Government of South Australia

South Australian Housing Trust
Minimum Design & Construction
Specification for Class 2 Buildings

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1 INTRODUCTION

1.1 GENERAL CONTRACT REQUIREMENTS

All proposals shall comply with this Minimum Design and Construction Specification (MDCS) together with any additional requirements issued by the Principal with the tender call and any encumbrances, building envelopes, Building Guidelines and Council requirements to which the proposed land is subject.

This MDCS is applicable to dwellings built for or on behalf of the South Australian Housing Trust (SAHT).

Comply with the current requirements of all current legislation and authorities including but not limited to:

Real Property Act 1886
Planning, Development & Infrastructure Act 2016 (including Development Act 1993)
Planning, Development & Infrastructure (General) Regulations 2017 (including Development Regulations 2008)
National Construction Code (NCC) including the Building Code of Australia (BCA)
SA Water and Water Industry Entities
SA Power Networks
Australian Energy Market Operator (AEMO)
Telecommunication Authorities e.g. Telstra, NBN Co.
Work Health & Safety Act 2012
Work Health & Safety Regulations 2012
Office of the Technical Regulator
Any Local Authority, statutory or other authorised body having jurisdiction over the work

1.1.1 Application

This specification applies to Contractor designed projects.

1.1.2 Approvals

Obtain Development Approval for the project. Refer to 'Part B - Specification' for approvals that may have already been obtained by the Principal. All completed works must comply with any Encumbrances and Development Approval including Building Rules Consent documentation.

1.1.3 Fees & Charges

Pay all fees and charges including:

- Development application fees, Planning and/or Building rules as needed;
- Application, inspection and approval fees for the provision and installation of services, except for those fees identified in 'Part B - Specification';
- All fees and charges for the installation of a digital electricity meter and electricity usage for the duration of possession of site, with the Contractors meter read prior to handover;
- Construction Industry Training Levy;
- Engineering and / or Independent Progress Payment inspections if required.

1.1.4 Insurance

Maintain the specified insurance's set out in the contractual requirements.
Provide copies of these insurances to the Principal prior to starting work on site.

1.2 NOTIFICATIONS - TENANTS, ADJOINING OWNERS & OCCUPIERS

1.2.1 Services

Where disruptions are made to existing services, especially water and electricity, the Contractor shall notify tenants and adjoining owners or occupiers of the restriction well in advance of the occurrence and shall minimise the disruption.

1.2.2 Notifications to Neighbours

The Contractor shall issue all Development Notices and Fencing Notices required in accordance with the Development Act and Fences Act as the Contractor is responsible for the cost of all fencing. Note that the Principal will not issue or accept any fencing notice and no half cost fencing recovery notices will be permitted to be issued to neighbours. The Contractor shall ensure that all fencing, retaining and boundary wall construction issues are discussed and resolved with adjoining owners/occupiers prior to any work being carried out to minimise cause for complaint.

Allow for protecting and replacing items on boundary fences e.g. roof stormwater, pipes, trellis, plants etc.

The Contractor shall consult with neighbours regarding timing of any demolition to existing fences to be replaced, the type and colour of fencing, as well as any retaining or boundary walls required. Install temporary fencing, as necessary and agreed to ensure the neighbours privacy and security is maintained and the requirements of Work Health and Safety are met. Ensure that any neighbour items affected during the installation of the fence, retaining or boundary walls, are protected and if necessary made good prior to the completion of works, and that the area is left in a tidy and trades like manner.

The Contractor is to issue reasonable notification to neighbours regarding any fence or other work on the boundary.

1.2.3 Disputes with Neighbours

The Contractor shall make the site supervisor known to all tenants/adjoining owners or occupiers so that complaints or disputes can be effectively managed.

Should any site work result in a dispute or require rectification work to adjoining properties, the Contractor shall resolve the dispute and carry out the rectification work required as soon as practicable but in any case prior to Practical Completion.

The Contractor should be aware that some sites might involve elderly tenants or owners or occupiers with particular concerns regarding noise, security and safety. Manage the project and adjust work times to address these concerns.

1.3 ALTERNATE PRODUCTS

Where a specific brand name product is specified, other equivalent products may be considered, however unless an alternate product has been accepted in writing, the specified brand name product must be used.

Should the Contractor wish to use an alternate product the Contractor must demonstrate in writing that the alternate product is equivalent to the brand name product and will provide equal to or better than the serviceable life of the specified product.

Such requests must include the full details of the proposed product and sufficient technical information to enable the Principal to make an informed assessment without seeking further information. The contractor is to allow the Principal reasonable time to assess an alternate product.

The Contractor will be advised in writing if the alternative product is accepted or not.

1.4 PROTECTION

Ensure ALL constructed items, significant or regulated trees are protected against damage for the duration of the contract period up to practical completion. Any damage shall be made good by the contractor prior to handover.

For the duration of the contract, the Contractor shall provide temporary fencing around the perimeter of the site which must remain in place until practical completion. Approval from the Principal is required where more than one entry/exit point is deemed necessary.

2. DESIGN REQUIREMENTS

2.1 GENERAL

This specification shall be for Class 2 buildings as defined by the Building Code of Australia.

All timber framed designs shall be as detailed or where not detailed shall be in accordance with AS 1720.3 (Timber Structures – Design Criteria for Timber-Framed Residential Buildings) and AS 1684 (Residential Timber Framed Construction – Part 2: Non-Cyclonic Areas; Part 4: Simplified – Non- Cyclonic Areas).

All steel framed designs, manufacturing, works and bracing shall be in accordance with AS 3623 (Domestic Metal Framing) and AS/NZS 4600 (Cold Formed Steel Structures).

The Principal has produced a number of design guidelines and these are accessible on the following web site: https://dhs.sa.gov.au/services/sa-housing-authority/housing-design-guidelines . Designers are encouraged to refer to these documents for guidance.

2.2 SPECIFIC REQUIREMENTS

2.2.1 General

Any site specific requirements, including service layouts, tree retentions, external appearances or finishes, that apply to a contract are given in 'Part B - Specification' and take precedence.

Where there is no design requirement in 'Part B - Specification', the design requirements in the following tables 1 to 3 shall apply.

In addition designers are to allow for all items specified in **Sections 3 and 4** of this specification.

2.2.2 Compliance

Within the BCA, NCC Volume 2 and quoted Australian Standards specific requirements exist for Class 2 buildings and these include:

- Fire resistance ratings for materials such as doors, load bearing and non-load bearing elements wall and ceiling linings;
- Sound transmission and insulation in general and for building components;
- Fire-fighting equipment;
- Weatherproofing;
- Structural provisions including earthquake loads;
- Signage, visibility and design for access and egress in general and in emergencies;
- Access for people with a disability;
- Ramps and balconies;
- Window treatments;
- Artificial lighting and power;
- Construction of exits.

New requirements have been added to the BCA, NCC Volume 2 and these include:

- New fire rating and resistance levels for building elements;
- Additional measures to mitigate hazards presented by combustible façades;
- In relation to fire propagation new verification method and more testing requirements for building products, and materials including external wall assemblies;
- Changes to evidence of suitability provisions and fire hazard properties in relation to products, materials, forms of construction and designs;
- Changes to provisions relating to external wall claddings, attachments, and the control of fire hazard properties of building elements;
- Changes to the 'Type of Construction Required' and FRL of Building Elements tables and non-combustible building elements;
- Changes to evidence of suitability in relation to resistance to the incipient spread of fire;
- New requirements for sprinklers or design features which avoid or mitigate the spread of fire.

Contractors shall meet these specific requirements demonstrating compliance through certification where necessary. All products and materials shall be installed in accordance with the manufacturer's recommendations, using proprietary products and processes and ensure compliance with the BCA, quoted Australian Standards and manufacturer warranties.

Table 1

1 Bedroom Apartment or Mews Unit

Living area in the range 55 to 65m² including all walls

Minimum Requirements	Minimum Floor Area and Width Dimension Clear dimensions including wall linings	Furniture and Fittings to be Accommodated Show on the design drawings
Passage	1.0 m width	Door latch offset distances to be maintained throughout dwelling only where the door opens towards the user
Living/dining	19.2 m² area 3.30 m width (living) 2.10 m width (dining)	Soft seating for four. Provide space for coffee table, freestanding TV/video/sound system, side table, dining table with four chairs and sideboard 1200 mm long.
Kitchen combined with living / dining	6.0 m² area 2.70 m width	Single bowl sink and cupboard. Adequate clear bench top 600 mm (deep including sink) ranging from 2.50 m to 3.90 m in length/cupboards with drawers. Pantry face dimension 450 to 600 mm minimum. Cooking appliances with 400 mm minimum adjoining bench tops both sides. Minimum 1500 mm wide circulation space between bench tops. Provide space for refrigerator 900 mm wide.
Sleeping Area	14.8 m² area 3.60 m width	Adequately sized wardrobe min. 600 x 1200 mm. Provide space for queen sized bed, two bedside tables and a dressing table and chair.
SAHT Universal Housing Design bathroom / laundry / WC (combined)	6.6 m² area 2.10 m width	Stepless shower area. Vanity cupboard with mirror over. Adequate length of towel rail. Toilet with circulation to meet SAHT universal design criteria. Laundry trough 45 litre with cabinet. Provide space for washing machine 750 mm wide. Location for clothes drier in apartments where external drying yards are not provided. It is possible to have the passage as a circulation space and the laundry facilities within an alcove provided it is naturally ventilated, the area is waterproofed, and graded to a floor trap. With this the bathroom can be reduced to 5.0 m^2
Storage		Linen cupboard 1000 x 500 mm deep and utility cupboard 500 x 500 mm. Joinery is not to be located in combined bathroom/laundry.
Clothes line		20 m Minimum length of line
Carparking	3.6 m wide x 6.0 m length 3.3 m wide x 6.0 m length 2.7 m wide x 6.0 m length	For carports a covered area 3.0 m wide is acceptable provided the paved width (including perimeter paving) is 3.6 m clear. For Housing not required to meet Universal requirements. For open car parking areas – width clear between lines 2.7 m

Notes:

i Floor areas exclude carport/garage, porches and veranda's, but include all walls and internal circulation areas;
ii Laundry facilities will not be required in developments where shared on-site or commercial laundry facilities are available;
iii Clothesline and undercover parking are site specific elements. At a minimum stepless entry is required at the main front door, a space for air drying laundry and car park shall be provided;
iv Internal room dimensions do not include walls;
v The width of a room is taken to be the smaller room dimension.

Table 2

2 Bedroom Apartment or Mews Unit

Living area in the range 65 to 75m² including all walls

Rooms Required	Minimum Floor Area and Width Dimension	Furniture and Fittings to be Accommodated
Passage	1.0 m width	Door latch offset distances to be maintained throughout dwelling only where the door opens towards the user.
Living/dining	19.8 m² area 3.30 m width (living) 2.10 m width (dining)	Soft seating for five. Provide space for coffee table, freestanding TV/video/sound system, side table, dining table with five chairs and sideboard 1500 mm long.
Kitchen (May be combined with Living/Dining)	6.1 m² area 2.70 m width	Single bowl sink and cupboard. Adequate clear bench top 600 mm (deep including sink) ranging from 2.80 m to 4.20 m in length/cupboards with drawers and pantry face dimension 450 to 600 mm minimum. Cooking appliances with 400 mm minimum adjoining bench tops both sides. Minimum 1500 mm wide circulation space between benchtops. Provide space for refrigerator 900 mm wide.
Main bedroom	14.8 m² area 3.60 m width	Adequately sized wardrobe min. 600 (d) x 1200 mm (l). Provide space for queen sized bed, two bedside tables and a dressing table and chair.
Other bedroom	7.5 m² area 2.60 m width	Provide space for one single sized bed, one bedside table, dressing table and chair and adequately sized wardrobe min. 600 (d) x 1200 mm (l).
SAHT Universal Housing Design bathroom / laundry / WC (combined)	6.6 m² area 2.10 m width	Stepless shower area. Vanity cupboard with mirror over. Toilet with circulation to meet SAHT universal design criteria. Adequate length of towel rail. Laundry trough 45 litre with cabinet. Provide space for washing machine 750 mm wide. It is possible to have the passage as a circulation space and the laundry facilities within an alcove provided it is naturally ventilated, the area is waterproofed, and graded to a floor trap. With this the bathroom can be reduced to 5.0 m^2
Storage		Linen cupboard 1000 x 500 mm deep and utility cupboard 500 x 500 mm. Joinery is not to be located in combined bathroom/laundry.
Clothes line		30 m Minimum length of line
Carparking	3.6 m wide x 6.0 m length 3.3 m wide x 6.0 m length 2.7 m wide x 6.0 m length	For carports a covered area 3.0 m wide is acceptable provided the paved width (including perimeter paving) is 3.6 m clear. For housing not required to meet Universal requirements. For open car parking areas – width clear between lines 2.7 m

Notes:

(i) Floor areas exclude carport/garage, porches and verandahs, but include all walls and internal circulation areas;
(ii) Internal room dimensions do not include walls;
(iii) The width of a room is taken to be the smaller room dimension.
(iv) Clothesline and undercover parking are site specific elements. At a minimum stepless entry is required at the main front door, a space for air drying laundry and car park shall be provided.

Table 3

2 Bedroom Dwelling

Living area in the range 75 to 90m² including all walls

Rooms Required	Minimum Floor Area and Width Dimension	Furniture and Fittings to be Accommodated
Passage	1.0 m width	Door latch offset distances to be maintained throughout dwelling only where the door opens towards the user
Living/dining	19.8 m² area 3.30 m width (living) 2.10 m width (dining)	Soft seating for five. Provide space for coffee table, freestanding TV/video/sound system, side table, dining table with five chairs and sideboard 1500 mm long.
Kitchen	7.3 m² area 2.70 m width	Single bowl sink and cupboard. Adequate clear bench top 600 mm (deep including sink) ranging from 2.80 m to 4.20 m in length /cupboards with drawers and pantry face dimension 450 to 600 mm minimum. Cooking appliances with 400 mm minimum adjoining bench tops both sides. Minimum 1500 mm wide circulation space between benchtops. Provide space for refrigerator 900 mm wide.
Main bedroom	14.8 m² area 3.60 m width	Adequately sized wardrobe min. 600 (d) x 1200 mm (l). Provide space for queen sized bed, two bedside tables and a dressing table and chair.
Other bedroom	10.8 m² area 3.00 m width	Provide space for two single sized beds, two bedside tables, dressing table and chair and adequately sized wardrobe min. 600 (d) x 1200 mm (l).
SAHT Universal Housing Design Bathroom / WC	7.0 m² area 2.40 m width	Stepless shower area and separate bath minimum 1500 mm long. Vanity cupboard with mirror over. Adequate length of towel rail. Toilet with circulation to meet SAHT universal design criteria.
Laundry	3.7 m² area 1.80 m width	Laundry trough 45 litre with cabinet. Provide space for washing machine 750 mm wide It is possible to have the passage as a circulation space and the laundry facilities within an alcove provided it is naturally ventilated, the area is waterproofed, and graded to a floor trap.
Storage		Linen cupboard 1000 x 500 mm deep and Utility cupboard 500 x 500 mm.
Clothes line		30 m Minimum length of line
Carparking	3.6 m wide x 6.0 m length 3.3 m wide x 6.0 m length 2.7 m wide x 6.0 m length	For carports a covered area 3.0 m wide is acceptable provided the paved width (including perimeter paving) is 3.6 m clear. For housing not required to meet Universal requirements. For open car parking areas – width clear between lines 2.7 m

Notes:

(i) Floor areas exclude carport/garage, porches and verandahs, but include all walls and internal circulation areas;
(ii) Internal room dimensions do not include walls;
(iii) The width of the room is taken to be the smaller room dimension.
(iv) Clothesline and undercover parking are site specific elements. At a minimum stepless entry is required at the main front door, a space for air drying laundry and car park shall be provided.

2.2.3 Universal Housing Design Requirements

All housing shall comply with the following SAHT Universal Housing Design Criteria (see 2.1 for web link) unless stated otherwise in 'Part B - Specification'.

2.2.3.1 Stepless access

Stepless access shall be provided throughout the property. There are to be no steps between the exterior paving and the building entrance or within the building itself, including the sole occupancy units. Showers shall not have a step down or a hob.

2.2.3.2 Entrance area

The external entrance area shall be stepless, drain well and with a gradient flatter than 1 in 40 in any direction. The entrance shall provide a min of 1600 mm shelter from the front door. Paving and flooring used at the entrance (external, at the threshold and internal) shall be slip resistant as approved by the Principal.

The use of a shallow threshold ramp at the main entrance (for the width of the entire entrance) is preferred to manage weathering and enable stepless access. The slope shall be a maximum of 1 in 8.

The access to and within the public areas of a class 2 complex are required to be accessible in accordance with the Federal Disability Discrimination Act 1992 - Disability (Access to Premises - Buildings) Standards 2010 (the Premises Standards).

2.2.3.3 Doorways

Entrance doors to the foyers of the building shall comply with the Premises Standards.

Doorways on each floor from the foyer to each apartment and within the apartment shall comply with the following:

Door Leaf	Clear Opening Door Width	Offset (clear space) at Latch Side
870 mm swing door	820 mm minimum	310 mm
Sliding	820 mm Minimum	Not required

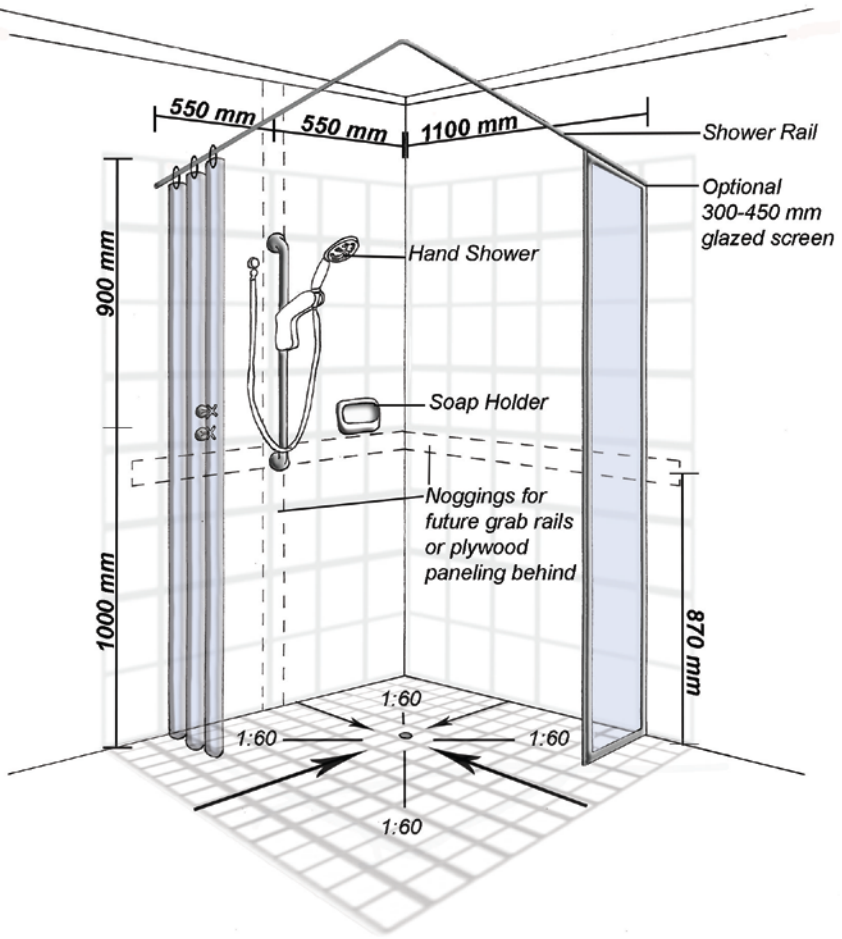
The offset at the latch space need only be provided where the door opens toward the user. All door furniture is to be lever handled.

2.2.3.4 External Causeways, Balconies and Walkways

For open walkways, causeways and balconies and the like on to which wind blown rain can fall, shall be drained to grates connected to the stormwater system and have a slip resistant surface. See Clause 3.20.2 Tiles for the list of approved tiles.

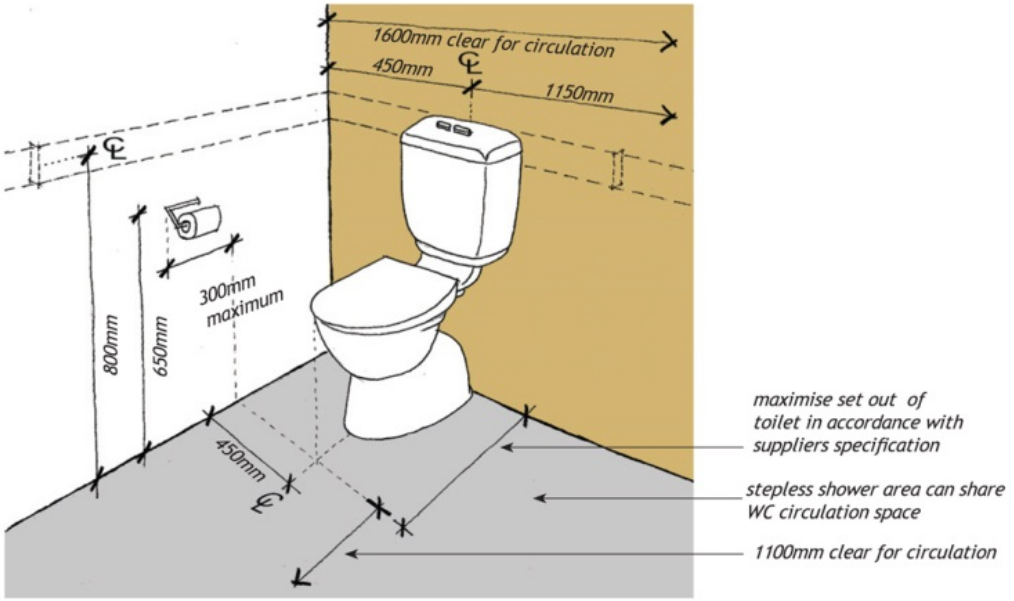
2.2.3.5 Shower

The minimum shower floor area is to be 1100 mm X 1100 mm. The fall in the shower area shall be between 1 in 50 and 1 in 60 and the area sloping into the shower outlet shall extend at least 100 mm past the shower screen or curtain.



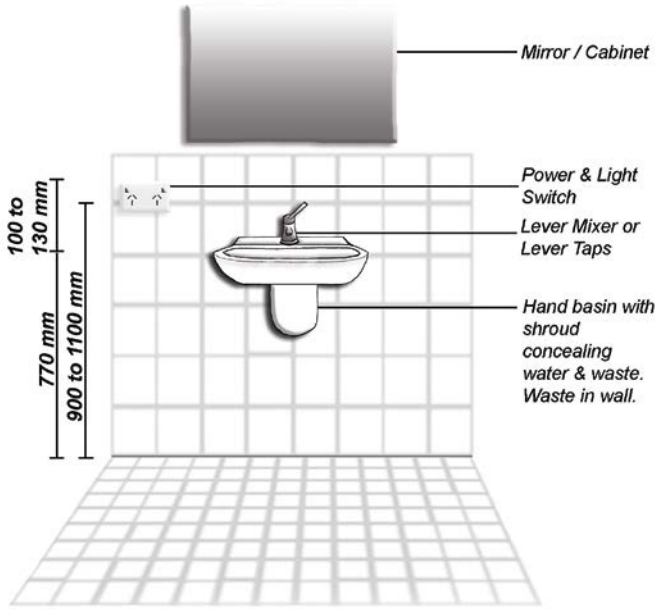
2.2.3.6 WC

A standard toilet bowl is to be used and located such that the front of the bowl is 600 mm from the wall and the centre line of the bowl is at 450 mm from a side wall and shall be at least 1150 mm from a screen or other fixture on the other side for circulation. This space can be shared and can be part of the shower area provided the shower curtain is 450 mm min away.



2.2.3.7 Hand Basin

Hand basins supported off the wall shall be an 8 litre capacity Caroma Opal 510, 720 or 920 or equal approved to suit the size and layout of the bathroom. The basin is to be fixed in accordance with the manufacturer's instructions using the supplied brackets. If a vanity unit is used the basin shall be a semi recessed type.



2.2.3.8 Paving and falls

Paving is to be 1000 mm wide clear and the width maintained at fixed items like hot water units. Cross falls are to allow drainage but are to be kept flatter than 1 in 40 and paths sloped at flatter than 1 in 20 except where ramps are provided.

2.2.3.9 Ramps

The following types of ramps can be used:

- The main entrance (see clause 2.2.3.2).
- Kerb Ramps can be used at kerbs (particularly applicable to group sites) or edges of porches or verandahs. Maximum length is 1520 mm with a slope of 1 in 8 and in general will be full width of a path.
- All other ramps to be at a maximum slope of 1 in 8, with landings and a slip resistant surface in accordance with the BCA stated requirement.

2.2.3.10 Controls

Light switches, air conditioning controls and the like, door handles and locks, shall be in the range of 900 mm and 1100 mm above floor level but shall be at a consistent height within a dwelling. Power points (GPO) are generally to be in the range 450 mm to 600 mm above floor level but can also be located in the range 900 mm to 1100 mm above floor level.

2.2.3.11 Sewer Stacks & Exhaust Fans

The position of toilets, bathrooms and ovens is crucial to the planning of sewer stack and exhaust fan locations to ensure adequate ventilation to atmosphere without the need for intrusion on other design elements i.e. sewer stacks passing through food pantries or venting into wall and floor cavities. Horizontal bulkheads for exhaust fans are NOT acceptable. Sewer stacks and exhaust fans flued to atmosphere shall be indicated on design drawings for consideration and approval by the Principal.

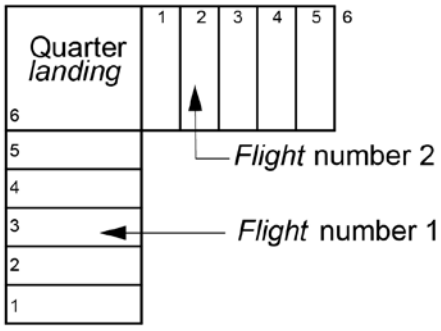
2.2.3.12 Windows

Where the bottom of an external window is 2 m or more above the external surface below it, the window opening must be provided with protection to limit the risk of a person (especially a young child) falling through. A barrier with a height not less than 865 mm above the floor is required. The barrier must prevent a 125 mm sphere to pass through and be child proof. The barrier must be able to restrict a 250 N force when directed against the window and have a child resistant release mechanism if the screen or device is able to be removed, unlocked or overridden.

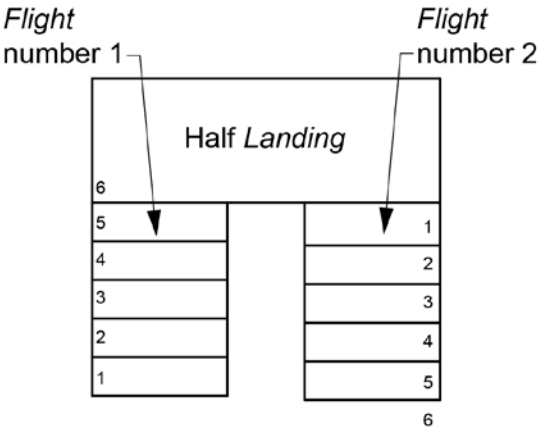
2.2.3.13 Stairs

Stairs shall be 2 distinct straight flights between a quarter or half landing as defined by the BCA Volume 2 Section 3.9.1. A straight flight of stairs is preferred using a quarter landing at the half way mark. Each landing edge abutting the stairs shall be the same width as the stairs (not less than 750 mm) and create a quarter or half landing. Continuous stairways (without landings), Tapered Treads and Winders are NOT acceptable.

IDENTIFICATION OF STAIR FLIGHTS (BCA /NCC Volume 2)



(a) Quarter landing stairway - 2 flights



(c) Half landing stairway - 2 flights

2.2.3.14 Ventilation & Lighting in Stairwells

- Stairwells shall have the following ventilation and lighting amenity, except where the walls are not external and a window cannot be installed.

- An oyster style wall light shall be installed 1950 mm above the quarter or half landing finished floor level. A ceiling light in the stairwell is NOT acceptable. The stair lighting must be safely accessible for future maintenance;
- A window is permitted at the quarter/half landing and it shall be openable and accessible for use, maintenance and cleaning. It shall be 865 mm above the landing floor level with the top height being no greater than 1950 mm. It is permissible to install a set of louvre windows that have flyscreen mesh and security bars, refer to section 3.11.5 Louvre Window Systems for further requirements.
- All of these windows will be frosted for privacy and in order to comply with BCA requirements shall;
  - not permit a 125 mm sphere to pass through the window opening or screen;
  - resist an outward horizontal action of 250 N against it;
  - have a child resistant release mechanism if the screen or device is able to be removed, unlocked or overridden.
- Two ventilated skylights shall be installed over each stair landing, one at the quarter/half landing and one at the top landing where the staircase finishes on the first storey.

2.2.4 Maintainability

Public housing is generally used as rental property for a significant part of its life. The maintenance of the property is the responsibility of the Principal. Contractors are to consider in their designs the costs relating to ongoing maintenance and are to ensure that their proposals are low maintenance. In addition consideration shall be given to accessing equipment and providing access to the roof for maintenance of the roof or any items installed on the roof.

This consideration shall be extended to 'Affordable Housing' designs where purchasers of sole unit housing will not be able to afford high maintenance and replacement costs for the life of the dwelling.

In particular consideration is to be given to;

- Using materials that require minimal maintenance;
- Using low maintenance finishes;
- Ensuring that there is appropriate and safe access to maintain the building and services;
- Any anchor points or other built in devices that need to be provided to enable the building to be maintained safely and economically shall be included in the construction of the building.

2.2.5 Site Layout & Design

The Principal is committed to the principles of Crime Prevention Through Environmental Design:

- Place windows overlooking sidewalks and parking areas;
- Create designs that provide surveillance, especially in proximity to designated points of entry and opportunistic points of entry;
- Use the shortest, least sight-limiting fence appropriate for the situation;
- Avoid the creation of “blind spots”;
- Use a single, clearly identifiable point of entry;
- Eliminate design features that provide access to roofs or upper levels;
- Create a line of site from front living areas and front doorways to the letterbox locations (address point) and out to the street for passive surveillance;
- Front yard fencing for corner allotments and dwellings overlooking a busy street frontage, should be low (generally 900 to 1200 mm high) and transparent;
- Site signage shall facilitate way finding for visitors and emergency services, with well lit, clear and concise signs appropriately placed throughout;
- Well lit front entrances and common areas (see site lighting requirements).

All areas should be formally delineated by the use of fencing or informally delineated with kerbs, paving or clearly definable building projection lines.

Tenants must be able to wheel bins out to the street via a stepless path.

It is up to the designer to ensure that vehicle movements will be orderly, with appropriate turning circles and clearly identified visitor car spaces. Care must be taken to ensure that vehicles do not pass by or park immediately adjacent to neighbouring bedroom and living room windows.

2.2.5.1 Private Open Space

Minimum private open space areas have been determined by the SAHT, as follows.

Dwelling Type	Minimum Useable Rectangle	Minimum Area
1 bedroom	3 x 5=15 m^2	15 m^2 area
2 bedroom	3 x 5=15 m^2	30 m^2 area
3 bedroom	4 x 6=24 m^2	45 m^2 area

Notes:
1. Clothes drying, bin storage, rainwater tank, plant and equipment are not included within the minimum useable rectangle except that for a one bedroom dwelling a retractable clothesline may intrude into the space.
2. Up to 30% of the area may be included under a pergola or veranda.

Rooftop recreational space is encouraged. The Contractor will need to demonstrate and provide detail in relation to future maintenance requirements, finishes, fixtures, drainage, waterproofing and layout. See **Section 3 Construction** for more detail in relation to requirements.

2.2.5.2 Site Benching, Finished Floor Levels (FFL’s) & Retaining Walls

If no ground floor FFL’s are provided, design FFL’s in accordance with the Council requirements and in order to achieve satisfactory stormwater disposal and sewer/effluent drainage to the site and all buildings. Allow for the necessary retaining structures and fill required to achieve finished design levels including paved and landscaped areas.

If drawings showing FFL’s are provided, the design is to be based on those levels.

The Contractor is to assess site cut, fill and retaining walls relevant to any FFL’s shown and include for such in their tender.

2.2.5.3 Services

All services must be contained within each land parcel, i.e. internal services cannot cross allotment boundaries, except for boundaries within a Community Titles group.

Design a services reticulation system suitable for the project. The design is not required to be submitted with the Tender Proposal, but may be asked for at any time following the close of tenders. Documentation showing all the services within the building and within the site external to the building is required. Care shall be taken to coordinate the services to make use of common trenching and to avoid clashing of different services.

Allow for:
1. any relocation of services due to new driveway crossovers;
2. any works in the street including making good on completion; and
3. electricity supply shall be three phase power.

2.2.6 Car Parking

Car parks shall be designed and constructed in accordance with development approvals, AS/NZS 2890 (Parking Facilities Set), engineer designs and/or the drawings provided. Each sole occupancy dwelling shall have its own car space and for every 10 sole occupancy dwellings there shall be 2 visitor spaces, with clear signage indicating allocations.

The area shall drain well with appropriate storm water systems and falls designed to avoid ponding of water. There shall be enough space for vehicles to enter and exit car parking spaces with clear road markings for their delineation and movement of traffic where appropriate.

The area shall be well lit for users and passive surveillance with site lighting in accordance with this specification. Power and water facilities shall be provided within the area for car washing and maintenance.

Where specified in 'Part B – Specification' bitumen shall be rated in accordance with site requirements for access by commercial vehicles.

2.2.7 Stormwater Disposal

2.2.7.1 General

Provide and document a stormwater disposal system for the site designed by an Engineer and obtain building rules approval for it. The site shall be effectively drained to ensure that site stormwater does not pond on the site or flow to and from adjacent properties. Where allotments have a backfall with rear easement drainage connections, roof and site stormwater is to be connected to these.

Sealed stormwater systems are not acceptable unless due to specific site conditions are approved by the Principal. For site specific requirements in relation to yard sumps and sealed stormwater systems refer to 'Part B – Specification'.

The use of pumps in stormwater disposal systems is strongly discouraged. Contractors will need to show that all other alternatives are not possible or viable, before a pumped stormwater system will be considered. Any proposed use of such systems must be approved by the Principal prior to preparation of construction drawings for presentation to Council.

The use of onsite soakage of surface (not roof) water may be a better option to pumps or site filling.

2.2.7.2 Retention and Detention Tanks

Provide and document a stormwater retention/detention system as required in 'Part B – Specification' or as required by local government.

Retention tanks can be buried underground and appropriately sized pumps can be connected to move the water to laundry taps or cisterns in sole occupancy units, or external water supplies (i.e. taps provided in communal areas such as the car park);

Ensure any required backflow prevention devices and valves have been installed in accordance with manufacturer's recommendations and are recorded for inclusion in practical completion documentation;

Under no circumstances are tanks to be connected to hot water units or services.

2.2.7.3 Detention Special Regulatory Requirements

The design engineer is expected to utilise Council's design information and where there are Council stormwater management detention requirements the following shall apply:

- If more than one tank is required they shall be interconnected with only one orifice control to ensure overflow will not be an issue;
- Undertake stormwater modelling to determine detention rates and provide the stormwater calculations to the Principal for confirmation of the preferred solution before lodging with council;
- Water shall be able to gravitate from detention storage into Councils underground street drainage with appropriate backflow prevention if required;
- Ensure any required backflow prevention devices and valves have been installed in accordance with manufacturers recommendations and are recorded for inclusion in practical completion documentation;

In all case the following options are viable, in order of priority as preferred solutions, and shall be presented to the Principal on a case by case basis for assessment prior to approval and submission to Council;

a) Increasing the size of detention tanks providing there is room for the additional footprint (this has a ceiling);
b) Increasing pipe sizes for detention pipe storage (usually very limited due to pipe cover & gutter discharge);
c) Consideration will be given to some onsite soakage Water Sensitive Urban Design (WSUD) if the soil conditions are suitable.
d) Shallow storage in the internal roadway; and
e) As a last resort a pump in a sump large enough to ensure stable operation of the pump.

In all cases the site stormwater solution shall be modelled and presented to the Principal prior to application to Council.

2.2.8 Footing Design

2.2.8.1 Design Criteria

Provide a footing designed by an approved structural engineer and obtain Building Rules approval. It is anticipated that in most cases the footing system will be a concrete raft with integral slab and beams. Provide inspections in accordance with the engineer's construction report including compaction of fill where applicable.

The engineering design shall allow for the future planting of trees and take into account any existing vegetation both on and adjacent to the site.

Where the engineering design calls for a compacted base or fill, test the fill in accordance with the engineer's construction report recommendations. Do not proceed until the correct compaction is achieved.

All concrete slab reinforcement shall be appropriately reinforced to ensure adequate crack control, particularly for termite protection. Ensure that all fabric is lapped and, where mesh is cut for penetrations or pipes, lap bars are provided.

Design for all services to be sleeved through the footing, not over the face of the footing.

2.2.8.2 Bore logs

The Contractor shall be responsible for obtaining all bore logs, soils tests, analysis and Footing Construction Reports for each site and house designed.

Bore logs and footing reports are not required for the purposes of tender, but will be required following awarding a tender and "Acceptance in Principle".

The Contractor will be responsible for engaging a suitably qualified engineer to design the footings and preparing the footing construction report. Each building footing system shall be designed for "tree effect". The consulting engineer shall also take into account the relevant soil classification of the site, especially "P" class sites where they apply.

2.2.8.3 Proposed Footings

For proposals where a preliminary soil report is included with tender documents, the tenderer shall base their proposal on the footing criteria set out in the engineer's soil report in 'Part B – Specification'.

Proposals without a preliminary soil report will require the tenderer to nominate the proposed footing system that they intend for this building construction with an indicative footings cost. Any variance between the nominated footing system and the approved footing construction report shall be treated as a variation to the contract.

2.2.9 Zoning of Internal Spaces for Heating and Cooling

To enable effective heating and cooling separation of spaces needs to be provided. Bathrooms, bedrooms and laundries are zones used infrequently therefore require less heating and cooling, and are best suited to the southern side of the building. Kitchens, living rooms and dining rooms are more frequently occupied throughout the day and so are best suited to the northern aspect of the property to make best use of natural ventilation and light.

To minimise the open living area that may require heating or cooling, designs should include doorways that can be closed. Each zone shall be designed so that it can be isolated from the adjoining zones. To enhance cross ventilation opportunities the placement of windows and external doors shall be carefully considered, particularly for zones where the accumulation of moisture may occur i.e. bathrooms, laundries, kitchens.

The use of sliding doors to separate living areas from passages is acceptable.

2.2.10 Heaters

Unless specifically identified in 'Part B – Specification' heaters shall be installed in the following colder areas.

Adelaide Hills/Barossa/Mid North/ Kangaroo Island, which includes the following towns - Aldgate, Balhannah, Brukunga, Hahndorf, Kangarilla, Littlehampton, Lobethal, Meadows, Mount Barker, Nairne, Williamstown, Woodside, Angaston, Auburn, Eudunda, Kapunda, Lyndoch, Nuriootpa, Riverton, Saddleworth, Tanunda, Clare, Freeling, Spalding, Kingscote; and
South East, which includes the following towns - Beachport, Kingston SE, Lucindale, Millicent, Mount Burr, Mount Gambier, Nangwarry, Naracoorte, Padthaway, Penola, Robe and Tarpeena

A split system reverse cycle air conditioner is to be installed as a heater.

2.2.11 Future Room Air-conditioner

Design for and make allowance for the future installation of a split system air conditioner.

2.2.12 Acoustics

Designs shall include the advice of a suitably qualified engineer to satisfy sound attenuation requirements.

Reference should be made to Minister's Specification SA 78B *Construction requirements for the control of external sound* and to the NCC Building Code of Australia volume one *Specification F5.2 Sound insulation for building elements.*

Refer also to clause 3.14 Insulation.

3. CONSTRUCTION REQUIREMENTS

3.1 SITE AND PROJECT MANAGEMENT

3.1.1 Site Issues

3.1.1.1 Environmental Control & Rubbish Removal

Contractors shall not use adjoining properties or the footpath or road reserve as a work area or for the storage of materials, site rubbish or fill without written approval. A copy of such approvals shall be forwarded to the Principals representative.

Sites shall be kept clean and tidy at all times and a safe working environment is to be maintained.

Debris and waste material shall be cleared periodically from the site. Contractors are encouraged to use waste bins or wire mesh rubbish traps to contain loose material.

Contractors shall comply with local Council ordinances or requirements set out in Development Guidelines with respect to waste management. Where ever possible waste is to be sorted and recycled.

Where there are adjoining residents ensure that the noise from machinery is controlled and sound from audio equipment, used by anyone on the site, is kept to low levels or turned off if requested.

During construction, the contractor shall ensure that mud and debris shall not be carried by vehicles leaving the site and deposited on adjacent properties or Council footpaths, paths and roads.

Construct temporary drains or other means to control site storm water to stop ponding on the site and to ensure water, mud or debris is not shed onto adjoining properties.

3.1.1.2 Protection of Trees

No tree on the Principals land will be pruned, lopped, cut down, removed or damaged in any way unless authorised. This extends to any ground works, which may expose or damage any root system. (i.e. digging footings, service pipe trenches, footings for retaining walls and fences, storage of machines or materials, and cut and fill operations).

Contractors should note these conditions apply also to any trees adjacent any of the Principals land, such as trees on Council property, street trees and trees on neighbour's land.

Any work including pruning, relocating, removal or planting of trees on Council property shall only be carried out after Council has given written approval.

3.1.1.3 Possession of Site

Prior to commencement on site of any work, the Principal will issue a "Possession of Site Notice" (DPS) to the contractor.

Prior to DPS, the site will be jointly inspected by both a representative of the Contractor and the Principal. The Principal will:

- Ascertain with the contractor the position of any existing trees and whether any tree on or adjacent the site is deemed a "significant tree". Any trees identified for retention, significant or otherwise will be adequately protected from damage during the currency of the contract. Noting that significant financial penalties exist for breaches of the Development Act;
- Ensure all Work Health and Safety (WHS) requirements are met;
- Inspect all boundary fences to determine those which need replacement or alteration;
- Reinforce the issuing of fencing notices to applicable neighbours;
- Reinforce the requirements when working on council or neighbouring properties;
- Check for sewer and water connections;
- Check for any gas and electrical connections;
- Check for any easements, overhead wires or other obstructions on or near the site;
- Locate all boundary marks including survey pegs and metal pins;
- Identify Permanent Survey Mark (PSM) and/or Temporary Bench Mark (TBM).
- Issue the contractors representative with a copy of the identification survey, showing all boundary marks and a copy of the sewer and water service locations;
- Arrange for removal of any rubbish from site and cut grass if necessary;
- Reinforce the requirements relating to stormwater management and rainwater tanks connected to toilets and stormwater detention;
- Discuss and agree any variations to the plans; and

- Mark on the site plan, and photograph any dilapidation of the council infrastructure outside the front boundary and side boundary if a corner allotment.

For Contractor designed projects, prior to works commencing Contractors will provide the Principals representative (Construction Coordinators) with the following final and development approved documentation;

- Dwelling plans indicating the layout and location of electrical services, sewer stacks, ventilated skylights (where required) and flued exhaust fans;
- Sewer and stormwater site plans with survey markings demonstrating the slope of the site and stormwater discharge;
- Service site plans showing the connection to mains, entry and location of electrical, gas, water and telecommunications services to the dwelling and outside areas;
- Delivery time frames and locations for hot water units, whitegoods, and other appliances as selected from this minimum specification or stipulated within the 'Part B – Specification';
- Contact details for the Contractors Site Supervisor(s), Consulting Engineer, and any other information that may be required or requested by the Principals representative.

3.1.2 Project Management - Mandatory Notification Stages for Inspections

The contractor shall notify the Principal when the following construction stages are reached:

ITEM	DETAILS of what is to be Inspected	Items to be in Place	Action	Timing to Notify the Principal
Footings	Inspection of trenches and reinforcing	Cast in of under floor plumbing, water and electrical tails, earth bonding	Site inspection	At same time as Engineer notified
Ground Floor	Finished Floor Level (FFL)		Contractor to supply 2 spot levels of finished ground floor, levels taken at centre of car park and 1 m inside front door	Supply sketch with levels within 48 hours of completing the slab or floor structure
Wall and Roof Frames	Inspection of framing generally, tie downs , bracing etc.			On completion of frames prior to roofing
Upper Storey Floor & Wall Framing	Inspection of framing generally			Notify if applicable - at or near completion of floor framing and trusses
Party Walls	At commencement of Party Wall construction	Inspection generally of construction	Notify for Surveys of Party Wall	Notify if applicable
1st Fix plumbing and electrical	Inspection of first fix plumbing and electrical			48 hrs prior to internal linings
Insulation	Inspection of insulation install	Insulation for sound attenuation	Site inspection	48 hrs prior to internal linings
Wet Areas – waterproofing	Inspection of wet area waterproofing application	Inspection of bath riser, termite protection and grouting		Prior to tiling
Perimeter paving	Inspection of damp proof membranes to slab edges	Slab edge damp protection and construction methods		Prior to perimeter paving
Car parks & Driveways	Inspection of base course		Site inspection	Prior to cement or bitumen pour
Hydraulic Services	Lifts, Water, Backflow Prevention	ALL hydraulic & water safety based items	Site inspection, certification & commissioning	Prior to Practical Completion and hand-over
Practical Completion (Hand Over)	Combined inspection of the work	All the work in the contract	Site Inspection	Practical Completion

3.1.3 Practical Completion Requirements

At Practical Completion and as a requirement for Practical Completion provide two hard copies and one digital copy of the Operation and Maintenance manuals for each sole occupancy unit and for any landlord equipment indexed and bound, along with 1 copy of the following information to the Principal;

- As Constructed Survey by a licenced surveyor showing accurately the set out of the building on the allotment with respect to true boundaries (set-backs etc.) all fencing, retaining walls and other boundary occupations relative to the true boundaries;
- The survey shall also include verification from the surveyor of the Finished Ground Floor Level of the building taken approx. 1.0 m inside the front door and one level centre of the car park slab. All FFLs are to be AHD (Australian Height Datum);
- As Constructed Drawings of the services within the buildings and the site – noting where any amendments to plans or elevations have occurred during construction;
- Details of the fire detection and fire-fighting equipment;
- As Constructed Services Drawings - showing the in-ground location and depth of all services (water, sewer, stormwater, gas, telecommunication, and electrical reticulation);
- The make, models, operating instructions and finishes of all appliances (including Hot Water Units and Stoves) and equipment installed by the contractor;
- The warranties & guarantees for any of the appliances, sanitary ware, tap ware, machinery, pumps, hot water units, stoves, door furniture, backflow prevention devices, lifts, and hardware, fixtures, fittings and finishes including windows, doors, screens, roofing, fascia's, gutters, tiles, vinyl, steel frames if applicable, treatments (termite), floor coverings, wall linings and coverings, electrical items and fittings including light fittings, air conditioner and heating units (as applicable) – ALL warranties shall be in the name of the South Australian Housing Trust and timed to commence at Practical Completion;
- A full and detailed finishes schedule of all selections and colours both internally and externally of all materials used;
- All certificates of Compliance;
- Wall Frame and Truss Certification from the designer and fabricator as well as the certification of all site supply, storage, erection, fixing and completion activities;
- Engineer's stormwater disposal certificate, stating installed system complies with the approved design;
- Engineer's footing and car park inspection certificates;
- Engineers inspections of upper floors (framing, insulation, services);
- Inspections of upper floor waterproofing and wet area falls;
- Certificates of Occupancy (if applicable) with a copy of the Development Approval;
- Builders Statement as required under the Development Approval;
- Evidence from a suitably qualified agent is required to confirm that lifts have been commissioned, registered with Safework SA and are safe to use at the time of Practical Completion;
- Tenant keys
- Information about lift installation including manuals, maintenance operation requirements, documentation relative to commission, the manufacturer and installer, shall be provided to the Principal at Practical Completion;
- Water Meters:
  - The make and model of meter;
  - SAHT serial number;
  - Cyble Unit number;
  - Reading;
  - Date of installation of the meter;
  - A time stamped digital photograph of the installation;
  - A declaration stating that the new meter has been tested for adequate flow and that the meter is registering when in use.
- Thermostatic mixing valves, tempering valves and backflow prevention devices – full and comprehensive diagrams including the installation specifications and positioning of devices. Copies of (post installation) test reports shall be retained by the tester and copies forwarded to the relevant authority having jurisdiction and the Principals representative;
- Roof anchors and fall arresters – location, manufacture and type – as constructed details;
- Termite treatment COC from company & notice in the electrical meter box identifying the work done;
- Any other item which may specifically relate to the building or sole occupancy units.

