Richmond Race Club

Kennel additions

Site Address

Street Address	308-322 Londonderry Rd
Suburb	Londonderry
State	NSW
Postcode	2753

Revision	Date	Approved by

Company name	Barbara Tarnawski Architects Pty Ltd
ACN/ABN	80 610694392
Address details	PO Box 32 Kurrajong NSW 2758
Telephone/Fax/Email	0245731320

Contents

0131 PRELIMINARIES

1 GENERAL

1.1 THE SITE

Site restrictions

Site limitations: Comply with the restrictions on the use of the site.

Access: Comply with access on to and within the site, use of the site for temporary works and constructional plant, including working and storage areas, location of offices, workshops, sheds, roads and parking, as documented.

Occupied premises

General: For the parts of the site designated as occupied premises:

- Allow occupants to continue in secure possession and occupancy of the premises for the required period.
- Maintain safe access for occupants.
- Arrange work to minimise nuisance to occupants and for their safety.
- Protect occupants against weather, dust, dirt, water or other nuisance.

Proposals: Submit details of proposed methods.

- Purpose of submission: Information only.

Protection of persons and property

Temporary works: Provide and maintain required barricades, guards, fencing, shoring, temporary roadways, footpaths, signs, lighting, watching and traffic management.

Accessways and services: Do not obstruct or damage roadways and footpaths, drains and watercourses and other existing services in use on or adjacent to the site. Determine the location of such services.

Property: Do not interfere with or damage trees and property which are to remain on or adjacent to the site, including adjoining property encroaching onto the site.

Rectification

Accessways and services: Rectify immediately any obstruction or damage to roadways and footpaths, drains and watercourses and other existing services in use on or adjacent to the site. Provide temporary services whilst repairs are carried out.

Property: Rectify immediately any interference or damage to trees and property which are to remain on or adjacent to the site, including adjoining property encroaching onto the site.

Existing services

Service to be continued: Repair, divert or relocate, as documented.

Trenches: If the existing service crosses the line of a required trench, or will lose support when the trench is excavated, provide permanent support for the existing service.

Redundant services: Remove redundant parts and make safe.

Interruptions to services: Minimise the number and duration of interruptions.

Proposals: Submit proposals for action to be taken to existing services before starting this work.

- Purpose of submission: For review.

Adjoining properties

Notice: At least 10 working days before commencing work, submit to owners and occupants of adjoining property written notice of intention to commence work and an outline description of the type and extent of work.

Revealed encroachments: If the works reveal unknown encroachments of adjoining property on to the site or of existing site structures on to adjoining property, immediately seek instructions.

Records: For each adjoining property to be recorded:

- Inspect the property with the architect and owner and occupant of the property, before commencement of work.
- Make detailed records of conditions existing within the property, especially structural defects and other damage or defacement.
- Arrange for at least 2 copies of each record, including drawings, written descriptions, and photographs, endorsed by the owner and occupant of the property, or their representatives, as evidence of conditions existing before commencement of work.

Endorsed copies: Submit one endorsed copy of each record. Keep the other endorsed copy on site.

- Purpose of submission: Information only.

1.2 CONSTRUCTION PLANT

Access

Access route: As nominated and documented.

Parking

Owner's existing parking areas: Use spaces only in designated parking areas and as documented.

Use of existing services

General: Existing services may be used as temporary services for the performance of the contract subject to conditions of use, as documented.

Temporary services

General: Provide temporary services for the performance of the contract, as documented.

Project signboards

General: Provide project-specific signboards and as follows:

- Locate where directed.
- Maintain in good condition for duration of the work.
- Obtain permission for removal.
- Remove on completion.

1.3 BUILDING THE WORKS

Surveys

General: Use information from a licensed surveyor for the following:

- Setting out.
- Check surveys.
- Final survey.

Survey marks

Definition: A survey peg, bench mark, reference mark, signal, alignment, level mark or any other mark used or intended to be used for the purpose of setting out, checking or measuring the work.

Care of survey marks: Preserve and maintain the principal's survey marks in their true positions.

Rectification: If the survey marks are disturbed or obliterated, immediately rectify.

Safety
Accidents: Promptly notify the contract administrator of the occurrence of the following:

- Accidents involving death or personal injury.
- Accidents involving loss of time.
- Incidents with accident potential such as equipment failure, slides and cave-ins.

Accident reports: Submit reports of accidents.

- Purpose of submission: Information only.

Contractor's representative
General: Must be accessible, and fluent in English and technical terminology.

Subcontracting
General: Submit a complete list of proposed subcontractors and suppliers.

Items supplied by owner
General: Materials and other items supplied free of charge to the contractor for installation in the execution of the works, as documented.

Unload and take delivery, inspect for defects and take care of the items. If defects are found, advise. Return unused items to the principal.

1.4 COMPLETION OF THE WORKS

Reinstatement
General: Before the date for practical completion, clean and repair damage caused by installation or use of temporary work and restore existing facilities used during construction to original condition.

Adjoining properties
Evaluation: At practical completion, for each property recorded, inspect the property with the architect and owner and occupant of the property, recording any damage that has occurred since the pre-commencement inspection.

Pest eradication
General: Employ suitably qualified pest exterminators. At practical completion verify that completed works are free of pest types, as documented.

1.5 MISCELLANEOUS

Contractor and owner to observe confidentiality
Publicity: Do not issue information concerning the project for publication in the media without prior written approval of the owner.

Compliance with the law
Requirements of authorities: The Principal, before entering into the contract, has given the notices, paid the fees, and obtained the permits, approvals and other authorisations as documented.

0171 GENERAL REQUIREMENTS

1 GENERAL

1.1 APPLICABILITY

General
Requirement: Conform to *0171 General requirements*, as appropriate, in all worksections.

1.2 PERFORMANCE

Bushfire protection
Bushfire Attack Level (BAL) to AS 3959 and BCA 3.10.5, as documented.

Energy efficiency
Energy efficiency approval commitments: To the performance requirements of BCA 2.6, the construction requirements of BCA 3.12, and as documented.

Structural design actions
Standard: To the AS/NZS 1170 series and AS 4055 as appropriate.

Importance level to AS/NZS 1170.0: Level 2.

1.3 STANDARDS

Current editions
General: Use referenced Australian or other standards (including amendments), and the NCC including state and territory variations which are current three months before the date of the contract except where other editions or amendments are required by statutory authorities. Any local authority requirements take precedence.

1.4 INTERPRETATION

Abbreviations
General: For the purposes of this specification the following abbreviations apply:

- BCA: National Construction Code series Volume Two: Building Code of Australia Class 1 and Class 10 buildings.
- NCC: National Construction Code.

Definitions
General: For the purposes of this specification, the following definitions apply:

- Contractor: Means the same as builder.
- Documented: Documented, as documented and similar terms mean contained in the contract documents.
- Hot-dip galvanized: Zinc coated to AS/NZS 4680 after fabrication.
- Metallic-coated: Steel coated with zinc or aluminium-zinc alloy via a continuous hot-dip process.
- Owner: Owner has the same meaning as client, principal or proprietor and is the party to whom the contractor is legally bound to construct the works.
- Professional engineer: As defined by the NCC.
- Proprietary: Identifiable by naming manufacturer, supplier, installer, trade name, brand name, catalogue or reference number.
- Provide: Provide and similar expressions mean supply and install and include development of the design beyond that documented.
- Required: Means required by the contract documents, the local council or statutory authorities.

- Supply: Supply, furnish and similar expressions mean supply only.

2 PRODUCTS

2.1 GENERAL

Manufacturers' or suppliers' recommendations
General: Provide and select, if no selection is given, transport, deliver, store, handle, protect, finish, adjust and prepare for use the manufactured items in accordance with the current written recommendations and instructions of the manufacturer or supplier.

Proprietary items/systems/assemblies: Assemble, install or fix to substrate in accordance with the current written recommendations and instructions of the manufacturer or supplier.

Product identification
Sealed containers: If materials or products are supplied by the manufacturer in closed or sealed containers or packages, bring the material or products to point of use in the original containers or packages.

Substitution
Identified proprietary items: Identification of a proprietary item does not necessarily imply exclusive preference for the identified item, but indicates the necessary properties of the item.

Alternatives: If alternatives to the documented products, methods or systems are proposed, submit sufficient information to permit evaluation of the proposed alternatives.

2.2 TIMBER

Moisture content
General: Make milled products from timbers seasoned as follows:

- To within 3% of the equilibrium moisture content appropriate to the timber and its intended conditions of use.
- With no more than 3% difference between any 2 pieces in any one group.

Acclimatisation
General: Acclimatise timber fitouts by stacking them for two weeks in the in-service conditions with air circulation to all surfaces after the following are complete:

- Air conditioning operational.
- Lighting operational.
- Site drainage and stormwater works are complete.
- Space fully enclosed and secure.
- Wet work complete and dry.

Unseasoned timber
General: If unseasoned timber is provided, or variation in moisture content is likely, make allowance for shrinkage, swelling and differential movement.

Recycled timber
Grit blasted or re-machined: Remove all nails and screws.

