

Emmaus Sydenham School

Architectural Specification Tender T2 Issue 10/09/2025

Revision	Date	Comment
T2	12.09.2025	Section 1.3 Added

**Roam Architects
94 Errol Street
North Melbourne VIC 3051
Tel: +61 3 9028 2625**

0131 Preliminaries	1
0171 General requirements	28
0181 Adhesives, sealants and fasteners.....	51
0183 Metals and prefinishes.....	56
0184 Termite management	60
0185 Timber products, finishes and treatment.....	62
0193 Building access safety systems	67
0201 Demolition	73
0315 Concrete finishes	77
0342 Light steel framing	80
0344 Steel – hot-dip galvanized coatings	83
0345 Steel – protective paint coatings	85
0382 Light timber framing.....	91
0383 Composite decking	96
0423 Roofing – profiled sheet metal.....	98
0431 Cladding – combined	102
0451 Windows and glazed doors	107
0453 Doors	115
0455 Door hardware	120
0461 Glazing.....	125
0471 Insulation and pliable membranes	130
0522 Partitions – framed and lined	134
0524 Partitions – glazed.....	140
0531 Suspended ceilings – combined.....	145
0551 Joinery	150
0572 Miscellaneous furniture and equipment	157
0574 Window coverings.....	160
0581 Signage.....	162
0612 Cementitious toppings.....	165
0621 Waterproofing – wet areas	170
0641 Applied wall finishes.....	176
0651 Resilient finishes	180
0652 Carpet	186
0671 Painting	191
0673 Powder coatings.....	198
0811 Fixtures and fittings	200

0131 PRELIMINARIES

1 GENERAL

1.1 GENERAL

The Preliminaries must be based on the Contractor's own assessment of the period covered by the Construction Programme included in the Contract or the Construction Programme furnished to the Superintendent.

The Contractor shall be deemed to have inspected the Site and:

- Examined all the information made available to them, including the Drawings, Specification, Schedules, Conditions of Tendering, reports, maps, diagrams and Contract Conditions.
- Examined all information relevant to the risks, contingencies and other circumstances which could affect the Contract Sum and which is obtainable by making reasonable enquiries.
- Examined the Site and its surroundings.
- Informed themselves as far as practicable of all relevant physical conditions on and below the surface of the Site and the climatic conditions at or near the Site.
- Informed themselves of the availability of labour and the accommodation required.
- Satisfied themselves as to the correctness and sufficiency of their Tender and that the lump sum price submitted covers the cost of performing all the obligations under the Contract.

Failure to do all or any of the above items will not relieve the Contractor of their liability to perform all the obligations under the Contract.

Where staff and labour costs are involved in the Preliminaries the lump sum shall include all on-costs such as accident compensation, insurance, superannuation, long service leave, holidays with pay, public holidays, sick leave, wet weather pay, payroll tax, Site allowances and any other indirect labour costs. They are to include future cost increases for the duration of the Contract.

Where selected and/ or nominated subcontract works are arranged by the Principal, the Contractor shall expressly and specifically allow for the provision of all Preliminaries and attendance as required. The lump sum for Preliminaries shall be deemed to include the provision of all Preliminaries and attendance free of charge to those selected or nominated Subcontractors and for any provisional sums.

The Preliminaries included in the Contract Sum shall allow for the proper completion of the work and for the Contractor's attendance on all Subcontractors. Attendance is deemed to include but is not limited to:

- Management, supervision and coordination and making good of Subcontractor's work and supply agreements.
- Providing programming information, ensuring work is carried out in the proper sequence according to the accepted Construction Programme, and ensuring that all Subcontractors and suppliers carry out proper programming activities in accordance with the Specification.
- Provide as necessary:
 - . Hardstand area for all Site facilities.
 - . All Site amenities including meeting rooms, lunch, change and ablution facilities and utility connections to the Site compound.
- Attending to progress claims and payments, variation claims, cash flow information and the like.
- Ensuring adherence by all Subcontractors and suppliers to the requirements of the Contract documents.
- Issuing of Contract documents to all Subcontractors and suppliers.
- Providing the necessary personnel and equipment for all hoisting and depositing of labour, materials, plant and equipment, at the required levels, in locations from which access to the final positions is practicable, including all works associated with creating access to and egress from the building and subsequent making good. Provision of general construction plant.
- Provision of water and electricity, including power for starting up and test running, and the provision of sufficient water and electrical outlets to all areas to facilitate the carrying out of all work. Sufficient

water and electrical outlets must be provided to all external areas of the Site to facilitate the practical carrying out of external work.

- Provision of sanitary and messing accommodation and all other employee facilities required by the Site Agreement, industry practice, industrial relations agreements and industrial awards, such as covered ways, drinking fountains and the like.
- Management of Site industrial relations matters in accordance with the Contract and the Specification, including ensuring that all Subcontractors and suppliers comply with any Site agreement.
- Provision of Site communications and telephone facilities as required to undertake and complete the work.
- Provision of covered space for the Contractor's and Subcontractors plant, storage of materials and the like.
- Affording all reasonable facilities, access and ample working space for carrying out work, including all necessary scaffold, scissor-lifts, boom lifts, means of access and the like.
- Provision of temporary shoring, temporary works and temporary retaining walls.
- Provision of survey information and setting out.
- Taking responsibility for setting out all chases, holes, sleeves, conduits, bolts, pipe hangers, brackets and the like, and building in the same.
- Cutting away and afterwards making good in all trades including rectifying defective work.
- Protecting finished work and the upkeep of the protection works.
- Obtaining all Shop Drawings, As-built Drawings, samples, operational and maintenance manuals, warranties and the like from Subcontractors and suppliers, as required by the Contract documents. Coordinate and review the same and all submittals and obtain acceptance from the Superintendent.
- Provision of bins within reasonable proximity of the work and regular removal of rubbish and debris from the Site. Carrying out a thorough final clean of all areas.
- Provision of general Site security.
- Site safety.
- The health and safety of all persons employed on the Site and the occupants and users of areas adjacent to the Site, including the general public.
- The protection of property.
- The provision of hoardings, fences, guard rails, barriers, overhead protection, waterproofing protection, temporary fire protection, warning lights, first aid services and the like.
- Ensure that Subcontractors and suppliers comply with the quality assurance requirements.
- Ensure that all Subcontractors and suppliers minimise inconvenience and disruption to any occupants as well as provide all facilities, protection and any other measures as required to ensure the same.
- Making good to all affected elements of the building following the removal of temporary facilities.

1.2 DRAWINGS AND SPECIFICATION

The documents which constitute the Contract are mutually explanatory and anything contained in one but not in the other shall be equally binding as if contained in all.

Any ambiguity, discrepancy or inconsistency found in the documents shall be notified to the Superintendent.

If the Contractor fails to notify the Superintendent of any ambiguity, discrepancy or inconsistency, it shall be deemed that the Contractor has allowed in the Contract Sum for the work constituting the greater expense.

Where repetitive features are not fully drawn, they shall be similar to those which are fully drawn.

The actual position and layout of existing services in relation to each other and to the surrounding work shall be verified on Site (VOS).

All measurements necessary to achieve a neat functional layout shall be taken on the Site by the Contractor who shall ensure that clearances for operation and maintenance are adequate and not in any case less than those indicated on the Drawings.

Any doubt regarding the clear intention of the Drawings shall be brought to the attention of the Superintendent before proceeding with that specific portion of the work involved.

If either the Drawings or Specifications omit particulars of minor work which nevertheless is clearly to be inferred or is necessary for the proper execution and completion of the work, then such minor work shall be executed by the Contractor as part of the execution of the work and at no extra cost or charge to the Principal.

1.3 ROCK

General

The definition of rock for the purposes of this contract is any inground natural obstruction that cannot be removed with a machine of 20t or less in good working order by an experienced and competent operator. Upon the prompt review of the Superintendent, witnessing a smaller than (or equal to) 20t machine failing to remove the rock or inground obstruction, they will instruct the Contractor to employ a machine of greater than 20t capacity and the costs associated will be a variation to the contract and the contract sum adjusted accordingly, using the rates as provided by the Contractor in the Tender Returnable Schedules - forming part of the contract.

The removal of rock refers to any bulk or detailed excavation, floaters, shelf rock or any geotechnical obstruction as may be required in the execution of the works.

Hard ground

Hard ground for the purposes of this contract is ground that cannot be excavated at a rate exceeding 10 cubic metres per hour with a 20T excavator of good working condition and operated by an experienced and competent operator.

Rippable rocks

'Rippable rocks' are those that are 600mm or less in diameter in any direction or any rocks which can be removed by a machine of 20t or less. **Any rocks removed which are within this definition would fall within Contractor's requirement to remove off-site without any additional cost to the Principal.**

Removal of rock or hard ground

Where rock, artificial material or hard ground conditions have been identified in the schedules, drawings or geotechnical report no additional claim shall apply to such conditions. Rock, artificial material or hard ground conditions as defined above may qualify for additional payment claim subject to:

- prompt notification of the Superintendent; and
- material stockpiled until the Superintendent has assessed quantities; or
- the Superintendent or representative is on site and assesses quantities under excavation.

Assessment of rock in trenches/ footings

The following procedure applies when assessing rock removed from Trenches/ Footings.

- Promptly notify the superintendent that rock has been discovered
- \$/m3 rates as stated in the contract are to be applied to the rock as it is found in-ground (no bulking).
- Contractor to provide photos of the rock 'in place', with the depth indicated using a measuring tape in the photo.
- Contractor to also provide photos of the rock once removed are also requested but need photos in ground must also be provided.
- Contractor to provide a marked-up plan to be provided that shows the location of the rock and the approximate length, & width.
- Contractor to identify location and type of the equipment used to remove the rock.
- Contractor to notify Superintendent prior to removal of rock from site so agreement of costs can be reached before any removal off site.

Assessment of rock in bulk excavation

It is acknowledged that any rock found during bulk excavation is not possible to measure 'in ground'. For the purpose of calculating any rock being removed from bulk earthworks, the following methodology shall apply:

- Promptly notify the Superintendent that rock has been discovered

- The Contractor is to provide photo evidence and mark-ups of the location where the rock was removed.
- The Contractor may stockpile rock on site and contact the Superintendent to validate the rock removal prior to removal from site.
- The Contractor is to engage a surveyor to survey the stockpile to verify the volume of the stockpile.
- Prior to removing rock from site, the Contractor is to contact the Superintendent so they can attend site to confirm what is being taken from site is rock only with no spoil mixed in.
- Once this is verified, the confirmed volume of the stockpile shall be the volume derived from the survey which will then be multiplied by the relevant rate provided within the contract.



1.4 CONTRACTOR'S CONSULTANTS

Generally:

- Where the Contractor requires consultants (including surveyors, engineers and architects) to prepare submittals, or for advice and professional services regarding any part of the construction process, the Contractor shall engage and pay for such consultants.
- Consultants engaged by the Contractor shall be qualified and experienced, and currently practising in the type of work to be undertaken.
- Submit to the Superintendent the names and details of such consultants.
- Properly manage, instruct and coordinate such consultants.
- The consultants shall be required to enter into a collateral warranty agreement directly with the Principal if directed to do so by the Superintendent.

Professional Indemnity Insurance:

- Consultants engaged by the Contractor shall obtain, pay premiums and maintain relevant professional indemnity insurance cover for the work carried out by that consultant.
- Submit evidence of such insurance before commencing the relevant work.
- The value of such insurance cover for each and any claim shall not be less than the capital value of the work which is the subject of the consultant's design, certification, submittals, advice or professional services.

1.5 DIMENSIONS AND SCALES ON DRAWINGS

Wherever shown on the Drawings and on details issued during the Contract period, figured dimensions shall be read in preference to scale readings.

Larger scale Drawings shall be read in preference to smaller scale Drawings of the same work.

All dimensions indicated on the Drawings shall be checked on Site.

Discrepancies shall be referred to the Superintendent before the job progresses to a stage where any adjustment to such dimensions would cause additional cost or substantial variation to the intent of the Contract, providing that the discovery of such discrepancies takes place at some antecedent time.

1.6 STATUTORY REQUIREMENTS

Comply with and give all notices required by any Act of Parliament, ordinance, regulation, agreement or by-law of any authority that has jurisdiction affecting the work or their workmen. Following a request from the Superintendent, or at completion of the work or termination of the Contract for any reason, surrender to the Superintendent any documents issued by or evidencing the approval of authorities in connection with the work. The Superintendent may order that work to which any such requirement applies, shall not be undertaken until such evidence is supplied.

Coordinate all inspections and work required to achieve a Certificate of Occupancy and/ or Certificate of Final Inspection from the registered Building Surveyor. Arrange and pay for all mandatory inspections in relation to the work and for all inspections required by authorities.

1.7 REQUIRED PERMITS

Unless otherwise indicated as obtained by the Principal or the Superintendent, obtain all required permits before commencing work, pay all associated fees, comply with all permit conditions and give all required notices to the Authorities.

Submit to the Superintendent copies of all permits and associated correspondence with the Authorities immediately following receipt.

Arrange all inspections required by the authorities.

1.8 CERTIFICATION

Generally:

- Provide all certification and any other documentation associated with the construction and completion of the work as requested by the Building Certifier.
- Submit all certification properly signed and attested by the responsible parties. In addition, submit copies of all related correspondence and records.

Product Certification:

- Where nominated in the Specification, provide product certification in the form of a statutory declaration.
- The requirement to provide product certification shall not reduce or modify the requirement to provide a warranty.

Building Code Certification:

- Provide as necessary, all Building Code of Australia compliance certification, including that required for Section J Energy Efficiency Compliance.

1.9 LIABILITY AND INSURANCE

Prior to commencing work on the Site, obtain all necessary insurances, required in the Contract, and maintain in place for the full duration of the project.

1.10 NUISANCE

Work shall be carried out in and around existing buildings in a manner so as to cause the least possible inconvenience to the public, staff, clients and visitors.

Take all practicable means to minimise noise resulting from their activities. All construction equipment shall be fitted with noise suppressors, acoustic linings or shields. All tools and silencers shall be kept in first class condition at all times.

Permission shall be obtained before carrying out work involving high level noise.

Comply with AS 2436 (2010), Guide to Noise Control on Construction, Maintenance and Demolition Sites, and all statutory regulations and guidelines concerning noise and nuisance arising from the Contract being carried out.

In all aspects, take all reasonable precautions to minimise disruption in and around the Site and elsewhere including, but not limited to the following items:

- Limiting noise levels and vibration during the work from tools, plant and operation.
- Respecting the rights of staff and the general public.
- Not using radios, CD players or devices capable of similar outputs to play music or other broadcasts.
- Not using offensive language within the hearing of the building occupants, users or general public. Avoiding offensive behaviour such as wolf whistling.
- Sexual harassment or racial discrimination is illegal and regulations relative to such harassment will be enforced. Any person who in the opinion of the Superintendent contravenes these regulations will be dealt with under the relevant Act and regulations.
- Limiting offensive odours arising from the work.
- Avoiding whenever possible the need for shouting in order to communicate.
- Provision and enforcement of suitable rules among the Contractor's staff and those of the Subcontractors, suppliers and others working on Site concerning the use of proper toilet facilities and the avoidance of spitting on Site.
- Consumption of alcohol and use of illegal substances while on Site is strictly prohibited.
- The avoidance of litter, trails of dirt and dust, etc.
- Dogs are not permitted on the Site.

- Adjoining building's occupants and the general public shall be protected against dust, dirt and water nuisance. The Contractor will be deemed to have made due allowance for this within the Contract Sum.
- The area immediately around the Site shall be kept clean of dust, mud and debris at all times. Should the Contractor fail to clean or clear the area within four hours of a request to do so by the Superintendent, the Superintendent can at the Contractor's expense organise for such cleaning. The cost will be deducted from the Contract Sum.

1.11 MATERIALS HANDLING (VERTICAL AND HORIZONTAL MOVEMENT)

Make allowance to offload and horizontally and/ or vertically handle all construction materials and equipment on Site and from the street. This includes any craneage requirements.

The Contractor shall make themselves aware of all restrictions and obstacles that may prevent materials being handled into position ready for inclusion into the work and make due allowance for all suitable alternative delivery arrangements.

The Superintendent reserves the right to turn away any delivery, and accept no responsibility for costs, where suitable provisions for handling of the delivered materials have not been arranged.

1.12 ACCESS/ SCAFFOLDING

The costs associated with achieving access to the workface which may include, but not limited to, scissor lifts or boom lifts, are to be borne by the Contractor.

The cost of supplying, erecting, dismantling and transporting scaffold shall be borne by the Contractor.

1.13 MATERIALS GENERALLY

Unless specified otherwise, all materials, fittings and accessories shall be new and the best of their respective kinds and in accordance with the requirements of the current issues of the relevant Australian Standards specifications, where such exist, or in their absence with relevant British Standards specifications, or other such standard accepted by the Superintendent.

As soon as practicable after entering into the Contract, place orders for and take all measurements necessary to ensure the supply of all materials and goods necessary to carry out and complete the work and take all reasonable measures to ensure that deliveries of such materials and goods will be made at such times as to sustain the necessary rate of progress of the work to achieve Practical Completion by the due date.

All necessary scaffolding shall be erected by persons holding a Certificate of Competency as laid down in the Local Government Act.

Allow for all materials as specified.

In the event of any material not being available, refer to the Superintendent for a decision on an alternative material.

Take all necessary action and be wholly responsible for ordering all materials and work in adequate time to meet the Construction Programme.

1.14 MATERIALS SAFETY DATA SHEETS (SDS)

Provide suitable accepted industry-standard Safety Data Sheets for all materials and products delivered to the Site.

Safety Data Sheets shall be available on Site for inspection by the Superintendent at any time without notice.

1.15 METHOD OF DESCRIBING ITEMS

Where an item is described in the Contract documentation as being "similar to" or "acceptable equivalent" to that listed in a particular company's catalogue, it is clearly understood that this has been done only to set an acceptable standard. The Superintendent shall have absolute discretion in deciding whether alternative materials proposed by the Contractor are acceptable.

When selecting equipment "similar to" or "acceptable equivalent" to that nominated in the Specification, delivery dates and availability of spares shall also be equal to equipment specified, prior to their inclusion.

1.16 PROPRIETARY PRODUCTS

Handle, store, prepare and use or fix each product in accordance with its manufacturer's current printed or written recommendations/ instructions. Inform the Superintendent if these conflict with any other specified requirement. Submit copies to the Superintendent when requested.

The Contract Sum shall be deemed to be based on the products as marketed and recommendations for their use current at the time of Contract award.

Obtain confirmation from manufacturers that the products specified and recommendations for their use have not changed since that time. Where such change has occurred, inform the Superintendent and do not place orders for or use the affected products without further instruction.

1.17 RIGHTS OF OWNERSHIP

Do not remove any goods or materials from the Site or an agreed delivery location. Ownership, but not the risk, of any goods or materials shall transfer to the Principal without recourse to the Contractor's terms and conditions once delivery occurs.

1.18 CONSTRUCTION PROGRAMME

Within 5 working days of the date that the Contract takes effect, provide a Construction Programme that indicates all major activities which are necessary for the work, as required by the Contract. The submittal and subsequent acceptance by the Superintendent of the Construction Programme shall be a condition precedent to the issue of any progress payment certificate.

Work shall commence immediately on receipt of an instruction to proceed from the Principal or Superintendent.

All Site work must be complete by the "finish" programme date.

The Construction Programme shall indicate earliest and latest starting and finishing dates for each activity, milestone events, float times, resource levels and shall highlight critical path activities. Include dates for completion of significant stages of each major activity of the work, such as Shop Drawings, placing orders, manufacturing, delivery, installation on Site, placing into operation, adjustment, testing and other activities specified by the Superintendent.

The Construction Programme must also detail day to day activities for the final stages of the work, including, without limitation, setting into operation, sub-let activities, adjustment, commissioning, testing and witnessing of acceptance tests.

The programmed start and finish dates, and hence the duration given, in general, must take into account:

- Relationship and sequence of each building activity.
- Earliest and latest starting date for each building activity, taking into account rostered days off (RDOs) and public holidays.
- Key milestone dates.
- Latest date for nomination of Subcontractors and suppliers and permission for use of Shop Drawings.
- Latest date for receipt of details from the Superintendent and the Subcontractors.

Failure to complete by the stipulated finish dates may make the Contractor at fault and liable for all subsequent costs and/ or charges associated with liquidated damages.

If the Superintendent considers that the Construction Programme is not satisfactory, provide an amended Construction Programme within 5 working days of being requested to do so by the Superintendent.

The provision of the Construction Programme and any revisions thereto, shall not relieve the Contractor of any obligations under the Contract, including the obligation to not, without reasonable cause, depart from an earlier Project Programme.

The Construction Programme shall be revised by the Contractor, as directed by the Superintendent, incorporating the following:

- Any changes in the scope of the work.
- Any change in the Contractor's sequence of the execution of the work.
- Methods by which the Contractor proposes to accelerate and complete the work where delays in progress have occurred.

- Any extensions of time for Practical Completion given by the Superintendent.

Provide a commissioning and handover programme during the build up to Practical Completion, which outlines the specific requirements to the reasonable satisfaction of the Superintendent.

1.19 BUILDING PRACTITIONER'S REGISTRATION

The Contractor must hold Building Practitioner's Registration with the Victorian Building Authority as required to obtain a building permit and perform the required building works. A copy of certificates shall be provided to the Superintendent.

1.20 PROJECT MANAGEMENT PLAN (PMP)

Within 10 working days of execution of the Contract, forward to the Superintendent a copy of the Project Management Plan. The PMP shall be specific to the project. A generic PMP will not be accepted. The plan shall be audited certifying that the PMP is adequate for the purposes for which it is to be used and complies with the Contractor's quality system.

If the Contractor fails to provide an acceptable PMP, the Superintendent may deduct from the Contract amount a sum equivalent to the cost of employing a lead auditor to undertake a review and correction of the PMP.

The PMP shall incorporate the requirements of the Quality Assurance (QA), Occupational Health and Safety (OH&S) and Environmental Management Systems (EMS) for the project.

Develop and implement business management services, which integrate the following system requirements for:

- Quality Assurance Management (AS/NZS ISO 9001 (2016)).
- Occupational Health and Safety (AS/NZS ISO 45001 (2018)).
- Environmental Management (AS/ NZS ISO 14001 (2016)).

1.21 TRAFFIC MANAGEMENT PLAN

Prepare and implement a traffic management plan.

The traffic management plan shall indicate all pedestrian and vehicular traffic movements around the Site, and shall indicate all procedures, equipment and personnel required to ensure the continuous safe passage of pedestrians and vehicles.

Submit the traffic management plan to the authorities, if required, and include any additional requirements or directions of the authorities.

1.22 INFORMATION SUPPLIED IN DIGITAL FORMAT

The Contractor shall be provided with one electronic copy of the Drawings and Specification in order to assist the Contractor's production of Shop Drawings and As-built Drawings subject to the following:

- All Drawings will be supplied in DWG and PDF format, sent via email or similar electronic medium. Drawings in DWG format are supplied 'For Information Only'.
- The Superintendent and the rest of the consultant team will not be responsible for errors, omissions or inaccuracies contained within the electronic files.
- The information supplied by the Superintendent and the consultant team is subject to copyright and shall be used solely for the production of Shop Drawings and As-built Drawings and is not to be disclosed or sold to other parties.

2 QUALITY ASSURANCE

2.1 GENERAL

Quality Assurance is a part of this Contract and shall be applied to the whole of the work. The quality system employed by the Contractor shall meet the requirements of AS/NZS ISO 9001 (2016). The Contractor shall implement their quality system throughout the life of the project. It is preferable that this system has been certified by an independent JAS-ANZ certifier.

This section has been prepared as a guide for the implementation of Quality Management procedures which shall include a trade by trade assessment of the specified requirements for Shop Drawings, samples, testing, formal inspections and the selection, quality assurance and verification of the materials and workmanship contained in all trade sections of the Specification.

Should the Contractor fail to comply with any aspect of the quality system the Superintendent may deduct from the Contract Sum an appropriate sum of money to accord with the relevant breach or reject the product and have the breach rectified by the Contractor without granting an extension of time.

Retain the services of competent personnel to engineer, test and execute the work all according to a Project Quality Plan which must be prepared for acceptance as part of the Contractor's Quality Management System procedures. The Project Quality Plan shall be submitted for acceptance within 10 working days of starting on Site.

The Contractor's Quality Management System shall provide planning and inspection procedures to establish conformity to the design documents and to identify non-conformance materials and/ or items of work and to monitor and ensure its rectification. The Contractor's Project Quality Plan shall include without limitation the following:

- Statement of Contractor's company policy in respect of Quality Management.
- Description of Contractor's Quality Management System organisation and management arrangement.
- Details of components of the system and the operation of the system (project specific):
 - . Measuring and test control.
 - . Design control.
 - . Procurement control.
 - . Inspection and test plans (list-project specific).
 - . Incoming inspection.
 - . In process inspection.
 - . Final inspection.
 - . Records.
 - . Non-conformance records.
 - . Corrective action reports.

2.2 NON-CONFORMANCE SYSTEM

Implement a non-conformance system for the project and have an updated register on Site. This register shall be made available to the Superintendent upon request.

The non-conformance system shall:

- Identify and hold non-conformance work for evaluation.
- Devise method of rectification of the non-conformance for acceptance by the Quality Assessor and/ or the Superintendent.
- Implement the accepted rectification procedure.
- Implement re-inspections and retesting procedures for materials and items of work which have undergone rectification following identification of non-conformance.

2.3 PROJECT QUALITY RECORDS

The Project Quality Plan shall establish and maintain a retention system for all proforma used during the Contract in respect of Quality Management including without limitation:

- The Project Quality Plan.
- Inspections and Test Plans including inspection and test records:
 - . For incoming materials and items of works.
 - . During manufacture.
 - . During installation/ construction.
 - . During commissioning.
 - . Non-conformance and disposition reports.
 - . Corrective action reports.
 - . Statement of final conformance or disposition administration.
 - . Requests for information.
 - . Contractor's instructions to Subcontractors.

- . Superintendent Instructions.
- . Consultant instructions.
- . Shop Drawings Review.
- . Sample approval.
- . Operation and Maintenance Manuals.
- . As-built Drawings.
- . Warranties.
- . Records of formal tuition and handover activities.
- Computer compatible CAD files, word processing, spreadsheet or database files shall be created in which all documents comprising the Project Quality Records are recorded.
- Make all records pertaining to the Contract available to the Superintendent at all times. Where requested, provide the Superintendent with a copy of the records.
- Quality records may be requested by the Superintendent at the end of the project. Allow for the compilation of these records at the completion of the project where requested.

3 OCCUPATIONAL HEALTH AND SAFETY

3.1 GENERAL

Implement health and safety procedures to comply with the Occupational Health and Safety Act and AS/NZS ISO 45001 (2018).

Supply evidence to demonstrate that the Health and Safety Management System complies with the Occupational Health and Safety Act and AS/NZS ISO 45001 (2018).

Prior to starting work on Site, provide the Superintendent with a copy of the following (the list, below, is to act as a guide only and the Contractor may provide any other material which they consider relevant to comply with the Act):

- Project Health and Safety Policy and Plan. The Plan shall be specific to the project. A generic Plan will not be accepted.
- Site establishments.
- Responsibilities and duties of the project team and Subcontractors.
- Health and Safety Project check list and hazard inspection.
- Procedure for Site induction of all people entering the Site.
- Procedure for accident and incident reporting.
- Procedure for plant/ equipment maintenance and inspections.
- Procedure for competency assessment of operators.
- Emergency procedures, including building evacuation and meeting points. These shall comply with the Principal's requirements.
- Provision of adequately trained staff on call and provision of appropriate safety and medical equipment.

The Contractor controls the Site and shall induct the following people who enter the Site:

- Contractor's employees and Subcontractor's.
- Subcontractor's employees.
- Superintendent, Superintendent's Representative, Clerk of Works and Consultants.
- Principal's representative and the Principal's Safety Auditor.
- Any council, utility or authority representatives.
- Any member of the public or other visitor to the Site.

The induction shall outline the Site layout, identify hazards and describe requirements for PPE (personal protective equipment) and particular Site restrictions.

During and outside work hours, two Contractor's representatives shall be contactable and responsible for health and safety at the Site at all times. One of the safety representatives shall be on Site at all times during work hours. Their names and telephone numbers shall be listed in the Health and Safety Plan.

Hold at least one "toolbox" meeting per fortnight with all Subcontractors to ("toolbox" meetings are formal meetings where minutes are recorded):

- Take action, if any is needed, over hazards that are identified.
- Discuss any improvements that can be made to working conditions.
- Reinforce project specific or other procedures operating on Site.
- Make their employees aware of good safety procedures.
- Do anything else the Contractor may want to discuss, direct or otherwise instruct.
- Minutes shall be taken and shall form part of the Health and Safety Plan.

Health and Safety Audits:

- The Health and Safety Plan shall be made available for inspection by the Superintendent or by the Principal's Safety Auditor when requested. The Health and Safety Plan shall be submitted to the Superintendent within 10 working days of the date of the letter of acceptance or the day the Contractor mobilises the Site, whichever comes first. The Superintendent may permit the Contractor to mobilise on Site providing at least the job-specific Safety Analysis has been accepted by the Superintendent and the balance of the Health and Safety Plan contents is submitted within 10 working days of mobilisation. An extension of time shall not be granted for any delay experienced by the Contractor for not having its Health and Safety Plan accepted.

Hold Point:

- Possession of Site shall not be granted until the Health and Safety/ Emergency Response Plan has been accepted by the Superintendent.

Health and Safety/ Emergency Response Plan:

- Maintain a Health and Safety/ Emergency Response Plan and when requested submit the plan to the Superintendent for acceptance. The Health and Safety Plan shall include, as a minimum, the following items:
 - . A photocopy of all competency certificates and "tickets" as required by the Occupational Health and Safety Regulations.
 - . A documented "Work Method Statement".
 - . Documented "Job-specific Safety Analysis".
 - . Daily checklist that the plant operators and foreman propose to use.
 - . Personal protective equipment and rules for the Site.
 - . The Site Induction and Training Plan.
 - . Contact names and telephone numbers for the two senior staff who shall have responsibility for health and safety responsibilities for the project.
 - . A statement confirming that the project shall be conducted safely in accordance with the Contractor's safety management system as tendered or previously advertised.
 - . "Toolbox" meeting minutes.

Daily Site Inspections:

- Unless otherwise delegated the foreman shall conduct a daily Site inspection to identify any hazards that may not be controlled by the Job-specific Safety Analysis and take appropriate action to control any hazard that is discovered. Any hazard identified shall be recorded in the foreman's diary or other appropriate report together with the action taken.

Personal Protective Equipment:

- Where an unsolicited visitor to the Site must pass a hazardous area before being inducted, signs and/ or barricades shall warn visitors about the necessary personal protective equipment.

4 ADMINISTRATION

4.1 PROJECTED CASH FLOW

Prior to the first progress payment being made, provide an estimated monthly cash flow schedule for agreement by the Superintendent.

4.2 SUBMITTALS

Make all required submittals nominated and described in the Specification.

Submittals shall be made progressively for each stage of work.

The purpose of submittals is limited to the following:

- Establishing quality standards.
- Providing permanent records for future maintenance and replacement.
- Providing additional construction details not indicated in the Contract Documents.
- Verifying compliance with the performance-based requirements.

Approval of submittals by the Superintendent is limited to acceptance in relation to the purpose of submittals stated above.

Acceptance of submittals by the Superintendent does not mean acceptance of:

- Suitability for intended purpose and durability.
- Sizes, weights and strength of products or components.
- Work that does not comply with legislative requirements.

Acceptance of submittals by the Superintendent does not reduce or modify:

- The Contractor's responsibility to provide a warranty.
- The Contractor's obligations.
- Any right of the Principal.

4.3 CONTRACTOR'S REQUESTS FOR INFORMATION

The Contractor may issue requests for information (RFI) to the Superintendent during the construction phase of the Project. It is the Contractor's responsibility to coordinate and consolidate all queries from its suppliers and Subcontractors and then determine whether there is a genuine need to issue an RFI.

4.4 CONFIDENTIALITY

Do not, without prior acceptance, either while work is in progress or after completion, disclose or permit disclosure by or to anyone, any matter or thing relating to the Site nor cause or permit such disclosure to occur on any film, photograph, video, soundtrack, printing or other media (whether for public broadcast or otherwise), as a direct or indirect result of possession of the Site.

4.5 INSPECTION AND TEST PLANS

Inspection and test plans (ITPs) are to be compiled for each trade indicating inspections, tests and submittals required in accordance with the relevant Specification. ITPs shall clearly show the parties responsible for each activity and the record form which is being used to verify the work.

5 SITE

5.1 ACCESS

At all times, take into account the nature of the Site and the requirements of the public and owners/users of adjacent properties. The Contractor's personnel shall conduct themselves in a polite and understanding manner at all times.

Isolate work areas in a safe manner to prevent access of the general public from entering work areas.

Submit details of Site access for acceptance prior to starting work on Site. Provide all necessary temporary crossovers, ramps, and the like, for vehicular access to the Site.

Provide safe passage for pedestrians and vehicles on public land adjacent to the Site at all times.

Provide and operate required traffic safety and control equipment, including barricades, signs and lights. Provide and operate additional traffic control equipment required by the relevant authorities, if any, and the personnel to operate such equipment if required.

5.2 SITE CONTROL PLAN

Prepare and submit a Site Control Plan within 10 working days of the commencement date.

The Site Control Plan shall include details and locations of:

- Site perimeter:

- . Temporary fences and hoardings.
- . Gates, security points and controls.
- . Temporary walls, Site retention and supports.
- . Temporary crossings and access.
- Loading areas:
 - . Locations of cranes and hoists, including mobile cranes.
 - . Loading and unloading areas.
- Temporary accommodation:
 - . Site offices.
 - . Toilets, lunch rooms, first aid and amenities.
 - . Storage areas.
- Pedestrian traffic:
 - . Vehicular traffic and public roads adjacent to the Site and adjacent property.
 - . Temporary obstructions, barriers, signs and lighting to public footpaths.
- Nuisance, water, dust and noise:
 - . Location of noisy equipment.
 - . Temporary drains, pumps, erosion and dust control.
- Vehicular traffic:
 - . Public roads and vehicular traffic adjacent to the Site and adjacent property.
 - . Temporary obstructions, barriers, signs and lighting to such roads.
 - . Temporary traffic controls, lights and personnel to operate such equipment if required.

Where the location of such items may change from time to time during the construction period the Site Control Plan shall be revised and resubmitted.

5.3 TEMPORARY FENCING AND HOARDING

To AS 4687 series.

Erect and maintain all necessary hoardings and fences, screen, gates, footways, gangways, gantries, platforms, temporary enclosures, etc, to protect the work, persons and property, as indicated on the Drawings or as otherwise required by local and other authorities.

Provide a 2400mm high solid hoarding to separate public areas from the construction zone.

Provide a sketch of the temporary fencing to the Superintendent for acceptance prior to erection.

Gates to temporary fencing shall be lockable and the fencing as a whole shall prevent the general public from entering work or storage areas. A key to lockable gates shall be provided to the Principal at the commencement of the work to enable emergency access.

The requirements of the Contractor's method of working shall be at their own responsibility in respect of erection and removal of fences and hoardings.

5.4 PROTECTION OF STRUCTURES AND SERVICES

Take care to protect all structures including walls and fences, and all services and property, during the execution of the work.

Give a minimum of 48 hours' notice, to the Superintendent, prior to the disconnection of any existing services. Any disconnected services shall be properly tagged and signed to the Superintendent's acceptance.

Payment for all restoration of existing structures, systems and services shall be deemed to be included in the Contract Sum.

At all times do everything prudent or necessary to ensure the safety and freedom from injury, damage or interference of all the adjacent public or private lands, properties, ways, services and all other adjacent real or personal property whatsoever and of persons at any time in the vicinity of the Site and, in particular, without affecting the generality of the foregoing. Carry out and provide such shoring or other forms of support, shielding, fencing and other protective and precautionary measures as may be necessary for any of the purposes aforesaid.

Provide such temporary paved areas, temporary roads, washing down facilities and associated drainage, etc, as are necessary to ensure that mud is not carried on to adjacent roads or paved areas by vehicles leaving the Site. Vehicles removing spoil, rubbish, etc, from the Site shall not be loaded beyond their normal capacity and shall be fitted with proper tail-boards and sideboards to eliminate the dropping of spoil or rubbish. Roads and paths, if fouled by spoil, concrete or other material, shall be cleaned immediately to the extent of washing if necessary or as directed by the Superintendent. The Contractor shall be held responsible for all damage caused by construction traffic (whether their own or that of Subcontractors or suppliers), workmen's vehicles, etc.

Ensure that access roads are cleaned on a daily basis and repair any damage to the road as a result of the work.

Remove from the Site all rubbish resulting from the work as it accumulates. Upon completion of the work, leave the Site in a clean, tidy and habitable condition.

5.5 SIGNBOARD

Provide a project signboard within 10 working days of the commencement date in a location as directed by the Superintendent. Maintain the signboard unobstructed and in good condition until Practical Completion.

The signboard shall be constructed from waterproof ply fixed to a braced sawn hardwood frame. The board shall be painted with acrylic enamel paint and include the names and company logos of the Principal, the Superintendent, the architect, all consultants and the Contractor signwritten thereon. The board shall also contain an artist's impression of the project as supplied by the Superintendent. The artwork to the signboards shall be of high quality and shall be as detailed by the Superintendent.

Obtain the required design and text from the Superintendent prior to commencement and submit construction details of the signboard to the Superintendent.

The Principal may provide additional signboards during the Contract. Cooperate and coordinate with the Principal's sign installation and maintain the Principal's signboards until Practical Completion.

Do not install or display other signs or advertisements without prior approval from the Superintendent. Remove any signage or advertisements immediately if instructed to do so by the Superintendent.

Supply and install appropriate signage for the Site to advise visitors clearly and in accordance with occupational health and safety guidelines. Do not erect any signs, signposts or advertisements on or near the Site except where allowed by the Principal.

5.6 ELECTRICITY

Arrange a temporary electricity connection to the Site with the relevant supply authority and pay all associated charges and usage fees. Allow for all temporary electrical switchboards and cabling to service the Site. Provide lead stands to support extension leads a minimum of 2.5m above the ground.

5.7 TEMPORARY LIGHTING

Provide temporary access lighting and all necessary task lighting to undertake the work.

5.8 NIGHT LIGHTING

Provide night lighting for any part of the Site which is potentially hazardous and which is not fully protected from contact by a person. Also provide night lighting for any part of the Site when directed by the Superintendent to do so.

5.9 WATER

Arrange connection with the relevant supply authority and pay all connection and usage costs.

The Contractor shall be responsible for any adjustment and extension to the service that they may require.

Take all practicable steps to minimise the use of water and prevent wastage of water.

Comply with all current water restrictions imposed by the authorities.

Pay all fees and fines imposed by the authorities with regard to excess consumption or wastage of water, if any.

5.10 PLANT

Provide, either directly or through their Subcontractors, all necessary plant and equipment (including tackle, tools, cranes, hoists, gantries, mixers, pumps, scaffolding, timbering, braces, struts, forms,

shutters, sheds and hoardings) required for the efficient and proper carrying out of the work and for its Practical Completion by the due date.

Plant equipment shall comply with all authority requirements, industrial agreements and accepted industry practices. Obtain all necessary permits, keep the equipment well maintained and regularly inspected.

Plant shall include suitable lighting to ensure a safe working environment.

5.11 TELEPHONE/ FAX SERVICE

Make application for a telephone connection to the Site immediately after notification of acceptance of Tender.

Arrange for the prompt installation of telephone and fax facilities, as a minimum, when establishing the Site and arrange for their prompt removal at Practical Completion.

Pay all charges associated with the installation, operation and removal of these services.

The Superintendent and their representatives shall have unrestricted use of this facility.

5.12 INTERNET

Provide a connection to the internet with broadband access to send and receive project related information.

Pay for installation and recurrent costs associated with the provision of this service.

Ensure that the internet band width has sufficient capacity to receive and send large format files and that the computer systems on Site have sufficient capacity and appropriate software to receive and read drawing files in .dwg format.

5.13 SITE ACCOMMODATION AND AMENITIES

Erect all Site office, lunchroom, toilet, first aid and other Site accommodation facilities as required to allow the Works to proceed until completion. Wherever possible, toilets and waste water shall be plumbed directly to the mains sewer, at the Contractor's expense. Where direct connection to the sewer is not possible, provide storage tanks for sewerage to be collected by tankers, at a frequency as agreed with the Superintendent.

Provide accommodation that is neat, clean, well constructed, watertight, well lit, ventilated and properly maintained.

Accommodation shall be erected before Site works commence and shall be removed at Practical Completion. The area shall be made good after their removal.

Amenities shall comply with legislative requirements, industrial agreements and accepted industry practice. The Contractor shall obtain all required permits, pay any applicable fees and comply with all conditions.

5.14 TEMPORARY STRUCTURES

All temporary structures erected on Site shall be maintained to present a neat, clean and orderly appearance including the condition of paintwork and structural repair.

5.15 PARKING ON SITE

The Contractor may use space available within the designated Site boundary for car parking for their personnel and Subcontractors. Where space within the designated Site boundary is not sufficient, the Contractor, their personnel and Subcontractors shall use car parking in surrounding streets, as required. Any costs associated with car parking, including, but not limited, metered parking, council permits and fines, shall be borne by the Contractor. At no time shall the Contractor, their personnel and Subcontractors park in any of the school's designated parking spaces or elsewhere within the school grounds, outside of the designated Site boundary.

6 SUBCONTRACTS

6.1 GENERALLY

Bind all Subcontractors (whether nominated or otherwise) by signed agreements to all conditions, obligations and responsibilities to which they, themselves, are bound under the Contract. Submit evidence to the Superintendent of the signed agreements with all Subcontractors, when requested.

Stipulate reasonable commencement dates and the order and manner for which the work is to be undertaken in conformance with the Contractor's Programme.

6.2 CONSENT FOR SUBCONTRACTING

In the event that the Superintendent does not dissent in writing within 5 working days, then such acceptance shall be deemed as being granted.

The Superintendent shall not unreasonably dissent to the subcontracting of any portion of the work and, in any case of such consent not being given the Superintendent shall state the reason to the Contractor. The Superintendent may issue conditional approval.

6.3 CONTRACTOR'S RESPONSIBILITY

An acceptance to subcontract any part of the work shall not relieve the Contractor from any of their liabilities or obligations under the Contract.

Notwithstanding any such acceptance to subcontract, the Contractor shall be liable to the Principal for the acts, defaults and neglect of any Subcontractor or any employee or agent of the Subcontractor as fully as if they were the acts, defaults or neglect of the Contractor or the employees or agents of the Contractor.

7 SUPERINTENDENT

7.1 SERVICE OF NOTICES

Verbal service of notices to the Contractor's responsible Site personnel by the Superintendent shall be an acceptable form of transmission of urgent instructions. Such instruction shall be later confirmed in writing as soon as practicable.

7.2 INSPECTION OF WORK BY THE SUPERINTENDENT

Provide facilities for the Superintendent and any person nominated by the Superintendent to facilitate inspection of the work including:

- Use of the Contractor's scaffolding, personnel lifts, swing stages, safety harnesses and the like.
- Protective clothing, including not less than four sets of new safety helmets, jackets, eye protection and boots, kept in new condition.

Inspection, testing of or comments made by the Superintendent or the Principal or any agent or employee of the Principal on any of the Drawings, Shop Drawings, As-built Drawings, Specification and/ or works completed by the Contractor, shall not impose liability for defective works upon the Principal and shall in no way reduce or cancel the Contractor's obligations under the Contract.

Engineering inspection, termed "supervision" means that work shall be inspected during construction and after completion for the purpose of determining whether such work has been conducted and completed in substantial conformity with the Drawings and Specification.

Work shall be inspected to determine whether the quality of materials is as specified, to witness such tests as are specified and considered necessary to confirm that materials, plant and equipment comply with and perform in accordance with the Drawings and Specification.

Inspected work which does not conform to the Contract documentation will be advised in writing to the Contractor giving the reason(s) for the nonconformity. Reinspection will occur when written advice is received from the Contractor advising that the defective work has been completed and now conforms to the Specification. If reinspection of previously advised defective work is found to be incomplete, the cost of all further reports and inspections shall be charged to and payable by the Contractor at current hourly rates plus expenses and such charges may be deducted from the Contract Sum.

Inspection does not guarantee that the work accepted conforms with the Drawings and Specification notwithstanding approval of such work by any notice in writing.

Inspection does not imply supervision of the conduct of the work, or the construction or the safety procedures followed in execution of the work.

If directed, give the Superintendent access to off-Site factory locations to inspect products and fabrication procedures before delivery to the Site.

Where any work is to be covered over or have other work fixed to it, give sufficient notice before such covering over.

7.3 SUPERINTENDENT'S REASONABLE SATISFACTION

No expression of the Superintendent's reasonable satisfaction or acceptance shall be deemed to be an acceptance of defective materials or workmanship not complying with the terms of the Contract, nor as authority for any variation, except where such variation is authorised as provided in the Contract.

7.4 AUTHORITY TO GIVE INSTRUCTIONS

The Contractor shall not accept instructions in relation to this Contract, other than those issued by the Superintendent.

8 CONDUCT OF SITE ISSUES

8.1 LABOUR, DIRECTION AND COORDINATION

Provide, either directly or through their Subcontractors, all necessary labour for the carrying out and completion of the work in accordance with the provisions of this Contract, including properly qualified personnel such as project engineers, expeditors, general and assistant foremen, leading hands and all other staff as may be necessary to ensure constant and competent direction and superintendence of all trades in all phases and parts of the work to comply with the required standards of the Contract.

The Contractor is responsible for the proper coordination of all work, including the work of all Subcontractors, and of all suppliers.

Manage all building components expressly made for the work manufactured off Site or stored or stockpiled off Site.

Ensure that the sequence of work prevents damage to completed work or delays to the programme.

Take full responsibility for employing effective methods to comply with the requirements of this Contract. Acceptance of such methods, if given by the Superintendent, shall be given without prejudice and shall not relieve the Contractor of their responsibility.

Unless otherwise specified, all workmanship shall conform to the appropriate Australian Standards.

Workmanship described in one section of the Specification and referred to in another section shall be of equivalent quality.

8.2 CONTRACTOR'S PERSONNEL

Appoint qualified and experienced people for the duration of the work.

Submit details of all key people to be appointed and retain the same key people for the duration of the construction period, unless otherwise accepted in writing.

All key people shall be able to speak, write and understand the English language.

Provide the Superintendent with the mobile telephone numbers of key people for communication at all reasonable times.

8.3 SITE INDUCTION

Provide and ensure that all construction personnel attend and receive a compulsory Site induction session in accordance with the legislative requirements before entering the Site for the first time.

The Site induction session shall instruct construction personnel on safety, conduct and all other relevant and project particular matters.

Keep records of attendance and issue all attendees with appropriate printed Site safety instructions.

Provide Site induction to any other person nominated by the Superintendent who may have reason to enter the Site.

8.4 SITE MEETINGS

Fortnightly Site meetings will be conducted at which a senior representative of the Contractor and the Superintendent shall be present to discuss progress and any other Site issues. Arrangements shall be made for the attendance of other staff members and representatives of Subcontractors and suppliers as may be required. Representatives of the Principal and the consultants may also attend such meetings.

Chair such meetings, prepare records of the proceedings (Site meeting minutes) and distribute them within 3 working days after the meeting to the Principal, the Superintendent and relevant consultants. Provide copies of relevant portions to the Subcontractors and suppliers as necessary.

The inclusion in the Site meeting minutes of any instruction given by the Superintendent shall, upon confirmation of such record at a subsequent meeting, cause such instruction to be deemed a Superintendent's written instruction in accordance with the Contract. Alternatively, confirm such an instruction, especially in writing, to the Superintendent in accordance with the Contract.

At each Site meeting, submit to the Superintendent:

- An update to the current monthly progress report containing the requirements of the Contract.
- An updated programme in bar chart format showing the work planned for the next month.

8.5 REPORTS AND RECORDS

Monthly progress report:

- Submit a written monthly progress report describing the progress of the work in relation to the Construction Programme, including work being carried out off-Site.
- Submit the monthly progress report to the Superintendent 2 working days before the last Site meeting in each calendar month.
- As a guide, the progress report shall include:
 - . Status against the Construction Programme and changes made to the Construction Programme since the previous report.
 - . Current critical path and near-critical paths indicating total float and constraints.
 - . Actions and corrections required to achieve Practical Completion.
 - . Status of Contract variation claims pending and approved, and forecast of variations anticipated, if any.
 - . Achievements including activities started and finished, milestones, outstanding information or approvals required and submittals completed and approved.
- Submit monthly, a current and complete list of Subcontractors including full name and contact details, scope of the subcontract work, status of required submittals, status of work completed and any other relevant information.

Daily diary:

- Keep a diary to record general progress of the work, any significant events, construction personnel numbers and Subcontractors on-Site, temperature and weather conditions, meetings, visitors to the Site, inspections, delays, unusual events, on-Site accidents and the like.
- The original copy of the Site diary shall be available for inspection by the Superintendent at any time without notice.
- Submit copies of the daily diary in part or in full, if directed by the Superintendent.

8.6 PHOTOGRAPHS

Make a photographic record of construction progress prepared by a competent photographer with suitable equipment, and submit photographs regularly.

Photographs shall be made using a digital camera with suitable resolution to meet the current standard of technology and output in .JPG format.

Submit an electronic copy by email or as directed by the Superintendent.

Photographs shall be automatically date stamped.

Take at least 50 views each week. The required views shall include:

- General views of the work, taken from constant positions.
- Each fit-out and installation area.
- Work to be demolished, before and after demolition.
- Work to be concealed, including services, concrete reinforcement and embedments before placing for each floor and installation area.

The Superintendent may nominate the required date, time and location and direction of each view and may direct additional views. Photographs shall be clear and sharp, showing work without obstruction by equipment, vehicles and the like, except where such equipment is relevant to the work.

Take photographs of particular stages of the work and construction details.

Send digital photographs to the Superintendent by email not later than close of business on the day of taking the photographs. Electronic documents shall be named to identify the project, location, level and date.

8.7 SITE SECURITY

The Contractor shall be wholly responsible for the proper and adequate safeguarding of the work and of fixed and unfixed materials on the Site during both working and non-working hours. This shall include but not be restricted to the risk of fire, water damage, theft, loss and interference.

No claims for extensions of time or extra costs will be allowed where damage or loss of materials or interruption of work was a result of the Contractor's failure to provide adequate safeguards.

At all intervals between work (eg overnight, public holidays, weekends, shutdowns), the Site shall be left in a secure condition that will not be considered an enticement for trespass, theft or other interference.

