

Purpose of Report: *Post Renovation Building Defects Report*
Date of Inspection: 17th October 2005
Property Description: **4-5 Bed F.S Timber Framed Residence**
Address of Property: **Burrawang NSW**
Invoice No.
Client Name: Mr & Mrs. M
Building Consultant: Mr. Dominic Ogburn AMAIB Lic No BC 359
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Conditions of the Property Inspection Report.

This building inspection report complies with AS 4349.1 and is based on the inspection of accessible and visible structures only and does not include the condition of inaccessible or concealed areas of buildings nor the existence of pests or asbestos. This inspection was essentially limited to assessing the interior / immediate exterior of this particular unit or lot. The client may have additional liability for defects or faults in the common property for which a special purpose inspection report would be required.

No responsibility can be accepted for defects, which are latent or otherwise not reasonably detected on a visual inspection without interference with or removal of the structures, coverings or fittings of the building. No liability shall be accepted for verbally submitted report findings unless confirmed in writing. We have not inspected woodwork on other parts of the structure which are covered, unexposed or inaccessible and we are therefore unable to report that any such part of the structure is free from defect.

Indicative budget costs estimates are given for repairs as a guide only. The company will not accept any responsibility with respect to accuracy of same. Budget estimates are based on letting the repair works in whole-related trade lots, not as individual items.

We reserve the right to charge, **without prior notice**, for additional inspection / **report discussion time** with the client **exceeding 20 minutes** (either on site or in telephone conversation), additional time associated with **inspecting self contained flats, separate kitchenettes** or dual occupancies or in **travelling beyond** our pre quoted total **90 minute allowance**; at the rate of **\$115 (excl GST) per hour** or part thereof.

A \$5.00 surcharge for report facsimile and/or e-mail transmission shall be applied, without prior notice. Invoiced accounts are **payable within 7 days of the date of invoice**.

If you fail to pay by due date then we will charge you interest on the amount outstanding at a rate of 1.5% above our principal bankers standard commercial rates.

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A cancellation fee of \$45 (excl GST) will apply in all cases, unless written notice of cancellation is given at least 48 hours prior. This report is intended for the use of the person named on the report who is the only person covered by our professional indemnity insurance in respect of the report and as such the report cannot be sold on and/ or the advice used by non indemnified parties.



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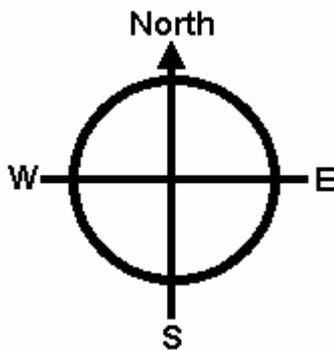


LEGEND

- Poor** = Inferior and in most cases requires significant repair / replacement.
Fair = Moderately good and in most cases either minor or smaller repairs will suffice
Good = Most advantageous, does not require further work.
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PROPERTY DIRECTION

The front of the property faces:



ABBREVIATIONS/ EXPLANATIONS LEGEND

A.C.	= Asbestos Cement	H/wd	= Hardwood
A/C	= Air Conditioner	H.W.S.	= Hot Water Service
AL	= Aluminium	L.H.S.	= Left Hand Side
Br/Wk	= Brickwork	L.m.	= Linear Metre
Co-ax	= Coaxial Cable	M.D.F.	= Medium Density Fibreboard
BCA	= Building Code Of Australia	M.C.	= moisture content (expressed as %)
C.I.	= Cast Iron	M	= Metre
C/W	= Cold Water	m²	= Square Metre
D/P	= Down Pipe	mm	= Millimetre
D.P.C.	= Damp Proof Course	P/Brd	= Plaster Board
D/W	= Dishwasher	Perps	= Perpend
E.L.C.B.	= Earth Leakage Circuit Breaker	R.C.D.	= Residual Current Device
F.C.	= Fibre Cement	R.H.S.	= Right Hand Side or Rolled Hollow Section.
FIB	= Fire Indicator Board		
F.R.L	= Fire Resistance Level	S.C.	= Solid Core
F.F.L.	= Finished Floor Level /Line	S.H.S.	= Square Hollow Section
F.R.	= Fire Rated/ Resistance	S.t.	= steel trowel
F.W.	= Floor Waste	S/W	= Stormwater
G.I.	= Galvanised Iron	W/M	= Washing Machine
G.P.O.	= General Purpose Outlet	W/P	= Waterproof
G.F.	= Ground Floor. (L.G.F) = Lower Ground	P.V.C.	= Poly Vinyl Chloride
H.C.	= Hollow Core	F.I.B.	= Fire Indicator Board
H/W	= Hot Water		



FOREWORD

On behalf of the client **Mr/s. M & L. M** I undertook a building survey of the subject **property** over one third of a day on **17/10/05**.

I photographed various elements and have made reference to them within this report. The weather was fine.

I note that the client advised me that Practical Completion was reached on April 2005 and the contract states that the defect liability period of 13 weeks commenced on the date of Practical Completion.

The builder was XY Constructions who have provided a certificate of Home Warranty Insurance (from HIA Insurance Services P/L) Certificate No 336543.

The original contract value was \$597,807.10 and included considerable P.C and Provisional sums.

At my suggestion the Owners specifically requested the Builder to forward "as built" certification documents and warranties which had not been provided as required upon practical completion. Documents were subsequently received as follows:

As part of my review I was provided with the following documents which I'm advised are contract documents:

- Council stamped 'M' Specification for proposed residence locked 25 D. P. 16169 for Burrawang' dated 29.7.04
- HIA NSW NHC the February 2004 construction contract dated 22.10.04
- Certificate of insurance for home Warranty dated 10.9.04
- PC and provisional sum final adjustment schedule dated 22.4.05
- Council stamped Architectural drawings MB04/01A & MB04/02 dated 29.7.04
- Various variation and contractor correspondence
- Various as built certification documents and wet area waterproofing warranty/ certificate including: Highlands Professional Waterproofing Manufacturers Warranty' dated 24.2.05, Rodney Webb Electrical, Raft Slab, Termite Management Notice, Smoke Detectors
- A&R Engineering Design, Southern districts Alarms Monitoring, Notification of Electrical Work & Telecommunications,
- Certificate of Installation (Contractor not specified)
- Bathroom & shower installations

I inspected both internally and externally all the accessible areas of the residence, with a view to compiling what essentially could be deemed a schedule of incomplete works, major and minor defects and repairs for acceptance by the client and builder.

