flexible ducts shall be installed with a bend radius to duct diameter ratio of 1 to 1, as a minimum.

There are bends to flexible ducts that have not met this requirement.

2.5.3 Hangers, support and load distribution systems

- (i) Flexible ducts shall be installed with a bend radius to duct diameter ratio of 1 to 1, as a minimum, as shown in Figure 2.5.2(D).

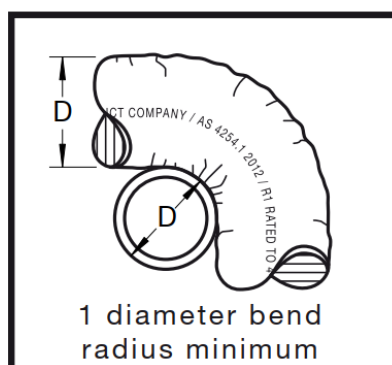
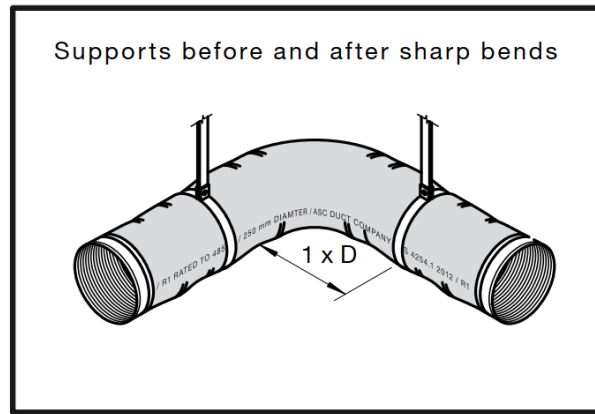


FIGURE 2.5.2(D) FLEXIBLE DUCT INSTALLATION—RADIUS BENDS



(b)

FIGURE 2.5.2(B) FLEXIBLE DUCT INSTALLATION



12.

AS 1684.2; 2.4: - Joints in laminated top plates are required to be a minimum of 1200 mm apart.

Joints in the top plates were found to be spaced less than 1200 mm

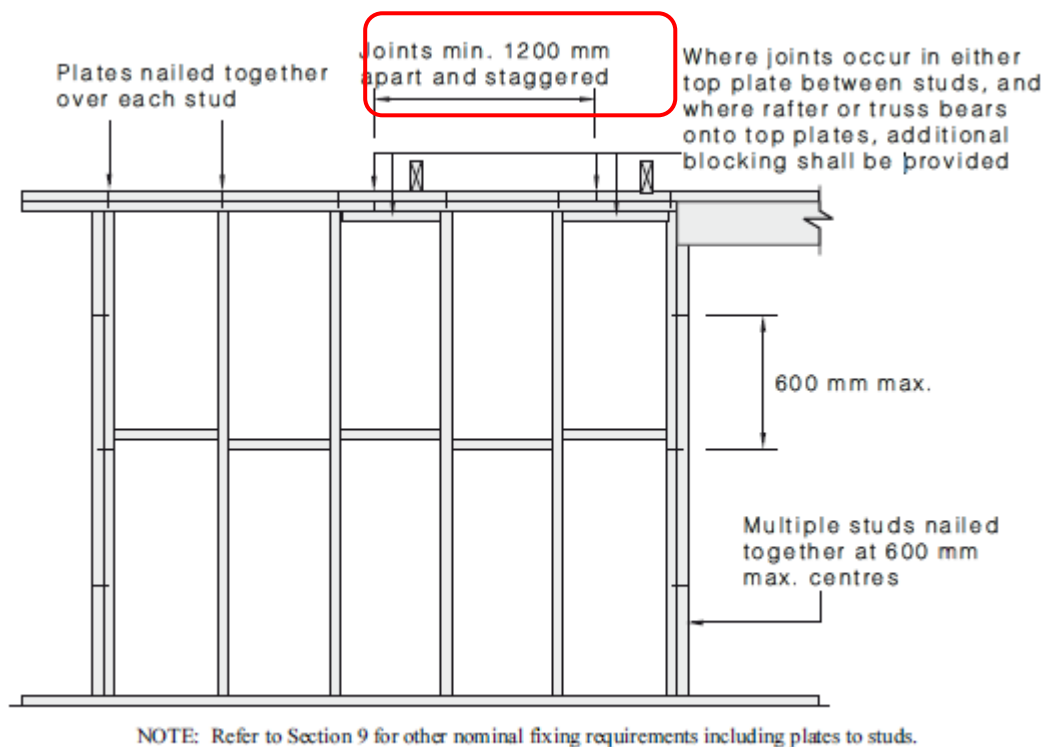


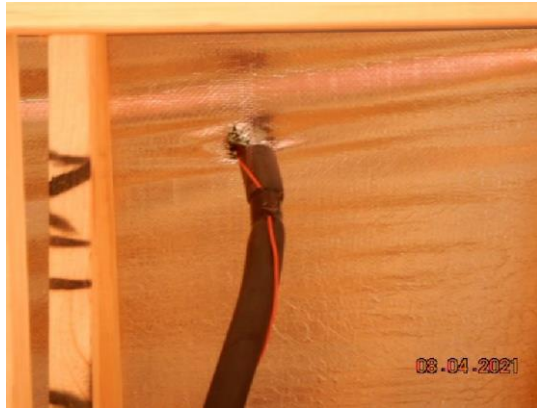
FIGURE 2.9 STUD/PLATE LAMINATION



13.

