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5 Curran St, North Melbourne

Issued for Tender



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Revision	Description	Date	Approved by
T1	Issue for Tender	16.05.2022	AF
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Summary of project

Apartment Summary	
Typology	Total
1 bed and 1 bath	1
2 beds and 2 baths	2
3 beds, 1 study, 3 baths and 1 powder room	1
3 beds and 2 baths	8
	12

Parking Type	Total
Standard car space 4900 x 2600	18
Wide car space 4900 x 2700	2
Wide car space 4900 x 3000	2
	22

5 CURRAN STREET, NORTH MELBOURNE

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0121 TENDERING

1 CONDITIONS OF TENDERING

1.1 RESPONSIBILITIES

General

Requirement: Provide a complete genuine tender.

1.2 GENERAL

Status

General: These conditions of tendering do not form part of the contract.

Interpretation

General: In these conditions of tendering, the word principal has the same meaning as owner and proprietor.

1.3 PROJECT INFORMATION

Outline description of the works

Description: 3 storey multi-unit residential development consist of 12 units boutique apartments above single basement carpark.

Description of the site

Location: 5 Curran Street, North Melbourne VIC 3051

Tender documents

The tender documents comprise the following:

- Conditions of tendering.
- Schedule of rates.
- Bills of quantities.
- General conditions of contract.
- Special conditions of contract.
- Schedule or annexure to general conditions of contract, partly pre-completed.
- Specifications.
- Drawings.
- Nominated subcontracts.
- Deeds of novation for nominated or selected subcontracts.
- Subcontract interfacing information, including services and facilities.
- Geotechnical site investigation reports, as follows: [complete/delete]
- WHS Safety Report (Design risk assessment): [complete/delete]
- Other documents issued by the principal for the purpose of tendering, as follows: [complete/delete]

Security: Do not disclose to third parties tender documents marked with a classification such as Restricted, Confidential or Secret, except with prior written approval of the principal and subject to the conditions imposed.

1.4 FURTHER INFORMATION

Contact person

Inquiries: Refer inquiries to the following:

- Name: David Beaconsfield / Michaels Beaconsfield
- Telephone: 0412 932 139 / 0499 100 645
- Email: david@mainsone.com.au / michael@mainsone.com.au

Site inspections

General: Information on dates and times at which the site will be available for inspection can be obtained from the contact person.

Addenda

General: Written addenda issued by the principal are the only recognised explanations of, or amendments to, the tender documents.

1.5 PREPARATION OF TENDERS**Tender form**

Form: Submit the tender on the *Tender form* provided.

Addenda: Confirm on the *Tender form* that allowance has been made of each addendum and any extensions of the tender period.

Name and address of tenderer: State the following:

- If an individual, the name in full and address of the individual.
- If an unincorporated body, the registered business name and address of the body and the name in full and address of each member of the body.
- If a company, the name, ABN and registered office address of the company.

Address for service of notices: Include on the *Tender form* an address for service of notices for the purpose of this tender and any subsequent contract arising out of this tender.

Execution: Sign the *Tender form* or, if a company, comply with the relevant provisions of the Corporations Law and regulations.

Scope

Scope: Tender for the whole of the work described in the tender documents unless the tender documents provide otherwise.

Exclusions: If unable to tender on parts of the works, inform the contact person in writing as soon as possible, defining the relevant parts and giving reasons.

Completion

General: Complete in full the *Tender form* and other required documents.

Alterations: Do not alter or add to tender documents except as may be required by these conditions of tendering.

Selected subcontracts

General: Submit with the tender the identity of subcontractors proposed for selected subcontract work.

Alternatives

General: Alternative proposals may be submitted with the tender for consideration, but the following must also be submitted:

- A conforming tender that complies with the tender documents.
- A detailed description of the alternative stating clearly how it differs from the requirements of the tender documents whilst complying with the principal's commercial and technical objectives.

Alternative time for practical completion: Consideration will be given to alternative tenders which offer different times for practical completion. The prescribed liquidated damages will apply to those different times.

Alternative working hours and working days: If the tender includes an allowance for work at times other than the working hours or working days prescribed in the tender documents, submit the working hours and days proposed.

Evidence of contractor's registration or licensing

General: If it is a statutory requirement of the state or territory in which the works are located that a contractor (as defined by the statutory requirement) be registered or licensed to carry out the work described in the tender documents, submit with the tender evidence of registration or licence.

Supporting costing information

Complete and submit the following supporting costing information: Priced bills of quantities, a priced schedule of rates, or a contract sum analysis.

Time for submission: Obtained from the contact person.

Prototypes

Produce and submit the following prototypes during construction stage: Apartment internal joineries (kitchen, island bench, pantry, drop off zone cabinet and typical ensuite bathroom including vanity, wall cabinet and shower screen).

Cost: The cost of this work will not be reimbursed.

Program

General: Submit a construction program in the form of a preliminary bar chart and network diagram, showing the following:

- Sequence of work.
- Periods within which various stages or parts of the work are to be executed.
- Critical paths of activities related to the work.
- Allowance for holidays.
- Restraints imposed by the contract documents.
- Significant milestones including separable parts, if any.
- Activity inter-relationships, including those activities to be undertaken by subcontractors and suppliers, both on and off site.
- External dependencies including provision of access, document approvals and work by others.
- The estimated value of work completed for each month.

Conflict of interest

General: Refer to AS4120 clause 4(k) on disclosure of conflict of interest.

Quality system

Tenderer's submission: Submit a statement of quality control resources.

1.6 SUBMISSION OF TENDERS

Lodgement

Procedure: Enclose tenders in a sealed envelope marked with the description of the work and tender item (if any) and lodge in the tender box at, or send by prepaid post to, the nominated place, by the date and time for closing of tenders.

Facsimile: Facsimile tenders received by the date and time for closing of tenders may be considered provided that a conforming tender, in the form required, is submitted within 24 hours.

Electronic transmission: Electronic tenders received by the date and time for closing of tenders may be considered provided that a conforming tender, in the form required, is submitted within 24 hours.

Oral tenders: Oral tenders will not be considered.

Franking: Impressions of franking machines are not acceptable evidence of timely posting or dispatch.

Supporting information: Enclose in a separate sealed envelope marked with the description of the work and the identity of the tenderer.

Late tenders

Prepaid post or facsimile: Late tenders submitted by prepaid post or facsimile may be considered, if the principal is satisfied that in the ordinary course of post or transmission they would have been received by the date and time for closing of tenders.

Hand delivery: Late tenders delivered by hand may be considered if the principal is satisfied that under normal circumstances they would have been received by the date and time for closing of tenders and that the delay was beyond the control of the tenderer.

Other: Late tenders sent by other forms of delivery or transmission will not be considered.

Closing of tenders

Date: A least 4 weeks. See AS 4120 clauses 6.4 for defaults.

Time: To be confirmed

Place for lodgement

Tender box location: To be confirmed

1.7 PROCEDURES AFTER TENDER PERIOD

Tender validity period

General: Unless withdrawn, tenders must remain valid from the date and time for closing of tenders, for the following period: **60 days**

Evaluation of tenders

General: In evaluating the tenders, the principal may take into consideration the following:

- Conformity with tender documents.
- Capital cost compared with estimated cost.
- Construction period.
- Proposed use of local subcontractors and suppliers.
- Proposed alternatives.
- Alternative working times proposed by the tenderer, and the cost to the principal of providing contract administration for the work under the contract at those times.
- Maintenance and running costs.
- Design proposals.
- Quality of prototypes.
- Construction program.
- Proposed methods.
- Quality assurance.
- Conflicts of interest.
- Life of proposed equipment.
- Standardisation of proposed equipment.
- Tenderer's CAD format.
- Value for money.
- Tenderer's resources.
- Tenderer's current commitments.
- Tenderer's previous performance.
- Industrial relations and safety records.

Qualifications: Tenders containing unauthorised alterations, additions or qualifications may be rejected.

Unpriced items: Costs relating to items not priced will be assumed to have been included elsewhere in the tender.

Correction of errors in tenders

Procedure: See AS 2124 clause 4.3 and AS 4000 clause 2.3 on errors in pricing.

Additional information

General: If required, submit additional information, by the stipulated date and time, to allow further consideration of the tender before any tender is accepted. Failure to meet this requirement may result in the tender being rejected.

Confidentiality

General: Treat as confidential any information provided after the tender period.

Acceptance of tender

Non-acceptance: The principal is not bound to accept the lowest or any tender, or to give reasons.

Acceptance: A tender is not accepted until notice in writing of acceptance is delivered by one of the following methods:

- Handed to the tenderer.
- Sent by prepaid post to, or left at, the address for service of notices stated in the Tender form.
- Transmitted by facsimile to the tenderer's facsimile number.

Formal instrument of agreement: Required.

2 TENDER FORM

Name of principal: [complete/delete]
Name of project: [complete/delete]
Tender – lump sum I/We tender to perform the work for the above project as described in, and in conformance with, the tender documents referenced in the <i>Conditions of tendering</i> and in conformance with the attached <i>Schedule of rates/Contract sum analysis/priced Bills of quantities</i> and for the lump sum (which includes specified provisional sums) of including GST (sum in words and figures)
The contract duration will be weeks from the date of site possession. This tender remains open for consideration for weeks from the date and time of closing of the tender period.
I/We acknowledge the receipt of addenda numbered during the tender period.
Name of tenderer
ABN/ACN
Telephone
Facsimile
Email
Tenderer's address or registered business office address
Address for service of notices
Tenderer's bank and branch address
Execution if tenderer is an individual or unincorporated body
Tenderer's signature
Witness' signature
Execution if tenderer is a company
The common seal of the tenderer was affixed in conformance with the Articles of Association
Director's signature
Secretary's signature
OR
Authorised officer's signature
Witness' signature
Date of tender

0131 PRELIMINARIES

1 GENERAL

1.1 GENERAL

General conditions

Contract: Design And Construct AS4902

Interpretation

General: The words owner and architect have the same meaning, respectively, as principal and contract administrator, unless the context requires otherwise.

Cross reference: **INTERPRETATION** in 0171 General requirements also applies.

1.2 THE SITE

Site restrictions

Site limitations: Comply with the following restrictions on the use of the site

Entry permits: Make available, to persons entering designated secure areas, valid entry permits. Make sure these persons comply with conditions of entry.

Personnel: Submit the full name, address, and date and place of birth of persons required to enter designated secure areas.

- Purpose of submission: For review.
- Timing of submission: At least 10 working days before entry is required.

Occupied premises

General: For the parts of the site documented in the **Occupied premises schedule**:

- Allow occupants to continue in secure possession and occupancy of the premises for the required period.
- Maintain safe access for occupants.
- Arrange work to minimise nuisance to occupants and for their safety.
- Protect occupants against weather, dust, dirt, water or other nuisance.

Proposals: Submit details of proposed methods.

- Purpose of submission: For information.
- Timing of submission: Before commencement of work.

Occupied premises schedule

Occupants	Occupied premises	Period of occupancy

Reinstatement

Accessways and services: Do not obstruct or damage roadways and footpaths, drains and watercourses and other existing services in use on or adjacent to the site. Determine the location of such services. Rectify immediately any obstruction or damage to such services and provide temporary services whilst repairs are carried out.

Trees and properties: Do not interfere with or damage trees and properties that are to remain on or adjacent to the site, including adjoining property encroaching onto the site. Rectify immediately any interference or damage to such trees and properties.

Existing services

Service to be continued: Repair, divert or relocate service, as documented.

Trenches: If the existing service crosses the line of a required trench or will lose support when the trench is excavated, provide permanent support for the existing service.

Redundant services: Remove redundant parts and make safe.

Interruptions to services: Minimise the number and duration of interruptions.

Changes to existing services: Submit proposals.

- Purpose of submission: For review.
- Timing of submission: Before starting work to existing services.

Adjoining properties

Notice: At least 10 working days before commencing work, give written notice to owners and occupants of adjoining properties of intention to commence work and an outline description of the type and extent of work.

Revealed encroachments: If the works reveal unknown encroachments of adjoining properties onto the site or of existing site structures onto adjoining properties, immediately notify the architect and seek instruction.

Records: For each property documented in the **Adjoining properties to be recorded schedule**:

- Inspect the property with the architect and owner and occupant of the property, before commencement of work.
- Make detailed records of conditions existing within the property, especially structural defects and other damage or defacement.
- Arrange for at least 2 copies of each record, including drawings, written descriptions and photographs, to be endorsed by the owner and occupant of the property, or their representatives, as evidence of conditions existing before commencement of work.

Endorsed copies: Submit one endorsed copy of each record. Keep the other endorsed copy on site.

- Purpose of submission: For information.
- Timing of submission: Before commencement of work.

Adjoining properties to be recorded schedule

Title	Owner	Description

1.3 CONSTRUCTION PLANT

General

Temporary works: Provide and maintain required hoardings, barricades, guards, fencing, shoring, temporary roadways, footpaths, signs, lighting and traffic management.

Owner's existing roads: Use only designated roads.

Parking

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

Owner's site office

General: Provide a weathertight site office for the use of the owner or the owner's agents before major site operations are started and as follows:

- Pay charges for services.
- Maintain in good order and in clean condition, with secure access, for duration of the work.
- Obtain permission for removal.
- Remove on completion.

Protective clothing

Requirement: Make available protective clothing for the use of visitors, as follows:

- Safety helmets: Type 1 to AS/NZS 1801.
- High visibility safety vests: To AS 4602.1.

Certification: Required.

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

Temporary fence

Requirement: See SA4687:2007

Temporary services

Requirement: As required. To be confirmed.

Use of existing services

General: Existing services may be used as temporary services for the performance of the contract subject to conditions of use, as documented in the **Existing services schedule**.

Existing services schedule

Service	Conditions of use

Project signboards

General: Provide project specific signboards and as follows:

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

Other signboards: Obtain approval before display of advertisements or provision of other signboards.

1.4 BUILDING THE WORKS**Surveys**

Setting out: Coordinate between land surveyor and Architect.

Final survey: Refer to feature survey drawing by land surveyor

Survey marks

Definition: A survey peg, benchmark, reference mark, signal, alignment, level mark or any other mark used or intended to be used for the purpose of setting out, checking or measuring the work.

Care of survey marks: Preserve and maintain the owner's survey marks in their true positions.

Rectification: If survey marks are disturbed or obliterated, immediately rectify.

Safety

Accidents: Promptly notify the architect of the occurrence of the following:

- Accidents involving death or personal injury.
- Accidents involving loss of time.
- Incidents with accident potential such as equipment failure, slides and cave-ins.