Noteworthy exclusions of the inspection are all the inaccessible elements e.g. sub floor areas, all concealed services, the internals of all walls and the mechanical services.

My inspection does not include any specific review of electrical, fire safety and mechanical and hydraulic services, or structural elements; however I have made some general observations and recommendations.

I'm advised that the builder has been fully paid for all the work and that Wingecarribee Council was the project principle certifying authority and also issued a certificate of occupation for the subject property.

I have been made aware of the terms of the parties contract pertaining to the property My overview also relies on industry accepted **good building practice**, the BCA and A.S. minimum requirements. The summary of 'essential and non major repairs' at the front of this report is not a definitive listing of all major and non major repairs as the [whole of this report must be read](#) to fully determine same.



SUMMARY OF CONDITION

ESSENTIAL REPAIRS/ MAJOR DEFECTS OR ADVICE (not in priority order)

1. **Shower area rectification** of noted *three bathrooms* for *inadequate falls* and/ or set downs, in accordance with the minimum requirements of A.S 3740 – 2004 (the BCA) and re issue revised certification warranty.
2. **Remove and replace defective HWS** (not as specified or as per manufacturer's minimum requirements), with *specified HWS* in an agreed external location and/ or contribute cost of doing same to alternative HWS as nominated by owner.
3. Significant *paint sealing of top and bottom edges of all timber internal doors* as per manufacturers warranty requirements and confirmation demonstration that *external WRC sliding doors* have been paint sealed.
4. Builder to confirm that the *operative noise and capacity* of the *Study* mechanical exhaust fan complies with A.S 1668 part 2 1991 and connect same to ducting carried to the outside, in accordance with the client's requirements
5. (a) *Reinstate defective topically applied paint floor finish* using suggested method so as to achieve polished concrete type floor inclusive of penetrating sealer, as specified.
(b) In the alternative should client decide on another floor finish builder to reimburse owner the cost of undertaking remedial works as a contribution towards same. Owner to obtain quotation from nominated contractor to complete Option A.
6. Builder to *reposition Bed 3 door opening* as per the approved contract design on Architectural Drawing *MB 04\01 A* and reinstate wall and floor finishes at his own cost.
7. Builder to substantiate as installed concrete floor finish variation and tiling costs and provide the manufacturers product specification details of the topically applied paint finish, as detailed.
8. Builder to reconstruct the *main entry paving* such that it does not embed and /or conceal any of the external cladding such that soft rot and/or undetected termite entry cannot occur.

NON MAJOR DEFECTS / REPAIRS OR ADVICE

1. Break up and remove remaining *original concrete septic tank* and make good soil.
2. Paint *seal tops and bottoms of all doors*, as per manufacturers warranty requirements.
3. Install *rubber buffers* to all bathroom joinery doors drawers as per kitchen.
4. Miscellaneous Garage cupboard repairs.
5. Recommend raking out of solid grouted joints and installation of *sealant filled movement joints* in all *vertical tile corners and all wall/floor joints*, so as to minimize likely future differential movement cracking and expansion related delamination.
6. Miscellaneous minor window/ door repairs and make good *ceiling insulation* as noted.
7. Builder is to provide written confirmation that all *external house timber cladding* is CCA finger jointed treated pine, as specified.
8. Remaining items as noted.



1.0 INTERNAL

1.10 Bathrooms

General

The residence has four bathrooms all of which have dedicated shower recesses comprising frameless toughened glass shower screens, with floor set downs. Three bathrooms are naturally ventilated and one mechanically.

1.10A APS Contract Review & Observations;

Contract specification *clause 12.3 Waterproofing Wet Areas* states that waterproofing To A.S. 3740 - 1994 (waterproofing of wet areas within residential buildings).

Contract specification *clause 12.4 Tiling* under sub clause 'Falls and levels' states "*grade floor tiling to even and correct falls generally and to floor waste and elsewhere as required Minimum fall generally 1:100 minimum fall in shower area 1:60*"

Contract sub clause *Sealed joints* states "filled joints with silicon sealant and finish flush with the tile surface where tiling joins sanitary fixtures and at corners of walls in showers"

Contract **clause 2.1 Standards** states "use referenced Australian or other standards (including amendments) which are current one month before the date of the contract where other editions or amendments are required".

The signed building contract is dated 22.10.04. A month earlier would be 22.9.05.

I'm a current sitting member of the committee that oversaw the revision A.S 3740 -1994.

Australian Standards advise me that the revised standard **A.S. 3740 -- 2004** was approved by the Council of Standards Australia on the 20 February 2004 and published on the 15 April 2004

The ABCB advise me that A.S 3740 was referenced by the BCA on May 1st 2004. **Refer Annexure No2**

Notwithstanding the clear contract condition Clause 21 in my professional opinion the revised wet area waterproofing standard **A.S 3740 - 2004** would apply to the works as constructed by the builder.

Refer Annexure No1 of extracts *from A.S 3740 -2004* which state following;

Clause 4.3 Falls In Floor Finishes; "*where required, falls in floor finishes shall allow all surface water to drain without ponding*".

Clause 5.11.2 Step down showers; **Figure 5.4 (c)** shows a typical stepped down shower construction for an unenclosed shower with a frameless shower screen.

This detail shows a minimum 25 mm overall floor step down requirement.