Classification: Visually graded.

Durability
General: Provide timbers with natural durability appropriate to the conditions of use or preservative-treated timbers of equivalent durability.

Natural durability class of heartwood: To AS 5604.

Preservative treatment: To the AS 1604 series.

Minimum requirement: To the **Natural and treated timber durability table**.

Natural and treated timber durability table

Exposure	**Natural timber**	**Treated timber**	**Remarks**
	Required durability class to AS 5604	**Required hazard class to the AS 1604 series**	
Inside, above ground. Completely protected from the weather. Well ventilated	Class 4	H1	Treated timber resistant to lyctids. Untreated timber must be protected from termites
Inside, above ground. Protected from wetting with nil leaching. Well ventilated	Class 3	H2	Treated timber resistant to borers and termites. Untreated timber must be protected with a finish
Above ground, exposed to weather. Periodic moderate wetting and leaching	Class 2	H3	Treated timber resistant to borers, termites and moderate decay. Applicable to weatherboards, fascias, pergolas (above ground), window joinery, framing and decking
In-ground	Class 1	H4 (Severe wetting and leaching)	Treated timber resistant to borers, termites and severe decay. Applicable to fence posts, greenhouses, pergolas (in-ground) and landscaping timbers
		H5 (Extreme wetting and leaching and/or critical uses)	Applicable to retaining walls, piling, house stumps, building poles, cooling tower fill

2.3 STEEL

Durability

General: Provide steel products protected from corrosion to suit the conditions of use.

Internal engineer designed steel members: Remove mill scale, rust, moisture and oil. Coat with a zinc phosphate primer to the manufacturer's instructions.

Built-in products below damp proof course: Stainless steel 316 or engineered polymer.

Corrosion resistance

General: Conform to the atmospheric corrosivity category as defined in AS 4312, the AS/NZS 2312 series, and as documented.

Compliance: Conform to the **Corrosion resistance table** or provide proprietary products with metallic and/or organic coatings of equivalent corrosion resistance.

Corrosion resistance table

Atmospheric corrosivity category to AS 4312	Heavy steel members including lintels more than 3.2 mm thick	Steel cladding, lining, trims and flashings
C1 and C2 (Low)	Galvanize after fabrication 600 g/m^2	Metallic-coated sheet AZ150
C3 (Medium)	Galvanize after fabrication 600 g/m^2	Metallic-coated sheet AZ200
C4 and T (High)	Stainless steel 316 or 316L or galvanize after fabrication 600 g/m^2 plus organic coating	Metallic-coated sheet AZ200 plus organic coating

Preparation and pre-treatment
Standard: To the AS 1627 series.

Galvanizing
General: Galvanize mild steel components (including fasteners) to AS 1214, AS 1397 or AS/NZS 4680, as appropriate, and in the following conditions:

- Exposed to weather.
- Embedded in masonry.
- Exposed to or in air spaces behind external leaves of masonry walls.
- In contact with chemically treated timber.

2.4 PROTECTIVE COATINGS

General
Environment: To AS 2312.1 clause 2.3.

Coating designation: To AS 2312.1 Table 6.3.

CCA (copper chrome arsenic) treated timber
Greasing: Before placing bolts or other metal components in contact with CCA-treated timber, paint contact surfaces or coat in grease or a bituminous coating.

Unseasoned timber
General: Do not fix in contact with steel framing without fully painting the contact surfaces of timber and steel.

2.5 FASTENERS

Self-drilling screws
Standard: To AS 3566.1.

3 EXECUTION

3.1 WALL CHASING

Holes and chases
General: Make holes and chases required in masonry walls so that the structural integrity of the wall is maintained. Do not chase walls nominated as fire or acoustic rated.

Parallel chases or recesses on opposite faces of a wall: Not closer than 600 mm to each other.

Chasing in blockwork: Chase only core-filled hollow blocks or solid blocks not designated as structural.

Concrete blockwork chasing table

Block thickness (mm)	Maximum depth of chase (mm)
190	35
140	25
90	20

3.2 FIXING

General

Suitability: If equipment is not suitable for fixing to non-structural building elements, fix directly to structure and trim around penetrations in non-structural elements.

Fasteners

Sufficiency: Use proprietary fasteners capable of transmitting the loads imposed, and sufficient for the rigidity of the assembly.

3.3 FOOTPATH CROSSING

General

Requirement: Provide a footpath and kerb crossing to local authority requirements.

3.4 COMPLETION

General

Removal of temporary work, services and plant: Remove temporary work services and construction plant within 10 working days after occupation of the works.

Final cleaning: Remove rubbish and surplus material from the site and clean the works throughout including interior and exterior surfaces exposed to view. Vacuum clean carpeted and soft surfaces. Clean debris from the site, roofs, gutters, downpipes and drainage systems.

Samples: Remove non-incorporated samples, sample panels and prototypes.

Warranties: Register with manufacturers, as necessary, and provide copies of manufacturers' warranties.

Instruction manuals: Provide the manufacturers' instruction manuals.

Operation: Make sure moving parts operate safely and smoothly.

Surveyor's certificate: Provide a certificate which confirms that the work, including boundary fences, has been correctly located.

Services layout: Provide a plan which shows the location of underground services.

Authorities' approvals: Provide evidence of approval of the local authority or principal accredited certifier and statutory authorities whose requirements apply to the work.

Keys: Provide two keys for each set of locks keyed alike and two keys for each lock keyed to differ.

0184 TERMITE MANAGEMENT

1 GENERAL

1.1 STANDARDS

General
Standard: To AS 3660.1.

Chemical soil barriers – reticulation systems
Type testing: To AS 3660.3 Section 5.

Termite management system notice
Requirement: Permanently fix a durable notice in a prominent location to BCA 3.1.4.4.

Certification
Requirement: Submit installation certificate to AS 3660.1 Appendix A3.

0201 DEMOLITION

1 GENERAL

1.1 STANDARDS

Demolition
Standard: To AS 2601.

1.2 SUBMISSIONS

Records
Dilapidation record:

- Before demolition: Submit to each owner of each adjacent property a copy of the part of the record relating to that property and obtain their written agreement to the contents of the record.
- Rectification work: Submit written acceptance of rectification works from the owner of each adjoining property affected.

2 PRODUCTS

2.1 DEMOLISHED MATERIALS

General
Removal: Except for items to be recovered for re-use in the works, or delivery to the owner and materials to be recycled in the works, take possession of demolished materials and remove them from the site. Do not burn or bury demolished materials on the site. Prevent spillage of demolished materials in transit.

Recycling: If possible, dismantle building components for off-site recycling.

3 EXECUTION

3.1 PROTECTION

Encroachment
General: Prevent the encroachment of demolished materials onto adjoining property, including public places.

3.2 DEMOLITION

Hazardous materials removal
Standard: To AS 2601 clause 1.6.2.

Notice of completion
General: Give at least 5 working days' notice of completion of demolition so that adjacent structures may be inspected following completion of demolition.

Reinstatement
Assessment of damage: Use the dilapidation record to assess the damage and rectification work arising from the demolition work.

Rectification: Repair damage arising out of demolition work. Obtain written acceptance from the owner of each adjoining property of the completeness and standard of the rectification work.

0222 EARTHWORK

1 GENERAL

1.1 STANDARDS

General

Earthwork: To the recommendations of AS 3798.

1.2 INTERPRETATION

Definitions

General: For the purposes of this worksection the following definitions apply:

- Site classification: To AS 2870 and BCA 3.2.4.
- Subgrade: The trimmed or prepared portion of the formation on which the pavement, footing or slab is constructed. Generally taken to relate to the upper line of the formation.
- Zone of influence: A foundation zone bounded by planes extending downward and outward from the bottom edge of a footing, slab or pavement and defining the extent of foundation material having influence on the stability or support of the footings, slab or pavement.
- Bad ground: Ground unsuitable for the purposes of the works, including fill liable to subsidence, ground containing cavities, faults or fissures, ground contaminated by harmful substances and ground which is, or becomes, soft, wet or unstable.
- Rock: Monolithic material with volume greater than 0.5 m^3 which cannot be removed until broken up by rippers or percussion tools.

2 PRODUCTS

2.1 FILL MATERIALS

General

Suitable material: To AS 3798 clause 4.4 including inorganic, non-perishable material suitably graded and capable of compaction to the documented density.

Unsuitable materials: Do not use unsuitable material for fill in conformance with AS 3798 clause 4.3.

3 EXECUTION

3.1 GEOTECHNICAL

As found site conditions

General: If the following are encountered, give notice immediately and obtain instructions before carrying out any further work in the affected area:

- Bad ground.
- Rock.

3.2 REMOVAL OF TOPSOIL

General

Extent: Areas of cut or fill and areas occupied by structures, pavements and embankments.

Maximum depth: 200 mm.

Soil removal: Remove topsoil unsuitable for re-use from the site to AS 3798 clause 6.1.8.

Topsoil stockpiles

General: Stockpile site topsoil intended for re-use and imported topsoil where necessary.