Accident reports: Submit reports of accidents.

- Purpose of submission: For information.

Contractor's representative

General: Must be accessible, and fluent in English and technical terminology.

Contacts: Submit names and telephone numbers of responsible persons who may be contacted after hours during the course of the contract.

- Purpose of submission: For information.
- Timing of submission: At the first site meeting.

Subcontracting

General: Submit a complete list of proposed subcontractors and suppliers.

- Purpose of submission: For information.

Order of work schedule

Portion of work	Order of work	Time of work

Portion of work	Order of work	Time of work

Program of work

Construction program: Submit a construction program showing the following:

- Sequence of work.
- Critical paths of activities related to the work.
- Allowance for holidays.
- Activity inter-relationships.
- External dependencies including provision of access, document approvals and work by others.
- Periods within which various stages or parts of the work are to be executed.

Time scale: Working days.

Updated program: Identify changes since the previous issue, and show the estimated percentage of completion for each item of work.

Purpose of submission: For information.

Program chart: Display in the contractor's site office an up-to-date bar chart and network diagram based on the construction program.

Site meetings

General: Hold and attend site meetings throughout the contract and arrange for the attendance of appropriate subcontractors, architect and appropriate consultants.

Frequency: Fortnight

Minutes: Make a record of site meetings. Distribute a copy of the minutes to each party.

- Purpose of submission: For review.
- Timing of submission: Within 5 working days after each meeting.

Progress photographs

General: Take colour progress photographs within 5 working days, before each site meeting. Submit 2 sets of prints and the digital files. Identify the project, date, time, location and orientation.

- Purpose of submission: For information.
- Timing of submission: At each site meeting.

Format: Jpeg**Items supplied by owner**

General: Materials and other items supplied free of charge to the contractor for installation in the execution of the works. Unload and take delivery, inspect for defects and take care of the items. If defects are found, advise. Return unused items to the owner.

Notice for delivery: Owner to liaise with builder.**Items supplied by owner schedule**

Location	Item	Quantity	Date

Changes to existing items

General: At least 5 working days before changing existing items, give notice.

Control of runoff stormwater

Requirement: In accordance to relevant authority requirement.

Persons other than contractor

Facilities: Refer to person other than contractor documentation.

Contractor/person other than contractor interfaces: Refer to person other than contractor documentation.

1.5 COMPLETION OF THE WORKS

Final cleaning

General: Before the date for practical completion, clean throughout, including interior and exterior surfaces exposed to view. Vacuum carpeted and soft surfaces. Clean debris from the site, roofs, gutters, downpipes and drainage systems. Remove waste and surplus materials.

Samples: Remove non-incorporated samples, prototypes and sample panels.

Reinstatement

General: Before the date for practical completion, clean and repair damage caused by installation or use of temporary work and restore existing facilities used during construction to original condition.

Adjoining properties

Evaluation: At practical completion, for each property documented in the **Adjoining properties to be recorded schedule**, inspect the property with the architect and owner and occupant of the property, recording any damage that has occurred since the pre-commencement inspection.

Pest eradication

General: Employ suitably qualified pest exterminators. At practical completion, verify that completed works are free of pest types documented in the **Pest eradication treatment schedule**.

Pest eradication treatment schedule

Pest type to be treated	Eradication method

Removal of plant

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

1.6 PAYMENT FOR THE WORKS

Progress claims

Anticipated progress claims: Submit a schedule of anticipated progress claims for the contract period.

- Purpose of submission: For information.
- Timing of submission: At commencement of the works.

Progress claim breakdown: Submit a statement of amounts claimed in respect of each worksection or trade heading designated in the specification.

- Purpose of submission: For review.
- Timing of submission: With each progress claim.

Import costs

Definition: Import costs include costs attributable to exchange rates, customs and import duty of imported content of items purchased for incorporation in the works.

Adjustment: If there are changes in rates applying to import costs of items documented in the **Import costs adjustment schedule**, add or deduct the amount of the difference to or from the contract sum, as applicable.

Import costs adjustment schedule

Item	Country of origin	Import cost

Method of measurement

General: In conformance with the principles of the Australian and New Zealand standard method of measurement of building works (ANZSMM).

1.7 MISCELLANEOUS

Contractor and owner to observe confidentiality

Publicity: Do not issue information concerning the project for publication in the media without prior written approval of the owner. Refer enquiries from the media concerning the project to the owner.

Compliance with the law

Requirements of authorities: The owner, before entering into the contract, has given the notices, paid the fees, and obtained the permits, approvals and other authorisations, as documented in the **Prior applications and approvals schedule**.

0160 QUALITY

1 GENERAL

1.1 RESPONSIBILITIES

General

Requirement: Provide a project Quality Management System, as documented.

1.2 CROSS REFERENCES

General

Requirement: Conform to the following:

- *0171 General requirements.*

1.3 STANDARDS

General

Standard: To AS/NZS ISO 9001.

1.4 INTERPRETATION

Definitions

General: For the purposes of this worksection, the definitions given in AS/NZS ISO 9000 and the following apply:

- Quality package: A designated part of the works, which may include the whole works, for which an individual quality system is required.
- Service: After sales service, repairs, maintenance.

1.5 SUBMISSIONS

Quality Plan

Quality package: Submit a Quality Plan for each quality package, at least 10 working days before work on that package commences. Keep a copy of each approved quality plan on site.

Calculations

Statistical techniques: Provide the methodology for statistical evaluation.

Execution details

Requirement: Provide the procedure for sign-off and audit.

2 PROJECT QUALITY MANAGEMENT SYSTEM REQUIREMENTS

2.1 DOCUMENTATION REQUIREMENTS

Quality plan

Standard: Conform to the recommendations of AS ISO 10005. Include inspection and test plans.

Documented procedures

Review: Provide evidence of revision(s) including dates, approval and status of each procedure.

Register: Maintain a register of documented procedures including the title, identifier and revision status.

2.2 DESIGN AND DEVELOPMENT OF PRODUCTS AND SERVICES

General

Plan and control of product design and development: As documented.

2.3 CONTROL OF EXTERNALLY PROVIDED PROCESSES, PRODUCTS AND SERVICES

General

External audits: Perform pre-tender surveys and audits of subcontractors and suppliers, as necessary with an approved auditor. Include audit and surveillance proposals in the Quality Plan along with results of pre-tender surveys.

Verification: The contract administrator may verify at source, or upon receipt, that purchased products conform to documented requirements.

2.4 PRODUCTION AND SERVICE PROVISION

Product identification and traceability

Requirement: As documented.

Identification: Identify all items of work, samples and site records by lot / number / barcode.

Traceability: Provide and maintain records of components for audit.

Service

Requirement: As documented.

3 MONITORING AND MEASUREMENT

3.1 DOCUMENT CONTROL

Changes to documents

Revision: Review and approve changes to documents using the same functions of the organisations that performed the original review and approval of the documents, unless documented otherwise.

Retention: As documented.

Evaluation: Make quality records available to the contract administrator for evaluation, within 2 days of the initial request.

Period of evaluation: Agree for each request, but at least 5 working days.

3.2 INSPECTION AND TEST PLANS

Content

Plan: Include the following:

- Detail all inspections and tests required including Hold points.
- Identify acceptance criteria and frequency of sampling and testing.
- Identify responsibilities for inspection and testing and product/service approval criteria.

Control of non-conforming product

Acceptance of concession: Before the provision or repair of a non-conforming product, obtain permission to use the product.

Hold points

Stages: Hold points during the construction/manufacturing process require release by the contract administrator.

Release: Requirements for release of a Hold point may include the following:

- Provision of information required by the technical specifications.
- Certification of design/construction or installation.
- Submission of any checklists or non-conformance forms as required.
- Inspection/demonstration of works.

Frequency of testing

General: Conform to the test requirements of the relevant standards and worksections, as documented.

3.3 AUDITING

General

Audit plan: Conform to the recommendations of AS/NZS ISO 19011 clauses 6.4 and 6.5.

Initial systems audit: Carry out before date of site possession.

3.4 CORRECTIVE ACTION

General

Review: Provide a procedure to review the various control methods to minimise non-conformance. Record amendments to the project Quality Management System resulting from corrective action.

Non-conforming works: Include in the Quality Plan the procedure for reporting any non-conforming works to the contract administrator and any corrective action requests.

4 SELECTIONS

4.1 SCHEDULES

Project Quality Management System schedule

Quality package	Activities included	Standard	Options
The whole of the works	All	AS/NZS ISO 9001	See below

Design and development schedule

Stage	Review	Verification	Validation	Authority

Service (maintenance) schedule

Quality package	Product	Service (maintenance) required

0164 COMMISSIONING

1 GENERAL

1.1 RESPONSIBILITIES

General

Requirement: Provide commissioning and related activities as documented.

1.2 CROSS REFERENCES

General

Requirement: Conform to the following:

- *0171 General requirements.*

1.3 STANDARDS

General

Standard: To SA TS 5342.

1.4 OTHER DOCUMENTS

Informative

Requirement: The documents listed in **COMMISSIONING INFORMATION, Documents provided for information only** are provided for information only.

1.5 INTERPRETATION

Definitions

General: For the purposes of this worksection, the definitions given in SA TS 5342 apply.

1.6 SUBMISSIONS

General

Requirement: To *0171 General requirements* and the following:

- Names and contact details of persons nominated as representatives.
- Evidence of nominated representatives' qualifications and expertise in relation to commissioning.

2 EXECUTION

2.1 REPRESENTATIVES

Qualifications

Requirement: For each role in the **Project roles schedule** within the control of this contract, provide representatives with qualifications, expertise and authority to act with respect of that role.

Functions

Requirement: Provide representatives to undertake commissioning related activities including the following:

- Attendance at commissioning meetings to **MEETINGS**.
- Review documents, procedures and methodologies for commissionability.
- Evaluate performance deficiencies identified during commissioning and recommend corrective action.
- Facilitate resolution of commissioning issues.

2.2 MEETINGS

Attendance

Requirement: Attend commissioning meetings to facilitate the commissioning process including to review, plan, coordinate and schedule commissioning

Frequency: To **Commissioning meetings schedule**.

Additional commissioning meetings: Attend additional commissioning related meetings as required throughout construction.

3 SELECTIONS

3.1 ROLES AND RESPONSIBILITIES

Project roles schedule

Role	Organisation	Person responsible in that organisation
Principal		
Commissioning manager		

3.2 MEETINGS

Commissioning meetings schedule

Meeting	Frequency
Commissioning team meeting	

0171 GENERAL REQUIREMENTS

1 GENERAL

1.1 PRECEDENCE

General

Order of precedence: If there is conflict or inconsistency between the worksections of this specification, the requirements of worksections take the following order of precedence:

- All worksections other than those listed below.
- *018 Common requirements* worksections.
- *0171 General requirements*.

1.2 CROSS REFERENCES

Common requirements

Requirement: Conform to the following worksections:

- *0181 Adhesives, sealants and fasteners*.
- *0182 Fire-stopping*.
- *0183 Metals and prefinishes*.
- *0185 Timber products, finishes and treatment*.

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

Precedence: The requirements of worksections override conflicting requirements of their referenced documents. The requirements of the referenced documents are minimum requirements.

Contractual relationships: Responsibilities and duties of the principal, contractor and contract administrator are not altered by requirements in the documents referenced in this specification.

Current editions: Use referenced documents which are the editions, with amendments, current 3 months before the closing date for tenders.

Exception to current editions: If statutory requirements 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 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.

1.5 INTERPRETATION

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 and Volume Two: Building Code of Australia Class 1 and Class 10 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 undertake the relevant tests; or
 - . An organisation outside 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 ISO/IEC 17025 to undertake the relevant tests.
- Appropriately qualified person: To NCC Schedule 3.
- 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, sub-systems, and their components meet the project requirements. This includes all work described as commissioning in referenced documents, even if carried out before static completion.
- Contract administrator: Has the same meaning as architect or superintendent and is the person appointed by the owner or principal under the contract.
- 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.
- Design parameters: Information used as the basis for design. It includes design requirements, performance criteria, performance parameters and similar terms.

- 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.
- Errors and omissions: For the design prepared by the contractor, errors and omissions have the same meaning as defects.
- Fire hazard properties: To NCC Schedule 3.
- Gas Network Operator: Has the same meaning as network operator in AS/NZS 5601.1.
- 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 contract administrator.
- High level interface: Systems transfer information in a digital format using an open system interface.
- Hot-dip galvanized: Zinc coated to AS/NZS 4680 after fabrication with coating thickness and mass to AS/NZS 4680 Table 1.
- Ingress protection: IP, IP code, IP rating and similar expression have the same meaning as IP Code in AS 60529.
- 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.
- 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. Metal thicknesses specified are base metal thicknesses.
 - . Ferrous open sections zinc coated by an in-line process: To AS/NZS 4791.
 - . Ferrous hollow sections zinc coated by a continuous or specialised process: To AS/NZS 4792.

- Network Utility Operator: To NCC Schedule 3. 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 contract administrator.
- 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 NCC Schedule 3.
- Proprietary: Identifiable by naming the manufacturer, supplier, installer, trade name, brand name, catalogue or reference number.
- Prototype: A full size mock-up of components, systems or elements to demonstrate or test construction methods, junctions and finishes, and to define the level of quality.
- 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.
- Statutory authority: A public sector entity created by legislation, that is, a specific law of the Commonwealth, State or Territory.
- Static completion: The state of a system when installation works are complete but have not been commissioned.
- 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, Gas Network 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.

2 SUBMISSIONS AND INSPECTIONS

2.1 SUBMISSIONS

General

Requirement: Make submissions, as documented.

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

Submission times

Default timing: Submit information or other material for information, comment or approval **at least 5 working days** before ordering products or starting installation of the respective portion of the works.

Proposed products schedules: If major products are not specified as proprietary items, submit a schedule of those proposed for use within 3 weeks of site possession.

Identification

Requirement: Identify the project, contractor, subcontractor or supplier, manufacturer, applicable product, model number and options, as appropriate and include relevant contract document references.

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 or .doc

CAD file format: .dwg version 2013 or .rvt version 2020 or .IFC

Transmission medium: ACONEX, Newforma or Microsoft 365 Outlook / Sharepoint

Project requirements

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 structural, fire and other properties to **BUILDING PENETRATIONS**.
- Certification: Certificates of conformance to documented 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.
- Electronic facility and asset management information: For the whole of the work to **ELECTRONIC FACILITY AND ASSET MANAGEMENT INFORMATION**.
- Execution details: Execution programs, schedules and details of proposed methods and equipment. For building services include the following:
 - . Embedded services: Proposed method for embedding services in concrete walls or floors or chasing into concrete or masonry walls.
 - . 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, fire hazard properties and fire-resistance of building elements.
- Marking and labelling: Samples and schedules of proposed marking and labels to **MARKING AND LABELLING**.
- 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.
- Prototypes: Prototypes of components, systems or elements.