C1 General "*the primary consideration for falls in floor finishes is to ensure water does not remain on the finished floor in a manner that can adversely affect the health or amenity of the occupants or deteriorate building elements..... Water should not pond on the floor, with the exception of residual water remaining due to surface tension*".

1.10B APS Builder supplied Certification/Warranty Observations;

The builder supplied "Highlands Professional Waterproofing Manufacturers Warranty' dated 24.2.05 (**Refer Annexure No3**) for the waterproofing of the various wet areas states under Note. "*Installation complies with the BCA and A.S. 3740 - 2004*"



1.12 Study Bathroom

General

This bathroom has no natural ventilation and incorporates a mechanical exhaust fan ducted through to the roof void - *Refer example Photo No 1.*

The BCA requires that a non naturally ventilated bathroom must incorporate mechanical ventilation.

When I inspected this bathroom I'm advised that it was at least some three hours after the owner had used the shower recess and water was ponding on the floor -- *Refer example Photo No2.*

I undertook a basic water test of the shower recess by simply switching on the shower rose and letting it run for some 5 minutes (with the shower door closed) and then turned off the water and observed drainage.

1.12 A APS Defect Investigation and Observations;

Shower recess; some 30 minutes after cessation of water testing significant excess water remained *ponding* on the floor-- *Refer example Photo No3.*

In my professional opinion neither the minimum requirements of A.S. 3740 - 2004 for adequate shower area floor falls and the Contract specification Clause 12.4 have not been achieved by the builder and is therefore non-compliant with the BCA.

The shower recess incorporates an approx 10mm floor set down - *Refer example Photo No 4.*

In my professional opinion the minimum floor set down requirements of A.S. 3740 - 2004 for a shower area (a minimum 25mm) have not been achieved by the builder and is therefore non-compliant with the BCA.

Mechanical exhaust; the mechanical exhaust fan is switched with light and ducted to the roof void over, which incorporates Anticon sarking and ceiling insulation.

In my professional opinion the roof void is essentially a sealed space and the intent of the BCA for non naturally ventilated bathrooms has not been met, as the mechanical exhaust should be ducted to the outside, to prevent condensation and moisture buildup within the roof void.

The operative noise mechanical exhaust fan is in my professional opinion excessive.

Vanity cupboard; the polyurethane finished vanity cupboard doors and drawers do not incorporate any rubber buffers, as per good building practice, and this may result in impact related damage to the finish.

Wall\Floor tiling; the bathroom generally incorporates large format tiles and are fixed to timber framed walls. With the exception of the vertical corner (of shower recess) or wall \floor and vertical corner tile joints have been solid grouted.

It is considered good building practice to provide some expansion provision to facilitate differential movement of ceramic tiles and the substrate to which they are fixed as by doing so this limits the opportunity for expansion related delamination of the tiles.

In my professional opinion I do not consider the vast majority of tile joints incorporate adequate expansion provision and it is possible over an extended period of time that the lack of same could lead to partial tile delamination and/or cracking.

Entry door; door does not incorporate a floor stop and inappropriately impacts on the wall mounted towel rail -*Refer example Photo No5.*

Refer also Door section of this report regarding the lack of adequate sealing to the top and bottom edges of doors



1.12 B APS Study Bathroom Recommendations;

Shower Recess; the shower area is not in accordance with the minimum requirements of A.S. 3740 – 2004 for which they have been certified compliant.

Builder to remove and reinstate shower recess so that the minimum requirements of A.S. 3740 – 2004 for floor falls and set down are achieved and that a revised warranty certificate be provided. If the builder fails to comply, take-up issue with the project PCA.

Mechanical Exhaust; builder to confirm that the *operative noise and capacity* of the mechanical exhaust fan complies with A.S 1668 part 2 1991 and connect same to ducting carried to the outside, in accordance with the client's requirements.

Vanity cupboard; recommend clear rubber buffers be installed on all drawers and doors.

Entry door; install doorstop as per other bathrooms.

Wall\floor tiling; the installation of sealant filled tile joints (beyond vertical shower recess corner) is not a contract requirement.

Notwithstanding this it is my professional opinion that such sealant filled joints should be installed. In the alternative I recommend tiles be monitored for future cracking and/or delamination



Photo No1



Photo No 2



Photo No 3





Photo No 4



Photo No 5



1.20 Playroom Bathroom

General

I undertook a basic water test of the shower recess by simply switching on the shower rose and letting it run for some 5 minutes (with the shower door closed) and then turned off the water and observed drainage.

1.20 A APS Defect Investigation and Observations;

Shower recess; some 30 minutes after cessation of water testing significant excess water remained *ponding* on the floor-- *Refer example Photo No6.*

In my professional opinion neither the minimum requirements of A.S. 3740 – 2004 for adequate shower area floor falls and the Contract specification Clause 12.4 have not been achieved by the builder and is therefore non-compliant with the BCA.

The shower recess incorporates an approx 10mm floor set down – *Refer example Photo No 4.*
In my professional the minimum floor set down requirements of A.S. 3740 – 2004 for a shower area (namely minimum 25mm) have not been achieved by the builder and is therefore non-compliant with the BCA.

Shower screen; the toughened glass shower screen door impacts slightly against the adjoining fixed panel at the upper section during closure – *Refer example Photo No7* and which could lead to impact related fracture.

Vanity cupboard; the polyurethane finished vanity cupboard doors and drawers do not incorporate any rubber buffers, as per good building practice, and this may result in impact related damage to the finish.

Wall\Floor tiling; the bathroom generally incorporates large format tiles and are fixed to timber framed walls. With the exception of the vertical corner (of shower recess) or wall \floor and vertical corner tile joints have been solid grouted.

It is considered good building practice to provide some expansion provision to facilitate differential movement of ceramic tiles and the substrate to which they are fixed, as by doing so this limits the opportunity for expansion related delamination of the tiles.

