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## Architectural Specification

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**This specification includes typical worksections for a domestic project. If a worksection includes components that are not included on the documentation or deemed as not required for these works, then it is to be omitted.**

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**0131 PRELIMINARIES****1 GENERAL****1.1 THE SITE****Site restrictions**

Site limitations: Comply with the following restrictions as noted on the architectural Site Plan.

Access: 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, is restricted to the areas noted on the architectural Site Plan.

**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.
- Make available 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, by such means as temporary screens.

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 flagging.

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 property which is to remain on or adjacent to the site, including adjoining property encroaching onto the site, and trees.

**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 property which is to remain on or adjacent to the site, including adjoining property encroaching onto the site, and trees.

**Existing services**

General: Attend to existing services as follows:

- If the service is to be continued, repair, divert or relocate. Submit proposals.
- If the service crosses the line of a required trench, or will lose support when the trench is excavated, provide permanent support for the existing service. Submit proposals.
- If the service is to be abandoned, remove redundant parts and make safe.

Proposals: Submit proposals for action to be taken with respect to existing services before starting this work. Minimise the number and duration of interruptions.

- Purpose of submission: For review.

**Adjoining property**

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 properties noted on the architectural site plan as 'Adjoining Properties':

- Inspect the properties with the contract administrator and owners and occupants of the properties, before commencement of work.

- Make detailed records of conditions existing within the properties, especially structural defects and other damage or defacement.
- Arrange for at least two copies of each record, including drawings, written descriptions, and photographs, to be endorsed by the owners and occupants, 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: Use public roads and accessways to site entrance. Refer to Client instructions and designated accessways noted on architectural site plan.

### Parking

Principal's existing parking areas: Use only designated parking areas.

### Use of existing services

General: Existing services may be used as temporary services for the performance of the contract subject to conditions written in the contract.

### Project signboards

General: Provide project-specific signboards and the following:

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

## 1.3 BUILDING THE WORKS

### Surveys

Design Survey: A copy of the site survey of the site from which all documentation has been based will be provided prior to the start of works.

Check surveys: All site levels are to be verified. Notify owner and contract administrator immediately if discrepancies between the original site survey are found.

### Survey marks

Definition: The term survey mark means 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 principal's survey marks are disturbed or obliterated, immediately give notice and rectify the disturbance or obliteration.

### 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: Components and other items identified in the architectural Materials and Finishes Schedule will be supplied free of charge to the contractor for installation in the execution of the works. Unload and take delivery of them, inspect them for defects and then take care of them. If defects are found, advise. Return unused items to the owner.

## 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 property

Evaluation: At practical completion, for properties noted on the architectural site plan as '**Adjoining Properties**' inspect the properties with the Clients Representative and owners and occupants of the properties, recording any damage that has occurred since the pre-commencement inspection.

### Pest eradication

General: Employ suitably qualified pest exterminators. At practical completion submit a certificate stating that completed works are free of pest types.

### Removal of plant

General: Within 10 working days after practical completion, remove temporary works and construction plant no longer required. Remove the balance before the end of the defects liability period.

## 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. Refer to the owner enquiries from the media concerning the project.

**0171 GENERAL REQUIREMENTS****2 GENERAL****2.1 APPLICABILITY****General**

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

**2.2 STANDARDS****Current editions**

General: Use referenced Australian or other standards (including amendments), and the BCA 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.

**2.3 INTERPRETATION****Definitions:**

General: For the purposes of this document the definitions given below apply:

- 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.
- Contractor: Means the same as builder.
- Metallic-coated: Steel coated with zinc or aluminium-zinc alloy via a continuous hot-dip process.
- Hot-dip galvanized: Zinc coated to AS/NZS 4680 after fabrication.
- Professional engineer: As defined by the BCA.
- Proprietary: Proprietary means 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.

**2.4 BUSHFIRE PROTECTION****General**

Bushfire Attack Level (BAL) to AS 3959: Refer to architectural drawings and Development Approval Notification supplied by Local Council.

Bushfire resistant design and construction: To BCA and Australian Standard AS 3959.

**3 PRODUCTS****3.1 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.

**Sealed containers**

General: 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 item so identified 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

### 3.2 TIMBER

#### Moisture content

General: Make milled products from timbers seasoned:

- 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 fit-outs 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 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, fascia's, 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



Exposure	Natural timber	Treated timber	Remarks
	Required durability class to AS 5604	Required hazard class to AS 1604 series	
		H5 (Extreme wetting and leaching and/or critical uses.)	Applicable to retaining walls, piling, house stumps, building poles, cooling tower fill

### 3.3 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.

#### Corrosion resistance

General: Conform to the following atmospheric corrosivity category as defined in AS/NZS 2312.

Atmospheric corrosivity category:

- For sites within 1km of ocean, category is: High
- For sites beyond 1km of ocean, category is: Low

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

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

#### Corrosion resistance table

Atmospheric corrosivity category to AS/NZS 2312	Heavy steel members including lintels more than 3.2 mm thick	Steel cladding, lining, trims and flashings
A and B (Low)	Galvanize after fabrication 600g/m <sup>2</sup>	Metallic-coated sheet AZ150
C (Medium)	Galvanize after fabrication 600g/m <sup>2</sup>	Metallic-coated sheet AZ200
D and F (High)	Stainless steel 316 or 316L or galvanize after fabrication 600g/m <sup>2</sup> plus organic coating	Metallic-coated sheet AZ200 plus organic coating

#### Preparation and pre-treatment

Standard: To AS 1627 series.

#### Galvanizing

General: Galvanize mild steel components (including fasteners) to AS 1214 or AS/NZS 4680, as appropriate, if:

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

### 3.4 PROTECTIVE COATINGS

#### General

Environment: To AS/NZS 2312 clause 2.3.

Coating designation: To AS/NZS 2312 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.

### 3.5 FASTENERS

#### Self-drilling screws

Corrosion resistance: To AS 3566.2 Table 1 and the **Fastener corrosion resistance table**.

**Fastener corrosion resistance table**

Atmospheric corrosivity category to AS/NZS 2312	Corrosion resistance class	
	Internal	External
A and B (Low)	1	3
C (Medium)	2	4
D and F (High)	3	Stainless steel 316

### 3.6 VAPOUR BARRIER

#### General

Vapour barrier to slabs: To AS 2870 clause 5.3.3.

Minimum thickness: 0.2mm.

## 4 EXECUTION

### 4.1 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 600mm to each other.

Chasing of blockwork: Chase only core-filled hollow blocks or solid blocks not designated as structural and to the **Concrete blockwork chasing table**.

**Concrete blockwork chasing table**

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

### 4.2 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.

### 4.3 FOOTPATH CROSSING

#### General

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

### 4.4 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 RESPONSIBILITIES****General**

Requirement: Provide a complete accredited termite management system.

System: The termite management system for the works can utilise one or more of the nominated products.

**1.2 STANDARD****General**

Termite barriers: To AS 3660.1.

**1.3 INSPECTION****Notice**

Inspection: Give sufficient notice so that inspection may be made of the completed termite barriers.

**2 PRODUCTS****2.1 NON-CHEMICAL BARRIERS****Concrete slab barrier**

Standard: To AS 3660.1 Section 4.

Services penetration barrier type: Termimesh Termiflange or similar style product.

Control joints: Stainless steel mesh barrier.

Material: 725 grade stainless steel.

**Termite cap and strip shields**

Standard: To AS 3660.1 Section 5.

Mesh barrier: Termimesh or similar style product.

Material: 725 grade stainless steel.

**Woven stainless steel mesh barriers**

Standard: To AS 3660.1 Section 6.

Mesh barrier: Termimesh or similar style product.

Material: 725 grade stainless steel.

Parging: Termiparge or similar style product.

**In ground Posts**

Mesh barrier: Termimesh Sock or similar style product.

Material: 725 grade stainless steel.

**2.2 CHEMICAL SOIL BARRIERS****General**

Standard: To AS 3660.1 Section 8.

Type testing: To AS 3660.1 Appendix E.

**Spray application**

Chemical: Imidacloprid or Fipronil

**2.3 NON-SOIL MATRIX BARRIERS****Concrete slab barrier**

Product: Kordon Termite Moisture Barrier or similar style product.

Material: Composite membrane incorporating a termiticide.

**Termite cap and strip shields**

Product: Kordon Termite Barrier or similar style product.

Material: Composite membrane incorporating a termiticide.

**Services penetration barrier**

Product: Kordon Kollar or similar style product.

Material: Composite membrane incorporating a termiticide.

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**3 EXECUTION****3.1 NON-CHEMICAL BARRIERS****Concrete slab barrier**

Standard: To AS 3660.1 Section 4.

**Termite cap and strip shields**

Standard: To AS 3660.1 Section 5.

**Woven stainless steel mesh barriers**

Applicators: Appointed manufacturer's personnel or approved and accredited contractors.

Standard: To AS 3660.1 Section 6.

**3.2 CHEMICAL SOIL BARRIERS****General**

Standard: To AS 3660.1 Section 8.

**3.3 NON-SOIL MATRIX BARRIERS**

Applicators: Appointed manufacturer's personnel or approved and accredited contractors.

**3.4 COMPLETION****Termite barrier notice**

General: Provide a durable notice permanently fixed in a prominent location to the building to BCA B1.4(i)(ii) or BCA 3.1.3.2(b) and AS 3660.1 Appendix A.

**Waste materials**

Progressive cleaning: Make sure that no waste materials that could attract termites remain on the site.

**Warranty**

Type: Renewable.

Warranty: Provide a warranty on both materials and workmanship.

Minimum period: 10 years.

Renewability: Renewable on a continuous basis without limit.

**Certificate of installation**

General: To AS 3660.1 Appendix A.

**Completion inspection**

Report: At the end of the defects liability period, inspect the termite control systems and submit a report on their efficacy and status.

**0201 DEMOLITION****1 GENERAL****1.1 STANDARDS****Demolition**

Standard: To AS 2601.

**1.2 SUBMISSIONS****Records**

Dilapidation record: Submit a copy of the dilapidation record for inspection. 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, before commencement of demolition.

**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: Where possible, dismantle building components for off-site recycling.

**3 EXECUTION****3.1 SUPPORT****Temporary support**

Existing buildings: Until permanent support is provided, provide temporary support for sections of existing buildings which are to be altered and which rely for support on work to be demolished.

**3.2 PROTECTION****Encroachment**

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

**Weather protection**

General: If walls or roofs are opened for alterations and additions, or the surfaces of adjoining buildings are exposed, provide temporary covers to prevent water penetration. Provide covers to protect existing plant equipment and materials intended for re-use.

**Security**

General: If walls or roofs are opened for alterations or additions, provide security against unauthorised entry to the building.

**Fixed items**

Individual protection: Protect all items in their existing position, with particular care of specific items noted on the architectural drawings and Materials and Finishes Schedule.

**3.3 DEMOLITION****Dilapidation record**

Purpose: Use the dilapidation record to assess the damage and making good arising out of demolition work.

**Hazardous materials removal**

Standard: To AS 2601 clause 1.6.2.

**Notice of completion**

General: Give at least 7 working days' notice of completion of demolition so that adjacent structures may be inspected following completion of demolition.

Making good: Make good any damage arising out of demolition work. Obtain written acceptance from the owner of each adjoining property of completeness and standard of making good.

## 0221 SITE MANAGEMENT

**1 EXECUTION****1.1 CONTROL AND PROTECTION****Erosion control**

General: Plan and carry out the work so as to avoid erosion, contamination, and sedimentation of the site, surrounding areas, and drainage systems.

**Dewatering**

General: Keep earthworks free of water. Provide and maintain slopes, crowns and drains on excavations and embankments to make sure free drainage. Place construction, including fill, masonry, concrete and services, on ground from which free water has been removed. Prevent water flow over freshly laid work.

**Water quality**

Wash out: Make sure that wash out does not enter waterways or stormwater drains.

Cross connection: Make sure that there are no cross connections between the stormwater and the public sewerage system.

**1.2 TREE PROTECTION****Standard**

General: Comply with the recommendations of those parts of AS 4970 which are referenced in this worksection.

**Trees to be retained**

Extent: All trees NOT marked for removal.

**Tree protection**

Tree protection zone: To AS 4970 Section 3.

Tree protective measures: To AS 4970 Section 4.

**Work near trees**

Harmful materials: Keep the area within the dripline free of sheds and paths, construction material and debris.

Work under trees: Do not remove topsoil from, or add topsoil to, the area within the dripline of the trees.

Hand methods: Use hand methods to locate, expose and cleanly remove the roots on the line of excavation.

**1.3 SITE CLEARING****Extent**

General: Clear only the following site areas:

- Areas to be occupied by works such as structures, paving, excavation, regrading and landscaping.
- Other areas designated to be cleared.

**Clearing and grubbing**

Clearing: Remove everything on or above the site surface, including rubbish, scrap, grass, vegetable matter and organic debris, scrub, trees, timber, stumps, boulders and rubble.

Grubbing: Grub out stumps and roots over 75mm diameter to a minimum depth of 500mm below subgrade under buildings, embankments or paving, and 300mm below the finished surface in unpaved areas. Backfill holes remaining after grubbing with sand material to prevent ponding of water. Compact the material to the relative density of the existing adjacent ground material.

**Disposal**

Spoil: Remove cleared and grubbed material from the site and dispose of legally.



**0222 EARTHWORK****1 GENERAL****1.1 STANDARDS****General**

Earthworks: To AS 3798.

General: Conform to the recommendations of those parts of AS 3798 which are referenced in this worksection.

**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.
- 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 0.5m<sup>3</sup> which cannot be removed until broken up by rippers or percussion tools.
- 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.

**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: 200mm.

**Topsoil stockpiles**

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

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

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: 400mm.

#### 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 which 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

#### Placing fill

Placement: To BCA 3.2.2.

Layers: Place fill in near-horizontal layers of uniform thickness no greater than 150mm 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.

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

Minimum relative compaction table

Location	Cohesive soils. Minimum dry density ratio (standard compaction) to AS 1289.5.4.1	Cohesionless soils. Minimum density index to AS 1289.5.6.1
Residential: Lot fill, house sites.	95%	70%
Pavements:		
Fill to support pavements	95%	70%
Subgrade to 300 mm deep	98%	75%

## 0223 SERVICE TRENCHING

**1 PRODUCTS****1.1 FILL MATERIALS****General**

Backfill material: To the *Earthwork* worksection **Fill materials**, free from stones larger than 100mm maximum dimension and as follows:

- Next to services: Do not place any particles greater in size than 25mm within 150mm of services.
- Under paved areas and within 4m 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  $\pm 1\%$  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.

**Segmental paving units**

Removal: Take up segmental 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**

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

Place fill: To **Placing fill** in the *Earthwork* worksection.

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

**2.4 SURFACE RESTORATION****General**

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

## 0241 LANDSCAPE – WALLING AND EDGING

**1 PRODUCTS****1.1 TIMBER****Preservative treatment**

Timber type: Provide only timbers with preservative treatment appropriate to the Hazard class.

Cut surfaces: Provide supplementary preservative treatment to all cut and damaged surfaces.

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

**1.2 SLEEPER WALLS****Sleepers**

General: To AS 3818.2.

Hardwood: Sound durability class or preservative treated hardwood railway sleepers.

Softwood: Sound preservative treated softwood sleepers.

**1.3 CRIB WALLS****General**

Type: Proprietary system of interlocking precast concrete or preservative treated timber cribs with selected backfill placed and compacted progressively with the crib to form a retaining wall.

Standard for masonry segmental retaining wall units: To AS/NZS 4455.3.

**1.4 GEOTEXTILE****General**

Type: Polymeric fabric formed from a plastic yarn composed of at least 85% by weight of propylene, ethylene, amide or vinylidenechloride and containing stabilisers or inhibitors to make the filaments resistant to deterioration due to ultraviolet light.

Identification and marking: To AS 3705.

**Protection**

General: Provide heavy duty protective covering. Store clear of the ground and out of direct sunlight. During installation do not expose the filter fabric to sunlight for more than 14 days.

**1.5 EDGING****General**

Type: Refer to Architectural or Landscaping drawings and associated schedules.

**2 EXECUTION****2.1 GENERAL****Set out**

General: Set out the positions of walls.

**Clearing**

Extent: Except trees or shrubs to be retained, clear vegetation within 1 m of the landscape walls. Grub out stumps and roots of removed trees or shrubs and trim the grass to ground level, but do not remove the topsoil.

**Excavation**

Extent: Excavate for foundations and footings.

**2.2 SLEEPER WALLS****Construction**

Wall: Erect sleeper posts at 2m centres, buried one third. Brace at half height of wall with sleepers returned into embankment, spiked to posts. Lay sleepers in stretcher bond behind the verticals and securely spike together at joints and at 2m centres. Back with geotextile and place a 100mm draining layer of coarse sand or fine gravel between the fabric and backfill.

Backing: Backfill to ground level with compacted fine crushed rock or gravels.

### 2.3 CRIB WALLS

#### Construction

Construction: Construct walls in conformance with the manufacturer's written requirements.

### 2.4 EDGING

#### Log edges

Installation: Excavate to lay logs at least half diameter into the ground. Spike through logs with two 13mm diameter galvanized mild steel rods per log, penetrating a minimum of 500mm into the subgrade. Drive the rods flush with the upper surface of the log. Butt the logs together to a close neat fit. Select adjacent logs for similar diameter.

#### Sawn timber

Installation: Set edgings flush with adjoining surfaces. Drive pegs into the ground at 1200mm centres on the planting side of the edging and on both sides of joints between boards, with peg tops 15mm below top of edging. Fix the pegs with galvanized nails, two per fixing.

Curving: Space the pegs to hold edging to a uniform curve. Reduce edging thickness to 15mm if required to enable it to be bent.

#### Sleeper

Installation: Spike through sleepers with two 13mm diameter galvanized mild steel rods per sleeper, penetrating a minimum of 500mm into the subgrade. Drive the rods flush with the upper surface of the sleeper. Arris the upper exposed sleeper edges to produce a 15mm wide face at 45mm to the edges.

#### Concrete

Edging strip: Place in a shallow trench between timber forms. Wood float finish flush with the adjacent finished grass level. Provide control joints, filled with resilient bituminous material, at 3m maximum centres.

#### Concrete kerb

Construction: Fixed form, extrusion or slip forms to AS 2876.

#### Spade work

Edges: Define mass planting beds by cutting through soil with garden spade at approximately 70mm to vertical. Remove sods from garden beds and spread throughout grassed areas.

Finish: Free from kinks in alignment with one curve grading evenly into the next, and free of straight sections.

#### Brick

Setting: On a 1:1:6 (cement:lime:sand) mortar haunch.

Laying: Refer to design and descriptions noted on Architectural or Landscaping drawings and associated schedules.

Joints: 3 mm struck flush.

Alignment: Even and free from dips, humps and bends.

Cleaning: Wash off mortar progressively.

## 0242 LANDSCAPE – FENCES AND BARRIERS

**1 PRODUCTS****1.1 TIMBER****Posts and rails**

Hardwood: To AS 2082.