The sarking under the roof has been cut around the roof penetrations. All areas must present sealed to an acceptable finish to comply with the energy rating requirements of the home.

Note; if the home has a BAL rating of 12.5 or over then the sarking will need to be sealed to a gap of no more than 3mm in this installation.



14.

It was noted that the dwelling was not watertight, as per the photos below.

Water cannot be allowed to enter a dwelling after the installation of batts or plaster.

The builder as a matter of urgency must seal the dwelling or alternately replace batts and plaster if they are wetted. I refer the builder to AS 2589 (Australian Plaster Standard) and AS 3999, (Australian Insulation Standard) which calls for both to be fully protected from moisture.



15.

NCC 2019; 3.3.5.6: - The clear width of the cavity must be not less than 25mm and must be maintained regardless of any wall membranes, sheet bracing or the like installed to the supporting frame.

Clear widths less than 25mm between the masonry veneer (mortar dags included) and the wall frame are non-compliant.

3.3.5.6 Cavities

The clear width of a **cavity** between the masonry veneer and the exterior face of the supporting frame must be not less than 25 mm wide and where the masonry veneer is constructed on a slab-on-ground, the **cavity** must be drained to the outside in accordance with 3.3.5.9.

Explanatory information:

The 25 mm clear width of the **cavity** needs to be maintained regardless of any wall membranes, sheet bracing or services installed to the supporting frame.



RHS of dwelling

16.

AS 3700: - The effect of any chases, holes and recesses required in the masonry shall be considered in the design to ensure that the masonry achieves the required performance.

The cutting of brickwork to this dwelling is deemed to not comply with this requirement.

4.3 CHASES, HOLES AND RECESSES

The effect of any chases, holes and recesses required in the masonry shall be taken into account in the design to ensure that the masonry achieves the required performance, including structural, moisture-resistance, fire-resistance, insulation and other properties required of the masonry.

NOTES:

- 1 The need for chases, holes and recesses to masonry should be minimized.
- 2 See also Clause 4.5.9.

9.3 LEAF THICKNESS

The thickness of the masonry veneer leaf shall be not less than 90 mm.



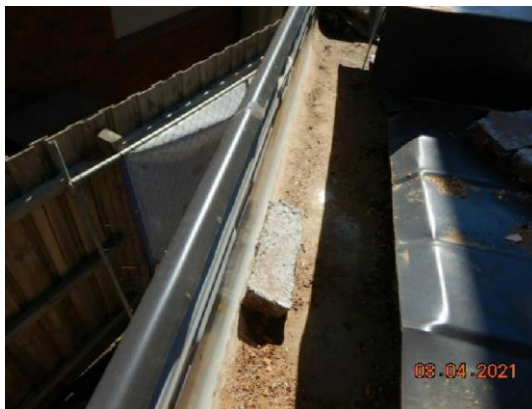
17.

Standards Australia HB 39: - The gutters and roof sheeting must be fully cleaned of metal particles, roof screws, pop rivets, mortar, paint, and the like.

The roof and gutter installation to this dwelling has not met this requirement.

3.6 CLEANING UP

Normal installation practices such as drilling and cutting usually leave offcuts and metallic swarf on or around the roof area. These materials and all other debris, including blind rivet shanks, nails and screws are to be cleaned from the roof area and gutter regularly during the installation process as unsightly staining of the surface due to oxidation of the metal particles will result, leading to corrosion and possible failure of the roofing material or guttering. Where practicable, the entire installation should be cleaned down with a blower vac, swept or, alternatively, if a water supply is available, hosed down at the completion of the work.



18.

NCC 2019: - The clear width of the cavity must be not less than 25mm and must be maintained regardless of any wall membranes, sheet bracing or the like installed to the supporting frame.

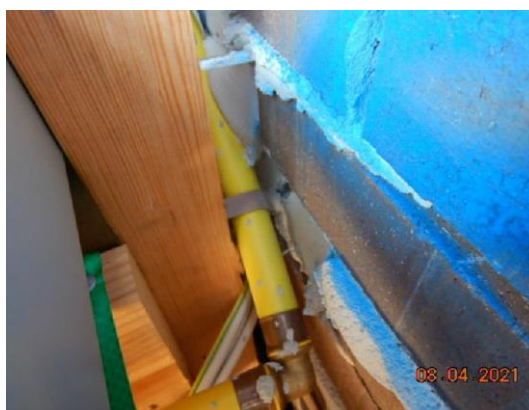
Clear widths less than 25mm between the masonry veneer and installed services are non-compliant.

