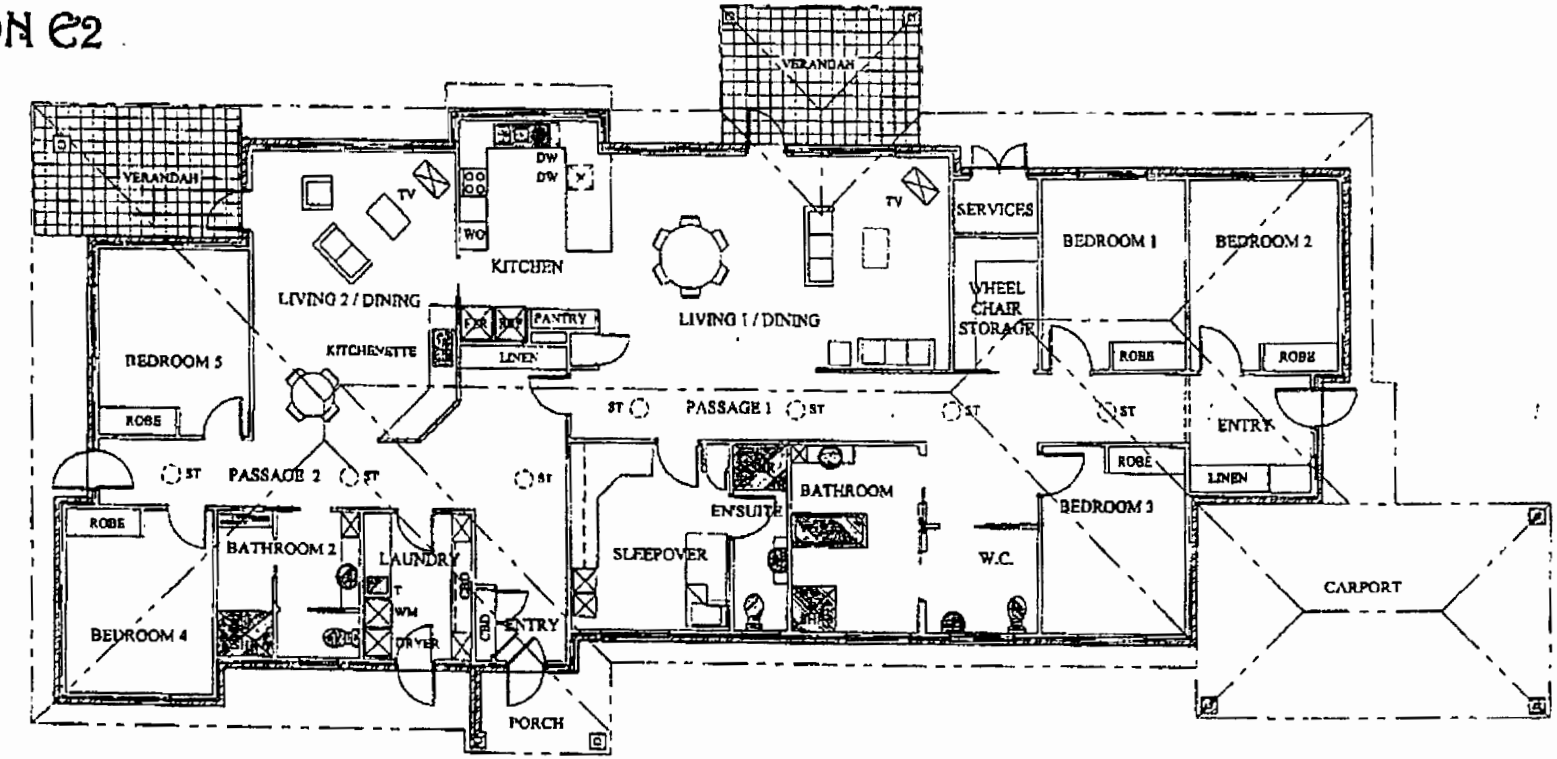
OPTION C2



FLOOR PLAN - (WITHOUT LOCKED PANTRY)

SCALE 1 : 100

GROSS FLOOR AREA : 294.25 SQ METRES
AREA OF CARPORT : 36.44 SQ METRES
COVERED EXTERNAL AREAS : 25.55 SQ METRES
EXTERNAL MECHANICAL STORE : 2.16 SQ METRES

CLIENT:
DEPARTMENT OF HUMAN SERVICES
DISABILITY SERVICES DIVISION
18 TH FLOOR, 535 COLLINS STREET
MELBOURNE, 3000

PROJECT:
PORTFOLIO OF DESIGNS
SHARED SUPPORTED ACCOMMODATION (SSA)
DISABILITY SERVICES

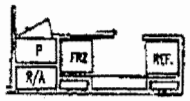
KEVYN JOY ARCHITECTS
11 ERRARD STREET NORTH - BALLARAT
PH-(03) 5331 3555 FAX-(61) 5331 3004
EMAIL- kjoy@ozemail.com.au
REGISTRATION No 4332

DRAWING:
FLOOR PLAN

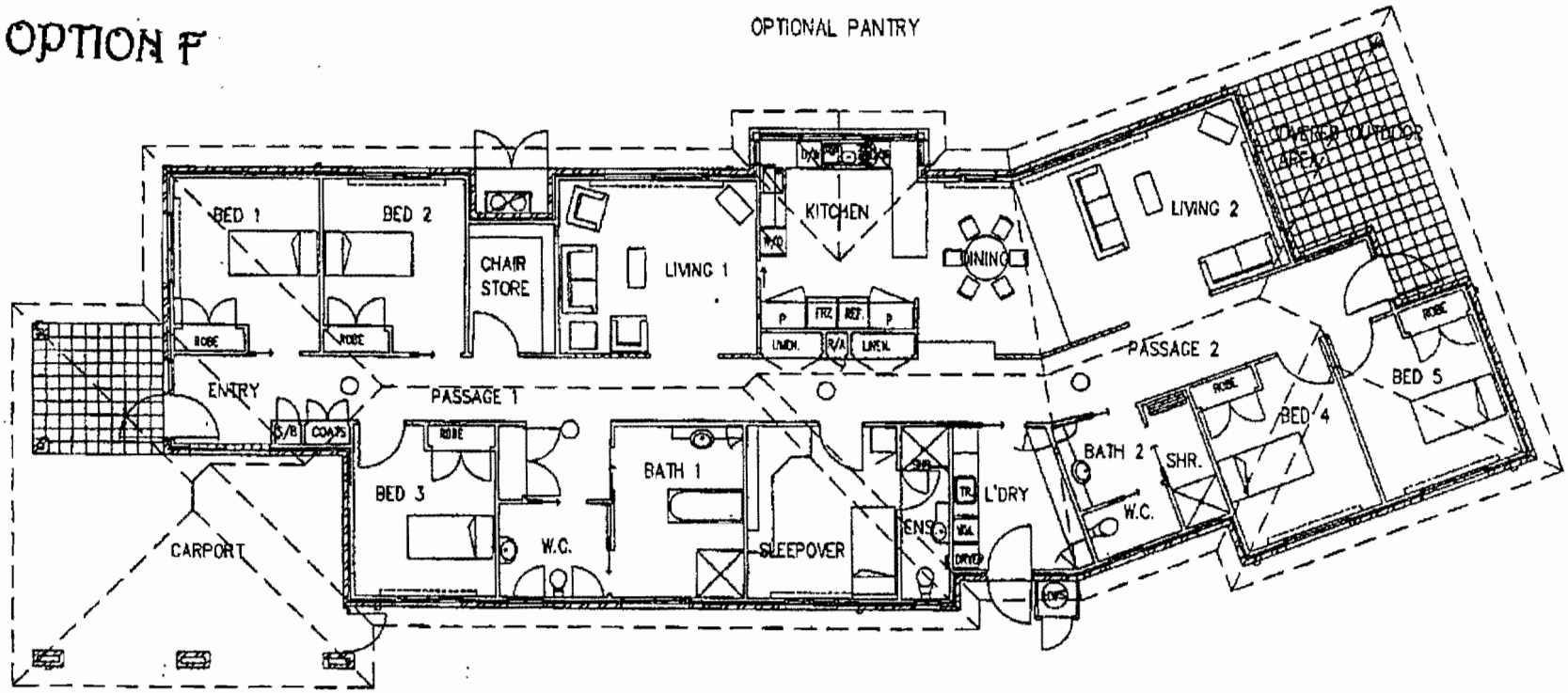
PROJECT:
PROPOSED COMMUNITY RESIDENTIAL UNIT
DEPARTMENT OF HUMAN SERVICES

DATE: MARCH 2004
SCALE: 1:100
DRAWN: CHRIS LOADER
DRAWING NUMBER: 1151-A1

OPTION F



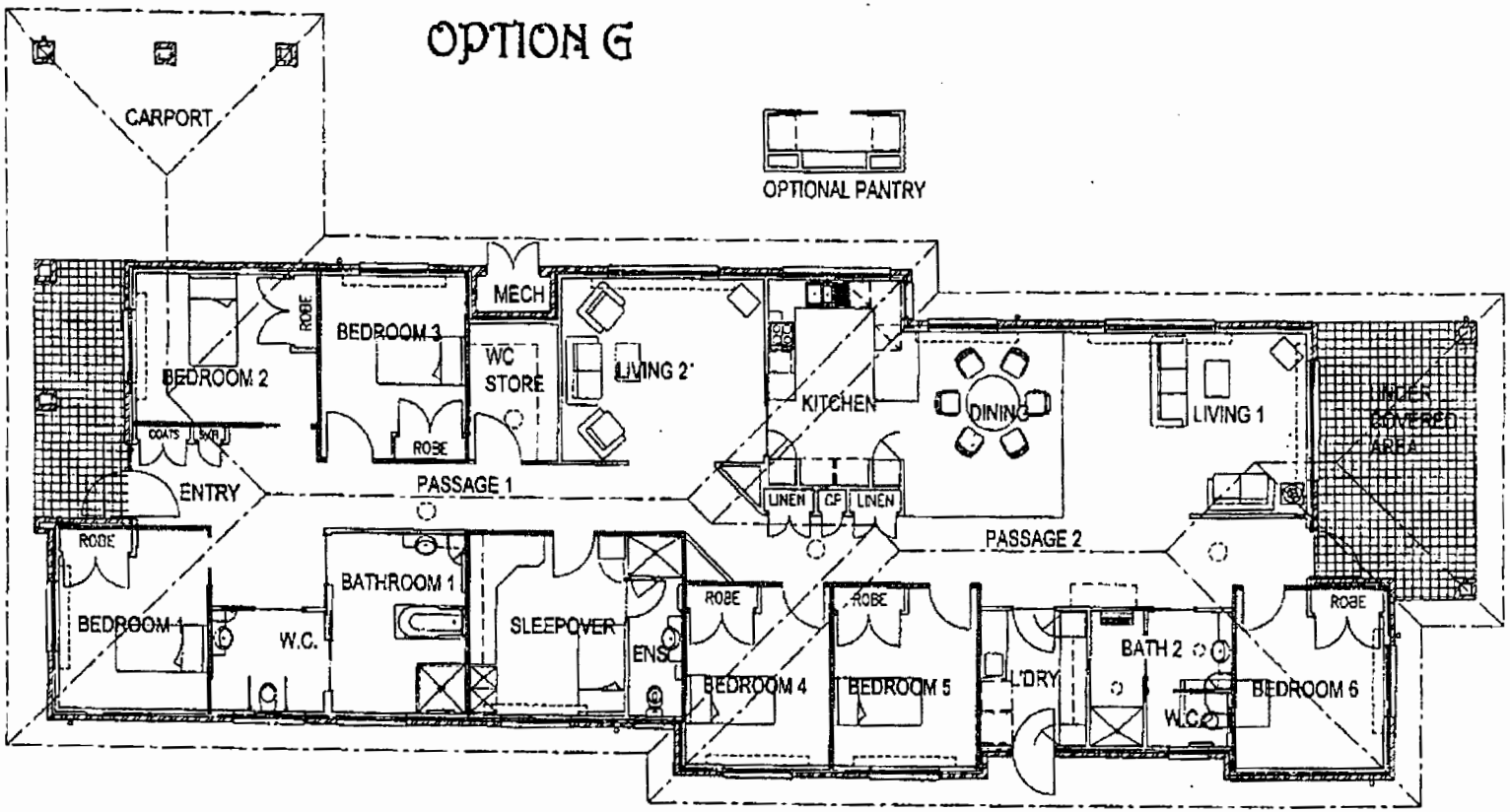
OPTIONAL PANTRY



GROSS FLOOR AREA = 275.11 SQM (INCLUDING EXTERNAL WALLS)
AREA OF CARPORT = 32.20 SQM.
COVERED EXTERNAL AREAS = 25.9 SQM.
EXTERNAL MECHANICAL STORE = 1.70 SQM.

	Client: DEPARTMENT OF HUMAN SERVICES DISABILITY SERVICES DIVISION 16TH FLOOR, 555 COLLINS STREET MELBOURNE 3000	Project: PORTFOLIO OF DESIGNS SHARED SUPPORTED ACCOMMODATION (SSA) DISABILITY SERVICES	ROSS M. MEROLLI PTY. LTD. ARCHITECTS 1ST FLOOR 59A/B CLAREMONT STREET, SOUTH YARRA, 3141. PH. 9804-8433 FAX. 9804-4488	SHEET: PORTFOLIO OF DESIGNS DRAWING: FLOOR PLAN – 5 BED & SLEEPOVER DATE: MARCH 2004 SCALE: 1:100

OPTION G



CLIENT:
DEPARTMENT OF HUMANS SERVICES
DISABILITY SERVICES DIVISION
18TH FLOOR, 555 COLLINS STREET,
MELBOURNE, 3000.

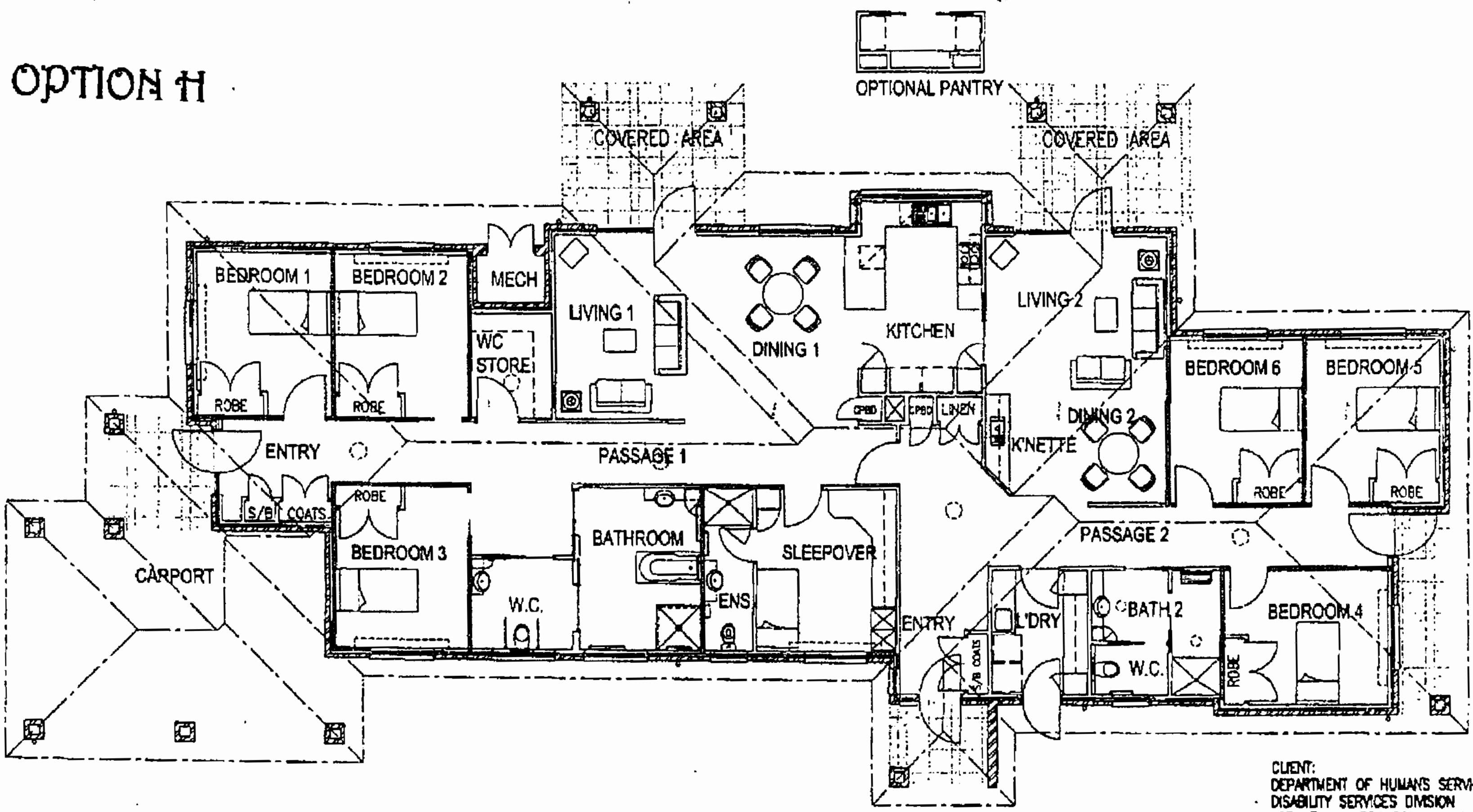
GROSS FLOOR AREA = 288.75QM (INCLUDING EXTERNAL WALLS)
AREA OF CARPORT = 34.5SQM
COVERED EXTERNAL AREAS = 32.1SQM
EXTERNAL MECHANICAL STORE = 2.3SQM

PROJECT:
PORTFOLIO DESIGNS
SHARED SUPPORTED ACCOMMODATION (SSA)
DISABILITY SERVICES

WOODHEAD INTERNATIONAL

PROJECT
DRAWING NUMBER
DATE
SCALE

OPTION H



CLIENT:
DEPARTMENT OF HUMANS SERVICES
DISABILITY SERVICES DIVISION
18TH FLOOR, 555 COLLINS STREET,
MELBOURNE, 3000.

GROSS FLOOR AREA = 308.7SQM (INCLUDING EXTERNAL WALLS)
AREA OF CARPORT = 47.4SQM
COVERED EXTERNAL AREAS = 50SQM
EXTERNAL MECHANICAL STORE = 3.1SQM

PROJECT:
PORTFOLIO DESIGNS
SHARED SUPPORTED ACCOMMODATION (SSA)
DISABILITY SERVICES

WOODHEAD INTERNATIONAL

PROJECT	PORTFOLIO DESIGN SPLIT 6 BEDROOM + SLEEPOVER
DRAWING NUMBER	
DATE	MARCH 2006
SCALE	1:100

Victorian Government
Department of Human Services
Office of Housing

Part 2
Reference Specification

To be read with Parts 1 and 3
To be used with AS 2124, AS 4300, or Minor Works
Edition 10 – September 2002

Contents

Edition 10 - September 2002

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Part 2_e10.doc

PREAMBLE

ADDITIONAL INFORMATION

The Part 2 - REFERENCE SPECIFICATION and the Part 3 - PROJECT SCHEDULES shall be read together.

Detailed requirements in the Part 3 - PROJECT SCHEDULES shall prevail over general requirements in Part 2 - REFERENCE SPECIFICATION Section.

If there is any discrepancy between the requirements of the Part 2 - REFERENCE SPECIFICATION and Part 3 - PROJECT SCHEDULES, notify the Superintendent and obtain clarification before commencing.

TRADE NAMES

Where trade or proprietary names, brands, catalogue or reference numbers for products are stated in Part 2 - REFERENCE SPECIFICATION or Part 3 - PROJECT SCHEDULES, the Contract Sum shall be deemed to have been based on the use of the stated products.

The successful Tenderer may offer alternative products of similar characteristics or type, quality, appearance, finish, method of construction and performance, after the Letter of Acceptance of Tender has been issued. Such proposals shall include appropriate technical details and copies of original quotations and supporting documents. The written approval of the Superintendent shall be the only authority for use of alternative products.

NOTE

The cross referencing of clauses between the Part 2 - REFERENCE SPECIFICATION and the Part 3 - PROJECT SCHEDULES is for convenience only, and shall not limit the obligations of the Contractor.

SECTION A - PRELIMINARIES

CONTENTS

A-01 PERMITS, REGULATIONS AND AUTHORITIES

A Generally:

The Works shall comply with the Building Code of Australia (BCA), relevant Australian Standards (AS), and the by-laws, requirements and regulations of relevant authorities.

The expression relevant authority means any statutory or other organisation, and its employees and agents, having jurisdiction over the Works, and includes the Relevant Building Surveyor and the authorities which supply services, including electricity, water, telephone, gas, sewerage, drainage and the like.

Except where indicated by the Principal, the Contractor shall make all applications and pay all fees required by any relevant authority. The Contractor shall prepare and submit applications including those which are required to be signed by the Principal.

The Contractor shall submit progressively evidence of applications made and fees paid, and submit copies of permits received by it from the issuing authorities.

The Principal reserves the right to direct the Contractor to make applications to relevant authorities and pay the related fees and charges otherwise indicated as carried out and paid for by the Principal.

B **Planning Permit:**

The Principal will arrange and pay for and obtain the Planning Permit where required.

C **Fire Risk Management:**

The Works shall comply with the requirements of Human Services Capital Development Guidelines, Series 7, 'Fire Risk Management', and the requirements of relevant and approved Fire Engineering reports. The Human Services Capital Development Guidelines are available from Information Victoria, 356 Collins Street, Melbourne, 3000, Tel. 1300-366-356. Confer with the OOH Project Manager (Liaison Officer).

D **Building Permit:**

For 'Fully Documented Projects', the Principal will arrange and pay for the services of the Relevant Building Surveyor, and lodge plans.

The Contractor shall:

- Notify the Relevant Building Surveyor of the Contractor's name to be indicated on the Building Permit and obtain the Building Permit.
- Give not less than three days notice to the Relevant Building Surveyor for required inspections.
- Obtain the Occupancy Permit or Certificate of Final Inspection, as appropriate.

For 'Design and Construct Projects' and 'Document and Construct Projects', the Contractor shall arrange, pay for and obtain all building certification, and submit the certificates to the Superintendent. Refer to Part 1 Part B for details.

E **Occupancy Permit and Essential Services Requirements**

Where required by Building Regulations, display the Occupancy Permit and the Essential Services Requirements, laminated and mounted in purpose made glazed notice boards screwed to wall in a location approved by the Building Surveyor.

Prior to undertaking upgrade works to an existing building check to ensure that the existing Building Occupancy Permit is valid for the occupancy and refers to the appropriate BCA occupancy classification.

F **Energy efficient construction:**

All new buildings shall be constructed to achieve 'five star energy rating' determined using the First Rate House Energy Rating measuring system by the Sustainable Energy Authority of Victoria.

A-02 TERMINOLOGY

A **Terminology used in the Specification:**

Defined expressions in the Contract shall have the same meaning in the Specification, and the following terminology used in the Specification shall have the associated meanings:

APAS:	Means Australian Paint Approvals Scheme (Formerly Government Paint Committee (GPC)).
approval:	Means approval by the Superintendent in writing.
approved:	Means such approval by the Superintendent has been obtained, or is required before commencing the applicable work.
BCA:	Means the Building Code of Australia.
DHS:	Means the Department of Human Services.
directed:	Means directed by the Superintendent.
including:	Means including but not limited to.
indicated:	Means indicated or described in the Contract Documents.
inspected:	Means inspected by the Superintendent.

OOH:	Means the Office of Housing.
product information:	Means the current edition of brochures, manuals and similar printed documents describing the appearance and properties of the manufacturer's products, including test results, guidelines and instructions for selection of suitable products with regard to use and conditions, and installation of materials, and related adhesives, fixings and accessories for a complete installation, and includes minuted oral statements by the manufacturer's employees, agents and representatives.
provide:	Means supply, deliver and install, and includes manufacture, fabricate, finish, test and commission as applicable.
required:	Means required by the Contract Documents, or by a relevant authority, or by law, or as required by site conditions to complete the whole or part of the Works, or directed by the Superintendent.
SSL:	Means the Scientific Services Laboratory.
submit:	Means submit to the Superintendent for approval, unless indicated as required for information only.

B **Usual, incidental and necessary work:**

Where an item or process is usual, incidental or necessary, or is reasonably and properly to be inferred from the Contract Documents, and minor items not expressly indicated but necessary for the completion of the Works, shall be deemed to be included, whether described or indicated in the Contract Documents, or not.

Include all work required by the condition of existing buildings, whether indicated in the Contract Documents, or not.

C **Existing dimensions:**

Existing dimensions shall be considered when setting out the Works. Verify dimensions and levels before commencing work on site or shop drawings.

Notify any discrepancies to the Superintendent for clarification and directions before commencing work.

D **On-site drawings:**

Prepare one complete set of Contract Documents with durable water-proof covers, and keep on site for the duration of the Works for inspection by the Superintendent. Covers may include sleeves, plastic lamination or plastic sheet securely sealed to plywood backing.

Keep on site a complete set of the approved shop drawings, with current amendments if any.

A-03 AS-BUILT DRAWINGS

During construction, keep accurate as-built records of sizes, locations and depths of footings, service pipes and ducts, including junctions, changes in direction, fittings, access points and sumps.

Before Practical Completion, request and obtain from the Superintendent copies of the relevant Drawings, mark up with the as-built information, and submit the marked up as-built drawings in good condition.

A-04 SURVEY AND SETTING OUT

The Superintendent will arrange for a surveyor to provide site boundary pegs and a temporary bench mark, and will provide survey drawings on request.

The Contractor shall notify the Superintendent not less than seven days before site boundary pegs and temporary bench marks are required.

No claim for extension of time or additional cost will be approved due to Contractor's delay or failure to notify the Superintendent.

The contractor shall engage and pay for a licensed surveyor to set out the Works, including fences and siteworks, and shall maintain site boundary pegs and temporary bench marks in good condition and correct positions until the set-out is certified correct. Any peg or bench mark accidentally or purposely removed before this time shall be re-established by the original surveyor at the Contractor's cost.

The contractor shall submit certified drawings prepared by the licensed surveyor to verify that the set-out complies with the indicated dimensions and levels, progressively at the following stages:

- Footings and floor slabs.
- Walls.
- Easements, services mains and connection points.
- Siteworks, including fences, roads and paths.

A-05 EXISTING CONDITIONS SURVEY OF ADJACENT PROPERTIES

Before commencing the Works, arrange with the Superintendent and the owners of adjacent properties, including relevant authorities for roads and paths, to carry out a complete and detailed existing conditions survey of the properties, as a basis for resolving possible future claims regarding damage or defects attributable to the Works. The survey shall include clear photographs of existing conditions, including visible defects and damage.

The expression 'adjacent properties' means the whole or part of buildings, structures, finishes, services, roads, paths, land, kerbs, channels, road openings, path crossings, parking areas, nature strips and other facilities, whether in public or private ownership, on adjacent sites, or on the site or the Works but indicated or intended to remain, as the context requires.

Submit two copies of the survey to the Superintendent. Provide each adjacent owner with a copy of the complete or relevant parts of the survey. Obtain and submit receipts or other records of providing such copies to each adjacent owner.

Regardless of any information provided by the Principal, the accuracy of the survey shall be the responsibility of the Contractor.

Failure to carry out such a survey will be deemed as evidence that the Contractor acknowledges that there are no defects or damage to adjacent properties before commencement of the Works.

Progressively monitor any change in conditions to adjacent properties. Measure and mark any changes in cracks and record any level changes or out of plumb conditions.

A-06 CONSTRUCTION PROGRAM

Prepare and maintain a detailed construction program showing the completion times of the significant stages and individual dwellings.

Submit construction program within 28 days of the date of the Letter of Acceptance.

The program shall indicate the required lead times for orders and delivery dates for items supplied by the Principal (TBS Items), and for work carried out by Separate Contractors.

A-07 CASH FLOW

Prepare and maintain a detailed estimate of the monthly cash flow requirements of work to be completed and claimed each month. Adjust and re-submit the estimate progressively based on actual cost of work claimed.

The cash flow estimate shall be coordinated with the construction program.

Submit cash flow estimate within 28 days of the date of the Letter of Acceptance.

A-08 SITE MEETINGS

Attend site meetings with the Superintendent to review progress, co-ordination and other matters.

Site meetings shall be held at a regular time and place each fortnight, or at regular intervals determined by the Superintendent.

Site meetings shall be chaired and minutes recorded by the Contractor. Distribute minutes to those present within seven days.

The Superintendent reserves the right to chair and minute the meetings.

Arrange the attendance of relevant site personnel, and other parties if directed.

A-09 SITE PERSONNEL AND RECORDS

A **Site personnel:**

Retain a full-time, experienced site supervisor on site for the duration of the Works. The site supervisor shall be authorised to receive directions from the Superintendent.

For work on occupied premises, the site supervisor, or another person appointed by the Contractor, shall be available after hours to attend site and take action in the event of an emergency.

Provide the after hours contact telephone numbers of the site supervisor for use in emergencies.

B **Records:**

Maintain a daily site diary which shall record general progress and any significant events, the number of personnel and list of on site subcontractors, temperature and weather conditions, meetings, visits and inspections, delays, unusual events and accidents.

The original site diary shall be available for inspection and copying by the Superintendent at any time without notice.

A-10 SITE IDENTIFICATION AND SIGN BOARDS

B **Unit identification and address:**

Provide suitable legible temporary signs to identify each dwelling number, building number, allotment number or street address, as appropriate. Such signs shall consist of text and numerals in Helvetica font or similar, 125 mm high, black on white background, on weather resistant boards not less than 250 x 400 mm. Boards shall be mounted on suitable posts or fixed to existing structures not less than 1900 mm above ground. Remove immediately after permanent dwelling numbers are fixed.

B **Contractor's sign:**

Except where a Community Information Board is required, the Contractor may erect a sign or signs to identify itself and its subcontractors and suppliers. Such signs may be free-standing or attached to hoardings, fences or structures. All such signs shall be subject to the Superintendent's approval. Unless directed in writing, do not identify the Principal or any information regarding the Works. Remove any unauthorised advertisements or signs immediately discovered or if directed. Remove all signs before Practical Completion. The Principal reserves the right to display any sign on hoardings or elsewhere.

C **Community Information Board:**

Where indicated or required, provide a Victorian Government Community Information Board. Install the Board within two weeks of Letter of Acceptance and before commencing on site. Remove when directed but not less than three weeks after Practical Completion. Remove footings, back-fill and make good to match adjacent landscaping. Refer to Drawings and Schedules for construction details and text.

Where a Community Information Board is required, do not erect any other free-standing signs or fix signs to any hoardings, fences or structures, unless approved by the Superintendent. If approved, such signs shall be installed well clear of the Community Information Board. Remove all unauthorised signs immediately.

A-11 TEMPORARY HOARDINGS AND SAFETY FENCES

Enclose the Works with suitable temporary barriers and protection, prevent the entry of unauthorised persons onto the site, and prevent injury, damage, vandalism and theft.

Supervise openings and access points to the Works during working hours and lock up the Works during non-working hours.

The Superintendent may require additional barriers and protection at no additional cost to the Principal.

Barriers and protection adjacent to roads and paths shall be fitted with night reflectors, orange plastic bunting and lighting as required for safety.

Barrier types shall include as appropriate:

- Hoardings of rigid, durable plywood, not less than two metres high, freshly painted.
- Chain mesh fencing, not less than two metres high.
- Wire strand fences, one metre high, with star pickets and two strands of wire, galvanized.
- Temporary rails and bunting, one metre high.
- Screens of continuous plastic sheeting, taped edges, to restrict dust and moisture.
- Existing fences, if approved by the Superintendent.
- Other suitable barrier types approved by the Superintendent.

A-12 HOURS OF WORK

Do not carry out on-site work outside working hours notified or approved by the relevant authority. The Superintendent reserves the right to direct that working hours be further modified or restricted.

A-13 CONDUCT IN OCCUPIED AND ADJOINING PREMISES

A **Generally:**

This clause applies to existing dwellings or other buildings which have been previously or currently inhabited or in use.

The expression occupied premises means existing buildings which are or have been inhabited or used, complete with the contents and possessions of the occupants, and includes the meanings individual dwellings, adjacent dwellings, groups of dwellings, all dwellings on the site, and the common areas of the site, as required by the context.

Unless otherwise directed, assume that occupied premises will be occupied continuously during the construction period. Cooperate and co-ordinate to ensure the minimum inconvenience to each occupant.

Possession of the site or parts of the site containing occupied premises shall not be construed as exclusive possession. Do not occupy or use any part of the site containing occupied premises, which has not been allocated for possession or use, unless the Superintendent has issued written approval.

Areas of the site containing occupied premises which are not for the exclusive use of the Contractor, including public areas and access walkways, shall be maintained in a clean and safe condition at all times.

Provide additional temporary barriers and protection to separate work areas in or adjacent to occupied premises from occupants and the public as required or where directed.

Occupied premises which are vacant at the time of the Works shall be regarded as for occupied premises.

B **Keys and existing security provisions:**

The Principal will provide keys or access cards to relevant areas from time to time. Sign for and be responsible for all such keys or access cards, and do not make or enable others to make unauthorised copies.

Where practicable, notify the Superintendent seven days before access is required.

Do not attempt to gain access to vacant premises other than by use of the proper keys.

Where the Principal has an existing security or surveillance system to occupied premises, co-ordinate proposed security procedures with the Principal's existing procedures, protect the existing security equipment, and ensure that existing security procedures are not compromised.

C **Working hours:**

Working hours for occupied premises shall be 8.00 a.m. to 5.00 p.m. Monday to Friday, unless otherwise directed. For un-occupied premises, working hours may be extended to 7.00 a.m. to 5.00 p.m. subject to approval by the Superintendent.

D **Nuisance:**

There shall be no smoking in occupied premises. There shall be no radios or similar devices used in or near occupied premises.

There shall be no dogs in occupied premises or on site adjacent to any residential or occupied premises.

E **Identity passes:**

Issue identification and security passes to all site personnel in occupied premises.

F **Protection of house contents:**

Maintain occupied premises in a secure condition at all times against trespass, vandalism and weather. Protect occupants' household contents and furniture during work in occupied premises from damage. Prevent the entry of paint, debris and dust into rooms, cupboards and areas where work is not being carried out, or over household contents and furniture.

Provide temporary covers and sealing as required.

Indemnify the Principal against all disputes arising from loss or damage to occupants' property during the construction period, including:

- Damage or required cleaning of occupant's household contents.
- Any consequential loss attributable to the site personnel.
- Theft, loss or damage to household contents caused directly by site personnel, or during working hours from occupied premises which are not vacated, or at any time from occupied premises which are vacated during the construction period.

Occupied premises shall be properly and securely locked when the Contractor is not on site and at the end of each working day.

G **Furniture relocation:**

Cooperate and co-ordinate with the occupants regarding the contents within occupied premises.

The occupant will be responsible for moving, protecting and reinstating all personal items and objects, including food, indoor-plants, clothing, the contents of cupboards, wall hung items and items of particular value.

Move, protect and reinstate all furniture, white goods and items not moved by the occupant or as required to carry out the Works.

H **Use of lifts:**

Where work on occupied premises is taking place in buildings with lifts, coordinate and cooperate with the Superintendent and the occupants with regard the use of the lifts.

Exclusive use of the lifts will not be granted. Restrict use of lifts to times and conditions directed by the Superintendent. Do not damage lift cars, controls or surroundings. Make good all such damage before Practical Completion.

I **Volatile and inflammable substances:**

No volatile and inflammable substances shall be used or stored in or near occupied premises. Use water-based adhesives and cleaning products only.

A-14 PROTECTION OF ADJACENT PROPERTIES

A **Generally:**

Protect adjacent properties from interference or damage attributable to the Works.

Ensure that the rights and interests of owners and occupants of adjacent properties are not adversely affected by the Works.

Comply with the requirements of relevant authorities in relation to adjacent properties, and ensure that all required notices have been given to adjacent property owners and occupants at the correct times.

Co-ordinate and cooperate with owners of adjacent properties for the construction of any required temporary and permanent support and protection for structures and ground-works on adjacent properties.

Obtain agreements with owners of adjacent properties regarding the construction procedures, timing and required access onto adjacent properties before commencing any such work.

B **Protection:**

Provide appropriate support and protection not less than that provided by existing ground-works, structures and fences before excavation or demolition. Maintain support and protection in good condition, alter as necessary, and remove before Practical Completion, or if directed.

Support and protection may include under-pinning, shoring, strutting, retaining walls, fencing and the like.

Submit computations for the proposed support and protection. Do not commence relevant work until the proposed support and protection has been approved by the relevant authority.

Indemnify the Principal against all disputes arising from failure to obtain approval from the adjoining owners, and from carrying out such works.

Where permanent supports for adjacent structures are required and are not indicated, notify the Superintendent and obtain instructions.

The Superintendent reserves the right to arrange for the rectification of damage or defects to adjacent properties attributed to the Works and deduct the cost of such rectification from the Contract Sum.

C **Adjacent roads, paths and land:**

Provide and maintain continuous access to adjacent properties and public areas for pedestrians and vehicles.

Do not close or obstruct any road or path unless required by the Contract Documents and carried out in accordance with the requirements of the relevant authorities.

Make arrangements with the relevant authorities for access to and from the site for personnel, goods and materials, and constructional plant and equipment.

Provide required temporary roads, crossings over existing roads and paths, in accordance with the requirements of the relevant authorities, and remove when no longer required.

Provide traffic control equipment as required from time to time or by the relevant authority.

Traffic control equipment shall include vehicle barricades, signs, traffic lights and the like.

D **Nature strips:**

Keep nature strips clear of debris and rubbish at all times. Do not make deliveries or store materials on roadways, paths or nature strips. Make good any damage to nature strip progressively.

E **Temporary crossings:**

Construct temporary crossings of sufficient width to accommodate vehicles accessing the site.

Unless otherwise directed, crossings shall be made out of 38 mm hardwood planks splayed at ends, bound together with 1.6 mm hoop iron or 4 mm wire and bedded on sand, or constructed to the requirements of the local authority.

A-15 EXCAVATIONS

Protect excavations, ground-works and exposed slopes to ensure the safety of site personnel, adjacent property, and the general public at all times.

Provide temporary supports, bracing, shoring, planking and strutting as required. Provide covers over holes.

The Superintendent reserves the right to require additional temporary supports at no additional cost to the Principal. No direction by the Superintendent shall relieve or modify the complete responsibility of the Contractor.

A-16 EXISTING SERVICES

A **Generally:**

Before commencing work, locate and identify existing services whether active or not and similar concealed items on or adjacent to the site which might be affected by the Works.

Coordinate with relevant services authorities and notify the authorities before commencing any work, which may affect the services provided by that authority.

Carry out all required work on services in accordance with the requirements of the relevant authority.

Record the location of all services discovered during the Works, including inactive or abandoned services on as-built drawings.

Maintain services to adjacent properties to ensure the proper operation and continuous supply of such services during the construction period.

B **Active, inactive and abandoned services:**

Protect and maintain existing active services at all times. Relocate services if required. Where relocation is for the convenience of the Contractor, pay the costs of such relocation.

Establish procedures required in the event of damage or interruption to active services on or adjacent to the site during construction. Immediately notify the relevant services authority in the event of damage or interruption, comply with all instructions by the authority, and pay for the repair or replacement of damaged services as directed by the authority.

Inactive services discovered during construction shall be progressively removed or sealed, and made safe.

Do not excavate by machine within 300 mm of existing underground services.

C **Damage to trunk services:**

Identify and protect trunk services on or adjacent to the site, and pay for the repair and all costs associated with any damage to such trunk services attributable to the Works.

Indemnify the Principal against any liability, loss or dispute resulting from damage to trunk services attributable to the Works.

Advise all relevant site personnel of the locations and safe working procedures for trunk services.

Maintain constant supervision of all work taking place adjacent to trunk services.

C **Continuity of services in Occupied Premises:**

Before disconnecting or interrupting services to occupied premises, give not less than 48 hours notice directly to the individual occupants and provide an estimate of the duration of disruption. Keep disruption of services to a minimum. Submit copies of notices.

Advise the Superintendent at least 48 hours before shut down of any reticulated building services (such as main electrical power, natural gas, cold water supply, and fire services).

Do not turn off electricity before 9.00 a.m. and reinstate before 5.00 p.m. each working day.

Occupant's telephone services shall be maintained in continuous operation.

Where plumbing work may take more than one day, and where permanent services cannot be re-instated at the end of the day, provide suitable temporary water supply, drainage and fittings, or make special alternative provision for toilet, bathroom and kitchen facilities.

Disconnect services at nearest stop valve, or switchboard, before cutting or opening service pipes and conduits. Provide temporary or permanent sealing as required where fittings are removed.

Provide required warning signs and carry out appropriate safety procedures when working on services.

A-17 TEMPORARY SERVICES

A **Generally:**

Provide all required temporary services required for the Works, including electricity, water, sewerage, storm water disposal, telephone and the like, regardless whether permanent services are available or not.

Make applications to the relevant authorities, pay all connection and consumption charges, comply with conditions, provide connections, equipment and reticulation, and remove entire installation and make good when no longer required or at Practical Completion.

B **Power, lighting and ventilation:**

Reticulate temporary power to required work areas. Comply with all safety requirements and notify all site personnel of safety procedures.

Provide general and access lighting to circulation and common areas.

Provide task lighting of adequate brightness and quality to carry out installation and inspection of the work of each Trade Section.

C **Use of existing electrical services:**

For work within individual dwellings of occupied and vacant premises, take meter readings at the commencement and conclusion of construction work and pay the occupant a reasonable agreed sum for the electrical power used for the Works.

For work within individual occupied premises, the Contractor may use the existing power supply, subject to reaching agreement with the occupant regarding such use, and the reimbursement of any costs before commencing. Do not connect any electrical equipment into occupant's power outlets before obtaining such agreement.

Use only properly earthed electrical equipment in good condition. The Principal and occupants will not be responsible for damage or injury resulting from such use of the Principal's or occupant's power supply.

D **Ventilation:**

Provide adequate ventilation to work areas when volatile coatings, solvents and adhesives are being used, and provide suitable warning notices. Provide mechanical air extraction equipment if required.

A-18 APPLICATIONS FOR NEW SERVICES CONNECTIONS

A **Drainage, sewer and water supply:**

The Principal will apply for drainage, sewer and water supply, and pay for the following as appropriate:

- Storm water levy and connection fees.
- Sewer contribution and connection fees.
- Authority fees associated with application for extensions and head-works charges for work outside the site boundary.

The Principal shall pay for the following as appropriate:

- Application fees and inspection fees.
- Water supply contribution, meter fees, and tapping fees.

The Contractor shall arrange required inspections by the relevant services authority, and submit associated documentation and records.

B **Plumbing:**

The Contractor shall arrange for the plumber to issue the Certificate of Compliance and submit to the Building Surveyor before handover. External gas fittings such as hot water units, may be fitted, and removed and replaced at completion for security reasons.

C **Electricity supply:**

The Contractor will apply in the name of the Principal, and pay for contributions, connection fees and refundable amounts for the electricity supply. The Principal will pay for the charges for consumption, if any, of the first meter reading.

The Contractor shall arrange required inspections by the relevant services authority, and submit associated documentation and records.

Following handover, the occupant will apply for the electricity supply to be transferred to her/his name.

D **Gas supply:**

The Principal will apply in the name of the Principal, and pay for contributions, connection fees and refundable amounts for the gas supply.

The Contractor shall arrange connection and required inspections by the relevant services authority, and submit associated documentation and records.

E **Telephone connection:**

The Contractor shall co-ordinate with the telephone carrier, provide cabling, pre-wiring, and submit associated documentation and records.

F **Public roads, paths and crossovers:**

The Contractor shall apply for and pay for refundable amounts and permits for use related to adjacent public roads, paths and crossovers.

The Contractor shall arrange required preliminary and final inspections with the relevant authority and obtain all relevant clearance certificates.

A-19 NOISE AND DUST

Minimise nuisance to the public and adjacent properties from noise and dust from the Works.

If directed, submit proposed procedures to minimise and control such nuisance and carry out approved procedures. Re-submit progressively any proposed changes to the approved procedures.

Limit noise-producing activities to normal working hours unless otherwise approved by the Superintendent.

All constructional plant and equipment shall be fitted with noise suppressers, acoustic linings or screens. Sirens and loud hailers shall not be used except in an emergency.

Use suitable equipment and procedures, screens and water spraying to reduce dust nuisance.

Spray dust-producing materials before loading in trucks or open containers. Use trucks with suitable covers for transporting dust-producing materials or materials that could be dislodged by wind.

A-20 FIRE SAFETY

Comply with the fire safety requirements of the relevant statutory authorities, BCA, approved Fire Engineering reports and relevant Standards.

Carry out work affecting the continuity of existing services, at the most convenient time to any occupants and organise the work to minimise the duration of any interruption.

Where the work affects the continuity of the fire protection to the premises:

- Advise the local Fire Brigade of the extent and period of the interruption to the services.
- Advise the Principal in writing of the extent and period of the interruption to the services.
- Implement the precautions required in the relevant Standards.

The Contractor shall inform the Superintendent at least 7 days before commencement of any upgrade or extension work in existing buildings having existing essential services being maintained by other contractors so that the Superintendent may arrange with Engineering Services Branch for the continuation of the services.

Advise the Superintendent and Emergency Services Testing and Servicing, at least 48 hours before shut down of any reticulated building services (such as main electrical power, natural gas and cold water), so that the emergency services maintenance contractor may ensure that service is remains operational after reconnection.

The period that all or part of the system will be interrupted shall be kept to a minimum and, where practical, parts of the system shall be interrupted in preference to the whole system.

Provide and maintain all required temporary fire protection equipment.

Co-ordinate and comply with all Principal's existing fire safety procedures, if any.

Store inflammable materials safely in accordance with industry standards and the relevant Standards.

Remove inflammable debris at the end of each day, including debris subject to spontaneous combustion.

Do not fight fires on or adjacent to the site.

A-21 ASBESTOS AND HAZARDOUS MATERIALS

A **Generally:**

Do not bring to the site or incorporate in the Works any material which contains toxic or dangerous substances, including asbestos or any material containing asbestos or mineral fibres.

B **Existing asbestos:**

Where required, carry out asbestos removal, or other containment or management procedures for existing and found asbestos products in accordance with:

NOHSC: 2002 Code of Practice for the Safe Removal of Asbestos. (www.nohsc.gov.au)

WorkSafe Victoria. DRAFT (Asbestos) Regulations 2002 (www.worksafe.vic.gov.au)

Contractors carrying out asbestos related work shall be licensed by the Victorian WorkCover Authority. All personnel involved in asbestos related work shall be properly trained and instructed in accordance with Victorian WorkCover Authority requirements, including relevant aspects of asbestos health hazards, safe working procedures, maintenance and wearing of respiratory protective equipment and protective clothing.

C **Found asbestos:**

Immediately notify the Superintendent of any asbestos or toxic material discovered on the site and arrange for removal and decontamination by a qualified specialist in accordance with an approved program of work.

D **Monitoring asbestos work:**

The OOH will engage and pay for a hygienist to monitor asbestos work.

Provide access to the Works so the hygienist may inspect any part of the asbestos work without notice.

The hygienist will arrange air monitoring and testing during asbestos work and will be responsible for issue of a clearance certificate at the end of each working day.

E **Asbestos related work procedures:**

Do not cut, drill or abrade materials containing asbestos. Where such work is required to remove materials containing asbestos do not use power tools. Hand tools only shall be used.

Take necessary precautions to protect the health of all site personnel and the general public from such materials.

F **Disposal:**

Properly dispose of all toxic and dangerous materials to a legal disposal location, and comply with the requirements of the relevant authority.

A-22 WATER AND EROSION

A **Control of water and moisture:**

Control moisture and dampness, which may cause damage or staining to existing occupied premises, new construction, and goods and materials during storage or construction.

Provide flashings, seal around penetrations, properly fix roofing and cladding and carry out all required work to ensure the exclusion of water and weather.

Control surface water, and prevent flooding, ponding, seepage and erosion generally which may cause damage or delay to the Works.

No additional costs or extension of time will be approved for remedial work, which results because of failure to prevent entry of moisture or to remove water.

Keep excavations and ground-works free of surface water. Prevent surface water flowing over freshly constructed work. Prevent surface water collecting on or near exposed slopes and excavations. Remove surface water immediately before back-filling or placing new work and services in excavations.

B **Construction drainage:**

Provide and maintain temporary drains, graded surfaces, embankments and the like to control the flow and collection of surface water. Keep drains clear at all times to enable unrestricted flow.

Prevent erosion of the site and contamination of adjacent areas.

Remove and make good as soon as temporary drains are no longer required.

Prevent water run-off from site, and sediment and debris carried by such run-off, over adjacent properties.

C **Pumping:**

Where required, provide maintain and continuously supervise suitable pumping equipment to remove water from the Works and the site.

Discharge water into approved storm water drains at locations and conditions approved by the relevant services authority. Do not discharge water over adjacent ground or near exposed slopes and excavations.

Provide effective settling pits or other methods to prevent discharge of silt or other solids into storm water drains, and dispose of silt to a legal disposal location.

A-23 TREES TO BE RETAINED

A **Generally:**

Before commencing work on site, assess and identify all trees which are indicated to be retained or removed, trees which may need partial cutting back or other work, and trees which are indicated to be removed, or required to be removed to enable construction or access.

Notify Superintendent of all trees proposed to be removed or cut back. Clearly mark trees to be retained with conspicuous plastic ribbon around the trunk, and maintain ribbons until Practical Completion.

Existing trees outside the building line shall be retained and protected during construction. Do not remove or cut back any trees for site sheds, storage, or access unless and before approved in writing by the Superintendent.

Provide temporary protection to all trees in close proximity to construction work which may be damaged by such work. Protection may include fencing, barricades or other suitable procedures.

B **Removal of trees:**

Remove trees by safe procedures without damage to adjacent trees, the Works, or adjacent properties.

Where tree preservation regulations are imposed by the authority, obtain and pay for the required permits and comply with all permit conditions.

C Excavation near trees to be retained:

Notify the Superintendent and arrange a joint inspection before carrying out excavation within the root zone of all trees to be retained. Root zone shall be equal to the diameter of the tree canopy (drip line).

Notify Superintendent if roots greater than 40 mm will be cut by excavation.

Unless otherwise approved, excavation within the root zone shall be carried out by hand digging to minimise damage to the roots.

Carry out initial digging to locate roots, cut roots by sawing, and apply approved tree wound sealant. Do not use axes for cutting roots.

The following product (s) satisfies the specification requirements: 'Steriprune'.

D Damage to trees to be retained:

Notify the Superintendent and arrange a joint inspection of any damage to trees to be retained. At the Superintendent's discretion, damaged trees shall be repaired by approved procedures or replaced.

Arrange and pay for all cutting back and repairs by an approved experienced specialist arborist. Refer to LANDSCAPE Section for technical requirements.

The Superintendent reserves the right to determine a monetary amount for the loss of amenity due to damaged trees and deduct that amount from the Contract Sum.

A-24 SEPARATE CONTRACTORS

The Principal retains the right to have specialist work carried out by Separate Contractors during the construction period. Where the Principal has engaged such Separate Contractors:

- Provide attendance, coordinate and cooperate with Separate Contractors.
- Integrate such specialist works into the overall construction program to ensure proper completion of all work before the Date for Practical Completion.
- Distribute copies of the adjusted construction program to relevant parties.
- Give Separate Contractors notice in writing of required commencement and completion dates not less than three weeks in advance.
- Provide adequate space for unloading and storage of goods and materials.
- Provide temporary services.
- Provide access to site amenities.
- Ensure that the site or relevant work areas are in a suitable condition for commencement of such specialist works.
- Protect work of Separate Contractors from damage and make good any such damage.

A-25 PENETRATIONS AND CHASING

Construct all required openings, penetrations, plinths, up-stands, set-downs and chasing to the Works for services and built-in items.

Coordinate with relevant subcontractors and obtain correct and accurate locations, sizes, tolerances, details, making good and statutory requirements of all such penetrations.

Jointly investigate with relevant subcontractors the optimum location of services and built-in items in relation to structural members, clearances, other services, and openings which may affect installation and proper functioning of such services and built-in items.

A-26 CONSTRUCTIONAL PLANT AND EQUIPMENT

Provide and maintain all required constructional plant and equipment.

Constructional plant and equipment shall include site sheds and facilities, storage compounds, hoisting and cranage, scaffolding, platforms, ladders, handrails, power tools, hand tools, safety equipment, and the like.

Constructional plant and equipment shall comply with the requirements of all relevant authorities. Obtain required permits, pay applicable fees and comply with all conditions and instructions.

Remove all constructional plant and equipment when no longer required.

A-27 ACCESS AND LOADING

A Parking:

There shall be no car parking on the grounds of occupied premises unless approved in writing by the Superintendent. Comply with imposed conditions, if any.

Make arrangements for car parking in legal designated areas which do not cause nuisance or obstruction to adjacent properties.

B Loading:

Set aside and clearly indicate on site loading and unloading areas where practicable. Coordinate location of loading areas on the grounds of occupied premises with the Superintendent.

Where loading cannot take place on site, designate areas of adjacent roads and paths approved by the Superintendent and relevant authorities. Comply with all conditions for such use.

Do not store goods and materials on adjacent roads and paths unless approved in writing by the Superintendent and relevant authorities.

Keep loading areas in a clean and safe condition at all times.

A-28 SITE ACCOMMODATION

A Generally:

Provide temporary site sheds and accommodation for administration, storage and site amenities.

Site sheds may be prefabricated or purpose made, and shall be properly constructed, in good condition, weather tight, with natural light and ventilation, power and lighting, and freshly painted. Site sheds shall be properly secured to a base or foundation, and connected to suitable drainage and sewerage in accordance with the requirements of the relevant services authorities. Locate site sheds in tidy groups in approved positions.

Keep site sheds maintained, tidy, clean, and in sanitary condition. Clean daily or more often if required.

Remove site sheds before Practical Completion. Make good after removal and properly disinfect adjacent areas.

Subject to written approval by the Superintendent, the Contractor may use Principal's existing accommodation, if applicable, or areas of the completed Works before handover, for temporary site accommodation. All such accommodation shall be made good before Practical Completion.

Do not use existing plant rooms and passage ways for site accommodation or storage.

B Amenities:

Provide site amenities in accordance with the requirements of the relevant authorities, industrial agreements and awards, and customary practice. Obtain all required permits, pay all applicable fees and comply with all conditions and instructions.

Site amenities shall include lunch rooms, change rooms, ablutions rooms including washing and screened toilet accommodation for male and female personnel.

Provide a first aid kit (Reference WWCA No. 18) and a sharps container to AS 4939.