3.2 SITE PREPARATION

3.2.1 Existing sites

In the event that old services, footings, brick or concrete structures are encountered below ground level during construction and where this was not readily evident at the time of proposal or tendering, (including information provided in 'Part B – Specification') the contractor is to notify the Principal immediately upon discovery.

The extent to which such items interfere with the new construction shall be determined on site jointly between the Principal and the Contractor, and any additional costs associated with the removal and reinstatement of the site shall be treated as a Variation to the contract.

3.2.2 Site Clearing

Prior to commencing construction, the entire site shall be completely cleared of all debris, roots and stumps shall be grubbed out, followed by backfilling and compaction to achieve specified site levels. Particular attention shall be paid to excavation works not damaging the roots of existing significant trees while backfilling and compacting where trees and roots are removed. Where suitable topsoil exists, stockpile it for future spreading in landscaped areas.

Areas outside of the building area are to be cleared of any deleterious materials or items and maintained in a neat and tidy manner. Care shall be taken to protect any trees which are to remain and the areas under them.

3.2.3 Services

Liaise with all service authorities and arrange for and pay for any connections to the service points. Service point locations are indicated in 'Part B - Specification'. Should the Contractor need to relocate existing service points, or the service point location nominated in a tender, it will be at their expense.

3.2.4 Site Levels and Benching

Bench sloping sites by cutting and filling to provide a level site surface. A single level surface is preferred with a "flat area" of a maximum crossfall 1:40 for outdoor spaces adjacent to the building to the sizes specified on the design drawings. Grade the rest of the site to the approved drawings. Grading and excavation shall allow for future surfaces (topsoil, paving, bitumen) to be added to the outdoor areas.

3.2.5 Stormwater Drainage

External spaces shall be graded, as per the design drawings, to allow them to be effectively drained and to ensure that site stormwater does not pond on the site, or flow to and from adjacent properties.

3.2.6 Imported Site Fill

Site fill shall be free of any contamination. Certification may be required at the Contractor's expense.

The Contractor is encouraged to use recycled material from a recognized supplier of recycled fill for under slab fill and filling under paths and driveways.

3.3 CONCRETE

3.3.1 Standard of Work

Unless otherwise specified or shown or included in the Consulting Engineering Construction Report, the work shall comply with the requirements of AS 3600 (Concrete Structures) and the Standards used in connection with that Standard.

3.3.2 Materials

(a) Cement
Cement shall comply with the requirements of AS 3972 (General purpose and blended cements);

(b) Sand
Sand shall comply with the requirements of AS 2758.1 (Aggregates and rock for engineering purposes – Concrete aggregates);

(c) Coarse Aggregate

Aggregate shall comply with the requirements of AS 2758.1 (Aggregates and rock for engineering purposes – Concrete aggregates);

(d) Reinforcement
All reinforcing shall comply with AS 4671 (Steel reinforcing materials);

(e) Water
Water shall be drinkable, or in accordance with the requirements set out in AS 1379 (Specification and supply of concrete);

(f) Pigments and Admixtures
Colouring pigments and admixtures shall be resistant to lime, alkalis and ultra-violet light, comply with AS 1478.1 (Chemical admixtures for concrete, mortar and grout – Admixtures for concrete) and to the approval of the Principals representative;

(g) Termite Treatment
Materials used shall be in accordance with the Principals Termite Procedures, September 2018 (see Appendix A – Procedures and Schedules)

(h) Moisture Vapour Membrane
Shall be 200µm Forticon or similar.

3.3.3 Concrete Mix

In all cases where requested by the Principal's representative, supply a certificate of compliance with the specified strength and slump.

3.3.3.1 Premix Concrete

Where available, pre-mixed concrete complying with the requirements of AS 1379 (Specification and supply of concrete) shall be used as follows:

- Use Class N20 using 14 mm aggregate and an 80 mm slump concrete, except where other strengths or sulphate resistant concrete is specified by the engineer.
- Sulphate Resistant Concrete shall be Class S30 using type SR Cement, 14 mm aggregate and an 80mm slump.
- To prevent segregation or stiffening, complete delivery and discharge of the truck shall be made within 1.5 hours of initial mixing.

3.3.3.2 Site Mixed Concrete

Where pre-mixed concrete is not available or where small quantities only are required site mix as follows:

- Proportion by volume 1:2:3 for cement, sand and aggregate.
- Measure all quantities in batches by approved methods, full mix for not less than 1.5 minutes after all portions added, place within 20 minutes of discharge from mixer.
- Discard concrete not placed within 20 minutes.

3.3.4 Formwork

Formwork shall be suitable for its purpose, sound and of good quality, sufficiently braced and strutted to be rigid and free from deflection and resist pressure from vibrators. All formwork shall be fixed in its final position prior to the pouring of any concrete and shall be easily removable without causing any damage. Shuttering shall be true to line and shape and confine the concrete to the specified and/or detailed dimensions.

Unless otherwise specified all formwork shall be Class 4 in accordance with AS 3610 (Formwork for concrete). Where concrete will be exposed either as general internal or external facades the formwork shall be Class 2 or 3 in accordance with AS 3610 (Formwork for concrete).

All inspections for the structural adequacy of any formwork, as required by the AS 3610 (Formwork for concrete), shall be the responsibility of the Contractor.

3.3.5 Reinforcement - General

All steel shall be free from mud, dirt, scale, loose rust, paint, grease, oil or other matter which may impair bond to the concrete. Accurately fabricate reinforcement for its required use.

All cover dimensions shall be measured to the outermost reinforcement as per attached details or the Engineer's report.

3.3.6 Preparation Before Pour

3.3.6.1 Inspection

Arrange for the engineer to inspect and provide a written certificate of inspection, prior to the pouring of any structural concrete. A copy shall be forwarded to the Principal within 2 working days after receipt.

3.3.6.2 Joining To Existing Slabs

Ensure that surfaces against which concrete is to be placed are clean, well dampened and/or treated with cement slurry where necessary, and the dowels or starter bars if required are in place.

3.3.6.3 Items to be in Position

All items to be built in, the moisture vapour barrier, termite barrier, control joint material, flashings, service pipes & conduits, starter bars etc. as applicable shall be in position before pouring commences.

Ensure capped PVC sleeves in or under car parks and the driveway(s), are in place for future irrigation.

3.3.7 Placing Concrete

3.3.7.1 General

Contractors must apply for permission from the Principal for non-continuous pouring of footing beams or an element of the total footings which result in a cold joint. Requests for permission shall be lodged with the Principal no later than 5 working days prior to the pour and be supported by appropriate information, including details of the joint preparation as approved by the Contractor's consulting engineer.

Contractors should not rely on such permission being granted and the Principal reserves the right to withhold such permission.

In the case of an emergency (e.g. a break in concrete supply) directions of the Contractor's consulting engineer are to be followed and a copy of the directions forwarded to the Principal within 24 hours. Agreement is to be reached with the Principal before any subsequent pours.

The following shall apply to all work placing concrete:

- All garages/carports and porches shall be poured as a part of the main slab. Where adjoining garage/carports and porches must be poured separately dowelled construction joints are required as specified in this document at Section 4.1.3.5 Dowelled Construction Joints (DCJ);
- All fabric is lapped with lap bars installed at cuts in mesh for penetrations or pipes;
- All services are sleeved through footings and not exposed on the face of the footing;
- Ensure services and reinforcement are not displaced during pour;
- Do NOT work concrete so as to cause segregation of fine and course aggregate;
- Place concrete in continuous operation to ensure fresh and placed concrete is still plastic;
- Joints not completed within 20 minutes are confined to control or expansion joints;
- Allow concrete footings to cure for at least 3 full days before commencing wall construction.

3.3.7.2 Severe Weather Conditions

When concreting in hot weather precautions shall be taken to avoid premature stiffening of the fresh mix and to reduce water absorption and evaporation losses. If the temperature of the surrounding air is higher than 32ºC the following shall apply unless otherwise agreed with the Principal's representative:

1. The formwork and reinforcement shall be continuously sprayed with cold water in advance of the concreting and any excess water shall be removed from the inside of the forms immediately prior to the placement of concrete.

2. Where metal formwork is used the reinforcement and the formwork shall be protected from the effects of hot winds and direct sunlight.

3. Suitable barriers shall be provided to protect the freshly placed concrete from wind, until the concrete has hardened sufficiently to allow it to be covered.

If the air temperature at the time of proposed placement exceeds 36ºC no concrete shall be poured.

3.3.8 Protection & Curing

3.3.8.1 General

Protect from damage by rain, dust, heat etc., until the concrete has set.

For Raft slabs, Floor slabs, Carports, Verandahs and Porches cover surfaces including exposed edges with 100 µm minimum thickness polythene within 3 hours after final trowelling of the floor. Hold down the sheeting to approval at all laps and edges. Taping of joints may be required. Leave protective membrane in place for at least 3 days.

When the air temperature exceeds 32ºC external paving shall be kept damp by spraying with water for at least 2 days after pouring.

For suspended slabs refer to the design engineer's requirements.

It is the Contractor's responsibility to ensure that a good bond will be obtained with any subsequently added rendering, topping or tiling as applicable to the Contract.

3.4 FOOTINGS, GROUND FLOOR SLABS AND SUSPENDED FLOOR SLABS

3.4.1 Excavation for Footings

Excavation for footings shall comply with the Engineer's report. Fill any over excavation with compacted underfloor fill or concrete. If any unexpected material is uncovered arrange for the engineer to inspect and issue instructions. Excavations shall be kept clean and safe.

3.4.2 Termite Treatment

All work is to be carried out in accordance with the Principals Termite Procedures, September 2018 (see Appendix A – Procedures and Schedules) and by a contractor accredited to do the work.

Provide to the Principal's representative a certificate of compliance from the company carrying out the termite treatment, and fix a notice, complying with AS 3660.1 (Termite Management – New Building Work), in the electrical meter box identifying the work done.

3.4.3 Finished Floor Levels

In addition to the requirements of the BCA the following falls shall be achieved on the finished floor surface:-

Shower alcoves are to be 1100 mm x 1100 mm and have stepless entry to meet universal housing requirements. Where there are two showers in the dwelling a second shower is permitted a hob, unless otherwise stated in 'Part B - Specification'. The fall in the floor of the shower alcove is to be between 1 in 50 and 1 in 60 and that fall shall extend 100 mm past the line of the shower curtain or glazed screen.

Bathroom floor areas outside of the shower are to be graded at a minimum slope of 1 in 100 and shall not pond. They may be graded into the shower alcove or into a separate floor trap.

Laundries between 1 in 80 and 1 in 100.

Balconies:

- to facilitate drainage, must be graded away from the building at a minimum slope of 1 in 100 and a maximum of 1 in 40;
- should be fitted with drainage outlets which shall be connected to the property's stormwater system;
- avoid perimeter/edge runoff as a method of draining the balcony;
- must be set down from doors/entrances by 50mm as required where adequate protection from rain and wind cannot be provided; and
- the design and construction must be compliant with AS 4654.2 – 2012.

Verandahs / Carports / Car Parks shall be graded to allow rainwater to run away from the house. Unless otherwise detailed or directed by the Principal's representative, grade to be a minimum of 1 in 200 and a maximum of 1 in 40.

3.4.4 Concrete Floor Finishes

Internal concrete floors shall be steel trowel finished in accordance with AS 1884 (Floor Coverings – Resilient sheet and tiles – Installation practices) suitable to receive vinyl flooring. Any imperfections shall be made good to the direction and satisfaction of the Principal.

For a tiled finish the subfloor will need to be set down to allow for the required bedding of the tiles at the correct fall. On completion clean down floor surfaces and paving and make good any surface defects caused during construction.

3.4.4.1 Surface to be Tiled

These include surfaces for mosaic tiles laid with adhesive, and quarry tiles bedded in special tiling mix. Allowing for the thickness of the scheduled tiles, screed floors to falls as required and finish a tiling thickness below floor traps, brass strips, etc. and generally off the wood float.

3.4.4.2 Surface to be Topped

Leave base concrete at a lower level to allow a minimum topping of 20 mm at any point.

While slab concrete is still green, brush with a stiff bristle broom to remove laitance and expose the coarse aggregate. Remove loose material and keep covered.

3.4.4.3 Extent of Setdowns

Set downs are to extend to the face of walls or the screed built up to the general building floor level to support the wall. Where there is a wall between wet areas the concrete floor is to be brought up to general building floor level.

On completion clean down floor surfaces and paving and make good any surface defects caused during construction.

3.4.5 Protection

Finished floor surfaces, subject to damage from traffic, falling material or damage on account of performing adjacent work and any such areas as may be directed by the Principal, shall be adequately protected.

In most cases damage to these areas will require the item to be replaced.

3.5 WALLS

3.5.1 Party & Common Walls

All party and boundary walls shall comply in fire resistance with the Building Code of Australia, National Construction Code Volume One for Class 2 buildings.

Where possible avoid services penetrating party or common walls. Where any penetration is required in the party wall seal the penetration, to ensure that the fire rating and sound transmission rating is not compromised. These walls must be continuous from the footing to the roof. The gap between the top of the wall and the roof deck is to be filled with mineral wool or other fire rating material.

For all joints in common walls between units either fill with 'Promat' Promaseal IBS 12 mm backing rod and one part sealant equal to Promat Promaseal – A Acrylic Sealant, or apply Hilti CP606 sealant at least 10 mm thick on a backer rod, or equal approved, applied as per the manufacturer's instructions.

For walls between floors ensure that the wall is completely sealed between floors or where the floors are combustible pass through the floors to ensure the fire rating and sound attenuation is maintained.

3.5.2 Boundary Walls

Boundary walls shall be constructed to ensure the fire rating is maintained for the full height and length. In constructing these take care not to damage neighbouring property.

Boundary wall construction will take into account that the Development Act states an allowance needs to be made for the neighbour to fill by 200 mm above the natural ground level.

3.5.3 Damp Proofing & Flashings

Damp-proof courses and flashings shall be resistant to corrosion and weathering.

Damp proof membrane and flashings shall be 0.5 mm minimum thickness black-embossed polyethylene manufactured in accordance with AS/NZS 2904 (Damp-proof courses and flashings), in long lengths and with end laps not less than 150 mm. Damp proof membranes or flashings shall be built in as follows:-

i) Under external masonry walls on the footing, of sufficient width to project 10 mm over external face and to extend across cavity and a minimum of 75 mm above floor level. The top edge of the upstand shall be fixed to each stud or built into internal masonry wall leaf as applicable (note: provide weep holes above). Where brickwork extends below 10 mm above the paving or a finished ground or landscaped level this flashing (with weep holes) is to be provided one course above the paving or finished ground;

ii) Under all masonry walls in solid masonry construction;

iii) Set one course above ceiling level, where a gable, or similar masonry section, at a party wall, or common divisional wall extends above an adjacent roof surface by less than 1000 mm. It shall have a 10 mm projection into cavity and extend 150 mm beyond the overlap of the sole occupancy units;

iv) Provide flashings and weather bars to sides and sills of window and door frames;

v) Provide a damp proof membrane flashing when masonry continues over a window or door opening or a meter box or similar;

vi) Where required in a particular situation to complete the damp proofing barrier; and

vii) Damp proof membranes shall be stepped where necessary and in some locations (e.g. where paving is sloped up to stepless entries) a second layer of damp proof barrier is generally required. The second membrane shall overlap the lower membrane for at least 1000 mm after the lower membrane has become at least 5 mm above the paving.

3.5.4 Ventilation

3.5.4.1 Cavity Ventilation

For construction with concrete raft floors, open perpends are required to the course immediately above the DAMP PROOF MEMBRANE, located at a maximum spacing of 600 mm centres or every alternate perpend joint in a regular pattern.

3.5.4.2 Ventilation Under Suspended Ground Floors

For ventilation under a suspended ground floor, proprietary vent bricks or galvanised pressed metal vents shall be built in at every fourth brick, horizontally, in the external leaf of masonry. The area behind a vent shall be left completely clear to provide a clear flow of ventilation.

Where internal footings are constructed, through ventilation shall be maintained under the floor.

3.5.5 Building In

Fixings, frames, metal boxes and fittings where appropriate shall be built in as the work proceeds.

Where boxes are built into an external wall, seal between the top of the box and the wall with a flexible sealant.

3.5.6 Sills and Copings

Form weathered sills under windows with all masonry units laid in cement mortar at minimum of 15 degree slope with consistent sill slopes throughout with sufficient overhang to form a drip. Window sill's adjacent doors must not protrude to such an extent that they restrict the swing of doors, including future screen doors.

3.6 WALL FRAMING

The following shall apply to all wall frame design, manufacturing and works:

- Compliance with stated relative (steel, timber) Australian Standards must be used in conjunction with AS/NZS 1170 (Structural Design Actions: Series) and AS 4055 (Wind Loads for Housing);
- Protect exposed timber or steel surfaces against damage during the construction period;
- Costs and work to include and demonstrate best trade practice;
- Costs and work to include all necessary fastenings, plugs, blocks, packing for the fitting of fixtures and hardware;
- Solid and rigid frames true to line without cutting or wedging to receive linings finished flush with the studwork;
- Costs and work to include tightly fitting joints and rigid fixings, with washers on bolts and nuts properly tightened by spanner;
- Take gable walls including inner leaf of veneer gables, up to roofline with full length studs and finish as support to underside of sprocket or dummy rafter;
- Fix general noggings at 1200 mm maximum centres and adjust any other nogging necessary for fixing of linings, hardware, flashings, allowance for future curtain, grab rails, air conditioner etc.;
- Roof trusses shall bear on seating points only so internal walls shall finish 20 mm below perimeter walls unless trusses are designed to land on the inside wall;
- For sizes, fixing details and location of lintels, beams, openings, refer to the Engineering details and below for specific work requirements and Australian Standards relative to timber or steel framing;
- Supply members in single lengths.

Timber

All designs, manufacturing, works and bracing shall be in accordance with AS 1720.3 (Timber Structures – Design Criteria for Timber-Framed Residential Buildings) and AS 1684 (Residential Timber Framed Construction – Part 2: Non-Cyclonic Areas; Part 4: Simplified – Non- Cyclonic Areas).

Galvanized nail and screw fixings shall be used. Where Ply, Hardboard, Weathertex or Fibre Reinforced Cement Board is to be applied under a lining or bracing, the timber studs shall be shallow notched so that the bracing is flush with the face studs. All studs, noggings and plates shall be gauged. Noggings, lintel beams and trimmers to receive lining must finish flush with the studwork so that linings will also be flush.

Steel

All designs, manufacturing, works and bracing shall be in accordance with AS 3623 (Domestic Metal Framing) and AS/NZS 4600 (Cold Formed Steel Structures). All stud walls are to have pre punched holes to allow for the running of services. Rubber or plastic inserts are to be provided to separate services from steel. Galvanised screw, rivet or mechanical interlock fixings shall be used unless otherwise specified. Where Ply, Hardboard, Weathertex or Fibre Reinforced Cement Board is to be applied to steel frame, sheet bracing cannot be used under the linings unless it covers the whole wall.

3.6.1 Junctions with Concrete Floors

Where wall frames are supported directly from concrete or previously constructed masonry, fix bottom plates with hardened steel pins at 1200 mm maximum centres or masonry anchors. Note:- additional fixings may be required to suit bracing. For steel framing a viscourse is required under the bottom plate.

3.6.2 Provision for Fixtures

The Contractor shall ascertain the type, manufacture and fixing height of the fixtures and trim to suit. Allow to provide openings and formwork for built in items such as; recessed cabinet(s), electrical load centre (switchboard), exhaust fan(s) and sewer stacks flued vertically to atmosphere, room heaters and similar item(s). Framework shall be installed for the future provision of a split system air conditioner to the main common area and on both levels of townhouses.

Curtain Blocks
Include the provision of curtain blocks fixed in line and either side of each window head. Fix a 90 x 35 on edge timber nogging or a 90 mm deep steel to allow for the installation of future curtain rails. This shall extend a minimum of 300 mm from the window opening.

Light Fittings
Provide 90 X 35 trimmers or noggings for fixing of batten holders and light fittings

Toilet & Bathroom Grab Rails
In toilets and bathrooms provide to the inside face of all four walls, 870 mm to centre of trim above finished floor level, 150 x 35 trim for the fixing of future grab rails. At the WC only provide an extra row 1400 mm to top of trim above finished floor level

Check framing and provide as detailed noggings and trimmers to side and end(s) of bath adjoining walls.

Shower Alcove Grab Rails
Provide, to the centre of the shower alcove wall, 1000 mm to bottom of trim above FFL and 1900 mm to top of trim above FFL 150 x 35 trims, for the fixing of future shower head support grab rail in shower alcove.

Clothes Drier
In the laundry area provide 140 x 35 support trim minimum of 600 mm long for wall hanging of clothes drier at 2100 mm height.

Corridor Hand Rails

Where noted in 'Part B - Specification' hand rails shall be selected and installed in accordance with AS 1428.1. (Design for Access & Mobility Part 1: General requirements for access – New Building Work). Provide 870 mm to centre of trim above finished floor level, 150 mm x 35 mm trim for future handrails - this will be a continuous trim along one side of a corridor. If there is a door at the end of the corridor the trim and handrail shall be located on the door handle side of the corridor. If the door opens into the corridor or is a swing door the handrail shall not impede use of the door or encroach into circulation space. Ideally the door swing will open away from the corridor into the adjacent room.

3.7 EXTERNAL WALL CLADDING

Aluminium Composite Panels shall NOT be used at all.

3.7.1 Timber & Plank Systems

3.7.1.1 General

Ensure all window door and frame flashings are installed correctly prior to fixing of cladding.

All External Wall Cladding shall be installed in accordance with the relevant Australian Standard, the manufacturer's recommendations and this technical specification.

Install sarking complying with AS/NZS 4200.1 (Pliable building membranes and underlays – Materials) in accordance with AS/NZS 4200.2 (Pliable building membranes and underlays – Installation requirements) behind all planks, boards, and behind sheets where recommended by the sheet manufacturer.

Complete all corners with proprietary trims and flashings according to the manufacturer's installation instructions.

3.7.1.2 Hardieplank™

Hardieplank™ shall be supplied in a finish (Smooth or Woodgrain) as detailed.

Fix planks as shown on the design drawings at each stud in accordance with manufacturer's recommendations.

Provide PVC jointing strips to ends of planks and stagger joints as the work rises.

For external corners finish with a preformed cement composite corner detail – Scyon Axent™ - as supplied by the manufacturer.

To internal corners stop planks against a 25 x 25 mm rough sawn timber batten fixed to studwork.

3.7.1.3 Weathertex Plank

Fix in accordance with the manufacturer's recommendations. Jointing strips and corner finishes shall be as for Hardieplank™. All cut ends or edges shall be primed prior to fixing.

3.7.1.4 Timber Boarding

Provide framing to allow fixing at not more than 600 mm centres, and any incidental backing timber or steel sections where necessary.

Double nail boards 15 mm from ends and at each intermediate position using 60 x 3.75 mm galvanised twisted shank pallet nails or 65 x 2.5 mm galvanised machine driven nails. For hand driven nails drill at board ends to prevent splitting. Alternatively the boarding can be screwed using counter sunk self-drilling screws suitable for the member and the board it is being attached to.

Where boards join over a stud the nails or screws are to be skewed to ensure correct penetration into the stud without splitting the edge of the stud.

3.7.1.5 F.R.C.B. Sheet Wall Lining

Fix external grade F.R.C.B. sheeting as scheduled in accordance with manufacturer's recommendations. Unless specified otherwise the sheeting is to be 6 mm thick.

3.7.1.6 Other Wall Lining

Other wall linings are to be installed in accordance with the manufacturer's recommendations.

3.7.2 Prefabricated Structural Systems

3.7.2.1 General

All structural panelised systems must be approved by the Principal prior to use, test results from AS/NZS 1530.4 (Methods for fire tests on building materials, components and structures, Part 4: Fire-resistance tests for elements of construction) and/or AS 5113 (Fire Propagation Testing & Classification of External Walls of Buildings) may be required to ensure Building Code of Australia fire rating requirements are met. All External Wall Cladding shall be installed in accordance with the relevant Australian Standard, the Building Code of Australia, manufacturer's

recommendations and this technical specification. The work shall be carried out and finished strictly in accordance with the best trade practice.

3.7.2.2 Insulated Structural Panels

Shall be detailed, installed and coated in accordance with the manufacturer's recommendations. Alternatively these are to be manufactured and installed as per engineering designs.

Products containing polyethylene, polystyrene or polyurethane are NOT suitable for use.

3.7.2.3 Pre-Fabricated Concrete Panels

Shall be detailed, installed and coated in accordance with the manufacturer's recommendations. Alternatively these are to be manufactured and installed as per engineering designs.

3.7.2.4 Aerated Autoclaved Concrete (AAC) panels (CSR Hebel Power Panels or similar)

These are to be installed and fixed in accordance with the manufacturer's recommendations and installation specifications which in brief includes:-

- Sark the studwork;
- Install the recommended flashings;
- Install the horizontal runs of perforated steel top hat as recommended for the site conditions by screwing the top hats to the stud wall and screw fix the panels to the top hat sections. Install by gluing panels together but allowing the recommended expansion or control joints;
- Where panels have been cut treat the exposed reinforcement with the recommended product;
- Seal all the control or expansion joints between the panels with the recommended sealer;
- All externally exposed panel installations shall be coated with an external coating system and sealant applied to the joints to ensure a water resistant and vapour permeable building envelope is achieved.

3.8 MASONRY

3.8.1 Standard of Workmanship and Materials

All masonry work shall be carried out in the best possible trade manner and unless otherwise specified or shown shall be in conformity with AS 3700 (Masonry Structures). Protect masonry stock to prevent on-site or weather damage and on larger jobs blend deliveries around the site.

3.8.2 Uniformity

All bricks and blocks shall be sound, uniform in shape and size and where used in face work, be free from unintentional surface defects and selected for even colour. All masonry units in any one wall shall be of the same material. Mixing of clay, concrete and aerated autoclaved concrete units will not be accepted.

3.8.2.1 Clay Bricks

The manufacture of bricks and methods of quality control shall comply with AS/NZS 4455.1 (Masonry Units, Pavers, Flags and Segmental Retaining Wall Units – Masonry Units).

3.8.2.2 Concrete Blocks & Bricks

Concrete masonry units shall be manufactured to AS/NZS 4455.1 (Masonry Units, Pavers, Flags and Segmental Retaining Wall Units – Masonry Units) and suit construction.

3.8.2.3 Aerated Autoclaved Concrete (AAC)

AAC shall be an accredited proprietary system used in accordance with the manufacturer's specification.

3.8.2.4 Natural Stone

Natural Stone shall be cut in rectangular blocks intended for use in masonry construction.

3.8.3 Mortar

3.8.3.1 Materials

Cement shall comply with AS 3972 (General Purpose and Blended Cements).

Use lime in compliance with AS 1672.1 (Limes and Limestones – Limes for Building).

Sand shall be fine aggregate with low clay content, free from efflorescing salts and chosen to produce the required mortar mix.

Water shall be drinkable.

Colouring Agents are to be added only if and as specified on the drawing

Additives for damp-proof mortar shall be of an approved manufacture and in a clear finish.

3.8.3.2 Mortar Mixes

Mortar shall comply with AS 3700 (Masonry Structures) which describes the different class of mortars mentioned below.

Use the following mixes as applicable. Measure materials by volume in the proportions stated:

(i) Composition mortar (Class M3) shall be, 1 cement : 1 lime : 6 sand and used for all general masonry work.

(ii) Cement mortar (Class M4) shall be 1 cement : 1/10th lime: 3 sand and used where a high durability is required e.g. retaining walls, fences and parapets.

(iii) Special mortar. Where the product has a specific mortar recommended (e.g. AAC) then the recommended mortar may be used.

3.8.3.3 Mixing

Mix mortar in suitable quantities, the amount depending on prevailing temperatures, to ensure use before initial set. Retempering after setting has commenced, and the mixing of fresh with stale mortar is not permitted.

3.8.4 Wall Construction

3.8.4.1 Brick Laying

Masonry units shall be laid on full beds of mortar nominally 10 mm thick and perpends shall be solidly filled. All work shall be constructed plumb and true to level, properly bonded to suit the masonry, using part masonry units as necessary. For AAC the manufacturers thin bed mortar may be used.

Keep the work clean and remove excess mortar. All cavities shall be left clean and free of mortar droppings.

In the external leafs of external walls open perpend joints shall be left and maintained in the course immediately above any damp-proof strip for weep holes. These are to be evenly spaced at less than 600 mm centres.

3.8.4.2 Steel Lintels for Masonry

Steel lintels shall be hot dip galvanised or proprietary galvanised lintels and shall be built in over masonry openings.

Lintels are to be as detailed on the drawings. Where no sizes are given on the drawings the sizes indicated in the following Table shall be used with each angle or arch bar carrying maximum 110 mm wall thickness.

Where the soffit of an opening is to be plastered, wrap the visible steel section in light galvanised mesh, before masonry is carried over.

Max opening in mm	Steel Sizes (mm) - Long leg of angles vertical	Galintal	Bearing each end (mm)
910	50 x 10 flat bar	8 x 85	100
1220	75 x 75 x 8 angle	100 x 100	150
1830	100 x 75 x 8 angle	100 x 100	150
2440	125 x 75 x 10 angle	150 x 100	200
3050	150 x 90 x 10 angle	150 x 100	200

3.8.4.3 Block Lintels and Bond Beams

Concrete lintel blocks shall be of minimum 200 mm height and to full wall thickness, with extensions beyond openings of minimum 200 mm each end. Reinforce as designed and fill with N20 concrete with maximum 7 mm aggregate.

3.8.4.4 Gabled Walling on Boundary

Masonry gables and part gables, shall be cut and laid to underside of battens or purlins of roof covering.

3.8.4.5 Closing of Cavity

Close cavity by returning masonry at jambs of opening below any window wall sill and door sill.

3.8.4.6 Junction of Walls Internal & External

Bond in alternating courses of intersecting walls or provide reinforcing of 30 mm x 0.8 mm x 200 mm long galvanised straps, or 2 x 6 mm x 200 mm long galvanised, or stainless steel, rods bonded in courses at maximum 400 mm intervals.

3.8.4.7 Reinforced Work

Provide masonry with steel reinforcing as detailed. Where indicated fill blockwork, cavities used as a retaining wall, or reinforced piers with concrete using 7 mm maximum aggregate.

3.8.4.8 Chasing

Chasing shall be of the minimum size needed and in any case the depth shall be no more than ⅓ the thickness of the masonry and shall run vertically where possible. Horizontal chases shall be no longer than 1 m except for a bath.

3.8.5 Cleaning & Pointing

3.8.5.1 Making Good and Pointing

Make good, patch and fill as required, including putlog holes, wall tops cut to rake, around service pipes, etc. Neatly trim flashings and cut damp proof membrane strips to even horizontal lines. Clean all visible surfaces

3.8.6 Rendering

3.8.6.1 Workmanship

Unless otherwise specified, rendered surfaces shall finish even and straight, with all faces and angles set plumb or level as applicable.

Unless otherwise directed the finished thickness of rendering shall be 12 mm.

3.8.6.2 Materials

Cement, lime, sand and water shall be as per Mortar (clause 3.8.3).

Unless otherwise specified render shall be 1 cement : 3 sand.

3.8.6.3 Mixing

Mix materials until uniform in colour and consistency. Do no remix or add to fresh mortar any mix showing signs of initial set.

3.8.6.4 Rendered Finish

Provide a 12 mm thick rendered finish to external masonry, finished to an even surface off a wood float. The edges of the render are to be formed with temporary formwork. Casing beads are not to be used for external render.

Rendered walls shall stop at the damp proof membrane with brickwork below left as face brickwork.

Pipes, cables, conduits etc. may be chased into the masonry and then the chase filled but they are not to be partially or fully buried in the render.

3.8.7 Ties and Reinforcement

3.8.7.1 Wall Ties

Masonry wall leaves shall be tied across the cavity with heavy galvanised wire, stainless steel or plastic ties, manufactured to comply with AS/NZS 2699 (Built-in Components for Masonry Construction – Set).

In veneer construction masonry shall be tied to stud wall framing at all regular stud positions, including gable ends.

Solid masonry ties shall be of size appropriate to the cavity width and built at least 50 mm into each leaf.

Where articulation joints occur, ties shall be built in both sides of the joint, spaced at not more than 300 mm from the joint.

All areas within one kilometre of the coast, all ties shall be hot dipped galvanised, stainless steel or other ties colour coded red.

3.8.7.2 Spacing of Wall Ties

Cavity Width	Tie	Maximum Spacing	
80 mm maximum	3.15 mm dia. for W28	600 mm horizontally	600 mm vertically
	4.0 mm dia. for W33 & 41	600 mm horizontally	600 mm vertically
Over 80 mm	6.3 mm dia.	600 mm horizontally	600 mm vertically
	or 19 x 3 mm	600 mm horizontally	600 mm vertically

3.8.7.3 Door Strap Ties

Timber door and window frames abutting masonry shall be secured with minimum 25 mm x 0.6 mm kinked galvanised straps, nominally 300 mm long, fixed to back of frames and set into courses at no more than 400 mm intervals vertically. For aluminium or steel, door and window frames use proprietary fixing straps.

3.8.7.4 Roof Ties in Solid Masonry

The fixing between the roof and the wall shall be as designed to transfer the wind and earthquake loads as appropriate. The minimum shall be :

3.8.7.4.1 Wall Plate Fixing

Wall plates shall be fixed to masonry with 3.2 mm galvanised nails into the mortar of perpends at every third joint.

3.8.7.4.2 Tie Down Fixing

In a course 1200 mm below top of walls, build in 10 mm diameter galvanised m.s rods across cavity and into both leaves of cavity or solid masonry walls as applicable.

Provide 32 x 1.2 mm galvanised straps, double and loop around rods and allow to extend each leg at least 300 mm above the topped wall for fixing to roof members.

The rods and straps are required at 1200 mm maximum centres and corresponding with roof truss or rafter positions.

For single leaf wall chase the render to fix a roof strap 500 mm down the wall at each rafter or truss. Cut out the existing mortar and mortar the strap 50 mm into the bed joint. Fix the strap to the wall with 2 screw fixings, one in bottom brick and one in the 2nd course from the top of the wall.

3.8.7.5 Reinforcement

Build into all concrete masonry walls including each leaf of cavity walls, galvanised ladder mesh joint reinforcement in accordance with manufacturer's recommendations.

3.8.8 Bed Joints & Perpends

3.8.8.1 Fair Face Work

Unless otherwise specified, finish the exposed external masonry and internal fair face work with recessed or round tooled joints.

3.8.8.2 Rendered Work

Rake out joints in masonry to be rendered or plastered.

3.8.8.3 Articulated Joints

For detailed requirements of Articulation Joints refer to Cement and Concrete Association Construction Note Technical Note 61.

Commencing at footing level form 10 mm wide straight and even full length joints to the top of the masonry.

For all articulated joints in walls provide Dunning Engineering BET300 ribbed expansion anchors, or equal approved. Build in the anchors at every fourth course.

Provide a polyethylene backer rod and seal with polyurethane sealant.

For all joints in common walls between units refer to clause 3.5.1.

3.8.9 Single Storey Reinforced Brick Piers

Where brick piers are provided (e.g. carports and garages) they and their reinforcing and fixings shall be designed, but shall not be less than 340 mm x 340 mm in size and reinforced and fixed as follows:

(i) Provide 1N12 starter bar located in the centre of the core, cogged into the footing/slab below. Reinforce the pier centre with 1N12 bars lapped 600 mm with the starter bars. Fill the core of the pier with 7 mm aggregate concrete in max. lifts of ten course vertical sections.
(ii) Securely (with an M12 bolt) fix pier to roof structure into position by either bending bar over the roof structure and fixing or chemical anchor fixed to the core to an angle and fix the angle to the roof structure. (Beam or Truss).

3.8.10 Fixing Roller Doors (& Other Heavy Items) to Hollow Bricks

All roller doors and other heavy items shall be installed to manufacturer's recommendations. Where no recommendations exist for hollow concrete and brickwork the following shall apply;

For hollow core brickwork & hollow concrete blockwork walls:
Use Hilti Hit HY70 adhesive grout with a Hilti Hit- SC 16 mm diameter x 50 mm long composite sleeve with Hilti Hit-V-F hot dipped galvanized steel threaded rod, 50 mm embedment. Drill a 16mm diameter hole x 60mm deep into brickwork.
Or
For hollow brickwork use:
Use Ramset Chemset 101 Plus adhesive grout with a 15 mm stainless steel sieve sleeve (Ramset ISM12) with a M10 hot dipped galvanized steel threaded rod, 64 mm rod embedment. Cut sieve sleeve 74 mm long, cut two 10mm long slits in one end and fold over to form a sieve end stop. The sieves can be made longer to ensure that it does not fall into a deep cavity in this case drill a 16mm diameter hole x 64mm deep into hollow brickwork.

For hollow core concrete blockwork walls use:
Use Ramset Chemset 101 Plus adhesive grout with a 14 mm diameter x 64 mm long nylon sleeve (Ramset ISS10) with a M10 hot dipped galvanized steel threaded rod, 64 mm rod embedment. Drill a 14mm diameter hole x 74mm deep into blockwork.

3.9 INTERNAL WALL LININGS

3.9.1 Linings - General

The fixing of lining materials to ceiling timbers, wall framing, battens or furring channels or directly to masonry shall be in accordance with manufacturer's written recommendations. All wall cavities and spaces shall be cleaned free of mortar droppings and debris prior to lining installation. Ensure all services are in working order and insulation is placed (in accordance with Section 3.14) prior to lining the walls.

Provide trimmers for openings, fixtures, etc., so that all ends of sheets and cut joints will be supported. Where sheet wall abuts a solid plastered wall or there is an articulation joint provide a P35 expansion joint or with flexible sealant or cover with a casing bead.

3.9.2 Wet Areas

Wet area rated boards such as plasterboard or internal fibre cement board or magnesium oxide board shall be used for the full extent of all walls within wet areas and fully behind wall tiling in the kitchen. All joints or penetrations shall comply with manufacturer's recommendations.

3.9.3 Plasterboard

3.9.3.1 Sheet Material

Plasterboard shall be a minimum of 10 mm thick and of Australian manufacture. Where used in wet areas water resistant (WR) board manufactured in accordance with AS/NZS 2588 (Gypsum Plasterboard) is to be used. The long edges of adjoining sheets shall be recessed. Flush sheets in accordance with manufacturer's recommendations.

Use fire rated board of the thickness detailed in the BCA on party walls where detailed as fire rated.

For public corridors and stairwells one of the following plasterboard products shall be installed:

- 13 mm CSR Gyprock™ EC08 Complete; or
- Knauf TruRock HD; or
- Boral Multistop™ 5HI.

3.9.4 Fibre Cement Board

3.9.4.1 Sheet Material

Board shall be manufactured in accordance with AS 2908.2 (Cellulose Cement Products – Flat Sheet) and where used in wet areas shall be water resistant (WR) board. Supply in room lengths 6 mm thick fibre reinforced cement sheeting equal to Hardie's Villaboard. Flush sheets in accordance with manufacturer's recommendations.

3.9.5 Plasterboard Cornices

Unless otherwise detailed use 55 mm cornice to finish plasterboard ceilings against vertical faces.

Fix with cornice cement to ceilings only, in straight lines and with corners mitred. Leave a 6 mm gap to the wall and seal between the wall and the cornice with a flexible sealant.
Stop mitres, nail holes, etc. and straight stop against adjacent surfaces as required.

3.9.6 Timber Mouldings

Skirting and architrave mouldings must match in profile. Timber mouldings shall not be sourced from a tropical rainforest species unless they are plantation. Unless detailed otherwise, skirtings shall be 70 mm high x 19 mm minimum, scribed accurately to the floor to accommodate future vinyl or other floor coverings.

Architraves must be a minimum of 60 mm x 19 mm. Short length finger jointed timber mouldings will not be accepted.

MDF mouldings and linings shall be pre-primed. Do not use MDF as skirting or trim where it may be exposed to water e.g. wet areas and all skirting boards.

All timber mouldings fitted to wet areas are to be protected from moisture, particularly the cut ends at the tiled floor and backs and edges against plasterboard wall linings.

3.10 FLOORS

3.10.1 Floor Construction

The following covers floors other than slab on grade (raft slab) construction.

3.10.1.1 Preparation and Clearance Under Suspended Ground Floors

The area under the ground floor shall be cleared of all vegetation and rubbish, including mortar and plaster droppings, timber or steel off cuts, bricks and concrete. A minimum of 200 mm clear space shall be provided between the ground level and the lowest timber or steel frame members or in accordance with the manufacturer's specification. Where sheet timber flooring, or concrete floors on steel deck is used, refer to the manufacturer's specifications for under floor ventilation requirements.

3.10.1.2 Timber Sizes

Timbers shall be as detailed or where not detailed shall be in accordance with AS 1720 (Timber Structures – Part 1: Design Methods; Part 3: Design Criteria for Timber-Framed Residential Buildings) and AS 1684 (Residential Timber Framed Construction – Part 2: Non-Cyclonic Areas; Part 4: Simplified – Non- Cyclonic Areas).

3.10.1.3 Steel Sizes

Steel members supporting floors shall be in accordance with the (Building Rules approval) design drawings and the supplier/manufacturer of the steel system.

3.10.2 Upper Floor Framing

3.10.2.1 General Requirements

Construct the framework for the upper floor as detailed.

Construct all work true to line and level, trim for stair opening and wherever else required and complete the framing ready to receive the flooring and ceiling materials.

3.10.2.2 Steel Members

Supply and fabricate steel members such as beams, angles, included in the structure to the engineer's details.

Bolt fix the structural steel using not less than 10 mm diam. bolts and any cleats, brackets and seating pads as detailed.

3.10.2.3 Timber Beams

Provide beam(s) to size and finish as indicated, solidly supported and fixed as detailed.

Supply and fix any special items including wrought timber or steel posts etc. in connection with the beam(s), as detailed.

3.10.2.4 Joists

Main joists shall be uniformly sized and to spacing's as detailed and to suit the flooring material. In the absence of other information they shall be spaced at not more than 450 mm centres. For timber joists provide solid blocking between joists to comply with AS 1684.2 (Residential Timber Framed Construction – Part 2: Non-Cyclonic Areas). Blocking between steel members shall be in accordance with the manufacturer's recommendations.

Provide noggings under joints in flooring not occurring over joists, unless the flooring manufacturer specifies otherwise.

For timber joists, noggings and fixing blocking shall be not less than 90 x 45 mm.

Fix blockings/trimmers between joists for the fixing of top plates of wall framing, running in the same direction as the joists.

Make the provisions relative to wet area floor sections, including any checking and reduction in depth of joists, as detailed.

3.10.3 Flooring

3.10.3.1 Particle Board/Plywood Flooring

Brand and quality of sheet flooring shall be clearly identified.

Provide board with tongues and grooves on long edges.

Fix sheet flooring with nails punched using minimum 50 mm nails, with nails spaced as set out in AS 1860.2 (Particleboard Flooring – Installation), i.e. at 150 mm maximum centres along edges and not closer than 10 mm to edge and at 200 mm maximum centres to intermediate joists.

In addition apply adhesive to sheet flooring manufacturer's recommendations to all joists in continuous beads and double beads at butt joints. Fill any joins with gaps wider than 1 mm.

Sand joins if necessary to achieve a flat floor.
Protect floor surfaces in accordance with the manufacturer's recommendations.

3.10.3.2 Wet Area Flooring

Unless otherwise detailed for upper floor wet area(s) supply and fix minimum 15 mm thick compressed F.R.C.B., using 50 mm galvanised or brass screws.

Butt joints shall occur centrally over joists or over 90 x 45 mm trimmer set flat between joists, with both edges screw fixed at maximum 250 mm centres or in accordance with the manufacturer's recommendations. Seal butt joints and pipe penetrations as recommended by the manufacturer.

Waterproof the whole floor of the wet area in accordance with AS 3740 (Waterproofing of domestic wet areas) and the Plumbing Code of Australia, NCC volume 3.

