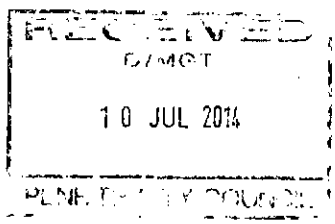
8 Appendix C – Engineering Assessment and BCA Report



PART 2.1 STRUCTURE

PERFORMANCE REQUIREMENTS

P2.1.1 Structural stability and resistance to actions

(a) A building or structure, during construction and use, with appropriate degrees of reliability, must—

(i) perform adequately under all reasonably expected design actions; and

(ii) withstand extreme or frequently repeated design actions; and

(iii) be designed to sustain local damage, with the structural system as a whole remaining stable and not being damaged to an extent disproportionate to the original local damage; and

(iv) avoid causing damage to *other properties*,

by resisting the actions to which it may reasonably be expected to be subjected.

(b) The actions to be considered to satisfy (a) include but are not limited to—

(i) permanent actions (dead loads); and

(ii) imposed actions (live loads arising from occupancy and use); and

(iii) wind action; and

(iv) earthquake action; and

(v) snow action; and

(vi) liquid pressure action; and

(vii) ground water action; and

(viii) rainwater action (including ponding action); and

(ix) earth pressure action; and

(x) differential movement; and

(xi) time dependent effects (including creep and shrinkage); and

(xii) thermal effects; and

(xiii) ground movement caused by—

(A) swelling, shrinkage or freezing of the subsoil; and

(B) landslip or subsidence; and

(C) siteworks associated with the building or structure; and

(xiv) *construction activity actions*; and

(xv) termite actions.

(c) The structural resistance of materials and forms of construction must be determined using five percentile characteristic material properties with appropriate allowance for—

(i) known construction activities; and

(ii) type of material; and

(iii) characteristics of the site; and

(iv) the degree of accuracy inherent in the methods used to assess the structural behaviour; and

(v) action effects arising from the differential settlement of foundations, and from restrained dimensional changes due to temperature, moisture, shrinkage, creep and similar effects.

(d) Glass installations that are at risk of being subjected to human impact must have glazing that—

(i) if broken on impact, will break in a way that is not likely to cause injury to people; and

(ii) resists a reasonably foreseeable human impact without breaking; and
(iii) is protected or marked in a way that will reduce the likelihood of human impact.

COMMENT

The structure of the Garage has been designed by a registered Structural Engineer. The structural plans are included in Appendix A. The engineer has provided a certificate confirming that the Garage was constructed as per the plans.

The engineers certificates are attached at the end of this report.

PART 2.2 DAMP AND WEATHERPROOFING

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.

(a) *Surface water*, resulting from a storm having an *average recurrence interval* of 20 years and which is collected or concentrated by a building or *sitework*, must be disposed of in a way that avoids the likelihood of damage or nuisance to any *other property*.
(b) *Surface water*, resulting from a storm having an *average recurrence interval* of 100 years must not enter the building.

(c) A drainage system for the disposal of *surface water* resulting from a storm having an *average recurrence interval* of—
(i) 20 years must—
(A) convey *surface water* to an appropriate *outfall*; and
(B) avoid *surface water* damaging the building; and
(ii) 100 years must avoid the entry of *surface water* into a building.

COMMENT

The Garage has been constructed so that the surface water runs away from the building in all directions. The water is redirected to and collected in the on-site dams.

F2.2.2 and P2.2.3 Weatherproofing and Dampness

A building is to be constructed to provide resistance to moisture from the outside and moisture rising from the ground.

A roof and external wall (including openings around windows and doors) must prevent the penetration of water that could cause—

(a) unhealthy or dangerous conditions, or loss of amenity for occupants; and
(b) undue dampness or deterioration of building elements.

Moisture from the ground must be prevented from causing—

(i) unhealthy or dangerous conditions, or loss of amenity for occupants; and
(ii) undue dampness or deterioration of building elements.

Barriers installed beneath slab on ground construction for the purposes of moisture must have a high resistance to damage during construction.

COMMENT

The Garage has been constructed so that it is impervious to external and rising moisture. The slab was constructed with an impervious membrane beneath on a blinding layer of sand.

PART 2.3 FIRE SAFETY

FUNCTIONAL STATEMENTS

F2.3.1 Protection from the spread of fire

A Class 1 building is to be protected from the spread of fire.

COMMENT

The Garage has been constructed to comply with AS3539-2009 Section 3 Construction General and Section 6 Construction for bushfire attack level 19 (BAL-19).