Stockpile heights: Establish stockpiles to maximum height of 1.5 m.

Protection: Protect the topsoil stockpiles from contamination by other excavated material, weeds and building debris.

3.3 EXCAVATION

Extent

Site surface: Excavate over the site to give correct levels and profiles required as the basis for structures, paving and landscaping. Make allowance for compaction or settlement or heaving.

Footings: Excavate for footings to the required sizes and depths. Confirm that the foundation conditions meet the design bearing capacity.

Crawl space: Provide a clear space under timber or steel bearers:

- Minimum clearance: 400 mm.

Rock

General: Do not use explosives.

Existing footings

Requirement: If excavation is required within the zone of influence of an existing footing, use methods including (temporary) shoring and underpinning that maintain the support of the footing and make sure that the structure and finishes supported by the footing are not damaged.

Existing services

Utility services: Contact DIAL BEFORE YOU DIG to identify location of underground utility services pipes and cables.

Bearing surfaces

General: Provide even plane bearing surfaces for loadbearing elements including footings. Step to accommodate level changes. Make the steps to the appropriate courses if supporting masonry.

Reinstatement of excavation

Requirement: If excavation exceeds the required depth, or deteriorates, reinstate with fill to the correct depth, level and bearing value.

Grading

External areas: Grade to give falls away from buildings, minimum 1:100.

Subfloor areas: Grade the ground surface under suspended floors to drain ground or surface water away from buildings without ponding.

3.4 PREPARATION FOR FILLING

Preparation

Stripping: Prepare the ground surface before placing fill (including topsoil fill), ground slabs or load bearing elements to AS 3798 clause 6.1.5. Remove materials which will inhibit or prevent satisfactory placement of fill layers, loose material, debris and organic matter.

3.5 PLACING FILL

General

Placement: To BCA 3.2.2.

Layers: Place fill in near-horizontal layers of uniform thickness no greater than 150 mm after compaction, deposited systematically across the fill area.

Placing at structures: Place and compact fill in layers simultaneously on both sides of structures, culverts and pipelines to avoid differential loading.

Moisture content: Adjust the moisture content of fill during compaction within the range of 85 – 115% of the optimum moisture content determined by AS 1289.5.1.1 or AS 1289.5.2.1 as appropriate, in order to achieve the required density.

Compaction

Density: Compact the subgrade and each layer of fill to the required depth and density, as a systematic construction operation. Shape surfaces to provide drainage and prevent ponding.

Excavated and stripped ground surface: After excavation and/or stripping, compact these surfaces to minimum depth of 150 mm.

Minimum relative compaction: To AS 3798 Table 5.1.

0223 SERVICE TRENCHING

1 PRODUCTS

1.1 FILL MATERIALS

General

Backfill material: To **FILL MATERIALS** in *0222 Earthwork*, free from stones larger than 100 mm maximum dimension and as follows:

- Next to services: Do not place any particles greater in size than 25 mm within 150 mm of services.
- Under paved areas and within 4 m of structures: Coarse sand, controlled low strength material or fine crushed rock.
- In reactive clay: In sites classified M, M-D, H1, H1-D, H2, H2-D, E or E-D to AS 2870, re-use excavated site material at a moisture content within ± 1% of that of the adjoining in situ clay.

2 EXECUTION

2.1 EXISTING SURFACES

Concrete and asphalt pavements

Method: Sawcut trench set-out lines for the full depths of the bound pavement layers except where the set out line is located along expansion joints.

Paving units

Removal: Take up paving units both full and cut by hand, between the trench set out lines, and neatly stack on wooden pallets at locations as directed.

2.2 EXCAVATING

Excavation

General: Excavate for underground services in conformance with the following:

- To required lines and levels, with uniform grades.
- Straight between access chambers, inspection points and junctions.
- With stable sides.

Trench widths

General: Keep trench widths to the minimum consistent with the laying and bedding of the relevant service and construction of access chambers and pits.

2.3 TRENCH BACKFILL

General

Place fill: To **PLACING FILL** in *0222 Earthwork*.

Timing: Backfill service trenches as soon as possible after laying and bedding the service, if possible on the same working day.

Layers: Compact all material in layers not exceeding 150 mm compacted thickness. Compact each layer to the relative compaction specified before the next layer is commenced.

2.4 SURFACE RESTORATION

General

Reinstatement: Reinstate existing surfaces removed or disturbed by trench excavation to match existing and adjacent work.

0310 CONCRETE

1 GENERAL

1.1 STANDARDS

General

Formwork design and construction: To AS 3610.1.

Plywood formwork: To AS 6669.

Reinforced concrete construction: To AS 3600.

Specification and supply of concrete: To AS 1379.

Residential ground slabs and footings: To AS 2870.

1.2 INTERPRETATION

Definitions

General: For the purposes of this worksection the following definitions apply:

- Ambient temperature: The air temperature at the time of mixing and placing of concrete.
- Average ambient temperature: Average value of the daily maximum and minimum ambient temperatures over the relevant period at a site.
- Weather - Cold: Ambient shade temperature < 10°C.
- Weather - Hot: Ambient shade temperature > 30°C.

1.3 TOLERANCES

Finishes

Formed surface finish quality: To AS 3610.1 Table 3.3.3.1 and the following:

- Visible: Class 3.
- Not visible: Class 5.

Unformed surfaces flatness: To the **Flatness tolerance class table**, for the documented class of finish, using a straightedge placed anywhere on the surface in any direction.

Flatness tolerance class table

Class	Measurement	Maximum deviation (mm)
A	2 m straightedge	4
B	3 m straightedge	6
C	600 mm straightedge	6

2 PRODUCTS

2.1 MATERIALS

Cement

Standard: To AS 3972.

Age: Less than 6 months old.

Storage: Store cement bags under cover and above ground.

Pre-mixed concrete supply
Standard: To AS 1379 by the batch production process.

Maximum slump: 100 mm.

Reinforcement
Standard: To AS/NZS 4671.

Polymeric film underlay
Vapour barriers and damp-proofing membranes: To AS 2870 clause 5.3.3.

Minimum thickness: 0.2 mm.

Curing compounds
Standard: To AS 3799.

2.2 FORMWORK

General
Trapped forms: Free of timber or chlorides and not to impair the structural performance of the concrete members.

Design
Formwork: The design of the formwork is the contractor's responsibility.

Plywood forms
Material: To AS 6669.

Grade: Use appropriate grade for the documented design dimensions, loading and surface quality.

Joints: Seal the joints consistent with the documented surface finish class.

Tolerances: To AS 3610.1 Section 3.

3 EXECUTION

3.1 POLYMERIC FILM UNDERLAY

Location
Requirement: Under slabs on ground including integral ground beams and footings, provide a vapour barrier or, in areas prone to rising damp or salt attack, a damp-proofing membrane.

3.2 FORMWORK

Substrates
Cleaning: Before placing concrete, remove free water, dust, debris and stains from the formwork and the formed space.

Corners
Work above ground: Chamfer at re-entrant angles, and fillet at corners.

- Face of bevel: 25 mm.

Void formers
Protection: Keep void formers dry until use, install on a firm level surface and place reinforcement and concrete with minimum delay.

3.3 REINFORCEMENT

Supports

Concrete, metal or plastic supports: Provide as follows:

- Able to withstand construction and traffic loads.
- With a protective coating if they are ferrous metal, located within the concrete cover zone, or are used with galvanized or zinc-coated reinforcement.

Spacing:

- Bars: ≤ 60 diameters.
- Mesh: ≤ 600 mm.

Supports over membranes: Prevent damage to waterproofing membranes or vapour barriers. If appropriate, place a metal or plastic plate under each support.

Projecting reinforcement

Protection: If starter or other bars extend beyond reinforcement mats or cages, through formwork or from cast concrete, provide a plastic protective cap to each bar until it is cast into later work.

Tying

Requirement: Secure the reinforcement against displacement at intersections with either wire ties, or clips. Bend the ends of wire ties away from nearby faces of formwork or unformed faces to prevent the ties projecting into the concrete cover.

Bar lapping

Requirement: Minimum lap as follows:

- Mesh sheets: Overlap by a minimum of 2 cross bars.
- Trench mesh: 500 mm.
- Bars: Greater of either 500 mm or 25 x bar diameter.
- Strip footing intersections and corners: Full width of intersecting reinforcement.

3.4 CONCRETE

Placing

Method: Avoid segregation and loss of concrete, and minimise plastic settlement. Maintain a nominally vertical and plastic concrete edge during placement.

Horizontal elements: Place concrete in layers not more than 300 mm thick. Compact the following layer into previous layer before previous layer has taken initial set.

Compaction

Methods: Use immersion and screed vibrators accompanied by hand methods as appropriate to remove entrapped air and to fully compact the mix.

Vibrators: Do not allow vibrators to contact set concrete, reinforcement or items including pipes and conduits embedded in concrete. Do not use vibrators to move concrete along the formwork. Avoid causing segregation by over-vibration.

Rain

Protection: During placement and before setting, protect the surface from damage.