- 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 AND PROTOTYPES**.
- Shop drawings: To **SHOP DRAWINGS**.
- Substitutions: To **SUBSTITUTIONS**.
- Tests:
 - . Test reports for testing performed under the contract.
- Warranties: To **WARRANTIES**.

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.

Notification times

Minimum notice: As documented.

Light levels

Lighting levels for inspection: To AS/NZS 1680.2.4.

Attendance

General: Provide attendance for documented inspections and tests.

3 PERFORMANCE

3.1 CORROSION RESISTANCE

Atmospheric corrosivity category

General: Atmospheric corrosivity category as defined in AS 4312:

Galvanizing

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

- Exposed to weather.
- Embedded in masonry.
- Exposed to or in air spaces behind the external leaf of masonry walls.
- In contact with chemically treated timber, other than copper chrome arsenate (CCA).

3.2 NOISE LEVELS

General

Requirement: Install systems to operate within the noise level limits, as documented for the contract design and documented equipment performance.

3.3 STRUCTURE

General

Requirement: If required, provide structures, installations and components as follows:

- Fixed accessways: To AS 1657.
- Structural design actions: To the AS/NZS 1170 series.

4 DESIGN

4.1 DESIGN DEVELOPMENT

General

Requirement: Complete the design of the work, including development of the design beyond that documented.

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

4.2 DESIGNER

General

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

5 PRODUCTS AND MATERIALS

5.1 GENERAL

Consistency

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

Low VOC emitting paints

Paint types: To the recommendations of AS/NZS 2311 Table 4.2.

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.
- Blowing agents:
 - . Materials that use chlorofluorocarbon (CFC) or hydrochlorofluorocarbon (HCFC) in the manufacturing process.
 - . A blowing agent with a global warming potential (GWP) ≥ 700 .

5.2 PROPRIETARY ITEMS

Manufacturer's or supplier's recommendations

General: Provide manufactured items to the manufacturer's or supplier's recommendations.

Proprietary items/systems/assemblies: Assemble, install or fix to substrate to the manufacturer's or supplier's recommendations.

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

Identification of proprietary items

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

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

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

5.3 SUBSTITUTIONS

General

Identified proprietary items: Identification of a proprietary item does not necessarily imply exclusive preference for the identified item, but indicates the necessary properties of the item.

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

- Product, method or system identification.
- 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 NCC compliance, if applicable.
- Evidence of conformity to a cited standard.
- Evidence that the performance is at least equal to that specified.

- Samples.
- Essential technical information, in English.
- 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.

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.

5.4 SAMPLES AND PROTOTYPES

General

Incorporation of samples: Only incorporate samples that have been endorsed for inclusion in the works. Do not incorporate other samples.

Retention of samples: Keep endorsed samples in good condition on site, until the date for practical completion.

Unincorporated samples: Remove on completion.

5.5 SHOP DRAWINGS

General

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.

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

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.

Commissioning requirements: Show provisions for testing and commissioning on the drawings.

Access for maintenance: Show space and provisions for access for maintenance.

Building work drawings for building services: On dimensioned drawings show the following:

- Access doors and panels.
- Conduits to be cast in slabs.
- Holding down bolts and other anchorage and/or fixings required complete with loads to be imposed on the structure during installation and operation.
- Openings, penetrations and block-outs.
- Sleeves.
- Plinths, kerbs and bases.
- Required external openings.

Submission medium: Electronic via ACONEX or Newforma

Drawing size: A1 or A3 or A4

CAD base drawings: .dwg version 2013

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.

6 ANCILLARY BUILDING WORK

6.1 WALL CHASING

Holes and chases

General: If holes and chases are required in masonry walls, make sure structural integrity of the wall is maintained. Do not chase walls with a fire-resistance level or an acoustic rating.

Parallel chases or recesses on opposite faces of a wall: Not closer than 600 mm to each other.

Chasing blockwork: Only chase core-filled hollow blocks or solid blocks which are not documented as structural.

Concrete blockwork chasing table

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

6.2 FIXING

General

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

Fasteners

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

6.3 BUILDING PENETRATIONS

Penetrations

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

- Structural building elements including external walls, fire walls, fire doors and access panels, other tested and rated assemblies or elements, floor slabs and beams.
- 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

Fire-resisting building elements: Seal penetrations with a system conforming to AS 4072.1.

Non fire-resisting building elements: 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 (for non fire-resisting building elements): 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.
 - . Fire-resisting and acoustic rated building elements: 50 mm beyond finished building surface.
 - . Floors draining to floor wastes: 50 mm above finished floor.
 - . Other locations: 5 mm beyond finished building surface.
 - . Termite management: To AS 3660.1.
- Thickness:

- . Metal: 1 mm or greater.
- . PVC-U: 3 mm or greater.

6.4 SUPPORT OF PLANT AND EQUIPMENT

Concrete plinths

General: Provide concrete plinths as documented and under all equipment located on concrete floor slabs as follows:

- Surround: Zinc (hot-dipped) coated steel, at least 75 mm high and 1.6 mm thick. Fix to the floor with masonry anchors. Fill with concrete.
- Height: 75 mm or greater, as documented.
- Reinforcement: Single layer of F62 fabric.
- Concrete: Grade N20.
- Finish: Steel float, flush with top edge of the surround.

Support of ground level plant and equipment

Ground level: Conform to the following:

- If the ground slope is 15° or more, or the area of the plant and equipment is extensive, obtain the advice of a professional engineer for the documentation of a suitable slab or platform.
- In all other cases, provide proprietary plastic or concrete supports installed with falls that achieve a raised, impervious and water shedding bearing surface.

Balustrades: If balustrades or screening are required, obtain the advice of a registered architect.

Support of plant and equipment mounted on roofs or elevated platforms

Platforms: If a platform is required, or the area of the plant and equipment mounted on roofs or elevated platforms is extensive, obtain the advice of a professional engineer for the documentation of a suitable platform.

Balustrades: If balustrades or screening are required, obtain the advice of a registered architect.

Roof level support: If any of the following apply to roof level support, obtain the advice of a professional engineer:

- The total load from any unit of plant or equipment exceeds 500 kg.
- The load from a unit of plant or equipment to any single support point exceeds 100 kg.
- The average loading of plant and equipment over the area extending 1 m on all sides beyond the plant and equipment exceeds 25 kg/m².

7 BUILDING SERVICES

7.1 SERVICES CONNECTIONS

Connections

General: Connect to utility service provider services or service points. Excavate to locate and expose connection points. Reinstate the surfaces and facilities that have been disturbed.

Utility service provider requirements

General: If the utility service provider elects to perform or supply part of the works, make the necessary arrangements. Install equipment supplied, but not installed, by the utility service provider.

7.2 SERVICES INSTALLATION

General

Fixing: If non-structural building elements are not suitable for fixing services to, fix directly to structure and trim around penetrations in non-structural elements.

Installation: Install equipment and services as follows:

- Plumb and securely fixed.
- Allow for movement in both structure and services.
- Arrange services running together, parallel to each other and adjacent building elements.

Concealment: Conceal all cables, ducts, trays and pipes except where installed in plant spaces, ceiling spaces and riser cupboards or documented to be exposed. If alternative routes are available, do not locate on external walls.

Lifting: Provide heavy items of equipment with permanent fixtures for lifting to the manufacturer's recommendations.

Suspended ground floors: Keep all parts of services suspended under ground floors at least 150 mm clear of the ground surface. Make sure services do not impede access.

Dissimilar metals

Jointing: Join dissimilar metals with fittings of electrolytically compatible material.

Temporary capping

Pipe ends: During construction, protect open ends of pipe with metal or plastic covers or caps.

Piping

General: Install piping in straight lines at uniform grades without sags. Arrange to prevent air locks. Provide sufficient unions, flanges and isolating valves to allow removal of piping and fittings for maintenance or replacement of plant.

Spacing: Provide at least 25 mm clear between pipes and between pipes and building elements, additional to insulation.

Changes of direction: Provide as follows:

- If practicable, long radius elbows or bends and sets, and swept branch connections.
- If pipes are led up or along walls and then through to fixtures, provide elbows or short radius bends.
- Do not provide mitred fittings.

Vibration: Arrange and support piping to prevent vibration whilst permitting necessary movement. Minimise the number of joints.

Embedded pipes: Do not embed pipes that operate under pressure in concrete or surfacing material.

Valve groupings: If possible, locate valves in groups.

Pressure testing precautions: Isolate items not rated for the test pressure. Restrain pipes and equipment to prevent movement during pressure testing.

Support and structure

Requirement: Provide incidental supports and structures to suit the services.

Pipe support systems

General: Provide proprietary support systems of metallic-coated steel construction.

Vertical pipes: Provide anchors and guides to maintain long pipes in position, and supports designed for the mass of the pipe and its contents.

Saddles: Provide saddle supports only on DN 25 or smaller pipes.

Dissimilar metals: If pipe and support materials are dissimilar, provide industrial grade electrically non-conductive material securely bonded to the pipe to separate them. Provide fasteners of electrolytically compatible material.

Uninsulated pipes: Clamp piping supports directly to pipes.

Insulated pipes:

- Spacers: Provide spacers at least as thick as the insulation between piping supports and pipes. Extend either side of the support by at least 20 mm.
- Spacer material: Rigid insulation material of sufficient strength to support the piping and suitable for the temperature application.

Support spacing: As follows:

- Cold and heated water pipes: To AS/NZS 3500.1 Table 5.6.4. Provide additional brackets, clips or hangers to prevent pipe movement caused by water pressure effects.
- Sanitary plumbing: To AS/NZS 3500.2 Table 10.2.1.
- Fuel gas: To AS/NZS 5601.1 Table 5.5.
- Other pipes: To AS/NZS 3500.1 Table 5.6.4.

Hanger size table

Nominal pipe size (DN)	Minimum hanger diameter for single hangers (mm)
50 maximum	10
65 to 90	12
100 to 125	16

Nominal pipe size (DN)	Minimum hanger diameter for single hangers (mm)
150 to 200	20

Differential movement

General: If the geotechnical site investigation report predicts differential movements between buildings and the ground in which pipes or conduits are buried, provide control joints in the pipes or conduits, as follows:

- Arrangement: Arrange pipes and conduits to minimise the number of control joints.
- Magnitude: Accommodate the predicted movements.

7.3 PLANT AND EQUIPMENT

General

Location: Locate so failure of plant and equipment (including leaks) does not create a hazard for the building occupants and causes a minimum or no damage to the building, its finishes and contents including water sensitive equipment or finishes.

Safe tray and an overflow pipe: Provide to each tank, hot water heater and storage vessel.

7.4 ACCESS FOR MAINTENANCE

General

Requirement: Provide access for maintenance of all items requiring inspection, measurement, operation, adjustment, repair, replacement and other maintenance-related tasks.

Standards: Conform to the relevant requirements of AS 1657, AS 1892.1, AS 2865 and AS/NZS 3666.1.

Work Health and Safety: Conform to the requirements of the applicable Work Health and Safety regulations.

Refrigerated or cooling plant: If the space is a refrigerated or cooling chamber inside a duct, air handling plant or similar, provided with an access door or personnel access panel and of sufficient size for a person to enter, provide the following to BCA G1.2:

- An access door.
- Internal lighting with external indicator lamp.
- An alarm.

Protection from injury: Protect personnel from injury caused by contact with objects including those that are sharp, hot or protrude at low level.

Plant room flooring surfaces: R10 Slip resistance classification to AS 4586.

Trip hazards: Do not run small services including drains and conduits across floors where they may be a trip hazard.

Manufacturer's standard equipment: If necessary, modify manufacturer's standard equipment to provide the plant access documented.

Clearances

Minimum clearances for access: Conform to the following:

- Vertical clearance: ≥ 2100 mm, vertically above horizontal floors, ground and platforms.
- Horizontal clearance: Preferably ≥ 750 mm clear, but in no case less than 600 mm between equipment or between equipment and building features including walls.
- If tools are required to operate, adjust or remove equipment, provide sufficient space so the tools can be used in their normal manner and without requiring the user to employ undue or awkward force.
- Hinged or removable components: To the manufacturer's recommendations.
- Within plant items: Conform to the preceding requirements, and not less than the clearances recommended in BS 8313.

Elevated services other than in occupied areas

Access classifications:

- Access class A: Readily accessible. Provide clear and immediate access to and around plant items. If plant or equipment is located more than 2.0 m above the ground, floor or platform, provide a platform with handrails accessible by a stair, all to AS 1657.
- Access class B: If the plant item requiring access is located more than 2.0 m above the ground, floor or platform, provide a platform with handrails accessible by a non-vertical ladder, all to AS 1657.
- Access class C: Locate plant so temporary means of access conforming to Work Health and Safety regulations can be provided.

Temporary means of access: Make sure there is adequate provision in place which is safe and effective.

Areas in which access is restricted to authorised maintenance personnel: Provide access as follows:

- Instruments, gauges and indicators (including warning and indicating lights) requiring inspection at any frequency: Readily accessible.
- Access required monthly or more frequently: Access class A.
- Access required between monthly and six monthly: Access class A or B.
- Access required less frequently than six monthly: Access class A, B or C.

Other areas: Provide access as follows:

- Locate to minimise inconvenience and disruption to building occupants or damage to the building structure or finishes.
- In suspended ceilings, locate items of equipment that require inspection and/or maintenance above tiled parts. If not possible, provide access panels where located above set plaster or other inaccessible ceilings. Arrange services and plant locations to reduce the number of access panels. Coordinate with other trades to use common access panels where feasible.
- Do not locate equipment requiring access above partitions.
- Instruments, gauges and other items requiring inspection at any frequency: Readily accessible.
- Labelling: If equipment is concealed in ceilings, provide marking to **MARKING AND LABELLING, Equipment concealed in ceilings**.

Facilities for equipment removal and replacement

Requirement: Provide facilities to permit removal from the building and replacement of plant and equipment, including space large enough to accommodate it and any required lifting and/or transportation equipment. Arrange plant so large and/or heavy items can be moved with the minimum changes of direction.

Removal of components: Allow sufficient space for removal and replacement of equipment components including air filters, tubes of shell and tube heat exchangers, removable heat exchanger bundles, coils and fan shafts. Provide access panels or doors large enough to permit the safe removal and replacement of components within air handling units.