F2.3.2 Fire detection and early warning

A Class 1 building is to be provided with safeguards so that occupants are warned of a fire in the building so that they may safely evacuate.

COMMENT

The building is not a Class 1 building but has been constructed to comply with AS3539-2009 Section 3 Construction General and Section 6 Construction for bushfire attack level 19 (BAL-19)

F2.3.3 Heating appliances

Heating appliances using controlled combustion located in a building are to be installed in a way which reduces the likelihood of—

(a) fire spreading beyond the appliance; and
(b) smoke from the appliance entering the building.

COMMENT

This section is not relevant to the building.

F2.3.4 Bushfire areas

A Class 1 building or a Class 10a building or deck associated with a Class 1 building constructed in a designated bushfire prone area is to provide resistance to bushfires in order to reduce the danger to life and reduce the risk of the loss of the building.

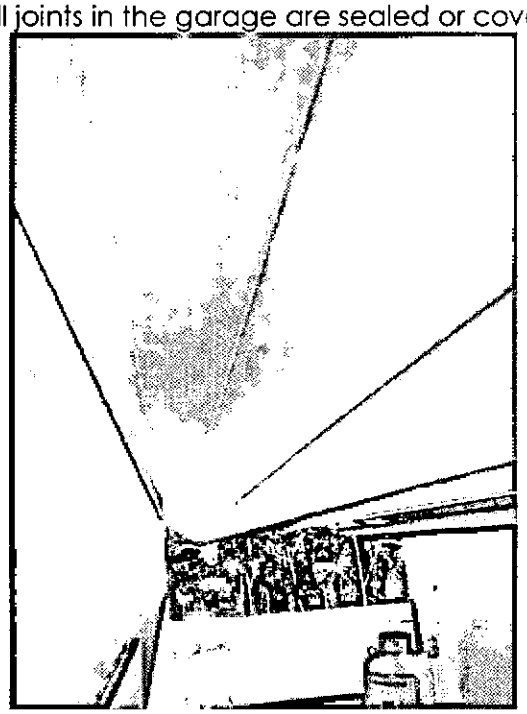
COMMENT

The Garage has been constructed to comply with AS3539-2009 Section 3 Construction General and Section 6 Construction for bushfire attack level 19 (BAL-19)

Floors
The floor is a reinforced concrete slab on ground design by a qualified structural engineer. Refer to the certificate at the end of this report.
Walls
The wall have been constructed of fibre-cement with a thickness greater that 6mm

Joints

All joints in the garage are sealed or covered.



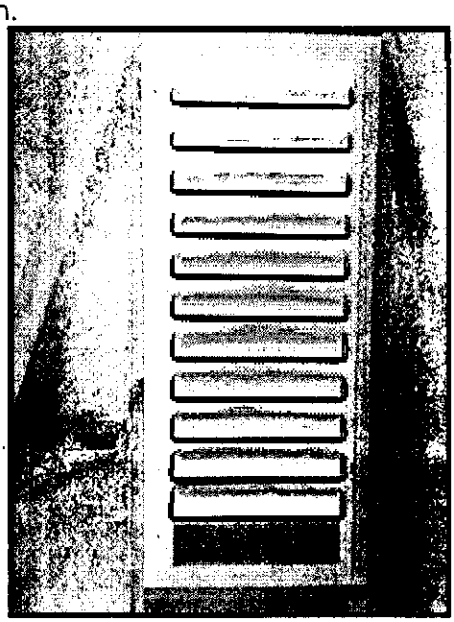
Fully sealed eaves lining

Fully sealed eaves lining

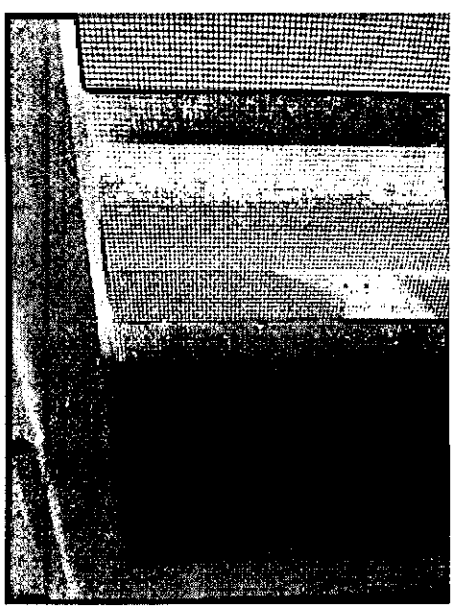
Fully sealed soffits

Vents

All vents have been screened with stainless steel mesh with a maximum aperture of 2mm.