Nominate a person who is responsible for securing the Site at night. The after hours home phone number of this person shall be given to the Superintendent at the commencement of the project.

8.8 BUILDING SET OUT

Upon taking possession of the Site, carry out a features and levels survey to establish or confirm title boundaries, existing levels, etc. Verify to the Superintendent that these are in accordance with the Contract documents prior to the commencement of Site work or bulk excavations.

Engage and pay for a licensed surveyor to establish or verify Site boundaries and datum points as required.

Upon completion of the project a check survey is to be made and the exact relationship of the building to adjacent structures is to be recorded.

A copy of both survey reports (in hard copy and electronic format) shall be provided to the Principal for record purposes.

8.9 COORDINATION OF SETTING OUT

Coordinate the setting out of the Site in an accurate manner and within the tolerances specified or implied in the Contract.

8.10 PRESERVATION OF BENCHMARKS

Preserve benchmarks at all times. If, for any reason, any are removed or obliterated they shall, at the cost of the Contractor, be replaced by a licensed surveyor acceptable to the Superintendent.

8.11 CONSTRUCTION LOADS

Ensure that no excessive loads are put on any parts of the structure during construction work. On request, supply to the Superintendent details of the loads for which the various parts of the structure were designed.

8.12 WORKING HOURS AND OVERTIME

Adhere to any time restrictions laid down by local council or any other authority having such jurisdiction with regard to construction activities and noise. Should work be required to be done during these restricted times, obtain approvals from the relevant authority.

Allow for whatever hours are necessary, including overtime, to complete all work by the date of Practical Completion.

Access to the Site and working hours are to be agreed with the Superintendent. At this time, however, it is assumed that full access is available to the Site for the purpose of completing work.

8.13 SAFETY WARNING SIGNS

Provide and display in prominent positions warning signs of dangerous activities, in accordance with AS 1319 and current dangerous goods legislation, and comply with all regulations appertaining thereto.

8.14 PROTECTION OF TRENCHES

Ensure that adequate safety barriers are provided and lit where trenches or other excavations are left open and shall provide suitable bridges and hoardings where access is required across them.

8.15 WELDING, CUTTING OR GRINDING IN SITU

All operations shall be carried out in accordance with AS 1674 Cutting and Welding Safety Code. Some important features of the code are:

- Before work commences a Hot Work Permit must be issued by the Contractor's Site foreman.
- Before issue of the permit the Site foreman shall inspect the Site and ensure that:
 - . All combustible materials shall be moved at least 10m clear of the work. Where this is not practicable combustible materials, including structural timber, shall be kept damp or shielded against the gas flame, sparks, slag or falling hot metal by sheet metal, fire resistant curtains, or similar (not ordinary tarpaulins).
 - . Any floor openings within 10m are covered, or if not possible, the floor below shall be protected.
 - . The area on the opposite side of a wall through which heat from a torch or flame might be conducted is clear of combustibles.
 - . A person is designated to stand by to watch for sparks, slag or hot metal that may penetrate the shields, and take action when necessary.
 - . Fire extinguishers are placed in special readiness in the area, and that the positions of hoses and hose reels are noted.
 - . Welders, assistants and watchers are instructed on the use of fire fighting equipment present.
- After operations are complete, or during interruptions (lunch or tea breaks), patrol areas shall be maintained, including surroundings and lower floors where smouldering fires may start, for one hour after work ceases.
- Special precautions must be taken where work in or near hazardous locations is unavoidable, eg where flammable solvents, gases or combustible dusts are present, on tanks, ovens, ducting or near spray shops. Refer to AS 1674 for particulars.
- Equipment that is damaged in any way must never be used. Regular inspection is necessary. Replacement of hoses at least annually is highly desirable.

8.16 FIRE PROTECTION

To minimise fire risk during construction, provide an adequate number of temporary fire extinguishers throughout the Site. As early as practicable, install and temporarily equip the fire hydrants where nominated in the Contract.

8.17 DISPOSAL OF EXCESS EXCAVATED MATERIAL

All excess excavated material shall be disposed of by the Contractor.

8.18 DISPOSAL OF CONTAMINANTS

The Contractor and any Subcontractors shall properly dispose of all solid, liquid and gaseous contaminants in accordance with statutory requirements. A waste management plan shall be submitted to the Superintendent for acceptance, prior to commencement.

8.19 DISPOSAL OF REFUSE

Remove, from Site, all refuse including food scraps and the like, resulting from the work.

Refuse which is dropped from upper floors shall be discharged in hoppers, shutters, chutes or refuse buckets which are covered or designed to confine the material completely and prevent dust emission.

8.20 CLEAN SITE POLICY

Keep the Site clean and tidy at all times.

Progressively clean up the Site and remove all accumulated, discarded and surplus building material and debris.

On completion of the works and prior to handing over to the Principal:

- Remove all temporary buildings, structures, fences, services, plant and equipment.
- Remove all surplus materials and debris and clean the Site.

8.21 DISPUTES FROM NEIGHBOURS

The Contractor shall not be entitled to any extension of time under the Contract where such proceedings or disputes with adjacent or neighbouring owners or occupiers are due to any default of the Contractor or to any act of the Contractor, other than an act required by this Contract.

If the Contractor receives a request or complaint from an adjacent property owner, the public or any other source:

- Respond courteously, and with regard to any previous directions by the Superintendent.
- Record all such requests and complaints received.
- Notify the Superintendent immediately.

8.22 EVACUATION PLAN

Prior to Practical Completion, prepare evacuation plans in accordance with the Principal's and Superintendent's requirements. Allow for evacuation plans to be placed at all exits. The evacuation plans shall be produced in A3 format and framed to the acceptance of the Superintendent.

9 EXISTING SERVICES

9.1 GENERAL PROCEDURE

All work to existing services shall proceed without disruption to adjoining areas.

Existing services, where disrupted, shall be reconnected.

9.2 EXISTING SERVICES - DETERMINATION PRIOR TO EXCAVATION

Before commencing any work, locate and identify all existing utilities on or adjacent to the Site that might be affected by the work and assess whether the utilities are active or inactive.

Record the location of all utilities on As-Built documentation including inactive utilities and progressively record any other utilities discovered during the work.

Locations of utilities indicated in the Contract Documents and other documents made available to the Contractor are approximate only. The Principal and the Superintendent shall not be responsible for the accuracy or completeness of such information.

Coordinate with and notify the authorities before commencing any work that affects the utilities provided by such authorities.

Obtain written confirmation from the authorities verifying that work has been carried out correctly.

Submit such written confirmation from the authorities progressively.

A minimum of 5 working days prior to commencing excavation on Site, forward to the Superintendent an application for permission to commence excavation.

Ascertain the exact location of existing services by undertaking exploratory hand excavation prior to machine excavation.

Disruption or damage to the existing services shall be the responsibility of the Contractor and all costs incurred shall be borne by the Contractor.

Work on utilities:

- Carry out all work on utilities, including inactive utilities, in accordance with the requirements of the authorities.
- Protect and maintain all existing active utilities on or adjacent to the Site at all times.
- Relocate utilities, as necessary to facilitate the work, and provide temporary utilities in accordance with the requirements of the authorities.
- Do not disrupt or prevent the continuous and proper supply of utilities during relocation.

Damage to utilities: In the event of any damage or disruption to any utilities on or outside the Site, immediately notify the Superintendent and the authorities.

9.3 INTERRUPTION OF EXISTING SERVICES

The Contractor shall be responsible for the full liaison with the relevant authorities. Similarly, give due notice of intended reconnection of services.

In no way shall work activities impact on, or interrupt, existing services to any area adjacent to the Site without prior advance notification being made to the Superintendent and acceptance having been obtained in return. Where interruption of services are likely to unduly impact on the function of adjacent areas, temporary services shall be put in place and be fully operational prior to interrupting that service.

9.4 CONNECTION TO EXISTING SERVICES

Before tapping into existing services, arrange closing down of the service with the relevant service provider where necessary and provide a minimum of 48 hours' notice to the Principal and the Superintendent. The shutdown shall be arranged so that there is no disruption to the Principal or adjacent property owners/ occupiers unless agreed otherwise. The Contractor is responsible for full liaison with the relevant authorities.

The Contractor shall be responsible for any overtime required to comply with this procedure and the Superintendent will accept no additional claim for overtime costs.

10 CERTIFICATION AND VARIATIONS

10.1 PAYMENTS

If no dispute arises over the value and/ or quality of the work, payment shall be made as provided in the Contract. All progress payments shall be deemed to be on account only. Payment may be made by electronic transfer, payee or order sent by prepaid post to the payee's address.

Before any payment is made, provide the Superintendent with a certificate or statement in writing, in a form accepted by the Superintendent and in accordance with the Contract certifying that the Contractor has paid all contributions in respect of the Contractor's employees, as required by any Act of Parliament, ordinance, regulation or otherwise. The certificate or statement must be provided in accordance with the relevant clauses of this document before any payment will be made to the Contractor.

Before becoming entitled to the final payment in respect of the work (including any variations or retentions), sign a Deed of Release prepared by the Superintendent certifying that:

- They agree to the final Contract Sum as stated on such certificate.
- Payments due and owing to their employees and all sums due and owing to their Subcontractors have been paid.
- The Contractor has no further claims under or arising from the Contract.

Payments will only be made in strict accordance with the Superintendent's Progress Claim format. As part of the progress claim, submit one copy of the monthly computerised payment records for:

- Superannuation.
- Redundancy payment scheme.
- Construction industry long service leave.

The Superintendent reserves the right not to process progress claims if the Contractor does not provide computerised payment records in accordance with the above. Detail, in all progress claims, the value of any and all taxes paid or payable in relation to the work.

Provide the Superintendent with a Quality Assurance Compliance Certification which states that the quality assurance verification of works has been undertaken.

10.2 PRELIMINARIES IN INTERIM PAYMENTS

Preliminaries will be valued for the purpose of inclusion in interim payments on the following basis:

- Fixed charge items will be valued as and when the charge is properly incurred.
- Time related charge items will be expressed as a percentage of the Contract Sum excluding the value of all preliminary items and provisional sums. This percentage will be added to the value of work properly executed and referred to in the Contract clause "Certificates and Payments" excluding the value of Changes. This method of valuing preliminary items is for the purposes of interim payments only and shall not be construed as setting a precedent for adoption in the valuation of Changes.

10.3 GST REQUIREMENTS

Comply with all current GST legislation.

10.4 SUPERANNUATION

Ensure that all superannuation obligations are met in accordance with statutory requirements and/ or relevant industrial awards and enterprise bargaining agreements. Make all records relating to superannuation payments on behalf of its employees available to the Superintendent (or their nominated representative) within 5 working days from the date of request.

10.5 PROGRESS CLAIMS

Unless stated otherwise in the Contract, progress claims by the Contractor shall be issued to the Superintendent for work completed to the last day of each month.

Progress claims shall set out the value of work completed for each major trade, nominated Subcontractors and nominated suppliers as defined in the form of Tender.

Variation claims are also to be submitted each month and are to include details of work and costs and must reference the Superintendent's instruction.

Provide evidence with each progress claim that all amounts due to Subcontractors and suppliers have been paid.

10.6 PAYMENT AGAINST PROGRESS CLAIMS

Progress payments by the Principal to the Contractor will only be made when the Contractor has submitted the Superintendent's certificate together with the Contractor's tax invoice.

10.7 CONTRACT VARIATIONS

Notwithstanding the provisions of the Contract, the following requirements shall also apply regarding variations:

- Prior approval is required for all variations.
- Request for variations outside the scope of the above are required to be submitted through the Superintendent to the Principal for formal approval before being put in hand. In this regard, the commitment shall be entered into, except upon issue of a notice to the Contractor by the Superintendent on behalf of the Principal.
- Where a variation is proposed, the Superintendent shall negotiate directly with the Contractor and, if outside the scope of the intent of the contingency sum, recommend same to the Principal.
- Where the Superintendent considers a variation so large or so involved as to require the services of a Quantity Surveyor for assessment of the value of the variation, they shall make a recommendation to the Principal.

11 COMPLETION

11.1 GUARANTEES AND WARRANTIES

All guarantees and warranties available for the supply and installation of materials, goods and equipment, which extend beyond the defects liability period, shall be assigned to the Principal prior to Practical Completion.

Submit written warranties for all items as nominated.

Warranties associated with service trades will be included in the relevant service specification.

Normal guarantees on workmanship according to the Contract shall also apply.

11.2 MAINTENANCE

Prior to commencement of the defects liability period, submit a maintenance schedule for the Superintendent's appraisal, setting out maintenance procedures and frequencies to ensure trouble free operation and maintain plant operating efficiency. The maintenance schedule shall be included in the Operation and Maintenance Manuals.

Routine maintenance of services is required in accordance with Australian Standards and the BCA.

Maintenance of essential services shall be included in the maintenance schedule and is typically referred to in the "Certificate of Occupancy" and/ or the "Certificate of Final Inspection".

Perform maintenance in accordance with statutory regulations and in accordance with the schedule. Maintenance shall be conducted in accordance with AS 1851 (all levels).

Perform maintenance at times and in a manner which will cause the least inconvenience to the normal operation of the building.

Coordinate the maintenance of the work with maintenance of other services to ensure all necessary Subcontractors are present when required for coordinated essential services tests.

Notify the Principal of intent to perform service at least 3 working days prior to each visit. Obtain the representative's signature on a service report at the end of each visit and leave a copy on Site. The service report shall detail the work carried out and shall list any adjustments and/ or rectification work found to be necessary.

Unsigned reports shall not be recognised and the Principal, at the end of the defects liability period, may elect to:

- Have additional services carried out to make up the number of signed reports at the Contractor's expense, or
- Deduct the cost of disputed visits at the pro rata rate for each of the maintenance visit(s) disputed.

At least 10 working days before carrying out the final service, request that an inspection be arranged to coincide with this service.

During the defects liability period, as defined in the Contract, the Contractor's responsibility shall include the provision of all labour and materials and the meeting of all other costs associated with the removal of defective parts and the installation, adjusting and testing of replacements. Carry out such work within a reasonable time.

This condition shall operate irrespective of the fact that payment for such part or parts may have been included in a Certificate of Payment issued by the Superintendent.

Under certain circumstances, particularly where an inherent defect is suspected in any item of plant or equipment, the Superintendent may direct that the defects liability period shall apply in full to that plant or equipment from the date of making good any replacement or otherwise and not from the original date of Practical Completion.

11.3 FURNITURE FITTINGS AND EQUIPMENT

The Contractor acknowledges Principal-supplied furniture, fittings and equipment will be delivered to Site, during the course of the work, and that the Contractor has allowed for installation of those items within their Contract price and within their Construction Programme:

- Acceptance of deliveries, storage and protection of all furniture, fittings and equipment to be purchased by the Principal.
- Coordination of the installation of all furniture, fittings and equipment purchased directly by the Principal.

Take responsibility for all Principal-purchased furniture, fittings and equipment to be stored and/ or installed prior to Practical Completion. Make good any damage to furniture, fittings and equipment while on-Site prior to Practical Completion.

11.4 CERTIFICATE OF OCCUPANCY

Obtain the Certificate of Occupancy and meet any regulatory requirements associated with the Certificate of Occupancy.

11.5 FINAL CLEANING

On completion, after all trades are finished and before the issue of a Certificate of Practical Completion:

- Thoroughly scrub, clean and seal all floors.
- Thoroughly clean all aluminium work (frames, kickplates, louvres, etc) and clean and polish all glass and mirrors.
- Ensure that all light fittings and mechanical air registers are cleaned.
- Check that all door closers are clean and correctly adjusted.
- Clean out all cupboards and shelves and any ducts and recesses.
- Clean all surfaces to the satisfaction of the Superintendent.

11.6 PRACTICAL COMPLETION

Further to the provisions of the Contract, the following shall apply:

- The Certificate of Practical Completion will not be issued until all the requirements of the Contract are met.

Notwithstanding the issue of the Certificate of Practical Completion, the Contractor shall diligently complete the Contract, including the following items:

- Clean and remove all surplus materials, rubbish, dirt, etc.
- Make good all damage, stains and blemishes and replace materials where necessary.
- Clean all surfaces and clean and polish glass and natural or chromed metal finishes.
- Bring all surfaces to the specified finishes.
- Check, test and ensure that all services and equipment are functioning efficiently and satisfactorily.
- Label all keys and hand over to the Superintendent.
- Submit to the Superintendent all guarantees, warranties, etc, specified within the Contract, including complete operation and maintenance manuals.
- Return all Contract documents.

11.7 DEFECTS INSPECTION

The Superintendent and relevant members of the Design Team shall be requested to undertake a Defects Inspection only when all items of work are complete and after the Final Cleaning has been done. All attempts shall be made to have the Works defect free prior to the Defects Inspection being undertaken. The Defects Inspection shall, in no way, be an inspection of incomplete work. The Superintendent and members of the Design Team shall be within their rights to cancel the Defects Inspection if the Works are considered to be insufficiently complete or clean.

11.8 OCCUPATION ON PRACTICAL COMPLETION

Further to the provisions of the Contract, the Principal shall be entitled to occupation of the whole of the work upon issue of the Certificate of Practical Completion.

Notwithstanding the Principal's occupation, the Contractor shall be granted access to the Site during the defects liability period to carry out any work required under the Contract. Such work shall be carried out at such times and in such a manner so as not to unreasonably interfere with the Principal's occupation.

In addition, provide a continuous maintenance service during the defects liability period to make adjustments to locks, doors, windows, drawers, catches, etc, without awaiting the report of these defects by the Superintendent. This service shall consist of four visits being made during the defects liability period with the Principal being given 48 hours' notice before each visit.

11.9 BUILDING KEYS

All keys to completed buildings are required to be individually mounted on a purpose built key cabinet, numbered in accordance with the room numbering system and handed to the Principal via the Superintendent upon the date of Practical Completion.

11.10 DEFECTS LIABILITY

The defects liability period shall be as stated in the Contract.

During the defects liability period, in addition to all other obligations, replace or otherwise make good:

- Any defect which becomes apparent.
- Any damage which results from such defect or from work to remedy such defect and which becomes apparent during the defects liability period.

Adjust and test equipment replaced during the defects liability period to show that the system of which it forms a part is giving commercial operation and the replaced items are performing according to the specified operating conditions.

Equipment repaired or replaced during its defects liability period shall have an 18-month defects liability period commencing from the date of making good, renewal or replacement.

Perform such rectification work as may be instructed in writing within 5 working days of notice. If the Contractor fails to rectify the work to the satisfaction of the Superintendent, the Principal may engage

others to finish such work without further notice and deduct the costs of same from amounts otherwise due or payable, or to recover such costs if they exceed the amounts due or payable. Such action shall not vitiate any of the responsibilities implied.

11.11 MAKING GOOD PRIOR TO ISSUE OF FINAL CERTIFICATE

Prior to the issue of the Final Certificate, upon written notification to the Superintendent and without cost to the Principal, make good all defects, however caused (except where due to fair wear and tear occurring after Practical Completion) and including:

- Shrinkage and/ or expansion cracks in concrete, timber, plasterboard and screeds.
- Warped and/ or twisted timber, doors, frames, windows, shelves.
- Loose and/ or drummy areas of screeds, vinyl or carpet.
- Stained and/ or marked concrete, plasterboard, vinyl, carpet, paint, clear finish and other applied finishes.
- Loose door furniture, window furniture, sanitary fittings, shelves, cupboards, supports, taps and outlets and flashings.
- Other defects as identified by the Superintendent.

11.12 FINAL COMPLETION

Final completion shall mean the end of the defects liability period or when defects notified during the defects liability period have been made good to the satisfaction of the Superintendent, whichever is later.

Final completion will not be granted until the Contractor provides evidence that they have undertaken maintenance of essential services as identified on the "Certificate of Final Inspection".

11.13 FINAL CERTIFICATE

The Superintendent shall not issue the Final Certificate until the Contractor has furnished:

- Evidence that they have lodged applications for Certificates of Final Approval required by any statutory authorities having jurisdiction over the work, or required by the Contract.
- As-Built Drawings warranties, Operation and Maintenance Manuals, software and training.
- Spare parts and materials as required by the Specification.
- Where deemed necessary by the Superintendent, a signed release.

A joint inspection shall be held prior to the completion of the defects liability period and all items noted for attention shall be completed to the satisfaction of the Superintendent and the Principal's representative before the Final Certificate is issued.

Drawings, supplied to the Principal at the time of Practical Completion, shall be reissued to the Principal upon issue of the Final Certificate. All changes, new works or other alterations shall be shown and identified with revision labels.

Prior to Practical Completion, provide the services of competent personnel to instruct the Principal's personnel in the operation and maintenance of the installed systems. Detailed instruction in the operation of building automation, remote control or monitoring system and all microprocessor-based control functions shall be provided.

12 PROVISIONAL SUMS

12.1 PROVISIONAL SUMS

Allow for the following procedure associated with the tendering and letting of all provisional sum packages:

- Allow, in the Tender, for all overhead costs and profit associated with the preparation, tendering, award and supervision on Site and off Site of all provisional sum packages as defined under the Contract.
- All provisional sum packages will be accepted by the Superintendent prior to being released for Tender by the Contractor.
- All provisional sum packages will be tendered by the Contractor.

- The Contractor and Superintendent will jointly select Subcontractors to be invited to Tender for the provisional sum packages.
- All provisional sum package Tenders will close at a location to be identified by the Superintendent.
- The Contractor and the Superintendent will open the Tenders in an "open book" arrangement.
- Ensure a minimum of three trade prices are received for each provisional sum Tender.
- The Contractor and the Superintendent will work together to ensure the scope of the provisional sum package can be achieved within the allocated budget.
- All provisional sum packages will be considered when assessing Practical Completion of all work.

0171 GENERAL REQUIREMENTS

1 GENERAL

1.1 GENERAL

General

This Specification shall be read in conjunction with all other contract documentation provided.

This worksection (*0171 General requirements*) is deemed to define minimum requirements that the Contractor must comply with. The requirements of other worksections of this specification override conflicting requirements of this worksection.

Discrepancies

Requirement: It is the responsibility of the Contractor to review all Contract Documents, including drawings, specifications, schedules, reports and the like, and to satisfy themselves with their completeness. If an item is shown in any documentation, whether shown in all relevant documentation or not, it must be allowed for. Should there be a discrepancy within or between any documents, forming part of the Contract Document set, the more costly item shall be allowed for.

1.2 CROSS REFERENCES

Cross referencing styles

General: Within the text, titles are cross referenced using the following styles:

- Worksection titles are indicated by *Italicised* text.
- Subsection titles are indicated by CAPITAL text.
- Clause titles are indicated by **BOLD CAPITAL** text.
- Subclause titles are indicated by **Bold sentence case** text.

1.3 REFERENCED DOCUMENTS

General

Contractual relationships: Responsibilities and duties of the Principal, Contractor and Superintendent are not altered by requirements in the documents referenced in this specification.

Current editions: All reference to standards, regulations and requirements of statutory bodies shall mean the latest published editions at the time of Contract award. Where such standards, regulations and requirements are amended after Contract award and affect the Contractor's responsibilities, immediately inform the Superintendent in writing.

Exception to current editions: If statutory requirements reference other editions or standards, conform to those other editions or standards.

Maintenance and repair works: If statutory requirements applicable to the maintenance or repair works reference other editions or standards, conform to those other editions or standards.

European standards: Any national European Standard (e.g. BS EN, IS EN or DIN EN) may be used in place of the equivalent referenced European Standard (EN).

1.4 INTERPRETATION

Documentation conventions

Imperative mood and streamlined language: The words shall or shall be are implied where a colon is used following a keyword or within a sentence or sentence fragment.

Subject of sentences and phrases: Specification requirements are to be performed by the contractor, unless stated otherwise.

Abbreviations

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

- AS: Australian Standard.
- BCA: National Construction Code Series Volume One: Building Code of Australia Class 2 to 9 Buildings.
- EN: European Norm (European Standard).

- GRP: Glass Reinforced Plastic.
- IP: Ingress protection.
- NATA: National Association of Testing Authorities.
- NCC: National Construction Code.
- NZS: New Zealand Standard.
- PCA: National Construction Code Series Volume 3: Plumbing Code of Australia.
- PVC: Polyvinyl Chloride.
- PVC-U: Unplasticised Polyvinyl Chloride. Also known as UPVC.
- SDS: Safety data sheets.
- VOC: Volatile Organic Compound.
- WHS: Work Health and Safety.

Definitions

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

- Access for maintenance: Includes access for maintenance, inspection, measurement, operation, adjustment, repair, replacement and other maintenance related tasks.
- Accessible, readily: Readily accessible, easily accessible, easy access and similar terms mean capable of being reached quickly and without climbing over or removing obstructions, using a movable ladder, and in any case not more than 2.0 m above the ground, floor or platform.
- Accredited Testing Laboratory:
 - . An organisation accredited by the National Association of Testing Authorities (NATA) to test in the relevant field; or
 - . An organisation outside of Australia accredited to undertake the relevant tests by an authority recognised by NATA through a mutual recognition agreement; or
 - . An organisation recognised as being an Accredited Testing Laboratory under legislation at the time the test was undertaken.
 - . An organisation accredited for compliance with AS ISO/IEC 17025 (2018) to undertake the relevant tests.
- Appropriately qualified person: To BCA Schedule 1.
- Attendance: Attendance, provide attendance and similar expressions mean give assistance for examination and testing.
- Commissioning: Advancement of an installation from static completion to full working order, including verification that the systems, subsystems, and their components meet the project requirements. This includes all work described as commissioning in referenced documents, even if carried out before static completion.
- Consumable: Materials or components intended to be replaced within the service life of the associated plant or equipment.
- Contractor: Has the same meaning as builder and is the person or organisation bound to carry out and complete the work under the contract.
- Default: Specified value, product or installation method which is to be provided unless otherwise documented.
- Design life: The period of time for which it is assumed, in the design, that an asset will be able to perform its intended purpose with only anticipated maintenance but no major repair or replacement being necessary.
- Documented: Documented, as documented and similar terms mean contained in the contract documents.
- Economic life: The period of time from the acquisition of an asset to the time when the asset, while still physically capable of fulfilling its function and with only anticipated maintenance, ceases to be the lowest cost alternative for satisfying that function.
- Electricity distributor: Any person or organisation that provides electricity from an electricity distribution system to one or more electrical installations. Includes distributor, supply authority, network operator, local network service provider, electricity retailer or electricity entity, as may be appropriate in the relevant jurisdiction.

- Fire hazard properties: To BCA Schedule 1.
- Geotechnical site investigation: The process of evaluating the geotechnical characteristics of the site in the context of existing or proposed construction.
- Give notice: Give notice, submit, advise, inform and similar expressions mean give notice (submit, advise, inform) in writing to the Superintendent.
- High level interface: Systems transfer information in a digital format using an open system interface.
- Hold point: The activity cannot proceed without the approval of the Superintendent.
- Hot-dip galvanized: Zinc coated to AS/NZS 4680 (2006) after fabrication with coating thickness and mass to AS/NZS 4680 (2006) Table 1.
- Ingress protection: IP, IP code, IP rating and similar expression have the same meaning as IP Code in AS 60529 (2004).
- Joints:
 - . Construction joint: A joint with continuous reinforcement provided to suit construction sequence.
 - . Contraction joint: An opening control joint with a bond breaking coating separating the joint surfaces to allow independent and controlled contraction of different parts or components, induced by shrinkage, temperature changes or other causes. It may include unbound dowels to assist vertical deflection control.
 - . Control joint: An unreinforced joint between or within discrete elements of construction which allows for relative movement of the elements.
 - . Expansion joint: A closing control joint with the joint surfaces separated by a compressible filler to allow axial movement due to thermal expansion or contraction with changes in temperature or creep. It may include unbound dowels to assist vertical deflection control.
 - . Sealant joint: A joint filled with a flexible synthetic compound which adheres to surfaces within the joint to prevent the passage of dust, moisture and gases.
 - . Structural control joint: A control joint (contraction, expansion and isolation) in structural elements when used with applied material and finishes.
 - . Substrate joint: A joint in the substrate which includes construction joints and joints between different materials.
 - . Weakened plane joint: A contraction joint created by forming a groove, extending at least one quarter the depth of the section, either by using a grooving tool, by sawing, or by inserting a premoulded strip.
- Local authority (local council): A body established for the purposes of local government by or under a law applying in a state or territory.
- Low level interface: Systems transfer information via terminals and voltage free contacts.
- Maintenance: Work that is carried out to preserve an asset, to allow for its continued use and function over its designed service life.
 - . Corrective maintenance: Maintenance initiated as a result of plant, equipment, systems, elements, before or after functional failure. This work can be planned or unplanned and includes repairs and replacement.
 - . Preventive maintenance: Planned maintenance of plant, equipment and other systems or elements, including cyclical or periodic maintenance, fire safety measures and statutory requirements.
- Manufacturer's recommendations: Recommendations, instructions, requirements, specifications (and similar expressions) provided in written or other form by the manufacturer and/or supplier relating to the suitability, use, installation, storage and/or handling of a product.
- Metallic-coated: Steel coated with zinc or aluminium-zinc alloy as follows:
 - . Metallic-coated steel sheet: To AS 1397 (2021). Metal thicknesses specified are base metal thicknesses.
 - . Ferrous open sections zinc coated by an in-line process: To AS/NZS 4791 (2006).
 - . Ferrous hollow sections zinc coated by a continuous or specialised process: To AS/NZS 4792 (2006).

- Network Utility Operator: To BCA Schedule 1. A person who undertakes the piped distribution of drinking water or non-drinking water for supply; or is the operator of a sewerage system or a stormwater drainage system.
- Obtain: Obtain, seek and similar expressions mean obtain (seek) in writing from the Superintendent.
- Pipe: Includes pipe and tube.
- Practical completion or defects free completion: The requirements for these stages of completion are defined in the relevant building contract for the project.
- Pre-commissioning: Verifying that the installation of a system is complete and ready for commissioning.
- Principal: Principal has the same meaning as owner, client and proprietor and is the party to whom the contractor is legally bound to construct the works.
- Professional engineer: To BCA Schedule 1.
- Proprietary: Identifiable by naming the manufacturer, supplier, installer, trade name, brand name, catalogue or reference number.
- Provide: Provide and similar expressions mean supply and install and include development of the design beyond that documented.
- Record drawings: Record drawings has the same meaning as as-installed drawings, as-built drawings and work-as-executed drawings.
- Referenced documents: Standards and other documents whose requirements are included in this specification by reference.
- Required: Required by the contract documents, the local or statutory authorities.
- If required: A conditional specification term for work which may be shown in the documents or is a legislative requirement.
- Sample: A physical example that illustrates workmanship, materials or equipment, and establishes standards by which the work will be judged. It includes samples and sample panels.
- Static completion: The state of a system when installation works are complete but have not been commissioned.
- Statutory authority: A public sector entity created by legislation, that is, a specific law of the Commonwealth, State or Territory.
- Superintendent: The person appointed, by the Principal, under the contract.
- Supply: Supply, furnish and similar expressions mean supply only.
- Tests - integrated system: Tests conducted on the project as a complete, integrated system to verify successful integration, interaction, and operation of all interrelated systems to the project requirements.
- Tests - production: Tests carried out on an item, before delivery to the site.
- Tests - site: Tests carried out on site.
- Tests - type: Tests carried out on an item identical with a production item, including with respect to materials, material suppliers, manufacturing processes, dimensions and marking.
- Tolerance: The permitted difference between the upper limit and the lower limit of dimension, value or quantity.
- Utility service provider: Includes Electricity distributor, Network Utility Operator and organisations providing other reticulated utilities including data and telecommunications services.
- Verification: Provision of evidence or proof that a performance requirement has been met or a default exists.

1.5 CONTRACT DOCUMENTS

Services diagrammatic layouts

General: Layouts of service lines, plant and equipment shown on the drawings are diagrammatic only, except where figured dimensions are provided or calculable.

Before commencing work:

- Obtain measurements and other necessary information.
- Coordinate the design and installation in conjunction with all trades.

Levels

General: Spot levels take precedence over contour lines and ground profile lines.

Drawings and manuals for existing services

Warranty: No warranty is given as to the completeness or accuracy of drawings and/or manuals of existing services.

2 SUBMISSIONS AND INSPECTIONS**2.1 SUBMISSIONS****Requirement**

General: Submit the following, as documented:

- Authority approvals: Notes of meetings with regulatory authorities and utility service providers whose requirements apply to the work and evidence that notices, fees and permits have been sought and paid, that utility service provider connections are complete and that statutory approvals by the authorities whose requirements apply to the work have been received.
- Building penetrations: Details of the methods to maintain the required properties to **BUILDING PENETRATIONS**.
- Certification: Certificates of conformance to documented and statutory requirements.
- Commissioning plan: For the whole of the work to **COMMISSIONING**.
- Commissioning program: For the whole of the work to **COMMISSIONING**.
- Design documentation: Drawings, calculations and specifications as documented.
- Execution details: Execution programs, schedules and details of proposed methods and equipment. For building services include the following:
 - . Embedded services: Proposed method for embedding or chasing services into concrete.
 - . Fixing of services: Typical details of locations, types and methods of fixing services to the building structure.
 - . Inaccessible services: If services will be enclosed and not accessible after completion, submit proposals for location of service runs and fittings.
- Fire performance: Evidence of conformity to requirement for combustibility and fire hazard properties of building elements.
- Operation and maintenance manuals: For the whole of the work to **OPERATION AND MAINTENANCE MANUALS**.
- Products and materials: Products and materials data, including manufacturer's technical specifications and drawings, product data sheets, type tests results, evidence of conformity to documented requirements, product certification, performance and rating tables, service connection requirements and installation and maintenance recommendations.
- Records: As-built documents, photographs, system diagrams, schedules and logbooks to **RECORD DRAWINGS**.
- Samples: Representative of proposed products and materials and including proposals to incorporate samples into the works, if any to **SAMPLES**.
- Shop drawings: To **SHOP DRAWINGS**.
- Substitutions: To **PROPRIETARY ITEMS, Substitutions**.
- Tests:
 - . Test reports for testing performed under the contract.
- Warranties: To **WARRANTIES**.

Contractor review: Before submissions, review each submission item and check for coordination with other work of the contract and conformance to contract documents.

Submit to: The Superintendent.

Schedule of submissions

General: Provide a schedule of all samples and shop drawings required to facilitate management of reviews and approvals throughout the project duration.

Submission times

Default timing: Make submissions at least 5 working days before ordering products or starting installation of the respective portion of the works.

Submission response times: Allow in the construction program for at least the following times:

- Shop drawings: 10 working days for the initial review and 5 working days for each subsequent resubmittal.
- Samples: 5 working days.
- Manufacturers' or suppliers' recommendations: 5 working days.
- Product data: 5 working days.
- Product/design substitution or modification: 5 working days.

Coordinate related submissions and do not cause delays by making late or inadequate submissions.

All nominated submission response times relate to the initial review of each submission. Where submissions are deemed inadequate, allow for an additional 5 working days for the review of each subsequent resubmission, until acceptance is given. Any delays caused due to the resubmission and subsequent review of submissions will be the responsibility of the Contractor.

Proposed products schedules: Submit a schedule of proposed products that have not been specified as proprietary items within 3 weeks of starting work on site.

Identification

Requirement: Identify the project, contractor, subcontractor or supplier, manufacturer, applicable product, model number and options, as appropriate and include relevant contract document references. If the submission covers more than one item, identify the item in the contract documents the submitted items relate to.

Non-conformance: Identify proposals that do not conform with project requirements, and characteristics which may be detrimental to successful performance of the completed work.

Errors

Requirement: If a submission contains errors, make a new or amended submission as appropriate, indicating changes made since the previous submission.

Electronic submissions

Electronic copies file format: PDF and DWG (where applicable).

Quantity: One.

Transmission medium: Email or specified document management system and/ or USB, if directed by the Superintendent.

Hard copy submissions

Hard copy quantity: Three.

Drawing size: A1, unless otherwise accepted by the Superintendent.

2.2 INSPECTION**Notice**

Concealment: If notice of inspection is required for parts of the works that are to be concealed, give notice when the inspection can be made before concealment.

Tests: Give notice of the time and place of documented tests.

Minimum notice for tests and inspections: 48 hours.

Light levels

Lighting levels for inspection: To AS/NZS 1680.2.4 (2017).

Attendance

General: Provide attendance for documented inspections and tests.

2.3 DILAPIDATION REPORT**General**

Prepare a Dilapidation Report which records the location, nature and condition of the following and any other item or service (whether on site or adjacent to the site) which has the potential to be adversely affected during the work:

- All areas, adjacent to or within the site that may be affected by the work, including but not limited to trees, nature strips, kerbs and channels, street furniture, traffic/ parking signs and the like.
- Buildings or any built works that are either near, adjacent to or within the site and which may be affected by work activities including but not limited to structures, landscaping, pavements, services, fences and the like.
- Services including but not limited to electricity, phone/ cable systems, water and gas supply, drainage and stormwater lines, services pits and the like.

The Dilapidation Report shall comprise both photographs and written records.

Submit two copies of the report to the Superintendent and agree its contents prior to commencing work on site.

The Contractor shall engage their own Structural Engineer to assist with the preparation of the Dilapidation Report, including, but not limited to, providing advice on the condition of existing structural elements and provisions for protection of existing structural elements that may be impacted by the work.

3 PERFORMANCE

3.1 MATERIALS AND COMPONENTS

Suitability of materials

Every part of the building must be constructed in an appropriate manner to achieve the requirements of the BCA, using materials that are fit for the purpose for which they are intended. The Contractor is responsible for adopting and installing appropriate proprietary accredited building products and shall ensure that those products/ assemblies are fit for the purpose they are intended and are installed in accordance with the manufacturer's recommendations.

Consistency

General: For each material or product use the same manufacturer or source and provide consistent type, size, quality and appearance.

Corrosion resistance

General: Conform to the following atmospheric corrosivity category as defined in AS 4312 (2019) and the AS 2312.1 (2014).

Exterior atmospheric corrosivity category: C3.

Interior atmospheric corrosivity category: C1.

Galvanizing

Severe conditions: Galvanize mild steel components (including fasteners) to AS/NZS 1214 (2016) or AS/NZS 4680 (2006) as appropriate, if:

- Exposed to weather.
- In contact with chemically treated timber, other than copper chrome arsenate (CCA).

Fire protection

Fire performance, in terms of fire hazard properties, of materials, composite systems and structure shall meet the requirements of the BCA.

Materials used for floor finishes shall be tested for critical radiant flux in accordance with AS ISO 9239.1 (2003).

Materials used for wall and ceiling linings shall be tested to determine the group number in accordance with AS ISO 9705 (2003), AS/NZS 3837 (1998) or AS 5637.1 (2015).

Materials used in external facades shall be tested to and meet the requirements of AS 5113 (2016) or other equivalent standards accepted under the BCA.

All other materials, as described in the BCA, shall meet the requirements for spread of flame index and smoke developed index when tested in accordance with AS/NZS 1530.3 (1999).

Supply test certificates to demonstrate that all materials meet the above requirements.

3.2 VOC LIMITS FOR PAINTS, ADHESIVES AND SEALANTS

All paints and adhesives and sealants applied on-site, including both exposed and concealed internal applications, shall meet the Volatile Organic Compounds (VOC) limits outlined below. The Contractor

is to seek approval with the Design Team and Superintendent before substituting any VOC containing products that have been listed in the reports, schedules or specifications for the project.

The Contractor shall obtain relevant supplier VOC datasheets and ensure confirmation of type and quantity of each product supplied to site are obtained from suppliers. The Contractor shall undertake a final audit at the end of the construction works to ensure that the paints, adhesives and sealant products specified and approved have been used.

The following items are excluded from these requirements:

- Glazing film, tapes, and plumbing pipe cements;
- Paints, adhesives and sealants used off-site, for example applied to furniture items in a manufacturing site and later installed in the fitout; and
- Adhesives and mastics used for temporary formwork and other temporary installations.

Total VOC (TVOC) values must reflect the final ready-to-use product, inclusive of tints (in the case of paints) and made in grams of VOC per litre (g/L) of ready-to-use product as per the list below. Most adhesives and sealants are addressed in the 'General purpose adhesives and sealants' category, unless they clearly belong in the other specialised product categories.

Maximum TVOC Content Limits for Paints, Adhesives and Sealants (g/L of ready-to-use product):

- General purpose adhesives: 50g/ litre.
- Interior wall and ceiling paint, all sheen levels: 16g/ litre.
- Trim, varnishes and wood stains: 75g/ litre.
- Primers, sealers and prep coats: 65g/ litre.
- One and two pack performance coatings for floors: 140g/ litre.
- Acoustic sealants, architectural sealant, waterproofing membranes and sealant, fire retardant sealants and adhesives: 250g/ litre.
- Structural glazing adhesive, wood flooring and laminate adhesives and sealants: 100g/ litre.

Refer below for testing methods:

- ISO 17895 for material with a presumed TVOC content <1%;
- ISO 11890 part 2 for material with a presumed TVOC content <15%;
- ISO 11890 part 1 for material with a presumed TVOC content >15%; or
- ASTM D3960, which is comprised of four individual testing procedures that measure TVOC (ASTM D2369), as well as density (ASTM D1475), water content (ASTM D4017). Exempt compounds (ASTM D4457) must not be subtracted in the calculation of VOC content.

The testing method for adhesive and sealants is the ASTM 03960 as detailed for paints as well as South Coast Air Quality Management District Rule 1168.

Theoretical VOC Calculations: Where TVOC content for the individual paints, adhesives and sealants ingredients is known, a theoretical calculation based on the subtotal of the known VOC values of the product's raw material components is acceptable. This is not relevant to carpets and engineered wood products where experimental testing is required. The calculations must include the following:

- Numerical TVOC results expressed in g/L of product; and
- Statement that the results have been obtained based on the subtotal of the known TVOC values of the product's raw ingredients.

3.3 WIND LOADS

General

Requirement: To AS/NZS 1170.2 (2021).

Site wind loads shall be confirmed with the Structural Engineer.

Accommodate, without damage or permanent deformation, the effects of wind loads where appropriate (eg external conditions or internal areas subject to external wind pressure).

3.4 SEISMIC RESTRAINT OF NON-STRUCTURAL COMPONENTS

General

Requirement: Seismic restraint to AS 1170.4 (2007). Comply with AS 1170.4 (2007) Section 8 for non-structural building parts and components required to be designed to resist seismic loads.

Provide all necessary engineering certification for all relevant systems to confirm compliance with AS 1170.4 (2007) seismic restraint has been achieved for the project. The level of documentation shall be sufficient to demonstrate that the systems to be installed are compliant for the project and the relevant building type. The documentation shall include the following as appropriate:

- Technical specifications for the systems;
- Manufacturers' specifications, technical manuals, installation requirements, details, product types etc;
- Structural engineering assessment, certification (Reg 126) from an appropriately qualified engineer to support the proposed installations have been sufficiently assessed for seismic restraint.

The Contractor shall provide all necessary post completion certificates to confirm the installations have been undertaken in accordance with the listed documentation above.

3.5 AIR PERMEABILITY

General

Minimise airflow from the outside to the inside of the building through joints/ junctions to control concentrated airflow.

Any air leakage shall be distributed and not concentrated at a single location.

Membrane tapes, where used in the external fabric, shall be of a high quality, incorporating a pressure sensitive adhesive, suitable for airtight bonding and sealing of penetrations and overlaps of vapour barriers and breather membranes. Tape shall be capable of bonding to a variety of surfaces, including, but not limited to, sheet membranes, insulation boards, plastics, metals and timber.

Where sealants are applied within the external fabric of the building and are not intended to be visible in the finished work, they shall not be black in colour. Black sealants, used in these applications, create difficulties with inspection of the quality of seals and should therefore be avoided.

3.6 WEATHER AND WATER PENETRATION RESISTANCE

General

The building envelope shall be absolutely weatherproof and watertight, ensuring the prevention of water leakage on to internal faces and any other part of the system that may be adversely affected.

Flashings and junctions with adjacent parts of the building shall be fully weatherproof and watertight under all conditions, with full allowance made for deflections and other movements.

Installations shall not be based on a single line of defence. The cavities between the lines of defence shall be drained and ventilated to the exterior.

All joints shall remain rigid and accommodate all movements and any applicable loads without compromising the watertightness of the system.

4 DESIGN

4.1 GENERAL

General

Conflict with the documents: If it is believed that a conflict exists between statutory requirements and the documents, notify the Superintendent immediately and provide a recommendation to resolve the conflict.

Certification of the design

Requirement: Submit certification verifying conformance of the design to the documented and statutory requirements.

4.2 DESIGN

General

Design by contractor: If the contractor provides design, use only appropriately qualified and registered persons.

5 PRODUCTS AND MATERIALS

5.1 PROPRIETARY ITEMS

Manufacturers' or suppliers' recommendations

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

Proprietary items/systems/assemblies: Assemble, install or fix to substrate in conformance with the recommendations of the manufacturer or supplier.

Project modifications: Advise of activities that supplement, or are contrary to the recommendations of the manufacturers or supplier.

Product identification

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

Other products: Marked to show the following, as applicable:

- Manufacturer's identification.
- Product brand name.
- Product type.
- Quantity.
- Product reference code and batch number.
- Date of manufacture.

Prohibited materials

General: Do not provide the following:

- Materials, exceeding the limits of those listed, in the Safe Work Australia Hazardous Chemical Information System (HCIS) Workplace exposure standards.
- Materials that use chlorofluorocarbon (CFC) or hydrochlorofluorocarbon (HCFC) in the manufacturing process.

Substitutions

Identified proprietary items: Identification of a proprietary item does not necessarily imply exclusive preference for the identified item, but indicates the necessary properties, performance and/ or appearance of the item and available warranties.

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

- Product, method or system identification.
- Product data sheets.
- Manufacturer's contact details.
- Detailed comparison between the properties of the documented product and proposed substitution.
- Details of manufacturer and/or installer warranty.
- Statement of BCA compliance, if applicable.
- Evidence of conformity to a cited standard or code of practice.
- Evidence that the performance is at least equal to that specified.
- Samples.
- Essential technical information, in English.
- Comparison between the products in relation to assembly method, finishes, installation methods and any protection/packaging.
- Reasons for the proposed substitutions.
- Statement of the extent of revisions to the contract documents.
- Statement of the extent of revisions to the construction program.
- Statement of cost implications including costs outside the contract.
- Statement of consequent alterations to other parts of the works.

- Statement of consequent maintenance conditions of warranty.

Availability: If the documented products or systems are unavailable within the time constraints of the construction program, submit evidence.

Criteria: If the substitution is for any reason other than unavailability, submit evidence that the substitution:

- Is of net enhanced value to the Principal.
- Is consistent with the contract documents and is as effective as the identified item, detail or method.

Costs: Pay the cost of submissions and of evaluation and tests of proposed alternatives, whether subsequently adopted or not. The costs will be calculated at the current charge-out rates of the relevant consultants.

Acceptance of substitutions shall be at the discretion of the Principal and Superintendent.

Lead times

The Contractor is responsible for determining the lead times associated with all specified materials and products and programming the works accordingly. No extensions of time will be granted due to disruptions in the Construction Programme caused by delays in procuring the specified materials and products. The Contractor may propose alternatives to the specified materials and products that have shorter lead times. However, lesser quality materials will not be accepted on this basis and the Superintendent is under no obligation to accept alternatives due to lead time issues associated with specified materials and products.

5.2 SAMPLES

General

General: Where required by the worksections and specifications and/ or as directed by the Superintendent, samples of materials and items comprising the work shall be submitted in duplicate by the Contractor to the Superintendent, labelled or otherwise identified, together with the date submitted. Provide all required data, evidence and certifications that the samples represent standards and materials which will comply with all provisions of their design and of the Contract. Obtain and submit endorsement from the relevant consultant.

Evaluation: Do not proceed with the related work until the accepted range of samples have been determined. The approved samples shall act as the control reference representing the standard to be adopted throughout and shall show any expected range in variation.

Incorporation of samples: If it is intended to incorporate samples into the works, submit proposals. Incorporate samples in the works which have been endorsed for incorporation. Do not incorporate other samples.

Retention of samples: Keep endorsed final submitted samples in good condition on site, for quality control comparisons until final acceptance of the work associated with each set of samples has been carried out.

Approval: Give notice before commencing work affected by samples unless the samples have been approved.

Criteria: Match approved samples throughout the works.

Unincorporated samples: Remove on completion.

5.3 SHOP DRAWINGS

General

Standard: To AS 1100.101 (1992), AS 1100.201 (1992), AS 1100.301 (2008), AS 1100.401 (1984) and AS/NZS 1100.501 (2002) as applicable.

General: Shop drawings mean complete drawings showing details of fabrication, assembly, installation and fixing methods of specific items or components, and shall include necessary explanatory notes and specifications.

Include provision in the construction programme for the production and distribution of shop drawings.

Verify relevant dimensions on site. Dimension drawings so that the items or components fit accurately into the required completed positions on site. The Contractor shall be responsible for all site-specific dimensioning and setout.

Refer discrepancies discovered in the contract documents to the Superintendent for clarification.

Checking: Ensure that the drawings have been checked before submission.

Acceptance of shop drawings shall imply only that the Contractor's interpretations of the relevant requirements of the contract are generally correct, but shall in no way relieve the Contractor of any obligations to construct and complete the works correctly or accurately.

Do not order, manufacture, assemble or supply any item or component needed according to requirements of shop drawings until the Superintendent returns the applicable approved stamped drawings.

The Superintendent may review shop drawings for compliance with the design intent, and make amendments, corrections, and the like, but no such review shall constitute an instruction under the contract, unless expressly stated to the contrary.

Documentation: Include dimensioned drawings showing details of the fabrication and installation of structural elements, building components, services and equipment, including relationship to building structure and other services, cable type and size, and marking details.

Amendments: Make amendments promptly and, if requested, resubmit amended shop drawings to the Superintendent.

Diagrammatic layouts: Coordinate work shown diagrammatically in the contract documents, and prepare dimensioned set-out drawings.

Record drawings: Amend all documented shop drawings to include changes made during the progress of the work and up to the end of the defects liability period.

Services coordination: Coordinate with other building and service elements. Show adjusted positions on the shop drawings.

Space requirements: Check space and access for maintenance requirements of equipment and services indicated diagrammatically in the contract documents.

Submission medium: Electronic and hardcopy, as detailed in GENERAL, **SUBMISSIONS**.

6 ANCILLARY BUILDING WORK

6.1 OFF-SITE DISPOSAL

Removal of material

General: Dispose of building waste material off site to the requirements of the relevant authorities.

6.2 PROTECTION

General

Provide necessary protective devices to protect all goods and materials, at all stages through to practical completion, against damage arising from, but not limited to, weather conditions, moisture, heat, humidity, direct sunlight, construction activities, other contractors, warping, distortion, abrasion and other conditions which could have an adverse effect on any goods and/ or materials.