Provide an adequate drinking water supply and equipment for hot water, food warming and refrigeration.

A-29 OCCUPATIONAL HEALTH AND SAFETY

Take responsibility and ensure the health and safety of all employees.

Be aware of and comply with the statutory occupational health and safety (OH&S) obligations and relevant acts, regulations and Standards, including but not limited to:

ACTS

Accident Compensation Act 1985
Dangerous Goods Act 1985
Equipment (Public Safety) Act 1994
Occupational Health and Safety Act 1985

REGULATIONS

Dangerous Substances (Placarding of Workplaces) Regulations 1985
Dangerous Goods (Prescribed List) Regulations 1988
Dangerous Goods (Storage and Handling) Regulations 1989
Dangerous Goods (Transport) Regulations 1987
Equipment (Public Safety) (General) Regulations 1995
Hazardous Substances Regulations 1996
Noise Regulations 1995
Plant and Equipment Regulations 1995
OH&S (Certification of Plant users and Operators) Regulations 1994
OH&S (Incident Notification) Regulations 1997
OH&S (Asbestos) Regulations 1992
OH&S (Manual Handling) Regulations 1999
OH&S (Issue Resolution) Regulations 1989
OH&S (Lead Control) Regulations 1988
OH&S (Confined Spaces) Regulations 1996

CODES OF PRACTICE

WorkSafe Australia Code of Practice for the Safe Removal of Asbestos (NOHSC 2002 1988)

AUSTRALIAN STANDARDS

AS 1288	Glass in Buildings - Selection and installation.
AS/NZS 1336	Recommended practices for occupational eye protection.
AS/NZS 1337	Eye protectors for industrial applications.
AS 1470	Health and safety at work - Principles and practices.
AS/NZS 1800	Occupational protective helmets - Selection, care and use.
AS/NZS 1801	Occupational protective helmets.
AS 1885	Measurement of occupational health and safety performance.
AS 1940	The storage and handling of combustible liquids.
AS/NZS 2161	Occupational protective gloves.
AS 2210	Occupational protective footwear.
AS/NZS 2311	Guide to the painting of buildings.
AS/NZS 3000	Electrical installations (A/NZ Wiring Rules).
AS 3500	National plumbing and drainage code.
AS 4361	Guide to lead paint management.
AS 4373	Pruning of amenity trees.
AS/NZS 4501	Occupational protective clothing.
AS/NZS 4801	Occupational health and safety management systems - Specification with guidance for use.
AS/NZS 4804	Occupational health and safety management systems - General guidelines on principles, systems and supporting techniques.
AS 4939	Non-reusable personal use containers for the collection and disposal of hypodermic needles and syringes
SAA HB9	Occupational personal protection.

SAA HB53	A management system for occupational health, safety and rehabilitation in the construction industry.

VICTORIAN WORKCOVER GUIDE NOTES

Victorian WorkCover Authority

VWCA No. 01	Tilt up construction
VWCA No. 03	Workplaces
VWCA No. 05	Lead control
VWCA No. 06	Temporary electrical installations on building and construction sites
VWCA No. 07	Manual handling regulations and code of practice
VWCA No. 08	Safety precautions in trenching operations
VWCA No. 10	Safe work on roofs (excluding villa constructions)
VWCA No. 11	Safe use of cranes in the building and construction industry
VWCA No. 13	Building and construction workplaces
VWCA No. 14	Demolition
VWCA No. 15	Manual handling (occupational over-use syndrome)
VWCA No. 16	Provision of occupational health and safety information in languages other than English
VWCA No. 17	Noise
VWCA No. 18	First aid in the workplace
VWCA No. 19	Plant
VWCA No. 20	Confined Spaces
VWCA No. 21	Demolition (Amendment No. 1)
VWCA No. 22	Safe work on roofs (excluding villa constructions) (Amendment No. 1)
VWCA No. 23	Plant (Amendment No. 1)

OTHER

DHS Sure Protection Against Infection
DHS Minimum Standards for Protection of Occupational Assault
DHS Manual Handling - Reducing the Risk - Reducing the Injuries

Be aware of and provide information, training and supervision for the following specific issues:

- Infection control is an area which provides safe systems of work to be developed including the provision of appropriate personal protective equipment.
- Hypodermic needles are an increasing risk and therefore a specific work instruction for dealing with the needles in a safe manner to eliminate the risk of needle stick injury shall be put in place and monitored.
- Manual handling issues need to be assessed and procedures and work instructions put in place to minimise the risk of injury.
- The storage and handling of chemicals shall be planned ensuring compliance to all relevant regulations.
- Material Safety Data Sheets for chemicals shall be available on request.
- Personal protective equipment such as safety boots or shoes, cover-all or protective clothing, gloves and sunglasses and hats for outside workers should be seen as a minimum requirement and shall be provided on work carried out under this contract.

Submit evidence (copies of documents) to verify compliance with all statutory applications, approvals, certificates and permits.

Promptly notify details of all accidents to the Superintendent, and provide monthly reports stating total hours worked, number of accidents and time lost, rehabilitation reports and other relevant information.

Remove from site of any person not wearing or using required safety clothing and equipment, or any person who refuses to carry out occupational health and safety related instructions.

A-30 SITE FACILITIES FOR THE SUPERINTENDENT

Make available to the Superintendent, from time to time:

- A meeting room within the Contractor's site accommodation with table and six chairs.
- The Contractor's site telephone and pay for all calls by the Superintendent.
- The Contractor's layout tables and site drawings, and adequate lighting.

Make available during the construction period, and as required during the Defects Liability Period, proper and safe access, ladders and gangways, lighting and necessary attendance for inspection of the Works by the Superintendent.

A-31 PROPRIETARY BRANDS

A Alternative products:

Where the Specification refers to one or more proprietary brand names preceded by the words:

"The following product (s) satisfies the specification requirements ... "

the Contract Sum shall be deemed to include the cost of such products, and the Contractor shall use one of such products in the Works.

The Contractor may offer alternative products with similar characteristics, quality, appearance, finish, method of construction or performance after the Letter of Acceptance of Tender has been issued. Such proposals shall include appropriate technical details and supporting documents. The written approval of the Superintendent shall be the only authority for use of alternative products.

B Single products:

Where the Specification refers to one or more proprietary brand names preceded by the words:

"The following single product satisfies the specification requirements ... "

the Contract Sum shall be deemed to include the cost of such products, and the Contractor shall use such products in the Works. No alternatives will be approved.

A-32 USE OF RAINFOREST TIMBER

It is prohibited to use in the Works timber harvested from a Victorian cool temperate or warm temperate rain-forest, or land adjacent to a rain-forest, constituting a rain-forest buffer area, as defined by the Department of Natural Resources and Environment or other relevant Victorian Government Department.

A-33 PRODUCTS TO BE SUPPLIED BY THE PRINCIPAL ('TBS' ITEMS)

A Responsibility:

Where indicated, receive from, take responsibility from time of delivery, and install TBS items supplied by Principal. Provide fixings, trim and coordination required for a complete installation.

Coordinate supply program with Superintendent, including dates, delivery locations and off-site storage locations.

Following Letter of Acceptance, the Superintendent will requisition the required TBS items and issue a copy of the requisition to the Contractor. Check the requisition and notify any errors to the Superintendent within seven days.

Notify Superintendent using 'Delivery Request for TBS Items' form, not less than six weeks before TBS items required, and indicate required delivery date and location.

B Delivery:

Issue and sign receipts for all deliveries. Submit copies of all receipts.

TBS items will be delivered to the site free of charge. Unload TBS items and move to installation or storage areas.

Inspect TBS items at time of delivery and notify Superintendent of any observed damage. At the Superintendent's discretion, the Principal will arrange for removal and replacement of damaged TBS items.

Protect and take responsibility for TBS items from the time of delivery until Practical Completion. At the Superintendent's discretion, any TBS items damaged after delivery shall be replaced or repaired at the Contractor's cost.

C Installation:

Install TBS items in accordance with the product information in such a way that will not void or limit the manufacturer's warranties, if any, and do not commission or operate TBS items without the written approval of the Superintendent, or do anything which might commence or void manufacturer's warranties. Use product information to ensure correct fitting and location of service connection points. Construct permanent access for routine service and maintenance.

A-34 REQUIRED INSPECTIONS

The Contractor shall give not less than three days notice to the Relevant Building Surveyor for all required inspections. The Contractor shall verify with the Relevant Building Surveyor the inspections required and the staging of inspections.In addition to the inspections required by the Relevant Building Surveyor, the Contractor shall give not less than two days notice to the Superintendent in writing and make arrangements for inspection of significant stages of work indicated.

Do not commence subsequent stages of work until the Superintendent has inspected and approved the following stages of work where appropriate:

- Excavation.
- Reinforcement to floors before placing concrete.
- Set-out of walls.
- Walls and roof framing, before loading of roof.
- Services before covering over.
- Framing fixing plaster sheeting and linings.
- Underlay before laying vinyl and carpet.
- Substrate preparation before painting.

Any approval by the Superintendent shall not reduce or modify the complete responsibility of the Contractor for the finished work.

A-35 CLEANING

A Progressively:

Keep the Works, adjacent common areas and adjacent properties affected by the Works, clean and tidy at all times. Clear and remove dirt and debris from the site progressively.

Provide sufficient personnel and equipment for cleaning operations.

Provide and regularly empty disposal containers for demolished materials, debris, discarded and surplus goods and materials generated by the Works. Locate containers as close as practicable to the relevant work area.

Containers shall not be located on public roads or paths unless approved by the relevant authority and all required permits have been obtained and fees paid.

The Superintendent may require any area to be immediately cleaned during the construction period at no additional cost to the Principal.

Remove all dirt and debris attributable to the Works from adjacent roads, paths and properties in accordance with the requirements of the relevant authorities.

B Vehicles and transportation:

Use trucks that will not spill or deposit dirt or debris on adjacent public roads, paths or properties.

Clean the tyres and underside of trucks before leaving the site.

Provide and maintain effective truck washdown and silt retention pits where required, and dispose of silt to a legal disposal location.

C Completion:

Before arranging handover inspections, finish, clean, and make good the Works including:

- Clear and remove surplus materials, dirt, debris and the like.
- Repair damage and defects to adjacent properties resulting from the Works.
- Repair damage, stains and blemishes, or replace work where required.
- Clean all surfaces, and polish glass, tile and metal finishes.
- Ease all doors, windows, drawers.
- Commission, lubricate and adjust locks and closers.
- Commission, test and ensure services and equipment are connected and operating properly.

Immediately before handover, vacuum clean carpets to remove all marks and soiling, and to lift the pile where appropriate, and mop all hard floor surfaces.

A-36 WARRANTIES AND GUARANTEES

Provide a warranty of approved wording for the work of every Trade Section unless indicated as not required. Refer to the relevant Trade Section for the requirement and warranty period.

The provision of a warranty shall not relieve the Contractor of responsibility to comply with the Contract Documents. The use of a proprietary or an approved system shall not relieve the Contractor of responsibility to provide a warranty. The provision of a warranty shall not relieve the manufacturer or supplier of goods and materials of responsibility for the safety and fitness for purpose of such goods and materials.

The warranty shall include all manufacturer's product warranties.

Warranties shall include an undertaking that all work will remain fit for the intended purpoec, in good appearance, free of defects and comply with statutory requirements for the warranty period.

Excepting fair wear and tear, warranties shall include the cost of:

- Rectification of other work to be removed and replaced to provide access for rectification of warranted work.
- Rectification of other work which has been damaged as a result of failure of the warranted work.
- The liability for and cost of any damage, including consequential damage, to persons or property arising from the failure of any part of the warranted work.
- The costs of removal and replacement of any defective or related work shall be without regard for whether the Principal or the occupant has benefited from use of such work during the warranty period.

Rectification procedures shall be carried out with minimum inconvenience to the Principal and the occupants of occupied premises. Where required, rectification procedures shall be carried out at particular times to suit the requirements of the Principal or occupants.

Where a manufacturer's or supplier's warranty for any item is usual but is not supplied with the item, provide a written guarantee for that item.

Unless otherwise directed, warranties shall name the Principal and its assigns and successors as the warrantee.

All warranties shall be guarantied by the Contractor. Should the warrantor fail to perform its obligations under the warranty, take responsibility for the performance of the warranty.

The warrantor shall be a party approved by the Principal. The warranty shall join the equitable owners of the warrantor company and its directors as parties to the warrantor.

In the case of product warranties, the warrantor shall include the manufacturer of the products, and any intermediate importor, agent, re-seller or supplier required by the Principal to be a party to the warrantor.

Except for work completed and accepted after Practical Completion, all warranties shall commence at Date of Practical Completion.

Unless otherwise indicated, the following items shall be warranted for the following periods:

Clause E-12	Termite protection	10 years
Clause E-20, 21	Membrane / water-proofing	10 years
Clause F-12	Termite protection	10 years
Clause I-07	Termite protection	10 years
Clause J-03	Joinery	2 years
Clause K-02	Metal / tile roofing / roof plumbing	6 years
Clause L-03	Timber doors	3 years
Clause L-03	Aluminium windows	10 years
Clause L-10	Steel security doors	5 years
Clause O-15	Vinyl sheet / tile	5 years
Clause O-15	Slip resistant vinyl sheet (slip resistance)	10 years
Clause O-03	Carpet	10 years
Clause P-06	Membrane / water-proofing	10 years
Clause P-09	Tiling	5 years
Clause R-03	Painting	3 years
Section U	Tapware	5 years
Section U	Stainless steel sinks / troughs / cabinets	10 years
Clause U-03	Plumbing fixtures, including baths / shower bases / hand basins / vanity basins / toilet suites	2 years
Section V	Fire protection equipment	5 years
Clause V-11	Smoke alarms	5 years
Section W	Mechanical equipment / appliances	2 years
Clause W-04	Ducted heating equipment	5 years
Clause W-05	Evaporative cooling equipment	5 years
Section X	Electrical equipment / appliances	2 years
Clause X-13	Exhaust fans	3 years
Clause Y-03	MATV systems	3 years

A-37 HANDOVER

The handover process shall include preliminary inspections by the Contractor and Superintendent, all making good, rectification and finishing by the Contractor, and a final inspection by the Relevant Building Surveyor, Contractor and Superintendent. The Works shall be substantially completed and cleaned before the preliminary inspection. The Superintendent will issue an unsigned handover certificate at the time of the preliminary inspection listing items to be completed or rectified. All handover inspections shall be carried out jointly.

Notify Superintendent regarding arrangements for the testing and servicing of emergency services for the duration of the Defect Liability Period as required by the BCA.

Handover shall be effective when the Superintendent has signed the handover certificate in acknowledgement that such items are completed and the Contractor has provided to the Superintendent all relevant keys. Handover shall be a requirement of Practical Completion. Handover may be progressive for agreed dwellings or areas.

Notify the Superintendent fourteen days before handover is required, and coordinate and arrange with the Superintendent for suitable dates for inspections, but in any case give not less than three days notice for any such inspection.

Before arranging inspections, make reasonable efforts to ensure the completion, cleaning and correction of defects. If it becomes apparent to the Superintendent during inspections, that the Contractor has not made such reasonable efforts, the Superintendent may terminate the inspection at its discretion.

Retain sufficient personnel and equipment on the site until handover to complete the required making good, rectification and finishing.

All keys shall be properly tagged and labelled with unit number, street number and name of street, as appropriate or directed.

All making good, rectification and finishing shall be completed within seven days of the preliminary inspection. The Superintendent retains the right to make arrangements for work not completed by the Contractor after seven days to be completed by others, and the cost deducted from the Contract Sum.

Evidence that 12 months maintenance for essential services is in place.

Certificates of Practical Completion shall be endorsed with the date of handover.

A-38 LODGING OF DOCUMENTS

As a requirement for issue of the Certificate of Practical Completion, obtain from subcontractors and submit all required documents relevant to the Works or any part, where applicable, including:

- Occupancy Permit (or Certificate of Final Inspection).
- Building Permit.
- Emergency Evacuation Plans.
- Independent System Certification.
- All system commissioning documents.

- Evidence of contracts for the ongoing maintenance of safety and emergency equipment.
- Certificate of Compliance from the Plumbing Industry Commission for plumbing work.
- Final certificate for plumbing and waste disposal.
- Notice of Completion of Electrical Work from the relevant authority for electrical work.
- Clearance certificate from the local authority relating to reinstatement of adjacent roads, paths and crossovers.

- Control Sheets for Pre-Painting Repairs and Painting (Clause R-21).
- As-built drawings.
- User manuals.
- Delivery dockets.
- Insurance policies.

- Warranties, guarantees, including warranties issued by sub-contractors or suppliers.
- Termite protection certificate.
- Surveyor's certification of set-out.
- All other certificates and approvals from any authority having jurisdiction over the Works.

END OF SECTION

SECTION B - DEMOLITION

CONTENTS

B-01 SUMMARY

Carry out general and detail demolition, remove debris and clean-up progressively, as required.

Inspect site during Tender Period, assess site and adjacent conditions, and include all required work in the Contract Sum, including noise control, safety and protection of work to remain.

Coordinate detail demolition with relevant Trade Sections to ensure the minimum delay between demolition and subsequent work.

Obtain all required permits and obtain all required insurance. Comply with permit and policy conditions, including all required inspections. Submit copies of permits and evidence of compliance.

B-02 REFERENCES

Comply with the following Standards. Keep Standards marked (*) on site during work.

AS 2436	Guide to noise control on construction, maintenance and demolition sites.
AS 2601 (*)	The demolition of structures.

NOHSC: 2002 Code of Practice for the Safe Removal of Asbestos. (www.nohsc.gov.au)

WorkSafe Victoria, DRAFT (Asbestos) Regulations 2002 (www.worksafe.vic.gov.au)

B-03 SUBMISSIONS

A Superintendent's Inspections:

Give sufficient notice so that the Superintendent may inspect the following:

- Adjacent structures before commencement of work.
- Existing services before disconnection or diversion.
- Trees to be retained, identified and protected, or proposed for removal.
- Contents, fixtures and fittings to be re-used or salvaged, before commencement of work.
- Site after removal of demolished materials.
- Services after re-connection or diversion.
- Adjacent structures after completion of demolition.

B Demolition methods:

Submit a demolition methods statement including:

- Appropriate demolition procedures, temporary support and sequence.
- Bracing, propping and water-proofing of the work to remain and adjacent properties.
- Locations and sequence for termination, reconnection and relocation of services.
- Protection of site personnel, adjacent properties and the public.
- Location of hoardings, bins and the like.

B-04 PERFORMANCE

A Demolition loads:

Existing work to remain after demolition shall support applicable dead and live loads.

Do not damage existing structural members required to remain after demolition. Do not stack or concentrate demolished materials on existing work in excess of live load capacity.

Construct temporary support if required. Construct permanent support to remaining work and adjacent property if required. Comply with the relevant Standards.

AS 1170 Minimum design loads on structures. (SAA Loading Code)

B **Temporary weather protection:**

Carry out partial and detail demolition so that weather and moisture are excluded from the interior of the remaining building in all weather conditions.

Existing work to remain after demolition shall be closed or covered as soon as practicable. Coordinate following work.

Install covers to protect existing work to remain permanently, when site is unattended and before inclement weather. Do not commence work before inclement weather if there is risk of weather damage.

B-05 DEMOLISHED MATERIALS

Except for materials to be salvaged for re-use or retention by the Proprietor, demolished materials shall become the property of the Builder and shall be removed from the site to a legal disposal location. Do not burn or bury demolished materials on site.

Demolished materials to be re-used or salvaged shall be handled carefully and if damaged through lack of care shall be replaced with materials of similar condition.

B-06 EXECUTION

A **Generally:**

Carry out demolition in a safe and orderly manner, remove materials and clean-up progressively.

Do not drop or throw materials. Lower by means of hoists or chutes. Materials shall be wetted to minimise dirt and dust, without causing water damage or nuisance. Fit trucks with tarpaulins to cover loads. Do not over-load trucks or spill debris on public streets.

B **Protection:**

Protect the public and property which is to remain on or adjacent to the site from interference or damage. Make good any such damage to match existing.

Take responsibility for any damage, inconvenience or annoyance to any third party and for the settlement of any disputes arising without cost to the Principal.

C **Nuisance:**

Keep dust and noise to a minimum.

D **Explosives:**

Do not use explosives unless approved in writing by the Superintendent before commencing.

E **Trees to be retained:**

Refer to PRELIMINARIES Section for TREES TO BE RETAINED Clause.

F **Services:**

Before commencing, locate and identify any existing or disused services.

Protect, support and maintain existing services in use on the site.

Cut, seal and remove redundant services and other obstacles to the construction of the Works in accordance with the requirements of the relevant services authorities and the Superintendent.

Pay disconnection fees. Return any disused meters to the relevant supply authority or company.

G **Asbestos:**

Notify Superintendent immediately on discovery of asbestos or other toxic materials and stop work in the affected area. Do not re-commence work in such areas until approved in writing.

Refer to PRELIMINARIES Section for ASBESTOS AND HAZARDOUS MATERIALS Clause.

Carry out asbestos removal, or other containment or management procedures for existing and found asbestos products in accordance with the OOH 'Standard Specifications for Management of Asbestos Products'.

H **Cutting and grinding:**

Tools and equipment used for cutting, chasing and grinding concrete and masonry shall be suitable for the purpose, causing minimum noise and vibration transmission through the base-structure, and including provision for capture, contain and store resulting dust, liquid and other waste.

All waste shall be stored and removed from the site to a legal disposal location using suitable closed containers and vehicles. Liquid waste shall not enter the stormwater or sewerage system.

All chasing shall be saw-cut to straight lines and uniform depth. Jack-hammers shall not be used. Openings to masonry shall be saw-cut.

END OF SECTION

SECTION C - GROUNDWORKS

CONTENTS

C-01 SUMMARY

Carry out site clearing, excavation, back-filling, grading and associated groundworks in a safe and orderly manner, remove debris and clean-up progressively, as required.

Inspect site during Tender Period, assess site and adjacent conditions, and include all required work in the Contract Sum, including noise control, safety and protection of work to remain.

Coordinate excavation with relevant Trade Sections to ensure the minimum delay between excavation and subsequent work.

- Coordinate with LANDSCAPING, CONCRETE and PAVING Sections as appropriate.
- Refer to DEMOLITION Section for removal of existing services. Back-fill resultant excavation.
- Refer to PRELIMINARIES Section for TREES TO BE RETAINED Clause.

C-02 REFERENCES

Comply with the following Standards:

AS 1289	Methods of testing soils for engineering purposes.
AS 1726	Geotechnical site investigations.
AS 3798	Guidelines on earthworks for commercial and residential developments.
AS 3798	Guidelines on earthworks for commercial and residential developments.
AS 4482	Guide to sampling and investigation of potentially contaminated soil.

C-03 SUBMISSIONS

A Superintendent's Inspections:

Give sufficient notice so that the Superintendent may inspect the following:

- Areas to be cleared.
- Excavation completed to design levels.
- Filling completed to design levels.
- Service trenches excavated ready for laying the services.
- Services laid in trenches and ready for back-filling.
- Top-soil in stockpiles before placing.
- Surplus excavated material to be measured, in stockpiles.
- Exposed rock in the excavations.

The Superintendent will not consider an application for a variation to the Contact Sum related to excavated material, if the material is removed from site before inspection by the Superintendent.

B As-built records:

Maintain records and submit as-built drawings to record the depth of all footings.

Refer to PRELIMINARIES Section for AS-BUILT DRAWINGS Clause.

C-04 PERFORMANCE

A Protection:

Protect the public and property which is to remain on or adjacent to the site from interference or damage. Make good any such damage to match existing.

Take responsibility for any damage, inconvenience or annoyance to any third party and for the settlement of any disputes arising without cost to the Principal.

Keep dust and noise to a minimum.

B Water:

Keep excavations and groundworks free of surface water.

Refer to PRELIMINARIES Section for WATER AND EROSION Clause.

C Shoring:

Construct shoring, planking and strutting required to retain the sides of the excavations, and to ensure safe working. Include safety covers over holes. Obtain Superintendent's approval for shoring method for excavations deeper than 1.7 metres.

C-05 SITE CLEARING

Clear the areas to be occupied by the Works such as excavations, re-grading, buildings, paving and the like, and areas indicated as areas to be landscaped or cleared. Clear and grub out to a minimum distance of 1200 mm around the building line.

In areas to be cleared, remove everything on or above the site surface, including rubbish, scrap vegetable matter and organic debris, scrub timber, stumps, boulders, rubble and the like.

Remove remaining site material to carry out the Works including old underground stumps, strip footings and services. Do not remove underground materials and services until construction starts in order to minimise water logging and retain soil compaction.

Remove the surface layer of the natural ground to a depth of 100 mm.

Grub out stumps and roots over 75 mm diameter to a minimum depth of 500 mm below subgrade under buildings or paving or 300 mm below finished surface in unpaved areas.

Spoil or top-soil retained on the site for future use shall be stockpiled in locations approved by the Superintendent.

C-06 EXCAVATION

A Generally:

Excavate to the correct design levels and profiles for footings, ground slabs, pads, service trenches, pits, paving, filling, landscaping and the like, to the required sizes and depths.

Excavate for septic tanks and disposal systems as required by the relevant service authority.

Make provision for compaction and settlement. Remove surplus excavated soil from the site.

B Public roads and paths:

Obtain approval of relevant authority before excavating any public road or path. Arrange the work so that at least half the width of thoroughfare is kept open for use.

Make clean saw cuts through existing pavements and remove excavated material without damage to adjacent pavement.

C Over-excavation:

Re-instate over-excavation to the correct depth, level and bearing value with back-filling compacted to match adjacent undisturbed ground, or with additional concrete, at no additional cost to the Proprietor. Refer to CONCRETE Section.

D **Grading generally:**

Grade finished ground surfaces to falls indicated. Where not indicated, grade 1500 mm adjacent to buildings to 3% minimum fall away, to prevent ponding in re-entrant corners and against buildings, and to ensure natural surface drainage to pits and surface drains.

E **Levels at gates:**

Excavation for paths shall enable opening of gates fully without use of offset hinges unless otherwise indicated. Bottom of gates shall be not more than 75 mm above finished paving level, with provision for 25 mm gate sag.

F **Footings and ground slabs:**

Battered slopes shall not be steeper than indicated slopes, except for excavation in stiff natural ground. Bottoms of footing trenches shall be level. Benching of footing trenches shall not exceed two brick courses (175 mm nominal).

Finished level of concrete ground slabs shall be between 200 and 550 mm above the finished ground level at slab perimeter. Benching shall not exceed 500 mm.

G **Excavation for service trenches:**

Coordinate with relevant Services Sections.

Make services trenches straight between access pits, inspection points, junctions and the like, with vertical sides and uniform grades. Locate trenches clear from buildings and paths.

Excavate service trenches with the minimum delay before installation of services, and back-fill as soon as practicable after installation and testing of services.

The depth of cover provided to all services installed underground including pipework and valves shall be in accordance with the requirements of the relevant authorities, Standards or Codes except that a minimum cover of 500 mm shall be provided.

H **Measurement:**

Where the Superintendent directs footing depths to be increased, Contract Sum variations shall be measured in accordance with Part 1 - Tender Form B - Schedule of Rates, and as follows:

- Depth shall be measured from the natural ground level before commencing the Works.
- Measured depths shall be averaged over the length of each footings section.
- Minimum depth of excavations for footings and stumps shall be 600 mm.

No Contract Sum variation for additional excavation will be approved unless the change in depth is more than 150 mm above or below the indicated depth.

C-07 ROCK REMOVAL

Carry out excavation in whatever type of material is encountered with the exception of rock.

Notify the Superintendent immediately rock is discovered and give two clear working days notice for a joint inspection by the Contractor and Superintendent before commencing removal or covering over of rock.

Payment will not be approved for rock removed before such joint inspection.

Rock shall be measured in its undisturbed condition as follows:

- Rock shall be defined as material found in ledges, masses, bedded or conglomerate deposits which present the characteristics of solid rock, and which in the opinion of the Superintendent would normally be removed by pneumatic equipment or explosives.
- Floaters shall be classified as rock only if the least dimension exceeds 800 mm or the volume exceeds 0.5 m3.
- Measurement shall not include any over-excavation required to remove rock.
- If the required widths or depths of the excavation are increased in order to remove floaters, such additional excavation shall be back-filled and compacted with approved materials similar to adjacent undisturbed ground, at no extra cost to the Principal.

- Payment for rock excavation shall be in accordance with the Part 1 - Tender Form B - Schedule of Rates.

For footing trenches, rock shall be measured as follows:

- Trenches less than 1000 mm deep shall be measured to the minimum width required by the construction, as determined by the Superintendent.
- Trenches more than 1000 mm deep, where site personnel are required to work within the trench, shall be measured as either the minimum width required by the construction or as for services trenches below, whichever is the greater.

For services trenches, rock shall be measured as follows:

Less than 1000 mm deep	450 mm wide
From 1000 mm to 2000 mm deep	550 mm wide
From 2000 mm to 3000 mm deep	650 mm wide
From 3000 mm to 4000 mm deep	750 mm wide
More than 4000 mm deep	900 mm wide

For open cut excavation, rock shall be measured as follows:

- Rock measurement shall be taken from the top of the rock surface down to the benched reduced level measured in the solid, within the confines of the excavation and/or within the limits indicated on the Drawings to the approval of the Superintendent.

Blasting and explosives shall not be used for rock removal unless approved in writing by the Superintendent before commencing.

C-08 BACK-FILLING

A **Generally:**

Back-filling material under slab-on-ground floors, paving and other structures shall be compacted material of suitable type, including:

- Grade 'B' crushed rock, evenly graded from 25 mm (maximum) to fines.
- Packing sand.
- Granitic sand.
- Gravel, evenly graded from 19 mm to fines.
- Crushed quarry products, evenly graded to 19 mm to fines.

Back-filling under slab-on-ground floors in excess of 75 mm over the whole area or 230 mm in any part shall be approved before commencing. All filling material shall be of one classification.

B **Compaction:**

Place and spread back-filling in 150 mm layers and compact by mechanical methods or hand tamping to prevent damage to services and adjacent work. Add sufficient water to ensure optimum moisture content for consolidation. Consolidate to uniform dry density of not less than 95% modified maximum dry density to AS 1289.

C **Contamination:**

Back-filling material shall not contain debris, building materials, crushed or broken bricks and concrete, organic matter, scoria, rock, silt, clay or expansive soil, material from site clearing or excavation, top-soil, organic material or material which will decay.

D **Back-filling for service trenches:**

Back-filling for services trenches shall be generally as for slab-on-ground construction, but shall not exceed 20 mm evenly graded material. Do not back-fill until required inspections and making good, if any, have been carried out.

C-09 LANDSCAPED AREAS

A **Excavation for landscaping:**

Coordinate with LANDSCAPING Section.

Excavate and grade areas to be landscaped for placing of top-soil and turf as follows:

- Garden beds: 125 mm below the required finished level (equal to depth of top-soil).
- Grassed areas: 75 mm below the required finished level (equal to depth of top-soil or turf).

Final gradient shall not exceed 25% or be less than 3%.

Leave work in a clean, rubbish free condition for planting.

B **Back-filling for landscaping:**

Construct required profiles to landscaped areas with suitable back-filling where required.

Back-filling material under landscaped areas shall be compacted natural soil, free of excessive clay to ensure free draining, and particle size not exceeding 50 mm.

Natural soil from site excavation may be re-used subject to approval by the Superintendent and proper stockpiling in locations approved by the Superintendent.

The excavation and filling shall be finished with an even surface to the entire area, trimmed to a firm and uniform sub-grade, free of depressions.

C-10 UNDER-PINNING

Notify Superintendent of proposed under-pinning before commencing. Do not carry out any under-pinning before carrying out an existing conditions survey of the affected property.

Refer to PRELIMINARIES Section for EXISTING CONDITIONS SURVEY Clause.

Do not commence under-pinning before carrying out an Existing Conditions Survey of the affected properties.

Excavate for and complete under-pinning in alternate bays before excavating between.

Where under-pinning occurs at depths below 600 mm or in clay soil, notify Superintendent to enable inspection before covering over.

END OF SECTION

SECTION D - LANDSCAPING

CONTENTS

D-01 SUMMARY

Carry out landscaping, including soils, plant-stock, fertiliser and consolidation, as required.

Inspect the site during the Tender Period, assess prevailing site and adjacent conditions 'as existing', including plant-stock types and quantities, and dimensions, and include all required work in the Contract Sum. No claim for additional cost or time will be approved due to site conditions.

- Refer to DRAINAGE Section for connection to site drainage system.
- Refer to MASONRY and CONCRETE Sections for retaining walls, if required.
- Refer to PLUMBING Section for water supply, including temporary water supply, if required.

D-02 REFERENCES

Comply with product information and the following Standards. Keep product information on site during work.

AS 2743	Potting mixes.
AS/NZS 4419	Soils for landscaping and garden use.
AS/NZS 4454	Composts, soil conditioners and mulches.
AS 4373	Pruning of amenity trees.

D-03 SUBMISSIONS

A **Approved landscaper:**

The work shall be carried out by an approved qualified landscaper. Submit details, including qualifications, recent similar projects, and referees. The approved landscaper shall keep a responsible representative in attendance on site at times during landscaping work.

B **Superintendent's inspections:**

Give not less than two days notice so that the Superintendent may inspect the following:

- Set-out of works.
- Site preparation, earthworks and weed eradication.
- Plant-stock at the nursery before delivery to site.
- Samples of mulch, gypsum and top-soil.
- Completion of lawn and garden bed construction and cultivation.
- Practical Completion.
- Completion of establishment period.

Cooperate with Superintendent, and make necessary arrangements with nursery for inspections.

C **Soil samples and test reports:**

Submit representative samples of top-soil for turf and garden bed areas for approval by the Superintendent. The samples shall be labelled with the name and address of the supplier.

The Superintendent may take a sample of imported soil for testing by an accredited NATA laboratory. If the test results indicate that the soil is not satisfactory, remove and replace.

Test results may include description of texture, pH value, salt content, plant growth elements, contaminating materials, and assessment of suitability of soil for general horticultural use.

D-04 EXECUTION

A **Generally:**

Before commencing, cover stormwater grates to prevent soil, mulch or other material entering pits and pipes. Any such material shall be removed by hand sweeping and digging and shall not be flushed down drains with water.

B **Protection of existing services:**

Locate all existing underground services on site and coordinate work to ensure that services are not damaged due to landscaping.

Where conflicts arise between services and the proposed landscaping, notify Superintendent.

Make good any damage to existing services due to landscaping at no cost to the Principal whether or not services are indicated.

C **Existing garden areas:**

Where new landscaping adjoins existing landscaping, make an even, level and continuous junction between the two sections and make good any damage caused to adjoining work.

D-05 NATURE STRIPS

On completion of landscaping, establish new seed-sown grass to all nature strips adjacent to the Works, whether indicated or not.

Excavate and back-fill with suitable top-soil as required. Ensure completed work is finished to a straight line between edges or kerbs.

D-06 TREES TO BE RETAINED

Refer to PRELIMINARIES Section for TREES TO BE RETAINED Clause.

Where roots in excess of 40 mm diameter within the drip-line of trees to be retained are required to be cut to avoid excavations, services or other damage, the work shall be carried out under the direction of an approved professional qualified arborist with a minimum of two years experience.

Minor work involving limited branch trimming and crown reduction may be carried out by a person with suitable training.

Where required work will affect more than 5% of the root system, the arborist shall prepare a report describing the proposed work and its effects. Submit report for approval before commencing work on affected trees.

D-07 PREPARATION OF PLANTING AREAS

A **Generally:**

Refer to GROUNDWORKS Section for site clearing, excavation, and grading generally.

Carry out final trimming and grading to the sub-soil as required for the landscaping works.

The finished level of grassed areas and garden bed top-soil shall be:

- Not higher than 125 mm below weep-holes or damp-proof courses in adjacent walls.
- Not lower than the bottom brick course. Footings and vapour barriers shall not be visible.
- Not above the bottom of fence plinths.
- Level with adjacent paths (for garden beds, including 75 mm mulch depth).

Depressions which develop during rolling shall be filled with suitable top-soil and compacted.

B **Delivery of top-soil:**

Refer to GROUNDWORKS Section for top-soil.

After approval of top-soil samples, notify the Superintendent of the intended date of delivery. All soils delivered to the site shall be consistent with the control samples.

If there is any doubt that the delivered top-soil does not conform to the control samples, the Superintendent may request additional soil tests. The cost of additional testing shall be at the Contractor's expense.

Imported top-soil shall be stockpiled in locations directed on site by the Superintendent.

C **Undisturbed natural soil profile:**

Where the natural soil profile has not been disturbed, prepare landscaping areas as follows:

- Cultivate top-soil without bringing sub-soils to surface.
- Remove grass and other plants, stones, building debris, and the like.
- Cultivate to a depth of 150 mm in garden bed areas and to 75 mm in lawn areas.
- Add top-soil to achieve grade and levels and mix with existing to avoid lamination.

D **Disturbed natural soil profile:**

Where the natural soil profile has been disturbed or excavated, and where the final level is below the natural surface, prepare garden beds and lawn areas as follows:

- Excavate to depth of 150 mm below final level in garden beds and 75 mm in lawn areas.
- Break up sub-soil and remove rock, building debris and the like to a depth of 75 mm.
- Place suitable top-soil to a depth of 150 mm in garden beds and 75 mm in lawn areas.
- Cultivate top-soil to produce a workable friable material.
- Add 25 mm of sandy-loam to lawn areas to ensure a suitable seed bed in clay soils.

E **Removal of weeds:**

All landscaped areas shall be sprayed with a suitable systemic herbicide (active ingredient glyphosphate and red marker dye) in accordance with product information. Sprayed areas shall be left for a period of 10 days before cultivation. Any weeds still alive after 10 days shall be re-sprayed or hand weeded until all weed growth is eradicated.

Remove all weeds from the landscaping areas before planting, and remove from site.

F **Gypsum:**

Where indicated, evenly spread horticultural gypsum to clay sub-soils at the rate of 1.5 kg/m2, and cultivate to a depth of 100 mm subsoil to thoroughly mix the gypsum and to eliminate compacted areas and hard pans.

D-08 TOP-SOIL

Top-soil for finished site works and landscaping shall be suitable imported top-soil in accordance with the relevant Standards.

AS/NZS 4419 Soils for landscaping and garden use.

Unless otherwise indicated, top-soil depth shall be:

- For garden areas: 125 mm minimum
- Grassed areas: 75 mm minimum.

Top-soil shall be free from contamination due to seeds, weeds and roots, stone or rubble, clods of subsoil and other debris. Top-soil shall not be delivered in a saturated condition.

Top-soil shall be free of industrial or agricultural contamination, including trade wastes, hydrocarbons, heavy metals and organo-chlorides. The Superintendent may request tests reports from a NATA registered laboratory to verify soil condition.

Top-soil for garden beds shall be:

- General Description: Light to medium friable clay loam.
- Texture: Capable of handling when moist, but lacking cohesion so it will fall apart easily.
- Acidity: Slightly acid to neutral, pH 5.5- pH 7.0.
- Stone Content: Less than 5% by dry weight, stone size not exceeding 10 mm.
- Decomposed Organic Matter: Up to 40% by volume.
- Un-decomposed Organic Matter: Less than 5% by volume free of weeds and sticks.
- Extraneous Matter: Absolutely free from rubbish, hydrocarbons, construction debris.

Top-soil from site clearing may be re-used subject to:

- Approval by the Superintendent for each proposed area of re-use.
- Proper stockpiling in locations approved by the Superintendent.
- Protection from contamination by construction debris.

Contaminated soil shall be removed from site and replaced with suitable material at no additional cost to the Principal. Surplus top-soil shall be removed from the site.

D-09 PLANTING

A Materials:

Plant-stock shall be supplied from approved nurseries and tagged with the correct botanical names.

Plant-stock shall be true to species, in vigorous healthy condition with well-developed root system, and free from pests and disease.

Place purchase orders for plants-stock as soon as practicable after Letter of Acceptance. Submit evidence of orders.

Where substitution is proposed, submit details to Superintendent in time for consideration before ordering. No substitution shall be made without written approval of the Superintendent.

B Procedures:

Thoroughly water all plant-stock before planting. Ensure that roots of plant-stock are not exposed to drying influences such as sun, wind or frost. On hot or windy days the plant-stock shall be covered with damp hessian during planting operations. The Superintendent may direct suspension of planting in periods of frost, drought, or when the soil is too wet.

Fertilise at the base of the planting hole with suitable slow-release fertiliser in accordance with product information for the plant-stock.

Place plant-stock vertical in the centre of planting hole with care to avoid damage to roots.

Back-fill the planting hole with top-soil and water-in at the same time.

Form a raised bank of compacted soil around the base of each plant to contain watering.

Stake and tie trees and shrubs to resist wind.

Protect newly-planted and grassed areas from pedestrian traffic by suitable methods until the plant-stock is well established. Protection may include three-strand wire fence on steel star pickets.

C Watering:

Water plant-stock immediately after planting and as required to maintain growth free of water stress until Practical Completion, at a rate not less than 6 mm of water in any period of seven days. Increase water during hot weather.

D Pruning:

Carry out pruning as required to remove broken, bruised or dead branches, with clean cuts without short stubs.

D-10 MULCH

Mulch shall be shredded pine wood or similar, nominal size 75 mm, aged to ensure that it contains no plant growth inhibitor, and free from clods of soil, rocks and extraneous materials.

Spread mulch to 75 mm depth on garden beds, raked and finished to a clean, even, neat appearance, and clear of stems of plant-stock.

D-11 PRE-GROWN TURF

A Generally:

Pre-grown turf shall be an suitable type free of noxious broadleaf weeds or grass.

The following product (s) satisfies the specification requirements: Strathayr 'Blue-Blend'.

Deliver turf to the site within 24 hours of being cut and install within 36 hours of being lifted.

During dry and windy weather, spray turf with water and cover with hessian to keep moist.

B Preparation of turf areas:

Excavate turf areas sufficient for compaction of the top-soil.

Spread suitable fertiliser with NPK ratio 12:12:8, at a rate of 40 grams / m2 evenly over site.

Mix fertiliser to a depth of 50 mm into top-soil, rake smooth and lightly water before laying turf.

C Laying:

Lay turf in stretcher bond pattern along contours. Cut turf edges with a sharp knife and firmly butt to adjoining strips. Turf shall be pushed into position, and not pulled or stretched. Prevent traffic over newly-laid areas.

After laying, tamp with a flat board and lightly roll. Fill occasional gaps with top-soil and tamp.

D Watering:

Turf shall be watered immediately after laying, and thoroughly at the end of each day to saturate soil to a depth of 75 -100 mm. Water turf daily for the first week except in periods of heavy rain. Water turf twice daily during hot dry conditions.

D-12 HYDRO-SEEDED TURF

A Generally:

Hydro-seeding shall be carried out be suitable procedures with a slurry of pulp mulch, fertiliser, seed, and equipment.

The following product (s) satisfies the specification requirements: Finn 'Hydro-Seed'.

Seed shall be pre-packed commercial fescue.

B Application:

Prepare hydro-seeded areas as for pre-grown turf. Carry out hydro-seeding on calm days only.

Slurry shall be agitated constantly and sprayed to ensure an even distribution of mix.

C Watering:

Hydro-seeding shall be maintained in a moist condition until satisfactory germination has occurred. Watering procedures and quantities shall be comply with product information. Water grass evenly at a rate not less than 6 mm of water in any period of seven days.

After satisfactory germination has been achieved, 'harden off' grass by progressively reducing the frequency and quantity of watering.

D-13 SEED-SOWN TURF

A **Generally:**

Submit details of proposed seed-sown-turf mix for approval before commencing. Include evidence of suitability for site conditions, season, prevailing weather, soils, exposure, shade and slopes.

Prepare seed-sown areas as for pre-grown turf with fertiliser mix of NPK ratio 10:4:6.

B **Watering:**

Water site evenly with minimum of 6 mm in each seven day period.

After 14 to 21 days repair areas that lack vigorous growth by over-seeding, replacing turf that has failed, or supplementary 'hydro-seeding', as appropriate. Remove weeds.

Carry out first cut when uniform growth reaches 75 mm and reduce height to 50 mm. Carry out final cut at the end of the Establishment Period.

D-14 ACCESSORY MATERIALS

A **Timber edge:**

Unless otherwise indicated, timber edging between garden beds and lawn areas shall be 75 x 25 mm treated pine in long lengths, laid to uniform gradients, with smooth even curves or straight as indicated, and neat butt joints.

Fix edging with 75 x 25 x 300 mm pegs driven flush with the top of the edging at joints and at 1200 mm maximum intervals. Nail edging to pegs with galvanised nails.

B **Mesh:**

Wire mesh for plant support shall be proprietary welded galvanised steel mesh, secured to walls and fences with galvanised fasteners at 600 mm centres horizontally and vertically.

D-15 ESTABLISHMENT

A **Generally:**

Care for the landscaping during an Establishment Period for thirteen weeks, commencing at the date of Practical Completion.

If landscaping is completed after the date of Practical Completion for the whole Works, the Establishment Period shall commence from the date of completion of the landscaping.

If landscaping is completed before the date of Practical Completion for the whole Works, the Establishment Period shall commence from the date of Practical Completion for the whole Works.

Landscaping shall be considered complete when grass areas show healthy and vigorous sward throughout and have been cut at least once, and planting areas show healthy vigorous growth.

B **Requirements:**

Establishment shall include the care of the landscaping by accepted horticultural practices, watering, mowing, fertilising, cultivation, aerating, weeding, re-turfing, pest and disease control, staking, pruning, replacement, re-planting, and keeping the site neat and tidy.

Defects to the landscaping during the maintenance period shall be rectified immediately. Mulched surfaces shall be kept in clean and tidy, and reinstated or topped up where required. Soil erosion or subsidence shall be made good.

C **Insecticide spraying:**

Spray against insect and fungus infestation in accordance with the product information as required, or if directed.

Notify the Superintendent of any occurrence of insect attack or evidence of disease, and notify Superintendent before any spraying.

D **Grass areas:**

Establish grass areas by watering, weeding, re-turfing, rolling, mowing, trimming and removing rubbish, or other operations as required.

Spray grass areas with suitable selective herbicide against broad leaf weeds.

Mow lawn areas not less than once every two weeks unless otherwise directed.

E **Watering:**

Grass, trees and garden bed areas are to be watered regularly throughout the establishment period to ensure continuous healthy growth. New planting shall receive regular and frequent deep soaking to ensure establishment and healthy growth.

Water by applying a minimum of 6 mm depth of water evenly over the site in any period of seven days. The minimum requirement shall be consistent with the natural rainfall of the site location.

During periods of hot and dry weather, lawn areas shall be watered on a daily basis, preferably in the early morning or late afternoon.

F **Pruning:**

Carry out pruning to trees and shrubs to encourage growth of dense foliage, to remove damaged growth, where beneficial to the condition of the plant-stock, or as directed.

G **Weeding:**

Carry out weeding to garden beds not less than fortnightly, unless otherwise directed.

H **Vandalism:**

Where plant-stock is dead, damaged, destroyed or stolen by others before completion of the Establishment Period, report damage to the Superintendent and carry out a joint inspection.

Rectify or replace damaged plant-stock as directed and carry out a further joint inspection after completion.

Where damage occurs before Practical Completion, pay for all costs of rectification or replacement. Where damage occurs during the Establishment Period, the costs will be determined by the Superintendent and paid by the Principal. Pay for all other reinstatement costs not due to vandalism.

Replacements shall be of the same species, and shall be free from disease and weeds.

I **Expiration of Establishment Period and Final Completion:**

On expiration of the Establishment Period, arrange a joint inspection with the Superintendent.

All work shall be completed and all defects rectified before the Final Certificate will be issued by the Superintendent.

D-16 LIMITED LANDSCAPE WORK FOR DETACHED HOUSES

Carry out the following finishing and landscape work for individual detached houses unless specified otherwise in Part 3 Project Schedules or the Drawings.

A **Site preparation:**

Remove and cart away from the site all building debris, surplus materials, and unsuitable sub-soil material brought to the surface by construction operations.

Grade all ground surfaces adjacent to the building and over the site, to drain water away from the building and prevent any ponding on the site.

Remove all exposed rock on site by grubbing out, or by capping to 150 mm above the finished ground surface and back-filling with top-soil.

Evenly grade soil surface to finish flush with top of paths and drives. Remove rough grass, roots and unsuitable sub-soil material from areas to be rotary hoed.

B **Nature strips:**

Before Practical Completion, clear all nature strips of all debris, rough grass, roots and rocks, and grade to an even uniform surface approved by the local authority. Nature strips shall also be rotary hoed and seeded and filled with top-soil to a depth of 75 mm where the existing top-soil is not suitable for grass seeding.

C **Rotary hoeing and grass seeding:**

Rotary hoe and plant grass seed to all areas of the site including front and back yards and up to wing fences, gates and side boundaries and including the area between drive strips.

Rotary hoe to a depth of 100 mm without disturbing existing trees. Where the site does not have suitable top-soil, fill with imported top-soil to a depth of 75 mm over all rotary hoed areas.

Rake rotary hoed areas to smooth even uniform grades and levels, and remove stones, hard materials, roots and debris brought to the surface. Evenly grade ground surfaces to drives and paths, free of hollows or low spots.

D **Grass seeding:**

Apply seed at a rate of 1 kilogram per 25 square meters and rake in to a depth of up to 15 mm. Apply lawn starter fertilizer at the rate recommended by the manufacturer. Water the area twice a day until there is an appropriate strike, and for an additional minimum of five continuous days.

E **Trees for individual detached houses:**

Supply prior to the occupant moving into the new house trees of species and type suitable to the area and climate. Acceptable size of trees will be 300 mm high. Trees shall be supplied in 200 mm pot containers, complete with labels stating the correct botanical name and planting instructions.

For properties of less than 500m^2 provide 3 trees (one or 2 in the front and the balance in the rear.)

For properties greater than 500 m^2 provide 5 trees (two or three in the front and the balance in the rear)

Where Town Planning permits are required, provide planting in accordance with the requirements of the Town Planning Authority not less than the above.

END OF SECTION

SECTION E - CONCRETE

CONTENTS

E-01 SUMMARY

Provide concrete including formwork, reinforcement, embedments and precast items, as required.

Refer to GROUNDWORKS Section for excavation.

E-02 REFERENCES

Comply with the following Standards. Keep Standards marked (*) on site during work.

AS 1012	Methods of testing concrete.
AS 1379	Specification and supply of concrete
AS 2870	Residential slabs and footings.
AS 2870.1 (*)	Construction.
AS 3600	Concrete structures.
AS 3610	Formwork for concrete.
AS 3660 (*)	Protection of buildings from subterranean termites.

E-03 SUBMISSIONS

A **Superintendent's inspections:**

Give sufficient notice (not less than two days) so that the Superintendent, and authority where required, may inspect the following:

- Excavations before placing blinding or normal concrete.
- Formwork and vapour barrier before placing reinforcement.
- Installation of termite barrier.

Fix reinforcement and embedments, and obtain Superintendent's approval before placing concrete.

B **As-built drawings:**

Where the as-built location of installed concrete differs from the Drawings, and where work is concealed, maintain records progressively and submit as-built drawings.

Refer to PRELIMINARIES Section for AS-BUILT DRAWINGS Clause.

C Details of concrete supplier:

Concrete shall be ready-mixed concrete by a registered manufacturer, unless otherwise. Submit details of registration. If this is not practicable, submit an alternative proposal in the Tender.

E-04 PERFORMANCE

A Concrete slump and strength:

Refer to Drawings for 28 day compressive strength and required slump. If not indicated, slump shall be not more than 75 mm.

B Testing:

Submit 'production assessment' details to AS 3600.

Where 'production assessment' details are not available for any reason, or where indicated, carry out and submit 'project assessment', including site sampling and testing, to AS 3600, Section 20, and AS 1012.

C Rejection of concrete:

Defective concrete shall be rejected to AS 3600, Section 19, and shall be demolished, removed from site and replaced. No claim for additional cost or time will be approved.

D Concrete class:

Unless otherwise indicated, concrete class to AS 3610 shall be:

- Precast items generally: Class 1.
- Exposed edges and soffits generally: Class 2.
- Concealed work, slumps and the like: Class 3.
- Other: Class 4.

E-05 CONCRETE MATERIALS

Concrete generally shall comply with AS 3600, Section 19. Ready-mixed concrete shall comply with AS 1379.

Do not use of admixtures unless approved in writing. If approved, comply with AS 3600, Clause 4.9. Do not add more water after initial mixing.

E-06 FORMWORK

A Generally:

Formwork shall comply with AS 3600, Clause 19.6 and AS 3610.

Design and construct formwork to ensure the dimensions, profiles, locations and surface finishes of finished concrete indicated on the Drawings.

Formwork shall be watertight and of sufficient strength to prevent excessive deflection under loads during placement and compaction of fresh concrete.

Inspect formwork immediately before placing concrete and remove all dirt and other debris.

Formwork ties shall be of suitable type and shall be removed carefully. Make good any visible damage to the concrete.

Formwork release agents shall be non-staining. Apply to clean formwork before placement of reinforcement.

B Formed surface finish:

Surface finish of formed concrete shall comply with AS 3610.

Set out the formwork to give a regular and tidy arrangement of panels, joints, bolt holes and visible elements in the formed surface.

C Removal of formwork:

Strip formwork and remove supports to AS 3600, Clause 19.8.2. Notify Superintendent and obtain approval to remove formwork before proceeding.

Dimensional tolerances shall comply with AS 3600, Clause 19.5, AS 3610, and as follows:

Formwork Class to AS 3610	Class 2	Class 3	Class 4
Deviation from position (mm)	15 mm	20 mm	25 mm
Misalignment - between pours	2 mm	3 mm	4 mm
Misalignment - across joints	2 mm	2 mm	4 mm

E-07 REINFORCEMENT

Fabricate and place reinforcement as indicated, including dowel bars where required. Reinforcement, including deformed bars and welded wire fabric shall comply with AS 3600, Clause 19.2, and the relevant Standards.

AS/NZS 4671 Steel reinforcing materials.

Reinforcement tolerances shall comply with AS 3600, Clause 19.5.3. Concrete cover shall comply with AS 3600, Clause 4.10, unless additional cover is indicated.

Reinforcement shall be free from loose rust, mill scale, dirt or other substances which might prevent proper bonding with the concrete.

Reinforcement shall be free from kinks and bends not indicated, and any defect that may affect strength, durability or appearance of the finished work.

Where embedments and built-in items require cutting of reinforcement, notify Superintendent and obtain approval before commencing. Include additional reinforcement where directed.

If additional splices are required, submit details to the Superintendent for approval.

Support reinforcement on bar chairs, support and spacer bars to ensure correct and secure position.