3.3.5.6 Cavities

The clear width of a **cavity** between the masonry veneer and the exterior face of the supporting frame must be not less than 25 mm wide and where the masonry veneer is constructed on a slab-on-ground, the **cavity** must be drained to the outside in accordance with 3.3.5.9.

Explanatory information:

The 25 mm clear width of the **cavity** needs to be maintained regardless of any wall membranes, sheet bracing or services installed to the supporting frame.



19.

Multiple sections to the wall wrap that require reinstating due to rips, tears, and openings.

All defective areas reworking as per the requirements of AS 4200.1, the manufacturer's installation guide and this dwellings energy report.

4.1 GENERAL

The pliable building membrane shall be cut neatly to allow penetration by chimneys, vents, pipes, cables and other services, as required.

4.2 THERMAL CONTROL

Where a pliable building membrane is installed as thermal control, penetrations shall be sealed to restrict air exchange between air cavities of either side of the membrane.

4.3 VAPOUR CONTROL AND AIR CONTROL

Where a pliable building membrane is installed as a vapour barrier or air barrier membrane, methods shall be used to restrict air exchange between air cavities of either side of the membrane in accordance with Clause 3.2.

4.4 WATER CONTROL

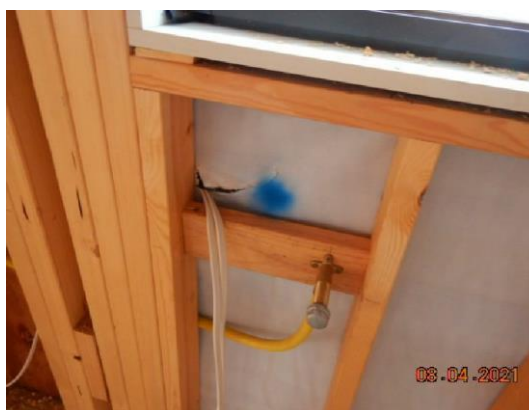
Where a pliable building membrane is installed as a water control membrane, penetrations shall be sealed with a pressure-sensitive and heat- and moisture-resistant tape.

NOTE: The membrane should divert the water away from the opening rather than towards it.

4.5 HOT FLUES

Where hot flues are installed, a pliable building membrane shall be installed with a space of 50 mm from the surface of any hot flue by sealing with a tape that is rated to be used at elevated temperatures, to avoid being a fire hazard.

NOTE: For a typical treatment of a pliable building membrane around a hot flue, see Figure 4.5.



20.

We refer the builder to the implied warranties where the builder agreed to build the dwelling in a **proper and workmanlike manner and with care and skill.**

8. Implied warranties concerning all domestic building work

The following warranties about the work to be carried out under a domestic building contract are part of every domestic building contract—

- (a) the builder warrants that the work will be carried out in a proper and workmanlike manner and in accordance with the plans and specifications set out in the contract;
- (d) the builder warrants that the work will be carried out with reasonable care and skill and will be completed by the date (or within the period) specified by the contract;



Brace cut, replace.



Short studs rear wall



Bolt heads protruding past wall frame





Pole protruding past frame

21.

It was noted that no allowance for brick growth and frame shrinkage has been allowed to the framing members to brickwork connection as documented below.

AS 4773.1:2015, part 2.3.2 calls for the builder to design an allowance. This should then be represented onto the plans. I noted that this was not the case. The builder will need to rework this item.

2.3.2 Design for serviceability

A masonry member or structure shall be designed to allow movements to be controlled or isolated so that damage to the masonry, the building and its components is avoided and the structural and other requirements are satisfied.

The movements to be allowed for shall include the following:

- (a) The expansion characteristics of clay masonry and the shrinkage characteristics of concrete masonry and calcium silicate masonry.
- (b) Thermal movements.
- (c) Deflections, shortening, shrinkage, creep and similar deformations in adjacent or associated materials.
- (d) Foundation movements.
- (e) Deformation due to construction loads or construction sequences.

If subjected to design loads or design building movement, masonry shall experience no damage, a low incidence of damage category 1 or an occasional incidence of damage category 2. The classification of damage with reference to walls is given in Table 2.1. Masonry is deemed to meet this performance requirement if it complies with this Standard and AS 4055 for the appropriate wind class and is constructed on concrete footings and/or concrete slabs complying with AS 2870 for the appropriate site classes nominated therein.



22.

The brick overhang to the dwelling needs to be supported. The BCA, part 3.2.2.7 calls for a maximum overhang of 15 mm. All areas exceeding 15 mm must be reworked and supported in accordance with AS 2870 prior to handover.