Softwood: To AS 2858.

**Pickets and palings**

Hardwood: To AS 2796.1, Section 8.

- Grade to AS 2796.2: Select.

Softwood: To AS 4785.1, Section 7.

Seasoned cypress pine: To AS 1810, Section 5.

**Preservative treatment**

Timber type: Provide only timbers with preservative treatment appropriate to the Hazard class.

Cut surfaces: Provide supplementary preservative treatment to all cut and damaged surfaces.

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

**1.2 STEEL****Steel tubes**

Posts, rails, stays and pickets: To AS/NZS 1163.

- Grade: C350L0.

**1.3 CONCRETE****General**

Standard: To AS 1379 – N20 or proprietary packaged mix.

**1.4 COMPONENTS****Steel panel fencing**

Steel framing: Zinc-coated or aluminium/zinc alloy coated steel to AS 1397.

Steel sheeting: Prepainted to AS/NZS 2728.

**Steel posts**

Finish: Galvanized.

**Timber fencing sizes**

Type: Provide preservative treated timbers with associated support framing. Ensure all components are appropriately treated to prevent decay from weather or vermin attack.

General: Conform to the timber members in the **Timber fencing sizes table**.

Timber fencing sizes table

Member	Preservative treated soft wood picket (mm)	Preservative treated soft wood paling/lap and cap (mm)	Hardwood or cypress pine paling/lap and cap (mm)
Maximum height	1200	1800	1800
End/corner gate posts	90 x 90	100 x 100	125 x 125 or 100 x 100
Intermediate posts	90 x 90	140 x 45 or 100 x 75	125 x 50 or 100 x 75
Maximum post spacing	2400	2400/2700*	2700*
Rails	70 x 40	75 x 50 or 100x 38	75 x 50 or 100x 38
Picket/paling size	70 x 19	75, 100 or 150* x 15	100 or 150* x 13
Capping	-	125 x 35	100 x 50
Footing type	Concrete or cement stabilised earth	Concrete or cement stabilised earth	Concrete or cement stabilised earth
Footing size (diameter x depth)	200 x 600	250 x 600	250 x 600

\* Three rail fences only

## Gates

Types: Refer to Architectural or Landscaping drawings and associated schedules.

## Fencing for swimming pools

Design, construction and performance: To AS 1926.1.

Location of fencing for private swimming pools: To AS 1926.2.

## 2 EXECUTION

### 2.1 CONSTRUCTION GENERALLY

#### Set-out

General: Set out the fence line and mark the positions of posts, gates and bracing panels.

Property boundaries: Contractor to undertake detailed site survey.

#### Excavation

Posts: Excavate post holes so that they have vertical sides and a firm base. Spread surplus material on the principal's side of the fence.

#### Erection

Line and level: Erect posts vertically. Set heights to follow the contours of natural ground.

#### Earth footings

Base: Place 100mm of gravel in the footing base under posts.

Compaction: Backfill with earth around posts, compacting firmly by hand or machine in 150mm deep layers.

#### Concrete footings

In ground: Place mass concrete around posts to protect posts from waterlogged conditions and finish with a weathered top falling 25mm from the post to ground level.

### 2.2 FENCING

#### Steel panel fencing

Protection: Make sure bottom rails have drain holes and are at least 50mm clear of the ground.



**Timber fencing**

General: Mortice posts, taper splice rails and nail twice in mortices. Set pickets and palings clear of the ground.

Picket fence: Nail twice to each rail.

Plain paling fence: Provide 3 rails for fences up to 1800mm high. Close butt palings and nail twice to each rail.

Lap and cap paling fence: Provide 3 rails for fences up to 1800mm high and locate 200mm from the bottoms of the palings and abutting the tops of palings. Close butt larger palings and nail twice to each rail. Fix smaller palings over joints and nail twice to each rail. Nail capping to the top rail.

**Gates**

Construction: Construct gates as follows:

- Ledges and braces: Match fence rails.
- Pickets or palings: Match fencing.

Hardware: Provide the following:

- Drop bolt and ferrule to each leaf of double gates.
- Latch to one leaf of double gates.
- Provision for locking by padlock.
- Hinges with smooth operation and adjustment for future sagging.

Hand access: Where required provide hand openings to give access from outside to reach locking provision.

<b>0250 LANDSCAPE – GARDENING</b>
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**1 GENERAL****1.1 STANDARDS****Soils**

Site and imported topsoil: To AS 4419.

Potting mixes: To AS 3743.

Composts, soil conditioners and mulches: To AS 4454.

**2 PRODUCTS****2.1 MATERIAL****Topsoil**

Source: Provide topsoil which contains organic matter, will support plant life and is free from stones, contaminants and weeds.

Site: If available, provide material recovered from the site.

**Turf**

Supplier: Obtain turf from a specialist grower of cultivated turf.

Quality: Provide turf of even thickness, free from weeds and other foreign matter.

**Fertiliser**

General: Provide proprietary fertilisers, delivered to the site in sealed bags marked to show manufacturer or vendor, weight, fertiliser type, N:P:K ratio, recommended uses and application rates.

**Plants**

Health: Supply plants with foliage size, texture and colour at time of delivery consistent with the size, texture and colour shown in healthy specimens of the nominated species.

Vigour: Supply plants with extension growth consistent with that exhibited in vigorous specimens of the species nominated.

Damage: Supply plants free from damage and from restricted habit due to growth in nursery rows.

Pests and disease: Supply plants with foliage free from attack by pests or disease.

**3 EXECUTION****3.1 PREPARATION****Weed eradication**

Herbicide: Eradicate weeds with a non-residual glyphosate herbicide in any of its registered formulae, at the recommended maximum rate.

**Earth mounds**

Placing: Place clean filling in layers approximately 150mm thick compacted to 85% of the dry density ratio of the surrounding soil as determined by AS 1289.5.4.1. Minimise slumping and further internal packing down.

Edges: Construct changes in grade over a minimum width of 500mm to smooth, gradual and rounded profiles with no distinct joint.

Existing trees: Maintain the natural ground level under the canopy.

**Planting beds**

Excavated: Excavate to bring the subsoil to at least 300mm below finished design levels. Shape the subsoil to fall to subsoil drains where applicable. Break up the subsoil to a further depth of 100mm.

Unexcavated: Remove weeds, roots, building rubbish and other debris. Bring the planting bed to 75mm below finished design levels.

Services and roots: Do not disturb services or tree roots; if necessary cultivate these areas by hand.

**Placing topsoil**

General: Spread the topsoil on the prepared subsoil and grade evenly, making the necessary allowances to permit the following:

- Required finished levels and contours may be achieved after light compaction.
- Grassed areas may be finished flush with adjacent hard surfaces such as kerbs, paths and mowing strips.

**Topsoil depths**

General: Spread topsoil to the following typical depths:

- Excavated planting areas: If using organic mulch, 225mm. If using gravel mulch, 250mm.
- Irrigated grassed areas generally: 150mm.
- Irrigated grassed areas, heavy use (e.g. playing fields, playgrounds, and public parks): 200mm.
- Non-irrigated grass areas: 100mm.
- Earth mounds:
  - . Mass planted surfaces: 300mm.
  - . Grassed surfaces: 100mm.
- Top dressing: 10mm.

**3.2 TURFING****General**

Species, variety & thickness: Specialist contractor to advise on appropriate selection to suit soil and topography conditions for approval by Client or Clients representative

Supply: Deliver the turf within 24 hours of cutting and lay it within 36 hours of cutting. Prevent the turf from drying out between cutting and laying. If it is not laid within 36 hours of cutting, roll it out on a flat surface with the grass up, and water as necessary to maintain a good condition.

Laying: Lay the turf in the following manner:

- In stretcher pattern with the joints staggered and close butted.
- Parallel with the long sides of level areas, and with contours on slopes.
- To finish flush, after tamping, with adjacent finished surfaces of ground, paving edging, or grass seeded areas.

Tamping: Lightly tamp to an even surface immediately after laying. Do not use a roller.

Fertilising: Mix the fertiliser thoroughly into the topsoil before placing the turf. Apply lawn fertiliser at the completion of the first and last mowing, and at other times as required to maintain healthy grass cover.

Watering: Water immediately after laying until the topsoil is moistened to its full depth. Continue watering to maintain moisture to this depth.

Levels: Where levels have deviated from the design levels after placing and watering, lift turf and regrade topsoil to achieve design levels.

**3.3 PLANTING****General**

Individual plantings in grassed areas: Excavate a hole to twice the diameter of the root ball and at least 100mm deeper than the root ball. Break up the base of the hole to a further depth of 100mm and loosen compacted sides of the hole to prevent confinement of root growth.

Watering: Thoroughly water the plants before planting, immediately after planting, and as required to maintain growth rates free of stress.

Placing: Remove the plant from the container with minimum disturbance to the root ball, make sure that the root ball is moist and place it in its final position, in the centre of the hole and plumb, and with the top soil level of the plant root ball level with the finished surface of the surrounding soil.

Fertilising-plants: In planting beds and individual plantings, place fertiliser pellets around the plants at the time of planting.

Backfilling: Backfill with topsoil mixture. Lightly tamp and water to eliminate air pockets.

### 3.4 MULCHING

#### Placing mulch

General: Place mulch to the required depth, clear of plant stems, and rake to an even surface flush with the surrounding finished levels. Spread and roll mulch so that after settling, or after rolling, it is smooth and evenly graded between design surface levels sloped towards the base of plant stems in plantation beds, and not closer to the stem than 50mm in the case of gravel mulches.

Depths: Spread organic mulch to a depth of 75mm, and gravel mulch to a depth of 50mm.

### 3.5 STAKES AND TIES

#### Stakes

Material: Hardwood, straight, free from knots or twists, pointed at one end.

Installation: Drive stakes into the ground at least one third of their length, avoiding damage to the root system.

#### Ties

General: Provide 50mm hessian webbing ties fixed securely to the stakes, one tie at half the height of the main stem, others as necessary to stabilise the plant.

### 3.6 COMPLETION

#### Cleaning

Stakes and ties: Remove those no longer required at the end of the planting establishment period.

Temporary fences: Remove temporary protective fences at the end of the planting establishment period.

## 0271 PAVEMENT BASE AND SUBBASE

## 1 PRODUCTS

## 1.1 BASE AND SUBBASE MATERIAL

**Granular material**

Requirement: Provide unbound granular materials, including blends of two or more different materials which when compacted develop structural stability and are uniform in grading and physical characteristics.

**Crushed rock and recycled material class**

Requirement: Provide crushed rock and recycled material as documented, from the following classes:

- Class 2: Pavement base material (with no minimum plasticity index) for unbound pavements which may not require a very high standard of surface preparation.
- Class 3: Subbase material for unbound flexible pavements.

## 2 EXECUTION

## 2.1 SUBGRADE PREPARATION

**General**

Requirement: Prepare the subgrade in conformance with the *Earthwork* worksection.

## 2.2 PLACING BASE AND SUBBASE

**General**

Weak surfaces: Do not place material on a surface that is weakened by moisture and is unable to support, without damage, the construction plant required to perform the works.

Spreading: Spread material in uniform layers without segregation.

Moisture content: Maintain wet mixed materials at the required moisture content before and during spreading. Add water to dry mixed materials through fine sprays to the entire surface of the layer after spreading, to bring the material to the required moisture content.

Compacted layer thickness: 200mm maximum and 100mm minimum. Provide layers of equal thickness in multilayer courses.

## 2.3 TOLERANCES

**Surface level**

General: Provide a finished surface which is free draining and evenly graded between level points.

## 2.4 SUBBASE AND BASE COMPACTION

**General**

Construction operation: Compact each layer of fill to the required depth and density, as a systematic construction operation and conform to the **Minimum relative compaction table**.

Minimum relative compaction table

Item description	Minimum dry density ratio (modified compaction) to AS 1289.5.2.1
Subbase	95%
Base	98%

**Compaction requirements**

General: Apply uniform compactive effort, over the whole area to be compacted, until the required density is achieved or until failure is acknowledged.

Equipment: Use rollers appropriate to the materials and compaction requirements documented.

**0274 CONCRETE PAVEMENT****1 GENERAL****1.1 STANDARDS****General**

Specification and supply: To AS 1379.

Materials and construction: To AS 3600.

Guide to residential pavements: To AS 3727.

**2 EXECUTION****2.1 GENERAL****Preparation**

General: Trim the ground to suit the required thickness of concrete and compact to a firm, even surface.

Prepared subgrade: Blind with sufficient sand to create a smooth surface free from hard projections. Wet the sand just before laying the underlay.

**Paving**

General: Place and compact concrete paving over a vapour barrier placed over the prepared ground surface.

**Grading**

General: Grade paving to even falls to drain away from buildings to drainage outlets without ponding. Minimum fall for drainage: 1:100.

**Thickness**

Minimum:

- Foot and bicycle traffic: 75mm.
- Light domestic traffic occasionally up to 3 tonne gross: 100mm.

**Curing**

General: Protect fresh concrete from premature drying and from excessively hot or cold temperatures. Maintain the concrete at a reasonably constant temperature with minimum moisture loss for the curing period of 7 days.

**2.2 JOINTS****Contraction joints**

General: Form tooled joints at maximum 2000mm spacing.

**Expansion joints**

General: Provide material and construction of options for expansion joints required at maximum 6 m spacing.

**Abutment with building**

General: Where concrete paving more than 1500mm wide abuts the wall of a building, cast-in 10mm thick bitumen impregnated fibreboard between the paving and the wall. Otherwise, turn up the vapour barrier.

**2.3 FINISHING METHODS**

Broom finishing: Wood float and broom to an even textured transverse scored surface with steel tooled margins. On gradients steeper than 10%, roughen the surface by scoring using a stiff brush or rake.

Exposed aggregate finish: Steel trowel to a smooth surface. After final set use clean water and brushes to remove the surface film of mortar until the aggregate is uniformly exposed without under cutting of the matrix.

Sponge finish: After floating, produce an even textured sand finish by wiping the surface using a damp sponge.

Pattern paving: After machine floating, apply a proprietary treatment producing an integral coloured and patterned surface.

## 0276 SEGMENTAL PAVERS – SAND BED

**1 GENERAL****1.1 STANDARDS****General**

Concrete and Clay segmental pavers: To AS/NZS 4455.2.

**1.2 PAVER THICKNESS****General**

Requirement: Minimum thickness:

- Foot and bicycle traffic: 40mm.
- Light domestic traffic occasionally up to 3 tonne gross: 60mm.

**2 PRODUCTS****2.1 MATERIALS****Sand**

Bedding and joint filling: Well-graded and free of deleterious materials such as soluble salts which may cause efflorescence.

**Cement**

Standard: To AS 3972, type GP.

**Mortar**

Mix proportions (cement:sand): 1:3.

**2.2 COMPONENTS****Masonry units and segmental pavers**

General: Provide pavers of clay, natural stone or concrete masonry, purpose-made for use as paving, or units made for bonded masonry construction but suitable for paving.

**3 EXECUTION****3.1 GENERAL****Preparation**

General: Trim the subgrade to the required profile and to suit the thickness of pavers and sand bed. Compact to a firm, even surface.

**Base course**

General: Conform to the *Pavement base and subbase* worksection.

**Edge restraint**

Perimeter: If not provided by other structures, provide edge restraints to bedding and units.

Type: Bed units in mortar at least 40mm thick.

Drainage: Position the edge restraint and pavers so that the top of the pavers is slightly above the front edge of the edge restraint.

**Bedding course**

Preparation: Remove all loose material from the prepared base.

Geotextile: Place fabric between the base course and the bedding sand.

Bedding sand: Screed uncompacted sand over prepared base uniformly to achieve a 30 mm thick layer. Maintain sand at a uniform loose density and moisture content.

**Grading**

General: Grade paving to even falls to drain away from buildings to drainage outlets without ponding. Minimum fall for drainage: 1:100.

**Cutting**

Cutting units: Cut paving units to maintain sharp edges and accurate joints and margins.

**Laying**

General: Lay paving units on the screeded sand bedding to the nominated pattern shown on the drawings.

Joints: 2 to 5mm gap.

Cut courses: 50mm minimum plan dimension. On footpaths and other linear elements, use at least two cut courses and maintain symmetry.

Compaction: Compact the sand bedding after laying paving units using a vibrating plate compactor and appropriate hand methods and continue until lipping between adjoining units is eliminated.

Joint filling: Spread dry sand over the paving units and fill the joints by brooming. Carry out one or more passes with the vibrating plate compactor and refill the joints with sand. Repeat the process until the joints are completely filled.



## 0310 CONCRETE

## 1 GENERAL

## 1.1 STANDARDS

## General

Formwork design and construction, formed surfaces: To AS 3610 and AS 3610.1.

Plywood formwork: To AS 6669.

Profiled steel sheeting including shear connectors: To AS 2327.1.

Specification and supply of concrete: To AS 1379.

Reinforced concrete construction: To AS 3600.

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.
  - . Hot: Ambient shade temperature > 30°C.

## 1.3 TOLERANCES

## Finishes

Formed surface quality of surface finish: To AS 3610.1 Table 3.3.2 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	2m straightedge	4
B	3m straightedge	6
C	600mm straightedge	6

## 1.4 SUBMISSIONS

## Certification

Formwork design certification: For other than profiled steel sheeting composite formwork, submit certification by a professional engineer experienced in formwork design verifying conformance of the design.

Formwork execution certification: Submit certification by a professional engineer experienced in formwork design and construction verifying conformance of the completed formwork, including the suitability of the formwork for the documented surface finish class.

## Design

Formwork: The design of the formwork other than profiled steel sheeting composite formwork is the contractor's responsibility.

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## 2 PRODUCTS

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### 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: 100mm.

#### Polymeric film underlay

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

#### Curing compounds

Curing compounds: To AS 3799.

### 2.2 FORMWORK

#### General

Lost formwork: Free of timber or chlorides and not to impair the structural performance of the concrete members.

#### Profiled steel sheeting composite formwork

Material: Hot-dipped zinc-coated sheet steel to AS 1397.

Minimum steel grade: G550.

Accessories: Adopt material and corrosion protection to match the profiled steel sheeting.

#### Plywood formwork

Material: Plywood sheeting 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.

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## 3 EXECUTION

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### 3.1 POLYMERIC FILM UNDERLAY

#### Location

General: 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

#### Preparation

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 25mm, unless otherwise noted.

#### Void formers

Protection: Keep void formers dry until time of use. Place them on a firm level surface and place reinforcement and concrete with minimum delay.

### 3.3 REINFORCEMENT

#### Supports

Proprietary concrete, metal or plastic supports: Provide chairs, spacers, stools, hangers and ties, 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:  $\leq 60$  diameters.
- Mesh:  $\leq 800\text{mm}$ .

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

General: 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 do not project into the concrete cover.

#### Minimum requirements

Splices: Splice as follows:

- Mesh sheets: 225mm.
- Trench mesh: 500mm.
- Bars: Greater of either 500mm or 25 x bar diameter.
- Strip footing intersections and corners: Full width of intersecting reinforcement.