E-08 PRECAST CONCRETE

Precast concrete items shall be complete with all required bracing, fixings, shims, jointing strips, flashings, sealants, grout and the like.

Precast items shall attain 14 MPa minimum compressive strength before transporting.

Handling and transporting precast concrete items without over-stressing or any other damage. Use suitable cradles and other handling equipment as required.

Carefully place precast items and securely fix in positions indicated.

E-09 EMBEDMENTS, SLEEVES AND CONDUITS

A Generally:

Embedments, fixings and built-in services shall comply with AS 3600, Section 14.

Coordinate with related Trade Sections and ensure the correct building-in of embedments, fixings and services including pipe sleeves, floor wastes, holding down bolts and the like.

Construct set-downs, rebates and other recesses required by related Trade Sections. Set-downs shall not reduce the slab thickness or cover to reinforcement. Refer to AS 2870.1, Figure 6.2.

Position tolerances shall not exceed:

- Embedded items: +/-10 mm.
- Fixings and anchorages: +/- 3 mm.

Embedments and fixings shall be non-ferrous metal (compatible with concrete) or hot dip galvanized steel to AS 4680.

B Telephone conduits:

Build-in conduits where required. Coordinate with TELEPHONE Section.

E-10 JOINTS

A Construction joints:

Construction joints shall comply with AS 3600, Clause 19.4.1 and 14.1.1.

Submit proposed locations of construction joints for approval before placing concrete.

Before placing fresh concrete on or against hardened concrete, thoroughly roughen the hardened surface, remove all laitance and loose material and keep damp for not less than 2 hours. Apply neat cement slurry brushed into the hardened surface immediately before placing fresh concrete. During placement of the fresh concrete, vibrate thoroughly along the joint area.

B Movement joints:

Construct movement joints of types and locations indicated, and fill joints with suitable joint-filler material suitable for the location.

Before filling, clean joint surfaces and prime if required in accordance with the product information. Finish joint-filler neatly and flush with adjacent surfaces.

Joints subject to ingress of water shall be made watertight.

C Control joints:

Control joints shall be saw cut to one third slab thickness as soon as concrete has sufficiently hardened.

E-11 VAPOUR BARRIER

Vapour barrier to concrete slabs-on-ground shall comply with AS 2870.1, Section 6.

Vapour barrier shall be 0.2 mm heavy duty polythene placed on a smooth substrate surface free from hard or sharp protrusions.

Substrate shall be sand or fine crushed rock, well watered and compacted to a smooth surface.

Lap all joints 200 mm and seal joints and around penetrations with pressure sensitive tape. Wrap vapour barrier around the outer surface of edge beams.

E-12 TERMITE BARRIER

For new construction, termite barrier shall be a suitable mechanical type to AS 3660.1 carried out by an approved specialist. Submit certificate of compliance.

The following product (s) satisfies the specification requirements: 'Term-Mesh', 'Granit Guard'.

Chemical termite barriers may be used in existing construction. Obtain approval in writing before commencing.

Provide warranty for termite barrier for correct performance for a period of ten years from Practical Completion. Include manufacturer's written product warranties.

Coordinate with MASONRY and CARPENTRY Sections as required.

E-13 CONCRETE PLACING AND COMPACTION

Handle and place concrete to AS 3600, Clause 19.1.3.

Do not place concrete when ambient temperature is above 32 C-degree or below 4 C-degree. Do not commence placing concrete when rain is falling, or if there is risk of rain damage.

Do not discharge concrete from a height more than 1.2 metres.

Maintain discharge at a steady rate with minimum practicable breaks between deliveries.

If excessive delay occurs or initial set takes place, immediately notify the Superintendent for approval to continue or make a construction joint.

Where concrete is moved more than 50 metres by wheel-barrow, thoroughly re-mix by hand shovelling before final placing.

Thoroughly compact concrete during placing with suitable mechanical vibrators. Work concrete under and around reinforcement and ensure uniform density, free from voids, segregation and honeycombing. Avoid over vibration that may cause segregation, and do not hold the vibrator against formwork or reinforcement.

Concrete slabs more than 100 mm thick shall be compacted with a suitable vibrating screed.

E-14 PROTECTION AND CURING

Protect and cure concrete to AS 3600, Clause 19.1.5.

Protect finished surfaces from rain damage until hardened.

Prevent rapid evaporation by sun or wind before application of the curing method.

Implement a suitable curing system within two hours of finishing the concrete, including:

- Ponding or continuous sprinkling of water.
- Cover with impervious sheet or membrane, such as polythene sheet.
- Cover with absorptive material such as 25 mm of sand, kept continuously wet.
- Proprietary liquid applied curing compound.

If used, polythene sheeting shall be taped to prevent moisture loss and weighed down to prevent lifting. When ambient temperature is above 30 C-degrees, the keep sheeting continuously wet.

For concrete surfaces to receive applied finishes, liquid applied curing compound shall be approved by the Superintendent before application.

Minimum curing period (extended when the temperature falls below 10 C-degrees) shall be three days, for Exposure Classifications A1 and A2, and seven days, for Exposure Classifications B1, B2 and C, to AS 3600, Clauses 4.3 and 4.4.

Take responsibility for any damage resulting from commencing work on concrete before full 25 days strength has developed.

Curing period before commencing such work shall be not less than:

- Footings: Seven days.
- Slab on ground: Ten days.

The Superintendent may direct a longer period during cold weather.

E-15 AS LAID AND MONOLITHIC FINISH

A Generally:

Finish as laid concrete as follows:

- Concrete floor slabs: Machine floated.
- Steps and stairs: Steel trowel.
- Set-downs for granolithic and mortar bedding: Wood float.

Normal tolerance of applied finish shall be +/- 6 mm over 3 metres, unless otherwise indicated.

B Machine floated finish:

After screeding, finish with suitable mechanical equipment to a uniform smooth texture. Steel trowel by hand in locations inaccessible to the machine float.

C Steel trowelled finish:

After screeding, finish by hand with a steel trowel, to produce uniform texture and appearance, free of trowel marks.

D Wood float finish:

After screeding, finish by hand with a wood float to produce uniform texture and appearance.

E Monolithic finish:

Where indicated, place a monolithic finish within one hour of placing concrete.

Monolithic mix shall be 1:1 parts cement to fine aggregate and 1.5 parts of bluestone toppings to 4 mm thick, as follows:

- Type 'A' finish: Power float and steel trowel to a true and even surface.
- Type 'B' finish: As for Type 'A' then lightly broom to ensure non-slip finish.

E-16 GRANOLITHIC FINISH

Where indicated, place a granolithic finish after concrete base has set, and in addition to structural slab thickness.

Granolithic mix shall be 1:3 parts cement to 5 mm bluestone toppings. Include suitable proprietary hardener where indicated in accordance with product information.

Before placing, securely fix dividing strips straight and level where required.

Roughen concrete to ensure mechanical bond. Remove loose particles of sand and dirt with stiff broom or wire brush. Wet concrete and brush with cement slurry.

Lay granolithic mix, bring to levels and grades by screeding. Work up with a wood float to thoroughly compact and eliminate irregularities and depressions.

Apply mixture of bluestone dust and cement by lightly sprinkling. Include carborundum particles where required for slip resistant finish at a rate not less than 600 grams / m2.

Finish with a steel trowel to a hard, smooth, even surface.

Unless otherwise indicated, thickness of granolithic shall be:

- Floor slabs: 40 mm.
- Stair treads: 25 mm.
- Stair risers: 20 mm.

E-17 FOOTINGS

A **Generally:**

Construct concrete footings to the sizes and positions indicated, to AS 2870.1.

Over excavation shall be back-filled with stable compacted fill, or with 17.5 MPa concrete. Wait two days to cure before placing footings.

B **Strip footings:**

Construct strip footings for brickwork, and widen where required for piers. Stepping of footings shall comply with AS 2870.1, Figure 6.7, or as indicated.

If services interfere with footings notify the Superintendent. Include additional concrete and reinforcement where directed.

C **Pad footings:**

Construct concrete pad footings and foundation blocks of the sizes and depths required by AS 2870.1 for the site classification or as indicated, for stumps, steel columns, posts and steel base supports to pergola and porch posts.

Accurately position built-in items and securely hold in place while concrete is placed.

D **Miscellaneous footings:**

Construct concrete footings for mail-boxes, handrail posts, fence posts, bollards, clothes lines, lighting stanchions, and the like. Finish top of footings neatly, level with the ground, and make mowing strip. Unless otherwise indicated, siteworks footings shall be 17.5 MPa concrete.

E **Deep beam or pier and beam footings:**

Where site conditions require deeper footings than indicated, the Contractor may elect to construct a deep beam or pier-and-beam footing. Submit details to the Superintendent for approval before proceeding.

F **Precast concrete stumps:**

Precast concrete stumps shall be made of normal reinforced concrete or prestressed precast concrete to the sizes and lengths indicated or required.

Include 10 mm diameter threaded rod cast in during manufacture, and washer for fixing bearers

Stumps more than 900 mm above ground, or where indicated, shall be braced. Include 13 mm diameter holes located 100 mm below bearer and 100 mm above ground.

All stumps shall be sound. Cracked stumps shall be removed from site.

Compressive 28 day strength shall be:

- Normal reinforcement: 25 MPa
- Prestressed: 40 MPa

Minimum stump sizes shall be:

Height above finished ground	Size
200 (min) to 1800 mm	100 x 100 mm
1800 to 3000 mm	130 x 130 mm

G **Pits:**

Construct drainage inspection pits, junction pits, grating pits, spoon drain pits, side entry pits, and distribution pits where indicated, complete with removable precast concrete covers.

Construct electrical and MATV distribution pits where indicated.

E-18 GROUND SLABS

A **Generally:**

Place concrete carefully. Do not puncture vapour barrier. Do not disturb reinforcement and formwork. Support pump hoses and wheel-barrow access above reinforcement and finished surface.

Before placing concrete, ensure that all services have been installed and tested where necessary, the ground has been properly prepared, and vapour barrier is in place.

B **Brick veneer to concrete slab edges:**

Construct suitable rebates in concrete slab edges to enable outer leaf of brick construction to extend below the finished ground level. Construct additional depth and width to edge beam dimensions to accommodate rebates.

C **Finish:**

Surfaces shall be finished within +/- 3 mm of true grade, as follows:

- Areas for carpet and vinyl: Steel trowel finish.
- Areas for ceramic tile: Textured broom finish for key.
- External slabs: Wood float finish.

Finish visible corners and joints with 16 mm radius rounding tool.

After stripping formwork, rub down exposed slab edges to remove loose material and expose any holes. Fill holes with mortar mix of 1:3 parts cement to sand, and finish flush. If directed, apply slurry of neat cement and water to the whole surface and finish smooth with a steel trowel.

D **Shower recesses:**

Where required for showers and falls in bathrooms, construct set-downs in concrete floor slabs to 50 mm nominal depth. Do not reduce required slab thickness or reinforcement cover.

E **Miscellaneous slabs:**

Construct concrete slabs for rubbish bin enclosures, garden sheds, and the like, not less than 75 mm thick. Build-in holding down bolts where required. Construct upper surfaces to fall and finish top and edges with a steel trowel.

Construct 100 mm wide perimeter mowing strip around garden sheds to match adjacent levels, and set floor 25 mm above adjacent levels to exclude water.

E-19 PORCH SLABS, STEPS AND THRESH-HOLDS

Porch slabs shall be constructed as a slab-on-ground, with vapour barrier and fill complying with AS 2870.1, Clause 6.1.2. Porch slabs shall be not less than 1550 x 1550 mm.

Remove formwork after completion.

For steps up to three treads, construct with mass concrete, with base set 100 mm below ground level on 50 mm compacted crushed rock base, and vapour barrier turned up concealed edges. For steps over three treads, construct on compacted filling. Support on brick base walls with separate footings.

For thresholds, construct rebate in base slab or wall, and finish as for concrete steps 19 mm above base floor level.

Tread and riser sizes shall be uniform over each flight. Treads shall fall slightly to shed water and prevent ponding.

Finish porch slabs, treads, risers and sides with steel trowelled granolithic. Tool nosings to 15 mm radius, and sides to 6 mm radius.

Construct five grooves to edge of porch slabs at steps or paths, and three grooves to treads, each 10 mm nominal depth, not less than 40 mm from nosing and stopping 100 mm from each side of tread.

E-20 WATER-PROOFING OF WET AREAS

Provide water-proofing admixtures to concrete shower bases, kerbs and elsewhere subject to water ponding. Comply with product information and relevant Standards.

AS 1478	Chemical admixtures for use in concrete, mortar and grout
AS 1478.1	Admixtures for concrete

Concrete kerbs shall be integral with floor where practicable. Turn reinforcing mesh up into kerbs. Concrete to wet areas shall be not less than 20 mPa.

Build in grated outlet flanges and water bars as required.

E-21 TANKING MEMBRANE

Tanking membranes to below ground concrete structures shall be approved proprietary products.

Submit product information for correct selection and installation of membrane.

Include a suitable protection such as fibre-cement sheet, where required.

Provide warranty for tanking membrane against penetration of water and moisture and other defects in materials and workmanship for a period of ten years from Practical Completion. Include manufacturer's written product warranties.

END OF SECTION

SECTION F - MASONRY

CONTENTS

F-01 SUMMARY

Provide masonry, including clay brick and concrete block, glass block, garden walls, retaining walls, and fire-rated masonry, complete with ties, lintels, flashings, control joints and embedments, as required.

Refer STRUCTURAL STEELWORK Section for built-in structural steel anchorage plates, rods and steel ties as necessary.

Refer to INSULATION Section for cavity insulation.

F-02 REFERENCES

Comply with product information and the following Standards. Keep product information and Standards marked (*) on site during work.

AS 2699	Wall ties for masonry construction.
AS 2975	Accessories for masonry construction.
AS 3972	Portland and blended cements.
AS 3660 (*)	Protection of buildings from subterranean termites.
AS 3700 (*)	Masonry in buildings (SAA Masonry Code)
AS/NZS 4347	Damp-proof courses and flashings - Methods of test.
AS/NZS 4455	Masonry units and segmental pavers.
AS/NZS 4456	Masonry units and segmental pavers - Methods of test.
AS A123	Mortar for masonry construction.

F-03 SUBMISSIONS

A **Sample panel:**

Where required, construct for approval a sample face brickwork panel to establish the quality standard for face brickwork, mortar colour and profile.

F-04 PERFORMANCE

A **Corrosion:**

Steel embedments shall be hot dip galvanized.

B Movement:

Construct control joints in masonry where indicated and as follows:

- Clay brickwork: Joint width not less than 15 mm. Joint spacing not more than 12 metres.
- Concrete blockwork: Joint width not less than 10 mm. Joint spacing not more than 8 metres.
- At internal corner junctions between adjacent units.

C Moisture protection:

Install flashings and damp-proof courses, construct cavities, remove mortar droppings, include water-proofing mortar additives and ensure that external elements exclude moisture from entering the building envelope.

D Fire:

Comply with manufacturer's fire resistant systems and product information.

F-05 MASONRY UNITS

A Generally:

Use face bricks for all exposed external and internal brickwork. Use commons in other locations.

Face bricks shall be of good general appearance and free from defects outside the range of approved samples.

B Brick:

Unless otherwise indicated, clay bricks shall be:

- Grade ST2 for face work.
- Grade ST3 elsewhere.

Cure clay bricks not less than seven days after firing. Cure concrete base structures not less than 28 days before laying masonry over.

Use 'Exposure' class bricks (AS 4455) below damp-proof course.

C Concrete block:

Unless otherwise indicated, concrete block units shall be:

- Strength grade 12.
- Starter course: 100 mm.

D Ordering, delivery and storage:

Pre-order and arrange delivery of bricks to prevent delay.

Concrete bricks and blocks shall be wrapped in polythene.

E Culling and blending:

Blend bricks with colour variations and discard unsuitable bricks on-site to ensure a high standard of face brickwork with even distribution of brick textures and colours.

Where different brick types are nominated for blending, order sufficient bricks to achieve a consistent blending throughout.

Discoloured bricks shall not be used for face work.

F-06 MORTAR

Mortar mix shall comply with AS 3700, Clause 8.4. Materials shall comply with AS 3700, Clause 2.2 and as follows:

- Cement: Type GP general purpose (AS 3972) with iron salts not exceeding 1%.
- Sand: Clean sharp fine aggregate, washed and graded (AS A123) with low clay content, free from efflorescing salts, and selected for colour and grading.
- Lime: Proprietary hydrated lime.
- Additives: Not to be used unless approved by the Superintendent.

Water shall be free from chlorides or any substances which may be harmful to brick, reinforcement and embedments.

Mortar shall only be used within one hour of first adding water.

Mortar colouring agents shall be pure oxides.

Ensure sufficient sand supply from one source for uniform mortar colour for all face brickwork.

Use additives in accordance with product information. Do not combine different additives in one mix. Establish optimum mix for each condition and do not vary for remainder of work.

Classification	Mix Proportions (Portland cement:Lime:Sand)
M1	0:1:3 or 1:1:12 for restoration work
M2 (Below ground)	1:2:9 or 1:2:8
M3 (Above ground)	1:1:6 or 1:0:5 + water thickener
M4	1:0.5:4.5 or 1:0:4 + water thickener

(Reproduced from AS 3700, Table 10.1)

F-07 STEEL LINTELS

Steel lintels shall be as follows:

Maximum span	Lintel size	Bearing each end (mm)
950	50 x 10 mm	150
1050	75 x 10 mm	150
1200	75 x 75 x 8 mm	150
1500	90 x 90 x 8 mm	150
1800	100 x 75 x 8 mm	150
2400	125 x 75 x 10 mm	230
3000	150 x 90 x 10 mm	230

All lintels shall be hot dip galvanized to AS 4680, with coated mass not less than 600 grams/m2.

In-line galvanized lintels shall not be used.

Support each brick skin of cavity walls on separate lintels.

Prop lintels to prevent deflection under the load of newly constructed brickwork. Remove propping after not less than seven days.

Keep lintels 6 mm clear of window heads and door frames.

F-08 CAVITIES TIES

Cavity ties for cavity brick or brick veneer shall be 3.15 mm galvanized wire of suitable shape.

Install cavity ties to AS 3700, Clause 3.8.

Fix cavity ties to timber frames with galvanized clouts or integral spikes.

Reinforce brickwork at corner locations with suitable ties at each third course.

The following product (s) satisfies the specification requirements: MFA 'Posi-Ties'.

F-09 BED JOINT REINFORCEMENT

Where required, bed joint reinforcement shall be galvanized woven wire mesh or welded wire equal in width to the leaf or solid wall, less the 15 mm cover from each exposed surface of the mortar joint, required by AS 3700, Clause 6.8.3.

Lap bed joint reinforcement 450 mm at splices. Fold and bend at corners so that the longitudinal wires are continuous. Stop 200 mm from control joints. Extend 450 mm beyond openings.

F-10 DAMP-PROOF COURSES

Damp-proof courses shall comply with AS 3700, Clauses 3.2.4 and 6.12, located where required and as follows:

- For walls adjoining infill floor slabs on membranes: In the course above the underside of the slab in internal walls and inner leaves of cavity walls. Extend 40 mm and dress down over the membrane turned up against the wall.
- For cavity walls on slab-on-ground: In the bottom course of the outer leaf, continuous across the cavity and up the inner face, turned 30 mm into the first course of the inner leaf above the slab, or in brick veneer construction, fastened to the inner frame above floor level. Extend 10 mm beyond external slab edge and turn down 45 degrees.
- For internal walls on slab-on-ground: In the first course above floor level.
- For timber floors: In the first course below the level of the underside of ground floor timbers in internal walls and inner leaves of cavity walls.

Lay damp course material in long lengths. Step as required, but not more than two courses per step. Preserve continuity of damp-proofing at junctions of damp-proof courses and water-proof membranes.

F-11 FLASHINGS AND WEATHERINGS

Flashings and weatherings shall comply with AS 4347.

Locate flashings and weatherings as required to AS 3700, Clauses 3.2.4 and 6.12, and the following locations where applicable:

- Under sills: 50 mm into the first joint below the sill, extending up across the cavity and under the sill.
- Over lintels to openings: Full width of outer leaf immediately above the lintel, continuous across cavity, 50 mm into the inner leaf, two courses above, or in veneer construction, turned up against the inner frame and fastened to it.
- Over roofs: Full width of external brickwork, stepped to roof slope, turn down not less than 50 mm over base flashing. Turn up within cavity, sloping inward across the cavity and fixed to or built-in to the inner leaf at least 75 mm above.
- At sites where cavities are closed: Full height flashing extending 75 mm beyond the closure into the cavity, interleaved with the sill and head flashing at each end. Fix to frame stiles.
- To brickwork above concrete slab floors, or suspended slabs: Build-in to outer face of studs at bottom plate level, turned down into rebate of slab, across cavity and laid under the first course of brickwork at the bottom of the cavity.
- At other locations indicated.

F-12 TERMITE BARRIER

For new construction, termite barrier shall be an suitable mechanical type to AS 3660.1 carried out by an approved specialist. Submit certificate of compliance.

The following product (s) satisfies the specification requirements: 'Termi-Mesh', 'Granit Guard'.

Chemical termite barriers may be used in existing construction. Obtain approval in writing before commencing.

Provide warranty for termite barrier for correct performance for a period of ten years from Practical Completion. Include manufacturer's written product warranties.

Coordinate with CONCRETE and CARPENTRY Sections as required.

Coordinate with MASONRY and CARPENTRY Sections as required.

F-13 CONTROL JOINTS AND SEALANTS

Construct control joints in brickwork to AS 3600 and where indicated.

Fill and caulk control joints, and heads, jambs and sills of all windows and door frames.

Joint filler shall be an suitable proprietary butyl mastic joint filler coloured to match brickwork. Clean surfaces and install in accordance with the product information over backing rod.

Joint filler shall be recessed 10 mm from brickwork surface, trowelled smooth and finished evenly and neatly.

Joints in fire-rated walls and at the tops of all party walls shall be filled with suitable fire-rated joint fillers, installed without gaps or interruptions between brickwork and roof covering materials.

Backing rod shall be a suitable compressible polyethylene foam rod.

The following product (s) satisfies the specification requirements: 'Ethafoam'.

F-14 EXECUTION

A Generally:

Workmanship shall comply with AS 3700, Section 8.

Protect adjacent work against damage during brickwork construction.

Clean brickwork progressively. Clean face work to remove mortar smears, stains, discoloration and the like.

Set out brickwork to maintain the required rod and bond with bed joints and vertical joints of uniform width and with the minimum cutting.

Commence face work not less than one full course, or more than two courses below adjacent finished ground level.

Match new work to adjacent existing work unless otherwise approved.

Keep perpends in alternate courses vertically aligned. Use solid bricks at ends of wing walls and windows sills.

For brick veneer walls, maintain a 25 mm minimum space between brickwork and timber studs.

Lay capping courses in water-proof mortar.

B Laying:

Lay bricks on a full bed of mortar. Fill joints completely with mortar. Keep perpends true, angles plumb and courses horizontal. Properly bond all bricks. Lay frogs uppermost.

The height of 7 courses of 75 mm brickwork shall be equal to 600 mm.

All face brickwork shall be in stretcher bond unless otherwise indicated. Use a masonry saw for all face brick cutting.

C Cavity walls:

Construct cavity walls to AS 3700, Clauses 3.2.2 and 8.10.

Keep cavities free of mortar droppings.

Maintain cavity wall widths indicated on the Drawings.

Fill the cavity to one course above finished ground level with mortar weathered towards the outer leaf.

D Weep holes:

Construct weep holes to AS 3700, Clause 3.2.3 by open perpends to external leaves of cavity walls in the course above damp-proof courses, flashings and cavity fill, and at the bottoms of unfilled cavities.

E Joints:

Construct joints as required to AS 3700, Clauses 3.6.2 and 8.7.2 and finish as follows:

- Exposed face brickwork: Tool raked 10 mm deep.
- Brickwork to be painted: Hand trowelled flush.
- Brickwork to be rendered: Raked out 10 mm deep.

Point-up around flashings and penetrations.

F **Built-in work:**

Build-in all necessary structural steel, bolts, plates, lugs, gratings, pipes, plugs and conduits. Carry out all required cutting and chasing, but do not chase into external face brickwork.

Build-in electric supply meter box and MATV cabinet. Support brickwork above on steel lintels.

Build-in door and window frames complete with fixing battens and lugs, and with flashings securely fixed in position. Leave 10 - 15 mm clearance around window and door frames.

Timber door and window frames to be painting shall be primed on all surfaces before building in. Frames to be stained shall be pre-treated. Refer to PAINTING Section.

G **Bagged brickwork:**

Where indicated as bagged brickwork, flush up irregularities to brickwork and cut mortar joints flush. Bag the surface with a dry hessian bag. Bagging shall be of medium texture. Before commencement, prepare a test panel 600 x 600 mm for approval.

H **Completion:**

Make good after other trades and after removal of scaffolding and finish to match surrounding work. Replace defective bricks, and point up faulty joints, holes and chases. Remove surplus mortar.

Remove green, yellow or brown staining with a 2% solution of oxalic acid and wash down with clean water not more than one hour after application.

Clean down face work and remove mortar staining with 5 - 10% solution hydrochloric acid and wash down with clean water.

Walls to be painted shall have smears, splashes and lumps removed and holes filled before painting. Wire brush and wash down in clean water only.

F-15 SUB-FLOOR CONSTRUCTION

Construct sub-floor walls and piers as required for the natural ground slope and the depth of strip footings.

For suspended concrete floor slab constructions, build-up sub-floor walls and piers from concrete footings to underside of slab. Leave door width openings beneath internal doorways, sufficient for access to all sub- floor areas.

Build-in galvanized steel sub-floor ventilators 230 x 150 mm at approximately 1500 mm intervals, and as required to ensure adequate cross-ventilation of the sub-floor space.

Construct termite barriers as required to isolate timber floors.

Refer to CONCRETE and MASONRY Sections for further details.

F-16 SUB-FLOOR ACCESS

Construct sub-floor access opening to all dwellings, not less than 850 mm wide x maximum available height through external wall where indicated on the Drawings or directed. Construct 230 mm piers to each side of opening with steel lintel over.

F-17 SILLS AND THRESHOLDS

Construct brick sills and thresholds soldly bedded and laid to falls with 20 mm overhang so that top surfaces drain away from the building, unless otherwise indicated.

Select bricks for soundness, shape, size and edge sharpness.

Machine cut and mitre bricks at corner windows.

Construct control joints to sills over 1300 mm length.

Refer also to CONCRETE Section for thresholds.

F-18 MISCELLANEOUS CONSTRUCTION

A **Generally:**

Construct miscellaneous brickwork such as surrounds to mail-boxes, fences, retaining walls, pits and soakage areas, brick-on-end paving under garden taps and the like, as indicated.

B **Inspection pits to drains:**

Construct pits to sizes indicated, and otherwise to authority requirements.

Refer to CONCRETE Section for bases and covers.

Fit cover flush to finish adjacent surface levels.

F-19 GLASS BLOCKS

Glass blocks shall be suitable proprietary types.

Install glass blocks in accordance with the product information and relevant Standards, and so that they are not subject to structural loads other than their own weight.

Lay blocks in stack bond with 10 mm to 15 mm joint thickness.

Reinforce every tenth vertical joint and every second horizontal joint with galvanized steel reinforcing rods, two rods to each joint as follows:

- Minimum 15 mm from external face.
- Minimum 10 mm from internal joint face.
- Minimum 15 mm between steel and glass.

Isolate glass blockwork from head and sides of surround framing with resilient control joints and bond breaking lining of silicone or polysulphide sealant bead, not less than 10 mm wide.

Wipe mortar smears from glass blocks after initial mortar set, and thoroughly clean after final set.

END OF SECTION

SECTION G - STRUCTURAL STEEL

CONTENTS

G-01 SUMMARY

Provide structural steelwork, including protective coatings, fixings and packers, as required.

Coordinate with other Sections and include brackets, cleats and fixings for adjacent work.

Refer to CONCRETE Section for building-in embedments supplied under this Trade Section.

G-02 REFERENCES

Comply with product information and the following Standards. Keep product information on site during work.

AS/NZS 1554	Structural steel welding.
AS 1163	Structural steel hollow sections.
AS/NZS 3678	Structural steel - Hot-rolled plates, floorplates and slabs.
AS/NZS 3679	Structural steel.
AS 3828	Guidelines for the erection of building steelwork.
AS 4100	Steel structures.
SAA HB48	Steel structures design handbook.
SAA/SNZ HB62	Code of practice for safe erection of building steelwork.

G-03 SUBMISSIONS

A **Shop drawings:**

Submit shop drawings for fabricated items, including fixings and connections, and obtain approval before commencing fabrication. Approval by the Superintendent shall not reduce or modify responsibility of the Contractor for the finished work.

B **Superintendent's inspections:**

Give not less than two days notice and suitable access so that Superintendent may inspect the work during fabrication, coating and erection.

G-04 PERFORMANCE

Steelwork shall be coated to prevent corrosion. External steel and fixings within three kilometres of coastline shall be hot dip galvanized. Other steel and fixings shall be protective coated with suitable coating systems. Submit product information for selection and application of protective coatings.

G-05 STRUCTURAL STEEL MATERIALS

Unless otherwise indicated, hot rolled structural steel grades shall be:

- Plates, floor plates and slabs: Grade 250 (AS 3678).
- Structural bars and sections: Grade 300 (AS 3679).
- Circular hollow sections less than 265 mm outside diameter: Grade 250 (AS 1163).
- Welded sections: Grade 300 (AS 3679.2).

Where a required structural section is not available, submit details of proposed substitution and obtain approval before proceeding. No claim for additional cost or time will be approved.

G-06 FABRICATION

Fabricate steelwork in accordance with approved shop drawings. Do not deviate from approved shop drawings without written approval before commencing changes. Identify steelwork with marks cross-referenced to shop drawings.

Ensure that the parts will fit together without straining or forcing. Include required connections, cleats, brackets and holes for attached work by others.

Unless otherwise indicated or approved, do not fabricate or weld structural steel on site.

Steel members shall be single lengths unless otherwise required or approved. Submit details and locations of proposed splices. Splices shall have full penetration butt welds. Site splices and joints shall be pre-assembled in the factory to ensure satisfactory fit.

Camber beams where indicated. Straighten bent or distorted members.

Carry out cutting and holing and remove all burrs, fins and other defects before assembly.

Welding shall be carried out by skilled personnel under the control of a qualified supervisor. Non-conforming welding shall be chipped or cut out and re-welded.

Handle and store steelwork to avoid damage. Store steelwork clear of the ground. Repair or replace damaged steelwork at the Superintendent's option.

G-07 PROTECTIVE COATINGS

Carry out preparation and apply protective coatings in accordance the coating product information for selection and application, appropriate for the base metal and exposure conditions, as follows.

- For hot rolled sections in external and damp locations: Hot dip galvanized.
- For hot rolled sections in internal dry locations: Zinc rich primer coating.
- For cold rolled sections in internal dry locations: in-line galvanized to AZ200, with cuts and welds protected with zinc rich primer (APAS 0014/1).
- For cold rolled sections in internal damp locations: in-line galvanized to AZ430, with cuts and welds protected with zinc rich primer (APAS 0014/1).

Comply with the relevant Standards:

AS 1397	Steel sheet and strip - Hot-dipped zinc-coated or aluminium/zinc-coated.
AS 1627	Metal finishing - Preparation and pretreatment of surfaces.
AS/NZS 2312	Guide to the protection of iron and steel against exterior atmospheric corrosion
AS 2551	Steel sheet and strip - Cold rolled, electrolytic zinc-coated.
AS/NZS 3750	Paints for steel structures.
AS 4680	Hot-dip galvanized (zinc) coatings on fabricated ferrous articles.

Thoroughly clean and remove oil and grease, loose scale, rust, dirt and harmful substances. If mechanical or chemical cleaning is insufficient, carry out abrasive blast cleaning to Class 2.5.

Hot dip galvanizing shall comply with AS 4680. Do not substitute in-line galvanized products.

Primers shall be factory applied zinc rich primer (APAS 0014/1) to a minimum dry film thickness of 65 microns. Touch up and make good any damaged or unprotected surfaces after erection. Refer to PAINTING Section for decorative painting.

G-08 ERECTION

Verify all dimensions on the site before fabrication and carry out set-out survey for steelwork. Supply templates and hold-down bolts to CONCRETE Section where required.

Erect steelwork safely and without damage to adjacent work. Include all required construction plant, equipment, scaffolding, and temporary bracing as required.

Erect steelwork straight, level and plumb. Do not finally tighten bolts or carry out permanent welding until sufficient members have been erected to enable the work to be aligned, levelled and plumbed.

Ensure steelwork is able to withstand all wind and other loads progressively during erection. Erection procedure shall ensure that no member is over-stressed or distorted during erection.

After erection, remove temporary bracing and the like and make good.

Grout column bases and beams bearing on masonry or concrete. Ensure grout is thoroughly packed under the full base area.

END OF SECTION

SECTION H - METALWORK

CONTENTS

H-01 SUMMARY

Provide metalwork, including proprietary manufactured and custom fabricated items, and items for building in by related Trade Sections, as required.

- Refer to CONCRETE Section for concrete slab floor.
- Refer to STRUCTURAL STEELWORK Section for structural steel.
- Refer to CARPENTRY Section for metal studs and metal items integral with framing.
- Refer to JOINERY Section for hardware and metal items integral with joinery.
- Refer to ROOFING Section for metalwork items integral with roofing.
- Refer to FENCING Section for metal fences and gates.
- Refer to DRAINAGE Section for metal sump grates, trench grates and covers.
- Refer to DOORS, WINDOWS Section for roller shutter / garage doors.

H-02 REFERENCES

Comply with product information and the following Standards. Keep product information on site during work.

AS 1074 Steel tubes and tubulars for ordinary service.

H-03 SUBMISSIONS

A **Shop drawings:**

Prepare shop drawings for fabricated items such as balustrades, stairs and the like, and submit for approval before commencing fabrication. Approval of shop drawings by the Superintendent shall not reduce or modify the complete responsibility of the Contractor for the finished work.

H-04 PERFORMANCE

A **Compatibility:**

Separate incompatible metals by concealed interlayers of suitable materials and thicknesses to prevent electrolytic corrosion.

B Coatings:

Metals shall be protected from chemicals, mortar splashes and other damaging factors that may cause staining and/or corrosion during manufacture, installation and/or service. Temporary protective coverings shall be removed before final clean-up.

H-05 MATERIALS AND WORKMANSHIP

Proprietary products shall be installed in accordance with the product information.

Fabricate work carefully from new, undamaged materials to relevant Standards. Fit work accurately to fine hairline joints. Bend tubes without undue deformation. Keep edges and surfaces clean, neat and free from burrs and indentations. Remove sharp edges and round to a fine radius.

Corrosion protection and finish coatings shall be factory applied where practicable or where indicated. Visible fixings shall be colour matched to adjacent finished work.

H-06 FIXINGS

Select fixings appropriate for the purpose, capable of transmitting the imposed loads, and sufficient to ensure the rigidity of the assembly, and withstand vibration and weathering.

Include all required fixings including screws, nails, anchors, bolts, anchors, rivets, tie-down straps, welding materials, adhesives and the like in accordance with the relevant Standards. Fixings shall be selected for corrosion resistance appropriate to the exposure conditions (AS 3566).

AS 1214	Hot-dip galvanized coatings on threaded fasteners (ISO metric coarse thread series).
AS 1897	Electroplated coatings on threaded components (metric coarse series).
AS 3566	Screws - Self-drilling - For the building and construction industries.

Exposed screw heads shall be flush countersunk unless otherwise approved.

H-07 METAL COATINGS AND FINISHES

A Steelwork:

Refer to STRUCTURAL STEEL Section for preparation for protective coatings to steel.

B Other coatings:

Powder coating, anodizing, electroplating and other coatings and finishes to metalwork where indicated or appropriate shall match control samples in accordance with the relevant Standards.

AS 1192	Electroplated coatings - Nickel and chromium.
AS 1231	Aluminium and aluminium alloys - Anodic oxidation coatings.
AS 1789	Electroplated coatings - Zinc on iron or steel.
AS 1790	Electroplated coatings - Cadmium on iron or steel.
AS 1791	Chromate conversion coatings - Zinc and cadmium.
AS/NZS 4506	Metal finishing - Thermoset powder coatings.

Extend coatings around exposed edges on to concealed surfaces.

H-08 WARDROBE HANGING RAILS

Wardrobe hanging rails shall be 25 mm chrome-plated brass tubing to the full width of wardrobe space, with 100 mm chrome-plated brass pillar ends securely fixed with chrome-plated brass raised-head screws. Include additional intermediate pillars at 600 mm nominal centres.

Provide hanging rails to each wardrobe cupboard.

H-09 TOWEL RAILS AND TOILET ROLL HOLDERS

Towel rails shall be 19 mm chrome-plated brass tubing with 100 mm chrome-plated brass pillar ends, securely fixed with chrome-plated brass raised-head screws and wall plugs.

Locate towel rails 1000 mm above floor.

Toilet roll holder shall be a suitable durable type in satin chrome finish.

The following product (s) satisfies the specification requirements: Efco 844, Lane P 730 SS

Locate toilet roll holder in a location as remote as practicable from shower recess to prevent paper becoming wet.

H-10 GRAB-RAILS / ASSIST-RAILS

Grab-rails / assist-rails shall comply with the relevant Standards:

AS 1428	Design for access and mobility.
AS 1428.1	General requirements for access - New building work
AS 1428.2	Enhanced and additional requirements - Buildings and facilities.

Fabricate grab-rails from ABS plastic or coated stainless steel profiled to provide a slip-resistant pattern, or Grade 304 stainless steel tube, 32 mm outside diameter, with 70 mm diameter flanges. Wall clearance shall be 50 mm.

Grab-rails shall be in one piece. Bends shall be smooth with uniform diameter. Connections shall be flush and smooth.

Grab-rails may include the following profiles:

- Toilet grab-rail, with horizontal section 500 mm and 45-degree section 300 mm.
- T-shape shower grab-rail, with 900 mm vertical section and 700 mm horizontal section.
- Vertical shower grab-rail, 900 mm.
- Towel / assist-rail, horizontal, 600 mm.
- Drop-down support arm.

Verify locations and handing before fabrication.

H-11 SHOWER CURTAIN RAILS

Shower curtain rails shall be suitable 19 x 44 mm slotted bed-screen track, complete with 90-degree, 230 mm radius bend, and brackets and 12 mm suspension hangers. Include plastic hooks and rotatable runners, ceiling supports and fixings.

The following product (s) satisfies the specification requirements: 'Windoware'.

H-12 GLAZED SHOWER SCREENS

Glazed shower screens shall be framed in natural anodized or powder coated aluminium and glazed with not less than 6 mm thick clear laminated Grade A safety glass in accordance with the relevant Standards.

AS 1288	Glass in Buildings - Selection and installation.

Safety glass shall be laminated or toughened. Wire glass shall not be used.

Fixings shall be stainless steel, finished flush.

The base of glazed shower screens shall be neatly sealed and water-proofed against adjacent work with PVC flashing strip and mould resistant, clear silicone sealant.

H-13 SHOWER SEATS

Shower seats shall be approved proprietary fold-down types, installed in accordance with product information and the relevant Standards.

AS 1428	Design for access and mobility.

Seats shall include simple positive locking mechanisms to enable easy folding up and down, without risk of sudden collapse.

Shower seats shall be fabricated from non-corrosive materials, and finished in white. Edges shall be rounded and fitted with appropriate buffers to prevent human injury and to prevent long term damage to adjacent surfaces. All fixings shall flush or rounded.

Seat dimensions shall be 900 x 400 mm nominal, height above floor 460 - 480 mm.

The following product (s) satisfies the specification requirements: Swan ABS Shower Seats

H-14 BRACKETS FOR INTERNAL BLINDS AND CURTAINS

A **Blinds:**

Brackets for internal blinds shall be purpose type dual purpose with an extension to support a 19 mm diameter curtain rail.

Brackets shall be made from 1.5 mm thick electroplated sheet steel, and be 107 mm long overall tapered arm, 50 mm high x 15 mm wide fixing leg. The arm shall be slotted at 36 mm and 85 mm centres for blinds and for curtain rail. Brackets shall be fixed to architrave in a location to enable blinds to fully overlap architraves.

Refer to JOINERY Section for PELMETS Clause.

B **Curtains:**

Curtain rails shall be white plastic coated 19 mm steel tube with end-caps.

Curtain rails shall extend 150 mm each side of internal window opening.

H-15 INTERNAL BLINDS

A **Generally:**

Internal blinds shall be suitable Holland blinds, complete with required fixings and accessories for windows and side-lights.

The following product (s) satisfies the specification requirements: Contract Blinds.

Submit details, including manufacturer's name, including verification of compliance with AS 1530.3 and a NATA laboratory test report on the fabric.

Blinds shall be colour matched both sides. Fabric shall be white or to match the blind colour. Verify colours before commencing.

The rollers shall be an all metal key-way type to provide adequate support to the blind without noticeable sag, manufactured from minimum 0.4 mm thickness Colorbond steel with minimum diameter of 32 mm. Idler and spring pins shall be metal. The fixed pin in the roller shall be 4 mm diameter.

Blind material shall be polyester based with a protective coating of impregnated resin able to be cleaned with a damp cloth as follows:

Polyester base cloth

- 100% textured polyester loom-state.
- Single beam weaving.
- Construction: 48 x 41.
- Denier: 300 x 300.
- Maximum weight: 125 gram / m2.

Finished coated fabric:

- Coating: Water based pigment acrylic.
- Nominal mass: 320 gram / m2.
- Thickness: 0.3 mm.
- Colour-fastness to light: Minimum 6 all colours and minimum 7 on blue wool scale.
- Dimensional change (length) 3 mm maximum all colours.

Blind construction shall be as follows:

- Thread shall be suitable polyester.
- Neat zigzag hemming, with side hems parallel to edge minimum 15 mm wide, over lath at the bottom and over a suitable key way device at the top perpendicular to the sides.
- Fitted with a string nylon plaited double pull cord with a plastic acorn and metal knot plate securely screwed to the lath with knotted end.
- With minimum of 150 mm of material left on the roller when the blind is opened to the sill.
- Rolled easily when blind is extended to full length (proper relationship of key-way to pawl.
- Spring mechanism capable of easy removal for maintenance.
- Pin holes and slot in the brackets matching the corresponding components in the roller.

Blinds shall be sized to be not less the 5 mm less than the roller length to overlap architraves in order to provide full cover over architraves. Pelmets and top architrave shall extend 150 mm past window frame to enable this.

Refer to JOINERY Section for PELMETS Clause.

Blind material shall be treated with fire retardant to minimise combustibility.

Blind operation shall be tested and left in satisfactory working order before handover.

B **Nominated suppliers:**

Holland blinds for 'Asset Improvement Group' (upgrade projects) work shall be supplied and installed by the following nominated supplier:

Contract Blinds
PO Box 666
Bayswater Victoria 3153
Tel (03) 9720-8877
Fax (03) 9720-7230

The OOH has entered into an arrangement with the nominated supplier for ('Government Contract') fixed rates and prices for the period applicable to the work.

Holland blinds for other work may be supplied by the nominated supplier, or another approved supplier. Submit product data and samples of alternatives for approval before commencing.

The Contractor shall include in the Contract Sum, the entire cost of the Holland blinds installation including measuring, supply, delivery and installation, and all accessories and any charges as may be applicable, using the above nominated supplier.

C **Narrow blinds:**

Roller blinds which are 450 mm or less in width shall be fitted with a manual side-winding mechanism and chain of metal alloy link balls.

H-16 UNIT NUMBERS

Verify house numbers in writing with Australia Post and the Superintendent before commencing.

Individual numbers shall be powder coated aluminium with two screw fixings. Letters shall be 75 mm high unless otherwise indicated or required.

A **Individual dwellings:**

House numbers for individual dwelling shall be as follows:

- Street number adjacent to front door, 1600 mm above floor level, in prominent location, or located on the security screen door.

B **Multi-unit housing projects:**

House numbers for multi-unit housing projects shall be as follows:

- Unit number adjacent to front door, 1600 mm above floor level, in prominent location, or located on the security screen door.
- Unit number, integral with mail-box, 25 mm nominal.
- Street number and street name or project name as directed, adjacent to the mail-box or entry gate as appropriate, 100 mm.

For multi-unit projects with 10 or more units, include suitable way-finding / directory signage to common footpaths.

H-17 MAIL-BOXES

Mail-boxes shall be suitable proprietary types as indicated or required in accordance with Australian Post Office (APO) requirements and relevant Standards.

AS/NZS 4253	Mailboxes.

Mail-boxes shall be front or rear opening, as appropriate, mounted between 800 to 1100 above ground, in an accessible location approved by Australia Post, and assembled in single or multi-bank units, as appropriate or directed. Build-in mail-boxes to timber or brickwork, or mount on free-standing post built-in to concrete base.

Construction shall be sufficiently robust to withstand tampering. Fixings shall be concealed where practicable and vandal-proof. Construction generally shall be cast or extruded aluminium, with stainless steel or galvanized steel fixings and accessories.

Each mail slot shall have a rain hood, and a clearly visible, integral number of 25 mm nominal height. Doors shall have provision for a pad-lock.

Submit details for approval before ordering.

H-18 BALUSTRADES AND HANDRAILS

Stairs, balustrades and handrails shall comply with the relevant Standards and the BCA.

AS 1170	Minimum design loads on structures. (SAA Loading Code)
AS 1657	Fixed platforms, walkways, stairways, and ladders - Design, construction and installation.

Provide balustrades and handrails where external terraces and porches exceed 500 mm above adjacent ground. Unless otherwise indicated, handrails shall be 1000 mm above adjacent levels.

For external handrails and balustrades, unless otherwise indicated member sizes shall be:

- Handrail: 50 mm diameter.
- Posts 35 mm
- Balusters: 25 mm spaced at not more than 150 mm.

Site measure and fabricate off-site for minimum on-site welding and fabrication.

External work shall be hot dip galvanized. Internal work shall be primer coated with zinc rich primer (APAS 0014/1) and site painted.

Handrails shall be continuous at landings and changes in direction, with joints welded and ground smooth, or sleeved to tight butt joints with fixings flush and located out of sight where practicable. Seal free ends of rails with end-caps. .

H-19 CLOTHES LINES

A **Generally:**

Clothes lines shall be suitable proprietary types as follows:

- Rotary hoist: 3000 mm diameter.
- Rectangular hoist: 2450 x 1520 mm.
- Parallel line: 2450 x 1800 mm wall or ground mounted.

Set clothes lines in concrete bases.

Each clothes line shall be identified with the manufacturer's nameplate permanently fixed to the frame, indicating company name, address, model number, and serial number if applicable.

Exposed metal components shall be hot dip galvanized steel or aluminium with powder coating at least 60 microns thick. Exposed plastic components shall be UV stabilised. Fixings and accessories shall be hot dip galvanized steel.

Clothes line wires shall be 1.1 mm, 6 strand galvanized steel wire, plastic coated.

B **Rotary hoists:**

Rotary hoists shall be fitted with four radial arms, braced and fitted with protective end caps. Head assembly shall be mounted on steel post, capable of rising 600 mm with lifting gear and winder, free to rotate, and restrained in the fully lowered position.

C **Rectangular hoists:**

Rectangular hoists shall be fitted with a non-rotating steel head-frame mounted on steel post, capable of rising 500 mm with heavy duty, corrosion resistant lifting gear and winder.

The following product (s) satisfies the specification requirements: Coopers Clothes Lines Rectangle Elevating Lines.

D **Parallel lines:**

Parallel lines shall be a U-shaped steel head-frame with intermediate spacer tube, with drums supported by two head-stays, mounted on wall brackets or steel posts built-in to the ground, providing easy folding of the head-frame flush with the wall or posts.

Operation shall be single-handed for folding and unfolding, with a suitable locking system.

H-20 GARDEN SHEDS

Garden sheds shall be steel framed, clad with Colorbond steel sheet, hinged door, skillion or gable roof, and fixed to a concrete base. Verify colour before commencing.

Unless noted otherwise, the floor area shall be 2.5 m2. Wall height shall be minimum of 2000 mm. Door shall be nominal 1900 x 850 mm.

Steel sheet shall be nominal 0.48 mm thickness.

The following product (s) satisfies the specification requirements: BHP 'Panelrib V-crimp'.

Framing generally shall be nominal 25 x 25 1.6 mm RHS. Connections shall be fully welded where practicable. Include welded lugs to bottom rails for fixing to concrete slabs.

Door frame shall be fully welded, with mid-rail, mounted on three galvanized butt hinges welded to frame, with chain restraint, and hasp and staple or pad-bolt suitable for standard pad-lock by occupant.

All framing shall be protective coated with zinc phosphate based primer to AS 4086.

Include required galvanized fixings, and Colorbond flashings and trims.

Concrete base shall be 100 mm thickness, out of 20 MPa concrete with F62 reinforcement mesh on 50 mm compacted sand. Finish slab 75 mm above adjacent ground. Refer to CONCRETE Section.

H-21 GARDEN CUPBOARDS

Garden cupboards shall be 1200 (wide) x 1500 (high) x 400 (deep) mm nominal, with double doors closing to a rigid centre pillar, and three adjustable metal shelves.

Garden cupboards shall be fabricated from 1.6 mm thick Zincalume steel sheet, grade AZ275 (AS 1397), of robust construction with stiffening sections spot welded to the doors and joints lapped and spot welded at close centres with the minimum number of lapped joints.

Door opening shall be a rebated double-fold profile with flush finish when doors are closed. Top of opening shall be folded to include a rainwater drip edge at the front.

Each door shall be mounted on three galvanized butt hinges welded to frame, with chain restraint, and hasp and staple suitable for standard pad-lock by occupant.

Fix to fence or wall as indicated on the Drawings, 100 mm minimum clear of ground.

H-22 MOBILE RUBBISH BINS

Occupants will obtain mobile rubbish bins ('wheelie' bins) from the Principal or relevant authority.

Security posts and pads for mobile rubbish bins in public areas shall fabricated out of galvanized steel posts and brackets with provision for pad-locking.

Verify size, number and location of bins before commencing.

Coordinate with CONCRETE Section for concrete pad.

H-23 LITTER BINS

Litter bins may be proprietary types or custom fabricated.

Bins shall be 275 (wide) x 275 (deep) x 890 mm nominal overall, with a restricted top opening 225 x 125 mm nominal and a lockable hinged bottom panel for easy removal of rubbish

Bins shall made out of 1.0 mm thick Zincalume steel sheet, grade AZ276 (AS 1397), and fitted with a galvanized steel bracket for mounting on a post or wall.

Bins shall be powder coated, to minimum thickness 60 microns, in green, orange or red colour.

H-24 EXTERNAL BLINDS

External blinds shall be suitable proprietary spring loaded retractable canvas awning roller blinds, with galvanized steel brackets, arms, guides and fixings, and Colorbond steel sheet pelmet box.

Fabric shall be vinyl coated cotton or fade-resistant canvas, colour matched both sides and seam sewn along edges. Include timber runner sewn into a seam on the bottom edge, and fold top edge over and staple fix to the roller.

Include spring loaded hardwood rollers, with metal-capped adjustable tension winder at one end, and metal-capped free-moving pin at the other end.

Site measure openings before ordering. Securely fix to walls, test and leave in operating order.

Provide a suitable pole with a metal hook for each dwelling to manually operate the blinds.

H-25 SERVICES SECURITY ENCLOSURES

Services security enclosures to external equipment shall be fabricated out of mesh welded mesh fixed to galvanized steel angle frame, with full width lockable opening doors.

Frame shall be nominal 40 x 40 x 4 mm galvanised steel angle.

Welded mesh shall be galvanized nominal 3.15 mm wires at 25 mm centres in both directions, fixed to inside of frame and continuously supported.

The following product (s) satisfies the specification requirements: ARC Weldmesh WG 3 11.

Frame shall be fixed to concrete equipment base and to adjacent wall at not more than 600 mm centres. Provide spacers for 5 mm clear gap between frame and concrete base.

The enclosure shall be paint finished (black) unless indicated as galvanized finish.

H-26 RECESSED ENTRY-MATS

Recessed mats shall be coir-matting type with built-in recessed brass mat-frames. Coir matting shall be nominal 25 mm deep, adhesive fixed to a durable PVC backing sheet in accordance with the relevant Standards.

The following product (s) satisfies the specification requirements: Floorspace.

BS 3959 Coir matting.

END OF SECTION

SECTION I - CARPENTRY

CONTENTS

I-01 SUMMARY

Provide carpentry, timber and steel framing, external cladding and trim, and sheet and strip flooring, as required.

- Refer to CONCRETE Section for precast concrete stumps and concrete footing pads.
- Refer to MASONRY Section for sub-floor masonry supports.
- Refer to PAINTING Section for priming of concealed timber surfaces.
- Refer to ROOFING Section for steel fascias and barge boards.
- Refer to INSULATION Section for sarking and insulation.

I-02 REFERENCES

Comply with product information and the following Standards. Keep product information and Standards marked (*) on site during work.

AS 1397	Steel sheet and strip - Hot-dipped zinc-coated or aluminium/zinc-coated.
AS/NZS 1562	Design and installation of sheet roof and wall cladding.
AS 1684	National timber framing code.
AS 1720	Timber structures (SAA Timber Structures Code).
AS 1860	Installation of particleboard flooring.
AS 2270	Plywood and blockboard for interior use.
AS 2271	Plywood and blockboard for exterior use.
AS 2796	Timber - Hardwood - Sawn and mill products.
AS 2908	Cellulose cement products.
AS 3623	Domestic metal framing.
AS 3660 (*)	Protection of buildings from subterranean termites.
AS 4055	Wind loads for housing.
AS/NZS 1859	Reconstituted wood based panels.
AS/NZS 2269	Plywood - structural.
AS/NZS 4256	Plastic roof and wall cladding materials.
AS/NZS 4347	Damp-proof courses and flashings - Methods of test.

I-03 SUBMISSIONS

A Superintendent's Inspections:

Give sufficient notice (not less than 2 days) so that the Superintendent may inspect structural carpentry before covered by sheeting, lining, roofing and the like.

I-04 PERFORMANCE

A Envelope protection:

Install flashings and ensure that external elements exclude moisture from building envelope.

B Durability:

Timber shall have natural durability appropriate to the location or shall be preservative treated in accordance with the relevant Standards to ensure long term durability.

External timber shall be preservative coated and decorative coating where visible.

C Corrosion:

External and exposed metalwork, including embedments, connections and fixings, shall be corrosion resistant or coated to prevent corrosion. External steel and fixings, and items in contact with pressure treated timber, shall be hot dip galvanized. Dissimilar metals shall be separated to prevent electrolytic action.

D Vermin proofing:

Prevent entry of vermin to interior of building by galvanized steel sheet or 10 mm mesh barriers.