3.10.3.3 Strip (or Board) Floors

Strip flooring boards shall be carefully laid and fixed in accordance AS 1684.2 (Residential Timber Framed Construction – Part 2: Non-Cyclonic Areas) and:-

(i) They shall be laid in straight and parallel lines with tongues fitted into grooves;
(ii) Ends of boards shall be cut square at joints and shall be butted tightly together;
(iii) End joints shall be made on a joist and joints in adjoining boards shall be staggered;
(iv) Nails in faces of boards shall be well punched to allow for subsequent sanding and stopping;
(v) Boards profiled for secret nailing and skew nailed through tongues at each joist shall have nails punched to permit the full entry of the tongue into the groove;
(vi) Stop and sand floor ready for finish or floor covering as required.

3.10.3.4 Other Flooring

Other flooring or flooring systems are to be installed in accordance with the manufacturer's recommendations.

3.10.4 Floor Coverings

3.10.4.1 General

Ensure that the base floors are constructed to suit the specified finish and that any correction if required, is made before commencing work.

3.10.4.2 Fire Hazard Properties

All floor coverings must comply with the requirements for floor covering as given in the latest version of the BCA Volume One Specification C1.10. In addition, the requirements for Class 2 buildings shall apply to all of the Principals Class 1 houses.

3.10.4.3 Moisture Tests

Take moisture readings where necessary and ensure that adhesive fixed materials are not laid until the moisture content for the whole area is below or at the maximum recommended by the adhesive or floor finish manufacturer.

3.10.4.4 On Completion

Upon completion of the installation of the Floor Covering(s), the following procedures shall be followed:

- clean and wash all vinyl sheeting and tiles, removing any stains, surplus adhesives or manufacturers' branding;
- vacuum carpet;
- make good any damage caused to other items on the property;
- refit any door stops as required and remove from site any excess material, off-cuts or any other relevant or associated rubbish from site; and
- provide a copy of the manufacturers' printed instruction on cleaning and maintenance of the vinyl sheeting, vinyl tiles or carpet installed to be left in the kitchen drawer of the property.

3.10.5 Vinyl

3.10.5.1 Materials

3.10.5.1.1 General

All proprietary products (e.g. adhesives, weld rods, levelling compounds) and installation methods used shall be in accordance with the manufacturer's recommendations. The vinyl surface shall have a plain finish providing multi shade and non-directional pattern. For all upper floors of flats use a heterogeneous with an acoustic backing (Type B) material.

3.10.5.1.2 Sheet vinyl

Vinyl sheeting required to be sealed and polished on a regular basis will NOT be accepted.
Sheet vinyl for general use shall comply with **Type A, B** or **C** as defined below.
Sheet vinyl to achieve acoustic treatment to floors shall comply with **Type B** as defined below.

a) Homogenous Sheet Vinyl (Type A)
Homogenous sheet vinyl floor covering shall have an overall thickness of not less than 1.5 mm. The colour and finish shall be uniform throughout the wear layer.
The sheeting is to be class 32 as defined in table 3 of EN 649 (Resilient Floor Coverings – Homogenous and Heterogeneous Polyvinyl Chloride Floor Coverings – Specification).
The sheeting shall meet a minimum wear resistance of P as measured under the EN 660-1 (Resilient Floor Coverings – Determination of Wear Resistance – Stuttgart Test) or EN 660-2 (Resilient Floor Coverings – Determination of Wear Resistance – Frick-taber Test).

b) Heterogeneous Sheet Vinyl (Acoustic Backed) (Type B)
Heterogeneous (backed acoustic) vinyl sheeting (for walk up flats) shall be light commercial that is flexible and durable with the specific purpose of reducing noise (16 – 18 db noise reduction).
If the wear layer is less than 0.7 mm, the wear layer is to be of pure PVC with a minimum thickness of 0.4 mm.
If the wear layer is 0.7 mm or greater the wear layer shall have the colour and finish uniform throughout its thickness.
The sheeting shall meet a minimum wear resistance of P as measured under the EN 660-1 (Resilient Floor Coverings – Determination of Wear Resistance – Stuttgart Test) or EN 660-2 (Resilient Floor Coverings – Determination of Wear Resistance – Frick-taber Test).
The product is to be laid in the conventional way with adhesive.

Gerflor Texline Pro or HQR is deemed to comply.

c) Heterogeneous Sheet Vinyl (Type C)
Heterogeneous vinyl sheeting shall have an overall thickness of a minimum of 1.5 mm with a wear layer of at least 0.7 mm of through colour and finish uniform throughout its thickness or 0.4 mm of pure PVC.
The sheeting is to be class 32 as defined in table 3 of EN 649 (Resilient Floor Coverings – Homogenous and Heterogeneous PVC floor coverings – Specification).
The sheeting shall meet a minimum wear resistance of P, for a through colour wear layer, as measured under the EN 660-1 (Resilient Floor Coverings – Determination of Wear Resistance – Stuttgart Test) or EN 660-2 (Resilient Floor Coverings – Determination of Wear Resistance – Frick-taber Test).
The product is to be laid in the conventional way with adhesive.

Approved Vinyl Flooring Products	
Homogenous Sheet Vinyl (Type A)	Armstrong Quantum, Accolade, Tarkett Primo Premium, Polyflor Classic Mystique and Gerflor Mipolam Action
Heterogeneous Sheet Vinyl (Acoustic Backed – Type B)	Gerflor Texline Pro, HQR, Tarkett 320T, Armstrong Timberline, Polyflor Forest fx

3.10.5.1.3 Vinyl Composition Tiles

Vinyl tiles shall be 2.00 mm thick and 300 mm square and shall be classified as Special Product in accordance with ISO 10595 (Resilient Floor Coverings – Semi-Flexible/Vinyl Composition (VCT) Poly (Vinyl Chloride) Floor Tiles – Specification) when tested in accordance with EN 660-2 (Resilient Floor Coverings – Determination of Wear Resistance – Frick-taber Test).

3.10.5.1.4 Nosings

Stair nosings shall be slip resistant, coloured to contrast and be part of the system used for the rest of the stair.

3.10.5.1.5 Skirtings

Skirting shall be 100 mm cover PVC skirting.

3.10.5.1.6 Vinyl Adhesive

Adhesives shall comply with the flooring manufacturer requirements.

3.10.5.1.7 Sheet vinyl underlay

Underlay shall be a medium density hardboard for timber floors complying with AS 1859.4 (Reconstituted wood-based panels – Specifications – Wet-processed fibreboard). Intafloor Ply underlay is deemed to comply.
Other sheet materials may be used with written approval from both the flooring manufacturer and the Principal.

3.10.5.2 Floor Preparation

All floor preparation shall be in accordance with AS 1884 (Floor Coverings – Resilient sheet and tiles – Installation practices).

Vinyl on Concrete Floors
Test all concrete floor surfaces in accordance with AS 1884 (Floor Coverings – Resilient sheet and tiles – Installation practices) to ensure that they are sufficiently dry and the surface meets the planeness and smoothness criteria. Adjust as necessary using manufacturer recommendations and proprietary products.

Prepare concrete floors by removal of glue and repairing any surface imperfections. Remove any small blemishes which may mar the finished appearance of the vinyl. All concrete floors receiving sheet vinyl coverings shall be swept clean and be free of dust before installation commences.

Vinyl on Timber and Board Floors
For timber board floors, ensure that the floor is well nailed, with nails punched and all boards are firm and secure. For strip and sheet timber floors lay underlay in accordance with manufacturer's recommendations and light sand (as specified for polishing) prior to laying vinyl floor coverings. Note on sheet floors it may be possible to sand the joints and not use an underlay.

3.10.5.3 Workmanship

Only one material and colour is to be laid in each property in accordance with the manufacturer's recommendations using proprietary products.

Sheet flooring shall be properly colour matched and laid with a minimum number of joins, using welds where necessary to create a continuous appearance.

Jointing is to be carried out in accordance with the manufacturer's specification, including any edge preparation, using matching colour and proprietary product PVC rod for hot welding joints. Finish vinyl on exposed edges, or junctions with other materials, with an approved aluminium edging strip. The edging strip is to be colour matched to complement the vinyl colour and shall be securely fixed.

All edges where vinyl abuts different surfaces i.e. walls, kick boards, cupboards etc. must be caulked (colour matched) to waterproof edges of vinyl.

The vinyl shall be cleaned to remove stains, surplus adhesive, and product branding, with door stops in place ready for use. Off cuts can be recycled and all other debris removed from site.

3.10.6 Carpet

3.10.6.1 Materials

Carpet shall be Domestic Grade and comply with AS 2404 – (Textile floor coverings – Fire propagation of the use-surface using a small ignition source) and should have the following minimum dimensions, 510gram (18 oz.) loop pile synthetic fibre (poly propylene) 3.6 metres wide.

Carpet underlay shall comply with AS 4288 (Soft underlays for textile floor coverings) and shall allow the concrete to breathe i.e. it shall not be impervious to moisture.

Only one colour should be laid in each dwelling. Rolls must be properly colour matched.

3.10.6.2 Preparation

Concrete Floors
New concrete floors must be checked for moisture content and that the surface is sound and suitable to receive carpet. Small holes or chips shall be filled and made smooth. All dust and debris shall be removed prior to laying any carpet.

Timber and Board Floors
Ensure that timber and board floors are firm, secure, well nailed with all nails punched to provide a smooth and even surface. Joins and surface irregularities shall be sanded to a smooth even finish. All dust and debris shall be removed with an industrial vacuum cleaner prior to laying carpet.

3.10.6.3 Workmanship

Carpet and underlay shall be laid and joined in accordance with AS/NZS 2455.1 (Textile floor coverings – Installation practice – General) and with the manufacturer's recommendations. Carpet shall be laid using the smooth edge method.

Where carpet is terminated at doorways or at changes in floor surface finish, use proprietary edge strips securely fixed and coloured to compliment the carpet.

3.11 WINDOWS

3.11.1 General

All glass and glazing shall comply with AS 1288 (Glass in Buildings – Selection and Installation).
All windows shall comply with AS 2047 (Windows and External Glazed Doors in Buildings).

Frames shall be shop fabricated into complete assemblies as detailed and scheduled. All windows shall be completed with flashings, and hardware shop fitted where practicable. Protect the frames from workshop to install, accurately position and build into work.

MDF is not to be used for external window frames.

Designs shall allow for the protection of openable windows as required by the BCA.

MDF is NOT to be used for external window frames.

3.11.2 Hardware and Seals

Make windows weatherproof with pile, neoprene and/or vinyl seals to meet the requirements of AS 2047 (Windows and External Glazed Doors in Buildings).

Generally sashes shall be fitted with approved positive locking devices. Any keyed window locks or latches shall be keyed alike.

Awning sashes shall be fitted with hinges or non-friction stays and Whitco chain operated window winders or equal approved.

Sliding units shall be light in operation without sticking and non-rattling at all positions. Roller units shall be easily replaceable in case of wear.

Double hung units shall include counter balances appropriate handles and sash fastener.

3.11.3 Flyscreens

Provide removable flywire screens to all opening sashes, with the frame matching the window frame colour with black anodised aluminium flywire of 0.25 mm wire thickness and equivalent to 18 x 14 or 18 x 18 mesh.

3.11.4 Aluminium Windows

The aluminium extrusions shall comply with AS 1866 (Aluminium and Aluminium Alloys – Extruded Rod, Bar, Solid and Hollow Shapes) and be at least equivalent to Australian Alloy B6063, temper designation T5. Unless specified otherwise, manufacture and install frames in accordance with AS 2047 (Windows and External Glazed Doors in Buildings).

Joints shall be accurately machined and screws shall be 18/8 type stainless steel. Reinforce mitres with extruded or pressed metal splines and seal joints with polyurethane on assembly.

All aluminium shall be powder coated to AS 3715 (Metal Finishing – Thermoset Powder Coating for Architectural Applications of Aluminium and Aluminium Alloys) colour as scheduled with powder coating complying with APAS 0155/2 (Thermosetting Powder Coatings) to a minimum thickness of 40µm, or anodized to AS 1231 (Aluminium and Aluminium Alloys – Anodic Oxidation Coatings) with a minimum coating thickness of 15µm, with all exposed surfaces free from blemishes.

3.11.5 Louvre Window Systems

Louvre window systems are to be used in consultation with a representative of the Principal. Generally this will be in areas where providing other open-able windows to achieve sufficient ventilation is problematic (laundries, bathrooms, stairwells), or in conjunction with full height glazed doors as an alternative ventilation source.

Glazing shall be toughened glass with rounded corners (Splayed glass blades) with a performance sill included to withstand 300Pa Water Resistance. All glazing shall comply with AS 1288 (Glass in Buildings – Set) and be sealed with Santoprene weather seal, and if louvre's can be mistaken for door openings or are within 300 mm of external door openings the glass used is to be grade 'A' safety glass.

All windows are to be fitted with fly screens on the outside of the blades fitted into window frame. For ground floor windows and in other places specified by the Principals representative, security bars designed as part of the window system shall be fitted at every blade.

Standard manual opening devices shall be used, automatic or motorised opening devices are NOT acceptable.

Frames for fly screens and security bars shall be exposure class aluminium finished clear anodised and powder coated to match existing or surrounding colours.

The Vantage Louvremaster window system or equivalent is deemed to comply.

3.12 ROOF AND CEILING FRAMING

3.12.1 General Requirements

Timber roof ceiling members shall be designed, manufactured, fixed, checked, notched, seated and tied down in accordance AS 1720.3 (Timber Structures – Design Criteria for Timber-Framed Residential Buildings) and AS 1684 (Residential Timber Framed Construction – Part 2: Non-Cyclonic Areas; Part 4: Simplified – Non- Cyclonic Areas).

Steel roof and ceiling members shall be designed, manufactured, and installed in accordance with AS 3623 (Domestic Metal Framing) and AS/NZS 4600 (Cold-Formed Steel Structures) for steel.

Incidental timbers shall be provided in accordance with AS 1720.3 (Timber Structures – Design Criteria for Timber-Framed Residential Buildings) and AS 1684 (Residential Timber Framed Construction – Part 2: Non-Cyclonic Areas; Part 4: Simplified – Non- Cyclonic Areas).

Incidental steel members are to be included as required to complete the roof structure.

Complete the ceiling framing with trimmers as required, including those for electric light fittings, ready for the fixing of the ceiling sheets.

3.12.2 Roof Trusses

The Design and Fabrication of roof trusses shall be carried out by an approved manufacturer. Every roof truss shall be clearly branded with the name of the manufacturer.

Allowance shall be made in the design of the roof trusses for:

- Future installation of solar panels;
- Future installation of veranda or other structural attachments to eaves or fascia;
- Any fixings for safety equipment for future maintenance on the roof.

This allowance shall include the addition of metal or timber (proprietary to the system) struts to roof trusses in order to support future load demands.

Where steel or other non-structural fascia's are being used, the overhangs of trusses shall be designed accordingly.

Installation of timber trussed roofs shall be in accordance with AS 4440 (Installation of Nail Plated Timber Roof Trusses) and AS 1720.3 (Timber Structures – Design Criteria for Timber-Framed Residential Buildings) and AS 1684 (Residential Timber Framed Construction – Part 2: Non-Cyclonic Areas; Part 4: Simplified – Non- Cyclonic Areas). The work shall be carried out and certified at all stages by an accredited timber frame truss certifier. Provide written evidence to the Principal of certification at each stage from fabrication to final erection and completion.

For steel frames it shall be in accordance with the manufacturer's installation recommendations.

3.12.3 Eaves and Soffits

Form eaves as detailed. Include the necessary provisions to ensure that all roofs and eaves are bird proofed. Provide fascia's to all eaves as detailed.

Metal fascia's shall be COLORBOND® in the colour scheduled and installed in accordance with the manufacturer's recommendations. Metal barges are to be in COLORBOND® and installed in accordance with the manufacturer's recommendations.

Install timber barge boards as detailed, including fixings to sprockets, tile battens, purlins, fascia's and blocking off dummy rafters as applicable. Finish to underside of roof tiles with 19 mm thick scribing piece of sufficient depth to be cut neatly to tiles and have a minimum 50 mm full bearing against barge.

Unless detailed otherwise, line with 4.5 mm flat F.R.C.B. fixed with proprietary fixing nails, to form horizontal soffits to Porches, Verandahs and such areas where indicated. For eaves the James Hardie Eclipsa pre-painted eaves lining system can be used.

Joints in sheets shall be set out to form a symmetrical pattern and shall be finished with 30 mm X 6 mm Cover batten, or joined with manufacturer's proprietary joiners. Joint positions shall coincide with timber above or a trimmer provided.

Finish to adjacent surface with timber mouldings.

3.12.4 Ceiling Access

Each unit shall have an accessible Access Hatch to access services in the ceiling space. Trim between ceiling joists to provide for a clear opening of at least 700 mm x 550 mm. Trim the opening and provide an access cover. Premade surrounds of uPVC or powder coated aluminium may be used. In addition access shall be provided for any landlord equipment or services.

3.13 ROOF CLADDING

3.13.1 Standards

The installed roofing shall comply with the following standards:

- Building Code of Australia (NCC Volume 1);
- For tiled roofing AS 2050 (Installation of Roof Tiles)
- For sheet steel roofing AS 1562.1 (Design and Installation of Sheet Roof and Wall Cladding – Metal)
- For downpipes and gutters AS 2179.1 (Specifications for Rainwater Goods, Accessories and Fasteners – Metal Shape or Sheet Rainwater Goods, and Metal Accessories and Fasteners) AS 3500.3.1 (National Plumbing and Drainage – Stormwater Drainage – Performance Requirements) & AS/NZS 3.500.3 (Plumbing and Drainage – Stormwater Drainage).

3.13.2 Warranty

Provide a 7 year written warranty for materials and workmanship for the installed roofing system, including all roofing elements, such as skylights and exhaust fan penetrations.

3.13.3 Roofing System & Materials

Comply with Council approvals, the Building Code of Australia, NCC Volume 1, Encumbrance and Design guidelines together with the following:

- Roof material shall be terra-cotta or coloured concrete tiles or shingles or COLORBOND® steel sheet roofing;
- All flashings must be COLORBOND® to match the roof colour;
- Where roof collection provides potable or drinking water lead flashings must NOT be used on roof systems;
- Provide 200 mm overhang to all Dutch gables/gables/verges with full gable framing;
- For locations within 500 metres of the ocean shoreline provide a roof cladding system guaranteed in writing by the manufacturer for that location.

3.13.4 Roof Lights (Skylights)

Unless detailed otherwise the minimum size of a sky light shall be 500 mm x 500 mm with acrylic dome at the roof level and aluminium surround to the ceiling with acrylic diffuser.
Combination roof light/exhaust fans may be used in wet areas in lieu of separate sky light and exhausting system.

3.13.5 Gutters & Downpipes

All works, designs and testing shall comply with AS 3500.3 (Plumbing and Drainage Part 3: Stormwater Drainage).

Gutters
All gutters shall be installed at a minimum grade of 1 in 500 towards the outlet and shall be in long lengths. Box gutters are not allowed, unless approved by the Principal.

Form gutters of 0.55 mm grade G300 or 0.42 mm grade G550 (Hi Tensile) COLORBOND® SMP or Z275 Galvabond steel or AM125 Zincalume. Where gutter is to be painted the outside face shall be in accordance with the design documentation. COLORBOND® steel gutters are deemed to comply.

Gutters shall be a minimum of 150 mm (W) x 83 mm (D), using 19 mm (W) x 2 mm surface mounted galvanised brackets spaced at maximum intervals of 900 mm using 20 mm x 4 mm round head zinc plated wood screws to the front of the timber fascia. Where there is no fascia, support gutters on 19 mm wide x 5 mm thick galvanised brackets, folded over gutter bead, hooked over lower tile or sheet batten. Locate bracket immediately over a rafter or truss top chord, at 1200 mm maximum centres.

Downpipes
The number of downpipes is to be minimized so that the maximum possible roof area is discharged into the rainwater tanks. Provide COLORBOND®, ZINCALUME® steel if painting is not required). Avoid using UPVC downpipes where possible to minimise recurrent painting.

Galvanised downpipes shall be 0.55 mm grade G300 or 0.42 mm grade G 550 (Hi Tensile) Z275 Galvabond steel or AM125 Zincalume.

Where downpipes from an upper level roof discharge onto a lower level roof provide spreaders 600 mm long with 20 mm holes at 100 mm centres, to discharge the water evenly.

Where a site storm water system applies connect the downpipes directly into the system using an approved adaptor to suit the profile of the downpipe.

Discharge downpipes to the rainwater tank(s), detention tank(s) or subsurface stormwater system using UPVC adaptors set at paving level. Where sealed systems have been approved by the Principal the sealed uPVC is to extend to the tank over flow or the gutter pop as appropriate.

Immediately after gutters are fixed, erect downpipes permanently. Downpipes shall be a minimum of 90 mm in diameter for round or 100 mm x 50 mm or 75 mm x 75 mm for rectangle or square varieties and designed in accordance with AS 3500.3 2018. Fixings shall be a minimum of 50 mm x 0.5 mm straps fixed at a maximum of 1500 mm ¢ matching COLORBOND® steel with proprietary corrosion resistant fixings.

3.14 INSULATION

3.14.1 Materials

Insulation shall be in sheets or batts and of a type that conforms to AS 3999 (Bulk Thermal Insulation - Installation), AS/NZS 4859.1 (Materials for Thermal Insulation of Buildings – General Criteria and Technical Provisions), AS 4426 (Thermal Insulation of Pipework, Ductwork and Equipment – Selection, Installation and Finish), and current BCA requirements for insulation. Insulation shall be provided for the internal and external walls, floor and roof spaces as part of the system to meet the energy efficiency and sound attenuation ratings required by the BCA and Ministers Specification 78B (Construction Requirements for the Control of External Sound).

Where thermal insulation is used as a part of the sound attenuation it shall be as required by the system.

Ensure insulation is kept clean, dry, and in its original shape whilst being transported and stored prior to installation. Tainted insulation covered in mud or debris is not to be installed.

3.14.2 Installation

Insulation shall be installed according to the manufacturer's installation requirements. Special care shall be taken when installing insulation around recessed luminaires and other ceiling based electrical items. Insulation and signage shall be installed in accordance with AS/NZS 3000 (Electrical Installations – Wiring Rules).

Insulation shall be installed with no gaps, fitted close to structures and sufficiently sealed at joints and ends. Any surface receiving insulation shall be made as smooth as possible to minimise air gaps. Ensure insulation is continuous in the roof and walls to all edges after all services have been installed.

3.15 DOORS

3.15.1 Types, sizes and finishes

3.15.1.1 Thickness

The nominal thickness, unless otherwise detailed shall be 40 mm for external doors and 35 mm for internal doors.

3.15.1.2 Manufacture & Installation Compliance

Doors and door sets shall comply with the appropriate requirements of the following Australian Standards;

- AS 2688 (Timber and composite doors);
- AS 1905.1 (Components for the Protection of Openings in Fire-Resistant Walls – Fire Resistant Doorsets);
- AS 1735.11 (Lifts, Elevators & Moving Walks - Fire Rated Landing doors);
- AS 2047 (Windows & External Glazed Doors in Buildings);
- AS/NZS 4505 (Garage Doors & Other Large Access Doors).

All glass in side lights to door frames, sliding or hinged doors is to be safety glass in accordance with AS 1288 (Glass in Buildings – Selection & Installation).

3.15.1.3 Types of Doors

Types of Doors	Application	Complying Australian Standard
External Flush	Exterior Grade Facings.	AS 2688 (Timber & Composite Doors)
Solid Core Doors	Interior or Exterior as determined by its location with particle board or medium density fibre board cores.	AS 2688 (Timber & Composite Doors)
External Glazed Doors	Exterior	AS 2047 (Windows & External Glazed Doors in Buildings) All glass in these assemblies is to be safety glass in accordance with AS 1288 (Glass in Buildings – Selection & Installation)
Half Glass Doors	Interior or Exterior.	AS 2688 (Timber & Composite Doors)
Internal Flush	Internal only.	AS 2688 (Timber & Composite Doors)
Fire Resistant Doorsets	Where required by BCA.	AS 1905.1 (Components for the Protection of Openings in Fire-Resistant Walls – Fire Resistant Doorsets)
Garage or Carport	Where required.	AS/NZS 4505 (Garage Doors & Other Large Access Doors)
Combination (Combi)	Where specified in Annexure 1 – shall be a solid core door with an opening glass panel & mesh security grille all set in an aluminium frame, all similar as manufactured by Combion or equal approved. Fire rated in accordance with BCA requirements.	AS 1905.1 (Components for the Protection of Openings in Fire-Resistant Walls – Fire Resistant Doorsets)
External Hinged Doors to Single Occupancy Units	Hollow Core with 6 mm thick MDF facings or Solid Core Doors. Fire rated in accordance with BCA requirements.	
Aluminium Glass Sliding Doors	Minimum of 1800 mm width & Maximum of 2100 mm width from living areas – as detailed on drawings. The door is to have an aluminium frame. The base track shall be a low profile to allow for step less entry. Fire rated in accordance with BCA requirements.	AS 2047 (Windows & External Glazed Doors in Buildings) All glass in these assemblies is to be safety glass in accordance with AS 1288 (Glass in Buildings – Selection & Installation)
Doors to Sole Occupancy Units	The entrance door to a flat from the foyer or stairwell shall be: • For 2 storey units 40 mm solid core • For 3 or more storeys a fire door rated at -/60/30. Fire rated in accordance with BCA requirements. All doors and door sets shall comply with self-closing and fire rated requirements as stated within the BCA. All doors shall be labelled with the name of the manufacturer, the type of door e.g. interior hollow core, and installed in accordance with the manufacturers recommendations using proprietary products • Where self-closing doors are required they shall be linked to the Fire Indicator Panel using a magnetic door holder system	Solid core to AS 2688 (Timber Doors) Fire rated doors to AS 1905.1 (Components for the Protection of Openings in Fire-Resistant Walls – Fire Resistant Doorsets)

3.15.1.4 Hardware

Supply and fit all relevant hardware to doors as scheduled below.

- Mount door furniture at height of 1000 mm from bottom of door to the centre line of the handle, unless detailed otherwise.
- External door lock barrels to sole occupancy units must be compatible with a 5 or 6 pin Lockwood or Gainsborough construction key system (Principals profiles) supplied with end user keys and matching pin

profiles.

- External doors to common areas for occupants (i.e. foyers, storage, bike rooms) shall be keyed on the same pin profile as the construction key profile to the sole occupancy units. **No end user keys or end user pin profiles are required for these doors i.e. they will only use the original construction key pin profile.**
- Doors to service maintenance rooms, equipment and panels (i.e. telecommunications, electricity, fire, lifts) where possible shall be on a construction key system **with a different pin profile,** using an alternative pin combination to that used on the sole occupancy units and external doors to common areas for occupants. Provision shall be made for secure storage (i.e. lock box with code access) of service master keys for future maintenance use where required. Indicate the location of secure storage on 'As Constructed Drawings'.
- All locks shall comply with AS 4145 (Locksets and Hardware for Doors and Windows – Set) and shall allow egress from the Sole Occupancy Unit without the use of a removable key.
- Double barrel locks shall NOT be used.

Type of Door	Hinges/Tracks	Door Handles/Hardware
External/Internal Hinged, Solid Core Doors	3 x 100 mm loose pin light narrow steel butt hinges	Lever handles with front & rear door locks keyed alike
Internal Hinged Hollow Core Doors	2 x 85 mm loose pin steel butts	Lever handle passage set
Internal Hinged Hollow Core Door to Bathroom/Shower	2 x 85 mm loose pin steel butts	Lever handle with privacy latch
Internal Sliding Doors	Sliding door track & fittings similar to Cowdroy Arrow or equal approved	2 per door 100 mm flush pulls
Doors to Toilet	Shall meet the requirements of the Building Code of Australia (National Construction Code) to allow emergency access	Lever handle with privacy latch
External Aluminium Sliding Doors	Track part of sliding door system must allow for stepless entry. See Appendix B - Detail Drawings.	Provide internal snib & external lock keyed alike to external hinged door locks.
External Aluminium Hinged Safety Doors	Manufactured according to specification below	Provide internal snib & external lock keyed alike to external hinged door locks. Lock to be Whitco Tasman Mark 2 or Whitco Tasman Escape Security Lock
Solid Core Doors Specified as fire resisting – that exit to a public space from a unit, e.g. flat to a stairway	3 x 100 mm loose pin light narrow steel butt hinges	Lever handles with front & rear door locks keyed alike. Lockwood 7724 door closer or equal approved

3.15.2 Magnetic Door Holder Systems

3.15.2.1 General

These systems apply where a self-closing fire door is required. Where a safety or screen door is to be added to the front door of a single occupancy unit, the main door to the unit will be required to be automatically self-closing.

There are 2 alternative systems that may be used. **System A** is a fully wired system with a controller and **System B** is a radio linked system where the smoke alarms send a signal directly to the magnetic door holders. Both systems are technically acceptable but depending on the number of sole occupancy units and the ease of wiring one may be more economical than the other. The contractor is to identify to the Principal's representative which system is most suited to the site before commencing work.

3.15.2.2 System A

System A will require the following items. All items and components used shall be compatible in operation, installed in accordance with the manufacturer's recommendations using all proprietary products.

3.15.2.2.1 Magnetic Holder

The magnetic holder shall be a wall mounted unit with a keeper fixed to the back of the door. This may need to be on a short stem in some cases. The holder shall be Brooks 24 V Magnetic Door Holder (wall mounted) MDH1405 or equal approved.

3.15.2.2.2 Smoke Alarms

Smoke alarms are to be Photoelectric type, Brooks EIB650iWX, 12 Volt Photo- Optical Smoke Alarm or equal approved.

3.15.2.2.3 Controllers

One controller is to be used in each stairwell or landing which has access to sole occupancy unit doors. The controller is to be a residential fire alarm panel, Brooks RFP6V2 Residential Fire Panel with Door P/S or equal approved.

The controller is to be set up to allow a time delay before activating the door closers for an alarm from a sole occupancy unit or room. This is to allow time to clear smoke caused by actions such as cooking fumes. The delay is to be not less than 30 seconds.

3.15.2.2.4 Installation

The control panel is to be located as close as possible or inside the main switch board in the stair well and is to be connected to the land lord power.

Place the smoke alarms in all units and add one to the top of the stair well or on the ceiling of the landing area, clear of sole occupancy unit doors.
Install the magnetic door holder behind the front door of each unit.
Wire the magnetic holders and smoke alarms back to the control panel.
Check the operation of the system to ensure it operates correctly and supply each unit with a single page information sheet about the system and their responsibilities to test the system within the unit.

Provide a copy of the technical data to the Principal's representative so that the system can be checked and maintained by the Fire Safety contractor.

3.15.2.3 System B

System B will require the following items. All items and components used shall be compatible in operation, installed in accordance with the manufacturer's recommendations using all proprietary products.

3.15.2.3.1 Magnetic Holder

The magnetic holders are to be a Brooks BAMFHRF RadioLink Magnetic Door Holder or equal approved connected to 240V power and designed to interface with the radio frequency smoke alarms.

3.15.2.3.2 Smoke Alarms

The smoke alarms are to be a radio frequency photoelectric alarm with a 10 year life inbuilt battery. It is to be a Brooks EiB650iC Optical or equal approved.

3.15.2.3.3 Installation

Place the smoke alarm with the new radio frequency alarm and add the alarms to the top of the stairwell or on the ceiling of each landing which has access to sole occupancy unit doors.

Install the Magnetic holder behind the door and attach the keeper to the back of the door.
Connect the magnetic holder to the mains power of the unit.
The system shall be set up so that an alarm in a unit or room will close the door of that unit or room and an alarm in the stairwell or landing will close all the doors leading into the stairwell or landing from a unit.
Initialize the system and ensure all the alarms activate all the magnetic holders and that they reset when the alarm is deactivated.
Check the operation of the system to ensure it operates correctly and supply each unit with a single page information sheet about the system and the responsibilities to test the system within the unit.

Provide a copy of the technical data to the Principal's representative so that the system can be checked and maintained by the Fire Safety contractor.

3.15.3 Timber Door Frames & Jambs

External frames:

- Door frames for fire rated doors shall be as required to meet the fire rating of the door.
- Material: Exterior grade seasoned Australian hardwoods:
    - External door frames shall be profiled so that the door furniture will not foul safety doors or external porch or eaves lights. Timber door sills are not acceptable.
    - MDF is NOT to be used for external door frames.

Internal Jambs

- Material: Pre-primed 32 mm MDF board or seasoned Australian hardwoods. Proprietary galvanised steel door jambs are also acceptable.

3.15.4 Metal Door Frames & Jambs

Fabricate frames from 1.2 mm thick ZF 100 zinc anneal sheet having not less than 100g/m² of zinc iron alloy coating to both surfaces. Press brake fold with pencil sharp radii in rectilinear length to profile indicated on drawings.

Fold or weld all joints and grind smooth. Prime both sides of joint with an approved metal primer.

Cut out frame for flush mounting hinges and back up with a short length of 35 mm x 5 mm thick mild steel plate drilled and tapped for screw mounting. Provide a universal stainless steel adjustable striker mounted to suit nominated door furniture height.

Reinforce frame head with 300 mm x 35 mm x 5 mm thick mild steel stiffener plates to receive nominated door closer if applicable.

On completion of painting and just prior to handover stage, install on the door frame stop, pressure sensitive, adhesive back, transparent, polyurethane polymer buffers.

Provide steel spreaders as necessary to retain the shape of the frame and building in straps (not wires) of 1.2 mm x 75 mm wide galvanised or zinc anneal steel, folded to fit into the profile of the door frame and projecting 150 mm and with two 35 mm diameter perforations.

3.15.5 Hinged and Sliding Flyscreen Doors

Aluminium safety sliding doors shall match the glass sliding door. It shall be lockable with a single cylinder lock (snib inside, keyed alike to all screen doors with key lock on the outside) and fitted with Locker Group Super RV (restricted vision) perforated aluminium mesh or approved equivalent. The mesh shall be securely fixed to the frame with mechanical fixings, a minimum of 2 fixings top and bottom and 6 fixings both sides, and fit a PVC or Neoprene bead over the edge of the mesh and into the retaining frame.

Comply with the requirements specified for aluminium windows and current Australian Standards relating to construction, glass and wind terrain. All glass in these assemblies is to be safety glass in accordance with AS 1288 (Glass in Buildings – Selection and Installation).

Aluminium hinged safety doors shall be fabricated from aluminium section in accordance with AS 1866 (Aluminium and aluminium alloys – Extruded rod, bar, solid and hollow shapes), of Australian Alloy B6063, temper designation T5, with a powder coated finish or bronze anodized. Extruded framing members shall be a minimum size of 70 mm (measured overall including a boxed section of 45 mm) x 18 mm x 1.3 mm. Joints are to be accurately machined and burred corners smoothed, and mitred joints reinforced with extruded or pressed metal splines of at least 3 mm thickness.

All connections shall be rigid, double fixed. The bottom rails of all doors shall be drilled in two positions with minimum 6 mm drainage holes. Fixings shall be Monel rivets or stainless steel screws. Fit mesh (Locker Group Super RV perforated aluminium mesh or equivalent) set with PVC or neoprene splines to inward facing side and fix the mesh with a minimum of 2 mechanical fixings top and bottom and 6 mechanical fixings both sides and fit a PVC or Neoprene bead over the edge of the mesh and in to the retaining frame.

3.15.6 Door seals and thresholds

“No step” thresholds and door seals are required at all external doors including door to carport/garage and sliding doors.

Fit Raven door seals to all external doors. Seals are to be RP4 or RP4T combined with an RP77.

To sliding aluminium doors set tracks down into the rebate with the top edge flush with FFL (finish all of the door and window heads at the same height). Note that external paving is to be graded up to the front of the track. Ensure that the track drains effectively to each side.

3.15.7 Door stoppers

Provide doorstops to all hinged doors, fitted to the adjacent wall or floor.

3.15.8 Main Entrance Access and Keying

All locks shall comply with AS 4145 (Locksets and Hardware for Doors and Windows – Set) and AS 1905.1 (Fire Resistant Doorsets).

All construction key pin profiles shall suit the Principal’s construction key system. This system has two pin profiles within one cylinder/barrel per set of lock hardware:

1. Short (3-4) pin profile for use by contractors and SAHT staff; and
2. Larger (5-6) pin profile that is activated by the first use of a customer/tenant key.

There are 3 keys used and these are referred to as C1, C2 (Lockwood products) or C3 (Gainsborough).

A two way intercom system shall be installed at the public entrances to the building to allow communication between visitors and individual sole occupancy units. This shall include access to each sole occupancy unit and the ability for each sole occupancy unit to automatically open the external door to allow visitors to enter the building.

Principal's pin profile arrangements will be as follows.

Sole Occupancy Units

External doors to sole occupancy units must be compatible with a 5 or 6 pin construction key system, supplied with end user keys and matching pin profiles. See figures 1 and 2 following.

All sole occupancy units shall be keyed to differ, including carport and garage roller doors (where applicable), but key end user profiles alike for all external doors. Allow access to main entrance and common area doors (i.e. main entrance, foyers, storage, bike rooms).

All door sets shall allow egress from the sole occupancy unit without the use of a removable key i.e. free lever egress to all exits.

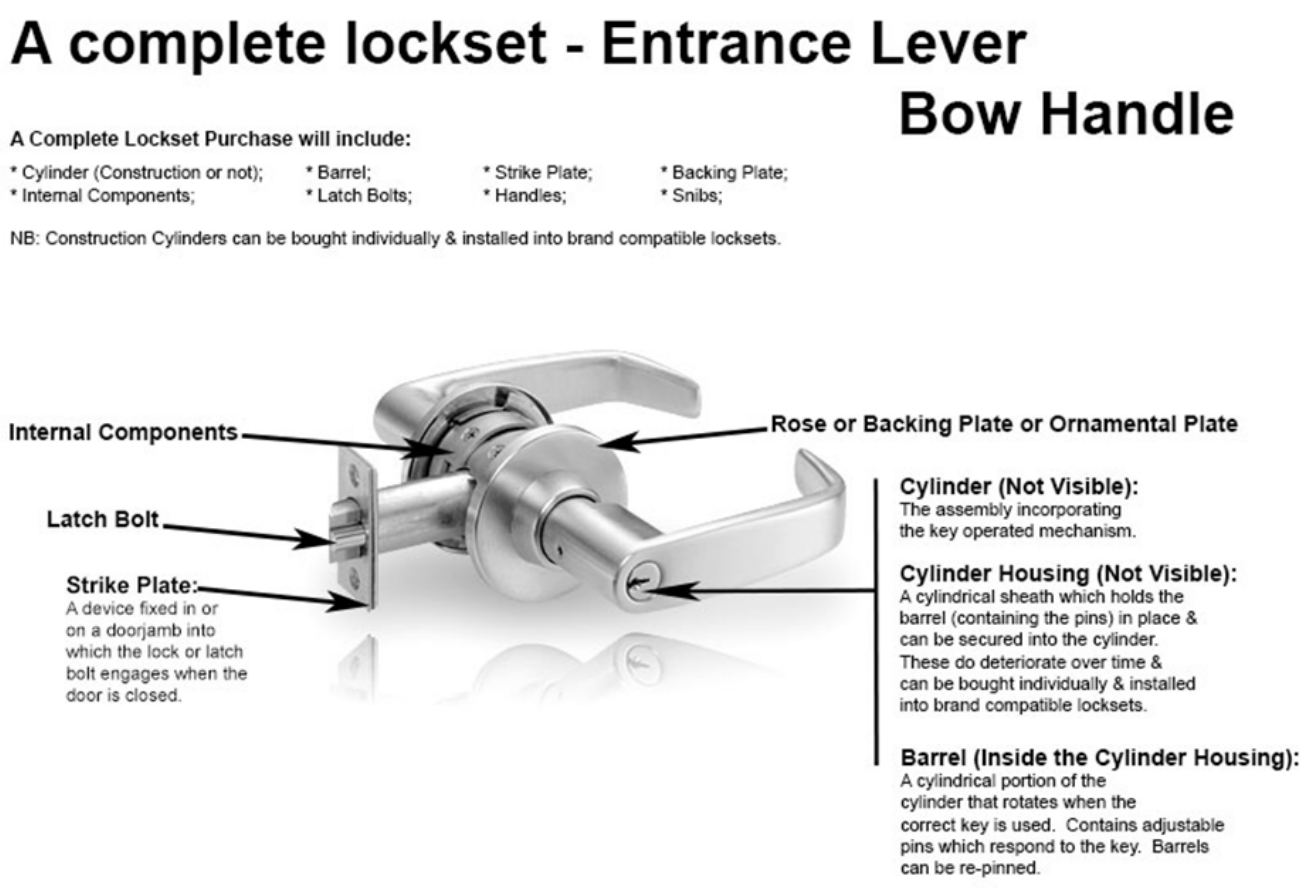
For each sole occupancy unit provide two unit keys and two carport/garage door (where required) keys to the Principal at hand over.

External Doors to Common Areas, Bike & Storage Rooms

External doors to common areas for occupants (i.e. main entrance, foyers, storage, bike rooms) shall be keyed on the same pin profile as the Principal's construction key profile to the sole occupancy units.

Doors to Service Maintenance Rooms

Doors to service maintenance rooms, equipment and panels (i.e. telecommunications, electricity, fire, lifts) where possible shall be on a construction key system. But with a different pin profile, using an alternative pin combination to that used on the sole occupancy units and external doors to common areas for occupants.



Cylinder Detail Drawings

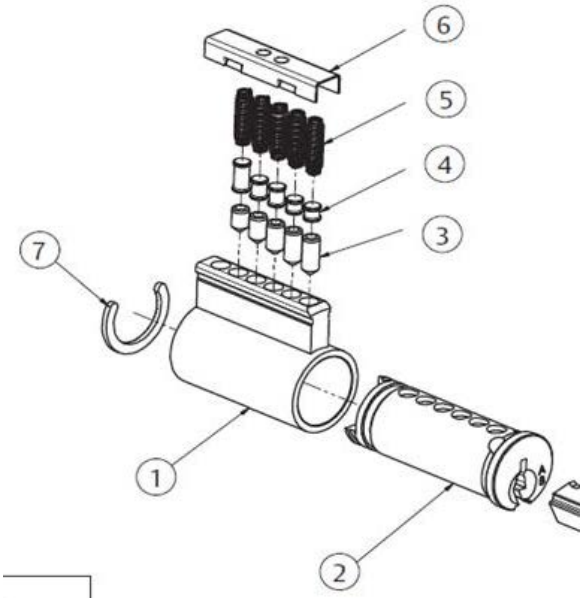


Figure 1

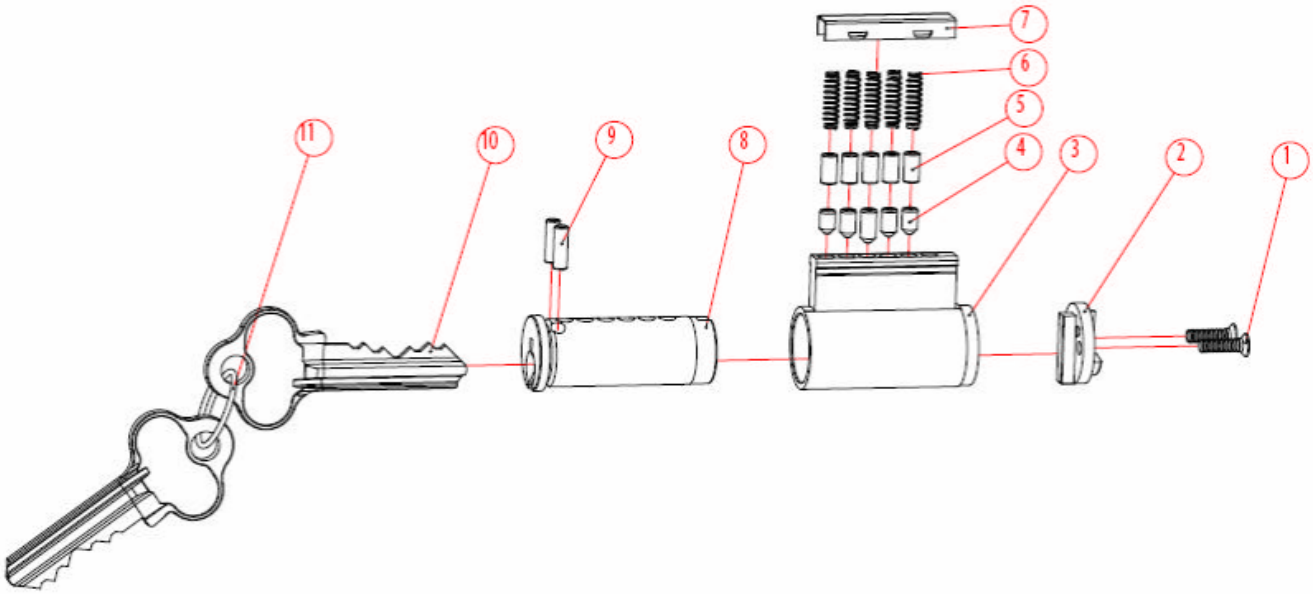
1. Cylinder Housing
2. Barrel
3, 4, 5. Pins & springs (used to set key combinations)
6. Sealing cap
7. Circlip

Brass Housing is also known as the Cylinder Housing

All of this sits within a cylinder linked to the internal components & latch bolt

Cylinder Detail Drawings

Figure 2



1. End cap screws
2. End cap
3. Cylinder housing
4, 5, 6. Pins & springs (used to set key combinations)
7. Sealing cap
8. Barrel
9. Anti-drill pins - used in high security products only
10. Key
11. Key ring

3.16 JOINERY

3.16.1 General

Joints in external joinery, e.g. door and window frames, sashes and doors shall be set in an adhesive complying with one of the following types and used strictly in accordance with the manufacturer's instructions regarding resin; hardener proportions; temperature ranges; and curing procedures:

- Epoxy Resin Adhesive

- Resorcinol Resin Adhesive
- Melamine/Urea Formaldehyde Resin Adhesive

Joints in internal joinery shall be set in waterproof mould resistant sealant in accordance with AS 4386 (Cabinetry in the built-in environment – Commercial and domestic).

Wall units shall extend to the ceiling level with ceiling cornice.

3.16.2 Cupboards

3.16.2.1 General

All boarding shall be Australian manufactured 16 mm first grade double sided melamine board to AS/NZS 1859.3 (Reconstituted Wood-Based Panels – Specifications – Decorative Overlaid Wood Panels). All works shall comply with AS 4386 (Cabinetry in the built-in environment – Commercial and domestic) and be protected from the ingress of moisture.