Cover: To the **Minimum cover to reinforcement table**.

**Minimum cover to reinforcement table**

Concrete element	Location	Minimum concrete strength (MPa)	Minimum cover to reinforcement (mm)
Unreinforced concrete	Generally	20	-
Reinforced concrete	Unless noted otherwise below	25	20
	Exterior: temperate, near- coastal (1 km to 50 km) and on ground and protected by membrane (bottom cover)	25	30
	On ground and unprotected by membrane (bottom cover)	25	40
	Footings	25	50
	Exterior: tropical, near- coastal (1 km to 50 km) and in contact with fresh water	32	40
	Exterior: coastal (100 m to 1 km) and permanently submerged in salt water	40	45
	Exterior: in tidal or splash zones	50	50

### 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.

Layers: Place concrete in layers not more than 300mm 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**

Placing concrete: Maintain temperature of the freshly mixed concrete at 5°C or more.

Formwork and reinforcement: Before and during placing maintain temperature at 5°C or more.

Temperature control: Heat the concrete materials, other than cement, to the minimum temperature necessary so that the temperature of the placed concrete is within the documented limits.

**Placing in hot weather**

Placing concrete: Maintain the temperature of the freshly mixed concrete at 35°C or less.

Formwork and reinforcement: Before and during placing maintain temperature at 35°C or less.

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.

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 and adopt procedures to make sure the following:

- Curing: Cure continuously from completion of finishing until the 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**

Application: Provide a uniform continuous flexible coating without visible breaks or pinholes, which remains unbroken at least for 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**

Protection: Provide protection as follows:

- Immediately after finishing, either cover exposed surfaces using an impervious membrane or hessian kept wet until curing begins or apply a curing compound.

**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 in the architectural Material and Finishes Schedule and in accordance with the following:

- For concrete finish as a substrate under resilient flooring: Steel trowelled finish with tolerance class A
- For concrete finish as a substrate under carpet: Steel trowelled or machine float finish with tolerance class A
- For concrete finish as a substrate under floor tiles: Trowelled finish with tolerance class C

#### Surface repairs

Method: If surface repairs are required, submit proposals.

### 3.9 COMPLETION

#### Formwork removal

Extent: Remove formwork, other than profiled steel sheeting composite formwork and lost formwork, including formwork in concealed locations.

Timing: Do not disturb formwork until concrete is hardened enough 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: 2 days.
- Bottom surfaces: 7 days with shoring and back-props left in position for 21 days.

#### 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 STANDARDS****General**

Materials and construction: To AS 4773.1 and AS 4773.2.

**2 PRODUCTS****2.1 DURABILITY****General**

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.

Proportions: 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 12.1.

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 from contamination**

General: Protect masonry materials and components from ground moisture and contamination.

**Bond**

Type: Refer to architectural Material and Finishes Schedule for required bond.

**Building in**

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

**Clearance for timber frame shrinkage**

General: In timber frame brick veneer construction, leave clearances between window frames and brick sill and between roof frames and the brick veneer as follows:

- Additional clearance: Accommodate additional shrinkage of unseasoned floor timbers.
- Single storey frames and ground floor windows (not for slab on ground): 10mm.
- Two storey frames and upper floor windows: 20mm.

**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**

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.

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 10mm to give a key.
- Thickness: 10mm.

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

**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:

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

**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 1800mm 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: 6000mm<sup>2</sup> 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: Provide minimum cavity widths in conformance with the following:

- Masonry walls: 50mm.
- Masonry veneer walls: 20mm between the masonry leaf and the loadbearing frame and between the masonry leaf and sheet bracing.

**Openings**

Do not close the cavity at the jambs of external openings.

**Wall ties connectors and accessories**

Protection: Install to prevent water passing across the cavity.

**3.5 DAMP-PROOF COURSES****Location**

General: Provide 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 30mm 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 75mm 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 40mm and dress down over the membrane turned up against the wall.

Height: Not less than:

- 150mm above the adjacent finished ground level.



- 75mm above the finished paved or concrete area.
- 50mm 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: Provide flashings as follows:

- Floors: Full width of outer leaf immediately above slab, continuous across cavity and up the inner face bedded in mortar, turned 30mm 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: 30mm 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. Extend at least 150mm 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 150mm beyond the ends of the lintels.
- At abutments with structural frames or supports: Vertical flash in the cavity from 150mm wide material, wedged and grouted into a groove in the frame opposite the cavity.
- At jambs: Vertically flash jamb extending 75mm 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 perpend.

Maximum spacing: 1200mm.

Weephole guards: Provide access barrier.

- Type: Black finished stainless steel mesh.

**3.7 WALL TIES****Location**

Spacing: To AS 4773.2 clause 9.7 and clause 10.6.

**Installation**

Embedment: At least 50mm into mortar ensuring that mortar cover is 15mm 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 REINFORCED AND GROUTED BLOCKWORK

#### Cleaning core holes

General: Provide purpose-made cleanout blocks or machine cut a cleaning hole at the base of each grouted core.

Location: Locate on the side of the wall which is to be rendered or otherwise concealed.

Cleaning: Rod cores to dislodge mortar fins protruding from the blocks and mortar droppings from reinforcement. Remove through the clean-out blocks.

#### Grouting

Commencement: Do not commence until grout spaces have been cleaned out and the mortar joints have attained sufficient strength to resist blow-outs.

Height of lift: Limit the height of individual lifts in any pour to make sure that the grout can be thoroughly compacted to fill all voids.

Compaction: Compact by vibration or by rodding.

Topping up: On the completion of the last lift, top up the grout after 10 min to 30 min, and vibrate or rod to mix with the previous pour.

### 3.10 LINTELS

#### Installation

General: Do not cut on site. Keep lintels 10mm 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.

### 3.11 BAGGING

#### Preparation

General: Cut joints flush before bagging.

#### Dry bagging

Application: Apply laying mortar to the surface using a hessian bag or similar. Flush up irregularities but leave a minimum amount of mortar on the surface.

**0342 LIGHT STEEL FRAMING****1 GENERAL****1.1 STANDARDS****General**

Design, materials and protection: To AS/NZS 4600.

Residential and low-rise steel framing: To NASH-1 (National Association of Steel Housing) Standard.

**1.2 TOLERANCES****General**

Manufacturing, assembly and installation tolerances: To NASH-1 Standard, Appendix D.

**1.3 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.

**Shop drawings**

General: 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 in accordance with documented project and AS/NZS 4600 requirements for the configurations and loadings.

Roof trusses: Submit drawings to show:

- Plan: Truss layout.
- Elevations: Arrangement of members, allowing for the accommodation of in-roof services and the size and section type of each member.
- Holding down and bracing: Details demonstrating capability to resist lateral and uplift forces.
- Method of assembly and connection details.

Wall frames: If pre-fabricated wall framing is used submit drawings to show:

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

**2 PRODUCTS****2.1 GENERAL****Storage and handling**

Requirement: Transport all components to site and store if required in a manner so as not to damage or distort the components.

**2.2 COMPONENTS****Cold-formed steel framing**

Cold-form sections from metallic-coated steel to AS 1397.

Corrosion protection: To BCA 3.4.2.2.

**Framing members**

Cold-formed steel framing: For a proprietary system, comply with NASH.1.

**3 EXECUTION****3.1 GENERAL****Fabrication**

Length: Cut members accurately to length so that they fit firmly against abutting members.

Service holes: Form holes by drilling or punching.

Bushes: Provide plastic bushes or grommets to site cut holes.

Swarf: Immediately remove swarf and other debris from cold-formed steel framing.

#### **Fastening**

Type: Select from the following:

- Bolting.
- Self-drilling, self-tapping screws.
- Blind rivets.
- Proprietary clinching system.
- Structural adhesives.
- Welding. On-site welded connections are not permitted.

#### **Welding**

Burning: Avoid procedures that result in greater than localised burning of the sheets or framing members.

#### **Prefabricated frames**

General: Protect frames from damage or distortion during erection. Provide temporary protection for members until permanent covering is in place.

#### **Metal separation**

General: Install lagging to separate non-ferrous service pipes and accessories from the framing.

#### **Unseasoned or CCA treated timber**

General: Do not fix in contact with framing without fully painting the timber and/or the steel.

#### **Earthing**

Permanent earthing: Required.

Temporary earthing: Provide temporary earthing during erection until the permanent earthing is installed.

#### **Protection**

General: Restore coatings which have been damaged by welding or other causes. Thoroughly clean affected areas back to base metal and coat with a zinc rich organic primer.

Grommets: Provide grommets to isolate piping and wiring from cold-formed steel framing.

### **3.2 FLOOR FRAMING**

#### **General**

Protection: If floor framing is for ground floor construction, make sure that it is protected from moisture, vermin and termites.

Construction loads: If construction loading exceeds design loading, provide additional support so as to avoid overstressing of members.

### **3.3 WALL FRAMING**

#### **Wall studs**

General: Provide studs in single lengths without splices. Place a stud under each structural load point from the roof or ceiling (except at openings). Provide multiple studs at points of concentrated load.

Maximum stud spacing: 600mm.

#### **Heads to openings**

Requirement: Provide lintels appropriate to load and span.

#### **Additional support**

General: Provide additional support in the form of noggings, trimmers and studs for support and fixing of lining, cladding, hardware, accessories, fixtures and fittings.

#### **Vermin barriers**

Requirement: Provide vermin barriers as follows:

- Brick veneer barrier: Fix 10mm steel wire mesh to the underside of the bottom plate of external stud walls, extending across the cavity for building into brickwork.

**Termite barriers**

Requirement: Provide termite barrier in accordance with *Termite Management* worksection.

**Damp-proof course**

Requirement: Provide damp-proof courses under the bottom plate of stud walls built off slabs or masonry dwarf walls, as follows:

- External walls (not masonry veneer): Turn up a minimum of 75mm on the inside and tack to stud. Project 10mm beyond the external slab edge or dwarf wall and turn down at 45°.
- Walls of bathrooms, shower rooms and laundries: Turn up a minimum of 150mm on the wet side and tack to studs.

Installation: Lay in long lengths. Lap full width at angles and intersections and at least 150mm at joints.

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

**Flashings**

Location: Provide flashings to external openings sufficient to prevent the entry of moisture. Form trays at the ends of sill flashings.

Masonry veneer construction: Extend across cavities and build into brickwork.

**Prefabricated walling**

Assembly: Factory assemble wall frames.

Bracing: Provide details of bracing.

Certification: Obtain certification from a professional engineer for the erected frames.

**3.4 ROOF FRAMING****Beam framing**

General: Construct framing for flat or pitched roofs where the ceiling follows the roof line, consisting of rafters or purlins supporting both ceiling and roof covering.

**Anti-ponding**

Requirement: Fix appropriate members to the tops of framing at the rear of fascias, to prevent sagging of and ponding on the sarking.

**Additional support**

General: Provide additional frame members at fibre cement or plasterboard sheeting or lining joint locations.

**Battens**

Requirement: Supply and fix battens suitable for span, spacing and proposed roofing material.

**3.5 TRUSSES****Fabrication**

Assembly: Factory assemble trusses.

**Supports for in roof services**

Water tank or heater: Where a water tank or heater is located in the roof space, provide a support platform to AS/NZS 3500.4 clause 5.5.

**Marking**

General: Permanently mark each truss to show:

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

**Installation**

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

Vertical movement: Over internal walls provide at least 10mm vertical clearance and use bracing methods which allow for vertical movements.

Holding down and bracing: Provide details demonstrating capability to resist lateral and uplift forces.

### 3.6 ROOF TRIM

#### **Fascia, valley gutter and barge boards**

Requirement: Supply and fix fascia, valley gutter and barge boards in conformance with the manufacturer's requirements.

### 3.7 COMPLETION

#### **Cleaning**

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

**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 1720.1.

**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 1720.1 requirements for span, spacings, loadings and deflections.

**Preservative treatment**

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

**Shop drawings**

General: Submit shop detail drawings or product design guide certified by a professional engineer stating that the design has been carried out in accordance with documented project, AS 1684 series and AS 1720.1 requirements for the configurations and loadings.

Roof trusses: Prepare drawings to show the following:

- On a plan, the truss layout.
- On elevations, the arrangement of members allowing for the accommodation of in-roof services and the size and section type of each member.
- Camber of bottom chord.
- The method of assembly, connection, lifting, holding down and bracing.

Wall frames: If wall framing is to be pre-fabricated, prepare drawings to show the following:

- On plan, the wall layout.
- On elevations, the arrangement of members, and the size and section type of each member.
- The method of assembly, connection, lifting, holding down and bracing.

**Subcontractors**

Prefabricated items: Submit the name and contact details of the proposed manufacturer.

**2 PRODUCTS****2.1 TIMBER****Fascias and barge boards**

General: Unless otherwise noted on the architectural drawings or associated schedule provide solid timber barge and fascia boards. Size to suit building roof design.

**2.2 SHEET PRODUCTS****Structural plywood**

Standard: To AS/NZS 2269.0.

Bond: Type A to AS/NZS 2754.1 (Int).

**Wet-processed fibreboard (including hardboard)**

Standard: To AS/NZS 1859.4.

## 2.3 COMPONENTS

### Mild steel post bases

Minimum dimensions:

- Stirrup: 75mm wide x 6mm thick.
- Dowel: 20mm diameter heavy tube.

Location: To timber posts supported off concrete slabs or footings.

Finish: Galvanize after fabrication.

### 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.

### Damp-proof course

Material: To AS/NZS 2904.

### Flashings

Material: To AS/NZS 2904.

## 3 EXECUTION

### 3.1 TRANSPORT AND DELIVERY

#### General

Handling and protection: Do not distort or damage timber or timber products.

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

#### Protection from weather

General: Provide temporary protection for members until permanent covering is in place.

### 3.2 FLOOR FRAMING

#### Bearers and joists

Levelling: Level bearers and joists by checking or by packing for the full width of the member with dense corrosion resistant material which is secured in place:

- Maximum thickness of packing: 3mm.

Spring: Lay bearers and joists to allow for straightening under loading.

Joints: Locate joints only over supports:

- Minimum bearing of bearers: 50mm.
- Minimum bearing of joists: 30mm.

Fixing: Secure bearers and joists to supports to provide restraint against lateral movement.

Joist restraint:

- Unseasoned timber: If joist timber is unseasoned, the span  $\geq 3000$ mm, and there is no ceiling lining, provide solid blocking between each joist in rows at 1800mm centres.
- Deep joists: If the joist depth:width ratio is  $\geq 4$ , restrain joists at the ends of the joists over supports and at  $\leq 1800$  mm centres using either of following as appropriate:
  - . Continuous trimming joists.
  - . Solid blocking or herringbone strutting.
- Trimmers or blocking dimensions:
  - . Depth: Joist depth less 25mm.
  - . Width:  $\geq 25$ mm.
- Herringbone strutting dimensions:  $\geq 38 \times 38$ mm.

### 3.3 WALL FRAMING

#### Wall framing

Bracing material: Refer to structural engineer's drawings and associated schedules.



**Additional support**

General: Provide additional support in the form of noggings, trimmers and studs for fixing lining, cladding, hardware, accessories, fixtures and fittings as required.

Maximum spacing of noggings: 1350mm centres.

**Vermin barriers**

General: Provide vermin barriers as follows:

- Brick veneer barrier: Close nail 10mm galvanized steel wire mesh to the underside of the bottom plate of external stud walls, extending across the cavity for building into brickwork.

**Damp-proof course**

General: Provide damp-proof courses under the bottom plate of stud walls built off slabs or masonry dwarf walls, as follows to AS/NZS 4200.1:

- External walls (not masonry veneer): Turn up at least 75mm on the inside and tack. Project 10mm beyond the external slab edge or dwarf wall and turn down at 45°.
- Walls of bathrooms, shower rooms and laundries: Turn up at least 150mm on the wet side and tack to studs.

Installation: Lay in long lengths. Lap full width at angles and intersections and at least 150mm at joints.

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

**Flashings**

Location: Provide flashings to external openings sufficient to prevent the entry of moisture. Form trays at the ends of sill flashings.

Masonry veneer construction: Extend across cavities and build into brickwork.

**3.4 ROOF AND CEILING FRAMING****Wall plates**

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

**Nailing plates**

General: Where timber joists, rafters or purlins bear on or into steel members, provide nailing plates to transfer the design loads, bolted to the steel member at 500mm maximum centres and 100mm maximum from the end of the nailing plate.

**Beam framing**

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

**Additional support**

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

**Anti-ponding boards**

Standard: To AS/NZS 4200.2.

**3.5 TRUSSES****Fabrication**

Camber: Camber bottom chord upward.

Overhangs: Free from spring or splits.

**Marking**

General: Permanently mark each truss to show:

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

- Support points

**Installation**

Nail plated prefabricated roof trusses: To AS 4440.

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

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

Vertical movement: Over internal walls provide at least 10mm vertical clearance and use bracing methods which allow for vertical movements.

**3.6 COMPLETION****Tightening**

General: Tighten bolts, screws and other fixings so that joints and anchorages are secure at practical completion.

## 0383 SHEET FLOORING AND DECKING

**1 GENERAL****1.1 STANDARDS****General**

Flooring and decking: To AS 1684.2, AS 1684.3 or AS 1684.4, as appropriate.

**2 PRODUCTS****2.1 DECKING****New timber decking**

Standard:

- Treated softwood to AS 4785.1 Section 4.
- Hardwood to AS 2796.1 Section 4.

**2.2 SHEET FLOORING****Plywood**

Standard: To AS/NZS 2269.0.

Plywood certified formaldehyde emission level to AS/NZS 2098.11: Class E1.

Grading:

- Veneer: CD.
- Grade: Bond Type A.

Durability: Preservative treatment to AS 1604.1 Table D1.

**Particleboard**

Particleboard: To AS 1860.1, Class 1.

Particleboard certified formaldehyde emission level to AS/NZS 2098.11: Class E1.

**Compressed fibre cement sheeting**

Standard: To AS/NZS 2908.2.

Category: 5.

**3 EXECUTION****3.1 GENERAL****Timber decking on steel joists**

General: Screw fix seasoned timber battens to the steel joists so that their top surfaces are aligned.

**3.2 FIXING SHEET FLOORING****Particleboard flooring**

Installation: To AS 1860.2.

**Plywood flooring**

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

**Compressed fibre cement flooring**

Installation: Lay the length of the sheets at right angles to the joists. Stagger the end joints and locate centrally over joists. Apply adhesive to edges of sheets and firmly butt join together.

Minimum number of spans across support: 2.

Fixing: Pre-drill screw holes with 1mm clearance over screw diameter and countersink. Fix with corrosion resistant countersunk screws.

Spacing of fasteners:

- Sheet edge and intermediate: Less than 450 mm.
- Corners and sheet edges: At least 12 mm from sheet edges and 50 mm from corners.

Wet area flooring: Stop screw heads with sealant.

### **3.3    FIXING DECKING**

#### **Timber decking**

Installation: Lay in long lengths with the ends of each board firmly butted to the next and firmly in contact with the joists. Stagger joints and make over joists.

Gap between edges of seasoned boards: 4mm.