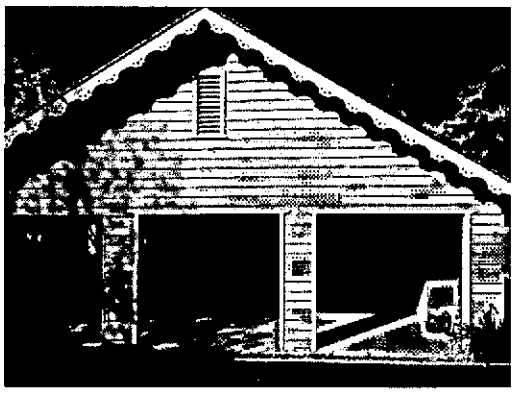
Meshed vent

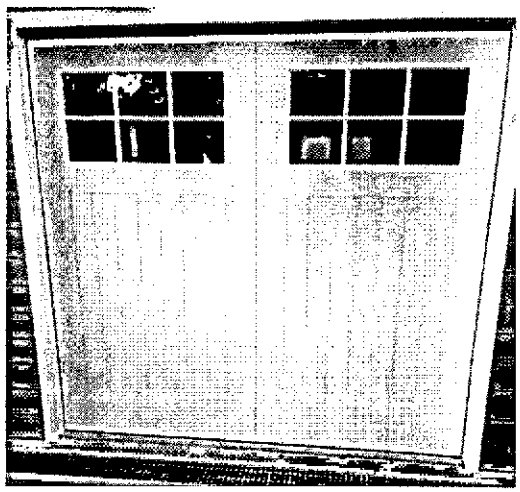


Close-up of mesh

Windows
The windows have been constructed of bushfire resisting timber. Refer to certificate from Windoor Pty Ltd following this report.

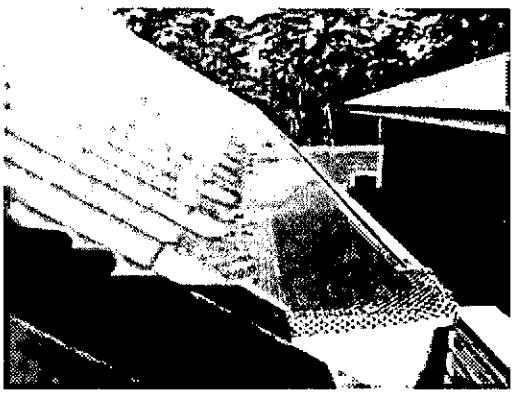
Doors
All doors are either non combustible (the tilt-a-door Garage doors) or are solid timber doors with a minimum thickness of 35mm and constructed of bushfire resisting timber (the side doors). Refer to certificate from Windoor Pty Ltd following this report. The doors are fitted with suitable weather seals, draft excluders with a maximum gap of 3mm.





Roof
The roof is constructed of metal deck and is completely sarked. There is no gap at the junction of the roof and the wall.

Gutters
the gutters have non combustible leaf guards installed.



PART 2.4 HEALTH AND AMENITY

F2.4.1 Wet areas

FUNCTIONAL STATEMENTS

A building is to be constructed to avoid the likelihood of—

(a) the creation of any unhealthy or dangerous conditions; or
(b) damage to building elements,

caused by dampness or water overflow from bathrooms, laundries and the like.

PERFORMANCE REQUIREMENTS

To protect the structure of the building and to maintain the amenity of the occupants, water must be prevented from penetrating—

(a) behind fittings and linings; or
(b) into concealed spaces,

of sanitary facilities, bathrooms, laundries and the like.

COMMENT

The Garage has a wet area included inside its perimeter. The WC has been constructed to comply with all requirements of the BCA. Refer to the waterproofing certificate included at the end of this report.

F2.4.2 Room heights
FUNCTIONAL STATEMENTS

A building is to be constructed to provide height in a room or space suitable for the intended use.

PERFORMANCE REQUIREMENTS

A room or space must be of a height that does not unduly interfere with its intended function.

COMMENT

This requirement is not required for a Garage but the Wet Area has a room height that complies with the intent of the BCA.