3.2.2.7 Edge rebates

Edge rebates for slab-on-ground, stiffened raft or *waffle raft* with masonry *cavity* or veneer construction must comply with the following:

- (a) The rebate must not be less than 20 mm, except as provided for in (d).
- (b) Exterior masonry must not overhang more than 15 mm past the edge of the slab.
- (c) The edge rebate must be flashed and drained in accordance with Part 3.3.4 and where it cannot be flashed it must be filled with mortar.
- (d) Edge rebates are not *required* for *single leaf masonry*.

Explanatory information:

See 3.2.5.4 for minimum edge beam details.



23.

It was noted that no sill flashings have been installed to the underside of the windows. The BCA calls for compliance with AS 4773.2. This Standard calls for sill flashings. It is not an obscure requirement but rather a requirement that is clearly defined and well presented in AS 4773.2, part 10.5.3.2.

The bricklayer will need to ensure that all flashings are installed to the minimums set out in the Standard.

10.5.3.2 Sill flashing

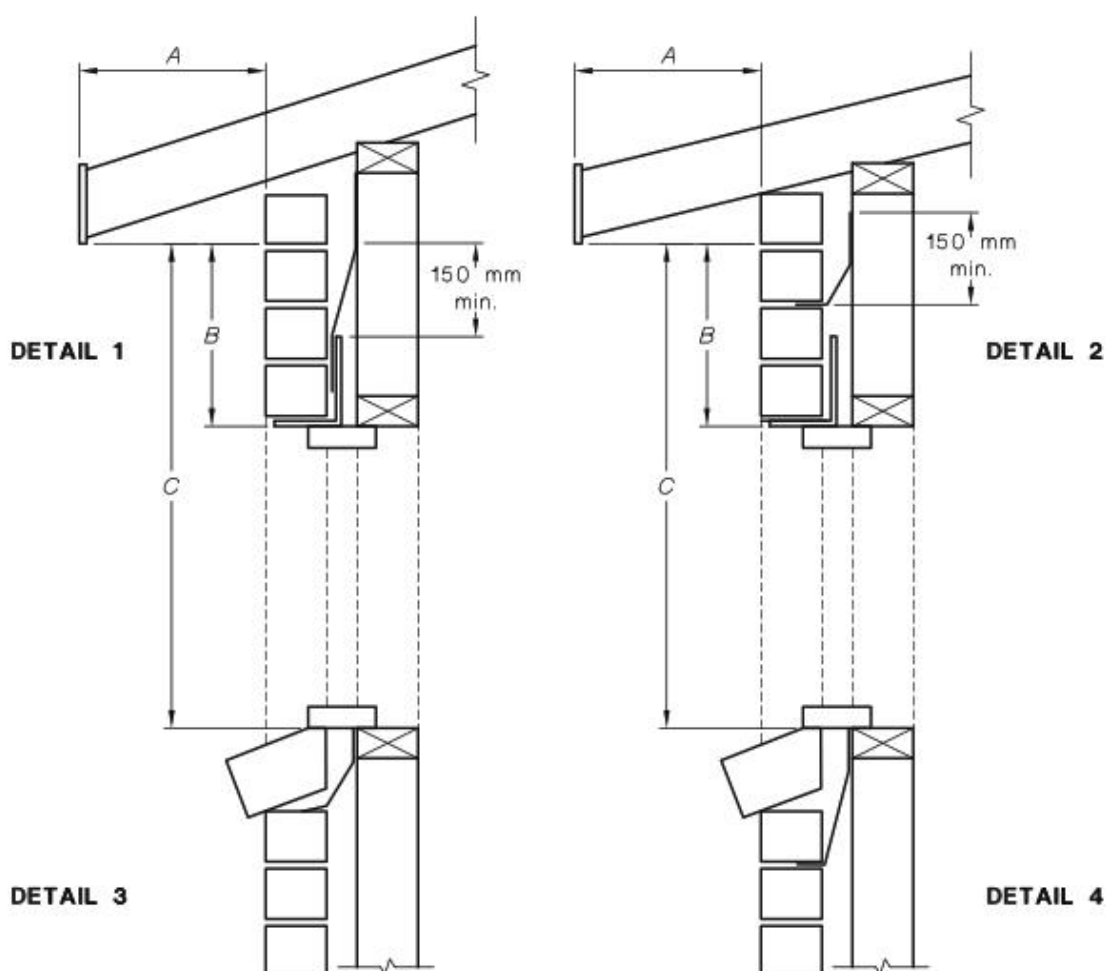
Sill and head flashings shall be installed so that water is shed towards the exposed skin. This is particularly critical at the end of flashings.

Sill flashing shall be built in below exposed masonry sills, as shown in Figure 10.6. It shall be embedded not less than 30 mm in the outer leaf, extend 150 mm beyond reveals on each side of the opening and be adequately secured to the inner leaf or window frame.