Finished surfaces, which are to be exposed in the work during construction, including, but not limited to, concrete, prefinished cladding, glazing, floor, wall and ceiling linings, metalwork, joinery, furniture and fixtures, shall be protected to ensure they are not damaged or marked in any way. Under no circumstances shall finished surfaces be used, by subsequent trades, for marking dimensions, instructions and the like.

Provide full details of the protective measures proposed for implementation at each of the following five stages:

- Manufacture and packaging of goods and materials at off-Site locations.
- Shipment to Site and unloading.
- Storage on Site and movement to point of installation or construction.
- During installation/ construction.
- Completion of installation/ construction.

Where components are delivered to the Site in packages or crates, each package or crate shall be labelled on the outside giving the reference and quantity of the contents so that deliveries can be accepted at the Site without needing to open any package.

Carefully remove all temporary protective elements immediately before practical completion, or at an appropriate time to the acceptance of the Superintendent, and leave surfaces perfectly clean and fit for immediate use.

6.3 FIXING

General

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

Fasteners

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

6.4 STRUCTURAL SUPPORT

General

Provide steel support structures, as necessary, having due regard for any requirements in excess of primary and secondary structural steel shown in the Structural Engineer's documentation and also any requirements shown on the drawings.

6.5 BUILDING PENETRATIONS

Penetrations

Requirement: Maintain the required structural integrity, waterproofing performance and other properties when penetrating or fixing to the following:

- Structural building elements including external walls and other tested and rated assemblies or elements.
- Membrane elements including damp-proof courses, waterproofing membranes and roof coverings. If penetrating membranes, provide a waterproof seal between the membrane and the penetrating component.

Sealing

Building elements generally: Seal penetrations around conduits and sleeves. Seal around cables within sleeves. If the building element is acoustically rated, maintain the rating.

Sleeves

General: If piping, cables or conduits penetrate building elements, provide metal or PVC-U sleeves formed from pipe sections as follows:

- Movement: Arrange to permit normal pipe or conduit movement.
- Diameter: Sufficient to provide a ring shaped space around the pipe or pipe insulation of at least 12 mm.
- Ferrous surfaces: Prime paint.
- Sealing: Seal between pipes or conduits and sleeves to prevent the entry of vermin.
- Terminations:
 - . Cover plates fitted: Flush with the finished building surface.
 - . Acoustic rated building elements: 50 mm beyond finished building surface.
 - . Other locations: 5 mm beyond finished building surface.
- Thickness:
 - . Metal: 1 mm or greater.
 - . PVC-U: 3 mm or greater.

7 COMPLETION

7.1 TOOLS AND SPARE PARTS

Spare parts

General: Provide spare parts listed in the appropriate worksections.

Replacement: Replace spare parts used during the maintenance period.

Tools and spare parts schedule

Submission timing: Prior to the date for practical completion.

Requirement: Prepare a schedule of tools, portable instruments and spare parts necessary for maintenance of the installation. For each item state the recommended quantity and the manufacturer's current price. Include the following in the prices:

- Checking receipt, marking and numbering in conformance with the spare parts schedule.
- Packaging and delivery to site.
- Painting, greasing and packing to prevent deterioration during storage.
- Referencing equipment schedules in the operation and maintenance manuals.
- Suitable means of identifying, storing and securing the tools and instruments. Include instructions for use.

Replacement: Replace spare parts used during the maintenance period.

7.2 SOFTWARE

General

Requirement: Provide the software required for the operation and management of building services systems and equipment.

7.3 WARRANTIES

General

Requirement: Where warranties are documented, name the Principal as warrantee. Register with manufacturers as necessary. Retain copies delivered with components and equipment.

Warranty period: Start warranty periods at practical completion.

Approval of applicator or installer: If the warranty is conditional on the manufacturer's approval of the applicator or installer, submit the manufacturer's written approval of the installing company, and authorised personnel, with evidence of qualifications and experience in the specific use of the product, material or system.

Interlocking warranties: Where applicable, cover materials and workmanship in the terms of the warranty in the form of interlocking warranties from the supplier and installer.

- Form: Against failure of materials and execution under normal environment and use conditions.

Submit manufacturer and subcontractor warranties progressively, upon completion of associated work.

7.4 CLEANING

Final cleaning

General: Before the date for practical completion, clean throughout, including all exterior and interior surfaces except those totally and permanently concealed from view.

Labels: Remove all labels not required for maintenance.

7.5 TRAINING

General

Standard: To SA TS 5342 (2021).

Duration: Instruction to be available for the whole of the commissioning and running-in periods.

Format: Conduct training at agreed times, at system or equipment location. Also provide seminar instruction to cover all major components.

Operation and maintenance manuals: Use items and procedures listed in the final draft operation and maintenance manuals as the basis for instruction. Review contents in detail with the Principal's staff.

Certification: Provide written certification of attendance and participation in training for each attendee. Provide register of certificates issued.

Demonstrators

General: Use only qualified manufacturer's representatives who are knowledgeable about the installations.

Maintenance

General: Explain and demonstrate to the Principal's staff the purpose, function and maintenance of the installations.

Operation

General: Explain and demonstrate to the Principal's staff the purpose, function and operation of the installations.

Seasonal operation

General: For equipment requiring seasonal operation, demonstrate during the appropriate season and within 6 months.

8 TESTING AND COMMISSIONING

8.1 TESTING – GENERALLY**Inspection and testing plan**

Requirement: Provide inspection and testing plan consistent with the construction program including details of test stages and procedures.

Notice

Site tests: Give notice of the time and place of documented tests.

Inspection: Give sufficient notice for inspection to be made of the commissioning, testing and verification tests on completion of commissioning.

Attendance

General: Provide attendance at tests.

Suppliers: If necessary to carry out documented tests, arrange equipment suppliers to assist.

Testing authorities

Requirement: Have tests carried out by an Accredited Testing Laboratory, accredited for the documented test method, except for site tests or test methods that do not have an Accredited Testing Laboratory.

Test equipment

Accuracy: Use testing equipment designed to test and/or measure system performance within the documented tolerances.

Calibration: Use only instruments that have current calibration certificates issued by an Accredited Testing Laboratory. Tag or label instruments with calibration date and calibration authority name. Provide copies of certification if requested.

Maximum period since last calibration: As recommended by the manufacturer but less than 12 months, except as documented.

Recalibration: If dropped or damaged, recalibrate instruments.

Testing equipment: Provide test equipment and tools to perform documented tests as follows:

- Special testing equipment: If documented, provide special equipment, tools and instruments required for testing or calibration.
- Other testing equipment: Provide standard testing equipment.

Testing procedures

Verification: Verify test procedures by:

- Manual testing.
- Monitoring performance and analysing results using the control system trend logs.
- A combination of the above methods.

Sampling: Sampling may be used subject to the following:

- Use a sampling strategy only for multiple identical pieces of non-life-safety or otherwise non-critical equipment.
- If at any point, more than one identical item has failed, stop testing, determine the cause, rectify and document changes made to remaining units, before continuing with functional testing of the remaining units.

Type tests

Type test reports: Required, as evidence of conformance of proprietary equipment.

Sound pressure level measurements

Requirement: Conform to the following:

- Correction for background noise: To AS/NZS 2107 (2016) Table B1.
- External: To AS 1055 (2018).
- Internal: To AS/NZS 2107 (2016).

- Measurement positions: If a test position is designated only by reference to a room or space, do not take measurements less than 1 m from the floor, ground or walls. For large equipment items including chillers, measure at 2 m and 7 m from the equipment item.
- Sound pressure level analysis: Measure the sound pressure level and the background sound pressure level over the full range of octave band centre frequencies from 31.5 Hz to 8 kHz at the designated positions.
- Sound pressure levels: Measure the A-weighted sound pressure levels and the A-weighted background sound pressure levels at the designated positions.

Test outcome

Requirement: Test as documented and achieve the following:

- Pass the documented Pass/Fail test, and/or
- Values that meet documented requirements, and/or
- Verification of manufacturer's claimed performance.

Failure of multiple items

Requirement: If 10% or 3, whichever is greater, of identical pieces (size does not constitute a difference) of equipment fail to perform as documented for any reason, treat all identical units as having failed. Submit notice of failure and conform to the following:

- Within one week of notification, examine all other identical units and record the results. Submit a report of the findings within two weeks of the original failure notice.
- Within two weeks of the original failure notification, submit a signed and dated explanation of the problem, including the cause of failure, the proposed solution, full equipment details and any other information. Do not exceed the documented requirements of the original installation with the proposed solution.

Rectification of failure under test

Requirement: If an item fails a documented test, rectify the cause of failure and repeat the test.

Submissions: If submission of test results is documented, submit results of both successful and unsuccessful tests.

Test reports

Requirement: Include the following:

- Documented performance criteria including, if documented, tolerances.
- Observations and results of tests and conformance or non-conformance with documented requirements.

Test validity period

Requirement: As documented or, if no validity period is documented, no older than 5 years.

Controls

General: Calibrate, set and adjust control instruments, control systems and safety controls.

Circuit protection

General: Confirm that circuit protective devices are sized and adjusted to protect installed circuits.

Certification

General: On satisfactory completion of the installation, testing and commissioning and before the date for practical completion, certify that each installation is operating correctly.

Integrated system tests

Requirement: Conduct integrated system tests as documented.

Tests: Provide the following:

- Test the integrated operation of the systems listed in each mode documented.
- Restoration of the systems to their pre-test condition on completion of the tests above.

Failure: If any of the systems fails to perform as documented, including return to normal operation, rectify the cause and repeat the integrated system test.

Deferred and seasonal tests

Deferred tests: If documented testing cannot be completed at the scheduled or documented time, the Superintendent may direct that they be deferred to a later time but as soon as possible after the scheduled or documented time.

Seasonal tests: If documented tests are dependent on specific weather conditions, they may be deferred to a time when weather conditions are close to the documented test conditions. Complete seasonal testing as soon as possible but no later than one month before the end of the defects liability period.

Functional tests

Function: Carry out functional and operational tests on each energised equipment item and circuit.

8.2 COMMISSIONING**Standard**

Requirement: Conform to SA TS 5342 (2021).

Static completion

Requirement: Systems, components and building elements are statically complete when:

- Their construction and installation is complete and as documented, including completion of all systems, components and building elements on which they are dependent for commissioning.
- All pre-commissioning tests have been successfully completed.
- They are safe and ready for commissioning.
- All cleaning that may adversely affect commissioning is complete.
- They have been inspected and all outstanding remedial work that may adversely affect commissioning is complete.
- All spaces required for access for commissioning are safe to use and cleared of obstructions that may adversely affect commissioning.

Commissioning plan

Requirement: Provide a commissioning plan to SA TS 5342 (2021) including the following:

- A summary of the work covered by the commissioning plan.
- The parties responsible for this work and any commissioning interrelationships.
- The basis of the design.
- General sequence of commissioning.
- Project specific commissioning methodologies for each system and building element to be commissioned.
- Pre-commissioning requirements.
- Project specific commissioning procedures for each commissioning activity including integrated system tests, deferred and seasonal tests.
- A project specific building tuning plan for all commissioned systems. Include building tuning procedures and tuning team members.
- Requirements for witnessing of tests and documented demonstrations of completion of commissioning.
- Commissioning program to **COMMISSIONING, Commissioning program**.

Commissioning program

Submissions: Submit a program consistent with, and forming part of, the construction program as follows:

- Set out the proposed program for completion, commissioning, testing and instruction.
- Identify related works and timing of the works prerequisite to successful and timely completion of the works.

Revisions: Submit revisions of the program as the project proceeds.

Plant operating period: Include time in the program for the documented plant operating period before the date for practical completion.

Commissioning activities

Requirement: Provide the following to SA TS 5342 (2021):

- Manage the commissioning process.
- Establish and manage the completion process.
- Review design documents for commissionability. Submit a report including any recommended changes.

- Review documented commissioning requirements. Submit a report including any recommended changes.
- Review construction documents for commissionability. Submit a report including any recommended changes.
- Develop, review and update the commissioning plan and commissioning program.
- Develop, review and update commissioning methodologies.
- Develop, review and update commissioning procedures.
- Report on interdependencies between trades that may affect commissioning.
- Develop, review and update procedures for initial start-up of systems.
- Develop, review and update integrated system test procedures.
- Carry out pre-commissioning activities. Record results and submit pre-commissioning records.
- Conduct commissioning activities to the commissioning methodologies and procedures. Record and submit commissioning records.
- Facilitate and conduct integrated system tests and demonstrations. Record and submit integrated system test records.
- Conduct documented demonstrations of completion of commissioning.
- Report on the progress of commissioning work.
- Report on conformance to the commissioning plan and program.
- Report on commissioning defects and issues and progress on their resolution.
- Develop, review and update commissioning report.
- Develop, review and update training materials, conduct training sessions to **TRAINING**.
- Develop, review and update operation and maintenance manuals to **OPERATION AND MAINTENANCE MANUALS**.
- Manage and report deferred and seasonal testing activities to **TESTING - GENERALLY**.
- Management and reporting of building tuning process.
- Periodically review performance data.

Verification of commissioning

Requirement: On completion of commissioning of the equipment or system, provide additional tests to verify that it is fully commissioned and operating to documented requirements.

8.3 BUILDING TUNING

General

Standard: To SA TS 5342 (2021).

Frequency: Three monthly or more frequently.

Duration: Until the end of the maintenance period. Provide last building tuning in the month before the end of the maintenance period.

Requirement: Provide the following:

- Review data from all recording systems against documented requirements.
- Review of building occupant feedback.
- If discrepancies are identified from the above, take corrective action to rectify them.
- Report on the findings of the reviews, corrective action and effect of corrective action.
- Recommend other action to improve the effectiveness, reliability and efficiency of systems.

9 PROJECT RECORDS

9.1 RECORD DRAWINGS

General

Requirement: Prepare record drawings showing the following:

- Installed locations of building elements, services, plant and equipment.
- Off-the-grid dimensions and depth if applicable.

- Any provisions for the future.

Recording, format and submission

Requirement: Record changes made during the progress of the works on a set of drawings kept on site for that specific purpose.

Drawing layout: Use the same borders and title block as the contract drawings.

Quantity and format: Conform to **SUBMISSIONS**.

Endorsement: Sign and date all record drawings.

Accuracy: If errors in, or omissions from, the record drawings are found, amend the drawings and re-issue in the quantity and format documented for **SUBMISSIONS**.

Date for submission: Not later than 2 weeks after the date for practical completion.

9.2 OPERATION AND MAINTENANCE MANUALS**General**

Standard: To SA TS 5342 (2021).

Authors and compilers: Personnel experienced in the maintenance and operation of equipment and systems installed, and with editorial ability.

Referenced documents: If referenced documents or worksections require submissions of manuals, include corresponding material in the operation and maintenance manuals.

Subdivision: By installation or system, depending on project size.

Revisions: Amend the operation and maintenance manuals to include changes made to the installation during construction and maintenance including changes to software and commissioning records.

Contents of manual

Table of contents: Include a table of contents in each volume. Title to match cover.

Table of amendments: Include a table of amendments.

Directory: Include names, addresses, email addresses and telephone and facsimile numbers of principal consultant, subconsultants, contractor, subcontractors and names of responsible parties.

Record drawings: Include complete set of record drawings, full size.

Drawings and technical data: Include as necessary for the efficient operation and maintenance of the installation.

Installation description: Include a general description of the installation.

Systems descriptions and performance: Include a technical description of the systems installed including the basis of design, the interrelation with other systems and the building and mode of operation, presented in a clear and concise format readily understandable by the Principal's staff. Identify function, normal operating characteristics, safety features and limiting conditions.

Commissioning records: Include commissioning records to SA TS 5342 (2021). Link commissioning records to item codes on the record drawings.

Training material: Include materials used to provide training, to **TRAINING**, in a form that can be used to train others.

Fire systems and equipment: Include documentation to AS 1851 (2012), including the schedule of essential functionality and performance requirements.

Digital photographic and video records: Provide documented digital photographic and video records, keyed to the drawings.

Equipment: Include schedules with the following details for installed equipment:

- Item code for use on record and diagrammatic drawings, and spare parts schedule.
- Equipment name plate data including serial number, if any.
- Name and contact details of the manufacturer and supplier.
- Catalogue list number(s).
- Location.
- Function.
- Performance figures and capacity data.
- Date of manufacture.

- Manufacturer's product data sheets including only relevant matter for the project. Mark each product data sheet to clearly identify specific products and component parts used in the installation, and data applicable to the installation.
- Additional information and commentary to illustrate relations of component parts.

Certificates:

- Certificates from authorities.
- Product certification.
- Test certificates for each service installation and all equipment.
- Warranties.

Trends: 7 day record of all trends at commissioning.

Operation procedures: Include for systems installed:

- Manufacturer's technical literature as appropriate.
- Safe starting up, running-in, operating and shutting down procedures. Include logical step-by-step instructions for each procedure.
- Control sequences and flow diagrams.
- Legend for colour-codes services.
- Schedules of fixed and variable equipment settings established during commissioning and maintenance.
- A list of special safety devices and their set points.
- Procedures for seasonal changeovers.
- Warnings to operators.
- Procedures for identifying and rectifying common faults.
- Recommendations for efficient plant operation.
- If the installation includes cooling towers, recommendations for water efficiency.
- Building tuning plan and procedure to **COMMISSIONING, Commissioning plan**.

Building occupants' guide: Include a concise guide written and illustrated for building occupants with no technical background. Include the following:

- Security provisions.
- Safety and access.
- Environmental features, including energy and water efficiency and waste management.
- Occupant relevant information on design and operation.
- Information for occupants on environmental systems that rely partially or wholly on local controls for heating, lighting, cooling, and ventilation.
- Contact details for faults, maintenance and emergencies.

Maintenance procedures:

- Detailed recommendations for periodic maintenance and procedures, including schedule of maintenance work with frequency and manufacturers' recommended tests.
- Manufacturer's technical literature as appropriate. Register with manufacturer as necessary. Retain copies delivered with equipment.
- Safe trouble-shooting, disassembly, repair and reassembly, cleaning, alignment and adjustment, balancing and checking procedures. Provide logical step-by-step instructions for each procedure.
- Schedule of spares, recommended to be held on site, for those items subject to wear or deterioration and that may involve the Principal in extended deliveries when replacements are required. Include complete nomenclature and model numbers, and local sources of supply.
- Schedule of normal consumable items, local sources of supply, and expected replacement intervals up to a running time of 40 000 hours. Include lubrication schedules for equipment.
- Instructions for use of tools and testing equipment.
- Troubleshooting procedures.
- Emergency procedures, including telephone numbers for emergency services, and procedures for fault finding.

- Safety data sheets (SDS).
- Instructions and schedules conforming to AS 1851 (2012), AS/NZS 3666.2 (2011), AS/NZS 3666.3 (2011) and AS/NZS 3666.4 (2011).

Maintenance records:

- Prototype routine service records conforming to AS 1851 (2012) prepared to include project specific details.
- Prototype periodic maintenance records and report to AS/NZS 3666.2 (2011), AS/NZS 3666.3 (2011) and AS/NZS 3666.4 (2011) as appropriate, prepared to include project specific details.
- Hard copies: Binders to match the manuals, containing loose leaf logbook pages designed for recording completion activities including operational and maintenance procedures, materials used, test results, comments for future maintenance actions and notes covering the condition of the installation. Include completed logbook pages recording the operational and maintenance activities performed up to the date for practical completion.
- Number of pages: The greater of 100 pages or enough pages for the maintenance period and a further 12 months.

Emergency information: For each type of emergency, including fire, flood, gas leak, water leak, power failure, water failure, system or subsystem failure, chemical release or spill, include the following:

- Emergency instructions.
- Emergency procedures including:
 - . Instructions for stopping or isolating.
 - . Shutdown procedures and sequences.
 - . Instructions for actions outside the property.
 - . Special operating instructions relevant to the emergency.
 - . Contact details relevant to the emergency.

Emergency information manual

Form of emergency information: Provide one of the following:

- An index and coloured tabs identifying emergency information for each type of emergency within the Operation and maintenance manual.
- A separate Emergency manual containing copies of emergency information from the main Operation and maintenance manual.

Format – electronic copies

Scope: Provide the same material as documented for hardcopy in electronic format.

Quantity and format: Conform to **SUBMISSIONS, Electronic submissions**.

Printing: Except for drawings required in **RECORD DRAWINGS** provide material that can be legibly printed on A4 size paper.

Format – hard copies

General: A4 size loose leaf, in commercial quality, 4 ring binders with hard covers, each indexed, divided and titled. Include the following features:

- Cover: Identify each binder with typed or printed title *OPERATION AND MAINTENANCE MANUAL*, to spine. Identify title of project, volume number, volume subject matter, and date of issue.
- Dividers: Durable divider for each separate element, with typed description of system and major equipment components. Clearly print short titles under laminated plastic tabs.
- Drawings: Fold drawings to A4 size with title visible, insert in plastic sleeves (one per drawing) and accommodate them in the binders.
- Pagination: Number pages.
- Ring size: 50 mm maximum, with compressor bars.
- Text: Manufacturers' printed data, including associated diagrams, or typewritten, single-sided on bond paper, in clear concise English.

Number of copies: 3.

Date for submission

Draft submission: The earlier of the following:

- 4 weeks before the date for practical completion.

- Commencement of training.

Final submission: Within 2 weeks after practical completion.

10 MAINTENANCE

10.1 PERIODIC MAINTENANCE

General

Requirement: Provide documented maintenance so that the condition and performance of the maintained work throughout and at the end of the maintenance period is equal to or better than that at the beginning of the maintenance period including with respect to the following:

- Performance, service delivery.
- Service life and reliability.
- Compliance with statutory requirements.
- Compliance with building rating requirements.
- Energy and water efficiency.
- Environmental impact.
- Health and safety.
- Risk management.

Inclusions: Include the following:

- Periodic and statutory maintenance, cleaning and replacement of consumables.
- Emergency repairs.
- Condition reporting.

Duration: From the time systems and equipment are put into service to the end of the maintenance period.

Maintenance period: The greater of the defects liability period and the period documented.

Faults: Rectify promptly.

Emergencies: Attend emergency calls promptly.

Annual maintenance: Carry out recommended annual maintenance procedures within the four weeks before the end of the maintenance period.

Maintenance program

General: Submit details of maintenance procedures and program, relating to installed plant and equipment, 6 weeks before the date for practical completion. Indicate dates of service visits. State contact telephone numbers of service operators and describe arrangements for emergency calls.

Maintenance records

General: Record in binders provided with the operation and maintenance manuals.

Referenced documents: If referenced documents or technical worksections require that logbooks or records be submitted, include this material in the maintenance records.

Certificates: Include test and approval certificates.

Service visits: Record comments on the functioning of the systems, work carried out, items requiring corrective action, adjustments made and name of service operator. On completion of the visit, obtain the signature of the Principal's designated representative on the record of the work undertaken.

Site control

General: Report to the Principal's designated representative on arriving at and before leaving the site.

10.2 STATUTORY INSPECTIONS AND MAINTENANCE

General

Duration: From the time systems and equipment are put into service to the end of the maintenance period.

Requirement: Provide inspections and maintenance of safety measures required by the following:

- AS 1851 (2012).
- Other statutory requirements applicable to the work.

Records: Provide mandatory records.

Certification: Certify that mandatory inspections and maintenance have been carried out and that the respective items conform to statutory requirements.

Annual inspection: Perform an annual inspection and maintenance immediately before the end of the maintenance period.

0181 ADHESIVES, SEALANTS AND FASTENERS

1 GENERAL

1.1 RESPONSIBILITIES

General

Requirement: Provide adhesives, sealants and fasteners, as documented.

Performance

Requirements: Conform to the following:

- Fitness for purpose: Suitable for particular use, capable of transmitting imposed loads, sufficient to maintain the rigidity of the assembly, or integrity of the joint.
- Finished surface: That will not cause discolouration.
- Compatibility: Compatible with the products to which they are applied.
- Sealant replacement: Capable of safe removal without compromising the application of the replacement sealant for future refurbishment.
- Movement: If an adhered or sealed joint is subject to movement, select a system certified to accommodate the projected movement under the conditions of service.

1.2 CROSS REFERENCES

General

Requirement: Conform to the following:

- 0171 General requirements.

1.3 SUBMISSIONS

Products and materials

Adhesives and sealants: Submit product data sheets.

Samples

Visible joint sealants: Submit colour samples.

Tests

Compatibility testing: Submit adhesion and compatibility testing data demonstrating that adhesives, sealants and fasteners are compatible with the materials to be fixed and are suitable for the project conditions.

Warranties

Requirement: Submit warranties in accordance with the requirements of 0171 General requirements.

- Period: As offered by the manufacturer.

1.4 INSPECTION

Notice

Inspection: Give notice so that inspection may be made of prepared joints and penetrations for each sealant application.

2 PRODUCTS

2.1 ADHESIVES

Standards

Gypsum plaster adhesive: To AS 2753 (2018).

High strength adhesive tape

General description: A foam of cross linked polyethylene or closed cell acrylic coated both sides with a high performance acrylic adhesive system, encased in release liners of paper or polyester.

Product classification: Select tape to suit substrate as follows:

- Firm high strength foam tapes: For high energy surfaces including most bare metals such as stainless steel and aluminium.

- Conformable high strength foam: For the following:
 - . Medium energy surfaces including many plastics, paints, and unfinished metals.
 - . Lower energy surfaces including many plastics, most paints and powder coatings, and unfinished metals.

Thickness: Select the tape to make sure a mismatch between surfaces does not exceed half the tape thickness under the applied lamination pressure.

2.2 SEALANTS

Standards

General: To ISO 11600 (2002).

Only polyurethane or silicone based sealants shall be incorporated into the works, unless prior acceptance has been obtained from the Superintendent.

Acoustic-attenuated elements: Use only 100% polyurethane mastic to perimeters and penetrations.

Visible sealants: Where visible or exposed in finished work, sealants shall match the colour of the material(s) being joined or sealed, whether natural or coated, unless specified otherwise.

Sealants to floors: Where sealant occurs in floors or paved areas, use only trafficable grade.

Anti-bacterial/ anti-fungal sealant: Where sealant is nominated as anti-bacterial or anti-fungal it shall achieve a rating of 0 for fungal growth when assessed in accordance with AS/NZS 1580.481.1.13 (1998). All sealants used to wet areas shall be anti-bacterial/ anti-fungal.

Lightweight building element joints

Joints subject to rapid changes of movement: Provide sealants that accommodate the movement of the contact materials.

Floor control joints

General: Provide trafficable sealants.

Bond breaking backing:

- Bond breaking materials: Non-adhesive to sealant, or faced with a non-adhering material.
- Foamed materials: Closed-cell or impregnated, not water-absorbing.

2.3 FASTENERS

General

Masonry anchors: Proprietary expansion or bonded type anchors, as documented.

Plain washers: To AS 1237.1 (2002).

- Provide washers to the heads and nuts of bolts, and the nuts of coach bolts.

Plugs: Proprietary purpose-made plastic.

Stainless steel fasteners: To ASTM A276/A276M (2024).

Steel nails: To AS 2334 (1980).

- Length: At least 2.5 times the thickness of the member being secured, and at least 4 times the thickness if the member is plywood or building board less than 10 mm thick.

Unified hexagon bolts, screws and nuts: To AS/NZS 2465 (1999).

Fasteners in CCA treated timber: Epoxy coated or stainless steel.

Bolts

Coach bolts: To AS/NZS 1390 (1997).

Hexagon bolts Grades A and B: To AS 1110.1 (2015).

Hexagon bolts Grade C: To AS 1111.1 (2015).

Nuts

Hexagon chamfered thin nuts Grades A and B: To AS 1112.4 (2015).

Hexagon nuts Grade C: To AS 1112.3 (2015).

Hexagon nuts Style 1 Grades A and B: To AS 1112.1 (2015).

Hexagon nuts Style 2 Grades A and B: To AS 1112.2 (2015).

Screws

Coach screws: To AS/NZS 1393 (1996).

Hexagon screws Grades A and B: To AS 1110.2 (2015).

Hexagon screws Grade C: To AS 1111.2 (2015).

Hexagon socket screws: To AS 1420 (2008).

Self-drilling screws: To AS 3566.1 (2002).

Self-tapping screws:

- Cross-recessed countersunk (flat – common head style): To AS/NZS 4407 (2015).
- Cross-recessed pan: To AS/NZS 4406 (2015).
- Cross-recessed raised countersunk (oval): To AS/NZS 4408 (2015).
- Hexagon: To AS/NZS 4402 (2015).
- Hexagon flange: To AS/NZS 4410 (2015).
- Hexagon washer: To AS/NZS 4409 (2015).
- Slotted countersunk (flat – common head style): To AS/NZS 4404 (2015).
- Slotted pan: To AS/NZS 4403 (2015).
- Slotted raised countersunk (oval – common head style): To AS/NZS 4405 (2015).

Blind rivets

Description: Expanding end type with snap mandrel.

Type: Closed end for external application, open end for internal application.

End material:

- Aluminium base alloy for metallic-coated or prepainted steel.
- Stainless steel for stainless steel sheet.
- Copper for copper sheet.

Size:

- For sheet metal to sheet metal: 3 mm.
- For sheet metal to supports, brackets and rolled steel angles: 4.8 mm.

Corrosion resistance

Atmospheric corrosivity category: To 0171 *General requirements*.

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

Corrosion resistance table

Atmospheric corrosivity category to AS 4312 (2019)	Threaded fasteners and anchors		Powder actuated fasteners
	Material	Minimum local metallic coating thickness (µm)	Material
C1	Electroplated zinc or Hot-dip galvanized	30	Stainless steel Type 316
C3	Hot-dip galvanized	45	Stainless steel Type 316

Finishes

Electroplating:

- Metric thread: To AS 1897 (2016).
- Imperial thread: To AS 4397 (2007).

Galvanizing:

- Threaded fasteners: To AS/NZS 1214 (2016).
- Other fasteners: To AS/NZS 4680 (2006).

Mild steel fasteners: Galvanize if:

- In external timbers.
- In contact with chemically treated timber other than CCA treated timber.

Epoxy coated: CCA treated timber.

Tamper resistant fixings

Tamper resistant fixings, where required, shall have a unique drive design to prevent removal with ordinary screw drivers and commonplace tools. Provide samples for acceptance prior to commencement of work and submit the unique drive tool at Practical Completion.

3 EXECUTION**3.1 ADHESIVES****General**

Requirement: Install to the manufacturer's recommendations.

Preparation

Substrates: Conform to the following:

- Remove any deposit or finish that may impair adhesion.
- If framed or discontinuous, provide support members in full lengths without splicing.
- If solid or continuous, remove excessive projections.
- If previously painted, remove cracked or flaking paint and lightly sand the surface.

Contact adhesive

Precautions: Do not use contact adhesive if:

- A substrate is polystyrene foam.
- A PVC substrate may allow plasticiser migration.
- The adhesive solvent can discolour the finished surface.
- Dispersal of the adhesive solvent is impaired.

Two-way method: Immediately after application, press firmly to transfer adhesive and then pull both surfaces apart. Allow to tack off and then reposition and press firmly together. Tap areas in contact with a hammer and padded block.

One-way method: Immediately after application, bring substrates together and maintain maximum surface contact for 24 hours by clamps, nails or screws as appropriate. If highly stressed, employ permanent mechanical fasteners.

High strength adhesive tape

Preparation:

- Non-porous surfaces: Clean with surface cleaning solvents such as isopropyl alcohol/water, wash down and allow to dry.
- Porous surfaces: Prime the surface with a contact adhesive compatible with the tape adhesive system.

Application to copper, brass, plasticised vinyl and hydrophilic surfaces such as glass and ceramics in a high humidity environment: Conform to the manufacturer's recommendations.

Applied lamination pressure: Make sure the tape experiences 100 kPa.

Application temperature: Generally above 10°C and to the manufacturer's recommendations.

Completion: Do not apply loads to the assembly for 72 hours at 21°C.

3.2 JOINT SEALING**General**

Requirement: Install to the manufacturer's recommendations.

Joint preparation

Cleaning: Cut flush joint surface protrusions and rectify if required. Mechanically clean joint surfaces free of any deposit or finish that may impair adhesion of the sealant. Immediately before sealant application, remove loose particles from the joint, using oil-free compressed air.

Bond breaking: Install bond breaking backing material.

Taping: Protect the surface on each side of the joint using 50 mm wide masking tape or equivalent means. On completion of sealant application, remove the tape and remove any stains or marks from adjacent surfaces.

Primer: Apply the recommended primer to the surfaces in contact with sealant materials.

Sealant joint proportions

General weatherproofing joints (width:depth):

- 1:1 for joint widths less than 12 mm.
- 2:1 for joint widths greater than 12 mm.

Sealant application

General: Apply the sealant to dry joint surfaces using a pneumatic applicator gun. Make sure the sealant completely fills the joint to the required depth, provides good contact with the full depth of the sides of the joint and traps no air in the joint. Do not apply the sealant outside the recommended working time for the material or the primer.

Weather conditions

Two pack polyurethanes: Do not apply the sealant if ambient conditions are outside the following:

- Temperature: Less than 5°C or greater than 40°C.
- Humidity: To the manufacturer's recommendations.

Joint finish

General: Force the sealant into the joint and finish with a smooth, slightly concave surface using a tool designed for the purpose.

Excess sealant: Remove from adjoining surfaces using cleaning material nominated by the sealant manufacturer.

Protection

General: Protect the joint from inclement weather during the setting or curing period of the material.

Rectification

General: Cut out and remove damaged portion of joint sealant and reinstall so repaired area is indistinguishable from undamaged portion.

3.3 TESTING

Installed sealant tests

Sampling: For each sealant test, take 3 samples of installed and cured sealant, each at least 50 mm long, from completed joints.

Reinstatement: Repair-as-new the joints from which the samples were taken.

3.4 FASTENERS

General

Requirement: Install to the manufacturer's recommendations.

Fastening to wood and steel

Timber substrates: To AS 1720.1 (2010) Section 4.

Self-drilling screws: To AS 3566.1 (2002) for timber and steel substrates.

Masonry anchors

Installation: To the manufacturer's recommendations.

0183 METALS AND PREFINISHES

1 GENERAL**1.1 RESPONSIBILITIES****General**

Requirements: Provide metal and prefinishes as documented.

Performance

Requirement: Provide metals in sections of strength and stiffness suited to their required function, finish and method of fabrication.

1.2 CROSS REFERENCES**General**

Requirement: Conform to the following:

- 0171 General requirements.

1.3 SUBMISSIONS**Samples**

General: Submit samples of the following:

- Stainless steel: One sample of every documented surface finish.
- Anodising: One sample of every colour and finishing option.
- Galvanised and metallic-coated steel elements: One sample of every documented surface finish, where intended to be exposed.
- Painted metal: One sample of every documented surface finish.
- Welded connections: One sample of each type of welded connection, where intended to be exposed.

2 PRODUCTS**2.1 METALS****Aluminium and aluminium alloys**

Drawn pipe: To AS/NZS 1867 (1997).

Drawn rod, bar and strip: To AS/NZS 1865 (1997).

Extrusions: To AS/NZS 1866 (1997).

Plate and sheets: To AS/NZS 1734 (1997).

Copper and copper alloys

Casting: To AS 1565 (2023).

Plate, sheet and strip: To AS 1566 (1997).

Rods, bars and sections: To AS/NZS 1567 (2023).

Composition and designations: To AS 2738 (2023).

Stainless steel

Bars: To ASTM A276/A276M (2024).

Plate, sheet and strip: To ASTM A240/A240M (2024).

Welded pipe (plumbing applications): To AS 1769 (1975).

Welded pipe (round, square, rectangular): To ASTM A554 (2021).

Steel

Sheet: To AS/NZS 1595 (1998).

Structural bars and sections: To AS/NZS 3679.1 (2016).

Structural hollow sections: To AS/NZS 1163 (2016).

Steel for prefinishes

Cold-rolled bar: Bright bars to AS 1443 (2004).

Cold-rolled sheet: To AS/NZS 1595 (1998).

Electric resistance welded tube: To AS 1450 (2007).

3 EXECUTION**3.1 GENERAL****Metal separation**

General: Take adequate measures to prevent bi-metallic corrosion between incompatible metals and to isolate aluminium components from cementitious surfaces. To this end attention is drawn to publication PD 6484, Commentary on Corrosion at Bi-metallic Contacts and its Alleviation.

Incompatible sheet metals: Prevent direct contact between incompatible metals. Provide separation by one of the following:

- Apply an anti-corrosion low moisture transmission coating such as alkyd zinc phosphate primer or aluminium pigmented bituminous paint to contact surfaces.
- Insert a concealed, non-conductive separation layer such as polyethylene film, adhesive tape, neoprene, nylon or bituminous felt.

Incompatible fixings: Do not use.

Incompatible service pipes: Install lagging or grommets. Do not use absorbent, fibrous or paper products.

Brazing

Lap-joints: Make sure brazed lap-joints have sufficient lap to provide a mechanically sound joint.

Butt joints: Do not use butt jointing for joints subject to load. If butt joints are used, do not rely on the filler metal fillet only.

Filler metal: To AS/NZS ISO 17672 (2023).

Soldering

Lap-joints: Provide a mechanically sound soldered joint with sufficient lap for roofing, guttering, metalwork.

Pipes: Make a leakproof soldered joint using joiners for copper pipes.

Solder: To AS 1834.1 (1991).

Welding

Aluminium: To AS/NZS 1665 (2004).

Stainless steel: To AS/NZS 1554.6 (2012).

Steel: To AS/NZS 1554.1 (2014).

Requirement: All visible welds shall be ground back flush to match associated material.

Finishing

Visible joints: Finish visible joints made by welding, brazing or soldering using methods appropriate to the class of work (including grinding or buffing) before further treatment such as painting, galvanizing or electroplating. Make sure self-finished metals are without surface colour variations after jointing.

Preparation

General: Before applying decorative or protective prefinishes to metal components, complete welding, cutting, drilling and other fabrication, and prepare the surface using a suitable method.

Standard: To the AS 1627 series.

Priming steel surfaces: If site painting is documented to otherwise uncoated mild steel or similar surfaces, prime as follows:

- After fabrication and before delivery to the works.
- After installation, repair damaged priming and complete the coverage to unprimed surfaces.

3.2 FERROUS STEEL FINISHES**Metallic-coated steel**

General: Steel coated with zinc or aluminium-zinc alloy as follows:

Electrogalvanized (zinc) coating on ferrous hollow and open sections: To AS 4750 (2003).

- Ferrous open sections by an in-line process: To AS/NZS 4791 (2006).
- Ferrous hollow sections by a continuous or specialised process: To AS/NZS 4792 (2006).
- Steel sheet and strip: To AS 1397 (2021).
- Steel wire: To AS/NZS 4534 (2006).

3.3 STAINLESS STEEL FINISHES

General

Requirement: Provide a surface finish to match accepted samples.

Pre-assembly

Mechanically polished and brushed finishes: Apply grit faced belts or fibre brushes that achieve uni-directional finishes with buffing, as required.

Bead blasted finish: Provide a uniform non-directional low reflective surface by bead blasting. Do not use sand, iron or carbon steel shot. Blast both sides of austenitic grades of stainless steel to equalise induced stress.

Unless nominated otherwise, all stainless steel used externally shall be grade 316 and have a polished finish (ASTM A480 (2023) No. 8 or EN 10088-2 (2014) class 2P), to reduce susceptibility to corrosion. Ensure all stainless steel used externally has a surface roughness smoother than 0.5 micron Ra.

Where a finished finish is used (ASTM A480 (2023) No. 4), the surface roughness shall not exceed 0.6 micron Ra. Submit samples for acceptance prior to manufacture.

Stainless steel surfaces shall be clean, free from contamination, such as carbon steel swarf or manganese sulphide inclusions, and have a continuous passive layer. Acid pickling, acid passivation or electropolishing, for sufficient time, will remove these contaminants from the surface as well as restore the passive layer, leaving the stainless steel with a clean and corrosion resistant surface.

Post-assembly treatment

If stainless steel is welded, the heat input will locally destroy the passive layer (a dark non-protective oxide is formed around the weld). To achieve best corrosion performance and restore passivity of the weld, the heat tint and underlying chromium depleted layer must be removed.

For general architectural applications, welds shall comply with AS/NZS 1554.6 (2012) Level 2, Class B. However, this specification does not guarantee the absence of structurally minor surface defects which can act as traps and corrosion initiating sites. The protruding weld can be ground flush, and good resistance to tea staining achieved (a Grade I finish) when polished to 320 grit or finer finish. The smoother the surface, the better the tea staining resistance. Passivation will occur in chloride-free, moist air within a day. Chemical passivation treatment with nitric acid may be applied to:

- Substantially reduce the time required for passivation.
- Provide a more corrosion resistant passive film.
- Remove possible iron contamination.
- Dissolve exposed manganese sulphides.

Chemical passivation must be applied after abrasion, if the environment is particularly aggressive.

Where a polished finish is desired, abrasives shall be used with lubrication if possible. In selecting abrasives, consideration shall be given to matching the surrounding finish.

Post-assembly finish

Brushed electropolish finish: Conform to the following:

- Pre-assembly finish: No. 4 polished.
- Post-assembly finish: Provide an electro-chemical process to achieve a surface roughness, Ra, no greater than 0.50 microns.

Mirror finish: Conform to the following:

- Pre-assembly finish: 2B cold-rolled finish.
- Post-assembly finish: Apply a polishing and buffing process to achieve a No. 8 mirror finish.

Completion

Cleaning: Clean and rinse to an acid free condition and allow to dry. Do not use carbon steel abrasives or materials containing chloride.

Protection: Secure packaging or strippable plastic sheet.

3.4 NON-FERROUS FINISHING

Mechanical finishes

Bright finished copper alloy surfaces: For indoor applications, apply a clear lacquer protective coating.

3.5 ELECTROPLATED FINISHES

Electroplated coatings

Chromium on metals: To AS 1192 (2004).

- Service condition number: At least 2.

Nickel on metals: To AS 1192 (2004).

- Service condition number: At least 2.

Zinc on iron or steel: To AS/NZS 1789 (2023).

3.6 ANODISING

General

Standard: To AS 1231 (2000).

Thickness grade: To the recommendations of AS 1231 (2000) Appendix H.

3.7 COMPLETION

Damage

Damaged prefinishes: Remove and replace items, including damage caused by unauthorised site cutting or drilling.

Repair

Anodising: Use sprayers or pens for minor scratches and mitre cuts as required.

Metallic-coated sheet: If repair is required to metallic-coated sheet or electrogalvanizing on inline galvanized steel products, clean the affected area and apply a two-pack organic primer to AS/NZS 3750.9 (2009).

Cleaning

General: On completion, clean all surfaces. Do not use abrasive cleaners.

0184 TERMITE MANAGEMENT

1 GENERAL**1.1 RESPONSIBILITIES****General**

Requirement: Provide termite management systems, as documented.

Performance

Requirement: Building protection from termite attack.

1.2 CROSS REFERENCES**General**

Requirement: Conform to the following:

- 0171 *General requirements*.
- 0181 *Adhesives, sealants and fasteners*.

1.3 STANDARD**General**

Termite management systems: To AS 3660.1 (2014).

1.4 INTERPRETATION**Definitions**

General: For the purposes of this worksection the definitions given in AS 3660.1 (2014) apply.

1.5 SUBMISSIONS**Samples**

General: Submit samples as follows:

- Representative samples of each type of termite barrier.

Certification

Installation: On completion, submit certificate to AS 3660.1 (2014) clause A3.

Operation and maintenance manuals

Requirement: Submit manuals to **COMPLETION**, **Operation and maintenance manuals**.

Products and materials

Manufacturer's data: Submit manufacturer's data including the following:

- Product data sheet.
- Recommendations for installation.

Type tests: Submit results, as follows:

- Termite management systems to AS 3660.3 (2014).

Records

Termite management system: Submit report to **MAINTENANCE**, **Inspection**.

Subcontractors

General: Submit names and contact details of proposed suppliers and installers.

Warranties

Requirement: Submit warranties in accordance with the requirements of 0171 *General requirements*.

- Type: Renewable.
- Period: 6 years.

1.6 INSPECTION**Notice**

Inspection: Give notice so that inspection may be made of the following:

- Completed earthworks or substrate preparation before system installation.

- Completed termite management system before concealing.
- Termite management system at the end of the defects liability period.

2 PRODUCTS

2.1 NON-SOIL MATRIX MANAGEMENT SYSTEMS

Concrete slab

Description: Composite membrane incorporating a termiticide.

Product: Kordon TB or acceptable equivalent.

System shall be installed at perimeters, joints and penetrations in new concrete slabs.

2.2 PHYSICAL SYSTEMS

Termite sheeting

General: To AS 3660.1 (2014) Section 5.

3 EXECUTION

3.1 GENERAL

Concrete slabs

Standard: To AS 3660.1 (2014) Section 4.

3.2 PHYSICAL SYSTEMS

Termite sheeting

General: To AS 3660.1 (2014) Section 5.

3.3 COMPLETION

Termite management system notice

Signage: Permanently fix a durable notice in a prominent location to BCA B1D4(i)(ii).

Cleaning

Requirement: Clean progressively and remove from the site waste building materials that could attract termites.

Operation and maintenance manuals

Requirement: For systems requiring post-construction monitoring, prepare a maintenance manual that includes the following:

- Inspection frequency.
- Instructions for inspection of termite activity and treatment effectiveness.
- Contact details of installers and manufacturer's authorised supplier of replacement components.

3.4 MAINTENANCE

Inspection

Requirement: At the end of the defects liability period, inspect the termite management system to AS 3660.2 (2017) clause 3.3.2.2. Prepare a report on the efficacy and status to AS 3660.2 (2017) clause 3.4.

0185 TIMBER PRODUCTS, FINISHES AND TREATMENT

1 GENERAL**1.1 RESPONSIBILITIES****General**

Requirement: Provide timber products with finishes and treatments as documented.

Performance

Requirements:

- Appropriate for durability.
- Appropriate surface finish.
- Appropriate certification for the finishing applications.

1.2 CROSS REFERENCES**General**

Requirement: Conform to the following:

- 0171 General requirements.

1.3 STANDARDS**General**

Sawn and milled products:

- Hardwood: To AS 2796.1 (1999).
- Softwood: To AS 4785.1 (2002).

Reconstituted wood based panels:

- Particleboard: To AS 1859.1 (2017).
- Dry process fibreboard: To AS/NZS 1859.2 (2017).
- Decorative overlaid wood panels: To AS/NZS 1859.3 (2017).
- Wet process fibreboard: To AS/NZS 1859.4 (2018).

Plywood:

- Structural: To AS/NZS 2269.0 (2012).
- Interior: To AS/NZS 2270 (2006), Bond type C, unless nominated otherwise.
- Exterior: To AS/NZS 2271 (2004), Bond type A.
- Marine: To AS/NZS 2272 (2006), Bond type A.
- Minimum bond quality: To AS/ NZS 2754.1 (2016), with thickness to suit the design requirements.
- Ensure that fastenings do not protrude above the surface of the sheet. Fastenings shall be of a type recommended for the purpose by the fastenings' manufacturer.

Glued laminated timber: To AS/NZS 1328.1 (1998).

Laminated veneer lumber: To AS/NZS 4357.0 (2022).

Timber grading methods:

- Stress graded: To AS/NZS 1748 series.
- Visually graded F-grade: To AS 2082 (2007) or AS 2858 (2023).

1.4 INTERPRETATION**Abbreviations**

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

- EWPA: Engineered Wood Products Association of Australasia.
- LVL: Laminated Veneer Lumber.
- MDF: Medium Density Fibreboard.

Definitions

General: For the purposes of this worksection, the definitions given in AS/NZS 4491 (1997) and the following apply:

- Dry process fibreboard (MDF): Panel material with a nominal thickness of 1.5 mm or greater, manufactured from lignocellulosic fibres (derived from wood or other materials) with application of heat and pressure, the bond of which is derived from a synthetic adhesive added to the fibres and the panels are manufactured with a forming moisture content less than 20%.
- Particleboard: Panel material manufactured under pressure and heat from particles of wood (wood flakes, strands, chips, shavings, sawdust and similar) and/or lignocellulosic material in particle form (flax shives, hemp hurds, bagasse fragments, rice hulls, wheat straw and similar) with the addition of an adhesive.
- Wet process fibreboard: Panel material with a nominated thickness of 1.5 mm or greater, manufactured from lignocellulosic fibres (derived from wood or other materials) with application of heat and/or pressure, the bond of which is derived from the felting of the fibres and the panels are manufactured with a forming moisture content greater than 20%.

1.5 SUBMISSIONS**Products and materials**

Chain of custody of forest products: Submit the following as evidence of conformity to

CERTIFICATION, Timber source certification:

- Third party certification of supplier's chain of custody management system.
- Formal claim of chain of custody by supplier.

Preservative treatment of timber: Submit a certificate from an independent testing authority to AS/NZS 1604.1 (2021) clause 1.5.3.6. Include details of treatment and a copy of the charge sheet.

Samples

Provide finished samples of all nominated timber products, for review and acceptance, within an appropriate timeframe to allow for additional samples or alternative products to be proposed, if the samples provided are not accepted.

Tests

Tests: Submit moisture content test results.

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

General: Deliver timber products to site in unbroken wrapping or containers and store so that the moisture content is not adversely affected.

Product identification

Preservative treated timber: Marking to AS/NZS 1604.1 (2021) clause 1.5.3 and including the following:

- A unique identifier for the treatment plant.
- A unique identifier for the preservative.
- Hazard class.

2.2 CERTIFICATION**Timber source certification**

Requirement: Use timber products originating from sustainably managed forests.

Certification programs:

- Responsible Wood: (formerly Australian Forestry Standard (AFS) and endorsed by PEFC) Certification of sustainable forest management to AS 4708 and chain of custody for forest and tree-based products to AS 4707. AS 4707 also allows chain of custody certification of mixed products (virgin and recycled raw material). Forest management and suppliers are certified by International Accreditation Forum (IAF) or JAS-ANZ accredited organisations. Select Responsible Wood to verify that forest and tree-based products are sourced from Australian forests and controlled sources, and

manufactured, processed and distributed through a sustainable Australian supply chain.
www.responsiblewood.org.au

- PEFC (Programme for the Endorsement of Forest Certification): Certification of sustainable forest management to PEFC ST 1003 (or PEFC ST 1002 for Group Certification) and chain of custody to PEFC ST 2002. PEFC is a federation of internationally recognised and mutually endorsed forest certification schemes. Some like Australia (Responsible Wood), Malaysia (MFCC), Indonesia (IFCC), China (CFCC), and Japan (SGEC) are national branded schemes whilst others are branded as PEFC. All mutually endorsed forest certification schemes can provide a PEFC claim on forest products. Forest management and suppliers are certified by JAS-ANZ accredited organisations or mutually recognised accreditation bodies. Select PEFC or PEFC endorsed certification to verify that forest products and supply chains meet these international standards. www.pefc.org
- FSC (Forestry Stewardship Council): Certification of sustainable forest management to FSC-STD-AUS-01-2018 EN and chain of custody for forest products to FSC-STD-40-004. FSC is a global eco-label. Certifiers are accredited by ASI International, a member of ISEAL, a global membership association for sustainability standards. Select FSC certification to verify forest products originate from well-managed forests, controlled sources, reclaimed materials, or a mixture of these.
au.fsc.org/en-au

Engineered timber product certification and identification

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

Certification programs:

- Glued laminated timber: To the Glued Laminated Timber Association of Australia (GLTAA) Product Certification System.
- Plantation timber: To the EWPA Plantation Timber Certification Scheme.
- Plywood: To the EWPA Plywood and LVL Product Certification Scheme.
- Wet process fibreboard, dry process fibreboard, particleboard: To the EWPA Particleboard and MDF Product Certification Scheme.