Placing in cold weather

Temperature limits: Maintain the following:

- Freshly mixed concrete: ≥ 5°C.
- Forms and reinforcement before and during placing: ≥ 5°C.

- Water: Maximum 60°C when placed in mixer.

Temperature control: Heat the concrete materials, other than cement, to the minimum temperature necessary so that the temperature of the placed concrete is ≥ 5°C .

Placing in hot weather

Temperature limits: Maintain the following:

- Freshly mixed concrete ≤ 35°C.
- Forms and reinforcement before and during placing: ≤ 35°C.

Temperature control: Select one or more of the following methods of maintaining the temperature of the placed concrete at 35°C or less:

- Cover the horizontal transport containers.
- Spray the coarse aggregate using cold water prior to mixing.
- Use chilled mixing water or ice.

Evaporation control barriers: Erect barriers to protect freshly placed concrete from drying winds.

3.5 CURING

General

Requirements: Taking into account the average ambient temperature at site over the relevant period affecting the curing, adopt procedures to make sure of the following:

- Curing: Cure continuously from completion of finishing, when the concrete has set sufficiently not to be damaged by the curing process, until the minimum total cumulative number of days or fractions of days, during which the air temperature in contact with the concrete is above 10°C, conforms to the following:
  - Fully enclosed internal surfaces: 3 days.
  - Other concrete surfaces: 7 days.
- End of curing period: Prevent rapid drying out at the end of the curing period.
- Protection: Maintain at a reasonably constant temperature with minimum moisture loss, during the curing period.

Curing compounds

Liquid membrane forming compounds: Provide a uniform continuous flexible coating without visible breaks or pinholes, which remains unbroken for at least the required curing period after application.

Substrates: Do not use wax-based or chlorinated rubber-based curing compounds on surfaces forming substrates to applied finishes, concrete toppings and cement-based render.

Cold weather curing

Temperature: Maintain concrete surface temperature above 5°C for the duration of the curing period.

Hot weather curing

Requirement: If the concrete temperature exceeds 25°C, or the ambient shade temperature exceeds 30°c, protect from drying winds and sun by using an evaporative retarder until curing is commenced.

Water curing

Method: Select a method of ponding or continuously sprinkling water to prevent damage to the concrete surface during the required curing period.

3.6 JOINTS

Construction joints

Location: Do not relocate or eliminate construction joints, or form undocumented construction joints. If emergency construction joints are made necessary by unforeseen interruptions to the concrete pour, submit a report on the action taken.

Preparation: Roughen and clean the hardened concrete joint surface. Remove loose or soft material, free water, foreign matter and laitance. Dampen the surface just before placing the fresh concrete and coat with a neat cement slurry.

Slip joints

Requirement: If concrete slabs are supported on masonry, provide proprietary slip joints.

3.7 FORMED SURFACES

General

Damage: Do not damage concrete works through premature removal of formwork.

Curing

General: If formwork is stripped before the minimum curing period for the concrete has elapsed, continue curing the exposed faces as soon as the stripping is completed.

Surface repairs

Method: If surface repairs are required, submit proposals.

3.8 UNFORMED SURFACES

Surface finishes

General: As documented.

Surface repairs

Method: If surface repairs are required, submit proposals.

3.9 COMPLETION

Formwork removal

Extent: Remove formwork, other than trapped forms, including formwork in concealed locations.

Timing: Do not disturb formwork until concrete has reached sufficient hardness to withstand formwork movements and removal without damage.

Stripping times: Leave formwork for suspended structures in place after pouring concrete for the following periods:

- Vertical surfaces: To AS 3610.1 Appendix C Table C2.
- Horizontal surfaces: To AS 3600 clause 17.6.2.

Protection

General: Protect the concrete from damage due to construction loads, physical and thermal shocks and excessive vibrations, particularly during the curing period.

Surface protection: Protect finished concrete surfaces and applied finishes from damage.

0331 BRICK AND BLOCK CONSTRUCTION

1 GENERAL

1.1 STANDARD

General
Materials and construction: To AS 4773.1 and AS 4773.2.

2 PRODUCTS

2.1 DURABILITY

General
Exposure environment: To AS 4773.1 clause 4.3.

Exposure locations: To AS 4773.1 clause 4.4.

2.2 MATERIALS

Bricks and blocks
Standard: To AS/NZS 4455.1 and AS/NZS 4455.3.

Minimum age of clay bricks: 7 days.

Salt attack resistance grade: To AS 4773.2 Table 2.1.

Mortar materials
Sand: Fine aggregate with a low clay content and free from efflorescing salts, selected for colour and grading.

Mortar mixes: To AS 4773.1 Table 3.1

2.3 BUILT-IN COMPONENTS

General
Durability class of built-in components: To AS 4773.1 Table 4.1.

Steel lintels
Angles and flats: Sizes to AS 4773.1 Table 12.2.

Cold-formed lintels: Designed to AS/NZS 4600.

Corrosion protection: To AS/NZS 2699.3.

Galvanizing: Do not cut after galvanizing.

Wall ties
Standard: To AS/NZS 2699.1.

Type: A.

Corrosion protection: To AS/NZS 2699.1.

Connectors and accessories
Standard: To AS/NZS 2699.2.

Corrosion protection: To AS/NZS 2699.2.

Flashings and damp-proof courses
Standard: To AS/NZS 2904.

3 EXECUTION

3.1 GENERAL

Mortar mixing
General: Measure volumes accurately to the documented proportions. Machine mix for at least six minutes.

Protection
Masonry materials and components: Protect from ground moisture and contamination.

During construction: Cover top surface of brickwork and blockwork to prevent the entry of rainwater and contaminants.

Bond
Type: Stretcher bond.

Building in
Embedded items: Build in wall ties and accessories as the construction proceeds. If not practicable to obtain the required embedment within the mortar joint in hollow masonry units, fill appropriate cores with grout or mortar.

Joining to existing
General: Provide a control joint where joining to existing structures. Do not tooth new masonry into existing work unless approved by a professional engineer.

Mortar joints
General: Set out masonry with joints of uniform width and the minimum of cutting of masonry units.

Solid and cored units: Lay on a full bed of mortar. Fill perpends solid. Cut mortar flush.

Face-shell bedded hollow units: Fill perpends solid. Cut mortar flush.

Joint thickness: 10 mm.

Finish: Conform to the following:

- Externally: Tool to give a dense water-shedding finish.
- Internally: If wall is to be plastered, do not rake more than 10 mm to give a key.

Rate of construction
General: Regulate the rate of construction to eliminate joint deformation, slumping or instability.

Rods
Set-out: Construct masonry to the following rods:

- 75 mm high units: 7 courses to 600 mm.
- 90 mm high units: 6 courses to 600 mm.
- 190 mm high units: 3 courses to 600 mm.

3.2 FACEWORK

Cleaning
General: Clean progressively as the work proceeds to remove mortar smears, stains and discolouration. Do not erode joints if using pressure spraying.

Acid solution: Do not use.

Colour mixing
Distribution: In facework, distribute the colour range of units evenly to prevent colour concentrations and banding.

Sills and thresholds
General: Solidly bed sills and thresholds and lay them with the top surfaces drain away from the building.

Minimum size of unit: Three quarters full width.

3.3 SUBFLOOR WORK

Bearer piers
Provide engaged or free standing unreinforced masonry piers to support bearers at 1800 mm maximum centres and to the **Bearer pier table**.

Bearer pier table

Type	Minimum size (mm)
Engaged	230 x 110 bonded or tied to walls
Freestanding up to 1500 mm high	230 x 230
Freestanding 1500 to 2700 mm high	350 x 350

Access openings
General: In internal walls, leave door-width openings beneath doorways to give access to underfloor areas.

Air vent location
General: Provide air vents to give adequate cross ventilation to the space under suspended ground floors.

Cavity walls: Provide matching vents in the internal leaves located as near as practicable to the air vents in the external leaves.

Location: Below damp-proof course to internal and external walls.

Minimum provision: 6000 mm^2 net ventilation area per linear metre of wall.

Underpinning
Requirement: Install underpinning while maintaining the building undamaged.

Grouting: Pack dry mix M4 mortar between underpinning and existing structure within 24 and 48 hours of completion of each panel of underpinning.

3.4 CAVITY WORK

Cavity clearance
General: Keep cavities clear at all times.

Cavity fill
General: Fill the cavity with mortar to 1 course above adjacent finished (ground) level. Fall the top surface towards the outer leaf.

Cavity width
General: Construct minimum cavity widths in conformance with the following:

- Masonry walls: 50 mm.
- Masonry veneer walls: 40 mm between the masonry leaf and the loadbearing frame and 25 mm minimum between the masonry leaf and sheet bracing.

Openings

Jambs of external openings: Do not close the cavity.

Wall ties, connectors and accessories

Protection: Install to prevent water passing across the cavity.