Sill flashing shall be either—

- (a) built in directly below the sill brick; or
- (b) built in one course below the sill brick.

NOTE: Weepholes may be omitted at sill flashings.



NOTES:

- 1 Flashing may be omitted where the opening is protected by a veranda, eave or the like.
- 2 Head flashing may be omitted where $A \geq 3B$.
- 3 Sill flashing may be omitted where $A \geq 3C$.
- 4 Details 1 and 2 are interchangeable, as are details 3 and 4.

Please note sill flashings can be omitted only when A is greater 3 times than C.



examples

24.

The NCC 2019; Part 2.2 Damp and Weatherproofing: - A building including any associated site work must be constructed in a way that protects people and other property from the adverse effects of redirected surface water.

Part 2.2 Damp and weatherproofing

Explanatory information:

Objective

O2.2

The Objective is to—

- (a) safeguard occupants from illness or injury and protect the building from damage caused by—
 - (i) surface water; and
 - (ii) external moisture entering a building; and
 - (iii) the accumulation of internal moisture in a building; and
 - (iv) discharge of swimming pool waste water; and
- (b) protect other property from damage caused by—
 - (i) redirected surface water; and
 - (ii) the discharge of swimming pool waste water.

Functional statements

F2.2.1 Surface water

A building including any associated sitework is to be constructed in a way that protects people and other property from the adverse effects of redirected surface water.



25.

Areas throughout the dwelling have visible signs of empty mortar joints to the perpend and beds.

AS3700 – 2011, part 11.4.2 states the following -

11.4.2 Mortar joints

Solid and cored units shall be laid on a full bed of mortar. Hollow units shall be face-shell bedded.

Vertical joints in fully bedded masonry shall be filled with mortar unless otherwise specified.

The Builder must ensure that all areas comply.



26.

The DPC cavity flashing has not been turned up 150 to the frame. I refer the builder to AS 3700 and AS 4773.2. Both Standards call for the flashing to return up the timber frame by 150 mm. All areas will need to be checked and compliant prior to plaster being placed.

9.6.2 Flashings and weepholes

9.6.2.1 Cavity flashings

Where it is supported on a concrete slab, cavity flashing shall be located at the base of the cavity and at all points where the cavity is interrupted by a structural element, an opening or the like.

A cavity flashing shall be—

- (a) turned up a minimum of 150 mm at the inner frame;
- (b) fixed to the inner frame at 600 mm maximum centres;
- (c) lapped at joints in a straight run by a minimum of 150 mm;
- (d) lapped at corners by the width of the leaf and cavity in accordance with Figure 9.1 or fanned in accordance with Figure 9.2; and
- (e) embedded not less than 25 mm into the outer leaf.

A cavity flashing that is also a DPC shall extend across the full width of the masonry skin. Flashing that protrudes past the face of the wall shall be either cut off or turned down.

Veneer walls shall be drained by weepholes at 1200 mm maximum centres. The raking of perpendicular joints to form weepholes shall extend the full width of masonry (through the wall) including bed joint at the level of the flashing.

Where cavity flashings are penetrated, the flashing shall be punched through or cut from the inside of the wall, and be fitted around the penetration and sealed.

In areas where termite management systems are required, all penetrations within the cavity shall be managed in accordance with the requirements of the NCC.

NOTE: Where there is a slab on ground that is Class A or S in accordance with AS 2870 on a sandy or limestone soil, a proprietary polymer emulsion flashing may be used.



Example, entire dwelling must comply

27.

I noted that the dwellings brick ties do not comply with the minimums set out in the Australian Standards. The BCA calls for compliance with AS 3700 and AS 4773.2. It is adopted by reference which means it makes up part of the BCA/NCC.

AS 3700, part 4.10 details wall ties into a dwelling. All documentation calls for brick ties to be installed into a dwelling at a minimum of 600 mm. However, in some places it must be doubled up.

The Australian Standards call for wall ties every 300 mm around openings in brickwork, such as doors, meter boxes and windows.

It also calls for ties every 300 to Articulation openings and the like.

Further, AS 4773.2, part 9.7 calls for wall ties every 300 mm to most openings and joints and 400 mm below intermediate floor levels.

There is much conjecture in relation to wall ties from some builder due to the changes in the BCA/NCC documentation on the subject. However, both Standards are adopted in the new BCA/NCC and hence mandate the installation of same.

All opens around all windows, doors and AJ's must have ties every 300 mm.


I noted on this dwelling that compliance was not present.

AS 3700

4.10 WALL TIES

Wall ties for cavity walls and masonry veneer walls shall be as follows:

- (a) Of Type A and a duty rating appropriate to the structural requirements of the masonry (see Clauses 7.6.2, 7.6.3 and 7.7.4).
- (b) Designed to transfer the appropriate loads.
- (c) Embedded at least 50 mm into the mortar joint and, where applicable, into the grout, have at least 15 mm cover from any exposed surface of the joint and be positively attached to the structural backing as follows:

- 
- (i) For face-fixed ties in masonry veneer more than 3.0 m above the ground, by screw fixing.
 - (ii) For side-fixed ties, by either screw or nail fixing.