Facilities for access

Equipment behind hinged doors: Provide doors opening at least 150°.

Equipment behind removable panels: Provide panels with quick release fasteners or captive metal thread screws.

Removable panels: Provide handles to permit easy and safe removal and replacement.

Insulated plant and services: If insulation must be removed to access plant and services for maintenance, arrange it to allow for removal and replacement without damage.

Piping

Requirement: Conform to the following:

- Provide access and clearance at fittings which require maintenance, inspection or servicing, including control valves and joints intended to permit pipe removal.
- Arrange piping so it does not interfere with the removal or servicing of associated equipment or valves or block access or ventilation openings.
- Preferably run piping, conduits, cable trays and ducts at high level and drop vertically to equipment.

Electrical equipment and controls

Electrical equipment: Provide clearances and access space to AS/NZS 3000.

Switchboards and electrical control equipment: Locate near the main entrance to plant space and with switchboards visible from the plant being operated.

Control panels: Locate near and visible from the plant being controlled.

7.5 VIBRATION SUPPRESSION

General

Requirement: Minimise the transmission of vibration from rotating or reciprocating equipment to other building elements.

Standard

Machinery noise and vibration: Vibration severity in Zone A to ISO 20816-1 and ISO 10816-3.

Speeds

General: If no maximum speed is prescribed, do not exceed 1500 r/min for direct driven equipment.

Connections

General: Provide flexible connections to rotating machinery and assemblies containing rotating machinery. Isolate pipes by incorporating sufficient flexibility into the pipework or by use of proprietary flexible pipe connections installed to prevent placing stress on pipes due to end reaction.

Inertia bases

General: If necessary to achieve the required level of vibration isolation, provide inertia bases having appropriate mass and to the following:

- Construction: Steel or steel-framed reinforced concrete with reinforcing bars welded between base sections. Position foundation bolts for equipment before pouring concrete.
- Supports: Support on vibration isolation mountings using height saving support brackets.

Vibration isolation mountings

General: Except for external equipment that is not connected to the structure of any building, support rotating or reciprocating equipment on mountings as follows:

- For static deflections < 15 mm: Single or double deflection neoprene in-shear mountings incorporating steel top and base plates and a tapped hole for bolting to equipment.
- For static deflections ≥ 15 mm: Spring mountings.

Selection: Provide mountings selected to achieve 95% isolation efficiency at the normal operating speeds of the equipment.

Installation: Set and adjust vibration isolation mounting supports to give clearance for free movement of the supports.

Spring mountings: Provide freestanding laterally stable springs as follows:

- Clearances: ≥ 12 mm between springs and other members such as bolts and housing.
- High frequency isolation: 5 mm neoprene acoustic isolation pads between baseplate and support.
- Levelling: Provide bolts and lock nuts.
- Minimum travel to solid: ≥ 150% of the designated minimum static deflection.
- Ratio of mean coil diameter to compressed length at the designated minimum static deflection: ≥ 0.8:1.
- Snubbing: Snub the springs to prevent bounce at start-up.
- Vertical resilient limit stops: To prevent spring extension when unloaded, to serve as blocking during erection and which remain out of contact during normal operation.

7.6 FINISHES TO BUILDING SERVICES

General

Requirement: If exposed to view (including in plant rooms), paint building services and equipment.

Surfaces painted or finished off-site: Conform to 0183 *Metals and prefinishes*.

Exceptions: Do not paint chromium or nickel plating, anodised aluminium, GRP, stainless steel, non-metallic flexible materials and normally lubricated machined surfaces. Surfaces with finishes applied off-site need not be re-painted on-site provided the corrosion resistance of the finish is not less than that of the respective finish documented.

Standard: Conform to the recommendations of AS/NZS 2311 Sections 3, 6 and 7 or AS 2312.1 Sections 6, 7 and 8, as applicable.

Inaccessible surfaces: If surfaces are inaccessible after installation, complete finish before installation.

Painting systems

New unpainted interior surfaces: To AS/NZS 2311 Table 5.1.

New unpainted exterior surfaces: To AS/NZS 2311 Table 5.2.

Paint application

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

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

Protection: Remove fixtures before starting to paint and refix in position undamaged when painting is complete.

Underground metal piping

Requirement: Provide corrosion protection for the following:

- Underground ferrous piping.
- Underground non-ferrous metal piping in chemically aggressive soils and environments.

Corrosion protection: Select from the following:

- Cathodic protection: Sacrificial anodes or impressed current. Incorporate a facility for periodic testing. Conform to the recommendations of AS 2832.1.
- Continuous wrapping using proprietary petroleum taping material.
- Impermeable flexible plastic coating.
- Sealed polyethylene sleeve.

Aggressive soils: If metallic piping or components are installed in chemically aggressive soil, provide additional protection as follows:

- Material: Continuous polyethylene sleeve to ASTM D1248 with a minimum thickness of 0.25 mm.
- Installation: Wrap or sleeve pipes and components. Tape joints between sections of polyethylene and between polyethylene and piping.

Repairs to finishes

Requirement: Repair damaged finishes to restore their corrosion protection, appearance and service life.

Painting of pipe threads: After pipe installation and before other finishes or insulation are applied, paint exposed threads in metallic-coated steel pipe with zinc rich paint.

7.7 MARKING AND LABELLING

General

Requirement: Mark and label services and equipment for identification purposes as follows:

- Locations exposed to weather: Provide durable materials.
- Pipes, conduits and ducts: To AS 1345 throughout its length, including in concealed spaces.
- Cables: Label to indicate the origin and destination of the cable.

Consistency: Label and mark equipment using a consistent scheme across all services elements of the project.

Label samples and schedules

Requirement: For each item or type of item, prepare a schedule of marking and labelling, including the following:

- A description of the item or type of item for identification.
- The proposed text for marking or labelling.
- The proposed location of the marking and labelling.

Submission timing: Before marking or labelling.

Electrical accessories

Circuit identification: Label isolating switches and outlets to identify circuit origin.

Operable devices

Requirement: Mark to identify the following:

- Controls.
- Indicators, gauges, meters.

- Isolating switches.

Equipment concealed in ceilings

Location: Provide a label on the ceiling, to indicate the location of each concealed item requiring access for routine inspection, maintenance and/or operation and as follows:

- Tiled ceilings, locate the label on the ceiling grid closest to the concealed item access point.
- Flush lined ceilings, locate adjacent to closest access panel.

Concealed equipment: Items to be labelled include the following:

- Fan coil units and terminal equipment (e.g. VAV terminals).
- Fire and smoke dampers.
- Isolating valves not directly connected to items otherwise labelled.
- Motorised dampers.

Wall mounted equipment in occupied areas

Location: Provide labels on wall mounted items in occupied areas including the following:

- Services control switches.
- Temperature and humidity sensors.

Points lists

Automatic control points: Provide plasticised, fade-free points lists for each automatic control panel and include terminal numbers, point addresses, short and long descriptors in the lists. Store in a pocket on the door of the panel.

Pressure vessels

General: Mount manufacturer's certificates in glazed frames on a wall next to the vessel.

Valves and pumps

General: Label to associate pumps with their starters and valves. Screw fix labels to body or attach label to valve handwheels with a key ring.

Underground services

Survey: Accurately record the routes of underground cables and pipes before backfilling. Include on the record drawings.

Records: Provide digital photographic records of underground cable and pipe routes before backfilling. Include in operation and maintenance manual.

Location marking: Accurately mark the location of underground cables and pipes with route markers consisting of a marker plate set flush in a concrete base, engraved to show the direction of the line and the name of the service.

Markers: Place markers at ground level at each joint, route junction, change of direction, termination and building entry point and in straight runs at intervals of not more than 100 m.

Marker bases: 200 mm diameter x 200 mm deep, minimum concrete.

Direction marking: Show the direction of the cable and pipe run by means of direction arrows on the marker plate. Indicate distance to the next marker.

Plates: Brass, aluminium or stainless steel with black filled engraved lettering, minimum size 75 x 75 x 1 mm thick.

Plate fixing: Waterproof adhesive and 4 brass or stainless steel countersunk screws.

Marker height: Set the marker plate flush with paved surfaces, and 25 mm above other surfaces.

Marker tape: Where electric bricks or covers are not provided over underground wiring, provide a 150 mm wide yellow or orange marker tape bearing the words WARNING – electric cable buried below, laid in the trench 150 mm below ground level.

Plastic pipe: Provide a detectable marker tape with trace wire to identify the route of buried piping. Terminate with 1000 mm coil in a readily accessible location. Tag to match the record drawings.

Labels and notices

Materials: Select from the following:

- Cast metal.
- For indoor applications only, engraved two-colour laminated plastic.
- Proprietary pre-printed self-adhesive flexible plastic labels with machine printed black lettering.
- Stainless steel or brass minimum 1 mm thick with black filled engraved lettering.

Emergency functions: To AS 1319.

Colours: Generally to AS 1345 as appropriate, otherwise black lettering on white background except as follows:

- Danger, warning labels: White lettering on red background.
- Main switch and caution labels: Red lettering on white background.

Edges: If labels exceed 1.5 mm thickness, radius or bevel the edges.

Labelling text and marking: To correspond to terminology and identifying number of the respective item as shown on the record drawings and documents and in operating and maintenance manuals.

Lettering heights:

- Danger, warning and caution notices: Minimum 10 mm for main heading, minimum 5 mm for remainder.
- Equipment labels within cabinets: Minimum 5 mm.
- Equipment nameplates: Minimum 40 mm.
- Identifying labels on outside of cabinets: Minimum 5 mm.
- Isolating switches: Minimum 5 mm.
- Switchboards, main assembly designation: Minimum 25 mm.
- Switchboards, outgoing functional units: Minimum 10 mm.
- Switchboards, sub assembly designations: Minimum 15 mm.
- Valves:
 - . \geq DN65: Minimum 25 mm.
 - . $<$ DN65: Minimum 10 mm.
- Self-adhesive flexible plastic labels:
 - . Labels less than 2000 mm above floor: 5 mm.
 - . Labels minimum 2000 mm above floor: 10 mm.
 - . Other locations: Minimum 5 mm.

Label locations: Locate labels so they are easily seen and are either attached to, below or next to the item being marked.

Fixing: Fix labels securely using screws, rivets, proprietary self-adhesive labels or double-sided adhesive tape and as follows:

- If labels are mounted in extruded aluminium sections, use rivets or countersunk screws to fix the extrusions.
- Use aluminium or monel rivets for aluminium labels.

Vapour barriers: Do not penetrate vapour barriers.

8 COMPLETION

8.1 TOOLS AND SPARE PARTS

Spare parts

General: Provide spare parts listed as documented.

Replacement: Replace spare parts used during the maintenance period.

Tools and spare parts schedule

Submission timing: At least 8 weeks before 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.

8.2 TRAINING

General

Standard: To SA TS 5342.

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.

Operation

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

Maintenance

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

Seasonal operation

General: For equipment requiring seasonal operation, demonstrate during the appropriate season.

8.3 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 visible labels not required for maintenance.

Removal of material

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

8.4 WARRANTIES

General

Requirement: If a warranty is documented, name the principal as warrantee. Register with manufacturers as necessary. Retain copies delivered with components and equipment.

Approval of installer: If installation is not by manufacturer, and product warranty is conditional on the manufacturer's approval of the installer, submit the manufacturer's written approval of the installing firm.

Principal's responsibilities: Submit details of responsibilities of the principal required to keep warranties in force.

9 TESTING AND COMMISSIONING

9.1 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 Table B1.
- External: To AS 1055.
- Internal: To AS/NZS 2107.
- 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.

9.2 COMMISSIONING

Standard

Requirement: Conform to SA TS 5342.

Static completion

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

- Their construction and installation is compete 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 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:

- 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.

9.3 BUILDING TUNING

General

Standard: To SA TS 5342.

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.

10 PROJECT RECORDS

10.1 TACTICAL FIRE DRAWINGS

General

Requirement: Provide sets of colour coded tactical fire drawings, showing all items and systems relevant in a fire to BCA Spec E1.8.

Scale: 1:200 or larger if required to be easily read under emergency conditions.

Coordination: Agree the format, colour coding and contents of the tactical fire plans with the Local Fire Authority before beginning documentation.

Location: Provide one set of the laminated drawings fixed to the wall or supplied in a vertical plan hanger in the fire control room.

Loose set: Provide a second set of identical drawings.

Operation and maintenance manuals: Provide a set of colour coded tactical fire drawings in each copy of the operating and maintenance manual.

Inclusions

Requirement: Include the following on the tactical fire drawings:

- Legend sheet at front of set.
- Colour coding key.
- Building: As follows:
 - . Floor plans.
 - . Pressurised and non-pressurised fire isolated stairs and passages.
 - . Smoke and fire compartments.
 - . Special risk areas.
- Fire services: As follows:

- . Automatic fire detection systems.
- . Automatic suppression systems including gas flooding systems.
- . Communications including warden intercommunication points.
- Fire control room.
- . Fire equipment including booster connections.
- . Fire hydrants, hose reels, portable fire extinguishers.
- . Fire detection control and indicating equipment (FDCIE).
- . Fire service lifts.
- . Fire telephone and control panel.
- . Hydrant and sprinkler pumps.
- . Hydrant/hose reels.
- . Sprinkler and hydrant, suction and booster connections.
- . Sprinkler control valves.
- Electrical services: As follows:
 - . Emergency power supplies.
 - . Essential services switchboards.
 - . Evacuation warning panel.
 - . Standby power plant.
 - . Substations/transformers.
 - . Switchboards, main switch room.
- Mechanical ventilation and air handling equipment: As follows:
 - . Air intakes, fans, ducts, shafts.
 - . Conditioners and mixing boxes.
 - . Fire dampers.
 - . General exhaust air fans, ducts, shafts, discharges.
 - . Smoke dampers.
 - . Smoke fans including exhaust fans, zone and stair pressurisation fans.
 - . Stair pressurisation systems.
 - . Supply air system.
- Mechanical ventilation and air handling equipment operation: As follows:
 - . Statement of normal condition.
 - . Condition upon fire alarm.
 - . Manual controls available.
- Hydraulic services: As follows:
 - . Gas meters.
 - . Gas supply control.
 - . Incoming water supplies and valves for the sprinkler, hydrant and fire hose reel systems.
 - . Water tank.

10.2 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.