All boarding, edges of all doors and drawers shall be finished with matching ABS or equivalent 2 mm edge strips to be applied with PUR waterproof glue fully adhered by an edge banding machine. The cabinet interior shall be finished in white melamine. All doors, drawer fronts, exposed ends including the ends each side of the stove, island backs, filler and scribing pieces shall be in selected finish. Finishes shall be selected from Appendix A- Procedures and Schedules - Interior Finish Schedule.

Kitchen cupboards shall be built in accordance with AS 4386 (Cabinetry in the built-in environment – Commercial and domestic). Line backs to match the internal cabinet finish.

Fit two plastic stops to each door and drawer. Toe rail for bench units and upright units shall be finished to match the cupboards. The end panels and toe rails shall be fixed to the unit and shall be scribed to the floor, walls and end panels as required.

3.16.2.2 Method of Assembling

All materials to be in permanent contact shall be suitably bonded with a flexible mould resistant waterproof sealant. Units shall be assembled using approved proprietary fixings. Modules shall be joined together using approved connectors.

3.16.2.3 Bench Tops

Bench tops shall be 33 mm first grade High Moisture Resistant particle board, in accordance with AS 4386 (Cabinetry in the built-in environment – Commercial and domestic) which requires laminate cover in accordance with ISO 4586 (High-pressure decorative laminates (HPL, HPDL) – Sheets based on thermosetting resins – Set). Cover bench tops with 0.7 mm minimum thickness Australian made first grade laminated plastic fixed all over with adhesive to manufacturer's recommendations. The top may have a minimum 10 mm rounded edge and a post form laminate applied. Vertical edges where not exposed, (e.g. next to cooker) shall be finished in matching laminate or with a 2 mm thick matching ABS (or equivalent) edge strip to be applied with PUR waterproof mould resistant glue.

Where a bench top is extended over an Island Unit all protruding corners shall have a minimum of 150 mm radius or splay or a 30 x 30 mm flared corner.

Island units shall have a toe space to both sides with the end panel extending and scribed to the floor.

Benchtop cut outs, wall scribes and joints shall be sealed with a flexible mould resistant waterproof sealant during installation and prior to the installation of a stainless steel sink and drainer set. The sink shall be installed in an approved manner with all fixings accessible to allow for the easy removal and replacement of the sink unit.

3.16.2.4 Drawers

Include Drawer Units where indicated, 450 mm to 600 mm in width, with a depth to suit the benchtop, overall design and provide maximum storage space. All drawers' sets shall consist of plastic coated components. Drawer slides shall be all metal, plated or epoxy coated, with nylon rollers. At least one top drawer shall have a floating plastic cutlery tray with space underneath for larger cooking utensils. All edges of drawers shall be finished with matching ABS or equivalent 2 mm edge strips to be applied with PUR waterproof glue fully adhered by an edge banding machine.

3.16.2.5 Doors

Two doors are required for module widths over 600 mm. Doors to corner units shall be provided with two hinged doors opening out of the corner providing unrestricted access to the corner cupboard.

Hang swing doors with adjustable hinges screwed to units using fully threaded screws designed for the cupboard material. All edges of all doors shall be finished with matching ABS or equivalent 2 mm edge strips to be applied with PUR waterproof glue fully adhered by an edge banding machine.

3.16.2.6 Linen, Wardrobe, Utility and Overhead Cupboards

Where nominated the following details apply.

All Doors
Where sliding doors are detailed they shall be UZIT or equal approved with an aluminium floor track, be constructed of at least 9 mm MDF with melamine on both faces and shall have an aluminium frame which includes a handle and shall have an aluminium top stabilizing channel. The aluminium shall be powder coated.

Sliding doors shall be full height of the cupboard with each door up to 1200 mm wide, which shall allow access to at least 550 mm of the unit. Hinged doors shall not exceed 600 mm in width and be split in height with bottom doors 2100 mm high and the top doors filling out the remaining space to the ceiling surrounded by architrave. Provide vertical shelf support struts at vertical hinged door intersections where required.

Linen Cupboards
Linen cupboards shall extend to the ceiling and be built-in between walls with plasterboard wall and ceiling linings as specified in this document (including cornice and skirting), so that insulation can be placed in the roof cavity above.

Provide fixed white melamine shelves up to a maximum depth of 400 mm and height of 500 mm with brackets secured to studs and quarter beading underneath for the entire length and depth of the shelves.

Provide five equally spaced shelves, the top one fixed with the remainder being fully adjustable.

Wardrobes
Wardrobes are to extend to the ceiling and the doors allow access to all areas of the wardrobe.

Provide melamine shelf with appropriate stiffener(s) and supply a 19 mm chrome plated brass tubular rail with chrome plated brass end supports and internal hangers

Proprietary end panels (i.e. aluminium framed melamine with a matching finish) for wardrobes in bedrooms shall be used. Nib or end walls to wardrobes are not permitted.

Utility Cupboards
Where pre-fabricated units are used they shall be secured to walls with fixings into the stud work in accordance with manufacturers recommendations. Where the units are built-in they shall be as for ***Linen Cupboards.***

To the utility cupboard provide one fixed shelf near the top (1/5 of the height of the unit) only.

Overhead Cupboards
Overhead cupboards may be used in Class 1a kitchens only and shall be installed in accordance with AS 4386 (Cabinetry in the built-in environment – Commercial and domestic), avoiding task areas requiring clearance i.e. over cooktops, sinks. In Class 1b dwellings overhead cupboards are not to be used.

3.16.2.7 Installation

Build in and firmly fix units in position to finish level and in the relation to adjacent surfaces intended.

For all bench units, seal between the underside of the tiles and the benchtop with a flexible mould resistant waterproof sealant.

3.16.2.8 Door Hardware

Supply all hardware components as specified below. Fit and fix as convenient and to minimise straining and damage during transport and installations.

(i) Bench & Overhead Units
95º opening automatic locking spring loaded all metal hinges with three way adjustment - 2 per door.

(ii) Linen & Utility Cupboard
As for (i) - 3 hinges per swing door.

(iii) Door & Drawer Handles
Handle to be 100 mm nominal long Satin Chrome D-Pull.

3.17 HARDWARE

3.17.1 Metal Cabinets

Provide a pressed steel group switchboard and a pressed metal box with separate electricity meters for each sole occupancy unit and landlord power. Provide boxes for NBN as required.

3.17.2 House Numbers

Provide 75 mm high postal numbers adjacent to the porch, clearly visible from the street. Provide 75 mm high unit numbers next to the front door to each unit.

3.17.3 Bathroom Accessories

3.17.3.1 General

All bathroom fittings including tap ware, accessories and framing to shower screens and mirror must be complementary in colour and style.

3.17.3.2 Shower Curtain Rail

Provide a chrome plated or powder coated shower curtain rail, fixed to trimmers in wall and ceiling (for corner of L shaped or curved rail) framing. Nominal alcove size shall be 1100 mm x 1100 mm.

3.17.3.3 Bathroom mirror

Provide a wall mirror 900 mm x 750 mm securely screw fixed to wall trim and capped with chrome domes, mounted above the vanity unit or basin and the double row of tiles i.e. 400 mm maximum above vanity unit or basin top. Set top of mirror maximum 1900 mm above finished floor level with the 900 mm edge horizontal to the vanity unit or basin top. Mirrors must not be installed over wall tiles.

3.17.3.4 Towel rails

Provide a minimum of one 1200 mm long single towel rail with a central pillar or, one 600 mm double towel rail securely fixed to wall trim at 800 mm above finished floor level. For more than 2 bedroom units provide an additional 450 mm of railing per each additional bedroom.

3.17.3.5 Soap holder/WC toilet roll holder

Provide soap holder to shower and WC toilet roll holder adjacent to WC. The soap holder shall not have any loose parts that can be accidently knocked off.

3.17.3.6 Vanity basin – All Sole Occupancy Units

For units that need to meet universal housing design requirements refer to section 2.2.2.

Vanity cabinet is to be 900 mm long x 500 mm wide x 800 mm high with laminated top and doors and constructed of water resistant materials. Finished internally with white Melamine shelving and edge strips. The hand basin is to be a 500 mm x 450 mm vitreous china semi recessed or recessed hand basin.
OR
Provide an 8 litre capacity Caroma Opal 510, 720 or 920 or equal approved wall basin. The basin is to be fixed in accordance with the manufacturer's instructions using the supplied brackets.

The vanity unit is to be supported on a water resistant base sealed to the floor. The floor and wall tiling should continue behind, below and above the vanity cupboard or wall basin and be sealed to it using a flexible mould resistant waterproof sealant.

A "P trap" is required with waste set in the wall to allow for later adaptions.

3.18. GLAZING

3.18.1 General

Provide safety glazing to all glazed doors, shower screens, side panels (sidelights) and other areas in accordance with AS 1288 (Glass in Buildings – Selection and Installations) and AS 2208 (Safety Glazing Materials in Buildings). Identify each piece with an approved marking or label.

3.18.2 Shower Screens

Shower screens and cubicles shall be glazed with laminated or toughened safety glass. Where provided the shower screen should be removable (i.e. tiling is continuous under and behind the screen).

Where the shower is directed towards the bath, toilet, hand basin or other fixture a shower screen at least 900 mm long shall be provided to protect the fixture. In the case of a bath the shower screen is to be fixed to the top lip of the bath and shall extend to the floor where it protrudes past the end of the bath. In all other cases the screen shall extend to the floor.

Where a shower is adjacent to a doorway or window a 200 mm long (toughened safety glass) shower screen is required to protect the door frame or window reveal and mouldings.

3.19 INTERNAL BLINDS

3.19.1 General

Provide roller blinds (often called Holland blinds), vertical blinds, curtain rods or curtains to street facing windows as specified by the Principals Representative or as stated within 'Part B - Specification'.

3.19.2 Safety Requirements

The design and installation shall comply with the requirements of the Federal Trade Practices (Consumer Product Safety Standard – Corded Internal Window Coverings) Regulations 2010 and the State Competition and Consumer (Corded Internal Window Coverings) Safety Standard 2014.

Unless approved otherwise all chains or cords shall be made safe by permanent fixings restraining the ends. Cord release devices are not to be used except where special written permission is given by the Principals representative.

Documentation relating to the safe use of cords shall be left in the top drawer of the kitchen cupboard.

3.19.3 Fixings

Fixings for the blind and curtain rail brackets shall be appropriate screws as recommended by the manufacturer. In general the studwork will be either light weight steel (Less than .7 mm thick) or timber and the appropriate type of screw shall be used. All sole occupancy units have blocking (usually timber) for the curtain rail brackets.

3.19.4 Installation

The blind or curtain is to be installed by a suitably qualified person who has been instructed by the manufacturer on the correct method of installation.

The curtain rod or track is to be fixed at a height such that the bottom of the rail is at least 20 mm above the inside of the top reveal. Where the window is wider than 1250 mm a central bracket supporting the rod is to be provided.

For blinds and curtain tracks the spacing and types of brackets shall be as recommended by the blind or curtain or mechanism manufacturer. Fixings shall be appropriate screws as recommended by the manufacturer.

3.19.5 Roller Blinds

3.19.5.1 General

Roller Blinds are to be manufactured to fit between the reveals of the window with minimal gaps each side of the blind and of sufficient length to enable the full height of the window to be covered with some spare fabric on the roller. They are to be a durable low maintenance blind which is robust with no easily removable parts once installed.

3.19.5.2 Fabric

When tested in accordance with AS 1530.2 (Methods for Fire Tests on Building Materials, Components and Structures – Test for Flammability of Materials) and AS 1530.3 (Methods for Fire Tests on Building Materials, Components and Structures – Simultaneous Determination of Ignitability, Flame Propagation, Heat Release and Smoke Release) the fabric shall have a Smoke-Development Index of not more than 5 and a Spread of Flame index not more than 8.

The fabric shall have a 10 year guarantee against fading and UV degradation. The fabric is to be easily wiped clean and is to provide UV block out. The fabric shall have a low VOC (Volatile Organic Compound) rating.

Eco Dawn Next Generation with Ultrafresh by UNILINE is deemed to comply.

3.19.5.3 Operating Mechanism

The Operating Mechanism shall be equal to the following:

- Uniline Chain Operated with an anodised lightweight aluminium tube and a Uniline spline attachment to roller
- Powder coated installation brackets to suit fabric colour.
- Nickel Plated Rotation chain with 2 clear polycarbonate stopper balls to set high and low fabric positions.
- Natural anodised or powder coated 22 mm aluminium bottom rails with spline attachment.
- The Mechanism shall have a minimum of a 5 year guarantee.

3.19.6 Vertical Blinds

3.19.6.1 General

Vertical Blinds are to be manufactured to provide a durable low maintenance blind which is robust with no easily removable parts once installed other than the fabric bottom weights. They are to be reveal fitted or face fitted as specified by the Principals representative.

3.19.6.2 Reveal Fitted Vertical Blinds

Reveal fitted blinds are to be designed to fit between the reveals of the window with minimal gaps each side of the blind and are to be of sufficient length to enable the full height of the window to be covered less 10mm to15mm from the window sill.

3.19.6.3 Face Fitted Vertical Blinds

Face fitted blinds are to be fitted to either the architrave or above the architrave (as the fixing permits). The width of the blind shall extend 100mm either side of the window opening and are to be of sufficient length to enable the full height of the window to be covered and extend 100 mm below the bottom of the window. For a full height window or glass sliding door assembly the bottom shall be kept 10mm to15mm from the finished floor.

3.19.6.4 Fabric

Unless specified otherwise the fabric shall be 100% polyester and acrylic coated. It shall be an approximate minimum weight of 370 gsm and of a minimum thickness of 0.39 mm. The standard slat width is to be in the range 125 mm to 130 mm and when closed shall overlap to provide a complete block out of the light. Unless specified otherwise, the colour of the fabric shall be Uniline ‘Natural”.

When tested in accordance with AS 1530.2 (Methods for Fire Tests on Building Materials, Components and Structures – Test for Flammability of Materials) and AS 1530.3 (Methods for Fire Tests on Building Materials, Components and Structures – Simultaneous Determination of Ignitability, Flame Propagation, Heat Release and Smoke Release) the fabric shall have a Smoke-Development Index of not more than 5 and a Spread of Flame index not more than 8.

The fabric shall have a Low VOC (Volatile Organic Compounds) rating and provide a UV (ultraviolet) protection factor that is a minimum of 50+. It is to be easily wiped clean and shall have a 10 year guarantee against fading and UV degradation.

Eco Dawn Next Generation with Ultrafresh by UNILINE is deemed to comply.

3.19.6.5 Operating Mechanism

The operating mechanism shall be controlled by a wand to avoid issues with safety related to chords. It shall be equivalent to Hunter Douglas EOS Vertical Track System Wand Operated Only.

3.20 TILING

3.20.1 Colour scheme

Colour coordinate floor and wall tiles with accessories and paint colours. The colour of the grout for the floor tiling shall be medium grey or colour matched to the tiles. White grout is not to be used for floor tiling however shall be used for wall tiles.

3.20.2 Tiles

The following tiles are to be used in the bathroom, WC, laundry and under the cooker. 200 mm x 200 mm versions of floor tiles specified shall be used on balconies and porches.

Wall tiles (200 mm x 200 mm) White Glazed Only	Floor tiles (100 mm x 100 mm)
Beaumont Tiles: – Plain White	Beaumont Tiles: 74707, 74708, 74724, 74725, 74726
Tiles on Bradman – Plain White	Tiles on Bradman:
Italia Ceramics: – RAL 9106 Gloss Plain White	Italia Ceramics: – Dotti 100 x 100, White Grey Matt, Ivory Matt, Grey Matt, or Tobacco Matt
Newton Ceramics: – CL-PR301AA Gloss White	Newton Ceramics: – 100 x 100 (RAKMRANTM1010 Anthracite Matt; RAKMRMOCM1010 Mocha Matt; RAKMRTMM1010 Timau Matt; RAKSTAVRM1010 Avorio Matt)

3.20.3 Floor tiling

Floor tiles as specified in the table above shall be used in wet areas including bathroom, WC and laundry, and under upright cookers only in the kitchen. 200 mm x 200 mm versions of the floor tiles specified shall be used on balconies and porches. Grout with a coloured grout to match the tiles. Tiles are NOT to be used on floors in living areas (dining, lounge), the kitchen (except under upright cookers, as above) or bedrooms. See Section 3.10 FLOORS for options.

The fall to the shower shall extend 100 mm past the line of the shower curtain. Shower area floors are to be finished with no set down at edges, and floor falls to all tiled areas shall be in accordance with the details outlined in Section 3.4.3 Finished Floor Levels.

Floor tiling shall be continuous under the vanity unit, broom cupboard, laundry trough and any other cupboard located in a wet area.

Water test wet area floors on completion. All water is to drain completely to floor trap with no ponding or escaping of the wet area.

3.20.4 Wall tiling

Provide 200 mm x 200 mm plain white glazed wall tiles selected from the table above to the following areas.

Kitchen: Two rows minimum over sink/bench cupboards, and fully behind the stove and any open wall areas under the bench to floor level.

Shower: Ten rows above floor level and 1200 mm wide minimum to each wall in the shower recess including the ends of baths in showers

Bathroom and WC: Tile the entire wall down to the floor behind vanity unit benches or basins. Two rows high over the full width of all vanity cabinets and basins and baths including side return. Exposed side walls of baths. One row of 200 mm minimum skirting tiles, including any hobs under fixed vanities.

Laundry: Two rows minimum high over the wash trough and behind W/M taps including side returns. One row of 200 mm minimum high skirting tiles.

Grout between all tiles except joints between tiles and fittings and between wall and floor tiles must be caulked with a neutral cured mould resistant flexible sealant.

3.20.6 Water-proofing

All waterproofing shall meet the requirements set out in the BCA and AS 3740 (Waterproofing of domestic wet areas).

In addition, the entire bathroom floor (including the shower alcove) is to be waterproofed and returned up the walls as a cove to 150 mm minimum above the finished floor level. At the door way the waterproofing is to extend to the top of the brass edge angle.

Use an approved manufacturers system such as BEAUMONTS ‘BARRIERFLEX’, ABA ‘SUPERFLEX 3’ or CROMMELIN CHEMICALS WETITE or equal approved.

Other wet area wall, floor and fixture junctions shall be in accordance with the SA wet area details as detailed in the BCA and AS 3740 (Waterproofing of domestic wet areas).

Carry out a water tightness test on all waterproofed floors.

3.21 PAINTING

3.21.1 Materials and finishes

All materials including primers and undercoats, stains, clear and paint finishes, putty, filler, etc. shall be the manufacturer's first quality stock lines.

In addition, all paints which are required to be part of a system (e.g. primer, undercoat, enamel) shall be of the same brand of manufacture, and applied in accordance with the manufacturer's 'best practice' recommendations.

Materials shall not be thinned, mixed or added to in any way other than in accordance with the manufacturer's instructions.

Seal new surfaces before applying paint finishes. External surfaces shall not be painted in wet or frosty weather, or when dusty conditions are prevalent.

3.21.2 Extent of Type of Paint

All work shall be carried out by an accredited Contractor, in accordance with the following tables, for finishes relevant to the Contract. Provide the coating systems as specified in addition to pre-priming or other pre-treatments. Allow to finish any incidental item(s) not specifically mentioned, as specified for similar work and as directed on site.

Timber, Board, Masonry & Rendered Products
All exposed surfaces of the external and internal timber in buildings shall be painted or stained.

Paint the following external materials: Fibre Reinforced Cement Board; Masonry and Rendered Surfaces except for coloured or tinted render.

Waterproof coating in accordance with the manufacturer's recommendations shall be applied to AAC panels.

External Timber - Painted

PAINT TABLE 1 - EXTERNAL TIMBER – PAINTED *Apply to wrought external timber. For timber doors an enamel finish shall apply. Prepare surfaces in accordance with AS 2311 (Guide to the Painting of Buildings)*			
DESCRIPTIONS	**Principals Requirement**	**APAS**	**Also known As**
NEW Timber *Option One*	Apply **One** coat of oil based pink primer **AND**	0181	Solvent based wood primer **|** Timber primer Oil based wood primer **|** Solvent borne wood primer
OR	Apply **One** coat of exterior/interior undercoat **AND**	0016/1	Solvent borne undercoat for exterior & interior use
	Apply **Two** coats of full gloss alkyd enamel.	0015/1	Full gloss alkyd enamel for exterior & interior use
Option Two	Apply **One** coat of latex wood primer **AND**	0183	Latex wood primer
	Apply **Two** coats of acrylic exterior low gloss.	0280/1	Gloss exterior latex paint

Internal Timber and Timber Products - Painted

PAINT TABLE 2 - INTERNAL TIMBER & TIMBER PRODUCTS – PAINTED *Apply to internal timber ONLY. Prepare surfaces in accordance with AS 2311 (Guide to the Painting of Buildings)*			
DESCRIPTIONS	**Principals Requirement**	**APAS**	**Also known As**
NEW Timber	Apply **One** coat of oil based pink or white primer **AND**	0181	Solvent based wood primer **|** Timber primer Oil based wood primer **|** Solvent borne wood primer
	Apply **One** coat of exterior/interior undercoat **AND**	0016/1	Solvent borne undercoat for exterior & interior use
	Apply **Two** coats of satin alkyd enamel.	0015/3	Semi-gloss interior enamel

Internal Timber - Stained

PAINT TABLE 3 - INTERNAL TIMBER & TIMBER PRODUCTS – STAINED *Apply to timber door frames, windows, skirtings, architraves, and any other mouldings adjacent to stained work. Prepare surfaces in accordance with AS 2311 (Guide to the Painting of Buildings)*			
DESCRIPTIONS	**Principals Requirement**	**APAS**	**Also known As**
NEW Timber	Apply **One** match up coat of transparent wax free stain **AND**	0111	Timber coloured spirit stain
	Apply **One** coat of polyurethane Sanding Sealer **AND**	0114	One pack interior varnish
	Apply **Two** coats of polyurethane liquid plastic (full gloss or semi-gloss as directed).	0114	One pack interior varnish

Internal Stairs and Handrails

PAINT TABLE 4 - INTERNAL STAIRS & HANDRAILS *Apply to staircase or internal steps, including any balustrading, posts etc. & to timber handrails. Prepare surfaces in accordance with AS 2311 (Guide to the Painting of Buildings)*			
DESCRIPTIONS	**Principals Requirement**	**APAS**	**Also known As**
NEW	Apply **Three** coats of satin polyurethane liquid plastic	0114	One pack interior varnish
	After painting supply and fix two 25 mm wide strips of 3M Safety-Walk General Purpose Tape, as supplied by Adept-Industrial Industries or equal approved. Strips shall be black or clear and extend for the full width of each tread, fixed 15 mm in from the nosing and 25 mm apart.		

Internal Timber - Clear Finish

PAINT TABLE 5 - INTERNAL TIMBER & TIMBER PRODUCTS – CLEAR FINISH *Prepare surfaces in accordance with AS 2311 (Guide to the Painting of Buildings)*			
DESCRIPTIONS	**Principals Requirement**	**APAS**	**Also known As**
NEW Timber *After sanding surface apply first coat of sanding sealer as per manufacturer's recommendations. When dry, remove raised grain with very fine sandpaper.*	Apply **Two** coats of polyurethane liquid plastic (full gloss or semi-gloss as directed).	0114	One pack interior varnish

Tempered Hardboard

PAINT TABLE 6 - TEMPERED HARDBOARD *Sealer coats shall be applied to both sides of external doors before or immediately upon delivery to site. Prepare surfaces in accordance with AS 2311 (Guide to the Painting of Buildings)*			
DESCRIPTIONS	**Principals Requirement**	**APAS**	**Also known As**
NEW External *Apply to tempered external hardboard, such as external skin of external door.*	Apply **One** coat of pigmented sealer (solvent borne) **AND**	0171	Solvent borne sealer
	Apply **One** coat of exterior/interior undercoat **AND**	0016/1	Solvent borne undercoat for exterior & interior use
	Apply **Two** coats of full gloss alkyd enamel.	0015/1	Full gloss alkyd enamel for exterior & interior use
NEW Internal *Apply to tempered internal hardboard, such as internal skin of external door.*	Apply **One** coat of pigmented sealer (solvent borne) **AND**	0171	Solvent borne sealer
	Apply **One** coat of exterior/interior undercoat **AND**	0016/1	Solvent borne undercoat for exterior & interior use
	Apply **Two** coats of full satin alkyd enamel.	0015/3	Semi-gloss interior enamel

Paint Base Boards

PAINT TABLE 7 - PRIME COATED HARD & PARTICLE BOARD – NEW ONLY *Apply to Prime Coated standard hardboard and Paint Base particle board prepared with resin impregnated paper. Prepare surfaces in accordance with AS 2311 (Guide to the Painting of Buildings)*			
DESCRIPTIONS	**Principals Requirement**	**APAS**	**Also known As**
NEW *Apply to Prime Coated standard hardboard and Paint Base particle board prepared with resin impregnated paper.*	Apply **One** coat of pigmented sealer (varnish based) **AND**	0171	Solvent borne sealer
	Apply **One** coat of exterior/interior undercoat **AND**	0016/1	Solvent borne undercoat for exterior & interior use
	Apply **Two** coats of full satin alkyd enamel.	0015/3	Semi-gloss interior enamel

Fibre Reinforced Cement Board, Masonry & Rendered Surfaces

PAINT TABLE 8 - FIBRE REINFORCED CEMENT BOARD, MASONRY & RENDERED SURFACES – PAINTED *Apply to F.R.C.B masonry and rendered surfaces including accessories. Prepare surfaces in accordance with AS 2311 (Guide to the Painting of Buildings)*			
DESCRIPTIONS	**Principals Requirement**	**APAS**	**Also known As**
NEW *Option One* ***OR***	Apply **One** coat of pigmented sealer (latex type) **AND**	0172	Interior latex sealer
	Apply **Two** coats exterior quality acrylic emulsion – low gloss	0280/3	Flat or low gloss exterior latex finish
Option Two	Apply **One** coat of an approved acrylic based filling type textured finish	0117/3	Long life texture coating for exterior concrete & masonry – medium build latex low profile

Metalwork and Un-plasticised PVC

The exposed metalwork of buildings externally and internally shall be painted. Generally service pipes shall match their background colour, unless otherwise directed. Brackets and cleats shall be painted out to colour match the work they connect. Flashings to tiled roofs shall be painted to match the background colour.

Black Steel

PAINT TABLE 9 - BLACK STEEL *Apply to ferrous metal surfaces, not previously prime coated. Prepare surfaces in accordance with AS 2311 (Guide to the Painting of Buildings)*			
DESCRIPTIONS	**Principals Requirement**	**APAS**	**Also known As**
NEW Black Steel	Apply **One** coat of metal primer **AND**	0032	Metal primer – Lead & Chromate free
	One coat of exterior/interior undercoat **AND**	0016/1	Solvent borne undercoat for exterior & interior use
	Two coats of full gloss alkyd enamel.	0115/1	Full gloss alkyd enamel for exterior & interior use

Primed Steel

PAINT TABLE 10 - PRIMED STEEL – NEW ONLY *Apply to shop primed structural steel, prime coated metal boxes, etc. after touching up with primer as required Prepare surfaces in accordance with AS 2311 (Guide to the Painting of Buildings)*			
DESCRIPTIONS	**Principals Requirement**	**APAS**	**Also known As**
NEW *Apply to shop primed structural steel, prime coated metal boxes, etc. after touching up with primer as required*	Apply **One** coat of exterior/interior undercoat **AND**	0016/1	Solvent borne undercoat for exterior & interior use
	Apply **Two** coats of full gloss alkyd enamel.	0115/1	Full gloss alkyd enamel for exterior & interior use

Zinc Coated Steel/Lead

PAINT TABLE 11 - ZINC COATED STEEL/LEAD *Apply to zinc anneal, galvanised, zincalume, lead flashings & zinc sillicate treated steel surfaces. Degrease with an approved commercial degreaser, wipe clean. Prepare surfaces in accordance with AS 2311 (Guide to the Painting of Buildings)*			
DESCRIPTIONS	***Principals Requirement***	***APAS***	***Also known As***
NEW *Option One* ***OR***	Apply **One** coat of metal primer **AND**	0032	Metal primer – Lead & Chromate free
	Apply **Two** coats of full gloss alkyd enamel.	0015/1	Full gloss alkyd enamel for exterior & interior use
Option Two	Apply **One** coat of metal primer **AND**	0032	Metal primer – Lead & Chromate free
	Apply **Two** coats of acrylic exterior low gloss. .	0280/1	Gloss exterior latex paint

COLORBOND® Steel

PAINT TABLE 12 - COLORBOND® STEEL – NEW & EXISTING *Degrease COLORBOND® coated steel & clean with an approved commercial degreaser, wipe clean. Prepare surfaces in accordance with AS 2311 (Guide to the Painting of Buildings)*			
DESCRIPTIONS	**Principals Requirement**	**APAS**	**Also known As**
NEW	Apply **Two** coats of acrylic exterior low gloss. .	0280/1	Gloss exterior latex paint

Non-Ferrous Metal

PAINT TABLE 13 - NON-FERROUS METAL *Degrease with an approved commercial degreaser, lightly rub off with a fine emery cloth using mineral turpentine as a lubricant, wipe clean. Prepare surfaces in accordance with AS 2311 (Guide to the Painting of Buildings)*			
DESCRIPTIONS	**Principals Requirement**	**APAS**	**Also known As**
NEW	Apply **One** coat of metal primer **AND**	0032	Metal primer – Lead & Chromate free
	Apply **One** coat of exterior/interior undercoat **AND**	0016/1	Solvent borne undercoat for exterior & interior use
	Apply **Two** coats of full gloss alkyd enamel.	0115/1	Full gloss alkyd enamel for exterior & interior use

Un-plasticised PVC

PAINT TABLE 14 - UN-PLASTICISED PVC – NEW & EXISTING *Degrease with an approved commercial degreaser, rub down with fine wet & dry, wipe clean. Prepare surfaces in accordance with AS 2311 (Guide to the Painting of Buildings)*			
DESCRIPTIONS	**Principals Requirement**	**APAS**	**Also known As**
NEW	Apply **Two** coats of acrylic exterior low gloss.	0280/1	Gloss exterior latex paint

Internal Walls and Ceilings

Paint plasterboard, timber based boards, magnesium oxide board and fibre cement board surfaces including plasterboard cornices, and incidental timber cornices and mouldings.

Walls - Acrylic

PAINT TABLE 15 - INTERNAL WALLS – PAINTED ACRYLIC *Prepare surfaces in accordance with AS 2311 (Guide to the Painting of Buildings)*			
DESCRIPTIONS	**Principals Requirement**	**APAS**	**Also known As**
NEW Plasterboard / Villaboard	Apply **One** coat of pigmented sealer (latex type) **AND**	0172	Interior latex sealer
	Apply **Two** coats of latex – Semi Gloss **OR**	0260/2	Semi-gloss interior latex paint
	Apply **Two** coats of latex – Low Gloss.	0260/3	Low gloss interior latex paint
NEW Masonry	Apply **One** coat of pigmented sealer (solvent borne) **AND**	0171	Solvent borne sealer for concrete & masonry
	Apply **Two** coats of latex – Semi Gloss **OR**	0260/2	Semi-gloss interior latex paint
	Apply **Two** coats of latex – Low Gloss.	0260/3	Low gloss interior latex paint

Ceilings - Acrylic

PAINT TABLE 16 - INTERNAL CEILINGS – PAINTED ACRYLIC *Apply to lined ceiling surfaces including plasterboard cornices, & to incidental timber cornices mouldings. Prepare surfaces in accordance with AS 2311 (Guide to the Painting of Buildings)*			
DESCRIPTIONS	**Principals Requirement**	**APAS**	**Also known As**
NEW	Apply **One** coat of sealer (latex type) **AND**	0172	Interior latex sealer
	Apply **Two** coats of acrylic based emulsion FLAT.	0260/4	Washable flat finish for interior use

Walls - Alkyd Enamel

PAINT TABLE 17 - INTERNAL WALLS – PAINTED ALKYD ENAMEL *Prepare surfaces in accordance with AS 2311 (Guide to the Painting of Buildings)*			
DESCRIPTIONS	**Principals Requirement**	**APAS**	**Also known As**
NEW Plasterboard / Villaboard	Apply **One** coat of pigmented sealer (latex type) **AND**	0172	Interior latex sealer
	Apply **Two** coats of full satin alkyd enamel.	0015/3	Semi-gloss interior enamel
NEW Masonry *Option One* ***OR***	Apply **One** coat of pigmented sealer (solvent borne)	0171	Solvent borne sealer for concrete & masonry
Option Two	Apply **One** coat of exterior/interior undercoat **AND**	0016/1	Solvent borne undercoat for exterior & interior use
	Apply **Two** coats of full satin alkyd enamel.	0015/3	Semi-gloss interior enamel

Ceilings - Alkyd Enamel

PAINT TABLE 18 – INTERNAL CEILINGS – PAINTED ALKYD ENAMEL *Prepare surfaces in accordance with AS 2311 (Guide to the Painting of Buildings)*			
DESCRIPTIONS	**Principals Requirement**	**APAS**	**Also known As**
NEW *Apply to lined ceiling surfaces including plasterboard cornices*	Apply **One** coat of pigmented sealer (latex type) **AND**	0172	Interior latex sealer
	Apply **Two** coats of full satin alkyd enamel FLAT.	0015/3	Semi-gloss interior enamel

Off-form Concrete Ceilings

PAINT TABLE 19 - OFF-FORM CONCRETE CEILINGS – NEW *Prepare surfaces in accordance with AS 2311 (Guide to the Painting of Buildings)*			
DESCRIPTIONS	**Principals Requirement**	**APAS**	**Also known As**
NEW	Apply **Two** coats of acrylic based emulsion FLAT	260/5	Ceiling paint – interior flat

Fencing
Paint all timber associated with a fence.

Timber Fencing

PAINT TABLE 20 - TIMBER FENCING – NEW & EXISTING *For new fencing one coat shall be applied before erection. Prepare surfaces in accordance with AS 2311 (Guide to the Painting of Buildings)*			
DESCRIPTIONS	**Principals Requirement**	**APAS**	**Also known As**
NEW	Apply **Two** coats of low sheen acrylic	0115	Lightly pigmented alkyd low gloss ranch finish for exterior timber

Steel Sheet Screen Fencing

PAINT TABLE 21 - STEEL SHEET SCREEN FENCING – PAINTED *Apply to one side of steel fencing and gates. Degrease with an approved commercial degreaser, wipe clean. Prepare surfaces in accordance with AS 2311 (Guide to the Painting of Buildings)*			
DESCRIPTIONS	**Principals Requirement**	**APAS**	**Also known As**
NEW	Apply **One** coat of latex metal primer **AND**	0134	Latex primer for galvanised steel & Zincalume®
	Apply **Two** coats exterior quality acrylic gloss	0280/1	Flat or low gloss exterior latex finish

Carpark Line Marking
On group sites paint carpark lines, unless coloured pavers have been used to designate carparks.

PAINT TABLE 22 **CAR PARK LINE MARKING – NEW & EXISTING** *Prepare surfaces in accordance with AS 2311 (Guide to the Painting of Buildings)*			
DESCRIPTIONS	**Principals Requirement**	**APAS**	**Also known As**
NEW	Apply **One** coat of line marking paint	0041/5	Road marking paint, water borne

3.21.3 Colours

Where the Principal has lodged for Planning Consent and colour schemes / material sections are included forming part of the Planning documents, those colour schemes / material selections shall be complied with.

For each sole occupancy unit and for the common areas provide a colour scheme (external and internal) with colour samples for approval by the Principal.

3.22 PLUMBING

3.22.1 Standards and Approvals

The installed water supply, waste, stormwater and sewer systems shall comply with manufacturers recommendations, AS/NZS 2032 (Installation of PVC Pipe Systems), AS/NZS 3500 (Plumbing & Drainage - Set), the BCA (NCC Volume 1), Plumbing Code of Australia (NCC Volume 3) together with the requirements of the Technical Regulator and SA Water or the Water Industry.

All products installed shall be certified and watermarked in accordance with the Australian Building Codes Board WaterMark Certification Scheme.

Unless stated otherwise in Part B – Specification, the Contractor shall pay all connection and inspection fees and obtain all required approvals. The Contractor shall submit certificates of compliance to the Principal at handover.

3.22.2 Water Supply

All services shall be sleeved through the footing, or if they come up the face of the footing be either copper or suitably protected against damage. Any pipework exposed externally above ground shall be copper. For slab on ground construction, no water supply pipes are to be placed under the slab without written permission.

Size pipework and design layout to ensure adequate water pressure and flows are achieved at all outlets.

Pressure reducing devices may be required to meet AS 3500 (Plumbing and Drainage – Set) for some allotments and the Contractor should ascertain this requirement from the relevant authority and allow all costs in its proposal. Pressure reduction will be needed to ensure the pressure at all outlets is less than 500 kPa.

3.22.3 Sanitary Drainage

All sanitary drainage shall be carried out in PVC-U and in accordance with AS 3500 (Plumbing and drainage set) and in particular AS/NZS 3500.2 (Plumbing and Drainage Part 2: Sanitary Plumbing and drainage).

Complete the system to the Water Industry sewer connections, septic tank and common effluent system as applicable. Underfloor waste pipes shall be tested before and after the pour. Any leaks or blockages found after the pour shall be immediately rectified.

Supply and lay 100 mm diameter, or 150 mm for larger sites, sewer drains in accordance with AS 3500 (Plumbing and drainage set). All inspection points shall be brought to the surface and covered with:

(i) a concrete riser block in garden areas;
(ii) a trafficable cast iron cover in driveways; and
(iii) a bolted trap screw in other paved areas.

3.22.4 Traps, Wastes and Soil Pipes

All works shall be carried out in accordance with AS/NZS 3500.2 (Plumbing and Drainage – Sanitary plumbing and drainage).

3.22.4.1 Traps

Floor traps shall be PVC-U unless otherwise specified (or copper where needed for fire rating in multi-storey buildings), with risers set to ensure regulation falls to gratings of the finished floor level. Finish with removable PVC-U approved pattern gratings.

Provide floor traps to suit the bathroom and laundry layouts. For stepless showers it is permissible to drain the whole floor into the shower floor trap, refer to Section 3.4.3 for falls.

Tape floor traps and risers during construction and seal all wastes to prevent blockage during pouring of concrete, finishing of floor surface, tiling, etc. Remove tape on completion.

3.22.4.2 Wastes and Soil Pipes

All wastes and soil pipes from fixtures to the drain outside the concrete paving alignment, including the Inspection Openings (IO's) shall be PVC-U with solvent cement welded joints. Where passing through concrete beams, PVC-U pipes shall be lagged with an approved flexible material not less than 25 mm thick.

Pipes and fittings shall be used and installed in accordance with the manufacturer's recommendations and AS 3500 (Plumbing and drainage set). Ensure that all exposed wastes are positioned to suit the fixture outlet.

Copper stacks shall be used in multi-storey buildings to enable fire rating of the floors.

3.22.4.3 Gully Traps

Where indicated or necessary, provide a gully trap with a domestic sink complete with grating and PVC adaptor. Where a separate flood gully is required use 100 mm PVC-U pop up flood gully.

Position an approved vitreous clay or fibre glass domestic sink against or at not more than 50 mm distance from footings and where shown, set neatly in paving at approved level and/or cement render down to 75 mm below ground level.

3.22.5 Vents

Provide PVC-U (or copper where needed for fire rating in multi-storey buildings) vents to sizes specified in AS 3500 (Plumbing and drainage set) including bends and fittings as required, and build in and conceal where practicable.

Position vents and pass through roof clear of roof members and flashings and securely fix clear of walls in an approved manner.

3.22.6 Stormwater Retention / Detention

3.22.6.1 General

All stormwater retention and detention systems shall be engineered in accordance with local authority guidelines, development and Principal approvals. The system shall be noted on 'As Constructed Drawings' provided at Practical Completion.

3.22.6.2 Roof Plumbing

Gutters have been designed for the maximum length at a grade of 1:500. No extra down pipes are to be added.

The Retention tank shall be connected to the roof in accordance with the engineers drawings, development and Principal approvals.
As detailed the maximum possible area of roof (check it is not less than 50 m^2) is to be directed to the tank.

3.22.6.3 Retention Tanks

The tanks shall be designed for the site conditions as a part of a complete system, installed in accordance with manufacturer recommendations using all proprietary products. Tanks are to be located so as not to create hazard or impediment to user space, perimeter paving and future maintenance activities. Where tanks are above ground they shall match the fence or wall colour and be permanently fixed on a suitable stand or concrete footing system designed for the site conditions.

3.22.6.4 Cover to Pipework

Where water service pipework is laid below ground the minimum cover to the top of the pipe must be not less than 300 mm under driveways, 225 mm in garden area and 75 mm under concrete paving.

3.22.6.5 Isolating Valves

An isolating valve is to be supplied at the tank. Where necessary a mains pressure isolating valve is to be supplied on the top up water supply to the rain water tank.

3.22.6.6 Toilet Cisterns

Toilet cistern is to be 4.5/3 litre flush with matching pan.

Use a Caroma Concorde Trident or equal when connected to mains pressure or a pumped rainwater system.

3.22.6.7 Detention

Install detention tanks as designed.

3.22.7 Fixtures

Benchtop cut outs for stainless steel sinks and drainer sets shall be sealed with a flexible mould resistant waterproof sealant prior to installation.

Provide the following fixtures as required:

- **Kitchen:** Stainless steel inset sink as per design requirements, see tables in Section 2 Design Requirements;
- **Laundry:** Stainless steel 45 litre wash trough with cabinet under;
- **WC:** A low level Vitreous china suite, compatible with and including dual flush low flow cistern (4.5/3 litre), combination seat/flap. Set the front of the pan 600 mm from the back wall and 460 mm from the side wall;
- **Hand basin:** Vitreous china as detailed in Section 2 Design Requirements;
- **Bath:** 1500 mm minimum long, pressed enamel steel or acrylic.

3.22.8 Cocks and Fittings

3.22.8.1 Tapware

All water cocks and fittings shall conform with AS 3500 (Plumbing and Drainage – Set) and the following requirements.

Heads and Flanges shall be 60/40 brass or die cast zinc alloy or ABS plastic.

All taps and mixers shall be manufactured to a standard equal to CB Ideal, Dorf, Raymor, or Ram Tapware. The Reece Posh Bristol range is acceptable. Tapware shall be matching throughout the sole occupancy unit and coordinated with bathroom accessories and tiling.

All tap heads shall have buttons marked H or C or colour coded red or blue as appropriate and shall be matching in a room. They shall be capstan head or lever handle, and have no sharp edges.

If lever handles are used they shall be a minimum of 70 mm long measured from the centre of the spindle to the end of the handle.

All mixer taps shall be a single lever control at least 70 mm long.

All jumper valve taps shall be fitted with “Hydroseal” or equal approved washers.

See below for the schedule of taps.

3.22.8.2 Finish

Exposed metal parts of internal tap ware, pipe extensions, nuts and tails shall be chromium plated and polished. External rough-bodied tap ware shall be nickel plated.

3.22.8.3 Breeching Pieces

Shall be dezincification resistant (DR) and fitted with brass lugs for fixing to masonry or framing and shall be fully concealed.

3.22.8.4 Schedule of Taps

All shall be hot and cold taps (unless otherwise stated) with the cold tap on the right as you face the taps for a horizontal install, for a vertical install the hot tap shall be the top tap.

SCHEDULE OF TAPS	
Location	**Fixture**
All Basins	Basin Set 12.7 mm with 150 mm fixed outlet **OR** 2 No. 15/12.7 mm Pillar Cocks OR a Mixer Tap **HOT & COLD**
Bath Sets	Bath Set 12.7 mm with breecher & 100 mm fixed outlet. Mixers are NOT to be used over the bath. **HOT & COLD**
Shower	2 No. 15/12.7 mm Stop Cocks (locate taps vertically aligned 150 mm inside the shower to minimise people getting wet when turning on the taps. Hot tap is to be the top tap). Mixers are NOT to be used in Showers. **HOT & COLD**
Normal Shower Hand Shower	**Normal:** Shower head is to be 3 star (3A) rated **Hand:** Round face handset & 800 mm PVC hose, white, with lockable sliding bracket on 700 mm c.p. on brass vertical rail (Shall provide 4-6 litres/minute or equal approved)
WC Suite	No. 15/12.7 mm Angle Type Stop Cock with c.p. connection to cistern **(COLD ONLY)**
Toilet Connected to Rainwater Tank	Isolating valve is to be low pressure 25 mm full flow ball valve installed at the rainwater tank with 20 mm c.p. connection to cistern. **COLD ONLY**
Kitchen Sink	Sink Set 12.7 mm **OR** Kitchen Mixer Tap. Swivel Outlet Length – for Standard Sink 200 mm, for Inset Sink 265 mm. Swivel outlets are to be measured from the centre of the swivel position to the centre of the outlet of the fitting**.** **HOT & COLD**
Wash or Laundry Trough	Breeching Piece, Swivel Outlet & 2 No. 15/12.7 mm Stop Cocks. **HOT & COLD** Where applicable supply a No. 15/12.7 mm bibcock for Rainwater labelled R.
Washing Machine	2 No. 15/12.7 mm Right Angle Washing Machine Cocks **HOT & COLD** Located on the wall min. 1200 mm from floor NOT under laundry trough
Cold Supply to HWU	No. 15 12.7 mm Stop Cock **(COLD ONLY)** Larger Stop Cock may be required on larger Continuous Flow models
External Watering Points	2 per stand pipe, front & rear No. 15/12.7 mm rough body nickel, tee head, screw nose bibcock **(COLD ONLY)**
House Isolating Stop valve	18 mm Stop valve

3.22.9 Hot Water Service

3.22.9.1 Hot Water Units

The hot water service to be installed in each sole occupancy unit is an ELWA Hotrun 240VE or equivalent which must be approved by the Principal. The unit must be able to produce at least 6 litres per minute with a temperature rise of 55° Degrees Celsius.

This ELWA Hotrun 240VE water heater is required to be connected to the switchboard (load centre) within the apartment to three phase power on a separate circuit with 35 Amp per phase breakers and protected by an RCD. Please note that if other brand three phase electric instantaneous hot water units are approved they may require larger circuit breakers and the contractor shall ensure the correct breakers are used.

At the end of the mains cold water supply install an isolation valve prior to the flexible connectors that lead into the main unit.