I-05 TIMBER MATERIALS

Structural timber shall be stress graded and branded in accordance with the relevant Standards.

AS 2858	Timber - Softwood - Visually stress-graded for structural purposes.
AS 2878	Timbers - Classification into strength groups.

Structural timber shall be colour coded as follows:

- Hardwood shall be F8 branded in green.
- Radiata Pine shall be F5 branded in black.
- Oregon shall be F7.

Marking shall be legible and indelible, including manufacturer's name or registered mark, not less than 600 mm from one end.

The Contractor may use higher stress grades, subject to approval by the Superintendent of a written proposal indicating proposed members to AS 1684.

Timber with any active termite infestation or other imperfections shall not be used, and immediately removed from site and replaced with suitable materials.

I-06 RAIN FOREST TIMBER

No timber harvested from a Victorian cool temperate or warm temperate rain forest, or timber harvested from land adjacent to a rain forest, constituting a rain forest buffer area as defined by the Victorian Department of Natural Resources and Environment shall be brought onto site or incorporated in the Works.

I-07 PRESERVATIVE TREATMENT

Carry out pressure treatment to timber with a suitable waterborne preservative appropriate to exposure and use in accordance with the relevant Standards. Submit evidence of treatment.

AS 1604	Specification for preservative treatment.
AS 1604.1	Sawn and round timber.

Include pressure treatment as follows:

- Radiata pine used bearers and joists and for externally fences or pergolas.
- Timbers in ground contact, such as fence posts.

Treated pine poles may be used for bollards and for pergola posts and fence cladding.

I-08 TERMITE BARRIER

For new construction, termite barrier shall be an suitable mechanical type to AS 3660.1 carried out by an approved specialist. Submit certificate of compliance.

The following product (s) satisfies the specification requirements: 'Termi-Mesh', 'Granit Guard'.

Chemical termite barriers may be used in existing construction. Obtain approval in writing before commencing.

Provide warranty for termite barrier for correct performance for a period of ten years from Practical Completion. Include manufacturer's written product warranties.

Coordinate with MASONRY and CONCRETE Sections as required.

I-09 FIXINGS

Fixings shall be appropriate to the purpose, sufficient to transmit the loads and stresses imposed and ensure rigidity of assembly in accordance with the relevant Standards.

AS/NZS 1111	ISO metric hexagon commercial bolts and screws.
AS 1214	Hot-dip galvanized coatings on threaded fasteners (ISO metric coarse thread series)
AS 3566	Screws - Self-drilling - For the building and construction industries.

Masonry anchors shall be proprietary expansion types. Plugs shall be proprietary plastic types.

Nailing for timber framing shall comply with AS 1684, Section 6.

Explosive driven fasteners shall not be used unless approved by the Superintendent for a particular purpose.

Fix timber framing to brickwork using slotted holes, M10 masonry anchor bolts and suitable washers. Adjust nuts to enable settlement movement.

Brackets to support timber posts off the ground shall be hot dip galvanized steel, set accurately into the concrete base neatly fitted to the post at least 25 mm above the base, and fixed to the post with at least one 12 mm galvanized bolt.

I-10 EXECUTION

A Generally:

The whole of the carpentry shall be carried out in the best and most workmanlike manner.

Carry out all required grooving, mitring, rebating, framing, housing, furring and the like. Include all required slips, fillets, wedges, casings, blocks, and the like.

B Trimming:

Trim for flues, vents, pipes, exhaust fans, light-fittings, hand rails, sanitary fittings and attached metalwork and skylight shafts as required.

C Services:

Make all necessary provision for and install services including electrical, television, general and sanitary plumbing, and the like.

D Enclosing exposed reticulations:

Exposed waste, vent pipes, and the like, on internal wall and/or ceiling surfaces shall be completely enclosed in 70 x 35 mm framing, and left ready for the plasterer and/or tiler. Construct suitable access openings and cover plates.

E **Electrical point of entry:**

Construct suitable point of entry for electrical supply. Coordinate with ELECTRICAL Section.

Trim between rafters, hard up against fascia and construct additional framing as required or directed to support electrical brackets and prevent deflection of the fascia.

I-11 TIMBER WALL FRAMING

Timber wall framing, studs, openings, lintels, noggings and plates, and the like shall comply with AS 1684.

Timber wall framing generally shall be F5 Radiata Pine unless otherwise indicated. Framing depth shall be 90 mm unless otherwise indicated.

Bottom plates shall be fixed to concrete floor slabs with 10 mm diameter galvanized bolts at no more than 1000 mm centres, and not less than 50 mm from slab edges.

Top plates shall be halved at joints, or connected with suitable gang nailed plates.

Walls shall be braced with F11 plywood. Wall ties shall be securely fixed to the studs.

Check out window sill trimmers for short studs under.

Flashings at window sills and elsewhere indicated shall be black polythene laminated aluminium core type. Wall base flashings shall be continuous and all joints water-proofed.

Tie walls together at corners as follows:

- For internal framed walls, use three 250 mm blocks, one hard against the top plates.
- For outside corners, use three 75 x 50 x 400 mm long blocks, one hard against top plates.

Fix noggings generally at 1100 mm above floor level, and where required for rails, shower curtains, toilet pans, access panels, cabinets and shelving, power outlets, skirting, tapware and the like. Studs or trimmers shall coincide with both ends of sink splash backs.

Except where trusses are supported on beams, locate studs directly below each roof truss, or construct suitable blocking to distribute truss loads to adjacent studs.

Partition walls shall be 65 mm clear of the bottom chords of trusses, and shall be fixed to the trusses with suitable framing anchors at each crossing.

Where the partition walls are parallel with roof trusses, the anchors shall be fixed to 75 x 38 mm noggings between bottom chords at not more than 1000 mm centres.

The Contractor may use steel head-beams over openings instead of timber trimmers. Head-beams shall be fixed with galvanized twisted shank flat-head nails to top plates and side studs. Submit a registered engineer's report, confirming the suitability of the proposed metal head-beams, and the product information.

I-12 STEEL WALL FRAMING

The Contractor may use pre-fabricated steel wall framing instead of timber framing, subject to the Superintendent's approval, providing that:

- The steel framing shall be manufactured by an accredited steel manufacturer.
- The use of steel framing shall be without extra cost.

Steel framing shall be cold formed zinc coated steel (minimum Z200) to AS 1397. Studs shall be one piece, positioned within 40 mm of load application in bearing walls. Use multiple studs under concentrated loads. Maximum stud spacing shall be 600 mm.

Nogging channels to support or fix cladding shall be spaced at 1350 mm maximum centres.

Install diagonal bracing or tensioned straps sufficient for the design wind loads.

Splice top and bottom plates for continuity and alignment.

Assemble frames by welding, self-drilling screws, or blind rivets. Spot prime welds with zinc-rich primer after cleaning.

Holes for plumbing and electrical services shall be pre-punched holes with flared edges. Edges of site cut holes shall be protected with suitable plastic bushes. Permanently earth the framing.

I-13 TIMBER FLOORS

A **Generally:**

Construct timber floors, including stumps, bearers and joists to AS 1684.

Timber sub-floor framing generally shall be F8 hardwood (OBHW), Oregon or composite beams as appropriate. Stumps shall be precast concrete unless otherwise approved by the Superintendent.

Upper floor joists shall be not less than 175 x 45 mm regardless of the timber type used.

B **Decking:**

Decking shall be hardwood slats to AS 2796 with rounded arrises. Install in long lengths (minimum 3 spans) double nailed at each bearing with galvanized nails flush driven. Join only over joists. Lay with nominal 4 mm spacing between slats.

For fibre-cement sheet sub-floors use high density compressed sheets installed in accordance with product information.

Punch nails below surface and fill holes and other depressions with suitable wood filler.

Strip flooring to be covered with carpet or resilient sheet or tile, shall be sanded to a smooth, level surface.

B **Clear finishes:**

Clear finished strip flooring shall be stopped with matching filler to a smooth sanded surface to AS 2796 free from irregularities and suitable to receive the finish.

Seal surfaces to be clear finished with oil-based penetrating timber sealer and apply two coats of clear gloss polyurethane to AS/NZS 2311, Reference No. 20.

Do not use floor until 48 hours after application of the final coat.

Refer to PAINTING Section for polyurethane.

I-14 ROOF FRAMING

A **Generally:**

Roof and ceiling framing shall comply with AS 1684.

Roof and ceiling framing generally shall be F8 hardwood (OBHW) or F5 Radiata Pine unless otherwise indicated.

Include solid blocking between the support points and at not more than 1.8 metres spacing for flat or pitched roofs where the ceiling follows the roof line and rafters or purlins act as beams to support both ceiling and roof covering, and where the depth of the rafters or purlins exceeds 4x width.

B **Roof trusses:**

Timber roof trusses shall be permanently marked to indicate:

- Manufacturer,
- Timber species.
- Pitch and span of trues and support points.

C **Trusses designed for additional loadings, such as hot water unit:**

Submit certified shop drawings to verify design of truss to AS 1720 for the span, spacing and loading requirements, and indicating:

- Location of the trusses in the building.
- Stress grade of timber.
- Size of each member.
- Method of fabrication.
- Method of permanent wind bracing.

In addition:

- Bottom chord shall be cambered 10 mm upward.
- Connector plates shall be fully pressed into truss members with no knots in plate area.
- Joint gaps shall not exceed 2 mm.
- Overhangs shall be free from spring or splits.
- Bow in chords shall be lesser of 50 mm, or L/200 maximum, when L is chord length.

Support trusses on bottom chord at two points only, unless designed for additional support. Fix to external wall plates with galvanized nail plate connectors. Plumb to within H/200, where H is the height.

Install suitable permanent wind bracing to AS 1684.

Unless otherwise indicated, plumb cut ends of trusses and securely fix fascias. Fix similar Oregon barge to match fascia and neatly mitre at joints.

I-15 CEILING BATTENS

Install timber ceiling battens to underside of roof trusses, rafters and upper floor joists to AS 1684. There shall be no direct fixing of ceilings to roof trusses, rafters and upper floor joists.

Do not use metal furring instead of timber.

Trim and frame as required to ensure adequate fixing for isolated battens and batten ends.

Ceiling battens shall be not less than 50 x 50 mm at 450 mm centres.

I-16 ROOFING BATTENS

Roofing battens shall comply with AS 1684.

Battens for tiled roofs shall be 50 x 38 mm F8 hardwood (OBHW) at 330 mm spacing generally. At gable ends, intermediate tile battens shall be 75 x 38 mm. Joints between battens shall occur on trusses and shall be not more than one joint in three consecutive rows.

Battens for metal sheet roofs shall be 75 x 38 mm F8 hardwood at 900 mm maximum spacing, firmly strapped to roof trusses or rafters at alternate fixing points with hoop iron straps.

Timber battens shall not bridge across party walls. Terminate battens at walls and bridge with 40 x 40 x 3 mm x 600 long galvanized steel fixed to battens with 25 mm galvanized clouts (two per end) nailed through pre-drilled holes spread 75 mm apart and 25 mm clear from each end.

I-17 EAVES CONSTRUCTION

Construct eaves overhangs in accordance with Drawings. Fascias shall be pressed metal unless otherwise indicated.

Exposed jack rafters to gable ends shall be 90 x 35 mm at 600 mm centres with cantilever 75 x 38 mm intermediate tile battens extending back to the second truss.

Slotted linings shall be 4.5 mm thick fibre-cement sheet, slotted for ventilation of roof space and with PVC cover strips at all joints.

Solid linings shall be 4.5 mm fibre-cement sheet with PVC cover strips at all joints.

Construct hardboard or fibre-cement sheet anti-ponding boards to carry sarking from the lowest roofing batten onto the top of the fascia without ponding.

I-18 EXTERNAL CLADDING

Unless otherwise indicated, external cladding shall be exterior grade fibre-cement lining boards.

External cladding shall complete with continuous sarking underlay, and timber mouldings to junctions of adjacent work.

I-19 CEILING ACCESS HATCHES

Construct an access hatch to each separate ceiling space under pitched roofs and elsewhere required for maintenance access. Verify locations before commencing. Minimum opening shall be 450 x 800 mm. Access hatch shall be site framed removable type or proprietary hinged type.

Frame opening with 35 x 19 mm KDHW edge frame and 42 x 13 mm KDHW visible trims.

Fabricate removable covers from 6 mm fibre-cement sheet with suitable framing and supporting lips.

Proprietary access hatch assemblies shall be fitted with friction stays and budget latches. Where installed in fire-rated or acoustic-rated work, access hatches shall have the same performance as surrounding work.

I-20 MISCELLANEOUS CONSTRUCTION

A **Ducts and hobs:**

Construct ducts and hobs for fixing of sanitary fixtures and fittings, grab-rails, taps, pipework, and the like.

Frame ducts and hobs out of 70 x 45 mm pine at 450 mm centres, and trim to adjacent work.

Install sheet linings to hobs and ducts as follows:

- Pre-laminated 16 mm water resistant particle board.
- Fibre-cement sheet where required for tiling.

The following product (s) satisfies the specification requirements: CSR 'Aqua Board'.

Make 10 mm overhang. Pre-laminated board shall be secretly fixed.

B **Electric meter boxes:**

Frame around electric meter box as required by the supply authority, and verify the supply entry position before commencing. Construct required rafter trimmers or fascia backing at point of entry. Coordinate with ELECTRICAL SERVICES Section.

C **Skylight openings:**

Trim for skylight openings at roof and ceiling with neat dressed KDHW 19 mm thick lining to the opening at ceiling level. Lining to extend below ceiling for beading.

Bead all round with 20 x 10 mm flat dressed hardwood beading.

Where shafts are required, frame up in KDHW or treated pine, using not less than 70 x 50 mm material and with framing studs spaced to suit fibrous plaster sheet lining.

D **Bath risers and building in:**

Frame up in minimum 75 x 50 mm F8 hardwood or 70 x 45 mm pine with continuous rail under bath lip and with studs at not more than 450 mm centres. Trim for and install water-resistant fibre-cement sheet backing for tiles.

Where bath risers and/or hobs on placed on slab-on-ground, bottom plates on concrete shall be placed on 0.2 mm black polythene sheeting turned up 100 mm minimum on all sides and ends. Check out face of studs, fix riser framing, hobs and dwarf walls, fix galvanized steel angles to the wall framing, support the bath and fix flashings.

E **Tank stands:**

Construct braced tank stands of Red Gum where indicated. Deck shall be at maximum height consistent with inlets from eaves gutters. Where more than one tank is provided, stands shall be at the same level and tanks inter-connected. Include termite barrier caps.

F **Building in hot water units:**

Where gas hot water units are mounted internally on timber framed walls, construct 9 mm heat resistant fibre-cement thermal rated backing sheet, arrised on edges all around. Size shall be 1200 x 750 mm or increased to comply with BCA. Cut neat holes for services. Fix with not less than 12 mm screws, countersunk and flush.

Where storage hot water units are located in the ceiling space, construct a support platform from 100 x 38 mm bearers at 450 mm maximum centres, supported on walls and packed up 25 mm so that top of bearers are above top of ceiling joists. Finish platform with 19 mm KDHW flooring.

G **Backing for gas wall heaters:**

Where gas wall furnaces are recessed into external cavity walls, seal back and bottom of recess with 4.5 mm fibre-cement sheeting on 50 x 25 mm battens. Where heater is on outside wall fix sheeting before commencing brickwork.

H **Ducting for gas console heaters:**

Where gas console heaters are located on a stud wall, conceal the flue within the wall cavity.

Where gas console heaters are located on double brick party walls, construct a framed duct behind the heater full height to the ceiling, clad in plasterboard. The duct shall be of sufficient depth to enable the flue to by-pass any roof framing or wall plates attached to the party wall above ceiling level.

I *Plinth* **for gas console heaters:**

For gas console heaters, construct a base of 18 mm thick compressed fibre-cement sheet to raise the heater above the level of the carpet to facilitate removal and cleaning of the air intake filter. The size of the base shall exactly match the base of the heater and butt hard to the skirting at back. Trim edges of the fibre-cement sheet smooth and straight.

J **Bases for electric space heaters:**

For electrical space heaters, construct a base of 18 mm thick compressed fibre-cement sheet. Butted hard to skirting at back and extend 25 mm beyond the front and sides of the heater.

Trim edges of the fibre-cement sheet smooth and straight. Finish the edges with a 12 mm quad fixed to floor for timber floors only.

K **Furring:**

Fix internal linings to masonry walls with galvanized steel furring at 450 mm centres. Include additional horizontal furring at floor level, at top of tile skirting, around taps, outlets and fittings to support sheet.

Furring and battens shall be spaced at not more than 450 mm centres, and fixed at not more than 300 mm centres.

I-21 RE-STUMPING AND TIMBER FLOOR REPAIR

Carry out re-stumping and timber floor repair in accordance with the relevent Standards:

AS 2870 **Residential slabs and footings.**

Inspect site during Tender Period, assess extent of work, and include all required work in the Contract Sum, including making good and repairs, safety and protection of work to remain. Notify Superintendent of any found asbestos and obtain directions. Where floors have subsided, verify the proposed finished floor level with the Supervisor before commencing.

Carefully remove base-boards and flooring required for access. Maintain all services during re-stumping. Do not interrupt the electrical earthing.

Replace all damaged stumps with new precast concrete stumps. Refer to CONCRETE Section. Replace any defective and under length braces.

Replacement stumps may be special 'restumper' type with hanger cast into stump and fixed to side of bearer. Stumps shall not be site trimmed to length. All stumps ends shall be undamaged.

Perimeter stumps shall have holes to enable bolting cleats for fixing plinths with 10 mm bolts. Top hole shall be 100 mm from top of stump with remaining holes at 225 mm centres.

Excavate stump holes to a sound base, with level bottoms and clean corners. Base of stumps shall be embedded into the ground not less than 450 mm, or 1/4 of the length for stumps more than 1800 mm above ground.

Fit galvanized steel termite caps and insert resilient damp proof barrier to isolate cap from top of stump and underside of bearer. Caps shall be 200 x 200 mm generally or 225 x 225 mm for 100 mm stumps.

The following product (s) satisfies the specification requirements: 'Mailhold'.

Bring floors to the correct level and to a true line throughout. Do not cause damage to plaster, doors, windows or other parts of the building.

Locate stumps on minimum 300 x 300 x 150 mm in-situ concrete pads, with an additional 150 mm in-situ collar around the stump. Cure pads for minimum 48 hours before loading. Back-fill stump holes and compact by ramming.

Securely fix stumps to floor structure with built-in threaded rods.

Stumps shall set plumb and aligned with the centre line of bearers and sole plates.

Provide two stumps at the change of floor levels.

Packing of stumps under bearers shall not exceed one thickness of 6 mm fibre cement board, nominal 150 x 65 mm securely clout nailed to underside of bearer.

Stumps more than 900 mm above ground shall be securely braced with 100 mm x 38 mm hardwood bolted with suitable 10 mm bolts. Bracing shall be single diagonal type on every alternate row of stumps in both directions. Stumps more than 1500 mm above ground shall be cross braced.

Base-boards shall be double nailed with 50 mm nails at each bearing, in straight lines with a maximum gap of 20 mm. Cleats for fixing base-boards shall be 75 x 38 mm Red Gum or Treated Pine. Bolts and nails for Treated Pine shall be galvanised.

Refurbish existing or construct suitable new 600 x 600 mm braced sub-floor access door though base-boards. Hang door at stump on 200 mm strap hinges and fit with 100 mm pad bolt. Use galvanized fixings and fittings. Reinforce opening with 100 x 50 mm Red Gum or Treated Pine dropper nailed to bearer and base-boards.

On completion, replace any base-boards broken during removal out of KDHW, painted to match existing base-boards with two coats of suitable paint. Refer PAINTING Section. Replace any flooring removed or damaged to match existing. Verify that all doors and windows are operating correctly. Ease, adjust and re-fit doors and windows as required to ensure correct operation. Make good all work affected by re-stumping, including removal of debris from under and around house.

END OF SECTION

SECTION J - JOINERY

CONTENTS

J-01 SUMMARY

Provide fabricated joinery, internal trim, skirtings, architraves, mirrors, and timber stairs and balustrades, as required.

- Refer to CARPENTRY Section for timber and metal framing and installation of metalwork.

Timber sizes shall be finished sizes, unless otherwise stated.

J-02 REFERENCES

Comply with product information and the following Standards. Keep product information on site during work.

AS/NZS 4386 Domestic kitchen assemblies.

J-03 SUBMISSIONS

A Samples:

Submit samples of fabrication quality, hinges and hardware for approval before commencing fabrication.

B Shop drawings:

Submit shop drawings for joinery, including fixings and connections, stairs and balustrades, including junctions with soffits and adjacent work, for approval before commencing fabrication.

C Superintendent's Inspections:

Give not less than two days notice so that Superintendent may inspect the following:

- Concealed work, before covering.
- First example of finished work, before proceeding with remainder.

D Warranty:

Provide warranty for joinery against defects in materials and workmanship for a period of two years from Practical Completion. Include manufacturer's written product warranties.

J-04 TIMBER

Timber shall be the best quality of its respective kind in accordance with the relevant Standards.

AS 2796 Timber - Hardwood - Sawn and mill products.

Unless otherwise indicated, timber shall be select grade kin dried and reconditioned hardwood (KDHW). Internal painted architraves, skirtings and trim may be MDF or radiata pine.

Radiata pine shall not be used north of the Dividing Range.

Timber shall be straight grained, sawn square in long lengths to required sizes, well seasoned, sound and free from defects, including insect damage, which may affect load carrying capacity or appearance of finished work. Do not use rain-forest timber species unless plantation grown.

Timber showing any trace of active termite other borer infestation shall be condemned, immediately removed from site and replaced at no additional expense to the Principal.

All timber, including pressure treated timber, but excluding recognised sill species, shall have a moisture content between 10% and 15% at the time of fixing.

Seasoned timber and joinery shall be stored under cover at all times and protected from the weather. Seasoned timber shall be preservative treated or primed before delivery to site.

J-05 WOOD-PANEL SHEET PRODUCTS

Particleboard and MDF shall be 'low formaldehyde emission' wood-panel made in Australia in accordance with the relevant Standards.

AS/NZS 1859 Reconstituted wood based panels.
AS/NZS 1859.1 Particleboard.
AS/NZS 1859.2 Medium density fibreboard.

J-06 PLASTIC LAMINATE

Plastic laminate generally shall be high pressure laminate (HPL) in accordance with the relevant Standards. Where indicated for internal surfaces, plastic laminate may be low pressure laminate (LPL) (Melamine).

AS 2924 Decorative thermosetting laminated sheet.

All surfaces shall be factory bonded in a continuous laminate sheet with no joins except for corner bench cupboards. Corner joints shall be mitred to a tight hairline. Edges shall be post-formed to pencil edge radius or edge trimmed in laminate to match primary surface. Benchtop laminate shall be heat resistant.

J-07 HINGES AND HARDWARE

Hinges shall be adjustable, self-closing, all-metal types, with 110 degree opening. Submit samples for approval. Doors in excess of 900 mm high shall be fitted with three hinges.

The following product (s) satisfies the specification requirements: Blum.

Door and drawer handles shall be stainless steel or satin chrome-plated 150 mm D-pulls. Plastic shall not be used. D-pulls to drawers shall be horizontal. All other D-pulls shall be vertical.

J-08 CABINETWORK FABRICATION

A Construction:

Fabricate cabinetwork out of wood-panel sheet products finished with plastic laminate to all surfaces and edges.

Fabricate cabinetwork plumb and square, rigidly fixed and braced, to match approved samples.

Joints shall be rebated, glued, doweled and screwed. Unless otherwise indicated, screws shall be 50 mm long x 7 mm diameter, and dowels shall be 40 mm long x 8 mm. Screw spacing shall not exceed 250 mm. Include intermediate dowels where spacing exceeds 150 mm. All fixings shall be concealed.

Benchtops shall be fixed to carcasses with suitable screw fixed metal brackets.

Corner doors shall be bi-folding with continuous brass piano hinges.

Seal edges of cabinetwork to adjacent walls and floors with water resistant sealant.

Vertical divisions in cupboards shall extend to the full depth of the cupboard. Door mullions are not acceptable.

Back panels shall extend to the floor to prevent vermin access under or into cupboards.

Adhesive and fixings shall comply with the relevant Standards. All fixings shall be concealed.

AS 2754 Adhesives for timber and timber products.

B Built-in equipment:

Make cut-outs for sinks, kitchen equipment, service lines and later maintenance access. Use manufacturer's templates and make tight hairline junctions between equipment and cabinetwork.

Construct suitable recess in overhead cupboards with false back to accommodate range hood.

Sink edges shall be bedded in water-proof sealant.

C Drawers:

Provide one set of drawers in each kitchen, with top drawer fitted for cutlery, and three additional drawers of equal depth.

Drawer supports shall be a suitable non-corrosive track and nylon roller system design for 20 kg nominal capacity, with built-in drawer stops, and capable of fine adjustment.

D Internal fittings:

Provide one snug fitting, moulded plastic cutlery tray with five compartments in the cutlery drawer.

The following product (s) satisfies the specification requirements: Howard Silvers.

Provide suitable plastic coated open wire basket drawers and supports for clothing, in wardrobes.

E Fixing and completion:

Support floor mounted cabinetwork on adjustable corrosion resistant legs to enable levelling and fixing kicker bases. Kicker bases shall be bedded with water-proof sealant.

Fix wall mounted cabinetwork with 75 x 19 mm KDHW fixing rail at the top of each unit, and fix to walls with 75 mm screws or wall plugs. Use not less than three fixings per unit.

After fixing, adjust hinges to bring doors to correct alignment.

Protect installed cabinetwork from damage during subsequent work.

J-09 POISON CABINET

Poison cabinets shall be suitable child-proof cabinets, 325 (wide) x 450 (high) x 150 (deep) mm nominal, with two compartments with fixed shelf 230 mm from the bottom.

The cabinet shall be fabricated from 16 mm particle-board faced both sides and edged with Melamine. The doors shall be side hinged with finger hole access to a concealed elbow catch or nylon spring lever catch.

J-10 BUILT-IN CUPBOARDS AND WARDROBES

Construct built-in cupboards to recesses with shelves, drawer units, hanging rods and partitions as indicated, and finished with skirtings, architraves and cornices to match adjacent work.

Coordinate with INTERNAL LININGS Section.

Shelves shall be fixed on continuous 45 x 19 mm KDHW cleats with 45 x 19 mm KDHW edging.

Doors shall be 2040 mm flush panel doors fitted with one pair 90 mm steel loose pin butt hinges, large magnetic catches and 100 mm metal 'D' pull handles.

Refer to METALWORK Section for WARDROBE HANGING RAILS Clause.

J-11 MIRRORS

Mirrors shall be electrolytically silvered and sealed, with exposed edges arrised and polished. Thickness shall not less than 4 mm thick annealed glass as scheduled, in accordance with the relevant Standards.

Wall mounted mirrors shall fixed to water resistant backing, with polished anodised or powder coated aluminium surround frame.

Mirrors to bathroom cabinets shall be fixed with chrome-plate brass corner clips and screws.

J-12 STAIRS

Fabricate internal stairs from KDHW or moisture resistant MDF, securely connected with dovetail joints.

Stringers shall be 32 x 240 mm, machined to receive dovetailed edge of treads and risers. Support stringers on 90 x 45 mm pine sub-stringers with 32 x 13 mm rebate to house stringer.

Treads shall be 32 mm thick, dovetailed to stringers with rounded nosing.

Risers shall be 18 mm thick, dovetailed to stringer and housed to treads, placed 25 mm from edge of tread nosing.

Balustrade assemblies shall be KDHW, with newel posts 90 x 90 mm, handrails moulded from 65 x 65 mm, shoe rails moulded from 65 x 32 mm, and balusters 32 x 32 mm.

J-13 TRIMS

Trims shall include mouldings, architraves, window trim and skirtings as required to complete the work. Unless otherwise indicated size shall be:

- Architraves: 40 x 19 mm with splay top.
- Skirtings: 65 x 19 mm with splay top.

Trims in wet areas shall be primed on all faces before fixing. Skirtings shall be bedded in water-proof sealant, hard to floor.

Carry out grooving, rebating, scribing, mitring, arrising, framing, housing, and the like, as required. Include fillets, wedges, blocks and the like, as required.

Prime dressed timber on all faces before delivery to suit finish.

Architraves over tops of windows shall extend 150 mm beyond window frame to enable fixing of Holland blind brackets and curtain rail brackets.

J-14 PELMETS

Fabricate internal pelmet boxes out of 140 x 19 mm KDHW or MDF.

Pelmet length shall exceed window opening by at least 150 mm.

Coordinate with METALWORK Section for curtain rods, brackets and blinds.

J-15 DEFAULT JOINERY DETAILS

Unless otherwise indicated, fabricate cabinet work as follows:

Nominal dimensions:

- Bench cupboards shall be nominal 900 mm high x 600 mm front to back.
- Overhead cupboards shall be nominal 900 mm high x 300 mm front to back.
- Overhead cupboards shall be mounted 600 mm above bench tops.
- Overhead cupboards over refrigerators shall be 600 mm deep with 300 mm false back.
- Internal colour shall be white. Verify external colours before commencing.

Bench carcasses:

- Carcasses shall be 16 mm MR particleboard, Melamine both sides and PVC edge strips.

Bench tops:

- Bench tops shall be not less than 32 mm MR particleboard.
- Bench tops shall be faced with 0.8 mm post form grade HPL plastic laminate, and self edged with matching HPL plastic laminate.

Doors and visible ends:

- Cupboard doors and visible ends shall be 18 mm HMR MDF.
- Doors shall be faced in Melamine both sides, ABS edged.

Shelves:

- Shelves shall be 18 mm MR particleboard, Melamine both sides, PVC edges.
- Shelves more than 800 mm span shall be 25 mm.
- Adjustable shelves shall have brass pins with sleeved ferrules (1 up, 1 down)
- Shelves shall have intermediate support where practicable.

Drawers:

- Drawer fronts shall be as for cupboard doors. Drawer interiors shall be faced in Melamine.
- Drawer sliders shall be durable fully opening proprietary metal telescoping types.

Kicker bases:

- Kicker bases to bench cupboards shall be 120 x 19 mm KDHW, faced with 0.8 mm HPL plastic laminate.

Joinery hardware:

- Handles and drawer-pulls shall be 100 mm nominal satin stainless steel 'D' pulls.

Use prefinished proprietary boards where practicable.

END OF SECTION

SECTION K - ROOFING

CONTENTS

K-01 SUMMARY

Provide tile and metal roofing, proprietary skylights, and roof plumbing, as required.

- Refer to CARPENTRY Section for roof framing and tiling battens.
- Refer to DRAINAGE Section for disposal of rainwater.
- Refer to INSULATION Section for sarking and insulation.

K-02 REFERENCES

Comply with product information and the following Standards. Keep product information and Standards marked (*) on site during work.

AS/NZS 1562	Design and installation of sheet roof and wall cladding.
AS 2049	Roof tiles.
AS 2050 (*)	Installation of roof tiles.
AS/NZS 2179	Specification for rainwater goods, accessories and fasteners.
AS 2180 (*)	Metal rainwater goods - Selection and installation.
AS 4046	Methods of testing roof tiles.
AS 4256	Skylights.
AS/NZS 4347	Damp-proof courses and flashings - Methods of test.
AS 4597	Installation of roof slates and shingles (Non-interlocking type).
SAA HB 39	Code of common practice for steel roofing.

K-03 SUBMISSIONS

A Information:

Product literature and product information for proprietary products.

B Samples:

- Examples of fabrication quality, if directed.
- Control sample of roof-tiles (not less than three).

C Verification:

Capacity of gutters and down-pipes.

D Inspections:

- Concealed work, before covering.
- First example of finished work, before proceeding with remainder.

E Warranty:

Provide warranty for roof covering against defects in materials and workmanship including leakage, delamination and fading of applied coatings, failure of recommended fixing method, fixing accessories against anticipated wind velocities, and deterioration of acrylic skylights from sunlight, for a period of six years from Practical Completion. Include manufacturer's written product warranties.

K-04 PERFORMANCE

A **Weather protection:**

Install flashings and ensure that external elements exclude moisture from building envelope.

B **Corrosion:**

Materials shall be corrosion resistance. Adjacent materials and products shall be electrolytically and chemically compatible with each other. Steel sheet shall be Zincalume generally for new work, except where zinc coated steel is required in contact with existing work.

C **Maintenance and vermin proofing:**

Prevent entry of birds and other vermin into downpipes, concealed spaces and inside of building.

Construct leaf guards to down-pipe entries and scribed battles and mesh where required.

K-05 CONCRETE AND TERRA COTTA TILES

A **Generally:**

Roof tiling shall comply with the relevant Standards (AS 2049 and AS 2050).

Verify tile colour before commencing.

Set out the roof to give an even tile gauge in each course, with full or purpose-made half tiles at verges. Avoid cutting tiles. Extend bottom course of tiles 50 mm over eaves gutter.

B **Mortar bedding:**

Bed and point ridges, hips, end verges, and cut tiles to valley gutters in mortar coloured to match the tiles.

For pointed verge, bed and point full or specially made half tiles on 100 x 5 mm thick fibre-cement pointing strip.

Bedding mortar mix shall be 1:1:5 parts cement / lime / sand, and shall be reinforced.

Screw fix the first three ridge tiles at gable ends with screw batten penetration of 20 mm minimum and set and point in butyl mastic. An alternate 'dry' verge using folded metal fascia with upstand and soaker counter flashing is acceptable.

Valley gutters shall be 130 mm wide and tiles shall be machine cut and bedded on a full bed of mortar coloured to match tiles.

C **Spare tiles:**

For each dwelling, supply only twelve spare roofing tiles and store in ceiling space on two 50 x 50 mm hardwood battens fixed to top of bottom chord adjacent to ceiling access hatch.

K-06 STEEL SHEET ROOFING

Sheet metal roofing and accessories shall be of a suitable proprietary metal roofing system in accordance with product information and relevant Standards (AS/NZS 1562).

Unless otherwise indicated, roofing shall be Colorbond steel sheet. Verify colour before commencing. Visible accessories shall match roofing colour.

Turn pans of sheets up at tops and down into gutters by mechanical means.

Include pre-cut notched eaves flashings and bird-proofing where necessary.

Extend bottom edge of metal roofing 50 mm over gutters.

Close off ribs at bottom of sheets by mechanical means or use purpose-made fillers or caps.

Finish ridges and verges with purpose-made ridge capping or barge rolls.

Paint the full length of all side laps of each sheet with one coat zinc chromate before fixing sheets.

Lay sheets with manufacturer's recommended end laps for particular roof pitch, one and a half corrugations side lap and 50 mm extension into gutters.

Fix at frequencies recommended by manufacturers, each fourth ridge and at overlaps and edges, using suitable special purpose hexagonal-head screws with rubber washers and not less than 50 mm length. Coat screw heads and rivets heads with matching colour roof paint.

Construct all cappings and flashings in materials compatible with roof sheeting.

Cut aluminium foil sarking to gutter line, sweep roof clean, clear gutters and give water test for roof watertightness and down-pipe flow.

K-07 GUTTERS AND DOWN-PIPES

A **Generally:**

Construct flashings, cappings, gutters, outlets, down-pipes and the like to complete the roof system in accordance with the relevant Standards (AS 2179 and AS 2180).

Visible rainwater goods shall be Colorbond, and concealed rainwater goods shall be Zincalume, unless otherwise indicated.

B **Valley gutters:**

Valley gutters shall be 0.6 mm thick, turned along roof slope and beaded on edge.

C **Eaves gutters:**

Eaves gutters shall be of proprietary brand to match roof system, nominally of 0.6 mm thick quad profile, 115 (wide) x 65 mm minimum high, lapped, riveted and soldered.

D **Down-pipes:**

Down-pipes shall be 0.6 mm thick with rectangular profile. Down-pipes shall be in long lengths with slip joints entered 40 mm in the direction of flow and soldered. Seams shall be at the back.

Connect top of down-pipes to gutters with offsets.

Connect bottom of down-pipes with shoe and galvanized steel disc cemented and caulked into socket of drain riser.

Secure down-pipes hard to walls with three 38 x 1.6 mm matching steel straps.

E **Box gutters:**

Box gutters shall be formed out of 0.6 mm thick unless otherwise indicated.

Lap joints 75 mm in direction of flow, rivet and seal watertight, rivets 30 mm apart and staggered in two rows. Fabricate stop ends. Construct expansion joints and ensure adequate falls.

Fabricate galvanized steel brackets to the box gutters with required fixing holes and cleats before galvanizing. Include galvanized straps, bolts, nuts, washers and the like as necessary.

F **Rainwater heads:**

Construct rainwater heads to sizes and of shapes indicated, from 0.60 mm thick Colorbond steel sheet, properly formed, riveted and soldered with sleeve flange at bottom to enter down-pipe to at least 75 mm depth.

G **Spreaders:**

Where indicated, construct spreaders to down-pipes. Spreaders shall be fabricated from down-pipe material and shall extend across roof at least 450 mm. Spreaders shall have stop ends and a series of outlet holes of total area exceeding the down-pipe outlet.

K-08 SKYLIGHTS

Skylights shall be standard proprietary type of size as indicated, with plastic outer and inner dome with anti-heat treatment, metal base with weathered flange, 200 mm Zincalume apron flashing, anti-splash vane, fixing lugs, and installed in accordance with product information.

Refer to CARPENTRY Section for shaft framing, and LINING AND PLASTERING Section for plasterboard lining and acrylic diffuser at ceiling level

K-09 FASCIAS AND BARGES

Fascias and barges shall be Colorbond steel, of suitable profile, minimum 0,60 mm thick, fixed in accordance with the product information.

Fabricate in longest practicable lengths without intermediate joints. Make joints at corners. Pop rivet to backing sleeves, and bed in sealant. Colour match pop rivet heads.

Fascias shall be 180 mm high, with 26 x10 mm return at top and 36 x 12 mm return at bottom with a slots for supporting eaves linings.

Soakers shall be 97 mm high, with 27 mm return at the top to fit over the barge, have a 70 mm inside upstand and a soaker of not less than 105 mm with a 16 mm return upstand.

For tiled roofs, the upstand shall be higher than the uppermost part of each tile. Make an even gap not more than 20 mm between the upstand and the edge of the tiles. Mortar pointing may be omitted.

K-10 FLASHINGS

A **Metal roofs:**

Flashings for metal roofs generally shall be 0.6 mm thick Colorbond steel.

Step flashings shall be wedged 35 mm into brick joints with zinc lacks. Apron flashings shall be turned 60 mm minimum under step flashings and gutters. Point raked joints with cement mortar.

B **Tiled roofs:**

Apron flashings for tile roofs generally shall be 0.7 mm thick soft zinc sheet, 300 mm wide, dressed down over tiles and under wall lining.

Where the overhang of the major span intersects the ridge of the minor span, turn flashing under the soffit of the major roof overhang and 150 mm down over the roof tiles, extended out to be overlapped 150 mm by the ridge tile and finished with the flashing turned back to construct a bead.

C **Services:**

Flash all services penetrating roof surface, properly boxed, soldered and dressed.

END OF SECTION

SECTION L - DOORS AND WINDOWS

CONTENTS

L-01 SUMMARY

Provide timber doors, fire doors, aluminium windows and glazed doors, including glazing, fixings, flashings, hardware and keying, as required.

- Refer to JOINERY Section for architraves and internal trims.
- Refer to FIRE PROTECTION Section for specific requirements relevant to each occupancy type with respect to the means of exit.
- Refer to MASONRY, CARPENTRY and INTERNAL LININGS Sections for building-in frames.

L-02 REFERENCES

Comply with product information and the following Standards. Keep product information and Standards marked (*) on site during work.

AS 1909 (*)	Installation of timber doorsets.
AS 2047	Windows in buildings.
AS 2047.1	Specification for materials and performance.
AS 2047.2	Construction, installation and maintenance.
AS 4420	Windows - Methods of test.
AS 2688	Timber doors.
AS 2689	Timber doorsets.

L-03 SUBMISSIONS

A **Information:**

Submit product information. Submit fire test certificates for fire-rated doors.

B **Samples:**

Submit samples of proprietary products and fixings, and examples of fabrication, if directed.

C **Shop drawings and computations:**

Submit shop drawings for doors and window indicating concealed details and methods of weather-proofing. Include computations to verify glass thicknesses and fixings.

D Superintendent's inspections:

Give not less than two days notice so that Superintendent may inspect the following:

- Concealed work, before covering.
- First example of finished work, before proceeding with remainder.

E Warranty:

Provide warranty for doors against defects in materials and workmanship including warping, delamination, for a period of three years from Practical Completion.

Provide warranty for aluminium windows against defects in materials and workmanship including coating durability and colour fastness for a period of ten years from Practical Completion.

Include manufacturer's written product warranties.

L-04 PERFORMANCE

A Weather protection:

Door and window assemblies shall exclude weather, moisture and air from interior of building.

B Fire:

Comply with product information. All approvals shall comply with the requirements of the BCA Part C Acoustics.

Comply with manufacturer's acoustic systems and product information.

L-06 DOORS

Flush panel doors shall comply with the relevant Standards (AS 2688 and AS 2689).

All doors shall carry a label indicating the materials used for the construction of the door.

Generally doors shall be not less than 34 mm thick and for painted finish, and shall be supplied in standard widths, 720 mm, 770 mm, 820 mm, 870 mm, 920 mm, 970 mm, and as required.

Doors to be stained shall be faced with close-grained water-proof premium grade plywood.

Increase internal frames or include additional blocking where required for hardware.

Sliding doors shall be as for hinged doors with grooved bottom rail.

A Solid core - block pine (internal and external)

Thickness	Not less than 35 mm overall.
Faces	Exterior Grade A plywood, 3.6 mm thick, filled and sanded for paint finish.
Core	Solid laminated kiln dried Radiata Pine (KDRP).
Rails / stiles	Rails and stiles 40 mm wide KDHW. Top and bottom rails shall cover the exposed end grain of the core.

B Solid core - (internal)

Thickness	Not less than 34 mm overall
Faces	Medium density fibreboard (MDF) or hardboard, 3.2 mm thick.
Core	Solid highly moisture resistant (HMR) MDF, HMR particle board or KDRP.
Rails / stiles	KDHW or KDRP not less than 28 mm wide. Top and bottom rails shall cover the exposed end grain of the core

C Universal (internal and external)

Thickness	Not less than 35 mm overall.
Faces	MDF, 4 mm thick, with 4 mm water-proof plywood filled and sanded for paint finish.
Core	Small cell core with a maximum cell size of 30 mm.
Rails / stiles	Rails 100 mm and stiles 120 mm wide, from KDRP or KDHW. Outer edges of the stiles shall be solid continuous KDHW.

D Semi-solid (internal)

Thickness	Not less than 37 mm overall.
Faces	Hardboard, 4.5 mm thick, for paint finish (or similar).
Core	Small cell core with a maximum cell size of 30 mm.

Rails / stiles	Rails 90 mm and stiles 68 mm wide, from KDHW or KDRP. Fire rails may be finger jointed. Locate 400 mm long lock block mid height on one side

E Flush panel (internal only)

Thickness	Not less than 35 mm overall.
Faces	MDF or hardboard, 3.2 mm thick for paint finish.
Core	Small cellular core with openings having a size of not greater than 30 mm.
Rails / stiles	Rails, not less than 90 mm wide, stiles not less than 120 mm wide from laminated KDHW or KDRP with solid continuous KDHW outer stile edges. Laminations shall have minimum width of 30 mm and may be butt jointed.

The following product (s) satisfies the specification requirements: 'Redicote'.

L-06 FIRE DOORS

Fire doors shall be suitable fire door-sets, in accordance with the relevant Standards. Submit test reports and logbooks. Label doors in accordance with the Standards.

AS/NZS 1905	Components for the protection of openings in fire resistant walls.
AS/NZS 1905.1	Fire-resistant doorsets.

Where fire doors are required normally to be held open, for access/operational reasons, they shall be fitted with magnetic door hold open devices.

Where fire doors serving as exit doors or in the path of travel to exit are required to be normally kept locked, for security reasons, they shall be fitted with electric door strike devices or magnetic door locks.

Test reports provided for fire door assemblies shall include the proposed door furniture including magnetic door hold open devices, electric door strike devices or magnetic door locks and or other door furniture.

Refer to FIRE PROTECTION Section for relevant requirements on magnetic hold open devices, electric door strikes and magnetic locks if required.

L-07 DOOR FRAMES

A External:

External door frames, transoms and mullions shall be made of not less than 45 x 135 mm KDHW with 12 mm rebated stops. Jambs shall be housed into heads and doweled into concrete thresholds with two 10 mm brass dowels each side. Where indicated, timber door sills shall be Jarrah. Fix securely to walls at 600 mm centres. Finish against brick reveals with 19 x 12 mm splayed wind mouldings, securely fixed and bedded in sealant. Prime all sides before installation.

B Internal:

Internal door frames shall be made of 19 mm KDHW x full width of wall thickness, with 38 x 12 mm planted stops. MDF shall not be used for door frames. Jambs shall be housed into heads. Finish jambs and stops hard to floor. Fix securely to walls at 600 mm centres. Fix additional packing at hinge and lock points of jambs, and centre and ends of heads.

C Installation:

Before commencing, verify substrates are suitable and to correct tolerances for installation.

At completion, verify in writing that fire-rated, moisture resistant, and acoustic systems have been installed in accordance with the product information for such systems.

L-08 HINGES

Each door leaf shall have hinges as follows:

- Internal doors 2040 mm high: Two 90 mm loose pin steel butt hinges.
- Internal doors over 2040 mm high or 920 wide: Three 90 mm loose pin steel butt hinges.
- External doors, 2040 mm high: Three 90 mm fixed pin brass butt hinges.
- External doors, over 2040 mm high: Three 90 mm fixed pin brass butt hinges.
- Fire-rated doors: Three hinges as required by fire test report.

Hinged doors to enclosed toilets with doors that open inwards shall be readily removable from the outside with a suitable hinge set.

The following product (s) satisfies the specification requirements: Dalco 'Escape Hinge Set'.

L-09 DOOR HARDWARE AND KEYING

A **Door hardware:**

Door hardware shall be suitable proprietary types approved by the Superintendent before commencing. Only one manufacturer shall be used throughout.

Door locks shall have a 60 mm backset.

Door furniture shall be satin chrome finish.

Door handles shall be located 1 metre above floor level. Keyholes shall be located 100 mm above handles.

Where exit doors are required to be normally kept locked, for security reasons, they shall be fitted with electric door strike devices or magnetic door locks.

Refer to FIRE PROTECTION Section for relevant requirements on electric door strikes and magnetic locks if required.

B **Keying:**

Front and rear doors and security doors for each unit shall be keyed alike.

Master-key the whole project only where indicated.

Provide two keys per dwelling / unit, clearly tagged and handed to the Superintendent in person at Practical Completion.

C **Weather seals:**

Provide weather seals to bottom jamb and top edges of all external doors.

L-10 SECURITY DOORS AND INSECT SCREEN DOORS

A **Scope Of Work:**

The work required under this section consists of all labour, material and equipment necessary to supply and install full height and/or half panel security doors as specified below to the properties listed in the SECURITY DOOR SCHEDULE. At various properties, this work will also include the removal and disposal of existing screen doors (including furniture) and making good.

Security doors shall be manufactured to comply with AS 2803 - Hinged Security Screen Doors.

B **Nominated suppliers:**

Security doors shall be supplied and installed by one of the following nominated suppliers. No other supplier or installer will be accepted:

Hyland & Sons Security Doors	GAP Technical Services
17 Bennet Street	P.O. Box 794
DANDENONG 3175	NOBLE PARK 3174
Tel: (03) 9706-9938	Tel: (03) 9791-5977
Fax: (03) 9706-9839	Fax: (03) 9791-9663
Contact : Mr Viv Hyland	Contact : Mr Maurice Gagliardi

The Contractor shall include in its Contract Sum, the entire cost of the security door installation including measuring, supply, delivery and installation, all accessories and any charges as may be applicable, using the above nominated suppliers.

C **Security door components:**

Construction of security door shall be as follows :

Door frame shall be 50 x 20 x 1.6 mm (min) rectangular hollow section (RHS), butt welded at the corners. Provide 2 no. 25 x 5 mm flat strengthening bars 188 mm apart. All exposed welds shall be ground flush. Fine, un-ground welds are not permitted.

Kick plate shall be 120 x 2 mm steel plate, welded to frame. Kick plate shall not overlap frame by more than 10 mm.

Centre plate shall be 186 x 120 x 2 mm, edge welded flush to frame for fixing of door numbers.

Lock cover-plate shall be 186 x 120 x 2 mm, edge welded flush to the frame to protect door lock.

Hinges shall be suitable steel security hinges, welded to door frame. Provide minimum three welds per hinge. Lubricate hinges at the time of installation.

The following product (s) satisfies the specification requirements: Lanes F1001 x 85 mm.

Security door infill material shall be expanded metal mesh to Australian Standards requirements for Class 1 doors. Weld expended metal mesh to the door frame at each contact point.

The following product (s) satisfies the specification requirements: BHP HH3056, Expamet 50/30, 'Intrudermesh' MM750.

Flywire mesh shall be aluminium expanded metal mesh, nominal size 3.0 mm SWM x 5.0 mm LWM, strand thickness 0.5 mm, strand width 0.5 mm, fitted to steel frame with metal edge trim section and high strength non-corrosive rivets at maximum 75 mm centres.

The following single product satisfies the specification requirements: 'Supermesh'.

Security Lock shall have an approved keying system, capable of being keyed alike to security door, front and back door (wherever possible), have a pin cylinder and internal snib with no key on the inside. The lock shall have a capability of being master keyed and shall be guaranteed for two years. The lock cylinder shall be keyed alike to front entry door where the lock cylinders are compatible. Fit matching striker plate to existing door jamb with anti-jemmy plate.

The following single product satisfies the specification requirements: 'C4' keying system.

Lock cowl. Fit a steel cowl around the lock thumb turn to prevent easy access to the thumb turn by levers and probes via deliberately cut holes in the mesh. The cowl shall not hinder the proper use of the thumb turn from inside the property by an authorised person.

Restricting chains. Fit 460 mm long steel restricting chain fitted to the head of the door frame by a 60 mm long, V-crimped 4 mm hard drawn wire impact load spreader, to restrict opening to 90 degrees.

Door knocker shall be cast aluminium, powdercoat finished to match door, riveted to door frame.

Numerals. House numbers are not required on security doors for individual villas or dwellings. For units, supply and fit unit numbers, using 75 mm pressed brass numerals fitted to centre plate with pop rivets. Numerals shall be fitted to main doors only.

Grommets. Place 10 mm diameter rubber grommets at the top and bottom of all steel frame door jambs on the striker side to prevent rattling.

D **Security door construction:**

Security door frame shall be a fully welded construction including attachment of plates, hinges and security mesh. Butt welds shall have full penetration and be ground flush. Intermediate rails shall be fixed to the top of the kick plate, then two at mid height. The lock housing may be formed by stamping or by welding a lock cage into the frame. Doors shall be free from any warping or distortion.

Locate hinges 150 mm from top and bottom. Fix 'Supermesh' with 3.2 mm aluminium pop rivets at not more than 75 mm centres. Locate knocker on lock stile, 1500 mm from bottom. Fix brass numerals with 'Gold 440' pop rivets.

E **Half-panel and sliding steel security door construction:**

Frame construction, mesh and finish for half-panel and sliding steel security doors shall be as manufactured by the nominated suppliers and generally of similar construction and finish as specified for full height security doors. Half-panel steel security doors shall be supplied with 1 mm thick steel plate to lower half of door.

Supply and install door furniture to half-panel steel security doors as specified above for full height security doors and provide appropriate sliding door deadlock for sliding security doors.

F **Finish to doors:**

All doors shall be polyester powdercoated in accordance with AS 3715 to selected colour, nominated from security door manufacturer's standard colour range.

Powder coat finish shall be to a minimum thickness of 50 microns.

G **Installation:**

Installation shall be in accordance with AS/NZS 2804.1 and AS/NZS 2804.2. Fix security doors in existing openings with three 25 mm counter-sunk stainless steel self tapping screws per hinge. Hinges shall not be packed-out.

Supply and install new jamb stops as required, to suit the frame type.

The restricting chain shall be securely fixed to the head of the door frame.

H **Tolerances**

The installation of the security doors shall conform to the following tolerances:

- Door width shall be within 9 mm of frame width.
- Hinge side tolerance maximum 6 mm clearance.
- Striker plate side tolerance maximum 4 mm with maximum 3 mm clearance at striker plate.
- Door length shall be within 10 mm of frame size with a maximum of 5 mm at top and 5 mm at bottom.

I **Keys:**

Door cylinders shall be supplied keyed alike to match existing entry door lock where the cylinders are compatible. Provide one additional key, supplied directly to tenant, or in the case of vacant units, supplied to the Housing Services Manager or representative. Where the existing door lock and cylinder is incompatible, security door cylinder shall be keyed separately and 2 no. keys provided as above.

J **Certificate Of Compliance:**

Security doors shall be inspected and tested by the manufacturer prior to delivery and shall be accompanied by a Certificate of Compliance and Inspection. Doors shall be stamped on the main frame with a serial number, recorded separately.

K **Removal Of Existing Screen Doors:**

Existing screen doors, (including redundant security doors), shall be removed and disposed of by the Contractor, unless nominated for retention by the Department. Where existing doors are nominated for retention they shall be delivered to the local Housing Office by the Contractor. Existing hinge chock-outs and screw holes shall be repaired as required and touched up to match the existing colour scheme, prior to installation of the new security doors.

L **Completion And Making Good:**

Clean all debris from the site and leave the installations in a sound, fully operational condition.

M **Warranty:**

In relation to the security door, provide a written warranty against defective design, materials and workmanship for a period of five years from the date of installation. Provide a two years written warranty in relation to the security lock.

N **Rear doors:**

Half panel steel security fly wire doors shall be constructed as for steel security doors, except that the lower half of the door shall be sheet metal, and with escape function snibs on the inside, but no locks.

O **Patio sliding doors:**

Sliding patio security fly wire doors shall be constructed in powder coated aluminium with heavy duty expanded toughened aluminium security mesh and woven aluminium fabric fly wire, fitted with keyed locks and with escape function snibs only on the inside.

The following product (s) satisfies the specification requirements: 'Ampilmesh'

L-11 GARAGE DOORS

Garage doors shall be manually operated roller doors fabricated out of powder coated steel, selected and installed in accordance with the product information and the relevant Standards.

AS/NZS 4504	Domestic garage doors - Methods of test.
AS/NZS 4505	Domestic garage doors.

Include standard manufacturer's key operated door locks.