Minimum number of spans across support: 3.

Nailing:

- General: Make sure the boards are in contact with the joists at the time of nailing, particularly where boards are machine nailed. If nails are to be less than 10 mm from ends of boards, pre-drill nail holes 0 to 1 mm undersize.
- Top nailing: Double nail at each bearing with nails driven flush. Offset nails at intermediate fixings or skew nail 10° in opposite directions.

Sealing: Apply 1 coat of water repellent preservative and 1 coat of finish coat to top surface of joists and all surfaces of boards before fixing.

**0411 WATERPROOFING – EXTERNAL AND TANKING****1 GENERAL****1.1 STANDARDS****Membrane materials**

Standard: To AS 4654.1.

**Membrane design and installation**

Standard: To AS 4654.2.

**1.2 INSPECTION****Notice**

Inspection: Give notice so that inspection may be made as follows:

- Substrate preparation completed.
- Secondary layers preparation completed.
- Before membranes are covered up or concealed.
- Underflashings complete prior to installation of overflashings.
- After flood testing.

**2 PRODUCTS****2.1 MEMBRANES****Membrane systems**

Requirement: Provide a proprietary membrane system certified as suitable for the intended external waterproofing.

**2.2 ACCESSORIES**

General: Install all accessories required to provide a complete, water-tight system

**Internal roof outlets**

General: Proprietary funnel shaped sump cast into the roof slab, set flush with membrane, with a flat removable grating and provision (e.g. clamp ring) for sealing the membrane into the base of the outlet.

**3 EXECUTION****3.1 PREPARATION****General**

Substrates: Prepare substrates as follows:

- Fill all cracks in substrates wider than 1.5mm with a filler compatible with the membrane system.
- Fill voids and hollows in concrete substrates with a concrete mix not stronger than the substrate.
- Remove projections.
- Remove deleterious and loose material.
- Remove all traces of a concrete curing compound if used.

Leave the surface free of contaminants, clean and dust free.

**Moisture content**

Concrete substrates: Cure for more than 21 days.

Moisture content: Verify that the moisture content of the substrate is compatible with the water vapour transmission rate of the membrane system by testing to AS 1884 Appendix A.

Test type:

- Hygrometer test: Seal a hygrometer to the substrate for more than 16 hours and measure the relative humidity of the air between the instrument and the slab.

**Falls**

Verify that falls in substrates are greater than 1.5%.

**Joints and fillets**

Control joints: Prepare all substrate joints to suit the membrane system.

**Priming**

Compatibility: If required, prime the substrates with compatible primers for adhesion of membrane systems.

**3.2 APPLICATION****Protection during installation**

General: Protect membrane from damage during installation and for the period after installation until the membrane achieves its service characteristics that resist damage.

**Drains**

General: Prevent moisture from tracking under the membranes at drainage locations.

Drains and cages: Provide removable grates or cages to prevent blockage from debris. If the finished surface is above the level of the membrane, provide a slotted extension piece to bring the grate up to the level of the finished surface.

Overflows: Apply a bond breaker to the perimeter of the overflow outlet at its junction with the surface to which the membrane will be fixed. Turn the membranes into the overflow to prevent moisture from tracking behind the membrane.

**Sheet joints**

Orientation of laps: Lap sheets on the upslope side of the roof fall over sheets on the downslope side.

End laps generally: Stagger end lap joints.

Bituminous sheet membranes:

- Side laps: 75mm.
- End laps: 100mm.
- Method: Heat welded.

Synthetic rubber membranes:

- Factory-vulcanized laps more than 40mm.
- Field side laps more than 50mm for side laps.
- Field end-laps more than 100mm for end laps.

Plasticised PVC (Polyvinyl chloride) membranes:

- Factory welded laps more than 30mm.
- Field-welded laps:
  - . If used over insulation boards more than 100mm.
  - . Other instances more than 75mm overlaps.

**Curing of liquid applied systems**

General: To the manufacturers' instructions.

**Control of movement**

General: Provide control joints located over control joints in the substructure.

Fillets and bond breakers: Size to allow the membrane to accommodate movement.

Bonded membranes: Carry control joints in the substrate through to and into the surface finish.

**Membrane terminations**

Membrane upturns: Provide upturns above the maximum water level expected from the exposure conditions of rainfall intensity and wind.

- Height: > 150 mm.
- Anchoring: Secure sheet membranes along the top edge.
- Edge protection: Protect edges of the membrane.
- Waterproofing above terminations: Waterproof the structure above the termination to prevent moisture entry behind the membrane using cavity flashings, capping, waterproof membranes or waterproof coatings.

Horizontal terminations: Do not provide. Use vertical terminations.

**Membrane vertical penetrations**

Pipes, balustrades, ducts, and vents: Provide separate sleeves for all pipes, ducts, and vents and have them fixed to the substrate.

**Membrane horizontal penetrations**

Sleeves: Protect PVC-U conduits and pipes with a sleeve of bitumen in order to seal to the membrane without burning the PVC-U. Do not use high density polyethylene (HDPE), polypropylene (PP) pipes or flexible PVC conduit.

**Membrane at balcony doors and windows**

Requirement: Install membrane prior to the fixing of door or window frames.

Membrane upturn:

- Sheltered areas: 40mm above the finished external floor surface or overflow level, whichever is the higher.
- Exposed areas: 150mm upturn from the finished external floor level or overflow level, whichever is the higher.

Hobless and flush thresholds: Install membrane prior to the fixing of door or window frames with a continuous grated drain abutting the external face of the door or window sill.

**Membrane around skylights and access openings**

Requirement: Install membranes to upstands prior to the installation of the skylight or access openings.

**Overlaying finishes on membranes**

Compatibility: If a membrane is to be overlaid with another system such as tiles, pavers, ballast, insulation or soil, provide an overlaying system that is compatible with and not cause damage to the membrane.

Bonded or partially bonded systems: If the topping or bedding mortar requires to be bonded to the membrane, provide sufficient control joints in the topping or bedding mortar to reduce the movement over the membrane.

Double slip sheet: If the topping or bedding mortar is structurally sufficient not to require bonding to the substrate, lay a double slip sheet over the membrane to separate it from the topping or bedding mortar.

Paint coatings: If maintenance pathways are indicated by a paving paint, use a paving paint which is compatible with the membrane.

**3.3 COMPLETION****Protection**

General: Keep traffic off membrane surfaces until bonding has set or for 24 hours after laying, whichever period is the longer.

Reinstatement: Repair or replace faulty or damaged work. If the work cannot be repaired satisfactorily, replace the whole area affected.

**Warranty**

Waterproofing: Cover materials and workmanship in the terms of the warranty in the form of interlocking warranties from the supplier and the applicator.

- Form: Against failure of materials and execution under normal environment and use conditions.
- Period: As offered by the supplier.

## 0421 ROOFING

**1 PRODUCTS****1.1 COMPONENTS****Fasteners**

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

**Insulation spacer**

Product: Refer to Architectural Materials and Finishes schedule.

**1.2 MATERIALS****Sheet metal roofing**

Standard: To AS 1562.1.

Prepainted and organic film/metal laminate products: To AS/NZS 2728.

Corrosion protection: To BCA Table 3.5.1.1a.

**Roof tiling**

Standard: To AS 2049.

Accessories: Provide the accessories, compatible with the tiles, necessary to complete the tiling.

**Glazed roofing**

General: Provide sloped overhead glazing fixed to glazing bars or directly to the roof framing. Provide the necessary trim, flashings and sealants.

Glass selection and installation: To AS 1288.

Certification: Required.

Certification provider: An organisation accredited by the Joint Accreditation System of Australia and New Zealand (JAS-ANZ).

**Plastic sheet roofing**

Unplasticised polyvinyl chloride (PVC-U) sheet: To AS 4256.2.

Glass fibre reinforced polyester (GRP) sheet: To AS 4256.3.

Polycarbonate: To AS 4256.5.

**Skylights**

General: To AS 4285.

**Roof ventilators**

Roof mounted heat exhaust vents: To AS 2427.

Proprietary roof mounted ventilators or smoke/heat ventilating systems: To AS 2665.

Finish: Match adjacent roofing.

**1.3 ROOF PLUMBING****General**

Standard: To AS/NZS 3500.3.

General: Provide the flashings, cappings, gutters, rainwater heads, outlets and downpipes necessary to complete the roof system.

**Materials**

Metal rainwater goods: To AS/NZS 2179.1.

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

**Proprietary flashings and cappings**

Standard: To AS/NZS 2904.



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## 2 EXECUTION

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### 2.1 INSTALLATION

#### Protection

General: Keep the roofing and rainwater system free of debris and loose material during construction and leave them clean and unobstructed on completion. Repair damage to the roofing and rainwater system.

#### 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.

### 2.2 SHEET METAL ROOFING

#### Roof sheet installation

Eaves: Treat ends of sheets as follows:

- Generally: Close off ribs at tops and bottoms of sheets by mechanical means or with purpose-made fillers or end caps.
- At gutters: Project sheets 50mm into gutters.

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

Accessories: Provide material with the same finish as roofing sheets.

### 2.3 TILING

#### Installation

Standard: To AS 2050.

Setting out: Set out the roof to give an even tile gauge in each course, with full or saw cut tiles at verges.

Bedding and pointing: Bed and point accessories including ridges, hips and verges, in coloured mortar.

- Colour: To match the tiles and accessories.

Pointed verge: Bed and point tiles on 100 x 5mm fibre cement pointing strip.

### 2.4 PLASTIC SHEET ROOFING

#### Installation

Standard: To AS 1562.3.

### 2.5 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 100mm 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 75mm above.

#### Gutters

Gutter sizing: Refer to architectural plans and Materials and Finishes Schedule for nominated gutter sizes and the average rainfall that gutter sizes have been based on. Contractor to ensure stormwater design in accordance with the average rainfall for the area of the site.

Minimum slope of eaves gutters: 1:200.

Minimum width overall of valley gutters: 400mm.

High-fronted gutters: Provide overflows to prevent back flow into roof or building structure.

**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.

**0431 CLADDING****1 PRODUCTS****1.1 MATERIALS****AAC panel cladding**

Type: A proprietary system of aerated autoclaved cement (AAC) panels.

Joints: Thin bed adhesive.

Control joints: At all external and internal corners, adjacent to all openings and at maximum 6 m centres.

**Hardboard planks**

Wet-processed fibreboard (including hardboard):

- Standard: To AS/NZS 1859.4.

Plank cladding type: A proprietary system of hardboard planks:

- Plank thickness: 9.5mm, unless otherwise noted.
- Joints and edges: PVC-U extrusions.
- External corners: Preformed metal joining pieces.
- Internal corners: Scribe.

**Fibre cement planks**

Standard: To AS/NZS 2908.2.

Plank cladding type: A proprietary system of single faced fibre cement building planks:

- Plank thickness: 7.5mm, unless otherwise noted.
- Joints and edges: PVC-U extrusion.
- Corners: Preformed metal joining pieces.

**Timber weatherboards**

Hardwood: To AS 2796.1.

Softwood: To AS 4785.1.

**Sheet metal cladding**

Standard: To AS 1562.1.

**Fibre cement cladding**

Standard: To AS/NZS 2908.2.

Cladding, eaves and soffit linings: Type A Category 3 (modulus of rupture  $\geq 7$  MPa).

Compressed cladding: Type A Category 5 (modulus of rupture  $\geq 18$  MPa).

Sheet cladding: Provide a proprietary system of single faced fibre cement sheets:

- Arrangement: Set out in even panels with joints coinciding with framing.
- Sheet thickness: 6mm minimum.
- Joints, corners and edges: PVC-U extrusion.

Eaves lining: Single faced fibre cement:

- Sheet thickness: 6mm minimum.
- Joints: PVC-U extrusion.

**Plastic cladding**

Unplasticised polyvinyl chloride (PVC-U) sheet: To AS 4256.4.

Glass fibre reinforced polyester (GRP) sheet: To AS 4256.3.

Polycarbonate: To AS 4256.5.

**1.2 COMPONENTS****Flashing material**

Standard: To AS/NZS 2904.

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## 2 EXECUTION

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### 2.1 CONSTRUCTION GENERALLY

#### Substrates or framing

Requirement: Before fixing cladding check the alignment of substrates or framing and adjust if necessary.

#### Fixing

Method: Nail to timber framing, screw to steel framing.

#### Accessories and trim

Requirement: Provide accessories and trim necessary to complete the installation.

#### Fixing eaves and soffit lining

Nailing: 150mm centres to bearers at maximum 450mm centres.

#### Metal separation

Requirement: Prevent direct contact between incompatible metals, and between green hardwood or chemically treated timber and aluminium or coated steel, by either:

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

### 2.2 PROPRIETARY SYSTEMS OR PRODUCTS

#### Fixing

Product fixing: Fix the following proprietary systems to manufacturer's recommendations:

- AAC cladding
- Hardboard plank cladding.
- Fibre cement plank cladding.
- Fibre cement cladding.

### 2.3 TIMBER WEATHERBOARD CLADDING

#### Preparation

Preservative treatment: For cladding with a natural or stained finish, finish the boards on both sides before installation by dipping or brushing with water-repellent preservative. Do not apply preservative if this is incompatible with a documented pigmented stain finish.

Cut surfaces: Treat freshly cut surfaces with water repellent before fixing.

#### Installation

Single lengths: Provide single lengths when installed vertically. Whenever possible provide single lengths of boards when installed horizontally.

Fixing at crossings:

- Seasoned milled weatherboards: 2 fixings.
- Unseasoned hardwood, sawn weatherboards, or secret nailed profiles: 1 fixing.

Nail heads: Treat visible nail heads as follows:

- In stained or clear finishes: Drive flush.
- In opaque finishes: Punch below the surface and fill flush with putty after the surface has been primed.

#### Joints

End grain joints: Install boards so that butt joints are in compression.

Internal and external corners: Butt against a stop bead of thickness at least that of the cladding.

### 2.4 SHEET METAL CLADDING

#### Cladding sheet installation

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

Accessories: Provide material with the same finish as cladding sheets, unless otherwise noted.

#### Corner flashing

Requirement: Finish off at corners with purpose-made folded flashing strips.

**2.5 PLASTIC CLADDING**

**Installation**

Standard: To AS 1562.3.

**0451 WINDOWS AND GLAZED DOORS****1 GENERAL****1.1 STANDARDS****General**

Selection and installation: To AS 2047.

**Glazing**

Glass type and thickness: To AS 1288, if no glass type or thickness is nominated.

Quality requirements for cut-to-size and processed glass: To AS/NZS 4667.

**2 PRODUCTS****2.1 GENERAL****Standards**

Flashings: To AS/NZS 2904.

Aluminium extrusions: To AS/NZS 1866.

**Glass**

Safety glasses: To AS/NZS 2208.

**Aluminium frame finishes**

Powder coating: To AS 3715:

- Grade: Architectural coating.

Anodising: To AS 1231:

- Thickness: ≥ 15 microns to 20 microns.

**2.2 COMPONENTS****Louvre window assemblies**

Requirement: Provide louvre blades mounted in a metal surround frame or sub-frame and able to withstand the permissible-stress-design wind pressure for that location without failure or permanent distortion of members, and without blade flutter.

Adjustable louvres: Provide louvre blades clipped into blade holders pivoted to stiles or coupling mullions, linked together in banks, each bank operated by an operating handle incorporating a latching device, or by a locking bar.

**Insect screens**

Fixed screens: Provide fixed screens to the window frames with a clipping device which permits removal for cleaning.

Hinged screens: Hinge at the top to give access to opening sash.

Roll up screens: Provide a proprietary retractable insect screen comprising aluminium frame with baked enamel finish, fibreglass mesh beaded into the frame, and a retraction system including tension spring, nylon bearings, positive self-locking device, and plastic sealing strip at sill.

Sliding screens: Provide a matching aluminium head guide, sill runner, and frame stile sections for screens not part of the window frame.

- Hardware: Nylon slide runners and finger pull handle. Provide pile strip closers against sash where necessary to close gaps.

Aluminium framed insect screens: Provide aluminium extruded or folded box frame sections with mesh fixing channel, mitred, staked and screwed at corners. Provide an extended frame section where necessary to adapt to window opening gear.

- Mesh: Bead the mesh into the frame channel with a continuous resilient gasket, so that the mesh is taut and without distortion.

**Security**

Security grilles and screen doors: To AS 5039.

Installation: To AS 5040.

## 2.3 HARDWARE

### Hardware documented generically

General: Provide hardware of sufficient strength and quality to perform its function, appropriate to the intended conditions of use, compatible with associated hardware, and fabricated with fixed parts firmly joined.

## 3 EXECUTION ---

### 3.1 INSTALLATION

#### Pre-glazing

Window assemblies and glazed doors: Supply inclusive of glazing, shop pre-glazed.

#### Windows and glazed doors

General: Install windows and glazed doors frames as follows:

- Plumb, level, straight and true within acceptable building tolerances.
- Fixed or anchored to the building structure in conformance with the wind action loading requirements.
- Isolated from any building loads, including loads caused by structural deflection or shortening.
- Allow for thermal movement.

#### Weatherproofing

Flashings and weatherings: Install flashings, weather bars, drips, storm moulds, caulking and pointing so that water is prevented from penetrating the building between frames and the building structure under prevailing service conditions, including normal structural movement of the building.

#### Fixing

Packing: Pack behind fixing points with durable full width packing.

Prepared masonry openings: If fixing of timber windows to prepared anchorages is by fastening from the frame face, conceal the fasteners by sinking the heads below the surface and filling the sinking flush with a material compatible with the surface finish.

#### Trim

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

## 0453 DOORS AND ACCESS PANELS

**1 GENERAL****1.1 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****Aluminium**

General: Assembled from aluminium sections, including accessories such as buffers, pile strips, strike plates, fixing ties or brackets and cavity flashing, with provision for fixing documented hardware.

**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 doors**

General: Provide flush doors of balanced construction.

**Construction**

Door thickness:

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

Edge strips: Minimum thickness 10mm. Increase overall thickness to greater than 15mm 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.

**Tolerance**

Squareness: The difference between the lengths of diagonals of a door: Maximum 3mm.

Twist: The difference between perpendicular measurements taken from diagonal corners: Maximum 3mm.

Nominal size (mm):

- Height:  $\pm 2$ .
- Width: +2, -0.

**Security screen doors**

Standard: To AS 5039.



## 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.

Type: Refer to architectural Materials and Finishes schedule.

## 3 EXECUTION ---

### 3.1 GENERAL

#### Security screen door

Standard: To AS 5040.

#### Ceiling access

General: Trim an opening and provide a loose access panel of minimum size 600 x 400mm.

#### Under floor access

Requirements: Provide a frame and a door, minimum size 720mm wide x 600mm high, complete with padbolt.

#### 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.

#### Aluminium 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: Screw once to studs at each fixing.

#### 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.

### 3.3 SLIDING INTERNAL DOORS

#### Accessories

Face mounted: Provide overhead track supports and head and jamb linings appropriate to the arrangement of the door, and removable pelmets at the head to allow access to the wheel carriages for adjustment.