Services record drawings

General: To **RECORD DRAWINGS, General and Recording, format and submission** and the following:

- Extensions and/or changes to existing: If a drawing shows extensions and/or alterations to existing installations, include sufficient of the existing installation to make the drawing comprehensible without reference to drawings of the original installation.
- Detention: If on-site detention tanks or pondage are provided, include the volume required on the drawing and the permitted flow rate to the connected system.
- Domestic cold water or fire mains: Show the pressure available at the initial connection point and the pressure available at the most disadvantaged location on each major section of the works.
- Stormwater: If storm water pipes are shown, include the pipe size and pipe grade together with the maximum acceptable flow and the actual design flow.

Diagrams: Provide diagrammatic drawings of each system including the following:

- Controls.
- Piping including all valves and valve identification tags.
- Principal items of equipment.
- Single line wiring diagrams.
- Acoustic and thermal insulation.
- Access provisions and space allowances.
- Fasteners.
- Fixtures.
- Switchgear and control gear assembly circuit schedules including electrical service characteristics, controls and communications.
- Charts of valve tag numbers, with location and function of each valve, keyed to flow and control diagrams.

Subsurface services: Record information on underground or submerged services to the documented quality level, conforming to AS 5488.1.

10.3 OPERATION AND MAINTENANCE MANUALS

General

Standard: To SA TS 5342.

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 operation and maintenance manuals to include changes made to the installation during the work.

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.

Baseline data: Include the baseline data to AS 1851, including baseline data to AS 1668.1, AS 1682.2, AS 1670.1 and AS/NZS 2293.1.

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

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

Digital photographic records: Include records to **MARKING AND LABELLING, Underground services**.

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.
- 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, AS/NZS 3666.2, AS/NZS 3666.3 and AS/NZS 3666.4.

Maintenance records:

- Prototype routine service records conforming to AS 1851 prepared to include project specific details.
- Prototype periodic maintenance records and report to AS/NZS 3666.2, AS/NZS 3666.3 and AS/NZS 3666.4 as appropriate, prepared to include project specific details.
- Hard copies: Binders to match the manuals, containing loose leaf log book 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 log book 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 sub system 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.

Delivery method: [complete/delete]

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.

11 MAINTENANCE

11.1 PERIODIC MAINTENANCE OF SYSTEMS AND EQUIPMENT

General

Requirement: Carry out periodic inspections and maintenance work as recommended by manufacturers of supplied systems and equipment and to statutory requirements.

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 in the **Maintenance requirements schedule**.

Faults: Rectify promptly.

Emergencies: Attend emergency calls promptly.

Annual maintenance: Carry out recommended annual maintenance procedures 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 log books 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.

11.2 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.
- 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.

12 SELECTIONS

12.1 PERFORMANCE

Noise level schedule

	A	B	C
Upper limit of noise caused by services			

12.2 SUBMISSIONS AND INSPECTIONS

Notices schedule

Item	Minimum notice

12.3 TESTS

Tests schedule

Test	Requirements

12.4 COMPLETION

Warranty schedule

Warranty	Form	Period

12.5 MAINTENANCE

Maintenance requirements schedule

Provision	Maintenance period (months)	Requirement

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 adhesive, sealant or fastener is compatible with materials to be fixed and is suitable for the project conditions.

Warranties

Manufacturer's warranty: Submit the manufacturer's published product warranties.

2 PRODUCTS

2.1 ADHESIVES

Standards

Gypsum plaster adhesive: To AS 2753.

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 bare metals.
 - . Lower energy surfaces including many plastics, most paints and powder coatings, and bare metals.

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

Total VOC limits

Requirement: Conform to the following maximum limits:

- General purpose adhesives: 50 g/L.
- Structural glazing adhesive, timber flooring and laminate adhesives: 100g/L.

2.2 SEALANTS**Standards**

General: To ISO 11600.

External masonry joints

General: Provide sealant and bond breaking materials which are non-staining to masonry. Do not use bituminous materials with absorbent masonry units.

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.

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.

Total VOC limits

Requirement: Conform to the following maximum limits:

- General purpose sealants: 50 g/L.
- Acoustic sealants, architectural sealants, waterproofing sealants: 250 g/L.
- Wood flooring and laminate sealant: 100 g/L.

2.3 FASTENERS**General**

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

Plain washers: To AS 1237.1.

- 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 A240/A240M.

Steel nails: To AS 2334.

- 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.

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

Bolts

Coach bolts: To AS/NZS 1390.

Hexagon bolts Grades A and B: To AS 1110.1.

Hexagon bolts Grade C: To AS 1111.1.

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	Threaded fasteners and anchors		Powder actuated fasteners
	Material	Minimum local metallic coating thickness (µm)	Material
C1 and C2	Electroplated zinc or Hot-dip galvanized	30	Stainless steel Type 316
C3	Hot-dip galvanized	45	Stainless steel Type 316
C4	Stainless steel Type 316	-	Stainless steel Type 316

Note: For categories C5, CX and T to the AS/NZS 2312 series, seek specialist advice.

Finishes

Electroplating:

- Metric thread: To AS 1897.
- Imperial thread: To AS 4397.

Galvanizing:

- Threaded fasteners: To AS/NZS 1214.
- Other fasteners: To AS/NZS 4680.

Mild steel fasteners: Galvanize if:

- Embedded in masonry.
- In external timbers.
- Exposed to or in air spaces behind the external leaf of masonry walls.
- In contact with chemically treated timber other than CCA treated timber.

Epoxy coated: CCA treated timber.

Nuts

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

Hexagon nuts Grade C: To AS 1112.3.

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

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

Screws

Coach screws: To AS/NZS 1393.

Hexagon screws Grades A and B: To AS 1110.2.

Hexagon screws Grade C: To AS 1111.2.

Hexagon socket screws: To AS 1420.

Self-drilling screws: To AS 3566.1.

Self-tapping screws:

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

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.

3 EXECUTION

3.1 ADHESIVES

General

Requirement: Install to the manufacturer's recommendations.

Preparation

Substrates: Conform to the following:

- Remove any deposit or finish which 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 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 which 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 FASTENERS

General

Requirement: Install to the manufacturer's recommendations.

Fastening to wood and steel

Timber substrates: To AS 1720.1 Section 4.

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

Masonry anchors

Installation: To the manufacturer's recommendations.

4 SELECTIONS

4.1 ATHE CODES IN THE HEADER ROW OF THE SCHEDULE DESIGNATE EACH APPLICATION OR LOCATION OF THE ITEM SCHEDULED. EDIT THE CODES TO MATCH THOSE IN OTHER CONTRACT DOCUMENTS.

4.2 SEALING, POINTING AND BEDDING

Application schedule

Application	Product	Relevant worksections
Metal flashings and rainwater goods	Refer to Material and Finishes Schedule	0421 Roofing – combined, 0423 Roofing – profiled sheet metal

Application	Product	Relevant worksections
Metal flashings and sealing non-porous substrates	Refer to Material and Finishes Schedule	<i>0431 Cladding – combined, 0436 Cladding – profiled and seamed sheet metal</i>
Window and external doors	Refer to Material and Finishes Schedule	<i>0432 Curtain walls, 0451 Windows and glazed doors, 0453 Doors and access panels,</i>

Adhesives, sealants and fasteners combined function schedule

Application	Product	Relevant worksections
Fixing and sealing acoustic ceiling tiles		<i>0531 Suspended ceilings – combined</i>
Control joints, tile adhesives and wet area sealants		<i>0631 Ceramic tiling, 0632 Stone and terrazzo tiling</i>
Timber floor control joints, adhesives and fixings		<i>0655 Timber flooring</i>
Wet area sealants and lightweight detail items		<i>0551 Joinery, 0811 Sanitary fixtures</i>

4.3 SEALING STRUCTURALLY DESIGNED CONTROL JOINTS**Application schedule**

Application	Sealant type	Bond breaking	Sealant colour	Relevant worksection
Masonry control joints				<i>0331 Brick and block construction,</i>
Trafficable masonry control joints				<i>0274 Concrete pavement</i>

0182 FIRE-STOPPING

1 GENERAL

1.1 RESPONSIBILITIES

General

Requirement: Provide fire-stopping, as documented.

1.2 CROSS REFERENCES

General

Requirement: Conform to the following:

- *0171 General requirements.*

1.3 STANDARDS

General

Service penetration fire-stopping systems: To BCA C3.15.

Control/construction joint fire-stopping systems: To AS 4072.1 and BCA C3.16.

1.4 INTERPRETATION

Definitions

General: For the purposes of this worksection, the definitions given in AS 4072.1 apply.

1.5 SUBMISSIONS

Certification

General: Submit evidence of conformity with the recommendations of AS 4072.1 Appendix B.

Certification: Submit a completed certification list and schedule for installed fire-stopped penetrations and control/construction joints.

- List form: To AS 4072.1 Figure B1.

- Schedule form: To AS 4072.1 Figure B2.

Execution details

General: Give notice, if substrates or penetrants or both are not suitable for fire-stopping.

Operation and maintenance manuals

General: For fire-stopping systems which are intended to be modified in service, submit a user manual.

Products and materials

General: Submit the following:

- Evidence that systems conform to documented requirements.
- Copies of relevant manufacturers' instructions.
- Product data sheets (PDS).

Type tests: Submit type test reports as evidence of conformance for each combination of fire-stopping system, application, type of service, substrate, penetration orientation and drawings of tested details. Include for the following:

- Service penetration fire-stopping systems: Fire-resistance tested to AS 1530.4.
- Fire-stop mortars: Resistance to explosive spalling to AS 1774.36.
- Control joint fire-stopping systems: Fire-resistance tested to AS 1530.4.

Samples

Sample panels: Supply a sample panel of each fire-stopping assembly, on representative substrates. If built into the works, identify by marking it as a control sample.

Size: 500 mm run for junction seals and 500 x 500 mm area for penetration seals.

Subcontractors

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

Warranties

Proprietary fire-stopping products and systems: Submit the manufacturer's published product warranties.

1.6 INSPECTION

Notice

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

- Service penetrations completed and ready for fire-stopping.
- Control/construction joints completed and ready for fire-stopping.
- Finished fire-stopping, before being concealed.

2 PRODUCTS

2.1 MATERIALS

Storage and handling

General: Deliver, unload and store products and accessories in unbroken manufacturer's packaging in a dry, well-ventilated and secure storage area, unaffected by weather.

Shelf life: Use materials that have not exceeded their shelf life.

Control joints

General: To AS 4072.1 clauses 2.3 and 4.7 and Appendix C.

Toxicity

Toxic materials: Free of asbestos and lead, and free of, nor requiring the use of, toxic solvents.

Toxicity in fire: Non-toxic.

Product certification

Conformance: Address the following:

- Statutory and performance requirements.
- Adequacy of application/installation.

Appointment: In the joint names of the contractor and the principal.

2.2 FIRE-STOPPING PRODUCTS

Fire-stop mortars

Type: Re-enterable cement-based compound, mixed with water. Non-shrinking, moisture resistant. Insoluble in water, after setting.

Formulated compound of incombustible fibres

Material: Formulated compound mixed with mineral fibres, non-shrinking, moisture resistant. Insoluble in water after setting.

Fibre stuffing

Material: Mineral fibre stuffing insulation, dry and free of other contaminants.

Standard: To AS/NZS 4859.1 Section 7.

Intumescent fire pillows

Material: Self-contained self-locking intumescent fire pillows for medium to large openings, where no additional support is required.

Fire-stop composite sheets

Material: Composite system comprised of a number of components, including a fire-resistive elastomeric sheet, bonded on either side with layers of sheet steel and/or steel-wire mesh covered with aluminium foil.

Fire-stop sealants

Material: Elastomeric sealant. Soft, permanently flexible, non-sag, non-shrinking, moisture resistant. Capable of providing a smoke-tight, gas-tight and waterproof seal when properly installed. Insoluble in water after setting.

Fire-stop foams

Material: Single component compound of reactive foam ingredients, non-shrinking, moisture resistant. Insoluble in water after setting.

Fire-stop putty

Material: Single component, mouldable, permanently flexible, non-shrinking, moisture resistant, intumescent compound which conforms to the following:

- Expands on exposure to surface heat gain to form a high-volume thermally insulating char that closes gaps and voids.
- Resists the turbulence of a severe fire.
- Can be placed by hand to form an immediate fire seal.
- Insoluble in water after setting.

2.3 COMPONENTS**Fire-stop collars**

Material: Mechanical device with incombustible intumescent fillers covered with sheet steel jacket. Airtight and watertight.

Fire-stop pillows

Material: Formed self-contained compressible flexible mineral fibre in cloth bags, rated to permit frequent changes in service.

Multi-service cable transit box

Material: Mechanical device consisting of a sheet steel sleeve containing heat reactive intumescent polymer, including intumescent seals and smoke rated brushes. The insulation rating can be increased by the incorporation of other fire-stopping products.

Control joint insert – elastomeric foam strip

Material: Elastomeric foam strip laminated with a graphite based intumescent compound on both sides, which is a water resistant seal that expands when exposed to heat.

Accessories

Permanent dam material: Non-combustible.

Installation accessories: Provide clips, collars, fasteners, stainless steel cable ties, temporary stops and dams, backing rods and other devices required to position, support and contain fire-stopping and accessories.

3 EXECUTION

3.1 PREPARATION**Substrates**

Cleaning: Clean substrates of dirt, dust, grease, oil, loose material, and other matter which may affect the bond of fire-stopping products.

Primer: Dry substrates for primers and sealants.

Restraint: Install backing and/or damming materials to arrest liquid material leakage. Remove temporary dams after material has cured.

3.2 INSTALLATION**General**

Extent: Fire-stop and smoke-stop interruptions to fire-resistance rated assemblies, materials and components, including penetrations through fire-resisting elements, breaks within fire-resisting elements (e.g. expansion joints), and junctions between fire-resisting elements.

Sequence: Fire-stop after services have been installed through penetrations and properly spaced and supported, after sleeving where appropriate, and after removal of temporary lines, but before restricting access to the penetrations, including before dry lining.

Ventilation: Supply ventilation for non-aqueous solvent-cured materials.

Density: Apply fire-stopping material to a uniform density.

Fire-stopping exposed to view: Finish surfaces to a uniform and level condition.

Cable separation: Maintain cable separation.

Protection: Protect adjacent surfaces from damage arising through installation of fire-stopping. Protect completed fire-stopping from damage arising from other work.

Loose or damaged fire-stopping material: Remove and replace.

Penetrations by pipes and ducts: Allow for thermal movement of the pipes and ducts.

Preventing displacement: Reinforce or support fire-stopping materials with non-combustible materials when:

- The unsupported span of the fire-stopping materials is greater than 100 mm.
- The fire-stopping materials are non-rigid (unless shown to be satisfactory by test).