L-12 BOLECTION MOULDED ENTRY DOORS

Bolection moulded entry doors shall be manufactured as for external solid core doors with additional mouldings on the external face forming four panels.

Mouldings shall be neatly mitred to hairline joints at corners.

L-13 GLAZED TIMBER DOORS:

Solid timber doors with two glazed openings shall be manufactured from select grade KDHW or Western Red Cedar frame, with 125 x 35 mm mid-rails, top-rails and stiles, and 200 x 35 mm bottom rails, finished sizes.

Flush doors with a single glazed openings shall be as for external flush panel solid core doors with 120 mm frame.

Rebate openings on outside and glaze with dressed KDHW beads thickness to finish flush, and fixed with brass nails.

Glaze timber rebates with back putty and puttied timber beads, neatly mitred to finish flush. Prime rebates before glazing.

L-14 WINDOWS AND EXTERNAL SLIDING DOORS

Windows and external sliding doors shall be proprietary powder coated products, selected and installed in accordance with the manufacturer's instruction and the relevant Standards.

AS/NZS 1866	Aluminium and aluminium alloys - Extruded rod, bar, solid and hollow shapes.
AS 3715	Metal finishing - Thermosol powder coating for architectural applications of aluminium and aluminium alloys

All windows shall be 'split mullion' type to achieve 'five star energy rating'.

The following product (s) satisfies the specification requirements: A&L Windows.

Unless otherwise indicated, openable sashes shall be horizontal sliding and fitted with aluminium framed fly screens.

Submit manufacturer's shop drawings and certified test report to indicate wind pressure rating and verify compliance with AS 2047 for each window type.

Windows shall be delivered to the site fully assembled, pre-glazed and protective wrapped.

Window design shall enable replacement of glass, insect screens and weather stripping from inside without removal or damage to windows or adjacent work.

Powder coating shall be not less than 60 microns thick. Verify colour before ordering.

Unless otherwise approved, windows shall be designed with mullions and transoms to ensure glass does not exceed 1000 x 900 mm.

Frame sections shall be straight and square, rigidly secured to adjacent sections with hairline joints, without pressure marks or indentations, without burrs and sharp edges. Seal frame joints during assembly. Opening sashes shall operate smoothly.

Include adequate drainage holes, air leakage sealing, and flashing legs to extrusions to ensure weathertight installation. Include aluminium external trims to aluminium windows.

Fixings shall be suitable stainless steel or aluminium types, concealed when window is installed and opening sections are closed.

Glaze aluminium rebates with resilient glazing profiles.

Aluminium windows shall be trimmed all round. Refer JOINERY Section for TRIMS Clause.

L-15 GLASS AND GLAZING

A **Glass:**

Glass shall annealed ('float') glass or Grade A safety glass where required, completely free from bubbles, waves and other defects, in accordance with the relevant Standards.

AS 1288	Glass in Buildings - Selection and installation.
AS/NZS 2208	Safety glazing materials in buildings.

Window glass generally shall be clear annealed glass. Glass to bathroom, laundry and toilet windows shall obscured.

Glass for shower screens, glazed doors and sidelights, shall be laminated Grade A safety glass.

Glass thickness shall comply with AS 2208, Part 1. Submit confirmation of thicknesses before commencing.

Annealed glass shall be not less than 4 mm and safety glass not less than 6 mm.

Permanently mark glazed doors and side panels, and safety glass to AS 1288.

Replace broken or scratched glass and all temporary marking before Practical Completion.

Wired glass shall not be used.

B **Polycarbonate safety glass:**

Where indicated, glazing shall be approved polycarbonate sheet in accordance with the relevant Standards.

AS 1288	Glass in Buildings Selection and Installation
AS/NZS 2208	Safety glazing materials in buildings.

The following product (s) satisfies the specification requirements: GE Plastics 'Lexan'.

Polycarbonate thickness shall comply with AS 2208, Part 1. Submit confirmation of thicknesses before commencing. Polycarbonate glass shall not be less than 4 mm thickness.

Ensure frames are designed to accommodate thicknesses.

L-16 WINDOW HARDWARE

All sliding window sashes shall be fitted with standard cam operated sash latches, and suitable night lock pins where required.

Window sashes located on the boundary with public open space shall be fitted with suitable security pins.

The following product (s) satisfies the specification requirements: Lanes 'Window Night Lock Pins'.

Night lock pins shall secure the window fully closed position or open 125 mm, and enable sash to fully open when released. Night lock pins shall be additional to the sash latch, shall be key-less, and shall be located out of reach from outside.

Windows shall be designed to enable replacement of hardware from the inside, and shall be fixed to prevent tampering. Locked windows shall not be openable from the outside.

Window hardware shall avoid sharp and protruding edges, or any feature that may cause injury or difficulty to persons operating the windows.

L-17 WINDOW INSECT SCREENS

Fabricate insect screens out of anodized aluminium sections not less than 1.6 mm thick, with woven aluminium mesh anodized black, fitted neatly into window frame and around sash winder where required.

Mesh shall be beaded to the full perimeter and made taut without bowing of the frame.

L-18 FLASHINGS

Prevent ingress of moisture with suitable PVC coated aluminium core flashing to all heads, jambs and sills of window frames and door frames. Flashings shall be sufficient unbroken length and width to cover full size of frames and width of walls, turned up at back and sides and turned down to front to shed moisture. Fix flashings to prevent dislodgement and sagging.

L-19 REPLACEMENT DOORS AND WINDOWS

Replacement doors and windows shall be as for new doors and windows.

Inspect site during Tender Period, assess extent of work, and include all required work in the Contract Sum, including making good and repairs.

Carefully remove architraves and trims and retain for re-use if practicable. Replace existing flashings and water bars. Install new corrosion resistant anchorages, sub-sills and fixing points as required.

Install new doors and windows plumb and square. Install existing trims and architraves if undamaged, or replace with matching new trims. Apply suitable sealant caulking, make good and re-paint adjacent work as required. Fit new hardware, ease and adjust and leave doors and windows weather-proof, secure and operating correctly. Remove all debris and clean work area.

END OF SECTION

SECTION M - LININGS AND PLASTERING

CONTENTS

M-01 SUMMARY

Provide internal linings for walls and ceilings of plasterboard and fibre-cement sheet, complete with substrate preparation, fixings, trims and accessories, as required.

Provide render and hard plaster including preparation of substrates as required.

- Refer to JOINERY Section for skirtings and other trims applied over linings.
- Refer to INSULATION Section for sarking and insulation.
- Refer to MASONRY and CARPENTRY Sections for substrates, including wall and roof framing, furring and battens.
- Refer to FIRE PROTECTION Section for specific requirements on linings and construction applicable to each occupancy type.

M-02 REFERENCES

Comply with product information and the following Standards. Keep product information and Standards marked (*) on site during work.

Sheet Linings

AS/NZS 2589	Gypsum linings in residential and light commercial construction - Application and finishing.
AS 3740	Water-proofing of wet areas within residential buildings.

Render and Plaster

AS 1397	Steel sheet and strip - Hot-dipped zinc-coated or aluminium/zinc-coated.
AS 1672	Limes and limestones.
AS 1672.1	Limes for building.
AS 2892	Gypsum plaster for building purposes.
AS 3972	Portland and blended cements.
AS CA 27 (*)	Code of recommended practice for internal plastering on solid backgrounds.
CCAA	Cement and Concrete Association of Australia: Cement Rendering.
BS 1014	Pigments for Portland cement and Portland cement products.

M-03 SUBMISSIONS

A **Product data:**

Submit product literature and product information for proprietary products and details of mix used for each coating.

B **Superintendent's inspections:**

Give not less than two days notice so that Superintendent may inspect the following:

- Concealed work, before covering.
- First example of finished work, before proceeding with remainder.

C **Verification:**

Before commencing, verify substrates are suitable and to correct tolerances for installation.

At completion, verify in writing that fire-rated, moisture resistant, and acoustic systems have been installed in accordance with the product information for such systems.

M-04 PERFORMANCE

Comply with product information and the BCA for performance requirements where required for:

- Fire.
- Acoustics.
- Moisture resistance.

The control of lining materials is consistent with the DHS policy of fire prevention.

M-05 REQUIREMENTS

Unless otherwise indicated or required:

- Fibre-cement sheet shall be used as a substrate for all tiled surfaces. Pack out flush as required to adjacent surfaces.
- Water resistant plasterboard for walls and ceilings of wet area rooms (bathroom, laundry and toilet) other than tiled areas. Do not use water resistant plasterboard as a tiling substrate.
- Foil backed plasterboard for internal linings to external precast concrete walls.
- Plasterboard shall be used for all other walls and ceilings of habitable rooms (living rooms, bedrooms, passages and entries, wardrobe and cupboard recesses, stair soffits).

Plasterboard thickness generally shall be as follows:

- Nominal 10 mm for stud and batten spacing not greater than 450 mm.
- Nominal 13 mm for stud and batten spacing over 450 mm and not greater than 600 mm.

Fibre-cement sheet for tiled surfaces shall be suitable type, 6.0, 9.0 mm or thicker, on studs and battens spaced at not more than 450 mm intervals.

The following product (s) satisfies the specification requirements: James Hardie 'Villaboard'

M-06 PLASTERBOARD SHEET

Plasterboard shall comply with the product information for selection and installation and the relevant Standards.

AS/NZS 2588	Gypsum plasterboard.

Fire resistant and water resistant plasterboard shall comply with the appropriate Certificate of Accreditation from the Division of Building Control.

M-07 FIBRE-CEMENT SHEET

Fibre-cement sheet and fixings shall comply with the product information for selection and installation and the relevant Standards.

AS 2908	Cellulose cement products.
AS 2908.2	Flat sheets.

Cement sheet for visible surfaces shall be recessed edge, flush joint type.

The following product (s) satisfies the specification requirements: James Hardie 'Villaboard'.

Cement sheet for tiling substrates shall be square edge type. Construct control joints in accordance with product information.

The following product (s) satisfies the specification requirements: James Hardie 'Versilux'.

M-08 PRE-FINISHED FIBRE-CEMENT SHEET

Pre-finished fibre-cement sheet for wet areas shall be an suitable proprietary product installed in accordance with the product information.

The following product (s) satisfies the specification requirements: James Hardie 'Lamipanel'.

Include required flashings and trims. Fixings shall be concealed.

M-09 BEADS AND TRIM

A **Generally:**

Corner beads, stopping beads, casing beads, reinforcing lath, furring and the like, shall be zinc or zinc-aluminium coated steel profiles, in accordance with the relevant Standards.

AS 1397	Steel sheet and strip - Hot-dipped zinc-coated or aluminium/zinc-coated.
AS 2551	Steel sheet and strip - Cold rolled, electrolytic zinc-coated.

Metal accessories and fixings shall be Class Z200 (AS 1397), and for wet areas shall be AZ450 (AS 1397). Beads shall be in unbroken lengths.

Reinforce at internal and external plasterboard corners, edges of openings and reveals, with full height square or round profiles as indicated.

Visible casing beads shall not be used in visible work. Plastic items shall not be used.

B **Flashings:**

Construct flashings at all internal corners of shower recesses, at splashbacks, behind wet area skirtings, and elsewhere required, in accordance with the relevant Standards.

Flashings shall be suitable proprietary types cut of 50 x 50 mm steel or PVC.

C **Ceiling access hatches:**

Refer to CARPENTRY Section.

M-10 SHEET INSTALLATION

A **Generally:**

Install sheet linings, and required fixings, jointing and stopping compounds, in accordance with the product information and relevant Standards.

Do not use nails unless approved by the Superintendent for the particular application.

Make neat openings for taps and fittings to accommodate thermal and other movements.

Seal perimeter of services and fittings penetrations and at junctions with floors, shower bases, baths, basins, sinks and wet area benches with durable mould-resistant sealant

Fill all holes and indentations. Finish joints flush and smooth without visible lines or contours.

B **Preparation:**

Do not commence internal linings until roof covering, external wall cladding, windows, electric and plumbing installations have been completed, and the building is closed from the weather.

Coordinate with CARPENTRY Section.

Before commencing, verify substrates and framing are suitable, straight and true and to correct tolerances. Rectify, pack and straighten as required before commencing installation to ensure correct finishes and tolerances of finished work.

Set out work to minimise joints. Stagger joints. Avoid joints aligning with edges of openings. Coincide sheet edges with framing, or reinforce with back-blocking.

Do not fix ceilings direct to roof members and trusses.

C **Fibre-cement sheet to tiled areas:**

Use thicknessed battens or packing to ensure continuity of surface between fibre-cement sheet and plasterboard. Fibre-cement sheet shall not be fixed over plasterboard sheeting.

D **Control joints:**

Construct control joints in accordance with product information and relevant Standards.

E **Fixing to masonry walls:**

Install sheet linings over masonry walls to timber battens or steel furring. Refer to CARPENTRY Section for furring. Do not use direct adhesive fixing unless approved by the Superintendent.

M-11 RENDER AND PLASTER MATERIALS

Cement and sand for render and screeds shall comply with the relevant Standards. Determine optimum mix proportions before commencing, then do not vary. Unless otherwise indicated

- Cement be Type GP general purpose Portland cement (AS 3972).
- White cement shall comply be Type A with iron salts not exceeding 1% (AS 3972).
- Sand shall be clean sharp fine washed sand graded to Table 1 (AS CA 27).

Indicative mix proportions for render:

Substrate	Cement / lime / sand
Dash coat	1:0:3
Clay brick or concrete	4:1:16
Concrete block	1:0:6
Calcium silicate brick	3:2:16
Water-proof render:	1:0:3 and suitable proprietary water-proof admixture.

Water-proofing admixtures shall be suitable proprietary types, selected and used in accordance with product information. Proprietary pre-mixed products may be used. Submit details.

Gypsum and lime for hard plaster shall comply with relevant Standards (1672.1 and AS 2592). Make up lime putty one day before use and keep wet.

Indicative mix proportions for plaster:

Mix type	Cement / lime / sand
Render coat	1:2:9
Finishing coat	Equal parts lime and plaster

M-12 SUBSTRATE PREPARATION

Ensure that built-in work is completed and that substrates are suitable and prepared for application of render and plaster.

Remove loose and harmful material and make substrate clean and dust free. Make good defects. Remove excessive protrusions. Fill voids, hollows, honeycombs and service chases with a mix not stronger than the substrate. Bridge built-in structural members and metalwork, chases and recesses with expanded metal lath. Ensure that service penetrations are sleeved to enable thermal movement.

Scabble or apply dash coat and rake out masonry joints to ensure mechanical key. Cross scratch initial coats to ensure mechanical key for later coats.

Dampen substrate before application of render and subsequent coats.

M-13 RENDER AND PLASTER INSTALLATION

A **Generally:**

Ingredients shall be accurately measured and thoroughly mixed dry in a machine mixer. Add sufficient water for workable consistency. Discard if unused after 60 minutes.

Construct vee joints around built-in frames. Construct vee control joints at not more than 6 metres and at joints in substrates. Construct decorative joints where indicated.

Return render and plaster into reveals.

Finished work showing crazing, discoloration, cracking, or out of plumb shall be demolished and replaced.

B **Render:**

Use progressively weaker coats for multi-coat work. Nominal thickness of render coat shall be 10-15 mm, progressively reducing for multi-coat work. Apply additional coats to required thickness. Each coat shall be dry before next is applied. Cure render by preventing rapid or uneven drying out. Unless otherwise indicated, finish render with wood or plastic foam float to fine sand texture. Colour and texture of exposed finished work shall match approved samples.

C **Hard plaster:**

Nominal render coat thickness shall be 10 mm. Nominal setting coat thickness shall be 2-3 mm. Each coat shall be dry before next is applied. Cure plaster by preventing rapid or uneven drying out. Finish plaster with steel trowel to a smooth hard surface.

M-14 CORNICES

All wall to ceiling junctions, including wet areas, stair soffits and plasterboard lined cupboards shall be finished with scotia cornice of 50 mm radius.

Fix cornices firmly with suitable cornice adhesive in accordance with the product information. Cornices shall be in single lengths where practicable.

Cornices shall be straight, accurately mitred at corners, with flush butt joints.

END OF SECTION

SECTION N - INSULATION

CONTENTS

N-01 SUMMARY

Provide insulation and sarking, as required for thermal and acoustic purposes.

Refer to the FIRE PROTECTION Section for specific requirements on linings applicable to each occupancy type.

N-02 REFERENCES

Comply with product information and the following Standards. Keep product information and Standards marked (*) on site during work.

AS/NZS 1562 (*)	Design and installation of sheet roof and wall cladding.
AS 2050 (*)	Installation of roof tiles.
AS 2423	Coated steel wire fencing products for terrestial, aquatic and general use
AS 2462	Cellulosic fibre thermal insulation.
AS/NZS 4200	Pliable building membranes and underlays.
AS/NZS 4200.1	Materials.
AS/NZS 4200.2	Installation requirements.

N-03 SUBMISSIONS

A **Superintendent's Inspections:**

Give not less than two days notice so that Superintendent may inspect the following:

- Concealed work, before covering.
- First example of finished work, before proceeding with remainder.

B **Product data:**

Submit product literature and product information for proprietary products and details of mix used for each coating.

N-04 REQUIREMENT

A **Thermal insulation:**

Provide thermal insulation batts as follows:

- Ceilings of all dwellings: R2.5 m2.K/w in compliance with the BCA.
- External wall frames and external stud frame brick veneer walls: R1.5 m2.K/w.

B **Sarking:**

Provide aluminium foil sarking as follows:

- All external wall frames and external stud frame brick veneer walls.
- Under the roof lining of metal deck roofs. Do not provide sarking to tiled roofs unless otherwise indicated.

C **Acoustic insulation:**

Provide suitable acoustic insulation in accordance with product information where indicated or required. Comply with the BCA for acoustic insulation.

D **Insulation for external precast walls:**

Provide plasterboard sheeting with integral reflective foil backing fixed on 35 mm furring channels. Refer LININGS AND PLASTERING.

The following product (s) satisfies the specification requirements: Boral 'Foilboard'.

E **Fire resistance:**

The control of lining materials is consistent with the DHS policy of fire prevention.

N-05 THERMAL INSULATION

A **Materials:**

Thermal insulation shall be suitable fibre-glass or polyester insulation batts.

The combustion indices of the insulation when tested to AS 2648, shall not exceed:

- Spread of flame: 0
- Smoke developed: 0
- Heat evolved: 0
- Ignitability: 0

The thermal resistance of the insulation material shall average not less than the nominal value stated by the manufacturer on the product label when tested to AS 2464.7.

The insulation shall be packaged to ensure full protection against damage and moisture during handling, delivery to site and until ready for installation. Any material which becomes wet at any time shall be removed from the site.

Thermal insulation over exhaust fans, extra low voltage down lights and electrical control gear should be cut away to allow adequate ventilation.

B **Insulation to walls:**

Wall insulation batts shall be 1380 x 430 or 580 mm to best fit the stud spacing, and friction fitted between the studs to be self-supporting.

Fit insulation tightly fitted around pipes, electrical wiring, electrical boxes, noggings, bracing, lintels, voids around lintels, steel beams and other construction within the wall.

The insulation shall be installed immediately before installation of plasterboard and shall be restrained from breaching the cavity by double sided laminated foil sarking.

C **Insulation to ceilings:**

Ceiling insulation batts shall be 1200 x 430 or 580 mm to best fit the spacing of ceiling members.

Insulation shall cover the whole ceiling area, including bulkheads, cupboards, wardrobes, baffles to ceiling vents, removable ceiling access hatch covers, and the like.

Neatly butt insulation batts to adjoining batts, framing members and to achieve continuity of insulation over the whole ceiling area.

Trim all over-length or over-width material with suitable shears to ensure insulation retains its normal expanded state without compression.

Ceiling insulation shall extend to outside edge of timber top plates of external walls in brick veneer, brick, concrete and timber constructions and to the inside edge of concrete.

Where roof pitch is less than 5 degrees, overlay continuous blanket of R2.5 insulation including foil sarking backing before fixing roofing.

D **Insulation to timber floors:**

Where required, timber flooring shall be insulated with Class A reflective foil laminate. Lay over the floor joists with a sag between 25 mm and 65 mm. Overlap sheets 150 mm.

N-06 SARKING

A **Materials:**

Sarking shall be double sided reflective laminated aluminium foil to AS 4200.

Sarking shall be anti-glare type, laid with blue side upward and outwards.

Flammability index shall be not more than 1.

Where sarking is damaged by puncturing, tearing, and the like, repair damage with sarking material, well lapped at edges and sealed with water-proof tape.

B **Sarking to walls:**

Install sarking to walls to prevent entry of moisture into the building, and so cavity is not bridged. Overlap all joins minimum 200 mm, and lap top sheets to shed moisture outside lower sheets.

Fix to the external face of studs with 25 mm washers or foil fasteners at 600 mm centres to top and bottom wall plates and to studs, and at 400 mm centres around openings.

C **Sarking to roofs:**

Install sarking to AS/NZS 1562 for metal roofs, and to AS 2050 for tiled roofs where indicated.

Lay sarking over roof battens and fall to valleys and gutters. Lap joints and fix with foil cleats before fixing tiles. Dish sarking 75 mm, lap 150 mm and drain into eaves gutters.

Sarking shall be neatly cut around flues or other obstructions, but shall not be in direct contact with any flues.

N-07 MESH SUPPORT

When battens are spaced at greater than 600 mm centres, construct mesh support to sarking, laid over purlins, rafters or battens as appropriate.

Mesh shall be 50 x 1.0 mm diameter galvanized wire netting to AS 2423.

N-08 CAVITY INSULATION FOR MASONRY

Where indicated, thermal cavity insulation to exterior double brick walls shall be R 1.0 m2 K/W:

- Expanded polystyrene sheet 38 mm thick.
- Proprietary extruded Styrofoam board 600 x 2400 x 30 mm thick.

Build-in the insulation horizontally with ship lapped edges to prevent penetration of water into building. Insulation shall be held hard against internal brick skin face with plastic clips fitted over cavity ties in accordance with product information.

END OF SECTION

SECTION O - FLOOR AND WALL FINISHES

CONTENTS

O-01 SUMMARY

Prepare substrates and provide vinyl sheet and tile, carpet, and other floor and wall finishes as required. Verify colour before ordering.

Commencement of flooring installation shall signify acceptance of the responsibility that the substrate is suitable for the flooring type to be installed.

- Refer to CONCRETE Section for monolithic and granolithic finish, and substrates.
- Refer to CARPENTRY Section for timber flooring, and substrates.
- Refer to TILING Section for tiling and water-proofing.
- Refer to FIRE PROTECTION Section for specific requirements on linings and construction applicable to each occupancy type.

Wet areas shall include kitchens, bathrooms, shower rooms, toilets and laundries.

Flooring materials shall be delivered to site in manufacturer's original packages legibly marked with the manufacturer's product identification, batch number or date of manufacture, and colour.

O-02 REFERENCES

Comply with product information and the following Standards. Keep product information and Standards marked (*) on site during work.

AS 1884 (*)	Floor coverings - Resilient sheet and tiles - Laying and maintenance practices.
AS 2055	PVC sheet floor-covering.
AS/NZS 2455 (*)	Textile floor coverings - Installation practice.
AS 3553	Adhesives for floor and wall applications - Resilient vinyl, linoleum and rubber sheet and tiles - Interior and exterior use.
AS 3740	Water-proofing of wet areas within residential buildings.
AS 4256	Soft underlays for textile floor coverings
AS/NZS 4586	Slip resistance of new pedestrian surface materials.
SAA HB 197	Introductory guide to the slip resistance of pedestrian surface materials.
BS 5808	Specification for underlays for textile floor coverings.

O-03 SUBMISSIONS

A **Product data:**

Submit product information for selection and installation.

B **Samples:**

Submit control samples, indicating the range of variation in colour and finish, if any.

Submit samples of accessories, if directed.

C **Superintendent's inspections:**

Give not less than two days notice so that Superintendent may inspect the following:

- Substrate preparation and setout, before installation.
- First example of finished work, before proceeding with remainder.

D **Warranties:**

Provide warranty for carpet against defects in materials and workmanship including colour loss, shrinkage and fair wear, failure to retain tufts for a period of ten years from Practical Completion.

Provide warranty for vinyl tiles and sheet against defects in materials and workmanship including distortion, colour fade and thinning for a period of ten years from Practical Completion.

Include manufacturer's written product warranties.

O-04 PERFORMANCE

A **Falls and levels:**

Grade floors to a even falls from doorway to floor wastes and elsewhere as required. Make level junctions with walls. If falls are not required, lay level. Make level areas under washing machines. Maintain finished floor level across changes of floor finish including carpet and at doorways. Unless otherwise indicated on the Drawings, falls shall be as follows:

- Minimum fall generally: 1:80.
- Minimum fall in two-sided shower areas: 1:80.

The area of the shower shall be nominal 1500 x 1500 mm.

B **Set-out:**

Arrange joints in sheet flooring to a regular pattern. Avoid joints in high traffic locations and close to walls.

C **Fire resistance:**

The control of lining materials is consistent with the DHS policy of fire prevention.

D **Slip Resistance:**

Finished surfaces shall be stable, safe, and minimise potential hazards of tripping or slipping due to misalignment of joints or too-slippery surfaces.

Submit certification that all installed pedestrian surfaces (excluding carpet) have a slip-resistant classification of 'R9' or 'F' in dry conditions and a slip-resistant classification of 'R10', 'V' or 'W' in wet conditions, in accordance with the relevant Standards (AS/NZS 4586).

O-05 SUBSTRATE PREPARATION

A **Generally:**

Ensure substrates are clean, dry, smooth and free from harmful matter in accordance with the relevant Standards (AS 2455). Make good existing timber flooring and securely nail loose flooring. Level uneven concrete surfaces by grinding or applying a suitable levelling compound.

Refer unusual or doubtful substrate conditions to the Superintendent for directions before laying underlay or carpet.

B **Moisture content:**

Verify that moisture content of substrates does not exceed 6% for concrete or the equilibrium moisture content for timber by measuring with an electronic meter.

Where the moisture content of the substrate exceeds 6% include an additional moisture water-proof barrier at no additional cost in order to prevent delay

Remove oil, concrete curing compounds or any substance which may reduce adhesion of damage the applied finish materials.

Fill and level substrate, and grind of high spots to ensure smooth, flat finished surface. Remove all dust and debris and ensure substrate is clean, dry and dust free before commencing.

Substrate tolerances for resilient finishes shall not exceed:

- No part of substrate surface shall be more than 6 mm below a 3000 mm straightedge.
- No part of substrate surface shall be more than 1.0 mm below a 300 mm straightedge.

C **Doors, quads and floor fittings:**

Remove doors to facilitate laying of carpet. Carefully trim and adjust doors to swing freely without resistance, and re-hang doors.

Remove existing quad mouldings, if any, and lay carpet neatly to face of skirting. Do not replace quad moulding unless directed by the Superintendent.

Remove floor-mounted doorstops, and replace on completion of carpet installation.

D **Existing carpet:**

For replacement of existing carpet, remove existing carpet, underlay and associated trims, and dispose in a legal disposal location.

Move existing furniture to a safe adjacent location during work, and return to original positions when work is complete.

E **Screeds and levelling beds:**

Where a screed or levelling bed is required, ensure concrete substrate is sufficiently rough to ensure a mechanical key. If necessary roughen surface by scabbling to expose the aggregate. Dampen thoroughly, then remove surface water. Immediately before application, scrub a coat of neat cement grout into the surface. For proprietary products comply with product information.

O-06 DOMESTIC CARPET

A **Generally:**

Domestic carpet shall be a suitable type, laid by the stretched method on underlay with perimeter gripper system. Carpet shall be from a publicly available stock range registered with the Australian Carpet Classification Scheme (ACCS), and from a single manufacturer and production batch.

Properties of domestic carpet

Grading	Domestic (ACCS No. 99042)
	Refer to Part 3 Project Schedules for applicable type
Pile construction	Level loop
Pile content	100% BCF polypropylene
Pile weight	610 gram / m2. (18 oz)
Width	3.66 m
Pattern repeat	None
Gauge	1/10
Finished pile height	4.5 mm
Stitch rate	37/10 cm
Primary backing	Heat stabilised woven polypropylene, 116 gram / m2.
Secondary backing	Leno weave polypropylene, BP Amoco ActionBac No. 3816, 105 gram / m2.
Stain resistance	Resist most soil, water and oil based stains because of its low moisture absorbance.
Anti-static protection	Retard the build-up of static electricity and significantly reduce the instances of shock
Microbial resistance	Fibres shall be naturally hypo-allergenic and not support the growth of bacteria.
Warranties	10 year limited wear warranty, 10 year anti-shock warranty, and 5 year stain release and fade warranty.

The following product (s) satisfies the specification requirements: Shaw Industries Australia 'Reliable II'.

B **Carpet colours:**

Carpet shall be available in a range of at least four neutral colours including a mid-grey and mid-brown and shall be plain or even mix. Verify control sample with Superintendent before ordering.

C **Nominated suppliers:**

Carpet for 'Asset Improvement Group' (upgrade projects) work shall be supplied and installed by the following nominated supplier:

Melbourne Carpet Specialists
100 Haddle Street
ABBOTSFORD 3067
Tel: (03) 9417-3281
Fax: (03) 9419-7129

The OOH has entered into an arrangement with the nominated supplier for ('Government Contract') fixed rates and prices for the period applicable to the work.

Carpet for other work may be supplied by the nominated supplier, or another approved supplier. Submit product data and samples of alternatives for approval before commencing.

The Contractor shall include in the Contract Sum, the entire cost of the carpet installation including measuring, supply, delivery and installation, and all accessories and any charges as may be applicable, using the above-nominated supplier.

O-07 WATER-PROOF CARPET

Water-proof carpet shall have a waterproof backing, and be suitable for institutional use and capable of routine wet vacuuming without damage or change in appearance.

The joints in the waterproof backing shall be seam-sealed to floor or welded so that no moisture can penetrate into the substrate from above.

Verify colours before commencing.

Water-proof carpet have a weave type which will not trap dirt, and shall be:

- Flocked or multi level loop pile, solution dyed 100% nylon pile vinyl, reinforced fibreglass backing.
- Dimensionally stable.
- Colour fast.
- Anti-microbial.
- Rot resistant.
- Stain and dirt resistant.
- Fire hazard properties: Accredited in accordance with the BCA, Clause C.1.10.4.(b) in relation to the class of building.

Water-proof carpet shall be suitable flocked, solution-dyed nylon carpet. Submit details of proposed carpet for approval before commencing.

The following product (s) satisfies the specification requirements: Flotex '2000', Interface-World-Gamma II-'System-6', Mannington Commercial with HP High Performance Backing.

O-08 STAIN-RESISTANT CARPET

Stain-resistant carpet shall be suitable fire-rated nylon or polypropylene broadloom carpet laid by the direct stick method. Verify colour before ordering.

The following product (s) satisfies the specification requirements: Tuftmaster 'BASF Zoftex 2000' (nylon), Autex 'Avondale' (polypropylene).

Carpet shall be rot-resistant, bleach-resistant, suitable for institutional and health care use, and capable of routine wet vacuuming without damage or change in appearance.

Properties of stain resistant carpet:

Nylon:

Carpet rating:	**Contract Heavy Duty (including stairs)**
Brand name:	Tuftmaster 'Zeftex' 'College Town'
Pile Construction:	Tufted fine gauge, low profile, high density pattern loop.
Pile composition:	100% nylon, solution dyed
Pile height:	3.8 mm.
Pile weight:	949 gram/m2.
Primary Backing:	Polypropylene, heat stabilized. 124 gm/m2
Secondary Backing:	ActionBac 948 gm/m2.
Total weight:	6.04 kg/m (Width 3.66 m)
Colour Fastness:	Bleach resistant
Fire hazard properties	Accredited in accordance with the BCA, Clause C.1.10.4.(b) in relation to the class of building.

Polypropylene:

Carpet rating:	**Contract Heavy Duty (including stairs)**
Brand name:	Autex 'Avondale'
Pile composition:	100% polypropylene, solution dyed.
Pile properties:	UV resistant, waterproof, insect resistant, will not support bacteria
Pile height:	3.6 mm.
Backing:	SBR latex.
Total weight:	Minimum 1800 gram/m2.
Fire hazard properties	Accredited in accordance with the BCA, Clause C.1.10.4.(b) in relation to the class of building.

O-09 UNDERLAY

A **Domestic carpet underlay:**

Underlay shall be an suitable type in accordance with the carpet product information for selection and installation, and the relevant Standards.

- Waffle rubber.
- Reconstituted polyurethane foam.
- Other types subject to independent accreditation in accordance with BS 6808.

The following product (s) satisfies the specification requirements: Bridgestone 'Air Step Black', Dunlop 'Government Spec', 'Ormsley' Domestic White.

B **Stain resistant underlay:**

Stain resistant underlay, if required, shall be an suitable type in accordance with the carpet product information for selection and installation, and the relevant Standards.

Construction	**Flexible rubber sheet underlay, direct stick.**
Thickness	3.07 mm
Width:	1830 mm
Total mass::	1300 gram/m2.
Work of compression:	55 Joules/m2
Backing:	Vinyl
Fire hazard properties	Accredited in accordance with the BCA, Clause C.1.10.4.(b) in relation to the class of building

The following product (s) satisfies the specification requirements: Bridgestone 'Airstep Supporta Pad Commercial Underlay'.

C **Hard underlay:**

Hard underlay to new or existing timber floors shall be follows:

- Wet areas and tiled areas: Fibre-cement sheet (AS 2908)
- All other areas: Hardboard sheet (AS/NZS 1859.4).

Prepare timber floors with rough sanding. Set out underlay with staggered joints and fix flush.

O-10 GRIPPER STRIPS

Gripper strips shall be suitable domestic type to AS 2455, Clause 2.3.7.2, selected for the relevant floor substrates and conditions.

The following product (s) satisfies the specification requirements: Roberts 'Smoothedge' No. 21-241 to 21-243.

Fixings shall be at not less than 150 mm spacing and no more than 35 mm from each end.

O-11 TRIMS AND EDGE STRIPS

Install suitable trims for a complete installation and to protect exposed edges, at doorways and junctions with adjacent materials. Trims may include cover strips, and built-in angles.

Junctions of adjacent flooring shall be finished flush and level. Where changes of flooring occure at doorways, make junctions under centre-line of closed door.

Edge strips shall be 38 mm wide natural anodised extruded aluminium sections, with textured finish and feathered edges. Edge strips shall not extend more than 2 mm above adjacent surfaces. Edge strips shall be used in single lengths only.

The following product (s) satisfies the specification requirements: Roberts 'Domestic Hammered Aluminium Naplock No. 2200', 'Ripplefirm No.1156'.

Fixing shall be at not less than 150 mm spacing and not more than 35 mm from each end.

Where control joints occur in substrates, stop floor finish on each side, fill joint with suitable sealant, and install suitable proprietary cover strip.

O-12 SUBSTRATE SEALING

Where carpet is subject the accidental spillage of bodily fluids, include suitable substrate sealer and underlay. Underlay shall be suitable for institutional purposes.

Sealer shall be two coats of proprietary latex acrylic medical water-proof sealer to concrete substrates. Sealer shall be 0.5 mm thick, applied 24 hours before laying carpets. Test concrete substrate for moisture content before application.

The following product (s) satisfies the specification requirements: 'Medi-Seal'.

O-13 CARPET INSTALLATION

A **Generally:**

Do not commence carpet laying until other work has been completed.

Ensure adequate ventilation when using volatile adhesives.

B **Laying underlay:**

Lay underlay in accordance with the product information and AS 2455.

In areas exceeding 3.66 m in either dimension, fix underlay by stapling (timber floors) or spot gluing around the perimeter. Underlay joints shall not coincide with carpet joints.

C **Laying carpet:**

Stretch and lay carpet in accordance with the product information and AS 2455 with required seaming, welding, and stitching for a complete installation.

Use the carpet gripper laying system unless otherwise directed by the Superintendent

Stretch carpet carefully without exceeding the required percentage elongation (AS 2455). Power stretchers may be used.

Install carpet flat, accurately fitted, and free from defects including warping, wrinkles, and twists, with seams straight and parallel to the walls and main traffic flow, to withstand movement of furniture without rucking.

Use suitable hot melt adhesive tape for all seaming.

The following product (s) satisfies the specification requirements: Roberts 'GT Silicone Release Tape No. 50-321.

Carry out carpet installation so that:

- Pile direction shall be consistent throughout.
- Not more than one longitudinal join shall be used in any room.
- Carpet shall be laid true to lines in all directions.
- Seams and cross joins shall be accurately cut, tight, close fitting.
- Pile shall not be caught in the seam.
- Loose or risen pile shall be clipped flush with the surface of the finished carpet.
- Excess seam welding adhesive shall be removed with suitable solvent.

Fit carpet into wall cupboards and wardrobes where the flooring is continuous.

Do not damage walls, skirtings, cupboards and other adjacent work during laying. Make good all damage to adjacent work.

D **Cleaning and protection:**

At completion of carpet installation, remove all scrap, off-cuts and trimmings.

Provide suitable temporary protection over the carpet (new and existing) during subsequent building works to protect carpet from staining and wear, particularly wear at doorways. Use perforated type protection to prevent condensation.

Remove temporary protection at Practical Completion, make good any defects, clean and leave the carpet ready for immediate occupation and use.

O-14 VINYL SHEETING

A **Generally:**

Vinyl sheeting shall be approved types of homogeneous construction, minimum 2 mm thickness, with either a chip or striated format decorative pattern extending throughout the total 2 mm thickness, laid on hard underlay over timber floors or on concrete, in accordance with the relevant Standards:

AS 2055 PVC sheet floor-covering.

Vinyl sheeting shall have minimum 50% PVC / binder content and factory applied polyurethane coating.

Submit product selections for approval before commencing.

B **Installation:**

Install vinyl sheet with continuous welded seam joints.

Seal vinyl sheet to vertical surfaces, skirtings and bases of sanitary and joinery fittings with suitable water-proof silicone sealant.

On completion of laying, remove all building debris, scuff marks, sweep clean with a soft broom and mop with a solution of warm water and vinyl cleaner.

O-15 SLIP RESISTANT VINYL SHEETING

A **Chip impregnated slip resistant vinyl sheeting:**

Vinyl sheet flooring in wet areas shall be 2 mm gauge laminated or full thickness vinyl sheet with integral silicone carbide or aluminium oxide or similar granules impregnated throughout the thickness of the wear layer

Vinyl sheet flooring shall have a minimum slip measurement value of R10 (ramp with rubber shoe wet + oil) to AS/NZS 4586 (or DIN51 130) for the service life of the product.

B **Embossed slip resistant vinyl sheeting:**

Embossed vinyl sheet flooring in wet areas shall be 2 mm gauge laminated or full thickness vinyl sheet with embossed patter of high and low points.

Embossed vinyl sheet flooring shall have a minimum slip measurement value of R10 (ramp with rubber shoe wet + oil) to AS/NZS 4586 (or DIN51 130) for the service life of the product.

B **General:**

Installation shall be undertaken in strictly in accordance with the suppliers installation instructions by trained tradesmen. Heat-weld all joints. All accessories shall be those recommended or provided by the supplier of the sheet.

Form coves to the height shown, or otherwise to a minimum of 150mm high. Provide proprietary cove fillets or bond-break bead. Taper the fillets at internal corners. Set-out the joints in the sheet to ensure full width sheets in shower recesses so that there are no edge joints occurring within the shower recesses (1500mm x 1500mm.). Fold and cut the vinyl to coves at corners with 'butterfly' fold method with the joint at 45 degrees to the vertical. Coordinate with PLUMBING Section to ensure sufficient edge margin to turn vinyl sheet down into double flange floor waster outlets and properly fix.

Seal the joint between the top edge of floor coves and wall vinyl with heat welding to vinyl wall surfaces or with proprietary wall capping strip as scheduled.

Seal the joint between the top edge of floor coves and other types of wall surface proprietary wall capping strip or otherwise as detailed.

O-16 VINYL WALL LININGS

Vinyl wall linings shall be suitable types in accordance with the relevant Standards. Sheet thickness shall be not less than 1.5 mm.

Set sheet out so that joints do not occur in shower recesses (1500 mmx 1500mm) or in internal corners. Vertical joints must occur a minimum of 150mm from internal corners.

Internal corners shall be fitted with coves fillets.

O-17 VINYL SKIRTINGS AND COVING

Vinyl skirtings shall be purpose-made, 100 x 3 mm thick with feathered edge to top.

Skirtings shall be fixed to wall and floor surfaces with contact adhesive.

Properly mitre internal and external corners to a straight, vertical hairline joint.

Make continuous coves to wet area vinyl with profiled backer and extend vinyl 150 mm up wall surfaces. Seal the joint between the top edge of cove to the vertical surface by heat welding to vinyl wall surfaces or with a suitable 'Z' flashing of PVC.

O-18 WATER-PROOFING OF WET AREAS

Provide water-proofing to vinyl floor wet areas as follows:

- Shower bases.
- Bathrooms with step-less showers and drained floors.
- Showers, laundries, and toilets with graded drained floors.
- Bathrooms and toilets and laundries in second floors and upper floors.

Refer to CERAMIC TILING Section for technical requirements.

END OF SECTION

SECTION P - CERAMIC TILING

CONTENTS

P-01 SUMMARY

Provide floor and wall tiling, complete with flashings and water-proof membranes, adhesives, grout, and tile accessories, as required. Verify colour before ordering.

Wet areas in this Trade Section shall mean kitchens, bathrooms, shower rooms, toilets and laundries.

- Refer to MASONRY, INTERNAL LININGS and RENDER AND HARD PLASTER Sections for substrates.
- Refer to METALWORK Section for fittings and PLUMBING Section for taps and fixtures.

P-02 REFERENCES

Comply with product information and the following Standards. Keep product information and Standards marked (*) on site during work.

AS 2358	Adhesives - For fixing ceramic tiles.
AS 3740	Water-proofing of wet areas within residential buildings.
AS 3958	Ceramic tiles.
AS 3958.1 (*)	Guide to the installation of ceramic tiles.
AS 3958.2 (*)	Guide to the selection of a ceramic tiling system.
AS 3972	Portland and blended cements.
AS 4459	Methods of sampling and testing ceramic tiles.
AS/NZS 4586	Slip resistance of new pedestrian surface materials.
SAA HB 197	Introductory guide to the slip resistance of pedestrian surface materials.
AS CA 27	Code of recommended practice for internal plastering on solid backgrounds.
BS 6431	Ceramic floor and wall tiles.

P-03 SUBMISSIONS

A **Product data:**

Submit the manufacturer's product data. Submit adhesive and grout product information for selection and installation.

B **Samples:**

Submit samples of tiles and accessories, indicating the range in variation of colour and finish.

C **Inspections:**

Give not less than two days notice so that Superintendent may inspect the following:

- Substrate preparation and setout, before installation.
- Water-proof membrane installed, before covering.
- First example of finished work, before proceeding with remainder.

P-04 PERFORMANCE

A **Slip resistance:**

Finished surfaces shall be stable, safe, and minimise potential hazards of tripping or slipping due to misalignment of joints or too-slippery surfaces.

Submit certification that all installed pedestrian surfaces (excluding carpet) have a slip-resistant classification of 'R9' or 'F' in dry conditions and a slip-resistant classification of 'R10', 'V' or 'W' in wet conditions, in accordance with the relevant Standards (AS/NZS 4586).

B **Falls and levels:**

Grade floors to even falls from doorway to floor wastes and elsewhere as required. Make level junctions with walls. If falls are not required, lay level. Make level areas under washing machines. Maintain finished floor level across changes of floor finish including carpet and at doorways. Unless otherwise indicated, falls shall be as follows:

- Minimum fall generally: 1:80.
- Minimum fall in shower areas: 1:60.

When not otherwise indicated, grade tiles to fall 20 mm to floor wastes.

C **Adhesion:**

Be responsible for ensuring proper adhesion of tiling to substrates.

P-05 REQUIREMENTS

Unless otherwise indicated:

- Wall tiles shall be 150 x 150 x 5 mm nominal glazed ceramic tile, with 3 mm joints and white grout. Colour shall be white, unless otherwise approved in writing.
- Flooring tiles shall be 50 x 50 x 4 mm nominal mosaic tile, with 3 mm joints and matching grout. Verify colour before ordering.
- Wall tiling in bathrooms shall be 1200 mm nominal generally, and 1800 mm nominal in shower recesses. Tiling shall extend behind fixtures.
- Tiled skirtings generally shall be 50 x 50 x 4 mm glazed mosaic tiles to 150 mm nominal with top edge horizontal all round room.
- Tiled splashbacks generally shall be two rows of 150 x 150 x 5 mm glazed ceramic tiles.
- Each shower recess shall have one matching ceramic soap holder.

Supply matching new spare tiles at Practical Completion equivalent to 1% of the work in manufacturer's original un-opened boxes.

P-06 SUBSTRATE PREPARATION

Remove oil, concrete curing compounds or any substance which may reduce adhesion of damage the applied finish materials.

Fill and level substrate, and grind off high spots to ensure smooth, flat finished surface. Remove all dust and debris and ensure substrate is clean, dry and dust free before commencing.

Where a screed or levelling bed is required, ensure concrete substrate is sufficiently rough to ensure a mechanical key. If necessary roughen surface by scabbling to expose the aggregate. Dampen thoroughly, then remove surface water. Immediately before application, scrub a coat of neat cement grout into the surface. For proprietary products comply with product information.

P-07 HARD UNDERLAY

Refer to FLOOR AND WALL FINISHES Section.

P-08 WATER-PROOFING OF WET AREAS

A Generally:

Provide liquid applied water-proof membranes to wet areas in accordance with the relevant Standards (AS 3740) and the requirements of the BCA as follows:

- Floors to bathrooms, laundries and toilets, turned up at edges.
- Walls behind tiling to showers, baths, basins, sinks, and troughs.
- Elsewhere required.

Comply with product information. Ensure that concrete has properly cured and remove any curing compounds which may affect adhesion or durability of membrane.

Provide warranty for water-proofing system against defects in materials and workmanship including failure to exclude moisture for a period of ten years from Practical Completion. Include manufacturer's written product warranties.

B Type:

Membrane shall be an suitable proprietary liquid applied or sheet membrane system providing a drained tank suitable for continuous immersion.

The following product (s) satisfies the specification requirements: ABA 'Superflex', 'Resaflex'.

Submit a current Australian Building Products and Systems Certification Scheme certificate or current technical opinion by the Australian Building Systems Appraisal Council stating that the system is suitable for use as a water-proofing system for use in wet areas, shower recess bases and associated floors and wall to floor junctions for tiled and vinyl sheeted surfaces.

C Installation:

Carry out required priming of substrate before installation. Apply membrane continuously for the whole area of the room. Place membrane beneath floor screed, if any, and continue up hobs and walls to a minimum height of 75 mm above the contained water level. Place membrane in shower recesses to a height of 1800 mm, and behind tiled splashbacks. Turn membrane down into floor waste flanges.

Install flashings around base of showers, vertical junctions of shower walls, and at splash backs to hobs.

P-09 TILES

Tiles shall be of first quality, uniform colour, free from twists, warps, distortion, face marking, broken or incomplete glazing. Submit manufacturer's verification that tiles are first quality, not 'seconds'.

Include glazed round edge tiles for exposed edges and corners.

Include ceramic accessories in matching colour and dimensions, including cove tiles, step treads, nosings, sills and the like.

Provide warranty for tiling against defects in materials and workmanship for a period of five years from Practical Completion. Include manufacturer's written product warranties.

P-10 ADHESIVE AND GROUT

Adhesive and grout shall be suitable proprietary products in accordance with product information and the relevant Standards. Bedding mortar shall comply with AS CA 27.

Adhesive shall be water-proof. Grout shall be a non-staining, mould resistant. Grout shall be white unless otherwise approved.

Sealant shall be suitable proprietary, non-hardening, mould resistant, one part silicone or polyurethane sealant with joint movement capability of +/- 25%.

P-11 TILE LAYING

Lay tiles in accordance with the product information for tiles and adhesives and the relevant Standards.

Tile joints shall be straight, plumb and perpendicular, with even joints. Setout from centre-line of visually important areas or openings. If practicable, ensure even margins all round and no units less than half size. Return tiles into sills, reveals and openings.

Cut tiles neatly to fit around fixtures and fittings, and at margins. Rub edges smooth. Drill holes for taps without damaging surfaces.

For fine finished concrete floor slabs laid to falls and for fibre-cement sheet underlays fixed over timber floors, lay tiles using suitable water-proof flexible adhesive.

For built-up showers and for set-downs in concrete floors, lay tiles on mortar bed mix of 1:4 parts cement / sand, not less than 25 mm thick with an suitable integral water-proofing admixture. Construct shower bases and grade to floor outlets, and the like, and return tiles up walls to make cove.

Construct 3 mm control joints at internal corners and floors, around penetrations, and at changes of substrate material. Control joints shall extend full depth of tile and adhesive or bedding. Fill control joints with a sealant applied over compressible filler or backing rod.

Properly grout all tile joints except control joins with selected coloured grouting.

Clean all tiling, clean all adjacent fixtures and fittings affected by work, make good as required and leave in satisfactory order. Protect installed tiling from damage during subsequent work.

Seal tiled flooring to vertical surfaces, skirtings and bases of sanitary and joinery fittings with suitable water-proof silicone sealant.

P-12 EDGE DETAILS

Junctions with adjacent floor finishes shall be finished flush and level.

Where changes of floor finishes occur at doors, make junction under centre-line of closed door.

For mortar bed tiling, install 3 mm nominal brass angle at junctions with different floor finishes, with top edge flush with the finished floor and the horizontal angle screw fixed to the substrate.

Refer to FLOOR AND WALL FINISHES Section for edge strips.

Finish exposed bedding edges with neat bevel to adjacent walls.

END OF SECTION

SECTION Q - PAVING

CONTENTS

Q-01 SUMMARY

Carry out paving works including masonry, concrete and bitumen paving, and associated edging, to the required falls and levels, as required.

- Refer to CONCRETE Section for concrete supply and laying.
- Refer to MASONRY Section for brick paving.
- Refer to HYDRAULIC SERVICES Section for drain pits and grates.

Inspect the site during the Tender Period, assess prevailing site and adjacent conditions 'as existing', and include all required work in the Contract Sum.

Q-02 REFERENCES

Comply with product information and the following Standards. Keep product information and Standards marked (*) on site during work.

AS 1141	Methods for sampling and testing aggregates
AS 1160	Bitumen emulsions for construction and maintenance of pavements.
AS 1289	Methods of testing soils for engineering purposes.
AS 1507	Road tars for pavements.
AS 2008	Residual bitumen for pavements.
AS 2150	Asphalt (hot mixed)
AS 2157	Cutback bitumen.
AS 2357	Mineral fillers for asphalt.
AS 2758	Aggregates and rock for engineering purposes.
AS 2876	Concrete kerbs and channels (gutters) - Manually or machine placed.
AS 3700	Masonry in buildings (SAA Masonry Code)
AS/NZS 2341	Methods of testing bitumen and related roadmaking products
AS 3727	Guide to residential pavements.
AS/NZS 4586	Slip resistance of new pedestrian surface materials.
SAA HB 197	Introductory guide to the slip resistance of pedestrian surface materials.
VicRoads (*)	Guide Note No. 407
VicRoads (*)	Guide Note No. 408

Q-03 SUBMISSIONS

A **Sample area:**

Prepare sample area not less than two m2 for approval by Superintendent before commencing balance of work.

Q-04 PERFORMANCE

A **Slip resistance:**

Finished surfaces shall be stable, safe, and minimise potential hazards of tripping or slipping due to misalignment of joints or too-slippery surfaces.

Submit certification that all installed pedestrian surfaces (excluding carpet) have a slip-resistant classification of 'R9' or 'P' in dry conditions and a slip-resistant classification of 'R10', 'V' or 'W' in wet conditions, in accordance with the relevant Standards (AS/NZS 4586).

B **Falls and levels:**

Grade paving to even falls indicated or required to drain surfaces away from buildings to drainage outlets without ponding.

Minimum grade for paving shall be 1 in 80, except bitumen paving which shall be 1 in 40.

Maximum permissible surface level deviation 1 in 300.

Q-05 CONCRETE PAVING

Refer to CONCRETE Section for technical requirements.

Paths shall be 1000 mm wide minimum or wider as indicated on the Drawings. Gradients shall not exceed 1:14 unless approved in writing. Paths on natural firm stable ground shall be a full 75 mm minimum thickness. Paths on filled or unstable ground shall be 100 mm thick. All paving shall be reinforced with F62 mesh at mid-slab.

Drives generally shall be 100 mm thick, reinforced with F72 mesh at mid-slab.

Obtain finished street levels if necessary from the relevant authority and lay paths and drives to match. Do not place concrete until alignment, levels and grades have been checked and approved by the Superintendent.

Grade the site, excavate for pavements and place 50 mm compacted crushed rock. Place edge boards to match finished levels.

Ensure paths are self-draining away from buildings to sumps and trench drains where indicated.

Finish concrete with a wood float in swirl pattern to give a non-slip surface. On steep grades finish concrete with cross-broom finish.

For paths, construct control joints at 1800 mm centres and movement joints at junctions with buildings and at 10 metre centres. For drives, construct control joints at 3 metre centres and movement joints at junctions with buildings and at 15 metre centres.

Q-06 KERBS AND CHANNELS

A **Generally:**

Where indicated, concrete kerbs and channels shall be:

- Low profile ride-over type, or
- Full height kerb to the profile indicated.

Kerbs and kerbs and channels may be slip formed, in-situ or precast concrete of minimum strength 20 MPa. For in-situ kerbs, construct control joints at not more than 6 metre centres.

Refer to CONCRETE Section for technical requirements.

B **Base course:**

Lay all kerbs and channels on 75 mm compacted crushed rock base course. In addition, bed precast kerbs on 25 mm of sand, accurately aligned and secured in position before placing the adjacent pavement.

Where kerbs to bitumen paving are not indicated as concrete, construct 100 x 35 mm durable timber edge boards supported by hardwood pegs at 1200 mm centres. At curves, peg spacing shall be reduced and edge slotted to retain correct curve profile.

Q-07 MASONRY PAVING

A Paving units:

Paving units of clay or concrete masonry shall be purpose-made types for use as paving.

B Laying on concrete base:

Where laying on concrete base, lay units on a mortar bedding not less than 12 mm thick.

For dry joints fill flush with bedding sand.

For mortar joints, fill flush with mortar and trowel smooth. Clean progressively to remove mortar smears and discoloration.

Laying on crushed rock base is not permitted.

C Bedding sand:

Bedding sand shall be clean coarse sand, free from deleterious matter including soluble salts or other contaminants liable to cause efflorescence or reduce skid-resistance.

Maximum particle size 4.75 mm. Not more than 30% passing 0.300 mm sieve.