The hot water service shall be installed in accordance with the manufacturer's recommendations using proprietary products, securely fixed in a discreet yet accessible location within the sole occupancy unit. This may include laundry alcoves, bathrooms or in the kitchen, whichever location is suitable for future maintenance access and represents the least distance to hot water outlets. This unit will supply all the hot water to that apartment.

The water delivery temperature from the ELWA Hotrun 240VE shall be set at 60 degrees Celsius, and not able to be adjusted by the end user.

After installation, the contractor is to complete the warranty form (in the name of the South Australian Housing Trust) and certificates of compliance and forward these to the Principal.

The ELWA Hotrun 240VE water heater must be connected to a reliable earth connection at all times and electrical resistance of the water should not be less than 1300 Ω/cm^2.

3.22.9.2 Temperature Control

The hot water unit will not supply tempered water and it is the responsibility of the Contractor to supply and install a tempering valve for each sole occupancy unit.

The hot water reticulation system shall be separated such that a tempering valve is installed to supply only the ablution taps in the bathroom with tempered water at 50°C. All other hot water taps (kitchen and laundry) are to be supplied with hot water direct from the hot water unit. The tempering valve shall be located as close as possible to the bathroom outlets but in a location where it can be easily maintained or replaced.

Where pipes are required to pass through the roof they shall be separated from the roof with a grommet and they shall be sealed to the roof with a Dektite or similar device.

All hot water pipework running externally shall be in copper and insulated.

3.22.9.3 Completion

Ensure that the hot water system is completely filled with water before connection to the electrical supply is made. Test connections to the system for leaks. The cold supply line must be additionally strutted if any vibration is apparent.

After installation, the Contractor is to complete the warranty form and return with the Practical Completion documentation along with the certificate(s) of compliance.

3.23 ELECTRICAL

3.23.1 Standards and Approvals

1) Make application for three phase power supply and pay all fees and charges;
2) The installed electrical system shall comply with AS/NZS 3000 (Electrical Installations – Australian/New Zealand Wiring Rules) – enhanced and new requirements apply as of June 2018;
3) On completion and prior to occupation provide verification of compliance in accordance with AS/NZS 3000 (Electrical Installations – Australian/New Zealand Wiring Rules), including the testing of RCD's, and an electrical certificate of compliance;
4) Provide earth stake in a metal connection box set flush with paving at the group meter board, located under or adjacent the meter board at each building main switch board;
5) Earth steel wall and roof frames back to sub-board and MEN system to ensure protection of the framing;
6) Connect earthing system to, the bar connected to the floor slab reinforcement with an earth stake clamp, and any metal pipes;
7) Provide telecommunication connection points and cable as specified, the building and each sole occupancy unit shall have the necessary infrastructure in readiness for the NBN;
8) Ensure adequate clearances and location of equipment for future maintenance and visual inspections.

3.23.2 General

In overhead SA Power Network areas, an over to under electrical consumer mains connection shall be provided to a connection point from each dwelling to the nearest adjacent stobie pole to the site. In underground SA Power Network areas, an SA Power Network service pit will be provided on or adjacent to the allotment for connection. Carry out any works in the street including all making good on completion.

All services shall be sleeved through the footing, or if they come up the face of the footing be suitably protected against damage.

Application for new connections is the responsibility of the Contractor, and site specific details including mains connection type and location is included in 'Part B - Specification'.

SAPN provide service to the property with a meter isolator in the main switchboard. From 1 December 2017, electrical retailers are responsible for the provision of new electrical meters and Australian Energy Market Operator (AEMO) accredited meter providers for their installation. Throughout possession of site the Contractor is responsible for providing digital electricity meters for all new single occupancy units, in their name. In order to assist with electrical supply handover the Principal's electricity supplier is SIMEC Zen Energy, and so the Contractor is encouraged to use this service provider. After final inspections and prior to handover, the Contractors meter is to have its final reading.

Where the supply authority elects to supply the site through a pole or in-ground pit connect to the power supply at a pole or pit and pay all connection fees and charges.

Provide a consumer main of appropriate capacity and connect to main switchboard. Provide cable markers to indicate location of all cable locations. Allow for all works in the street including making good on completion.

3.23.3 Switchboard

Provide main switchboard being an approved galvanized sheet metal enclosure on a publicly accessible wall or as a free standing unit for meter reading access. Switchboard to house an individual meter for each sole occupancy unit and a landlord meter for the common area. Each meter shall be permanently labelled with the street address of the unit it serves.

3.23.4 Meters

Provide three phase smart meters for each sole occupancy unit and the landlord meter. The Contractor's electrician is to request for a landlord meter with the state government's electrical retailer SIMEC Zen Energy in the name of the South Australian Housing Trust and it is to be installed prior to practical completion.

3.23.5 Earthing System

All earth stakes shall be protected by a connection box. Each stake shall be a minimum of 1300 mm long, metal rods of copper or copper coated steel not less than 12 mm diameter, and shall include a suitable point if necessary for hand driving in normal domestic applications. Include with each stake an earth bonding clamp complying with AS 1882 (Earth and bonding Clamps) and selected to connect a 6 mm^2 earthing conductor to the stake.

Where exposed the earth wire shall be protected in a 20 mm conduit to the earth stake. Bond the earth wire to all metal water pipes including rainwater tank tap pipe in accordance with AS/NZS 3000 (Electrical Installations – Australian / New Zealand Wiring Rules).

Earth Connection Boxes shall comprise a cast or fabricated metal unit with hinged lid and no bottom and a 16 mm diameter hole in each of the 2 adjacent walls. Clear internal dimensions shall be not less than 150 mm x 125 mm and 75 mm deep. Minimum thickness of fabricated box material be 1.6 mm steel galvanised after fabrication. Hinges shall be of a type to prevent seizure without lubrication. The lid shall open at least 110° and shall require forcing to close, with provision for opening only using a screwdriver or similar tool. Emboss on the lid the words 'ELECTRIC EARTH' in letters at least 10 mm high. With external lugs or grips shall be formed in two opposite walls to secure box to concrete.

3.23.6 Load Centre

To each unit provide a flush mounted load centre with not less than 24 modules and protected circuit breakers of the same brand.

The load centre shall be installed and located within the sole occupancy unit in a discreet location (such as a passage way) where accessibility by workers is not compromised. They shall be located and configured in accordance with AS/NZS 3000 (Electrical Installations – Australian / New Zealand Wiring Rules).

Circuit Breakers

The circuit breakers shall comply with the requirements of the Office of the Technical Regulator and AS/NZS 3000 (Electrical Installations – Australian / New Zealand Wiring Rules) and shall be located in the sole occupancy unit in an enclosure (Load Centre).

Each enclosure shall be fitted with a hinged lid or cover giving a degree of protection in accordance with AS 1939 Supplement 1 & 2 (Degrees of Protection Provided by Enclosures for Electrical Equipment (IP Code) – Wallcharts 1 & 2) of not less than IP23. (Clipsal® RMXE212F {flush mounted} or equal approved).

The arrangements within each enclosure shall be as follows:

- The enclosure shall be supplied assembled complete with circuit breakers as listed below. The RCD protected circuit breakers shall be connected to the RCD using an insulated rigid flat copper busbar.

Required Items	Required Circuits
THREE PHASE COMPONENT	
Main Switch	1 x 80A Main Three Phase isolator for entire load centre
Hot Water Unit	1 x three phase RCD (40A per phase)
Hot Water Unit	1 x CB three phase 40A
SINGLE PHASE COMPONENT	
Power	1 x 63A R.C.D.
Power 1 & 2	2 x 16A C.B. Power 1 & 2
Air Conditioner	1 x 20A C.B
Cookers/Stoves	1 x 35A C.B. May need to be larger for 900 mm wide cookers
Lighting & Smoke Alarms	1 x 10A RCDMCB
Labelling - Label main switches, R.C.D.'s & each type of enclosure	Smoke Alarms, Light, Power 1, Power 2, Stove, HWS, Air Con, Heater etc.

Guarantee
The circuit breakers, enclosures and attachments shall be guaranteed against faulty workmanship and performance for a period of twelve months.

Note: These are the Principal's minimum requirements, but the supply authority may have additional requirements.

3.23.7 Power Outlets

POWER POINTS OR GPO's

Power points, GPO's & light switches shall be fixed face units Clipsal Schneider-Electrical Standard Range,
HPM Standard Range OR Deta 3000 Range are deemed to comply.
Power points, GPO's & light switches with removable components are not acceptable.
External power fittings exposed to weather shall be weatherproof (IP 56 minimum).
Smoke Detectors shall be wired on a separate circuit to lights.

Minimal requirements follow

Location	Number & Type
Passage Separate Dining Room Laundry (1.2 m above FFL) Carport/Garage (1 m above FFL) Adj. Roller Door Bathroom (within tiled area) Exhaust Fans (for each) Next to Telephone point (2 off) Next to each TV point (2/3 off) Future Gas Room Heater NBN	1 Double GPO
Main Bedroom All other Bedrooms Separate Family Room Kitchen (Over Bench top Areas)	2 Double GPO's
Separate Living Room Combined Dining/Family	3 Double GPO's
Refrigerator (1.2 m Above FFL) Reverse Cycle Air Conditioner (1.5 m Above FFL with 'No Voltage' reset*)	1 Single GPO
Combined Living/Dining Room	4 Double GPO's
External wall for future split a/c unit	Weather Resistant 20A isolator

* To protect air conditioners during power failure a 'No voltage' reset GPO is required. Designed to suit a 20 A air conditioner the installation shall include a rocker or push switch at the GPO for the tenant to use once mains power is restored. In all cases twin active cables from the GPO shall lead to the load centre and a voltage compatible contactor OR under voltage relay in its own pole. The voltage compatible contactor OR under voltage relay shall have no other items connected to it.

3.23.8 Power & light switch-mounting heights (to centre lines)

Unless otherwise specified position wall mounted GPO's 600 mm above floor level except that, for kitchens position wall mounted GPO's 200 mm above the kitchen bench tops.

Locate all power points to comply with the Wiring Rules AS/NZS 3000 (Electrical Installations – Australian / New Zealand Wiring Rules) requirements generally and in particular comply with requirements in wet areas.

Position light switches 1000 mm above floor level.

3.23.9 Lighting

Fluorescent or LED lighting shall be used wherever possible. Traditional incandescent lights and low voltage halogen lights are not allowed.

The minimum lighting requirements are as follows:

- Kitchen: 1 x 36W fluoro light with prismatic diffuser minimum 20W up to 36W; separate selective task lighting over benches is optional;
- All other rooms including storage area under stairs in townhouses: Safety batten holders with 240 volt;
- External doors protected by porch or eaves: Safety batten holders with 240 volt 15 watt compact fluorescent lamps;
- The position of external batten holders or lights must not restrict the swing of a flywire door;
- External doors not protected by eaves or porch. Weatherproof light fitting to IP56 minimum: Carports/garages: safety batten holder with 240 volt 15 watt compact fluorescent lamps;
- Two way switch to hall or passages, carport/garage and living room to external door, as well as any other room with through traffic; and
- Exposed external light fittings shall be weatherproof (IP56 min.).

3.23.10 Exhaust fans

Provide ceiling exhaust fans over each shower ducted to outside air.

To laundries, bathrooms and WC's without external opening windows provide ceiling exhaust fans with 10 minute run-on timer, switched to light.

All ceiling exhaust fans shall have separate sheet metal or PVC-U ducting extending through the roof to outside air roof cowls of sheet metal or polypropylene matching the roof colour. Exhaust fans shall not be horizontally flued to atmosphere.

Exhaust fans shall provide 15 air changes per hour to the room it serves. In general 250 mm diameter ceiling fans are acceptable. Fantech EZIFIT fan is deemed to comply.

3.23.11 Smoke Detectors

Install a smoke and fire detection system in accordance with the Building Code of Australia (NCC) and AS/NZS 1668.1 (The use of ventilation and air conditioning in buildings – Fire and smoke control in multi-compartment buildings), AS 1670 (Fire detection, warning, control and intercom systems – Systems design, installation and commissioning - Set) requirements.

Smoke alarms shall be PSA LIF5800RL/2 **OR** Brooks EiB166e or EiB650iC **OR** Clipsal (Schneider-Electric) 755RLPSMA4 or 755LPSMA4 with fixing box, hush button and backup battery power source hard wired to its own RCD protected circuit to avoid interference from dimmers etc. The smoke alarm shall be labelled 'SAHT'.

All smoke detectors must be interconnected.

3.23.12 Antenna & Television points

Provide and install an external broad band standard digital television antenna suitable to receive all digital, UHF and VHF channels. The antenna shall be located on the roof at the rear of the dwelling so as not to be visible from the street in a suitable position to achieve an adequate signal. Polarisation shall be horizontal in the metropolitan area and vertical or to suit the local signal in country areas.

Television sockets shall be 75 ohm, combined with a double GPO adjacent, white and wall box mounted at a height to suit the GPO. Provide one television point (with GPO) to the living room and bedroom 1.

3.23.13 Electric Cookers

3.23.13.1 Installation

Cookers are available for purchase by the Contractor from the Principal's contracted supplier. The Contractor must select a cooker from the Cooker Schedule and make all necessary provisions for it in the construction of the house and install it prior to practical completion.

The following procedure will occur:

(i) The Contractor is to allow provisions for a specified cooker from the Electric Cooker Schedule below, and install it prior to practical completion in accordance with manufacturer's installation manual;
(ii) The Contractor is to advise the Principals representative of the type of cooker to be installed, required delivery date and address;
(iii) After installation, the Contractor is to complete the warranty form certificates of compliance and return to them to the Principal as a part of the practical completion documentation.

Stabilisation brackets are required on cookers including elevated oven models.

For electric cookers connect cooker using double insulating cable via a flexible PVC conduit fixed at each end. The electric cooker will be connected with a length of cable in a flexible conduit, long enough to allow the cooker to be moved away from the wall by 1200 mm. The supply is to terminate behind the cooker at a height of approximately 800 mm above floor level and approximately 150 mm from the right side of the cooker. Provide an isolating switch adjacent to the cooker in accordance with AS/NZS 3000 (Electrical Installations – Australian / New Zealand Wiring Rules) noting access and cooker clearance requirements.

Terminate the supply cable into a Clipsal® Cooker Socket (31VCS) or equal approved on the wall. Supply a Clipsal® Cooker Plug (800 CL) or equal approved and connect to the cable connected to the cooker.

Secure the base of the cooker to the floor or cupboard top using a stabilising bracket as supplied by the manufacturer and fixings as required to prevent the cooker from tilting forward and the front moving sideways.

To prevent strain on the cable secure a restraining chain 900 mm long to the back of the cooker and the wall. The chain shall be fixed near the top of the cooker so that it can be supported while the cooker is pushed back into position.

All upright cookers will be installed so that the hotplate is at least 10mm higher than the level of the bench top and there is a horizontal gap of at least 13 mm and no greater than 15 mm from surrounding bench tops. Where cookers are installed adjacent to side walls the clearance shall be 100 mm from the edge of the cooker to the wall. Cookers must be installed in accordance with manufacturers' installation manual.

3.23.13.2 Electric Cooker Schedule

Size of house	Cooker Model	Wall Oven or under Bench with cook top Electric	Microwave Cooker
1 Bedroom Flat or Bedsit	WHC322BA Westinghouse 2 Burner with Microwave WMS281WF **OR** CFE535WB Upright 540mm	Not Applicable	Not Applicable
1 Bedroom	CFE533WB Upright 540 mm	WVE665W Fan Forced **OR** WVES613W (L or R side door swing) **BOTH** with WHC322BA cooktop 2 zone ceramic	WMF4102WA microwave
2 Bedroom (non-Family)	CFE533WB Upright 540 mm	WVE665W Fan Forced **OR** WVES613W (L or R side door swing) **BOTH** with WHS642W cooktop 4 zone	WMF4102WA microwave
2 Bedroom (Family) **3 Bedroom**	CFE533WB Upright 540 mm	WVE665W Fan Forced **OR** WVES613W (L or R side door swing) **BOTH** with WHS642W cooktop 4 zone	WMF4102WA microwave

3.23.14 Allowance for Future Split System Air Conditioner

Provide 20 A circuits to the location specified for that apartment to allow installation of split system air conditioning units, located so that the compressor will be away from bedroom windows. Ensure there is sufficient space for air flow.

Provide a weather resistant isolator in a suitable location for the external part of the unit. In the roof space provide a conduit from that location to enable wiring to the living area for the in room part of the unit.

3.24 TELECOMMUNICATIONS

3.24.1 Contractor responsibility

The National Broadband Network (NBN) is being rolled out in a variety of formats therefore it is essential that the Contractor take direction from NBN Co. regarding the technical requirements for each installation. The Contractor shall work collaboratively with NBN Co., their associated contractors and the Principal to ensure that each dwelling and/or site is ready for or connected to the network infrastructure at practical completion, including areas where NBN services are not yet available.

Contractors shall contact NBN Co. via the website as soon as practical after being awarded a contract and submit all necessary information (including designs for pathway or pit and pipe installations) to ensure appropriate lead in times for service connection.

The Contractor shall pay to NBN Co. the developer contribution charge per dwelling, and cover all other costs associated with preparing and connecting the dwelling(s) and/or site(s) to the network infrastructure. These costs include additional NBN Co. charges, associated labour/consultant costs, and all items as specified by NBN Co., relative to the type of installation required on the site, i.e. all conduit, cabling, internal and external connection points to the actual building(s) and site perimeter(s), pathway or pit and pipe construction.

In all cases contracted dwellings shall be ready to receive NBN services regardless of that program time line, with the following included in all new class 1 building developments.

3.24.2 Installation requirements

All communications cabling, conduit, bends, works etc. shall comply with the NBN Co. technical works specifications, including all references to standards for cabling, conduit, connection points, pathway or pit and pipe construction.

Install a conduit from the street to an appropriate place near the front of the house as per NBN Co. requirements.

Internal connection points within the dwelling(s) shall be located nearby to the kitchen over a bench top away from the sink and cooking areas, and in the main bedroom, both with a double GPO adjacent. All internal connection points shall have fixed face plates and cable waiting for connection shall have drawstring attached to assist future connection work.

Where a Power Supply Unit (PSU) and Network Termination Device (NTD) are a part of the internal NBN Co. specification, supply and install a Clipsal® box 3105PEN7440. The box shall be recessed into an internal wall, within 40 m of the external wall connection, with the top of the box set at a height in the range 1500 mm to 1800 mm above floor level.

Install a double power point in the box, install a conduit from the external wall NBN connection up the external cavity and through the roof and down into the box. Install another conduit from the top of the box to approximately 300 mm above the ceiling capped both in the box and in the ceiling space, to allow for any future cabling from the box. The box will house the PSU and NTD as detailed in the NBN Co specification.

3.24.3 Telephone cables

Telephone cables may utilize the conduits supplied for future NBN installations and are to be provided where NBN infrastructure is not available at the time of building construction.

3.25 LIFTS

Lifts and lift shafts shall be constructed in accordance with AS 1735 (Lifts, escalators & moving walks – Set, AKA SAA Lift Code) and in accordance with the manufacturers recommendations by appropriately qualified persons using all proprietary products and components.

Lifts shall be suited for passenger and goods with all regulated emergency features i.e. telephone to maintenance services, shut down in case of fire, capacity to accommodate emergency patient transport.

Lift registration and commissioning is required prior to Practical Completion with all necessary documentation to be provided to the Principal. The Contractor is responsible for all associated fees and charges in relation to lift registration and commissioning.

All user manuals and maintenance related documentation for the lifts shall also be provided to the Principal at Practical Completion.

4. OTHER EXTERNAL CONSTRUCTION REQUIREMENTS

4.1 CONCRETE PAVING

4.1.1 General

There shall be no step in the path from the street, carport or carpark into all the doors of the buildings or into the sole occupancy units. On some steep sites it may be applicable to provide steps as well as the stepless entry. On group sites provide kerb ramps as needed and a kerb or wheel stop to prevent wheels from damaging buildings or landscaping.

For all driveways, including roads on group sites, provide for a 75 mm diameter PVC sleeve (capped) under all driveways, 1500 mm from the front of the house to facilitate a future irrigation system. Location of sleeve must be clearly identified on site.

4.1.2 Concrete paving

Paving is to be laid to enable the surface water to drain. Provide stormwater sumps and/or spoon drains and pipes as detailed on the drawings.

Where more than one step is provided to a doorway in addition to the stepless entry a landing is to be provided at the adjacent floor level. The landing and stair shall have handrails as detailed. For porches and verandahs the porch or verandah may be used as the landing.

Where freestanding carports are provided they shall have a 1000 mm clear wide connecting path to the perimeter paving.

Paving levels as shown on the design drawing shall be followed. However, where levels are not given on a drawing the following shall apply:-

- All paving is to be at least 15 mm below the damp proof membrane and slope away from the building, except at doorways and porches of stepless entries.
- Where a visible edge is part of the termite management system a greater height of exposed concrete is required.
- Slope the paving at 1 in 14 (maximum) unless approved otherwise.
- Where possible eliminate all steps, however where this is not practicable paving shall be laid to give the minimum number of steps.
- Steps less than 110mm and more than 180 mm are to be avoided.
- Paving levels shall take into account the level of other structures e.g. sheds, garages, retaining walls etc. and the neighbouring property, where appropriate.
- In paving and driveways provide formed tooled joints at intervals not exceeding 1200 mm by cutting through the screeded surface to a minimum depth of 30 mm and for full width of the paving. After finishing the surface, tool the joints.

For porches and verandahs, provide tooled joints to line up with posts or as directed by the Principal's representative. Where the surface is to be tiled do not provide tooled joints.

4.1.3 Construction Details

4.1.3.1 Steps, Landings and Ramps

Steps landings and ramps shall be in accordance with the details. These are always to be attached to adjacent paving with a dowelled construction joint (DCJ) even if the adjacent paving is unreinforced.

Ramps shall be designed to take loading forces in accordance with the Building Code of Australia and AS/NZS 1170.1 (Structural Design Actions – Permanent, Imposed & Other Actions) and shall have a gradient not steeper than 1:8.

4.1.3.2 Perimeter Paving

Unless detailed otherwise perimeter paving and paving to clothes line and access paths shall:

- Be 1000 mm wide clear,

- Unless agreed by the Principal's representative in writing or specified otherwise in 'Part B - Specification', stepless perimeter paving is to extend for the full perimeter of the house including porches and carports;
- Localised widening may be required around hot water services, steps, etc. to maintain a minimum 1000 mm width and have a cross fall of 25 mm away from the walls;
- Be 75 mm thick reinforced with RF62 reinforcement mesh;
- For fold or paralines and extendalines, as well as a path to the line, the area under the line is to be paved;
- For rotary lines the path is to extend 500 mm past the central support post;
- Where a step is formed in the paving the vertical section shall be a minimum 200 mm thick; and
- Infill inside the right angled corners with a triangular section of paving between 300-450 mm in length along the path.

4.1.3.3 Driveway Paving

Unless detailed otherwise, driveway paving shall be concrete and:

- 3000 mm wide as a minimum width increasing to 3600 mm at the kerb in addition to the driveway side perimeter paving where possible;
- 100 mm thick concrete reinforced with RF62 reinforcement mesh fabric minimum;
- Stepless at any carports or garages and at the road cross over;
- Provide tooled joints in the new driveway to match the paving and to enable future removal (by saw cutting) of part of the driveway for renewal of storm water pipes or sewer mains. A minimum of one down the middle is to be provided.

4.1.3.4 Finishes

External concrete carport/garage floors, where provided, shall be steel trowel finish. Protect against damage by rain until the concrete has adequately set.

Concrete paths shall be finished with a steel trowel to give a smooth but non-slip finish.

4.1.3.5 Dowelled Construction Joints (DCJ)

Construct dowelled construction joints in accordance with the detail in the following locations (refer typical joint layout plans Appendix B - Detail Drawings):

- at a maximum of 10 m along a path or drive;
- one side of each corner;
- at the junction of 2 paths or path to driveway;
- at junction of driveway to crossover;
- junctions to step landings, ramps and the like.

When connecting to existing slabs or paving use galvanised steel or Grade 316 stainless steel rods minimum 5.6 mm in diameter up to 350 mm long which shall be installed by:

- drilling 2 x 6 mm holes into the existing;
- pushing the rods into the holes; and
- on completion sealing the DCJ's with a polyurethane sealant.

4.1.3.6 Separation of Paving

Paving abutting footings and structures or services passing through the paving (e.g. stormwater pipes) shall be separated with 10 mm polyurethane foam filler or backer strip finished level with the surface of the paving. This joint is not to be sealed.

4.1.3.7 Crossovers

Provide driveway crossovers to each individual house from the property boundary to the street. For group sites with common access roads provide two way access crossovers. Crossovers shall be constructed in accordance with the requirements and details of the Local Government Authority. Obtain all approval and pay fees and charges.

Remove redundant crossovers and make good kerbs, gutters and footpaths to match existing.

4.1.4 Unit paving

Where detailed on the design drawing or where Council/Encumbrance requirements call for masonry unit paving provide minimum 60 mm thick interlocking pavers for vehicular driveways and 40 mm thick pavers for perimeter paving.

Select and lay all paving in accordance with manufacturer's specification and technical information. Lay pavers at the correct fall to drain the surface water to the stormwater disposal system.

Provide a minimum 100 mm thickness compacted quarry rubble or PM71 base under all unit paving. Bed the pavers on 30 mm sand base and finish with concealed concrete retaining edge for perimeter paving and 100 mm concrete edge strips / kerbs for driveways.

4.1.5 Reinstatement

Where it is necessary to cut Council paths satisfy the requirements of the Local Government Authority. Where footpaths are damaged or cut, the slab shall be replaced complete back to the nearest tooled joints. Before placing any concrete the base shall be compacted.

4.2 BITUMEN PAVING

Unless detailed otherwise, bitumen paving shall be:

- light duty for areas for pedestrian, cycle and cars but not where trucks or larger vehicles are likely to travel; or
- heavy duty for access roads and car parks within larger group sites.

4.2.1 Heavy Duty Bitumen Paving

Unless detailed otherwise, heavy duty bitumen pavement shall be 260mm thick consisting of:

- sub base 80mm;
- base course 150mm;
- bituminous surface 30mm.

4.2.2 Light Duty Bitumen paving

The pavement thickness shall be 150mm in all consisting of:

- base course 125mm;
- bituminous Surface 25mm.

4.2.3 Bituminous surfacing

4.2.3.1 Preparation

The areas to be sealed during the day shall be thoroughly swept before other work is commenced.
Any foreign matter adhering to the surface shall be removed. Adequately protect adjacent concrete and other surfaces against splashing and as required.

4.2.3.2 Temperature restrictions

Hot mix asphalt shall not be laid when the pavement temperature (measured in the shade) falls below 10°C and special care shall be taken when the temperature is between 10°C and 15°C.

4.2.3.3 Tack coat

Apply a uniform tack coat complying with CSR grade emulsion to AS 1160 (Bituminous emulsions for the construction and maintenance of pavements) sprayed at ambient temperature.

4.2.3.4 Hot mix asphalt

The design, manufacture, transportation and laying of hot mix asphalt shall comply with AS 2150 (Hot mix asphalt – A guide to good practice).

Unless directed otherwise by the Principals representative, use bituminous hot mix with aggregate size and thickness as follows:

- extra heavy duty paving 14 mm mix, 35 mm thick;
- heavy duty paving - 10 mm mix, 30 mm thick;
- light duty paving - 7 mm mix, 25mm thick;
- re-surfacing mix - 5 mm mix, 20 mm thick.

4.2.4 Sub-base construction

4.2.4.1 Material

Sub-base material shall be PM2/20RG or PM2/20QC as defined in Appendix 1 Department of Planning, Transport and Infrastructure (DPTI), Master Specification, Division 2 Road Work Part 215 “Supply of Pavement Materials.

4.2.4.2 Workmanship

After grading the sub-grade or general fill, spread in an even layer of the required thickness and water and compact to finish at a density of not less than 95% of the maximum density defined in AS 1289, 5.2.1 (Methods of testing soils for engineering purposes – Soil compaction and density tests – Determination of the dry density/moisture content relation of a soil using modified compactive effort).

4.2.5 Base construction

4.2.5.1 Material

Base material shall be PM1/20RG or PM1/20QC as defined in Appendix 1 of Department of Planning, Transport and Infrastructure (DPTI), Master Specification, Division 2 Road Work Part 215 “Supply of Pavement Materials”.

4.2.5.2 Workmanship

Spread uniform layer of approved base material, providing the required thickness, measured after compaction. Segregation of the material shall be kept to a minimum and further reduced where required by previous stockpiling and watering.

When the desired uniformity is obtained the material shall be graded to the required cross-section and thoroughly rolled without adding further water.

After this compaction the formation shall be watered and re-rolled as necessary to finish at not less than 98% of the maximum dry density defined in AS 1289 5.2.1 (Methods of testing soils for engineering purposes - Soil compaction and density tests – Determination of the dry density/moisture content relation of a soil using modified compactive effort).

The completed base course shall be inspected and approved before commencing the bituminous, concrete or unit paving surface treatment.

4.3 RETAINING WALLS

4.3.1 Retaining walls

Provide retaining walls as detailed in Appendix B - Detail Drawings, the design drawings and ‘Part B – Specification’. Retaining walls which require engineering designs and Council approval must be inspected by the engineer at appropriate times during construction and inspection certificates shall be provided to the Principal.

Engage a licensed surveyor to identify property boundaries before the construction of any boundary walls. Do not encroach onto the adjoining property.

Retaining walls not constructed in accordance with the approved design will not be accepted. Any rectification work to any retaining wall deemed necessary shall be carried out at the Contractor’s expense.

4.3.1.1 Pier and Steel Beam Retaining Walls

All retaining walls constructed with bored or excavated piers, steel I beams and precast concrete sleepers or panels shall comply with the following:

- All piers to a retaining wall shall be consecutively numbered on the plan;
- Final depths and pier sizes shall be recorded against the corresponding number on the plan;
- All field data and records shall be submitted to the Principal on completion of the wall;
- Field data and records shall be made available at any time upon request by the Principal;
- Steelwork forming part of a retaining wall is to be protected against corrosion with inorganic zinc silicate or galvanized coating prior to installation; any site damage shall be made good; exposed steel visible after completion of the wall shall be painted with an approved paint, colour matched to the adjacent concrete panels; and
- Backfill behind retaining walls shall be machine compacted in 150 mm maximum layers.

4.3.1.2 Retaining walls combined with fence posts

Incorporate boundary fence posts into the construction of the retaining wall or concrete retaining edge. Walls are to have a smooth concrete finish.

Height	Appendix B - Detail Drawing
up to 250 mm	RW1 with 1N12 top and bottom and W6 ties at 1200 centres
up to 600 mm	RW3 as detailed on CD11
600-800 mm	RW3A as detailed on CD11 2A

Refer to standard retaining wall details and fencing for additional requirements.

4.3.1.3 Landscaping retaining walls and internal protective fencing

Retaining walls that are not associated with a boundary are to be constructed according to the design details. Where they are not fully designed they shall be selected to achieve a durable and aesthetic appearance, and shall be designed and constructed according to the manufacturers details.

Provide 900 mm high powder coated tubular steel fencing to these retaining walls where they exceed 700 mm in height, to prevent people falling.

4.3.2 Garden areas

Manage weeds on site throughout the contract including physical removal and spraying.

Top soil shall be loam and free from any contaminants with imported topsoil being classified as General Purpose Soil complying with AS 4419 (Soils for Landscaping and Garden Use). It shall be suitable for all domestic use including growing vegetables.

Provide and place weed and stone free topsoil or suitable stockpiled onsite topsoil, to a depth of between 100 mm and 150 mm, to all garden areas in the rear yards. The finished level shall match the paving and shall not cover the base of the fencing. Grade and lightly compact the topsoil to give an even finish across the site.

The front yard shall be left free of all debris, building waste, stones, weeds and rubbish and scarified (i.e. all soil loosened or rotary hoed to break up the compaction caused during construction) and left at a level, and in a suitable condition, for between 100 mm and 150 mm of topsoil to be laid for landscaping by the Principal.

4.3.3 Landscaping

The Principal will provide front and common area planting to each dwelling or group site.

4.3.4 Completion

Remove from site all rubbish, Contractors debris, weeds, unwanted plant growth and loose rocks from external areas, including making good council verges. Rake out front and back yards. Clean down paths and leave tidy ready for immediate occupation.

4.4 CLOTHES LINE

Clothes lines shall be as defined in Section 2 Design Requirements, and shall be installed in accordance with the manufacturer's requirements. Clothes line posts are to be encased in a separate concrete casing separated from the concrete paving area, unless agreed otherwise in writing.

Clothes hanging options on balconies shall be retractable or fold against an external wall. They shall not interfere with any door swings, egress or hang over the edge of balcony railings. Where possible they shall be shielded from view and designed specifically for small spaces. All possible solutions need to be presented to the Principal for approval.

4.5 FENCING

4.5.1 Site Fencing - General

Carry out all fencing in accordance with the requirements in the tender documents, 'Part B – Specification'. All fencing work must comply with any Development Approvals and Council guidelines applicable for the area.

Should any site work result in dispute or require rectification to property, the Contractor is responsible to resolve any disputes and carry out the work prior to Practical Completion.

Remove any existing asbestos cement fences in accordance with asbestos removal regulations and procedures.

Ensure that the houses and rear yards will not overlook existing houses to rear or side yards and that consideration for neighbouring properties is respected. Replace any existing fencing that does not meet these requirements. This may require additional retaining walls or fencing that separates properties, and is expected to be detailed in the Contractor's proposal.

Side boundary fencing where designed forward of the building line shall be reduced in height as applicable to permit adequate visibility of oncoming traffic, etc. from the driveway.

Ensure that all fences are true to line, vertical, and placed in their correct position. The maximum divergence of the centre of the fencing from the title boundary is 50 mm.

Where level differences exist between adjoining allotments a concrete retaining wall shall be provided. Fencing on top of retaining walls must be scribed to the top of the wall with a maximum gap under the fence of 10 mm. The bottom of the fence sheeting should not be used for retaining purposes and must be clear of the soil.

Fences and gates shall be arranged so that electric and gas meters are readily accessible from the street without passing into the rear yard.

4.5.2 Rear Screen Fencing

Fence all properties with a minimum of 1800 mm high capped and clad with double sided COLORBOND® sheeting. Provide screen fencing behind the front alignment of the house.

COLORBOND® fencing is to be selected from the Standard COLORBOND® range. The sheeting shall have a Base Metal Thickness of 0.35 mm. COLORBOND® shall comply with GPC-C-170 Prefinished / Pre-painted Exterior Sheet Steel Metal Cladding.

Fix sheets with half flute side laps, using 10-16 mm x 16 mm self-drilling hexagonal head of equal approved one operation screws complying with AS 3566.1 Class 3 (Self-drilling screws for the building and construction industries – General requirements and mechanical properties). For COLORBOND® sheeting the fixings shall be pre-finished, in a matching colour to the sheeting.

Steel sheet fencing, shall be finished with 0.5 mm thick COLORBOND® coated capping matching the fence. The capping shall have 35 mm face widths and be fixed with Monel rivets or 8 mm x 12 mm self-drilling screws at 600 mm centres.

"Hi-Bond" paint any screen fencing, gates, posts, rails, to match COLORBOND® fencing where exposed to the street or to any internal common areas.

4.5.3 Front Fencing

Where required under “Development Guidelines”/Encumbrances or indicated in the “Proposal Information Notice”, provide 900 mm high tubular steel fencing with powder coated finish. Front and side fencing must return to the car park boundary or division gates.

Where there is no front fence, define the limits of the allotment/s with 120 mm wide x 100 mm concrete edging strips to side boundaries to clearly differentiate ownership extent.

4.5.4 Panel or Good Neighbour® or Superdek® Fences

Provide panel fencing as scheduled with all fully capped panels set between 50 mm x 50 mm galvanised steel or galvanised and powder coated SHS steel posts set into the ground using concrete in accordance with Clause 4.5.6 ‘Concrete for Fence Posts’.

The SHS steel posts shall have a minimum wall thickness of 1.6 mm, however where the ultimate design wind speed is 40 m/s or more (Category 2 on drawings) the minimum wall thickness shall be increased to 2.5 mm. All posts shall be fitted with approved galvanised caps. Assemble the panels as recommended by the manufacturer and provide all fixings to posts in a galvanised or powder coated finish to match.

4.5.5 Gates

Where there is access to the building, provide at least one 900 mm wide hand gate with top and bottom matching capping including a padlock, and front latch tail. Construct the gates as for fencing above using the Standard COLORBOND® range with capping. The bottom capping on the gates shall have 10 mm drain holes drilled through the bottom at 600 mm maximum centres.

Where there is a front fence, a 900 mm wide entry gate and 1000 mm wide paving may be required if the porch entry is separate from the drive side, e.g. corner allotment.

4.5.6 Concrete for fence posts

Set all steel posts on 75 mm of concrete and fully surround the post with concrete to posthole diameter of a minimum of 200 mm, or to the size detailed on the drawings, and smooth trowel finish the surface at ground level. The concrete is to be compacted into the hole around the post using a crowbar or similar device.

4.6 SITE SIGNAGE

All dwellings and letterboxes shall be provided with a dwelling number not less than 75 mm in height in proximity to the front entrance door, positioned between 1300 mm and 1800 mm from the finished ground level. The number shall be in a contrasting colour to its substrate.

4.7 STORAGE – BIKES AND GENERAL

All storage spaces shall be as per design drawings with the following features.

Provide a store room for bikes with a floor stand or rack capable of accommodating a bike for each sole occupancy unit. The floor stand or rack must allow sufficient room for users to secure their bikes using traditional bike security chains or restraints.

Provide a store room with individual storage spaces of equal dimension for each sole occupancy unit. The individual storage spaces shall be divided by sturdy cage wire with the open sections small enough to prevent ingress by hands i.e. less than 60 mm. Each storage space shall have its own cage door with a sliding bolt and capacity for tenants to install a sturdy padlock for security.

All storage space main doors shall be keyed alike with the main entrance pin profiles and have adequate lighting.

4.8 EXTERNAL WATER SERVICE

4.8.1 Materials

All materials and products used in the installation of hot and cold water services shall comply with the relevant statutory requirements. Pipes and fittings for use in hot and cold water services shall be in accordance with AS/NZS 3500.1 (Plumbing and Drainage – Water Services) and AS/NZS 3500.4 (Plumbing and Drainage – Heated Water Services), subject to the limitations listed for the use of those types, except that all water pipe work exposed above the ground shall be copper.

4.8.2 General

All single occupancy units are to be individually metered and the meters tagged with a durable tag showing the street address. A manifold system of SA Water meters are to be installed.

All external water services shall be copper or plastic tube and, notwithstanding the requirements of AS 2032 (Installation of PVC Pipe Systems) and AS 3500 (Plumbing and Drainage – Set), all such services greater than 25 mm diameter shall be laid with minimum 600 mm cover below finished surface level unless otherwise agreed with the Principal. Any pipework exposed above ground shall be copper unless otherwise directed.

Size pipework and design layout to ensure adequate water pressure and flows are achieved at all outlets.

Pressure reducing devices may be required to meet AS 3500 (Plumbing and Drainage – Set) for some allotments and the Contractor should ascertain this requirement from the relevant authority and allow all costs in its proposal. Pressure reduction will be needed to ensure the pressure at all outlets is less than 500 Kpa.

Provide each outdoor common space with two double headed “T” shaped standpipes with 300 mm square x 150 mm thick concrete surround. Locate standpipes one in the front yard and one in the rear. Locate standpipes close to a path away from driveway, porch, clothesline or external doors. Do not fix to or close to the external house wall where it would result in a hose being across paths or driveways.

4.9 FIRE SERVICE

Site fire services as follows shall be required to designated group sites.

The Fire Mains and Hydrant System both externally and where necessary within the building will be required to provide a minimum flow as required under the current building regulations. The Contractor shall be responsible for making arrangements and testing of the complete fire service to standards as required by the SA Metropolitan Fire Service (SAMFS), SA Water and the relevant water industry.

4.10 FIRE MAINS

The Contractor shall supply, install, commission and test the complete fire hydrant system required to protect the proposed dwellings as outlined in AS 2419.1 (Fire Hydrant Installations – System Design, Installation and Commissioning).

The Contractor shall carry out the works in accordance with the requirements of AS 2032 (Installation of PVC Pipe Systems) and AS 3500.1 (Plumbing and Drainage – Water Services) (including variations specified under Water Industry Act 2012), SA Water and the SAMFS and the design drawings.

Unless detailed otherwise the Contractor is to supply and install 100 mm. IPLEX Blue brute pipe or equal approved PVC-U pipe. (Class PN 16 or greater) complying with AS 4765 (Modified PVC (PVC-M) Pipes for Pressure Applications) or 100 mm DICL pipes.

Install a single spring loaded check valve in the pipework system inside and adjacent to the property boundary in an accessible position. The valve when loaded shall be in the closed position. There shall be no branches to other services prior to the check valve. The check valve is to be installed in a chamber of adequate size to facilitate the changing or servicing of the valve. The chamber and cover are to be designed for the proposed traffic conditions.

Pipes shall be laid in accordance with the manufacturer’s recommendations and AS 2566.1 & AS 2566.2 (Buried Flexible Pipelines – Structural Design/Installation) complete with concrete thrust blocks, joints, tees, bends and

reducers as required. Irrespective of any manufacturer's requirements fire mains are to be laid at least 750 mm below finished levels.

Bedding to pipework shall be an approved free running coarse sand compacted as specified. Excavate adjacent to pipe sockets to allow the full length of the pipe barrel to bear evenly on the compacted bed. Do not commence backfilling until the work is inspected and passed. Pipes shall be tested with water under mains pressure as soon as the thrust blocks have reached full strength and there is sufficient fill (if any is required to enable the pipes to be pressure tested for at least 2 hours at 1700 kPa). Backfill and compact the trenches to the underside of the finished pavement using suitable and approved filling.

Fill is to be placed in 100 mm layers, watered and compacted by three passes of a vibrating roller, trench wacker or plate.

4.11 FIRE HYDRANT AND STANDPIPE

Provide for double headed pillar hydrant(s) in a location(s) that complies with the requirements detailed in AS 2419.1 (Fire Hydrant Installations – System Design, Installation and Commissioning) or as detailed on the drawings. The hydrant standpipe shall be 100 mm NB galvanised "Heavy" steel pipe to AS 1074 (Steel Tubes and Tubulars for Ordinary Service), wrapped against corrosion below ground level using "Denso" tape. Outlets shall be SAMFS type 64 mm bronze globe valves with male hose fitting and cap. Valve outlets are to face in the horizontal plane at a height of between 1000 mm and 1200 mm above finished ground level. Paint the standpipe white, valves and caps Fire Brigade red with 2 coats of enamel paint over etching primer.

The hydrant system will be required to provide a minimum flow as required under the current Building Regulations. The Contractor shall be responsible for making arrangements and testing of the complete fire service to standards as required by the SAMFS and SA Water.

An internal fire hydrant will be located to suit the requirements of the BCA for Class 2 buildings.

4.12 STORMWATER SYSTEMS

4.12.1 General

All work shall comply with AS 1254 (PVC-U pipes and fittings for storm water and surface water applications) and AS 1260 (PVC-U pipes and fittings for drain, waste and vent application) unless otherwise scheduled.

Unless detailed otherwise, connect all downpipes and rainwater tank overflows to the street kerb and gutter. The acceptable minimum grade for stormwater is 0.5%. Above ground level risers are to be kept as close as practical to the building fabric.

All work on Council property is to be carried out to the local government requirements.

Follow the design requirements on floor levels and stormwater disposal.

4.12.2 Group Sites

The Principal will not accept drowned or sealed systems for either discharge to the street or discharge into tanks. Follow the design requirements on floor levels and stormwater disposal.

Fall paving and grading away from the dwellings towards sumps. Provide sufficient sumps to drain all yard and common spaces to ensure stormwater does not pond. See below for specification detail.

4.12.3 Pipework

All PVC pipework and fittings shall be fully solvent glued. Unless otherwise detailed pipework shall be a minimum of 90 mm PVC-U stormwater grade and under common drives 100 mm sewer class PVC-U.

On group sites the pipework shall be sized for the stormwater flows, and pipes larger than 200 mm diameter are to be concrete.

The storm water pipe from the property boundary to the kerb and gutter shall be 90 mm diameter DN medium galvanised steel pipe (or similar approved) for a single unit or as sized for a group site.

For a wet system the pipework sewer class pipe underground and size shall be as designed. The sealed pipe shall extend as a riser to the gutter pop to form the down pipe. This riser is to be in 80 mm PVC-U sewer class pipe unless detailed otherwise.

4.12.4 Sumps and Grated Inlets

The use of sumps, soakage and drainage systems must be stated on design tender drawings and be pre-approved by the appropriate Principals representative prior to building in.

For front and rear yard spaces the minimum size of a stormwater outlet shall be a 100 mm diameter grate with a 300 mm x 300 mm x 100 mm concrete surround connected to a 90 mm diameter stormwater pipe. Provide sufficient sumps to drain all yard and common area spaces to ensure stormwater does not pond.

In areas where foot traffic only is expected the grate is to be an Iplex grate model W155150 or equal approved. The grate is to be connected to the storm water pipe and is to be set either in a concrete path or in a block of concrete a minimum of 300 mm (w) x 300 mm (l) x 100 mm thick.

For vehicular trafficked areas steel or cast iron grates shall be used on a pre-cast or insitu concrete base with a minimum size of 300 mm (w) x 300 mm (l) x 150 mm thick.

All sumps shall have a smooth interior for ease of cleaning and of the size specified or where the size is not specified, sized to suit the grates and/or pipes associated with them. All pipes entering or exiting the sumps shall be joined into the sump using an appropriate cement based mortar or sealed with a flexible sealant. The base of the sump shall be at the level specified and where no level is specified shall be between 50 mm and 100 mm below the invert of the lowest pipe.

All grates in roadways or drives on group sites shall be class medium traffic and in single units class light traffic. Where driveways back fall toward the unit provide a grated channel capable of carrying light vehicular traffic. Acceptable inlet and sump details are labelled as Grated Inlet Details – Light Duty contained in Appendix B - Drawings.

At Practical Completion provide an Engineer's certificate that the installed system complies with the approved design.

4.12.5 Laying

Connect to all down pipes and overflow pipes and install storm water pipes in the ground with a minimum cover of 200 mm from top of pipe to existing ground or paving level. Lay all storm water with a minimum 0.5% gradient (1 in 200) to the street water table.

Supply and install a screw top access storm water IP on each riser above the paving before the adaptor for the downpipe.

