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SPECIFICATION

Proposed Multi Dwelling Development

Lot A & B, DP 408065, 101 Cobar Street, Nyngan

Bogan Shire Council

(THIS SPECIFICATION TO BE READ IN CONJUNCTION WITH
CURRENT BCA AND ALL CURRENT AUSTRALIAN STANDARDS)



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SPECIFICATION

ALL AUSTRALIAN STANDARDS REFERRED TO IN THIS SPECIFICATION ARE TO BE THOSE CURRENT AT TIME OF CONSTRUCTION.

1. SITE PREPARATION

GENERAL

Standard

Ground works for slabs and footings: to AS 2870.

Interpretation

Rock: Monolithic material with volume greater than 0.5m³ which cannot be removed until broken up by mechanical means such as rippers or percussions tools.

Bad ground: Ground unsuitable for the work, 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.

Line of influence: A line 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.

Sub-grade: The trimmed or prepared portion of the formation on which the pavement or slab is constructed.

Immediate Notice

If rock or bad ground is encountered, advise the owner immediately.

Explosives

Do not use explosives.

1.2 DEMOLITION – where noted on plans

Standard

Demolition: to AS 2601.

Demolished Materials

Except for materials to be salvaged and retained by the owner or re-used, take possession of demolished materials and remove them from the site. Do not burn or bury demolished materials on the site.

Support

Provide temporary support for sections of existing buildings, which are to be altered, and which rely for support on work to be demolished

Weather Protection

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.

Security

If walls or roofs are opened for alterations or additions, provide security against unauthorised entry.

1.3 TREES TO BE RETAINED – where noted on plans

Marking

Mark trees which are required to be retained using suitable non-injurious, easily visible and removable means of identification. Remove the identification on completion.

Protection

Protect from damage trees which are required to be retained. Do not remove topsoil from the area within the drip line of the trees and keep this area free of construction material and debris. Excavation If excavating near trees required to be retained, use band methods to locate, expose and cleanly remove the roots on the line of excavation.

1.4 ENVIRONMENTAL PROTECTION

Erosion Control

Avoid erosion, contamination and sedimentation of the site, surrounding areas and drainage systems.

Dewatering

Keep the site free of water and prevent water flow over new work.

1.5 SITE CLEARING – where noted on plans

Extent

Limit clearing to areas to be occupied by construction, paving or landscaping.

Clearing Operations

Remove everything on or above the site surface, including rubbish, scrap, grass, vegetable matter and organic debris, scrub, trees, timber, stumps, boulders and rubble. Remove grass to a depth just sufficient to include the root zone.

Grubbing

Grub out or grind stumps and roots over 75mm diameter to a minimum depth of 500mm below sub-grade under construction, and 300mm below the finished surface in unpaved areas.

Removal of Topsoil

General: Remove the topsoil layer of the natural ground which contains substantial organic matter over the areas to be occupied by construction and paving.

Maximum depth: 100mm.

Topsoil Stockpiles

Stockpile site topsoil required for re use.

Protect stockpiles from contamination by other excavated material, weeds and building debris.

Surplus Material

Take possession of surplus material and remove it from the site.

1.6 EXCAVATION – where noted on plansExtent

Excavate to give the levels and profiles required for construction. Site services, paving and landscaping. Allow for compaction or settlement.

Foundations

After excavation, confirm that the bearing capacity is adequate.

Under Floor Access

Provide a minimum clearance to underside of timber bearers of 400mm.

Bearing Surfaces

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

Reinstatement

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

Existing Footings

If excavation is required below the line of influence of an existing footing, use methods which maintain the support of the footing and ensure that the structure and finishes supported by the footing are not damaged.

Grading

Grade the ground surface externally and under suspended floors to drain ground or surface water away from buildings without ponding.

1.7 SURFACE PREPARATION – where noted on plansGeneral

Before placing fill, ground slabs or load bearing elements, remove loose material, debris and organic matter and compact the ground to achieve the required density.

Placing Fill

Place fill in layers and compact each layer to achieve the required density.

Moisture Content

If necessary to achieve the required density or moisture content, adjust the moisture content of the fill before compaction.

1.8 PILING – where noted on plansBored Piers

After excavating bored piers, remove loose material and water from the base and confirm the bearing capacity. Do not allow loose material to fall down the hole before or during concreting; provide a liner if necessary.

Timber Piled Footing System

Provide a proprietary system designed to AS 2870.

Screw-in Foundations

Provide a proprietary system designed to AS 2159.

1.9 SERVICE TRENCHES – where noted on plansExcavation

If practicable, make trenches straight between manholes, inspections points and junctions, with vertical sides and uniform grades.

Trench Widths

Keep trench widths to the minimum consistent with the laying and bedding of the relevant service and construction of manholes and pits.

Backfilling

General: Backfill service trenches as soon as possible after laying the service. Place backfill in layers. Compact each layer to a density sufficient to minimise settlement.

Backfill material: Excavated soil or well graded inorganic material with maximum particle size of 75mm

- Next to services: Do not place any particles greater in size than 25 mm within 150 mm of services.
- Under paved areas: Course sand, controlled low strength material or fire crushed rock.
- In reactive clay sites classified M, H or E to AS 2870: Impervious material.

2. CONCRETE CONSTRUCTION**2.1 GENERAL**Cross Reference

Refer to the General requirements section for termite protection.

Standards

Concrete structures generally: to AS 3600.

Ground slabs and footings: to AS 2870.

2.2 GROUND SLAB VAPOUR BARRIERMaterial

Provide a proprietary vapour barrier which:

- consists of high impact resistant polyethylene film minimum 0.2 mm thick which has been pigmented and branded by the manufacturer;
- has a current Australian Building Products and Systems Certification Scheme certificate; or
- has a current technical opinion issued by the Australian Building Systems Appraisal Council stating that it is suitable for use as a vapour barrier, when not subject to liquid water pressure, for concrete slabs on ground.

Base preparation

Blind the surface with sufficient sand to cover any hard projections. wet the sand just before placing the vapour barrier.

2.3 REINFORCEMENTMinimum Lap

Splice as follows:

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

Minimum Cover

Unprotected by membrane on ground or external surfaces: 40 mm.

Protected by membrane on ground: 10 mm.

Internal surfaces: 20 mm.

Aggressive soil or salty environment: 65 mm.

2.4 CONCRETEReady Mixed Supply

Standard: to AS 1379. by the batch production process.

Maximum slump: 100 mm.

Concrete Placing

Depth: If concrete is deeper than 350 mm, place it in layers so that each succeeding layer is blended into the preceding one by the compaction process.

Slabs and pavements: Place concrete uniformly over the width of the slab so that the face is generally vertical and normal to the direction of placing.

Compaction

Vibrate concrete to remove entrapped air, but avoid over-vibration that may cause segregation.

Curing

Protection: Protect concrete from premature drying and from excessive hot, cold and/or windy conditions.

Method: Cure concrete by

- using a proprietary curing compound; or
- keeping it covered and moist for the following periods:
 - In-ground footings: 2 days
 - Exposed footings, beams and slabs: 7 days.

Formwork Removal

Remove timber formwork.

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 backprops left in position for 21 days.

2.5 JOINTSConstruction Joints

Joint preparation: roughen and clean the hardened concrete joint surface, remove loose or soft material, free water and foreign matter. Dampen the surface before placing the concrete.

Slip Joints

If concrete slabs are supported on masonry, provide proprietary pre-lubricated slip joints.

2.6 CONCRETE BEARER SUPPORTSGeneral

Provide proprietary pre-cast stumps to support bearers at 1800 mm maximum centres.

Concrete Stumps

General: Set stumps 25 to 50 mm into concrete pad footings.

Marking: Maker's name on one face.

Bracing: Brace stumps which project above the ground by more than 12 times the width of their smallest face.

Concrete Stump Construction Table

Provide sizes and reinforcement as follows:

Length (mm)	Size (mm)	Reinforcement
Up to 1400	100 x 100 x 110 dia	One 5 mm hard drawn wire
1401 to 1800	100 x 100 x 110 dia	Two 5mm hard drawn wires
1801 to 3000	125 x 125 x 140 dia	Two 5mm hard drawn wires

3. TIMBER AND STEEL CONSTRUCTION

3.1 GENERAL

Cross References

Refer to the following sections:

- General requirements: for termite protection and timber durability.
- Concrete construction: for concrete bearer supports.
- Brick and block construction: for clearance for timber frame shrinkage and masonry bearer supports.
- Block and tile finishes: for waterproofing of wet areas.
- Painting: for priming of steel and timber before fixing and repair of zinc-coated steel after cutting and welding.