Penetrations: Provide structural support around the opening.

3.3 FIRE-STOPPING SYSTEMS

Control joint insert – elastomeric foam strip

Site conditions: Make sure that the application area is free from dust, oil, solvents or any other foreign substances.

Installation: In accordance to manufacturer's specification

Fire-stop mortars

Ambient conditions: Do not install below 5°C.

Formulated compound of incombustible fibres

Installation: In accordance to manufacturer's specification

Fibre stuffing

Installation: Compress to 40% of its uncompressed volume.

Fire-stop composite sheets

Installation: In accordance to manufacturer's specification [complete/delete]

Fire-stop sealants

Ambient conditions: Do not store above 32°C. Do not install outside the temperature range recommended by the sealant manufacturer. Do not install when humidity exceeds that recommended by the sealant manufacturer for safe installation.

Fire-stop foams

Ambient conditions: Do not store above 32°C. Do not install below 15°C or above 32°C. Do not apply when temperature of substrate and air is below 15°C. Maintain this minimum temperature before, during and for 3 days after installation.

Installation: Test substrates for adhesion and prime if necessary. Place in layers for homogenous density, filling cavities and spaces. Place sealant to completely seal junctions with adjacent dissimilar materials.

Fire-stop putty

Ambient conditions: Do not install below 5°C. Do not allow the material to freeze.

Installation: In accordance to manufacturer's specification [complete/delete]

Fire-stop collars

Installation: In accordance to manufacturer's specification [complete/delete]

Fire-stop pillows

Ambient conditions: Do not install in conditions outside the manufacturer's recommendations.

Multi-service cable transit box

Installation: In accordance to manufacturer's specification

3.4 COMPLETION

Cleaning

Requirement: Clean the finished surfaces and remove spilled and excess fire-stopping materials without damaging other work.

Labelling

Requirement: To the recommendations of AS 4072.1 Appendix B.

Additional marking: Include the following text in addition to the above: CAUTION – FIRE BARRIER MUST REMAIN SEALED.

Location: Attach labels to cables, conduits, pipes and ducts on both sides of and close to, the control joint or penetration. On large items, provide multiple labels.

Warranties

Requirement: Provide warranties as offered by the manufacturer.

0183B 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

Requirement: Submit samples of the following:

- Stainless steel: One sample of every documented surface finish.
- Anodising: One sample of every colour and finishing option.

2 PRODUCTS

2.1 METALS

Stainless steel

Bars: To ASTM A276/A276M.

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

Welded pipe (plumbing applications): To AS 1769.

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

3 EXECUTION

3.1 GENERAL

Metal separation

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-metallic 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 1167.1.

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.

Welding

Aluminium: To AS/NZS 1665.

Stainless steel: To AS/NZS 1554.6.

Steel: To AS/NZS 1554.1.

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 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.

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

3.3 STAINLESS STEEL FINISHES

General

Requirement: Provide a surface finish to match the approved sample.

Pre-assembly

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 stainless steel to equalise induced stress.

Post-assembly pre-treatment

Heat discolouration: Remove by pickling.

Welds: Grind excess material, brush, and polish to match the pre-assembly finish.

Post-assembly finish

Electropolish finish: Provide an electro-chemical process to stainless steel Type 316.

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 R_a , no greater than 0.50 μm .

Mirror finish: Conform to the following:

- Pre-assembly finish: 2B cold-rolled finish.
- Post-assembly finish: Apply a polishing and buffering 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 ELECTROPLATED FINISHES

Electroplated coatings

Chromium on metals: To AS 1192.

- Service condition number: At least 2.

Nickel on metals: To AS 1192.

- Service condition number: At least 2.

Zinc on iron or steel: To AS 1789.

3.5 ANODISED FINISHES

General

Standard: To AS 1231.

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

3.6 PREPAINTED FINISHES

Air-drying enamel

Application: Spray or brush.

Finish: Full gloss.

General use:

- Primer: Two-pack epoxy primer to AS/NZS 3750.13.
- Top coats: 2 coats to AS 3730.6.

Oil resistant use:

- Primer: Two-pack epoxy primer to AS/NZS 3750.13.
- Top coats: 2 coats to AS/NZS 3750.22.

Equipment paint system

Description: Brush or spray application using paint as follows:

- Full gloss enamel finish coats, oil and petrol resistant: To AS/NZS 3750.22, two coats.
- Prime coat to metal surfaces generally: To AS/NZS 3750.19 or AS/NZS 3750.20.
- Prime coat to zinc-coated steel: To AS 3730.15 or AS/NZS 3750.16.
- Undercoat: To AS/NZS 3750.21.

Prepainted metal products

Standard: To AS/NZS 2728.

Product type: To AS/NZS 2728: Not lower than the type appropriate to the documented atmospheric corrosivity category.

Stoving enamel

Application: Spray or dip.

Two-pack liquid coating

Application: Spray.

Finish: Full gloss.

Primer: Two pack epoxy primer to AS/NZS 3750.13.

Topcoat:

- Internal use: Proprietary polyurethane or epoxy acrylic system.
- External use: Proprietary polyurethane system.

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.

Cleaning

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

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 and fire-resistance.
- Appropriate certification for the finishing applications.

1.2 CROSS REFERENCES**General**

Requirement: Conform to the following:

- *0171 General requirements.*
- *0671 Painting.*

1.3 STANDARDS**General**

Sawn and milled products:

- Hardwood: To AS 2796.1.
- Softwood: To AS 4785.1.

Reconstituted wood based panels:

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

Plywood:

- Structural: To AS/NZS 2269.0.
- Interior: To AS/NZS 2270.
- Exterior: To AS/NZS 2271.
- Marine: To AS/NZS 2272.

Glued laminated timber: To AS/NZS 1328.1.

Laminated veneer lumber: To AS/NZS 4357.0.

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 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.

Certificate of preservative treatment: Submit a certificate that the timber has been treated to AS/NZS 1604.1 clause 1.5.3.6.

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 clause 1.5.3.2 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.

Engineered timber product certification and identification

Branding: 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.

Inspection: If neither branding nor certification is adopted, have an independent inspecting authority inspect the timber.

2.3 FIRE-RESISTANCE

General

Timber structures: To AS/NZS 1720.4.

Bushfire-prone areas

Standard: To AS 3959.

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.

Naturally termite-resistant timbers: To AS 3660.1 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: Do not provide untreated timbers containing lyctid susceptible sapwood.

Untreated sapwood: If used, place to the outside of joints or in locations exposed to higher levels of ventilation.

Preservative treatment

Wood-based products: To AS/NZS 1604.1.

Verification requirements: To AS/NZS 1604.2.

Test methods: To AS/NZS 1604.3.

Moisture content

Test: Methods as follows:

- Timber: To AS/NZS 1080.1.
- Plywood: To AS/NZS 2098.1.
- Reconstructed wood-based products: AS/NZS 4266.1.

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

Hardwood: To AS 2796.1 Table B1.

Softwood: To AS 4785.1 Table B1.

Surface coating

Painting and staining: To *0671 Painting*.

Application: To the manufacturer's specification.

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: Provide a seal coating of preservative treatment and include inside bolt holes and the end grain of the timber.

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

Fasteners: To prevent chemical treatments reacting with fasteners, install to manufacturer's recommendations.

3.2 SHRINKAGE RESTRAINT

General

Requirement: Use seasoned timber, if possible, to avoid shrinkage restraint, particularly where timber elements are integrated with steel and/or concrete.

Moisture content: Use finishes and end-grain sealants to minimise moisture content changes.

Fasteners: Align fasteners along member axis and use single fasteners at joints.

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

Unseasoned timber: Provide as follows:

- Drill holes 10% oversize.
- Use species with similar shrinkage values to reduce movement and shrinkage.
- For framing provide adequate clearance at the top of masonry veneer and face fixed members to reduce vertical 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.

0191 SUNDRY ITEMS

1 GENERAL

1.1 RESPONSIBILITIES

General

Requirement: Provide sundry items, as documented.

Performance

Requirements: Installation as follows:

- Undamaged and free of surface defects or distortions.
- Correctly located and aligned, plumb, level and straight.
- Fixed firmly in position.
- Connected to the nominated service(s).

1.2 CROSS REFERENCES

General

Requirement: Conform to the following:

- 0171 General requirements.

1.3 SUBMISSIONS

Certification

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

Operation and maintenance manuals

Requirement: Submit a maintenance manual and, if required, an operation manual with the technical specification and manufacturer's recommendations for the item to be installed.

Samples

Labelling: Label each sample, giving the brand and product name, manufacturer's code reference, date of manufacture and intended building location.

Shop drawings

General: Submit shop drawings, to a scale that best describes the detail, showing the following:

- Details of fabrication and components.
- Details of fabrication involving other trades or components.
- Information necessary for site assembly.
- Proposals for the break-up of large items as required for delivery to the site.
- Proposed method of joining the modules of large items.
- Fixing locations and types.

Warranties

Requirement: Submit a manufacturer's and/or installer's warranty.

1.4 INSPECTION

Notice

Inspection: Give notice so inspection can be made of the following:

- Set-out of item locations before fixing.
- Completion of installation.

2 PRODUCTS

2.1 GENERAL

Storage and handling

General: Deliver, unload and store components and accessories in unbroken manufacturer's packaging.

3 EXECUTION

3.1 PREPARATION

Substrates

General: Prepare the substrate to receive the item.

Protection

General: Protect existing work from damage during the installation and rectify any damage. Provide temporary coverings if required.

3.2 INSTALLATION

Accessories and trim

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

3.3 COMPLETION

Cleaning

Requirement: Remove packaging. Clean the completed assembly and surrounds. Wipe down appliances and fittings with a damp, soft, clean cloth.

Warranties

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

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

0193 BUILDING ACCESS SAFETY SYSTEMS

1 GENERAL

1.1 RESPONSIBILITIES

General

Requirement: Provide building access safety systems, as documented.

Performance

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

1.2 DESIGN

General

Designer: Refer to SAYFA (Appendix)

Requirements

General: To DESIGN in 0171 General 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.
- External lighting.
- Aerials and telecommunications equipment.

1.3 CROSS REFERENCES

General

Requirement: Conform to the following:

- 0171 General requirements.

1.4 STANDARDS

General

Personal equipment for working at height: To AS/NZS 1891.1, AS/NZS 1891.2, AS 1891.3, AS/NZS 1891.4 and AS 1891.5.

Rope access system: To AS/NZS 4488.1, AS/NZS ISO 22846.1 and AS/NZS ISO 22846.2.

1.5 INTERPRETATION

Abbreviations

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

- PPE: Personal protective equipment.

Definitions

General: For the purposes of this worksection, the definitions given in AS/NZS 1891.1, AS/NZS 5532 and AS/NZS ISO 22846.1 apply.

1.6 SUBMISSIONS

Certification

General: Submit certification of installed system.

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 anchors and system components in plan and elevation.
 - . Proposed methods of fixing to each substrate type in the building.

Safe work method statement (SWMS) for the designed system: [complete/delete]

Marking and labelling

Requirement: Samples and schedules of proposed marking and labels for each system component.

Operation and maintenance manuals

General: Submit a manual describing the following:

- Limitations of the system.
- Operation procedures and methods.
- PPE user manuals.
- Care and maintenance requirements.

Products and materials

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

- Product data sheets.
- Installation and maintenance recommendations.

Type tests: Submit results, as follows:

- Personal equipment for working at height.
- Rope access systems.
- Fixed ladders.
- Single point anchors.

Subcontractors

General: Submit names and contact details of proposed suppliers and installers as recommended by the manufacturer.

Tests

Site tests: Submit results of proof load tests of drilled-in anchors.

Warranties

Requirement: Submit the warranties for each type of building access safety system, as documented.

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 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.

2.2 FALL PROTECTION SYSTEMS

Access safety system

System: Refer to SAYFA (Appendix)

Anchors

Single point anchors: To AS/NZS 5532.

Vertical lifeline and ladder systems

Product: Vertical rail systems including cables, fixed ladders, guides and fall arrestor trolleys.

Fixed ladders: To AS 1657.

Personal protective equipment (PPE)

Harness: Supply two full body harnesses to AS/NZS 1891.1 with shock absorbing lanyards to AS 1891.5.

Storage: PPE storage holdall supplied by the manufacturer.

Tests

Personal equipment for working at height: Tested as follows:

- Harnesses: To AS/NZS 1891.1 Section 4.
- Horizontal lifeline and rail systems: To AS/NZS 1891.2.
- Lanyard assemblies and pole straps: To AS 1891.5 clause 3.4.

Rope access systems:

- Rope grabs and descenders: Static load test to AS/NZS 4488.1 Appendix A.
- Back-up type rope grabs and descenders: Dynamic load and performance test to AS/NZS 4488.1 Appendix B.

Warranties

Warranty terms: Refer to SAYFA (Appendix)

3 EXECUTION

3.1 INSTALLATION

Standards

Personal equipment for working at height: To the AS/NZS 1891 series.

Rope access systems: to AS/NZS 4488.1.

Subcontractor

Installer: Registered installer, approved by the manufacturer.

Labels and signage

General: To AS/NZS 1891.4 clause 2.2.9.

3.2 TESTING

Proof load test for anchors

Drilled-in anchors: Load test drilled-in anchors used in shear and not in axial tension (direct pull-out) before use.

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

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.

Warranties

Requirement: 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.
- Period: As offered by the supplier/manufacturer.

3.5 MAINTENANCE

General

Preventative and mandatory system maintenance: By an Accredited Height Safety Inspector/Certifier, in conformance with AS/NZS 1891.4 Section 9 and manufacturer's maintenance/recertification recommendations.

Checklist for all inspections: To AS/NZS 1891.2 Supp 1 Table 8, and AS/NZS 1891.4 Section 9 and Appendices C and D.

The installer/competent person: To AS/NZS 1891.4 clause 1.4.2.

Regular scheduled periodic inspections

Standard: To AS/NZS 1891.4 Section 9.

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 months period.
- 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 clause 9.5.

Ongoing maintenance

Certificate: Submit the completion certificates and notify the proprietor of the requirement for continued interval testing.

4 SELECTIONS

4.1 FALL PROTECTION SYSTEMS

General

Type: Refer to SAYFA (Appendix)

0194P RAVEN DOOR SEALS AND WINDOW SEALS**1 GENERAL****1.1 RESPONSIBILITIES****General**

Requirement: Provide RAVEN door seals and window seals, as documented.

Performance

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.