Where a wet system is used the pipework shall be taken up to the gutters and a screw top access IP shall be fitted to each downpipe on the vertical section, immediately above the paving.

Solvent clean and solvent cement all joints between pipework and fittings. Excess solvent cement shall be wiped from the joint immediately after the joint is made.

4.12.6 Fixing of Wet System Risers

Fix the riser (down pipe) to the wall with proprietary brackets at least twice in its height at a maximum of 1.5 m centres. Insert foam, or similar, between the brackets and the riser to allow the riser to slide in case of ground movement. Provide a movement joint between the gutter pop and the riser.

4.13 SITE LIGHTING

All site lighting is to be designed by a specialist lighting engineer in accordance with AS/NZS 1158.3.1 (Lighting for roads and public spaces – Pedestrian area (Category P) lighting – Performance & Design Requirements).

Site lighting shall be designed to address night time security for tenants and to aid visibility during vehicular movement. All globes, luminaires shall be LED and replaceable.

The minimum design standard shall be:

- category P3 in accordance with AS/NZS 1158.3.1 (Lighting for roads and public spaces – Pedestrian area (Category P) lighting – Performance & Design Requirements);
- LED luminaire of Type 3 (in larger group or common areas >20m^2);
- LED luminaire of Type 4 (in smaller group or common areas <10m^2);
- LED Luminaire of Type 6 (in single lane driveways/hammerhead/cul de sac of 1-6 dwellings);
- the stated glare control criteria in Table 2.10 of AS/NZS 1158.3.1 (Lighting for roads and public spaces – Pedestrian Area (Category P) Lighting – Performance and design requirements); and
- shielded luminaire using visors to reduce glare for drivers, to keep the upward waste light ratio to 20% or less and positioned to reduce spill light into neighbouring spaces and dwellings.

Where lighting is to aid visibility during vehicular movement they shall be bollard mounted with the luminaire set between 600 – 1000 mm from the finished ground level. They shall be Type 6 LED luminaires with shields to direct light away from buildings, windows and on to the horizontal plane, to manage vertical illuminance and control obtrusive effects.

Environmental factors which influence vertical luminance i.e. fences, landscaping, reflective surfaces etc, shall be taken into consideration when selecting location, luminaires and shielding. For example bollard lighting installed within 500 mm of fencing shall be shielded from the fence to prevent reflective glare and to direct light into the task space. Care shall be taken to avoid obtrusive spill light into private neighbour or tenant spaces, this work shall be carried out and demonstrated in accordance with AS 4282 (Control of the obtrusive effects of outdoor lighting).

To minimize this, the location, the type of fitting and the amount of shielding to be used shall be calculated and presented to the Principal for approval in accordance with Appendix E of AS/NZS 1158.3.1 (Lighting for roads and public spaces – Pedestrian Area (Category P) Lighting – Performance and design requirements) and the design brief. Documentation submitted for approval shall also demonstrate compliance with the specifications for bollards.

All bollards shall be galvanised steel or aluminium powder coated set in concrete in a 300 mm diameter and 500 mm deep hole with the concrete surface smoothed with a trowel, level with the surrounding ground surface. A cage suitable for the bollard shall be installed in the concrete to support 240V electrical conduit connection to the bollard. Mounting plates and cage housing shall be suitable for the bollard in accordance with the manufacturer's recommendations.

Bollards shall be manufactured to the following requirements:

- Grade 304 or 316 steel; or
- Aluminium extrusions complying with AS 1866 (Aluminium and Aluminium Alloys – Extruded Rod, Bar, Solid and Hollow Shapes) and be at least equivalent to Australian Alloy B6063, temper designation T5; and
- Aluminium powder coated to AS 3715 (Metal Finishing – Thermoset Powder Coating for Architectural Applications of Aluminium and Aluminium Alloys) with powder coating complying with APAS 0155/2 to a minimum thickness of 40µm, or anodized to AS 1231 (Aluminium and Aluminium Alloys – Anodic Oxidation Coatings) with a minimum coating thickness of 15µm, with all exposed surfaces free from blemishes.

Mounting gear (luminaire and gear tray) shall be easily accessed for maintenance, sealed and rated between IP54 and IP65 and secured with tamper proof bolts or screws.

Where lighting is for the security of tenants, sensor lights shall be added to the front wall of the building no higher than 2400 mm and no lower than 2000 mm. They shall be Type 6 LED luminaires with shields to direct light away from buildings, windows and on to the horizontal plane, to manage vertical illuminance and control obtrusive effects.

In common recreational areas the lighting shall be fitted with timers and sensors so that the lights are motion activated and non-responsive during daylight hours. Components used shall be proprietary to the lighting system and installed in accordance with manufacturer's recommendations.

In general external lighting is to be controlled by a photo electric cell.

4.14 EXTERNAL COMMON AREAS

Shall have lighting as described in Site Lighting above and provide seating suitable for outdoor applications. This may include bench seating and tables constructed from recycled plastic with a timber component, or pre-fabricated systems. In all cases the seating shall be of a sturdy construction and permanent in its location.

Government of South Australia

South Australian Housing Trust
Minimum Design & Construction
Specification for Class 2 Buildings

Appendix A

Procedures and Schedules

SA Housing Authority

Government of South Australia

TERMITE PROCEDURES, SEPTEMBER 2018

General

The contractor is to record all work on a durable notice firmly secured within the electrical meter box.

The following are not acceptable:

- Exposed footing as perimeter treatment.
- Under slab irrigation systems.

Any damage which occurs to the termite protection (either “Termi-Mesh”. “Kordon” ,“FMC Homeguard”, “Smartfilm” or “Trithor”) shall be repaired by the licensed installer.

New Build Treatment

New Raft Slabs - Penetrations & Perimeter Paving

In all cases works shall be carried out in accordance with AS 3660.1 (Termite Management – New building work) and the Building Code of Australia, National Construction Code. Termite treatment shall apply to all new build projects regardless of the construction materials used.

Protect penetrations with Termimesh, Kordon, Trithor, Smartfilm, Homeguard or PVC-U “collars” and increase the reinforcement to RF92 for a 100 mm slab on ground, or RF82 for a waffle slab, to control shrinkage cracks.

For paving with sand bedding & joints Chemical Irrigation System – chemicals will rise up into sand	**Suitable for concrete perimeter paving**
	Granitgard, Hand Spray, Termimesh parged to footing & embedded in concrete paving
For a garden bed with no paving provide a 300 mm wide concrete edge strip over the edge treatment.	For a Kordon, Trithor, Smartfilm or Homeguard systems, extend Kordon, Trithor, Smartfilm, TMB or Homeguard 300 mm under concrete pavement

Bath Outlet

Bath outlet infill shall be protected by Kordon, Trithor, Smartfilm, Homeguard, collars or Termimesh. The use of a spray to protect the infill is NOT acceptable.

If PVC “collars” are used then adjustment for the bath outlet is to be carried out above the slab (e.g. larger pipe through slab and reducer to bath to give the required tolerance).

Where “Kordon” ,“FMC Homeguard” , “Smartfilm” or “Trithor system is used, the bath riser PVC waste pipe shall be protected using minimum 750 mm x 750 mm squares of “Kordon”, “FMC Homeguard”, “Smartfilm” or “Trithor as agreed by Technical Services with the licenced installer.

For Termimesh the riser shall be treated with the manufacturer’s special detail.

Where foam or other block-outs are used in the slab around the bath riser, the block-out size shall not exceed 300 mm x 300 mm. Block-outs shall be backfilled with good quality concrete including cleaning, proper preparation of slab edge surfaces and priming prior to placement of the concrete.

Walls on Boundaries (zero lot line)

Termiguard have a system where a rebate is provided in the footing and they insert an irrigation pipe and pump it with chemical. Other treatments simply push the entry point further up the wall and are NOT acceptable.

Responsive Maintenance Treatment

In all cases works shall be carried out in accordance with AS 3660.2 (Termite Management – In and around existing buildings and structures), this procedure and instructions from Technical Services. Instructions from Technical Services shall take precedence.

All responsive maintenance works shall have the Contractor 'check and report' on suspected termite activity. The submitted report shall be assessed, approved and recorded as for a trial by Technical Services prior to and after implementation of works.

The report is to identify the location of the termites, the extent of damage, the entry points, any attached units and the proposed treatment method. If significant work or other units need inspecting to complete the report a preliminary report is to be given to the Principals representative detailing what has been found and advising the 'extent of work' required to enable the inspection to be completed. This 'extent of work' may include the removal of wall linings and/or sections of brickwork, which must not proceed until approved by Technical Services.

Technical Services can make variations to the Contractors 'extent of work' recommendations and these directions must be adhered to, so as to avoid Non-Compliance. If there are extenuating circumstances in which variation to the procedures or Technical Services direction is needed, approval is to be sought from Technical Services prior to proceeding.

As a part of 'Check and Report' and prior to any treatment the contractor is to check the meter box for the notice of previous work and modify the extent of work on this record as appropriate once the works are completed.

Whenever BIFLEX is used' it shall be prepared in a solution at 500mls per 100 litres of water (ie 1 part to 200 parts) which has a life of at least 10 years. Lower concentrations have a shorter life and are not to be used.

Where a termite attack has been identified on a building the whole of the building is to be re-treated and in some cases this will include attached units.

In all cases the treatment will include a treatment around the exterior of the footing as well as within the building.

Treatment of a local area is only to be undertaken when the termite barrier in that area has been disturbed and requires reinstatement.

Contractors are to ask tenants if they have any health issues that may be affected by the chemicals or the work before any treatment is initiated. The Principals representative is to note any tenant issues on the appropriate records management system.

Existing Raft Slabs

Where directed by Technical Services the following works shall be carried out after the killing of the termites by the pest control contractor. Drilling into slabs shall NOT occur without written direction from Technical Services.

Where the entry point is known:

Slab treatment:

- For holes through the slab seal with sand epoxy grout;
- For entry up the outside of the footing no slab treatment is required.

Expansion joints in masonry cavities treatment:

(usually these are party walls between units & all of these areas shall be treated even if they are not the current point of entry)

- Clean the cavity (this may involve removing part or all of the base of 1 leaf of the wall (i.e. may have to under set 1 leaf).
- Install a Termguard or similar irrigation pipe over the joint (in general this can be done by removing a few bricks in the outside and sliding the pipe in).
- Pump the system with chemical.
- Treat expansion joints in floor area.
- Expose the joint for its full length.
- Grind down the slab slightly.
- Parge a piece of Termimesh with an expansion fold over the joint. This is to extend the full length of the joint

and down the external face to below the perimeter treatment.
- Replace floor covering allowing for expansion at the joint. For vinyl flooring a proprietary expansion strip is to be used

Where entry point is unknown:

- Drill at 300 mm MAX centres and inject with Chlorpirofos , Biflex or Premise as follows
- 1 row of holes approx 100 mm from both faces of the walls in the area of attack (for cavity walls it is not necessary to treat between the leaves.)
- Seal up edge beam penetrations for electrical wiring, telecom, etc.
- 4 holes around each slab penetration including the bath.
- Treat any expansion joints as above.

Initial Installation or Prior to New Paving

Whenever perimeter paving is added to a building perimeter, treatment is to be installed. For replacement of local areas of paving or the addition of part of the perimeter pavement or where the treatment is disturbed, trenching treatment is required for that area where details of an existing perimeter treatment are in the meter box.

For paving with sand bedding & joints Chemical Irrigation System – chemicals will rise up into sand	**Suitable for concrete perimeter paving**
	Granitgard, Hand Spray, Termimesh parged to footing & embedded in concrete paving
For a garden bed with no paving provide a 300 mm wide concrete edge strip over the edge treatment.	For a Kordon, Trithor, Smartfilm or Homeguard systems, extend Kordon, Trithor, Smartfilm, TMB or Homeguard 300 mm under concrete pavement

Walls on Boundaries (zero lot line)

Where it is considered necessary by Technical Services to obtain some protection bond Kordon, Trithor, Smartfilm, TMB, Homeguard or Termimesh onto the footing and extend up the wall 300 mm above the neighbour's finished level.

Treating Existing Perimeter Paving

Where the concrete perimeter paving is against the footing, drill the paving at 300 mm max centres at a distance between100 mm and 120 mm from the footing face and inject a chemical barrier, and seal with sand epoxy grout.

For pavers lift the pavers treat the soil and relay pavers directly onto the treated soil. Where the paving is against a wall, i.e. above the footing, the paving is to be lowered to below the top of the footing and then treated as new paving. Where the levels make this impractical, a special site specific detail will need to be agreed. The detail is to be prepared by the contractor and approved by Technical Services.

Timber and Other Suspended Floors

Suspended floors can be treated by cleaning the debris from under the floor and then spraying the dirt with Chlorpirofos, Biflex or Premise. While other systems such as Granitgard, Kordon, Trithor, Smartfilm, TMB, Homeguard or reticulation systems could be installed for suspended floors, spraying is considered the most economical.

Masonry (stone or brick) dwarf walls with no concrete footing

Special care is needed to ensure termites cannot come up through the wall.
Inject soil under wall prior to spraying making sure that the solution totally saturates soil under wall.

NOTE: For wide dwarf walls it is recognised that this may not be possible without causing a footing failure and in those circumstances the soil under the footing is to be treated from both sides of the footing and the Principals representative is to be advised that the barrier under the dwarf walls may be incomplete. Notation in such cases shall be made on the durable notice firmly secured within the electrical meter box.

Timber Stumps

Saturate the soil around the stump to at least 150 mm depth and ensure ant caps are in place.
At the junction of stumps and perimeter paving ensure continuity of barrier from under the floor to 300 mm under the paving. Inject from under the floor and through the paving if necessary.

Treatment of Mixed Floors

Where the main part of the house is a suspended timber floor and the wet area is a slab on ground, the following applies:

- *Timber floor* to have under floor spray;
- *For a sound slab* treat around the walls. Drill holes at 300 mm maximum centres 100 mm from the wall face and inject Chlorpirofos, Biflex or Premise. Treat around all service penetrations (4 holes per penetration) including the bath;
- *For a floor in poor condition*, i.e. cracked, drill the whole slab at 300 mm maximum centres and inject chemical.
  Note: If the slab is in this condition the contractor is to refer to Technical Services written directions before proceeding.

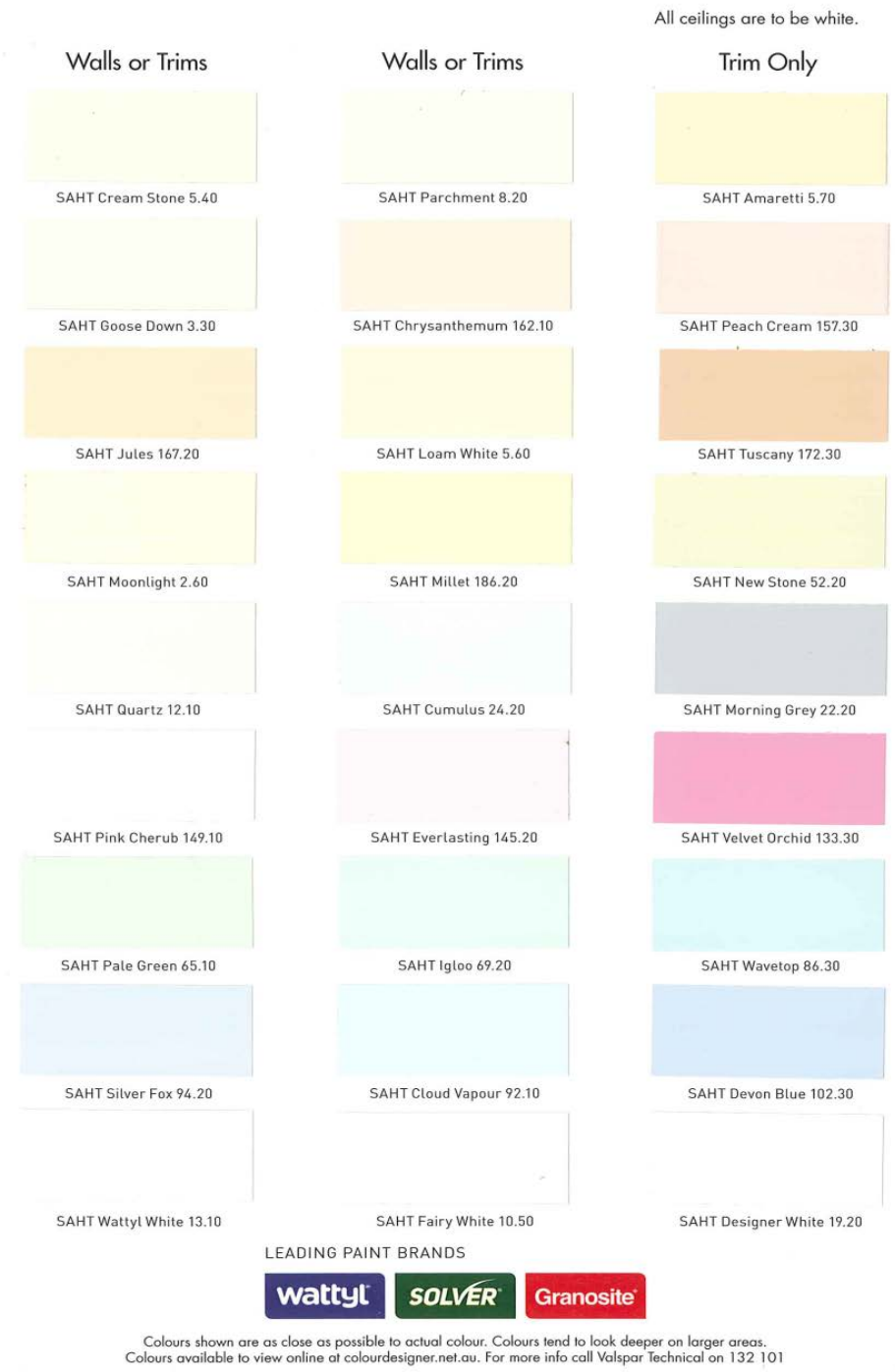
Replacement of Wet Area Floors

Where wet area (bathroom, toilet, laundry) slabs on fill are replaced, treat under the slab with Kordon, Trithor, Smartfilm, TMB, or Homeguard. Place a layer of Kordon, Trithor, Smartfilm, TMB or Homeguard on top of the sand over the entire area and extend at least 50 mm under adjacent floor slab or turn up the Kordon, Trithor, Smartfilm, TMB or Homeguard against the wall for the full depth of the slab. Penetrations shall be detailed with Kordon, Trithor, Smartfilm, TMB or Homeguard in accordance with the manufacturer's recommendations.

Baiting Systems

Baiting systems are not to be installed without written permission from Technical Services.

INTERIOR PAINT SCHEDULE



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Minimum Design & Construction
Specification for Class 2 Buildings

Appendix B

Detail Drawings

STANDARD DETAILS

Retaining Wall Details Part 1 (RW1 & RW2)

Concrete Sleeper Retaining Wall – Retaining for Cut Sites (type 1) CSRW – D1 -1

Concrete Sleeper Retaining Wall – Retaining for Fill Sites (type 2) CSRW – D2 - 1

Retaining Wall Details – CD 11(2)

Retaining Wall Details – 600 – 800 mm – RWSCD11 (2A) A

Rainwater Retention and Detention Tank SKO1-C

Reclaimed Water Connection Details for Existing Connections

Reclaimed Water Connection Details for Future Connections

Grated Inlet Details – Light Duty

Typical Pegging Plan

Typical Identification Survey

Typical “As Constructed” Identification Survey

Typical “As Constructed” Services Plan – Stormwater

Typical “As Constructed” Services Plan – Electricity/Telecommunication and Gas

Typical “As Constructed” Services Plan – Sewer and Water using Meter Manifold

Typical Joint Layout

Typical Joint Layout

Dowelled Construction Joint Detail

Stepless Entry Detail - Typical Hinged Entry Door 14115_SD01

Stepless Entry Detail - Typical Hinged Entry Door 14115_SD02

Stepless Entry Detail - Typical Hinged Door 14115_SD03

Stepless Entry Detail – Typical Hinged Door 14115_SD04

Stepless Entry Detail – Typical Sliding Doors 14115_SD05

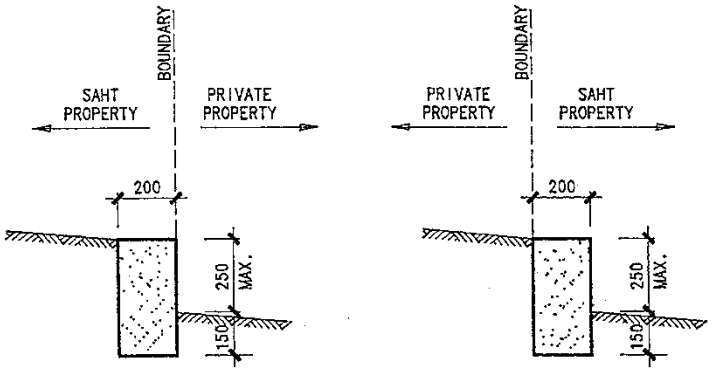
Stepless Entry Detail – Typical Sliding Doors 14115_SD06

Stepless Entry Detail – Typical Sliding Doors 14115_SD07

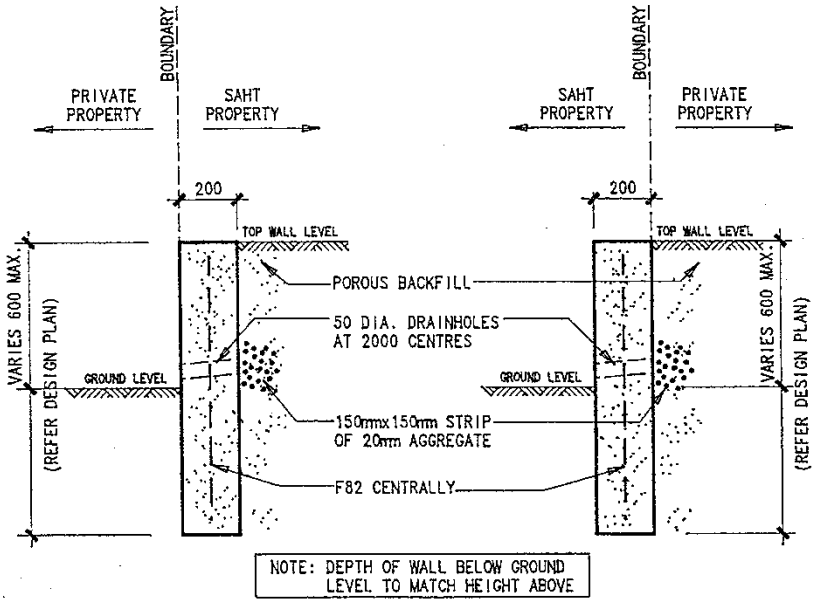
Stepless Entry Detail – Typical Balcony Sliding Doors 14115_SD08

Stepless Entry Detail – Typical Balcony Sliding Doors 14115_SD09

Temperature Control Devices Installation Diagrams



RETAINING WALL (RW1)



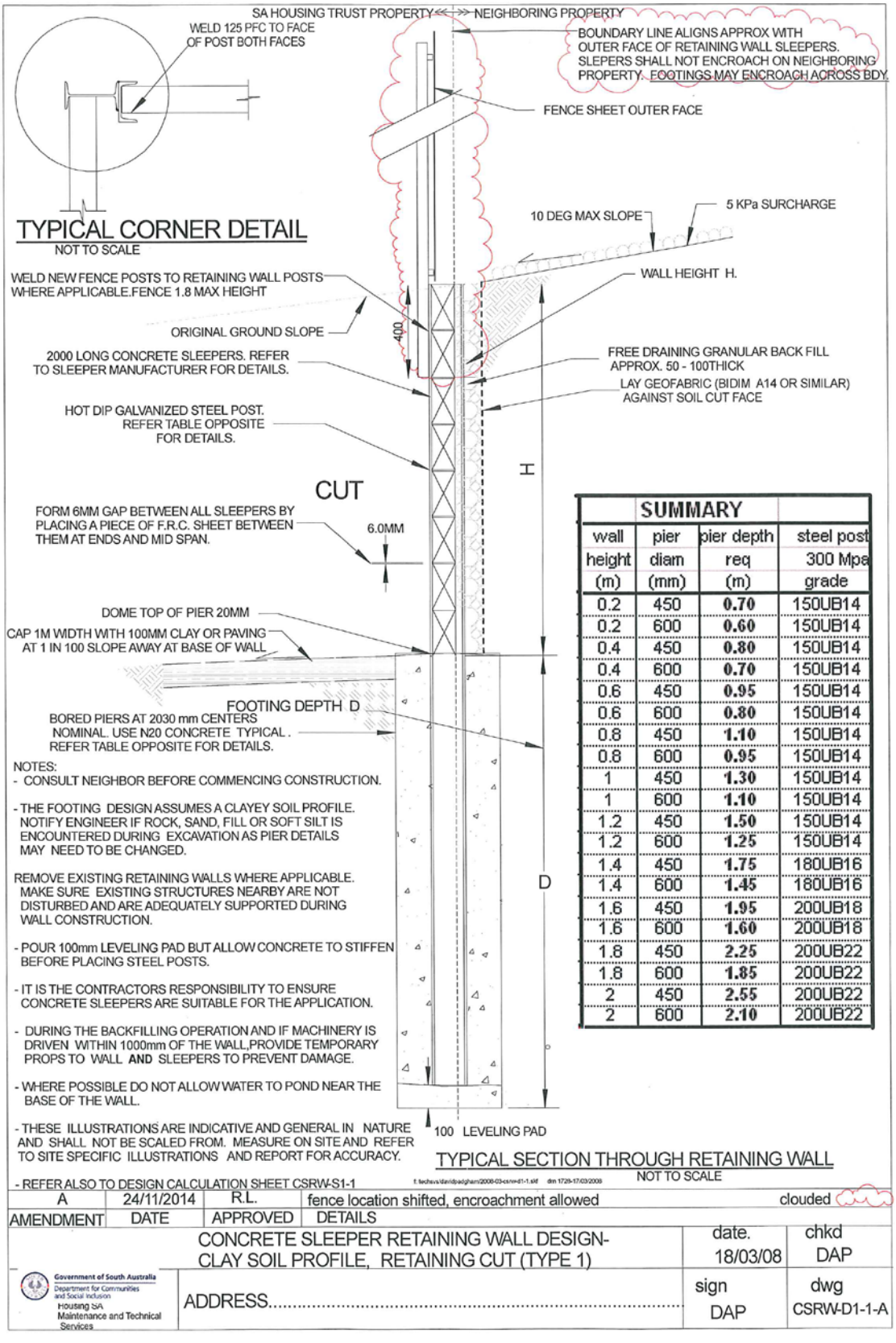
RETAINING WALL (RW2)

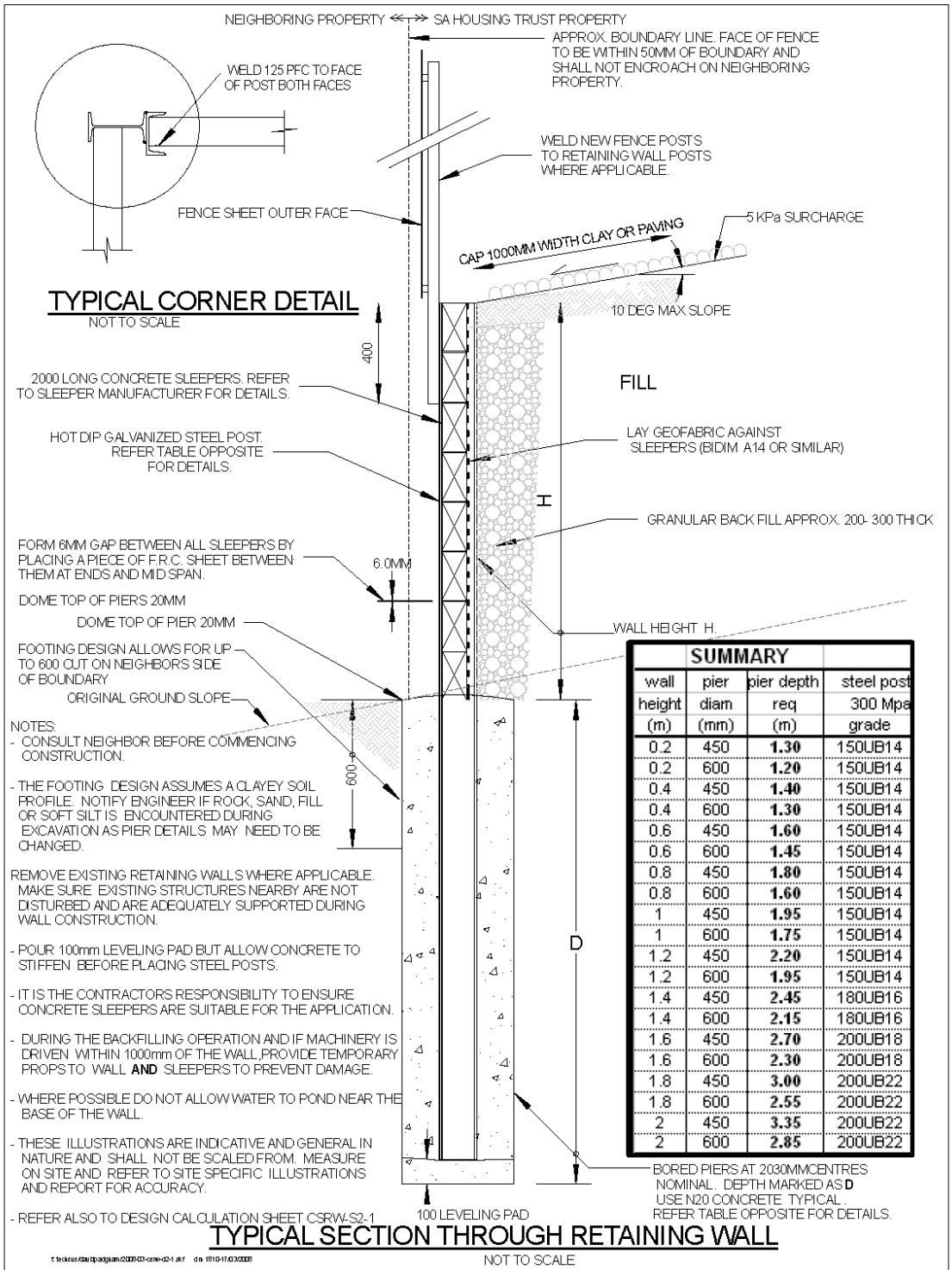
RETAINING WALL DETAILS – PART 1

TYPICAL DETAILS ONLY

BUILDERS ENGINEER IS RESPONSIBLE FOR ALL RETAINING WALL DESIGN

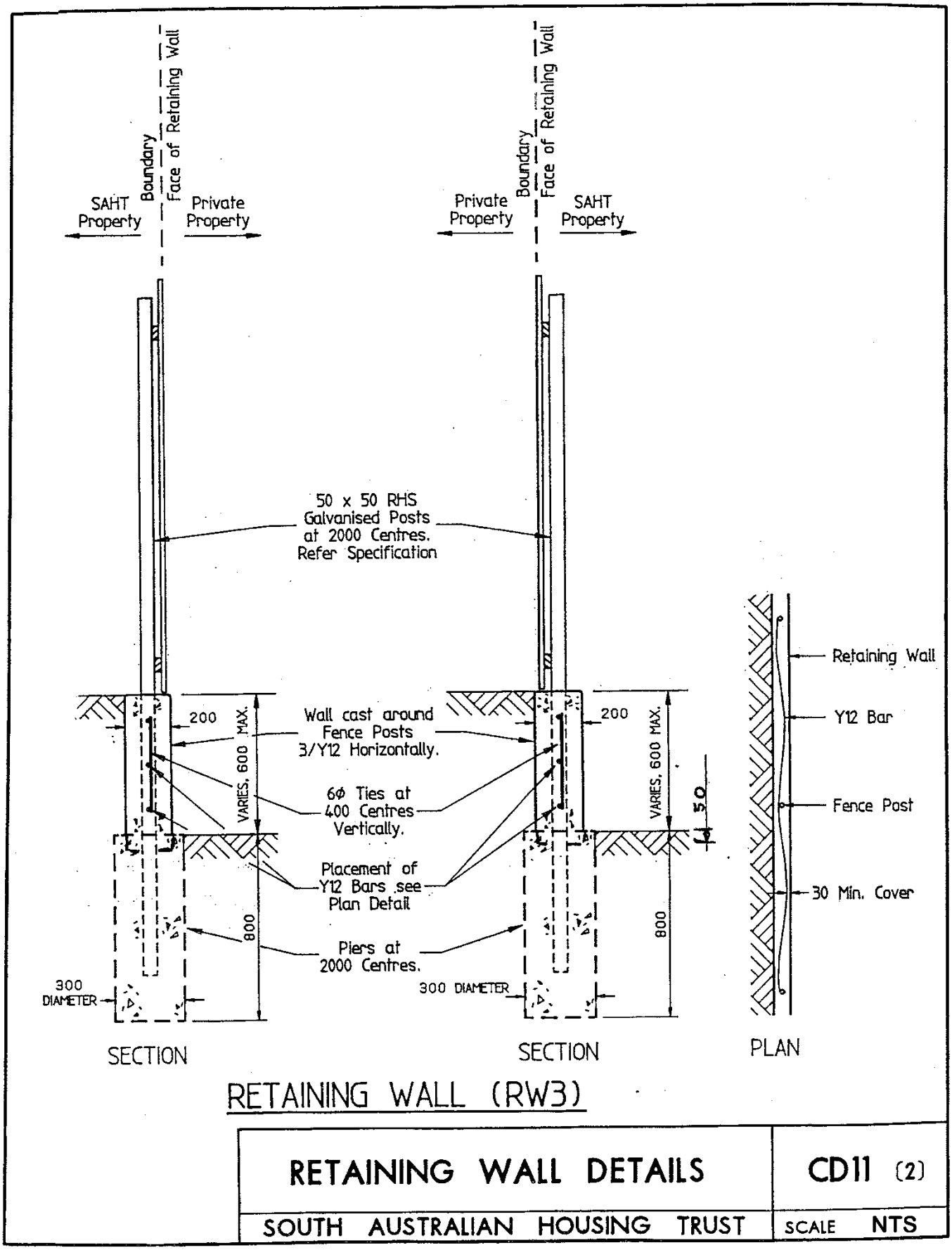
ALL RETAINING WALLS TO BE CONTAINED ON THE TRUST'S ALLOTMENT


SA HOUSING TRUST PROPERTY
NEIGHBORING PROPERTY
WELD 125 PFC TO FACE OF POST BOTH FACES
BOUNDARY LINE ALIGNS APPROX WITH OUTER FACE OF RETAINING WALL SLEEPERS. SLEPERS SHALL NOT ENCROACH ON NEIGHBORING PROPERTY. FOOTINGS MAY ENCROACH ACROSS BDY.
FENCE SHEET OUTER FACE
TYPICAL CORNER DETAIL
NOT TO SCALE
10 DEG MAX SLOPE
5 KPa SURCHARGE
WELD NEW FENCE POSTS TO RETAINING WALL POSTS WHERE APPLICABLE.FENCE 1.8 MAX HEIGHT
WALL HEIGHT H.
ORIGINAL GROUND SLOPE
400
2000 LONG CONCRETE SLEEPERS. REFER TO SLEEPER MANUFACTURER FOR DETAILS.
FREE DRAINING GRANULAR BACK FILL APPROX. 50 - 100THICK
LAY GEOFABRIC (BIDIM A14 OR SIMILAR) AGAINST SOIL CUT FACE
HOT DIP GALVANIZED STEEL POST. REFER TABLE OPPOSITE FOR DETAILS.
H
CUT
FORM 6MM GAP BETWEEN ALL SLEEPERS BY PLACING A PIECE OF F.R.C. SHEET BETWEEN THEM AT ENDS AND MID SPAN.
6.0MM
DOME TOP OF PIER 20MM
CAP 1M WIDTH WITH 100MM CLAY OR PAVING AT 1 IN 100 SLOPE AWAY AT BASE OF WALL
FOOTING DEPTH D
BORED PIERS AT 2030 mm CENTERS NOMINAL. USE N20 CONCRETE TYPICAL . REFER TABLE OPPOSITE FOR DETAILS.
D
100 LEVELING PAD
NOTES:
- CONSULT NEIGHBOR BEFORE COMMENCING CONSTRUCTION.
- THE FOOTING DESIGN ASSUMES A CLAYEY SOIL PROFILE. NOTIFY ENGINEER IF ROCK, SAND, FILL OR SOFT SILT IS ENCOUNTERED DURING EXCAVATION AS PIER DETAILS MAY NEED TO BE CHANGED.
REMOVE EXISTING RETAINING WALLS WHERE APPLICABLE. MAKE SURE EXISTING STRUCTURES NEARBY ARE NOT DISTURBED AND ARE ADEQUATELY SUPPORTED DURING WALL CONSTRUCTION.
- POUR 100mm LEVELING PAD BUT ALLOW CONCRETE TO STIFFEN BEFORE PLACING STEEL POSTS.
- IT IS THE CONTRACTORS RESPONSIBILITY TO ENSURE CONCRETE SLEEPERS ARE SUITABLE FOR THE APPLICATION.
- DURING THE BACKFILLING OPERATION AND IF MACHINERY IS DRIVEN WITHIN 1000mm OF THE WALL,PROVIDE TEMPORARY PROPS TO WALL AND SLEEPERS TO PREVENT DAMAGE.
- WHERE POSSIBLE DO NOT ALLOW WATER TO POND NEAR THE BASE OF THE WALL.
- THESE ILLUSTRATIONS ARE INDICATIVE AND GENERAL IN NATURE AND SHALL NOT BE SCALED FROM. MEASURE ON SITE AND REFER TO SITE SPECIFIC ILLUSTRATIONS AND REPORT FOR ACCURACY.
- REFER ALSO TO DESIGN CALCULATION SHEET CSRW-S1-1
TYPICAL SECTION THROUGH RETAINING WALL
NOT TO SCALE
SUMMARY
wall height (m) | pier diam (mm) | pier depth req (m) | steel post 300 Mpa grade
0.2 | 450 | 0.70 | 150UB14
0.2 | 600 | 0.60 | 150UB14
0.4 | 450 | 0.80 | 150UB14
0.4 | 600 | 0.70 | 150UB14
0.6 | 450 | 0.95 | 150UB14
0.6 | 600 | 0.80 | 150UB14
0.8 | 450 | 1.10 | 150UB14
0.8 | 600 | 0.95 | 150UB14
1 | 450 | 1.30 | 150UB14
1 | 600 | 1.10 | 150UB14
1.2 | 450 | 1.50 | 150UB14
1.2 | 600 | 1.25 | 150UB14
1.4 | 450 | 1.75 | 180UB16
1.4 | 600 | 1.45 | 180UB16
1.6 | 450 | 1.95 | 200UB18
1.6 | 600 | 1.60 | 200UB18
1.8 | 450 | 2.25 | 200UB22
1.8 | 600 | 1.85 | 200UB22
2 | 450 | 2.55 | 200UB22
2 | 600 | 2.10 | 200UB22
A | 24/11/2014 | R.L. | fence location shifted, encroachment allowed | clouded
AMENDMENT | DATE | APPROVED | DETAILS
CONCRETE SLEEPER RETAINING WALL DESIGN- CLAY SOIL PROFILE, RETAINING CUT (TYPE 1)
date. 18/03/08
chkd DAP
Government of South Australia
Department for Communities and Social Inclusion
Housing SA
Maintenance and Technical Services
ADDRESS.....
sign DAP
dwg CSRW-D1-1-A



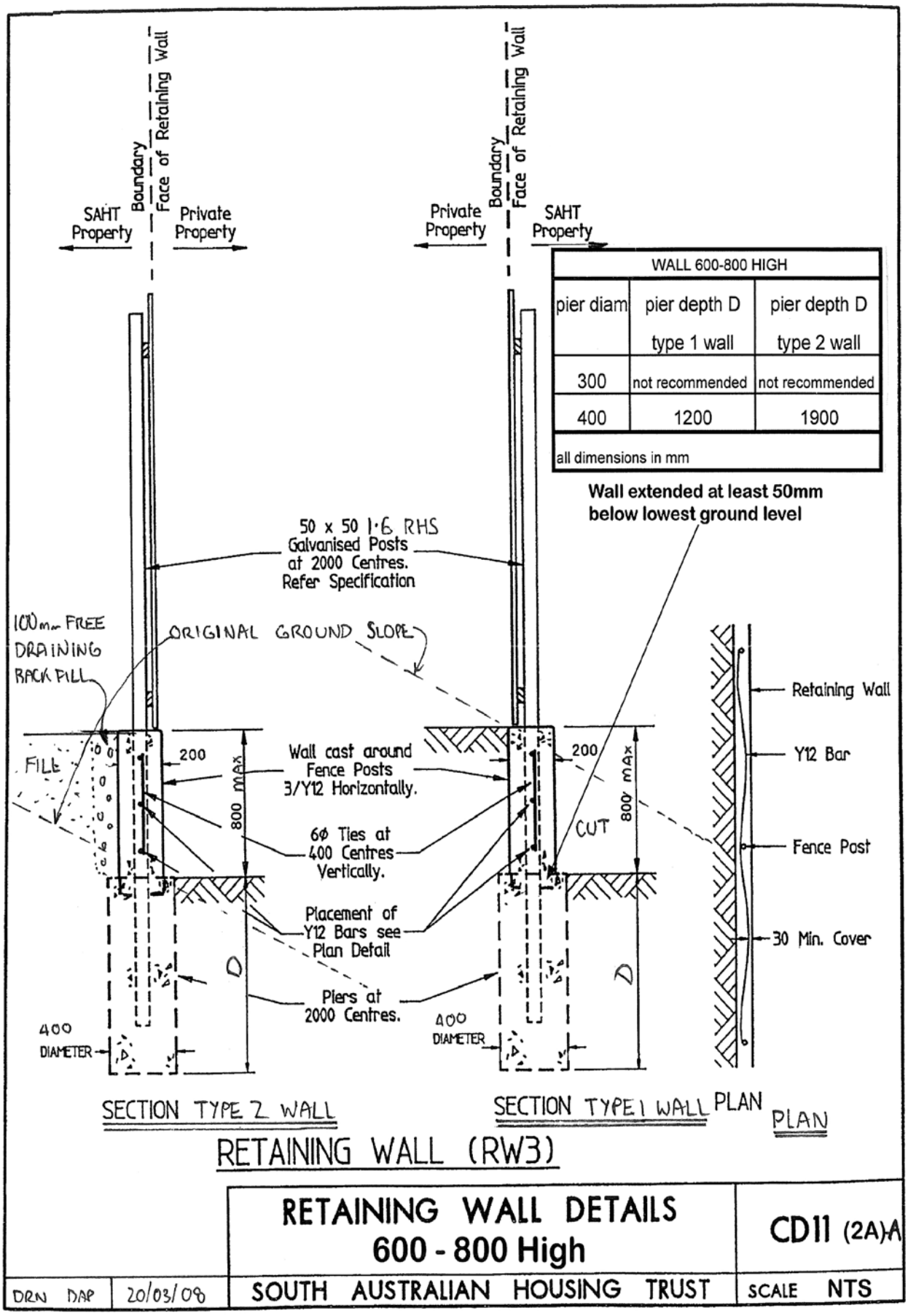
SUMMARY			
wall height (m)	pier diam (mm)	pier depth req (m)	steel post 300 Mpa grade
0.2	450	**1.30**	150UB14
0.2	600	**1.20**	150UB14
0.4	450	**1.40**	150UB14
0.4	600	**1.30**	150UB14
0.6	450	**1.60**	150UB14
0.6	600	**1.45**	150UB14
0.8	450	**1.80**	150UB14
0.8	600	**1.60**	150UB14
1	450	**1.95**	150UB14
1	600	**1.75**	150UB14
1.2	450	**2.20**	150UB14
1.2	600	**1.95**	150UB14
1.4	450	**2.45**	180UB16
1.4	600	**2.15**	180UB16
1.6	450	**2.70**	200UB18
1.6	600	**2.30**	200UB18
1.8	450	**3.00**	200UB22
1.8	600	**2.55**	200UB22
2	450	**3.35**	200UB22
2	600	**2.85**	200UB22

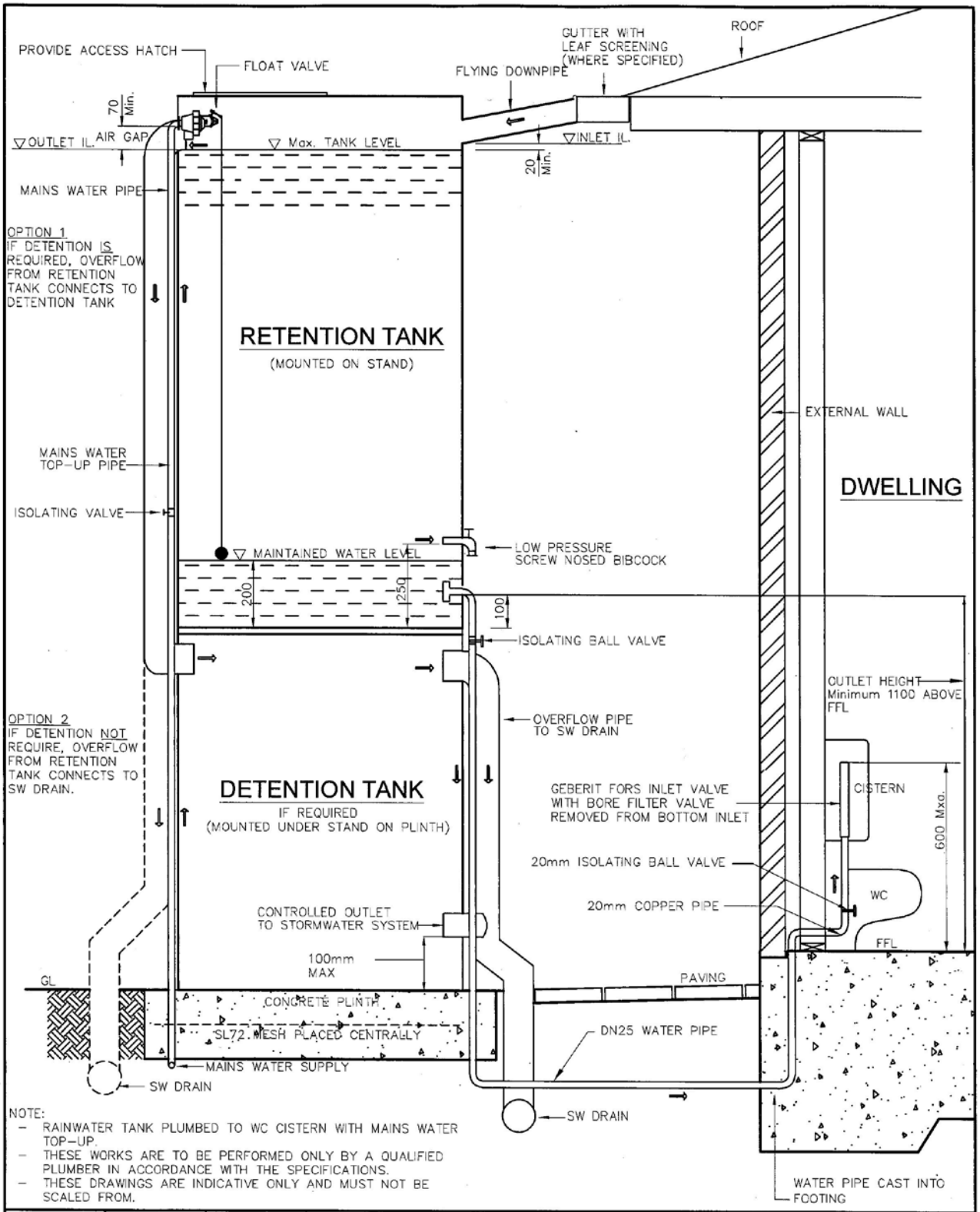
SITE CONCRETE SLEEPER RETAINING WALL DESIGN- CLAY SOIL PROFILE, RETAINING FILL (TYPE 2)		date. 18/03/2008	chkd DAP
Government of South Australia Department for Families and Communities Housing SA Maintenance and Technical Services	ADDRESS / SITE.....	sign DAP	dwg CSRW-D2-1