Standards

Timber framing and flooring: to AS 1684. or AS 1720.

Structural steelwork: to AS 4100.

Cold-formed steel framing: Provide a proprietary system designed to AS 3623.

Preparation of metal surfaces: to AS 1627.

3.2 MATERIALS AND COMPONENTS

Cold-formed Steel Framing

Cold-form sections from zinc-coated steel or aluminium/zinc alloy coated steel: to AS 1397.

Corrosion Protection: to BCA

Self-drilling Screws

Standard: to AS 3566.1-2002 corrosion resistance Class 2 to AS 3566.

Flashings and Damp-proof Courses

Standard: to AS/NZS 2904.

Timber Fasteners

Metal washers: Provide washers to the heads and nuts of all bolts and coach screws.

Steel straps: Zinc-coated steel to AS 1397. minimum size 25 x 1 mm or 30 x 0.8 mm.

Galvanising

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

- exposed to weather;
- embedded in masonry; or
- in contact with chemically treated timber.

3.3 CONSTRUCTION GENERALLY

Welding

Standard: To AS/NZS 1554.

Grommets

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

Swarf

Remove swarf and other debris from cold-formed steel framing immediately after it is deposited.

CCA Treated Timber

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

Steel framing: Do not fix CCA treated timber in contact with cold-formed steel framing.

Priming Steel

Before fixing, prime steel which is not galvanised or zinc-coated.

3.4 FLOORS

General

Standard: to AS 1684.

Strip Flooring

Do not fix strip flooring until the work is weather tight.

Particleboard Flooring

Standards: to AS/NZS 1860. (Int) and install to AS 1860.

Junctions: Sand junctions lightly to a smooth, level surface.

Fibre Cement Flooring

Compressed sheets: to AS/NZS 2908.

Minimum thickness:

- Joist spacing up to 450 mm: 15 mm
- Joist spacing 450-600 mm: 18 mm

Plywood Flooring

Standard: to AS/NZS 2269. bond type A, tongue and grooved.

Minimum thickness (F8):

- Joist spacing to 450 mm: 14 mm
- Joist spacing 450-600 mm: 19.5 mm

Minimum thickness (F11):

- Joist spacing to 450 mm: 13 mm
- Joist spacing 450-600 mm: 18.5 mm

3.5 WALL FRAMING**General**

Standard: to AS 1684.2 – 2010

All new timber framework to comply with the current Australian Standard 1684.2 - 2010

Timber Wall Framing

Provide gauged timbers for studs, noggings and plates in double faced walls.

Additional Support

General: Provide additional support in the form of noggings, trimmers and studs for fixing lining.

Maximum spacing of of noggings: 1350 mm centres.

Vermin Barriers for Suspended Floors

Masonry veneer barrier: Secure 10 mm galvased wire mesh to the underside of the bottom plate of external stud walls, extending across the cavity for building into brick work.

Damp-proof Courses

Clad-frame walls: provide damp-proof courses under the bottom plate of external clad-frame walls built off slabs or masonry board walls.

Flashings

Provide flashings to external openings sufficient to prevent the entry of moisture.

3.6 ROOF AND CEILING FRAMING TRUSSES**Wall Plates**

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

Nailing Strips

Where timber joists, rafters or purlins bear on steel members, provide 50mm thick nailing strips bolted to the flange of the steel member.

Strutted Framing

General: Construct traditional timber pitched roof framing consisting of rafters and ceiling joists supported at intermediated points by a system of underpurlins strutted off walls or strutting beams and braced by collar ties, and ceiling hanging beams.

Beam Framing

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

Roof Trusses

General: factory-assemble trusses.

Chamber: 10 mm upward in bottom chord.

Connections: Connector plates pressed to contact with the truss members. No knots in plate area.

Joints: No gaps greater than 2 mm.

Overhangs: Free from spring or splits.

Installation: to AS 4440.

Support: Support trusses on 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.

Supports for Water Containers

Where a water container or heater is located in the roof space, provide a support platform to AS/NZS 3500.

Additional Support

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

Anti-ponding Boards

Standard: to AS/NZS 4200.

3.7 TIMBER ROOF TRIM**Priming Timber**

Prime exposed timber all round before fixing and re-prime cut edges if trimmed in-situ.

Fascia, Valley Gutter and Barge Boards

Minimum Thickness:

- Fixed at up to 600 mm centres: 19 mm
- Fixed at up 600-900 mm centres: 32 mm

4. BRICK AND BLOCK CONSTRUCTION**4.1 GENERAL**

Cross References

Refer to the following sections:

- General Requirements: for termite protection
- Timber Construction: for structural steelwork.

Standard

Masonry generally: to AS 3700.

Masonry units: to AS/NZS 4455.

4.2 MATERIALS AND COMPONENTS

Steel Components

Galvanising: Galvanise mild steel components (including fasteners) to AS 1214. or AS/NZS 4680. -as appropriate.

Durability Requirements: to AS/NZS 2699.

Clay Bricks Durability Class

Below damp proof course: use exposure class to AS/NZS 4456.

Wall Ties

Standard: to AS/NZS 2699.

Seismic Areas: Type B.

Flashings and Damp-proof Courses

Standard: to AS/NZS 2904.

Mortar Materials

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

Additives: Do not provide additives unless required.

Mortar Mix Table

Provide mortar mixes as follows:

Location	Mortar Proportions <i>Cement : Lime : Sand</i>	Mortar Type <i>To AS 3700</i>
Concrete or calcium silicate masonry	1:0.5 + water thickener	M3
Grouted and reinforced masonry	1:0.4 + water thickener	M4
Underpinning, high strength masonry	1:0-0.25:3	M4
Other masonry	1:1:6	M3

4.3 CONSTRUCTION GENERALLY

Joints and Cutting

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

Joints

Externally: Tool to give a dense water-shedding finish.

Internally: Rake to give a key if wall is to be plastered.

Rod

76 mm high bricks: 7 courses to 600 mm.

90 mm high bricks: 6 courses to 600 mm.

190 mm high bricks: 3 courses to 600 mm.

Bond

Single leaf construction: Stretcher bond.

Perpends

Keep perpends in alternate courses virtually aligned and fill them completely with mortar.

Colour Mixing

In facework, distribute the colour range of units evenly to prevent colour concentrations.

Sills and Thresholds

Solidly bed masonry sills and thresholds and lay them so that the top surfaces drain away from the building.

Appearance

Level facework clear of mortar smears, stains and discolouration. Do not clean using an acid solution and do not erode joints if using pressure spraying.

Chimneys and Fireplaces

Follow the guidelines given in SAA HB33-1992.

4.4 BEARER SUPPORTS

Bearer Piers Table

Provide engaged or free standing unreinforced masonry piers as follows to support bearers at 1800 mm maximum centres:

Type	Minimum size (mm)
Engaged	230x110 bonded or tied to walls
Freestanding up to 1500 mm high	230x230
Freestanding 1500 mm to 2700 mm high	350x350

Access Openings

Internal walls below suspended ground floors, leave door width openings beneath doorways to give access to underfloor areas.

Air Vents

General: Provide air vents to give adequate cross ventilation to the space under suspended ground floors. In cavity walls, provide an equal number of matching vents in the internal leaves located as near as practicable to the vents in the external leaves.

Minimum provision: 7300 mm² net ventilation area per linear metre of wall.

4.5 DAMP-PROOF COURSES

Location

Provide damp-proof courses in the following locations:

- 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 44 mm and dress down over the membrane turned up against the wall.
- Cavity walls built off slabs on ground: In the bottom course of the outer leaf, continuous horizontally across the cavity and up the inner face bedded in mortar, turned 30 mm into the inner leaf one course above; or, in masonry veneer construction, fastened to the inner frame 75 mm above floor level.
- At 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.

Installation

Lay in long lengths. Lap the full width of angles and intersections and 150 mm at joints. Step as necessary, but not more than two courses per step. Preserve continuity of damp-proofing at junctions of damp-proof courses and waterproof membranes. Install at least 150 mm above adjacent finished ground. Sandwich damp-proof courses between mortar.

4.6 CAVITY MASONRY WALLS

Minimum Cavity Width

Masonry walls: 50 ± 10 mm.

Masonry veneer walls: 25 mm between the masonry leaf and the loadbearing frame and 40mm between the masonry leaf and sheet bracing, if any.