D Mortar:

Mortar mix proportions shall be 1:3 parts cement / sand, to AS 3700, Clause 2.2.

Q-08 BITUMEN PAVING

A Subgrade preparation:

Remove top-soil and excavate or fill to required levels.

Install suitable subsoil drains 375 mm deep where wet areas are found or where the ground water is likely to occur within 300 mm of the base course.

Back-fill with suitable material, consolidated to 95% modified maximum dry density to AS 1289. Spread in 150 mm layers and compact by at least 3 passes per layer with a vibrating roller. Add sufficient water to ensure optimum moisture content for consolidation.

If soft spots occur during compaction, excavate, fill with suitable fill material and compact, to ensure even compaction.

Obtain approval from the Superintendent for subgrade preparation before subsequent work.

Where the subgrade strength is below 100 kPa or CBR 7, stabilise using lime or cement, thoroughly mixed with subgrade material not less than 300 mm and compacted.

B Base course:

Base course material shall be 40 mm 'A Grade' crushed rock to AS 2758.2 and AS 1141.

Spread in 150 mm layers and compact by at least 5 passes per layer with a vibrating roller. Add sufficient water to ensure optimum moisture content for consolidation.

Accurately grade the surface to the falls indicated.

Fill any honey comb surfaces with crushed fines, water in and compact thoroughly.

Where base course depth is not indicated, and for stable subgrade of firm sands or stiff clay with bearing strength of at least 150 kPa or CBR 17, depth shall be not less than:

Location	Base course thickness
Driveway for up to 3 units:	100 mm
Driveway for 4 or more units:	150 mm
Access for heavy (garbage) vehicles:	200 mm

For lower strength sub-grades increase the base course thickness by:

Subgrade Strength	Extra thickness
150 kPa or CBR 12	50 mm
100 kPa or CBR 7	100 mm

C Surface sealing:

Surface sealing may include:

- Chip seal.
- Hot mix asphaltic concrete.

Verify type, give notice and obtain approval before commencing.

Primer type shall be:

- In warmer weather: Cut-back bitumen.
- In colder weather: Bitumen emulsion.

Cure primer 3-4 weeks before applying the first seal coat.

D Chip seal:

Apply bitumen sealer and sufficient 'A Grade' size 10 stone chip to completely cover the seal, and roll compact thoroughly. After 3-4 weeks sweep the surface and remove all loose chips.

After twelve months, or other period to be advised by the Superintendent, apply a second sealer and 'A Grade' size 5 stone chip. Comply generally with VicRoads Guide Note No. 408.

E Hot mix asphaltic concrete:

Hot mix shall be laid by an approved subcontractor. Submit details for approval before commencing. Apply 'Type L' size 7 hot mix asphaltic concrete and compact thoroughly. Final thickness not less than 20 mm. Comply generally with VicRoads Guide Note No. 407.

END OF SECTION

SECTION R - PAINTING

CONTENTS

R-01 SUMMARY

Prepare and paint or otherwise finish all new and existing surfaces as indicated on the Drawings and Schedules.

Surfaces identified by location shall automatically include all substrates in that location for which a paint system is listed in Paint Systems Schedules, including all items such as soffits, structural framing, fascias, barges, rainwater goods and flashings, exposed pipes and balustrades as appropriate for the location.

Walls and ceilings shall automatically include all items such as windows, doors, frames, skirtings, architraves, cornices and all other trims, interiors of built-in cabinets and wardrobes and surfaces concealed by furniture, appliances, equipment and landscaping.

R-02 REFERENCES

All work shall comply with the relevant Standards including:

AS/NZS 2311	Guide to the painting of buildings.
AS/NZS 2312	Guide to the protection of iron and steel against external atmospheric corrosion.
AS 3730	Guide to the properties of paints for buildings - Parts 0-30 and 100

R-03 WARRANTY

The quality of painting on properties maintained by the OOH has on some occasions failed to meet acceptable industry standards. This is a serious concern to the OOH.

In this Contract, special attention will be given to ensure that the quality of paint, pre-painting preparation and paint application is of a high standard and that the resultant coatings are attractive, serviceable and durable.

Provide warranty for painting against defects in materials and workmanship and satisfactory performance for a period of three years from Practical Completion. Include manufacturer's written product warranties.

R-04 NOTICE TO OCCUPANTS

For occupied premises, give seven days notice to occupants before commencing work.

R-05 POISONOUS SUBSTANCES

Do not leave poisonous substances, solvents, acids, etc, unattended and remove to a safe storage location at the end of each work phase.

R-06 RELOCATION OF FURNITURE

For occupied premises, relocate all heavy and/or bulky furniture and loose fittings within the premises as required to carry out the work. Cooperate and coordinate with the occupant and the Superintendent.

Occupants shall be responsible for relocating the contents of cupboards and wardrobes, removing wall hung pictures and other small items before commencing work.

R-07 PROTECTION

Protect all unpainted surfaces, furniture, fittings and floor coverings from paint and dust during the course of the work with suitable covers and masking.

Mask door furniture, switch plates, light-fittings and other fixtures to protect from inadvertent paint application. Where existing floor coverings, such as carpet or vinyl are not to be replaced, cover all areas with thick polythene sheet secured in place before commencing work.

Avoid damage to occupant's gardens and surrounds. Shrubs and trees shall be carefully tied back and staked as necessary to enable the work to be carried out. Cutting back of shrubs and trees should be done by the occupant with sufficient prior notice to carry out pruning work.

The Contractor will be responsible for all damage, including damage to the occupant's property, caused by the Contractor or due to the painting work.

R-08 MATERIALS AND COMPONENTS

A **Construction plant and equipment:**

All construction plant, tackle, tools, brush-ware, drop sheets, tarpaulins and any required scaffolding necessary shall comply with applicable regulations.

B **Paints and finishes:**

All paints and other coatings shall comply with the Australian Paint Approval Scheme. Refer to attached table showing the generic paint types, APAS Specification Numbers, and equivalent AS/NZS 2311 reference numbers. Submit evidence of compliance, if directed.

C **Combinations:**

Do not combine paints from different manufacturers in a paint system (including paints for surface preparation and undercoats). For clear timber finish systems, use only the combinations of putty, stain and sealer recommended by the manufacturer of the top coats. Putty types shall be compatible with the surface and paint system being used.

D **Paint system description:**

If a paint or clear finish system is referred to only by its final coat (for example by the manufacturer's brand name, or the generic name) use in addition to the final coat, the appropriate stains, primers, sealers and undercoats, suitable for the substrate and compatible with the finish coat and each other.

E **Delivery:**

Deliver paints to the site in the manufacturer's sealed and labelled containers. Ensure that containers of materials are identified by an APAS Specification Number on the container.

F **Tinting:**

Use only products which are colour tinted by the manufacturer or supplier.

G **Putty:**

For timber finishes, use oil or polymer based putty. Putty shall be of a proper consistency and coloured where necessary to match the existing and surrounding work. All stopping shall be

completed before undercoating on newly primed surfaces. No putty stopping shall be carried out on old dry painted or raw timber surfaces.

H **Composition:**

Schedule 1 or Schedule 2 paints shall not be used. (Refer to Uniform Standard 1994).

I **Adulterated materials:**

Cans of paint not in immediate use shall be sealed to prevent evaporation and entry of dirt.

Where paint supplied by the manufacturer is adulterated in any way other than by thinning to the allowed maximum with suitable thinners, replace such defective paint with a new batch whether such defective paint is the subject of a warranty claim against the manufacturer or not.

All surfaces painted with material that does not conform to the required standards or are in any way adulterated, shall be cleaned off and repainted by the Contractor with paint complying with the relevant APAS standard, at no cost to the OOH.

R-09 PAINT SAMPLES

A **Paint samples:**

The Superintendent reserves the right to take samples of liquid paint from the painter's pots without notice to determine whether the paint used corresponds to the standard of the manufacturer's batch and not adulterated or over-diluted in any way. Should samples taken fail to meet the test requirements or fail to compare satisfactorily with initial test records, remove all defective paint and repaint the whole of the work.

B **Coated samples:**

Submit samples of each coating system on representative substrates, one square metre, showing colour, gloss level, texture and physical properties. Samples shall demonstrate the intermediate steps of the coating system.

R-10 GENERAL SURFACE PREPARATION

A **Removal of paint:**

All chocolded, chalked, loose, flaking or otherwise defective paint shall be removed before painting by either hand sanding, mechanical sanding using an orbital or band sander or by burning off. Machine disc sanding is not permitted.

If old paint is to be removed by burning off, only portable cylinder gas torch flames shall be used.

Take all necessary precautions to prevent fire damage to the surfaces and to the property and to render the work area safe. Fire extinguishers shall be positioned close by burning off work and a portable hand held fire extinguisher shall accompany each gas torch.

Burning off shall only be undertaken between the normal time for the commencement of work and 3.00 p.m. except where work is to cease before 4.00 p.m. in which case the burning off operations shall cease prior to the cessation of work.

Note that total fire ban regulations apply to burning off.

Timber ceilings, eaves, soffits and other surfaces that could present a fire hazard shall not be burnt off. These surfaces shall be stripped by belt or orbital sanders, hand sanding or paint removers.

Any chemical paint remover used shall be a non-flammable water rinse-able liquid.

B **Cleaning down:**

Remove any paint inadvertently applied to hardware, electrical switch plates and power points etc. during previous painting contracts.

All surfaces shall be cleaned or washed to remove all dirt, dust, grime, old oxidised paint film, rust, scale and grease etc.

C **Sanding:**

Surfaces shall be sanded back to give full adhesion to the paint finish required. All areas shall be brought to a smooth even surface before painting.

Remove any paint runs, blobs, roller marks etc. that may have been left after previous painting contracts.

All surfaces primed and undercoated with solvent borne materials shall be lightly papered and dusted.

D **Priming:**

All new, bare, exposed and prepared surfaces shall be primed before the application of the required finish.

E **Stopping:**

All putty, stopping and filling shall be carried out after priming. Knots in timber shall be treated with a knotting compound before painting.

All filling and stopping shall be carried out with suitable commercial filler which is compatible with the surface being painted and the required paint system.

Use filler tinted to match the substrate if the finish is transparent. All protruding nail heads shall be punched below the surface, filled and touched up with primer.

All defects to metal surfaces shall be filled with two pack epoxy filler and sanded smooth.

R-11 PREPARATION OF PREVIOUSLY PAINTED SURFACES

A **Cleaning down:**

Previously painted ceilings and wall surfaces with gloss, satin or flat paint in sound condition, shall be prepared by washing down by using a detergent solution such as sugar soap to remove all dirt and grease before minor stripping, stopping and repainting.

B **Dry stripping:**

Any loose or flaking material on ceilings or walls that cannot be removed by washing, shall be dry-stripped of blistered and flaking paint, contact paper, stickers and the like.

C **Woodwork:**

Previously painted and/or stained woodwork shall be thoroughly cleaned down with a detergent solution before stopping, re-staining and varnishing and/or repainting. Re-staining and varnishing shall be done as separate operations. All surfaces shall be sanded back to give full adhesion to the paint finish required.

D **Painted steel frames and cabinets:**

All rust scale shall be removed by cleaning down thoroughly with a wire brush and medium/coarse grade emery cloth/paper. In cases of extreme rust, the frames and cabinets shall be treated with appropriate rust inhibitor in accordance with the product information after first cleaning with wire brush and emery cloth/paper to remove loose rust scale.

E **Stopping:**

Wall and ceiling cracks shall be properly cut out and stopped up with neat gypsum plaster or an appropriate cellulose filler.

Drummy plaster shall be removed and made good with suitable patching materials.

Loose stopping over nails to plaster sheets shall be removed and the nail punched before re-stopping. All loose plaster sheets shall be re-nailed with galvanised clouts, punched and stopped.

All nail holes and cracks in painted woodwork shall be stopped with wood putty or ready mixed wood fillers. All nail holes and cracks in stained woodwork shall be stopped with wood putty stained to match the existing colour of the woodwork or ready mixed coloured wood fillers.

All indentations, holes and surface imperfections in walls, ceilings and joinery including doors, architraves, window frames, skirtings etc. shall be filled with appropriate filler and sanded smooth. Wood putty or fillers used shall be of a quality proprietary brand.

All surfaces shall be rubbed down between coats. Any surfaces that have a high gloss retention shall be rubbed down with wet or dry carborundum paper before the application of any paint.

F **Removal or sealing of marks and stains:**

Where any pen or grease etc. marks exist on walls to be painted, remove with a suitable hydrocarbon solvent or graffiti remover. Do not use methylated spirits on surfaces suspected of having been coated with a water based latex finish. Seal with a solvent borne alkali resistant pigmented sealer (APAS 0171). Where water or hydrocarbon stains are present, seal with a solvent borne undercoat (APAS 0016/1).

G **Removal of mould:**

Where surface mould is present, scrub off mould completely. Wash down with a mixture of warm water and detergent. Change water frequently to avoid cross contamination of surfaces.

Follow with a thorough wash down with a mixture of three parts warm water and one part of bleach. Leave for one hour and then clean the bleach solution from the surface. Allow to dry before painting.

Where a very heavy mould infestation is present, sterilise the area with a proprietary anti-mould solution in accordance with the product information. This step shall be carried out in addition to those above.

H **Removal of moss and lichen:**

Remove moss and lichen using a hard brush or broom. Saturate the affected surface with a solution of the following:

- Ammonium Carbonate: 70g
- Copper Sulphate: 20g
- Water: 1 litre

Saturate the surface and leave for 3 - 6 days, brush thoroughly and wash well with water.

When dry, apply a mix of 3:1 parts water to bleach and leave on the surface for 30 minutes.

Wash well with water to complete the moss / lichen removal process.

I **Smoke damaged surfaces:**

Where smoke damage is present, wash thoroughly with trisodium phosphate in warm water. Seal remaining stain with the proprietary stain sealer made by the manufacturer whose products shall be applied in subsequent coats. Proceed as for unstained surfaces.

J **Copper piping:**

Remove all stains by means of an abrasive. Remove residue with mineral turpentine and clean with a lint free cloth before painting.

K **Concrete surfaces where saponification has occurred:**

Saponification (soap formation) is caused by reaction between alkalis in concrete and the resins in enamels. The appearance is as if paint stripper has been applied to the surface.

Affected areas shall be cleaned back to bare concrete to ensure a suitable surface for painting. All surrounding areas shall be sound.

Bare concrete shall be sealed with a solvent borne alkali resistant pigmented sealer (APAS 0171).

L **Metalwork:**

For the pre-treatment of metalwork the following steps shall be taken:

Mild steel (Wrought iron and ferrous metal)

Remove any rust, scale, or peeling paint with a wire brush and scraper. To the exposed metal areas, apply a rust conversion compound (rinse type). If heavy rust areas remain, repeat the process.

The following product (s) satisfies the specification requirements: Wattyl 'Metal-Prep' or Dulux 'Deoxidine 624'.

Prime bare metal surfaces with a zinc phosphate primer (APAS 0162/2 or APAS 0032).

Galvanised Steel and Non Ferrous Metals

Unpainted new or old galvanised steel shall be treated with an acid etching agent of an suitable brand using abrasive plastic pads. Do not use steel wool.

The following product (s) satisfies the specification requirements: Dulux 'Galv-Prep'.

New galvanised steel shall be pre-treated at least 24 hours before the application of the first coat of paint. The surface should be a light blue-grey colour and evenly wetted with the agent. Wash thoroughly with water and when dry, apply one coat of latex type galvanised iron primer (APAS 0134).

Treat existing (non-new) galvanised steel, including guttering, down-pipes and barge cappings as follows. Thoroughly remove all loose, flaking and old paint by wire brushing and scraping. After cleaning, treat as with the required treatment for the pre-treatment of galvanised steel outlined above.

M **Stained and varnished wood finishes:**

All existing stained and varnished surfaces shall be tested for film integrity before painting (where stain or varnish is to be reapplied) by the following method:

- Cut two parallel lines approximately 10 mm apart and 40 mm long. Apply adhesive tape over the cut area. Quickly remove the tape and inspect for removal of the varnish film. If there is significant removal of the film, the coating shall be thoroughly sanded back to ensure a sound surface for the application of the new material.
- If the previously varnished surface is to be over-coated with a solid coloured enamel system, the varnish coating shall be sanded back to bare timber. The resultant surface shall then to be prepared as for new timber.

N **Stripping wallpaper:**

Use an appropriate commercial stripping agent or steam method and ensure that all glue and wall paper is removed from walls. Repair any damage caused to plaster by scrapers etc. Allow the plaster to dry for a minimum of 24 hours before applying paint.

O **Lead based paints:**

Where lead based paint is present at commencement, or found during construction, carry out an approved lead management procedure as directed, to AS 4361 - Guide to lead paint management. Consult with Superintendent regarding the method of management before commencing any work in areas where lead based paint is present.

Test all buildings constructed before 1970 for the presence of lead based paint before commencing work, and submit all test results to the Superintendent.

R-12 ACCEPTANCE OF CONDITIONS

Ensure that surfaces are dry and smooth and in all respects in good condition to receive finish before applying painting material.

Application of painting material to any surface will be held as acceptance of that surface and working conditions as suitable for a good quality finish.

Take entire responsibility for paintwork which has broken down or is defective in any manner and make good such defective work at no additional cost.

R-13 WEATHER CONDITIONS

All work shall be carried out only under conditions favourable to painting. Avoid painting under adverse conditions or in a dusty atmosphere.

Paint shall not be applied when the temperature is below ten degrees Celsius or the relative humidity is above 85% at any time during drying time applicable to the particular paint in use.

Painting shall cease in wet weather and after 3.00 p.m. in the afternoon when there is a likelihood of fog or frost.

No painting shall undertaken after a heavy dew, frost or fog until surfaces are thoroughly dry.

R-14 WORKMANSHIP

The whole of the work shall be completed in a thorough and professional manner to the best trade standards. All workmen shall be skilled painters under the supervision of the Contractor's foreman who shall be readily available to take instruction regarding the work. Materials shall be used strictly in accordance with the product information from original branded containers.

A **Stirring:**

All paint shall be thoroughly stirred before use. No additives will be permitted except as required herein.

B **Dilution:**

Dilution of solvent-borne paints by the addition of mineral turpentine, shall be kept to a minimum and shall not exceed 5% by volume.

C **Repair of galvanising:**

Where galvanised surfaces have been subsequently welded, prime the affected area with a single pack zinc rich primer (APAS 0014/1).

D **Priming before fixing:**

Apply one coat of wood primer (two coats to end grain) to the back of external fascia boards, timber door and window frames, bottoms of external doors, associated trims and glazing beads before fixing in position. All surfaces of replacement weatherboards shall be pre-primed before installation.

E **Number of coats:**

Unless required as a one coat or two coat system, each paint system consists of not less than three coats. Apply additional coats if necessary to:

- Prepare porous or reactive substrates with prime or seal coats consistent with the manufacturer's recommendations.
- Achieve satisfactory opacity and/or texture.

F **Application:**

Apply the first coat immediately after substrate preparation and before contamination of the substrate can occur.

Multi-coat work shall stand not longer than seven days before the application of the next coat. External priming on dressed timber shall be re-coated with primer where four weeks has elapsed between the time of applying original primer and the finishing coats.

Re-coat times shall be as recommended by the manufacturer.

Ensure that each coat of paint or clear finish is uniform in colour, gloss level, thickness and texture, and free of runs, sags, blisters or other discontinuity.

Each coat shall have a uniform even application and all finishes shall be free of brush or roller marks, dust, grit, blemishes and shall be true to colour.

All surfaces shall be thoroughly dry before application of subsequent coats.

Each coat shall be lightly rubbed with glass paper between coats except for wall and ceiling surfaces painted with acrylic latex paints.

Where two coat applications are required, the first coat shall be of the selected colour but of a recognisably different tone, achieved by tinting, to enable full cover to be obtained when the final finishing coat of the selected colour is applied.

Ensure adequate ventilation during application and drying of paint finishes.

Paint is generally to applied by brush or roller, although airless spraying is acceptable under certain circumstances. Where paint is applied by brush it shall be laid off so that no brush marks show. Each coat shall be allowed to dry and be rubbed down with glass or garnet paper of a suitable grit before the next coat is applied.

Where rollers are used, all edges and corners shall be cut-in by brush before the application of the roller. Roller coats shall be as close to cut-in work as practicable. Roller size shall not exceed 300 mm in width. All cutting in shall be neat, clean and precise.

Airless spray application is acceptable for covering large areas in one colour. External painting using airless spray equipment shall not be carried out on windy days. Paint manufacturers' product information for airless spray application shall be followed.

The Contractor will be held responsible for over-spray drifting into neighbouring premises and for the reparation of any damages resulting therefrom. Spray painting of open lattice type structures is not acceptable.

Internal painting using airless spray equipment is not acceptable in occupied premises. All areas not to be coated during the airless spray operation shall be thoroughly masked up to avoid the deposition of unwanted over-spray.

Air-assisted spraying is not acceptable under any circumstances.

R-15 STAINING AND PAINTING FENCING

A **Staining:**

Where fences are to be stained, apply two coats of pigmented preservative stain both sides including all rails, boards, posts, plinths, gates and gate frames. Verify colours before commencing.

For paling fences, apply the first coat of stain to both sides of the structure and the under-palings. Apply first coat to cover-palings both sides before fixing. Apply the second coat of stain to the completed fence.

For horizontal rail fences, apply two coats of stain on both sides after erection.

B **Painting:**

Where fences are to be painted, prime and paint both sides of fence, including all boards, rails, posts, plinths, gates and gate frames.

Apply priming and first coat to all dressed timber before erection and finishing coat after erection.

R-16 MAKING GOOD

On completion, clean off all marks, paint spots and stains and restore damaged surfaces to their original condition. Touch up decorative paintwork or misses only with the paint batch used in the original application. Make good after other trades and finish off in a tradesman-like manner to the approval of the Superintendent.

If any cracks or other defects appear in the paintwork before Practical Completion, or during the Defects Liability Period or Warranty Period, they shall be cut out, stopped, made good and repainted to the satisfaction of the Superintendent. Should any repainting of surfaces be required, the extent of work shall cover a complete surface or a termination line to be agreed by the Superintendent. Localised touching up will not be permitted.

R-17 COMPLETION AND CLEANING UP

On completion of the works, clear away all debris, tins, scaffolding and other materials from the site.

Clean all windows, floors, baths, basins, tiles and stained woodwork free from paint, paint splashes, smears or blemishes caused by workmen during the performance of the contract.

Wherever applicable, re-fit window stops, pelmets, door furniture and general fittings. Ensure items are free of any paint.

The disposal of cleaners, waste products and other fluids shall be exercised with proper care and in compliance with the Victorian Environment Protection Act. The discharge of toxic fluids and other wastes, etc. into the sewerage or drainage system is strictly prohibited.

R-18 PAINT SYSTEM SCHEDULE

For each of paint system listed in the Painting Schedules, and for each substrate, this schedule indicates:

- The number and sequence of coats.
- The paint type for each coat.

References are APAS Specification Numbers, unless otherwise stated. Refer Clause R-20 for table showing the correlation between APAS and equivalent AS/NZS 2311 paint systems.

Continued next page ...

Location	1st Coat	2nd Coat	3rd Coat	4th Coat
Substrate: Concrete / Render / Plaster / FC Sheet / Plasterboard / Fibrous Plaster / GRC				
Internal wet areas				
Bare concrete only	APAS 0171 Solvent borne sealer for concrete, masonry	APAS 0183/2 Interior latex undercoat	APAS 0260/2 Semi gloss interior latex	APAS 0260/2 Semi gloss interior latex
Previously painted surfaces	APAS 0183/2 Interior latex undercoat OR APAS 0260/2 Semi gloss interior latex	APAS 0260/2 Semi gloss interior latex	APAS 0260/2 Semi gloss interior latex OR n/a	n/a
Internal living areas				
Bare concrete only	APAS 0171 Solvent borne sealer for concrete, masonry	APAS 0183/2 Interior latex undercoat	APAS 0260/3 Low gloss interior latex	APAS 0260/3 Low gloss interior latex
Previously painted surfaces	APAS 0260/3 Low gloss interior latex	APAS 0260/3 Low gloss interior latex		
External	APAS 0171 (bare concrete only) Solvent borne sealer for concrete, masonry	APAS 0260/3 Low gloss exterior latex	APAS 0260/3 Low gloss exterior latex	
Substrate: Exposed Fibre-Cement				
External				
New	APAS 0171 Solvent borne sealer for concrete, masonry	APAS 0260/3 Low gloss exterior latex OR APAS 0260/1 Gloss exterior latex	APAS 0260/3 Low gloss exterior latex OR APAS 0260/1 Gloss exterior latex	n/a
Previously painted	APAS 0171 Solvent borne sealer for concrete, masonry (Spot seal bare areas)	APAS 0260/3 Low gloss exterior latex OR APAS 0260/1 Gloss exterior latex	APAS 0260/3 Low gloss exterior latex OR APAS 0260/1 Gloss exterior latex	n/a
Substrate: Plasterboard				
Wet areas Walls, cupboards				
Bare plaster only	APAS 0172 Latex sealer for wallboards	APAS 0260/2 Semi gloss interior latex	APAS 0260/2 Semi gloss interior latex	n/a
Previously painted	APAS 0260/2 Semi gloss interior latex	APAS 0260/2 Semi gloss interior latex		
Living areas				
Bare plaster only	APAS 0172 Latex sealer for wallboards	APAS 0260/3 Low gloss interior latex	APAS 0260/3 Low gloss interior latex	n/a
Previously painted surfaces	APAS 0260/3 Low gloss interior latex	APAS 0260/3 Low gloss interior latex	n/a	n/a

Location	1st Coat	2nd Coat	3rd Coat	4th Coat
Substrate: Brick Wall Surfaces (If Previously Painted)				
External and internal	APAS 0171 (Spot seal bare areas) Solvent borne sealer for concrete, masonry	APAS 0280/3 Low gloss exterior latex	APAS 0280/3 Low gloss exterior latex	
Substrate: Non-Galvanised, Non-Primed Steel				
Internal and External	Pre-treat with an acid based metal conditioner	APAS 0032 Metal primer	APAS 0280/1 Gloss exterior latex	APAS 0280/1 Gloss exterior latex
Substrate: Galvanised Steel, Zinc coated and Zinc alloy coated steel (Zincalume)				
Internal and External	Pre-treat with acid based metal conditioner	APAS 0134 Metal primer for zinc coated surfaces - latex	APAS 0280/1 Gloss exterior latex	APAS 0280/1 Gloss exterior latex
Substrate: Non-galvanised, Shop primed or Pre-coated Steel				
Internal and External	Detergent Wash	APAS 0280/1 Gloss exterior latex	APAS 0280/1 Gloss exterior latex	
Substrate: Aluminium, Copper and PVC Pipes				
Internal and External	APAS 0134 Metal primer for zinc coated surfaces - latex (compatible with aluminium, copper and PVC substrates)	APAS 0280/2 Semi gloss latex, exterior	APAS 0280/2 Semi gloss latex, exterior	
Substrate: Exterior Timber Weatherboards				
New (bare)	APAS 0183 Wood primer, latex	APAS 0280/1 Gloss exterior latex	APAS 0280/1 Gloss exterior latex	
Previously painted				
1. Coated with enamel	APAS 0163/1 Exterior latex undercoat	APAS 0280/1 Gloss exterior latex	APAS 0280/1 Gloss exterior latex	n/a
2. Coated with latex	APAS 0280/1 Gloss exterior latex	APAS 0280/1 Gloss exterior latex	n/a	n/a
Substrate: Unprimed Hardboard / Particleboard / Organic Fibre board				
New and Bare Board	APAS 0183 Wood primer, latex	APAS 0280/1 Gloss exterior latex OR APAS 0280/2 Semi gloss latex, exterior	APAS 0280/1 Gloss exterior latex paint OR APAS 0280/2 Semi gloss latex, exterior	
Previously painted board	APAS 0183 Wood primer, latex type Spot prime bare areas	APAS 0280/1 Gloss exterior latex paint OR APAS 0280/2 Semi gloss latex, exterior	APAS 0280/1 Gloss exterior latex paint OR APAS 0280/2 Semi gloss latex, exterior	

Location	1st Coat	2nd Coat	3rd Coat	4th Coat
Substrate: Exposed Dressed Timber				
Internal and external new timber	APAS 0183 Wood primer, latex	APAS 0280/1 Gloss exterior latex OR APAS 0280/2 Semi gloss latex, exterior	APAS 0280/1 Gloss exterior latex OR APAS 0280/2 Semi gloss latex, exterior	
Previously painted timber	APAS 0183 Wood primer, latex Spot prime bare areas	APAS 0280/1 Gloss exterior latex OR APAS 0280/2 Semi gloss latex paint, exterior	APAS 0280/1 Gloss exterior latex OR APAS 0280/2 Semi gloss latex paint, exterior	
Substrate: External Sawn Timber				
New and previously painted timber	APAS 0280/4 Heavily pigmented gloss latex ranch finish for exterior timber, OR APAS 0280/5 Heavily pigmented low gloss latex ranch finish, exterior timber	APAS 0280/4 Heavily pigmented gloss latex ranch finish, exterior timber, OR APAS 0280/5 Heavily pigmented low gloss latex ranch finish, exterior timber	N/A	N/A
Substrate: Stained Timber (Internal)				
New Timber	APAS 0111 Timber coloured spirit stain, OR APAS 0115 Lightly pigmented solvent borne ranch finish, exterior timber	APAS 0114 One pack interior varnish (Satin OR Gloss)	APAS 0114 One pack interior varnish (Satin OR Gloss)	
Previously Stained Timber	APAS 0114 One pack interior varnish (Satin OR Gloss)	APAS 0114 One pack interior varnish (Satin OR Gloss)		
Substrate: Stained Timber (External)				
New Timber	APAS 0115 Lightly pigmented solvent borne ranch finish, exterior timber	APAS 0055. One pack exterior varnish	APAS 0056. One pack exterior varnish	
Previously Stained Timber	APAS 0055. One pack exterior varnish	APAS 0056. One pack exterior varnish		

Substrate	Material	1st Coat	2nd Coat

Location: Verandah Flooring

Previously painted timber:			
(a) Oil based enamel	Touch-up bare areas with oil based primer	Semi-gloss enamel	Semi gloss enamel
		Apply clean washed sand evenly to surface and remove excess before first coat is dry.	
(b) Water-based latex	Touch-up bare areas with textured non-slip paint	Textured non-slip paint	Textured non-slip paint
Previously painted concrete:			
(a) Oil based enamel	Touch-up bare areas with gloss paving paint	Paving paint	Paving paint
		Apply clean washed sand evenly to surface and remove excess before first coat is dry	
(b) Water-based latex	Touch-up bare areas with textured non-slip paint	Textured non-slip paint	Textured non-slip paint

R-19 COMPARISON TABLE FOR APAS AND AS/NZS 2311

The following table compares ABAS numbers and the corresponding AS/NZS 2311 numbers for generic paint types.

ABAS Nos.	Paint type	AS/NZS 2311
APAS 0011	Roofing paint - solvent borne	29
APAS 0015/1	Enamel, full gloss, solvent borne - exterior	5
APAS 0015/2	Enamel, full gloss, solvent borne - interior	5
APAS 0015/3	Semi gloss paint, solvent borne	3
APAS 0016/1	Undercoat, solvent borne	17
APAS 0032	Metal primer	11
APAS 0055	One pack exterior varnish (general purpose)	21
APAS 0111	Timber coloured spirit stain	18
APAS 0114	One pack interior varnish	19
APAS 0115	Lightly pigmented solvent borne ranch finish for exterior timber	23
APAS 0134	Metal primer for zinc coated surfaces - latex type	12
APAS 0162/2	Zinc phosphate metal primer	11
APAS 0163/1	Exterior latex undercoat	17A
APAS 0163/2	Interior latex undercoat	17A
APAS 0171	Solvent borne sealer for concrete and masonry	15
APAS 0172	Latex sealer for wallboards	18
APAS 0181	Wood primer, solvent borne	10
APAS 0183	Wood primer, latex	10A
APAS 0260/1	Interior gloss latex	9
APAS 0260/2	Semi gloss interior latex	8
APAS 0260/3	Low gloss interior latex	7
APAS 0260/4	Washable flat finish for interior use	6
APAS 0280/1	Gloss exterior latex	9
APAS 0280/2	Semi gloss latex paint, exterior	8
APAS 0280/3	Flat or low gloss exterior latex finish	7
APAS 0280/4	Heavily pigmented gloss latex ranch finish for exterior timber	23
APAS 0280/5	Heavily pigmented low gloss latex ranch finish for exterior timber	23

R-20 CONTROL SHEET FOR PRE-PAINTING REPAIRS AND PAINTING

Complete a copy of this control sheet for each job to give formal assurance for the quality and completeness of the work. Tick each item and sign each section, to verify that each stage of work has been completed in accordance with the Specification and correct industry practice.

Project Name: Works No: Property Address: INSPECTION ITEM	Insert tick ✓	Contractor to sign / date
1. OCCUPANT AND PROPERTY ISSUES		
Occupant given opportunity to select one of several prepared colour schemes.		
Occupant given adequate notice before commencement of work.		Signed .....
Contractor moved heavy / bulky items of furniture.		
Property and fixtures protected by use of drop sheets, masking out etc.		Date .....
2. PRE-PAINTING PREPARATION		
All scheduled repair works completed.		
Surfaces scheduled to be painted were washed/sanded as appropriate.		
Exist. paint spots and smears removed from door hardware, electrical plates, etc.		Signed .....
Cracks, gaps, indents etc filled and sanded smooth.		
Bare timber primed before filling.		Date .....
3. APPLICATION		
Paint colours match approved colour scheme.		
All paints and coatings applied are APAS approved.		
Required number of coats applied to all areas.		
All gloss levels and textures as required.		
Each coat has uniform, even application and effective coverage.		Signed .....
Finishes are free of brush or roller marks, dust, grit and blemishes.		
All coatings cut in sharply at trims, architraves, skirtings, fittings and junctions etc.		Date .....
4. PRACTICAL COMPLETION		
Paint spots and smears cleaned from glass, fixtures and all other surfaces.		
All doors and windows operate satisfactorily.		Signed .....
Contractor replaced heavy / bulky items of furniture.		
Care and all debris removed from site, all areas left clean.		Date .....

END OF SECTION

SECTION S - FENCING

CONTENTS

S-01 SUMMARY

Provide fences and gates in accordance with the Victorian Fencing Act as required.

Inspect the site during the Tender Period, assess prevailing site and adjacent conditions 'as existing', and include the full cost of all required fencing in the Contract Sum, including the full cost of boundary and party fencing. Do not include the recovery of shared costs from adjacent property owners.

Verify responsibility for arranging fencing agreements with adjacent property owners and responsibility for recovery of shared costs with Superintendent before commencing work.

Arrange a mutually acceptable time with each adjacent occupant for the work, and protect children, property and livestock affected by the work.

Refer to Part 3 Project Schedules and Drawings for height of fences.

S-02 REFERENCES

Comply with the standards and procedures published by the Housing Industry Association, Fencing Division, and the relevant Standards.

AS 1074	Steel tubes and tubulars for ordinary service.
AS 1606	Preservative treated farm fencing timber.
AS 1725	Galvanized rail-less chainwire security fences and gates.
AS 2423	Coated steel wire fencing products for terrestial, aquatic and general use
AS/NZS 4534	Zinc and zinc/aluminium-alloy coatings on steel wire.

S-03 SUBMISSIONS

A **Superintendent's Inspections:**

Give not less than two days notice so that Superintendent may inspect the following:

- Setout, before installation.

S-04 PERFORMANCE

A **Services:**

Ascertain position of underground services adjacent to or crossing fence lines and avoid damage to services and other works. Where such damage occurs, make good immediately.

Refer to PRELIMINARIES Section for EXISTING SERVICES Clause.

B **Corrosion:**

All metal fencing, gates and components shall be hot dip galvanized or Zincalume coated.

C **Termites:**

Where the site is subject to infestation by termites (including low-risk areas) or where indicated, fencing shall be resistant to termite attack.

S-05 ALIGNMENT OF FENCES

A **Party fences (side and rear):**

Party fences shall mean fencing to boundaries adjacent to private properties, private thoroughfares and reserves. Party fencing shall be located over the centre-line of the boundary, with posts and rails inside the boundary line, and the inside face of the palings over the boundary line.

Party fences shall be paling type unless otherwise indicated.

B **Wing fences:**

Wing fences for detached houses shall mean fencing separating the front yard from the back yard within the individual allotment, including vehicle gates to one side and pedestrian gates to the other side.

C **Front fences:**

Front fences shall be wholly inside boundary lines.

Front fences shall be post and rail type unless otherwise indicated.

D **Boundary fences:**

Boundary fences shall mean fencing to boundaries adjacent to public thoroughfares and reserves, and other OOH owned properties. The whole of boundary fencing shall be located inside the allotment boundary (inside a line joining survey pegs).

E **Other:**

Gate heights shall match the height of adjoining fences.

In unpaved path areas where fencing abuts street paving, obtain proposed levels of any future paving from the relevant authority, and erect fences to match such levels.

S-06 PALING FENCES

A **Generally:**

Paling fences may be constructed with concrete or timber posts, plinth blocks and plinths, at the Contractor's option. Selection of palings shall be based on availability except that all paling facing any one allotment shall be consistent.

Posts generally shall be built-in to post holes with dry-mixed cement-rich concrete mix.

B **Posts:**

Timber posts shall be Red Gum or Jarrah or hardwood or pressure treated Pine. Unless otherwise indicated, timber corner posts and end (gate) posts and shall be 125 x 125 mm, and intermediate posts shall be 125 x 75 mm. Tops shall be finished with a neat splay-out.

Concrete fence posts and accessories shall be suitable proprietary prestressed types. Unless otherwise indicated, concrete corner posts and end (gate) posts shall be 130 x 95 mm, and intermediate posts shall be 130 x 45 mm.

Posts shall be evenly spaced at 2700 mm maximum centres.

Posts shall built-in 500 mm to 200 mm diameter post-holes, on a 150 mm thick concrete pad, erected plumb and to true lines. Post holes shall be back-filled with cement stabilised soil (6 kg dry cement per post-hole) and thoroughly rammed.

Where the last post is within 900 mm of the corner, brace with 100 x 50 mm rail nailed to cross rails. If the last post abuts a masonry wall, brace to wall with suitable masonry anchors.

Where the last post is not within 900 mm of the corner, include an extra post.

C **Plinths:**

Fencing plinths may be timber or concrete. Verify type of plinth before commencing.

Timber plinths shall be 150 x 25 mm Red Gum or pressure treated Pine, in minimum two panel lengths and fixed to timber plinth blocks with three 75 x 2.8 mm flat-headed galvanized nails.

Plinths shall be aligned evenly, generally following finished ground levels, with +/- 50 mm cut into the ground or above ground to overcome local irregularities along the fence line.

D **Rails:**

Rails shall be unseasoned hardwood (fencing quality) in long lengths.

Top and bottom rails shall be 75 x 50 mm. Intermediate rails shall be 75 x 38 mm. Joints in rails shall be made at alternate posts and staggered.

Check-in rails to timber posts without over-cutting and double nailed with minimum 75 x 2.8 mm bullet-head nails. Fix rails to concrete posts with galvanized wire ties stapled to rails with 35 x 3 mm diameter galvanized staples, two per wire.

E **Palings:**

Palings shall be 12 mm thick sawn hardwood or pressure treated Pine of required length. Paling widths shall be 125 or 150 mm for under-palings (uniform throughout fence) with 100 mm wide cover-palings. Palings shall lap at least 25 mm.

Palings shall be cut tight onto plinths and placed truly vertical. Fence tops shall be cut to straight lines, finished parallel to the plinth line.

Reject all palings with knot holes or loose gum shakes.

Fix under-palings with one 40 x 2.5 mm diameter flat-head nail to top and bottom rails, and cover-palings with two 50 x 2.8 mm diameter flat-head nails to each rail.

S-07 CHILD SAFETY FENCES

Child safety fences shall be pre-finished proprietary steel tube fence systems in accordance with the product information and relevant Standards for swimming pool safety fences.

AS 1926	Swimming pool safety.
AS 1926.1	Fencing and gates for private swimming pools.
AS 1926.2	Swimming pool safety - Location of fencing for swimming pools.
AS 2820	Gate units for private swimming pools.

All gates shall be of matching construction fitted with suitable tamper-proof latches, and security locks where indicated or required.

S-08 METAL FENCES

Metal fences shall be suitable proprietary systems selected and installed in accordance with product information.

Posts and rails shall be in-line galvanized.

Infill cladding shall be Colorbond sheet or metal tube pickets. Verify colour before ordering. Include metal capping to top of infill sheets, and sealed stop ends to tube pickets.

Fix cladding with metal thread screws at not more than 200 mm centres to each rail.

S-09 HORIZONTAL BOARD FENCES

A **Generally:**

Horizontal board fences shall be constructed with timber posts as for paling fencing, except posts shall not be further than 1800 mm apart, and built-in not less than 600 mm to ground. Plinth shall be 150 x 38 pressure treated Pine nailed with 100 mm bullet-head nails.

B **Infill boards:**

Infill with horizontal boards of 135 x 19 mm hardwood, where painted finish is indicated, and 150 x 25 mm hardwood or pressure treated Pine, where stained finish is indicated.

Fix boards 8 mm apart and double nail to posts with 65 mm galvanized nails.

S-10 POST AND RAIL FENCES

A **Generally:**

Post and rail fences shall be constructed with 125 mm diameter pressure treated Pine logs. Bolts shall be 12 mm galvanized coach bolts with double washers and nuts.

Post and rail fences shall be parallel with the slope of the ground unless otherwise directed.

B **Post and rail construction:**

Posts shall be spaced at 3400 mm maximum centres and built-in 600 mm to post holes.

Locate rails 500 mm above ground level to top of rail. Rails shall have 300 mm extensions beyond posts with 300 mm gap between ends of rails.

Notch posts 25 mm maximum for rails and bolt together. Recess nuts flush with surface of timber. Cut exposed bolt ends flush with nut.

S-11 TWO-RAIL CHAIN-WIRE FENCES

Two-rail chain-wire fencing and matching gates shall comply with the relevant Standards.

Chain-wire shall be 50 mm nominal mesh with knuckled selvedges.

Posts shall be 50 mm nominal diameter galvanized steel tubes with galvanized steel caps and socket brackets for rails. Maximum post spacing shall be 3000 mm. Rails shall be 32 mm nominal diameter. Pedestrian gates shall be framed with 20 mm nominal diameter tube.

Set posts in footings 250 (diameter) x 750 mm deep with 20 MPa concrete. Trowel top smooth and level, and to finish 100 mm below adjacent ground line. Back fill and tamp down level. Remove spoil.

Lace chain-wire to posts and rails with 2 mm diameter galvanized wire.

Include all standard fixing accessories and gate hardware for a complete installation.

S-12 RURAL FENCES

Rural fences shall be constructed with pressure preservative treated pine posts and heavy gauge fencing wire (AS 2423).

Corner posts shall be not less than 100 mm diameter, with similar bracing struts in each direction. Intermediate posts shall be not less than 75 mm diameter.

Notch bracing struts to corner posts and bolt together with 12 mm diameter black bolts and two 25 mm washers. Angle struts at 60 degrees nominal to ground line.

Set posts in 200 mm diameter post holes, back-fill to within 50 mm of ground level with cement-stabilised soil well compacted and cover with excavated soil.

Set struts aligning centre-line of strut to centre level of hole, and fill as for posts.

Drill posts for fencing wire. Pass wire through holes, turn twice around corner or end posts and turn once around intermediate posts, using suitable wire strainer to ensure taut straight wires.

Top wire shall be 1200 mm above ground. Bottom wire shall be not less than 150 mm above ground at any point between adjacent fence posts. Wires shall be less than 250 mm apart.

S-13 GATES

A **Generally:**

Gates shall be constructed from galvanized steel framing with Zincalume or Colorbond facing, and all required hinges, latches, bolts and the like in galvanized steel. Gates shall be braced for

rigidity and to prevent sagging. Joints shall be fully welded and ground flush. Cut ends and damage to galvanizing shall be repaired with zinc rich primer.

Gates 1500 mm high and over shall have a hand hole for access to the latch, except for gates with keyed lock or gothic ring latch, and gates with access from the inside only.

Gates for 1000 mm wide openings shall be single leaf, and for 2700 mm wide openings shall be double leaf.

Where the angle of fences or other causes would reduce the effective opening of double gates to 2500 mm or less, gates shall be constructed at right angles to the drive. Construct return fences whether indicated or not. Construct leading gate of double gates in position indicated.

Gates shall be same height and sheeted to match adjacent fences. Bottom of gates shall be not more than 75 mm above paving level. Where the fall across a double gate opening exceeds 150 mm, gates shall be contoured to suit fall of ground.

B **Accessories:**

Include heavy duty ball-bearing gate hinges in hot-dip galvanized steel with fixing accessories to timber, steel or concrete posts or walls where indicated.

All solid panel gates shall have a pad-bolt fitted to enable the gate to be locked from the inside.

Install latches, pad-bolts or locks where indicated and include drop bolt for double gates, complete with anti-lift-off bracket to top hinge.

C **Framing:**

Construct gate framing out of 25 mm nominal diameter galvanized pipe with 20 mm nominal diameter pipe braces.

Hinges shall be galvanized steel with "U" bolt fixings to each gate, and galvanized drop bolt and keeper to one gate of each pair. Gate latch shall be galvanized "D" type with tongue and stop to double gates and galvanized hook latch to single gates.

Hang gates true and plumb to fence posts, and leave ready for sheeting to match adjoining fencing.

Build-in 150 (length) x 20 mm diameter galvanized pipe to concrete at gate entry to receive gate bolt. Where this is not practicable, drill concrete for pipe, set firmly and make good.

D **Colorbond gates:**

Colorbond facing shall be 0.45 mm sheet steel to required colour, with Colorbond capping. Fix with self-tapping cadmium plated screws at 150 mm maximum centres.

Paint frame in accordance with Clause R-19 Substrate: Non-Galvanised, Non-Primed Steel.

E **Zincalume sheeted gates:**

Zincalume facing shall be 0.40 mm sheet steel with capping. Fix with self-tapping cadmium plated screws or compatible steel rivets, at 150 mm maximum centres.

Spray paint entire gate in Latex primer for galvanised steel (APAS 0134).

Paint frame in accordance with Clause R-19 Substrate: Non-Galvanised, Non-Primed Steel.

F **Horizontal board gates:**

Construct gates in horizontal board fences to match fence, with boards 6 mm apart and fixed to pipe frame with two 10 mm galvanized bolts at each crossing. Construct 125 mm diameter hand hole in one leaf.

S-14 STAINING AND PAINTING

Refer to PAINTING Section.

END OF SECTION

SECTION T - DRAINAGE

CONTENTS

T-01 SUMMARY

Provide sanitary, stormwater and subsoil drainage, including connection to approved discharge points, as required.

Underground services and surface drainage layouts indicated are diagrammatic only, and are subject to the requirements of the relevant authority.

Inspect the site during the Tender Period and include all authority requirements in the Contract Sum. Where required to connect into existing drains, include cost of locating, excavating and re-instating pits, roads, kerbs, nature strips, paths and the like. Where authority requirements vary from those indicated, obtain clarification from the Superintendent before commencing.

- Coordinate with DEMOLITION, GROUNDWORKS, PLUMBING and ROOFING Sections.
- Refer to GROUNDWORKS Section for excavation and back-filling.

Coordinate work to ensure minimum duration of open trenches and openings into main drains

T-02 REFERENCES

Comply with the following Standards. Keep Standards marked (*) on site during work.

AS 3500 (*) National plumbing and drainage code.

T-03 SUBMISSIONS

A **Superintendent's Inspections:**

Give sufficient notice so that the Superintendent may inspect the following:

- Trenches excavated and pipe bedding placed.
- Pipes installed and ready for testing.
- Underground or enclosed work ready to be covered or concealed.

Obtain approval from the Superintendent at each stage before proceeding with the next stage.

B **Authority requirements:**

Sanitary drainage shall be carried out by licensed and registered plumbers approved by the relevant authority.

Obtain approval from the relevant authority progressively as required and on completion, including the environmental protection / trade waste authority where applicable.

Arrange for and pay all fees for inspections required by the authority including:

- Below ground sanitary drains external to the building(s).
- Sanitary drains and waste pipes under the floor slab, before pouring concrete slabs.
- Hot and cold water services in trenches before back-filling.
- Pipes in wall cavities before closing off.
- Final inspection of internal and external sanitary and stormwater drains.

Coordinate payment of statutory fees with PLUMBING Section.

Arrange and pay for testing of sanitary drains and make good any defects.

Submit copies of the authority's approval certificates to the Superintendent. Obtain final certificate of approval of sanitary drains and submit to the Superintendent before Practical Completion. Refer to PRELIMINARIES Section for 'Notice of Completion'.

Where the authority does not carry out these inspections submit suitable certification from an independent testing agency employing licensed personnel.

C **As-built drawings:**

Submit as-built drawings of the installed stormwater and sanitary drainage layout. Indicate locations, offsets and depths from finished levels of all pipes and fittings, inspection openings, cleaning eyes, pits and the like.

T-04 PERFORMANCE

A **Protection:**

Protect the public and property which is to remain on or adjacent to the site from interference or damage. Make good any such damage to match existing.

Take responsibility for any damage, inconvenience or annoyance to any third party and for the settlement of any disputes arising without cost to the Principal.

Keep dust and noise to a minimum.

T-05 DRAINAGE MATERIALS

A **Pipes and fittings:**

Pipes and fittings shall comply with the relevant Standards.

AS/NZS 1254	PVC pipes and fittings for storm and surface water applications
AS/NZS 1260	PVC pipes and fittings for drain, waste and vent applications.
AS 1432	Copper tubes for plumbing, gasfitting and drainage applications.
AS 1589	Copper and copper alloy waste fittings.
AS 1631	Cast grey and ductile iron non-pressure pipes and fittings.
AS 1741	Vitrified clay pipes and fittings with flexible joints - Sewer quality.
AS 2439	Perforated plastics drainage and effluent pipe and fittings.
AS 3688	Water supply - Copper and copper alloy body compression and capillary fittings and threaded-end connectors.
AS 3795	Copper alloy tubes for plumbing and drainage applications.
AS 4058	Precast concrete pipes (pressure and non-pressure).
AS/NZS 4401	High-density polyethylene (PE-HD) pipes and fittings for soil and waste discharge (low and high temperature) systems inside buildings - Specifications.

Unless otherwise indicated, pipework grades shall be:

- UPVC for stormwater: Class HD (AS 1254)
- UPVC for sewer: Class SH (AS/NZS 1260)
- Vitrified clay for sewer: Grade A, Class Y (AS 1741)
- Concrete shall be used for stormwater only.
- Copper: Type D (AS 1432)

UPVC sewer and vent pipes and fittings shall be permanently marked with the manufacturer's name and the approving authority. Vitrified clay sewer pipes and fittings shall be tested and permanently marked with the approving authority.

Include bends, traps, disconnector gullies, junctions, inspection openings, and other fittings as required.

B **Jointing:**

Jointing shall comply with the relevant Standards.

AS 1646	Elastomeric seals for waterworks purposes.
AS/NZS 3879	Solvent cements and priming fluids for use with unplasticized PVC (uPVC) pipes and fittings.

Vitrified clay and concrete pipes and fittings shall be jointed with rubber ring joints. Use root growth inhibitor.

UPVC pipes and fittings shall be rubber ring jointed or solvent welded with contrasting colour dyes. Use pink cleaning agent and blue bonding agent to verify that the cleaning has taken place before bonding.

T-06 EXECUTION

A **Pipe laying:**

Comply with product information and relevant Standards.

AS 2032	Code of practice for installation of UPVC pipe systems.
AS 3725	Loads on buried concrete pipes.
AS 4060	Loads on buried vitrified clay pipes.

Lay pipes to uniform gradients, in straight runs, with watertight joints and spigot ends in the direction of flow. Use pipes in full lengths unless not otherwise practicable.

Ensure that fittings which require maintenance are easily accessible.

Keep drains clear of paths and at least 600 mm clear of walls where practicable.

B **Bedding:**

Unless otherwise directed, drainage pipes, including barrels and collars, shall be fully bedded on 75 mm of suitable sand or fine crushed rock.

Back-filling

Do not back-fill until drains have been inspected, tested where required, and approved by the relevant authority and the Superintendent.

UPVC pipes shall be covered with 100 mm of bedding material.

C **Gradients:**

Lay pipes to the maximum gradients practicable in relation to site levels, required depth of cover and authority's requirements, but not less than:

Type	Diameter (mm)	Grades (UPVC)	Grades (Clay and Concrete)
Sewer	65-80	1 in 40	Not applicable
	100	1 in 60	1 in 60
	150	1 in 80	1 in 80
Stormwater	100	1 in 100	1 in 80
	150	1 in 150	1 in 100
Subsoil	90-150	1 in 300	1 in 200

Stormwater drains shall be sewer grade, minimum diameter 100 mm, except connections between down-pipes and collection pits may be 90 mm UPVC stormwater pipe laid at minimum gradient of 1:50.

D **Cover:**

For underground pipes ensure cover not less than:

Type	No vehicle access	Vehicle access	Under building slabs
Clay	200 mm	450 mm	300 mm
Concrete	200 mm	450 mm	300 mm
UPVC	300 mm	600 mm	450 mm

When minimum cover is not practicable, encase that section of pipe in 150 mm thick 20 MPa concrete. Make adequate provision for expansion movement in pipe. Alternatively, use Class X

reinforced concrete pipe with rubber ring joints for stormwater only, or cast iron pipe where approved by the Superintendent.

No part of the pipe or pipe collars shall intrude into pavement base course.

E Pipe supports:

Above ground pipework shall be adequately supported by hangers, saddles, clamps or special brackets where required. Include support at joints, changes of direction and at suitable intervals to prevent sagging. Enable thermal movement of the pipework.

Isolate support bracket from pipe where dissimilar metals are used.

External metal brackets including their anchors shall be either hot dipped galvanised steel or a non ferrous metal.

Maximum support spacing:

Type	Horizontal pipe	Vertical pipe
PVC	AS 2032 Table 6.3	
Cast iron	2.0 metres	2.0 metres
Copper- internal	1.8 metres	1.8 metres
Copper- external	0.9 metres	1.8 metres

F Encased UPVC pipe:

Where pipes pass through or are encased in concrete, include suitable bond-breaking collars or wrapping to enable free thermal movement or otherwise construct suitable expansion joints to pipework. Ensure sufficient space and wrapping around fittings. Wrapping type may include not less than 20 mm neoprene material.

G Inspection openings:

Include inspection openings complete with purpose made covers at all bends and junctions and at 9000 mm intervals.