1.2 PERFORMANCE**Bushfire-prone areas**

Bushfire Attack Level (BAL): To AS 3959.

1.3 COMPANY CONTACTS**RAVEN technical contacts**

Website: www.raven.com.au.

1.4 CROSS REFERENCES**General**

Requirement: Conform to the following:

- *0171 General requirements.*

1.5 STANDARDS**Seals general**

Quality management for manufacture: To ISO 9001.

Acoustic applications: Tested to AS 1191 or EN ISO 10140-2 and rated to AS/NZS ISO 717.1.

Fire door assemblies: To AS 1530.4 and AS 1905.1.

Smoke door assemblies: To BCA Spec C3.4, tested to AS 1530.7 and rated to AS 6905, and tested to EN 1634-3.

Combined fire and smoke door assemblies: To BCA Spec C3.4, AS 1530.4, AS 1905.1, AS 1530.7 and AS 3959 for weather seals providing BAL FZ.

Buildings in bushfire-prone areas: To AS 3959:

- BAL-40: Flame retardant silicon, PVC and TPE weather seals with a Flammability Index not more than 5 when tested to AS 1530.2.
- BAL-FZ: Approved door seals for use with fire doorsets tested to AS 1530.4.

Weather and energy saving seals for proprietary windows and door assemblies: To AS 4420.1 clause 5 and clause 6, and AS 2047.

Door bottom and perimeter seals for glazed external doors: To AS 2047.

Threshold plates: To AS 1428.1.

1.6 MANUFACTURER'S DOCUMENTS**Technical manuals**

Website: www.raven.com.au/domino/raven/ravenweb.nsf/html-v/catalogue2.

1.7 INTERPRETATION**Abbreviations and definitions**

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

Ordering abbreviations:

- Al: Aluminium.
- C/A: Clear anodised (15 µm for perimeter seals. 25 µm for threshold plates).

- B/A: Bronze anodised (15 µm for perimeter seals. 25 µm for threshold plates).
- EPDM: Ethylene Propylene Diene Monomer.
- PE: Painted Polyester Enamel finish (special order and extra cost).
- PVC: Polyvinyl Chloride.
- Si: Silicone Rubber.
- TPE: Thermo Plastic Elastomer.

2 PRODUCTS

2.1 GENERAL

Product substitution

Other products: Conform to **SUBSTITUTIONS** in 0171 General requirements.

Product identification

General: Marked to show the following:

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

2.2 MATERIALS

Al

Material: Commercial grade alloy B6060, 6061 or 6063 with T5 or T6 hardness.

Finish to visible extrusions:

- Satin clear or medium bronze anodised, or as documented.
- Anodising thickness:
 - . Perimeter seal extrusions: Minimum 15 µm.
 - . Threshold plates and threshold plate seals: Minimum 25 µm.

PVC

RAVEN proprietary grade PVC extrusions:

- Highest quality available.
- Added UV inhibitors where exposed to sunlight.
- Self-extinguishing grade.
- Antimicrobial additive.
- Service temperature - 5°C to + 70°C.

Si

RAVEN proprietary grade silicon rubber extrusions:

- Are unique and where designated (SE) are self-extinguishing.
- Added UV inhibitors.
- Antimicrobial additive.
- Service temperature - 60°C to + 230°C.

TPE

RAVEN proprietary grade TPE extrusions:

- Highest quality available.
 - Added UV inhibitors.
 - Flammability Index less than 5 to AS 1530.2 where indicated for bushfire-prone areas.
- Service temperature - 40°C to + 100°C.

EPDM

RAVEN proprietary grade closed cell EPDM rubber extrusions:

- Highest quality available as developed by the automotive industry.
- Added UV inhibitors.
- Classified SE/B self-extinguishing burn rate to SAE J 369, and ISO 3795.
- Service temperature - 40°C to + 70°C.

3 EXECUTION

3.1 INSTALLATION

Handing

Requirement: Match door seals to the handing of doors.

Supply

Factory fit and retrofit: Deliver door seals for door perimeter seals and door bottom seals in complete sets for each door, ready for installation.

Identification: Mark packaging with relevant floor level and door location number.

Packaging: For rigid length seals, provide recyclable cartons and recyclable polythene with fixings and fitting instructions.

Off-site installation to proprietary window and door assemblies: Supply RAVEN TPE and silicon rubber weather stripping on bulk reels.

Door assemblies

Modification: Rebate and groove door assemblies to suit the dimensions recommended by RAVEN.

Fitting instructions: Conform to RAVEN's fitting instructions, supplied with each product.

Fixing

Fasteners:

- Unexposed applications: Zinc-plated self-tapping fasteners supplied by RAVEN with each product.
- External coastal exposure applications: Substitute the standard fasteners supplied with equivalent stainless steel fasteners.

Backset: Allow backset clearances as required for hinging, latching and automatic closers.

Proprietary aluminium door/window frames: Select the fixing options to suit the documented RAVEN perimeter/frame seals.

3.2 COMPLETION

Warranties

Required: Refer to manufacturer / supplier.

4 SELECTIONS

4.1 SELECTING A SEALING SYSTEM DUTY LEVEL

Sealing System Duty Level guide

SYSTEM DUTY LEVEL	Building/Room type	Suggested sealing systems	
		Single door	Double doors
LIGHT DUTY (Residential)	Apartments Bedrooms/sleeping areas Guest house rooms Living areas	RP120 + RP60 RP113 + RP3	RP120 + RP123 + RP510 RP520 + RP4 + RP150
MEDIUM DUTY (Commercial / Light industrial)	Art studios Auditoriums Bars and lounges Board rooms Boarding house rooms Cafés Carparks	RP78Si + RP8Si RP94Si + RP127Si RP10Si +	RP78 + RP8Si + RP71Si RP94Si + RP127Si + RP16Si

SYSTEM DUTY LEVEL	Building/Room type	Suggested sealing systems	
		Single door	Double doors
traffic areas, such as Class 3 to 6 buildings.	Cinemas/home theatres Classrooms Computer rooms Consulting rooms Control rooms Convention centres Corridors / lobbies Drama studios Executive offices Film or television studios Gyms Hotel rooms/motel rooms Laboratories Libraries Meeting rooms Music practice/studio rooms Offices Places of worship University tutorial rooms/lecture theatres	RP38Si	RP10Si + RP126Si + RP16Si
HEAVY DUTY (Heavy Commercial / Public / Industrial) Generally used in heavy pedestrian and wheeled traffic areas, such as Class 5 to 10 buildings.	Airports Court rooms Delivery suites Factories Food courts Government and defence rooms/buildings High security rooms Intensive care wards Music recording studios Prisons Recovery rooms Utility rooms Shopping malls/supermarkets Sound stages	RP10Si + RP38Si RP87Si + RP70Si RP24Si + RP70Si	RP10Si + RP38Si + RP16Si RP87Si + RP70Si + RP16Si RP24Si + RP70Si + RP37

4.2 NOISE – ACOUSTIC

R_w30 to R_w33 acoustic sealing system schedule

R_w	Raven acoustic sealing systems	Door			System Duty level	Door No.
		Hinge	Configuration	Thickness (mm)		
30	RP78Si + RP8Si	Butt	Single	35	M	
	RP78Si + RP35Si	Butt	Single	35	M	
	RP10 / RP10Si + RP99Si	Butt	Single	35	H	
	RP10Si + RP8Si	Butt	Single	40	M	
	RP94Si + RP8Si	Butt	Single	44	M	

R _w	Raven acoustic sealing systems	Door			System Duty level	Door No.
		Hinge	Configuration	Thickness (mm)		
	RP94Si + RP99Si	Butt	Single	44	M	
	RP10Si + RP126Si + RP16Si	Butt	Double	45	H	
	RP10Si + RP128Si + RP71Si	Butt	Double	45	H	
	RP24 + RP38 + RP71	Butt	Double	45	H	
	RP24Si + RP38Si + RP16Si	Butt	Double	45	H	
	RP44Si + RP127Si + RP71Si	Butt	Double	45	M	
	RP84Si + RP126Si + RP16Si	Butt	Double	45	H	
	RP84Si + RP128Si + RP71Si	Butt	Double	45	H	
	RP84Si + RP8Si + RP71	Butt	Double	45	M	
	RP87HSi + RP126Si + RP16Si	Butt	Double	45	H	
31	RP120 + RP8Si	Butt	Single	44	M	
	RP84Si + RP127Si + RP71Si	Butt	Double	45	H	
32	RP10 / RP10Si + RP99Si	Butt	Single	44	H	
	RP10 / RP10Si + RP99Si	Butt	Single	44	H	
	RP10 / RP10Si + RP99Si + RP16Si	Butt	Double	44	H	
	RP10 / RP10Si + RP99Si + RP71Si	Butt	Double	44	H	
	RP10 / RP10Si + RP99Si + RP85	Butt	Double	44	H	

R_w	Raven acoustic sealing systems	Door			System Duty level	Door No.
		Hinge	Configuration	Thickness (mm)		
	RP24 + RP38	Butt	Single	44	H	
	RP24 + RP70	Butt	Single	44	H	
	RP47Si + RP38	Butt	Single	44	H	
	RP47Si + RP70	Butt	Single	44	H	
	RP93Si + RP99Si	Butt	Single	44	M	
	RP120 + RP38	Butt	Single	44	M	
	RP10Si + RP127Si	Butt	Single	48	H	
33*	RP78Si + RP8Si	Butt	Single	40	M	
	RP530 + RP38	Butt	Single	50	M	
	RP530 + RP70	Butt	Single	50	M	

Note: (*) Door Assembly R_w ratings above R_w32 require acoustically constructed door leaves.

Rw34 to Rw40 acoustic sealing system schedule

R_w	Raven acoustic sealing systems	Door			System Duty level	Door No.
		Hinge	Configuration	Thickness (mm)		
34*	RP78Si + RP530 + RP70	Butt	Single	50	M	
36*	RP78Si + RP124 + RP8Si	Butt	Single	35	M	
	RP120 + RP520 + RP8Si + RP99Si	Butt	Single	44	M	
	RP10Si + RP127Si	Butt	Single	68	H	
37*	RP78Si + RP8Si	Butt	Single	35	M	
	RP10Si + RP128Si	Butt	Single	35	H	
	RP24Si + RP38Si	Butt	Single	35	H	
	RP120 + RP520 + RP38 + RP99Si	Butt	Single	44	M	
	RP24Si + RP127Si + RP126Si	Butt	Single	48	H	

R_w	Raven acoustic sealing systems	Door			System Duty level	Door No.
		Hinge	Configuration	Thickness (mm)		
38*	RP120 + RP127Si	Butt	Single	48	M	
	RP78Si + RP530 + RP70 + RP117Si	Butt	Single	53	M	
39*	RP78Si + RP120 + RP70	Butt	Single	53	M	
40*	RP124 + RP127Si	Butt	Single	48	M	

Note: (*) Door Assembly R_w ratings above R_w32 require acoustically constructed door leaves.

R_w41 to R_w50 acoustic sealing system schedule

R_w	Raven acoustic sealing systems	Door			System Duty level	Door No.
		Hinge	Configuration	Thickness (mm)		
41*	RP78Si + RP530 + RP38 + RP16Si	Butt	Double	54	M	
42*	RP10Si + RP124 + RP8Si + RP128Si	Butt	Single	35	H	
	RP24Si + RP124 + RP8Si + RP38Si	Butt	Single	35	H	
	RP87Si + RP124 + RP8Si + RP128Si	Butt	Single	35	H	
	RP10Si + RP124 + RP127Si	Butt	Single	68	H	
	RP24Si + RP127Si + RP126Si	Butt	Single	68	H	
43*	RP78Si + RP124 + RP8Si + RP128Si	Butt	Single	35	M	
	RP10Si + RP124 + RP8Si + RP128Si	Butt	Single	35	H	
	RP10Si + RP124 + RP127Si	Butt	Single	48	H	

45*	RP10Si + RP124 + RP127Si + RP126Si	Butt	Single	48	H	
	RP78Si + RP120 + RP70 + RP120 + RP71 + RP393Si	Butt	Double	54	M	
	RP24Si + RP124 + RP127Si + RP126Si	Butt	Single	68	H	
46*	RP78Si + RP120 + RP2004F + RP8Si	Butt	Double	60	M	
	RP85 + RP124 + RP127Si + RP126Si	Butt	Single	68	H	
47*	RP78Si + RP120 + RP70 + RP71 + RP393Si	Butt	Single	54	M	
49*	RP78Si + RP120 + RP2004F + RP8Si + RP71 + RP393Si	Butt	Double	60	M	
Note: (*) Door Assembly R_w ratings above R_w32 require acoustically constructed door leaves.						

Other acoustic sealing system schedule

R_w	Raven acoustic sealing systems	Door			System Duty level	Door No.
		Hinge	Configuration	Thickness (mm)		
30	RP47Si	Broad butt	Single	35	H	
	RP118Si + RP71Si + RP117Si	Broad butt	Double	45	M	
	RP118Si	Broad butt	Single	45	H	
31	RP84Si + RP51F + RP52F	Sliding	Single	35	M	
	RP93Si + RP71Si + RP97Si	Broad butt	Double	45	M	
	RP118Si + RP8Si + RP16Si	Broad butt	Double	45	M	
32	RP47Si	Broad butt	Single	44	H	

R_w	Raven acoustic sealing systems	Door			System Duty level	Door No.
		Hinge	Configuration	Thickness (mm)		
34*	RP10Si + RP51F + RP52F	Sliding	Single	35	M	
35*	RP71Si + RP71Si + RP96	Pivot	Single	50	M	
38*	RP94Si + RP8Si	Broad butt	Interconnecting	40	M	
44*	RP530 + RP70	Broad butt	Interconnecting	50	M	
52*	RP78Si + RP120 + RP70 + RP71 + RP393Si	Broad butt	Interconnecting	54	M	

Note: (*) Door Assembly R_w ratings above R_w32 require acoustically constructed door leaves.