Openings

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

Cavity Flashings

Location: Provide flashings in the following locations:

- Floors: Full width of outer leaf immediately above slab, continuous across cavity and up the inner face bedded in mortar, turned 30 mm into the inner leaf two courses above.
- Under sills: 30 mm into the outer leaf bed joint one course below the sill, extending up across the cavity and under the sill in the inner leaf or the frame. Extend at least 150 mm beyond the reveals on each side of the opening.
- Over lintels to openings: Full width of outer leaf immediately above the lintel, continuous across cavity, 30 mm into the inner leaf two courses above or turned up against the frame and fastened to it. Extend at least 150 mm beyond the ends of the lintels.
- At abutments with structural frames or supports: Vertical flashing in the cavity from 150 mm wide material, wedged and grouted into a groove in the frame opposite the cavity.
- At roof abutments with cavity walls: Cavity flashing immediately above the roof and over-flash the roof apron flashing.

Installation: Sandwich flashings between mortar except where on lintels.

Pointing: Point up joints around flashings to fill voids.

Weepholes

General: At ground floors, provide weepholes in the form of open perpend to external leaves of cavity walls in the course above cavity flashings.

Maximum spacing: Every third perpend.

Clearance for Timber Frame Shrinkage

In seasoned timber frame brick veneer construction, leave the following clearances between window frames and brick sill and between roof frames and the brick veneer:

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

4.7 WALL TIES

Wall Tie Application

Classification: to AS/NZS 2699.

Type: to BCA

Spacing: to BCA

Corrosion protection: to BCA

4.8 AUTOCLAVED AERATED CONCRETE WALLS

General

Provide a proprietary system which:

- has a current Australian Building Products and Systems Certification Scheme certificate; or
- has a current appraisal report issued by the CSIRO Building Products and Systems Appraisal stating that the system is suitable for use in walls in buildings.

4.9 CONTROL OF MOVEMENT

Aging of Bricks and Concrete

Minimum age of clay bricks: 7 days.

Minimum age of concrete supports to clay bricks: 28 days

Control Joints for Clay Brickwork

Maximum length of continuous wall: 6 m.

Minimum width of control joint: 15 mm.

Control Joints for Calcium Silicate and Concrete Masonry

Maximum length of continuous wall: 8 m.

Minimum width of control joint: 10 mm.

Flexible Ties and Anchors

If ties or anchors extend across control joints, provide ties or anchors which maintain the stability of the masonry without impairing the effectiveness of the joint.

Joint Material

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.

4.10 STEEL LINTELS

General

Provide a proprietary cold-formed flat-based type designed to AS/NZS 4600.

Material

Mild steel galvanised: to AS/NZS 4680. Do not cut after galvanising.

Corrosion protection: to AS/NZS 2699..

Steel Flats and Angles

Sizes: to BCA .

Material: Mild steel galvanised to AS/NZS 4680. Do not cut after galvanizing.

Corrosion protection : to AS/NZS 2699.

Installation

General: Install with the longest leg vertical. Keep lintels 5 mm clear of heads and frames. Pack mortar between the angle upstand and supported masonry units.

Propping: To prevent deflection or excessive rotation, temporarily prop proprietary cold-formed lintels until the masonry reaches its required strength.

Minimum propping period: 3 days.

4.11 BAGGING

Joints

Cut joints flush before bagging.

Dry Bagging

Apply laying mortar to the surface using a hessian bag or similar to a consistent thickness. Flush up irregularities, but leave the minimum possible amount of mortar on the masonry surface.

5. INSULATION AND SARKING

5.1 GENERAL

Interpretation

Sarking-type material: Flexible membrane material normally used for waterproofing, vapour retarding or thermal reflective insulation.

5.2 MATERIALS AND COMPONENTS

Bulk Insulation

Cellulosic fibre: to AS 2462.

Mineral wool batts and blankets: to AS 3742.

Mineral wool in loose fill: to AS 2461.

Polystyrene: to AS 1366.

Wool: to AWRAP/A202.

Sarking Material

Standard: to AS/NZS 4200.

Floor insulation: Provide perforated material.

5.3 INSTALLATION

Bulk Insulation

Standard: to AS 3999.

Batts: Fit tightly between framing members. If support is not otherwise provided, secure nylon twin to the framing and stretch tight.

Loose fill: Provide boxing to retain loose fill on external edges, cavities and penetrations, and to prevent spilling.

Sarking Material

Standard: to AS/NZS 4200.

Wall Sarking

General: Provide vapour-permeable sarking under cladding which does not provide a permanent weatherproof seal, including:

- boards fixed vertically or diagonally;
- boards or planks fixed in exposed locations where wind driven rain can penetrate the joints; and
- unpainted or unsealed cladding.

Installation: Apply to the outer face of external stud walls from the top plate down over the bottom plate and flashing. Run across the studs and lap at least 150 mm at joints.

Roof sarking

General: Provide sarking to:

- Tile roofs below 20° pitch;
- Tile roofs where the design wind velocity exceeds 33 m/s; and
- Tile roofs for a width of 2 m below a gutter discharging through a spreader from the point of discharge to the gutter below.

Anti-ponding boards: Provide 4.5 mm fibre-cement anti-ponding boards to eaves of tile roofs below 20° pitch.

Ridge ventilation: Finish sarking at least 50 mm clear of ridges.

6. ROOFING

6.1 GENERAL

Cross Reference

Refer to the Insulation and sarking section for roof sarking requirements.

6.2 MATERIALS AND COMPONENTS

Flashing Material

Standard: to AS/NZS 2904.

Tiled roofs: 20 kg/m² lead.

Fasteners

Self-drilling screws: to AS 3566., corrosion resistance class 3 to AS 3566.

Exposed fasteners: Provide fasteners which are pre-finished with a coating to match the roofing material, or provide matching purpose-made plastic caps.

6.3 TILING – where noted on plans

Materials

Standard: to AS 2049.

Installation

Standard: to AS 2050.

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

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

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

6.4 METAL ROOFING – where noted on plans

Design and Installation

Standard: to AS 1562.

Visible Accessories

Provide material with the same finish as roofing sheets.

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 50 mm into gutters.

Swarf

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

6.5 ROOF PLUMBING

Selection and Installation of Metal Rainwater Goods

Standard: to AS/NZS 3500.

PVC rainwater goods and accessories: to AS/NZS 2179.

Sealing: Seal fasteners and mechanically fastened joints with silicone sealant.

Flashings and Cappings

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

Wall abutments: Where a roof abuts a wall, provide over-flashings as follows:

- Masonry: Stepped and built in to the full width of the leaf;
- Planked cladding: Stepped; or
- Other: Raking.

Gutters

Minimum slope of eaves gutters: 1:200.

Minimum width overall of valley gutters: 400 mm.

7. CLADDING**7.1 GENERAL**Cross References

Refer to the following sections:

- General requirements for timber durability.
- Insulation and sarking, for wall sarking requirements.

7.2 MATERIALS AND COMPONENTSFlashing material

Standard: to AS/NZS 2904.

Fasteners

Steel nails: Hot-dip galvanised to AS 4680.

Self-drilling screws: to AS 3566., corrosion resistance class 3 to AS 3566.

7.3 PLASTIC CLADDING – where noted on plansStandard

Unplasticised polyvinyl chloride (UPVC) sheet: to AS/NZS 4256.

Glass fibre reinforced polyester (GRP) sheet: to AS/NZS 4256.

Polycarbonate: to AS/NZS 4256.

Installation

Standard: to AS/NZS 1562.

7.4 HARDBOARD CLADDING – where noted on plansGeneral

Standard: to AS/NZS 1859.

Exterior cladding: Exterior hardboard.

Sheltered exterior cladding: Tempered hardboard.

Plank Cladding

General: Provide a proprietary system of hardboard planks 9.5 mm thick.

Joints and edges: UPVC extrusions.

External corners: Pre-formed metal joining pieces.

Internal corners: Scribe.

7.5 FIBRE CEMENT CLADDING – where noted on plansStandard

General: to AS/NZS 2908.

Plank Cladding

Type: Provide a proprietary system of single faced fibre cement planks 7.5 mm thick.

Joints and edges: UPVC extrusions.

Corners: Pre-formed metal joining pieces.

Sheet Cladding

Type: Provide single faced fibre cement sheets 6 mm thick.

Joints, corners and edges: UPVC extrusions.

Eaves Lining

Type: Provide a proprietary system of single faced fibre cement sheets 4.5 mm thick nailed at minimum 200 mm centres to bearers at maximum 600 mm centres.

Minimum bearer size:	For rafter overhang:
33 - 600 mm	50 x 38 mm
600 - 1500 mm	75 x 38 mm

Joints: UPVC extrusions.