RETAINING WALL (RW3)

RETAINING WALL DETAILS	CD11 (2)
SOUTH AUSTRALIAN HOUSING TRUST	SCALE NTS


SAHT Property
Boundary
Face of Retaining Wall
Private Property
Private Property
Boundary
Face of Retaining Wall
SAHT Property
WALL 600-800 HIGH
pier diam
pier depth D type 1 wall
pier depth D type 2 wall
300
not recommended
not recommended
400
1200
1900
all dimensions in mm
Wall extended at least 50mm below lowest ground level
50 x 50 1·6 RHS Galvanised Posts at 2000 Centres. Refer Specification
100mm FREE DRAINING BACK FILL
ORIGINAL GROUND SLOPE
FILL
200
800 MAX
Wall cast around Fence Posts 3/Y12 Horizontally.
6ø Ties at 400 Centres Vertically.
Placement of Y12 Bars see Plan Detail
Piers at 2000 Centres.
D
400 DIAMETER
CUT
Retaining Wall
Y12 Bar
Fence Post
30 Min. Cover
SECTION TYPE 2 WALL
SECTION TYPE 1 WALL
PLAN
PLAN
RETAINING WALL (RW3)
RETAINING WALL DETAILS
600 - 800 High
CD11 (2A)A
DRN DAP
20/03/08
SOUTH AUSTRALIAN HOUSING TRUST
SCALE NTS



Revision	Date	By
C	21/08/18	SLC
B	06/08/09	DAP
A	28/06/05	DAP

TITLE **RAINWATER RETENTION AND DETENTION TANK DETAIL**

SOUTH AUSTRALIAN HOUSING AUTHORITY

NOT TO SCALE

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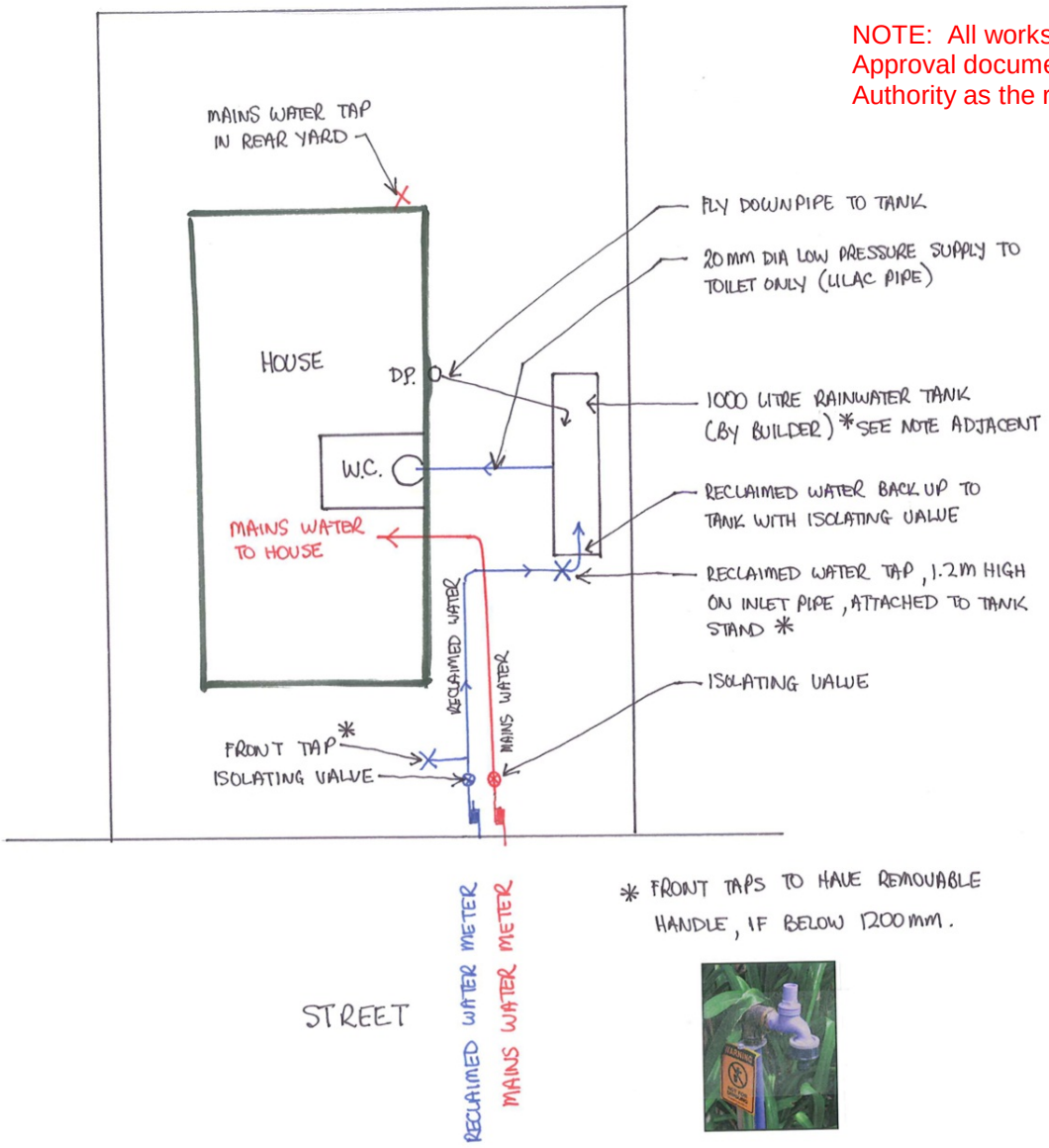
DWG SKO1-C

RECLAIMED WATER CONNECTION DETAILS — FOR EXISTING CONNECTIONS

NOTE: All works must be carried out in accordance with Development Approval documentation and the directions from the Local Government Authority as the recognised local Water Industry



* FRONT TAPS TO HAVE REMOVABLE HANDLE, IF BELOW 1200 MM.

NOTES:

ALL WORK TO BE INSTALLED TO THE APPROVAL OF S.A. WATER.

SIGNAGE ON RECLAIMED WATER SYSTEM TO BE IN ACCORDANCE WITH S.A. WATER REQUIREMENTS

NO TAPS TO BE INSTALLED IN THE RAINWATER TANK.

S.A. WATER TO ADVISE WHEN THE RECLAIMED WATER IS AVAILABLE.

IN NATIONAL BUILDING PROJECTS, 2 LINKED 1000 LITRE TANKS DRAINING 80% OF THE ROOF SHALL BE INSTALLED IN ACCORDANCE WITH SAHT. DETAIL DRAWINGS SK01B AND SK02.

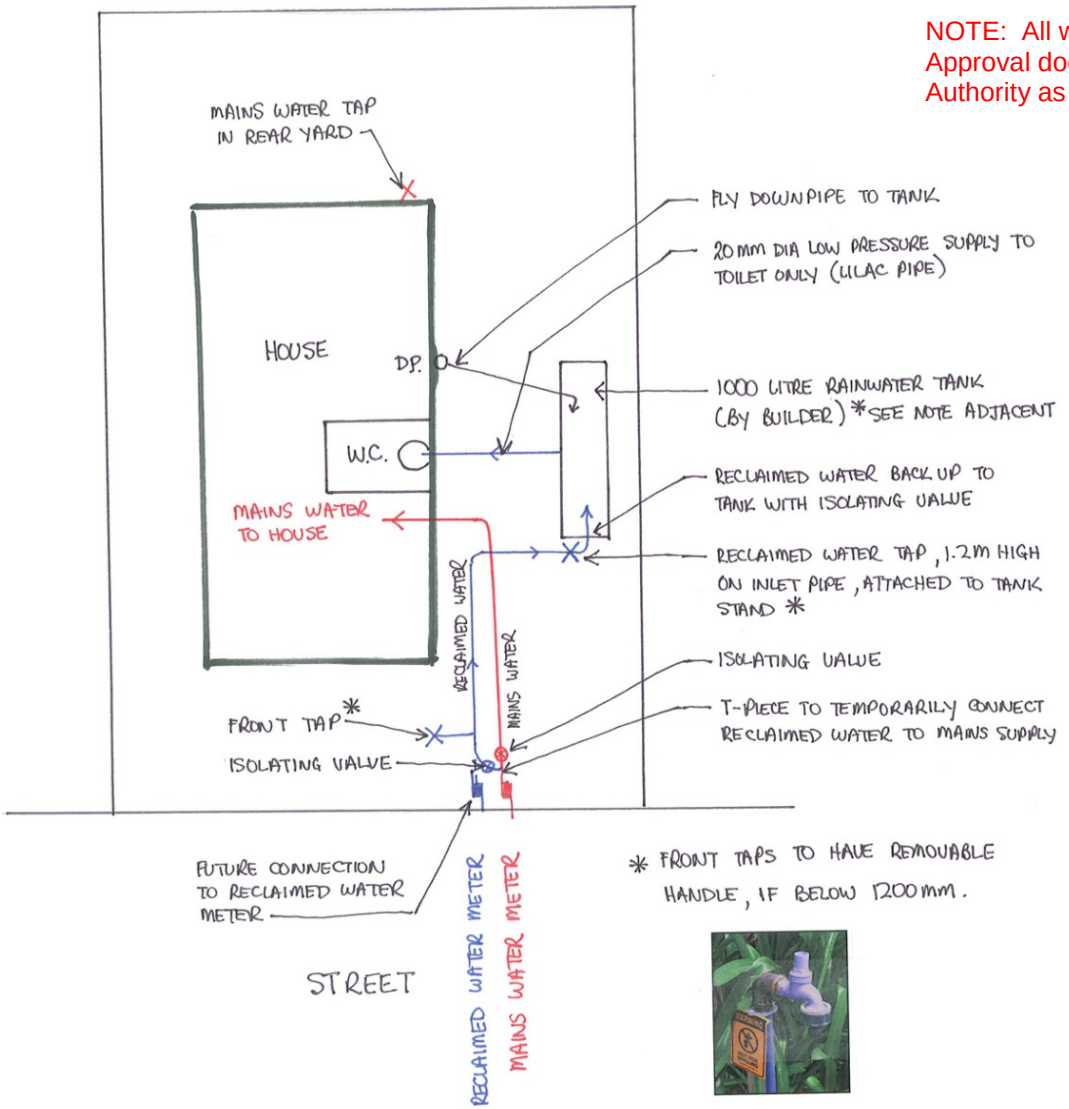
"RECYCLED WATER - DO NOT DRINK"

SIGNAGE ON STORAGE TANKS, TOILET CISTERN INLET VALVES AND ADJACENT TO TAPS

AUGUST 2013

RECLAIMED WATER CONNECTION DETAILS — FOR FUTURE CONNECTIONS

NOTE: All works must be carried out in accordance with Development Approval documentation and the directions from the Local Government Authority as the recognised local Water Industry



* FRONT TAPS TO HAVE REMOVABLE HANDLE, IF BELOW 1200 MM.

NOTES:

ALL WORK TO BE INSTALLED TO THE APPROVAL OF S.A. WATER.

SIGNAGE ON RECLAIMED WATER SYSTEM TO BE IN ACCORDANCE WITH S.A. WATER REQUIREMENTS

NO TAPS TO BE INSTALLED IN THE RAINWATER TANK.

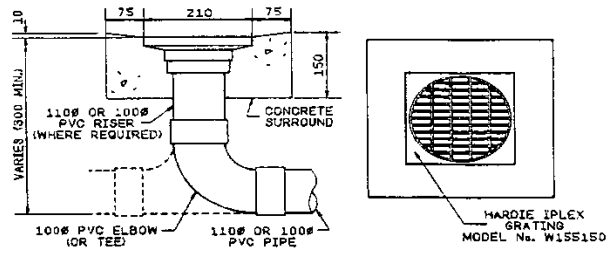
S.A. WATER TO ADVISE WHEN THE RECLAIMED WATER IS AVAILABLE.

IN NATIONAL BUILDING PROJECTS, 2 LINKED 1000 LITRE TANKS DRAINING 80% OF THE ROOF SHALL BE INSTALLED IN ACCORDANCE WITH SAHT. DETAIL DRAWINGS SK01B AND SK02.

"RECYCLED WATER - DO NOT DRINK"

SIGNAGE ON STORAGE TANKS, TOILET CISTERN INLET VALVES AND ADJACENT TO TAPS

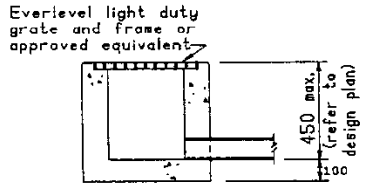
AUGUST 2013



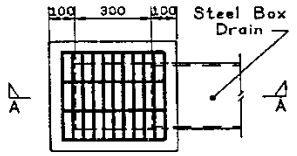
SECTION PLAN

GRATED INLET (GI1)

SCALE 1:10

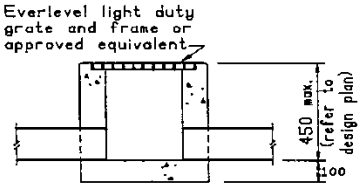


SECTION A-A

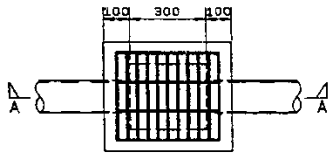


PLAN

GRATED INLET (GI2)

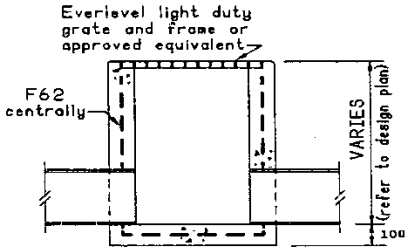


SECTION A-A

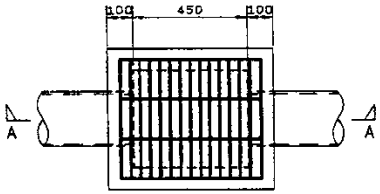


PLAN

GRATED INLET (GI3)



SECTION A-A

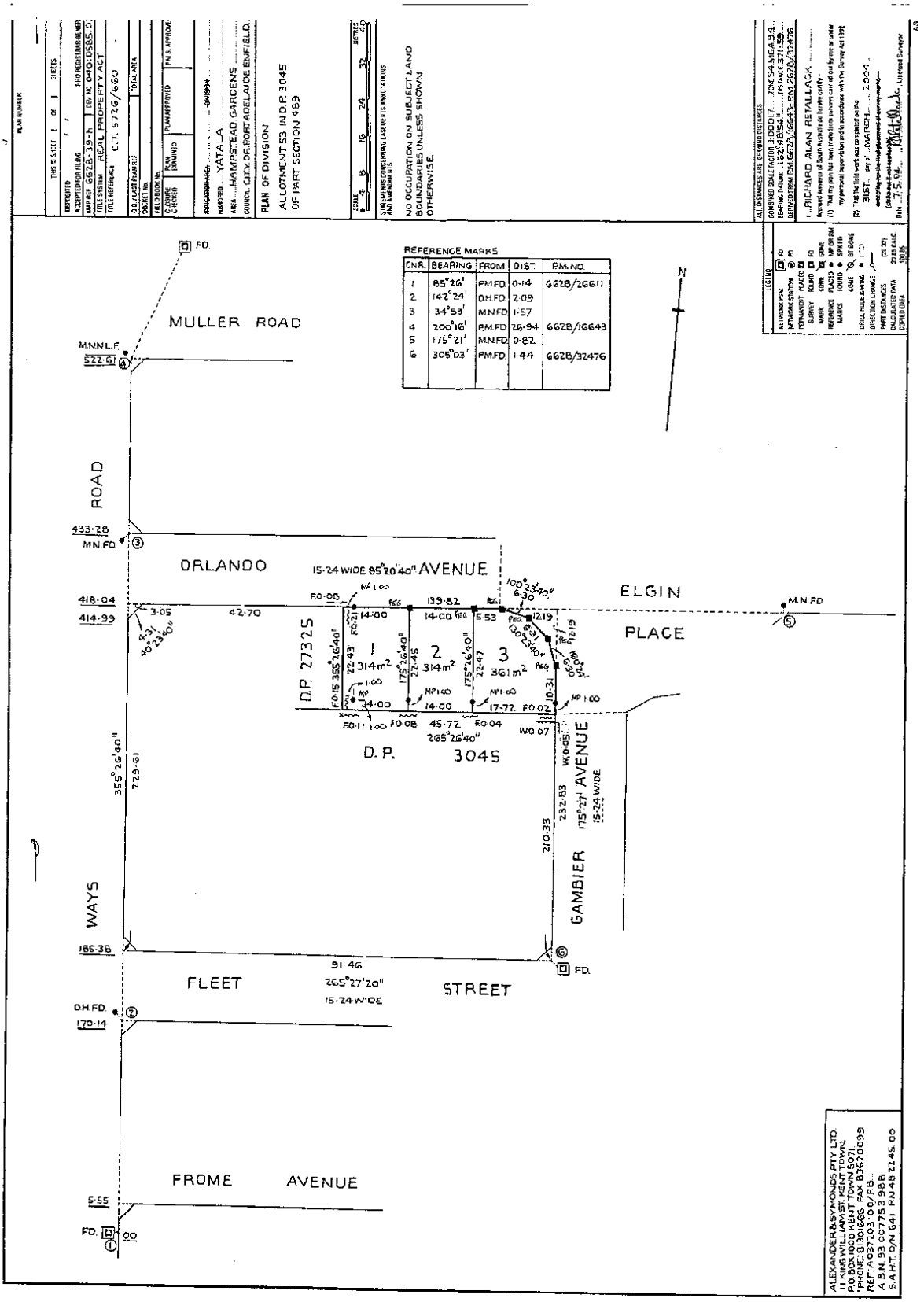


PLAN

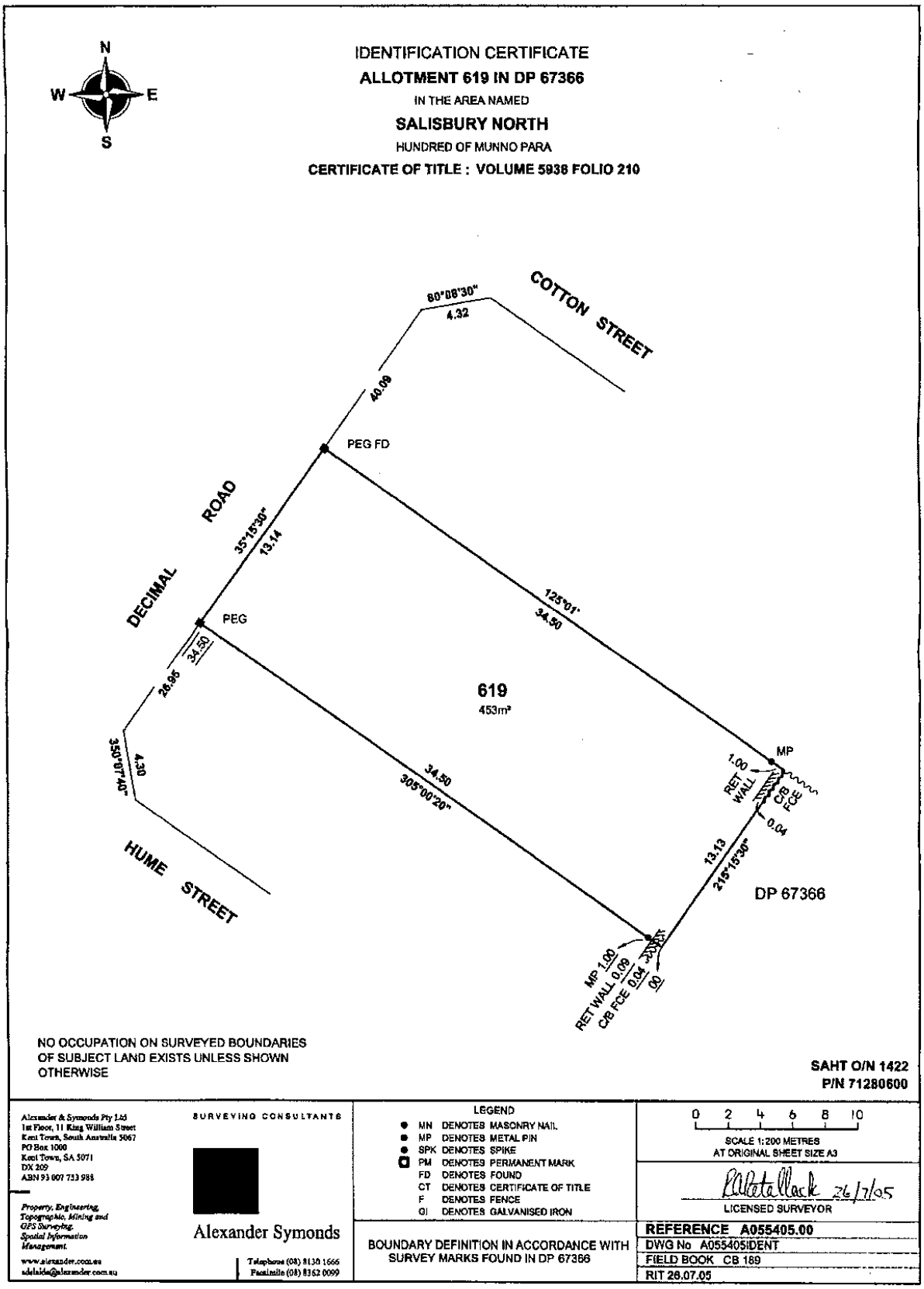
GRATED INLET (GI4)

	MASTER	GRATED INLET DETAILS (light duty)	CD5
DRAWN			
CHECKED			
DATE	15/11/91	SOUTH AUSTRALIAN HOUSING TRUST	SCALE NTS

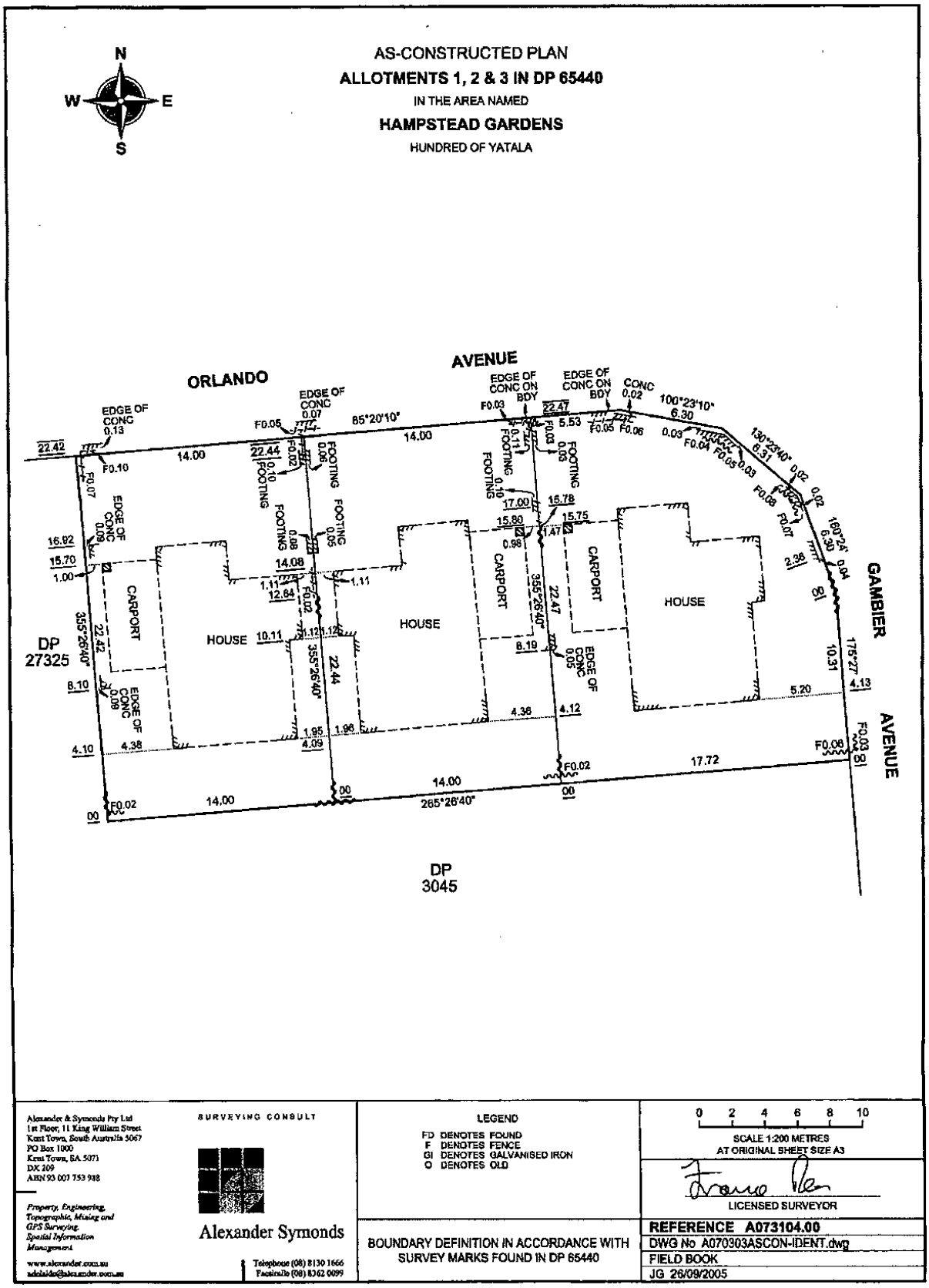
Typical Pegging Plan

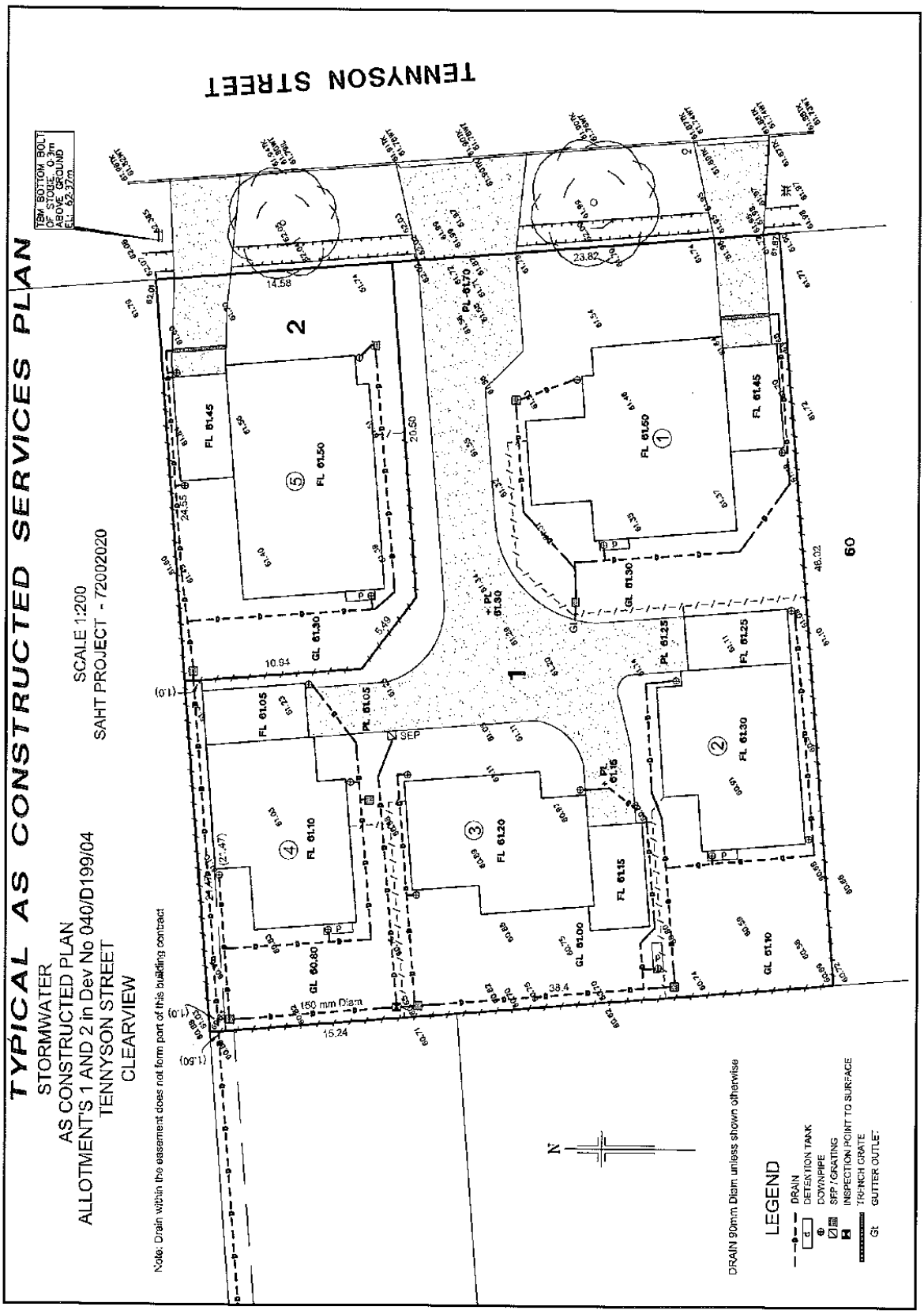


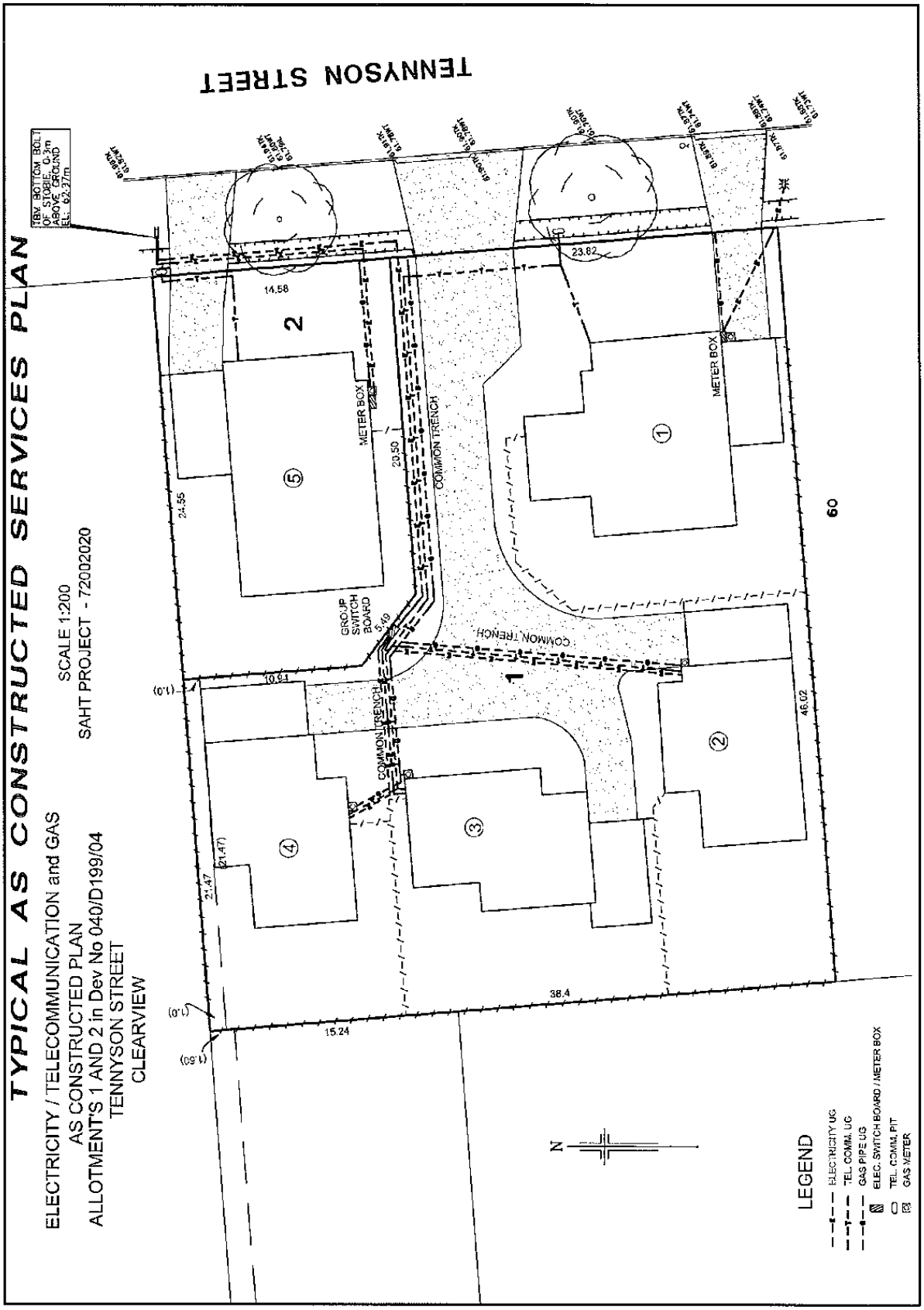
Typical Identification Survey

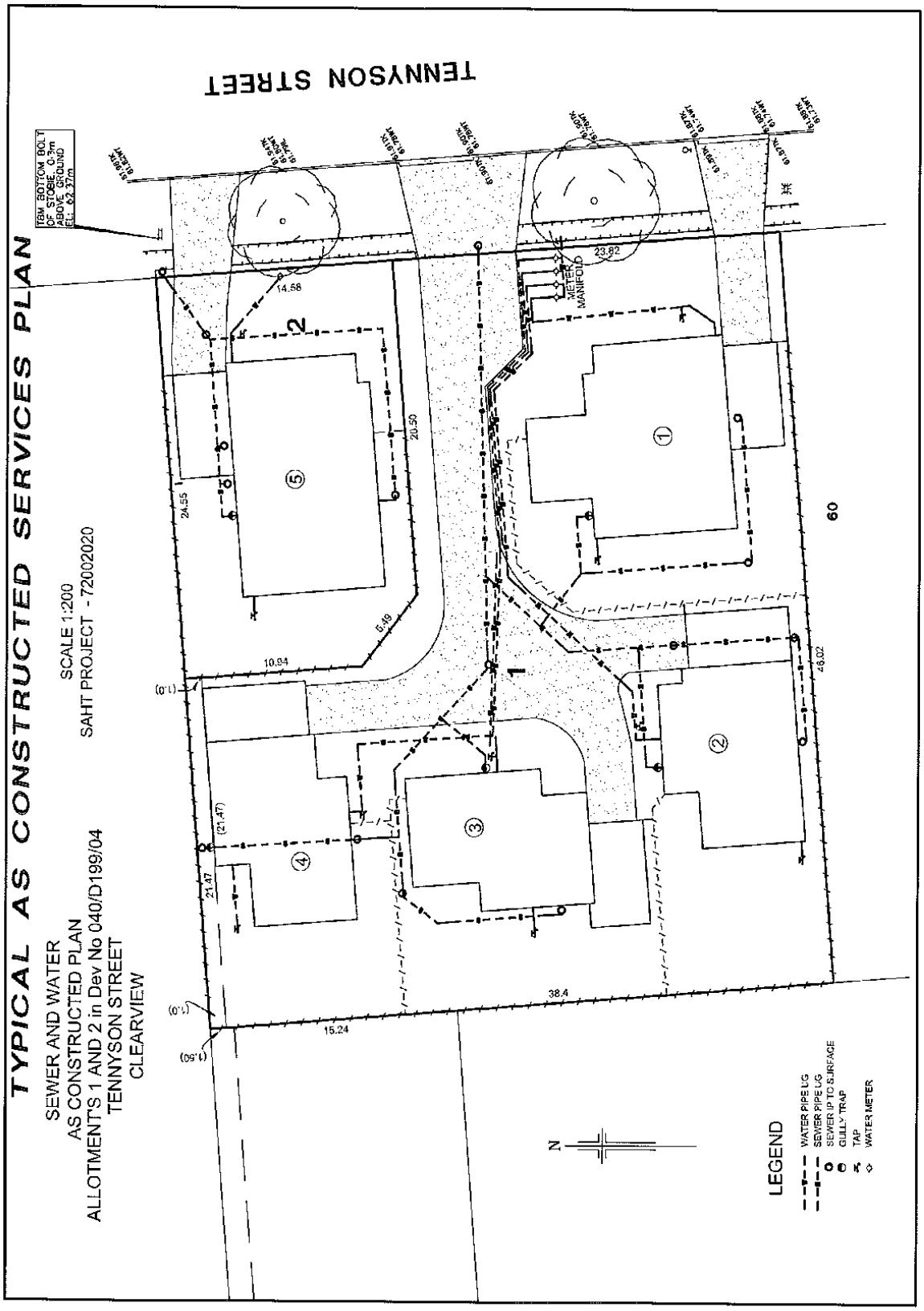


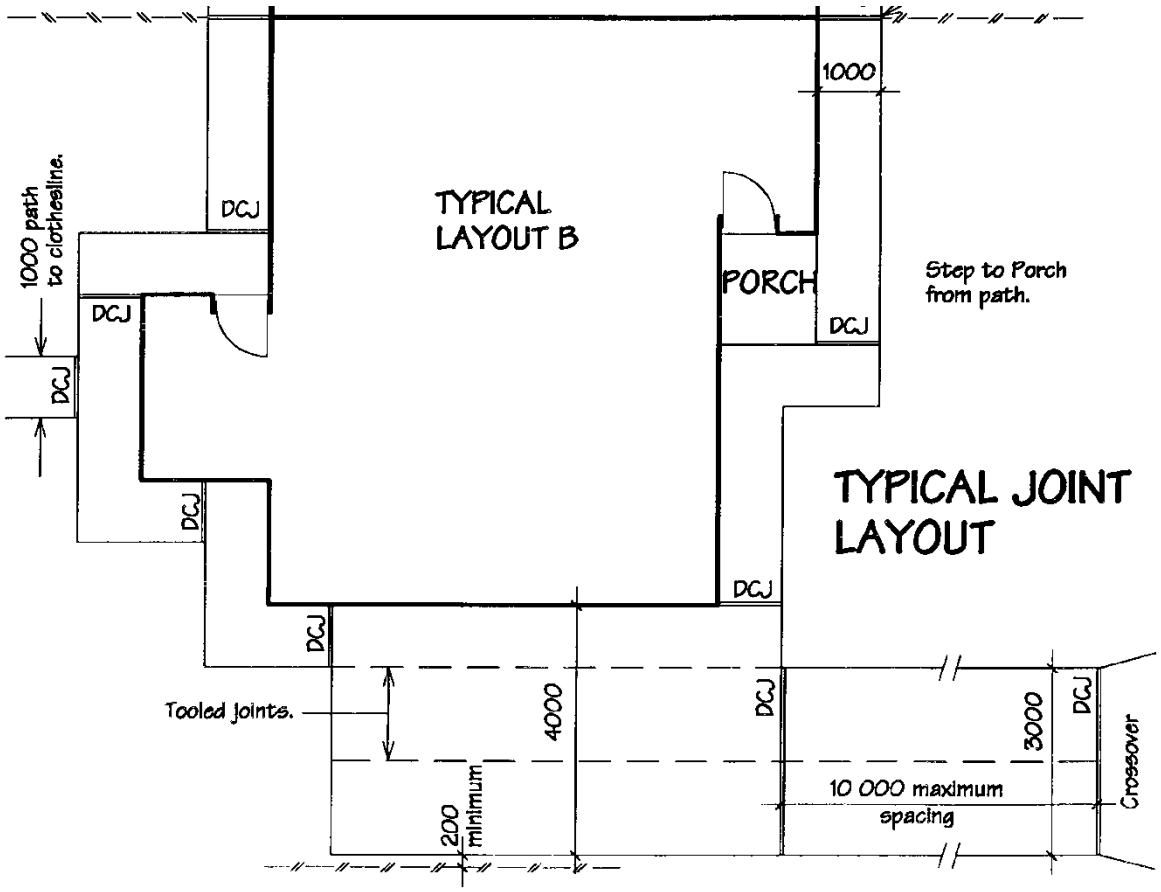
Typical “As Constructed” Identification Survey




TYPICAL AS CONSTRUCTED SERVICES PLAN
STORMWATER
AS CONSTRUCTED PLAN
ALLOTMENT'S 1 AND 2 in Dev No 040/D199/04
TENNYSON STREET
CLEARVIEW
SCALE 1:200
SAHT PROJECT - 72002020
Note: Drain within the easement does not form part of this building contract
TENNYSON STREET
TBM BOTTOM BOLT OF STOBE, 0.3m ABOVE GROUND EL: 62.37m
150 mm Diam
DRAIN 90mm Diam unless shown otherwise
LEGEND
DRAIN
DETENTION TANK
DOWNPIPE
SEP / GRATING
INSPECTION POINT TO SURFACE
TRENCH GRATE
GUTTER OUTLET

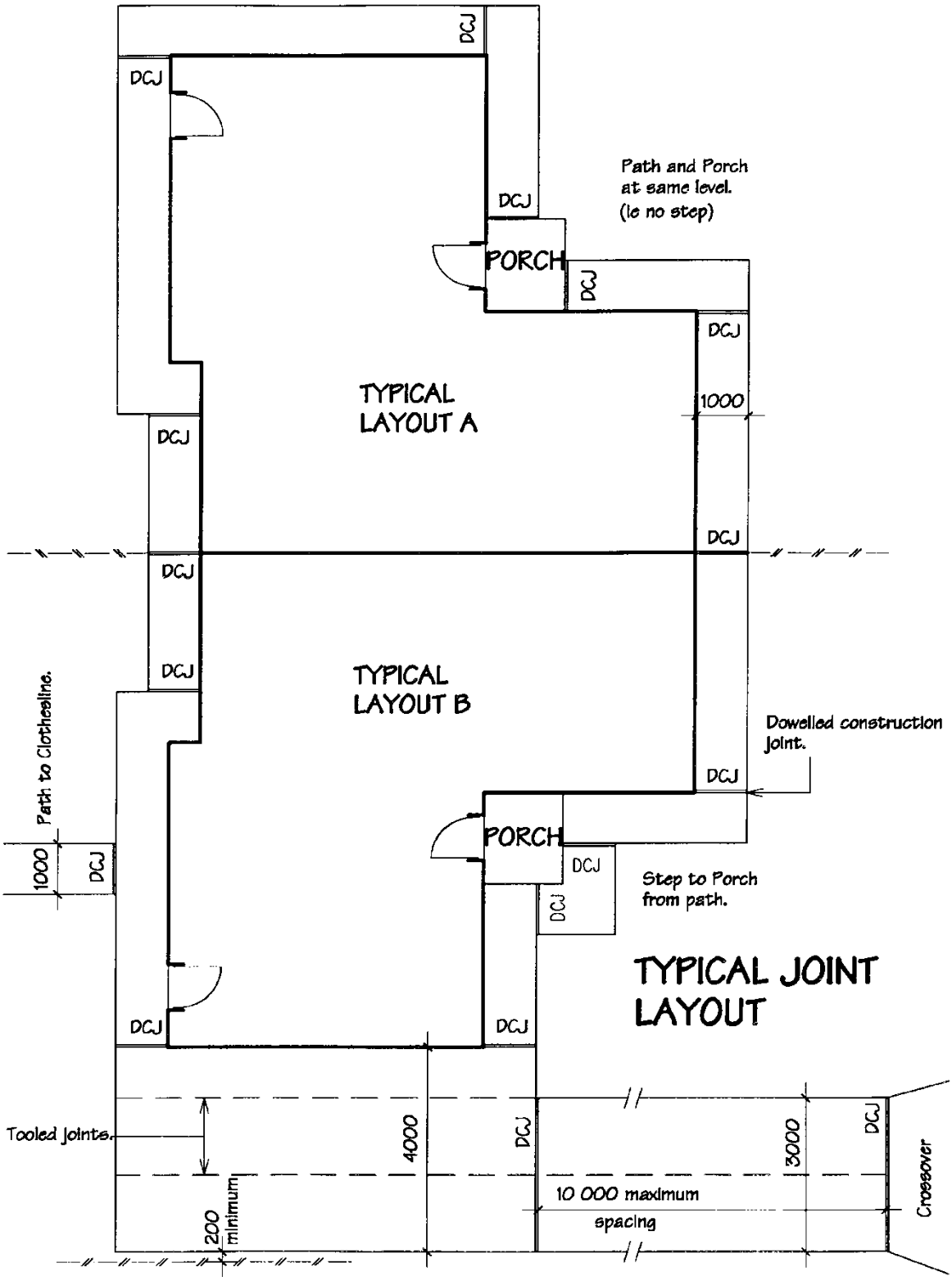

TYPICAL AS CONSTRUCTED SERVICES PLAN
ELECTRICITY / TELECOMMUNICATION and GAS
AS CONSTRUCTED PLAN
ALLOTMENT'S 1 AND 2 in Dev No 040/D199/04
TENNYSON STREET
CLEARVIEW
SCALE 1:200
SAHT PROJECT - 72002020
TENNYSON STREET
TBM BOTTOM BOLT OF STOBIE, 0.3m ABOVE GROUND EL: 62.37m
METER BOX
COMMON TRENCH
GROUP SWITCH BOARD
14.58
23.82
20.50
24.55
5.49
10.91
46.02
21.47
38.4
15.24
60
LEGEND
ELECTRICITY UG
TEL COMM. UG
GAS PIPE UG
ELEC. SWITCH BOARD / METER BOX
TEL. COMM. PIT
GAS METER