In my professional opinion I do not consider the vast majority of tile joints incorporate adequate expansion provision and it is possible over an extended period of time that the lack of same could lead to partial tile delamination and/or cracking.

1.20 B APS Playroom Bathroom Recommendations;

Shower Recess; the shower area is not in accordance with the minimum requirements of A.S. 3740 – 2004 for which they have been certified compliant.

Builder to remove and reinstate shower recess so that the minimum requirements of A.S. 3740 – 2004 for floor falls and set down are achieved and that a revised warranty certificate be provided.

If the builder fails to comply, take-up issue with the project PCA.

Shower Screen; builder to adjust and/or replace shower screen doors as to prevent impact against adjoining panels and to create even gap margins.

Vanity cupboard; recommend clear rubber buffers be installed on all drawers and doors.

Wall\floor tiling; the installation of sealant filled tile joints (beyond vertical shower recess corner) is not a contract requirement.

Notwithstanding this it is my professional opinion that such sealant filled joints should be installed.

In the alternative I recommend tiles be monitored for future cracking and/or delamination





Photo No 6



Photo No 7

1.30 Main Bathroom

General

I undertook a basic water test of the shower recess by simply switching on the shower rose and letting it run for some 5 minutes (with the shower door closed) and then turned off the water and observed drainage.

1.30 A APS Defect Investigation and Observations;

Shower recess; some 30 minutes after cessation of water testing significant excess water remained *ponding* on the floor-- *Refer example Photos No8 & 9.*

In my professional opinion neither the minimum requirements of A.S. 3740 – 2004 for adequate shower area floor falls and the Contract specification Clause 12.4 have not been achieved by the builder and is therefore non-compliant with the BCA.

The shower recess incorporates an approx 10mm floor set down – *Refer example Photo No 4.* In my professional the minimum floor set down requirements of A.S. 3740 – 2004 for a shower area (namely minimum 25mm) have not been achieved by the builder and is therefore non-compliant with the BCA.

Vanity cupboard; the polyurethane finished vanity cupboard doors and drawers do not incorporate any rubber buffers, as per good building practice, and this may result in impact related damage to the finish.

Wall\Floor tiling; the bathroom generally incorporates large format tiles and are fixed to timber framed walls. With the exception of the vertical corner (of shower recess) or wall \floor and vertical corner tile joints have been solid grouted.

It is considered good building practice to provide some expansion provision to facilitate differential movement of ceramic tiles and the substrate to which they are fixed, as by doing so this limits the opportunity for expansion related delamination of the tiles.

In my professional opinion I do not consider the vast majority of tile joints incorporate adequate expansion provision and it is possible over an extended period of time that the lack of same could lead to partial tile delamination and/or cracking.



1.30 B APS Main Bathroom Recommendations;

Shower Recess; the shower area is not in accordance with the minimum requirements of A.S. 3740 - 2004 for which they have been certified compliant.

Builder to remove and reinstate shower recess so that the minimum requirements of A.S. 3740 - 2004 for floor falls and set down are achieved and that a revised warranty certificate be provided. If the builder fails to comply, take-up issue with the project PCA.

Vanity cupboard; recommend clear rubber buffers be installed on all drawers and doors.

Wall\floor tiling; the installation of sealant filled tile joints (beyond vertical shower recess corner) is not a contract requirement.

Notwithstanding this it is my professional opinion that such sealant filled joints should be installed.

In the alternative I recommend tiles be monitored for future cracking and/or delamination



Photo No 8



Photo No9



1.40 Bedroom 1 Ensuite Bathroom

General

I undertook a basic water test of the shower recess by simply switching on the shower rose and letting it run for some 5 minutes (with the shower door closed) and then turned off the water and observed drainage.

1.40 A APS Defect Investigation and Observations;

Shower recess; some 30 minutes after cessation of water testing no significant water remained on the floor.

In my professional opinion the minimum requirements of A.S. 3740 – 2004 for adequate floor falls and the Contract specification Clause 12.4 have been achieved by the builder and is therefore compliant with the BCA.

The shower recess incorporates an approx 10mm floor set down – *Refer example Photo No 4.* In my professional the minimum floor set down requirements of A.S. 3740 – 2004 for a shower area (namely minimum 25mm) have not been achieved by the builder and is therefore non-compliant with the BCA.

Vanity cupboard; the polyurethane finished vanity cupboard doors and drawers do not incorporate any rubber buffers, as per good building practice, and this may result in impact related damage to the finish.

Wall\Floor tiling; the bathroom generally incorporates large format tiles and are fixed to timber framed walls. With the exception of the vertical corner (of shower recess) or wall \floor and vertical corner tile joints have been solid grouted.

A number of vertical corner wall tiles are nearly, or are, abutting one another at the *vertical internal corner over entry door way*, which has not been grouted.

This appeared to be fairly typical for other vertical corners in this bathroom.

It is considered good building practice to provide some expansion provision to facilitate differential movement of ceramic tiles and the substrate to which they are fixed, as by doing so this limits the opportunity for expansion related delamination of the tiles.

In my professional opinion I do not consider the vast majority of tile joints incorporate adequate expansion provision and it is possible over an extended period of time that the lack of same could lead to partial tile delamination and/or cracking.

1.40 B APS B1 Ensuite Bathroom Recommendations;

Shower Recess; the shower area is not in accordance with the minimum requirements of A.S. 3740 – 2004 for which they have been certified compliant.

Builder to remove and reinstate shower recess so that the minimum requirements of A.S. 3740 – 2004 for floor set down is achieved and that a revised warranty certificate be provided.

If the builder fails to comply, take-up issue with the project PCA.

Vanity cupboard; recommend clear rubber buffers be installed on all drawers and doors.

Wall\floor tiling; the installation of sealant filled tile joints (beyond vertical shower recess corner) is not a contract requirement.

A number of tile joints have not been grouted – builder to rectify.