3.5 DAMP-PROOF COURSES

Location

General: Locate damp-proof courses as follows:

- Timber floors: In the first course below the level of the underside of ground floor timbers in internal walls and inner leaves of cavity walls.
- Cavity walls built off slabs on ground: In the bottom course of the outer leaf, continuous horizontally across the cavity and up the inner face bedded in mortar, turned 30 mm into the inner leaf 1 course above.
- Masonry veneer construction: In the bottom course of the outer leaf, continuous horizontally across the cavity. Fastened to the inner frame 75 mm above floor level.
- Walls adjoining infill floor slabs on membranes: In the course above the underside of the slab in internal walls and inner leaves of cavity walls. Project 40 mm and dress down over the membrane turned up against the wall.

Height: Not less than:

- 150 mm above the adjacent finished ground level.
- 75 mm above the finished paved or concrete area.
- 50 mm above the finished paved or concreted area and protected from the direct effect of the weather.

Installation

General: Lay in long lengths. Lap the full width of angles and intersections and 150 mm at joints. Step as necessary, but not more than 2 courses per step for brickwork and 1 course per step for blockwork. Sandwich damp-proof courses between mortar.

Junctions: Preserve continuity of damp-proofing at junctions of damp-proof courses and waterproof membranes.

3.6 FLASHINGS

Location

General: Locate flashings as follows:

- Floors: Full width of outer leaf immediately above slab, continuous across cavity and up the inner face bedded in mortar, turned 30 mm into the inner leaf 2 courses above for brick and 1 course for block. If the slab supports the outer skin and is not rebated, bed the flashing in a suitable sealant.
- Under sills: 30 mm into the outer leaf bed joint 1 course below the sill, extending up across the cavity and under the sill in the inner leaf or the frame for masonry veneer. Extend at least 150 mm beyond the reveals on each side of the opening.
- Over lintels to openings: Full width of outer leaf immediately above the lintel, continuous across cavity, turned 30 mm into the inner leaf 2 courses above for brick and 1 course for block or turned up against the frame and fastened to it. Extend at least 150 mm beyond the ends of the lintels.
- At abutments with structural frames or supports: Vertical flash in the cavity from 150 mm wide material, wedged and grouted into a groove in the frame opposite the cavity.
- At jambs: Vertically flash jamb extending 75 mm into the cavity, interleaved with the sill and head flashing at each end. Fix to jambs.

- At roof abutments with cavity walls: Cavity flash immediately above the roof and over-flash the roof apron flashing.

Installation
General: Sandwich flashings between mortar except where on lintels.

Pointing: Point up joints around flashings to fill voids.

Weepholes
Location: Provide weepholes to external leaves of cavity walls in the course immediately above flashings, and cavity fill, and at the bottoms of unfilled cavities.

Form: Open perpends.

Maximum spacing: 1200 mm.

Weephole guards: Provide access barrier.

3.7 WALL TIES

Location
Spacing: To AS 4773.2 clause 9.7 and clause 10.6.

Installation
Embedment: At least 50 mm into mortar ensuring that mortar cover is 15 mm minimum to the outside face of the mortar.

3.8 CONTROL JOINTS

General
Location and spacing: Provide contraction joints, expansion joints and articulation joints to AS 4773.2 Section 7.

Control joint filling
Installation: Clean the joints thoroughly and insert an easily compressible backing material before sealing.

Sealant depth: Fill the joints with a gun-applied flexible sealant for a depth of at least two-thirds the joint width.

Sealant type: External: UV stable.

Flexible masonry ties
Requirement: Provide stabilising ties at control joints and abutting structural elements, including columns, beams and slab soffits.

3.9 LINTELS

Installation
General: Do not cut on site. Keep lintels 10 mm clear of heads of frames.

Steel lintels: Pack mortar between any vertical component and supported masonry units. For angles install with the long leg vertical.

Propping: Provide temporary props to lintels to prevent deflection or rotation.

0382 LIGHT TIMBER FRAMING

1 GENERAL

1.1 STANDARDS

General

Framing: To AS 1684.2, AS 1684.3 or AS 1684.4, as appropriate.

Design: To AS 1720.3.

Nailplated roof trusses: To AS 1720.5.

1.2 SUBMISSIONS

Design

General: Where the structural drawings define performance criteria, submit independent design, documentation and certification from a professional engineer, including for the erected work.

Reactions: Provide location and magnitude of reactions to be accommodated by the support structure.

Floor and wall frame member sizes: Submit a schedule of proposed member sizes, certified as meeting stated project, AS 1684 series and AS 1720.3 requirements for span, spacings, loadings and deflections.

Preservative treatment

CCA treated timber: If proposed to be used, submit details.

Shop drawings

Requirement: Submit shop drawings, to a scale that best describes the detail, or product design guide certified by a professional engineer stating that the design has been carried out to AS 1684 series and AS 1720.3 requirements for the documented configurations and loadings.

Prefabricated roof trusses: Include the following:

- Plan: Truss layout.
- Elevations: Arrangement of members allowing for the accommodation of in-roof services and the size and section type of each member.
- Camber of bottom chord.
- Method of assembly, connection, lifting, holding down and bracing.

Prefabricated wall frames: Include the following:

- Plan: Wall layout.
- Elevations: Arrangement of members, and the size and section type of each member.
- Method of assembly, connection, lifting, holding down and bracing.

2 PRODUCTS

2.1 GENERAL

Storage and handling

General: Do not distort or damage timber or timber products.

Moisture content: Maintain the equilibrium moisture content of seasoned timber.

Protection from weather: Provide temporary protection for members until permanent covering is in place.

2.2 TIMBER

Fascia, valley and barge boards
Hardwood: To AS 2796.1.

Softwood: To AS 4785.1.

2.3 COMPONENTS

Fasteners
Installation: Do not split or otherwise damage the timber.

Coating: Before placing bolts in contact with CCA treated timber, coat the shank of the bolt in a grease or bituminous coating.

3 EXECUTION

3.1 ROOF AND CEILING FRAMING

Wall plates
Fixing: Fix timber wall plates to masonry, with either straps, bolts or both.

Fixing plates
General: Provide 45 mm minimum thick timber fixing plates to transfer the design loads where timber joists, rafters or purlins bear on or into steel members. Bolt to the steel member at maximum 500 mm centres and maximum 100 mm from the end of the fixing plate.

Beam framing
Ridge straps: Butt ends of rafters together at ridge, and strap each pair together with 900 mm long steel strap passing over the ridge, triple nail to each rafter.

Supports for water containers
General: If a water container or heater is located in the roof space, provide a support platform to AS/NZS 3500.4 clause 5.5.1.

Additional support
General: Provide a frame member behind every joint in fibre cement sheeting or lining.

Anti-ponding boards
Standard: To AS 4200.2.

3.2 TRUSSES

Marking
General: Permanently mark each truss to show:

- Project identification.
- Manufacturer.
- Tag or number.
- Location.
- Support points.

Installation
Nailplated prefabricated roof trusses: To AS 4440.

Support: Support trusses on bottom chord at two points only, unless designed for additional support.

Plumb: The lessor of H/50 or 50 mm, where H is the height of the truss at the point where plumb is being measured.

Vertical movement: Provide at least 10 mm vertical clearance plus ceiling batten depth over internal non-load bearing walls. Use bracing methods that accommodate the design vertical movements.

3.3 ROOF TRIM

Fascia, valley and barge boards
Requirement: Fix fascia, valley gutter boards and barge boards.

3.4 COMPLETION

Fasteners
Requirement: Make sure all bolts, screws and other fixings have been tightened so that joints and anchorages are secure at practical completion.

Cleaning
General: On completion of framing remove debris from any gaps between members and make sure void between bottom chord of trusses and top of any non-supporting internal walls is clear.

0421 ROOFING

1 PRODUCTS

1.1 COMPONENTS

Fasteners
Prefinished exposed fasteners: Finish with an oven baked polymer coating to match the roofing material.

Insulation spacers
Description: Proprietary spacer system to prevent excessive compression of insulation between roof sheeting and framing.

1.2 MATERIALS

Sheet metal roofing
Standard: To AS 1562.1.

Corrosion protection: To BCA Table 3.5.1.1.

1.3 ROOF PLUMBING

General
Description: Flashings, cappings, gutters, rainwater heads, outlets, downpipes and accessories necessary to complete the roof system.

Flashing and capping: Notched to match profile of roof sheeting.

Standards
Roof drainage: To AS/NZS 3500.3.

Metal rainwater goods: To AS/NZS 2179.1.

PVC-U rainwater goods and accessories: To AS/NZS 3500.3.

Flashings and cappings: To AS/NZS 2904.

2 EXECUTION

2.1 INSTALLATION

Protection
General: Keep the roofing and rainwater system free of debris and loose material during construction.

Thermal movement
Requirement: Provide for thermal movement in the roof installation and the structure, including movement in joints and fastenings.

Metal separation
Requirement: Prevent direct contact between incompatible metals, and between green hardwood or chemically treated timber and aluminium or coated steel, by either of the following methods:

- Applying an anti-corrosion, low moisture transmission coating to contact surfaces.
- Inserting a separation layer.

Reinstatement
Extent: Repair or replace damage to the roofing and rainwater system. Touch up minor damage to prepainted metal roofing.