7.6 TIMBER BOARD CLADDING – where noted on plansPreparation

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 Specified pigmented stain finish.

Installation

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

Fixing: Nail twice to each crossing except for sawn weatherboard and secret nailed profiles.

Nailheads: Treat visible nailheads as follows:

- In stained or clear finishes: Drive flush; or

- 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 timber bead at least as thick as the cladding board.

7.7 METAL CLADDING – where noted on plans

Design and Installation

Standard: to AS 1562.

Visible Accessories

Provide materials with the same finish as cladding sheets.

7.8 AAC CLADDING – where noted on plans

Cladding

To manufacturers design and specification.

Panel Cladding

Type: Provide a proprietary system of AAC Panels.

Panel Thickness: To be 75 mm.

Joints: Thin bed adhesive.

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

8. DOORS AND WINDOWS

8.1 GENERAL

Cross References

Refer to the following sections:

- Lining; for architraves.
- Painting; for priming of frames and doors before installation.

8.2 MATERIALS AND COMPONENTS

Flashings

Standard: to AS/NZS 2904.

Metal Finishes

Zinc plating: to AS 1789. at least service condition no. 2.

Anodising: to AS 1231. at least class AA10.

Thermoset powder coating: to AS 3715.

Glass

Selection and installation. to AS 1288.

Doorsets

Timber doors: to AS 2688.

Timber frames and jamb linings: to AS 2689.

Security screen doors: to AS/NZS 2803.

Windows Materials and performance: to AS 2047.

Preglazing

If possible, pre-glaze doors and windows.

8.3 CONSTRUCTION GENERALLY

Standards

Doorset installation: to AS 1909.

Window installation: to AS 2047.

Security screen doors installation: to AS/NZS 2804.

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.

Installation

Install doorsets and windows so they:

- are plumb, level, straight and true;
- are adequately fixed or anchored to the building structure; and
- will not carry building loads, including loads caused by structural deflection or shortening.

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.

Linings

Provide reveal and jamb linings as necessary.

8.4 TIMBER DOORS

Door Thickness

Generally: 35 mm.

External doors and doors over 900 mm wide: 40 mm.

Door Construction

External doors: Solid construction.

Internal doors: Flush panel cellular core.

Medium density fibre board doors: Board designated by the manufacturer as having a moisture resistance which is suitable for the exposure of the door.

Priming

Prime timber doors on top and bottom edges before installation.

Door Stops

Install door stops to prevent door furniture striking the wall or other surface.

Hinge Table

Provide 3 hinges for external doors and door leaves over 2040 mm in height or 820mm in width and as follows:

Thickness of door (maximum)	Weight of door (maximum)	Number of hinges (per door leaf)	Size of hinges (steel)
35 mm	35kg	2	85 x 60 x 1.6 mm
40 mm	68kg	3	100 x 75 x 1.6 mm

8.5 SLIDING INTERNAL DOORSGeneral

Suspend sliding doors from overhead tracks and wheel carriages appropriate to the size and mass of the doors.

Accessories

General: Provide overhead track supports and head and jamb linings appropriate to the arrangements 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.

8.6 GARAGE DOORSGeneral

Standard: to AS/NZS 4505.

Motorised Operation (if required)

Provide a proprietary operator with a limit switch, manual safety stop and reversing mechanism, and overload cutout operated by a battery-powered radio remote controller and by a direct push-button or key switch. Locate operating switch 1.5m above floor level.

8.7 LOCKSETSExternal Doors

Provide a 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: Provide key-lockable surface mounted bolts.

Door Lockset Mounting Heights

To centreline of spindle: 1 m above finished floor.

Keying

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

8.8 TOILET COMPARTMENT DOORSGeneral

Removable hinges to be provided to toilet compartment doors in accordance with the Building Code of Australia Clause 3.8.3.3

9. LINING**9.1 GENERAL**Cross Reference

Refer to the Block and tile finishes section for water-proofing of wet areas.

9.2 MATERIALS AND COMPONENTSPlasterboard

Standard: to AS/NZS 2588.

Sheet Thickness: minimum 10 mm.

Fibre Cement

Standard: to AS/NZS2908.

9.3 SHEET LINING – where noted on plans

Supports

Install timber battens or proprietary cold-formed galvanised steel furring channels:

- if framing member spacing exceeds the recommended spacing;
- if direct fixing of the sheeting is not possible due to the arrangement or alignment of the framing or substrate; and
- to support fixtures.

Installation

Plasterboard: to AS/NZS 2589.

Framed construction: Screw or nail or combine with adhesive.

Masonry construction: Adhesive fix direct to masonry.

Wet areas: Do not use adhesive.

Joints

General: Provide recessed edge sheets and finish flush with perforated reinforcing tape.

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

Wet areas: Provide the flashings, trim and sealants necessary to ensure wet areas are waterproofed.

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

Control joints: Install purpose-made zinc-coated control joint beads in walls and ceilings at the following maximum centres and to coincide with structural movement joints:

- Plasterboard: 12 m.
- Fibre-cement: 7.2 m.

9.4 TONGUE AND GROOVE LINING – where noted on plans

Installation

Stained or clear finished boards: Select board to give a random pattern. At corners, return the same board to give a continuous grain pattern.

Fixing: Nail twice to each crossing except for secret nailed profiles.

Nailheads: Treat visible nailheads as follows:

- In stained or clear finishes: Drive flush.
- In opaque finishes: Punch below 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.

9.5 TRIM

General

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

10. TROWELLED COATINGS

10.1 GENERAL

Cross References

Refer to the following sections:

- Block and tile finishes, for waterproofing of wet areas.
- Painting, for priming of embedded steel.

10.2 MATERIALS AND COMPONENTS

Plaster Materials

Sand: Fine aggregate with a low clay content, selected for grading.

Cement: to AS 3972.

Lime: to AS 1672.

Gypsum plaster: to AS 2592.

Metal lath: Expanded metal to AS 1397.

Lime Putty Mixes

Make a coarse mix of lime putty and sand 16 hours before use and do not allow to dry out.

Gauged Mixes

To improve workability, mixes required to contain only cement and sand may be gauged by the addition of lime up to 25% of the cement content (i.e. not as a substitute for the cement).

Autoclaved Aerated Concrete Walls

Provide a proprietary render or premixed plaster recommended by the wall system manufacturer.

10.3 SUBSTRATE

Correction of Substrate

Before plastering, make good defects in the substrate. Hack off excessive projections. Fill voids and hollows with a mix not stronger than the substrate nor weaker than the first coat.

Untrue Substrate

If one coat application is required, but the substrate is not sufficiently true to comply with the thickness limits for one coat, or has excessively uneven suction resulting from variations in the composition of the substrate, apply 2 coats.

Cleaning

Remove loose material and leave the surface clean and dust free.

Embedded Items

Sheath water pipes and other embedded items to permit thermal movement. If ungalvanised steel items are to be embedded in plaster, prime before fixing.

Chases

If chases or recesses are more than 50 mm wide, cover with metal lath extending at least 75 mm beyond each side of the recess.

Metal Backgrounds

Fix metal lath to provide a key for plaster.

Concrete

Apply a proprietary bonding agent before plastering.

10.4 PLASTERING – where noted on plansThickness Limits

One coat work: 12-15 mm.

Multi-coat work:

- First coat: 9-15 mm.
- Floating coat (if any): 9-15 mm.
- Finishing coat (except setting coat): 6-9 mm.
- Setting coat: 2-3 mm.

Cement Rendering

Proportions by volume (cement:lime:sand) for clay and dense concrete brick:

- Clay and dense concrete brick: 1:0.25:4.

Two or Three Coat Set Plaster

Proportions by volume:

- Undercoats: 1:1:6 cement:lime putty:sand
- Setting coat: 1:1 lime putty:gypsum plaster.

Tolerances

Finish plane surfaces within a tolerance of 6 mm in 3 m, determined using a 3 m straight edge placed anywhere in any direction. Finish corners, angles, edges and curved surfaces within equivalent tolerances.

Curing

Do not allow rapid or uneven drying out.

V-joints

Provide V-joints at the following locations:

- Junctions between different substrate materials.
- Abutments with other finishes.
- Joints in the structure.

Edge Trim

Provide purpose-made zinc-coated steel sections as corner beads and stop beads.

10.5 CEMENT BASED FLOOR TOPPINGS (GRANO) – where noted on plansPreparing Hardened Surfaces

If toppings are to be applied to hardened concrete surfaces, scabble the surface to expose the aggregate. Thoroughly dampen and leave free of standing water. Immediately before placing, scrub a coat of neat cement grout into the surface, or apply a suitable adhesive.