Branding

Requirement: Brand timber products under the authority of a certification scheme applicable to the product. Locate the brand on faces or edges which will be concealed in the works.

2.3 FORMALDEHYDE AND FORMALDEHYDE BASED PRODUCTS

All engineered wood products, used internally, including exposed and concealed applications, must have low formaldehyde emissions as defined in the list below, or contain no formaldehyde.

Engineered wood products are defined as particleboard, plywood, veneer, MDF and decorative overlaid wood panels and include both finished and unfinished products.

These requirements are not applicable to exterior applications, formwork, reused engineered wood products or raw timber.

The limits listed here are defined according to the nominated test protocol. The levels listed are equivalent results for different test procedures.

Formaldehyde Limits for Engineered Wood Products

Test Protocol	Maximum Formaldehyde Emission Limit
AS/NZS 2269:2004, testing procedure AS/NZS 2098.11:2005 method 10 for Plywood	1 mg/ L
AS/NZS 1859.1:2004 - Particleboard, with use of testing procedure AS/NZS 4266.1:2017	1.5 mg/ L
AS/NZS 1859.2:2004 - MDF, with use of testing procedure AS/NZS 4266.1:2017	1 mg/ L
AS4357.4 - Laminated Veneer Lumber (LVL)	1 mg/ L
Japanese Agricultural Standard MAFF Notification No.701 Appendix Clause 3 (11) - LVL	1 mg/ L
JIS A5908:2003 - Particleboard and Plywood, with use of testing procedure JIS A1460	1 mg/ L
JIS A5905:2003 - MDF, with use of testing procedure JIS A1460	1 mg/ L
JIS A1901 (not applicable to Plywood. Applicable to high pressure laminates and compact laminates)	0.1 mg/ m ² hr

ASTM D5116	0.1 mg/ m ² hr
ISO 16000 part 9, 10 and 11 (also known as EN 13419)	0.1 mg/ m ² hr (at 3 days)
ASTM D6007	0.12 mg/ m ³
ASTM E1333	0.12 mg/ m ³
EN 717-1 (also known as DIN EN 717-1)	0.12 mg/ m ³
EN 717-2 (also known as DIN EN 717-2)	3.5 mg/ m ² hr

2.4 DURABILITY

General

Requirement: Provide timbers with natural durability appropriate to the conditions of use, or preservative-treated timber of equivalent durability.

Natural durability class: To AS 5604 (2022).

Naturally termite-resistant timbers: To AS 3660.1 (2014) Appendix C.

Timber quality: Free of core wood (material within 50 mm of the tree's centre) and free of splits, checks, loose knots and cavities. Free of sapwood (lighter coloured wood found on the outer layer of the tree).

Lyctid susceptible timbers: To AS 5604 (2022). Do not provide untreated timbers containing lyctid susceptible sapwood.

Untreated sapwood: Do not use in applications requiring treated timber or natural durability.

Preservative treatment

Wood-based products: To AS/NZS 1604.1 (2021) or preservative treated products conforming to BCA A5G3.

Verification requirements: To AS/NZS 1604.2 (2021).

Test methods: To AS/NZS 1604.3 (2021).

Moisture content

Test: Methods as follows:

- Timber and glued laminated timber products: To AS/NZS 1080.1 (2012).
- Plywood and LVL: To AS/NZS 2098.1 (2006).
- Reconstituted wood-based products: To AS/NZS 4266.1 (2017).

Protection: Protect timber and timber products stored on site from moisture and weather. For milled, prefinished, prefabricated and similar elements that are to be protected in the final structure, provide temporary weather protection until the permanent covering is in place.

2.5 FINISHING

Production finish

Glued laminated timber: To AS/NZS 1328.1 (1998).

Hardwood: To AS 2796.1 (1999) Table B1.

Plywood: To AS/NZS 2269.0 (2012), AS/NZS 2270 (2006), AS/NZS 2271 (2004) and AS/NZS 2272 (2006).

Softwood: To AS 4785.1 (2002) Table B1.

2.6 PLYWOOD

Finish shall be suitable for its location, sanded:

- Visible surfaces with clear finish: Veneer quality A.
- Other visible surfaces: Veneer quality B.

2.7 PARTICLEBOARD

General

Requirement: Use paint quality veneered moisture resistant particleboard for surfaces to be painted or plastic laminate faced.

2.8 MDF

General

Requirement: Alterations to MDF, including cutting, trimming, planing, sanding and drilling, on Site shall be avoided wherever possible. Where alterations are required, the work shall be carried out in a designated, enclosed MDF cutting area with suitable ventilation and in accordance with all relevant safety procedures.

3 EXECUTION

3.1 JOINTS

General

Joints and connections: Use hot-dipped galvanized or stainless steel fasteners, composite bolts, nails or nailed metal connectors.

Timber-to-timber interfaces: To the manufacturer's recommendations and the following:

- Provide a seal coating of preservative treatment.
- Make sure the inside of bolt holes and the end grains of the timber are coated.

Water retention: Avoid details that may trap water, including housed, checked or birdsmouth joints.

Fasteners: To prevent chemical treatments reacting with fasteners.

3.2 SHRINKAGE RESTRAINT

General

Requirement: If possible, use seasoned timber, particularly where timber elements are integrated with steel and/or concrete.

Moisture content: Maintain a timber moisture content near the anticipated in-service equilibrium moisture content.

Fasteners: Where possible, align fasteners along member axis.

Connections: Use connections that allow for movement without adversely affecting the performance of the connection.

Unseasoned timber: Provide as follows:

- Drill bolt holes 2 mm or 10% larger than the bolt diameter.
- Use species with similar shrinkage values to reduce movement and shrinkage.
- Provide adequate clearance between unseasoned timber framing, and interfacing structures and materials to allow for movement.

3.3 FINISHING

Ploughing

General: Back plough boards liable to warp (e.g. if exposed externally on one face). Make the width, depth and distribution of ploughs appropriate to the dimensions of the board and degree of exposure.

Painting

Edges: Chamfer edges of work to receive paint or similar coatings.

Priming: For woodwork to be painted, prime hidden surfaces before assembly.

0193 BUILDING ACCESS SAFETY SYSTEMS

1 GENERAL**1.1 RESPONSIBILITIES****General**

Requirement: Provide permanent building access and safety equipment, as documented.

Performance

Roofing and cladding: Maintain the waterproofing integrity without damage or distortion. Maintain the structural integrity of the supporting elements.

1.2 DESIGN**Requirements**

Access: Provide a system for three workers at any one time, to access the following:

- Full extent of gutters.
- Roof mounted plant and equipment.
- Roof areas within 2.5 m of fall hazards not otherwise protected by parapets or guard rails.
- External façade areas including glazing.

1.3 CROSS REFERENCES**General**

Requirement: Conform to the following:

- 0171 *General requirements.*
- 0181 *Adhesives, sealants and fasteners.*
- 0183 *Metals and prefinishes.*

1.4 STANDARDS**General**

Fixed platforms, walkways, stairways and ladders for use by operating, inspection, maintenance and servicing personnel: To AS 1657 (2018).

Personal equipment for working at height: To AS/NZS 1891.1 (2020), AS/NZS 1891.2 (2001), AS 1891.3 (2020), AS/NZS 1891.4 (2009) and AS 1891.5 (2020).

Rope access system: To AS/NZS 4488.1 (1997), AS/NZS ISO 22846.1 (2020) and AS/NZS ISO 22846.2 (2020).

1.5 INTERPRETATION**Abbreviations**

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

- PPE: Personal protective equipment.

Definitions

General: For the purposes of this worksection, the definitions given in AS 1657 (2018), AS/NZS 1891.1 (2020), AS/NZS 5532 (2013) and AS/NZS ISO 22846.1 (2020) apply.

1.6 SUBMISSIONS**Certification**

General: Submit certification of installed system to **COMPLETION, Certification.**

Design documentation

General: To 0171 *General requirements* and the following:

- Calculations: Submit calculations by a professional engineer experienced in building access safety systems.
- Certification: Submit certification by a professional engineer experienced in building access safety systems design as evidence of conformance to documented requirements.

- Drawings: Submit the following drawings:
 - . Layout of roof access stairways and ladders, platforms and walkways.
 - . Details of stairways and ladders, walkways, including elevated walkways and required guardrailing.
 - . Layout of anchors, static lines and system components in plan and elevation.
 - . Proposed methods of fixing to each substrate type in the building.

Marking and labelling

Requirement: Samples and schedules of proposed marking and labels for each system component.

Operation and maintenance manuals

Requirement: Submit manual to **COMPLETION**, **Operation and maintenance manuals**.

Products and materials

Manufacturer's data: Submit manufacturer's data including the following:

- Product data sheets.
- Installation and maintenance recommendations.

Type tests: Submit results for the following:

- Proprietary stairways and fixed ladders: To **FIXED STAIRWAYS AND LADDERS, Tests**.
- Proprietary platforms, walkways and guardrailing: To **FIXED PLATFORMS, WALKWAYS AND GUARDRAILING, Tests**.
- Personal equipment for working at height: To **FALL PROTECTION SYSTEMS, Tests**.
- Rope access systems: To **FALL PROTECTION SYSTEMS, Tests**.
- Single point anchors: To **FALL PROTECTION SYSTEMS, Tests**.

Samples

General: Submit the following:

- Pedestal brackets with safety eyebolts of each proposed type.
- Travelling anchor/ sliding mechanism of each proposed type.
- Fixed anchor brackets of each proposed type.

Shop drawings

Requirement: Submit shop drawings showing all components including methods of assembly and fixing.

Subcontractors

General: Submit name and contact details of proposed suppliers and installers as recommended by the manufacturer.

Tests

General: Provide independently certified test data to demonstrate compliance.

Site tests: Submit results of proof load tests of drilled-in anchors.

Warranties

Requirement: Submit warranties in accordance with the requirements of *0171 General requirements*.

- Period: As offered by the manufacturer and the installer.

1.7 INSPECTION**Notice**

Inspection: Give notice so that inspection may be made of the following:

- Shop fabricated or assembled items ready for delivery to the site.
- Commencement of shop or site welding.
- All equipment attachments with concealed fixings, before they are covered.
- Site erected assemblies on completion of erection, before applying finishes.
- Steel surfaces prepared for, and immediately before, site applied finishes.

Installation inspector: Registered height safety inspector or professional engineer.

2 PRODUCTS

2.1 GENERAL

Product identification

General: Marked to show the following:

- Manufacturer's identification.
- Installer's contact details.
- Intended location.
- Load rating and direction.
- Current inspection/service date.
- Batch number or serial number of the components.

Signage

General: Include all mandatory and documented signage.

2.2 FALL PROTECTION SYSTEMS

General

The Contractor shall take full responsibility for the design, final detailing, supply and installation of all fall protection systems and associated components/ accessories, including conducting all necessary testing.

Access safety system

System: Fall arrest/ restraint systems comprising some or all of the following:

- Harness gear and ancillary equipment.
- Horizontal lifeline and rail systems.
- Inertia reels.
- Anchorage devices.

Anchors

Single point anchors: To AS/NZS 5532 (2013).

PPE

Harness: Supply two full body harnesses to AS/NZS 1891.1 (2020) with shock absorbing lanyards to AS 1891.5 (2020).

Storage: PPE storage holdall supplied by the manufacturer.

Tests

Personal equipment for working at height: Tested as follows:

- Harnesses: To AS/NZS 1891.1 (2020) Section 4 and Appendix A to F.
- Horizontal lifeline and rail systems: To AS/NZS 1891.2 (2001) Appendix A to E.
- Lanyard assemblies and pole straps: To AS 1891.5 (2020) clause 3.4.

Rope access systems:

- Rope grabs and descenders: Static load test to AS/NZS 4488.1 (1997) Appendix A.
- Back-up type rope grabs and descenders: Dynamic load and performance test to AS/NZS 4488.1 (1997) Appendix B.

2.3 FIXED STAIRWAYS AND LADDERS

General

Product: Fixed stairways and fixed ladders complete with all required handrails, guardrailing, cages and restricted access devices.

Standard: To AS 1657 (2018).

Tests

Stair assembly: To AS 1657 (2018) Appendix D.

Fixed ladders: To AS 1657 (2018) Appendix F.

Test reports: To AS 1657 (2018) Appendix E.

Ladder fall protection systems

Product: Vertical systems including cables, rails, guides and fall arrestor trolleys.

Standard: Selection of system to AS 1657 (2018) Table H1.

Design of fall protection devices: To AS 1891.3 (2020).

2.4 FIXED PLATFORMS, WALKWAYS AND GUARDRAILING**General**

Product: Fixed platforms and walkways complete with all required guardrailing and toe boards.

Balustrades: Provide a proprietary or bespoke fabricated system, as documented.

Standard: To AS 1657 (2018).

Material: Aluminium, corrosion-resistant steel, fibre reinforced polymer.

Tests

Guardrailing: To AS 1657 (2018) Appendix B.

Infill: To AS 1657 (2018) Appendix C.

Test reports: To AS 1657 (2018) Appendix E.

3 EXECUTION**3.1 INSTALLATION****General**

Installation: To the manufacturer's recommendations and the following:

- Fixed platforms, walkways, stairways and ladders: To AS 1657 (2018).
- Personal equipment for working at height: To the AS/NZS 1891 series.
- Rope access systems: To AS/NZS 4488.1 (1997).
- Incompatible materials: Separate using concealed layers of suitable materials in appropriate thicknesses.

Subcontractor

Installer: Registered installer, approved by the manufacturer.

Fixing to structure

General: Provide fabricated predrilled or purpose-made brackets and bases and attach to the building structure with fixings compatible with the substrate.

Proprietary items: Install to the manufacturer's recommendations.

Labels and signage

General: To AS/NZS 1891.4 (2009) clause 2.2.9.

3.2 TESTING**Testing of installed work**

General: On completion of the installation, carry out tests to confirm the system's competence in accordance with AS/NZS 5532 (2013), AS/NZS 1891.2 (2001) and AS/NZS 1891.4 (2009), and issue certification confirming compliance with all installation requirements.

Proof load test for anchors

Testing: Following completion of the installation, proof load test all friction and glued-in anchors to 50% of the design ultimate strength capacity in conformance with AS/NZS 1891.4 (2009) clause 3.1.2(g).

Report: Record the following:

- Details of organisation and inspector performing the test.
- Date test was performed.
- Load cell details and calibration date.
- A reference of each item tested including a description of the item location.
- The item ultimate load.
- The test load applied.
- Duration of test.

- Results of test.
- Photo of each item showing peak load applied.

3.3 TRAINING

General

Responsibilities: Coordinate the training of owner's facilities management personnel in conformance with 0171 General requirements.

Training records: Video record all training sessions. Catalogue and include recordings with the operation and maintenance manuals.

3.4 COMPLETION

Certification

Completion certificate: Provide inspection, testing and certification by an Accredited Installer and/or Accredited Height Safety Inspector:

- Upon completion of the installation at the date for practical completion.
- Upon the expiry of the defects liability period or 12 months after completion of the installation, whichever is the lesser, and valid for a further 12 month period.

Reinstatement

Extent: Repair or replace damage to the roofing and rainwater system. If the work cannot be repaired satisfactorily, replace the whole area affected.

Touch up: If it is necessary to touch up minor damage to prepainted metal roofing, do not overspray onto undamaged surfaces.

Cleaning

Roofing and rainwater drainage system: Remove debris, metal swarf, solder, sealants and unused materials.

Operation and maintenance manuals

Requirement: Prepare a manual that includes the following:

- Instructions and recommended procedures for operating and routinely maintaining the equipment.
- Technical information relating to all access and anchorage equipment provided including design, testing, installation, and conformance of the system to relevant industry standards and manufacturer's instructions.
- Special provisions for use (e.g. training, additional equipment, rescue provisions).
- A statement that devices are for personnel use and note specific equipment that is not for personnel use.
- Include certification and equipment logs in conformance with AS 1657 (2018) Section 8 and Appendices, and AS/NZS 1891.4 (2009) Section 9.
- As-built documentation: Suitable for use for long-term operations and maintenance.

3.5 MAINTENANCE

General

Preventive and mandatory system maintenance: By an Accredited Height Safety Inspector/Certifier, in conformance with AS/NZS 1891.4 (2009) Section 9 and manufacturer's maintenance/recertification recommendations.

Checklist for all inspections: To AS/NZS 1891.2 Supp 1 (2001) Table 8, and AS/NZS 1891.4 (2009) Section 9 and Appendices C and D.

The competent person: To AS/NZS 1891.4 (2009) clause 1.4.8.

Regular scheduled periodic inspections

Standard: To AS/NZS 1891.4 (2009) clause 9.3 and the following:

- Provide inspection, testing and certification by an Accredited Installer and/or Accredited Height Safety Inspector.
- Record the date of the next system inspection and period of validity and display the certificate at the access points of the work area or on the individual system components where provision is made.

Inspection after a fall or other event

Standard: To AS/NZS 1891.4 (2009) clause 9.5.

Ongoing maintenance

Certificate: Submit the completion certificates and notify the proprietor of the requirement for continued interval testing.

0201 DEMOLITION

1 GENERAL

1.1 RESPONSIBILITIES

General

Requirement: Carry out demolition, as documented.

1.2 CROSS REFERENCES

General

Requirement: Conform to the following:

- 0171 General requirements.

1.3 STANDARD

General

Demolition: To AS 2601 (2001).

1.4 INTERPRETATION

Definitions

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

- Demolition: The complete or partial removal of a building or structure, by pre-planned and controlled methods or procedures.
- Dilapidation record: The photographic or video and written record of the condition of the portion of the existing building retained, adjacent buildings, and other relevant structures or facilities, before the start of demolition work.
- Dismantle: The reduction of an item to its components in a manner to allow re-assembly.
- Recover: The disconnection and removal of an item in a manner to allow re-installation.

1.5 SUBMISSIONS

Authority approvals

Evidence of compliance: Before commencing demolition, submit evidence of the following:

- Requirements of authorities relating to the work have been obtained.
- A permit to demolish from the appropriate authority.
- A scaffold permit from the appropriate authority (if scaffolding is proposed to be used).
- Certification that each person having access to the construction site has completed site-specific WHS induction training.
- Precautions necessary for protection of persons and property have been taken and suitable protective and safety devices have been provided to the approval of the relevant authority.
- Fees and other costs have been paid.

Execution details

Requirement: Submit the following, as documented:

- Hazardous Substances Management Plan, including laboratory analysis of hazardous substances.
- Investigation and work plan.
- Safe Work Method Statement.

Off-site disposal locations: Submit details of the proposed locations for the disposal of material required to be removed from the site, and evidence of conformance with the requirements of relevant authorities.

Tests

Requirement: Submit compliance test results for building services components to be re-used.

1.6 INSPECTION

Notice

Inspection: Give notice so that inspection may be made of the following:

- Adjoining and adjacent structures before starting demolition.
- Services before disconnection or diversion.
- Trees documented to be retained, before starting demolition.
- Remaining excavations after removal of underground work.
- Site after removal of demolished materials.
- Services after reconnection or diversion.
- Adjoining and adjacent structures at completion of demolition.

2 PRODUCTS

2.1 DEMOLISHED MATERIALS

Demolished material classes table

Class	Requirement	Ownership
Recovered items for re-use in the works	Recover, without damage, items identified for re-use in the works Store safely and securely until reinstatement	Contractor
Recovered items for delivery to the Principal	Recover, without damage, items identified for delivery to the Principal	Principal
Demolished for removal	Remove, from the site, demolished materials not identified to be retained. Do not burn or bury on site Transit: Prevent spillage of demolished materials in transit	Contractor

3 EXECUTION

3.1 HAZARDOUS SUBSTANCES

General

Requirement: Give notice immediately if hazardous materials or conditions are found, whether actual or suspected.

Prior to the commencement of the demolition, undertake audits, as required, to determine the type and location of hazardous materials. Obtain all approvals, as required, for their safe removal.

Audit

Requirement: If hazardous materials are found on site, prepare a Hazardous Substances Management Plan to AS 2601 (2001) clause 1.6.1. Include the following:

- Asbestos-containing materials.
- Flammable or explosive liquids or gases.
- Toxic, infective or contaminated materials.
- Radiation or radioactive materials.
- Noxious or explosive chemicals.
- Tanks or other containers that have been used for storage of explosive, toxic, infective or contaminated substances.

Removal of hazardous substances

Standard: To AS 2601 (2001) clause 1.6.2.

3.2 INVESTIGATION AND WORK PLAN

General

Requirement: Before demolition or stripping work, prepare the work plan to AS 2601 (2001) Section 2. Include the checklist items appropriate to the project from AS 2601 (2001) Appendix A, and the following:

- Method of protection and support for adjoining or adjacent structures.
- Locations and details of service deviations and terminations.
- Sequence of work.
- Wheel loads of tipping or loading vehicles.

3.3 PROTECTION

Encroachment

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

Existing services

Location: Before starting demolition, locate and mark existing underground services by potholing or other non-destructive digging, in the areas that will be affected by the demolition operations.

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

Essential services: Shut off, cap or control services not required for the demolition work, at or outside the building line before commencing demolition. Conform to the requirements of the relevant existing utility authority, as appropriate.

Underground utility services to be retained: Do not excavate by machine within 1 m of existing underground services.

Recovered items

General: If items are documented for recovery and re-use, minimise damage during removal and recover all associated components required for their re-use.

Trees

Where trees are required to be retained and protected, provide protective fences and do not permit any type of activity within such fences. Do everything necessary to ensure trees are not damaged in any way.

3.4 DEMOLITION – BUILDING WORKS

General

Requirement: To the approved Safe Work Method Statement and work plan.

Encroachment

General: If encroachments from adjacent structures are encountered and are not documented, give notice and obtain instructions.

Material below grade

Remaining voids: Stabilise and provide barriers.

Explosives

General: Do not use explosives.

3.5 DEMOLITION – BUILDING SERVICES

General

Requirement: Decommission, isolate, demolish and remove from the site all equipment and associated components that have become redundant as a result of the demolition.

Breaking down: Disassemble or cut up equipment where necessary to allow removal.

Components for re-use

General: Before returning to service, clean components and test for conformance to Australian Standards, as required.

3.6 COMPLETION

Notice of completion

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

Reinstatement

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

Rectification: Repair damage arising out of demolition work. Obtain written acceptance from the Superintendent of the completeness and standard of the rectification work.

Removal of temporary supports

General: Obtain written instructions from the structural engineer at the completion of demolition before removing temporary supports.

0315 CONCRETE FINISHES

1 GENERAL

1.1 RESPONSIBILITIES

General

Requirement: Provide finishes to concrete surfaces, as documented.

Performance

Requirement: Compatible with documented finishes.

1.2 CROSS REFERENCES

General

Requirement: Conform to the following:

- 0171 General requirements.

1.3 STANDARDS

General

Formed surfaces: To AS 3610.1 (2018).

1.4 TOLERANCES

Formed surfaces

Form face deflections: To AS 3610.1 (2018) Table 3.3.4.1.

Straight elements: To AS 3610.1 (2018) Table 3.3.5.1.

Unformed surfaces

Flatness: As follows:

- Floors nominated to receive carpet: The maximum deviation under a 3 metre straight edge shall be 5mm and under a 150mm straight edge shall be 1mm, when laid in any direction.
- Floors nominated to receive resilient finishes: The maximum deviation under a 2 metre straight edge shall be 4mm and under a 150mm straight edge shall be 1mm, when laid in any direction.
- Floors nominated to be exposed in the finished work: The maximum deviation under a 3 metre straight edge shall be 6mm, when laid in any direction.
- All other as-laid floors: The maximum deviation under a 3 metre straight edge shall be 12mm, when laid in any direction.
- Rectify non-conforming 'as laid' concrete by suitable procedures, such as levelling compounds or grinding.

1.5 SUBMISSIONS

Samples

A range of 300mm x 300mm samples of each type of concrete finish, using proposed concrete mix and surface treatments as specified and as applicable and showing the range of colour variation anticipated in the finished work.

Subcontractors

General: Submit names and contact details of proposed suppliers and Subcontractors.

Tests

Slip resistance: Submit test results, as follows:

- Site slip resistance test of completed installation to AS 4663 (2013).

1.6 INSPECTION

Notice

Inspection: Give notice so that inspection may be made of the following:

- Completed formwork with all dust and debris removed from forms.
- Evaluation of surface finish.

1.7 SLIP RESISTANCE AND SLIP RESISTANCE TESTING

General

Exposed concrete floor surfaces shall be stable, safe and minimise the risk of slipping or tripping due to slippery surfaces or misaligned joints. Slip resistances shall comply with the requirements of HB 197 (1999) and HB 198 (2014).

Provide slip resistance test certificates to confirm that slip resistance values are in accordance with AS 4663 (2013).

Arrange and pay for on-Site slip resistance testing of all types of concrete floor surfaces that are left exposed in the finished work and in sufficient number to cater for all areas and conditions including ramps, steps, entrances etc. Testing shall be undertaken by a registered testing laboratory. Tests shall include pendulum and dry floor friction testing in accordance with AS 4663 (2013).

2 PRODUCTS

2.1 UNFORMED SURFACES

Finishing methods

Worked Concrete Finish – Hand float: Float the concrete to an even surface with no ridges or steps, then immediately commence curing. When the concrete is suitably stiff, hand trowel to give a uniform, smooth surface, free from trowel marks. The surface shall be suitable for receiving screeds.

Worked Concrete Finish – Power float: Float the concrete to an even surface with no ridges or steps, then immediately commence curing. When the concrete is suitably stiff, power trowel to give a uniform, smooth but not polished surface, free from trowel marks and other blemishes and suitable to receive the specified flooring material. Hand float in locations inaccessible to the machine float. If, because of inadequate finishing or protection, the surface of the concrete is not suitable to receive the specified flooring material, make good by application of a smoothing compound. Generally to areas that are to receive carpet, resilient finishes or paint/ sealer finishes.

Steel trowel finish: The most basic flat, smooth finish possible and achieved by trowelling the concrete surface with a steel hand trowel, to produce the final consolidated finish free of float marks and uniform in texture and appearance.

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

Broom finish: After machine floating and steel trowelling use a broom or hessian belt drawn across the surface to produce a coarse even-textured transverse-scored surface (wet pendulum test value: P5). Generally to external concrete pavements, unless nominated otherwise.

2.2 COLOUR CONSISTENCY

The consistency of the concrete colour is of great importance. Select all suppliers, materials and all methods to ensure the specified finish and consistency, including but not limited to the following:

- Main plant shall have a consistent supply to achieve the specified finish.
- Back-up plant shall be selected to achieve an equivalent supply.
- Cement, fines and other aggregates shall be from one region/ source in order to achieve consistent concrete colour.
- Batching the concrete precisely and mixing thoroughly.
- Bracing or stiffening the formwork to reduce flexibility.
- Ensuring that the formwork face material has a uniform absorbency.

Colour shall be within the relevant tonal scale range as defined in AS 3610.1 (2018) for the specific class of finish or as agreed with the Superintendent based on benchmarks or samples, which shall then become the colour standard for the project.

2.3 MISCELLANEOUS

Polymeric film underlay

Vapour barriers and damp-proofing membranes: To AS 2870 (2011) clause 5.3.3.

3 EXECUTION

3.1 FORMED SURFACES

General

Surface finish: To AS 3610.1 (2018) Table 3.3.3.1 and as documented.

Damage: Do not strip formwork prematurely if damage to the concrete may be caused.

Curing

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

Evaluation of formed surfaces

General: If evaluation of formed surface tolerance or colour is required, complete the evaluation before surface treatment.

Surface repairs

Requirement: Surfaces repairs to concrete finishes shall be minimal and consistent to an accepted sample. As far as possible, the finished surface shall be achieved without subsequent surface repairs being necessary. The improvement of the surface finish (eg filling noticeable surface blemishes) shall be agreed prior to any work being carried out.

3.2 UNFORMED SURFACES

General

Finished levels: Strike off, screed and level slab surfaces to finished levels and to the flatness tolerance documented.

Surface repairs

Method: If surface repairs are required, submit proposals.

External surfaces

Ensure that all external concrete surfaces are constructed so that ponding of rainwater does not occur.

3.3 POLYMERIC FILM UNDERLAY

Location

Requirement: Under slabs on ground, including integral ground beams and footings, not subject to hydrostatic water pressure, provide a vapour barrier.

Base preparation

Requirement: Conform to base type, as follows:

- Concrete working base: Remove projections above the plane surface, and any loose material.
- Graded prepared subgrade: Blind with sand to create a smooth surface free from hard projections. Lightly wet the sand just before laying the underlay.

Installation

Standard: To AS 2870 (2011) clause 5.3.3.

Requirement: Lay underlay over the base, as follows:

- Lap joints at least 200 mm and seal the laps and penetrations with waterproof adhesive tape.
- Face the laps away from the direction of concrete pour.
- Continue up vertical faces past the damp-proof course where applicable, and tape fix at the top.
- Patch or seal punctures or tears before placing concrete.
- Cut back as required after concrete has gained strength and formwork has been removed.

0342 LIGHT STEEL FRAMING

1 GENERAL**1.1 RESPONSIBILITIES****General**

Requirement: Provide light steel framing, as documented.

Performance

Requirements:

- Suitable for having linings and cladding fixed to it.
- Conforming to the documented performance criteria.
- Conforming to the requirements of NASH-1 (2005) or NASH-2 (2014).

1.2 CROSS REFERENCES**General**

Requirement: Conform to the following:

- 0171 *General requirements.*
- 0181 *Adhesives, sealants and fasteners.*
- 0183 *Metals and prefinishes.*

1.3 STANDARDS**General**

Design, materials and protection: To AS/NZS 4600 (2018).

Low-rise steel framing: To NASH-1 (2005) (National Association of Steel Housing) and NASH-2 (2014).

1.4 INTERPRETATION**Definitions**

General: For the purposes of this worksection, the definitions given in NASH-1 (2005) and NASH-2 (2014) apply.

1.5 TOLERANCES**General**

Manufacturing, assembly and installation tolerances: To NASH-1 (2005) Appendix D and NASH-2 (2014) Appendix A.

1.6 SUBMISSIONS**Certification**

Erected frame: Submit certification that the erected frame conforms to the documented project requirements.

Design documentation

General: Where the structural documentation defines performance criteria, submit, as follows:

- Design to AS/NZS 4600 (2018) or NASH-1 (2005): Independent design, documentation and certification from a professional engineer.
- To NASH-2 (2014): Certification of conformance to the requirements of NASH-2 (2014) from a professional engineer.

Reactions: Submit the location and magnitude of reactions that are to be accommodated by the support structure.

Frame member sizes: Submit a schedule of proposed member sizes, certified as meeting stated project, and AS/NZS 4600 (2018) or NASH-2 (2014) requirements for span, spacings and loadings.

Shop drawings

General: Submit shop drawings, to a scale that best describes the detail, requirements for the documented configurations and loadings.

Prefabricated wall frames: Include the following:

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

Warranties

Requirement: Submit warranties in accordance with the requirements of 0171 *General requirements*.

- Period: As offered by the manufacturer.

1.7 INSPECTION**Notice**

Inspection: Give notice so that inspection may be made of the following:

- Damp-proof course installed before installation of steel framing.
- Steel framing erected on site before lining or cladding.

2 PRODUCTS

2.1 GENERAL**Storage and handling**

Requirement: Transport all components to site and store, if required, so that components or their coating are not damaged or distorted.

Frames: If required, store on a flat even surface and do not load with other items.

Exposure: Minimise exposure of components to the weather, both during storage, handling and after erection.

2.2 COMPONENTS**Damp-proof course**

Membrane: To the membrane requirements of AS 2870 (2011) or AS/NZS 2904 (1995).

Cold-formed steel framing

General: Cold-formed sections from steel, metallic-coated to AS 1397 (2021).

Corrosion protection: To NASH-2 (2014) Section 8.

Framing members

Cold-formed steel framing for proprietary systems: To NASH-1 (2005) or NASH-2 (2014).

3 EXECUTION

3.1 GENERAL**Frame fabrication**

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

Service holes: If not pre-punched, form holes by drilling or punching, without compromising the structural integrity of the frame, located centrally within the web of the section, conforming to the requirements of NASH-2 (2014).

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

Fastening

Prefabricated framing: Fasten framing elements using fasteners, as documented, to the fabricator's requirements.

Framing built in-situ: Use fasteners, as documented, from the following types:

- Bolting.
- Self-drilling, self-tapping screws.
- Blind rivets.

- Proprietary clinching system.
- Structural adhesives.
- Welding. On-site welded connections are not permitted.

Compatibility: Compatible with steel frame to prevent galvanic corrosion of dissimilar metals.

Welding

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

Prefabricated frames

General: Protect frames from damage or distortion during erection.

Unseasoned or CCA treated timber

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

Earthing

Requirement: To AS/NZS 3000 (2018). Provide temporary earthing during erection until the permanent earthing is installed.

Protection

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

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

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

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

3.2 WALL FRAMING

Wall studs

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

Maximum stud spacing: 600 mm.

Heads to openings

Requirement: Provide lintels appropriate to load and span.

Additional support

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

Damp-proof course

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

- External walls: Turn up a minimum of 75 mm on the inside and tack to studs. Project 10 mm beyond the external slab edge and turn down at 45°.
- Walls of wet areas: Turn up a minimum of 150 mm on the wet side and tack to studs.

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

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

Flashings

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

3.3 COMPLETION

Cleaning

General: On completion of framing remove debris from any gaps between members.

0344 STEEL – HOT-DIP GALVANIZED COATINGS

1 GENERAL

1.1 RESPONSIBILITIES

General

Requirement: Provide hot-dip galvanized coatings for the protection of concealed mild steel products and structural steelwork against atmospheric corrosion as documented.

Performance

Requirement: Control atmospheric corrosion to structural steelwork and steel products until the first scheduled maintenance.

1.2 CROSS REFERENCES

General

Requirement: Conform to the following:

- 0171 General requirements.
- Structural Engineer's documentation.

1.3 STANDARDS

General

Coating: To AS/NZS 4680 (2006).

Coating on fasteners: To AS/NZS 1214 (2016).

Durability: To AS/NZS 2312.2 (2014).

Metal finishing

Coating mass/thickness minimum: To AS/NZS 4680 (2006).

Threaded fasteners coating mass/thickness minimum: To AS/NZS 1214 (2016).

1.4 SUBMISSIONS

Execution details

Holes and lifting lugs: If holes and lifting lugs are required to facilitate handling, filling, venting and draining during galvanizing, submit details on size and location.

Detailing features: If design and fabrication features of the items to be galvanized may lead to dimensional change, distortion or difficulties during galvanizing, identify these and submit details for improvement.

Tests

Galvanising tests: Submit results to AS/NZS 4680 Appendix G6.

1.5 INSPECTION

Notice

Inspection: Give notice so that inspection may be made of the following:

- Coating appearance and thickness, at the galvanizing plant.

2 EXECUTION

2.1 GENERAL

Care

Embrittlement: Take due care to avoid embrittlement of susceptible steels.

Mechanical properties: Avoid mechanical damage. Make sure that mechanical properties of the base metal do not change.

Surface preparation

Surface contaminants and coatings generally: Chemical clean, then acid pickle.

Chemical cleaning: To AS 1627.1 (2003).

Acid pickling: To AS 1627.5 (2003).

- Inhibitor: Required.

Coating process

General: To AS/NZS 4680 (2006) Section 6.

Threaded fasteners: To AS/NZS 1214 (2016) Section 5.

Post treatment

General: Passivate.

Drilling after completion of hot-dip galvanizing

Repair: Prime drill hole surfaces to AS/NZS 4680 (2006) Section 8 before the surfaces begin to corrode.

Surface finish

Standard: To AS/NZS 4680 (2006) Section 7.

Coating quality: Continuous and as smooth and evenly distributed as possible. Free of blisters, roughness, sharp points, flux residues and any defects that may affect the end use of the article.

Silicon killed steels: Dull grey is acceptable provided a sound and continuous coating is achieved.

Surplus zinc on fastener threads: Remove.

Friction-type bolted connections: Treat coated contact surfaces to achieve the required design slip factor, without removing excessive coating thickness as follows:

- Contact surface preparation: To *GAA Best practice guide for hot dip galvanized bolts and bolted joints (2020)*.
- Slip factor test: To AS 4100 (2020) Appendix J.

Coating repair

Rejection: If uncoated surfaces or areas damaged by handling at the galvanizing plant exceed the limits specified for repair in AS/NZS 4680 (2006) Section 8, reject the galvanizing.

Extent and methods: To AS/NZS 4680 (2006) Section 8.

Preparation of galvanised surfaces for paint finishes

Coarse preparation: Remove spikes, and make sure edges are free from lumps and runs.

Light sweep blasting before painting: Required.

- Maximum zinc removal: 10 µm.
- Abrasive grade (range): 150 to 180 µm.
- Abrasive type: Clean ilmenite or garnet.
- Blasting angle to surface: 45° maximum.
- Blast pressure (maximum): 275 kPa.
- Distance of nozzle from surface (range): 350 to 400 mm.
- Nozzle type: 10 to 13 mm orifice diameter venturi type.

2.2 TESTING

Galvanizing tests

Coating thickness tests: To AS/NZS 4680 (2006) clause 9.2 and Appendix G.

Testing authority: NATA registered galvanizing plant.

2.3 SITE WORK

Site welding

Requirement: Site welding shall be avoided. Where site welding is unavoidable, provide the intended work methods to the Superintendent and obtain acceptance before commencement of work.

Weld areas: Where site welding is accepted, reinstate coating to AS/NZS 4680 (2006) Section 8.

Site coating reinstatement

Rejection: If any item has damaged areas exceeding the limits specified for repair in AS/NZS 4680 (2006) clause 8.1, reject the item.

Extent: Areas damaged by transport, site welding, site flame cutting, site handling, or erection.

Method: To AS/NZS 4680 (2006) Section 8.

0345 STEEL – PROTECTIVE PAINT COATINGS

1 GENERAL**1.1 RESPONSIBILITIES****General**

Requirement: Provide protective paint coatings for the protection of exposed mild steel products and structural steelwork against atmospheric corrosion, as documented.

Performance

Requirement: Control atmospheric corrosion to structural steelwork and steel products until the first scheduled maintenance.

Period from application to first scheduled maintenance: 15 years.

1.2 CROSS REFERENCES**General**

Requirement: Conform to the following:

- 0171 General requirements.
- Structural Engineer's documentation.

1.3 STANDARDS**General**

Surface preparation and coating: To AS/NZS 5131 (2016) Section 9 and the recommendations of AS 2312.1 (2014).

1.4 INTERPRETATION**Abbreviations**

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

- DFT: Dry Film Thickness.
- ITP: Inspection and Test Plan.
- PDS: Product Data Sheet.
- SDS: Safety Data Sheet.
- µm: Micron (10⁻⁶m).

Definitions

General: For the purposes of this worksection the definitions given in AS/NZS 2310 (2002) and the following apply:

- Coating contractor: The protective coatings application contractor conducting the on- or off-site coating application works.
- Coating manufacturer: The supplier and/or manufacturer of the protective coating materials used.
- Inspection and test plans (ITP): A series of formal inspection and test plans, prepared by the coating contractor to reflect the specific inspection and testing that will be carried out on the surface preparation, coating application and the record keeping tasks to be undertaken.

1.5 SUBMISSIONS**Execution details**

Detailing features: If design and fabrication features of the items to be coated may lead to difficulties, identify these and submit details for improvement.

Repair of damaged coating: If the protective coating is damaged, submit a coating repair proposal, based on the coating manufacturer's recommendations for reinstating the corrosion protection function of the system.

Reinstatement: If final coat varies from the submitted sample, submit proposals for reinstatement of the visible final coating system.

Maintenance painting

Recoating systems: Submit details of coating systems for maintenance painting of previously coated items and structural elements, including surface preparation.

Products and materials

Multi-component coatings: If partial mixing of packs is proposed, submit details.

Quality

ITPs: Submit for each proposed coating system.

Quality supervisor: Submit the name and record of experience of the person responsible for the implementation of the ITPs.

Records

General: Prepare and maintain records of all surface preparation and coating application works as follows:

- Standards: To AS 3894.10 (2002), AS 3894.11 (2002), AS 3894.12 (2002), AS 3894.13 (2002) and AS 3894.14 (2002).
- Reference the relevant parts of the ITP and record conformance.

Samples

Painting and coating colour: Submit a 400 x 400 mm sample of the finished product for each coating system.

Retention: Retain samples for comparison during application.

Subcontractors

General: Submit names and contact details of proposed suppliers and applicators.

Requirement: Submit proof of currency of the applicator's environmental operating licence.

Substrate acceptance

Applicator: Submit the applicator's certification of the acceptability of the coating substrate before commencing installation.

Galvanised steel surfaces: Where galvanised steel is intended to be painted, confirm the galvanising method with the paint manufacturer prior to fabrication, to ensure the paint coating system will be warrantable upon completion. Upon completion of galvanising, provide all relevant documentation, including certification that the galvanising was performed to the paint manufacturer's requirements. The Contractor will be held responsible for any situation arising where the coating system is not warrantable due to inadequate coordination of the galvanising process and/ or lack of documented and certified procedures.

Warranties

Requirement: Submit warranties in accordance with the requirements of *0171 General requirements*.

- Period: 15 years.

1.6 INSPECTION

Notice

Inspection: Give notice so that inspection may be made of the following:

- Items after fabrication, before commencing surface cleaning and preparation.
- Surfaces after preparation, before application of first coating.
- Coating stages:
 - . After application of primer or seal coats.
 - . After application of each subsequent coat.
- Repair of coating damage: Exposure of corrosion pitting or significant metal loss by blasting process.

2 PRODUCTS

2.1 GENERAL

Storage and handling

Requirement: Handle, store, mix and apply all protective coatings in conformance with the manufacturer's recommendations.

Original containers: Deliver coating products to site in manufacturer's labelled and sealed containers.

Ambient temperature range for storage: 3°C to 30°C, or to the manufacturer's recommendations.

Sunlight: Protect coating materials from direct sunlight before mixing or adding the converter (catalyst).

Use-by-date: Use products with limited shelf life before their use-by-date, unless written authorisation from the coating manufacturer's technical services section is provided.

Paint material

Requirement: To AS/NZS 5131 (2016) clause 9.9.3.

Proprietary products

Requirement: Provide all products from the one manufacturer's supply.

Product data sheets (PDS): Keep on site copies of all relevant manufacturer's PDS.

Safety data sheets (SDS): Keep on site copies of all relevant manufacturer's SDS.

Recording: To AS/NZS 5131 (2016) clause 9.9.5.

3 EXECUTION

3.1 GENERAL

Product warnings

Requirement: Conform to the SDS.

Surroundings

Protection: Prevent the release of abrasives, overspray or paint waste debris into the air, ground or to any watercourse. Prevent damage to other assets, services or equipment.

Reinstatement: Repair and/or clean affected surrounding areas.

Working area

General: Perform all painting under cover and/or protected from rain, condensation, dew, excessive wind, overspray or wind-blown dust.

Period: Continue protection where any of these conditions exist until the coating is no longer affected.

3.2 SURFACE PREPARATION

General

Requirement: Conform to AS/NZS 5131 (2016) clauses 9.3, 9.4 and 9.5.

Defects: Remove all surface defects, including cracks, laminations, deep pitting, weld spatter slag, burrs, fins, sharp edges and other defects before preparing the surface for coating.

Galvanized, aluminium and zinc primed surfaces

Requirement: Remove grease, oil and other solvent-soluble contaminants to AS 1627.1 (2003). Allow to dry and immediately proceed with priming.

Galvanized and aluminium surfaces: Abrade surfaces to a medium coarse type finish to provide an adhesion key.

Zinc primed surfaces: If present, remove zinc salts from zinc primers.

Treatment of welds

Requirement: Clean welds to remove roughness, using power tools to AS 1627.2 (2002). Remove filings by vacuuming or compressed air.

Temporary welds: Grind flush any temporary welds.

Porous, skip or stitch welds: Not permitted.

Site welding: If possible, avoid site welding. If on site welding is required, prepare and treat the weld to AS/NZS 5131 (2016) clause 9.12.2.

Shop priming

Requirement: Dust off and apply a coat of primer in conformance with the manufacturer's recommendations.

Site coating

General: High pressure wash down all surfaces with clean water. Lightly sand down primer/intermediate coats, which have been shop applied, before site application of next coat.

3.3 PREPARATION ASSESSMENT

General

Conformance: Assess all surfaces of each steel member for conformance with the documented preparation requirements.

Abrasive blast cleaning

Assessment: To AS 1627.4 (2005) and AS 1627.9 (2002).

Mechanical cleaning

Assessment: To AS 1627.9 (2002).

Surface profile

General: To AS 3894.5 (2002) Method A.

Surface dust from abrasion

General: To AS 3894.6 (2002) Method C.

Chloride level testing

Test: To AS 3894.6 (2002) Method A.

Maximum allowable chloride levels: 50 mg/m² for critical applications (heavy condensation, fresh water ponding or immersion) or to manufacturer's recommendations.

Conformance: If the maximum allowable chloride level is exceeded, rewash the affected surface area until the chloride level is within the acceptable limits using clean water or chloride neutralising solutions. Jet-washing or steam cleaning is also acceptable before re-testing and re-abrasive blasting.

Timing of testing: Early in the blasting work so that removal procedures can be started before the blasting is completed.

3.4 MIXING

General

Requirement: To AS/NZS 5131 (2016) clause 9.9.6.

Powered agitators: Mix coatings thoroughly. Mix package sizes larger than 4 litres using powered agitators driven by air motors.

Multi-component coatings: Combine as whole pack units before application.

Thinners: If addition of thinners is proposed, conform to the coating manufacturer's recommendations for the documented product.

Colour consistency: If colour consistency is required, pre-mix tinted products, before the addition of the curing agent or converter and before coating application.

3.5 COATING APPLICATION

General

Requirement: Conform to AS/NZS 5131 (2016) clause 9.9 and the PDS.

Painting and coating colour: Verify all project finish colours with the retained samples.

Final surface preparation or coating application

Limits: Do not apply coating if any of the environmental/climatic/substrate conditions listed in AS/NZS 5131 (2016) clause 9.9.10 exist or if the following conditions are present:

- Ambient air temperature below 5°C or above 40°C.
- Substrate temperature below 5°C or above 35°C.
- The specified surface cleanliness will deteriorate before the full prime coat application can be completed.
- Surface preparation standard has not been achieved.
- Time between final surface preparation and the commencement of coating has exceeded 4 hours.
- Visual tarnishing or black spots develop on the surface of the steel.

Exception: Preliminary blast or other surface preparations may be performed in conditions that are outside the limits, provided the final surface preparation and all coating applications are undertaken under the limit conditions.

Pre-coating: Before the spray application of each coating, stripe coat by brush method all edges, welds, seams, rivets, bolts, boltholes (including slots) and difficult to spray areas. Prime the underlying surfaces of replacement bolts, washers and nuts before installation.

Procedure: Conform to the coating order requirements for each coating designation, as documented.

Subsequent coats: Before applying any subsequent coating layers, make sure the surface condition of preceding coats are clean, free from defects and conform to the requirements documented.

Wet film thickness (WFT)

Method of measurement: To AS 3894.3 (2002) Appendix C using an approved wet film gauge continuously during application.

Dry film thickness (DFT)

Method of measurement: To AS 3894.3 (2002) Section 10.

Extent: Measure all surfaces at the completion of each prime, intermediate and finish coats, including areas of the element difficult to paint, masked by structure, or where double or light coating is likely.

Number of measurements: To AS 3894.3 (2002) Section 7.

Coatings with DFT 150 µm or less: If testing, deduct the effect of the measured surface profile from all DFT readings.

Single readings: Conform to the following:

- The average of 5 point readings for each 10 m² area of coating surface to be within the documented coating thickness range.
- No single point reading in any 10 m² to be less than 80% of the specified minimum coating thickness. If the average of three readings is used to produce a point reading, an individual reading may be less than 80% of the minimum coating thickness.
- Check any single reading that is greater than 150% of the documented maximum DFT with three additional readings within 50 mm of the original reading. If the average of these three readings is not greater than 150% of the specified DFT, take the average reading as the point reading. If greater than 150%, reject the DFT for that area. If no maximum limit for DFT is documented, consult manufacturer.

Rectification and defects

Rectification: Re-work areas rejected, using the same surface preparation, coatings and sequence as for the original work.

Defects (including under-thickness and over-thickness): Mark with dustless chalk, adhesive inspection labels or masking tape. Do not use crayon, paint or spirit based ink pens.

3.6 PROTECTION

Contamination

Surfaces: Prevent contamination of coated surfaces, which are not yet dry, from blasting dust, abrasive or surface preparation debris and any other foreign matter.

Post application care

General: Protect the coating against physical, chemical, or atmospheric damage until all components are fully cured.

Care: Stack and handle all coated items using fabric slings or padded chains. Use soft packaging, carpet strips or other deformable materials between all coated items.

Water ponding: Stack coated items to prevent water ponding.

3.7 COATING REPAIR

Repair of coating damage

Preparation: Feather back by hand or machine sand all leading edges of intact coating adjacent to the repair, to remove any sharp edge.

Surface contamination: Remove by dusting or blowing down before applying the first coat of paint.

Sequence: Apply the repair coating in the same sequence and manner as the original coating.

Areas damaged without exposing the primer: Wash with a proprietary detergent solution, rinse with clean water and abrade so that edges of sound paint are feathered. Coat the area with the appropriate intermediate and finishing coat materials.

Areas damaged exposing the primer or steel surface: Blast clean to the original standard. Prepare at least 50 mm into the sound coating and to a further feathering zone of approximately 50 mm. Recoat with the documented system to restore the film thickness and integrity over the whole prepared surface including the feathered zone.

Aesthetic reinstatement: If required, repaint to a physical or discernible boundary line.