Cleaning
General: Remove debris, metal swarf, solder, sealant and used materials. Clean out gutters and downpipes.

2.2 SHEET METAL ROOFING

Installation
Standard: To AS 1562.1.

Ridges and eaves: Treat sheet ends as follows:

- Project sheets 50 mm into gutters.
- Close off ribs at bottom of sheets using mechanical means or with purpose-made fillers or end caps.
- Turn pans of sheets up at tops and down into gutters by mechanical means.
- Provide pre-cut notched eaves flashing and bird proofing if required.
- Close off ridges with purpose-made ridge fillers of closed cell polyethylene foam.

Swarf: Remove swarf and other debris as soon as deposited.

Accessories: Provide accessories with the same finish as roofing sheets to complete the roofing installation.

2.3 ROOF PLUMBING

Jointing sheet metal rainwater goods
Sealing: Seal fasteners and mechanically fastened joints. Fill the holes of blind rivets with silicone sealant.

Flashings and cappings
Upstands: Flash projections above or through the roof with two part flashings consisting of an apron flashing and an over-flashing, with at least 100 mm vertical overlap. Provide for independent movement between the roof and the projection.

Wall abutments: Provide overflashings where roofs abut walls, stepped to the roof slope in masonry and planked cladding, otherwise raking and as follows:

- In masonry: Build into the full width of the outer leaf. Turn up within cavity, sloping inward across the cavity and fixed to or built in to the inner leaf at least 75 mm above.

Gutters
Minimum slope of eaves gutters: 1:200.

Minimum width overall of valley gutters: 400 mm.

Eaves gutter overflow measures: To BCA 3.5.3.4.

Downpipes
General: Prefabricate downpipes to the required section and shape where possible. Connect heads to gutter outlets and, if applicable, connect feet to rainwater drains.

Downpipe support: Provide supports and fixings for downpipes.

0453 DOORS AND ACCESS PANELS

1 GENERAL

1.1 STANDARDS

General

Timber and composite doors: To AS 2688.

1.2 INTERPRETATION

Definition

General: For the purposes of this worksection the following definition applies:

- Doorset: An assembly comprising a door or doors and supporting frame, guides and tracks including the hardware and accessories necessary for satisfactory operation.

2 PRODUCTS

2.1 DOOR FRAMES

Timber frames

Hardwood: To AS 2796.1.

- Grade: Select.

Softwood: To AS 4785.1.

- Grade: Select.

Joints:

- Morticed head and through tenons.
- Trenched head:
  - . Bare faced tenons on jambs.
  - . Full let-in jambs.

2.2 DOORS

General

Doors: Proprietary products manufactured for interior or exterior applications and for the finish required.

Flush panel doors

General: Provide flush panel doors of balanced construction.

Construction

Door thickness:

- General: 35 mm.
- External doors and doors over 900 mm wide: 40 mm.

Edge strips: Minimum thickness 10 mm. Increase overall thickness to greater than 15 mm to accommodate the full depth of the rebate in rebated doors. Apply to the external edges of door after the facings are bonded to the door framing/core and finish flush with outside surface of the facings.

Tolerances

Standard: To AS 2688 clauses 4.1 and 5.3.

2.3 ANCILLARY MATERIALS

Flashings
Standard: To AS/NZS 2904.

Weather bars
General: Provide a weather bar under hinged external doors, locate under the centres of closed doors.

3 EXECUTION

3.1 GENERAL

Priming
General: Prime timber door leaves on top and bottom edges before installation.

3.2 FRAMES

General
Frames: Install the frames as follows:

- Plumb, level, straight and true.
- Fixed or anchored to the building structure.
- Isolated from any building loads, including loads caused by structural deflection or shortening.

Timber frames
Building into masonry: Screw galvanized steel brackets twice to jambs and build in.

Fixing to masonry openings: Build in seasoned timber plugs to masonry joints or use proprietary expansion anchors and screw twice through jambs at each fixing.

Fixing to stud frame openings: Back screw twice to jambs at each fixing.

Heads of fasteners: Conceal where possible, otherwise sink the head below the surface and fill the sinking flush with a material compatible with the surface finish.

Finishing
Trim: Provide mouldings, architraves, reveal linings, and other internal trim using materials and finishes matching the door frames. Install to make neat and clean junctions between the frame and the adjoining building surfaces.

Weatherproofing
Flashings and weatherings: Install flashings, weather bars, drips, storm moulds, caulking and pointing to prevent water from penetrating the building between the door frame and the building structure under the prevailing service conditions, including normal structural movement of the building.

0454 OVERHEAD DOORS

1 GENERAL

1.1 STANDARD

General

Garage doors: To AS/NZS 4505.

2 EXECUTION

2.1 INSTALLATION

Frames, guides and tracks

Requirement: Install frames as follows:

- Plumb, level, straight, true, and within tolerances and clearances recommended by the manufacturer.
- Fixed or anchored to the building structure using mechanical fixings suitable for the substrate and the imposed loads.
- Isolated from any building loads, including loads caused by structural deflection or shortening.

0455 DOOR HARDWARE

1 PRODUCTS

1.1 COMPONENTS

Hinges

Requirement: Provide 3 hinges for external doors and door leafs over 2040 mm in height and 600 mm in width. Conform to the **Hinges table**.

Hinges table

Size of door (mm x mm)	Number of hinges (per door leaf)	Size of hinges (steel)
2040 x 920	3	100 x 75 x 2.5 mm
2040/2400 x 1020	4	100 x 100 x 2.5 mm

Locksets

External doors: Push-button key and knob set and a double-cylinder dead bolt to each door.

Internal doors:

- Generally: Passage sets.
- Bathrooms, showers and toilets: Privacy sets.
- Sliding patio doors and windows: Key-lockable surface mounted bolts.

Keying

Requirement: Key doors (excluding garage doors) alike and key windows alike.

2 EXECUTION

2.1 INSTALLATION

Supply

Delivery: Deliver door hardware items, ready for installation, in individual complete sets for each door, as follows:

- Clearly labelled to show the intended location.
- In a separate dust and moisture proof package.
- Including the necessary templates, accessories, fixings and fixing instructions.

Mounting height

Door lockset mounting heights: 1000 mm above finished floor to centreline of spindle.

Locks

Cylinders: Fix vertically and with consistent key alignment.

Door stops

Fixing: Fix on the floor, skirting or wall, as appropriate, to prevent the door or door furniture striking the wall or other surface.

Fasteners

Materials: Provide materials compatible with the item being fixed, and of sufficient strength, size and quality to perform their function.

- Concealed fixings: Provide a corrosion resistant finish to concealed fixings.
- Exposed fixings: Match exposed fixings to the material being fixed.

Security: Locate exposed fixings to lock furniture on the inside faces of external doors.

Support: Provide appropriate back support (for example lock stiles, blocking, wall noggings and backing plates) for hardware fixings.

Hinges

Metal frames: Fix hinges using metal thread screws.

Timber doorsets: Install butt hinges in housings equal in depth to the thickness of the hinge leaf (except for hinges designed for mounting without housing), and fix with countersunk screws.

0471 THERMAL INSULATION AND PLIABLE MEMBRANES

1 GENERAL

1.1 INTERPRETATION

Definition
General: For the purposes of this worksection the following definition applies:

- Pliable building membrane: To AS/NZS 4200.1 and equivalent to sarking-type material in the NCC.

2 PRODUCTS

2.1 MATERIALS

Insulation
Cellulosic fibre (loose fill): To AS/NZS 4859.1 Section 4.

Mineral wool blankets and cut pieces (compressible): To AS/NZS 4859.1 Section 7.

Polyester (compressible): To AS/NZS 4859.1 Section 6.

Polyisocyanurate (rigid cellular RC/PIR): To AS 1366.2.

Polystyrene (extruded rigid cellular RC/PS-E): To AS 1366.4.

Polystyrene (moulded rigid cellular RC/PS-M): To AS 1366.3.

Polyurethane (rigid cellular RC/PUR): To AS 1366.1.

IR reflective (formed shapes and compressible with one or more external IR reflective surfaces): To AS/NZS 4859.1 Section 9.

Wool: To AS/NZS 4859.1 Section 5.

Pliable building membrane
Standard: To AS/NZS 4200.1 and BCA 3.12.1.1.

3 EXECUTION

3.1 GENERAL

Bulk insulation
Standard: To AS 3999 and BCA 3.12.1.1.

Installation: Firmly butt together fibre batts or blankets, with no gaps except as follows:

- Access openings and vents: Do not obstruct.
- Light fittings: To AS/NZS 3000 clause 4.5.
- Electrical cables: To AS 3999 clause 2.6.

Pliable building membrane
Standard: To AS 4200.2 and BCA 3.12.1.1.

3.2 ROOFS

Pliable building membranes
Sarking membrane:

- Location: Provide sarking under tile and shingle roofing.

Vapour barrier:

- Installation: Lay over the roof framing with sufficient sag to allow the bulk insulation to achieve its full thickness. Overlap all edges 150 mm and seal all joints with pressure sensitive adhesive tape.

Metal roofs - thermal break strips

Product type: Proprietary item.