Placing

General: Spread the topping mix, compact and float.

Thickness: 20 ± 5 mm.

Monolithic placing: Spread the topping mix as soon as surface water has disappeared from the base.

Curing

Use a method which prevents cracking or crazing resulting from drying shrinkage without impairing the adhesion of subsequent finishes.

Granolithic Topping

Mix proportions: 1:1:1.5 (cement:fine aggregate:5 mm coarse aggregate).

Water:cement ratio: 0.5 maximum.

Slump: 50 mm maximum.

Margins to Toppings

Integral toppings: Form margins to cementitious toppings integrally in the topping material.

Coved skirtings: Form the cove in topping material and finish the top to a neatly struck line. Mitre internal and external angles.

11. BLOCK AND TILE FINISHES**11.1 GENERAL**Standards

Follow the guidance given in AS 3958. and AS 3958.

11.2 MATERIALS AND COMPONENTSExposed Edges

If available, provide purpose-made border tiles with the exposed edge (whether round, square or cushion) glazed to match the tile face.

Accessories

If available, provide tile accessories such as round edge tiles, cover 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.

Adhesives

Standard: to AS 2358.

PVA based adhesives: Do not use in wet areas or externally.

Mortar Materials

Sand: Fine aggregate with a low clay content selected for grading.

Cement: to AS 3972.

Bedding Mortar

Proportioning: Select proportions from the range 1:3 to 1:4 cement:sand to obtain satisfactory adhesion. Provide minimum water.

Grout

Cement based proprietary grout: Mix with water. Fine sand may be added as a filler in wider joints.

Portland cement based grout: Mix with fine sand. Provide minimum water consistent with workability.

Proportioning:

- For joints up to 3 mm: 1:2 cement:sand.
- For joints over 3 mm: 1:3 cement:sand.

Preparation

Prepare the substrates, including the following:

- Remove deleterious and loose material and leave the surface dust-free and clean;
- For mortar bedding, wet the substrate as necessary to achieve suitable suction. Alternatively, apply a proprietary bonding agent to the substrate to improve adhesion.

11.3 WATERPROOFING WET AREAS

Standard

General: to AS 3740.

Membrane

Provide a proprietary liquid applied or sheet membrane system which:

- has a current Australian Building Products and Systems Certification Scheme certificate; or
- has a current appraisal report issued by the CSIRO Building Products and Systems Appraisal stating that the system is suitable for use as a waterproofing system for use in wet areas, shower recess bases and associated floors and wall/floor junctions which are to be tiled.

Installation

Floor wastes: Turn membrane down onto the floor waste puddle flanges and adhere.

Hobs: Extend membrane over the hob and into the room at least 50 mm. For hobless showers extend 1800 mm into the room.

External tiling: Provide a waterproof membrane under external floor tiling, to balconies and over habitable rooms, which forms a drained tank suitable for continuous immersion. Do not run under bounding walls.

Curing: Allow membrane to cure fully before tiling.

11.4 TILING – where noted on plans

Cutting and Laying

Cut tiles neatly to fit around fixtures and fittings and at margins where necessary. Drillholes without damaging tile faces.

Rub edges smooth without chipping. Return tiles into sills, reveals and openings. Butt up to returns, frames, fittings and other finishes.

Variations

Distribute variations in hue, colour, or pattern uniformly by mixing tiles or tile batches before laying.

Protection

Keep traffic off floors until the bedding has set and attained its working strength.

Setting Out

General: Set out tiles to give uniform joint widths within the following limits:

- Internal ceramic tiling: 1.5-3 mm.
- Mosaic tiling: As dictated by pattern.
- Quarry tiles: 6-12 mm.
- Vitrified floor tiles: 3-5 mm.

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, ensure 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.

Minimum fall generally: 1:100.

Minimum fall in shower areas: 1:60.

Change of finish: Maintain finished floor level across changes of floor finish including carpet.

Preparation of Tiles

Adhesive bedding: Fix tiles dry.

Mortar bedding: Soak porous tiles in water for half an hour and then drain until the surface water has disappeared.

Floor Finish Dividers

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

Ventilate the space below fully enclosed baths with at least 2 ventilating tiles.

Sealed Joints

Fill joints with silicone sealant and finish flush with the tile surface where tiling joins sanitary fixtures and at corners of walls in showers.

12. FLOOR COATINGS AND COVERINGS

12.1 GENERAL

Cross Reference

Refer to the Painting section for finishing of sanded timber floors and cork tiles.

12.2 MATERIALS AND COMPONENTS

Hardboard Underlay

Standard: to AS/NZS 1859. standard hardboard Type RD, manufactured as flooring underlay.

Resilient Underlay Alternatives

Needled underfelt: Provide a felt composed of 60% animal fibre and 40% jute, reinforced with polypropylene scrim with a minimum mass of 50 g/m², or hessian fabric with a minimum mass of 150 g/m².

Synthetic foam underlay: Provide a high density synthetic latex flat cushion foam sandwiched between reinforced carrier fabric.

Rubber underlay: Provide a heavy-duty natural rubber, waffle pattern, with a backing of reinforcing fabric, either hessian, spun nylon or polyester.

Hot-melt Adhesive Tape

Provide a glass fibre and cotton thermoplastic adhesive coated tape 60 mm wide on a 90 mm wide metal foil base and backed with silicon-coated release paper.

Carpet

Minimum class: Domestic Medium Duty under the Australian Carpet Classification Scheme.

12.3 SUBSTRATE

Substrate Preparation

Prepare the substrate including the following:

- Stripping and cleaning: Remove deleterious and loose material including existing floor coverings and any surface treatment which could adversely affect adhesion.
- Repairs: Make good to the surface finish as necessary. Fill depressions with a suitable filler and remove high spots and Projections. If necessary, lay a steel-trowelled underlay to concrete substrate.
- Fixture and fittings: Remove door stops and other fixtures and refix in position undamaged on completion of the installation.
- Basic sanding: Produce an even plane sanded surface on strip flooring to be covered with carpet or resilient sheet or tile. Lightly sand the junctions of sheet flooring.
- Fine sanding: If flooring is to be clear finished, stop with matching filler and produce a smooth sanded surface, free from irregularities and suitable to receive the finish.

12.4 LAYING CARPET – where noted on plans

Standard

General: to AS/NZS 2455.

Setting Out

General: Lay the carpet in continuous lengths without cross joins in the body of the area. Make unavoidable cross joins at doorways under the closed door.

Joints in underlay: Ensure 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.

Fixing

Gripper strip: Provide preformed gripper strip and tackless edge strip. Space fixings at 150 mm maximum centres.

Permanent stick method: Immediately after laying, and again one hour later, roll the carpet from the centre diagonally towards each edge using a 65kg multi-wheeled roller. Do not roll foam-backed carpet.

Edge Strip

Provide a proprietary aluminium edgestrip at exposed edges of the carpet. If edge strips occur at doorways, make the junction underneath the closed door.

12.5 LAYING RESILIENT FINISHES

Standard

General: to AS 1884.

Sheet Set Out

Set out sheets to give the minimum number of joints. Run sheet joints parallel with the long sides of floor areas.

Tile set out

Set out tiles from the centre of the area. Match edges and align patterns. Arrange the material so that variation in appearance is minimised.

Joints

Butt edges together to form tight neat joints showing no visible open seam and cold weld.

Junctions

Scribe neatly up to returns, edges, fixtures and fittings. Finish flush with adjoining surfaces.

Cleaning and Protection

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.

13. PAINTING

13.1 GENERAL

Standards

Follow the guidance given in AS/NZS 2311. and AS/NZS 2312.

13.2 MATERIALS AND COMPONENTS

Combinations

Do not combine paints from different manufacturers in a paint system.

Delivery

Deliver paints to the site in the manufacturers' labelled containers. Ensure containers are marked with the APAS (Australian Paint Approvals Scheme) specification number.

Autoclaved Aerated Concrete Walls

Do not apply oil-based paints.

13.3 PAINTING

Order of Work

Complete clear timber finishes before commencing opaque paint finishes in the same area.

Protection

Remove door furniture, switch plates, light fittings and other fixtures before starting to paint and refix in position on completion of painting.

Restoration

Clean off marks, paint spots and stains progressively. Touch up damaged decorative paintwork or misses with the paint batch used in the original application.

Substrate Preparation

Provide a filler tinted to match the substrate if the finish is transparent.

Paint Application

Apply the first coat immediately after substrate preparation and before contamination of the substrate can occur. Ensure each coat of paint or clear finish is uniform in colour, gloss, thickness and texture, and free of runs, sags, blisters or other discontinuance.