Wheel carriages: Fully adjustable precision ball race type providing smooth, quiet operation.

**Cavity sliding doors**

General: Proprietary product comprising steel and timber frame construction with rigid steel top, base and rear supporting members and incorporating the overhead door track, ball race type wheel carriages guides, stops, split jamb linings and removable pelmet.

<b>0454 OVERHEAD DOORS</b>
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**1 GENERAL**

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**1.1 STANDARD****General**

Garage doors: To AS/NZS 4505.

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**2 EXECUTION**

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**2.1 INSTALLATION****Frames**

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

**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, 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, fixings and fixing instructions.

**Mounting height**

Door lockset mounting heights: 1050mm above finished floor to centreline of spindle, unless otherwise noted.

**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.

**0467 GLASS COMPONENTS****1 GENERAL****1.1 STANDARDS**

Materials and installation: To AS 1288.

Safety glasses: To AS/NZS 2208.

**1.2 SUBMISSIONS****Certification**

Balustrade design: Submit a professional engineers' certificate confirming conformance with AS/NZS 1170.1 clause 3.6.

Sealant compatibility: Submit statements from all parties to the installation certifying the compatibility of sealants and glazing systems to all substrates.

**2 PRODUCTS****2.1 MIRRORS****Reflective surface**

Type: Silver layer deposited on the glass or glazing plastic.

Protective coatings: Electrolytic copper coating at least 5 µm thick, and 2 coats of mirror backing and edge sealing paint having a total dry film thickness of at least 50 µm.

**Safety mirror**

Type: Vinyl backed Grade A safety mirror.

Safety compliance: To AS/NZS 2208.

**Solid backed annealed glass mirrors**

Backing: 9mm waterproof plywood.

Adhesive fixing to backing: Non-acidic silicone adhesive at the rate recommended by the manufacturer.

Installation to backing: Clean the back of the glass panel and apply walnuts of adhesive together with double sided adhesive tape for temporary support and affix directly to the backing.

**2.2 SHOWER SCREENS****Type**

Proprietary system comprising frames of extruded aluminium, stainless steel, or PVC-U, assembled around safety glass to form fixed panels and sliding, hinged or pivoted doors.

**2.3 GLASS BALUSTRADES****Glass balustrade systems**

General: Provide a glass balustrade system as noted in architectural Materials and Finishes Schedule.

Glass: Grade A safety glass.

Certification: Ensure proposed balustrade system is approved for use by Building Certifier assigned to project

**3 EXECUTION****3.1 FIXING MIRRORS****Vinyl backed Grade A safety mirrors and solid annealed glass mirrors**

Screw fixing: Fix direct to wall plugs with dome-headed chromium-plated screws in each corner and at 900 mm maximum centres around perimeter. Provide polyethylene sleeves and washers or prevent contact between screw and glass. Do not over-tension the screws.

Frame fixing: Proprietary aluminium frames to mirror perimeter, corners mitred. If unbacked, bed glass edges in a continuous resilient gasket. Attach the frame to the substrate with concealed screw fixings. Seal the frame to the substrate with paintable sealant which will not react with the mirror coating. Do not allow the sealant to contact the mirror back.

Bead fixing: Rebated timber beads to mirror perimeter, corners mitred. If unbacked, bed glass edges in a continuous resilient gasket. Screw fix the beads to the substrate.

Clip fixing: Fix direct to wall plugs with chromium-plated fixed clip and spring clip fixings at 900mm maximum centres around perimeter. If unbacked, provide polyethylene or cork washers to prevent contact between clips and mirror back.

### **3.2 GLAZED SHOWER SCREENS**

#### **Water shedding**

General: Provide an assembly which sheds water to the inside without retaining it on the frame surfaces. Seal the edge of the frame to adjoining surfaces with a resilient strip.

#### **Sliding assemblies**

Hanging: Hang the sliding sash on stainless steel or nylon sheaves on overhead channel track formed in the frame head, and fit nylon or equivalent bottom guides.

Hardware: Pull handles on both sides of sash, or of leading sash in multiple sash arrangements.

#### **Fixing**

Proprietary shower screens: To the manufacturer's recommendations.

### **3.3 GLASS BALUSTRADES**

#### **Standard**

Glass balustrades: To AS 1288 Section 7.

## 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 BCA.

**2 PRODUCTS****2.1 MATERIALS****Insulation**

Cellulosic fibre (loose fill): To AS/NZS 4859.1 Section 5.

Mineral wool blankets and cut pieces: To AS/NZS 4859.1, Section 8.

Polyester: To AS/NZS 4859.1 Section 7.

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.

Reflective thermal insulation: To AS/NZS 4859.1, Section 9.

Wool: To AS/NZS 4859.1, Section 6.

**Pliable membrane**

Standard: To AS/NZS 4200.1.

**3 EXECUTION****3.1 GENERAL****Bulk insulation**

Standard: To AS 3999.

General: Make sure fibre batts or blankets are firmly butted 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 membrane**

Standard: To AS/NZS 4200.2.

**3.2 FLOOR INSULATION****Under suspended framed floors - bulk insulation**

Product type: Proprietary item as noted in the Materials and Finishes schedule.

Installation: Fit tightly between framing members. If other support is not provided, staple nylon twine to the framing and stretch tight.

**Below concrete slab on ground**

Product type: Rigid cellular extruded sheets.

Laying pattern: Stretcher bond, with edges tightly butted.

Damp proof membrane: Lay over insulation.

**3.3 WALL INSULATION****Framed wall thermal break strips**

Product type: Proprietary item as noted in the Materials and Finishes schedule.

Application: To steel or timber framing with lightweight external cladding.



R-value:  $\geq 0.2$ .

Screw fixing: Button head screws at 1m centres.

Adhesive fixing: Wallboard adhesive walnuts at 1m centres.

#### **Framed walls – bulk insulation**

Product type: Proprietary item as noted in the Materials and Finishes schedule.

Installation: Friction fit between framing members. If other support is not provided, staple nylon twine to the framing and stretch tight.

#### **Full masonry cavity walls**

Product: Rigid cellular insulation board.

Application: To the inner brick skin.

Fixing: Proprietary plastic clips on pre-installed wall ties.

Installation: Horizontally with the tongue to the top edge and firmly against the inner brick skin. Keep boards clean and dry and free from mortar and grout. Do not bridge the cavity.

Flashings: Install flashings before installing insulation panels. Prevent entry of water behind the insulation boards.

#### **Vapour permeable (breathable) membrane**

Application: Provide a vapour permeable membrane behind the external facing material which does not provide permanent weatherproofing or may be subject to condensation forming on the internal face, including the following:

- Boards fixed vertically or diagonally.
- Boards or planks fixed in exposed locations where wind driven rain can penetrate the joints.
- Unpainted or unsealed cladding.
- Masonry veneer.

Installation: Run the vapour permeable membrane horizontally on the outer face of external wall framing, over the flashing, from the bottom plate up. Pull taught over the framing and fix to framing members. Seal across the wall cavity at the top.

Horizontal laps: At least 150mm wide, lapped to make sure water is shed to the outer face of the membrane.

### **3.4 ROOF INSULATION**

#### **Pliable 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 150mm and seal all joints with pressure sensitive adhesive tape.

#### **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.

#### **Ceiling insulation – bulk insulation**

Product type: Fibre batts.

Installation: Fit tightly between framing members.

**0511 LINING****1 PRODUCTS****1.1 MATERIALS AND COMPONENTS****Plasterboard**

Standard: To AS/NZS 2588.

**Fibre cement**

Standard: To AS/NZS 2908.2.

Wall and ceiling linings: Type B, Category 2.

Minimum thickness: 6mm.

**2 EXECUTION****2.1 CONSTRUCTION GENERALLY****Substrates or framing**

General: 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 necessary to complete the installation.

**2.2 PLASTERBOARD LINING****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.

**Installation**

Gypsum plasterboard: To AS/NZS 2589.

**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 12m centres in plasterboard linings or 7.2m 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.

**2.3 FIBRE CEMENT LINING****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 fibre cement is not possible due to the arrangement or alignment of the framing or substrate.
- Where the lining is the substrate for tiled finishes.

**Installation**

General: Run sheets across the framing members. In flush jointed applications, stagger end joints in a brick pattern and locate them on framing members, away from the corners of large openings. Provide supports at edges and joints.

Timber framed construction: Nail only or combined with adhesive.

Steel framed construction: Screw only or combined with adhesive.

- Wall framing: Conform to the following:
- Do not fix to top and bottom plates or noggings.
- In tiled areas: Provide an extra row of noggings immediately above wall-to-floor flashings. Fix sheet at 150mm centres to each stud and around the perimeter of the sheet.

Ceilings: Fix using screw or screw and adhesive to ceiling furring members. Do not fix sheets to the bottom chords of trusses.

Wet areas: Do not use adhesive fixing alone.

### **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.

Dry joints: Provide square edged sheet and finish with a PVC-U joining section.

Control joints: Provide purpose-made metallic-coated control joint beads at  $\leq 7.2$ m centres in walls and ceilings and to coincide with structural control joints.

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

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

- Control joints:  $\leq 4.2$ m centres and space to suit joints required in tiling.
- Internal corners: Reinforce with metallic-coated steel angles. In corners subject to continuous moisture, flash over the angle and under the sheeting with continuous bitumen coated aluminium flashing.

## 0551 JOINERY

## 1 PRODUCTS

## 1.1 JOINERY MATERIALS AND COMPONENTS

**Joinery timber**

Hardwood for trim: To AS 2796.1.

Hardwood for furniture: To AS 2796.3.

Seasoned cypress pine: To AS 1810.

Softwood for trim: To AS 4785.1.

Softwood for furniture: To AS 4785.3.

Finished sizes for milled timber: Not less than the documented dimension unless qualified by a term such as nominal, out of or ex to which industry standards for finished sizes apply.

**Plywood**

Interior use generally: To AS/NZS 2270.

Interior use, exposed to moisture: To AS/NZS 2271.

**Non-structural glued laminated timber**

Standard: AS 5067.

**Wet processed fibreboard (Including hardboard)**

Standard: To AS/NZS 1859.4.

**Particleboard**

Standard: To AS/NZS 1859.1.

**Dry processed fibreboard (Including medium density fibreboard)**

Standard: To AS/NZS 1859.2.

**Decorative overlaid wood panels**

Standard: To AS/NZS 1859.3.

**Certification**

General: Brand panels under the authority of a recognised certification program applicable to the product. Locate the brand on faces or edges which will be concealed in the works.

**High-pressure decorative laminate sheets**

Standard: To AS/NZS 2924.1.

**High-pressure decorative laminate sheet application table**

Classes: Provide classes as follows:

Class to AS/NZS 2924.1	Application
HGS or HGP	Kitchen work-tops
VGS or VGP	Kitchen front panels
VLS	Other vertical locations

Thickness (minimum):

- For horizontal surfaces fixed to a continuous substrate: 1.2mm.
- For vertical surfaces fixed to a continuous substrate: 0.8mm.
- For post formed laminate fixed to a continuous substrate: 0.8mm.
- For vertical surfaces fixed intermittently (e.g. to studs): 3.0mm.
- For edge strips: 0.4mm.

**Stone facings**

General: Provide stone or engineered stone slabs within the visual range of approved samples. In natural stone, repair mud veins or lines of separation that are integral to the selected pattern with resin fillers and back lining.

**Splashbacks**

Glass: 6mm toughened colourback glass to AS/NZS 2208.

Stainless steel: Grade 304, fine finished finish.

**1.2 DOMESTIC KITCHEN ASSEMBLIES****Standard**

General: To AS/NZS 4386.1.

**1.3 WARDROBE, CUPBOARD AND DRAWER UNITS****Plinths, carcasses, drawer fronts, shelves and doors**

Material: Select from the following:

- Overlaid high moisture resistant particleboard.
- Overlaid high moisture resistant medium density fibreboard.

Thickness: 16mm, unless otherwise noted.

Adjustable shelves: Support on proprietary pins in holes bored at equal centres vertically.

- Spacing: 32mm.

Fasteners: Conceal with finish.

Drawer fronts: Rout for drawer bottoms.

Drawer backs and sides:

- Material: PVC film wrapped particleboard.
- Thickness: 12mm, unless otherwise noted.
- Installation: Mitre corners leaving outer skin of foil intact, finish with butt joints, glue to form carcass and screw to drawer front. Rout for drawer bottoms.

Drawer bottoms:

- Material: PVC film laminated hardboard.
- Thickness: 3mm.

**Drawer and door hardware**

Hinge types: Concealed metal hinges with the following features:

- Adjustable for height, side and depth location of door.
- Self-closing action.
- Hold-open function.
- Nickel plated.

Slides: Metal runners and plastic rollers with the following features:

- 30 kg loading capacity.
- Closure retention.
- White thermoset powder coating or nickel plated.

**1.4 WORKING SURFACES****Laminated benchtops**

Material: High moisture-resistant particleboard or medium density fibreboard.

Finish: High pressure decorative laminate sheet.

Exposed edges: Extend laminate over shaped nosing, finishing more than 50mm back on underside. Splay outside corners at 45°.

Minimum thickness: 32mm.

Balance underside: Extend laminate to the undersides of benchtops if subject to excessive moisture from equipment such as dishwashers.

**Stone benchtops**

Material: Refer to architectural Materials and Finishes schedule.

Benchtop backing: Provide backing board to suit size and weight of nominated stone benchtop.

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**2 EXECUTION**

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**2.1 JOINERY****General**

Joints: Provide materials in single lengths whenever possible. If joints are necessary, make them over supports.

Framing: Frame and trim where necessary for openings, including those required by other trades.

**Accessories and trim**

General: Provide accessories and trim necessary to complete the installation.

**Fasteners**

Installation: Secure plinths and carcasses to floors, walls, or both at not more than 600 mm centres.

Visibility: Do not provide visible fixings except in the following locations:

- Inside cupboards and drawer units.
- Inside open units, in which case provide proprietary caps to conceal fixings.

Fix joinery units to substrate as follows:

- Floor mounted units: 600mm centres max.
- Wall mounted units: To each nogging and/or stud stiffener.

Fixings: Screws with washers into timber or steel framing, or masonry anchors.

**Adhesives**

General: Provide adhesives to transmit the loads imposed and to ensure the rigidity of the assembly, without causing discolouration of finished surfaces.

**Finishing**

Junctions with structure: Scribe plinths, benchtops, splashbacks, ends of cupboards, kickboards and returns to follow the line of structure.

Edge strips: Finish exposed edges of sheets with edge strips which match sheet faces.

**Benchtops**

Installation: Fix to carcass at least twice per 600mm length of benchtop.

Joint sealing: Fill joints with sealant matching the finish colour and clamp with proprietary mechanical connectors.

Edge sealing: Seal to walls and carcasses with a sealant, which matches the finish colour.

**Splash backs**

Glass: Fix with non-acidic silicone adhesive. Apply at the rate recommended by the manufacturer.

Installation: Clean the back of the glass panel and apply walnuts of adhesive together with double sided adhesive tape for temporary support, and affix directly to the substrate.

**2.2 TIMBER STAIRS****Set out**

General: Set out stair rod to give uniform risers and uniform treads respectively in each flight.

**Fabrication**

Closed strings: Trench for treads and risers.

Cut strings: Profile for treads and risers. Mitre riser ends.

Treads: Unless otherwise noted on architectural details, arris nosings to a pencil-round. Return nosings at cut strings.

Groove for riser tongue in closed riser stair. Set riser 15mm back from nosing.

Top tread: Flush with finished floor, otherwise to match stair treads. Provide similar tread section as nosing to floor edges around stairwell.

Risers: Unless otherwise noted on architectural details, tongue to tread. Mitre to string in cut-string stairs.

**Installation**

General: Glue joints in internal work. In closed riser stairs, wedge treads and risers to strings. Plant 2 glue-blocks behind each tread to riser junction. Trim floors to carry ends of stairs and around stairwell.

Stair bolts (to open rise close string stairs): 8mm diameter mild steel, one at each end and one at centre of flight, transversely between strings. Draw strings tight against ends of treads.

Fascia: Of depth sufficient to overlap 19mm below ceiling and fixed to floor joists hard up under nosing.

Trim: Provide beads and mouldings as necessary, including a scotia or similar planted under the tread nosing against the risers and cut strings, a bead between wall strings and wall, and a bead behind the fascia over the ceiling finish.

**Soffit lining**

If required, fix to 38 x 38mm nailing battens notched and nailed to the underside of treads and risers of closed rise stairs at the centre of flights and at each side.

**2.3 TIMBER BALUSTRADES****General**

Requirement: Unless otherwise noted on architectural details, provide a balustrade to the stair and landing, consisting of newels, handrail, balusters, and associated mouldings.

**Newels**

General: Halve and bolt to strings. Turn tops to detail.

**Handrails**

General: Unless otherwise noted on architectural details, on edge. Bullnose arrises 13mm radius. Stub tenon to newels.

**Balusters**

General: Unless otherwise noted on architectural details, at 100mm centres. Stub tenon to handrail at top and to tread or floor at bottom.

**2.4 TRIM****General**

General: Provide timber or medium density fibreboard trim, such as beads, skirtings, architraves, mouldings and stops to make neat junctions between components, finishes and adjacent surfaces.

Proprietary items: Provide complete with installation accessories.

**Fixing**

To masonry walls: Wall plugs at 600mm centres.

To stud walls: Nail to plate or framing at 600mm centres.

**0572 MISCELLANEOUS FIXTURES AND APPLIANCES****1 EXECUTION****1.1 PROPRIETARY STAIR SYSTEMS****General**

Materials, design and construction: To AS 1657 and BCA 3.9.1.

Straight flight stair assembly: A proprietary system, pre-assembled and fixed in place, comprising the following:

- Stair flights with treads and risers.
- Top landing.
- Balustrade to stair flight and landing.

Circular stairs: A proprietary system, mechanically assembled and fixed in place, comprising the following:

- A central steel tube column.
- Prefabricated metal treads sleeved over and cantilevered from the column.
- Top landing.
- Balustrade and handrail to stair and landing.
- Spacers, fixings and accessories necessary to complete the system.



<b>0574 WINDOW COVERINGS</b>
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**1 PRODUCTS**

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**1.1 MATERIALS****Fire hazard**

General: Do not provide materials which, when subject to fire conditions, will emit excessive smoke or toxic fumes.

**Fabrics**

Uncoated woven and knitted fabrics: To AS 2663.1.

Coated woven and knitted fabrics: To AS 2663.2.

- Performance classification (minimum): 2.

## 0611 RENDERING AND PLASTERING

**1 GENERAL****1.1 INTERPRETATION****Abbreviations**

General: For the purpose to this worksection the following abbreviations apply:

- CRF: Cement render – finish.
- CRM: Cement render – medium.
- CRS: Cement render – stronger.
- CRW: Cement render – weaker.
- GPF: Gypsum plaster – finish.

**2 PRODUCTS****2.1 MATERIALS AND COMPONENTS****Accessories**

Beads: Provide metal proprietary sections manufactured to be fixed to substrates and/or embedded in the plaster to form and protect plaster edges and junctions.