TYPICAL AS CONSTRUCTED SERVICES PLAN
SEWER AND WATER
AS CONSTRUCTED PLAN
ALLOTMENT'S 1 AND 2 in Dev No 040/D199/04
TENNYSON STREET
CLEARVIEW
SCALE 1:200
SAHT PROJECT - 72002020
TENNYSON STREET
TBM BOTTOM BOLT OF STOBIE, 0.3m ABOVE GROUND EL: 62.37m
METER MANIFOLD
LEGEND
WATER PIPE UG
SEWER PIPE UG
SEWER IP TO SURFACE
GULLY TRAP
TAP
WATER METER
N



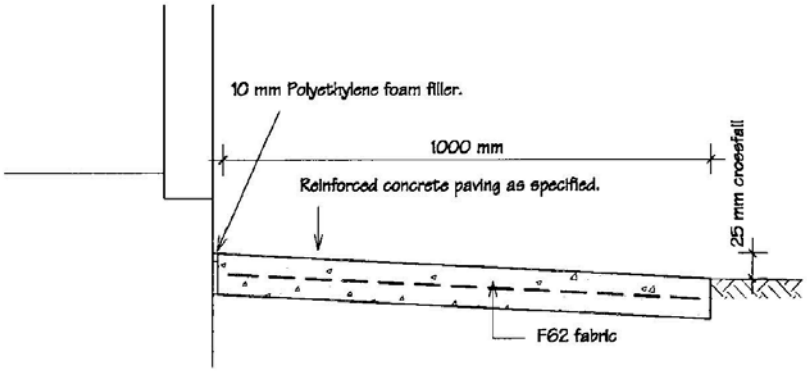
SOUTH AUSTRALIAN HOUSING TRUST

1-9-98

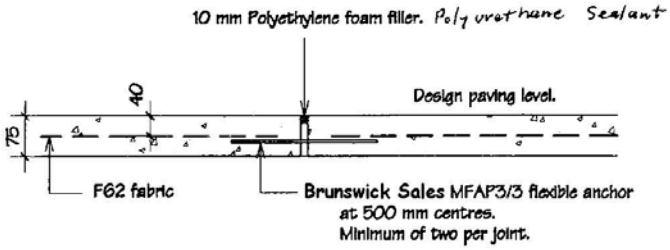


SOUTH AUSTRALIAN
HOUSING TRUST

issue date
1-9-98



PATH DETAIL

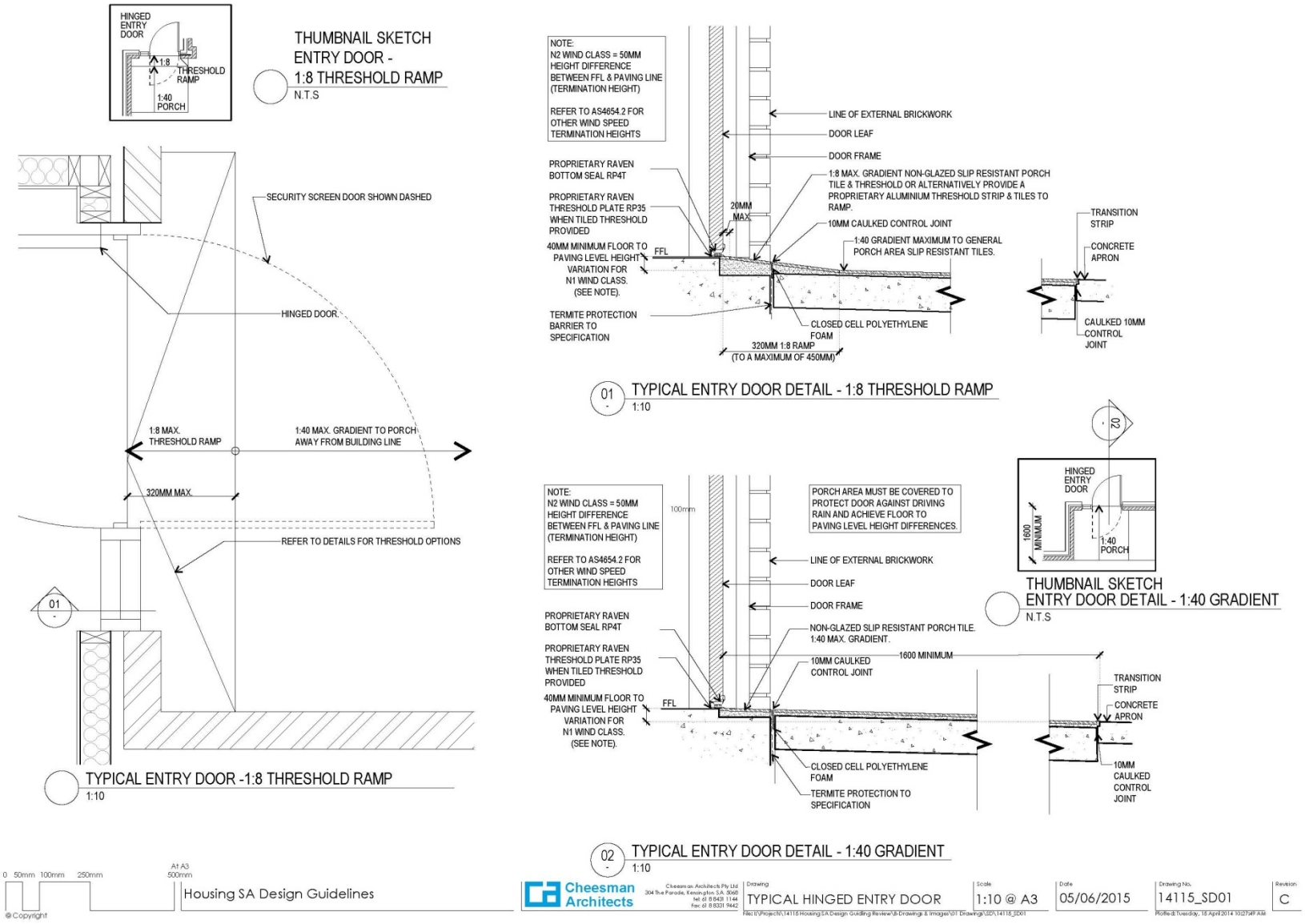


DOWELLED CONSTRUCTION JOINT DETAIL

NOTE For 100 mm thick driveways with F62 fabric
use Brunswick Sales MFAP3/3 anchors at 300 mm centres

SOUTH AUSTRALIAN
HOUSING TRUST

1-9-98


HINGED ENTRY DOOR
1:8 THRESHOLD RAMP
1:40 PORCH
THUMBNAIL SKETCH
ENTRY DOOR - 1:8 THRESHOLD RAMP
N.T.S
SECURITY SCREEN DOOR SHOWN DASHED
HINGED DOOR.
1:8 MAX. THRESHOLD RAMP
1:40 MAX. GRADIENT TO PORCH AWAY FROM BUILDING LINE
320MM MAX.
REFER TO DETAILS FOR THRESHOLD OPTIONS
01
TYPICAL ENTRY DOOR -1:8 THRESHOLD RAMP
1:10
NOTE:
N2 WIND CLASS = 50MM HEIGHT DIFFERENCE BETWEEN FFL & PAVING LINE (TERMINATION HEIGHT)
REFER TO AS4654.2 FOR OTHER WIND SPEED TERMINATION HEIGHTS
LINE OF EXTERNAL BRICKWORK
DOOR LEAF
DOOR FRAME
PROPRIETARY RAVEN BOTTOM SEAL RP4T
PROPRIETARY RAVEN THRESHOLD PLATE RP35 WHEN TILED THRESHOLD PROVIDED
1:8 MAX. GRADIENT NON-GLAZED SLIP RESISTANT PORCH TILE & THRESHOLD OR ALTERNATIVELY PROVIDE A PROPRIETARY ALUMINIUM THRESHOLD STRIP & TILES TO RAMP.
20MM MAX.
10MM CAULKED CONTROL JOINT
1:40 GRADIENT MAXIMUM TO GENERAL PORCH AREA SLIP RESISTANT TILES.
40MM MINIMUM FLOOR TO PAVING LEVEL HEIGHT VARIATION FOR N1 WIND CLASS. (SEE NOTE).
FFL
TERMITE PROTECTION BARRIER TO SPECIFICATION
CLOSED CELL POLYETHYLENE FOAM
320MM 1:8 RAMP (TO A MAXIMUM OF 450MM)
TRANSITION STRIP
CONCRETE APRON
CAULKED 10MM CONTROL JOINT
01
TYPICAL ENTRY DOOR DETAIL - 1:8 THRESHOLD RAMP
1:10
02
HINGED ENTRY DOOR
1600 MINIMUM
1:40 PORCH
THUMBNAIL SKETCH
ENTRY DOOR DETAIL - 1:40 GRADIENT
N.T.S
NOTE:
N2 WIND CLASS = 50MM HEIGHT DIFFERENCE BETWEEN FFL & PAVING LINE (TERMINATION HEIGHT)
REFER TO AS4654.2 FOR OTHER WIND SPEED TERMINATION HEIGHTS
100mm
PORCH AREA MUST BE COVERED TO PROTECT DOOR AGAINST DRIVING RAIN AND ACHIEVE FLOOR TO PAVING LEVEL HEIGHT DIFFERENCES.
LINE OF EXTERNAL BRICKWORK
DOOR LEAF
DOOR FRAME
PROPRIETARY RAVEN BOTTOM SEAL RP4T
NON-GLAZED SLIP RESISTANT PORCH TILE. 1:40 MAX. GRADIENT.
1600 MINIMUM
PROPRIETARY RAVEN THRESHOLD PLATE RP35 WHEN TILED THRESHOLD PROVIDED
10MM CAULKED CONTROL JOINT
40MM MINIMUM FLOOR TO PAVING LEVEL HEIGHT VARIATION FOR N1 WIND CLASS. (SEE NOTE).
FFL
CLOSED CELL POLYETHYLENE FOAM
TERMITE PROTECTION TO SPECIFICATION
TRANSITION STRIP
CONCRETE APRON
10MM CAULKED CONTROL JOINT
02
TYPICAL ENTRY DOOR DETAIL - 1:40 GRADIENT
1:10
0 50mm 100mm 250mm
At A3 500mm
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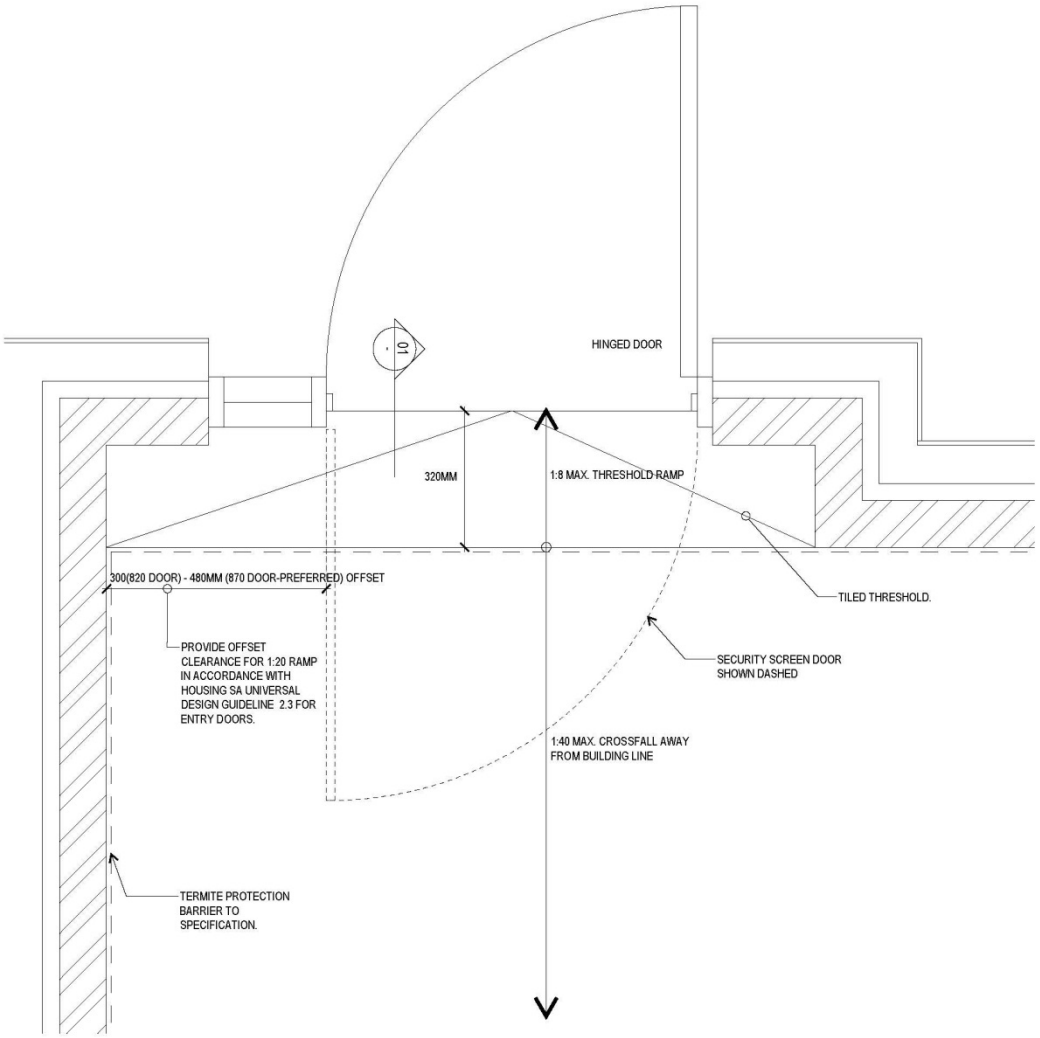
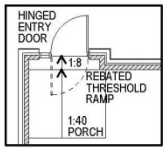
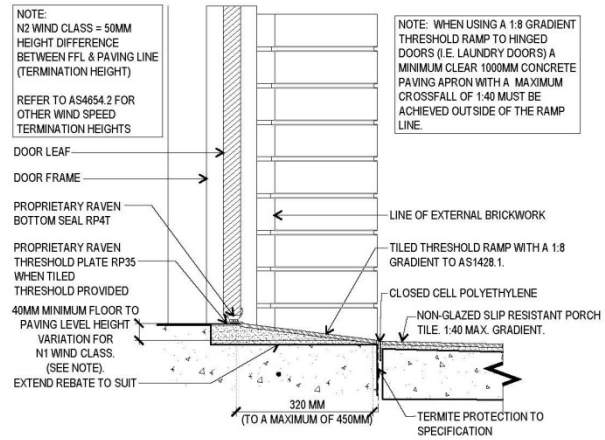
Cheesman Architects
Cheesman Architects Pty Ltd
304 The Parade, Kensington S.A. 5068
tel. 61 8 8431 1144
fax. 61 8 8331 9442
Drawing
TYPICAL HINGED ENTRY DOOR
Scale
1:10 @ A3
Date
05/06/2015
Drawing No.
14115_SD01
Revision
C



TYPICAL HINGED DOOR -1:8 REBATED THRESHOLD RAMP
1:10



THUMBNAIL SKETCH HINGED DOOR - 1:8 REBATED THRESHOLD RAMP
N.T.S



01 - TYPICAL HINGED DOOR DETAIL - 1:8 REBATED THRESHOLD RAMP
1:10

0 50mm 100mm 250mm A1 A3 500mm

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Drawing	Scale	Date	Drawing No.	Revision
TYPICAL HINGED ENTRY DOOR	1:10 @ A3	05/06/2015	14115_SD02	C

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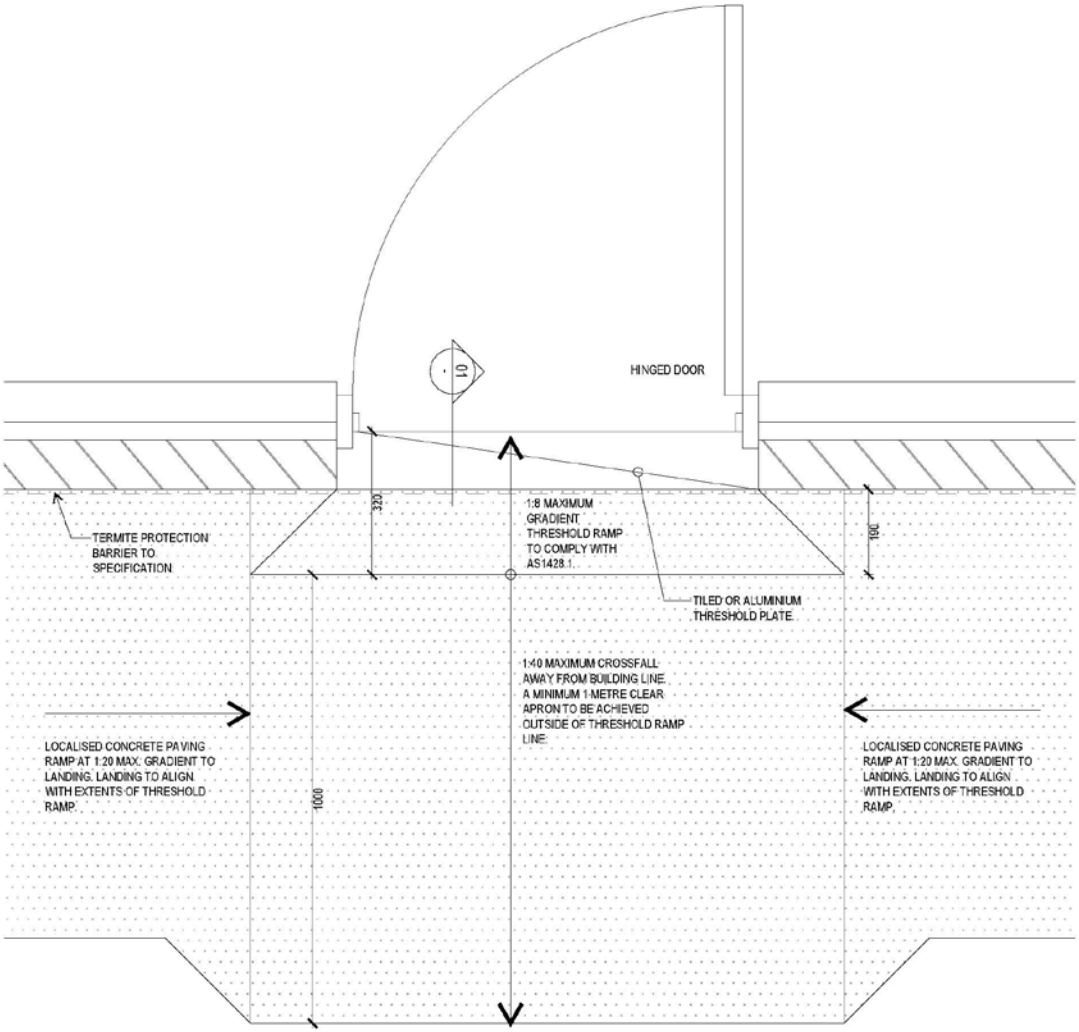
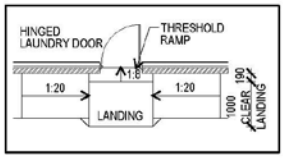
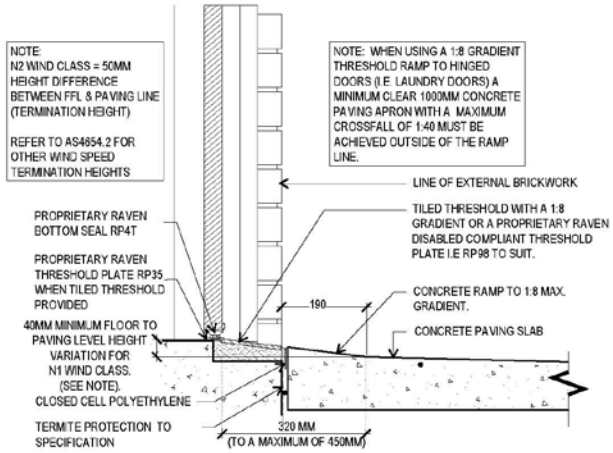


TYPICAL HINGED DOOR -1:8 THRESHOLD RAMP
1:10



THUMBNAIL SKETCH
HINGED DOOR -1:8 THRESHOLD RAMP
N.T.S



01 TYPICAL HINGED DOOR DETAIL - 1:8 THRESHOLD RAMP
1:10

DETAIL APPLICABLE TO LAUNDRY DOORS AND CARPORT ENTRANCES

0 50mm 100mm 250mm A1 A3 500mm
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Cheesman Architects
Cheesman Architects Pty Ltd
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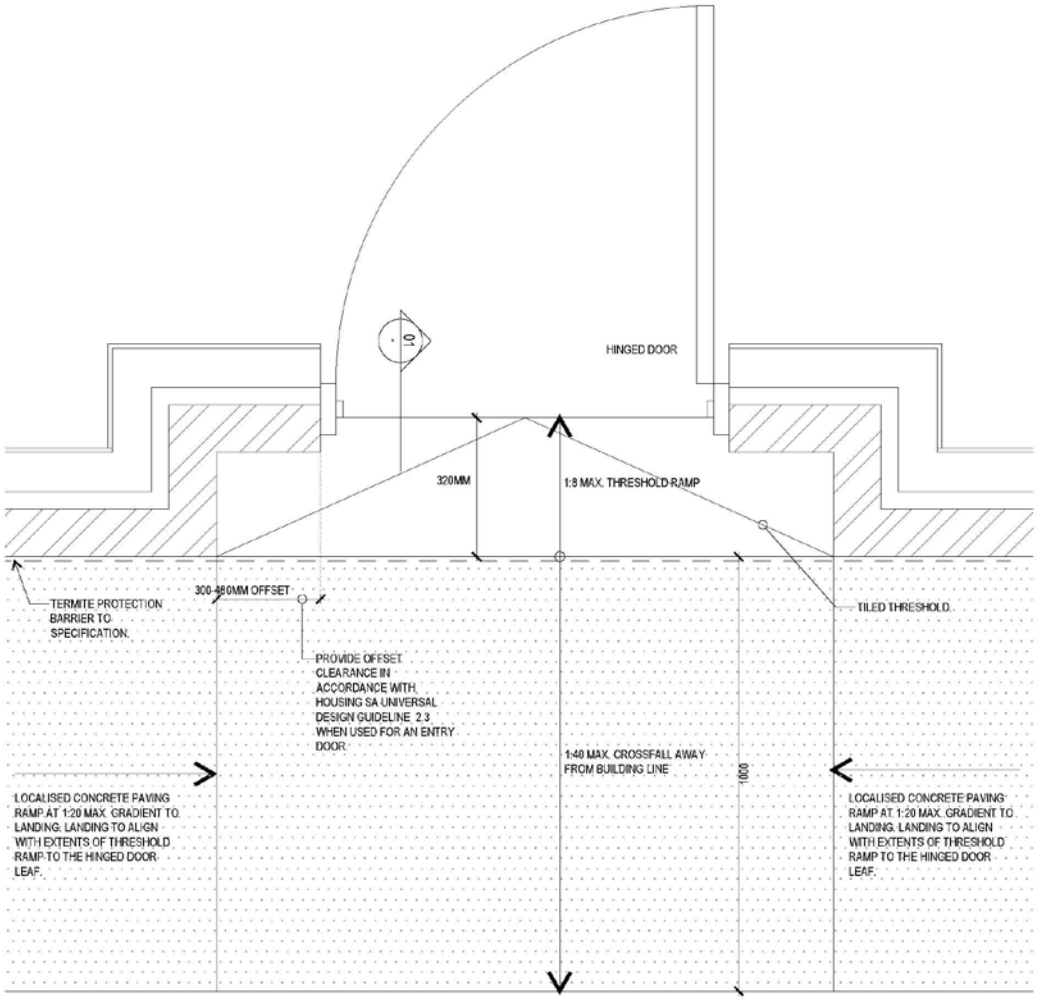
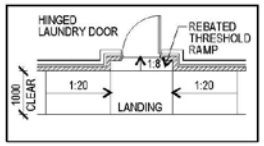
fax: 61 8 8331 9442

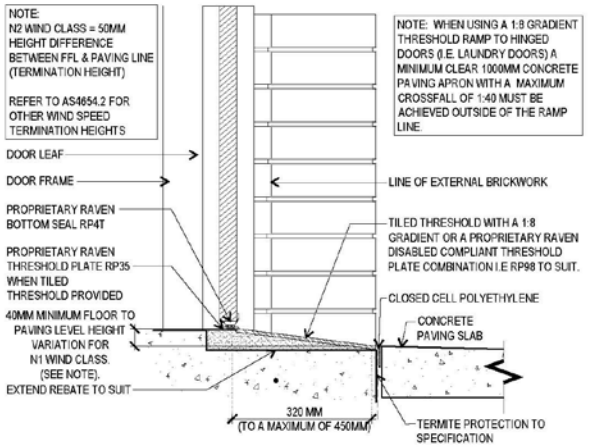
Drawing	Scale	Date	Drawing No.	Revision
TYPICAL HINGED DOOR	1:10 @ A3	05/06/2015	14115_SD03	C



TYPICAL HINGED DOOR -1:8 REBATED THRESHOLD RAMP
1:10



THUMBNAIL SKETCH
HINGED DOOR -1:8 REBATED THRESHOLD RAMP
N.T.S



01 - TYPICAL HINGED DOOR DETAIL - 1:8 REBATED THRESHOLD RAMP
1:10

DETAIL APPLICABLE TO LAUNDRY DOORS AND CARPORT ENTRANCES

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0 50mm 100mm 250mm
A1 A3
500mm

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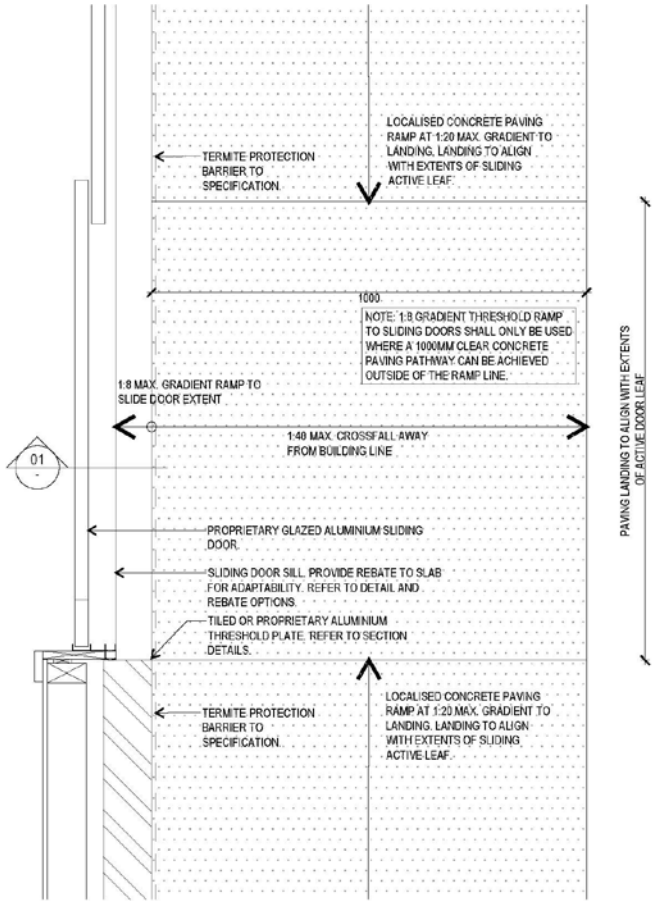
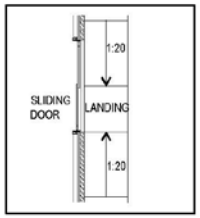
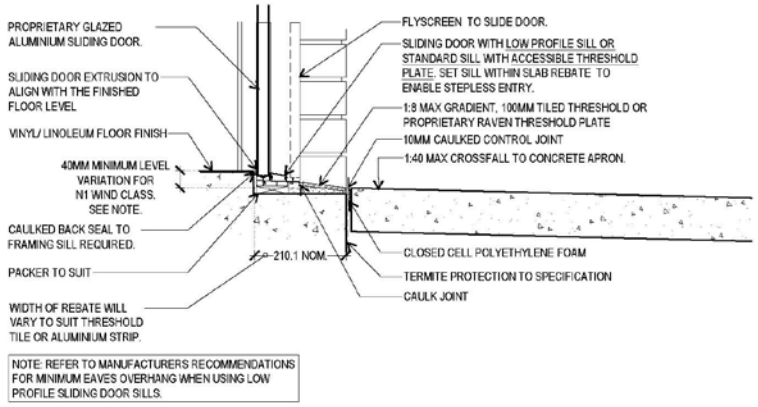
Drawing: TYPICAL HINGED DOOR
Scale: 1:10 @ A3
Date: 05/06/2014
Drawing No.: 14115_SD04
Revision: C



TYPICAL SLIDING DOOR -1:20 RAMP
1:10



THUMBNAIL SKETCH
SLIDING DOOR - 1:20 RAMP
N.T.S



01 TYPICAL SLIDING DOOR DETAIL - 1:20 RAMP
1:10

0 50mm 100mm 250mm
At A3 500mm
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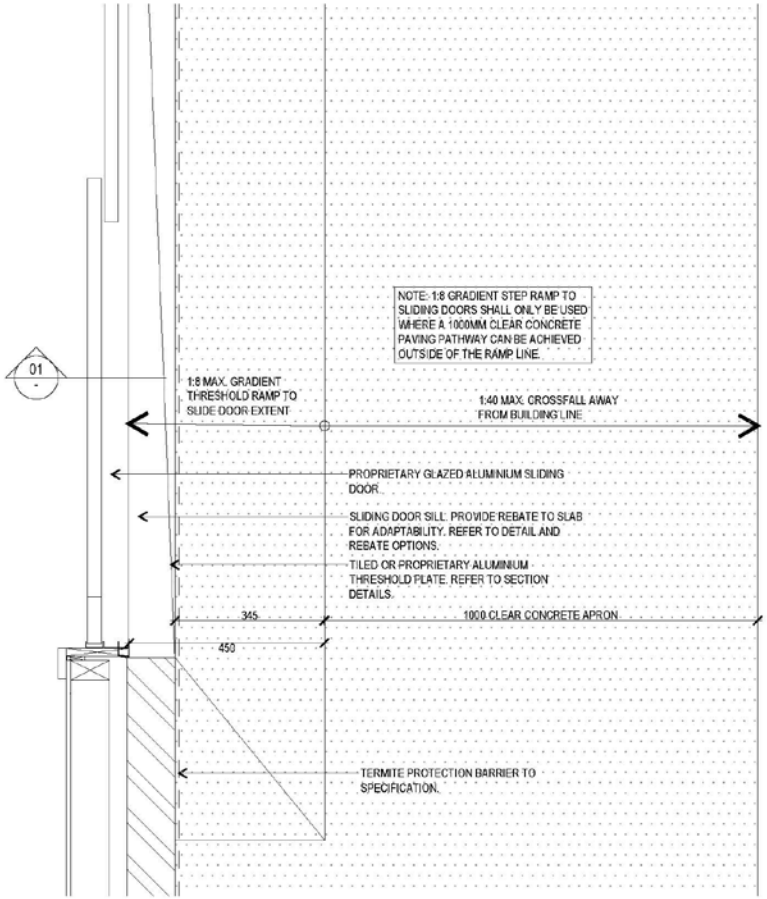
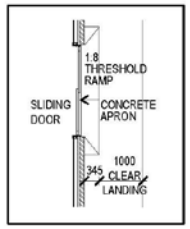
Fax: (08) 8031 9442

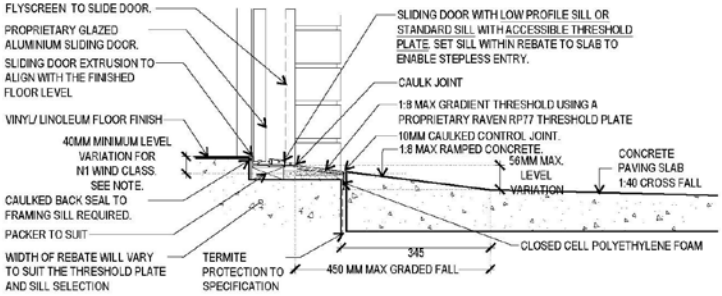
Drawing	Scale	Date	Drawing No.	Revision
TYPICAL SLIDING DOORS	1:10 @ A3	05/06/2014	14115_SD05	C



TYPICAL SLIDING DOOR -1:8 THRESHOLD RAMP
1:10



THUMBNAIL SKETCH SLIDING DOOR - 1:8 THRESHOLD RAMP
N.T.S



01 - TYPICAL SLIDING DOOR DETAIL - 1:8 THRESHOLD RAMP
1:10

0 50mm 100mm 250mm
A1 A3 500mm
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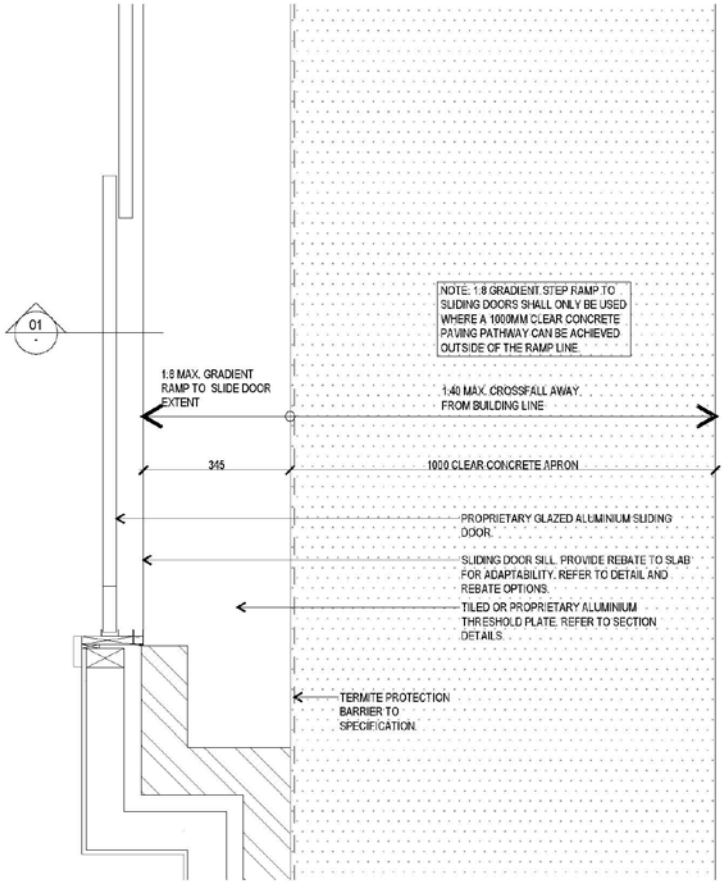
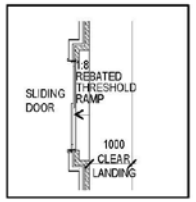
Drawing: TYPICAL SLIDING DOORS
Scale: 1:10 @ A3
Date: 05/06/2014
Drawing No.: 14115_SD06
Revision: B



TYPICAL SLIDING DOOR -1:8 REBATED THRESHOLD RAMP
1:10



THUMBNAIL SKETCH SLIDING DOOR - 1:8 REBATED THRESHOLD RAMP
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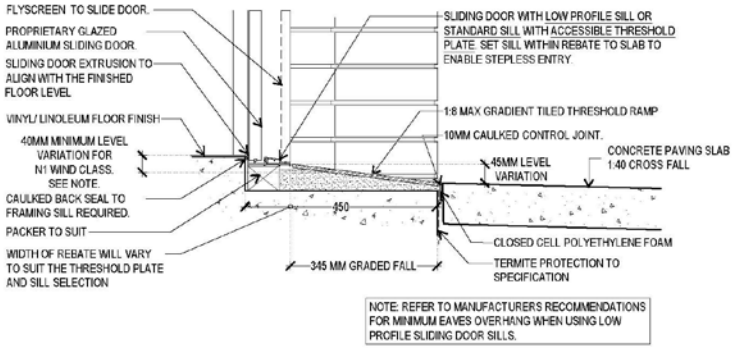

01 TYPICAL SLIDING DOOR DETAIL - 1:8 REBATED THRESHOLD RAMP
1:10

0 50mm 100mm 250mm
A1 A3
500mm
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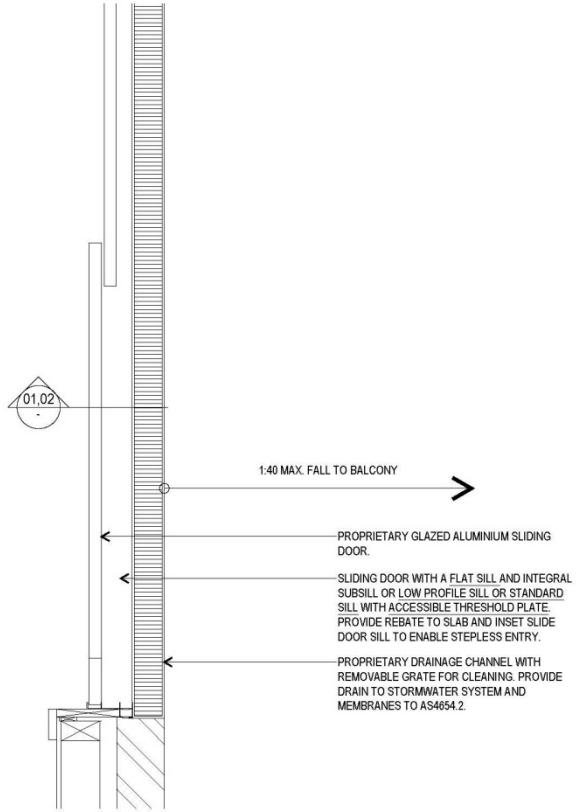
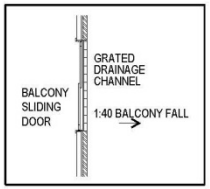
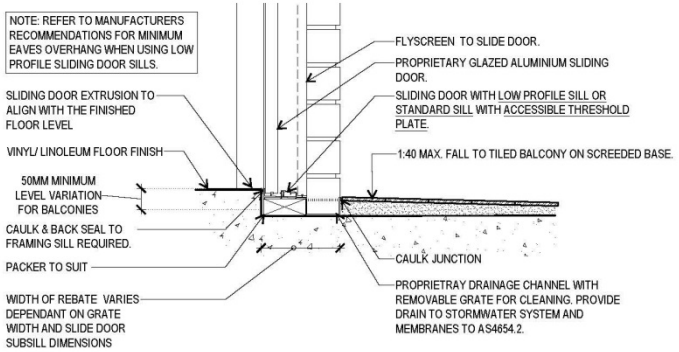
Drawing: TYPICAL SLIDING DOORS | Scale: 1:10 @ A3 | Date: 05/06/2014 | Drawing No.: 14115_SD07 | Revision: B



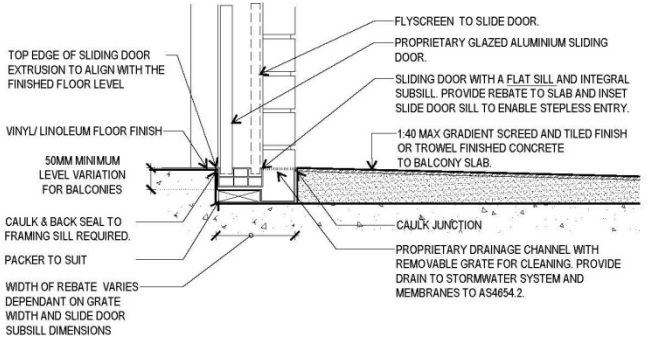
TYPICAL BALCONY SLIDING DOOR - GRATED DRAINAGE CHANNEL
1:10



THUMBNAIL SKETCH BALCONY SLIDING DOOR - GRATED DRAINAGE CHANNEL
N.T.S



01 - TYPICAL BALCONY SLIDING DOOR DETAIL - GRATED CHANNEL & STANDARD SLIDE DOOR SILL
1:10



02 - TYPICAL BALCONY SLIDING DOOR DETAIL - GRATED CHANNEL & FLAT SLIDE DOOR SILL
1:10

0 50mm 100mm 250mm
At A3 500mm
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Housing SA Design Guidelines

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Drawing	Scale	Date	Drawing No.	Revision
TYPICAL BALCONY SLIDING DOORS	1:10 @ A3	05/06/2014	14115_SD08	B

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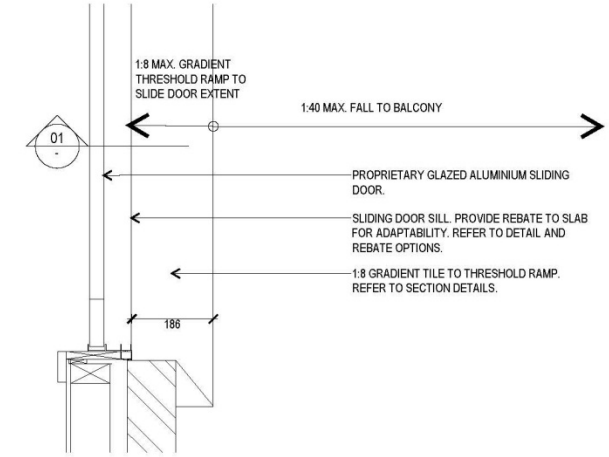
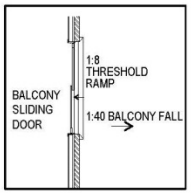
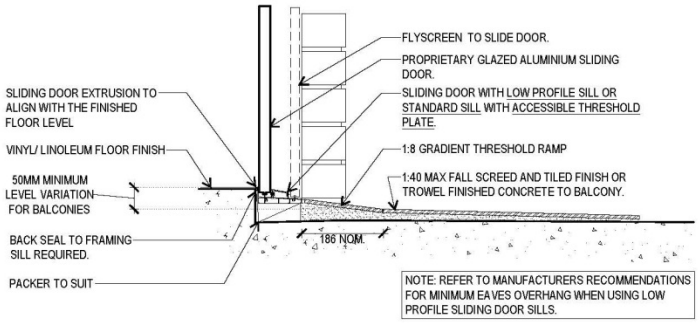


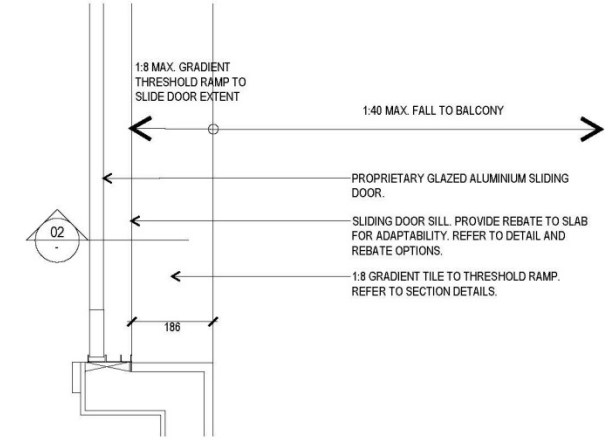
TYPICAL BALCONY SLIDING DOOR - 1:8 THRESHOLD RAMP
1:10



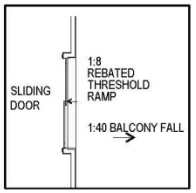
THUMBNAIL SKETCH
BALCONY SLIDING DOOR -
1:8 THRESHOLD RAMP
N.T.S



TYPICAL BALCONY SLIDING DOOR DETAIL -
01 1:8 THRESHOLD RAMP
1:10



TYPICAL BALCONY SLIDING DOOR - 1:8 REBATED THRESHOLD RAMP
1:10



THUMBNAIL SKETCH
BALCONY SLIDING DOOR -
1:8 REBATED THRESHOLD RAMP
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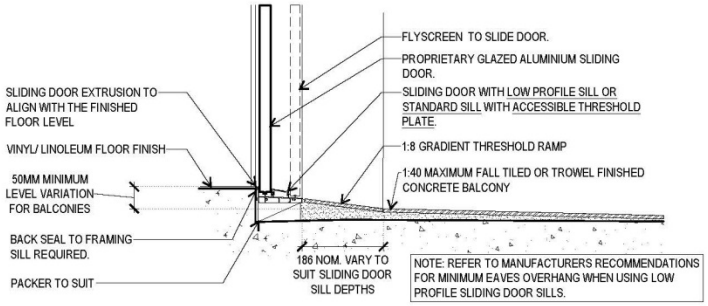

TYPICAL BALCONY SLIDING DOOR DETAIL -
02 1:8 REBATED THRESHOLD RAMP
1:10

0 50mm 100mm 250mm
At A3 500mm
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Drawing	Scale	Date	Drawing No.	Revision
TYPICAL BALCONY SLIDING DOORS	1:10 @ A3	05/06/2014	14115_SD09	B

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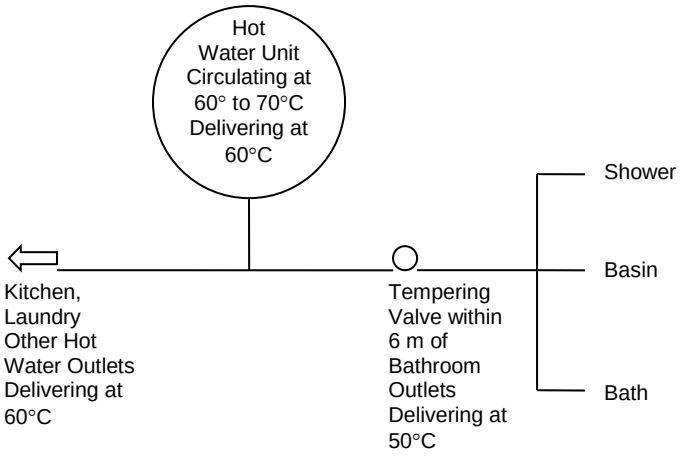

Tempering Valve Installation Diagram - Class 2 dwellings

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