Notwithstanding this it is my professional opinion that such sealant filled joints should be installed.

In the alternative I recommend tiles be monitored for future cracking and/or delamination.



2.0 Timber Doors

General

All of the internal doors including those at main entry and exits (e.g. laundry and front door) appear to be a solid core type.

2.0 A **APS Contract review observations;**

Contract specification *clause 10.40 Timber Doors* under *internal doors* "painted solid core" type. Contract specification under *Priming* states that "prime timber doors on top and bottom edges before installation".

Contract specification *clause 10.40* Under '*Doorstops*' states "install doorstops to prevent door furniture striking the wall or other surface"

In my professional experience all known door manufacturers provide a conditional warranty which essentially requires that all edges of a timber door (including top and bottom edges) are to be prime sealed with up to 4 coats of paint, so as to a cupping and warpage.

Refer Annexure No5 showing Corinthian doors conditional warranty requirement

2.0 B **APS Door Defect Investigation and Observations;**

I'm unaware as to which manufacturer supplied the project doors to the builder.

With the possible exception of the laundry exit door *none of the internal doors* including the main entry and Garage internal entry, have been *paint sealed on both the top and bottom edges*.

The lack of same in my professional opinion contravenes manufacturers typical conditional warranty requirements and could lead to future cupping and/or warpage, which is unlikely to be covered by the manufacturer.

I was unable to determine if any of the *WRC sliding doors\windows* have been adequately paint sealed on the top and bottom edges.

2.0 C **APS Door Recommendations;**

Builder to adequately paint seal both the top and bottom edges of all timber doors in accordance with the manufacturers requirement, this may require the complete removal of some doors.

Builder should demonstrate that the sliding doors\windows have been adequately paint sealed a letter of confirmation and a demonstration to the client by removal of a few sample doors.



3.0 Hot Water Service

General

An electric heat pump storage unit has been installed in the north eastern corner of the double garage located on the concrete slab, with condensate overflow lines discharging out through an external timber stud wall. As part of this report I undertook considerable background research with the suppliers of quantum hot water services and investigated their web site.

3.0 A APS Contract review observations;

Contract specification under *clause 14, Plumbing & Drainage* sub clause *14.2 Materials and components Water Heater* states; "*Quantum model 340 T2S heat pump system or equivalent selected by the proprietors and a 3.5 star efficiency rated*".

Contract specification under *model\capacity* states; "*340 T2S*" and which has a 340 Litre storage capacity.

Contract specification clause 14.3 under *General* states; "install typing in straight lines and to uniform grades. Arrange and support the piping so that the remains free from vibration and water hammer, while permitting thermal movement".

A location for the hot water is not noted within the specification or on the contract drawings. The cost of the hot water heater was covered by a provisional sum of \$1,500 within the contract, which was adjusted at the end by the builder to amount of \$2,381.25.

Contract Architectural Drawing *MB 04\01 A* shows the residence to have a total four bedrooms with a minimum sleeping capacity of No8 off people, via four single beds and two double beds.

3.0 B APS Defect Investigation and Observations;

Capacity: the builder has supplied and installed a *Quantum model 270 ACH- 134* hot water heater on the garage floor, which has a 270 litre storage capacity. The as installed hot water heater is contrary to the specified HWS unit, namely *Quantum model 340 T2S*, which has a 340 storage litre capacity.

The owners advised me that the builder did not consult with them in relation to changing the size (storage capacity) of the hot water service at any time.

The builder has charged for the as installed 270 litre hot water unit being \$2,381.25 as detailed on 22.04.05 Allowances claim.

Enviro Friendly Products' are a nominated distributor for Quantum heat pumps.

As part of this report I put a series of specific questions to this distributor regarding Quantum hot water heaters. *Refer Annexure No 4* of an e-mail letter dated 19.10.05.

John Payne of Enviro Friendly Products' advised me that the 270 litre HWS (*270 ACH- 134*) unit "is recommended for 4-5 people" and that the 340 Litre unit (*340 T2S*) "is recommended for 5 - >6"

Given these manufacturers recommendations and that the house was designed to have a minimum sleeping capacity of No 8 off people, it is my professional opinion that the 270 litre hot water service, as installed by the builder without the client's approval or agreement, has inadequate storage capacity and is contrary to the contract.

I'm advised that the owners' own enquiries established from council technicians that at least a 400 litre capacity HWS would be required for a 4/5 bedroom house and that a 430 litre capacity was the advice from several Rheem technicians. Independent installers who were contacted confirmed the need for a HWS of at least 400 litres.



I understand from the owners that they received correspondence stating that “with a 270 litre Quantum heat pump, if you try to shower even 6 or 7 people in a typical 1 hour peak you will run out of hot water”.

Location: the hot water unit is located within a recess at the rear of the garage and located on the floor slab—*Refer Photo No10* and I’m advised that from project commencement the owner’ stated intent was to have the HWS installed internally and that the builder knew this.

The manufacturers manual states under ‘Location’ “The front service, of the heat pump section (on top of the tank) must be accessible from the front of the heater this must NOT face the wall. The fan MUST not be up against a wall (minimum clearance 500 mm)”

Refer Photo No which shows that HWS fan faces the eastern external wall and is located within 300 mm of same and is clearly contrary to the minimum manufacturer installation requirements.

Given the current location I cannot envisage how compliance with manufacturer’s installation requirements could be achieved.

John Payne of Enviro Friendly Products’ advised me that Quantum has a “strong recommendation to install these HWS units externally” so as to reduce noise and increase operating efficiency and further that if the intention was to install such a unit internally, the installer would have been advised of possible consequences by Quantum technical manager Michael Fraser (Ph 1800 644 705).

I **recommend** the owners contact Mr M.Fraser and provide him with a copy of this report and seek his inspection of the installation and a written response.