Lath: Provide a proprietary product manufactured from raised expanded metal for use with plaster.

**Admixtures**

Plasticisers or workability agents: Do not use in cement plasters.

**Aggregates**

Sand: Fine, sharp, well-graded sand with a clay content between 1% and 5% and free from efflorescing salts.

**Plaster for autoclaved aerated concrete**

General: Provide a proprietary product manufactured for use with the wall system.

**Bonding products**

General: Provide proprietary products manufactured for bonding cement-based plaster to solid substrates.

**Cement**

Standard: To AS 3972.

Type: GP.

**Colouring products**

General: Provide proprietary products manufactured for colouring cement plaster.

Integral pigment proportion: 5% maximum by weight of cement.

**Cornice cement**

General: Provide a proprietary product manufactured for use with the cornice.

**Cornices**

Cast plaster: Proprietary item.

**Gypsum plaster**

General: Provide a proprietary product containing calcium sulfate hemihydrate with additives to modify setting.

**Lime**

Limes for building: To AS 1672.1.

**Lime putty**

General: Prepare lime putty as follows:

- Stand dry hydrate of lime to AS 1672.1 and water for 24 hours or more without drying out.
- Stand quicklime and water for 14 days or more without drying out.

**Metal lath**

Internal: Expanded metal to AS 1397 coating class Z350.

External: Stainless steel or PVC-U.

### Mixes

General: Select a mix proportion to suit the conditions of application conforming to the **Mix proportion table**.

Measurement: Measure binders and sand by volume using buckets or boxes. Do not allow sand to bulk by absorption of water.

Plaster mixing: Machine mix for 3 to 6 minutes.

Strength of successive coats: Make sure successive coats are no richer in binder than the coat to which they are applied.

**Mix proportion table – Cement render, by volume**

Mix type	Substrate		Upper and lower limits of proportions by volume		
			Cement	Lime	Sand
-Single or multi-coat systems with integral finishing treatments -Base coats in multi-coat systems with cement or gypsum finishes	CRS	Dense and smooth concrete and masonry	1	0	3
			1	0.5	4.5
	CRM	Regular clay or concrete masonry	1	0.5	4.5
			1	1	6
	CRW	Lightweight concrete masonry and other weak substrates	1	1	6
			1	2	9
Second coat - Internal	CRF	Cement render base coats	1	1	6
			1	2	9
Second coat - External	CRF	Cement render base coats	1	1	5
			1	2	6

**Mix proportion table – Gypsum finish coat, by volume**

Mix type	Substrate		Upper and lower limits of proportions by volume			
			Gypsum	Cement	Lime putty	Sand
Gypsum finish coats	GPF	Cement render base coats	1	-	1.5	-
			1	-	2	-

### Control joint products

General: Provide proprietary products manufactured for use with the plastering system and to accommodate the anticipated movement of the substrates and/or the plaster.

### Water

General: Clean and free from any deleterious matter.

## 2.2 SPECIALIST PLASTER FINISHES

### Polymer modified render

Basecoat render: Proprietary polymer modified cementitious render supplied as a complete plastering system.

Finish coats: Proprietary trowelled on coloured and textured polymer modified finish coats.

### 3 EXECUTION

#### 3.1 SUBSTRATE

##### Substrates

General: Provide substrates as follows:

- Clean and free from any deposit or finish which may impair adhesion of plaster.
- If framed or discontinuous, support members in full lengths without splicing.
- If solid or continuous, remove excessive projections and fill voids and hollows with plaster stronger than the first coat and not weaker than the substrate.

Absorbent substrates: If suction is excessive, control it by dampening but avoid over-wetting and do not plaster substrates showing surface moisture.

Dense concrete: If not sufficiently rough to provide a mechanical key, roughen by scabbling or the like to remove 2mm of the laitance and expose the aggregate then apply a bonding treatment.

Painted surfaces: Remove paint and hack the surface at close intervals.

Untrue substrates: If the substrate is not sufficiently true to ensure conformity with the thickness limits for the plaster system or has excessively uneven suction resulting from variations in the composition of the substrate, apply additional coats without exceeding the thickness limits for the substrate or system.

##### Beads

Location: Fix beads as follows:

- Angle beads: At all external corners.
- Drip beads: At all lower terminations of external plaster.
- Beads for control of movement: At all control joints.
- Stop beads: At all terminations of plaster and junctions with other materials or plaster systems.

Joints in beads: Provide dowels to maintain alignment.

Mechanical fixing to substrate:  $\leq 300\text{mm}$  centres.

##### Bonding treatment

General: If bonding treatment is required, throw a wet mix onto the background. Mix proportions to the following:

- Cement plaster (cement:sand): 1:2.
- Gypsum plaster (gypsum:sand): 1:2.

Curing: Keep continuously moist for 5 days or more and allow to dry before applying plaster coats.

Thickness:  $\geq 3 < 6\text{ mm}$ .

##### Embedded items

General: If there are water pipes and other embedded items, sheath them to permit thermal movement.

##### Lath

Location: Provide lath as follows:

- Chases: If chases or recesses are 50mm wide or greater, fix metal lath extending 75mm or more beyond each side of the chase or recess.
- Metal and other non-porous backgrounds: Fix metal lath to provide a key.

#### 3.2 APPLICATION

##### Plastering

Base coats: Scratch-comb each base coat in two directions when it has stiffened.

Metal lath: Press the plaster through the apertures of expanded metal lath and wings of beads.

##### Finishing treatments

Plain:

- Bag: Rub the finish coat when set firm with a hessian pad to achieve a finish mainly free from sand.
- Carborundum stone: Rub the finish coat when set hard with a carborundum stone to achieve a finish free from sand.
- Foam float: Float finish coat on application with a wood or plastic float to an even surface and finish with a foam float to achieve a fine sand textured finish.

- Steel trowel: Steel trowel finish coat to a smooth dense surface which is not glass-like and is free from shrinkage cracks and crazing.
- Wood or plastic float: Float the finish coat on application to an even surface with a wood or plastic float.

#### Incidental work

General: Return plaster into reveals, beads, sills, recesses and niches. Plaster faces, ends, and soffits of projections in the substrate, such as string courses, sills, pilasters and corbels. Run neatly finished throating on soffits of external projections. Trim around openings. Plaster exposed internal surfaces of built-in cupboards.

#### Joining up

General: If joining up is required, make sure joints are imperceptible in the finished work after decoration.

#### Control joints

General: Provide joints in the finish to coincide with control joints in the substrate. Make sure that the joint in the substrate is not bridged during plastering.

Size:

- Depth: Extend the joint right through the plaster and reinforcement to the substrate.
- Width: 3mm, or the same width as the substrate joint, whichever is greater.

Damp-proof courses: Do not continue plaster across damp-proof courses.

Plastering on metal lath: Provide control joints to divide the plastering area into rectangular panels 10 m<sup>2</sup> or less.

V-joints: Provide V-joints, cut right through the plaster to the substrate, at the following locations:

- Abutments with metal door frames.
- Abutments with other finishes.
- Junctions between different substrates.

#### Decorative joints

General: Apply decorative joints in the second coat of two coat work as required.

#### Plaster thickness

General: To the **Plaster thickness table**.

**Plaster thickness table**

Substrate	Cement render, total thickness of single or multi-coat work (mm)	Gypsum/lime plaster (mm)
Brickwork and blockwork	12 min	3 max
Lightweight concrete and blocks	12 min	3 max
Metal lath measured from the face of the lath	18 min	3 max

#### Temperature

General: If the ambient temperature is 10°C or less or 30°C or more make sure that the temperature of mixes, substrates and reinforcement at the time of application are between 5°C and 35°C.

#### Tolerances

General: Finish plane surfaces within a tolerance of 6mm in 2400 mm, determined using a 2400mm straightedge placed anywhere in any direction. Finish corners, angles, edges and curved surfaces within equivalent tolerances.

### 3.3 COMPLETION

#### Curing

General: Prevent premature or uneven drying out and protect from the sun and wind.

Keeping moist: If a proprietary curing agent is not used, keep the plaster moist as follows:

- Base coats and single coat systems: Keep continuously moist for 2 days and allow to dry for 5 days before applying further plaster coats.
- Finish coats: Keep continuously moist for 2 days.

**0612 CEMENTITIOUS TOPPINGS****1 PRODUCTS****1.1 MATERIALS****Admixtures**

Standard: To AS 1478.1.

**Aggregates**

Coarse aggregate: Nominal single size less than or equal to 1/3 topping thickness.

Fine aggregate: Fine, sharp, well-graded sand with a low clay content and free from efflorescing salts.

**Bonding products**

General: Provide proprietary products manufactured for bonding cement-based toppings to concrete substrates.

**Cement**

Standard: To AS 3972.

- Type: GP.

**Water**

General: Clean and free from any deleterious matter.

**2 EXECUTION****2.1 PREPARATION****Substrates**

General: Provide substrates as follows:

- Clean and free from any deposit which may impair adhesion of monolithic or bonded toppings.
- Remove excessive projections and fill voids and hollows with a mix not stronger than the substrate or weaker than the topping.
- Roughen hardened concrete by scabbling or the like to remove 2mm of the laitance and expose the aggregate.

**Bonded toppings**

General: Before laying topping wash the substrate with water and provide a bonding product or treat as follows:

- Keep wet for 2 hours or more.
- Remove surplus water and brush on neat cement or a clean slurry of cement and water.
- Place the topping while the slurry is wet.

**2.2 APPLICATION****Laying**

General: Spread the mix and compact. Strike off, consolidate and level surfaces to finished levels.

Monolithic toppings: Lay while concrete subfloor is plastic and the surface water is no longer visible.

Toppings over 50mm thick:

- Lay in two layers of equal thickness.
- Place a layer of reinforcement between the layers of toppings. Lap reinforcement 200mm and tie. Do not create four-way laps.

**2.3 SURFACE FINISHES****Finishing methods – primary finish**

Machine float finish:

- After levelling, consolidate the surface using a machine float.
- Cut and fill and refloat immediately to a uniform, smooth, granular texture.
- Hand float in locations inaccessible to the machine float.

Steel trowel finish: After machine floating finish as follows:

- Produce a smooth surface relatively free from defects using power tools.

- When the surface has hardened sufficiently produce the final consolidated finish free of trowel marks and uniform in texture and appearance using steel hand trowels.

Burnished finish: Continue steel trowelling until the concrete surface attains a polished or glossy finish, uniform in texture and appearance, and free of trowel marks and defects.

Wood float finish: After machine floating use wood or plastic hand floats to produce the final consolidated finish free of float marks and uniform in texture and appearance.

Broom finish: After machine floating draw a broom or hessian belt across the surface to produce a coarse even-textured slip-resistant transverse-scored surface.

Scored or scratch finish: After screeding, give the surface a coarse scored texture using a stiff brush or rake drawn across the surface before final set.

Sponge finish: After machine floating, obtain an even textured sand finish by wiping the surface using a damp sponge.

Exposed aggregate finish: After floating and when concrete has stiffened, wet the surface and scrub with stiff fibre or wire brushes, flushing continuously with clean water, until the aggregate is uniformly exposed. Rinse the surface with water.

#### **Finishing methods – supplementary finish**

Abrasive blast: After steel trowelling, abrasive blast the cured surface to provide texture or to form patterns without exposing the coarse aggregate using fine hard, sharp graded abrasive particles.

Coloured applied finish: Apply a proprietary liquid or dry shake material to a steel trowel finished surface in conformance with the manufacturer's written requirements.

Stamped and coloured pattern paved finish: A complete proprietary finishing system.

Polished finish: After steel trowelling, grind the cured surface of the concrete.

#### **Slip resistant treatment**

Surface treatment: Apply silicon carbide granules after floating and before the topping surface has set, and trowel into the surface so that the granules remain exposed.

Application rate: 1 kg/m<sup>2</sup> evenly distributed.

#### **Surface colouring**

General: Apply the colouring product after floating and before the topping surface has set and trowel into the surface so that it is even in colour.

#### **Surface treatment**

General: Apply the surface treatment after floating and before the topping surface has set.

#### **Temperature**

General: Make sure that the temperature of mixes, substrates and reinforcement are not less than 5°C or greater than 35°C, at the time of application.

Severe temperature: If the ambient shade temperature is greater than 38°C, do not mix topping.

## **2.4 CONTROL OF MOVEMENT**

### **General**

General: Provide control joints as follows:

- Over structural control joints.
- To divide complex room plans into rectangles.
- Around the perimeter of the floor.
- At junctions between different substrates.
- To divide large topping finished areas into bays.

Depth of joint: Right through to the substrate.

Sealant width: 6 – 25mm.

Depth of sealant: One half the joint width, or 6 mm, whichever is the greater.

## **2.5 JOINT ACCESSORIES**

### **Weather bars**

General: Provide a corrosion resistant metal weather bar under hinged external doors. Locate under the centres of closed doors.

**Floor finish dividers**

General: Finish cementitious toppings at junctions with differing floor finishes with a corrosion resistant metal dividing strip suitable fixed to the substrate, with top edge flush to the finished floor. If changes of floor finish occur at doorways make the junction directly below the centre of the closed door.

**2.6 COMPLETION****Curing**

General: Prevent premature or uneven drying out and protect from the sun and wind.

Curing: Use a curing product or, as soon as it has set sufficiently, keep the toppings moist by covering with polyethylene film for at least seven days.



## 0621 WATERPROOFING – WET AREAS

**1 GENERAL****1.1 STANDARDS****Wet areas**

Waterproofing: To AS 3740.

**2 PRODUCTS****2.1 PRODUCTS****Membranes**

Standard: To AS/NZS 4858.

**Membrane systems**

Requirement: Provide a proprietary membrane system certified as suitable for the intended external waterproofing.

**Shower tray**

General: Purpose-made jointless shower tray, with wall upstands at least 50mm higher than the hob upstands. Set hob masonry on the inside of the tray upstands.

**Bond breakers**

Requirement: Compatible with the flexibility class of the membrane to be used.

Material: Purpose made bond breakers tapes and closed cell foam backing rods or fillets of sealant.

**Sealants**

Requirement: Waterproof, flexible, mould-resistant and compatible with host materials.

**3 EXECUTION****3.1 PREPARATION****Substrates**

General: Provide substrates as follows:

- Clean and free of any deposit or finish which may impair adhesion of membranes.
- If walls are plastered, remove loose sand.
- If walls or floors are framed or discontinuous, support members in full lengths without splicing.
- If floors are solid or continuous:
  - . Remove excessive projections.
  - . Fill voids and hollows greater than 10mm with abrupt edges with a cement:sand mix not stronger than the substrate nor weaker than the bedding.
  - . Fill depressions less than 10mm with a latex modified cementitious product with feathering eliminated by scabbling the edges.
  - . Fill cracks in substrates wider than 1.5mm with a filler compatible with the membrane system.

External corners: Round or arris edges.

**Moisture content**

Concrete substrates: Cure for at least 21 days.

Moisture content: Verify that the moisture content of the substrate is compatible with the water vapour transmission rate of the membrane system by testing to AS 1884 Appendix A.

Test type:

- Hygrometer test: Seal a hygrometer to the substrate for at least 16 hours and measure the relative humidity of the air between the instrument and the slab.

**Falls**

Substrate: If the membrane is directly under the floor finish, make sure the fall in the substrate conforms to the fall nominated for the finish.

**Water stop angles**

Requirement: Provide water stop angles at door thresholds and shower enclosures to support the waterproof membrane at junctions between waterproofed and non-waterproofed areas.

**Bond breakers**

Requirement: After the priming of surfaces, provide bond breakers at all wall/floor, hob/wall junctions and at control joints where the membrane is bonded to the substrate.

Sealant fillet bond breakers:

- Application: Form a triangular fillet or cove of sealant to internal corners within the period recommended by the membrane manufacturer after the application of the primer.
- Widths: 8 mm minimum to vertical corners. 10 – 12mm to horizontal corners.

Backing rod bond breakers: Retain in position with continuous length of tape pressed firmly in place against the surfaces on each side of the rod.

**3.2 APPLICATION****Protection**

General: Protect membrane from damage during installation and for the period after installation until the membrane achieves its service characteristics that resist damage.

**Extent of waterproofing**

Waterproof or water-resistant surfaces: To requirements of BCA 3.8.1.2.

**Vertical membrane terminations**

Upstands: At least 150mm above the finished tile level of the floor or 25mm above the maximum retained water level, whichever is the greater.

Anchoring: Secure sheet membranes along the top edge.

Edge protection: Protect edges of the membrane.

Waterproofing above terminations: Waterproof the structure above the termination to prevent moisture entry behind the membrane using tiler's angle and finish overlaps.

**Door jambs and architraves**

Requirement: If the bottom of doorjambs and architraves do not finish above the floor tiling, waterproof their surfaces below tile level to provide a continuous seal between the perimeter flashing to the wall/floor junction and the water stop angle.

**Drainage connections**

Floor wastes: Turn membrane down 50mm minimum into the floor waste drainage flanges and adhere to form a waterproof connection.

**Enclosed showers with hobs**

Internal membranes: Extend membrane over the hob and into the room at least 50mm.

**Unenclosed showers**

Requirement: Extend membrane at least 1500mm into the room from the shower rose outlet on the wall.

**Membrane vertical penetrations**

Pipes, ducts, and vents: Provide separate sleeves for all pipes, ducts, and vents and have fixed to the substrate.

**Membrane horizontal penetrations**

Sleeves: Provide a flexible flange for all penetrations, bonded to the penetration and to the membrane.

**Curing of liquid applied systems**

General: To the manufacturer's instructions.

Curing: Allow membrane to fully cure before tiling.

**Overlaying finishes on membranes**

Requirement: Protect waterproof membranes with compatible water-resistant surface materials that do not cause damage to the membrane.

Bonded or partially bonded systems: If the topping or bedding mortar is required to be bonded to the membrane, provide sufficient control joints in the topping or bedding mortar to reduce the movement over the membrane.

### 3.3 COMPLETION

#### Protection

General: Keep traffic off membrane surfaces until bonding has set or for 24 hours after laying, whichever period is the longer.

Reinstatement: Repair or replace faulty or damaged work. If the work cannot be repaired satisfactorily, replace the whole area affected.

#### Warranty

Waterproofing: Cover materials and workmanship in the terms of the warranty in the form of interlocking warranties from the supplier and the applicator.

- Form: Against failure of materials and execution under normal environment and use conditions.
- Period: As offered by the supplier.

## 0631 CERAMIC TILING

**1 GENERAL****1.1 STANDARDS****Tiling**

General: Comply with the recommendations of those parts of AS 3958.1 which are referenced in this worksection.

**Slip resistance**

Classification: To AS 4586.

Slip resistance measurement of completed installations: To AS 4663.

**2 PRODUCTS****2.1 TILES AND ACCESSORIES****Tiles**

Standard: To AS ISO 13006.

Coves, nosings and skirtings: Provide matching stop-end and internal and external angle tiles moulded for that purpose.