F2.4.4 Light
FUNCTIONAL STATEMENTS

(a) A habitable room within a building is to be provided with openings to admit adequate natural light consistent with its function or use; and
(b) A space within a building used by occupants is to be provided with artificial lighting consistent with its function or use which, when activated in the absence of suitable natural light, will enable safe movement.

PERFORMANCE REQUIREMENTS

(a) A habitable room must be provided with windows so that natural light, when available, provides a level of illuminance appropriate to the function or use of that part of the building.
(b) Artificial lighting must be installed to provide a level of illuminance appropriate to the function or use of the building to enable safe movement by occupants.

COMMENT

This requirements is not required for a Garage as there are no habitable rooms.

F2.4.5 Ventilation
FUNCTIONAL STATEMENTS

A space used by occupants within a building is to be provided with adequate ventilation consistent with its function or use.

PERFORMANCE REQUIREMENTS

(a) A space within a building used by occupants must be provided with means of ventilation with outdoor air which will maintain adequate air quality.
(b) A mechanical air-handling system installed in a building must control—
    (i) the circulation of objectionable odours; and

(ii) the accumulation of harmful contamination by micro-organisms, pathogens and toxins.

(c) Contaminated air must be disposed of in a manner which does not unduly create a nuisance or hazard to people in the building or other property.

COMMENT

This requirements is not required for a Garage as there are no habitable rooms. The WC within the garage has been provided with ventilation through an opening window.

F2.4.6 Sound insulation
FUNCTIONAL STATEMENTS

A building element which separates dwellings is to be constructed to prevent undue sound transmission between those dwellings.

PERFORMANCE REQUIREMENTS

(a) Walls separating dwellings must provide insulation against the transmission of airborne sound sufficient to prevent illness or loss of amenity to the occupants.

(b) Walls separating a bathroom, sanitary compartment, laundry or kitchen in a dwelling from a habitable room (other than a kitchen) in an adjoining dwelling, must provide insulation against impact generated sound sufficient to prevent illness or loss of amenity to the occupants.

(c) The required sound insulation of walls must not be compromised by the incorporation or penetration of a pipe or other service element.

COMMENT

This requirements is not required for a Garage as there are no habitable rooms.

CERTIFICATES AND WARRANTIES

The following are a series of Certificates and warranties that have been provided by the consultants, contractors and suppliers for the Garage.

abvd design

Consulting Structural and Civil Engineers

48 O'Neill Street, Brighton-Le-Sands NSW 2216 Phone: 02 9587 9192

18 June 2014

STRUCTURAL CERTIFICATE

Re: Proposed Garage at: 152 Parkriver Close, Mulgoa

This is to certify that the garage footing raft slab has been constructed generally in accordance with structural details prepared by our firm. We certify that the slab is structurally adequate as constructed in accordance with AS1170, AS2870 and AS3600 requirements.

Yours faithfully,

D. Miladinovic, MIE Aust, CPEng

ABVD Design

A B C Frames and Trusses Pty Ltd
A.B.N. 72 134 563 321
Unit 4 - 14 Anne Street
ST. MARYS. NSW 2760
Ph. (02) 9623 3100 Fax. (02) 9675 4140

16th June 2014

Janice Clair
152 Parkriver Close,
MULGOA NSW 2745

RE: JOB @ 152 PARKRIVER CLOSE, MULGOA

The frame & roof trusses supplied to the above mentioned property were manufactured to the Building Code of Australia.

Yours sincerely,

Duilio Crosariol

APPLICATION
AND
PRODUCT WARRANTY

PRIMARY CONTRACTOR: JANICE CLAIR 152 PACKRIVER CLOSE MULGOA NSW 2745

PROJECT NAME: JANICE CLAIR

APPLICATOR: DAMIAL AIRABDALY

MANUFACTURER:

PERIOD OF GUARANTEE: 10 Years on Internal Wets Areas

COMMENCEMENT OF GUARANTEE: 1 BATHROOM

WARRANTY ISSUED FOR: 20/02/2014

All products and applications carried out at 152 PACKRIVER CLS MULGOA comply with Manufacturers requirements and Australian Standards AS3740, 2004 and F1.7 of the Building Code of Australia.

..... guarantee that the application of the waterproof membranes Supplied by the mentioned Manufacturer, satisfactorily meets all the requirements set by the Manufacturer, are managed and applied by the applicator to the Manufacturers recommendations The application of the product shall uphold it's characteristics as implied by the manufacturer for The period stated above.

This guarantee is subject to the special conditions.

.....
Director

LIC NO 196088

DATE: 27/02/2014