The manual for the States ...”*therefore locating the unit away from bedrooms or living areas is recommended (both the owners and any neighbours). Obviously installing near a bedroom window may be annoying to the occupants”*

The owners advised me they had made a request to the builder to install the hot water heater within the garage. I’m advised that the builder did not consult with the owners in relation to any possible consequences relating to significant operative noise and/or reduced efficiency, prior to installing.

John Payne responded to a series of questions I put to him as follows regarding location;

Q: Quantum has a strong recommendation to install these HWS units externally so as to reduce noise and increase operating efficiency, an internal installation would be unusual and mostly based on clients strong requirements.

A: The assumption is that it will be installed externally, for efficiency reasons. Noise would be a secondary consideration.

Q: When installed internally a suitable location might be a double garage given the HWS need to draw air in and would be less efficient in summer because of the cooler space.

A:Yes.

Q: If a builder were intending to s&f such a unit internally Quantum's technical manager would advise him of the possible consequences and considerations

A: Yes

Q: including the operating noise is 51DbA.

A: Yes- in fact 52db. at 1.5 metres.

Q: I would appreciate you advising me if the strong external recommendation and the possible consequences on installing internally are specifically listed on any Quantum installation data sheets



A: P7 of the Installation manual reads...

Discussing airflow..."The Compact therefore is best located externally; however a large double-garage (minimum of 120 cubic metres) may also be suitable."

Operative noise; In my professional opinion and as advised by John Payne' this operative noise is the equivalent to and/or greater than many external air-conditioning units and in my opinion the operative noise of the HWS is quite significant and intrusive.

A review of the manufacturers installation manual indicates that the operating noise is *52 DbA* at 1.5 metres. This was confirmed by John Payne of Enviro Friendly Products'

I consider the operating noise to be unacceptably high including seeming vibrational noise as generated by the partially loose water supply and condensate lines, which penetrate through enclosing timber framed walls and which I'm advised are not acoustically insulated.

The lack of any acoustic seals around the Garage rear timber entry door would also be contributory.

I'm advised that after installation, when the owners reported the noise issue they were advised by Ian Thomson, the building supervisor for S&I Constructions, that the builder arranged for a site visit by a representative of Quantum or the supplier for the purposes of questioning the noise of the installed heater.

I am advised by the owners that Mr Thompson informed them that the installation noise was considered acceptable by the Quantum representative. I have not sighted any written correspondence from suppliers concerning same.

I am also advised that no comment was made to the owners concerning the internal installation of the hot water heater, nor its non-compliance with the minimum manufacturer's requirements for location. I would expect the manufacturer to confirm same.

Installation; the *water supply and condensate overflow pipes* have not be adequately secured or isolated to prevent vibrational noise and are in my professional opinion contributory to the amount unacceptable of noise generated and are contrary to Contract Specification clause 14.3 General as previously noted.

Refer Photos No11 & 11A showing the hot water service *condensate lines* inappropriately discharging onto entry patio paving, which is partially in contact with the lower external timber wall cladding and is promoting moisture gain within the cladding and which could lead to soft rot deterioration. Refer also Section 7A of this report for further comment.

3.0 C APS Hot Water Service Recommendations;

Capacity \ location \ operative noise \ installation; the builder has supplied and installed and charged for a *Quantum model 270 ACH- 134* hot water heater, without prior agreement with the owners and which is contrary to the contract specification requirement.

In my professional opinion and according to the distributor recommendations the as installed hot water service is inadequately sized for the subject property and the capacity of the hot water heater as per the original specification is not adequate for the occupancy of the property as described in the approved plans.

The hot water heater has not been installed in accordance with the minimum manufacturer requirements for clearance from enclosing walls and accessibility and in my professional opinion in its current location it cannot comply. The various supply and condensate pipes had not been correctly installed and inappropriately discharge onto external wall cladding and paving.



In my professional opinion the builder failed to adequately advise the owners of the significant implications of installing a heat pump hot water service internally including reduced efficiency and operating noise.

I consider the builder is substantially liable and **recommend** the hot water service be removed and replaced with the specified *Quantum* model 340 T2S in accordance with the manufacturers minimum installation requirements and in an agreed external location (possibly outside Garage) and as close as possible to usage points. All hot water service pipe work should be adequately secured and free from vibration, the condensate line should be connected to a waste tundish.

I consider the builder liable for the cost of this work however as the builder has charged for the smaller non specified HWS I consider the builder would be entitled to a variation extra for the supply only cost difference between the two models, which I'm advised by Enviro Friendly Products equates to some \$385.

Should the owner select an alternative hot water heating option, such as a solar/ electric type then I **recommend** that the builder make an equal value contribution towards the cost of the installation of same equivalent to the cost of removing existing and installing specified *Quantum* model 340 T2S excluding larger capacity supply cost of some \$385.





Photo No10



Photo No11



Photo No11A



Photo No12 Bed 3 Door



4.0 Bed 3 Southern division Wall/ Door

APS Contract review observations; Contract Architectural Drawing *MB 04\01 A* shows Bed 3 entry door to be located in the southern wall, hinged on the right hand side, and with no nib such that the door opens parallel and flush with the bathroom western wall and so as to permit locating to single beds centrally (as shown on plan) and as per the adjacent Bed2.

4.0 A APS Defect Investigation and Observations;

The builder has installed the Bed 3 entry such that there is a approx 500mm wide nib on the eastern side, which is contrary to the contract Architectural Drawing *MB 04\01 A* and as per the attached marked up Architectural plan (below), thereby denying the opportunity to install the single beds side-by-side in the location as shown on the drawing. *Refer Photo No12* on previous page.