Defects: If corrosion pitting or areas of significant metal loss and defects are exposed by the blasting process, advise for inspection and have areas passed as being fit for service before proceeding with the coating system.

Timing: Apply the protective coating system within 4 hours of blast cleaning or in any case before visual tarnishing of the steel occurs.

3.8 COMPLETION

General

Joints: On completion, seal all joints and mating surfaces with a compatible polyurethane sealant.

4 SELECTIONS

4.1 GENERAL

Minimum dry film thicknesses for protective paint coating systems shall be in accordance with the manufacturer's current written instructions to ensure opacity of the finished coatings and to achieve the required performance.

The preparation and application of the nominated protective paint coating systems, including the use of primers, where applicable, shall comply with the manufacturer's current written instructions.

4.2 PAINT TO EXPOSED STRUCTURAL STEEL

Product: Dulux Protective Coatings or acceptable equivalent.

Surfaces:

- Exposed structural steel.

Abrasive blast finish to AS 1627.4 (2005) Class 2.5.

Coatings:

- Initial coat: Zincanode 402 to DFT of 75 microns.
- Intermediate coat: Duremax GPE to DFT of 150 microns.
- Finishing coat: Weathermax HBR polyurethane to DFT of 100 microns.

Preparation and application: In accordance with the manufacturer's written instructions.

Colours: As scheduled.

0382 LIGHT TIMBER FRAMING

1 GENERAL**1.1 RESPONSIBILITIES****General**

Requirement: Provide light timber framing, as documented.

1.2 CROSS REFERENCES**General**

Requirement: Conform to the following:

- 0171 General requirements.
- 0181 Adhesives, sealants and fasteners.
- 0185 Timber products, finishes and treatment.

1.3 STANDARDS**General**

Framing: To AS 1684.2 (2021), AS 1684.3 (2021) or AS 1684.4 (2010), as appropriate.

Design: To AS 1720.1 (2010).

1.4 INTERPRETATION**Definitions**

General: For the purposes of this worksection, the definitions given in the AS 1684 series apply.

1.5 TOLERANCES**Floors**

Maximum deviation from a 3 m straightedge laid in any direction on the floor framing: 5 mm.

Walls tolerances table

Property	Permitted deviation
Generally: Verticality in 2 m	1:500
Generally: Flatness ¹ in 2 m	3 mm
Features ² : Verticality in 2 m	1:1000
Features ² : Horizontality in 2 m	1:1000
1. Flatness: Measured under a straightedge laid in any direction on a surface. 2. Features: Conspicuous horizontal or vertical lines including external corners, parapets, reveals, heads, sills.	

1.6 SUBMISSIONS**Certification**

Requirement: Submit certification by an appropriately qualified person of the design, documentation and erected work to the AS 1684 series and/or by a professional engineer to AS 1720.1 (2010).

Include the following:

- Reactions: Provide location and magnitude of reactions to be accommodated by the support structure. If part of the structure is manufactured by a prefabricator, provide location and magnitude of reactions and tie down forces.
- Frame member sizes: A schedule of proposed member sizes, certified as meeting stated project requirements for spans, spacings, loadings and deflections.
- Species and stress grade.

Products and materials

Supply: Submit supplier's evidence of conformity, which may be included on an invoice or delivery docket, verifying that the timber conforms to the documented requirements.

Inspection: Submit the inspection authority's evidence of conformity verifying that the erected timber frame conforms to the documented requirements.

Moisture content: Submit records of moisture content to AS/NZS 1080.1 (2012).

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

Shop drawings

General: Submit shop drawings, to a scale that best describes the detail, certified by a professional engineer stating that the design has been carried out to the requirements of the AS 1684 series and AS 1720.1 (2010), for the documented configurations and loadings.

Prefabricated wall frames: Include the following:

- Wall plan, showing all wall layouts.
- Elevations showing the arrangement of members, and the size and section type of each member.
- The method of assembly, connection, lifting.
- Location and details of tie down and bracing.

Subcontractors

Prefabricated items: Submit the name and contact details of proposed manufacturers, suppliers and installers.

1.7 INSPECTION

Notice

Inspection: Give notice so that inspection may be made of the following:

- Prefabricated units before installation.
- Fabricated items before priming or water-repellent treatment.
- Bolts after final tightening.
- Timber work after erection but before it is covered.

2 PRODUCTS

2.1 GENERAL

Storage and handling

Handling: Do not distort or damage timber or timber products. Do not mark or stain the surface of architecturally expressed structural elements. Use identified loading and lifting points.

Storage: To manufacturer's specifications and the following:

- Maintain integrity of structural timber and treatments.
- Store architecturally expressed structural elements and elements for internal use under cover.

Moisture content of seasoned timber: Provide protection throughout handling and storage to maintain a moisture content within the targets for seasoned timber (15% maximum) and ideally near the equilibrium moisture content anticipated in service.

Marking

Branding: Brand structural timber, under the authority of a recognised product certification scheme to *0185 Timber products, finishes and treatment* as applicable to the product. Locate the brand mark on faces or edges that will be concealed in the works. Include the following data for timbers not covered by branding provisions in Australian Standards or regulations for which branding is required:

- Stress grade.
- Method of grading.
- If seasoned, the word, SEASONED or DRY, or an abbreviation of seasoned, such as SEAS or S.
- The certification mark of the product certification scheme.
- The applicable standard.

Preservative treatment

Requirement: To *0185 Timber products, finishes and treatment*.

2.2 TIMBER

Certification

Requirement: Certification, chain of custody and product labelling to *0185 Timber products, finishes and treatment*.

2.3 LAMINATED VENEER LUMBER AND GLUED LAMINATED TIMBER

Laminated veneer lumber

Standard: To AS/NZS 4357.0 (2022).

Glued laminated timber

Standard: To AS/NZS 1328.1 (1998).

2.4 STRUCTURAL PLYWOOD

General

Standard: To AS/NZS 2269.0 (2012).

Bond: Type A to AS/NZS 2754.1 (2016).

Veneer

Veneer quality to visible surfaces: CD (minimum) to AS/NZS 2269.0 (2012).

2.5 COMPONENTS

Nailplated joined beams

Type: Engineered beam made from stress-graded timber pieces joined together with nailplates.

Mild steel post bases

Embedment: Embed base a minimum of 150 mm into the concrete support and to the manufacturer's recommendations.

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

Finish: Galvanized.

Fasteners

Requirement: Conform to *0181 Adhesives, sealants and fasteners*.

CCA treated timber: If in contact with CCA treated timber, provide hot-dip galvanized bolts with plastic sheaths, or bituminous or epoxy coatings to manufacturer's recommendations

Damp-proof course

Material: To AS/NZS 2904 (1995) or suitable alternative material conforming to BCA A5G3.

Flashings

Material: To AS/NZS 2904 (1995) or suitable alternative material conforming to BCA A5G3.

2.6 FINGER JOINTED STRUCTURAL TIMBER

General

Performance: To AS/NZS 8008 (2022).

Adhesive bond performance: To AS/NZS 8008 (2022).

Production: To AS 5068 (2006).

Material requirements: As documented.

2.7 RECONSTITUTED WOOD PRODUCTS

Wet process fibreboard (including hardboard)

Standard: To AS/NZS 1859.4 (2018).

Bending strength: To AS/NZS 1859.4 (2018) Section 7.

Material requirements: As documented.

3 EXECUTION

3.1 GENERAL

Installation

Framing: To the AS 1684 series.

Fastener installation: To *0181 Adhesives, sealants and fasteners*. Do not split or otherwise damage the timber.

3.2 FLOOR FRAMING

Bearers and joists

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

Maximum thickness of packing: 3 mm.

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

Joints

Requirement: Locate joints only over supports:

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

Fixing and restraint

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

Deep joists: To AS 1684.2 (2021) clause 4.2.2.3.

Trimmers or blocking dimensions:

- Depth: Joist depth less 25 mm.
- Minimum thickness: 25 mm.

Engineered timber joists: Provide lateral restraint to the manufacturer's recommendations.

3.3 WALL FRAMING

Additional support

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

Spacing of noggings: Maximum 1350 mm centres.

Damp-proof course

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

- External walls: Turn up at least 75 mm on the inside and tack. Project 10 mm beyond the external slab edge and turn down at 45°.
- Walls of wet areas: Turn up at least 150 mm on the wet side and tack to studs.

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

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

Flashings

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

3.4 ROOF AND CEILING FRAMING

Fixing plates

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

Beam framing

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

Additional support

Requirement: Provide additional frame members at the following locations:

- Hanging light fittings.
- Access panels.
- Any other hanging services or fixtures and fittings.

Anti-ponding boards

Standard: To AS 4200.2 (2017).

3.5 COMPLETION

Protection

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

Tightening

Requirement: Retighten bolts, screws and other fixings so that all joints and anchorages are secure at the date of practical completion.

Cleaning

General: On completion of framing remove debris from any gaps between members.

0383 COMPOSITE DECKING

1 GENERAL**1.1 RESPONSIBILITIES****General**

Requirement: Provide composite decking, as documented.

1.2 CROSS REFERENCES**General**

Requirement: Conform to the following:

- 0171 *General requirements.*
- 0181 *Adhesives, sealants and fasteners.*
- 0382 *Light timber framing.*

1.3 STANDARDS**Slip resistance**

Classification: To AS 4586 (2013).

1.4 INTERPRETATION**Definitions**

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

- Decking: Intermittently-supported external flooring with drainage gaps between boards.
- Subfloor: The structure that supports the flooring.

1.5 TOLERANCES**Decking**

Maximum vertical deviation for adjacent boards: 2 mm.

1.6 SUBMISSIONS**Operation and maintenance manuals**

Requirement: Submit manual to **COMPLETION**, **Operation and maintenance manuals**.

Products and materials

Type tests: Submit results, as follows:

- Slip resistance of decking.

Samples

General: Submit samples of the following:

- Three 500 mm length samples of each type of decking demonstrating the natural range of variation in texture, finish and colour anticipated in the work.

Subcontractors

General: Submit names and contact details of proposed suppliers and installers.

Tests

Site tests: Submit results, as follows:

- Slip resistance of completed installation.

Warranties

Requirement: Submit warranties in accordance with the requirements of 0171 *General requirements*.

- Period:
 - . Composite decking: 7 years.

1.7 INSPECTION**Notice**

Inspection: Give notice so that inspection may be made of the following:

- Subfloor before laying decking.
- Completion of installation.

1.8 SLIP RESISTANCE AND SLIP RESISTANCE TESTING OF FLOORING

Flooring shall be stable, safe and minimise the risk of slipping or tripping due to slippery surfaces or misaligned boards/ joints. Slip resistances shall comply with the requirements of HB 197 and HB 198.

Provide slip resistance test certificates to confirm that slip resistance values are in accordance with AS 4663.

Arrange and pay for on-Site slip resistance testing of finished flooring and in sufficient number to cater for all areas and conditions including ramps, steps etc. Testing shall be undertaken by a registered testing laboratory. Tests shall include wet pendulum and dry floor friction testing in accordance with AS 4663.

2 PRODUCTS

2.1 GENERAL

Storage and handling

Decking: Deliver to site and store on dry ground on level bearers 150 mm high, block stacked, banded and protected against the weather.

2.2 DECKING

Composite decking

General: Proprietary composite decking boards.

3 EXECUTION

3.1 GENERAL

Subfloors

General: Make sure support members are in full lengths without splicing.

Flatness: Less than 3 mm deviation of the substrate under a 3 m straightedge laid in any direction with no abrupt variations greater than 1 mm over 250 mm.

3.2 FIXING DECKING

Composite decking

Installation: To manufacturer's recommendations.

3.3 TESTING

Site tests

Slip resistance of completed installation: To AS 4663 (2013).

3.4 COMPLETION

Rectification

General: Correct any defects to joints and leave the installation complete and clean.

Operation and maintenance manuals

Requirement: Prepare a manual that includes details for the care and maintenance of the decking, including manufacturer's published instructions.

4 SELECTIONS

4.1 COMPOSITE DECKING

Composite decking shall be as nominated in the Finishes Schedule.

Installation shall be in accordance with the manufacturer's recommendations and as scheduled.

0423 ROOFING – PROFILED SHEET METAL

1 GENERAL**1.1 RESPONSIBILITIES****General**

Requirement: Provide a profiled sheet metal roofing system and associated work, as documented.

1.2 CROSS REFERENCES**General**

Requirement: Conform to the following:

- 0171 General requirements.
- 0181 Adhesives, sealants and fasteners.
- 0183 Metals and prefinishes.
- 0193 Building access safety systems.
- 0342 Light steel framing.
- 0382 Light timber framing.
- 0471 Insulation and pliable membranes.

1.3 STANDARDS**General**

Standard: To AS 1562.1 (2018).

1.4 INTERPRETATION**Definitions**

General: For the purposes of this worksection, the definitions given in AS 1562.1 (2018) apply.

1.5 TOLERANCES**Sheet metal roofing**

Supporting members: To AS 1562.1 (2018) clause 4.2.3.

1.6 SUBMISSIONS**Operation and maintenance manuals**

Requirement: Submit manual to **COMPLETION**, **Operation and maintenance manuals**.

Products and materials

Type tests: As appropriate for the project, submit evidence of conformity to the following:

- Metal roofing generally: Roof sheeting and fastenings to AS 1562.1 (2018) clause 5.4 for resistance to concentrated load and to AS 1562.1 (2018) clause 5.5 for resistance to wind pressure.

Samples

Requirement: Submit samples of the following:

- Custom profiled flashings and cappings.
- Sheet metal finishes showing the range of variation available.
- Sealants.
- Trims and accessories with a colour finish.
- All fixing types to suit the scheduled finish.

Subcontractors

General: Submit name and contact details of proposed suppliers and installers.

Tests

General: Provide independently certified data to demonstrate compliance with the specification.

Warranties

Requirement: Submit warranties in accordance with the requirements of 0171 General requirements.

- Period: 45 years against corrosion to perforation and 20 years against flaking and peeling of the coating.

1.7 INSPECTION

Notice

Inspection: Give notice so that inspection may be made of the following:

- Roof supports.
- The parts of the roofing, sarking, vapour barrier, insulation and roof plumbing installation before covering up or concealing.

2 PRODUCTS

2.1 GENERAL

Storage and handling

Storage: Store metal roofing materials as follows:

- Away from uncured concrete, on a level base and not in contact with other materials that cause staining, denting or other surface damage.

Handling: Handle metal roofing materials as follows:

- Use gloves when handling precoated metal roofing material.
- Use soft soled shoes when fixing or working on roofs.
- Protect edges and surfaces from damage. Do not drag sheets across each other or over other materials.

2.2 SHEET METAL ROOFING

Standards

Design and materials: To AS 1562.1 (2018).

Fasteners

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

Fastenings to timber battens: Fastenings long enough to penetrate the thickness of the batten without piercing the underside.

Profiled fillers

Type: Purpose-made closed cell polyethylene foam profiled to match the roofing profile.

Location: Provide profiled fillers under flashings to the following:

- Ridges.
- Eaves.
- Lapped joints in roof sheeting.

Safety mesh

Standard: To AS/NZS 4389 (2015).

Requirement: Install welded safety mesh below all metal roofing, to provide fall protection during construction and to assist in the prevention of sagging of associated insulation and sarking.

2.3 ROOF PLUMBING

General

Roof drainage: To AS/NZS 3500.3 (2021).

Requirement: Provide flashings, cappings, gutters, outlets and downpipes as nominated in the Finishes Schedule, as detailed on the drawings and as necessary to complete the roof system.

Materials

Metal rainwater goods: To AS/NZS 2179.1 (2014).

PVC-U rainwater goods and accessories: To AS/NZS 3500.3 (2021).

Flashings and cappings

Standard: To AS/NZS 2904 (1995).

Material and colour: Match roof sheeting.

Rib notching: Match roof sheeting.

3 EXECUTION

3.1 INSTALLATION

Protection

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

Thermal movement

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

Metal separation

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

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

3.2 SHEET METAL ROOFING

Roof sheet installation

Standard: To AS 1562.1 (2018).

All roof sheets are to be installed in long lengths running from the ridge to the eaves.

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

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

Where insulation is installed below the roof sheeting, provide spacers along the roof purlins to ensure that the insulation recovers to its nominal thickness. Spacer size shall be selected to suit the insulation thickness.

3.3 BUILDING ELEMENTS

Ridges and eaves

Sheet ends: Treat as follows:

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

Ridge and barge

Capping: Finish off along ridge and verge lines with purpose-made ridge capping or barge rolls.

End laps

General: If end laps are unavoidable, and the sheet profile is not suitable for interlocking or contact end laps, construct a stepped type lap.

3.4 ROOF PLUMBING

Jointing sheet metal rainwater goods

Butt joints: Make joints over a backing strip of the same material.

Sealing: Seal fasteners and mechanically fastened joints. Fill the holes of blind rivets with silicone sealant.

Flashings

Installation: Flash roof junctions, upstands, abutments and projections through the roof. Preform to required shapes if possible. Notch, scribe, flute or dress down as necessary to follow the profile of adjacent surfaces. Mitre angles and lap joints 150 mm in running lengths. Provide matching expansion joints at 6 m maximum intervals.

Upstands: Flash projections above or through the roof with two part flashings, consisting of a base flashing and a cover flashing, with at least 100 mm vertical overlap. Provide for independent movement between the roof and the projection.

Large penetrations in low pitch roofs: Extend the base flashing over the roofing ribs to the ridge to prevent ponding behind the penetrating element.

Fixing to pipes: Seal with neutral cured silicone rubber and secure with either of the following:

- Clamping ring.
- Proprietary flexible clamping shoe with attached metal surround flashing.

Gutters

General: Form stop ends, downpipe nozzles, bends and returns. Dress downpipe nozzles into outlets. Provide overflows to prevent back-flooding. Size to pass 100% of the design rainfall. Discharge overflows in locations so water does not enter the building or cause damage to the building.

External downpipes

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

Access cover: Provide a removable watertight access cover at the foot of each downpipe stack.

Downpipe support: Provide supports and fixings for downpipes.

Internal downpipes

Access: Provide access openings as follows:

- At each junction and bend.
- At the foot of each stack.
- At every second floor level.

3.5 COMPLETION

Reinstatement

Extent: Repair or replace damage to the roofing and rainwater system. If the work cannot be repaired satisfactorily, replace the whole area affected.

Touch up: If it is necessary to touch up minor damage to prepainted metal roofing, do not use spray paints.

Cleaning

Roofing and rainwater drainage system: Remove debris, metal swarf, sealants and unused materials.

Exposed metal surfaces: Clean surfaces of substances that interfere with uniform weathering or oxidation.

Roof plumbing: Clean out spoutings, gutters and rainwater pipes after completion of roof installation.

Operation and maintenance manuals

Requirement: Prepare a manual that includes recommendations from the roofing manufacturer or supplier for the maintenance of the roofing system including frequency of inspection and recommended methods of access, inspection, cleaning, repair and replacement.

4 SELECTIONS

4.1 METAL SHEET ROOFING

Prefinished profiled metal sheet roofing shall be as nominated in the Finishes Schedule, complete with all standard and non-standard accessories and incidentals.

Finish: Colorbond Standard. Colour: As scheduled.

Installation shall be in accordance with the manufacturer's recommendations.

0431 CLADDING – COMBINED

1 GENERAL

1.1 RESPONSIBILITIES

General

Requirement: Provide external cladding and associated work, as documented.

1.2 CROSS REFERENCES

General

Requirement: Conform to the following:

- 0171 General requirements.
- 0181 Adhesives, sealants and fasteners.
- 0183 Metals and prefinishes.
- 0342 Light steel framing.
- 0382 Light timber framing.
- 0471 Insulation and pliable membranes.

1.3 TOLERANCES

Permitted deviations

Metal cladding panels:

- Panel fabrication: Maximum allowable deviations shall be as follows:
 - . Length: Maximum allowable deviation for lengths between 1000mm and 4000mm shall be -0mm/ +6mm and for lengths between 4000mm and 8000mm shall be -0mm/ +12mm.
 - . Width: Maximum allowable deviation shall be -0mm/ +4mm.
 - . Thickness: Maximum allowable deviation shall be ± 0.2 mm.
- Installation:
 - . General: Install all component parts level, true to line with uniform joints and reveals.
 - . Maximum deviation for vertical members: 3mm under a 5m straight edge and 5mm under an 11m straight edge.
 - . Maximum deviation for horizontal members: 3mm under an 8.5m straight edge.
 - . Maximum offset from true alignment between abutting members: 1mm.
 - . Variation of joint width between two panels: ± 2 mm.

1.4 SUBMISSIONS

Fire performance

Combustibility: Submit evidence of conformance to PRODUCTS, **FIRE PERFORMANCE, Combustibility.**

Fire hazard properties: Submit evidence of conformance to PRODUCTS, **FIRE PERFORMANCE, Fire hazard properties.**

Operation and maintenance manuals

Requirement: Submit manual to **COMPLETION, Operation and maintenance manuals.**

Products and materials

Materials used in external facades shall be tested to and meet the requirements of AS 5113 (2016) or other equivalent standards accepted under the BCA.

Type tests: As appropriate for the project, submit evidence of conformance to the following:

- Water penetration to AS/NZS 4284 (2008).
- Structural testing to AS/NZS 4284 (2008).
- Resistance to wind pressure to AS 4040.2 (1992).
- Resistance to impact to AS/NZS 4040.5 (1996).

Samples

Finish: Submit samples of the cladding material showing the range of variation available.

Sample size: 500 x 500 mm.

Sample panels

Prior to commencement, construct sample panels of the following:

- Section of aluminium panel cladding, nominally 1000mm long x 1000mm high, incorporating all components of the complete external wall system, including framing, linings, breather membranes/ vapour barriers, flashings, fixings and ancillary items and showing examples of joints between panels. The sample panel shall demonstrate the quality anticipated in the finished work.

Shop drawings

Submit shop drawings to a scale that best describes the detail, showing the following:

- Dimensioned elevations of all elements.
- Details of construction, connections and all support systems.
- Dimensions of all typical elements and of any special sizes and shapes.
- Provision for the exclusion and/or drainage of moisture.
- Jointing details and method of fixing between individual elements and between this installation and adjacent work, including adjustment.
- Sealant types and full size sections of all sealant-filled joints and backing rods.
- Provision for thermal movement.
- Provision for movement under seismic and wind loads.
- Sequence of installation.
- Co-ordination requirements with other work.
- Schedule of materials, finishes, componentry, hardware and fittings.

Subcontractors

General: Submit names and contact details of proposed suppliers and installers.

Warranties

Requirement: Submit warranties in accordance with the requirements of *0171 General requirements*.

- Period:
 - . Aluminium cladding: 10 years.

1.5 INSPECTION**Notice**

Inspection: Give notice so that inspection may be made of the following:

- Workshop assemblies before delivery to the site.
- Framing, pliable membranes and insulation before covering up or concealing.

2 PRODUCTS

2.1 GENERAL**Storage and handling**

Requirement: Store and handle materials to the manufacturer's recommendations and the following:

- Protect materials including edges and surfaces from damage.
- Keep dry and unexposed to weather.
- Do not drag sheets or panels across each other or over other materials.
- Cladding panels: Store unpacked panels by size in racks and protect from scratching, warping or bending.
- Store materials away from uncured concrete on a level base.
- Do not store materials in contact with other materials which may cause staining, denting or other surface damage.
- Use gloves when handling precoated cladding material.

Components

Fasteners and ties: Type, size, corrosion resistance class and spacing to the cladding manufacturer's recommendations.

Flashings: To AS/NZS 2904 (1995).

Composite panels

Requirement: Composite metal faced cladding panels shall not be used.

2.2 WEATHERPROOFING**General**

Compliance: Comply with the requirements of BCA F3P1 including, but not limited to, the provision of type test data for all installed products and systems applicable to the work and evidence of conformance of completed installations for both deemed-to-satisfy provisions and any documented performance solutions, as applicable.

2.3 FIRE PERFORMANCE**Combustibility**

Cladding: Tested to AS 1530.1 (1994) and deemed non-combustible.

Fire hazard properties

Group number: To AS 5637.1 (2015).

Bonded laminated materials: Tested to AS/NZS 1530.3 (1999). Fire hazard indices, as follows:

- Spread of Flame Index: 0.
- Smoke-Developed Index: ≤ 3 .

2.4 ALUMINIUM PANELS**General**

Requirement: Proprietary, solid, non-combustible aluminium panels.

Panel joints and control joints: Integral.

Flexible sealant: Non-staining to the manufacturer's recommendations.

Finish

Powder coating: Where panels have a powder coat finish, powder coating shall be done with the same batch of powder, by the same applicator, in the same direction (i.e. all vertically or all horizontally), and, if possible, at the same time.

3 EXECUTION

3.1 PREPARATION**Substrates or framing**

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

Flexible underlay: Check that the underlay or insulation is restrained.

Cladding: Make sure the cladding is clean and free of dust and loose particles.

3.2 INSTALLATION**General**

Requirement: Install cladding as follows:

- Provide any subframing or furring necessary to give proper support and to ensure cladding remains flat.
- Fix cladding firmly against framing to the manufacturer's recommendations.
- Plumb, level, straight and to documented tolerances.
- Fixed or anchored to the building structure in conformance with the wind action loading recommendations.
- Isolated from any building loads, including loads caused by structural deflection or shortening.
- Allow for thermal movement.

Cladding layout: Cut/fabricate and install cladding to suit the layout as documented.

Protection: Protect surfaces and finishes, including the retention of protective coatings during installation.

Proprietary systems or products

Requirement: Use panels and components from a single proprietary system and install to the manufacturer's recommendations.

Accessories and trim

Requirement: Provide accessories and trim required to complete the installation, or as documented.

Control joints

General: To coincide with structural movement joints and in accordance with the cladding manufacturer's recommendations.

Metal separation

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

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

Incompatible metal fixings: Do not use.

Horizontal cladding

Horizontal cladding surface:

- Minimum slope: 1:15.
- Staining: Slope away from visible vertical facade areas to prevent staining.

Defective and damaged parts

Defective components: Do not install component parts which are defective, including warped, bowed, dented, abraded or broken members.

Damaged parts: Remove and replace damaged parts during installation.

3.3 ALUMINIUM PANEL CLADDING**General**

Fabrication: Factory fabricate panels and elements wherever possible.

Installation: Install panels as follows:

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

Protection: Protect surfaces and finishes, including the retention of protective coatings during installation.

Joints

Requirement: Rigidly secure joints other than movement and open joints. Reinforce as required and fix with hairline abutments or as documented.

Control joints:

- Location: To coincide with structural movement joints, as documented.

3.4 COMPLETION**Fasteners**

Requirement: If required, adjust for weather tightness without distortion of external panel face.

Reinstatement

Extent: Repair or replace damage to the cladding. If the work cannot be repaired satisfactorily, replace the whole area affected.

Damage to pre-painted finish: Replace panels with scratches in the pre-painted finish greater than 2 mm in width visible from the ground.

Cleaning

Requirement: Remove excess debris, metal swarf, solder, sealants and unused materials.

Exposed metal surfaces: Clean surfaces of substances that interfere with uniform weathering or oxidation.

Protection: Remove protective coatings using methods required by the manufacturer after completion.

Cladding: Clean surfaces with soft, clean cloths and clean water to the manufacturer's recommendations.

Operation and maintenance manuals

Requirement: Prepare a manual that includes the manufacturer's published use, care and maintenance requirements.

4 SELECTIONS

4.1 ALUMINIUM PANEL CLADDING

Prefinished aluminium panel cladding shall be as nominated in the Finishes Schedule, complete with all standard and non-standard accessories and incidentals.

Finish: As scheduled.

Installation shall be in accordance with the manufacturer's recommendations.

0451 WINDOWS AND GLAZED DOORS

1 GENERAL

1.1 RESPONSIBILITIES

General

Requirement: Provide windows and glazed doors, as documented.

Performance

Product design: Provide windows with sashes capable of being opened to satisfy the maintenance requirements, as documented.

1.2 CROSS REFERENCES

General

Requirement: Conform to the following:

- 0171 *General requirements.*
- 0181 *Adhesives, sealants and fasteners.*
- 0183 *Metals and prefinishes.*
- 0461 *Glazing.*

1.3 STANDARDS

General

Selection and installation: To AS 2047 (2014).

Glazing

Glass type and thickness: To AS 1288 (2021), if no glass type or thickness is nominated.

Materials and installation: To AS 1288 (2021).

Quality requirements for cut-to-size and processed glass: To AS/NZS 4667 (2000).

1.4 INTERPRETATION

Definitions

General: For the purposes of this worksection, the definitions given in AS/NZS 4668 (2000) and the following apply:

- Hardware: To AS 4145.1 (2008) Section 2.
- Total system SHGC: Solar heat gain coefficient as defined by the BCA and tested in conformance with NFRC 200 (2023).
- Total system U-Value: Thermal transmittance as defined by the BCA and tested in conformance with NFRC 100 (2023).
- Weathering: Inclined upper external surface, such as of a coping, sill, or top of a buttress or chimney, designed to shed rainwater quickly and throw it clear of the facing material below.

1.5 SUBMISSIONS

Certification

Windows and glazed doors: Submit evidence of conformity to AS 2047 (2014).

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

Opacified glass: Submit a report, from the manufacturer, certifying that the proposed method of opacifying the glass will not be detrimental to the glass or affect the glass product warranty.

Toughened glass: For each batch of glass, submit certification from the manufacturer of heat soaking.

Operation and maintenance manuals

Requirement: Submit manual to **COMPLETION**, **Operation and maintenance manuals**.

Products and materials

Safety glazing materials: Submit evidence of conformity to AS 2208 (2023).

Where required, carry out project specific tests and provide certification to demonstrate that the windows and glazed doors have been tested to meet the following:

- Air infiltration: To AS 2047 (2014) and AS 4420.1 (2016).
- Watertightness: To AS 2047 (2014) and AS 4420.1 (2016). No water penetration shall occur under the test conditions as specified.
- Wind resistance: To AS/NZS 1170.2 (2021).
- Operation force test: To AS 4420.1 (2016).
- Deflection test: To AS 4420.1 (2016).

If the testing data submitted is not deemed to be satisfactory by the Superintendent, laboratory tests shall be carried out to satisfy the requirements of the specification and as agreed with the Superintendent.

Type tests: Submit results, as follows:

- Windows: To AS 2047 (2014).
- Weighted sound reduction index (R_w): Rated to AS/NZS ISO 717.1 (2004).

Samples

Window and door framing: Submit the following:

- Accessory and hardware items documented descriptively or by performance (i.e. not documented as proprietary items) including locks, latches, handles, catches, sash operators, anchor brackets and attachments, masonry anchors and weather seals.
- Colour samples of prefinished production material (e.g. anodised or organic coated extrusions and sheet), showing the limits of the range of variation in the selected colour.
- Joints made by proposed techniques.
- Sections proposed to be used for frames and sashes.
- Label each sample, giving the series code reference and date of manufacture.

Glazing: Submit samples of glazing materials, each at least 300 x 300 mm, showing documented visual properties and the range of variation, if any, for each type of glass.

Visual indicators: Examples of the proposed visual indicator strips on glazing.

Hardware: Hardware components in the proposed materials and finishes, including operating handle, hinge and locking device.

Shop drawings

General: Submit shop drawings, to a scale that best describes the detail, showing the following:

- Full size sections of members.
- Details of all glazing types.
- Hardware, fittings and accessories including fixing details.
- Junctions and trim to adjoining surfaces.
- Layout (sectional plan and elevation) of the window assembly.
- Methods of assembly.
- Methods of installation, including fixing, caulking and flashing.
- Provision for vertical and horizontal expansion.
- Method of glazing, including the following:
 - . Rebate depth.
 - . Edge restraint.
 - . Clearances and tolerances.
 - . Glazing gaskets, adhesives and sealant beads.

Subcontractors

General: Submit names and contact details of proposed manufacturers and installers.

Warranties

Requirement: Submit warranties in accordance with the requirements of *0171 General requirements*.

- Period:
 - . Window and glazed door assemblies: 10 years.

1.6 INSPECTION

Notice

Inspection: Give notice so that inspection may be made of the following:

- Openings prepared to receive windows (where windows are to be installed in prepared openings).
- Fabricated window assemblies at the factory ready for delivery to the site.
- Fabricated window assemblies delivered to the site, before installation.
- Commencement of window installation.

2 PRODUCTS

2.1 GENERAL

Storage and handling

Storage: Store in a clean, dry area and unaffected by weather, to the manufacturer's recommendations. Protect from building materials and loose debris such as wet paint and welding splatter.

Handling: Handle frames to the manufacturer's recommendations and as follows:

- Stack upright, off the ground and against a flat, vertical surface.
- Carry in the vertical position with sashes locked.
- Do not rack frames out of square.
- Do not remove any bands and corner bracing until after installation.

Marking

Window assemblies: To AS 2047 (2014) Section 8.

Identification: Marked to show the following:

- Manufacturer's identification.
- Product brand name.
- Product type.
- Quantity.
- Product reference code and batch number.
- Date of manufacture.
- Material composition and characteristics such as volatility, flash point, light fastness, colour and pattern.

Acoustic performance

Windows and doors: Rating to AS/NZS ISO 717.1 (2004).

Protection of openable windows

Fall prevention: To BCA D3D29.

2.2 GLASS AND GLAZING

Performance

Glass: Free from defects which detract from appearance or interfere with performance under normal conditions of use.

Heat soaking

Requirement: Heat soak glass to AS 1288 (2021) clause 3.8.

Standard: To EN 14179-1 (2016).

Marking: To EN 14179-1 (2016) or certified by the manufacturer to AS 1288 (2021) clause 3.8.2.

Safety glazing materials

Standard: To AS 2208 (2023).

Type: Grade A to AS 1288 (2021).

Marking: To AS 1288 (2021) clause 5.23.

Heat strengthened glass

Requirement: Heat strengthened annealed glass that requires extra strength and thermal resistance.

Standard: To ASTM C1048 (2018).

Ceramic-coated glass

Requirement: Heat strengthened or toughened glass with a coloured ceramic coating fused to and made an integral part of the surface to ASTM C1048 (2018), Condition B.

Opacified glass

Requirement: Glass with an opacifier permanently bonded to the inner face.

Insulating glass units (IGUs)

Manufacture, testing and installation: To AS 4666 (2012).

2.3 GLAZING MATERIALS

General

Requirement: Glazing materials, including putty, glazing compounds, sealants, gaskets, glazing tapes, spacing strips, spacing tapes, spacers, setting blocks and compression wedges, shall be appropriate for the conditions of application and the required performance.

Jointing materials

Requirement: Jointing and pointing materials that are compatible with each other and the contact surfaces, and non-staining to finished surfaces to manufacturer's recommendations. Do not provide bituminous materials on absorbent surfaces.

Elastomeric sealants

Sealing compounds (polyurethane, polysulfide, acrylic): To ASTM C920 (2018) or ISO 11600 (2002).

Sealing compounds (silicone): To ASTM C920 (2018) or ISO 11600 (2002).

Sealing compounds (butyl): To ASTM C1311 (2022).

Primer

Compatibility: Apply the manufacturer's recommended primer to the surfaces in contact with sealant materials.

Control joints

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

Foamed materials (in compressible fillers and backing rods): Closed-cell or impregnated types that do not absorb water.

Bond breaking: Provide backing rods, and other back-up materials for sealants, that do not adhere to the sealant.

2.4 EXTERNAL ALUMINIUM FRAMED WINDOWS AND GLAZED DOORS

External aluminium framed window and glazed door suites shall be as nominated in the Window Schedule and the Door Schedule.

Exposure category (design wind pressure): To AS/NZS 1170.2 (2021).

Glazing details: As scheduled and in accordance with AS 1288 (2021) and *0461 Glazing*.

Finish: As scheduled.

2.5 FRAMES

Aluminium frames

Standard: To AS 2047 (2014) clause 3.1.

Construction: Assembled from aluminium sections, including accessories such as pile strips, fixing ties or brackets and cavity flashings, with provision for fixing documented hardware and seals.

Subsill: If the frame includes a subsill, provide a self-draining section.

2.6 INSECT SCREENS

Fixed aluminium framed screens

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

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

Requirement: Fixed screens shall be fitted to the window frames with a clipping device which permits removal for cleaning.

2.7 VISUAL INDICATORS ON GLAZING

General

Any glazing capable of being mistaken for a doorway or opening, where there is no chair rail, handrail or transom, shall be clearly marked with a contrasting line that complies with AS 1428.1 (2021).

2.8 ALUMINIUM FRAME FINISHES

Powder coatings

Standard: To AS 3715 (2002).

Anodised

Standard: To AS 1231 (2000).

Thickness: 25 microns.

2.9 ANCILLARY COMPONENTS AND FITTINGS

Extruded gaskets and seals

General: Provide seals, as documented.

Materials: Non-cellular (solid) elastomeric seals as follows:

- Rubber products: Neoprene, ethylene propylene diene monomer (EPDM) or silicone rubber.
- Flexible polyvinyl chloride (PVC): E type compounds, colourfastness grade B.

Flashings

General: Corrosion resistant, compatible with the other materials in the installation, and coated with a non-staining compound where necessary.

Standard: To AS/NZS 2904 (1995).

Nylon brush seals

General: Dense nylon bristles locked into galvanized or stainless steel strips and fixed in a groove in the edge of the door or in purpose-made anodised aluminium holders fixed to the door with double sided PVC foam tape.

Pile weather strips

Standard: To AAMA 701/702 (2023).

Material: Pile and backing or equivalent polypropylene, low friction silicone treated, ultraviolet stabilised, fixed to the frame to the manufacturer's recommendations.

Finned type: A pile weatherseal with a central polypropylene fin bonded into the centre of the backing rod and raised above the pile level.

Weather bars

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

Requirement: Where a threshold plate is used in conjunction with a weather bar, to a door on an accessible path of travel, the threshold plate shall comply with AS 1428.1 (2021) and all provisions of the BCA.

2.10 HARDWARE

Hardware documented generically

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

Window locks and latches

Standard: To AS 4145.2 (2008).

Sash balances

Requirement: Match the spring strength of the balances to the sash weight they support.

Security

All openable windows shall be fitted with window locks to suit the application and as recommended by the manufacturer.

Openable windows shall be fitted with a device to restrict the opening to a maximum width of 125mm and capable of withstanding an outward horizontal force of 250N.

Opening force

The maximum opening force required to open non-fire rated doors on continuous accessible paths of travel shall be in accordance with AS 1428.1 (2021).

2.11 KEYING**Contractor's keys**

Master key systems: Do not use any key under a master key system.

Identification

Labelling: Supply each key with a purpose-made plastic or stamped metal label legibly marked to identify the key, attached to the key by a metal ring.

Key material

Pin tumbler locks: Nickel alloy, not brass.

Lever locks: Malleable cast iron or mild steel.

Keying system

Coding of locks: If window locks are included in building key code groups, provide cylinder or pin tumbler locks coded to match.

Number of keys

Requirement: Supply a minimum of four keys for each lock type.

3 EXECUTION

3.1 GLASS PROCESSING**General**

Processing: Perform required processes on glazing, including cutting, obscuring, silvering and bending. Form necessary holes, including for fixings, equipment and access openings. Process exposed glass edges to a finish not inferior to ground arrised.

3.2 INSTALLATION**Glazing**

General: Install the glazed systems as follows:

- Permanently fix in place each piece of glass to withstand the normal loadings and ambient conditions at its location without distortion or damage to glazing materials.
- No transfer of building movements to the glazing.
- Watertight and airtight for external glazing.

Temporary marking: Use a method that does not damage the glazing. Remove marking only after certification and acceptance of the installation.

Toughened glass: Do not cut, drill, edgework or permanently mark after toughening. Use installation methods that prevent the glass making direct contact with metals or other non-resilient materials.

Frameless installations: Join the vertical edges of adjacent glass panels with silicone jointing compound.

Heat absorbing glass: In locations exposed to direct sunlight, provide wheel cut edges free from damage or blemishes, with minimum feather.

Preglazing

Glazed assemblies: Supply inclusive of glazing, shop preglazed.

Windows and glazed doors

General: Install windows and glazed door frames as follows:

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

Weatherproofing

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

Fixing

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

Fasteners: Conceal fasteners.

Fasteners and fastener spacing: Conform to the recommendations of the manufacturer.

Joints

General: Make accurately fitted tight joints so that neither fasteners nor fixing devices such as pins, screws, adhesives and pressure indentations are visible on exposed surfaces.

Sealants: If priming is recommended, prime surfaces in contact with jointing materials. If frames are powder coated, apply a neutral cure sealant.

Operation

General: Make sure moving parts operate freely and smoothly, without binding or sticking, at correct tensions or operating forces and are lubricated.

Protection

Removal: Remove temporary protection measures from the following:

- Contact mating surfaces before joining up.
- Exposed surfaces before completion of the works.

3.3 HARDWARE**Fasteners**

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

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

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

- Hollow metal sections: Provide backing plates drilled and tapped for screw fixing, or provide threaded inserts (rivet nuts) with machine thread screws. Do not use self-tapping screws or pop rivets.

Operation

General: Make sure working parts are accurately fitted to smooth close bearings, without binding or sticking, free from rattle or excessive play, lubricated where appropriate.

Supply

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

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

3.4 COMPLETION**Hardware**

Adjustment: Leave the hardware with working parts in working order, and clean, undamaged, properly adjusted, and lubricated where appropriate.

Keys

Contractor's keys: Immediately before the date for practical completion, replace cylinders to which the contractor has had key access during construction with new cylinders that exclude the contractor's keys.

Keys: For locks keyed to differ and locks keyed alike, verify quantities against key records, and deliver to the Superintendent at practical completion.

Key codes: Submit the lock manufacturer's record of the key coding system showing each lock type, number and type of key supplied, key number for re-ordering, and name of supplier.

Repair of finish

Polyester or fluoropolymer coatings: Contact supplier for approval to apply touch up products, otherwise replace damaged material.

Cleaning

Method: Clean with soft clean cloths and clean water, finishing with a clean squeegee. Do not use abrasive, acidic or alkaline materials.

Extent: All frames and glass surfaces internally and externally.

Operation and maintenance manuals

Requirement: Prepare a manual that includes the following:

- Window and glazed door manufacturer's published recommendations for operation, care and maintenance.
- Hardware manufacturer's published recommendations for use, care and maintenance.

0453 DOORS

1 GENERAL

1.1 RESPONSIBILITIES

General

Requirement: Provide doors, frames and doorsets, as documented.

1.2 CROSS REFERENCES

General

Requirement: Conform to the following:

- 0171 General requirements.
- 0181 Adhesives, sealants and fasteners.
- 0183 Metals and prefinishes.
- 0185 Timber products, finishes and treatment.
- 0455 Door hardware.
- 0522 Partitions – framed and lined.

1.3 STANDARDS

General

Timber and composite doors: To AS 2688 (2017).

1.4 INTERPRETATION

Definitions

General: For the purposes of this worksection the definitions given in AS 2688 (2017) and the following apply:

- Balanced construction: Flush door construction where the facings on one side of the core are nominally equal in thickness, grain direction, properties and arrangement to those on the other side of the core, such that uniformly distributed changes in moisture content will not cause warpage.
- Door frame: Includes jamb linings.
- Doorset: An assembly comprising a door or doors and supporting frame, guides and tracks including the hardware and accessories necessary for operation.
- Flush door: A door leaf with two plane faces which entirely cover and conceal its structure. It includes doors with intermediate rail, blockboard, medium density fibreboard (MDF) and particleboard cores.
 - Solid core door: A flush door with a solid core continuous between stiles and rails or edge strips and fully bonded to the faces.

1.5 SUBMISSIONS

Operation and maintenance manuals

Requirement: Submit manual to **COMPLETION**, Operation and maintenance manuals.

Products and materials

Type tests: Submit results, as follows:

- Weighted sound reduction index (R_w): To AS/NZS ISO 717.1 (2004).

Samples

General: Submit samples as follows:

- 300mm x 300mm sample of each type of door specified.
- Door frame minimum 300mm length of each type.
- Samples of seals.
- Samples of glazing materials, where applicable.

Shop drawings

General: Submit shop drawings showing details of each assembly, component and connection and information relevant to fabrication, surface treatment and installation for the following:

- Steel door frames.
- Aluminium door frames.

Subcontractors

General: Submit names and contact details of proposed suppliers and installers.

Warranties

Requirement: Submit warranties in accordance with the requirements of *0171 General requirements*.

- Period:
 - . Timber doors generally: 5 years.

1.6 INSPECTION**Notice**

Inspection: Give notice so that inspection may be made of the following:

- Door frames in place before hanging door.
- Doors hung and prior to the installation of door furniture.

2 PRODUCTS**2.1 FRAMES****Aluminium frames**

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

Threshold: If the frame includes a threshold member, provide a self-draining section with anti-skid surface.

Steel frames

General: Continuously welded from metallic-coated steel sheet sections, including accessories such as buffers, strike plates, spreaders, switch boxes, fixing ties or brackets, and cavity flashing with provision for fixing documented hardware and electronic security assemblies, and prefinished with a protective coating.

Base metal thickness:

- General: Minimum 1.2 mm.

Metallic coating class to AS 1397 (2021): ZF100.

Finish: Grind the welds smooth, cold galvanize the welded joints and shop prime.

Hardware and accessories: Provide 4 mm backplates and lugs for fixing hardware including hinges and closers. Screw fix the hinges into tapped holes in the backplates.

2.2 DOORS**General**

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

Materials

Standards: Conform to the following:

- Decorative laminated sheets: To AS/NZS 2924.1 (2024).
- Wet process fibreboard (including hardboard): To AS/NZS 1859.4 (2018).
- Dry process fibreboard (including medium density fibreboard): To AS/NZS 1859.2 (2017).
- Particleboard: To AS 1859.1 (2017).
- Plywood and blockboard for interior use: To AS/NZS 2270 (2006).
- Plywood and blockboard for exterior use: To AS/NZS 2271 (2004).
- Seasoned cypress pine: To AS 1810 (1995).
- Timber – hardwood: To AS 2796.1 (1999).

- Timber – softwood: To AS 4785.1 (2002).

Identification

Panel doors: Provide panels branded under the authority of a recognised certification scheme to *0185 Timber products, finishes and treatment*, as applicable to the product. Locate the brand on faces or edges which will be concealed in the works.

Flush panel doors

General: Provide flush doors of balanced construction.

Solid core: Solid flush doors as follows:

- Flush door with blockboard: Core plate of timber strips laid edge to edge, fully bonded to each other and to facings each side of no less than two sheets of plywood veneer or as otherwise nominated.
- Flush doors with particleboard: Core plate of particleboard fully bonded to facings each side of no less than two sheets of plywood veneer or as otherwise nominated.

Construction

General: To AS 2688 (2017). All materials, core materials, edgings, facing materials and adhesives and preservative requirements for timber doors and associated works shall be selected to satisfy the appropriate environmental conditions. All adhesives, fixings and associated elements shall have moisture resistant properties to match core materials.

Adhesives:

- Internal: To AS/NZS 2270 (2006).
- External: To AS/NZS 2271 (2004).

Door thickness: 40 mm, unless detailed otherwise, or as necessary to achieve the nominated performance requirements.

Cut-outs: If openings are required in flush panel doors (e.g. for glazing), do not make cut-outs closer than the width of the stiles at the edges of the doors.

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

Double doors

Double doors other than double acting doors: Provide rebated meeting stiles or fix equivalent metal T stop to one leaf. Form rebates to suit standard rebated hardware.

Finish

All doorways shall have finishes to achieve a minimum 30% luminance contrast in accordance with AS 1428.1 (2021).

Opening force

The maximum opening force required to open non-fire rated doors on continuous accessible paths of travel shall be in accordance with AS 1428.1 (2021).

Tolerances

Squareness: The difference between the lengths of diagonals of a door shall be <3 mm.

Twist: The difference between perpendicular measurements taken from diagonal corners shall be <3 mm.

The maximum variation from the stated size of doors shall be as follows:

- Height: ± 2 mm.
- Width: +2mm/ -0mm.

2.3 DOORSETS

Marking and labelling

Doors and doorsets: To AS 2688 (2017) clause 2.5.

Acoustic performance

Doorsets: Rating to AS/NZS ISO 717.1 (2004).

2.4 ANCILLARY MATERIALS

Door seals

Acoustic applications: Tested to AS 1191 (2002) or EN ISO 10140-2 (2021) and rated to AS/NZS ISO 717.1 (2004).

Weather and energy saving seals: To AS 4420.1 (2016) Sections 5 and 6, and AS 2047 (2014).

Extruded gaskets and seals

Materials: Non-cellular (solid) elastomeric seals as follows:

- Rubber products: Neoprene, ethylene propylene diene monomer (EPDM) or silicone rubber.
- Flexible polyvinyl chloride (PVC): E type compounds, colourfastness grade B.

Flashings

General: Corrosion-resistant, compatible with the other materials in the installation, and coated with a non-staining compound where necessary.

Standard: To AS/NZS 2904 (1995).

Jointing materials

General: Compatible with each other and with the contact surfaces and non-staining to finished surfaces. Do not provide bituminous materials on absorbent surfaces.

Nylon brush seals

General: Dense nylon bristles locked into galvanized steel strips and fixed in a groove in the edge of the door or in purpose-made anodised aluminium holders fixed to the door with double sided PVC foam tape.

Pile weather strips

General: Polypropylene or equivalent pile and backing, low friction silicone treated, ultraviolet stabilised.

Standard: To AAMA 701/702 (2023).

Weather bars

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

Requirement: Where a threshold plate is used in conjunction with a weather bar, to a door on an accessible path of travel, the threshold plate shall comply with AS 1428.1 (2021) and all provisions of the BCA.

3 EXECUTION

3.1 FRAMES

General

Frames: Install the frames as follows:

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

Frame fixing

Brackets: Metallic-coated steel:

- Width: Minimum 25 mm.
- Thickness: Minimum 1.5 mm.

Jamb fixing centres: Maximum 600 mm.

Joints

General: Make accurately fitted joints where fasteners, pins, screws, adhesives and pressure indentations are not visible on exposed surfaces.

Aluminium frames

Fixing to stud frame openings: Screw once to studs at each fixing.

Steel frames

Fixing to stud frame openings: Attach galvanized steel brackets to jambs and screw twice to studs at each fixing.

Finishing

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

Seals

General: Provide the fixings, rebates, grooves, and clearances required for installation and operation of the seals. Allow seals unwound from coils to settle before use.

Weatherproofing

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

3.2 DOORS**Painting**

General: Paint shall be applied to both faces and all edges, including top and bottom, of doors. If doors are not pre-painted prior to installation, ensure top and bottom edges are primed and painted before hanging.

Tolerances

Installation: To AS 2688 (2017) Section 7.

3.3 DOORSETS**General**

Installation: To AS 2688 (2017) Section 7.