Application: To steel framing supporting sheet metal roofing.

R-Value: ≥ 02.

Metal roofs – bulk insulation

Product type: Fibre blankets or batts.

Installation:

- Batts: Fit tightly between framing members.
- Blanket for sound insulation: Install over the roof framing, reflective thermal insulation (if any), and mesh support, so that the blanket is in continuous contact with the underside of the metal roofing sheets.

0511 LINING

1 PRODUCTS

1.1 MATERIALS AND COMPONENTS

Plasterboard
Standard: To AS/NZS 2588.

2 EXECUTION

2.1 CONSTRUCTION GENERALLY

Substrates
Requirement: Plumb, level, in true alignment and to the lining manufacturer's recommendations.

Timber, steel framing and battened masonry: To AS/NZS 2589 clause 4.2.

Preparation: Before fixing linings check and, if necessary, adjust the alignment of substrates or framing.

Ceiling linings
General: Do not install until at least 14 days after the timber roof structure is fully loaded.

Accessories and trim
General: Provide accessories and trim as required to complete the installation.

Cornices: Proprietary item, as documented.

2.2 PLASTERBOARD LINING

Installation
Gypsum plasterboard: To AS/NZS 2589.

Supports
General: Install timber battens or proprietary cold-formed galvanized steel furring channels as follows:

- Where framing member spacing exceeds the recommended spacing.
- Where direct fixing of the plasterboard is not possible due to the arrangement or alignment of the framing or substrate.
- Where the lining is the substrate for tiled finishes.
- If required to support fixtures.

Joints
Flush joints: Provide recessed edge sheets and finish flush using perforated paper reinforcing tape.

External corner joints: Make joints over metallic-coated steel corner beads.

Control joints: Provide purpose-made metallic-coated control joint beads at not more than 12 m centres in plasterboard linings or 7.2 m centres in fibre cement lining in walls and ceilings and to coincide with structural control joints.

Wet areas: Install additional supports, flashings, trim and sealants as required.

Joints in tiled areas: Do not apply a topping coat after bedding perforated paper tape in bedding compound.

0702 MECHANICAL DESIGN AND INSTALL

1 GENERAL

1.1 STANDARDS

General

Mechanical ventilation: To AS 1668.1 and AS 1668.2, as required by the NCC.

Refrigeration systems: To AS/NZS 5149.1, AS/NZS 5149.2, AS/NZS 5149.3 and AS/NZS 5149.4.

Mechanical systems: Conform to the recommendations of SA HB 276.

Heating and cooling systems: To AS/NZS 5141.

1.2 AIR CONDITIONING DESIGN

Standards

General: To the recommendations of one or more of the following:

- AIRAH Design Application Manuals.
- ASHRAE Handbooks.
- CIBSE Guides.

Method of calculation: Manual or software that employs the data and methods in the above standards.

Design criteria

Outside design conditions: Use outdoor design conditions listed in AIRAH DA09, Table 1 or Table 1A for the following:

- The location geographically closest to the site.
- Comfort (or non-critical process) conditions.

Inside design conditions:

- Summer: 24°C dry bulb, 50% relative humidity.
- Winter: 21°C dry bulb.

Temperature variation: Limit the temperature difference in air conditioned spaces served by the same zone or system to 2°C as follows:

- Between any 2 points in the space from floor level to 1500 mm above floor level.
- More than 2000 mm from cooking equipment and more than 1000 mm from any other appliance.
- When outside conditions are in the range specified above.
- After the plant has been operating for one hour.
- With the temperatures measured in the same 5 minute period.

Zoning: Divide the systems into temperature controlled zones to meet the specified permissible limits in temperature variation and the system divisions documented.

Fresh air: Supply fresh air to spaces with air conditioning systems via the air handling system.

Heating: Reverse cycle.

Windows, walls, floors and roofs: Refer to drawings for construction and insulation.

Internal window shading type: As documented.

Ambient noise emitted: Lower than the level that can be heard within a habitable room in any neighbouring residential premises, regardless of whether any door or window to that room is open.

2 PRODUCTS

2.1 AIR CONDITIONING EQUIPMENT

Standards

Ducted air conditioners: To AS/NZS 3823.1.2.

Non-ducted air conditioners: To AS/NZS 3823.1.1.

Equipment

Performance: Supply equipment as follows:

- Made by a manufacturer with a demonstrated ability to provide spare parts and service promptly to the site.
- Operational within the documented range of outdoor design conditions under the calculated loads without excessive head pressure or icing.
- Labelled to AS/NZS 3823.2.

Refrigerant: Provide refrigerant listed as Safety Group A1 or A2L in AS/NZS ISO 817 and having an Ozone Depletion Potential of 0 and Global Warming Potential less than 700.

Reverse cycle units: Provide effective outdoor coil defrost facility that prevents room temperature dropping more than 2°C during defrost.

Split systems and variable refrigerant flow systems: Provide indoor and outdoor units from the same manufacturer, designed and automatically controlled to operate as an integrated whole, under the documented operating conditions and over the whole capacity range of the system.

Cabinet: Aluminium, powder coated steel or moulded ABS plastic with metallic-coated steel or stainless steel fasteners. Insulate and vapour seal cabinet and drain trays to prevent external condensation under all operating conditions.

Drain trays: Aluminium, stainless steel or plastic to collect all moisture inside indoor and outdoor units.

Filters: Washable panel type with at least 85% of arrestance when tested to AS 1324.2, Test Dust No.4.

Coils: Copper tube with aluminium plate fins.

Controls

General: Provide the following functions:

- Temperature control for each zone located to accurately sense zone temperature.
- Fan speed selection for multi and variable speed fans.
- Day/night zone changeover if scheduled.
- Time switch for each system with ≥ 6 temperature programs per day, separate programs for each day of the week, manual set point over ride and Vacation temperature set back.

3 EXECUTION

3.1 REFRIGERATION PIPEWORK

General

Pipes: To AS/NZS 1571.

Deemed to comply: Split system manufacturer's standard pre-charged piping kit standard.

Pipe insulation

General: Insulate all refrigerant and drain piping that may sweat with chemically blown closed cell nitrile rubber in tubular form to ASTM C534. Protect insulation from sunlight and mechanical damage.

Insulation thickness: 13 mm for pipes less than DN 20, 19 mm otherwise.

Pipe duct

Duct: Run exposed piping external to the building in a metallic-coated steel duct and run cables in the same duct. Provide a removable cover or similar for access. Paint duct to match the surrounding surface.

Condensate drains

Requirement: Provide trapped, at least DN 20 condensate drains to AS/NZS 3666.1 from each indoor coil and safety tray. Provide drains from each reverse cycle outdoor coil unless casing freely drains to a roof or other location where condensate will not cause damage or pond.

3.2 UNIT INSTALLATION

General

Outdoor equipment: Provide clearance around units for condenser air flow and maintenance access. Make sure discharge air does not short-circuit to condenser intake.

Equipment at ground level: Mount on 100 mm level concrete plinth or equivalent impervious material.

Duct connections: Provide internal or external flexible duct connections at indoor unit.

Vibration isolation

Suspended units: Provide at least 4 metal spring or rubber-in-shear isolation mountings with at least 25 mm static deflection and 98% isolation efficiency.

Floor mounted units: Provide neoprene waffle pads. Bolt in place.

Safety trays

General: If leaks or condensation from equipment could cause nuisance or damage to the building or its contents, provide a galvanized steel safety tray under the equipment.

3.3 COMPLETION

Commissioning

General: Commission the systems to manufacturer's recommendations using instruments calibrated within the past 12 months.

Checklist: Submit signed commissioning checklist before the date for practical completion.

Cleaning

General: Clean filters, outdoor coils, grilles and diffusers before the date for practical completion.

Operating and maintenance instructions

Requirement: Provide written operating and maintenance instructions containing the following:

- Contractor's contact details for service calls.
- Manufacturers' maintenance and operation literature.
- Manufacturers' warranty certificates if the manufacturers' warranty period is greater than the defects liability period.
- Description of day to day operation.
- Setting of time switches.
- Schedule of recommended maintenance.

Record drawing: Provide a drawing of the system as installed.

3.4 MAINTENANCE

General

Maintenance period: The greater of 12 months from the date of completion of commissioning of the systems and the duration of the Defects Liability Period.

Corrective maintenance: Attend site and undertake corrective maintenance within 24 hours of receipt of verbal or written advice.

Preventative maintenance: Provide preventative maintenance recommended by the equipment manufacturer. Provide all materials including consumable items and refrigerant.

Summer preventative maintenance visit: Provide at least one preventative maintenance visit during the months of December, January or February. Carry out preventative maintenance and provide electronic data logger or thermohydrograph to record temperatures at one location in each zone over a period of 7 days. Submit results. If the temperature recorded is outside the specified tolerance identify and correct the cause and repeat the test.

Maintenance reports: Submit a signed maintenance report setting out the work done and any measured values after each visit.

0802 HYDRAULIC DESIGN AND INSTALL

1 GENERAL

1.1 STANDARDS

General

Plumbing and drainage: To the AS/NZS 3500 series.