Priming before Fixing

Timber: Apply a first coat (two coats to end grain) to exposed roof trim, timber doors and window frames, tops and bottoms of doors, associated trims and glazing beads before fixing in position.

Steel: Apply a priming coat of zinc-rich organic binder to APAS 2916.

Repair of Galvanising

If galvanised or zinc-coated surfaces have been cut or welded after galvanising, prime the affected area with a zinc-rich organic binder to APAS 2916.

Finishing Timber and Cork Floors

After sanding, finish with 3 coats of clear floor sealer to APAS 0205.

Paint System Description

If a system is referred to only by its final coat (e.g. by the manufacturer's brand name, the APAS specification code or the generic name) provide stains, primers, sealers and undercoats which are suitable for the substrate and are compatible with the finish coat and each other.

Paint Final Coat

Table Provide paints as follows:

Final coat	Use paint to APAS specification
Interior	
- Full gloss solvent-borne: interior	APAS-0015
- Flat latex: interior	APAS-0260/4

<ul style="list-style-type: none"> - Low gloss latex: interior - Semi-gloss latex: interior - Glass latex: interior 	APAS-0260/3 APAS-0260/2 APAS-0260/1
Exterior <ul style="list-style-type: none"> - Full gloss solvent-borne: exterior - Flat latex: exterior - Low gloss latex: exterior - Gloss Latex: exterior - Semi Gloss Latex: exterior - Exterior latex stain, opaque - Exteriors stain, lightly pigmented 	APAS-0015/1 APAS-0280/3 APAS-0280/3 APAS-0280/1 APAS-0280/2 APAS-0280/5 APAS-0115
Paving <ul style="list-style-type: none"> - Paving paint, semi-gloss - Paving paint, gloss 	APAS-0200/1 APAS-0200/2

14. **TIMBER FIXTURES**

14.1 **GENERAL**

Cross References

Refer to the following sections:

- General requirements, for timber durability.
- Doors and windows, for timber doors and reveal and jamb linings.

14.2 **MATERIALS AND COMPONENTS**

Moisture Content

Make milled products from timbers seasoned:

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

Finished Sizes

Provide milled timbers with actual dimensions which are at least the required dimensions, except for dimensions qualified by a term such as "nominal" or "out of" to which industry standards for finished sizes apply.

Hardboard

Standard: to AS/NZS 1859.

Particleboard

Standard: to AS/NZS 1859.

Medium Density Fibreboard

Standard: to AS/NZS 1859.

Decorative Overlaid Wood Panels

Standard: to AS/NZS 1859.

Decorative Laminated Sheet

Standard: to AS/NZS 2924.

Decorative Laminated Sheet Application Table

Provide classes as follows:

Class to AS/NZS 2924-1987	Application
HGS or HGP	Kitchen work-tops
VGS or VGP	Kitchen front panels
VLS	Other locations

14.3 **CONSTRUCTION GENERALLY**

General

Construction: Build components square and install plumb.

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

Fasteners and Adhesives

General: Provide fasteners, adhesives or both to transmit the loads imposed and ensure the rigidity of the assembly. Do not split, discolour or otherwise damage timber or sheets.

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

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

Finishing

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

14.4 TIMBER STAIRS AND BALUSTRADES – where noted on plans

General

All stair riser and goings to comply with Part 3.9.1 of the Building Code of Australia.

Closed Strings

Trench for treads and risers.

Cut strings

Profile for treads and risers. Mitre riser ends.

Treads

Dress nosings to a pencil-round. Return nosings at cut strings. Groove for riser tongue in closed riser stair. Set riser 19 mm back from nosing.

Top Tread

Flush with finished floor, otherwise to match stair treads. Provide similar tread section as nosing to floor edges around stair well. Risers Tongue to tread. Mitre to string in cut-string stairs.

Joints

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 stair well.

Fascia

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

Soft Lining

Fix to 38 x 38 mm 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.

Newels

Halve and bolt to strings.

Handrail

Stub tenon to newels.

Balusters

Stub tenon to handrail at top and to tread or floor at the bottom.

14.5 CUPBOARD AND DRAWER UNITS – where noted on plans

Standards

General: to AS/NZS 4386.

Plinths, Carcasses, Drawer Fronts, Shelves and Doors

Material: Provide melamine overlaid high moisture resistant particleboard or melamine overlaid high moisture resistant medium density fibreboard.

Minimum thickness: 16 mm.

Finish: Provide decorative laminated sheet if necessary

- to conceal fasteners; or
- to provide selected colours.

Installation: Secure plinths and carcasses to floors, walls, or both at not more than 66 mm centres.

Drawer fronts: Rout for drawer bottoms.

Adjustable shelves: Support on proprietary pins in holes bored at 32 mm centres vertically.

Drawer and Door Hardware

Hinges: Provide concealed all-metal hinges with the following features:

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

Slides: Provide metal runners and plastic rollers with the following features:

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

14.6 BENCHTOPS – where noted on plans

Laminated Benchtops

Material: Provide high moisture resistant particleboard or medium density fibreboard.

Minimum thickness: 32 mm.

Finish: Decorative laminated sheet adhesive fixed.

Sealing underside: Laminate undersides of benchtops if

- likely to be subject to excessive moisture from equipment such as dishwashers; or
- the benchtop is not restrained against warping by cupboard carcass or support framing.

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

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

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

14.7 CEILING AND UNDER FLOOR ACCESS

Ceiling

Trim an opening and provide a loose access panel of minimum size 600 x 400 mm. Under floor provide a frame and a door, minimum size 720 mm wide x 600 mm high, complete with padbolt.

15. PLUMBING AND DRAINAGE

15.1 GENERAL

Cross References

Refer to the following sections:

- Site preparation, for service trenches.
- Roofing, for roof plumbing and rainwater tanks.
- Block and tile finishes, for waterproofing of wet areas.
- Painting, for priming steel or iron before installation and exposed piping required to be painted.
-

Standard

Plumbing and drainage products: to SAA MP52.

Connections

Excavate to locate and expose the connection points and connect to the authorities' 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.

15.2 MATERIALS AND COMPONENTS

Finishes

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

- Internal locations such as toilet and kitchen areas: bright chrome plate.
- Externally: paint.
- Concealed but accessible spaces (including cupboards and non-habitable enclosed spaces): Leave unpainted except for required identification marking.

Valves

Finish valves to match connected piping.

15.3 CONSTRUCTION GENERALLY

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, whilst permitting thermal movement. Keep the number of joints to a minimum. Prevent direct contact between incompatible metals.

Concealment

If practicable, conceal piping and fittings requiring maintenance or servicing so that they are, accessible within non-habitable enclosed spaces such as roof spaces, subfloor spaces and ducts. Keep pipelines in subfloor spaces at least 150 mm above ground and ensure 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 passes through building elements provide purpose-made metal or plastic sleeves formed from pipe sections. Prime steel or iron before installation.

Pipe Supports

The same as the piping, or galvanised or non-ferrous metals, with bonded PVC or glass fibre woven tape sleeves where needed to separate dissimilar metals.

Cover Plates

Where 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.

15.4 STORMWATER

Standard

General: to AS/NZS 3500.

Waterless composting toilets: to AS/NZS 1546.

Onsite domestic waste water treatment units: AS/NZS 1546.

Cleaning

During construction, use temporary covers to openings and keep the system free of debris. On completion, flush the system using water and leave it clean.

Pipelaying

Lay pipelines with the spigot ends in the direction of flow.

Downpipe Connections

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

Subsoil Drains

Connection: Connect subsoil drains to the stormwater drainage system.

Trench width: Minimum 450 mm.

Subsoil drains: Provide proprietary perforated plastic pipe.

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

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

Backfilling: Backfill with 20 mm nominal size washed screenings, to the following depths:

- To the underside of the bases of overlying structures such as pavements, slabs and channels.
- To within 75 mm of the finished surface of unpaved or landscaped areas.

Pits

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

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

15.5 WASTEWATER

Standard

General: to AS 3500.

Cleaning

During construction, use temporary covers to openings and keep the system free of debris. On completion, flush the system using water and leave it clean.

Septic Tanks

Precast concrete or glass fibre reinforced plastic septic tank: to AS/NZS 1546.

Effluent disposal: to AS/NZS 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.

15.6 FRESH WATER

Standards

General: to AS/NZS 3500.

Tap Positions

Locate hot tap on the left of, or above, the cold water tap.

Accessories

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.

Heater Installation

Location: Locate water heaters where they can be maintained or replaced without damaging adjacent structures, fixtures or finishes.