NOTES:

- 1 AS 2699 (see all parts) requires the manufacturer to supply the fasteners with the ties.
- 2 Tests have shown that nail fixing for face-fixed ties in timber veneer construction and clip-on ties in steel stud veneer construction do not provide the required attachment to the structural backing under earthquake loading.
- 3 Reduction of embedment within the limits of wall tolerance (see Table 12.1) is assumed not to affect performance.

(d) Spaced to comply with the following:

- (i) Not greater than 600 mm in each direction.
- (ii) Adjacent to horizontal or vertical lateral supports and control joints, and around openings in the masonry, with the first row of ties located within 300 mm from the line of lateral support, the control joint or the perimeter of opening.

When a masonry veneer connected to a flexible structural backing is continuous past a horizontal floor support, this edge distance applies to the first row of ties immediately above and below the line of the floor.

Where ties are required to be designed for double the design tie force (see Clauses 7.6.2 and 7.7.4) and this is achieved by doubling the number of ties in the row, all the ties in the row are required to satisfy the edge distance requirement.

NOTE: A row of ties may be in a single bed joint or distributed between up to two adjacent bed joints, provided both bed joints are within 300 mm of the line of the floor or support.

AS 4773.2

9.7 WALL TIES

Wall ties shall be selected and spaced in accordance with the documents, Table 9.2 and Figure 9.7 and shall be fixed in accordance with Figure 9.8.

Ties shall be placed in such a manner that they are within—

- (a) 300 mm of control joints;
- (b) 300 mm from the ends and tops of walls;
- (c) 300 mm from openings and intersecting walls;
- (d) 300 mm above intermediate floor level in two-storey construction; and
- (e) 400 mm below intermediate floor level in two-storey construction, except where circumstances do not allow for this, such as where the frame is obscured by window flashing.

In all cases, the maximum vertical and horizontal spacing shall not exceed 600 mm.

Wall ties shall be installed in accordance with Clause 9.5 to prevent water transfer to the inside of the building with provision for long-term shrinkage of the timber frame.

Ties shall be doubled—

- (i) at the first row of ties above and below the floor level in two-storey construction (see Figure 9.7);
- (ii) at the top of the wall (see Figure 9.7); and
- (iii) at intersecting internal stud walls (see Figure 9.7).

Where ties are required to be doubled, they shall be placed in adjacent courses (as shown in Figure 9.7 or shall be placed in the same course on each side of the stud. Where the ties are doubled and are in adjacent courses, only the first tie shall be within the required distance.

Veneer ties shall be fixed with the fastener type used during the testing of the tie.

NOTE: AS 2699.1 requires the manufacturer to supply the fastener.

Ties shall be embedded at least 50 mm into the masonry leaf.



28.

AS 2589; Clause 4.4.3.1.3: - Perimeter fasteners shall be installed to plasterboard at internal angles, external corners, and wall and ceiling junctions, at a maximum of 300 mm centres.

Note: square set wall ceiling junctions should be installed at 150 mm centres.

Additional members (studs, nogging, trimmers, etc) need to be installed to the areas below for the plasterer to meet this requirement.

4.4.3.1.3 *Perimeter fixing*

Fasteners shall be installed at a maximum of 300 mm centres at all internal angles, external corners, wall ceiling junctions with cornices and at openings. For perimeter fastening, fasteners shall be spaced not less than 10 mm or more than 16 mm from the edges and ends of the gypsum plasterboard.

NOTE: Ceiling perimeter fasteners for square set wall ceiling junctions should be installed at 150 mm centres.



29.

As per AS 5601, clause 5.3.8 this pipe cannot be joined with a threaded connection inside a non-ventilated concealed place.

Please note that the kPa rating for domestic use is 2.75 in Victoria.

The plumber must ensure that the threaded connection only takes place in a ventilated place.

Alternately, the plumber can ensure that the threaded connection is located into the cavity area only which is vented.

5.3.8 Piping in a concealed location other than underground or embedded in concrete

Where *consumer piping* is to be in a concealed location, other than underground or embedded in concrete, the requirements detailed in Table 5.2 shall apply.