Exposed edges: Purpose-made border tiles with the exposed edge (whether round, square or cushion) glazed to match the tile face. If such tiles are not available, mitre tiles on external corners.

**Accessories**

General: If available, provide tile accessories such as round edge ceramic tiles, cove tiles, step treads and nosings to stairs, landings, and thresholds, skirtings, sills, copings and bath vents, which match the surrounding tiles, composition, colour and finish.

**2.2 MATERIALS****Adhesives**

Standard: To AS ISO 13007.1.

PVA (polyvinyl acetate)-based adhesives: Do not use in wet areas or externally.

**Mortar materials**

Cement type to AS 3972: GP.

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

**Bedding mortar**

Mix proportion (cement:sand), by volume: Select proportions from the range 1:3 to 1:4 for satisfactory adhesion. Provide minimum water.

**Water**

General: Clean and free from any deleterious matter.

**Grout**

Cement-based proprietary grout: Mix with water. Fine sand may be added as a filler in wider joints.

Terra cotta tiles: Provide proprietary polymer modified grout.

General purpose cement-based grout: Mix with fine sand. Provide minimum water consistent with workability.

Pigments for coloured grout: Colourfast fillers compatible with the grout material. For cement-based grouts, provide lime-proof natural or synthetic metallic oxides compatible with cement.

**3 EXECUTION****3.1 SUBSTRATES****Drying and shrinkage**

General: Before tiling, allow at least the following times to elapse (for initial drying out and shrinkage) for these substrates:

- Concrete slabs: 42 days.
- Concrete blockwork: 28 days.

- Toppings on slabs and rendering on brick or blockwork: A further 21 days.
- Rendering on swimming pool shell: A further 28 days minimum.

### 3.2 PREPARATION

#### Substrates without wet area membranes

General: Conform to the following:

- Clean off any deposit or finish which may impair adhesion or location of tiles.
- If framed or discontinuous, support members are in full lengths without splicing.
- If solid or continuous:
  - . Remove excessive projections.
  - . Fill voids and hollows greater than 10mm with abrupt edges with a cement:sand mix not stronger than the substrate or weaker than the bedding.
  - . Fill depressions less than 10mm with a latex modified cementitious product and eliminate feathering by scabbling the edges.

Absorbent substrates: If suction is excessive, control it by dampening but avoid over-wetting and do not apply mortar bedding to substrates showing surface moisture.

Dense concrete: If not sufficiently rough to provide a mechanical key, roughen by scabbling or the like to remove 3 mm of the surface and expose the aggregate; then apply a bonding treatment.

#### Substrates with wet area membranes

General: Make sure substrates are as follows:

- Clean and free of any deposit or finish which may impair adhesion or location of tiles.
- Compatible with all components of the floor system.

### 3.3 TILING GENERALLY

#### Cutting and laying

Cutting: Cut tiles neatly to fit around fixtures and fitting and at margins where necessary. Drill holes without damaging tile faces. Cut recesses for fittings such as soap holders. Rub edges smooth without chipping.

Laying: Return tiles into sills, reveals and openings. Butt up to returns, frames, fittings, and other finishes. Strike and point up beds where exposed. Remove tile spaces before grouting.

#### Variations

General: Distribute variations in hue, colour, or pattern uniformly, by mixing tiles or tile batches before laying.

#### Protection

Floor tiles: Keep traffic off floors until the bedding has set and attained its working strength.

#### Floor finish dividers

General: Finish tiled floors at junctions with differing floor finishes with a corrosion-resistant metal dividing strip fixed to the substrate. If changes of floor finish occur at doorways, make the junction directly below the closed door.

#### Bath ventilation

General: Ventilate the space below fully enclosed baths with at least 2 vermin proofed ventilating tiles.

### 3.4 SETTING OUT

#### Tile joints

Joint widths: Set out tiles to give uniform joint widths within the following limits:

- Floors:
  - . Dry pressed tiles: 3mm.
  - . Extruded tiles: 6mm.
  - . Vitrified: 3 to 5mm.
  - . Quarry tiles: 6 to 12mm.
- Mounted mosaics: To match mounting pattern.
- Walls:
  - . Dry pressed tile: 1.5mm.

- Extruded tile: 6mm.

Joint alignment: Set out tiling with joints accurately aligned in both directions and wall tiling joints level and plumb.

Joint position: Set out tiles from the centre of the floor or wall to be tiled and, if possible, make sure cut tiles are a half tile or larger.

Fixtures: If possible, position tiles so that holes for fixtures and other penetrations occur at the intersection of horizontal and vertical joints or in the centre of tiles.

#### **Falls and levels**

General: Grade floor tiling to even and correct falls generally and to floor wastes and elsewhere as required. Make level junctions with walls. If falls are not required, lay level.

Fall, general: 1:100 minimum.

Fall, in shower areas: 1:60 minimum.

Change of finish: Maintain finished floor level across changes of floor finish including carpet.

### **3.5 BEDDING**

#### **Preparation of tiles**

Adhesive bedding: Fix tiles dry; do not soak.

Mortar bedding: Soak porous tiles in water for half an hour and then drain until the surface water has disappeared.

Terra cotta tiles: Use pre-sealed tiles or apply a breathable sealer and lay dry. If a final sealed finish is selected, use a compatible laying sealer.

#### **Bedding**

General: Use bedding methods and materials which are appropriate to the tile, the substrate, the conditions of service, and which leave the tile firmly and solidly bedded in the bedding material and adhered to the substrate. Form falls integral with the substrate.

### **3.6 GROUTED AND SEALANT JOINTS**

#### **Grouted joints**

General: Commence grouting as soon as practicable after bedding has set. Clean out joints as necessary before grouting.

Face grouting: Fill the joints solid and tool flush. Clean off surplus grout. Wash down when the grout has set. When grout is dry, polish the surface with a clean cloth.

#### **Sealant joints**

General: Provide sealant joints filled with sealant and finished flush with the tile surface as follows:

- Where tiling is cut around sanitary fixtures.
- At corners of walls in showers.
- Around fixtures interrupting the tile surface, for example pipes, brackets, bolts and nibs.
- At junctions with elements such as window and door frames and built-in cupboards.

Material: Anti-fungal modified silicone.

Width: 5mm.

Depth: Equal to the tile thickness.

## 0651 RESILIENT FINISHES

**1 GENERAL****1.1 STANDARDS****General**

Installation: To AS 1884.

**2 PRODUCTS****2.1 MATERIALS****Wet processed fibreboard (hardboard) underlay**

Standard: To AS/NZS 1859.4.

Classification: General purpose medium board, manufactured specifically as flooring underlay.

Thickness: 5.5mm.

**3 EXECUTION****3.1 PREPARATION****Substrates**

General: To AS 1884 Section 3.

**Concrete substrates**

Moisture content: Do not commence installation unless the moisture content of the concrete has been tested to AS 1884 Appendix A and the values in clause A3.1.2 or A3.1.3 have been obtained.

Surface treatments: Mechanically remove the following surface treatments:

- Sealers and hardeners.
- Curing compounds.
- Waterproofing additives.
- Surface coatings and contamination.

Concrete substrate correction: Remove projections and fill voids and hollows with a levelling compound compatible with the adhesive. Allow filling or levelling compound to dry to manufacturer's recommendations.

Cleaning: Remove loose materials or dust.

**Timber and plywood substrates**

Moisture content: Do not commence installation unless the moisture content of battens/joists or plywood substrate has been tested to AS/NZS 1080.1 for timber and AS/NZS 2098.1 for plywood and values obtained as follows:

- Air-conditioned buildings: 8 to 10%.
- Intermittently heated buildings: 10 to 12.5%.
- Unheated buildings: 12 to 15%.

Timber substrate correction: Remove projections. If conformance to a planeness tolerance of 4mm in 2m determined using a 2m straightedge cannot be achieved, provide an underlay in brick pattern with joints avoiding substrate joints.

**Working environment**

General: Do not start work before the building is enclosed, wet work is complete and dry, overhead work is complete and good lighting is available. Protect adjoining surfaces.

**3.2 SHEET AND TILE INSTALLATION****Sheet set out**

General: Set out sheets to give the minimum number of joints. Position joints away from areas of high stress. Run sheet joints parallel with the long sides of floor areas, vertically on non-horizontal surfaces.

**Tile set out**

General: Set out tiles from centre of room. If possible cut tiles at margins only, to give a cut dimension of at least 100mm x full tile width. Match edges and align patterns. Arrange the cut tiles so that any variation in appearance is minimised.

**Joints**

Non-welded: Butt edges together to form tight neat joints showing no visible open seams.

Chemical welding: Apply seaming compound 100mm wide to the substrate centrally under the seam. Roll the seam until the compound is forced up into the joint. Clean off flush using a damp cloth.

**Junctions**

General: Scribe neatly up to returns, edges, fixtures and fittings. Finish flush with adjoining surfaces.

**3.3 COMPLETION****Protection of sheet materials**

General: Keep traffic off floors until bonding has set or for 24 hours after laying, whichever period is the longer. Do not allow water in contact with the finish for 7 days.

**Reinstatement**

Extent: Repair or replace faulty or damaged work. If the work cannot be repaired satisfactorily, replace the whole area affected.

**Cleaning**

General: Clean the finished surface. Buff and polish. Before the date for practical completion, mop and leave the finished surface clean and undamaged on completion.



## 0652 CARPETS

**1 PRODUCTS****1.1 MATERIALS****Carpet**

Minimum class: Residential Medium use under the Australian Carpet Classification Scheme.

Total VOC limit:

- Generally: 0.5 mg/m<sup>2</sup>.
- Compliance: To the Environmental Classification Scheme operated by the Carpet Institute of Australia.

**Wet processed fibreboard (hardboard) underlay**

Standard: To AS/NZS 1859.4.

Classification: General purpose medium board, manufactured specifically as flooring underlay.

Thickness: 5.5mm.

**Soft underlay alternatives**

Standard: To AS 4288.

**Hot-melt adhesive tape**

General: Glass fibre and cotton thermoplastic adhesive coated tape 60mm wide on a 90mm wide metal foil base and backed with silicon-coated release paper.

**Preformed gripper strips**

General: Domestic grade plywood carpet gripper strip with 3 rows of rust-resistant angled pins of length appropriate to the carpet type.

**Edge strips**

Type: Refer to architectural Materials and Finishes schedule.

Location: At exposed edges of the carpet and at junctions with different floor finishes or finishes of different thickness. Where edge strips occur at doorways, locate the junctions directly below the closed door.

**2 EXECUTION****2.1 GENERAL****Substrates**

Cleaning concrete surfaces: Mechanically remove the following surface treatments:

- Sealers and hardeners.
- Curing compounds.

Cleaning timber surfaces: Remove oil, grease and traces of applied finishes.

Concrete substrate correction: Remove projections and fill voids and hollows with a levelling compound compatible with the adhesive.

Timber substrate correction: Remove projections. If conformance to the flatness tolerance of 6mm in 3000mm, determined using a 3000mm straightedge placed anywhere in any direction cannot be achieved, fix an underlay in brick pattern with joints avoiding substrate joints.

Fixtures: Remove door stops and other fixtures and refix in position undamaged on completion of the installation.

**Moisture content**

General: Do not commence installation of flooring unless:

- Concrete substrate: The moisture content of the concrete has been tested to AS/NZS 2455.1 Appendix B and values in AS/NZS 2455.1 clause 2.4.2(c) have been obtained.
- Plywood substrates and timber flooring products: The moisture content has been tested to AS/NZS 2098.1 for plywood and AS/NZS 1080.1 for timber and values obtained as follows:
  - . Air-conditioned buildings: 8 to 10%.
  - . Intermittently heated buildings: 10 to 12.5%.
  - . Unheated buildings: 12 to 15%.

## 2.2 LAYING CARPET

### Standard

General: To AS/NZS 2455.1.

### Setting out

General: Lay the carpet in continuous lengths without cross joins in the body of the area. If unavoidable cross joins at doorways, create the joins directly below the closed doors.

Joints in underlay: Make sure joints in underlay do not coincide with carpet joints. Do not carry underlay over carpet grippers or edge strips.

### Seaming methods

Woven carpet: Machine or hand sew.

Tufted carpet: Provide hot-melt adhesive tapes.

### Carpet installation

Gripper strip: To AS/NZS 2455.1 clause 3.5.

Direct stick method. To AS/NZS 2455.1 clause 3.6.

## 0654 ENGINEERED PANEL FLOORS

**1 PRODUCTS****1.1 MATERIALS****Flooring panels**

General: Provide the proprietary flooring system nominated in the **Engineered panel floor schedule**.

**Floating floor underlay**

General: Provide the proprietary closed cell foam sheeting that is integral to the flooring system.

**Acoustic underlay**

General: Resilient underlay fixed with compatible adhesive.

**Adhesive**

Ventilation: Provide adequate ventilation appropriate for moisture curing.

**2 EXECUTION****2.1 GENERAL****Storage**

General: Deliver panel flooring to site in unbroken wrapping or containers and store so that its moisture content is not adversely affected. Do not store on the substrate until the moisture content of the substrate is suitable for the installation of the floor. Do not store in areas with wet plaster.

**Substrates**

Cleaning concrete surfaces: Mechanically remove the following surface treatments:

- Sealers and hardeners.
- Curing compounds.

Concrete substrate correction: Remove projections and fill voids and hollows with a levelling compound compatible with the adhesive.

Existing timber flooring substrates: Remove cupping, rough material and surface finishes by basic sanding.

Flatness: Not greater than 3mm deviation of the surface under a 3m straightedge laid in any direction with no abrupt variations greater than 1mm over 250mm.

**Moisture content**

General: Do not commence installation of flooring unless:

- Concrete substrate: The moisture content of the concrete has been tested to AS 1884 Appendix A and values in clauses A3.1.2 and A3.1.3 have been obtained.
- Plywood underlay and timber flooring products: The moisture content has been tested to AS/NZS 2098.1 for plywood and AS/NZS 1080.1 for timber and values obtained as follows:
  - . Air-conditioned buildings: 8 to 10%.
  - . Intermittently heated buildings: 10 to 12.5%.
  - . Unheated buildings: 12 to 15%.

**2.2 LAYING****Trial set-out**

General: Prepare a trial panel set-out to each area as follows to:

- Maximise the size of equal margins of cut panels.
- Locate control joints.

**Control joints**

General: Provide control joints as follows:

- Against vertical building elements: 12mm wide cork filled.
- To divide floors into maximum dimensions of 6m: 4mm wide silicone sealant filled.

## 0655 TIMBER FLOORING

**1 GENERAL****1.1 TOLERANCES****Tolerances**

Maximum deviation of the finished floor surface: 3mm from a 3m straightedge laid in any direction.

**2 PRODUCTS****2.1 GENERAL****Storage and handling**

General: Deliver timber flooring to site in unbroken wrapping or containers and store so that its moisture content is not adversely affected.

**Adhesive**

Ventilation: Provide adequate ventilation appropriate for moisture curing.

**2.2 STRIP FLOORING****Recycled timber**

Standard: To FWPA PN06.1039.

- Grading: To Section 5.

**New timber**

General: Conform to the **Grading table**.

**Grading table**

Product	Standard	Grade
Hardwood	AS 2796.2	High Feature Grade if available for the species selected, otherwise Select Grade.
Seasoned cypress pine	AS 1810	1
Softwood – pinus ssp	AS 4785.2	Appearance
Softwood – other	AS 4785.2	Select

**Identification**

General: Identify timber using branding or certification.

Branding: Locate the brand mark on faces or edges which will be concealed in the works.

**3 EXECUTION****3.1 SUPPORT FIXING****Battens for strip flooring on steel joists**

General: Screw fix seasoned battens along the steel joists with countersunk screws so that their top surfaces are aligned.

**3.2 FLOOR FIXING****Room environment**

General: During fixing and stabilising, operate the heating system of radiant heated or air-conditioned rooms at 1.5°C above normal maximum temperature.

**Adhesive**

Strip flooring: Use a urethane elastomer adhesive in addition to nails as follows:

- Intermittently supported flooring: 6 mm bead along each joist or batten.

**Nailing**

General: Make sure the boards are in contact with the subfloor at the time of nailing, particularly where boards are machine nailed. Skew nail in a uniform pattern. If nails are to be less than 12mm from ends of sheets or boards, pre-drill nail holes 0 to 1mm undersize.

Secret nailing: Do not use boards of more than 85mm cover width and use one nail or staple skewed at 45°. Do not cramp more than one board at a time.

Sinking: Punch nails 3mm below finished surfaces and fill the sinking flush with a material tinted to match the flooring which is compatible with the floor finish.

Top nailing: For boards more than 65mm cover width, use two nails skewed 10 degrees in opposite directions. Do not cramp more than 800mm width of boards at one time.

**Control joints**

Perimeters: Provide 10mm wide joints against vertical building elements.

Floors less than 6 x 6m: Partially cramp strip flooring to allow a 1 mm gap every 600mm or 1.5mm every metre.

Floors over 6 x 6m: Additionally, divide floors into maximum dimensions of 6m with joints 4mm wide filled with a flexible sealant compatible with the applied finish.

**Strip flooring**

General: Blend floor boards from more than one pack to distribute the colour range and grade features throughout the floor.

Installation: Lay in straight and parallel lines with each board firmly butted to the next and firmly in contact with the subfloor. Cramp sufficient only to bring the boards together and no more than 800 mm of flooring at any one time.

Fixing to softwood joists, battens or underlay: Apply adhesive in addition to nailing.

Set-out: Locate joints in boards so that they are evenly and symmetrically distributed and as follows:

- General: Staggered and at least 450mm apart.
- Butt joints: Centrally on supports.
- End-matched joints: Not in adjacent boards.
- Minimum number of spans across supports: 2.

**3.3 COMPLETION****Protection**

General: Provide protection as follows:

- Floors: With hardboard taped at all butt joints. Do not cover with sheet plastic.
- Stair treads: Full timber or plywood casing.

## 0656 FLOOR SANDING AND FINISHING

**1 GENERAL****1.1 STANDARDS****Floor sanding and finishing**

General: To AS 4786.2.

**2 PRODUCTS****2.1 FINISH****Filler**

General: Non-oil based and compatible with the coating system.

**Coating system**

Quality: Provide premium quality lines.

Combinations:

- Do not combine clear finishes from different manufacturers in a coating system.
- Provide only the combinations of filler, stain and sealer recommended by the manufacturer of the top coats.

Delivery: Deliver all products to the site in the manufacturer's labelled and unopened containers.

**3 EXECUTION****3.1 PREPARATION****Lighting**

General: Provide supplementary lighting to allow close examination of the entire process.

**Substrate**

General: Do not commence sanding until:

- Adhesives have cured.
- Floor heating has been switched off for 48 hours.
- Filler has dried as indicated by the colour fading.

Before finishing: Make sure substrates are clean and free of any deposit which may impair the following:

- Application of the coating system.
- Adhesion of resilient finishes.

**Preparation**

General: Punch nails 3mm below the surface. Remove protruding items from floor such as staples, nails and tacks. Fill open grained timber with materials compatible with those used in subsequent finishing operations.