Oil fired heaters: to AS 1691.

Solid fuel heaters: to AS/NZS 2918.

Temperature

Maximum temperature at ablution outlets: 50°C.

Isolating Valves

Provide isolation valves to water heaters.

Cleaning

On completion, flush the pipelines using water and leave them clean.

15.7 RAINWATER TANKS – where noted on plans

General

Type: Provide a proprietary reinforced concrete, plastic or coated steel tank with flat base and pitched roof for storage of rainwater.

Installation: to AS/NZS 3500.

Coated steel tank: Fully support the tank above ground level.

Material: Hot-dipped zinc-coated steel or aluminium/zinc-coated steel.

Reinforced concrete or plastic tank: Trim and compact the ground and place a level bed of sand at least 50 mm thick to support the tank.

15.8 GAS

Standard

General: to AS 5601.

Buried Pipes

Warning tape: During backfilling, lay plastic warning tape above and for the full length of buried gas pipes.

Type: Minimum 100 mm wide, with "GAS PIPE UNDER" marked continuously.

Commissioning

On completion of installation and testing, turn on isolating and control valves and purge and charge the installation.

16. ELECTRICAL AND MECHANICAL INSTALLATIONS

16.1 GENERAL

Cross Reference

Refer to the site preparation section for service trenches.

Refer to the electrical installations worksection for electrical exhaust fan requirements.

Refer to the windows work section for external louvres.

Standard

Electrical work: to AS/NZS 3018.

Mechanical ventilation: to AS 1668.

Refrigeration systems: to AS 1677. and the recommendations of SAA HB40.

Electrical Interpretation

ED S&IR: the Electricity Distributor's Service and Installation Rules.

RCD: Residential Current Device.

Mechanical Interpretation

AIRAH: Australian Institute of Refrigeration and Airconditioning and Heating.

AREMA: Airconditioning and Refrigeration and Equipment Manufacturers Association of Australia.

ASHRAE: American Society of Heating, Refrigeration and Air Conditioning Engineers.

16.2 CONSTRUCTION GENERALLYStandards

Circuit breakers to AS 3947.

Electrical Accessories to AS/NZS 3100.

Luminaries: to AS 3137.

Smoke Detectors to AS 3786.

Switchboards: to AS 3439. or as appropriate.

Telecommunications Accessories: to AS/ACIF S008.

Television Antenna: to AS 1417.

Telecommunications System

Telephone cable only – Speech and lowband frequencies (≤ 100 kHz)

Small Office/Home Office Cable Class

Class A Speech and low band frequencies (≤ 100 kHz)

Class B Medium bit rate data (≤ 1 MHz)

Class C High bit rate data (≤ 16 MHz)

Class D Very high bit rate data (≤ 100 MHz)

16.3 INSTALLATIONGeneral

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

Consumer Mains & Metering

Provide a consumer mains and connect to the main service.

Electricity distributor's requirements: Provide metering, protection and control equipment as required by the ED S&IR.

Underground Mains

Excavate to locate and expose the connection points. 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.

Maximum demand and spare capacity

Calculate the maximum demand of the installation in accordance with AS/NZS 3018. and give the owner a copy of the calculations.

Spare capacity: Provide:

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

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

Fixed and stationary appliances: Treat socket outlets supplying fixed or stationary appliances likely to cause an RCD to trip due to earth leakage currents in accordance with AS/NZS 3018. Do not connect to circuits that supply socket outlets intended for hand held or portable appliances.

Wiring

Conceal cables and conduits, including underground cable or conduit entering the building, in a manner that will allow wiring replacement without structural work or the removal of cladding, lining, plaster or cement rendering. Installation: Do not penetrate damp-proof courses. Arrange wiring such that it does not bridge the cavity in external masonry.

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

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

Minimum conduit diameter: 20 mm.

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

Switchboards

Do not locate a switchboard in a position prohibited by AS/NZS 3018. or the ED S&IR. Verify that any proposed location complies, and if the location is not compliant, recommend a suitable location to the owner.

Construction: Enclosed type with a hinged lid. Provide circuit breakers and RCD's.

Telephone and Television Pre-wiring

Arrange for pre-wiring before installation of linings, paving and landscaping.

Telecommunications

Standard: to AS/ACIF S009. and the recommendations of SAA HB29.

Submissions: Submit required applications for the telecommunications services to the telecommunications services carrier. Liaise with the carrier and submit the Telecommunications Cabling Advice (TCA1 to the Australian Communications Cabling Authority (ACA).

Small office/home installations: to AS/ACIF S009. and AS/NZS 3086. and in accordance with the recommendations of SAA HB29.

Television & Audio Systems

Installation and testing: to AS/NZS 1367.

Antenna: Provide television outlet plates and from them run concealed coaxial cables to a roof-mounted antenna position.

Conduits for further cabling: \geq mm diameter and drawstrings.

Accessories

Provide electrical accessories necessary for a complete installation including but not limited to switches, dimmers, socket outlets, and telecommunications outlets.

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 3018.

Luminaries

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

Dimmers and Control Devices

Locate dimmers and control devices for future access. Provide ventilation and acoustic treatment to suit the device characteristics.

Appliance Wiring

For permanently connected appliances, provide standard wall boxes (or a wall bracket in stud framed structures) with flush blank plate, angle take off terminator, and approximately 900 mm of flexible conduit terminated at the appliance and supported in accessible locations.

Smoke Detectors

Installation and Testing: to AS 1670.

Provision: Provide smoke detectors to the requirements of the Building Code of Australia. Connect to mains primary power supply.

Pipework Insulation

Sheath external insulated pipework to provide protection against ultra-violet light and mechanical damage.

Testing and Certification

Electrical installations: Test to AS/NZS 3017. Give the owner a certificate showing test results and certifying compliance with AS/NZS 3018.

Telecommunications Cabling: to AS/NZS 3086. and the recommendations of SAA HB29. Test the cable link performance in the maximum frequency and data rate for the cable class, and the cable category. Give the owner a certificate showing test results and certifying compliance with AS/NZS 3086.

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

17. FENCES AND EXTERNAL WALLS**17.1 GENERAL**Cross Reference

Refer to the General requirements section for timber durability.

17.2 MATERIALS AND COMPONENTSGalvanising

Galvanise mild steel components as follows:

- Threaded fasteners: to AS 1214.
- Other components: to AS 4680.

Concrete

Standard: to AS 1379. or proprietary packaged mix.

Steel Panel Fencing

Self-drilling screws: to AS 3566. corrosion resistant class 3.

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

Steel sheeting: Pre-painted to AS/NZS 2728.

Steel Posts

Galvanise to AS 4680.

Concrete Posts

Reinforce and precast from concrete to AS 1379.

Timber Fencing

Provide timber members as follows:

Member	Preservative treated	Preservative treated	Hardwood or cypress
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	soft wood picket (mm)	soft- wood paling/ lap & cap (mm)	pine paling/lap & cap (mm)
Maximum height	1200	1800	1800
End/corner gate posts	90x90	100x100	125x125 or 100x100
Intermediate posts	90x90	140x45 or 100x75	125x50 or 100x75
Maximum post spacing	2400	2400/2700*	2700
Rails	70x40	75x50 or 100x38	75x50 or 100x38
Picket/paling size	70x19	75, 100 or 150x15*	100 or 150x13*
Capping		125x35	100x50

*three rail fences only

17.3 CONSTRUCTION GENERALLY

Clearing

Clear vegetation on the fence alignment. Grub out the stumps and roots of removed trees or shrubs and trim the grass to ground level but do not remove the topsoil.

Excavation

Excavate footings so that they have vertical sides and firm base.

Minimum Footing Size

Generally: 200 mm diameter x 600 mm deep.

In loose material: 250 mm diameter x 900 mm deep.

In rock: 250 mm diameter x 300 mm deep.

Line and Level

Erect posts vertically to follow the contours of the natural ground.

Earth Footings

Place 100 mm of gravel in the footing base under posts and backfill with earth around posts, compacting firmly by hand or machine in 150 mm deep layers.

Concrete Footings

Place mass concrete around posts and finish with a weathered top falling from the post to ground level.

Steel Panel Fencing

Ensure bottom rails have drain holes and are at least 50 mm 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: Use 2 rails for fences up to 1.8 m high. Close butt palings and nail twice to each rail.

Lap and cap paling fence: Use 3 rails for fences up to 1.8 m high with the top rail located to receive the capping. 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.