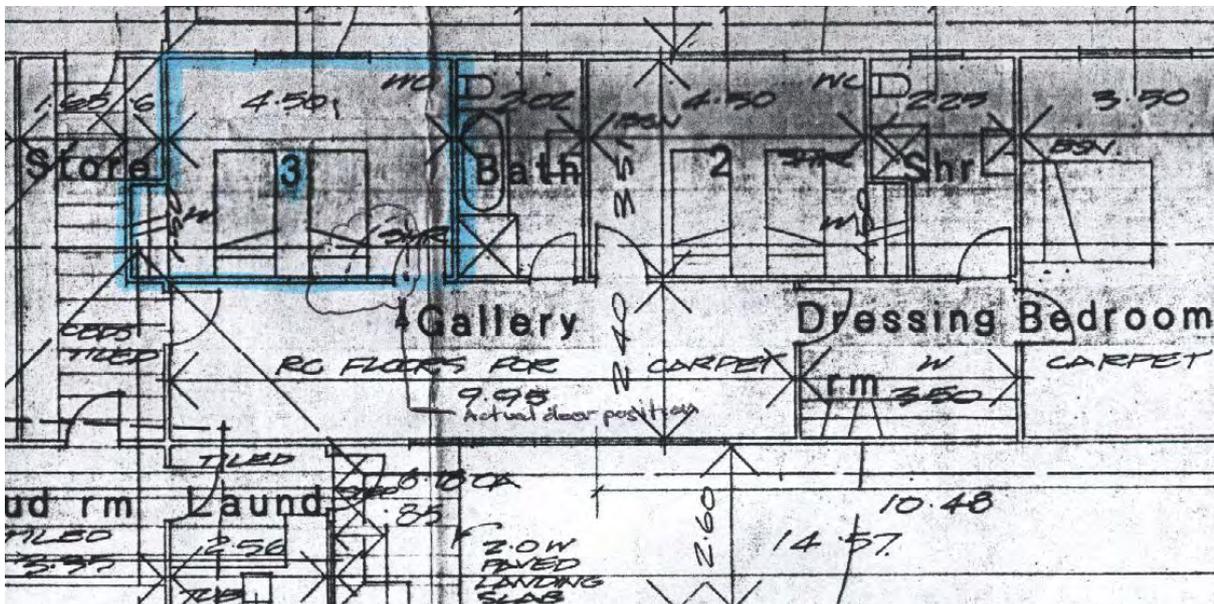
Bedroom 2 entry door has been constructed as per the approved plan.

The owners advise me that they were not consulted the builder and nor did they provide their agreement to install the subject door in the revised position.

In my professional opinion I can see no tangible or justifiable reason as to why the builder changed the door' position which now prevents positioning two single beds as per the approved design.

4.0 B APS Bed 3 Southern division Wall/ Door Recommendations;

In my professional opinion the builder is fully liable for this construction error and I recommend that the builder reposition the door as per the approved design on Architectural Drawing *MB 04\01 A* and reinstate wall and floor finishes and be fully liable for all associated costs.



Marked up Architectural Plan *MB 04\01 A*



6.0 Ceiling Insulation

6.0 A APS Contract review observations;

Contract project specification states under clause 7.2 'Bulk insulation mineral wool batts & blankets'; to A.S. 3742 - 1990 and under Ceiling; minimum R3.5 batt insulation and under Installation 'Standards to A.S.3999 -- 1992' Batts; "fit tightly between framing members".

6.0 B APS Defect investigation and Observations;

My inspection of the roof void revealed that no ceiling insulation has been installed over the *Garage* and the timber lined main entry *Veranda* ceilings.

A random inspection of the as installed ceiling insulation revealed that much of the insulation has not been installed correctly as it has not been fitted tightly between framing members and significant gaps exist.

I'm unable to determine whether the contract did or did not require the *Garage* and entry veranda ceilings to be insulated, however good building practice would suggest that they should be particularly given the southern highlands location.

6.0 C APS Ceiling Insulation Recommendations;

I **recommend** that the builder rectify the as installed ceiling insulation so that the ceiling insulation is fitted tightly between framing members particularly at junction with the external wall top plates.



7.0 Miscellaneous

7.0 A APS Defect investigation and Observations;

Fireplace;

The contract architectural drawings MB 04\01 A details a *flued fireplace* being installed at the eastern end of the Living Rm.

The owners advise me that the builder had said he was unable to install the specified fireplace in the designed position due to the presence of a roof ridge above, which he said would impede the installation of a chimney.

In my professional opinion the builder's reasons for not installing the specified fireplace are insufficient because an offset flue section could have been installed such that the chimney roof penetration came out at the southern side of the Living room roof ridge.

Pre - existing Septic Tank;

I'm advised that the original aged septic tank (of demolished cottage) was specified to be demolished and removed as part of the demolition contract of cottage.

I'm advised by the owners that the builder had only broken up the concrete as recent rains have uncovered the walls of the tank - *Refer Photo No23*.

Garage storage cupboard;

I'm advised that there are numerous conspicuous screw fixings, within the internal cupboard linings, which are unsightly.

Paving\cladding;

I'm advised that the builder supplied and installed the main entry veranda paving.

Refer example *Photos No 24 & 24 A* (of entry branded paving and adjacent external timber wall lining) showing the paving level at the eastern end has been built up and is partially concealing the external lower timber wall cladding.

Notwithstanding my prior recommendations with respect to the inappropriate discharge of the HWS condensate, in my professional opinion the noted build up paving construction could promote soft rot (by capillary action) and also *undetected termite entry*.

The contract specification *clause 9.4* Timber Board Cladding if selected' specifies '*CCA finger jointed treated pine*'. I was unable to determine whether the as installed external cladding is as specified.

Bed3 window;

Refer page 20 of marked up contract architectural drawing MB 04\01 A, which details a window to be centrally located in the northern external wall.

Refer *Photos No 25* showing window which when I measured the offsets both sides of the window revealed that it is significantly out of centre.

7.0 B APS Miscellaneous Recommendations;

Fireplace; I'm advised the builder did not charge for the installation of the fireplace and whilst I **recommend** no action be taken, in my professional opinion the builders reasons for not installing the fireplace cannot be substantiated.