3.4 COMPLETION**Operation**

General: Make sure moving parts operate freely and smoothly, without binding or sticking, at correct tensions or operating forces and that they are lubricated where appropriate.

Protection

Temporary coating: On or before the date for practical completion, or before joining up to other surfaces, remove all traces of temporary coatings used as a means of protection.

Operation and maintenance manuals

Requirement: Prepare a manual that includes the manufacturer's published recommendations for service use.

0455 DOOR HARDWARE

1 GENERAL

1.1 RESPONSIBILITIES

General

Requirement: Provide door hardware, as documented.

1.2 CROSS REFERENCES

General

Requirement: Conform to the following:

- 0171 General requirements.
- 0181 Adhesives, sealants and fasteners.
- 0183 Metals and prefinishes.
- 0451 Windows and glazed doors.
- 0453 Doors.

1.3 INTERPRETATION

Abbreviations

General: For the purposes of this worksection, the abbreviations given in AS 4145.1 (2008) Appendix D apply.

Definitions

General: For the purposes of this worksection, the general definitions given in AS 4145.1 (2008) Section 2 and Appendix E apply.

1.4 SUBMISSIONS

Execution details

Door-by-door schedule: Submit a door-by-door hardware schedule.

Information sources: This worksection and the contract drawings.

Key control system

General: Submit details of the proprietary key control security system proposed by the lock manufacturer for locks required to accept a group key (master, grandmaster).

Alterations and additions: Submit details to extend the existing key control security system for locks required to accept a group key.

Operation and maintenance manuals

Requirement: Submit manual to **COMPLETION**, **Operation and maintenance manuals**.

Records

Door hardware schedule: Submit a schedule, prepared by the door hardware supplier, showing changes to the contract door hardware schedule resulting from the following:

- Approval of a hardware sample.
- Acceptance of an equivalent to a specified proprietary item.
- A contract variation to a door hardware requirement.

Key coding system: Submit the lock manufacturer's record of the key coding system showing each lock type, number and type of key supplied, key number for re-ordering, and name of supplier.

Samples

General: Submit samples of all hardware types.

Subcontractors

General: Submit names and contact details of proposed supplier and installer.

Warranties

Requirement: Submit warranties in accordance with the requirements of *0171 General requirements*.

- Period: As offered by the manufacturer.

2 PRODUCTS

2.1 GENERAL

Supply

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

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

Hardware specified generically: Provide hardware of the required strength and quality to perform its function, appropriate to the intended conditions of use, suitable for use with associated hardware, and fabricated with fixed parts firmly joined.

2.2 LOCKS AND LATCHES

Standard

General: To AS 4145.2 (2008).

Padlocks

Standard: To AS 4145.4 (2002).

Lock and latch classification

Rating systems: To AS 4145.1 (2008) Section 3.

Performance requirements: To AS 4145.2 (2008) Section 3.

2.3 HINGES

Butt hinge materials

Timber doors in steel frames:

- Material: Stainless steel.

Aluminium framed glazed doors or timber doors in aluminium frames:

- Material: Aluminium.

Doors fitted with closers: Provide low friction ball bearing hinges.

Power transfer hinges: Provide hinges that allow wires to be transferred unbroken between the door and frame.

Lift-off doors: If toilet cubicles require lift-off doors, provide lift-off hinges and allow for door panel with sufficient clearance at the head to allow door removal.

Number of hinges

General: Use the table below, to determine the number of hinges required based on the nominated door leaf height and weight only. For other door leaf sizes or for doors with applied finishes, use the weight of the door to determine the number of hinges required. For a door leaf over 80 kg, use pivot hinges.

Solid core timber doors

Size of hinges: Determine the size of the hinge based on the door leaf thickness:

- 35 to 43 mm thick door: 100 x 75 mm butt hinges with a minimum thickness of 2.5 mm.
- 44 to 55 mm thick door: 100 x 100 mm butt hinges with a minimum thickness of 2.5 mm.
- > 55 mm thick door: Refer to the door by door hardware schedule.

Hinge pin: Supply fixed pins to hinges of doors opening out or designated as a security doors. For all other doors, provide loose pins.

Wide throw: If necessary, use wide throw hinges to achieve the required door swings in the presence of obstacles such as nibs, deep reveals and architraves.

Hinges for timber doors table

Door height (mm)	Door leaf weight (kg)	Number of hinges
Up to 2300	≤ 50	3
Up to 3000	≤ 65	4
Above 3000	≤ 80	5

Aluminium doors

Application: Aluminium hinges for aluminium doors, or for doors of other materials in aluminium frames.

Hinges for aluminium doors table

Nominal hinge size (L x W x T) (mm)	Door leaf weight (kg)	Knuckles (minimum)	Screws/hinge leaf (minimum)
100 x 70 x 3	≤ 30	3	3
100 x 80 x 3.5	≤ 50	5	4
130 x 50 x 3.4	≤ 75	Interfold	3

Length (L) is the dimension along the knuckles, not including hinge tips, if any, and width (W) is the dimension across both hinge leaves when opened flat.

2.4 ANCILLARIES

Bolts

General: Barrel bolts, flush bolts and tower bolts with keepers, including lock plates, staples, ferrules or floor sockets.

Door seals

Acoustic applications: Tested to AS 1191 (2002) or EN ISO 10140-2 (2021) and rated to AS/NZS ISO 717.1 (2004).

Weather and energy saving seals: To AS 4420.1 (2016) clause 5 and clause 6, and AS 2047 (2014).

Extruded gaskets and seals

General: Provide seals, as documented.

Materials: Non-cellular (solid) elastomeric seals as follows:

- Rubber products: Neoprene, ethylene propylene diene monomer (EPDM) or silicone rubber.
- Flexible polyvinyl chloride (PVC): E type compounds, colour fastness grade B.

Nylon brush seals

General: Dense nylon bristles locked into holding strips and fixed in a groove in the edge of the door or in purpose-made anodised aluminium holders fixed to the door or frame to the manufacturer's recommendations.

Pile weatherstrips

General: Polypropylene or equivalent pile and backing, low friction silicone treated, ultraviolet stabilised, fixed to the door or frame to the manufacturer's recommendations.

Standard: To AAMA 701/702 (2023).

Rebated doors

General: For mortice locks or latches to rebated doors, provide purpose-made rebated pattern items.

Strike plates

General: Use strike plates supplied with the locks or latches. Do not provide universal strike plates.

Weather bars

General: Provide corrosion-resistant weather bars or threshold plates under hinged external doors, located under the centres of closed doors or to manufacturer's recommendations.

2.5 DOOR CONTROLLERS

Standard

General: To AS 4145.5 (2011).

Performance

Requirement: Provide door controllers, pivots, floor or overhead door closers, suitable for the door type, size, weight, sliding action and swings required and the operating conditions, including wind and air conditioning pressure.

2.6 KEYING

Keying requirements

Standard: To AS 4145.1 (2008) for keying security.

Requirement: Obtain approval for keying from the Superintendent.

Temporary construction keys and cylinders

Requirement: Provide one of the following:

- Loan cylinder: Install for construction locks and replace at practical completion.
- Construction keyed master key cylinder: Keep up-to-date records of keys issued including recipient's name, company and contact details, date issued and date returned.

Delivery of keys

Great grandmaster, grandmaster and master keys: Arrange for delivery direct to the Principal.

For locks keyed to differ and locks keyed alike: Check the quantity against key records, and deliver keys to the Superintendent at practical completion.

Group keying

Existing system extension: Obtain the details of existing group or master key systems of the system to be extended.

Future extensions: Provide master and grandmaster group keying systems capable of accommodating future extensions.

Proprietary keying control security system: Provide for cylinder or pin-tumbler locks that accept a group key (e.g. master key, maison key).

Stamping: Stamp keys and lock cylinders to show the key codes and/or door number as scheduled.

Identification

Labelling: Supply each key with a purpose-made plastic or stamped metal label legibly marked to identify the key, attached to the key by a metal ring.

Key material

Lever locks: Malleable cast iron or mild steel.

Pin tumbler locks: Nickel alloy, not brass.

Number of keys

Requirement: Supply a minimum of four keys for each lock type.

3 EXECUTION

3.1 INSTALLATION

General

Handing: Before supply, verify on site, the correct handing of hardware items.

Operation: Make sure working parts are accurately fitted to smooth close bearings, without binding or sticking, free from rattle or excessive play, lubricated where appropriate.

Mounting height

Locks and latches: Centreline of the door knob or lever spindle above finished floor: 900mm to 1100mm, unless detailed otherwise.

Locks

Cylinders: Fix vertically and with consistent key alignment.

Door stops

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

Fasteners

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

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

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

Support:

- Hardware fasteners: Provide appropriate back support, such as lock stiles, blocking, wall noggings and backing plates.
- Hollow metal sections: Provide backing plates drilled and tapped for screw fixing, or provide rivet nuts with machine thread screws. Do not use self-tapping screws or pop rivets.

Floor springs

General: Form a recess in the floor slab for the floor spring box, securely fix and grout the box in place so that the cover plate is flush with the finished floor.

Hinges

Metal frames: Fix hinges using metal thread screws. Do not weld hinges to frames.

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

3.2 COMPLETION

Adjustment

General: Leave the hardware properly adjusted with working parts in working order, and clean, undamaged, properly adjusted, and lubricated where appropriate.

Opening force performance: To AS 1428.1 (2021).

Keys

Contractor's keys: Immediately before practical completion, replace or reset cylinders to which the contractor has had key access during construction to exclude the contractor's keys.

Operation and maintenance manuals

Requirement: Prepare a manual that includes the manufacturer's published recommendations for use, care and maintenance of the hardware provided.

0461 GLAZING

1 GENERAL**1.1 RESPONSIBILITIES****General**

Requirement: Provide glazing, as documented.

Performance

Thermal qualities: U-Value and Solar heat gain coefficient (SHGC) as documented.

1.2 CROSS REFERENCES**General**

Requirement: Conform to the following:

- 0171 *General requirements.*
- 0181 *Adhesives, sealants and fasteners.*

1.3 STANDARDS**Glazing**

Glass type and thickness: To AS 1288 (2021), if no glass type or thickness is nominated.

Materials and installation: To AS 1288 (2021).

Quality requirements for cut-to-size and processed glass: To AS/NZS 4667 (2000).

1.4 INTERPRETATION**Definitions**

General: For the purpose of this worksection the definitions given in AS/NZS 4668 (2000) apply.

1.5 SUBMISSIONS**Certification**

Design: Submit an engineers' certificate confirming conformance to AS 1288 (2021).

Opacified glass: Submit a report, from the manufacturer certifying that the proposed method of opacifying the glass will not be detrimental to the glass or affect the glass product warranty.

Toughened glass: For each batch of glass, submit certification from the manufacturer of heat soaking.

Installation: Submit certification from the fabricator that the method of glazing, the selection of sealant systems and conditions next to the glass conform to the following:

- Compatible with the edge seal of insulating glass units (IGUs) and self-cleaning glass.
- Will not be detrimental to the long term structural performance, weathering capabilities and visual qualities of the glass.

Glazier's data: Submit the glazing subcontractor's statement certifying the following:

- A satisfactory thermal safety assessment.
- The assembled frame provides the required glazing clearances and tolerances, and maximum and minimum joint configurations, based on the bow, warp and kink characteristics of the required glass types, and is ready for glazing.

Execution details

Site glazing: If site glazing is intended, submit proposals.

Operation and maintenance manuals

Requirement: Submit manual to **COMPLETION**, **Operation and maintenance manuals**.

Products and materials

Safety glazing materials: Submit evidence of conformity to AS 2208 (2023).

Samples

General: Submit samples of glazing materials, each at least 300 x 300 mm, showing the visual properties and range of variation, if any, for all types of glass.

Shop drawings

Requirement: Submit shop drawings showing the following:

- Glazing configuration.
- Method of glazing.
- Rebate depth.
- Edge restraint.
- Clearances and tolerances.
- Glazing gaskets and sealant beads.
- Edge treatment for glazing with exposed edges.

Subcontractors

General: Submit names and contact details of proposed suppliers and installers.

Warranties

Glazing subcontractor's warranty: Provide an undertaking conditional only on compliance with the manufacturers' recommendations for maintenance, to repair or replace glass and glazing materials that become defective or prove unsuitable for the nominated application; during the warranty period.

Glass manufacturer's warranty: Provide an undertaking, conditional only on compliance with the manufacturer's recommendation for installation and maintenance, to supply replacement glass units to the site for replacement of defective units defined as follows:

- IGU units: Units in which the hermetic seal has failed as evidenced by intrusion of foreign matter, or internal condensation at temperature above 2°C.
- Coated glass units (including coated super insulating glass units): Units in which the metallic coating shows evidence of manufacturing defects, including but not necessarily limited to cracking or peeling, as determined in conformance with ASTM C1048 (2018).

Toughened glass warranty: Provide a manufacturer's warranty certifying that toughened glass has been subjected to a heat soaking process that has converted at least 95% of the nickel sulfide content to the stable beta-phase.

1.6 INSPECTION**Notice**

Inspection: Give notice so that inspection may be made of the following:

- Glazing products before they are installed.

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

Storage: Store glass and glazing materials in a clean, dry area and unaffected by weather, to the manufacturer's recommendations. Protect from building materials and loose debris such as wet plaster, paint and welding splatter.

Handling: Handle glass to the manufacturer's recommendations and as follows:

- Stack upright, off the ground and against a flat, vertical surface.
- Carry in the vertical position.

2.2 GLAZING**Performance**

Glass: Free from defects which detract from appearance or interfere with performance under normal conditions of use.

Heat soaking

Requirement: Heat soak glass to AS 1288 (2021) clause 3.8.

Standard: To EN 14179-1 (2016).

Marking: To EN 14179-1 (2016) or certified by the manufacturer to AS 1288 (2021) clause 3.8.2.

Safety glazing materials

Standard: To AS 2208 (2023).

Type: Grade A to AS 1288 (2021).

Marking: To AS 1288 (2021) clause 5.23.

Heat strengthened glass

Requirement: Heat strengthened annealed glass that requires extra strength and thermal resistance.

Standard: To ASTM C1048 (2018).

Laminated glass

Laminated glass shall be Grade A in accordance with AS 2208 (2023).

Laminated glass shall consist of a number of sheets of flat glass with a suitable interlayer between each glass sheet. The layers can be clear, translucent or coloured depending on the design intentions of the glazing. The glass may be annealed, heat strengthened, or heat soaked toughened, as required to meet the performance requirements of the Specification.

Final selection of glass type and thickness of each layer, together with type, opacity, density and location of interlayer and coatings shall be accepted prior to commencement of work.

The bottom supported edges of laminated glass panes shall be cut flush over the width of the pane to provide even distribution of vertical load to the setting blocks.

Toughened glass

Glass shall conform to the following requirements in the horizontal toughening process:

- Maximum overall bow: 0.003mm per millimetre measured along the glass edge.
- Maximum local bow: The maximum deviation for flatness from peak to trough not to exceed 0.3mm per 300mm or 0.15mm at the edge or 0.08mm in the middle.
- Rollerwave: Glass shall be sized to provide for consistent and horizontal alignment of ripples. Provide proposals describing how the extent of rollerwave will be controlled. Provide full-sized samples of all types of heat treated glass to demonstrate the range of rollerwave anticipated, prior to commencing glass production.
- Edge dip: 0.25mm maximum.

Ceramic-coated glass

Requirement: Heat strengthened or toughened glass with a coloured ceramic coating fused to and made an integral part of the surface to ASTM C1048 (2018), Condition B.

Opacified glass

Requirement: Glass with an opacifier permanently bonded to the inner face.

Unacceptable blemishes in heat-treated flat glass (including tinted and coated glass)

Standard: To AS/NZS 4667 (2000).

Insulating glass units (IGUs)

Manufacture, testing and installation: To AS 4666 (2012).

Low iron glass

Requirement: Unless nominated otherwise, low iron glass shall be used for all applications where edges of glass will be exposed in the finished work.

Mirrors

Type: Silver layer deposited on the glass.

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

Mirrors shall be as nominated in the Finishes Schedule.

Solid backed mirrors

Backing: 9 mm waterproof plywood.

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

2.3 GLAZING MATERIALS

General

Glazing materials: Provide putty, glazing compounds, sealants, gaskets, glazing tapes, spacing strips, spacing tapes, spacers, setting blocks and compression wedges appropriate for the conditions of application and the required performance.

Jointing materials

Requirement: Provide recommended jointing and pointing materials which are compatible with each other and with the contact surfaces and non-staining to finished surfaces. Do not provide bituminous materials on absorbent surfaces.

Elastomeric sealants

Sealing compounds (polyurethane, polysulfide, acrylic): To ASTM C920 (2018) or ISO 11600 (2002).

Sealing compounds (silicone): To ASTM C920 (2018) or ISO 11600 (2002).

Sealing compounds (butyl): To ASTM C1311 (2022).

Primer

Compatibility: Apply the manufacturer's recommended primer to the surfaces in contact with sealant materials.

Control joints

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

Foamed materials (in compressible fillers and backing rods): Closed-cell or impregnated types which do not absorb water.

Bond breaking: Provide backing rods, and other back-up materials for sealants, which do not adhere to the sealant.

2.4 ANCILLARY COMPONENTS AND FITTINGS**Extruded gaskets and seals**

Materials: Non-cellular (solid) elastomeric seals as follows:

- Rubber products: Neoprene, ethylene propylene diene monomer (EPDM) or silicone rubber.
- Flexible polyvinyl chloride (PVC): E type compounds, colourfastness grade B.

Pile weather strips

Standard: To AAMA 701/702 (2023).

Material: Polypropylene or equivalent pile and backing, low friction silicone treated, ultraviolet stabilised.

Finned type: A pile weather seal with a central polypropylene fin bonded into the centre of the backing rod and raised above the pile level.

3 EXECUTION

3.1 GLASS PROCESSING**General**

Processing: Perform required processes on glazing, including cutting, obscuring, silvering and bending. Form necessary holes, including for fixings, equipment, access openings, etc. Process exposed glass edges to a finish not inferior to ground arised.

3.2 INSTALLATION**Glazing**

General: Install the glass as follows:

- Permanently fix in place each piece of glass to withstand the normal loadings and ambient conditions at its location without distortion or damage to glazing materials.
- No transfer of building movements to the glazing.
- Watertight and airtight for external glazing.

Temporary marking: Use a method that does not damage the glazing. Remove marking only after certification and acceptance of the installation.

Toughened glass: Do not cut, work, or permanently mark after toughening. Use installation methods that prevent the glass making direct contact with metals or other non-resilient materials.

Heat-absorbing glass: In locations exposed to direct sunlight, provide wheel cut edges free from damage or blemishes, with minimum feather.

Preglazing

Glazed assemblies: Supply inclusive of glazing, shop preglazed.

3.3 FIXING MIRRORS

General

Adhesive fixing: Clean surfaces to be bonded. Apply non-acidic silicone adhesive to the manufacturer's recommendations. Secure the rear of the mirror to the substrate with double sided adhesive tape until the adhesive cures.

3.4 COMPLETION

Replacement

Requirement: After replacing damaged glass, leave the work clean, polished, free from defects, and in good condition.

Cleaning

Method: Clean with soft clean cloths and clean water, finishing with a clean squeegee. Do not use abrasive, acidic or alkaline materials.

Extent: All frames and glass surfaces internally and externally.

Operation and maintenance manuals

Requirement: Prepare a manual that includes the manufacturers' published recommendations for in-service use.

0471 INSULATION AND PLIABLE MEMBRANES

1 GENERAL**1.1 RESPONSIBILITIES****General**

Requirement: Provide insulation and pliable membrane systems, as documented.

Performance

Requirements:

- Complete for their function.
- Conforming to the detail and location drawings.
- Firmly fixed in position.

1.2 CROSS REFERENCES**General**

Requirement: Conform to the following:

- 0171 *General requirements*.
- 0181 *Adhesives, sealants and fasteners*.

1.3 INTERPRETATION**Definitions**

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

- Batts: Flexible insulation supplied as factory cut pieces and composed of mineral fibre (glass and rock fibre) or polyester fibre.
- Bio-soluble: A product that dissolves in bodily fluids and is quickly cleared from the lungs.
- Blankets: Flexible insulation supplied as factory cut rolls and composed of mineral fibre (glass and rock fibre) or polyester fibre, and may be combined with reflective facings.
- Fire hazard properties: Terminology to BCA Schedule 1.
- Pliable building membrane: To AS 4200.1 (2017) and equivalent to sarking-type materials as defined in the BCA.
- Thermal insulation terminology: To AS/NZS 4859.1 (2018).
- Vapour permeable (breathable) membrane: A flexible membrane material, normally used for secondary waterproofing that allows for the transmission of water vapour.

1.4 SUBMISSIONS**Fire performance**

Fire hazard properties: Submit evidence of conformity to PRODUCTS, **FIRE PERFORMANCE**, **Fire hazard properties**.

Products and materials

Thermal insulation properties: Submit evidence of conformity to AS/NZS 4859.1 (2018) and AS/NZS 4859.2 (2018).

Samples

General: Submit representative samples of each type of insulation.

Warranties

Requirement: Submit warranties in accordance with the requirements of 0171 *General requirements*.

- Period: As offered by the manufacturer.

1.5 INSPECTION**Notice**

Inspection: Give notice so that inspection may be made of the installed pliable membrane and insulation before covering up or concealing.

2 PRODUCTS

2.1 GENERAL

Marking

Identification: Marked to show the following:

- Manufacturer's identification.
- Product brand name.
- Product type.
- Quantity.
- Product reference code and batch number.
- Date of manufacture.
- Material composition and characteristics such as volatility, flash point, light fastness, colour and pattern.

Storage and handling

Labelling: Deliver mineral fibre products to site in packaging with third party mark of conformity indicating product is bio-soluble and not listed as hazardous material in the Safe Work Australia Hazardous Chemical Information System (HCIS).

2.2 FIRE PERFORMANCE

Fire hazard properties

Insulation materials: Tested to AS/NZS 1530.3 (1999). Fire hazard indices as follows:

- Spread-of-Flame Index: ≤ 9 .
- Smoke-Developed Index: ≤ 8 if Spread-of-Flame Index > 5 .
- Materials with reflective facing: Tested to AS/NZS 1530.3 (1999) and the recommendations of Appendix A6.

Pliable membranes: Flammability Index tested to AS 1530.2 (1993): ≤ 5 .

Insulation materials shall be non-combustible in accordance with AS 1530.1 (1994), where required by the BCA.

2.3 INSULATION AND PLIABLE MEMBRANES

General

Mineral fibre insulation: Bio-soluble and not listed as a hazardous material in the Safe Work Australia Hazardous Chemical Information System (HCIS).

Insulation

Standard: Thermal insulation materials to AS/NZS 4859.1 (2018):

- Polyester (compressible): To AS/NZS 4859.1 (2018) Section 6.
- Mineral wool blankets and cut pieces (compressible): To AS/NZS 4859.1 (2018) Section 7.
- IR reflective (formed shapes and compressible with one or more external IR reflective surfaces): To AS/NZS 4859.1 (2018) Section 9.

Pliable membranes

Standard: To AS 4200.1 (2017).

Vapour barrier:

- Vapour control classification: Class 1.

Sarking membrane (other than walls):

- Water control classification: Water barrier.

Vapour permeable (breathable) membrane: Minimum class 4.

Fasteners and supports

General: Metallic-coated steel.

Mesh support to roof insulation

Welded safety mesh: To AS/NZS 4389 (2015).

3 EXECUTION

3.1 GENERAL

Bulk insulation

Requirement: To AS 3999 (2015) and BCA J4D3.

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

- Access openings and vents: Do not obstruct.
- Light fittings: To AS/NZS 3000 (2018) clause 4.5.
- Electrical cables: To AS 3999 (2015) clause 2.6.

Glass wool and rock wool insulation: Conform to the ICANZ Industry code of practice for the safe use of glass wool and rock wool insulation (2003).

Pliable membranes

Installation: To AS 4200.2 (2017) and BCA J4D3.

3.2 WALL INSULATION

Framed walls – thermal break strips

Product: TBA Firefly Vulcan R0.2 Thermal Break or acceptable equivalent.

Application: To steel framing with lightweight external cladding.

R-Value: ≥ 0.2 .

Fixing: In accordance with the manufacturer's recommendations.

Framed walls – bulk insulation

Product type: Fibre batts.

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

Vapour permeable (breathable) membrane

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

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

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

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

End or vertical overlaps: At least 150 mm wide made over framing.

Openings: Run the vapour permeable membrane over the openings and leave covered until windows and doors are installed. Cut the membrane on a 45° diagonal from each corner of the opening, fold the flaps inside and fix to the inside frame of the opening. If the membrane is used to provide a continuous air tight layer, seal all joints with pressure sensitive adhesive tape.

Fixing: Install as follows:

- Timber frames: Metallic-coated clouts, 20 mm long 6 to 8 mm staples or punched multi-point metallic-coated steel brads.
- Metal frames: Hex head screws, with either 20 mm diameter washers or through hardboard strips.

3.3 ROOF INSULATION

General

Location: The whole of the roof area.

Mesh support to roof insulation

Locations: Provide support to the following:

- Sarking, vapour barrier or reflective thermal insulation membranes laid over roof framing members which are spaced at more than 900 mm centres.
- Blanket type thermal insulation laid over roof framing members.

Welded safety mesh: Lay over the roof framing and pull taut. Dishing will not be acceptable. Staple to timber frame, wire to steel frame.

Installing welded safety mesh: To AS/NZS 4389 (2015).

Pliable membranes

Vapour barrier:

- Installation: Lay over the roof framing. Overlap all edges 150 mm and seal all joints with pressure sensitive adhesive tape.

Metal roofs – bulk insulation

Product: Fibre blankets.

Installation:

- Insulation blanket: Install over the roof framing, reflective thermal insulation (if any), and mesh support, so that the blanket is in continuous contact with the underside of the metal roofing sheets.
- Combined blanket and reflective insulation: Lay facing reflective insulation face downwards over safety mesh.

Provide spacers along the roof purlins to ensure that the insulation recovers to its nominal thickness. Spacer size shall be selected to suit the insulation thickness.

3.4 CEILING INSULATION

Ceiling insulation – bulk insulation

Product type: Fibre batts or blankets.

Application: Over ceiling lining.

Installation: Butt joint and lay over ceiling lining.

4 SELECTIONS

4.1 INSULATION AND PLIABLE MEMBRANES GENERALLY

Thermal and acoustic insulation and pliable membrane products, including thicknesses, R-values, densities and locations, shall be as nominated in the Finishes Schedule.

4.2 PIPE INSULATION

Location: To downpipes and waste pipes, where contained within framed walls and ceilings, adjacent to habitable rooms.

Acoustic insulation system comprising a polymer barrier adhered to a convoluted acoustic foam with an outer layer of foil.

Product: Fletcher Insulation Soundlag 4525C or acceptable equivalent.

Thickness: 25mm.

0522 PARTITIONS – FRAMED AND LINED

1 GENERAL**1.1 RESPONSIBILITIES****General**

Requirement: Provide internal framed and lined partition systems, as documented.

Performance

Strength and stability: To remain stable, and without rattle and signs of deflection or permanent deformation under normal conditions of use, including the slamming of doors.

Serviceability: To support imposed dead loads, seismic loads, wind loads, including designated eccentric loads and not to deflect in excess of the following, where H is the height of the partition:

- The lesser of H/240 or 30 mm for partitions subjected to wind loads and lined with flexible material.
- The lesser of H/360 or 20 mm for partitions subjected to wind loads and lined with brittle materials.
- H/500 for eccentric loads.

1.2 CROSS REFERENCES**General**

Requirement: Conform to the following:

- 0171 *General requirements.*
- 0181 *Adhesives, sealants and fasteners.*
- 0183 *Metals and prefinishes.*
- 0342 *Light steel framing.*
- 0382 *Light timber framing.*
- 0471 *Insulation and pliable membranes.*
- 0531 *Suspended ceilings – combined.*
- 0671 *Painting.*

1.3 TOLERANCES**Framed and lined partitions**

Finished framing: To AS/NZS 2589 (2017) clause 4.2.2.

1.4 SUBMISSIONS**Certification**

Installed partitions: Submit a certificate from an independent testing authority as evidence that the partition systems conform to the documented weighted sound reduction index (R_w).

Fire performance

Fire hazard properties: Submit evidence of conformity to PRODUCTS, **FIRE PERFORMANCE**, **Fire hazard properties**.

Products and materials

Manufacturer's data: Submit manufacturer's standard product literature for each partition type.

Type tests: Submit results as follows:

- Impact resistance.
- Pressure resistance.
- Surface indentation resistance.
- Weighted sound reduction index (R_w): To AS/NZS ISO 717.1 (2004).

Samples

General: Submit samples as follows:

- 500mm x 500mm sample of all wall lining types.
- 500mm length of all metal framing components.

- 300mm length of all trims.
- One access panel.
- All fixing types.

Subcontractors

General: Submit the names and contact details of proposed suppliers and installers.

Warranties

Requirement: Submit warranties in accordance with the requirements of *0171 General requirements*.

- Period: All partition systems shall remain structurally sound, without visible deformation, for 10 years.

1.5 INSPECTION

Notice

Inspection: Give notice so that inspection may be made of the following:

- Set-out before installation.
- Partition framing before installation of specified insulation, linings and finishes.
- Framed and lined partitions ready to receive framed and glazed components.

2 PRODUCTS

2.1 FIRE PERFORMANCE

Fire hazard properties

Group number: To AS 5637.1 (2015).

2.2 TESTING

General

Impact resistance, lightweight partitions: To withstand impact without permanent deformation, damage, failure of fastenings.

- Test method: To ASTM E695 (2003).

Pressure resistance: To withstand a uniformly distributed load normal to the plane of the partition without permanent deformation or damage or excessive deflection.

- Test method: To ASTM E72 (2015).

Weighted sound reduction index (R_w): To AS/NZS ISO 717.1 (2004).

2.3 PARTITION SYSTEMS

General

General: Partition systems shall be as detailed in the Wall and Partition Types Drawings.

2.4 FRAMING

Light steel framing

General: Proprietary framing system of metallic-coated folded steel strip lipped studs and channel section top and bottom tracks and noggings.

Sections and members: To AS/NZS 4600 (2018).

Timber framing

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

Timber species: Radiata pine.

Seasoning: Required.

Stress grade: F5 to AS/NZS 1748.1 (2011).

2.5 LINING

Plasterboard

Standard: To AS/NZS 2588 (2018).

Plasterboard wall linings shall be as nominated in the Wall and Partition Types Drawings.

Thickness: As nominated in the Wall and Partition Types Drawings.

Accessories

General: Provide accessories necessary to complete the installation including the following:

- Corner beads.
- Stop beads.
- Shadowlines.
- Control joints.

Adhesives

General: Provide adhesives of types appropriate to their purpose and substrates, applied to transmit the loads imposed without causing discolouration of finished surfaces.

Sealants

General: Provide sealants of types appropriate to their purpose for acoustic ratings, and compatible with partition materials and building substrate.

2.6 SKIRTINGS**Aluminium skirtings**

Aluminium skirtings shall be as nominated in the Finishes Schedule.

Finish: As scheduled.

Joints: Internal angles: Scribed.

External angles: Grooved on the back and folded.

Running joints: Butted.

Adhesive fix skirtings using a suitable contact adhesive. Immediately remove any excess adhesive on the face of the skirtings, wall face or floor finish.

2.7 WALL ACCESS PANELS**General**

Product: Trafalgar APM-KC-600-WW flush wall access panels, 600mm x 600mm, with key cam lock and concealed metal frame, or acceptable equivalent.

Performance: As required to match the surrounding wall.

Wall access panels shall have a finish to match the associated wall, unless detailed otherwise.

Location: As necessary to provide access to in-wall services.

Ensure all access panels are free from obstructions that could damage the panel during removal and replacement.

Identification

General: Provide each access panel with an identification mark.

Reinforcement

General: Reinforce the back of the access panel to prevent warping and facilitate handling.

3 EXECUTION**3.1 PREPARATION****Substrate**

General: Prepare the substrate to receive the partitions.

Protection

General: Protect existing work from damage during the installation and rectify any damage. Provide temporary coverings if required.

3.2 INSTALLATION**Partition erection**

General: Install partitions plumb, level, on their correct alignment, and firmly fixed.

Building movements:

- Provide clearances or deflection heads so that partitions are not damaged by structural building movements including long term slab deflection.

- If acoustic properties are required, provide a resilient foam or mastic seal having properties equal to those required for the partition.

Suspended slabs: Provide deflection heads.

Structural floor control joints

General: Do not run or fix partitions framing across control joints.

Acoustic rated partitions

General: Isolate the frames from floors, ceilings and vertical abutments with beads of non-hardening sealant compatible with the materials to be sealed.

Trim

General: Provide trim such as beads, mouldings, stops and skirtings to make neat junctions between lining components, finishes and adjacent surfaces.

Sealing acoustic rated partitions

General: Apply sealant to the manufacturer's recommendations and as follows:

- Around services pipes and penetrations.
- Electrical outlets and recessed lights: Line back and sides of fixture with plasterboard and seal around fixture junction with sealant.
- Around perimeter of lining panels: Provide continuous runs of sealant.

3.3 LIGHT STEEL FRAMES

Tracks

General: Conform to the following:

- Fix bottom tracks to floor substrate.
- Fix top wall tracks to suspended ceiling grid or as documented.
- Fix deflection head tracks to the structural soffit above.

Fixing to metal deck roofs: Provide for vertical uplift movement, as documented.

Fixing to suspended ceilings: Provide intermediate support and bracing at maximum 1500 mm centres and at all load concentrations, doorways and jamb studs.

Seismic movement: If required, do not butt wall tracks or deflection heads against each other. Provide 10 mm clearance between tracks, or as documented.

Track fixing: Fix top and bottom tracks at 600 mm maximum centres generally, and 100 mm from ends. Splice plates at ends to maintain continuity and alignment.

Stud framing

General: Provide studs in single lengths without splices. Rotate intermediate studs into tracks for friction fixing. Screw fix jamb studs, corner studs and wall intersection studs to tracks.

Fixing: Fix noggings at 1350 mm maximum centres vertically and as required for skirtings and wet area lining. Make sure that faces of noggings and studs are accurately aligned.

Lintels: Install a stiffened top plate lintel for spans of 1800 mm or greater.

Jambs

General: Install boxed double studs at jambs and heads to all openings.

Additional frame support

General: Provide frame support for fixing the following:

- Floor and wall mounted fixed joinery units, furniture and equipment.
- All wet area fittings and fixtures.
- All grab rails and handrails.
- Window covering rails and brackets.

Timber nogging: Provide 240 x 40 mm timber nogging with proprietary stud fixing brackets for wall hung sanitary fittings.

Stud stiffening: Provide stud stiffening to support wall hung joinery units and equipment with:

- Full height close fitting timber inserts.
- Boxed steel lipped studs.

Stud service holes

General: Use factory pre-cut flared holes, or provide site cut holes punched or drilled on the centreline of the member and fit proprietary plastic bushes or grommets. Splice additional stiffening to studs if site cut service holes exceed 1/3 the depth of the member.

Metal separation

General: Isolate non-ferrous service pipes and accessories from the metal framing.

Earthing

Permanent earthing: Required.

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

Cavity walls

General: If bridging is nominated, follow the manufacturer's recommendations.

Staggered stud framed walls

General: Provide studs staggered at 300 mm centres set in oversized top and bottom plates so that each face has stud fixings at 600 mm centres.

3.4 TIMBER FRAMES**Moisture content**

General: Do not install framing that does not meet the following values tested to AS/NZS 1080.1 (2012):

- Air conditioned buildings: 8 to 10%.
- Intermittently heated buildings: 10 to 12.5%.
- Unheated buildings: 12 to 15%.

Framing

General: Construct wall frames to AS 1684.4 (2010) Section 6 as appropriate for internal walls.

Double faced walls: Provide gauged timbers in studs, noggings and plates.

3.5 PLASTERBOARD LINING**Installation**

Gypsum plasterboard lining: To AS/NZS 2589 (2017).

Finish level: Flush plasterboard walls shall generally achieve a level 4 finish in accordance with AS/NZS 2589 (2017). Where walls are subjected to glancing light conditions and/ or finished with dark or glossy paints, a level 5 finish shall be achieved.

Multiple sheet layers

Joints:

- Fill and flush up all joints and fixings in each layer and caulk up perimeters and penetrations before installing following layers.
- Stagger all sheet joints: Minimum 200 mm.

Joints and joint treatment

General: Install joint accessories as documented, in conformance with manufacturer's recommendations. Install plumb, level and true to line.

Flush joints: Provide recessed edge sheets and finish flush, using joint reinforcing tape bedded in joint compound.

Butt joints: Make joints over framing members or otherwise provide back blocking.

External corner joints: Provide purpose fabricated perforated metallic-coated steel corner beads, bedded in joint compound.

Sheet metal partition end caps: Provide purpose fabricated perforated metallic-coated steel end caps, sized for partition thickness and bedded in joint compound.

MDF end caps: Provide recessed edge sheets and finish flush using joint reinforcing tape and joint compound.

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

Control joints: Provide purpose-made metallic-coated control joint beads at maximum centres in accordance with the lining manufacturer's recommendations and to coincide with structural control joints. Bed in joint compound.

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

3.6 COMPLETION

Rectification

General: Correct any defects to joints, remove any excess joint compound, and leave the partition installation complete, clean and ready for the application of finishes.

0524 PARTITIONS – GLAZED

1 GENERAL**1.1 RESPONSIBILITIES****General**

Requirement: Provide glazed partitions, as documented.

Performance

Strength and stability: To remain stable, and without rattle and signs of deflection or permanent deformation under normal conditions of use, including the slamming of doors.

Serviceability: To support imposed dead loads, seismic loads, wind loads, including designated eccentric loads and not to deflect in excess of the following, where H is the height of the partition:

- The lesser of H/240 or 30 mm for partitions subjected to wind loads and lined with flexible material.
- The lesser of H/360 or 20 mm for partitions subjected to wind loads and lined with brittle materials.
- H/500 for eccentric loads.

1.2 CROSS REFERENCES**General**

Requirement: Conform to the following:

- 0171 *General requirements.*
- 0181 *Adhesives, sealants and fasteners.*
- 0183 *Metals and prefinishes.*
- 0455 *Door hardware.*
- 0461 *Glazing.*

1.3 STANDARDS**General**

Selection and installation: To AS 2047 (2014).

Glazing

Glass type and thickness: To AS 1288 (2021), if no glass type or thickness is nominated.

Materials and installation: To AS 1288 (2021).

Quality requirements for cut-to-size and processed glass: To AS/NZS 4667 (2000).

Terminology for work on glass: To AS/NZS 4668 (2000).

1.4 INTERPRETATION**Definitions**

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

- Partition - glazed: A partition system consisting of a suite of exposed sections forming door and window frames, ceiling channels, sills, glazing and accessories; and generally intended for use in conjunction with framed and lined partition systems.

1.5 SUBMISSIONS**Certification**

Installed partitions: Submit a certificate from an independent testing authority as evidence that the partition system installed conforms to the documented weighted sound reduction index (R_w).

Toughened glass: For each batch of glass, submit certification from the manufacturer as evidence of heat soaking.

Operation and maintenance manuals

Requirement: Submit manual to **COMPLETION**, **Operation and maintenance manuals**.

Products and materials

Manufacturer's data: Submit manufacturer's standard product literature for each partition type.

Safety glazing materials: Submit evidence of conformity to AS 2208 (2023).

Type tests: Submit results as follows:

- Impact resistance.
- Pressure resistance.
- Surface indentation resistance.
- Weighted sound reduction index (R_w): To AS/NZS ISO 717.1 (2004).

Samples

Glazing materials: Submit samples of glazing materials, each at least 300mm x 300mm, showing specified visual properties and the range of variation, if any, for each type of glass.

Visual indicators: Examples of the proposed visual indicator strips on glazing.

Glazing framing systems: Submit samples of the following:

- Prefinished sections of framing showing the limits of the range of variation in the selected finish, at least 300mm long.
- Joints made by proposed techniques.
- Skirting, skirting duct, and skirting duct stop ends, returns and removable covers, at least 300mm long.

Shop drawings

General: Submit shop drawings to a scale that best describes the detail, showing the following:

- Plans, sections and elevations of the installation.
- Full size sections of members and details of partition intersections and terminations.
- Dimensions, clearances, tolerances, and provision for expansion.
- Junctions and trim to adjoining surfaces.
- Doors and frames, including door seals and door stops coordinated with documented door thicknesses.
- Coordination with documented door hardware.
- Glass types, thicknesses and glazing methods.
- Details of safety markings that make glass visible.
- Glass processing required for fixing hardware to frameless glass doors.
- Methods of fixing partitions.
- Details of acoustic treatments to joints.
- Method of providing reticulation of services, access to services, and service outlets.
- Performance data of components and assemblies.
- Specification of materials and finishes.

Subcontractors

General: Submit names and contact details of proposed manufacturers and installers.

Warranties

Requirement: Submit warranties in accordance with the requirements of *0171 General requirements*.

- Period: 5 years.

1.6 INSPECTION

Notice

Inspection: Give notice so that inspection may be made of the following:

- Set-out before installation.
- Openings prepared to receive glazed partitions.
- Framed and lined partitions ready to receive the framed and glazed component.

2 PRODUCTS

2.1 GENERAL

Storage and handling

Glass and glazing materials: Store in a clean, dry area, unaffected by weather and to the manufacturer's recommendations. Protect from building materials and loose debris such as wet plaster, paint and welding spatter.

Handling glass: To the manufacturer's recommendations and without damage.

2.2 TESTING

General

Impact resistance, glazed partitions: To withstand impact without permanent deformation, damage, failure of fastenings.

- Test method, flat glass: To AS 2208 (2023) Appendix D.

Pressure resistance: To withstand a uniformly distributed load normal to the plane of the partition without permanent deformation or damage or excessive deflection.

- Test method: To ASTM E72 (2015).

Weighted sound reduction index (R_w): To AS/NZS ISO 717.1 (2004).

2.3 GLAZED PARTITIONS

General

Requirement: Proprietary non-load bearing glazed partition suite comprising main frames, door frames, sills, ceiling channels and other extrusions and accessories to form a complete and finished system.

Aluminium frames

Standard: To AS 2047 (2014) clause 3.1.

Aluminium extrusions: To AS/NZS 1866 (1997).

Construction: Assembled from aluminium sections, including accessories such as pile strips, fixing ties or brackets and cavity flashings, with provision for fixing documented hardware and seals.

Subsill: If the frame includes a subsill, provide a self-draining section.

Sealants

General: Provide sealants of types appropriate to the purpose for acoustic ratings and compatible with partition materials and building substrate.

2.4 GLASS

Performance

Glass: Free from defects that detract from appearance or interfere with performance under normal conditions of use.

Heat soaking

Requirement: Heat soak glass to AS 1288 (2021) clause 3.8.

Standard: To EN 14179-1 (2016).

Marking: To EN 14179-1 (2016) or certified by the manufacturer to AS 1288 (2021) clause 3.8.2.

Safety glazing materials

Standard: To AS 2208 (2023).

Type: Grade A to AS 1288 (2021).

Marking: To AS 1288 (2021) clause 5.23.

Unacceptable blemishes in heat-treated flat glass (including tinted and coated glass)

Standard: To AS/NZS 4667 (2000).

Ceramic-coated glass

Description: Heat strengthened or toughened glass with a coloured ceramic coating fused to and made an integral part of the surface to ASTM C1048 (2018), Condition B.

2.5 GLAZING MATERIALS

General

Requirement: Glazing materials (including putty, glazing compounds, sealants, gaskets, glazing tapes, spacing strips, spacing tapes, spacers, setting blocks, shims and compression wedges) appropriate for the conditions of application and the required performance.

Glazing tapes

Standards: To AAMA 800 (2016), Products coded 804.3, 806.3 or 807.3, as applicable.

Jointing materials

General: Jointing and pointing materials which are compatible with each other and with the contact surfaces and non-staining to finished surfaces. Do not provide bituminous materials on absorbent surfaces.

Primer

Compatibility: Apply the manufacturer's recommended primer to the surfaces in contact with sealant materials.

Extruded gaskets and seals

Materials: Non cellular (solid) elastopressive seals as follows:

- Rubber products: Neoprene, ethylene propylene diene monomer (EPDM) or silicone rubber.
- Flexible polyvinyl chloride (PVC): E type compounds, colourfastness grade B.

2.6 VISUAL INDICATORS ON GLAZING

General

Any glazing capable of being mistaken for a doorway or opening, where there is no chair rail, handrail or transom, shall be clearly marked with a contrasting line that complies with AS 1428.1 (2021).

2.7 ALUMINIUM FRAME FINISHES

Powder coatings

Standard: To AS 3715 (2002).

Anodised

Standard: To AS 1231 (2000).

Thickness: ≥ 15 microns to 20 microns.

3 EXECUTION

3.1 GENERAL

Preparation

Substrate: Prepare the substrate to receive the partitions.

Protection

General: Protect existing work from damage during the installation and rectify any damage. Provide temporary coverings if required.

3.2 INSTALLATION

General

Requirement: Conform to manufacturer's recommendations and assembly details.

Frame erection

Frames: Install main frames, sills, ceiling channels, door and window frames and other framing members as follows:

- Plumb, level, square, straight and true.
- Fixed or anchored to the building structure.
- Isolated from any building loads, including loads caused by structural deflection or shortening.
- Joints tightly fitted and neatly aligned.
- Door and window openings accurately sized.
- Use concealed fixings.

Sealant

Acoustic sealant: If documented or if required to maintain rated acoustic performance, bed sill and ceiling channels in acoustic sealant.

3.3 PARTITION GLAZING**Glass processing**

Processing: Perform required processes on glass, including cutting, obscuring, silvering and bending. Form necessary holes, including for fixings, hardware, equipment and access openings. Process exposed glass edges to a finish not inferior to ground arrised.

Framed glazing

Assembly: Provide proprietary glazing beads and resilient (PVC, butyl or similar) glazing tapes, gaskets and inserts, to hold the glass firmly without distortion and to withstand the documented loadings.

Frameless glazing

Assembly: Join the vertical edges of adjacent glass panels with a clear silicone jointing compound.

Support: For frameless installations not fixed directly to the building structure, provide adequate connection of the top and bottom glazing channels or bead to resist lateral loads.

3.4 COMPLETION**Cleaning**

General: Remove protective coverings, replace damaged glass and leave the work clean, polished, free from defects, and in good condition.

Operation and maintenance manuals

Requirement: Prepare a manual that includes the following:

- Full product information for each partition system, including product designations, components list, colours and finishes, and accessories.
- Information on all glass, including type, thickness, and details of any colouration or treatment affecting the physical appearance of the installation.
- Information on all doors and hardware supplied as part of the partition system, including door type, size, finishes, and hardware details.
- Maintenance recommendations.
- Copies of type-tests and compliance certificates for acoustic or other system performance requirements.

4 SELECTIONS

4.1 INTERNAL GLAZED PARTITION SYSTEMS

Proprietary aluminium framed internal glazed partition systems and associated glazed doors shall be as nominated in the Window Schedule and the Door Schedule.

Glazing details: As scheduled and in accordance with AS 1288 (2021) and *0461 Glazing*.

Finish: As scheduled.

0531 SUSPENDED CEILINGS – COMBINED

1 GENERAL

1.1 RESPONSIBILITIES

General

Requirement: Provide suspended ceilings, as documented.

1.2 CROSS REFERENCES

General

Requirement: Conform to the following:

- 0171 General requirements.
- 0181 Adhesives, sealants and fasteners.
- 0183 Metals and prefinishes.
- 0471 Insulation and pliable membranes.
- 0522 Partitions – framed and lined.
- 0671 Painting.

1.3 STANDARDS

General

Suspended ceilings: To AS/NZS 2785 (2020).

1.4 INTERPRETATION

Definitions

General: For the purposes of this worksection the definitions given in AS/NZS 2785 (2020) and the following apply:

- Ceiling unit: Tile, panel, plank, strip or open grid supported within a ceiling suspended system.

1.5 TOLERANCES

Suspension system

Flatness, twist, winding and bow: 1.5 mm deviation from a 1.5 m straightedge placed in any position.

Deflection: To AS/NZS 2785 (2020) Table 2.4.5.

Setting out and levelling: To AS/NZS 2785 (2020) Appendix D.

Sheeted or flush ceiling suspension system

Suspension system bearing surface for flush lined ceiling: To AS/NZS 2589 (2017) Table 4.2.2.

Deflection: To AS/NZS 2589 (2017) Table 3.5.1.2.

Panel systems

Panel to panel lipping or plan offset shall not exceed 0.5mm and shall be non-cumulative across any ceiling.

Grid creep across any ceiling shall not exceed 1.5mm in a 10m length.

Joints between panels shall be consistent, square and flush, being clamped together by the support system. Where gaskets are installed in joints, they shall not vary in width by more than 10% of the width of the gasket in place.

1.6 SUBMISSIONS

Fire performance

Fire hazard properties: Submit evidence of conformity to PRODUCTS, **FIRE PERFORMANCE, Fire hazard properties.**

Products and materials

Type tests: Submit results as follows:

- Weighted suspended ceiling normalised level difference: To AS/NZS ISO 717.1 (2004).
- Weighted sound absorption coefficient: To AS ISO 11654 (2002), as tested to AS ISO 354 (2006).

- Weighted sound reduction index: To AS/NZS ISO 717.1 (2004).

Samples

General: Submit samples as follows:

- Suspension system: Sections proposed for the suspension system, including suspension rods, clips, wall angles and trim.
- Ceiling material: Lining and ceiling units, with insulation, showing the extremes and mean of variation in colour, pattern, or texture of the proposed finish.
- Methods: Methods of jointing, fixing, height adjustment, retaining and removing ceiling units.
- Access panels: One complete access panel in the proposed finish.

Shop drawings

Set-out drawings: Submit proposed set-out, indicating cut ceiling units if any, before installation.

Coordinate with plenum services layouts, building structure and other factors affecting the layout.

Subcontractors

General: Submit names and contact details of proposed suppliers and installers.

Warranties

Requirement: Submit warranties in accordance with the requirements of *0171 General requirements*.

- Period: All ceiling systems shall remain structurally sound, without visible deformation, for 10 years.

1.7 INSPECTION

Notice

Inspection: Give notice so that inspection may be made of the following:

- The suspension system before the installation of ceiling units or linings.
- The ceiling assembly before the installation of fittings and site painting, if applicable.

2 PRODUCTS

2.1 GENERAL

Storage and handling

Requirement: Store suspended ceiling system and components in a dry and secure storage area, unaffected by weather.

2.2 FIRE PERFORMANCE

Fire hazard properties

Group number: To AS 5637.1 (2015).

Marking

Identification: Marked to show the following:

- Manufacturer's identification.
- Product brand name.
- Product type.
- Quantity.
- Product reference code and batch number.
- Date of manufacture.
- Material composition and characteristics such as volatility, flash point, light fastness, colour and pattern.