17.4 GATES – where noted on plans

General

Construction: Construct gates as follows:

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

Hardware: Provide the following:

- Drop bolt and ferrule to each leaf of double gates.
- Latch to one leaf of double gate.
- Provision for locking by padlock.
- Hinges to ensure smooth operation.

Hand access: Provide hand holes to give access from outside to reach locking provision.

17.5 BRICK FENCES – where noted on plans

Standards

Follow the guidance given in Clay Brick and Paver Institute Technical Notes 21A 21B and SIC.

Construction generally

Provide a structurally sound brickwork fence composed of:

- footings;
- brickwork panels; and
- lateral support where necessary in the form of piers, posts or return walls.

18. LANDSCAPING

18.1 GENERAL

Cross Reference

Refer to the General requirements section for timber durability.

18.2 MATERIALS AND COMPONENTS

Concrete Standard: To AS 1379. or proprietary packaged mix.

18.3 PREPARATION

Weed Eradication

Eradicate weeds using a non-residual glyphosate herbicide in any registered formulae, at the recommended maximum rate.

Surplus Spoil

Remove surplus spoil from site. Do not burn vegetative material.

18.4 SUBSOIL

Ripping

General: If practicable, rip parallel to the final contours. Do not rip when the subsoil is wet or plastic. Do not rip within the dripline of trees to be retained.

Ripping depths: Rip the subsoil to the following typical depths:

Compacted subsoil: 300 mm.

Heavily compacted clay subsoil: 450 mm.

Cultivation

Cultivate to a minimum depth of 100 mm. Do not disturb services or tree roots; if necessary, cultivate these areas by hand. During cultivation, thoroughly mix in materials required to be incorporated into the subsoil. Remove stones exceeding 25 mm, clods of earth exceeding 50 mm, and weeds, rubbish or other deleterious material brought to the surface during cultivation. Trim the surface to the required design levels after cultivation.

Additives

General: Apply additives after ripping or cultivation and incorporate into the upper 100 mm layer of the subsoil.

Gypsum: Incorporate at the rate of 0.25 kg/m².

18.5 TOPSOIL

General

Provide topsoil which is free from unwanted matter and is suitable for reuse on site as topsoil.

Source

If it is available, provide site topsoil.

Placing Topsoil

Spread the topsoil on the prepared subsoil and grade evenly, making the necessary allowances so that:

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

Consolidation

Compact lightly and uniformly in 150 mm layers. Avoid differential subsidence and excess compaction and produce a finished topsoil surface which is:

- finished to design levels;
- smooth and free from stones or lumps of soil;
- graded to drain freely, without ponding, to catchment points;
- graded evenly into adjoining ground surfaces; and
- ready for planting.

Topsoil Depths

Spread topsoil to the following typical depths:

- Planting areas: 225 mm.
- Irrigated grassed areas generally: 150 mm.
- Grass areas: 100 mm.

18.6 TURFING

Turf

Obtain turf from a specialist grower of cultivated turf. Provide turf of even thickness, free from weeds and other foreign matter.

Supply

Deliver the turf within 24 hours of cutting and lay it within 36 hours of cutting. Prevent it from drying out between cutting and laying.

Fertilising

Mix fertiliser thoroughly into the topsoil before placing the turf.

Laying

Lay turf:

- in "stretcher" pattern with the joints staggered and close butted;
- parallel with the long sides of level areas, and with contours on slopes; and
- 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.

Watering

Water immediately after laying until the topsoil is moistened to its full depth.

18.7 PLANTING

Excavation

Excavate a plant hole for each plant large enough to accept the root ball plus 0.1 m³ of backfilling with topsoil.

Plants

General: Provide plants which:

- have large healthy root systems, with no evidence of root curl, restriction or damage;
- are vigorous, well established, free from disease and pests, of good form consistent with the species or variety; and
- are hardened off, not soft or forced, and suitable for planting in the natural climatic conditions prevailing at the site.

Trees: Provide trees which, unless required to be multi-stemmed, have a single leading shoot.

Labelling

Label at least one plant of each species or variety in a batch using a durable, readable tag.

Planting Conditions

Do not plant in unsuitable weather conditions such as extreme heat, cold, wind or rain. In other than sandy soils, suspend excavation when the soil is wet, or during frost periods.

Watering

Thoroughly water plants before planting and immediately after planting.

Fertilising

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

18.8 MULCHINGMulch

General: Provide mulch which is free of deleterious and extraneous matter such as stones, soil, weeds and sticks.

Application: Place mulch clear of plant stems and rake an even surface flush with the surrounding finished level.

Depth: 75 mm.

18.9 STAKES AND TIESStakes

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.

Stakes sizes:

- For plants 1 to 2.5 m high: Two 50 x 50 x 1800 mm stakes per plant.
- For plants smaller than 1 m high: One 38 x 38 x 1200 mm stake per plant.

Ties

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

Webbing: Provide 50 mm hessian webbing stapled to the stake.

19. PAVING AND ROADS**19.1 GENERAL**Cross Reference

Refer to the General requirements section for timber durability.

Footpath Crossing

Provide a footpath and kerb crossing to local council requirements.

19.2 MATERIALS AND COMPONENTSMortar Materials

Sand: Use a fine aggregate with a low clay content selected for grading.

Cement: to AS 3972.

Mortar

Mix proportions 1:3 cement:sand.

19.3 CONSTRUCTION GENERALLYGrading

General: Grade paving to even falls to drain away from buildings to drainage outlets without ponding.

Minimum fall for drainage: 1:100.

19.4 BASE COURSEPreparation

Prepare the subgrade to suit the thickness of the base course and paving. If necessary, loosen the ground to a depth of 200 mm and adjust the moisture content before compaction. Compact the ground to a firm, even surface using at least 2 passes of a vibrating plate compactor or roller. Remove and replace soft areas.

Base Course Material

Provide crushed rock consisting of hard, dense, durable particles free from deleterious material, with a maximum particle size of 26.5 mm, uniformly graded, with a maximum clay content of 6% by mass.

Placing

Spread and compact the base course to a firm, tight, close textured surface using at least 3 passes of a vibrating plate compactor or roller. Adjust the moisture content as needed to facilitate compaction.

Base Course Minimum Thickness Table

Comply with the following minimum thicknesses:

	Site classification to AS 2870			
	Unit paving		Bituminous paving	
	A	S & M	A	S & M
<i>Foot and bicycle traffic</i>	0	0	50 mm	100 mm
<i>Light domestic traffic occasionally up to 3 tonne</i>	0	75 mm	100 mm	150 mm

19.5 BITUMINOUS PAVING

Hotmix Paving

Standard: Place and compact asphaltic concrete paving over the prepared base course to AS 2734.

Mix designation: AC7.

Binder type: Class 170 bitumen.

Minimum thickness: 25 mm.

Tack coating: Bituminous emulsion spray to AS 2734.

19.6 UNIT PAVING

Masonry Units

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

Standard: to AS/NZS 4455.

Minimum thickness:

- Foot and bicycle traffic: 40 mm.
- Light domestic traffic occasionally up to 3 tonne gross: 50 mm.

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

Laying Unit Paving

General: Over the base course, lay the unite on bedding sand screeded to a uniform thickness not exceeding 50 mm, and to the required falls and levels. Do not disturb the screeded sand bedding before the units are laid. Provide a gap of 1-3 mm wide between adjoining units. After laying, tamp the units using a vibrating plate compactor.

Dry joints: Fill the joints flush with clean, fine sand or screened bedding sand passing a 1.18 mm sieve, vibrate into the joints and then make 2 further passes of the vibrating plate compactor.

Edge Restraint

Provide edge restraint where needed to support the sand bedding and maintain the paving shape. Bed units in mortar at least 40 mm thick.

19.7 IN SITU CONCRETE PAVING

Concrete

Standard: to AS 1379.

Minimum Thickness

Foot and bicycle traffic: 75 mm.

Light domestic traffic occasionally up to 3 tonne gross: 100 mm.

Preparation

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

Control Joints

Form tooled joints at maximum 2 m spacing.

Expansion Joints

Cast-in 10 mm thick bitumen impregnated fibre board joint filler at maximum 6 m spacing.

Abutment with Building

If concrete paving more than 1.5 m wide abuts the wall of a building, provide a strip of 10 mm thick bitumen impregnated fibreboard between the paving and the wall.

Finishing Methods

Broom finishing: Wood float and broom to an even textured slip-resistant surface with steel tooled margins. On gradients steeper than 10%, roughen the surface by scoring.

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.

Stamper pattern: Use a proprietary system.

The requirements for in Situ concrete may be varied if it is reinforced. AS 3727. (Guide to residential pavements) can be used for design purposes.