Original Septic tank; I **recommend** that the builder is to remove all remnants of the original septic tank from site and make good the surrounding soil.

Garaged storage cupboard; I **recommend** that the builder to make good internal cupboard screw fixings by either the installation of proprietary plastic cover caps or filling and painting to match the surrounding finish.



Entry paving; I **recommend** that the builder is to reconstruct the paving such that it does not embed and /or conceal any of the external cladding such that soft rot and/or undetected termite entry cannot occur.

External cladding; I **recommend** that the builder is to provide written confirmation that all external house timber cladding is CCA finger jointed treated pine, as specified.

Bed3 Window; No action.



Photo No23



Photo No24



Photo No24A



Photo No25



8.0 CONCLUSION

In my considered professional opinion the present condition of the residence is reflected in the 'Summary' section at front of this report.

I note that when the majority of defects are considered in their entirety, they might be deemed **major** defects, as reasonable habitation of the property would be quite difficult, given the work access requirements and multiple follow on trades.

The owners advise me that they have been unable to utilise and occupy the residence to the extent they intended due to the nature and extent of the envisaged defects rectification.

As such the builder should be requested to give a clear indication as to the maximum completion time required and provide written notification of same so that I may re- inspect and provide a final evaluation.



Résumé of Mr. Dominic J Ogburn of Access Property Services P/L

Objective

Professional Building Consultant & Construction Managers

Qualifications or Achievements

1985 Dept Of Industrial Relations certificate for Construction Safety Training

1989 MBA Site Safety Committee Training Certificate.

1998 Accredited Mediator with OFT & LEADR

1985 Fully Licensed builder (Lic No89515C)

1996 Associate Member Of the Australian Institute Of Building

2002 ACA nominated consumer representative to Australian Standards for revised **A.S 3740 2004** (wet area water proofing).

2003 OH&S Induction Training Course (Green card)

2004 OFT Building consultant Lic No BC 359 issued.

2004 Author of 'Your Home buying selling renovating building' (consumer advocacy book) publishers Allen & Unwin.

2005 Wrote and license OFT approved NSW Owner Builder education course 'Own It Build It'

2005 20 years experience in the building industry and expert witness

Education

1979–1981 NSW Institute Of Technology

B. Appld Science Building (part time) completed 3 years of 6 year course.

1981–1984 Sydney Technical College

Completed and awarded Building Certificate (Revised Course).



Experience

1991 – 2004

Access Property Services P/L

Building Consultancy & Construction Management

Building Consultancy

- * Pre and post purchase building surveys of new and old, semi commercial and residential properties, including specializing in final building defect surveys on multi unit residential buildings and their common areas for Owner's corporations.
- * Building diagnostics
- * ACA Consumer representative committee member of A.S 3740 2004 (wet area waterproofing)
- * Expert witness and building dispute resolution
- * Report submission and presentation on Sydney Aircraft Insulation pilot project to the Senate Select Committee for aircraft noise.
- * Heritage surveys including SCEGGS Darlinghurst for H. Tanner & Ass
- * Instrumental in the completion of the 2002 NSW Building Inquiry
- * Act as construction manager on larger residential building renovation projects and in assisting owner- builders in smaller similar projects
- * Have assisted the NSW Office Of Fair Trading in revising and implementing 2003 new residential building contracts.
- * Assist a variety of Architects in developing residential design projects and frequently take on their traditional superintendent role.
- * Author of 'Your Home' and owner-builder education course Own It Build It.

Some Projects Completed As Construction Manager For APS

Scope of works determination, sourcing contractors, designers, budget provision, contract administration and programming for a variety of smaller and up market residential refurbishment's including;

- 4/4 Milsons Rd Cremorne contract value \$0.50 Mil 02'
- 16 - 20 Hereward St Maroubra (67 Units) Contract value \$1.5 Mil 97' 98'
- 4 Seaview Av Hardboard contract value \$0.40 Mil 99'
- 452 Glenmore Rd Paddington contract value \$0.25 Mil 99'
- 78 Adelaide St Woollahra contract value \$0.40 Mil 02'
- 52 Shellcove Rd neutral Bay contract value \$1.10 Mil 02'

Some Multi Unit Residential Buildings Inspected For Owners Corporations

- Republic 2- Darlighthurst
- The Altair Kings -Cross
- The Mondrian - Alexandria
- Colgate Palmolive – Balmain
- Cape Cabarita – Breakfast Pt
- The Regis Towers – Sydney
- Top Of The Town - Darlinghurst

1980 –1991 Stuart Brothers Pty Ltd (*builders*)

(Mar 80' - Aug 85') **Trainee Supervisor, Q.S & Estimator**

(Aug 85' - Mar 91') **Senior Construction Manager**

Formal work based training in quantity surveying and construction estimating

Total responsibility of letting and administering contracts

Construction programming and cost controlling and reporting

Variation compilation

Construction Litigation of a number of claims up to \$2Mil

Client/ architect liaison on both lump sum and cost plus contracts for commercial and residential projects

Some Projects Completed As Construction Manager For Stuart Bros

- * The Wintergarden (Rose Bay) \$7.5Mil luxury residential development
- * 50 Miller St Nth Sydney two stage complete refurbishment of 11 storey commercial building Contract value = \$11 Mil.
- * The Glebe Estate D & C of No 22 dilapidated houses for the Dept Of Housing Contract value = 2.5Mil
- * Perpetual Trustees Head Office Hunter St. Restoration and refurbishment Contract value \$0.85 Mil.
- * Restoration of 652 - 662 George St The Rocks for Sydney Cove Redevelopment Authority Contract Value \$0.45 Mil
- * Commonwealth Bank Refurbishment's incl development and implementation of their initial Auto Bank Service.
- * Similar operation for State Bank ATM service

References

Robert Puflett of Flower & Samios (architects) Ph 9660 9977

Virginia Zandarini of V. Zandarini & Ass (architects) Ph 9389 7989

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