2.3 CEILING SYSTEMS

Proprietary systems

Consistency: Provide suspended ceilings as complete proprietary systems, fabricated by one manufacturer.

Installation: Specialist installers recommended by the ceiling system manufacturer.

Support: Fix proprietary suspension system to the structural supports.

Materials

Coated steel: To AS 1397 (2021).

Aluminium: To AS/NZS 1866 (1997).

Protective coatings for steel components: To AS/NZS 2785 (2020) Appendix F.

Protection against atmospheric corrosion: To AS 2312.1 (2014) and AS/NZS 2312.2 (2014).

2.4 CEILING UNITS

General

Ceiling units shall be as nominated in the Finishes Schedule.

2.5 LINING

Plasterboard

Standard: To AS/NZS 2588 (2018).

Plasterboard ceiling linings shall be as nominated in the Finishes Schedule.

Thickness: As scheduled.

Sealants

Acoustic sealant: Non-hardening sealant compatible with the ceiling materials and rated to match the ceiling system's acoustic performance.

2.6 CEILING ACCESS PANELS

General

Product: Trafalgar APM-KC-600-WW flush ceiling access panels, 600mm x 600mm, with key cam lock and concealed metal frame, or acceptable equivalent.

Performance: As required to match the surrounding ceiling.

Ceiling access panels shall have a finish to match the associated ceiling, unless detailed otherwise.

Location: As necessary to provide access to in-ceiling services.

Ensure all access panels are free from obstructions that could damage the panel during removal and replacement.

Identification

General: Provide each access panel with an identification mark.

Reinforcement

General: Reinforce the back of the access panel to prevent warping and facilitate handling.

3 EXECUTION

3.1 CONSTRUCTION GENERALLY

Working environment

General: Do not start work before the building is enclosed, wet work is complete and dry, and all work above the ceiling, including services, is complete.

Protection

General: Protect existing work from damage during the installation.

Partitions

General: If partitions are attached to the underside of the ceiling systems, include the partition mass in the seismic mass of the ceiling.

Stability

General: Install the ceilings level and fix to prevent looseness or rattling of ceiling components under normal conditions.

Structure-borne sound

General: Provide a ceiling system which does not amplify structure-borne sound. Provide suitable proprietary products or systems for reducing contact vibrations between structure and ceiling.

Control of movement

Abutments: Install the ceiling to allow for differential movement at abutting surfaces.

Alignment: Align ceiling control joints with structural control joints. Do not bridge structural control joints.

Prefinishes

General: Repair damaged prefinishes by recoating.

3.2 SUSPENSION SYSTEM

Ceiling grid

Set-out: Align ceiling unit joints and centrelines of visible suspension members with documented grid lines. If not documented, set out with equal margins.

Suspension system

Support members: Install support members as follows:

- Space as required by the loads on the system and the type of ceiling.
- Allow for the installation of services and accessories, including ductwork, light fittings and diffusers.
- Provide additional back support or suspension members for the fixing of services and accessories to prevent distortion, overloading or excessive vertical deflection.
- Allow for access for maintenance of services.

Failure: Provide a ceiling system that will not progressively fail with failure of any one suspension point.

Height adjustment: Provide height adjustment with a length adjustment device at each suspension point, permitting length variation of at least 50 mm.

Grid members: If required, notch grid members at the junction with the perimeter trim to make sure the ceiling units lie flat on the perimeter trim.

Restriction: Do not attach the suspension system to the lip or flange of purlins.

Services

Support: Conform to the following:

- If the service has not been designed to accept the ceiling load, do not fix suspension members to services (e.g. ductwork).
- If services obstruct the ceiling supports, provide bridging and suspension on each side of the services.
- Do not support services terminals on ceiling units.

Bracing

General: Provide bracing to prevent lateral movement and to resist the imposed horizontal seismic force.

Bulkheads

General: Integrate bulkheads with the ceiling structure and brace to prevent lateral movement. If the ceiling is terminated at a bulkhead, provide for seismic requirements.

Fasteners

General: Provide concealed fasteners. If material supporting hangers is less than 3 mm thick, do not use screw fasteners.

3.3 CEILING UNITS

Installation

Fitting: Fit ceiling units accurately and neatly, without distortion, and free from air leakage and staining.

Lock clips: If ceiling units are exposed to loads from wind actions or if required for security, insert lock clips at the junction of carrier rails and units.

Pattern and texture: Set out patterned or heavily textured materials with a consistent direction of pattern or texture.

Service penetrations

General: Provide openings for all services elements, including light fittings, ventilation outlets, detectors, sprinklers and loudspeakers.

Repair: If services pass through ceiling grid members, provide additional grid members and support or relocate service.

Cut ceiling unit edges

General: Conceal, or finish to match prefinished edges, including at openings for services elements.

3.4 PLASTERBOARD LINING

Installation

Gypsum plasterboard lining: To AS/NZS 2589 (2017).

Finish level: Flush plasterboard ceilings shall generally achieve a level 4 finish in accordance with AS/NZS 2589 (2017) clause 3.1. Where ceilings are subjected to glancing light conditions and/ or finished with dark or glossy paints, a level 5 finish shall be achieved.

Suspended flush ceilings: Fix using screw or screw and adhesive to ceiling members or support frame.

Multiple sheet layers

Joints: Fill and flush up all joints and fixings in each layer and caulk up perimeters and penetrations before installing following layers. Stagger all sheet joints by minimum 200 mm.

Joints

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

Butt joints: Make joints over framing members or otherwise provide back blocking.

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

Control joints: Provide purpose-made perforated metallic-coated control joint beads at maximum centres in accordance with the lining manufacturer's recommendations and to coincide with structural control joints. Bed in joint compound. If possible, position joints to intersect light fixtures, vents or air diffusers.

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

3.5 TRIM

General

Trim: Provide trim at junctions with other building elements and surfaces, including walls, beams and penetrations, consistent with the materials and finishes of the ceiling system.

Accessories

General: Provide accessories as part of the proprietary ceiling system necessary to complete the installation.

3.6 COMPLETION

Rectification

General: Correct any defects, remove any excess joint compound from plasterboard linings, and leave the ceiling installation complete, clean and ready for the application of finishes, where applicable.

4 SELECTIONS

4.1 SUSPENDED PLASTERBOARD CEILINGS

Plasterboard ceiling linings shall be as nominated in the Finishes Schedule, fixed to suspended ceiling system at 600mm maximum centres.

Where ceilings abut walls, provide Rondo P50 shadow stopping angles. Gaps between the wall and the metal edge of the stopping angle shall be filled with a paintable flexible sealant.

4.2 SUSPENDED PLYWOOD PANEL CEILINGS

Plywood panel ceiling linings shall be as nominated in the Finishes Schedule.

Installation shall be in accordance with the manufacturer's recommendations and as scheduled.

0551 JOINERY

1 GENERAL**1.1 RESPONSIBILITIES****General**

Requirement: Provide joinery, as documented.

1.2 CROSS REFERENCES**General**

Requirement: Conform to the following:

- 0171 General requirements.
- 0181 Adhesives, sealants and fasteners.
- 0183 Metals and prefinishes.
- 0185 Timber products, finishes and treatment.
- 0522 Partitions – framed and lined.

1.3 TOLERANCES**General**

Requirement: Fabricate and install joinery items to substrates undamaged, plumb, level, straight and free of distortion.

Tolerances table

Property	Tolerance
Plumb and level	1:800
Offsets in flush adjoining surfaces	0.5 mm
Offsets in revealed adjoining surfaces	2 mm
Alignment of adjoining doors	0.5 mm
Difference in scribe thickness for joinery items centred between walls	2 mm
Doors centred in openings	0
Joints in finished surfaces	0

1.4 SUBMISSIONS**Certification**

Requirement: Submit one of the following, as evidence of conformity to documented requirements for grading, species and board size:

- Supplier's certificate, which may be included on an invoice, delivery docket or packet label.
- Report by an independent inspecting authority.

Moisture content: Submit documentation noting moisture content of timber products.

Operation and maintenance manuals

Requirement: Submit manual to **COMPLETION**, Operation and maintenance manuals.

Products and materials

Manufacturer's data: Submit manufacturer's product data.

Proprietary items: Submit the manufacturer's standard drawings and details showing:

- Methods of construction.
- Assembly and fixing, with dimensions and tolerances.

Samples

General: Submit samples as follows:

- 500mm length of each benchtop type including front edge profile and wall junction.

- Timber veneer: Provide three variants, two samples of each variant showing maximum expected variation.
- Laminate: Provide three variants, two samples of each variant showing maximum expected variation.
- Metals: Provide three variants, two samples of each variant showing maximum expected variation.
- Fabric: Two swatches of each type.
- Cupboard door: One sample, complete with hardware.
- Drawer front: One sample, complete with hardware.
- Typical hardware items: Two samples, showing each finish.
- 300mm length sample of each type of trim in the specified finish.

Shop drawings

General: Submit shop drawings to a scale that best describes the detail, showing the following:

- Overall dimensions for all joinery units.
- Materials, thicknesses and finishes of elements including doors, divisions, shelves and benches.
- Type of construction including mitre joints and junctions of members.
- Hardware type and location.
- Temporary bracing, if required.
- Procedures for shop and site assembly and fixing.
- Benchtop layout including joint arrangement and penetrations.
- Locations of fixtures to be installed in the units.
- Relationship of fixture to adjacent building elements.
- Details of fabrication involving other trades or components.
- Proposals for the break-up of large items as required for delivery to the site.
- Proposed method of joining the modules of large items.
- Where items of joinery are required to reticulate services, the shop drawings shall demonstrate that all services have been adequately coordinated.

Timing: Before fabrication.

Subcontractors

General: Submit names and contact details of proposed suppliers and installers.

Warranties

Requirement: Submit warranties in accordance with the requirements of *0171 General requirements*.

- Period: 2 years.

1.5 INSPECTION**Notice**

Inspection: Give notice so that inspection may be made of the following:

- Shop fabricated or assembled items ready for delivery to the site.
- Openings prepared to receive assemblies.
- Site erected assemblies on completion of erection, before covering up by cladding and encasing.
- Surfaces prepared for, and immediately before, site applied finishes.
- Completion of installation.

2 PRODUCTS**2.1 DELIVERY AND STORAGE****General**

Requirement: Deliver joinery units to site in unbroken wrapping or containers and store so that its moisture content is not adversely affected. Do not store in areas of wet plaster. Store in an adequately ventilated space away from heat and direct sunlight. Keep storage time to a minimum by delivering items only when required for installation.

2.2 JOINERY MATERIALS AND COMPONENTS

Certification

Timber based products: Label panels under the authority of a recognised certification scheme to *0185 Timber products, finishes and treatment*, as applicable to the product. Locate the brand on faces or edges that will be concealed in the works.

Joinery timber

Hardwood: To AS 2796.1 (1999).

- Grade: Select.

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

Clear finished timber and veneer: Make sure all visible surfaces are free of branding, crayon or chalk marks and of blemishes caused by handling.

Plywood

Interior use generally: To AS/NZS 2270 (2006).

Interior use, exposed to moisture: To AS/NZS 2271 (2004).

Visible surface with a clear finish: Veneer quality A.

Other visible surfaces: Veneer quality B.

Wet processed fibreboard (including hardboard)

Standard: To AS/NZS 1859.4 (2018).

Particleboard

Standard: To AS 1859.1 (2017).

Melamine overlaid particleboard: Particleboard overlaid on both sides with low pressure melamine.

Dry-processed fibreboard (including medium density fibreboard)

Standard: To AS/NZS 1859.2 (2017).

Melamine overlaid medium density fibreboard: Medium density fibreboard (STD MDF) overlaid on both sides with low pressure melamine.

Decorative overlaid wood panels

Standard: To AS/NZS 1859.3 (2017).

High-pressure decorative laminate (HPDL) sheets

Standard: To AS/NZS 2924.1 (2024).

Minimum thickness: Conform to the following:

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

Fabrics

Textile upholstery fabrics shall comply with AS 2687 (1997).

Upholstered surfaces shall be covered neatly and uniformly with the nominated fabrics, without visible seams.

Fabrics shall be taut without evidence of stretching.

Warp and weft shall remain parallel or at right angles as required.

Upholstered items, where the upholstery is distorted or uneven, will be rejected.

Sharp corners to substrates shall be smoothed to avoid piercing of fabric.

Metals

Metals shall be free from defects that will impair their strength, durability, performance or appearance. Metals used in exposed work shall be produced to the highest commercial standards of flatness, free from surface blemishes including waves, striations, tool and die marks, other defects and/ or impurities and manufacturers' names and identifying numbers. Profiles shall be true to angle or curvature as required.

2.3 VENEERS

Timber veneer

Standards: To AS/NZS 2097 (2006) and AS/NZS 2098 (series).

Veneer quality: To AS/NZS 2270 (2006).

Grades (minimum requirement):

- Select grade, veneer quality A, for visible surfaces to have clear finish or to have no coated finish.
- General purpose grade, veneer quality B, for other visible surfaces.

Requirement: Provide veneers in the agreed matching arrangement, flitch batched and falling within the visual range of the approved samples.

Condition core material and veneers before bonding.

Apply veneers with edges tight butted, with no gaps or other open defects. Set out veneers so that veneers are aligned in regular uniform symmetry, unless otherwise specified.

Finished components shall be free from bow, twist, scratches, chipping, pimpling, depressions, glue spill, staining and other defects. Sand to a fine, smooth finish, free from sanding marks.

All timber veneer boards shall have a balancing veneer of equal strength to the rear surface to ensure no cupping.

2.4 JOINERY ASSEMBLIES

Standard

Cabinetry generally: To AS 4386 (2018).

Plinths

Material: Select from the following:

- Exterior general purpose plywood.
- High moisture resistant particleboard.
- High moisture resistant medium density fibreboard.

Thickness: 18 mm, unless nominated otherwise.

Fabrication: Form up with front and back members and full height cross members at not more than 900 mm centres.

Fasteners: Conceal with finish.

Installation: Scribe to floor and secure to wall to provide level platform for carcasses.

Carcasses

Material: Select from the following:

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

Thickness: 18 mm, unless nominated otherwise.

Joints: Select from the following:

- Proprietary mechanical connections.
- Dowels and glue.
- Screws and glue.
- Proprietary joining plates and glue.

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

- Spacing: 32 mm.

Fasteners: Conceal with finish.

Installation: Secure to walls at not more than 600 mm centres.

Drawer fronts and doors

Material: Select from the following:

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

Thickness: 18 mm, unless nominated otherwise.

Door size: Not exceeding 1.5 m² on face, with 2400 mm maximum height and 900 mm maximum width.

Drawer fronts: Rout for drawer bottoms.

Edges shall receive ABS edge strips.

Drawer backs and sides

Material: Melamine overlaid particleboard.

Thickness: 18 mm, unless nominated otherwise.

Installation: Mitre corners leaving outer skin of foil intact, finish with butt joints, glue to form carcass and screw to drawer front. Rout for drawer bottoms.

Drawer bottoms

Material: Melamine overlaid particleboard.

Thickness: 18 mm, unless nominated otherwise.

Door hardware

Hinge types: Concealed metal hinges with the following features:

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

Hold open angle: Minimum 90 degrees.

Piano hinges: Chromium plated steel, extending full height of doors.

Number of hinges: Determine the number and spacing of hinges in accordance with the manufacturer's recommendations, giving regard to the weight and height of the door panel.

Drawer hardware

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

- Heavy duty loading capacity.
- Integrated soft and self-closing action.
- Closure retention.
- White thermoset powder coating or nickel plated.

2.5 WORKING SURFACES

Laminated benchtops

Material: 33mm thick high moisture resistant (HMR) particleboard, unless nominated otherwise.

Finish: High-pressure decorative laminated sheet.

Balance underside: Extend laminate to the undersides of benchtops.

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

Edges shall receive ABS edge strips.

3 EXECUTION

3.1 JOINERY

Standard

Cabinetry generally: To AS 4386 (2018).

General

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

Framing: Frame and trim where necessary for openings.

Concealed surfaces: Prime surfaces concealed by substrates.

Deficiencies: Examine joinery units for completeness and remedy deficiencies.

Substrate: Damp clean and vacuum substrate surfaces that will be permanently concealed.

Acclimatisation

General: Acclimatise the joinery items by stacking in the in-service conditions with air circulation to all surfaces after the following are complete:

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

Accessories and trim

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

Fasteners

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

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

Visible fasteners: Where fasteners are unavoidable on visible joinery faces, sink the heads below the surface and fill the sinking flush with a material compatible with the surface finish. In surfaces which are to have clear or tinted finish, provide matching wood plugs showing face (not end) grain. In surfaces which are to have melamine finish, provide proprietary screws and caps finished to match.

Fix joinery units to substrates as follows:

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

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

Adhesives

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

Finishing

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

Joints: Scribe internal and mitre external joints.

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

Matching: For surfaces which are to have clear or tinted finish, arrange adjacent pieces to match the grain and colour.

Hygiene requirements: To all food handling areas and voids at the backs of units in all areas, seal all carcass and junctions wall/floor, and cable and pipe entries with silicone beads for vermin proofing. Apply water resistant sealants around all plumbing fixtures and make sure sealants are fit for purpose.

Benchtops

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

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

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

Labelling

General: Permanently mark each unit of furniture with the manufacturer's name, on an interior surface.

3.2 TRIM**General**

Requirement: Provide trim such as beads, mouldings, stops and skirtings to make neat junctions between lining components, finishes and adjacent surfaces.

Fixing

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

3.3 COMPLETION

Cleaning

Temporary coatings: On or before completion of the works, or before joining up to other surfaces, remove all traces of temporary protective coatings.

Requirement: Remove all dust, marks and rubbish from all surfaces and internal spaces. Clean and polish all self-finished surfaces.

Operation and maintenance manuals

Requirement: Prepare a manual that includes the manufacturer's published recommendations for service use.

4 SELECTIONS

4.1 JOINERY GENERALLY

Joinery units shall be as detailed on the drawings.

Joinery finishes shall be as nominated in the Finishes Schedule.

0572 MISCELLANEOUS FURNITURE AND EQUIPMENT

1 GENERAL

1.1 RESPONSIBILITIES

General

Requirement: Provide miscellaneous furniture and equipment as documented.

1.2 CROSS REFERENCES

General

Requirement: Conform to the following:

- 0171 General requirements.

1.3 SUBMISSIONS

Fire performance

Fire hazard properties: Submit evidence of conformity to PRODUCTS, **FIRE PERFORMANCE**, **Fire hazard properties**.

Operation and maintenance manuals

Requirement: Submit manual to **COMPLETION**, **Operation and maintenance manuals**.

Products and materials

Manufacturer's drawings: Submit the manufacturer's standard drawings and details showing the following:

- Methods of construction.
- Height adjustment mechanism and leg detail.
- Assembly and fixing, with dimensions and tolerances.
- Connection methods for all removable components.

Pest resistance: Submit evidence of conformity to PRODUCTS, **MATERIALS**, **Pest resistance** tested to AS 2001.6.1 (1980).

Samples

General: Submit a sample of each type of furniture and equipment item. Upon acceptance, and where deemed suitable by the Superintendent, the samples may be incorporated into the work.

Shop drawings

General: Submit shop drawings to a scale that best describes the detail showing the following:

- Construction, assembly and fixing details for custom designed (non-standard) furniture and equipment items.
- The proposed layout for furniture and equipment installations.

Subcontractors

General: Submit names and contact details of proposed suppliers and installers.

Warranties

Requirement: Submit warranties in accordance with the requirements of 0171 General requirements.

- Period: As offered by the manufacturer.

1.4 INSPECTION

Notice

Inspection: Give notice so that inspection may be made of the following:

- Custom-built furniture and equipment items fabricated and ready to be delivered to the site.
- Furniture and equipment items delivered to site before installation.
- Building locations or substrates prepared to receive furniture and equipment before installation.
- Completion of installation.

2 PRODUCTS

2.1 GENERAL

Storage and handling

Requirement: Transport all furniture and equipment to site and store without damage or distortion of components.

Marking and labelling

General: Label furniture and equipment with the following details in an inconspicuous location:

- Manufacturer's name and address.
- Date of manufacture.

2.2 FIRE PERFORMANCE

Fire hazard properties

Fire hazard indices for all materials: Tested to AS/NZS 1530.3 (1999).

2.3 WORKSTATIONS

General

Standard: To AS/NZS 4442 (2018).

2.4 MATERIALS

Decorative overlaid wood panels

Standard: To AS/NZS 1859.3 (2017).

Dry process fibreboard (including medium density fibreboard)

Standard: To AS/NZS 1859.2 (2017).

Particleboard

Standard: To AS 1859.1 (2017).

Plywood

Interior use generally: To AS/NZS 2270 (2006).

Interior use, exposed to moisture: To AS/NZS 2271 (2004).

Visible surface with a clear finish: Veneer quality A.

Other visible surfaces: Veneer quality B.

High-pressure decorative laminate sheets

Standard: To AS/NZS 2924.1 (2024).

Thickness (minimum):

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

Powder coating

Application to aluminium and aluminium alloy substrates: To AS 3715 (2002).

Application to metal substrates other than aluminium: To AS 4506 (2024).

Stainless steel

Finish: Surface finish 4 (general purpose polished).

Flexible cellular polyurethane

Standard: To ISO 5999 (2013).

Textile upholstery fabrics

Fabrics: To AS 2687 (1997).

Vinyl: To ISO 7617-1 (2024).

Performance classification (minimum): 3.

Wool and wool blend fabrics:

- Woolmark Pure New Wool/Woolmark Wool Rich Blend certification: Required.

Antimicrobial treatment

Requirement: Non-metallic, colourless, odourless, positively charged polymer applied during manufacturing to form a molecularly bonded surface to resist bacteria and mould growth.

Pest resistance

Requirement: Provide upholstery fabrics composed entirely of materials either inherently resistant to insect attack or treated against insect attack, by application of insecticide to the yarn during the dyeing or scouring process.

Insect resist agents for wool: Conform to the recommended application levels published by the Woolmark Company for Level 4 protection.

3 EXECUTION

3.1 INSTALLATION

General

Supply and install all items in accordance with the manufacturer's instructions and carry out operational testing of the items, where applicable.

Fabrics

Fabric surface: Provide a finished surface that is smooth and without irregularities.

3.2 COMPLETION

Operation and maintenance manuals

Requirement: Prepare a manual that includes the manufacturers' data as follows:

- Recommendations for demounting and relocation.
- Recommendations for service use, care and maintenance.
- List of manufacturers and suppliers for replacement parts.

4 SELECTIONS

4.1 FURNITURE AND EQUIPMENT

Furniture and equipment shall be as nominated in the FFE Schedule.

0574 WINDOW COVERINGS

1 GENERAL

1.1 RESPONSIBILITIES

General

Requirement: Provide window coverings, as documented.

1.2 CROSS REFERENCES

General

Requirement: Conform to the following:

- 0171 *General requirements.*
- 0181 *Adhesives, sealants and fasteners.*
- 0451 *Windows and glazed doors.*

1.3 SUBMISSIONS

Fire performance

Fire hazard properties: Submit evidence of conformity to **PRODUCTS, FIRE PERFORMANCE, Fire hazard properties.**

Operation and maintenance manuals

Requirement: Submit manual to **COMPLETION, Operation and maintenance manuals.**

Products and materials

Manufacturer's drawings: Submit manufacturer's standard drawings and details showing the following:

- Methods of construction.
- Assembly and fixing, with dimensions and tolerances.

Pest resistance: Submit evidence of conformity to **PRODUCTS, MATERIALS, Pest resistance** tested to AS 2001.6.1 (1980).

Samples

General: Submit two samples, 300 mm x 300 mm, of each window covering fabric, showing material, colour, texture, pattern and other visible characteristics. The sample shall include a 300 mm length of the window covering track system, including the manufacturer's standard control system furniture items and accessories.

Shop drawings

General: Submit shop drawings to a scale that best describes the detail, showing the following:

- Window coverings: Show sizes, locations, and details of fabrication and installation.
- Tracks: Show installation and anchorage details, and locations of controls.

Subcontractors

General: Submit names and contact details of proposed suppliers and installers.

Warranties

Requirement: Submit warranties in accordance with the requirements of *0171 General requirements.*

- Period: As offered by the manufacturer.

1.4 INSPECTION

Notice

Inspection: Give notice so that inspection may be made of the following:

- Building locations or substrates prepared to receive window coverings before installation.

2 PRODUCTS

2.1 FIRE PERFORMANCE

Fire hazard properties

Windows coverings: Tested to AS/NZS 1530.3 (1999).

2.2 MATERIALS

Fabrics

Uncoated woven and knitted fabrics: To AS 2663.1 (1997).

- Performance classification (minimum): 2.

Coated woven and knitted fabrics: To AS 2663.2 (1999).

- Performance classification (minimum): 2.

Vertical blind fabrics: To AS 2663.3 (1999).

Anti-microbial treatment

Requirement: Non-metallic, colourless, odourless, positively charged polymer applied during manufacturing to form a molecularly bonded surface to resist bacteria and mould growth.

Pest resistance

Requirement: Provide window coverings composed entirely of materials either inherently resistant to insect attack or treated against insect attack by moth, by application of insecticide to the yarn during the dyeing or scouring process.

Insect resist agents for wool: Conform to the recommended application levels published by the Woolmark Company for Level 4 protection.

Powder coating

Application to aluminium and aluminium alloy substrates: To AS 3715 (2002).

Application to metal substrates other than aluminium: To AS 4506 (2024).

3 EXECUTION

3.1 INSTALLATION

General

Installation: Install tracks in documented locations using manufacturer's purpose fabricated mounting brackets, clips, track splicing and other hardware. Install window coverings to hang plumb and level, and true to line.

Fixing: Provide concealed mechanical fixings suitable for mounting tracks to substrate. Match exposed mounting hardware to the finish and colour of adjacent track.

Adjustment: Adjust all operating hardware for smooth operation free from binding, and to provide even, accurate alignment of window covering in open and closed positions.

Safety: Install child safety devices on all control cords. Install all control cords in conformance with *Competition and Consumer (Corded Internal Window Coverings) Safety Standard (2014)*.

3.2 COMPLETION

Operation and maintenance manuals

Requirement: Prepare a manual that includes the manufacturer's data as follows:

- Recommendations for service use, care and maintenance.
- List of manufacturers and suppliers of replacement parts.

4 SELECTIONS

4.1 WINDOW BLINDS

Proprietary window blinds shall be as nominated in the FFE Schedule.

Installation shall be in accordance with the manufacturer's recommendations.

0581 SIGNAGE

1 GENERAL

1.1 RESPONSIBILITIES

General

Requirement: Provide signage systems, as documented.

Performance

Requirement: Provide signage as follows:

- Appropriately secured.
- Located within a clear line of vision.
- To contrast with the background.
- With clean, well defined edges or arrises, and free from blemishes.

1.2 CROSS REFERENCES

General

Requirement: Conform to the following:

- 0171 *General requirements.*
- 0181 *Adhesives, sealants and fasteners.*
- 0183 *Metals and prefinishes.*

1.3 STANDARDS

Signs

Safety signs - design and use: To AS 1319 (1994).

Signs and graphics for disability access: To AS 1428.1 (2021) and AS 1428.2 (1992).

Emergency escape lighting and exit signs: To AS 2293 (series).

Tactile wayfinding signs: To AS 1428.4.2 (2018).

1.4 INTERPRETATION

Definitions

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

- Illuminated signs: Signs consisting of cabinets enclosing a light source, illuminating translucent face panels bearing the specified signage.
- Statutory signage: Signs prescribed by the BCA and statutory authorities.

1.5 SUBMISSIONS

Operation and maintenance manuals

Requirement: Submit manual to **COMPLETION**, **Operation and maintenance manuals**.

Samples

Materials: Submit samples showing each colour and finish of exposed signage materials and accessories. If there is a range of colours and/or textures for a particular item, submit samples showing the extremes and mean of the range.

Shop drawings

General: Submit shop drawings showing the following information if appropriate:

- Layout, construction and fixing details for custom designed (non-standard) sign systems.
- Large scale (full size if practicable) lettering layouts for individual letter signs.
- Computer generated graphic images.
- Full size spacing templates for individually mounted characters.
- Location template drawings for anchorages to permanent construction. Show type of anchorage.
- Wiring diagrams for illuminated signs.

Warranties

Requirement: Submit warranties in accordance with the requirements of 0171 *General requirements*.

- Period: As offered by the manufacturer.

1.6 INSPECTION**Notice**

Inspection: Give notice so that inspection may be made of the following:

- Custom-built signage and graphic items fabricated and ready to be delivered to the site.
- Signage and graphic items delivered to site before installation.
- Building locations or substrates prepared to receive signage and graphic items before they are installed.

2 PRODUCTS

2.1 SIGNAGE GENERALLY**General**

General: Provide all general, directional, room identification and statutory signage as documented.

2.2 STATUTORY SIGNS

All statutory signage shall be in accordance with the BCA, and any other relevant standards.

Signage shall include, but not be limited to, the following:

- Escape doors.
- Services cupboard doors.

2.3 MATERIALS**Materials standards**

Aluminium:

- Plate for engraving: Alloy and temper designation 6063-0 to AS 2848.1 (1998).
- For casting: To AS 1874 (2000).
- Finishes:
 - . Anodising: To AS 1231 (2000).
 - . Powder coating: To AS 3715 (2002) and AAMA 2604 (2022).

Stainless steel:

- External: Type 316. Electropolish surface finish.
- Internal: Type 304. No. 4 brushed (general purpose polished) surface finish.

Plastics:

- PVC-U sheet: Semi-rigid sheet.
- Rigid cellular polystyrene: To AS 1366.3 (1992), class VH for cut-out shapes.

Brass and bronze: Plate, sheet and strip: To AS 1566 (1997).

- Finish: Patinated.

Glass type and thickness: To AS 1288 (2021).

Photoluminescent exit signs: To BCA E4D8(a)(ii).

2.4 BRAILLE SIGNAGE

Provide signs suitable for the sight impaired including Braille and tactile signage. Braille and tactile signage must comply with BCA D4D7 and Spec 15 and AS 1428.1 (2021).

Include Braille and tactile signage for:

- Sanitary facilities.
- Space with hearing augmentation system.
- Identifying whether sanitary facility is left or right handed.
- Ambulant facilities.

- Location of accessible entrances.

3 EXECUTION

3.1 WORKMANSHIP

Production

General: Form signage and graphic items accurately with clean, well defined edges or arises, free from blemishes.

Engraving to two layer plastic laminate: Engrave lettering to expose the lower laminate.

Engraved and filled: Lettering precision cut and filled colouring material. Clean faces of all filling material.

Casting: Produce shapes free of pits, scale, blow holes or other defects, hand or machine finished if necessary.

Laser cut lettering: Individual vinyl letters with self-adhesive backing.

Printed lettering: Lettering and graphic images screen/digitally printed on:

- Film with self-adhesive backing.
- Acrylic sheet.
- Aluminium plate.
- Stainless steel plate.

Large format digital printing: Lettering and graphic images screen printed film with self-adhesive backing.

Signwriting: Lettering and graphic images hand painted direct to the background by a tradesman with recognised qualifications and demonstrated skills.

Fabricated: Three dimensional, formed as follows:

- Laser cutting from solid material and hand finished as necessary.
- Moulding: Individual plastic hollow three dimensional characters and shapes formed by:
 - . Injection moulding.
 - . Vacuum forming.
- Built-up individual shapes by fabricating the faces and edges from separate pieces neatly and securely joined.

3.2 INSTALLATION

General

Requirement: Install signage and graphic items level and plumb, securely mounted, with concealed corrosion and theft-resistant fixings.

Self-adhesive signs

Requirement: Fix free of bubbles and creases.

Illuminated signs

Electrical fittings: Provide a junction box for power connection, and the necessary lamps with proper mountings, protection, and accessories including wiring transformers and insulators.

3.3 COMPLETION

Cleaning

General: Remove protective coverings, replace damaged signage and leave the work clean, polished, free from defects, and in good condition.

Operation and maintenance manuals

Requirement: Prepare a manual that includes the manufacturers' data as follows:

- Recommendations for service use, care and maintenance.
- List of manufacturers and suppliers of replacement parts.

0612 CEMENTITIOUS TOPPINGS

1 GENERAL**1.1 RESPONSIBILITIES****General**

Requirement: Provide cementitious toppings as documented.

Performance

Requirements:

- Consistent in level, finish, colour and texture.
- Free of discontinuities.
- Resistant to impacts and loads expected in use.
- Resistant to environmental degradation within the manufacturer's stated life span.
- Accommodating movement in the substrate between control joints.
- If bonded, compatible with the substrate and without drummy areas.
- Without obvious shrinkage cracks.

Self-levelling screeds: Provide if substrates for the various overlaid flooring types cannot meet the performance requirements.

1.2 CROSS REFERENCES**General**

Requirement: Conform to the following:

- 0171 *General requirements.*
- 0181 *Adhesives, sealants and fasteners.*
- 0315 *Concrete finishes.*

1.3 INTERPRETATION**Definitions**

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

- Concrete class – normal: Concrete that is specified primarily by a standard compressive strength grade up to 50 MPa and otherwise in conformance with AS 1379 (2007) clause 1.5.3.
- Granolithic topping: A topping mix with the coarse aggregate restricted to between 2 and 3 mm.
- Laitance: Scum or whitish deposit that rises to the surface of newly placed, over-wet concrete or over-trowelled mortar.
- Self-levelling screed: Setting mixture used to make a surface smooth or horizontal to align with another surface.
- Substrate: The surface to which a material or product is applied.
- Topping: Mixture of binders, aggregate and water applied to substrates in a plastic state and dried and cured to a hard surface.
- Topping method:
 - . Bonded or post-applied: Topping that is bonded to a hardened substrate from which laitance has been removed and to which a bonding agent has been applied.
 - . Monolithic or wet applied: Topping placed on a plastic substrate so that a chemical bond is created between the substrate and the topping.

1.4 TOLERANCES**General**

Thickness: Maximum deviation from the documented thickness:

- Thickness < 15 mm: ± 2 mm.
- Thickness ≥ 15 < 30 mm: ± 3 mm.

- Thickness ≥ 30 mm: ± 5 mm.

Flatness: Maximum deviations from a straightedge laid in any direction on a plane surface:

- Screeds to receive carpet: 5 mm from a 3 m straightedge.
- Screeds to receive resilient finishes: 4 mm from a 2 m straightedge.
- All other screeds: 6 mm from a 3 m straightedge.
- Or as otherwise required to suit the tolerance of the associated floor finish.

1.5 SUBMISSIONS

Products and materials

Manufacturer's data: Submit manufacturer's product data for the following:

- Admixtures.
- Bonding products.

Samples

General: Submit samples of the following products:

- Control joint products.

Subcontractors

General: Submit names and contact details of proposed suppliers and installers.

Tests

Site tests: Submit results, as follows:

- Flatness.
- In situ crushing resistance/soundness.

1.6 INSPECTION

Notice

General: Give notice so that inspections may be made of the following:

- Substrates ready for laying of toppings.

2 PRODUCTS

2.1 GENERAL

Storage and handling

General: Deliver, unload and store products and accessories in unbroken manufacturer's packaging and containers in a dry, well-ventilated and secure storage area, unaffected by weather.

2.2 MATERIALS

Aggregates

Standard: To AS 2758.1 (2014).

Coarse aggregate: Nominal single size not more than 1/3 topping thickness.

Fine aggregate: Fine, sharp, well-graded sand with a low clay content and free from efflorescing salts. Nominal single size not more than 1/4 topping thickness for toppings less than 40 mm thick.

Bonding products

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

Cement

Standard: To AS 3972 (2010).

- Type: SL.

Concrete

Standard: To AS 1379 (2007).

Unreinforced topping: Normal-class.

Reinforced topping table

Above ground exposure location	Compressive strength (MPa)	Cover to reinforcement (mm)
Internal	25	30
External	32	40

Reinforcement

Standard: To AS/NZS 4671 (2019).

Mesh: SL 62.

Maximum joint spacing: 6 m internal, 4 m external.

Curing products

General: Provide proprietary products manufactured for use with cement-based toppings and with the floor finish to be laid on the toppings.

Water

General: Clean and free from any deleterious matter.

2.3 CONTROL JOINTS**Control joint materials**

Control joint strip: A proprietary expansion joint consisting of a neoprene filler sandwiched between plates with lugs or ribs for mechanical keying. Set flush with the finished surface.

Proprietary slide plate divider strip: An arrangement of interlocking metal plates grouted into pockets formed in the concrete joint edges.

Sealant: One-part self-levelling non-hardening mould-resistant, silicone or polyurethane sealant applied over a backing rod. Finish flush with the surface.

- Floors: Trafficable, shore A hardness greater than 35.

Backing rod: Compressible closed cell polyethylene foam with a bond-breaking surface.

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

General: Prepare substrates as follows:

- Clean and remove any deposit that may impair adhesion of monolithic or bonded toppings.
- Remove excessive projections.
- Voids and hollows:
 - . More than 10 mm with abrupt edges: Fill with a sand/cement mix not stronger than the substrate or weaker than the topping.
 - . Less than 10 mm: Scabble edges to eliminate a featheredge and apply a latex modified cementitious product.

Substrates for bonded toppings

Hardened concrete: Roughen hardened concrete by scabbling or the like to remove 2 mm of the surface and expose the aggregate.

3.2 APPLICATION**Installation**

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

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

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

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

Toppings over 50 mm thick:

- Lay in multiple layers of equal thickness and no greater than 50 mm for each layer.
- Place a layer of reinforcement between layers as required. Lap reinforcement 200 mm and tie. Do not create four way laps.

Temperature control

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

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

3.3 SURFACE FINISHES

Finishing methods – primary finish

Machine float finish:

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

Steel trowel finish: After machine floating finish as follows:

- Produce a smooth surface relatively free from defects using power tools.
- When the surface has hardened sufficiently, use steel hand trowels to produce the final consolidated finish free of trowel marks and uniform in texture and appearance.

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

3.4 CONTROL OF MOVEMENT

General

Requirement: Provide control joints as follows:

- Location:
 - . Over structural control joints.
 - . To divide complex room plans into rectangles.
 - . Around the perimeter of the floor.
 - . At junctions between different substrates.
 - . To divide large topping-finished areas into bays.
 - . At abutments with the building structural frame and over supporting walls or beams where flexing of the substrate is anticipated.
- Depth of joint: Right through to the substrate.
- Depth of elastomeric sealant: One half the joint width, or 6 mm, whichever is the greater.

Control joints to divide topping into bays: Provide joints using one of the following methods:

- Form in situ using square edge steel forms and trowelling a 3 mm radius to edges.
- Form a groove, extending at least one quarter the depth of the section, either by using a grooving tool, by sawing, or by inserting a premoulded strip.
- Install a control joint proprietary product, to manufacturer's recommendations.

3.5 SELF-LEVELLING SCREED

Installation

Requirement: Pour on and spread in conformance with the manufacturer's recommendations. Finish without any bubbles and make sure screed is correctly installed into corners and re-entrant angles.

3.6 JOINT ACCESSORIES

Floor finish dividers

General: Provide a corrosion resistant metal dividing strip suitably fixed to the substrate, at junctions with differing floor finishes and with the top edge flush to the finished floor.

3.7 TESTING

Flatness tests

Method: If flatness properties are required, test to ASTM E1155 (2023).

In situ crushing resistance/soundness tests

Method: To BS 8204-1 (2003).

3.8 COMPLETION

Curing

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

Keeping moist: If a proprietary curing agent is not used, as soon as toppings have set sufficiently, keep them moist by water spraying or covering with polyethylene film for 7 days.

Joint sealant

General: If required, seal joints as follows:

- Formed joints: ≤ 25 mm deep with filler and bond breaker.
- Sawn joints: Full depth of cut.

Protection

General: Protect finished work from damage during building operations.

4 SELECTIONS

4.1 BONDED SCREED

Bonded screed to set downs as necessary.

Product: Ardex A38 Rapid Set Screed Cement or acceptable equivalent.

Substrate shall be primed with a bonding slurry comprising Ardex P51 Primer and Bonding Agent, in accordance with the manufacturer's recommendations, prior to laying screed.

Contractor to confirm thickness and falls.

Trowel the surface to a level of finish suitable for the nominated floor finish.

4.2 SELF-LEVELLING POLYMER SCREEDS

Where the structural slab does not achieve the specified tolerances for flatness and level for the nominated floor finish, the surface shall be rectified using a proprietary self-levelling polymer screed.

Product: Ardex K55 Rapid Drying Levelling and Smoothing Compound or acceptable equivalent.

Bonded construction to receive floor finishes.

With mix proportions as recommended by the manufacturer.

Laid as recommended by the manufacturer.

0621 WATERPROOFING – WET AREAS

1 GENERAL**1.1 RESPONSIBILITIES****General**

Requirement: Provide wet area waterproofing systems as documented.

Performance

Requirements:

- Graded to floor wastes, to dispose of water without ponding.
- Able to prevent moisture entering the substrate or adjacent areas.

1.2 CROSS REFERENCES**General**

Requirement: Conform to the following:

- 0171 *General requirements.*
- 0181 *Adhesives, sealants and fasteners.*
- 0315 *Concrete finishes.*
- 0522 *Partitions – framed and lined.*
- 0612 *Cementitious toppings.*

1.3 STANDARDS**Waterproofing wet areas**

Standard: To AS 3740 (2021).

1.4 INTERPRETATION**Definitions**

General: For the purposes of this worksection the definitions given in AS 3740 (2021) and the following apply:

- Bond breaker: A system preventing a membrane bonding to the substrate, bedding or lining.
- Membranes (waterproof): Impervious barriers to liquid water which may be:
 - . Installed below floor finishes.
 - . Installed to the face of the walls.
 - . Applied in liquid or gel form and air cured to form a seamless film.
- Substrate: The surface to which a material or product is applied.
- Waterproof (WP): The property of a material that does not allow moisture to penetrate through it.
- Waterproofing systems: Combinations of membranes, flashings, drainage and accessories which form waterproof barriers and which may be bonded to substrates.
- Water resistant (WR): The property of material that restricts moisture movement and will not degrade under conditions of moisture.
- Wet area: An area within a building supplied with a floor waste.

1.5 SUBMISSIONS**Products and materials**

Documentation: Submit copies of product manufacturer's:

- Product technical data sheets.
- Type tests: Submit certificates verifying conformance to AS/NZS 4858 (2004) Table 8.1.

Records

General: Submit photographic records to EXECUTION, **GENERAL**, **Reporting**.

Flood tests: Submit photographic records to **TESTING**, **Flood tests**.

Samples

Provide the following samples:

- Each type of membrane, on a representative substrate where necessary.
- Miscellaneous accessories such as reinforcing fabric, sealant, fixings, primers, adhesives, caulking and protective sheeting.

Membrane samples shall be stepped to indicate the different layers.

Subcontractors

Each type of membrane shall be installed by the respective manufacturer's approved installer. Submit name and contact details of proposed suppliers and installers.

All personnel employed in the preparation and installation process shall be trained and experienced operatives.

Certification

Before starting each membrane installation on Site, provide a certificate for each stating that the respective substrates are satisfactory in all respects to receive the membranes. Each certificate shall be signed by both the installer and the Contractor.

On completion of each membrane type, area or zone, provide a certificate for each stating that the installation has been carried out in accordance with the requirements of the specification. Each certificate shall be signed by the installer and the Contractor. The certificates shall be provided before concealment of the membrane.

Each type of certificate referred to in this clause shall be submitted in duplicate.

Tests

Site tests: Submit results, as follows:

- Substrate moisture content test.
- Flood test.
- Electronic leak detection test.

Warranties

Requirement: Submit warranties in accordance with the requirements of *0171 General requirements*.

- Period: 10 years.

1.6 INSPECTION

Notice

Inspection: Give notice so that inspection may be made of the following:

- Substrate preparation completed.
- Secondary layers preparation completed.
- Before membranes are covered up or concealed.
- After site testing.

2 PRODUCTS

2.1 GENERAL

Storage and handling

General: Store and handle to the manufacturer's recommendations and as follows:

- Protect materials from damage.

2.2 MEMBRANES

General

Standard: To AS/NZS 4858 (2004).

Membrane systems

Requirement: Provide proprietary membrane systems certified as suitable for the intended wet area waterproofing.

Waterstop angles

Material: Rigid, corrosion resistant angles compatible with the waterproof membrane system.

Bond breakers

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

Material: Purpose made bond breaker tapes or fillets of sealant.

Flashings

Requirement: Flexible waterproof flashings compatible with the waterproof membrane system.

Liquid membrane reinforcement

Requirement: Flexible fabric compatible with the waterproof membrane system.

Sealants

Requirement: Waterproof, flexible, mould-resistant and compatible with the waterproofing system and to the manufacturer's recommendations.

Adhesives

Requirement: Waterproof and compatible with the waterproofing system.

3 EXECUTION

3.1 GENERAL

Reporting

General: Make progressive photographic records of the waterproofing installation. Label photographs with the date and location.

Timing: Record at the following stages:

- After substrate preparation.
- After primer application.
- After membrane installation.
- After protection from traffic provided.

3.2 APPLICATION GENERALLY

Trained applicators

Membranes specified shall only be installed by thoroughly trained and competent applicators licensed by the manufacturer of the material. Provide evidence of licensed status before the work commences.

Installation

General: Installation including preparation shall be in accordance with the manufacturer's written instructions. Provide all necessary upturns, downturns and flashings necessary to provide a waterproof protection system suitable for the conditions likely to be encountered.

Setting out: Accurately set out the works. Provide masking of adjacent surfaces.

3.3 PREPARATION

Substrates

General: Inspect site conditions before start of work on site and before delivery of materials. Ensure conditions are satisfactory for installation. Arrange for rectification required by adjoining trades before delivery of materials. Start of work means total acceptance of conditions.

Preparation: Prepare substrates as follows and as required by the membrane manufacturer to ensure substrates are:

- Clean and free of any deposit or finish which may impair adhesion of membranes.
- If substrates are framed or discontinuous, support members are in full lengths without splicing.
- If substrates are solid or continuous:
 - . Excessive projections are removed.
 - . Voids and hollows greater than 10 mm with abrupt edges are filled with a cement:sand mix not stronger than the substrate nor weaker than the bedding.
 - . Depressions less than 10 mm are filled with a latex modified cementitious product with feathering eliminated by scabbling the edges.
 - . Cracks in substrates wider than 1.5 mm are filled with a filler compatible with the membrane system.

External corners: Round or arris edges.

Moisture content

Concrete substrates: Cure for at least 28 days.

Moisture content: Verify that the moisture content of the substrate is compatible with the water vapour transmission rate of the membrane system by testing to the recommendations of AS 3740 (2021) Appendix F.

Falls

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

Control joints

Finishes: Align control joints in finishes and bedding with control joints or changes in materials in the substrate.

Water stop angles

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

Sizing: Size the vertical leg of the water stop angle to conform to the requirements of AS 3740 (2021).

Corners: Cut the horizontal leg and bend the vertical leg at corners instead of forming vertical joints between separate lengths of angle.

Fixing: Fix water stop angles to the substrate with compatible sealant or adhesive and corrosion-resistant countersunk or wafer head screws.

Priming

Compatibility: If required by the membrane manufacturer, prime the substrates with a primer compatible with the membrane system.

Bond breakers

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

Sealant fillet bond breakers:

- Application: Form a triangular fillet or cove of sealant to internal corners within the period recommended by the membrane manufacturer after the application of the primer.
- Width: Conform to AS 3740 (2021) Table 4.10.

3.4 INSTALLATION

Ambient conditions

Requirement: Do not install in conditions outside the manufacturer's recommendations.

Protection

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

Extent of waterproofing

Waterproof or water resistant surfaces: To the requirements of BCA F2D2 and Specification 26.

Flashings

Junctions between waterproof surfaces: Provide a bond breaker at internal corners behind flashings.

Junctions between waterproof surfaces and other surfaces: Provide a bead of sealant at the following junctions:

- Waterproof and water-resistant surfaces.
- Water-resistant and water-resistant surfaces.
- Water-resistant and non water-resistant surfaces.

Perimeter flashings: Provide continuous flashings to the full perimeter of waterproof areas at wall/floor junctions and to waterstop angles.

Vertical flashings: Provide vertical corner flashings continuous across wall/wall junctions.

Vertical liquid applied flashings:

- Return legs at least 40 mm on each wall.
- Overlap the vertical termination of the floor waterproofing membrane at least 20 mm.

Reinforcement: At coves, corners and wall/floor junctions with gaps greater than 3 mm reinforce liquid applied membranes with reinforcement fabric tape recommended by the membrane manufacturer. Fold the tape in half lengthways and embed it in the first coat of membrane with one half of the tape on each side of the corner or joint. Apply a second coat of membrane to seal the fabric.

Door jambs and architraves

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

Membrane about doors

General: Ensure upturns onto walls and floor finish dividers are continuous around frames. Install membrane prior to the fixing of door frames.

Drainage connections

Floor wastes: Provide floor wastes of sufficient height to accommodate the thickness of floor finishes and bedding at the outlet position. Position leak control flange to drain at membrane level. Turn membrane down 50 mm minimum into the floor waste leak control flanges, and adhere to form a waterproof connection.

Preformed drainage channels:

- With continuous leak control flanges: Provide a continuous waterproof connection between the membrane and the channel.
- Without leak control flanges: Provide continuous waterproofing under the channel and terminate the membrane at a floor waste with a recessed leak control flange.

Taps and spouts

Requirement: Waterproof penetrations for taps and spouts with proprietary flange systems or a sealant.

Provision for servicing: Install taps in a manner that allows tap washers or ceramic discs to be serviced without damaging the waterproofing seal.

Membrane horizontal penetrations

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

Membrane vertical penetrations

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

Curing of liquid applied systems

General: To the manufacturer's instructions.

Curing: Allow membrane to fully cure before commencing subsequent work.

Penetrating elements of overlaying finishes and fixtures

Generally avoid penetrating membranes including with fasteners. Only where such penetrations cannot be avoided, seal around all penetrating elements including any fasteners through membranes for fixing of elements above membranes, generally by upturning the membrane onto the penetrating element or detailing the membrane around installed firm threaded rod or stud fasteners. The membrane applicator shall oversee installation of the overlaying element.

Overlaying finishes on membranes

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

Suitable materials: Conform to AS 3740 (2021).

Compatibility: If a membrane is to be overlayed with another system, provide an overlaying system that is compatible with and will not cause damage to the membrane.

Inspection: The membrane is to be checked for damage and certified by the membrane applicator immediately prior to covering up.

3.5 TESTING**Substrate tests**

Moisture content: Test substrate for suitability for the installation of membranes to AS 3740 (2021) Appendix F.