TABLE 5.2
PIPING IN CONCEALED LOCATION

Operating pressure	Accessibility (Note 1)	Ventilation required? (Note 2)	Pipe materials and jointing
Up to and including 7 kPa	<i>Accessible</i>	Yes	Pipes and jointing as per Table 4.1
	Inaccessible	Yes	Pipes as per Table 4.1 Joints to be kept to a minimum
	<i>Accessible or Inaccessible</i>	No	Pipe as per Table 4.1 Joints to be <i>permanent joints</i> and kept to a minimum
Exceeding 7 kPa	<i>Accessible</i>	Yes	Pipes as per Table 4.1 Joints to be <i>permanent joints</i> and kept to a minimum
	Inaccessible		Not to be installed

NOTES:

- 1 In this Table *accessible* means access can be gained by, for example, a ceiling access opening or sub-floor door except that in a multi-storey building it means able to be viewed at each floor.
- 2 For ventilation requirements see Clause 5.3.12.

5.3.12 Ventilation of concealed piping

Where *consumer piping* is to be installed in a void, duct or sleeve and the conditions in Clause 5.3.8 indicate ventilation is required; all of the following shall apply:

- (a) Ventilation openings are to be provided at each end of the area.
- (b) The openings are to be in a safe location.
- (c) Each opening is to have a free ventilation area that complies with Table 5.3.

TABLE 5.3
VENTILATION FOR CONCEALED PIPING

Cross-sectional area of void, duct or sleeve m ²	Minimum free ventilation area of each opening
Not exceeding 0.05	Full cross-sectional area
Exceeding 0.05 but not exceeding 7.5	0.05 m ²
Exceeding 7.5	0.006 × cross-sectional area of void, duct or sleeve in m ²





30.

AS 4773.2: - Cavity flashings in a straight run shall be lapped at joints by a minimum of 150mm. Cavity flashings at corners shall be lapped by the width of the leaf and cavity (see Fig. 9.1).

Note: These requirements also apply to combined damp proof course flashings.

Damp proof course flashings to this dwelling do not meet this requirement.

9.6.2.1 *Cavity flashings*

Where it is supported on a concrete slab, cavity flashing shall be located at the base of the cavity and at all points where the cavity is interrupted by a structural element, an opening or the like.

A cavity flashing shall be—

- (a) turned up a minimum of 150 mm at the inner frame;
- (b) fixed to the inner frame at 600 mm maximum centres;
- (c) lapped at joints in a straight run by a minimum of 150 mm;
- (d) lapped at corners by the width of the leaf and cavity in accordance with Figure 9.1 or fanned in accordance with Figure 9.2; and
- (e) embedded not less than 25 mm into the outer leaf.

A cavity flashing that is also a DPC shall extend across the full width of the masonry skin. Flashing that protrudes past the face of the wall shall be either cut off or turned down.

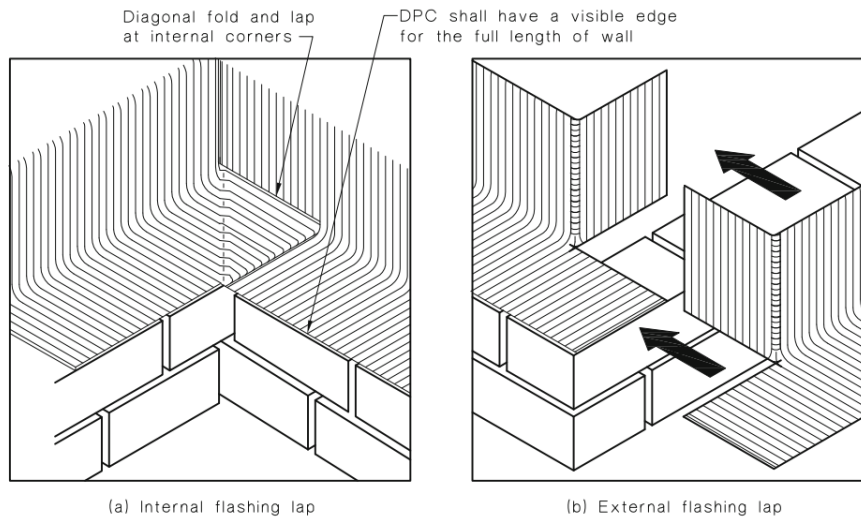


FIGURE 9.1 FLASHING AT CORNERS



31.

AS 1684.2; 6.2.1.3: - Corner blocks (and nogging, where applicable) to intersecting walls shall be spaced not more than 900mm apart.

A few intersecting walls have insufficient or missing blocks.

6.2.1.3 Wall junctions

Studs at wall junctions and intersections shall be in accordance with one of the details shown in Figure 6.3. Studs shall be not less in size than common studs. All junctions shall have sufficient studs, which shall be located so as to allow adequate fixing of linings.

All intersecting walls shall be fixed at their junction with blocks or noggings fixed to each wall with 2/75 mm nails. Blocks or noggings shall be installed at 900 mm max. centres.