**3.2 SANDING****Basic sanding – general**

General: Remove irregularities caused by cupping or mismatching of the flooring materials, with a drum type sanding machine and coarse abrasives.

**Basic sanding – strip flooring**

General: First cut at 45° to the length of the boards, second cut at 90° to the first cut, and third cut parallel to the length of the boards.

Boundary areas: Bring to the same surface condition as the main sanded area, using disc sanding.

Inaccessible areas: Hand scrape to produce an even, plane surface.

**Stopping and filling**

General: Select a colour to produce an average match with the final coated timber in tone, colour and texture.

Minor cracks: Fill and stop punched nails with a putty knife.

Deeper holes: Fill in layers greater than 6 mm allowing each fill to dry. Make sure cavities are filled slightly above the surface without air pockets.

Porous timber: Flood fill with the cloth application of water-based filler diluted to a creamy consistency.

#### **Finish sanding – general**

General: Provide a clear finished surface free of scratch marks when observed under the design light level when standing.

#### **Finish sanding – strip flooring**

General: After basic sanding, cut twice parallel to the length of the boards using increasingly fine abrasives. If hard surfaces show excessive scratching apply an initial cut at 90° to the grain direction.

Boundary areas: Bring to the same surface condition as the main sanded area, using disc sanding.

Inaccessible areas: Hand scrape to produce the same surface condition as the main sanded area.

Water based coating system: Sand with a final grade of paper of minimum F220 screen back.

#### **Cleaning**

General: After each sanding operation remove all dust by all of the following:

- Removal from cracks by hand.
- Vacuum cleaning.
- Tack rag cleaning.

### **3.3 COATING SYSTEM**

#### **General**

Finish: provide coating system as follows:

- Consistent film thickness.
- Consistent level of gloss.

#### **Wet paint warning**

General: Place notices conspicuously and do not remove them until the coating system has cured and hardened.

#### **Application**

General: Apply the coating system in conformance with the manufacturer's recommendations. Maintain a wet edge throughout the whole area.

#### **Sanding**

General: Fine sand between coats only within the depth of the finish and remove dust.

#### **Finishing cork floors**

Sealer: After sanding, finish with 3 coats of clear floor sealer.

#### **Timber floor coating system**

Coating: If edge bonding of strip flooring is known to occur, apply a sealer compatible with the final coat.

Final coats: 2 coats of water-based polyurethane applied with a continuous wet edge and to the manufacturer's recommendations.

### **3.4 COMPLETION**

#### **Cleaning**

General: Vacuum clean the area and protect with fabric drop sheets. Do not use plastic sheeting.

## 0671 PAINTING

**1 GENERAL****1.1 STANDARDS****Painting**

General: To the recommendations of those parts of AS/NZS 2311 which are referenced in this worksection.

**2 PRODUCTS****2.1 PAINTS****Paint brand**

Quality: If the product is offered in a number of levels of quality, provide premium quality lines.

**Low VOC emitting paints**

VOC limits for low odour/low environmental impact paint types:

- Primers and undercoats: < 65 g/litre.
- Low gloss white or light-coloured latex paints for wall areas: < 16 g/litre.
- Coloured low gloss latex paints: < 16 g/litre.
- Gloss latex paints for timber doors and trims: < 75 g/litre.

**Combinations**

General: Do not combine paints from different manufacturers in a paint system.

Clear timber finish systems: Provide only the combinations of putty, stain and sealer recommended by the manufacturer of the top coats.

**Delivery**

General: Deliver paints to the site in the manufacturer's labelled and unopened containers.

**Putty and fillers**

Material: To the recommendation of the paint system manufacturer as suitable for the substrate and compatible with the primer.

**Tinting**

General: Provide only products which are colour tinted by the manufacturer or supplier.

**3 EXECUTION****3.1 PREPARATION****Order of work**

Other trades: Before painting, complete the work of other trades as far as practicable within the area to be painted, except for installation of fittings, floor sanding and laying flooring materials.

Clear finishes: Complete clear timber finishes before commencing opaque paint finishes in the same area.

**Protection**

General: Before painting, clean the area and protect it against dust entry. Use drop sheets and masking to protect finished surfaces or other surfaces at risk of damage during painting.

Internal and external fixtures and furniture: Remove door furniture, switch plates, light fittings and other fixtures before starting to paint, and refix in position on completion of painting.

Adjacent surfaces: Protect adjacent finished surfaces liable to damage from painting operations.

**Wet paint warning**

General: Place notices conspicuously and do not remove them until the paint is dry.

**Repair**

General: Clean off marks, paint spots and stains progressively and restore damaged surfaces to their original condition. Touch up new damaged decorative paintwork or misses with the paint batch used in the original application.



**Substrate preparation**

General: Prepare substrates to receive the painting systems.

Cleaning: Clean down the substrate surface. Do not cause undue damage to the substrate or damage to, or contamination of, the surroundings.

Filling: Fill cracks and holes with fillers, sealants, putties or grouting cements as appropriate for the finishing system and substrate, and sand smooth.

Clear finish: Provide filler tinted to match the substrate.

Clear timber finish systems: Prepare the surface so that its attributes will show through the clear finish without blemishes, by methods which may involve the following:

- Removal of bruises.
- Removal of discolourations, including staining by oil, grease and nailheads.
- Bleaching where necessary to match the timber colour sample.
- Puttying.
- Fine sanding (last abrasive no coarser than 220 grit) to show no scratches across the grain.

**Unpainted surfaces**

Standard: To AS/NZS 2311 Section 3.

**Previously painted surfaces**

Preparation of a substrate in good condition: To AS/NZS 2311 clause 7.4.

Preparation of a substrate in poor condition: To AS/NZS 2311 clause 7.5.

Preparation of steel substrates with protective coatings: To AS/NZS 2312 Section 10 and AS 1627.1.

**3.2 PAINTING****Light levels**

General:  $\geq 400$  lux.

**Paint application**

Standard: To AS/NZS 2311 Section 6.

Timing: Apply the first coat immediately after substrate preparation and before contamination of the substrate can occur. Apply subsequent coats after the manufacturer's recommended drying period has elapsed.

**Priming before fixing**

General: Apply one coat of wood primer (2 coats to end grain) to the back of the following before fixing in position:

- External fascia boards.
- Timber door and window frames.
- Bottoms of external doors.
- Associated trims and glazing beads.
- Timber board cladding.

**Spraying**

General: If the paint application is by spraying, use conventional or airless equipment which does the following:

- Satisfactorily atomises the paint being applied.
- Does not require the paint to be thinned beyond the maximum amount recommended by the manufacturer.
- Does not introduce oil, water or other contaminants into the applied paint.

Paint with known health hazards: Not permitted on site.

**Sanding**

Clear finishes: Sand the sealer using the finest possible abrasive (no coarser than 320 grit) and avoid cutting through the colour. Take special care with round surfaces and edges.

**Repair of galvanizing**

General: For galvanized surfaces which have been subsequently welded, or which have been welded, prime the affected area.

Primer: Organic zinc rich coating for the protection of steel to AS/NZS 3750.9 Type 2.

**Tinting**

General: Tint each coat of an opaque coating system so that each has a noticeably different tint from the preceding coat, except for top coats in systems with more than one top coat.

**Services**

General: If not embedded, paint new services and equipment, except chromium, anodised aluminium, GRP, PVC-U, stainless steel, non-metallic flexible materials and normally lubricated machined surfaces. Repaint proprietary items only if damaged.

**3.3 PAINT SYSTEMS****Paint system description**

Generally: The paint system is referred to by its final coat.

Primers and undercoats: Provide primers and undercoats recommended by the manufacturer of the selected final coat as suitable for the substrate and the final coat.

Number of coats: Unless specified as one or two coat systems, each paint system consists of at least 3 coats.

Selection: Provide paint systems that conforms to the **Paint final coat table**.

**Paint final coat table**

Final coat	Applicable Australian Standard
<b>Interior</b>	
Flat latex	AS 3730.1
Floor varnish – moisture cured	AS 3730.27
Floor varnish – two pack isocyanate cured	AS 3730.27
Low gloss latex	AS 3730.3
Semi-gloss latex	AS 3730.2
Gloss latex	AS 3730.12
<b>Exterior</b>	
Full gloss solvent-borne	AS 3730.6
Flat latex	AS 3730.7
Low gloss latex	AS 3730.8
Gloss latex	AS 3730.10
Stain, lightly pigmented	AS 3730.28
Latex stain, opaque	AS 3730.16
Semi-gloss latex	AS 3730.9
<b>Paving</b>	
Paving paint, semi-gloss	AS 3730.29
Paving paint, gloss	AS 3730.29

**0702 MECHANICAL DESIGN AND INSTALL****1 GENERAL****1.1 STANDARDS****General**

Mechanical ventilation: To AS/NZS 1668.1 and AS 1668.2, as required by the BCA.

Refrigeration systems: To AS/NZS 1677.2 and the recommendations of SAA HB 40.1 and SAA HB 40.2.

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

**1.2 AIR CONDITIONING DESIGN****Standards**

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

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

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

**Air conditioning design**

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 1500mm above floor level.
- More than 2000 mm from cooking equipment and more than 1000mm 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 architectural drawings Materials and Finishes Schedule.

Internal window shading type: As noted in the architectural Materials and Finishes Schedule.

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.

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

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.

Supply diffusers:

Type: Contractor to provide selection of supply diffuser for approval by Client Representative

Return air grille:

Type: Contractor to provide selection of supply diffuser for approval by Client Representative

### 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 DUCTWORK

#### Standard

Flexible duct: To AS 4254.1.

Rigid ductwork: To AS 4254.2.

#### Flexible duct

Material: Aluminised fabric clamped on formed metal helix with insulation blanket wrapped around duct and covered with an outer vapour barrier.

Installation: Install flexible duct as straight as possible with minimum number of bends. Maximise bend radius but not less than required by AS 4254.1 clause 2.5.3(i). Check for and rectify any crushed flexible duct.

Support: To AS 4254.1. Limit sag to less than 40mm/m.

#### Duct insulation

General: Insulate ducts to reduce heat gain and prevent condensation. Provide continuous vapour barrier around ducts carrying conditioned air. Insulate flexible connections on ducts carrying air below ambient temperature.

#### Cleaning

General: Clean interior of ductwork progressively during installation.

### 3.2 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: 13mm for pipes less than DN 20, 19mm otherwise.

**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.

**3.3 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 100mm 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.

**3.4 COMPLETION****Commissioning**

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

Check list: Submit signed commissioning check list 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.

**3.5 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: Provide 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****Connections to Network Utility Operator mains**

General: Excavate to locate and expose the connection points and connect to the Network Utility Operator mains. On completion, backfill and compact the excavation and reinstate surfaces and elements which have been disturbed such as roads, pavements, kerbs, footpaths and nature strips.

**Piping**

General: 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 150mm 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**

General: 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, AS/NZS 3500.4 or AS/NZS 3500.5.

Copper pipe: To AS 4809.

**Pipe material**

General:

- Cold water: Copper or polybutylene
- Heated Water: Copper or polybutylene

Insulation in addition to that required by AS/NZS 3500: Insulate all heating water pipes

**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.

**Water heaters**

Location: Locate water heaters where they can be maintained or replaced without damaging adjacent structures, fixtures or finishes.

Standards:

- Electric water heaters: To AS/NZS 4692.1.
- Energy performance: To AS/NZS 4692.2.
- Gas hot water heaters: To AS 4552 and AS 4552.2. If a flue damper is available for the water heater supplied, provide one.
- Solid fuel heaters: To AS/NZS 2918.

Tariff: Install so that the heating system qualifies for the tariff concession or subsidy offered by the statutory authority.

Isolating valves: Provide isolation valves to water heaters.

Water heater type: Gas or electrical as noted in the architectural Materials and Finishes Schedule.

- Manufacturer: Contractor to provide product options for approval by the Clients Representative.

**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.

**Solar and heat pump systems**

General: Provide a proprietary automatic water heater comprising solar collector and storage container, with or without supplementary heating unit and including connections, controls and necessary fittings.

Standard: To AS/NZS 2712.

**Hot water temperature control**

Thermostatic mixing valves:

- Manufacturer: As noted in the architectural Materials and Finishes Schedule.
- Type: As noted in the architectural Materials and Finishes Schedule.

Special taps:

- Manufacturer: As noted in the architectural Materials and Finishes Schedule.
- Type: As noted in the architectural Materials and Finishes Schedule.
- Temperature: Maximum water temperature to be 60°C to hot water taps to kitchen and laundry sinks. All other hot water taps to have maximum water temperature of 50°C.

**Cleaning**

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

**2.4 STORMWATER****Standard**

General: To AS/NZS 3500.3 or AS/NZS 3500.5.

**Cleaning**

General: During construction, use temporary covers to openings and keep the system free of debris. On completion, clean and flush the system.

**Pipe laying**

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

**Downpipe connections**

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

**Subsoil drains**

Connection: Connect subsoil drains to the stormwater drainage system.

Trench width: Minimum 450mm.

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 0.25mm 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: 25mm 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 or AS/NZS 3500.5.

Waterless composting toilets: To AS/NZS 1546.2.

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

**Cleaning**

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

On completion: Clean and flush the system.

**Septic tanks**

Standard: To AS/NZS 1546.1.

Effluent disposal: To AS 1547.

**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.

**2.6 RAINWATER TANKS****Standards**

Metal tanks and rainwater goods: To AS/NZS 2179.1.

Design and installation: To the recommendations of SAA HB 230.

Polyethylene tanks: To AS/NZS 4766.

Coated steel tanks: Metallic-coated steel with polymer film to AS 2070 on the inside and prepainted on the outside.

Bladder tanks: Proprietary plastic bladder type constructed from polymer conforming to AS 2070, resistant to puncture and microbial attack.

**Rainwater tanks**

Type: As noted in the architectural Materials and Finishes Schedule.

Connect to: Ensure at least one ground floor toilet is reticulated to water tank in-line for local council regulations.

Accessories: Provide accessories needed to complete the installation and constructed from corrosion resistant material compatible with the tank material. Include the following:

- Inlet and outlet connections.
- Floating outlet to draw water from the upper part of the tank.
- Tight fitting lids or insect proof screens at all openings.
- Flap valves at every opening to the tank.
- Calmed inlet to the tank to prevent stirring sediment.
- Flywire screened overflow siphon to skim surface contaminants.
- Vermin proof, child proof access opening.



- Easily cleanable filter prior to the entry to the tank with maximum 1mm mesh size.

**First flush diverter**

General: Provide a first flush diverter. Arrange to drain completely.

Sizing: Select for at least 20 L/100 m<sup>2</sup> rainwater catchment area.

Construction: Corrosion resistant and compatible with the rainwater plumbing and tank.

Discharge: Discharge waste water from the first flush diverter either:

- If permitted by the local authority, onto grassed areas away from tank and building footings.
- To the stormwater installation.

**Installation**

General: Provide structural support to withstand the mass of the tank when full without deformation or excessive settling. Support connecting piping independently of the tank. Provide a 300 mm long section of reinforced flexible hose to prevent piping exerting a load on the tank. Pipe overflow to discharge away from the tank. Prevent the entry of sunlight to the interior of the tank.

Above ground tanks: Restrain the tank to prevent movement, when empty, caused by wind and other loads. Provide a level base with gaps not exceeding 10mm, free of sharp projections and projecting beyond the edge of the tank at all points.

Polyethylene tanks: Trim and compact the ground and place a level bed of sand at least 50mm thick.

Coated steel tanks: Fully support the tank on a self-draining timber or concrete base. Prevent contact with dissimilar metals. Arrange so that no part of the tank is below ground level and so that adjacent ground surfaces fall away from the tank. Do not use sharp objects inside the tank. Remove swarf with a magnet if drilling or cutting.

Bladder tanks: Locate on level base free from sharp objects. Install with manufacturer's supporting frame. Provide over-pressurising relief and air vent.

Cleaning: Flush the rainwater system. Wash and flush tanks to remove manufacturing and other contaminants.

**2.7 GREYWATER SYSTEMS****Standards**

Design and installation: To the recommendations of SAA HB 326.

**Greywater diversion devices**

Standard: To ATS 5200:460.

WaterMark: Required.

Access: Locate to facilitate access for inspection and maintenance.

**Tanks**

General: Provide an appropriately sized surge tanks.

Overflow: Pipe to sewer.

Arrangement: Prevent the entry of sunlight to the interior of the tank.

**Backflow prevention**

Standard: To AS/NZS 3500.1 and the requirements of the Network Utility Operator.

**2.8 GAS****Standard**

Reticulated gas systems: To AS/NZS 5601.1.

**Buried pipes**

Warning tape: During backfilling, lay plastic warning tape 300 mm above and for the full length of buried gas pipes.

- Type: Minimum 100mm wide, with GAS PIPE UNDER marked continuously.

**Commissioning**

General: On completion of installation and testing, turn on isolating and control valves and purge and charge the installation.

**0902 ELECTRICAL DESIGN AND INSTALL****1 GENERAL****1.1 STANDARDS****General**

Electrical installation: To AS/NZS 3008.1.1 and SAA HB 301.

Telecommunications cabling: To AS/CA S008, AS/CA S009, AS/NZS 3080, SAA HB 29 and SAA HB 252.

Domestic electricity meter enclosures: To AS 6002.

**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.

**Consumers mains and metering**

General: Provide consumers mains and connect them to the electricity distributor mains.

Electricity distributor's requirements: Provide metering, protection, and control equipment as required by the ED S&IR.

**Switchboards**

Standard: To AS/NZS 3439.3.

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 sub-mains.
- ≥ 25% spare capacity in final sub-circuits.

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.

**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: 20mm.

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 4783.2 and AS/NZS 4782.2.
- 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 sub-circuits and terminate at fixed appliances, hot water units, packaged air conditioning and other plant and equipment.

Isolation switch: Provide isolating switch adjacent to equipment.

**Telecommunications**

Submissions: Submit required applications for telecommunications services to the telecommunications services carrier and liaise with the carrier.

Installations requiring telephony only: To AS/CA S009.

Small office/home office installations: Category 6, to AS/CA S009 and AS/NZS ISO/IEC 15018 and in accordance with the recommendations of SAA HB 29.

**Television systems**

General: Provide an analogue and digital television distribution system to AS/NZS 1367 and conforming to the recommendations of Digital Broadcasting Australia.

Antennas: Provide and locate antennas to receive all locally available free-to-air television stations.

**Network Systems**

General: Provide a coaxial cabling system suitable for satellite or cable network operator's services.

Conduits for future cabling: 5mm diameter with drawstrings.

**Intruder alarm system**

General: Provide intruder alarm system.

Standard: To AS/NZS 2201.1.

**Smoke detection**

General: Provide smoke detectors to the requirements of the BCA. Connect smoke detectors 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, and SAA HB 29.

**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 and the recommendations of SAA HB 29. Test the cable link performance in accordance with the recommendations of SAA HB 29 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 Telecommunications Cabling Advice (TCA1).

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



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## Appendix A

Document No: A901

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Document Name: Materials and Finishes Schedule

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