Authorised products: Listed in the WaterMark Product Database, unless otherwise required by the network utility operator.

2 EXECUTION

2.1 INSTALLATION

Piping

Requirement: Install piping in straight lines and to uniform grades. Arrange and support the piping so that it remains free from vibration and water hammer, while permitting thermal movement. Keep the number of joints to a minimum. Prevent direct contact between incompatible metals.

Embedded pipes: Do not embed pipes that operate under pressure in concrete or surfacing material.

Concealment: If practicable, conceal piping and fittings requiring maintenance or servicing so that they are accessible within non-habitable enclosed spaces such as roof spaces, subfloor spaces and ducts. Keep pipelines in subfloor spaces at least 150 mm above ground and make sure access can be provided throughout for inspection. Provide at least 25 mm clearance between adjacent pipelines (measured from the piping insulation where applicable).

Building penetrations: If piping or conduit penetrates building elements, provide metal or PVC-U sleeves formed from oversized pipe sections.

Cover plates: If exposed piping emerges from wall, floor or ceiling finishes, provide cover plates of non-ferrous metal, finished to match the piping, or of stainless steel.

Pipe support materials: The same as the piping, or galvanized or non-ferrous metals, with bonded PVC-U or glass fibre woven tape sleeves where needed to separate dissimilar metals.

2.2 FINISHES

General

Requirement: Finish exposed piping, including fittings and supports as follows:

- In internal locations such as toilet and kitchen areas: Chrome plate copper piping to AS 1192 service condition 2, bright.
- Externally and steel piping or worn fittings internally: Paint.
- In concealed but accessible spaces (including cupboards and non-habitable enclosed spaces): Leave copper and plastic unpainted except for required identification marking. Prime steel piping and iron fittings.
- Valves: Finish valves to match connected piping.

2.3 COLD AND HEATED WATER

Standards

General: To AS/NZS 3500.1 and AS/NZS 3500.4.

Copper pipe: To AS 4809.

Pipe material
General: Provide pipework for the reticulation of cold and heated water and as documented.

Tap positions
Requirement: Locate hot tap to the left of, or above, the cold water tap.

Fittings and accessories
General: Provide the accessories and fittings necessary for the proper functioning of the plumbing systems, including taps, valves, outlets, pressure and temperature control devices, strainers, gauges and pumps.

Heated water temperature
Standard: To AS/NZS 3500.4.

Maximum temperature at ablution outlets: 50°C.

Maximum recommended temperature at kitchen sinks and laundry tubs: 60°C.

Hot water temperature control
Requirement: Provide thermostatic mixing valves or special taps that automatically control the temperature at the mixed outlet to a preselected temperature.

Cleaning
General: On completion, flush the pipelines using water and leave pipelines clean.

2.4 STORMWATER

Standards
General: To AS/NZS 3500.3.

Pipe laying
General: Lay pipelines with the spigot ends in the direction of flow.

Downpipe connections
General: Turn up drain branch pipelines to finish 50 mm above finished ground or pavement level.

Subsoil drains
Connection: Connect subsoil drains to the stormwater drainage system.

Trench width: Minimum 450 mm.

Subsoil drains: Provide proprietary perforated plastic pipe.

Filter fabric: Provide a polymeric fabric formed from a plastic yarn containing stabilisers or inhibitors to make the filaments resistant to deterioration due to ultraviolet light.

Filter sock: Provide a polyester permeable sock capable of retaining particles of 0.25 mm size. Securely fit or join the sock at each joint.

Pits
Cover levels: Locate the top of covers or gratings, including frames as follows:

- In paved areas: Flush with the paving surface.
- In landscaped areas: 25 mm above finished surface.
- Gratings taking surface water runoff: Set to receive the runoff without ponding.

2.5 WASTEWATER

Standards

General: To AS/NZS 3500.2.

Waterless composting toilets: To AS/NZS 1546.2.

On-site domestic wastewater treatment units: To AS 1546.3.

Cleaning

During construction: Use temporary covers to openings and keep the system free of debris.

On completion: Clean and flush the system.

Vent pipes

Staying to roof: If fixings for stays penetrate the roof covering, seal the penetrations and make watertight.

Terminations: Provide bird-proof vent cowls made of the same material and colour as the vent pipe.

0902 ELECTRICAL DESIGN AND INSTALL

1 GENERAL

1.1 STANDARDS

General

Electrical installation: To AS/NZS 3000 and SA HB 301.

Electrical cable selection: To AS/NZS 3008.1.1.

Telecommunications cabling: To AS/CA S008, AS/CA S009, AS/NZS 3080, and SA/SNZ HB 252.

1.2 INTERPRETATION

Abbreviations

General: For the purposes of this worksection the following abbreviations apply:

- ED S&IR: The Electricity Distributor's Service and Installation Rules.
- RCD: Residual Current Device.

Definition

General: For the purposes of this worksection the following definitions apply:

- Telephony: Speech and low band frequencies (= 100 kHz).

2 EXECUTION

2.1 GENERAL

Applications and compliance

General: Submit all necessary applications for electricity supply. Liaise with the electricity distributor and comply with the ED S&IR.

Switchboards

Standard: To AS/NZS 61439.3.

Construction: Enclosed type with a hinged lid. Provide circuit breakers and RCDs.

Location: Verify that the location selected is compliant before proceeding.

Maximum demand and spare capacity

General: Calculate the maximum demand of the installation in accordance with AS/NZS 3000 and provide a copy of the calculations.

Spare capacity: Provide the following:

- > 10% spare capacity in mains and submains.
- > 25% spare capacity in final subcircuits.

Load balancing: Spread electrical load equally across circuits to prevent overloading and inadvertent circuit breaker operation.

Fixed and stationary appliances: Treat socket outlets supplying fixed or stationary appliances likely to cause an RCD to trip due to earth leakage currents in accordance with AS/NZS 3000. Do not connect to circuits that supply socket outlets intended for hand held or portable appliances.

Spare spaces: Provide switchboards with ≥ 25% spare positions for future single phase circuit breakers.

Accessories
General: Provide accessories necessary for a complete installation including but not limited to switches, dimmers, socket outlets, and telecommunications outlets. Provide accessories located in close proximity of the same size and material and from the same manufacture.

Mounting: Flush mount accessories to the wall (or ceiling) unless noted otherwise. Provide proprietary wall boxes in masonry and wall brackets in stud walls.

Wet areas: Position accessories in locations containing baths showers or other fixed water containers to comply with the requirements of AS/NZS 3000.

Wiring
Concealed cables and conduits: Provide conduits as necessary to allow wiring replacement without structural work or the removal of cladding, lining, plaster or cement rendering.

Sequence of work: Install conduits and cables before the installation of wall and ceiling linings, and before any external landscaping works.

Installation: Do not penetrate damp-proof courses. Arrange wiring such that it does not bridge the cavity in external masonry.

Conduit sizes: Provide conduits of sufficient internal diameter and arranged so that cables are not subject to undue mechanical stress during installation.

Minimum conduit diameter: 20 mm.

Conduits for future use: Provide a non-metallic drawstring having a breaking strain > 100 kg.

Luminaires
Standard: to AS/NZS 60598.1.

Non-specified luminaires: Provide a bayonet cap batten holder and lamp at each lighting point location where no luminaire is documented.

Minimum energy performance standards:

- General: To AS/NZS 4782.2 and AS/NZS 4783.2.
- Self-ballasted lamps: To AS/NZS 4847.2.
- Incandescent lamps: To AS 4934.2.

Lighting control systems
General: Locate grouped dimmers and control devices for future access. Provide ventilation and acoustic treatment to suit the device characteristics.

Appliances
General: Provide final subcircuits and terminate at fixed appliances, hot water units, packaged air conditioning and other plant and equipment.

Isolation switch: Provide isolating switch adjacent to equipment.

Smoke detection system
General: Provide smoke alarms to the requirements of the BCA 3.7.5. Connect smoke alarms to mains power.

Labelling
General: Provide labels including control and circuit equipment ratings, functional units, notices for operational and maintenance personnel, incoming and outgoing circuit rating, sizes and origin of supply.

Telecommunications cables: Label telecommunications cables, cross connects and outlets in accordance with the requirements of AS/NZS 3080.

Label colours
Generally: Black lettering on white background except as follows:

- Main switch and caution labels: Red lettering on white background.
- Danger, warning labels: White lettering on red background.

2.2 COMPLETION

Testing and certification
Electrical installations: Test to AS/NZS 3017. Provide a certificate showing test results and certifying compliance with AS/NZS 3000.

Telecommunications cabling: To AS/NZS ISO/IEC 15018. Test the cable link performance at the maximum frequency and data rate for the cable class, and the cable category. Provide a certificate showing test results and certifying compliance with AS/NZS ISO/IEC 15018.

Submission: Provide ACMA Telecommunications Cabling Advice (TCA1) form.

Television and audio systems: To AS/NZS 1367. Test the complete television and audio system. Provide a certificate showing test results and certifying compliance.