- Maximum relative humidity of concrete or cementitious screeds: To AS 3740 (2021) Appendix F2.4.

Membrane continuity tests

Conduct one of the following tests to confirm continuity of the membrane.

Flood test: To AS 3740 (2021) Appendix C2.

- Records:

- . Make photographic records of the flooded areas and adjacent areas.
- . Label photographs with the date and location.

Electronic leak detection test: To AS 3740 (2021) Appendix C3.

3.6 COMPLETION

Reinstatement

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

4 SELECTIONS

4.1 LIQUID MEMBRANES – INTERNAL WET AREAS

Locations: Generally to all amenities, WCs, cleaner's rooms and the like.

Extent including but not limited to: Whole of the floor area with turn up at walls and wall areas at basins, tubs and sinks.

Substrate: Cementitious screed graded to fall on/ or new reinforced concrete or plasterboard lined walls.

Overlay: Vinyl or as otherwise nominated on the drawings.

Type:

- One-part, liquid applied, fibre reinforced, water based, SBR modified acrylic waterproofing membrane.
- Product: GCP Silcor 145 FB Class III membrane or acceptable equivalent.
- Substrates shall be primed as recommended by the membrane manufacturer.

Characteristics:

- Number of coats: 2.
- Total thickness (minimum): 1mm.

Performance requirements:

- Resistant to permanent wetness.

0641 APPLIED WALL FINISHES

1 GENERAL**1.1 RESPONSIBILITIES****General**

Requirement: Provide applied wall finishes to substrates, as documented.

1.2 CROSS REFERENCES**General**

Requirement: Conform to the following:

- 0171 General requirements.
- 0181 Adhesives, sealants and fasteners.
- 0183 Metals and prefinishes.
- 0522 Partitions – framed and lined.

1.3 TOLERANCES**Wall panels**

Deviation from true grid lines and planes: 1:1000 to maximum 3 mm.

Misalignment with adjoining surfaces at grid junctions: 1 mm.

Panel thickness deviation: +1 mm, -0 mm.

Length and width of panels: $\pm 0.1\%$ of the dimension or 0.5 mm, whichever is the greater.

Flatness, twist, winding and bow: 1.5 mm from a 1500 mm straightedge placed in any position.

Deviation of edges: ± 1 mm.

1.4 SUBMISSIONS**Fire performance**

Fire hazard properties: Submit evidence of conformity to **FIRE PERFORMANCE, Fire hazard properties.**

Operation and maintenance manuals

Requirement: Submit manual to **COMPLETION, Operation and maintenance manuals.**

Products and materials

Requirement: For each type of finish, submit the following:

- Product data sheets.

Pest resistant materials: Submit evidence that textile components have been treated for resistance to fabric pests.

Type tests: Submit results as follows:

- Weighted sound absorption coefficient: To AS ISO 11654 (2002), as tested to AS ISO 354 (2006).
- Weighted sound reduction index: To AS/NZS ISO 717.1 (2004).

Samples

Requirement: Submit samples of each documented type of the following finishes:

- 300 x 300 mm sample of each type of wall lining, including examples of edge treatment, where applicable.
- All fixing types.

Shop drawings

General: Submit shop drawings to a scale that best describes the detail, showing the following:

- Procedures for shop and site assembly and fixing.
- Proposals for the break-up of large items into modules for delivery to the site.
- Proposed module jointing method of large items.

Substrate acceptance

Requirement: Submit evidence of installer's acceptance of the walling substrate before starting installation.

Warranties

Requirement: Submit warranties in accordance with the requirements of 0171 *General requirements*.

- Period: As offered by the manufacturer.

1.5 INSPECTION**Pre-installation meeting**

Requirement: Before installing wall panels, arrange for an inspection by the panel installer and by the substrate/support framing installer to examine substrate/frame tolerances and other conditions affecting panel installation.

Notice

Inspection: Give notice so that inspection may be made of the following:

- Items fabricated off-site before delivery.
- Completed substrate/framing preparation.
- Wall panel set-out before fixing panels.
- Completed wall panel installation.

2 PRODUCTS

2.1 GENERAL**Storage and handling**

General: Deliver, unload and store panel units and accessories in unbroken wrapping or containers. Handle and install panels without distorting panels or exposing panels to surface damage from the weather or construction activities. Avoid contaminating panel faces with adhesives, solvents or cleaners during installation.

Storage: Keep storage period to a minimum by delivering items only when required for installation. Store panels to the manufacturer's recommendations and as follows:

- Store materials flat, in dry, well-ventilated space.
- Do not stand or drop panels on ends or corners.
- Protect edges from damage.

Exposure to direct sunlight: If recommended by the manufacturer, shield panels from direct sunlight until installation.

2.2 FIRE PERFORMANCE**Fire hazard properties**

Group number: To AS 5637.1 (2015).

2.3 PROPRIETARY PANELS**General**

Panels: Provide proprietary panels and associated trims as documented.

3 EXECUTION

3.1 PREPARATION**Substrate condition**

Requirement: Make sure support framing, insulation or substrate lining conforms to the wall finish manufacturer's recommended requirements including moisture content, smoothness and other surface imperfections. Correct out of tolerance work and other deficient conditions before installing panels.

Substrate surface: Smooth, clean, dry, free of dust, defects or imperfections that will affect the installation. Fill dents or cracks as recommended by the manufacturer. Tape or seal joints in the substrate to prevent the ingress of dust and foreign particles travelling from the wall cavities to the applied wall finish.

Cleaning: Wipe down substrate surface with a damp cloth before installing applied wall finish.

Cleaning substrate surfaces: Damp clean and vacuum substrate surfaces that will be permanently concealed.

Acclimatisation

Requirement: Acclimatise panels by stacking them in the ambient temperature and humidity in which they will be installed, with air circulation to all surfaces after the following have been installed and are operational:

- Air conditioning.
- Lighting.
- Site drainage and stormwater works.
- Space fully enclosed and secure.
- Wet work: Completed and dry.

Storage: Remove packaging and store panels in the installation space not less than 48 hours before installing.

3.2 INSTALLATION GENERALLY

Wall panels

Accuracy: Construct and install panels and components plumb, level and square, as documented.

Joints: Provide materials in single lengths if possible. If joints are required, install over framing supports.

Framing: Provide additional framing members at openings and penetrations, including those required by other trades.

Accessories and trim

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

Fasteners

Exposed fixings: Provide as documented.

Concealing exposed fixings: If fastenings are unavoidable on the panel face, countersink the fastener heads and fill the sinking flush with a material compatible with the final finish. For timber surfaces requiring a clear or tinted finish, provide matching wood plugs showing face grain. Do not use plugs showing end grain.

Adhesives

Requirement: Provide adhesives to transmit the loads imposed and achieve assembly rigidity, without discolouring the finished panel face.

Finishing

Corners: Scribe internal and mitre external corners.

Edge strips for panel edges: If required, finish exposed edges of panels with edge strips matching the panel face.

Matching adjoining panels: Arrange and match panels as follows:

- Generally: If panel matching is required, install panels so that the finish, texture, pattern and grain matches that of the adjoining panel, as appropriate.

3.3 PROPRIETARY PANELS

General

Installation: Mount panels using a framing system in accordance with the manufacturer's recommendations and conforming to the following:

- Panel alignment: Generally install perpendicular to the framing.
- Short edge joints: Backed by a framing member for fixing.

3.4 COMPLETION

General

Requirement: Clean finished surfaces to the panel manufacturer's recommendations. Remove adhesives, sealants and other stains. Replace damaged panels and accessories that cannot be repaired.

Operation and maintenance manuals

Requirement: Prepare a manual that includes the manufacturer's recommendations for the care and maintenance of each type of finish. Include a program for regular cleaning and instructions for removing, repairing and replacing of the finish or panel.

4 SELECTIONS

4.1 PINBOARD PANEL WALL LININGS

Pinboard panel wall linings shall be as nominated in the Finishes Schedule.

Installation shall be in accordance with the manufacturer's recommendations.

Provide an aluminium trim to the perimeter of panels as scheduled.

0651 RESILIENT FINISHES

1 GENERAL

1.1 RESPONSIBILITIES

General

Requirement: Provide resilient floor and wall finishes to substrates, as documented.

1.2 CROSS REFERENCES

General

Requirement: Conform to the following:

- 0171 General requirements.
- 0181 Adhesives, sealants and fasteners.
- 0315 Concrete finishes.
- 0522 Partitions – framed and lined.
- 0612 Cementitious toppings.
- 0621 Waterproofing – wet areas.

1.3 STANDARDS

General

Installation: To AS 1884 (2021).

Slip resistance

Classification: To AS 4586 (2013).

1.4 INTERPRETATION

Definitions

General: For the purposes of this worksection the definitions given in AS 1884 (2021) and the following apply:

- Resilient floor coverings classification: To EN ISO 10874 (2012).
- Substrate: The surface to which a material or product is applied.
- Underlay: An in situ levelling material on the substrate to provide a smooth and level surface.

1.5 SUBMISSIONS

Fire performance

Fire hazard properties: Submit evidence of conformity to PRODUCTS, **FIRE PERFORMANCE**, **Fire hazard properties**.

Operation and maintenance manuals

Requirement: Submit manual to **COMPLETION**, **Operation and maintenance manuals**.

Products and materials

Manufacturer's data: Submit the manufacturer's product data for each type of finish, and the manufacturer's recommendations for its application in the project including the following, as appropriate:

- Thickness and width of sheet or size of plank.
- Adhesive and jointing method.
- Resistance to wear, indentation, chemicals, light and fire.
- Flexibility and bending strength.

Type tests: Submit results, as follows:

- Slip resistance to AS 4586 (2013).

Samples

Range: Submit labelled samples of resilient finishes illustrating the range of colour, pattern or texture of the product.

Minimum size per sample:

- Sheets: 300 x 300 mm.
- Planks: A whole plank.
- Linear accessories, (including coving, skirting and protection strips): 300 mm long.
- Welded joints: 300 mm long.

Identification: Label each sample, with brand, product name, and manufacturer's code reference.

Trial set-out: Prepare a trial set-out before fixing.

Subcontractors

General: Submit names and contact details of proposed suppliers and installers.

Substrate acceptance: Submit evidence of installer's acceptance of the flooring substrate before starting installation.

Tests

Site tests: Submit results, as follows:

- Site slip resistance test of completed installations.
- Surface pH test.
- Moisture content test.

Warranties

Requirement: Submit warranties in accordance with the requirements of *0171 General requirements*.

- Period: 10 years.

1.6 INSPECTION

Notice

Inspection: Give notice so that inspection may be made of the following:

- Substrate immediately before fixing resilient finishes.
- Trial set-outs before execution.
- Finished surface before applying sealers or polishes (if any).
- Completed installation.

1.7 SLIP RESISTANCE AND SLIP RESISTANCE TESTING

General

Installed pedestrian surfaces shall be stable, safe and minimise risk of slipping or tripping due to slippery surfaces or misaligned joints. Slip resistance shall comply with AS 4586 (2013).

Slip resistance test certificates shall be provided in accordance with the relevant standards (AS 4586 (2013), AS 4663 (2013), HB 197 (1999) and HB 198 (2014)) to confirm slip resistance ratings are as per that specified for each resilient finish. Batch testing shall be carried out in accordance with the requirements of AS 4586 (2013) and provision of certification that the batches provided to the project have been tested not more than 12 months prior to their installation into the project.

Where no slip resistance criteria is specified, materials complying with HB 197 (1999) and HB 198 (2014) recommendations for specific usages will be submitted for approval prior to ordering. Provide test certification in the same manner as those covered by the specified slip resistance rating.

2 PRODUCTS

2.1 GENERAL

Storage and handling

Requirement: Store and handle to the manufacturer's recommendations.

Marking

Identification: Marked to show the following:

- Manufacturer's identification.
- Product brand name.
- Product type.
- Quantity.

- Product reference code and batch number.
- Date of manufacture.
- Material composition and characteristics such as volatility, flash point, light fastness, colour and pattern.

2.2 FIRE PERFORMANCE

Fire hazard properties

Critical radiant flux: Tested to AS ISO 9239.1 (2003).

2.3 UNDERLAYS

Cementitious

General: Polymer modified cementitious smoothing and self-levelling compound.

Thickness: 3 mm minimum.

2.4 ADHESIVES

General

Requirement: To the resilient finishes manufacturer's recommendations.

2.5 SHEETS AND PLANKS

Polyvinyl chloride (PVC)

Standard: To AS 1884 (2021) and as follows:

- Homogeneous: To EN ISO 10581 (2020).
- Heterogeneous: To EN ISO 10582 (2018).
- PVC on jute or polyester felt backing: To EN 650 (2012).
- Heterogeneous PVC on foam layer: To EN ISO 11638 (2022).
- PVC with particle based enhanced slip resistance: To EN 13845 (2017).
- PVC semi-flexible vinyl composition tiles (VCT): To EN ISO 10595 (2012).

Slip-resistant sheet vinyl

Slip resistance classification: To AS 4586 (2013).

3 EXECUTION

3.1 SUBCONTRACTORS

General

Requirement: Use specialist installers recommended by the material manufacturers.

3.2 PREPARATION

Substrates

General: To AS 1884 (2021) Section 3.

Substrate tolerance table

Property	Length of straightedge laid in any direction	Maximum deviation under the straightedge
Planeness	2 m	4 mm
Abrupt deviations	150 mm	0.5 mm

Concrete substrates

Requirement: Do not start installation of the resilient finishes until the concrete substrate conforms to AS 1884 (2021) clause 3.1 and the adhesive and resilient finish manufacturers' recommendations.

Substrate rectification: Conform to the following:

- Surface treatments: Mechanically remove any incompatible surface treatments, including the following:
 - . Sealers and hardeners.
 - . Curing compounds.

- . Waterproofing additives.
- . Surface coatings and contamination.
- Planeness, smoothness, projections: Remove projections and fill voids and hollows with a smoothing and self-levelling compound compatible with the adhesive. Allow filling or levelling compound to dry to manufacturer's recommendations.

Cleaning: Remove loose materials or dust.

Working environment

General: Do not start work before the building is enclosed, wet work is complete and dry, overhead work is complete and good lighting is available. Protect adjoining surfaces.

Conditioning

Conditioning of floor covering and subfloor: To AS 1884 (2021) clause 4.1 and manufacturer's recommendations.

Trial set-out

General: Prepare a trial tile and plank set-out to each area.

Wet areas

Requirement: Where resilient finishes are applied to floors and walls in wet areas, where wet area membranes are used, a suitable cement based smoothing compound, compatible with the membrane, the resilient finishes and associated adhesive, shall be applied over the membranes, prior to installation of the resilient finishes.

3.3 INSTALLATION

General

Requirement: To AS 1884 (2021) Section 5 and the manufacturer's recommendations.

Sheet set-out

General: Set out sheets to give the minimum number of joints. Position joints away from areas of high stress. Run sheet joints parallel with the long sides of floor areas, vertically on non-horizontal surfaces.

Plank set-out

General: Set out planks from centre of room. Align patterns, texture and grain in one direction.

Edges

General: Make sure edges are firm, unchipped and machine-cut accurately to size and square to the face, and that edges are square to each other before installation.

Joints

Non-welded: Butt edges together to form tight neat joints showing no visible open seams.

Hot welded: After fixing, groove the seams using a grooving tool and weld the joints with matching filler rod, using a hot air welding gun. When the weld rod has cooled, trim off flush.

Expansion joints

General: To the manufacturer's recommendations for joint widths, and area and length limitations.

Junctions

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

Rolling

General: If rolling is required, roll the finish in multiple directions before the adhesive sets.

Cleaning

General: Keep the surface clean as the work proceeds.

3.4 PLANKS

General

Laying: Lay as follows:

- Adhesive fix: Apply acrylic adhesive over whole subfloor surface.

General: Keep planks flat during storage. Before laying, allow the planks to relax and decompress, and make sure that the backs are free of loose material.

Laying: Lay planks in stretcher bond, unless detailed otherwise. Match edges and align joints and studs. Make sure the whole surface of the plank or accessory is in contact with the substrate.

3.5 FALLS AND LEVELS

Grading

Requirement: Grade resilient flooring to even and correct falls to floor wastes and elsewhere as required. Make level junctions with walls. Where falls are not required, lay level.

Fall: Conform to falls as documented and the following:

- Falls to floor wastes: 1:80 minimum.

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

3.6 JOINTS AND ACCESSORIES

Junctions

General: Where seams or changes of floor finish occur at doorways, locate the joint on the centreline of the closed door leaf.

Accessories

General: Provide purpose-made matching moulded accessories for nosings, coves, skirtings, edge cover strips and finishes at junctions, margins, and angles, if available. Otherwise, form accessories from the resilient finish material. Provide solid backing for radiused coves and nosings.

Junctions with other floor finishes

General: Unless detailed otherwise, maintain the finished floor level at junctions with other floor finishes. Diminishing strips at changes in floor finishes will not be accepted. Provide an aluminium L-shaped trim, maximum 3mm thick, at the junction ensuring that floor finishes, on each side, and the top of the trim are finished at the same height.

Edge strips and threshold strips

Installation: To AS 1428.1 (2021) and the manufacturer's recommendations.

Caulked joints

General: Provide caulked joints filled with sealant and finished flush with the flooring surface at the junction of built in joinery and other fixtures in contact with the floor.

Control joints

Location: Provide control joints as follows:

- Over structural control joints.
- At junctions between different substrates.

Depth of joint: Right through to the substrate.

Sealant width: 6 to 25 mm.

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

Control joint materials – sheet flooring

Proprietary slide plate divider strip: Provide interlocking metal plates grouted into pockets formed in the concrete joint edges to finish flush with the flooring surface.

Coved skirtings

Site formed coving: Carry the flooring material up over a profiled coving section to form the skirting and mitre and weld all joints. Make sure the radius of the coving section conforms to the floor finish manufacturer's recommendations for sheeting material and thickness.

Cove formers shall generally achieve a cove radius of 10mm at the floor/ wall junction, unless detailed otherwise.

Height: As nominated in the Finishes Schedule and/ or as detailed on the drawings.

3.7 TESTING

Substrate tests

Moisture content: Test substrate for suitability for the installation of resilient floor coverings to AS 1884 (2021) Appendix A.

- Maximum relative humidity of concrete: To AS 1884 (2021) Appendix A3.2.

Surface pH: Test concrete subfloor for suitability for the installation of resilient floor coverings to AS 1884 (2021) Appendix C.

- Maximum pH: 10.

Site tests

Slip resistance of completed installation: To AS 4663 (2013).

3.8 COMPLETION**Protection**

Finished floor surface: Keep traffic off floors for a minimum of 24 hours after laying or until bonding has set, whichever period is the longer. Avoid contact with water for minimum 7 days after laying.

Reinstatement

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

Cleaning

General: Clean the finished surface. Buff and polish. Before the date for practical completion, mop and leave the finished surface clean and undamaged on completion.

Spare materials

General: Supply spare matching resilient finishes and accessories of each type for future replacement purposes. Store the spare materials on site where directed.

Quantity: At least 1% of the quantity installed.

Storage location: On site as directed by the Superintendent.

Operation and maintenance manuals

General: Prepare a manual that includes manufacturer's recommendations for care and maintenance for each type of finish.

4 SELECTIONS

4.1 VINYL SHEET FLOORING

Background/ base: Power floated concrete slab/ graded screed.

Preparation: In accordance with the manufacturer's recommendations.

Vinyl sheet shall be as nominated in the Finishes Schedule.

Adhesive and primer shall be as recommended by the manufacturer.

Seam welding: Hot weld with welding rod.

Finishing: Mop wash or lightly machine scrub with alkaline cleaner in accordance with the manufacturer's recommendations.

Special requirements: Coved skirtings on support formers.

Slip resistance: Oil wet ramp test: R10.

4.2 VINYL PLANK FLOORING

Background/ base: Power floated concrete slab.

Preparation: In accordance with the manufacturer's recommendations.

Vinyl planks shall be as nominated in the Finishes Schedule.

Adhesive and primer shall be as recommended by the manufacturer.

Finishing: Mop wash or lightly machine scrub with alkaline cleaner in accordance with the manufacturer's recommendations.

Slip resistance: Oil wet ramp test: R10.

4.3 SHEET WALL VINYL

Background/ base: Plasterboard lined walls.

Preparation: In accordance with the manufacturer's recommendations.

Wall vinyl shall be as nominated in the Finishes Schedule.

Adhesive and primer shall be as recommended by the manufacturer.

Seam welding: Hot weld with welding rod.

Finish resilient sheet wall lining neatly at the top edge, ensuring a straight and level line with no irregularities.

0652 CARPET

1 GENERAL**1.1 RESPONSIBILITIES****General**

Requirement: Provide carpet to substrates, as documented.

Performance

Requirement: Make sure carpets:

- Remain secure and consistently smooth for the warranted life of the carpet under normal use conditions.
- Form the pattern required, where applicable.

1.2 CROSS REFERENCES**General**

Requirement: Conform to the following:

- 0171 *General requirements.*
- 0181 *Adhesives, sealants and fasteners.*
- 0315 *Concrete finishes.*
- 0612 *Cementitious toppings.*

1.3 STANDARDS**Slip resistance**

Classification: To AS 4586 (2013).

1.4 INTERPRETATION**Abbreviations**

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

- ACCS: Australian Carpet Classification Scheme.
- CIAL: Carpet Institute of Australia Limited.
- ECS: Environmental Certification Scheme.
- IRA: Insect Resist Agent.
- VOC: Volatile Organic Compound.

Definitions

General: For the purposes of this worksection, the definitions given in AS 2454 (2007), AS 2455.1 (2019) and AS 2455.2 (2019) apply.

1.5 TOLERANCES**General**

Requirement: To AS/NZS 1385 (2007).

1.6 SUBMISSIONS**Fire performance**

Fire hazard properties: Submit evidence of conformity to PRODUCTS, **FIRE PERFORMANCE**, **Fire hazard properties**.

Operation and maintenance manuals

Requirement: Submit manual to **COMPLETION**, **Operation and maintenance manuals**.

Products and materials

Manufacturer's documentation: Submit copies of the following data:

- Product data sheets.

Slip resistance classification: Submit evidence of conformity to documented requirements.

Type tests: Submit results of the manufacturer's testing as evidence of conformity to documented requirements.

Samples

General: Submit labelled production run samples demonstrating the range of colour, pattern, texture and pile yarn available in the required carpet types.

Sample size: Submit the following:

- Carpet tiles: 4 x tile size.
- Edge strip, trims and extrusions: Submit a 300 mm length of each type.

Penetrations: If required, submit one production carpet sample with a penetration access cut.

Shop drawings

General: Submit a floor covering plan to a scale that best describes the detail, including set-out point, location of joints and conformance to AS 2455.1 (2019) clauses 2.2.2 and 2.2.3.

Subcontractors

General: Submit name and contact details of proposed suppliers and installers.

Tests

Moisture content and alkalinity of substrate: Submit test report as evidence of conformity to

PREPARATION, Substrate.**Warranties**

Requirement: Submit warranties in accordance with the requirements of *0171 General requirements*.

- Period: 10 years.

1.7 INSPECTION**Notice**

Inspection: Give notice so that inspection may be made of the following:

- Each batch of material upon delivery.
- Trial set-outs before execution.
- Fixings and edge strips installed ready to lay carpet.
- Completed carpet after cleaning and before covering for protection.

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

Requirement: Store on a flat, clean, dry, well ventilated and secure storage area, elevated above the subfloor and unaffected by weather.

2.2 FIRE PERFORMANCE**Fire hazard properties**

Critical radiant flux: Tested to AS ISO 9239.1 (2003).

2.3 CARPET**Batching**

Requirement: Carpet from one manufacturing batch and dye lot.

Antimicrobial treatment

Requirement: Non-metallic, colourless, odourless, positively charged polymer applied during manufacturing to form a molecularly bonded surface to resist bacteria and mould growth.

Insect resistance

Requirement: Carpets comprising materials either inherently resistant to insect attack or treated against insect attack by moth and carpet beetle, by application of insect resist agents (IRA) to the wool and wool blend yarns during wet processing at the manufacturing stage.

Insect resist treatment of wool: Application Level 4 to the recommendations of Woolmark Specification CP-4 (2016).

Electrostatic propensity

Maximum electrostatic propensity value: 2500 V at a relative humidity of 25% tested to AATCC TM 134 (2019).

Stain and soil resistance

Requirement: Colourless acid-based dye stain blocker applied to dyed fibres.

Total VOC

Total VOC emission tested to ISO 10580 (2010): < 0.5 mg/m²/h.

2.4 CARPET TILES**General**

Type: Non-stick, non-curling carpet tiles capable of being taken up without damage and then re-laid in different positions.

Marking: On the back, showing manufacturer's instructions or directional arrow for laying.

Tolerances

Requirement: Conform to the following:

- Dimensional tolerance: 0.2%.
- Squareness: Maximum difference of 2 mm between lengths of diagonals.

Sustainable carpet tile backing

Re-usable backing: Proprietary vinyl backing to carpet tiles capable of separation and recycling in new carpet tiles.

2.5 UNDERLAYS**Application**

Performance: To AS 2455.1 (2019) clause 1.5.2.

Cementitious

General: Polymer modified cementitious smoothing and self-levelling compound.

Thickness: 3 mm minimum.

2.6 OTHER MATERIALS**Adhesives**

General: Compatible with the floor covering material, and suitable for bonding it to the subfloor to AS 2455.1 (2019) clause 1.5.3.

Friction compound: Suitable for holding carpet tiles in position without permanent sticking.

2.7 ACCESSORIES**Junctions**

General: Where seams or changes of floor finish occur at doorways, locate the joint on the centreline of the closed door leaf.

Junctions with other floor finishes

General: Unless detailed otherwise, maintain the finished floor level at junctions with other floor finishes. Diminishing strips at changes in floor finishes will not be accepted. Provide an aluminium L-shaped trim, maximum 3mm thick, at the junction ensuring that floor finishes, on each side, and the top of the trim are finished at the same height.

Edge strips and threshold strips

Installation: To AS 1428.1 (2021) and the manufacturer's recommendations.

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

Pre-installation requirements: To AS 2455.1 (2019) Section 2.

Working environment: Do not start work before the building is enclosed, wet work is complete and dry, overhead work is complete and good lighting is available.

Protection: Protect adjoining surfaces.

Substrates

General: Conform to the following:

- To AS 2455.2 (2019).
- Clean and free of any deposit or finish which may impair adhesion or location and functioning of control joints.
- Free of any imperfections, including ridges, indentations and projections which may adversely affect the installed carpet.

Concrete substrate rectification: Remove projections, grind as necessary and fill voids and hollows with a levelling compound compatible with the adhesive to achieve the required tolerance.

Moisture content and alkalinity of concrete substrate: Do not start installation until the moisture content and alkalinity of the concrete substrate has been tested to **TESTING, Substrate tests** and conforms to the values in AS 2455.1 (2019) Appendix B.

Fixtures: Remove door stops and other fixtures, and refix in position undamaged on completion of the installation. Make sure fixings penetrate substrate and are stable.

Substrate tolerance table

Property	Length of straightedge laid in any direction	Maximum deviation under the straightedge
Planeness	2 m	4 mm
Smoothness	150 mm	1 mm

Conditioning

General: Stabilise the room temperature for seven days before, and two days after laying carpet as follows:

- Areas with air conditioning installed: Run air conditioning at operational temperature.
- Air conditioned areas not operational: Maintain a room temperature range between 10°C and 35°C.
- Non-air conditioned areas: Install at room temperature between 10°C and 35°C.

Carpet tiles: Unpack tiles at least 48 hours before installation.

3.2 INSTALLATION – CARPET TILES

General

Installation: To AS 2455.2 (2019) and the manufacturer's recommendations.

Set-out: Do not provide cut tiles which are less than half a tile width. Provide full tiles in doorways. Keep joint lines straight.

Laying: Do not allow the pile to catch in the joint.

3.3 TESTING

Substrate tests

Moisture content and alkalinity of concrete substrate: Test substrate to AS 2455.1 (2019) Appendix B.

3.4 COMPLETION

Spares

Spare material: Supply spare matching materials of each type, colour and design of carpet from the same batch for future replacement purposes.

Labelling: Label spare material appropriately, including the location of the laid area corresponding to each batch. Securely and separately package each batch in a suitable wrapping.

Quantity of spare material: At least 1% of the quantity installed.

Storage location: On site as directed by the Superintendent.

Cleaning

Requirement: Progressively clean the work. Remove waste, excess materials and adhesive.

Final cleaning: When the installation is complete, clean the carpet as necessary to remove extraneous matter, marks and soiling and to lift the pile where appropriate.

Protection

Requirement: Provide fabric drop sheets. Do not use plastic sheeting. If wheeled traffic is to follow carpet installation, protect with hardboard sheets butted and fixed with adhesive tape.

Operation and maintenance manuals

Requirement: Prepare a manual that includes the following:

- A technical specification of the carpet installation.
- The manufacturer's recommendations for use, care and maintenance of the carpet to AS/NZS 3733 (2018).
- The names and address of the supplier and manufacturer of each component.

4 SELECTIONS

4.1 CARPET TILES

Background/ base: Power floated concrete slab.

Preparation: Make good to substrate as required. Ensure there are no ridges, undulations, or the like, in the substrate that may cause premature wear to the carpet.

Carpet tiles shall be as nominated in the Finishes Schedule.

Method of laying: 100% tackifier as recommended by the manufacturer.

0671 PAINTING

1 GENERAL**1.1 RESPONSIBILITIES****General**

Requirement: Provide coating systems to substrates, as documented.

Performance

Requirement: Provide coating systems as follows:

- Consistent in colour, gloss level, texture and dry film thickness.
- Free of runs, sags, blisters, or other discontinuities.
- Paint systems which are fully opaque or at the documented level of opacity.
- Clear finishes at the level of transparency consistent with the product.
- Fully adhered.
- Resistant to environmental degradation within the manufacturer's stated life span.

1.2 CROSS REFERENCES**General**

Requirement: Conform to the following:

- 0171 *General requirements*.

1.3 STANDARDS**Painting**

General: To the recommendations of those parts of AS/NZS 2311 (2017) referenced in this worksection.

1.4 INTERPRETATION**Definitions**

General: For the purposes of this worksection, the definitions given in AS/NZS 2310 (2002) and the following apply:

- Gloss unit: Numerical value for the amount of specular reflection relative to that of a standard surface under the same geometric conditions.
- Levels of gloss finish: When the specular direction is 60 degrees, surfaces with the following specular gloss reading are defined as follows:
 - . Full gloss: > 85 gloss units.
 - . Gloss: > 50 and ≤ 85 gloss units.
 - . Semi-gloss (satin): > 20 and ≤ 50 gloss units.
 - . Low gloss (low sheen): > 5 and ≤ 20 gloss units.
 - . Flat finish (matt): ≤ 5 gloss units.
- Paint: A product in liquid form that, when applied to a surface, forms a dry film having protective, decorative or other specific technical properties.
- Primer, prime coat: The first coat of a coating system that helps bind subsequent coats to the substrate and which may inhibit its deterioration.
- Substrate: The surface to which a material or product is applied.
- Undercoat: An intermediate coat formulated to prepare a primed surface or other prepared surface for the finishing coat.

1.5 SUBMISSIONS**Samples**

Clear finish coatings: Submit samples of timber or timber veneer matching those to be used in the works as follows:

- Requirement: Label for identification and prepare, putty, stain, seal and coat in conformance with the documented system.
- Size: Large enough to be cut into 4 segments.

Opaque coatings: Submit labelled samples of each coating system, on representative substrates, showing surface preparation, colour, gloss level, texture, and physical properties.

Products and materials

General: Submit the following at least 3 weeks before the paint is required:

- Paint brand name and product range quality statement.
- The published recommendations for maintenance.

Subcontractors

Specialist applicators: Submit name and contact details of proposed specialist applicators.

Warranties

Requirement: Submit warranties in accordance with the requirements of *0171 General requirements*.

- Period: 7 years.

1.6 INSPECTION

Notice

Inspection: Give notice so that inspection may be made of the following:

- Painting/ clear finishing stages:
 - . Completion of surface preparation.
 - . After application of final coat.

2 PRODUCTS

2.1 GENERAL

Storage and handling

General: Store materials not in use in tightly covered containers in well-ventilated areas with temperatures maintained at the manufacturer's recommendations.

Marking

Identification: Marked to show the following:

- Manufacturer's identification.
- Product brand name.
- Product type.
- Quantity.
- Product reference code and batch number.
- Date of manufacture.
- Material composition and characteristics such as volatility, flash point, light fastness, colour and pattern.

2.2 PAINTING MATERIALS

Standards

Paint types: To AS/NZS 2311 (2017) Table 4.2 and the following:

- Metal primer - general purpose for iron and steel: To AS/NZS 3750.19 (2008).
- Metal primer - latex for metallic zinc surfaces: To AS 3730.15 (2006).
- Metal primer - solvent borne for ferrous metallic surfaces: To AS 3730.21 (2006).
- Metal primer - zinc-rich organic for iron and steel: To AS/NZS 3750.9 (2009).

Combinations

General: Do not combine products from different manufacturers in a paint system.

Clear timber finish systems: Provide only the combinations of putty, stain and sealer recommended by the manufacturer of the topcoat.

Putty and fillers

Material: To the recommendations of the paint system manufacturer, suitable for the substrate and compatible with the primer.

Tinting

General: Provide only products which are colour tinted by the manufacturer or supplier.

Toxic ingredients

General: To the *Therapeutic Goods (Poisons Standard) Instrument (2024)* Part 2 Division 9.

3 EXECUTION**3.1 PREPARATION****Order of work**

Other trades: Before painting, complete the work of other trades as far as practicable within the area to be painted, except for the installation of fittings, floor sanding and laying flooring materials.

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

Protection

General: Before painting, clean the area and protect it from dust contamination. Use drop sheets and masking agents to protect surfaces, including finished surfaces and adjacent finishes, during painting.

Fixtures and furniture: Remove door furniture, switch plates, light fittings and other fixtures before painting, and conform to the following:

- Labelling and storage: Attach labels or mark fixtures using a non-permanent method, identifying location and refixing instructions, if required. Store and protect against damage.

Difficult to remove fixtures: Where removal is impractical or difficult, apply surface protection before substrate preparation and painting.

Wet paint warning

Notices: Place in a conspicuous location and do not remove until the paint is dry.

Substrate

General: Prepare substrates to receive the documented paint systems, to the paint manufacturer's recommendations.

Cleaning: Clean down the substrate surface. Do not cause damage to the substrate or the surroundings.

Filling: Fill cracks and holes with fillers, sealants, putties or grouting cements as appropriate for the finishing system and substrate, and sand smooth.

- Clear finish: Provide filler tinted to match the substrate.

Clear timber finish systems: Prepare the surface so that its attributes will show through the clear finish without blemishes, using methods including the following:

- Removal of bruises.
- Removal of discolourations, including staining by oil, grease and nail heads.
- Bleaching where necessary to match the timber colour sample.
- Puttying.
- Fine sanding, with the last abrasive no coarser than 220 grit, so that there are no scratches across the grain.

Treated surfaces: If surfaces have been treated with preservatives or fire retardants, make sure the paint system is compatible with the treatment and does not adversely affect its performance.

Substrate moisture content

Requirement: Use a moisture meter to demonstrate that the moisture content of the substrate is at or below the recommended maximum level for the type of paint and the substrate material.

Unpainted surfaces

Standard: To AS/NZS 2311 (2017) Section 3.

Cleaning external surfaces

Sound external surfaces other than timber: Remove dirt, grease, loose and foreign matter, efflorescence and mould by water blasting or steam cleaning without damaging the surface. Remove remaining loose material with appropriate hand tools.

Efflorescence: Eliminate the source of salt and water before cleaning. Allow surface to dry for 15 to 30 days before repainting.

3.2 PAINTING SYSTEMS**General**

Number of coats: Except where one or two coat systems are documented, each paint system consists of at least 3 coats.

New unpainted interior surfaces

Standard: To AS/NZS 2311 (2017) Table 5.1.

New unpainted exterior surfaces

Standard: To AS/NZS 2311 (2017) Table 5.2.

Specialised painting systems

Standard: To AS/NZS 2311 (2017) clause 5.2.

3.3 APPLICATION**Paint application**

Standard: To AS/NZS 2311 (2017) Section 6.

Timing: Apply the first coat immediately after substrate preparation and before contamination of the substrate can occur. Apply subsequent coats after the manufacturer's recommended drying period has elapsed.

Light levels

General: ≥ 400 lux.

Painting conditions

General: Unless the paint is recommended, by the manufacturer, for such conditions, do not paint under the following conditions:

- Dusty conditions.
- Relative humidity: $> 85\%$.
- Surface temperature: $< 10^{\circ}\text{C}$ or $> 35^{\circ}\text{C}$.

Priming timber before fixing

General: Apply one coat of wood primer, 2 coats to end grain, to all timber surfaces that will be inaccessible after installation, before fixing in position.

Spraying

General: If the paint application is by spraying, use conventional or airless equipment which conforms to the following:

- Satisfactorily atomises paint being applied.
- Does not require paint to be thinned beyond the maximum amount recommended by the manufacturer.
- Does not introduce oil, water or other contaminants into the applied paint.

Coatings with known health hazards: Not permitted on site.

Sanding

Clear finishes: Sand the sealer using abrasives no coarser than 320 grit without cutting through the colour. Take special care with round surfaces and edges.

Repair

Requirement: Clean off marks, paint spots and stains progressively and restore damaged surfaces to their original condition.

Maintenance painting: To AS/NZS 2311 (2017) Section 8.

Repair of galvanizing

Cleaning: For galvanized surfaces which have been subsequently welded, power tool grind to remove all surface contaminants, including rust and weld splatter. Prime affected area immediately after cleaning.

Primer: Type 2 organic zinc-rich coating for the protection of steel to AS/NZS 3750.9 (2009).

Tinting

General: Tint each coat of an opaque coating system so that each has a noticeably different tint from the preceding coat, except for top coats in systems with more than one top coat.

Doors

Drying: Maintain door leaf in the open position during drying. Do not allow door hardware or accessories to damage the door finish during the drying process.

3.4 COMPLETION**General**

Protection and masking: Remove masking and protection coverings before paint has dried.

Cleaning: On completion of painting, remove splatters by washing, scraping or other methods which do not scratch or damage the surface.

Reinstatement: Repair, replace or refinish any damage, including works of other trades. Touch up new damaged paintwork or misses only with the paint batch used in the original application.

Fixtures: Refix removed and undamaged fixtures in the original locations. Make sure they are properly fitted and in proper working order.

Disposal of paint and waste materials

Requirement: Conform to requirements of the local government authority.

4 SELECTIONS**4.1 GENERAL**

Paint systems shall be as nominated in the Finishes Schedule and as detailed below.

Minimum dry film thicknesses for paint systems shall be in accordance with the manufacturer's current written instructions to ensure opacity of the finished coatings and to achieve the required performance.

The preparation and application of the nominated paint systems, including the use of primers, where applicable, shall comply with the manufacturer's current written instructions.

4.2 INTERIOR ACRYLIC PAINT – LOW SHEEN

Product: Dulux EnvirO2 Interior Low Sheen or acceptable equivalent.

Surfaces:

- Plasterboard lined walls and ceilings.

Preparation and application: In accordance with the manufacturer's written instructions.

Coatings:

- Primer: Dulux EnvirO2 Acrylic Sealer Undercoat.
- Finishing coats: Two coats of Dulux EnvirO2 Interior Low Sheen or as required to achieve the specified DFT.

Brush, roller or spray application to the acceptance of the Superintendent. Spray application shall be 'back-rolled'.

System DFT: 80 microns.

Colours: As scheduled.

To wet areas, apply Dulux Wash & Wear +PLUS Kitchen & Bathroom Low Sheen Acrylic in lieu of the Dulux EnvirO2 Interior Low Sheen top coats.

4.3 INTERIOR ACRYLIC ENAMEL PAINT – SEMI GLOSS

Product: Dulux Aquanamel Semi Gloss or acceptable equivalent.

Surfaces:

- Internal timber doors.

Preparation and application: In accordance with the manufacturer's written instructions.

Coatings:

- Primer: Dulux 1 Step Oil Based Primer Sealer Undercoat applied off-site to bare natural timber to prevent tannin leaching.
- Finishing coats: Two coats of Dulux Aquanamel Semi Gloss or as required to achieve the specified DFT.

Spray, roller or brush application to the acceptance of the Superintendent. Spray and roller applications shall be followed by brush strokes to provide an even and uniform "brushed" appearance.

System DFT: 90 microns.

Colours: As scheduled.

4.4 EXTERIOR ACRYLIC PAINT – SEMI GLOSS

Product: Dulux Weathershield Semi Gloss or acceptable equivalent.

Surfaces:

- External timber doors.

Preparation and application: In accordance with the manufacturer's written instructions.

Coatings:

- Primer: Dulux 1 Step Oil Based Primer Sealer Undercoat applied off-site to bare natural timber to prevent tannin leaching.
- Finishing coats: Two coats of Dulux Weathershield Semi Gloss or as required to achieve the specified DFT.

Spray, roller or brush application to the acceptance of the Superintendent. Spray and roller applications shall be followed by brush strokes to provide an even and uniform "brushed" appearance.

System DFT: 90 microns.

Colours: As scheduled.

4.5 ACRYLIC ENAMEL PAINT TO INTERNAL METALWORK – SEMI GLOSS

Product: Dulux Aquanamel Semi Gloss or acceptable equivalent.

Surfaces:

- Internal steel door frames.

Preparation and application: In accordance with the manufacturer's written instructions.

Coatings:

- Primer: One coat of Dulux Professional Galvanised Iron Primer.
- Finishing coats: Two coats of Dulux Aquanamel Semi Gloss.

Spray, roller or brush application to the acceptance of the Superintendent. Spray and roller applications shall be followed by brush strokes to provide an even and uniform "brushed" appearance.

System DFT: 80 microns.

Colours: As scheduled.

4.6 ACRYLIC PAINT TO EXTERNAL METALWORK – SEMI GLOSS

Product: Dulux Weathershield Semi Gloss or acceptable equivalent.

Surfaces:

- External steel door frames.

Preparation and application: In accordance with the manufacturer's written instructions.

Coatings:

- Primer: One coat of Dulux Professional Galvanised Iron Primer.
- Finishing coats: Two coats of Dulux Weathershield Semi Gloss or as required to achieve the specified DFT.

Spray, roller or brush application to the acceptance of the Superintendent. Spray and roller applications shall be followed by brush strokes to provide an even and uniform "brushed" appearance.

System DFT: 80 microns.

Colours: As scheduled.

0673 POWDER COATINGS

1 GENERAL

1.1 RESPONSIBILITIES

General

Requirement: Provide powder coating systems to substrates, as documented.

1.2 CROSS REFERENCES

General

Requirement: Conform to the following:

- 0171 General requirements.

1.3 STANDARDS

Substrates

Application to aluminium and aluminium alloy substrates for architectural applications: To AS 3715 (2002) and AAMA 2603 (2022), AAMA 2604 (2022) and AAMA 2605 (2022) as appropriate.

Application to metal substrates other than aluminium for architectural applications: To AS 4506 (2024).

1.4 INTERPRETATION

Definitions

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

- Powder coating: The process of preparing, applying, fusing and curing a thermoset powder coating material to a substrate:
 - . Thermoset powder coating: A mixture of finely ground particles of pigment and resin sprayed on to a prepared substrate. Charged powder particles adhere to electrically grounded surfaces until heated and fused into a smooth coating in a curing oven.
 - . Polyester powder coating: Uses an enhanced polyester resin.
 - . Fluoropolymer powder coating: Uses PTFE (poly tetra fluoro ethylene) for aluminium substrates.
- Substrate: The surface to which a material or product is applied.

1.5 SUBMISSIONS

Products and materials

Coating manufacturer: Submit the following details at least 3 weeks before fabrication:

- Recommended coating system for the nominated service condition.
- Brand name.
- Storage and handling recommendations.
- Product data sheets.
- Maintenance recommendations.

Samples

Powder coat samples: Submit labelled samples of each coating system, on representative samples, showing surface preparation, colour, gloss level, texture, and physical properties.

Subcontractors

Specialist applicators: Submit name and contact details of proposed specialist applicators as registered by the coating manufacturer.

Warranties

Requirement: Submit warranties in accordance with the requirements of 0171 General requirements.

- Period:
 - . Aluminium substrates: 10 years.
 - . Steel substrates: Up to 10 years, according to the corrosivity category of the Site.

2 PRODUCTS

2.1 GENERAL

Storage and handling

General: To AS 3715 (2002) Appendix D for powder coated aluminium and AS 4506 (2024) Appendix D for all other powder coated materials.

2.2 MATERIALS

Performance requirements

Powder coating to aluminium and aluminium alloy: To AS 3715 (2002) Section 2.

Powder coating to metals, other than aluminium: To AS 4506 (2024) Section 2.

3 EXECUTION

3.1 PREPARATION

Substrate pre-treatment and application

Powder coating to aluminium: To AS 3715 (2002) Appendix G.

Powder coating to metals, other than aluminium: To AS 4506 (2024) Appendix I.

3.2 COMPLETION

Cleaning

Aluminium architectural applications: Clean completed assembly to AS 3715 (2002) Appendix C.

Metal, other than aluminium, architectural applications: Clean completed assembly to AS 4506 (2024) Appendix E.

4 SELECTIONS

4.1 POWDER COATING GENERALLY

Powder coating to metal substrates shall be as nominated in the Finishes Schedule.

Where powder coatings are applied to perforated substrates, surfaces shall be primed in accordance with the manufacturer's recommendations prior to application of the powder coating.

For zinc coated and mild steel, demonstrate compliance with the requirements of AS 4506 (2024) by providing a certificate from the coating applicator stating the atmospheric classification, substrate material and method of surface preparation. Application of powder coating to steel shall include suitable surface preparation and priming, in accordance with the powder coat manufacturer's recommendations, to achieve a warrantable system.

Powder coating products must be applied by an applicator registered with the manufacturer.

0811 FIXTURES AND FITTINGS

1 GENERAL

1.1 RESPONSIBILITIES

General

Requirement: Provide fixtures and fittings as documented.

1.2 CROSS REFERENCES

General

Requirement: Conform to the following:

- 0171 *General requirements.*
- 0181 *Adhesives, sealants and fasteners.*
- 0183 *Metals and prefinishes.*

1.3 STANDARDS

Authorised products

Standard: Listed in the WaterMark Product Database, unless otherwise required by the Network Utility Operator.

Standards

Sanitary fixtures and tapware: To ATS 5200 series.

Toilets: To AS 1172.1 (2014) and AS 1172.2 (2014).

Sinks: To AS 1172.4 (2019).

Toilet suites and sinks for disabled persons: To AS 1428.1 (2021).

Grab rails: To AS 1428.1 (2021).

Labelling

Water efficiency labelling: Provide only products conforming to and labelled to the Water Efficiency Labelling Scheme (WELS).

1.4 SUBMISSIONS

Samples

One of each fixture, fitting and accessory. Upon acceptance, and where deemed suitable by the Superintendent, the samples may be incorporated into the work.

Warranties

Requirement: Submit warranties in accordance with the requirements of 0171 *General requirements.*

- Period: As offered by the manufacturer.

2 PRODUCTS

2.1 GENERAL

All fixtures shall be free from imperfections, true to line, angles, curves and colours, smooth, watertight, where required, and complete in every respect.

All porcelain sanitary fixtures shall be of fired vitreous chinaware of the best quality, non-absorbent and burned so that the whole mass is thoroughly fused and vitrified, producing a material, white in colour, which when fractured shows a homogeneous mass, close grained and free from pores.

One manufacturer shall supply all fixtures, unless specified otherwise.

2.2 SEALANT POINTING

Sealant shall be silicone based with fungicide.

3 EXECUTION

3.1 GENERAL

All fixtures and fittings shall be installed in accordance with the manufacturer's recommendations. Assemble and install fixtures, fittings and accessories so that surfaces designed with falls drain as intended.

Use non-ferrous or stainless steel fastenings, unless otherwise specified.

Noggings, bearers, etc, required to support fixtures and fittings shall be accurately positioned and securely fixed.

Reinforcing shall be provided as required to ensure a rigid and secure assembly. Exposed surfaces shall be free from dents, tool marks, warpage, buckle, glue and open joints. All joints, corners and mitres shall be accurately fitted. Fastenings shall be concealed. Threaded connections shall be made up tightly so that threads are entirely concealed.

All joints and corners shall be accurately fitted to shapes and dimensions shown, with all lines, angles and surfaces in true alignment, plumb, level and in proper plane.

Use the proper thickness of metal, adequate stiffeners, supports and proven details of assembly so that the finished material conforms to the highest standards of the industry. Reinforce members and joints with steel plates, bars, rods or angles for rigidity and strength as needed.

Do not install units that have members that are warped, bowed, deformed or otherwise damaged or defaced. Remove and replace such members as directed.

Accurately cut and form the materials to the required shape and profile with all exposed surfaces free from irregularities and defects. Carefully fit and match all components before assembly to maintain continuity of line between them. Provide hairline joints between contact surfaces of non-welded joints, unless shown otherwise. Complete all cutting, drilling, welding, etc, before the application of final finishes.

Drill, countersink and tap components as necessary to receive threaded fasteners. Use concealed fasteners wherever possible. Set out exposed fasteners where permitted in an even manner.

Accurately align components and rigidly secure all non-moving joints by welding or fixing with machine screws or bolts. Reinforce joints and components as necessary to achieve the required strength and provide proper joint fixing. Ensure that no areas of unfinished material are visible in the finished work. Drive in all exposed fasteners level and flush with the adjacent surfaces. Disassemble only to the extent necessary to facilitate transportation to Site.

All elements of framework and associated beads and strips shall be stored on Site such that they do not get damaged or distorted.

At Practical Completion, remove protective coverings, tapes, etc, and check for damage and defects. Test for satisfactory operation and replace all damaged or defective components/ accessories. Thoroughly clean the whole installation.

3.2 SANITARYWARE

Toilet seats and lids shall be stable when raised.

Cisterns:

- Cistern operating components shall be as recommended by the cistern manufacturer. The ball valve shall match the pressure of the water supply.
- Fix cisterns at heights recommended by the manufacturer unless otherwise specified or shown on the drawings.
- Fix overflow pipe to falls and locate to give visible warning of discharge.

Fix taps securely, making a watertight seal with the associated fixture.

Wastes/ overflows shall be bedded in waterproof jointing compound and fixed with a resilient washer between fixture and backnut.

3.3 FIXING OF TAPS

Taps shall be fixed securely, making a watertight seal with the associated fixture.

4 SELECTIONS

4.1 SANITARY FIXTURES AND FITTINGS

Sanitary fixtures and fittings, including toilets, basins, tapware, grab rails and sundry accessories and equipment, shall be as nominated in the FFE Schedule.