Completion and making good

On completion remove all debris and flush pipework completely clean. Hand over the work in a neat and tidy condition. Make good adjacent roads, paths, landscaping and buildings generally, and outside site boundaries where damaged or disturbed by drainage works.

T-07 SANITARY DRAINAGE

A Generally:

Connect sanitary drainage from the outlets of sanitary fixtures to the sewer main or septic tank, as applicable. Include required fittings, vents, traps, pits and the like.

Verify requirements with authority before installing sanitary drainage under buildings.

B Traps:

Include disconnector traps, fixture traps, gullies and boundary traps where required. Include cast iron gratings to gullies and sealed inspection covers to boundary traps.

Set gullies on a concrete base.

C Vents:

Include vent pipes as required, properly stayed, with bird-proof terminations. Include flashings and make roof penetrations watertight.

D Floor wastes:

Floor wastes to shower recesses, bathrooms, laundries and where indicated, shall be chromium plated brass grate screwed to UPVC body. Set flush with finished floor.

Laundry troughs shall be connected directly to drains. Connection of troughs to floor waste gullies is not acceptable.

Trap shower and floor wastes collecting direct waste water, and connect to the sanitary system.

Dry floor wastes, not charged by other fixtures, shall discharge directly to the outside.

E Concrete protective surrounds:

Protect sanitary drainage and fittings exposed above ground with concrete collars not less than 75 mm thick, neatly and smoothly finished not less than 75 mm above and below ground level.

Where overflow relief gullies, ground vents, disconnecting gullies and the like are located in garden or grassed areas, include 400 mm circular or square concrete surround.

T-08 STORMWATER DRAINAGE

A Generally:

Install stormwater drains from down-pipes, surface drains, agricultural drains and drainage pits to approved discharge points.

Include side entry inlets, grated inlets, inspection pits and access covers as required.

B Down-pipe connection:

Install vertical tail 75 mm above finished ground or paving level for down-pipe connection. Protect from ultra-violet radiation and other damage with concrete collar 75 mm thick extending 75 mm below ground level.

Seal down-pipes into clay pipes with mortar mix 1:3 parts cement / sand, neatly sloped and smooth.

C Kerb connection:

Where drains discharge into street channels and cores have not been left in the kerb, carefully cut, install drainage and make good. Do not break out the kerb. Where the work is unsatisfactory, the Superintendent may direct the complete section of kerb and channel to be replaced at no additional cost to the Principal.

T-09 SUBSOIL DRAINAGE

A Generally:

Agricultural drains where indicated or required shall intercept groundwater seepage and prevent water build-up behind walls and under floors. Connect drains to stormwater drainage system using stormwater pits.

B Agricultural drain:

Agricultural drain materials may include:

- Perforated plastic pipe: Type 1, Class 100 (corrugated) (AS 2439).
- Slotted 100 mm diameter UPVC pipe.
- Other suitable proprietary products including geotechnical drainage fabric.

C Installation:

Lay pipes to suitable falls and surround with 150 mm layer of 20 mm crushed rock screenings.

Back-fill with clean rubble to the underside of pavements, slabs, and top-soil filling.

D Soakage pits:

Where indicated or required, construct soakage pits.

T-10 SUMPS AND PITS

A New pits:

Construct pits of 20 MPa concrete or precast concrete to sizes not less than indicated on the Drawings or required by the authority in accordance with the relevant Standards.

AS 4198 Precast concrete access chambers for sewerage applications.

The internal size of all new pits shall be not less than 300 x 300 mm. Grated inspection openings (IOs) of 100 mm or 150 mm diameter shall not be used for surface drainage.

Set pits on compacted crushed rock base.

For in-situ concrete, minimum thickness shall be 120 mm for walls, and 150 mm for floors. For precast concrete, minimum wall and floor thickness shall be 80 mm.

Unless otherwise indicated for depths over 1.2 metres, reinforcement shall be F718.

Include built-in steps for pits over 1.0 metre deep. Include cored holes for pipe entry.

Build-in pipes and form invert with mortar mix of 1:3 parts cement / sand, finished with smooth transitions.

B **Existing pits:**

Break into existing pits to connect new work and make good to authority requirements.

C **Pit covers:**

Pit covers generally shall be precast concrete with lifting points, or metal grate with built-in metal frame where indicated.

Covers to sewer pits in roadways and paths shall be proprietary cast iron with concrete infill capable of supporting vehicular traffic.

D **Grated inlet pits:**

Construct grated inlet pits of concrete or pre-moulded polymer where indicated or where fall from buildings cannot be achieved. Set grates to match the final ground level.

Construct grated inspection openings (IOs) under all garden taps and car washing bay taps.

T-11 SEWERAGE TREATMENT

A **Grease trap:**

Where indicated or required by the authority, install a precast concrete or glass fibre grease trap of required size and type. Connect only kitchen sink waste outlet to the grease trap.

B **Septic tank system:**

Where indicated or required by the authority, install an suitable proprietary precast concrete or glass fibre septic tank system of required size and type, in accordance with the relevant Standards.

AS/NZS 1546	On-site domestic waste water treatment units.
AS/NZS 1546.1	Septic tanks.
AS 1547	Disposal systems for effluent from domestic premises.

Include suitable connecting drains, distribution pit and effluent disposal drains.

C **Sewerage treatment plant:**

Where indicated or required by the authority, install an suitable proprietary sewerage treatment plant of required size and type, in accordance with the relevant Standards.

If gravity discharge is not practicable, include an pump and pit of minimum internal size 600 x 600 mm and 900 mm below inlet pipe invert.

Coordinate with ELECTRICAL Section for electrical connection.

T-12 WORKS TO BE TAKEN OVER BY AUTHORITY

Where ownership of drainage work is to be transferred to the relevant authority, ensure that all personnel carrying out the work are accredited under the standards of that authority.

Submit written evidence of such accreditation to the Superintendent and do not commence work until approved.

Obtain all required authority approvals before commencing work and carry out all work in accordance with the authority requirements. Make good any work which fails to meet authority approval.

END OF SECTION

SECTION U - PLUMBING

CONTENTS

U-01 SUMMARY

Provide a complete plumbing installation, including sanitary fixtures and fittings, hot and cold water reticulation, tapware, gas reticulation, appliances and accessories, as required. Include pipes, vents, wastes, traps and fittings.

- Refer to PRELIMINARIES Section for 'To Be Supplied' appliances.
- Refer to DRAINAGE Section for storm water and sanitary drainage.
- Refer to FIRE PROTECTION Section for the fire safety measures applicable to each occupancy type including gas appliance safety measures, thermal cut-out devices and gas stop systems.

Plumbing work shall be carried out by qualified personnel in accordance with the Uniform Plumbing and Sewerage Regulations of Victoria and requirements of the authority.

Supply fixtures with sufficient protective wrapping to prevent damage and marking, and store in wrapping until immediately before installation. Defective fixtures shall be replaced.

All fixtures shall be white unless otherwise approved. Sizes are nominal overall dimensions. Proposed differences shall be approved before installation.

U-02 REFERENCES

Comply with product information and the following Standards. Keep product information and Standards marked (*) on site during work.

AS 3500 (*)	National plumbing and drainage code.

U-03 SUBMISSIONS

A **Fees and inspections:**

Refer to PRELIMINARIES Section for payment of area contribution extensions and head-works charges, application fees and inspection fees by the Principal.

Coordinate with DRAINAGE Section regarding timing of applications and payment of fees.

Arrange for tapping the water main and installation of the meter.

Final payment certificate will not be issued until the Contractor submits to the Superintendent the Certificate of Compliance stating that all works have been carried out to its requirements.

B **Testing:**

Arrange authority testing and approval of pipework and joints before back-filling trenches.

Test pipework to 2000 kPa in accordance with AS 2032, Sections 4.4.2, 4.4.3, 4.4.5 and 4.4.7.

AS 2032 Code of practice for installation of UPVC pipe systems.

Keep and submit accurate records of the tests of each section, including:

- Identification of pipe section.
- Test brochure.
- Test results.
- Approval of the responsible authority.

C **Warranties:**

Provide warranty for all plumbing fixtures against defects in materials and workmanship including provision for correct operation, water tightness, colour fastness, flaking, crazing and chipping of exposed surfaces, for a period of two years from Practical Completion. Include manufacturer's written product warranties.

U-04 PERFORMANCE

A **Existing services:**

Before commencing, accurately locate positions and levels of electrical and telephone cables, gas and water mains, sanitary and storm water drains existing or proposed in the vicinity of proposed work.

Where existing services are in conflict with and would cause alterations to the new work, notify the Superintendent before commencing new work.

Take responsibility for any damage to existing services and make good any damage to the relevant authority requirements without additional cost to the Principal.

B **Preparation of bases:**

Refer to CONCRETE Section for miscellaneous bases and plinths. Take responsibility for tolerances and final levelling beds to ensure that baths and shower bases are level and drain to waste outlets.

U-05 MAINS SUPPLY AND METERS

Underground water service from authority's underground main to meter position, shall be of size required by authority, complete with brass stop valve, checking valve and all required fittings. Water meters shall comply with the relevant Standards.

AS 3565 Meters for cold potable water.

Verify the location and height of the water meter with the Superintendent before proceeding.

Locate meters and hydrant cocks if any as close as practicable to the finished ground level and not more than 300 mm to top of fitting unless otherwise directed.

For single dwellings, purchase water meters from the water supply authority. Record and submit details of the registered numbers to each meter and locations.

For multi-unit projects, include check meter to the main supply line as required by the water supply authority.

Water meter for domestic supply shall have minimum 20 mm inlet/outlet.

Where a fire service is required, include an additional un-metered dedicated supply in accordance with the fire authority requirements.

Water meter shall have a suitable filter and 500 kPa pressure reduction valve on the outlet.

Water meter for high water pressure areas subject to major pressure fluctuations shall include.

- Pressure limiting valve, variable 300 - 700 kPa installed after the water meter, with filter as required by the water quality.
- Expansion valve, 15 mm internal, 700 kPa installed just before the hot water unit (after the non-return valve).

U-06 PIPEWORK

A **Generally:**

Pipework materials for water reticulation may be copper or polymer generally in accordance with the relevant Standards. Do not use galvanized steel pipe.

Verify use of copper or polymer pipe before commencing.

Do not use polymer pipe in multi-storey or exposed locations where all water reticulation shall be of copper pipework.

All copper hot water pipework including reticulated heating systems shall be insulated with minimum 15 mm pipe insulation suitable for use in external exposed applications.

B **Copper Pipe:**

Copper pipe and fittings shall comply with the relevant Standards.

AS 1167	Welding and brazing - Filler metals.
AS 1432	Copper tubes for plumbing, gasfitting and drainage applications.
AS 3688	Water supply - Copper and copper alloy body compression and capillary fittings and threaded-end connectors.

Junctions between pipes shall be made with brass or copper fittings. Use capillary fittings, compression fittings, silver brazed slip joints, or screwed joints.

Fittings shall be de-zincification resistant.

For silver brazed joints use low temperature silver brazing alloy rods to AS 1167, classification B2, and oxyacetylene heating or oxy-propane heating.

For slip joints soften and expand the pipe to make joint not less than 10 mm long for pipe size 15-20 mm.

Copper pipe shall have a wall thickness required by the authority but not less than:

Diameters	Wall thickness
100 to 80 mm	1.6 mm
65 to 25 mm	1.2 mm
18 mm	1.0 mm
15 mm	0.9 mm

Internal exposed pipework and fittings for basin, cistern and hot water unit connections shall be chromium plated.

C **Polymer - polybutylene pipe and cross linked polyethylene pipe:**

Pipe and fittings shall comply with the relevant Standards.

AS/NZS 2642	Polybutylene (PB) pipe for hot and cold water applications.
AS/NZS 2492	Cross linked polyethylene (XLPE) pipe for hot and cold water applications.
AS 3500	National plumbing and drainage code.

Piping shall be not less than class 18 pressure rating (AS 3500).

Joints shall be push fit or crimped, using only the manufacturer's purpose made fittings and tools. Use only one brand and manufacturer of pipe throughout.

Polymer pipe shall not be used in the following applications:

- Between hot water unit and temperature tempering valve.
- Part of a water meter assembly.
- Vertical riser, or within 100 mm either side of a vertical riser.
- Within 1 metre of the inlet or outlet of a hot water unit.
- Where subject to direct sunlight.

- Underground in parts of the site subject to chemical termite treatment.
- Where pipe is subject to contamination.
- Where hot water is un-tempered.
- Where not controlled by a pressure reduction valve.
- Where pipe is subject to petroleum products.
- In continuous systems in circulation loops where water is in excess of 60 C-degrees.

D **Installation:**

Install pipework in accordance with relevant Standards.

Dead legs on hot water pipes shall not exceed 2 metres.

External pipework shall laid not less than 300 mm below finished ground level. External risers extending not more than 150 mm above floor level will be accepted.

Internal pipework generally shall be concealed within roof spaces and dropped through walls to fittings. Pipes shall not be located under or within concrete floor slabs. Pipework shall not bridge between studs and brickwork.

Isolate pipework passing through brick or concrete or in contact with incompatible materials with plastic or other suitable isolating sleeves, with not less than 6 mm annular clearance.

Install pipework so that marking is visible for inspection.

Fix pipes with proprietary copper clips and brass screws only, at 1200 mm maximum centres and 230 mm from any termination or change of direction. Isolate clips from timber and pipes with 25 x 5 mm thick felt strips.

Do not restrict internal diameter of pipework by cutting, bending, joining or fixing. When pipes are joined by welding, the branch shall not extend into the internal diameter of the main.

Construct all required openings, chases, ducting to complete the installation.

Seal all fittings to walls and floors with water-proof silicon or acrylic sealant.

E **Location of pipework:**

Install cold water pipework in locations which minimise increase in temperature due to solar radiation. Pipework may be located as follows:

- External walls (horizontal pipework shall be located low down in the wall).
- Inside sarking.
- Within wall and ceiling insulation.
- Within wall framing.
- On top of ceiling joists in roof spaces that are pitched ventilated.
- Subfloor spaces where the space is accessible.

Pipework shall NOT be located as follows:

- Exposed positions on north and west facing walls.
- In contact with external cladding.
- In close proximity to the cladding under roof purlins and rafters.
- Within unventilated roof spaces.
- Within in inaccessible sub-floor spaces.

Any pipework subject to possible temperature increase from solar radiation shall be lagged with durable thermal insulation.

U-07 HOT WATER UNITS

A **Generally:**

Install hot water units in accordance with the product information and relevant Standards.

AS 1357	Valves primarily for use in warm and hot water systems.
AS 3500.4	Hot water supply systems.
AS 4426	Thermal insulation of pipework, ductwork and equipment - Selection installation and finish.

B **Pipework:**

Cold water supply to hot water units shall be 18 mm copper or 22 mm polymer. Hot water supply pipework shall be 18 mm copper or 22 mm polymer. Hot water branch pipework shall be 12 mm copper or 15 mm polymer. Pipework between shower breaching piece and outlets shall be 18 mm copper pipe or 22 mm polymer.

Hot water pipework, including expansion pipe and shower trombone, shall be pre-insulated or lagged, and all joints shall be lagged to continuously insulate pipework before fixing framing.

Lagging shall be suitable chlorofluorocarbon-free (CFC-free), flexible fire-retardant elastomeric insulation material or pre-formed aluminium foil backed rigid sectional fibre-glass. Hair felt lagging shall not be used.

Cold water supply to hot water units shall be fitted with:

- Stop valve.
- Non-return valve (duo valve).

C **Locations:**

Storage type hot water units shall be located externally on level precast concrete slab. Continuous flow type hot water units shall be mounted on an external wall with suitable corrosion resistant brackets.

Do not fix hot water units to timber fences. Where a hot water unit is adjacent to a fence, protect with 9 mm thick compressed fibre-cement sheet extended 100 mm beyond dimensions of unit.

For gas hot water units, ensure correct heat protection requirements and clearances between flue and adjacent windows, doors, fences and the like.

For gas hot water units with electric controls, install a 10 amp 240 volt weather-proof earthed GPO as close as practicable but not further than 1500 mm from the unit. For gas hot water units, ensure the gas supply is adequate while all other appliances are operating.

D **Drainage:**

Construct tundish adjacent to hot water units out of 100 mm PVC pipe set 450 mm vertically into the ground and filled with 16 mm bluestone screenings. Construct a 15 mm pipe from the hot water unit pressure relief valve to tundish, offset 1000 mm from horizontal, and finish 150 mm clear above tundish.

E **Capacities:**

Hot water unit capacities shall be:

- One bedroom units: 90 litre gas or 250 litre off-peak storage (electric) units.
- Two or three bedroom units: 135 litre gas or 315 litre off-peak storage (electric) units.
- Four bedroom units: 170 litre gas or 400 litre off-peak storage (electric) units.

U-08 SOLAR HOT WATER UNITS

A **Generally:**

Provide solar boosted hot water services as required including roof support, fittings, hot and cold-water reticulation, accessories, gas and or electrical reticulation.

- Refer to ELECTRICAL SERVICES Section for electrical installation.
- Refer to PLUMBING Section for general requirements.

Solar hot water units shall be installed in houses designated under the Solar Hot Water Scheme and Sustainable Energy Authority of Victoria (SEAV) Rebate Take Up.

The installation shall be accredited by the SEAV in order to qualify for the Rebate.

B **To Be Supplied (TBS) Items:**

Solar hot water units shall be supplied as TBS items, unless otherwise directed by the Superintendent in writing.

- Refer to PRELIMINARIES Section for "To Be Supplied Items"

C **References:**

Comply with the following Standards. Keep Standards marked (*) on site during work.

AS 1056	Storage water heaters.
AS 1357	Water supply - Valves for use with unvented water heaters.
AS/NZS 2712	Solar and heat pump water heaters - Design and construction
AS 3500	National plumbing and drainage code.
AS 3500.4 (*)	Hot water supply systems.
AS 3498	Authorization requirements for plumbing products - Water heaters and hot-water storage tanks.
AS 5601	Gas installations (AG 601).

D **Installation:**

The installation shall be carried out in accordance with the product information and the relevant Standards. Work shall be undertaken by qualified installers approved by the manufacturer.

E **Pipe-work:**

All exposed pipe shall be copper. The amount of pipe-work located externally shall be minimised. Provide thermal insulation to all hot water piping. External thermal insulation shall be weatherproof.

F **Warranty:**

Provide warranty for solar hot water units against defects in materials and workmanship including leakage for a period of seven years from Practical Completion. Include manufacturer's written product warranties.

The warranty shall include the removal and reinstallation of any faulty unit.

The Contractor shall state the maximum call out time for service calls during the warranty period.

G **Data Plate:**

Provide a durable data plate to each unit containing the following information:

- Manufacturer's trade name address and telephone number.
- Model designation or number.
- Month and year of manufacture.
- Serial number on data plate and stamped on the main body of the heater.
- Any 'warning' labels necessary.

H **Requirements:**

All units shall include the following features:

- Provide mains pressure hot water.
- Systems may be either pump - split system or close coupled passive thermo-siphon.
- Gas supplementary heating is required except that supplementary heating shall be electric in localities without town gas.
- All systems shall include an automatic frost protection system.
- Provide point of discharge for the pressure relief valves to a tundish connected to the underground pipe drainage system.

For systems with roof-top storage tanks and boosters, provide a ground level isolation switch to the power supply. Locate the switch in the laundry of kitchen. Label the switch 'SOLAR BOOSTER RESET SWITCH'.

I **Provision Of Panel Support Frames:**

Provide a standard frame assembly for sloping tile roof or sloping metal roof installation as applicable to the roof.

Frames additional to those supplied as standard with the unit, such as Raised Pitch Frames and Special Mounting Frames shall be supplied by the Contractor as required for the proper installation in accordance with product information. The Contractor shall purchase additional frame assemblies from the same manufacturer to match the panels.

J **Claiming SEAV Rebate:**

Where the Contractor supplies the unit, the Contractor shall charge the Department for the supply of the unit. The amount to be charged for the supply of the unit shall be 'the full cost of purchase (including GST) less the amount of the rebate'. Where the Department supplies the unit under TBS provisions, the Contractor shall charge for installation only.

The rebate is determined from the SEAV accredited list available.

The Contractor shall order the unit from the selected manufacturer and pay the manufacturer an amount equal to 'the full cost of purchase (including GST) less the amount of the rebate'.

Where the Department supplies the unit under TBS provisions, the Contractor shall charge for installation only. In both circumstances, the Contractor shall submit the required certification on the SEAV Application and Report Form Parts A, B and C after installation. The Superintendent / Consultant, may certify Part B as the Applicant (owner). Part D is not applicable.

The Contractor shall return the completed SEAV Application and Report Form to the manufacturer supplier in order to enable the manufacturer to claim the rebate. The form shall certify that all items are satisfactorily undertaken, i.e. all items are ticked.

The OOH may process the Payment Claim after the form is returned to the manufacturer. Information regarding the application, pricing of systems, and approved brands is obtained from the SEAV on 1300 363 744.

K **Record Form:**

Complete and the attached OOH RECORD FORM (SOLAR HOT WATER UNITS) with payment claims for the installation. Payment may be withheld until the form is returned completed.

After installation, the Contractor shall submit the completed form to the Superintendent with the Progress Variation Claim

Refer to ADDENDUM FORMS for details.

U-09 HOT WATER TEMPERATURES AND CONTROLS

A **Temperature requirements:**

All hot water supply shall be zoned as follows:

- Zone 1: Kitchen and laundry: Tempered water in the range 55 to 60 C-degrees.
- Zone 2: Bathroom: Adjustable controller ('Tempset') in the range 35 to 48 C-degrees.

For storage type hot water units, the temperature of water in the storage tank shall be in the range 60 to 75 C-degrees.

For continuous flow type gas hot water units, flow rate shall be 24 litres per minute limited to 50 C-degrees.

The above maximum temperatures shall not be exceeded.

The minimum temperature of storage type hot water units shall be less than 60 C-degrees to inhibit bacteria growth.

Kitchen and laundry outlets shall include kitchen sink, laundry trough, clothes washer and dish washer if fitted.

Bathroom outlets shall include bath, shower and handbasin (personal use).

B **Temperature controllers:**

Hot water temperature controls shall comply with authority requirements and AS 3500.4.1.

Zone 1 controllers shall be approved tempering valves complying with AS 1357.2, approved by QAS and carrying a QAS licence number.

AS 1357	Water supply - Valves for use with unvented water heaters.

The following product (s) satisfies the specification requirements: Reliance Manufacturing Company (RMC) 'TVA50HP'.

Locate tempering valves in readily accessible external locations, adjacent to hot water unit, with sufficient length of pipe to ensure that tempering valve is not less than 1 metre from any outlet.

Zone 2 controllers shall be approved adjustable electronic key-pad located in secure remote position adjusted to 42 C-degrees.

The following product (s) satisfies the specification requirements: Infinity, Rinnai, Aquamax.

U-10 TAPS AND OUTLETS

A **Generally:**

Taps, outlets and valves shall comply with the relevant Standards.

AS 1628	Water supply - Copper alloy gate, globe and non-return valves.
AS 3498	Metal bodied and plastic bodied taps.
AS/NZS 3718	Water supply - Metal bodied taps - Specified by performance.
AS 4032	Thermostatic mixing valves - Materials, design and performance requirements.

Taps and outlets shall be 15 mm nominal, chrome-plated brass. Plastic taps shall not be used.

Taps for disabled use shall be quarter-turn lever type. Basin taps generally may be quarter-turn lever type. Elsewhere tap heads shall be capstan type.

Taps shall be fitted with red and green (or blue) hot and cold indicator buttons. Hot water tap shall be on the left side. Taps shall be fitted with fibre or plastic washers.

Include wall escutcheons of satin chrome-plated brass. Tap escutcheons to tiling shall be bedded with silicone sealant.

B **Shower outlets:**

Unless otherwise indicated, family dwellings shall have wall outlets, and older persons and community residential units shall have hand held showers.

Shower outlets shall be controlled flow suitable for mains pressure or low pressure water supply as appropriate, in accordance with the relevant Standards.

AS/NZS 3662	Water supply - Water efficient mains pressure shower spray heads.

The shower shall not discharge hot or cold water over the person operating the shower taps. Shower outlets shall be located to avoid splashing or scalding.

Flow rate shall not exceed 12 litres per minute at a pressure of 250 Pa. Flow limit shall be 10 litres per minute.

Submit a water efficiency test certificate of AA rating issued by the relevant authority.

The spray pattern shall be uniform, free of any misting, with firm consistent pressure, not influenced by variations in mains supply.

Mains pressure shower outlets shall be fitted with a plastic or brass flow restrictor to the inlet and correctly faced to the water flow. Low pressure shower heads shall be free of restrictions. Any fitted restrictions shall be removed.

Wall mounted shower outlets shall be fitted with an articulated arm with multi-directional adjustable rose in chrome-plated brass. Mounting height of taps shall be 1050 mm nominal and mounting height of outlet shall be 1650 mm nominal.

C **Hand held shower outlets:**

Hand held shower assemblies shall be suitable proprietary types, constructed with moulded ABS plastic hand-piece / outlet, and reinforced vinyl hose, with no sharp or conductive components likely to cause injury. Assemblies shall be complete with vertical slide rail not less than 30 mm diameter with firmly fixed at each end, and adjustable mounting bracket for hand-piece / outlet. Hose length shall be 1500 mm.

Mounting height of taps and low end of slide rail shall be 1050 mm.

U-11 GAS SUPPLY AND APPLIANCES

A **Generally:**

Gas reticulation and appliance installation shall comply with the relevant Standards and gas supply authority requirements, and the regulations of the Plumbing Industry Commission.

AS 1464	Plastics pipes and fittings for gas reticulation - Unplasticized PVC (UPVC)
AS 2033	Installation of polyethylene pipe systems.
AS 5601	Gas installations (AG 601).

Gas installation shall carried out by a plumber licensed by the Plumbing Industry Commission.

Arrange with the gas supply authority for tapping the gas main, supply line onto site and meters. Pay all associated fees. Locate meters on the end walls to each group of dwellings and not outside front or rear door of individual dwellings.

Reticulate gas from meter to gas appliances, including all incidental work required to complete the installation. Install isolating valves where required by authority.

External gas pipework shall be installed not less than 300 mm below ground surface.

On completion, open isolating and control valves and purge and charge the system and test system to authority requirements. Pay for gas used during installation and testing.

All open flame gas fired appliances installed within a building that is to be protected by an automatic fire sprinkler system shall be fitted with an approved flame-guard system to prevent the gas flame from being extinguished on activation of a building fire sprinkler system. Where this is not possible provide an automatic gas stop system as specified in the FIRE PROTECTION Section.

B **Gas appliances:**

Install gas appliances in accordance with product information. Commission appliances by checking gas rates and operation and leave in proper working order.

Collect product information and operating instructions and leave on site in a position nominated by the Superintendent.

C **Gas stove:**

In specific occupancies gas stoves and cook tops shall be provided with an electrically operated isolating switch located remotely to enable staff to shutoff the gas supply to the gas appliance by operating a gas stop system, as detailed in the FIRE PROTECTION Section.

D **Gas space heater:**

Gas space heaters shall be console or wall furnace type as indicated.

Install heater on a plinth above the floor finish and top of carpet. Coordinate and install flues in cavities or purpose made framed ducts. Refer to MASONRY and CARPENTRY Sections.

When heaters requiring balanced flues and power flues are supplied by the Principal, flues should be supplied with the space heater.

Coordinate with ELECTRICAL Section for location of GPO adjacent to the heater.

Gas space heaters shall be provided with a thermal cut-out device as specified in the FIRE PROTECTION Section to reduce the risk of fire.

U-12 FLUES AND VENTS

All gas appliances, heaters, dryers, and all range hoods and exhaust fans, including items supplied by the Proprietor, shall be fitted with metal flues and ducts. All enclosures housing gas appliances shall be adequately ventilated in accordance with the manufacturers requirements to prevent the build-up of gas to dangerous levels.

Vent to the outside to an above roof ducted weatherproof cowl in accordance with appliance product information, gas authority requirements and BCA. Install as work proceeds. Cowls shall be coloured to match the roof colour.

Include fabricated sheet metal vents, cowls, covers and the like generally. Flues for gas heaters shall be proprietary stainless steel types. Refer to PAINTING Section for site painting.

U-13 TOILET SUITES

Toilet suites shall be suitable proprietary types made from vitreous china in accordance with the relevant Standards and approved by the relevant authority.

AS 1172 Water closet of 6/3 L capacity

AS 1978 Vitreous china used in sanitary appliances.

Toilet suites shall have a dual flush 6/3 litre capacity cistern and compatible pan. Install toilet suites for disabled use where indicated.

Cisterns shall be quiet in operation, with flush buttons clearly and permanently identified.

Seat and flap shall be double flap rigid-moulded plastic with required fixings.

Cisterns shall be porcelain unless otherwise approved.

U-14 BATHS

A **Generally:**

Baths shall be suitable proprietary types, manufactured from vitreous enamelled pressed steel in accordance with the relevant Standards and approved by the relevant authority.

AS/NZS 2023 Baths for ablutionary purposes.

Bath size shall be 1600 x 750 x 390 mm nominal. Baths 800 mm wide may be used.

B **Hydraulic lift bath:**

Hydraulic lift island baths for disabled patient care shall be suitable proprietary types.

The following product (s) satisfies the specification requirements: 'Easy Way Bath'.

Hydraulic lift island baths shall be manufactured complete with replaceable vitreous enamelled pressed steel bath, solid surface surrounds and suitable electric / hydraulic mechanisms, in accordance with the relevant Standards and approved by the relevant authority.

AS 3000 Electrical installations - (AS/NZ Wiring Rules)

Bath size shall be 1800 x 750 x 330 mm nominal with a lift range measure to top of bath from floor from 845 to 935 mm. Bath shall be fitted with an suitable safety plug.

The following product (s) satisfies the specification requirements: Kambrook 'Safety Plug'

U-15 BASINS

Hand basins shall be suitable proprietary types, manufactured from vitreous china, in accordance with the relevant Standards and approved by the relevant authority.

AS 1730 Washbasins.

AS 1978 Vitreous china used in sanitary appliances.

Basin size shall be 460 mm nominal. Basins shall have integral soap recess.

Include concealed, corrosion resistant brackets and fixings. Brackets shall be cast aluminium, of sufficient strength to ensure rigid support under normal conditions of use.

Wall hung basins shall have matching shroud.

Vanity basins shall be either self-rimming drop-in type, or semi-recessed style for narrow bench tops, with precision ground contact surfaces.

Verify number of tap-holes before ordering.

U-16 SINKS

Sinks shall be suitable proprietary types, made from minimum 20 gauge, 18/8 grade polished stainless steel, in accordance with the relevant Standards and approved by the relevant authority.

AS 1756 Household sinks.

Sink sizes shall be 1200 wide for single centre bowl and 1500 mm for double centre bowl.

Sinks shall be free of visible defects, including scratches, dents and discoloration.

Include all required fixing clips, cutting templates, plug outlets and plugs.

'Fascia' sinks shall have 15 mm tile upstand with left or right return for corner locations.

U-17 TROUGHS

Wash troughs shall be suitable proprietary types, made from 20 gauge, 18/8 grade polished stainless steel, in accordance with the relevant Standards and approved by the relevant authority.

AS 1226 Laundry troughs and tubs.

Troughs size shall be 630 x 470 mm (standard) or 470 x 630 mm (narrow) x 230 mm deep.

Troughs shall be fitted with outlet grate and tight fitting plug, and reversible by-pass if indicated.

Troughs shall be available in cabinet, inset or wall-mounted types.

Cabinets shall be made from pre-painted 0.8 mm Zincalume steel sheet, 875 mm high, of robust and durable construction, with hinged door and catch, and finished in vinyl or polyester. Cabinet troughs shall have 15 mm tile upstand with left or right hand return for corner locations.

AS 1397 Steel sheet and strip - Hot-dipped zinc-coated or aluminium/zinc-coated.

AS/NZS 2728 Prefinished / prepainted sheet metal products for interior/exterior building applications - Performance requirements.

Inset troughs shall have a rolled flat rim all round, and include a set of holding clips and screws.

Wall-mounted troughs shall mounted from two heavy duty galvanized steel cantilever brackets.

U-18 SHOWERS

A **Proprietary shower bases:**

Proprietary shower bases shall be suitable proprietary types installed in accordance with the product information and the relevant Standards, and approved by the relevant authority.

AS 3588 Shower bases and shower modules.

Shower bases shall be manufactured from:

- Sanitary grade acrylic sheet with fibre-glass reinforcement.
- Vitreous enamelled pressed steel.
- Precast polyester resin.

Shower sizes shall be 900 x 900 mm nominal or larger for self draining floors.

Set out shower alcoves to avoid butt edge joints in vinyl sheet coverings. Coordinate with FLOOR AND WALL FINISHES Section. Coordinate set-out of floor waste outlets to ensure proper turn down of vinyl sheet into double flange floor waste outlets.

B Proprietary shower enclosures:

Proprietary shower enclosures shall be suitable moulded reinforced plastic assemblies, complete with integral wall and overhead panels, in left or right hand configurations, and curtain tracks, complete with runners, hooks, and replaceable white plastic shower curtain.

- Refer to CONCRETE Section for support base.
- Refer to METALWORK Section for rails and seats.

U-19 FLOOR WASTES AND OUTLETS

All water-proof floors and shower outlets shall be fitted with leak-control double-flange floor wastes.

All baths, sinks and troughs shall be supplied with a chrome-plated brass outlet and rubber plug.

U-20 VALVE BOXES

External isolation stop valves shall be contained in moulded valve boxes with hinged flaps, nominal 150 mm size.

Protect valve boxes with 100 mm concrete surrounding base and edge.

Valve boxes located in paving shall finish flush.

External stop valves shall be not more than 150 mm from the finished ground level.

Clearly identify valve boxes by painting both faces of cover and the interior with an suitable durable paint as follows:

- Main stop valve: Red.
- Unit stop valve: Yellow.
- Garden stop valve: White.

U-21 GARDEN TAPS

Garden taps generally shall be 15 mm nominal mounted on 20 mm hard drawn copper pipe standpipe with 20 mm elbow. Locate garden taps over drainage outlets or soakage pits.

Unless otherwise indicated, standpipes shall be 700 mm above finished ground level, fixed to 75 x 50 mm red gum support post or adjacent fence post or wall.

U-22 COMMUNAL AREA TAPS

Communal area taps shall be inverted hose cocks in suitable proprietary valve boxes.

The final locations shall be determined on site by Superintendent before commencing.

U-23 RAINWATER TANKS

Rainwater tanks shall be a complete water supply system including pressure pump systems, pipework and water overflows as required.

Concrete tanks shall be ferro-concrete 22,750 litre capacity, with integral top, removable access hatch, air disconnected overflow pipe, brass outlet with 25 mm brass stop valve and shall be placed on levelled, compacted, ground.

Metal tanks shall be squat type, fabricated from 0.6 mm thick galvanized steel, with conical top, removable access hatch, down-pipe inlet fitted with strainer, air disconnected overflow and brass outlet with outlet valve to fit nominal size 25 mm copper pipe. Joints shall be lapped, double rivated, soldered with 50/50 lead/tin solder and completely sweated. Set tanks on stands where indicated.

Double tanks shall be interconnected at lower level with nominal size 25 mm copper pipe.

Connect roof guttering to discharge into tanks. Where guttering cannot be drained directly into the tank, connect with sealed siphon system.

Construct syphon system out of 100 x 50 mm PVC down-pipes securely strapped to walls at 1000 mm centres, connected and sealed into 90 mm mains water quality PVC pipe underground

connection to tank. Run pipe through a pit located adjacent to the tank, with an inverted inspection opening in the pipe to enable draining and cleaning of the pipe.

At tank overflow outlet install 0.6 mm galvanized steel sheet rainwater head with hinged lid, or other disconnected overflow connection and 100 x 50 mm PVC down-pipe terminating 500 mm above grated disconnector trap leading to overflow drain.

U-24 FIXING OF GAS COOKING APPLIANCES

Fix upright stoves and wall ovens to the floor, walls and adjacent work with suitable concealed corrosion resistant metal brackets and fixings to prevent tipping forward.

END OF SECTION

SECTION V - MASTER ANTENNA TELEVISION SYSTEM

CONTENTS

V-01 SUMMARY

Design, provide, test and commission a Master Antenna Television System (MATV), complete with associated fixings and accessories as required, including:

- Cables and connectors.
- Screening and shielding.
- Amplifiers and active components.
- Equalisers.
- Passive components.

Inspect site during the Tender Period, assess off-air signal strength and picture quality to ensure the suitability of the antennae proposed, and include all required work in the Contract Sum.

Refer to ELECTRICAL Section for power supply to antenna amplifier.

All wiring and related conduits, pipes and the like shall be built-in and concealed unless approved by the Superintendent in writing before commencing work.

V-02 REFERENCES

Comply with product information and the following Standards. Keep product information and Standards marked (*) on site during work.

AS/NZS 1053	Limits and methods of measurements of radio interference characteristics of sound and television broadcast receivers and associated equipment.
AS 1367	Multiple outlet distribution systems - Sound and vision.
AS 1417	Receiving antennas for radio and television in the frequency range 30 mHz to 1 GHz.
AS 1939	Degrees of protection provided by enclosures for electrical equipment (IP Code).
AS/NZS 3000 (*)	Electrical installations (AS/NZS Wiring Rules)
AS/NZS 3250	Approval and test specification - Mains operated electronic and related equipment for household and similar general use.
AS/NZS 3260	Approval and test specification - Safety of information technology equipment including electrical business equipment.
IEC 96-3	Radio frequency Cables - Part 3: General requirements and tests for single-unit coaxial cables for use in cabled distribution systems.
IEC 728	Cable Distribution Systems, is primarily intended for sound and television signals operating between 30 mHz and 1000 mHz.

V-03 SUBMISSIONS

A Shop drawings:

Submit a schematic system design with the Tender.

Submit complete shop drawings for approval before commencing work. Shop drawings shall include complete system design, head-end layout, installation details, and manufacturer's technical data for each item of equipment.

B Approved subcontractor:

The work shall be carried out by fully qualified and skilled personnel experienced in MATV system design and installation, and approved by the Superintendent. Submit details.

C Warranty:

Provide warranty for MATV system against defects in materials and workmanship including failure and system performance for a period of ten years from Practical Completion. Include manufacturer's written product warranties.

V-04 PERFORMANCE

A Generally:

Performance shall be stable over a range of normal operating conditions, including ambient temperature from 0 to 45 C-degrees and power supply voltage variations of +/- 10%.

B Channels:

The system shall ensure reception of all free-to-air VHF/UHF television channels, including:

Metropolitan	Regional
ABC - 2	ABC
HSV - 7	VtC
GTV - 9	PRI
ATV - 10	SCN
SBS - 28	SBS
Community - 31	

The channel number and signal polarity assignments shall relate to the repeater station providing the best off-air signal-to-noise ratio.

C Carrier levels at system outlets:

Carrier levels at any television outlet shall be within the range 65 - 75 dBmV.

D Maximum signal level:

Maximum signal level on any system transmission line shall not exceed 120 dBuV or 1.0 V peak.

E Signal level differences at outlets:

The maximum level difference for any wanted channel in signal between any two outlets shall not exceed 6 dB.

Subjective sound and picture quality

With unimpaired input, picture and sound impairment to any single parameter shall be not less than Grade 4 on the following scale (CCIE recommendation 500-1, Kyoto, 1978 Vol. XI)

5	Imperceptible
4	Perceptible (not annoying)
3	Slightly annoying
2	Annoying
1	Very annoying

V-05 EQUIPMENT AND COMPONENTS

A Antenna systems:

The antenna system shall comply with the relevant Standards (AS 1417).

The antenna, or antenna system, shall ensure the best possible signal, free of interference, ghosting and other visible or audible impairments, and shall have adequate bandwidth to receive all transmitted information without affecting the relative levels of individual carriers and ensure that the signal levels off air of different channels are of a similar magnitude.

The output impedance of the antenna shall be 75 ohms. Antennae shall use F-type connectors.

Make provision for wind loading on the antenna support structure. Make provision for potential effects of shielding by adjacent structures, including known future structures, to ensure suitability of the selection and positioning of the antennae.

B **Distribution cable:**

Distribution cables shall be coaxial type with nominal characteristic of 75 ohms. The return loss and tolerance on characteristic impedance shall comply with AS 1367 Table 1. The structural return loss (SRL) of the cable shall not be less than 10 dB.

Shielding (screening) shall be sufficient to limit disturbance radiation and/or reception of unwanted signals to AS 1053, Section 4. For connections between drop-taps and wall outlets, cable with single-braid screen or the equivalent may be used, otherwise double-braid screen or equivalent shall be used.

C **Amplifiers:**

The distribution and repeater amplifiers shall ensure and maintain the required signal levels and minimise signal impairment. System design shall not require amplifiers to exceed 80% of rated output. Amplifiers may be single-channel or wide-band.

Radio frequency cable connections to the amplifier shall use appropriate F-type coaxial connectors. Saddle and clamp connectors shall not be used. Connectors shall be considered as part of the amplifier for the purpose of performance testing.

Include suitable earthing in accordance with relevant Standards (AS 3000 and AS 3250).

Off-air signal amplifiers shall ensure a high level of isolation from roof-mounted equipment to minimise possible damage due to lightning strikes.

Single and wide band amplifiers shall comply with the following minimum requirements:

Amplitude/frequency response	+/- 0.5 dB for one television channel +/- 2 dB over designed frequency range	
Input and output impedance:	75 ohms	
Cross modulation	Less than - 48 dB (for 4 channels) Less than - 60 dB (more than 4 channels)	
Isolation between outputs	22 dB	
Output level (max)	120 dBuV	
	VHF	UHF
Frequency range	40 - 230 mHz	520 - 820 mHz
Return loss ratio - Input	13 dB	8 dB
Return loss ratio - Output	13 dB	9 dB
Noise figure - Antenna amplifier	6 dB	6 dB
Noise figure - Distribution amplifier	7 dB	8 dB
Noise figure - Repeater amplifier	7 dB	8 dB

D **Outlets:**

Television outlets shall be mounted on wall plates to match GPO plates in style and colour.

Isolation at any signal frequency between system outlets shall not be less than 22 dB. The minimum return loss for individual components shall comply with AS 1367 Table 2.

Cable connections to wall outlets shall be F type coaxial connectors.

Outlets shall be socket type suitable for use with an MATV systems and incorporate mains voltage isolation.

E **Passive Components:**

Passive components shall be designed or screened to minimise the effects of radiation and/or reception of interfering signals.

Cable connections to passive components shall be F-type coaxial connectors.

The minimum return loss for individual components shall comply with AS 1367 Table 2.

V-06 INSTALLATION

Install MATV systems in accordance with the product information and AS 1417.

Conduct site tests to determine the optimum off-air signal strength and picture quality before installing antennae or masts. Submit test results to the Superintendent on request.

Amplifiers, other than antenna amplifiers and other active components, shall be installed in lockable security cabinets. Cabinets shall be accessible for servicing and weather-proof when mounted outdoors (rating IP 53 to AS 1939). Coordinate with ELECTRICAL SERVICES Section regarding position of GPOs for active equipment.

All cabling shall be installed to AS 3000 and as follows:

- External trunking shall be concealed in white UPVC conduit.
- Underground trunking shall be installed in conduit with a maximum diameter of 32 mm.
- Underground cables shall be of a water-proof construction.
- RG 11 grade cable shall be used for trunking and connection to the drop taps (directional couplers).
- RG 6 grade cable shall only be used between drop taps and the wall outlets.

Internal trunking shall be laid in the roof space and be fully accessible. Cables shall be fixed to cable-trays, catenary or ceiling joists with approved fixings at regular intervals.

Cabling to outlets shall be located in the wall framing and run in 25 mm diameter white UPVC conduit when run in brick walls.

V-07 TESTING AND COMMISSIONING

A **Generally:**

Carry out testing and commissioning in the presence of the Superintendent five days before Practical Completion to enable rectification of unsatisfactory work.

Notify Superintendent ten days before proposed date of commissioning, and submit as-built drawings and documented test results before commissioning.

Commissioning of the MATV system shall be a condition of Practical Completion.

Include all equipment required for commissioning, including a properly calibrated field strength meter and good quality colour television receiver.

Carry out qualitative and quantitative test evaluations on not less than 40% of outlets, randomly selected by the Superintendent.

B **Subjective test evaluation - Video and audio signal:**

Carry out subjective evaluation of video and audio signal on all channels as follows:

- Adjust television receiver to each designated channel under test.
- Observe picture from a distance of five times picture height in subdued ambient light.
- Evaluate and record the following:

Signal-to-noise	Check for noise or snow.
Signal-to-Hum	Check for wide horizontal.
Frequency Response	Check for smearing, streaking or edge effects on parts of the picture.
Inter and Cross-modulation	Check for vertical, diagonal or horizontal patterns
Envelope Delay	Check for horizontal displacement of colours from the outline of the images to which they belong.
Echo	Check for horizontally displaced secondary or multiple images.
Audio Quality	Check for audible background noises such as hiss, hum or buzz.

C **Quantitative test evaluation - Video signals:**

Carry out quantitative evaluation of the video signal levels of all channels with the field strength meter at the following locations:

- Off air at antenna(e)
- Launch levels at all amplifiers (headed and repeaters)
- All wall outlets.

END OF SECTION

SECTION W - TELEPHONE

CONTENTS

W-01 SUMMARY

Provide telephone cabling and pre-wiring as required.

Under the agreement between Telstra and the OOH, Telstra will install cabling and pre-wiring to the first telephone point in each dwelling or a main distribution frame (MDF) at no charge, provided that the Contractor has constructed the required trenches and access points. Arrange for Telstra to return to the site when appropriate to test and fit off to the first telephone point in each dwelling or main distribution frame.

All subsequent telephone points and wiring from the main distribution frame, and an additional return visits by Telstra for any reason, will be charged to the Contractor at standard prices.

Coordinate with Telstra and give sufficient notice to ensure that work is complete before Practical Completion so that telephone connections will be available to occupants immediately following application to Telstra. Occupants will be responsible for the cost of connections and hand-sets by direct arrangement with a carrier.

For Community Residential Units, arrange with Superintendent to obtain the name of the occupant, and have the connection made in the name of the occupant so that it is operational at handover.

Cabling and pre-wiring to subsequent telephone points or from the MDF may be carried out by Telstra or other carriers, at the Contractor's option. All work shall be carried out by Austel approved personnel.

Verify with the Superintendent the required number and location of outlets before commencing. Refer to Schedules for telephone requirements.

Where a fire sprinkler system is installed, include a dedicated cable pair for connection to the fire authority at Practical Completion or a later date. Submit authority's certificate of acceptance of the installation.

All wiring and related conduits, pipes and the like shall be built-in and concealed unless approved by the Superintendent in writing before commencing work.

Refer to FIRE PROTECTION Section for requirements with respect to the provision and location of telephones for emergency use applicable to specific occupancy types, and for the connection of Fire Panels to alarm monitoring stations.

W-02 REFERENCES

Comply with product information and the following Standards. Keep product information and Standards marked (*) on site during work.

AS/NZS 3085	Telecommunications installations - Administration of communications cabling systems.
AS/NZS 3086 (*)	Telecommunications installations - Integrated telecommunications cabling systems for small office / home office premises.

W-03 LIAISON AND COORDINATION

Liaise and coordinate with Telstra for the supply and installation of all pre-wiring conduits, pits and cabling for the system as required at the commencement of the Contract.

Contact the Telstra Pre-Provisioning Centre at the commencement of the project, but not less than 6 weeks before commencement of site trenching and enclosing the frame.

The pre-wiring installation shall be undertaken by a Telstra Approved Contractor.

*For multi unit developments, the point of contact for all pre-provisioning work and enquires from the 'Early Consultation' phase to the 'Assessment of Application' phase is Construction Research Australia Pty Ltd at:

*Amended15 Oct 2002

- Email: <telstra@conres.com.au>
- Postal address: Locked Bag 1160, Wahroonga, NSW 2076
- Telephone: , Free Call 1800 180 118 or (02) 9482-1254
- Internet www.conres.com.au

For pre-provisioning work for individual housing call Telstra Sales on 132200*.

*Amended15 Oct 2002

W-04 TRENCHING AND ENTRY POINTS

Carry out all required excavation and back-filling of common or exclusive trenches within the site at the appropriate time for pre-wiring by the authority in accordance with the authority requirements. Refer GROUNDWORKS Section.

For dwellings with concrete floors, build-in conduits of 19 mm PVC, complete with flexible joints, elbows and external ends plugged to authority requirements, to ensure concealed access from trenches to wall cavities and the like. Refer CONCRETE Section.

END OF SECTION

SECTION X - MECHANICAL SERVICES

CONTENTS

X-01 SUMMARY

Provide mechanical services including heating, evaporative cooling and air-conditioning systems, as required.

- Refer to PLUMBING Section for gas supply and fitting.
- Refer to ELECTRICAL Section for electrical power wiring and control wiring, and for exhaust fans and range hoods.
- Refer to FIRE PROTECTION Section for specific fire safety requirements on ducted heating and ventilation systems applicable to each occupancy including thermal cut-out devices and system shutdown on fire alarm.

The work of this Trade Section is performance based. Design and be responsible for the complete system (s) in accordance with the statutory and performance requirements.

All wiring and related conduits, pipes and the like shall be built-in and concealed unless approved by the Superintendent in writing before commencing work.

X-02 REFERENCES

Comply with product information and all relevant Standards, BCA requirements, OOH Standards Policy Manual and statutory requirements at the time of issue of the Building Permit.

X-03 SUBMISSIONS

A **Product data:**

Submit product information for selection and installation.

B **Shop drawings:**

Submit shop drawings for the complete design and installation of mechanical systems at a suitable scale, fully coordinated with all other services and the building fabric. Indicate all equipment, duct and register layout, and associated electrical wiring and control diagrams.

Do not order equipment or commence of installation until shop drawings have been approved by the Superintendent. Approval by the Superintendent shall not reduce or modify responsibility of the Contractor for the finished work.

C **As built drawings and User Manuals:**

At completion of the installation and commissioning of the system, submit the copies of a complete User Manual, including as-built drawings, final commissioning results and full equipment technical details.

D **Superintendent's Inspections:**

Give not less then two days notice so that Superintendent may inspect the following:

- Concealed work, before covering.

E **Copies of submissions:**

Keep copies of all submissions on site during work.

X-04 DUCTED HEATING SYSTEMS

A **Generally:**

The ducted heating system shall be designed and installed complete with all required electric and electronic controls and accessories.

Locate the unit to minimise adverse effects resulting from sound emissions, with sound attenuation to minimise emission. Avoid locating equipment close to neighbouring properties.

The furnace shall be externally located. The location shall be in a service bay beside the building. Include an enclosed riser duct to the ceiling space. Internally ceiling mounted furnaces shall not be provided.

The system shall include a factory assembled, gas fired furnace, with ceiling mounted supply air registers and return air grille connected to the furnace with proprietary duct fittings and insulated flexible ducts. The system shall be commissioned ready for continuous, automatic, safe and efficient operation.

The system design shall be carried by an experienced qualified engineer, specialist installation contractor or equipment supplier, and shall make provision for all building or structural restrictions, occupancy requirements and services coordination.

B **Design:**

The system shall be designed to maintain internal temperatures at a constant 22 C-degrees with an ambient temperature of 5 C-degrees. The equipment and duct distribution system shall be selected and sized on the basis of final building design and heat load, with a minimum rating equivalent to 42 watts per cubic metre of occupied areas, unless documented calculations can be submitted to substantiate a lesser rating. The system design shall be carried out to ensure adequate distribution of heated air to all occupied areas, with a least one ceiling supply air register to each area.

The return air grille shall be located in a suitable common area such as a central passage, and shall be complete with hinged core and filter.

Submit complete shop drawings, including locations for all equipment, duct reticulation, supply air registers, return air grille and temperature sensor / controllers.

Submit written confirmation from the duct furnace manufacturer, verifying the suitability for the project design requirements.

C Duct furnace:

The duct furnace shall be an approved natural gas fire type, including flue, cowl, controls, gas and electrical connections.

The furnace shall be mounted externally and ducted into the ceiling space. The furnace shall NOT be mounted within the roof space.

The following product (s) satisfies the specification requirements: Brivis, Lennox, Stadt.

Mount furnace off-ground on suitable galvanized steel brackets in accordance with authority requirements.

Coordinate with ELECTRICAL SERVICES Section for adjacent service light.

Coordinate with HYDRAULICS SERVICES Section to ensure adequate gas supply is available for the duct furnace. Verify with Superintendent.

D Ductwork:

The duct shall be suitable proprietary insulated fittings, insulated metal return air plenum and insulated flexible ducts.

Comply with the BCA, Amendment No 4 to Clause 3.7.1.9. All flexible ductwork used for the transfer of products initiated from a heat source that contains a flame shall comply with:

AS/NZS 4254	Ductwork for air-handling systems in buildings.
AS 1530	Methods for fire tests on building materials, components and structures.

UL 181 Burn Tests.

E **Air outlets and grilles:**

Supply air outlets shall be flush ceiling mounted, 'blow' adjustable, selected size and type for the required air quantities. Each branch take-off to supply air registers shall contain a suitable balancing device.

Outlets shall be steel or aluminium, finished with white powder coating.

The return air grille shall be flush ceiling mounted with a hinged egg-crate type core, and minimum 15 mm filter panel. Air velocity over filter shall not exceed 2.54 metres / second.

Location of registers and grilles shall be fully coordinated with adjacent services, including fire sprinkler heads, smoke detection, and lighting.

F **Controls:**

The system temperature controller shall be an approved combined temperature sensor / controller, and shall be 'user friendly', 24 hour programmable, with on / off over-ride and temperature adjustment to 35 C-degrees. All control equipment shall be year 2000 compliant.

The following product (s) satisfies the specification requirements: Siemens, Landis, or Staefa 'Chronogyr Rev11'.

The controller shall be located in an approved central area, at a nominal height of 1500 mm, in a position subject to the ambient room temperature but not effected by direct solar radiation.

G **Fire Protection:**

Refer to FIRE PROTECTION Section for requirements applicable to each occupancy for ducted heating systems including thermal cut-out devices and shut-down of system on fire alarm.

H **Commissioning and service:**

At completion, the system shall be fully commissioned for correct operation in all modes, and air balanced to ensure adequate airflow to all areas.

I **Warranty:**

Provide warranty for the ducted heating system against defects in materials and workmanship for a period of five years from Practical Completion. Include manufacturer's written product warranties.

Provide a maintenance service agreement for a period of one year from Practical Completion.

X-05 EVAPORATIVE COOLING SYSTEMS

Locate the unit so as to minimise adverse effects resulting from sound emissions. Include sound attenuation to minimise emission. Avoid locating equipment close to neighbouring properties.