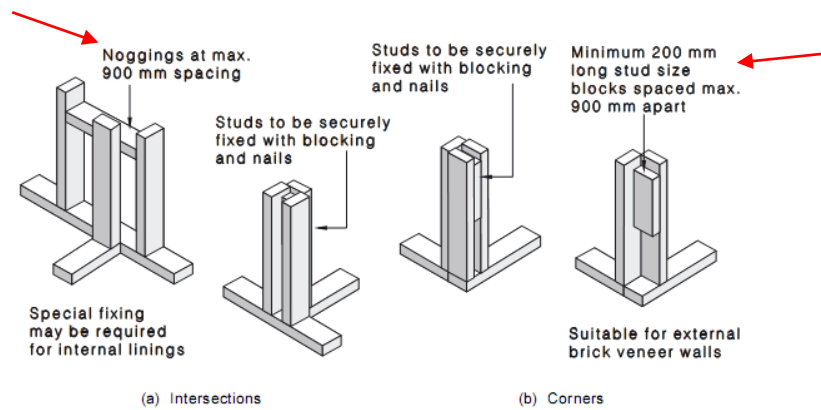


FIGURE 6.3 TYPICAL WALL JUNCTIONS



32.

The services at the metre box area enter the dwelling's timber wall frame area through a services conduit. All services passing from the external soil into the dwelling must be closed ensuring termite entry is blocked.

There must not be an open gateway to allow termites to enter the wall frame area of the dwelling.

The builder will need to have the termite protection company return to site and rework the installation of this service to comply with the termite protection requirements.



Rectification Required: YES

TERMS & CONDITIONS OF Darbecca Pty Ltd SITE INSPECTION AND REPORT

1. Purpose

The purpose of our inspection is to identify any defects in the finishes and the quality of those finishes presented by the builder at the stage of works nominated on the front of this report. This report contains a schedule of building defects that in the writer's judgement do not reach an acceptable standard of quality, level of building practice, or have not been built in a proper workmanlike manner relative to the Building Code of Australia, the relevant Australian Standards or the acceptable standards and tolerances as set down by the Building Control Commission.

2. Scope

Our engagement is confined to that of a Building Consultant and not that of a Building Surveyor as defined in the Building Act, of 1993. We therefore have not checked and make no comment on the structural integrity of the building, nor have we checked the title boundaries, location of any easements, boundary setbacks, room dimensions, height limitations and or datum's, glazing, alpine and bush-fire code compliance, or any other requirements that is the responsibility of the Relevant Building Surveyor, unless otherwise specifically noted within this report.

3. Assumed Finishes

Our inspection was carried out on the quality of the fixtures and finishes as installed, and no investigation of any documentation or statutory requirements was carried out to verify their correctness.

4. Documentation

Unless otherwise noted any contractual documentation made available to us during our inspection is only viewed on an informal basis and we make no certification that the building has been constructed in accordance with them.

5. Non-Destructive Inspection

Unless otherwise noted our inspection was carried out on a non-destructive basis and exclude anything that would have require the removal of any fixtures, fittings, cladding, insulation, sisalation, roofing, lining materials, excavated of any soil or the removal of any part of the plastic membrane.

6. Measurements/Levels

Unless otherwise noted all measurements have been taken with a standard ruler, and levels with either a 900 or 2100mm long spirit level.

7. Services, Appliances, Plants and Equipment

Unless otherwise noted, we did not test or check for appropriateness, capacity, correct installation or certification of any service, appliances, plant, and equipment, i.e., heaters, hot water units, air conditioners, ovens, hotplates, dishwashers, range hoods, spa pump, electrical wiring, gas lines, electricity and water supply, sewer, stormwater and agricultural drains.

8. Client Use

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Any reference contained within this report to the Building Code of Australian, an Australian Standard, a manufacturers technical data sheet or installation instruction is neither exhaustive nor a substitute for the original document and are provided as a guidance only. Darbecca Pty Ltd or the author of this report for the use or reliance upon of the part references contained within this report will accept no responsibility.

11. Report Exclusions

- a)** Defects in inaccessible parts of the building including, but not limited to, the roof space and or the sub-floor area unless otherwise noted,
- b)** Defects not apparent by visual inspection, or only apparent in different weather or environmental conditions as to those prevailing at the time of the inspection,
- c)** Defects that we did not consider significant enough to warrant any rectification work at the time of our inspection,
- d)** Defects outside the scope of the client brief
- e)** Check measure of rooms, walls, and the overall building, for size, parallel and squareness unless otherwise noted,
- f)** Landscaping, retaining wall/s, or any structures outside the roofline of the main building unless otherwise noted,
- g)** Enquiries of Council or any other Authorities,
- h)** Investigation for asbestos and or soil contamination,

- i) Investigation for the presence of any termites or borers and for the correct installation of any termite barriers and or other risk management procedures or devices.
- j) Defects in relation to PVC sewage and storm water pipes are not covered in this inspection. Clients must seek the services of a licenced plumber to check all sewage and storm water pipes.

12. VCAT Suitability

Unless specifically noted this report has not been prepared in-line with the requirements of Practice Note VCAT 2.