Domestic evaporative cooling systems shall be approved proprietary units, with cold water supply and electric controls and circulating fans, and associated supply air ducts, in accordance with the product information and relevant Standards.

AS 2913 Evaporative air-conditioning equipment.

Evaporative cooling systems shall be sized in accordance with the manufacturer's tables with not less than one supply outlet in each living area.

X-06 DUCTED AIR CONDITIONING SYSTEMS

A **Generally:**

Ducted airconditioning systems shall be approved proprietary units, with electric controls and circulating fans, and associated supply air ducts, registers and return air, in accordance with the product information and relevant Standards.

AS 1661 Air-conditioning units - Methods of assessing and rating performance.

AS 1861.1 Refrigerated room air-conditioners.

AS 1861.2 Refrigerated package air-conditioners.

AS/NZS 3179 Approval and test specification - Refrigerated room air-conditioners.

Locate the unit so as to minimise adverse effects resulting from sound emissions. Include sound attenuation to minimise emission. Avoid locating equipment close to neighbouring properties.

Air conditioning systems shall be sized in accordance with the manufacturer's tables with not less than one supply outlet in each living and sleeping area, and bathroom.

Controls shall include time clocks and thermostats, located in secure positions. Verify positions with Superintendent before installing.

Equipment and ductwork shall be ceiling mounted unless otherwise approved. Ceilings registers shall be colour coordinated with ceiling and shall be vandal-proof.

B **Fire Protection:**

Refer to FIRE PROTECTION Section for requirements applicable to each occupancy for ducted air conditioning systems including thermal cut-out devices and shut-down of system on fire alarm.

X-07 HYDRONIC PANEL CONVECTION HEATING SYSTEM

A **Generally:**

The hydronic panel convector heating system shall be designed and installed complete with all required electric and electronic controls and accessories. The system shall be commissioned ready for continuous, automatic, safe and efficient operation.

The system design shall be carried by an experienced qualified engineer, specialist installation contractor or equipment supplier, and shall make provision for all building or structural restrictions, occupancy requirements and services coordination.

B **Design:**

The system shall be designed to maintain internal temperatures at a constant 20 C-degrees with an ambient temperature of 5 C-degrees. The equipment and radiator panels shall be selected on the basis of final building design and heat load but at a minimum rating equivalent to 50 watts per cubic metre of occupied areas, unless documented calculations can be submitted to substantiate a lesser rating.

The boiler selection shall include 25% allowance for 'warm up'. The system design shall include for 'partial system operation' of only 30% radiators and reduced water flow with the inclusion of an automatic differential by-pass valve installation across the flow and return pipework.

Submit complete shop drawings, including locations for all equipment, radiators and temperature sensor / controllers.

Submit written confirmation from the manufacturer, verifying suitability of the equipment for the project design requirements.

C **Equipment:**

The boiler shall be an external mounted, natural gas powered, free-standing or wall mounted 'packaged' hydronic unit, complete with all associated pumps, diaphragm expansion tanks, fill and pressure regulating valves, water, gas and electrical connections.

In the case of larger capacity system requirements, use non-packaged built-up systems with boilers of suitable capacity.

The following product (s) satisfies the specification requirements: Raypak 'Deltapak Series', Hendy 'HR35X'

D **Radiators:**

Radiators shall be selected to suit the individual space heat load requirements in accordance with manufacturer's recommended 'heat correction factor', to operate at:

- Inlet water temperature of 85 C-degrees.
- Outlet water temperature of 65 C-degrees.
- Mean water temperature of 75 C-degrees.

The following product (s) satisfies the specification requirements: Brugman, Barlo.

Radiators for bathroom or en-suite locations shall be single panel type, and all other locations shall be of double panel type complete with side and top cover plates.

As a general guide the size of radiators for the bedrooms should be in the vicinity of 1.46 kW. Carry out all required calculations to verify heat loads.

Provide each radiator with a 'thermostatic' control valve to the inlet, complete with built-in sensing element and provision for 'locked adjustment set point' by 'memory clip' adjustment facilities. The outlet of each radiator shall be fitted with a 'Lockshield' type valve and a vandal-proof end cover.

The following product (s) satisfies the specification requirements: MNG, 'Oventrop'.

E **Pipework installation:**

Pipework shall be copper to AS 1432 Type B, with silver soldered joints. All bends are fittings shall be of fully formed long radius or proprietary items, without corrugation or flattening of the pipes.

Pipework shall be sized to suit the design water flow rates but shall be not be less than 20 mm diameter, except for final connections to the radiators. Final connection shall include approved 'escutcheon' plates at each wall penetration.

Pipework shall be concealed in walls and roof spaces. No pipework shall be installed under concrete slabs or surface mounted.

The pipework shall accommodate all thermal expansion and contraction, and shall be graded to prevent of air locks. Where sections of pipework may collect air, provide 12 mm vent valves to high points, discharging to copper tundishes drained to waste.

Before insulating or building-in pipework, carry out hydrostatic testing for not less than 24 hours, at a test pressure of 700 kPa. Submit all test results including non conforming results.

Insulation shall be closed cell type, rated at a minimum K factor of 0.037 W/m at a mean temperature of 24 C-degrees. Where exposed, insulation shall be encased with 0.5 mm thick Zincalume steel.

The following product (s) satisfies the specification requirements: 'Armaflex'.

F **Controls:**

The boiler installation shall be controlled by an approved temperature controller system. All control equipment shall be year 2000 compliant.

The following product (s) satisfies the specification requirements: Siemens, Landis, or Staefa 'Chronogyr Rev11'.

The controller shall be located in an approved central area, at a nominal height of 1500 mm, in a position subject to the ambient room temperature but not effected by direct solar radiation.

G **Commissioning and service:**

At completion, the system shall be fully commissioned for correct operation in all modes. All air shall be bled from the system and water flow rates 'balanced' to each radiator with adjustment of the thermostatic valve 'memory clip' to ensure constant room temperatures of 21 C-degrees when valves are turned on to the maximum commissioned setting.

H **Warranty:**

Provide warranty for the evaporative cooling system against defects in materials and workmanship for a period of five years from Practical Completion. Include manufacturer's written product warranties.

Provide a maintenance service agreement for a period of one year from Practical Completion.

END OF SECTION

SECTION Y - ELECTRICAL SERVICES

CONTENTS

Y-01 SUMMARY

Provide a complete electrical installation as required, including:

- Mains supply from street to distribution point in overhead or underground installation.
- Mains supply to meter box and switch board of each unit.
- Service wiring and fittings.
- General lighting and power outlets.
- Emergency lighting and exit signs.
- Electrical Earth Leakage (RCD) Protection.
- Public lighting.
- Equipment.
- Conduit and draw wire for telephone.

Inspect the site during the Tender Period and include supply authority's requirements in the Contract Sum. Where authority's requirements vary from those indicated, obtain clarification from the Superintendent before commencing.

The work shall be carried out by qualified registered personnel in accordance with the Fire Underwriters Association of Victoria and requirements of the supply authority.

- Refer MATV Section for television antennae.
- Refer TELEPHONE Section for telephone installation.
- Refer GROUNDWORKS Section for excavation and back-filling.
- Refer METALWORK Section for Meter Box.
- Refer to FIRE PROTECTION Section for specific fire safety requirements for each occupancy.

All wiring and related conduits, pipes and the like shall be built-in and concealed unless approved by the Superintendent in writing before commencing work.

Y-02 REFERENCES

Comply with product information and the following Standards. Keep product information and Standards marked (*) on site during work.

AS/NZS 3000 (*)	Electrical installations (AS/NZ Wiring Rules)
AS 3003	Adequate electrical installations in domestic premises.

Y-03 SUBMISSIONS

A **As-built drawings:**

Submit as-built drawings including location and depth of underground wiring and pits.

B **Superintendent's Inspections:**

Give not less than two days notice so that Superintendent, and authority where required, may inspect the following:

- Underground cables or conduits ready for back-filling.
- Embedded or concealed cabling or conduits before covering.
- Arrange for inspections, pay fees, and obtain final certificates from the relevant authority.
- Arrange for Principal to pay the authority for the connection and first meter reading at handover.

Y-04 PERFORMANCE

A **Load capacity:**

The electrical system shall have sufficient load capacity for correct operation under normal conditions of use.

B **Maintenance:**

Coordinate with adjacent work for required access points and locate services in accessible spaces where practicable to ensure long term maintenance access without need for structural damage.

C **Structural Integrity:**

Do not cut, notch or drill structural members or water-proof barriers to reticulate services.

All thermal insulation over exhaust fans, extra low voltage down lights and electrical control gear should be cut away and boxed to allow adequate ventilation of the equipment.

Y-05 MAINS SUPPLY

Depending whether the site is a single or multiple unit project, consult with the supply authority for an approved point of connection, and whether height brackets are required.

A **Multiple units:**

For multi-unit projects, provide underground mains supply to the distribution pillar and continue underground to the meter and general services distribution board in each block of units. Run conduits and cable in the floor slab to each unit circuit breaker box.

B **Single or individual units:**

For single or individual units, provide underground mains to the entry point, unless overhead mains are indicated. Continue to the meter box and switchboard.

Mains shall be of adequate capacity for outlets and equipment plus 10% reserve. Consult with the supply authority and provide multiphase mains if necessary.

Y-06 METER BOX AND SWITCH BOARD

A **Generally:**

Consult with supply authority and Superintendent regarding location of the meter board before commencing work. Do not locate meter boards on bedroom walls. Make provision for authority equipment and arrange installation.

B **Metering:**

Electric hot water unit and storage space heaters shall have a common meter for off-peak tariff, with dual face time clock. Lighting and power shall be on a seperate meter.

C **General Services Distribution Board:**

Where indicated, provide a general services distribution board for each block of units. Include one spare circuit each for light and power and circuits for public lighting / utilities. Provide a double 15 amp GPO. Label all circuits.

D **Switchboard:**

Where indicated, provide in each unit approved plastic switchboard units of capacity for all items indicated plus one spare circuit each for lighting and power. Include approved circuit breakers labelled to indicate the area or appliance served. Provide separate circuits for clothes drier, washing machine, electric stove, and other hard wired appliances.

Provide an earth leakage (RCD) circuit breaker to all general power and lighting circuits.

E **Public light and power:**

Public light and power shall be supplied from a separate dedicated switch board housed in a cabinet or room, pad-locked with a Power Industry lock (PI Padlock). Power Industry locks may be obtained from Engineering Services Branch, OOH, Tel. (03) 9637 4426.

F **Meter boxes:**

Meter boxes for meter boards and switchboards shall be weather-proof galvanized steel cabinets approved by the electric supply authority for single and multi-phase power.

Meter boxes shall be fabricated out of 1.0 mm thick Zincalume steel sheet, grade AZ275 (AS 1397), with punch-out holes top and bottom for cable access. Corner joins shall be folded and welded with a folded flash guard extending 8 mm at front edges. Hinged doors shall be reinforced with 6 mm folded edges, louvre vents, stay bracket and turnbuckle lock. Steel sheet, and all cuts and welds, shall be fully coated with zinc rich primer (APAS 0014/1). Refer to PAINTING Section for site painting. Refer to MASONRY Section for building in.

Meter boxes for multi-unit developments shall be lockable. Verify lock type and keying before commencing. Verify required size of meter box before commencing.

Y-07 WIRING

A **Generally:**

Wiring shall be copper cored, thermoplastic sheathed (TPS) cable, clipped at 600 mm maximum centres.

All wiring and conduits shall be concealed, including entry point to building, in a manner that will enable wiring replacement without structural work, removal of cladding or lining. Do not penetrate damp-proof courses.

Install wiring above the ceiling or below the floor and run vertically to the GPO or switch and clip to stud. Do not locate wiring in the cavity space between party walls or external masonry walls.

Provide direct wiring to fixed appliances. Junction boxes shall be fully accessible for inspection and testing.

B **Sub-Circuit Wiring:**

Install sub-circuit wiring to each of the light and power outlets indicated on the Drawings. Wiring shall be TPS, 15 amp minimum size for power, 10 amp minimum size for lighting.

C **Conduits:**

Conduits and fittings shall be swabbed, cleaned and dried internally and all rough ends and openings reamed by the electrician before wiring is installed.

D **Underground cables:**

Include cable markers at regular intervals.

E **Earthing:**

Power points, lighting outlets, metal conduits, metal framing, metal appliances, and metal hot and cold water reticulation pipework shall be earthed with twisted copper earthing wire, secured at 300 mm centres and connected to an earthing stake.

Earthing stake shall be metal and of diameter, length, and depth into ground as required by the supply authority. Locate stake as close to external walls as practicable.

Y-08 GENERAL PURPOSE OUTLETS (GPOs)

GPOs shall be earthed, 10 amp polycarbonate combined flush rocker switches, with double three pin sockets unless otherwise indicated.

Comply with the supply authority requirements for water-proof switches in wet areas.

All switches shall have a red indicator button on the rocker to indicate the ON position.

Mount GPOs on galvanized mounting plates in stud walls and recessed boxes built-in to masonry walls, 300 mm above floors and 200 mm above bench tops, unless otherwise indicated.

Provide over-size switches for disabled use where indicated.

Provide two or more circuits for GPOs in the kitchen.

Y-09 EARTH LEAKAGE PROTECTION

A Residual current devices (RCDs):

Provide residual current devices (RCDs) to all general power and lighting circuits, including the refrigerator circuit, unless otherwise directed by the Relevant Fire Safety Engineer.

Provide residual current devices (RCDs) in all new accommodation, alterations and additions except where adding, repairing and replacing GPOs, or where adding, repairing and replacing fire protection services and smoke alarms, as follows:

- GPO circuits: Switchboard type.
- Communal laundries: Circuit breaker type for all power circuits.

Residual current devices (RCDs) shall comply with AS/NZS 3000, Clause 4.14.9 and Appendix H Clause H2.6, and OOH 'Installation Guide for RCDs in Residential Projects'.

AS/NZS 3000	Electrical installations (Australian / New Zealand Wiring Rules)
AS/NZS 61008	Residual current operated circuit-breakers with integral overcurrent protection for household and similar uses (RCBOs).

Refer to FIRE PROTECTION Section for specific earth leakage protection requirements applicable to each occupancy type.

Y-10 LIGHTING

Provide light-fittings and equipment indicated or required, and public lighting complete light-sensitive switch to lighting circuits to multi-unit projects, in accordance with relevant Standards.

AS/NZS 1158	Road lighting.
AS 3137	Approval and test specification - Luminaires (lighting fittings)

Confirm location of light-fittings and switches with the Superintendent before installing. Fit neatly to the ceiling and install trims supplied with the fitting. Keep fixings concealed.

Include energy efficient luminaires with all light-fittings. Use compact fluorescent luminaires where practicable.

Where light-fittings are not indicated, provide 5 amp white bakelite holders with 60 watt pearl luminaires. Keep fittings clear of front and rear screen doors.

Light switches shall be flush mounted rocker type with 70 x 30 mm cover plate and a red indicator button on the rocker switch to indicate the ON position. Provide minimum rating of 240V and 10 amp. Mount switches 1350 mm from the floor.

Screw fix batten holders and ceiling roses to 150 x 25 mm timber plates fixed to ceiling framing.

Y-11 ELECTRIC APPLIANCES

A Generally:

Include all required wiring and accessories such as wall box with flush blank plate, angle take off terminator, and flexible PVC conduit and cable of suitable length.

Refer to FIRE PROTECTION Section for additional specific requirements on electrical appliance safety applicable to each occupancy type.

B Oil filled electric heaters:

Oil filled electric space heaters shall be console type as indicated.

Install heater on a plinth above the floor finish and top of carpet. Refer CARPENTRY Section for building in.

C Electric stove and hot plates:

Wiring circuit shall be suitable for stove rating and comply with supply authority requirements.

Assemble stove and install according to product information. Connect to supply, test and leave fully operational.

Upright stoves shall be fixed to the floor or walls with suitable concealed corrosion resistant metal brackets and fixings to prevent tipping forward.

In specific occupancies identified in FIRE PROTECTION Section an additional electrically operated isolating switch shall be located remotely within a nominated location and shall be wired in series with the local appliance isolating switch required by AS/NZS 3000 to enable staff to manually shut-off the power supply to the electric stove and or hot plate from a remote location.

D Hot water unit:

For electric storage hot water units, connect the main heating element to the off-peak tariff circuit and to a separate circuit breaker in the switchboard. Arrange with the supply authority for provision of a time clock control. Test and leave fully operational.

For instantaneous hot water units with electric controls, provide a 10 amp 240 volt external weather-proof earthed power point located as close as practicable but not further than 1500 mm from the unit.

E Electric storage space heater:

Connect to the off-peak tariff circuit and to a separate circuit breaker in the switchboard. Arrange for a time clock control with the supply authority.

Electrical storage space heaters will be controlled by a remote wall mounted thermostat supplied with the heater. Install the thermostats to the product information, provide all necessary wiring and leave in satisfactory operating order.

The electric storage space heater shall be assembled ONLY by approved specially trained and experienced electricians nominated by the supply authority or manufacturer. Pay for damages caused due to faulty installation or handling.

Electric space heaters shall be provided with a thermal cut-out device as specified in Section V - FIRE PROTECTION to reduce the risk of fire due to overheating.

Y-12 EXHAUST FANS

A Generally:

Provide ceiling and wall mounted exhaust fans and associated duct in accordance with the relevant Standards.

AS 2631	Performance of household electrical appliances - ventilating fans.

Fan blades and motor shall be vibration-free and shall operate quietly and efficiently. Fans shall have long-life motors and shall have ball bearings rated for continuous running. Fan housing and motor support framing shall be of metal sturdy construction, unless otherwise approved.

Axial flow type fans shall be equipped with an easily removable insect-proof, clip-on cover grille for the inlet and an outlet cover.

Impeller type fans shall be equipped with an automatic pressure or solenoid operated draught shutter that operates silently.

Fans shall be tested before delivery and shall carry an supply authority approval number. Fans shall include manufacturer's name plate indicating model number and motor rating.

External colour shall be white.

Include all required accessories to complete the installation including clips, screws or other fixings, duct extensions for wider wall cavities or special situations, rubber gaskets for window installations and three-pin plug unless indicated for hard wiring in both window and wall applications.

All exhaust fans should be fitted with a metal shroud extending at least 100 mm above ceiling joist to facilitate separation of thermal insulation from electrical equipment.

Include duct length for brick walls in the range 125 - 325 mm and for timber walls in the range 100 - 230 mm.

All thermal insulation over exhaust fans, extra low voltage down lights and electrical control gear should be cut away to allow adequate ventilation of the equipment.

Metal exhaust fans, having a continuous rating and electrical earth, shall be installed and wired from an adjacent power circuit which has earth leakage protection.

Consideration should be given to the provision of industrial type exhaust fans in houses where occupants are incontinent and laundry services are high.

B Warranty:

Provide warranty for exhaust fans against defects in materials and workmanship for a period of three years from Practical Completion. Include manufacturer's written product warranties.

C Performance:

The minimum air movement capacity for fans shall be:

Size (diameter)	Flow rate (m3/hr)	Motor rating (amp)
175 mm	200	0.2 amp
210 mm	240	0.3 amp
250 mm	450	0.4 amp
300 mm	615	0.5 amp
For two speed impeller fans		
250 mm	450 (High) 200 (Low)	
For dual impeller ducted fans:		
150 mm	300	0.3 amp (6m duct)
200 mm	700	0.4 amp (6m duct)

Neatly cut hole in ceiling for fans and securely fix into place. Provide three pin socket next to fan and flush mounted switch on wall, complete with red neon light and labelled 'FAN'.

Y-13 RANGE HOODS

Range hoods shall be suitable for ducted air removal to outside of building. Re-circulating systems are not acceptable. Range hoods shall be available in two sizes, nominally 600 mm and 900 mm in length.

Casings shall be available in at least four colour options which shall include white, light grey and light brown. The minimum thickness of casing material shall be 0.5 mm. The casing finish shall be of smooth even surface, be hard enough to withstand grease penetration, and suitable for cleaning by application of normal household grease removal aids of mildly abrasive nature. Range hoods shall have at least the following components:

- Two speed, mains wired, ball-bearing fan.
- Cook-top illuminating light of at least 40 watt strength.
- Separate light and fan controls.
- Safety thermal overload fan cut-off.
- Full length multi-layered aluminium filters that are dishwasher proof.
- Cleaning access to filters.
- Replacement access to light globe.

Ducted air removal range hoods shall have all necessary ducting accessories including duct attachment facility and energy efficient fire flap.

Fix range hood over the stove or range top and coordinate with ELECTRICAL SERVICES Section. Range hoods shall be ducted to the outside of the building, unless otherwise indicated.

[redacted]

Refer to METALWORK Section for ducting requirements.

Y-14 DUCTS AND ACCESS PANELS

Provide sheet metal ducting from exhaust fans and range hoods to the outside of the building. Provide weather-proof cowls and insect-proof grilles to all outlets.

Where indicated, provide inspection openings in duct walls with a removable cover panel> cover panels shall be 400 x 600 mm nominal, fabricated out of 1.0 mm Zincalume steel fully coated with zinc-rich primer. Panels shall be creased to minimise distortion and corners rounded off. Drill and fix in position with five cup-head chrome-plated screws.

Refer PAINTING Section for site painting.

Y-15 SEWAGE TREATMENT PLANT

Where indicated, provide and connect electrical equipment for the sewage treatment plant. Connect by underground cable to the public lighting circuit if provided. Install and connect control panels (overload protection, neon operating indicator, on-off switch) and time clocks in meter boxes. Test electrical equipment and leave in satisfactory operating order. Provide approved electric sump pump and install in pit complete with float switch, and isolating switch at pump.

Y-16 ELECTRIC WATER PUMP

Where water tanks are required provide and install pump. Connect power supply cable and earth wire to pump via underground PVC conduit complete with armoured flexible connection at pump. Provide water-proof GPO at pump and circuit breaker labelled 'PUMP' in the switchboard. Test pump motor and switch and leave fully operational.

Y-17 TELEVISION ANTENNA POWER SUPPLY

GPOs for television antenna amplifiers shall be on separate circuits and shall be metered on the public light and power circuits. Provide a double outlet adjacent to equipment.

Y-18 FRONT DOOR BELL

Door bells shall be mains power front door bell to all units in accordance with product information. Locate the push button adjacent to the front door and the chime in the main passage. In general housing projects, where here units are not provided with a door knocker, provide an electric door bell. In community housing projects and group and rooming house projects, refer to the schedules.

Y-19 EMERGENCY LIGHTING AND EXIT SIGNAGE

A **General:**

Refer to FIRE PROTECTION Section for specific requirements on where emergency lighting and exit signage is required.

Emergency lights and illuminated exit sign installations shall be:

- [redacted]
- Self-contained, non-maintained emergency lights.
- Self-contained, sustained (continuously illuminated) exit signs.
- Comply with AS/NZS 2293 including timer, test button, reset button and phase failure relays.
- Classified by an approved authority to AS/NZS 2293, and the classification clearly marked on the luminaire label.
- Maintenance Log Book.
- Comply with the requirements of the BCA
- Numerically identified with a permanent approved engraved labels with numbers corresponding with the log book identification and as-built drawings.

B **Installation:**

Install emergency lights and exit signs in accordance with the installation requirements detailed in this Section and connect to dedicated electrical circuits appropriately labeled at the local switchboard except that common circuits may be used for new and existing emergency lights and exit signs where it is practicable to do so.

Emergency lights and existing shall not be connected to normal lighting circuits unless specifically approved by the OOH.

New emergency lights and exit signs shall be fitted with a Nickel Cadmium (4 Amp Hour) battery. Battery shall be located within ceiling/concealed spaces and shall be readily accessible for maintenance.

Emergency lights shall either be:

- Recess mounted with 3 core PVC/PVC flexible cable, fitted with a polarised 3 pin plug top, OR;
- Recess mounted emergency lights incorporated in a normal lighting luminaire with a 4 core PVC/PVC flexible cable and polarised 4 pin plug top, OR
- Spitfire type emergency lights recessed in ceiling.

Circuit breakers on the relevant switchboards and controlling both emergency lighting fittings, exit signs and general lighting fittings shall be clearly identified and labelled with EW Cornelius type circular tags with engraved E/L symbol, and securely fixed to the escutcheon plate.

Provide an engraved notice worded 'WARNING - Interruption to supply will discharge emergency lighting batteries' securely fixed on the relevant switchboard.

C **Log Book and User Manuals:**

Provide the Log Book and User Manuals for the emergency lighting system as a part of the as-built manual for the whole project. Details shall be as required in AS 2293 Part 1.

The log book and User Manuals shall comprise:

- Hard cover plastic ring binder.
- Embossed lettering for project name on the front cover.
- Front page with Project, Principal, Sub-contractor, Consultant's names and addresses.
- Index.
- Sections as required and separated by indexed section dividers. A3 sized copies of all floor plans showing locations of emergency lights and illuminated exit signs.

- Description and manufacturer's brochures and catalogue number of all emergency luminaries and illuminated exit signs.
- A schedule of all emergency luminaries and illuminated exit signs depicting location, manufacture, catalogue number, circuit and switchboard origin.
- Log sheets for six and twelve monthly test of functions as described in AS 2293 Part 2. Each luminaire shall be listed by location and luminaire number in the log sheet and sufficient sheets shall be provided for recording test results over a five year period.

D **Testing and maintenance:**

Test the Emergency Lighting System to the satisfaction of the Inspecting Authority.

Demonstrate the operation of the emergency lighting system by performing the twelve monthly test to AS 2293 before the date of Practical Completion.

All units which fail to operate for the required period will be rejected and shall be replaced with new units which shall be similarly tested after installation.

Record the results of the test at practical completion in the log book.

Carry out the six and twelve monthly tests to AS 2293 Part 2 and record the results in the log book.

Rectify all defects, including replacement of failed luminaires during the defects liability period.

The log book shall be located as directed.

Circuit breakers on the relevant switchboards controlling emergency lighting fittings, exit signs and general lighting fittings shall be clearly identified and labelled with EW Cornelius type circular tags with engraved E/L symbol, and securely fixed to the escutcheon plate.

Provide an engraved notice worded 'WARNING - INTERRUPTION TO SUPPLY WILL DISCHARGE EMERGENCY LIGHTING BATTERIES' securely fixed on the relevant switchboard.

Y-20 POWER SUPPLY FOR PUBLIC TELEPHONE

Provide power supply and lighting for telephone as required.

Y-21 COMMISSIONING AND TESTING

On completion, commission and test the complete installation to the satisfaction of the Superintendent and the supply authority.

Submit Completion Notices to supply authority within 24 hours of the work being approved.

Neatly align switches and GPOs, and clean light-fittings before Practical Completion.

Y-22 FIXING OF ELECTRIC COOKING APPLIANCES

Fix upright stoves and wall ovens to the floor, walls and adjacent work with suitable concealed corrosion resistant metal brackets and fixings to prevent tipping forward.

END OF SECTION

SECTION Z - FIRE PROTECTION

CONTENTS

Z-01 SUMMARY

Provide fire protection including self contained smoke alarms, as required for single dwellings defined as Class 1a under the BCA and the DHS Capital Development Guidelines (CDG) Series 7 CDG 7.8 Fire Risk Management in Single Dwellings.

For fire protection for all other building types refer to the relevant Part 3 Project Schedules.

Z-02 REQUIREMENTS

A **Generally:**

Fire protection requirements for single dwellings shall be as follows:

B **Smoke alarms:**

Each building shall be provided with smoke alarms complying with the Building Control Commission Practice Note 27. The smoke alarms shall be mains powered with battery backup.

The installation shall be to the satisfaction of the relevant Building Surveyor.

C **Fire Separation of Buildings:**

Separation of single dwellings shall comply with the requirements of the BCA.

D **Door Operation:**

All doors on the escape path should be readily openable from the side that faces a person exiting the building.

E **Appliance Safety:**

Individual heaters, where provided, by the DHS shall be fixed in position and be constructed, installed and guarded in accordance with relevant Standards and the BCA.

The DHS is unable to effectively control appliances brought into single dwellings by tenants.

F **Wall and Ceiling Linings:**

Wall and ceiling linings shall be non-combustible (e.g. plasterboard, cement sheet and the like) in new houses constructed for rental purposes. During refurbishment non-combustible wall and ceiling linings shall be selected.

Non-combustible means not deemed combustible by the BCA or when tested to AS 1530.1.

G **Floor Coverings:**

For new houses and in existing houses where carpets are being replaced as part of refurbishment works, consideration should be given to selecting a carpet with low flammability and flame spread characteristics.

A pure wool carpet or equivalent shall be considered to exhibit low flammability and low flame spread characteristics in the context of floor coverings in buildings.

H **Electrical Protection:**

Earth leakage protection employing residual current devices (RCD) shall be installed to electrical switchboards supplying general power and lighting circuits.

All new electrical services shall be in accordance with AS/NZS 3000.

Earth leakage protection shall be provided to:

- All new properties;
- All fully upgraded properties;
- All buildings at the time of electrical rewiring.

The adequacy of the existing electrical wiring shall be checked prior to use by a qualified Electrician and reports retained by the facility concerned. Methods such as thermal imaging may be adopted to identify overloaded circuits.

The Electrician shall recommend the frequency of subsequent inspections, taking account of the age and state of the existing wiring and nominate any urgent works required to address any hazards. These urgent works shall be undertaken as soon as practicable.

Consideration should be given to providing protection against or minimising the risk from electrical surges.

Where the mains, main earth, or switchboard of existing installations are not in accordance with AS/NZS 3000 they shall be brought into compliance as soon as practicable.

I **Ducted Heating and Ventilation Systems:**

It is recommended that if the use of ducted heating and ventilation systems cannot be avoided, then consideration should be given to offsetting their effects by, as a minimum, the following precautions:

- Ducting shall be non-combustible when tested in accordance with AS 1530.1.
- Adequate fire prevention measures at the heat source including thermal cut-out devices.

Z-03 SMOKE ALARMS

A **Generally:**

Smoke alarms shall comply with the relevant Standards, as follows

AS 1670	Fire detection, warning control and intercom systems - System design, installation and commissioning
AS 1670.06	Smoke alarms
AS 3786	Smoke alarms

The following single product satisfies the specification requirements: (as applicable.)

- Brooks ~~Model EIFFSITL~~: Ionisation-type smoke-alarm.
- Brooks ~~Model EIFFSPTL~~: Photoelectric-type smoke-alarm.
- Brooks ~~Model EIFFSTTL~~: Heat alarm.
- Brooks ~~Visalert~~ visual alarms to be installed in units/areas occupied by the hearing impaired.*

Final selection of the type and location of smoke and heat alarms shall take into consideration the potential for nuisance and false alarms due to dust, cooking fumes, moisture etc, and the most effective response to the expected combustion products.

Ionisation smoke alarms are generally considered suitable for use in corridors and areas leading to bedrooms where bedrooms are separated from the living area by a corridor.

Ionisation smoke alarms shall be equipped with a temporary silencing control ('Hush Control') facility as part of the device. The silenced position shall be indicated or be automatically reset after an interval not more than five minutes.

Photoelectric smoke alarms are generally considered suitable for installation within bedrooms, living areas and small apartments.

Smoke alarms shall not be located in areas where they may result in false alarms. Where smoke alarms are required to be installed in areas where they may be subject to false alarms heat alarms shall be installed in lieu of smoke alarms. These areas could include bathrooms, kitchens, garages and laundries.

Self-contained smoke alarms shall operate on mains supply with rechargeable stand-by power source. The battery shall be a Lithium battery with a 10-year life span and not be removable when the unit is opened.

Externally energised, 12 volt DC, smoke or heat alarms shall be fitted with an on/off dip-switch located within the device to permit the isolation of the device for repairs and or maintenance. On isolation a fault indication shall appear on the RFP.

The self-contained, 240 volt AC, smoke alarms shall incorporate the following features:

- Battery low indication (visual or audible)
- Manual test button
- Automatic self-test function
- Main power 'ON' indication (visual)
- Alarm indication (visual)

Externally energised, 12 volt DC, smoke alarms shall incorporate the following features:

- Manual test button
- Power 'ON' indication (visual)
- Alarm indication (visual)
- Automatic self-test function
- On/off isolation dip-switch located within the device

Provide warranty for smoke alarms against defects in materials and workmanship for a period of five years from Practical Completion. Include manufacturer's written product warranties.

B Visual Alarms:

In residences occupied by the hearing impaired, visual alarms shall be installed to alert occupants in the event of a fire alarm, 240 volt AC or 12 volt DC as applicable. The visual alarms incorporate a strobe light with a 176 candela, luminous intensity.

The following single product satisfies the specification requirements: 'Brooks' Model Visalert

Visual alarms shall be approved and listed by the Scientific Services Laboratory (SSL) to meet the requirements specified and shall be designed, installed and commissioned in accordance with the manufacturer's requirements, OOH requirements, DHS-Capital Development Guidelines and other Standards or Codes as applicable.

The visual alarms shall be installed in conjunction with smoke alarms within a residence. The installation of visual alarms does not delete the need for smoke alarms. Visual alarms shall be located in the bedrooms of the hearing impaired occupants and within the living areas of the residences if required.

Where self-contained smoke alarms are provided the visual alarms shall be 240 volt AC units powered and controlled from the RFP and shall be fitted with a rechargeable stand-by battery power source. The battery shall be a Lithium battery with a 10-year life span and not be removable when the unit is opened.

Where externally energised smoke alarms are provided the visual alarms shall be 12 or 9 volt DC units powered and controlled from the RFP.

The visual alarms shall incorporate the following features:

- Audible battery low indication (240 volt AC units only).
- Manual test button.
- Automatic self-test function.
- Power 'ON' indication (visual).
- Alarm indication (visual).

END OF SECTION

REVISION HISTORY

27.09.00 (PS)

24.10.00 (PK)

08.11.00 (PS) H-12 GLAZED SHOWER SCREENS / Anodised and powdercoated aluminium.

08.11.00 (PS) J-11 MIRRORS / Anodised and powdercoated aluminium.

08.11.00 (PS) L-10 SECURITY DOORS AND INSECT SCREEN DOORS / Redrafted.

08.11.00 (PS) S-07 PALING FENCES / Use of treated Pine included.

17.11.00 (PS) V-16 FIRE INDICATOR PANEL - ADDRESSABLE

28.11.00 (PS) H-20 GARDEN SHEDS.

07.12.00 (PS) U-07 HOT WATER UNITS / B Pipework

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23.04.01 (PK) A-13 CONDUCT IN OCCUPIED AND ADJOINING PREMISES / Renamed

23.04.01 (PK) A-13D Nuisance (no dogs)

23.04.01 (PK) A-29 SITE FACILITIES FOR THE SUPERINTENDENT / Redraft

23.04.01 (PK) D-12 HYDRO-SEEDED TURF / Fescue.

23.04.01 (PK) H-10 GRAB-RAILS / ASSIST-RAILS

23.04.01 (PK) H-11 SHOWER CURTAIN RAILS / Syton now owned by Windoware.

23.04.01 (PK) H-18 INTERNAL BLINDS / (Holland Blinds) Nominated suppliers

23.04.01 (PK) H-20 GARDEN SHEDS / Sizes

23.04.01 (PK) I-21 RE-STUMPING AND TIMBER FLOOR REPAIR / Rename

23.04.01 (PK) L-20 DEFAULT DOOR LOCKS AND HARDWARE

23.04.01 Section O FLOOR AND WALL FINISHES / Revise Section generally (Delete O-13 Vinyl Tiles)

23.04.01 (PK) O-08 DOMESTIC CARPET / Nominated Suppliers

23.04.01 (PK) O-08 STAIN-RESISTANT CARPET / Nylon and Polypropylene

23.04.01 (PK) O-13 CARPET INSTALLATION / Move vacuuming to Preliminaries

23.04.01 (PK) O-14 VINYL SHEETING / 60% PVC / binder / 2 mm minimum thickness / Brands

23.04.01 (PK) S-04 PERFORMANCE / Termite attack.

23.04.01 (PK) S-06 HEIGHT AND LEVEL OF FENCES

23.04.01 (PK) S-07 PALING FENCES / Concrete plinths

23.04.01 (PK) U-06 PIPEWORK / Insert A-Generally (PK).

23.04.01 (PK) U-09 GAS SUPPLY AND APPLIANCES / Automatic gas shut-off valve.

23.04.01 Section V FIRE PROTECTION / V-10, V14, V-15, V-16 (FIP, sprinkler heads and smoke detectors)

23.04.01 (PK) X-10 Refrigerator Circuits / Delete and renumber / Amend X-09

23.04.01 (PK) X-19 EMERGENCY LIGHTING AND EXIT SIGNAGE / Include use of torches in CRUs.

--

14.05.01 (PK) A-01 / L Energy efficient construction (POLICY)

14.05.01 (PK) A-32 USE OF RAINFOREST TIMBER

14.05.01 (PK) E-07 REINFORCEMENT / Revised Australian Standard AS/NZS 4671

14.05.01 (PK) E-12, F-12, I-06 TERMITE BARRIER / Do not use chemical termite barriers

14.05.01 (PK) E-19 PORCH SLABS, STEPS AND THRESH-HOLDS / Minimum size 1550 x 1550 mm (POLICY)

14.05.01 (PK) H-17 MAIL-BOXES / shall be front or rear opening as appropriate (POLICY)

14.05.01 (PK) H-20 GARDEN LOCKERS / Renamed (POLICY)

14.05.01 (PK) H-21 GARDEN CUPBOARDS / Renamed / Area 2.5 m2. (POLICY)

14.05.01 (PK) J-07 HINGES AND HARDWARE / 150 mm D-pulls (POLICY)

14.05.01 (PK) O-14 VINYL SHEETING / 50% PVC / blador / Brands to be approved /

14.05.01 (PK) O-05 CONCRETE PAVING / Width 1000 mm, gradient not more 1:14 (POLICY)

14.05.01 (PK) U-07 HOT WATER UNITS / Capacities (POLICY)

14.05.01 (PK) U-08 TAPS AND OUTLETS / Capstan heads elsewhere (POLICY)

14.05.01 (PK) X-10 LIGHTING / Energy efficient luminaires (POLICY)

15.06.01 (PS) Title 'Volume' changed to 'PART'.

11.07.01 (PS) U-06 Copper hot water pipe to be insulated.

11.12.01 (PS) S-08 Paling fences shall be either 1650 mm or 1950 mm nominal high

12.12.01 (PS) V-22 EMERGENCY SERVICES TESTING AND SERVICING entire new clause.

12.12.01 (PS) D-16E Trees for detached houses.

14.02.02 (PS) L-16B Polycarbonate safety glass.

05.03.02 (PS) Z 03 TELEPHONE Contact for arranging telephone services.

06.03.02 (PS) V-22 EMERGENCY SERVICES TESTING AND SERVICING Statement of Maintenance

19.03.02 (PS) O-07 WATERPROOF CARPET. Clause revised.

11.07.02 (PK) U-08 SOLAR HOT WATER UNITS Add new clause

11.07.02 (PK) U-09 HOT WATER TEMPERATURES AND CONTROLS Add new clause

11.07.02 (PK) U-10 to U-23 Numbers adjusted

11.07.02 (PK) H-15C NARROW BLINDS Add new subclause

11.07.02 (PK) APPENDIX - REQUIRED FORMS Add new section

11.07.02 (PK) U-25 FIXING OF GAS COOKING APPLIANCES Add new clause

11.07.02 (PK) X-22 FIXING OF ELECTRIC COOKING APPLIANCES Add new clause

11.07.02 (PK) H-19C CLOTHES LINES Add Coopers Clothes Lines Rectangle Elevating Lines.

11.07.02 (PK) H-20 RECESSED ENTRY MATS Add new clause

11.07.02 (PK) U-06E LOCATION OF PIPEWORK / Add new subclause

11.07.02 (PK) A-20 ASBESTOS AND HAZARDOUS MATERIALS / Revised references

11.07.02 (PK) S-05 and S-06 ALIGNMENT AND HEIGHT OF FENCES / Combine. Renumber following clauses.

11.07.02 (PK) S-13E and S-13D GATES / Revise painting of frames.

11.07.02 (PK) O-17 VINYL SKIRTINGS AND COVING Revise method of cutting.

11.07.02 (PK) J-09 POISON CABINET / Revised

11.07.02 (PK) Section Y - MASTER ANTENNA TELEVISION SYSTEM and clauses renamed Section V

11.07.02 (PK) Section Z - TELEPHONE and clauses renamed Section W

11.07.02 (PK) Section W - MECHANICAL SERVICES and clauses renamed Section X

11.07.02 (PK) Section X - ELECTRICAL SERVICES and clauses renamed Section Y

11.07.02 (PK) Section V - FIRE PROTECTION and clauses renamed Section Z

11.07.02 (PK) Section Z - to apply to BCA Class 1a / CDC 7.6 detached General Rental Units only.

22.08.02 (PS) Section O - FLOORING Clause O-15, O-16, O-17 Slip Resistant Vinyl Sheet, chip impregnated and embossed, cove, wall cladding.

22.08.02 (PS) Section A-36 Warranty Clause O-15 Slip resistant vinyl sheet (slip resistance), 10 years

22.08.02 (PS) Section H-20 GARDEN LOCKERS changed to GARDEN SHEDS, door 850 wide, roof options.

22.08.02 (PS) Edition 10 released for CRU.

22.08.02 (PS) U-08 SOLAR HOT WATER UNITS Add solar booster reset switch to Subclause H.

06.09.02 (PK) Combine A-16 EXISTING SERVICES with A-17A.

06.09.02 (PK) Move A-30 to A-17 and combine with A-17B as TEMPORARY SERVICES w

06.09.02 (PK) Renumber existing clauses A-18 to A-29 as A-19 to A-30

06.09.02 (PK) Create new clause A-18 APPLICATIONS FOR NEW SERVICES CONNECTIONS from existing subclauses A-01F, G, H, I, J, and K.

06.09.02 (PK) Rename existing clauses A-02 TERMINOLOGY

06.09.02 (PK) Revise H-08 WARDROBE HANGING RAILS

06.09.02 (PK) Revise L-14 WINDOWS AND EXTERNAL SLIDING DOORS

06.09.02 (PK) Revise slip resistance Standards from AS 3661 to AS/NZS 4586.

06.09.02 (PK) Revise Section R generally for APAS instead of GPC.

06.09.02 (PK) Revise S-05 ALIGNMENT AND HEIGHT OF FENCES to 1800-2000 mm.

06.09.02 (PK) Revise S-13F GATES / Painting of Zincalume gates.

06.09.02 (PK) Revise U-20 VALVE BOXES

06.09.02 (PK) Relocate U-24 REQUIRED TAPS AND OUTLETS to Part 3 Project Schedules.

06.09.02 (PK) Revise Y-09 ELECTRICAL PROTECTION to include RCD for refrigeration circuit.

21.09.02 (PK) Rename Y-09 EARTH LEAKAGE PROTECTION.

21.09.02 (PK) Add A-13M Volatile and Inflammable substances

21.09.02 (PK) Add A-17D TEMPORARY SERVICES / Ventilator.

21.09.02 (PK) Delete R-06 COLOUR SCHEDULE and renumber following clauses

21.09.02 (PK) Revise S-01 SUMMARY (FENCES) Refer to Part 3 Project Schedules for fence heights.

21.09.02 (PK) Rename S-06 ALIGNMENT OF FENCES

02.10.02 (PK) Revise A-31 PROPRIETARY BRANDS and consequent product references (VIPP policy)

02.10.02 (PK) Revise H-13 SHOWER SEATS

04.10.02 (PK) Revise A-28D SITE ACCOMMODATION for first aid kit and sharps container.

04.10.02 (PK) Revise A-29 OCCUPATIONAL HEALTH AND SAFETY Ads AS 4939.

04.10.02 (PK) Revise Y-08 GENERAL PURPOSE OUTLETS (GPOs)

04.10.02 (PK) Revise J-13 TRIMS

04.10.02 (PK) Revise H-14 BRACKETS FOR INTERNAL BLINDS AND CURTAINS

04.10.02 (PK) Revise H-15 INTERNAL BLINDS.

15.10.02 (PS) Revise W-03 LIAISON AND COORDINATION

15.10.02 (PS) Revised Z-03 SMOKE ALARMS. Types listed

EDITION 10

Victorian Government
Department of Human Services
Office of Housing

Part 3
Edition 10(c)
Project Schedules

To be read with Parts 1 and 2

Community Residential Units (CRU)

(Fire Risk Management Guidelines 7.4)

Updated 16/03/2004 (See revision History following section Zb)

Project Information

(User note: In order to read non-printable specification writer's guide notes, view this document with the paragraph markers on (show / hide ¶) in the standard tool bar. Delete this text prior to publication.)

Works No.: ....###1

Description of Works: ....###2

Location of Works: ....

Consultant's Name: ....

Consultant's Telephone No.: ....

Project No.: ....

Project Coordinator (a Department Officer): ....

Project Coordinator's Telephone No.: ....

Specification Issue Date: ....

Contents

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(User note: In order to read specification writer's guide notes, view this document with the paragraph markers on (show / hide ¶) in the standard tool bar.)

Record of update for version Edition 10a

23/01/04 (PS) Sections W, X, Y, Z updated. Door and Window Schedules located within Section L Fire Services attachment redrafted and included as section Zb.

PREAMBLE

ADDITIONAL INFORMATION

The Part 2 - REFERENCE SPECIFICATION and the Part 3 - PROJECT SCHEDULES shall be read together.

Detailed requirements in the Part 3 - PROJECT SCHEDULES shall prevail over general requirements in the Part 2 - REFERENCE SPECIFICATION Section.

If there is any discrepancy between the requirements of the Part 2 - REFERENCE SPECIFICATION and Part 3 - PROJECT SCHEDULES, notify the Superintendent and obtain clarification before commencing.

TRADE NAMES

"Where the specification is design specific, i.e. includes a proprietary brand name it shall do so in order to indicate the design, quality or suitability of the required goods and materials and is subject to the following requirements.

The contractor may offer an alternative product of similar characteristics or type, quality, appearance, finish, method of construction and performance, after the letter of acceptance of tender has been issued subject to a Variation of the contract.

The written approval of the Superintendent shall be the only authority for use of the alternative product.

Such proposals shall include appropriate technical details and copies of original quotations and supporting documents.

The original contract sum shall be deemed to have been based on the use of the proprietary products stated in the specification.

The substitution shall be made at no additional cost to the contract, if the product is of less cost than the original the contract amount may be adjusted correspondingly.

The substitution of preferred products shall be undertaken within the provisions of VIPP."

The Principal is not bound to accept a substitution.

NOTE

Any cross-referencing of clauses between the Part 2 Reference Specification and the Part 3 Project Schedules is for convenience only, and shall not limit the obligations of the Contractor.

Also, refer to relevant drawings for location and quantities of specified equipment.

TENDER DOCUMENTS

SITE PARTICULARS (SEE ATTACHMENTS)

Title	Drawing No.	Issue	Date
Copy of titles			
Copy of Town Planning Permit			
Geotechnical / Contamination Report			
Manufacturer's Hardware Schedules			
Correspondence from services authorities:			
- Electricity			
- Gas			
- Sewer			
- Storm water			
- Water			
- Telephone			
Copy of Town Planning Permit			
Copy of Council Property Information			
Copy of Dial Before You Dig Information.			
Landscape Specification			
Fire Sprinkler Specification			
Emergency Lighting Specification			
Enhanced Security Specification			
Asbestos removal			

WORKING DRAWINGS

Title	Drawing No.	Issue	Date
Cover Sheet			
Existing Conditions / Survey Plan			
Site Plan			
Demolition / Excavation Plan			
Plans and Elevations - Type 1			
Plans and Elevations - Type 2			
Typical Joinery Details - 1			
Typical Joinery Details - 2			
Typical Structural Layout - Footings / Flooring			
Typical Structural Layout - Roofing			
Typical Services Layout - Type 1			
Typical Services Layout - Type 2			

Electrical Services			
Hydraulic Site Layout			
Fire Protection Equipment			
Mechanical services			
Civil Works Details			
Civil Works Site Layout			
Landscaping Site Layout			
Landscaping Details			

STANDARD DRAWINGS

REFER TO THE ATTACHMENTS AT REAR.

SITE PARTICULARS

SECTION A – PRELIMINARIES

Home Owners Warrantee	The project is exempt pursuant to Ministerial Order Gazette S98 23 May 2003.
CLASS OF BUILDING	
Class (BCA)	
Applicable (CDG) Fire Risk Management Guidelines	7.4
FIRE REPORT	
Reference / Author:	
DESCRIPTION OF PROJECT	
Describe	
SITE IDENTIFICATION	
Postal address:	
Certificate of Title Volume / Folio Nos.:	
Lot Nos.:	
OOH PLAN ROOM NUMBER	
Number:	
PROVISIONAL SUMS	
Excavation of Rock and or unforeseen soil conditions. (Section C)	
Watering System (Section D)	
Blinds and curtains (Clause H-15)	
Shower curtains.	
SITE MEETINGS (Clause A-08)	
Site Meetings shall be held:	Fortnightly
SITE IDENTIFICATION AND SIGN BOARDS (Clause A-10)	
A Community Information Board:	Not required
TEMPORARY HOARDING AND FENCES (Clause A-11)	
Chain-mesh fencing, 2 metres high to street boundary. Party boundaries to be fenced with permanent high paling fence or with temporary 2 metre high chain mesh fence.	Required
Other:	

HOURS OF WORK (Clause A-12)	
Additional special protection required:	Required
NOISE AND DUST (Clause A-16)	
Special Noise Limitations:	
Additional details:	
TREES TO BE RETAINED (Clause A-23)	
Additional special protection required: >	
TERMITE PROTECTION	
Termite protection:	Required / Not required.
Under floor slabs:	Required / Not required.
Under paving:	Required / Not required.
To external walls:	Required / Not required.
Under timber floor:	Required / Not required.
ASBESTOS	
Is asbestos management / removal required	
Is negative air pressurization required?	
SOIL CLASSIFICATION	
Soil Classification is:	Refer to soil test / Other

TRADE SECTIONS

SECTION B - DEMOLITION

Demolition by Contractor:	(State)
Site is vacant:	(State)
Items to demolished and removed:	(State)
Removal of objects:	(State)
Items retained and protected:	(State)
Items to be salvaged and re-used:	(State)
Items salvaged and stored:	(State)
Fences to be removed:	(State)
Items demolished by Principal:	(Before commencement) (State)
Asbestos removal:	(State)

SECTION C - GROUNDWORKS

Provisional Sum:	Excavation of Rock / Amount $
Particular project requirements:	(State)
Site stripping	
Excavation	
Fill	

SECTION D - LANDSCAPING

Nature strips:	Clean and level ground, prepare and provide seeded grass. Undertake work in accordance with Specification Part 2.
Landscape works:	Provide landscape in accordance with Consultant design Drawings, in conformity with Policy Manual, and Town Planning requirements and Specification Part 2.
Nature Strip (before):	Before completion, clean the nature strip and provide fresh topsoil and plant grass.
Nature Strip (after):	Provide Certificates from the Council's approval officer that all work has been completed to the satisfaction of the Council.
Watering system:	A simple 'domestic' installation. Do not include programmable timer.

SECTION E - CONCRETE

Footings (Clause E-17):

Concrete footings:	Contractor to notify Superintendent before pouring

	concrete footings.
Ground slabs (Clause E-18):	
Concrete floor slab construction:	Refer Structural Drawings.
Timber floor construction:	Refer Structural Drawings. Refer CARPENTRY Section.
Rejection of slabs:	Non-complying slabs may be rejected.
Sloping floors:	Sloping floors with grades to floor waste shall be on screeds and not cast in-situ with the structural slab. Provide set-down indicated on Drawings.
Set-downs for graded floors:	Graded floors (in wet areas) shall be constructed using screeds. Provide set-down in the structural slab as indicated. Forming gradients in the structural slab is not acceptable.
Gradients in bathrooms (generally):	Slope of 1:70 max to 1:80 min in accordance with AS1428.1
Gradients in shower areas (shower recess area):	Slope of 1:60 max to 1:50 min in accordance with AS1428.1
Water test to graded floors:	Immediately after forming graded floors, and before curing, notify the Superintendent and in the Superintendent's presence, carry out the following test. Measure gradients to ensure compliance with Drawings and Specifications, and carry out a water test to verify that floors drain to wastes as required. After the test remove excess water and dry floor. Replace screeds (or slabs) that do not comply.
Mat recesses:	Mat recesses not required.
Steps and thresholds (Clause E-19):	
Steps:	Slip resistant broom finish.
Tread width:	Maximum 250 mm / 300 mm.
Riser height:	Maximum 180 mm.
Location:	Refer to Drawings.
Other:	
Ramps:	Refer to Drawings. Slip resistant broom finish.
Hand rails:	Refer METALWORK. Refer Drawings.

SECTION F - MASONRY

General:

Face brick walls:	Throughout (wall, base, plinth, band, sill)
Concealed brickwork:	(State)
Face bricks selection:	Pressed bricks. (State)
Mortar colour:	Natural.
Jointing:	Raked.
Special brickwork:	(State)

Insulation:	(State)
Miscellaneous construction (Clause F-18) :	
Meter box:	(State)
Bin enclosure walls, brick:	(State)
Fences, brick:	(State)
Letter box, brick:	(State)
External walls, brick:	(State)
Front fence, brick:	(State)
Acrylic / Glass block walls (Clause F-19):	
Glass blocks:	Wolke 190 mm x 190 x 80 mm by Bremner and Sons Tel. (03) 9571-0179.
Installation:	Include reinforcement rods, mortar and silicone sealant.
Acrylic blocks:	Hy-Lite Products.
Frame:	Powdercoated aluminium frame to match windows to frame the glass blocks.
Location:	Refer to window and door schedule and drawings.

SECTION G - STRUCTURAL STEEL

Project requirements:	(State)
Pergolas:	(State)
Carports:	(State)
Protective coatings (Clause G-07):	

All structural steel to be hot dip galvanized after fabrication.

SECTION H - METALWORK

Bathroom fittings:

Soap-holders (Shower and bath):	Acorn recessed Stainless Steel Soap Holder (A1832FA) OR BRADLEY AUSTRALIA MODEL 0403 RECESSED SOAP DISH WITHOUT DRIP
Soap-holders (Laundry):	Caroma Balmoral Soap-holder. Code No. 694300.
Shower curtain rails / sliding hooks:	(For use with step-less showers) Dekora Series 9000 'Monotrack' OR Handrail Industries 'A1' track, powder coated finish, to suit shower size. Install 2100 mm above finished floor level. Refer Provisional Sums for shower curtain.
Toilet roll holders (Each WC):	Bobrick Recessed Toilet Roll Holder Cat No B-667
Towel-rails:	Dalco No. 1007, Nominal 900 / 1200 x 19 mm, SCP.
Bath frame:	By specialist fabricator. Manufacture from stainless steel in accordance with Drawings.