4.3 SMOKE DOORS

Smoke sealing system schedule

RAVEN smoke sealing system	Door				System Duty level	Door No.
	Seal installation type	Hinge	Configuration	Thickness (mm)		
RP120 + RP8Si	Mortised	Butt	Single	35+	M	
RP120 + RP35Si	Face fixed	Butt	Single	35+	M	
RP150 + RP8Si	Face fixed	Butt	Single	35+	M	
RP78Si + RP8Si	Mortised	Butt	Single	35+	M	
RP78Si + RP38Si	Face fixed	Butt	Single	35+	M	
RP78Si + RP35Si	Face fixed	Butt	Single	35+	M	
RP78Si + RP128Si	Face fixed	Butt	Single	35+	M	
RP124 + RP128Si	Face fixed	Butt	Single	35+	M	
RP124 + RP126Si	Face fixed	Butt	Single	35+	M	
RP124 + RP127Si	Face fixed	Butt	Single	40+	M	
RP23 + RP8Si	Mortised	Butt	Single	35+	M	
RP24Si + RP38Si	Semi mortised	Butt	Single	40+	H	
RP87Si + RP126Si	Semi mortised	Butt	Single	40+	H	

RAVEN smoke sealing system	Door				System Duty level	Door No.
	Seal installation type	Hinge	Configuration	Thickness (mm)		
RP78Si + RP38Si + RP16Si	Semi mortised	Butt	Double	40+	M	
RP120 + RP8Si + RP120	In meeting stile rebate	Butt	Double	40+	M	
RP150 + RP8Si + RP150	In meeting stile rebate	Butt	Double	40+	M	
RP124 + RP35Si + RP71Si	Face fixed	Butt	Double	40+	M	
RP130Si + RP129F + RP130Si + RP115 threshold plate	On meeting stile	Pivot double acting	Double	40+	H	

Smoke sealing system schedule - fire engineered alternative solution tested to AS 1530.7

RAVEN smoke sealing system	Door				System Duty level	Door No.
	Seal installation type	Hinge	Configuration	Thickness (mm)		
RP120 + RP8Si	Mortised	Butt	Single	35+	M	
RP670 + RP8Si	Mortised	Butt	Single	35+	M	
RP124 + RP35Si	Face fixed	Butt	Single	35+	M	
RP76Si + RP8Si	Mortised	Butt	Single	35+	M	
RP78Si + RP38Si + RP16Si	Semi mortised	Butt	Double	47+	M	
RP124 + RP8Si + RP16Si	-	Butt	Double	40+	M	
RP150 + RP126Si + RP150	In meeting stile rebate	Butt	Double	40+	M	
RP130Si + RP129F + RP130Si + RP115 threshold plate	In meeting stile	Pivot double acting	Double	40+	H	
RP130Si + RP129Si + RP130Si + RP115	In meeting stile	Pivot double acting	Double	40+	H	

RAVEN smoke sealing system	Door				System Duty level	Door No.
	Seal installation type	Hinge	Configuration	Thickness (mm)		
threshold plate						

4.4 FIRE DOORS

Combined smoke and acoustic sealing system schedule

RAVEN smoke sealing system	Fire door				System Duty level	Door No.
	Seal installation type	FRL (Fire Rating)	Configuration	Thickness (mm)		
RP120 + RP8Si	Mortised	Up to - /240/60	Single/Double	38 and 47	M	
RP10Si + RP8Si	Mortised	Up to - /240/60	Single/Double	38 and 47	M	
RP24Si + RP38Si	Semi Mortised	Up to - /240/30	Single/Double	47	H	
RP78Si + RP8Si	Mortised	Up to - /240/60	Single/Double	38 and 47	M	
RP78Si + RP35Si	Face Fixed	Up to - /240/60	Single/Double	38 and 47	M	
RP78Si + RP38Si	Face Fixed	Up to - /240/60	Single/Double	38 and 47	M	
RP78Si + RP127Si	Mortised	Up to - /240/60	Single/Double	47	M	
RP87HSi + RP128Si	-	Up to - /240/30	Single/Double	38 and 47	H	
RP93Si + RP99Si	Fully Mortised	Up to - /240/30	Single/Double	47	M	
RP87Si + RP128Si	-	Up to - /240/30	Single/Double	38 and 47	H	
RP94Si + RP126Si	Semi Mortised	Up to - /240/30	Single/Double	47	M	

Threshold at doorways schedule

RAVEN threshold (plates/ramps and plate seals)	AS 1428.1 compliant	Durability ANSI/BHMA A156.21 designation	Fire door		System Duty level	Door No.
			FRL (fire resistance level)	Configuration		
RP4b	-	J33100	Up to - /240/30	Single/Double	M	
RP13	Yes	J30300	Up to - /240/30	Single/Double	H	
RP18	-	J34370	Up to - /240/30	Single/Double	H	
RP19	-	-	Up to - /240/30	Single/Double	H	
RP27	-	J33100	Up to - /240/30	Single/Double	H	

RAVEN threshold (plates/ramps and plate seals)	AS 1428.1 compliant	Durability ANSI/BHMA A156.21 designation	Fire door		System Duty level	Door No.
			FRL (fire resistance level)	Configuration		
RP28	-	J32130	Up to - /240/30	Single/Double	H	
RP29	-	J32130	Up to - /240/30	Single/Double	H	
RP66	Yes	J32140	Up to - /240/30	Single/Double	H	
RP77	Yes	J38130	Up to - /240/30	Single/Double	H	
RP82	Yes	J32300	Up to - /240/30	Single/Double	H	
RP91	-	J30300	Up to - /240/30	Single/Double	H	
RP95	Yes	J32300	Up to - /240/30	Single/Double	H	
RP96	Yes	J32300	Up to - /240/30	Single/Double	H	
RP98	Yes	J38130	Up to - /240/30	Single/Double	H	
RP109Si	-	J36100	Up to - /240/30	Single/Double	H	
RP110Si	-	J36100	Up to - /240/30	Single/Double	H	
RP111Si	-	J36100	Up to - /240/30	Single/Double	H	
RP112	Yes	J38130	Up to - /240/30	Single/Double	M	
RP115	Yes	J32130	Up to - /240/30	Single/Double	H	
RP116	Yes	J32130	Up to - /240/30	Single/Double	H	
RP117Si	-	J36100	Up to - /240/30	Single/Double	H	
RP137	Yes	J32130	Up to - /240/30	Single/Double	H	
RP138	Yes	J38130	Up to - /240/30	Single/Double	H	

Garage door sealing system schedule

Bushfire Attack Level (BAL) to AS 3959	Side hung (ember attack) - Perimeter and door bottom seals	Garage doors (ember attack) - roller and sectional overhead doors	Door No.
BAL – LOW Note: There is no further requirement from AS 3959.	RAVEN weather and energy draught seals	RAVEN Nylon Brush Strip seal with a flammability rating no greater than 5. Includes: RP2a, RP2b, RP41, RP49, RP50, RP51F, RP57, RP58,	

Bushfire Attack Level (BAL) to AS 3959	Side hung (ember attack) - Perimeter and door bottom seals	Garage doors (ember attack) - roller and sectional overhead doors	Door No.
		RP74, RP74F, RP75 at door head and sides where required. Door bottom seal RP4T or RP51Si (if bottom seal not supplied with door). Option: Threshold plate RP91	
BAL 12.5 - BAL 29	RAVEN weather and energy draught seals	RAVEN Nylon Brush Strip seal with a flammability rating no greater than 5. Includes: RP2a, RP2b, RP41, RP49, RP50, RP51F, RP57, RP58, RP74, RP74F, RP75 at door head and sides where required. Door bottom seal RP114 or RP51Si (if bottom seal not supplied with door). Option: Threshold plate RP91	
BAL - 40	RAVEN seals with a flammability index ≤ 5 tested to AS 1530.2	RAVEN Nylon Brush Strip seal with a flammability rating no greater than 5. Includes: RP2a, RP2b, RP41, RP49, RP50, RP51F, RP74, RP74F, RP75 at door head and sides where required. Door bottom seal RP4T or RP51Si (if bottom seal not supplied with door). Option: Threshold plate RP91	
BAL - FZ	RAVEN seals tested to AS 1530.4 used with fire-resisting doorsets to AS 1905.1 and BCA Spec C3.4	RAVEN Nylon Brush Strip seal includes: RP2a, RP2b, RP41, RP49, RP50, RP51F, RP74, RP74F, RP75 at door head and sides where required. Door bottom seal RP4T or RP51Si (if bottom seal not supplied with door). Option: Threshold plate RP91.	

4.5 WEATHER AND ENERGY

Weather sealing system schedule

RAVEN weather sealing systems	Door		System Duty level	Door No
	Hinge	Configuration		
RP113 + RP54	Butt	Timber single	M	
RP78Si + RP4 + RP16Si	Butt	Timber single and double	M	
RP10 + RP8Si + RP98	Butt	Single aluminium	H	
RP84Si + RP89 + RP77	Butt	Single	M	
RP74F + RP74F + RP52F + RP82	Pivot	Timber single and double	H	
RP130Si + RP129Si + RP130Si + RP115	Pivot	Timber single and double	H	
RP89 + RP89 + RP116	Pivot	Aluminium	M	
RP74F + RP74F + RP19	Pivot	Aluminium	H	
RP51F + RP2a	Sliding	Timber	H	
RP51F + RP74F	Sliding	Timber	H	
RP73 + RP17b	Sliding	Timber	L	
RP41 + RP4T + RP91	Panel lift garage door	Metal	H	
RP57 + RP4T + RP91	Roll-up garage door	Metal	H	
RP500 Series Weather Stripping	Folding doors and windows	Timber	H	
RP600 Series Weather Stripping	Folding doors and windows	Timber	H	

4.6 ACCESS AND MOBILITY

Application - thresholds at doorways

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 STANDARDS

General

Demolition: To AS 2601.

1.4 INTERPRETATION

Definitions

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

- Demolition: The complete or partial dismantling 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 starting demolition, submit evidence of the following:

- Requirements of authorities relating to the work under the contract have been obtained.
- A permit to demolish has been obtained from the appropriate authority.
- A scaffold permit has been obtained 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.
- Treatment for rodent infestation has been carried out and a certificate has been obtained from the appropriate 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 substance.
- Investigation and work plan.

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.

Recycling: Submit details of the proposed recycling facility.

- Certification: Submit evidence of disposal of recycled materials.
- Concrete crushing: If proposed on site, submit details of plant and environmental controls.

Stockpile locations: Submit details of the proposed locations of on-site stockpiles for demolished materials for recycling in the works. Coordinate with the locations for storage of other waste streams, and prevent mixing or pollution.

Records

Dilapidation record:

- Before demolition: Submit to each owner of each adjacent property, a copy of the part of the record relating to that property and obtain their written agreement to the contents.
- Rectification work: Submit written acceptance of rectification works from the owner of each adjoining property affected.

Tests

Requirement: Submit test results of compliance tests for building service components to be re-used.

1.6 INSPECTION

Notice

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

- Adjacent structures before starting and at completion of demolition.
- Services before disconnection or diversion.
- Trees documented to be retained, before starting demolition.
- Contents of building before starting demolition.
- Structure after stripping and removal of roof coverings and external cladding.
- Underground structures after demolition above them.
- Excavations remaining after removal of underground work.
- Site after removal of demolished materials.
- Services after reconnection or diversion.

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 in the Recovered items for re-use in the works schedule	Principal/proprietor
Recovered items for delivery to the principal	Recover without damage items identified in the Recovered items for delivery to the principal schedule	Principal/proprietor
Demolished material for recycling in the works	Stockpile material identified in the Demolished material for recycling in the works schedule	Contractor
Demolished material for recycling off-site	Demolish and deliver for recycling material identified in the Demolished material for recycling off-site schedule	Contractor
Dismantle for relocation as part of the works	Dismantle without damage and store items identified in the Dismantle for relocation schedule	Principal/proprietor
Demolish for removal	Remove from the site demolished materials identified in the Demolish for removal	Contractor

Class	Requirement	Ownership
	schedule. Do not burn or bury on site Transit: Prevent spillage of demolished materials in transit	

3 EXECUTION

3.1 HAZARDOUS SUBSTANCES

Identified hazardous substances

Register: Hazardous substances have been identified as present on site and a Hazardous substances register has been prepared.

Audit

Requirement: Prepare a Hazardous Substances Management Plan to AS 2601 clause 1.6.1. Include the following:

- Asbestos or material containing asbestos.
- Flammable or explosive liquids or gases.
- Toxic, infective or contaminated materials.
- Radiation or radioactive materials.
- Noxious or explosive chemicals.
- Tanks or other containers which have been used for storage of explosive, toxic, infective or contaminated substances.

Removal of hazardous substances

Standard: To AS 2601 clause 1.6.2.

3.2 INVESTIGATION AND WORK PLAN

General

Requirement: Before demolition or stripping work, prepare the work plan to AS 2601 Section 2. Include the checklist items appropriate to the project from AS 2601 Appendix A, and the following:

- Method of protection and support for adjacent property.
- Locations and details of service deviations and terminations.
- Sequence of work.
- If the demolition program results in components temporarily cantilevered, provide a certificate from a professional engineer.
- Proposals for the safe use of mobile plant on suspended structural members including provisions for the protection of lower floors in the event of structural failure.
- If implosion methods are proposed, provide a separate report of methods and safeguards.
- Wheel loads of tipping or loading vehicles.

3.3 SUPPORT

Temporary support

General: If temporary support is required, certification for its design and installation is required from a professional engineer engaged by the contractor.

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

Ground support: Support excavations for demolition of underground structures.

Adjacent structures: Provide supports to adjacent structures where necessary, sufficient to prevent damage resulting from the works.

- Lateral supports: Provide lateral support equal to that given by the structure to be demolished.
- Vertical supports: Provide vertical support equal to that given by the structure to be demolished.

Permanent supports

General: If permanent supports for adjacent structures are necessary and are not documented, give notice and obtain instructions.

3.4 PROTECTION

Encroachment

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

Weather protection

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

Dust protection

General: Provide dustproof screens, bulkheads and covers to protect existing finishes and the immediate environment from dust and debris.

Security

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

Temporary screens

General: Fill the whole of designated temporary openings or other spaces using dustproof and weatherproof temporary screens, fixed securely to the existing structure, and installed to shed water to avoid damage to retained existing elements or adjacent structures and contents.

Type: Timber framed screens sheeted with 12 mm plywood and painted. Seal the junctions between the screens and the openings.

Temporary access

General: If required, provide a substantial temporary doorset fitted with a rim deadlock, and remove on completion of demolition.

Exposed surfaces

General: Where necessary, protect and weatherproof the surfaces of adjacent structures exposed by demolition.

Existing services

Location: Before starting demolition, locate and mark existing underground services in the areas which will be affected by the demolition operations.

Utility services: Contact DIAL BEFORE YOU DIG to identify location of underground utility services pipes and cables.

Excavation: Do not excavate by machine within 1 m of existing underground services.

Fixed items

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.

3.5 DEMOLITION – BUILDING WORKS

Encroachment

General: If encroachments from adjacent structures are encountered and are not documented, give notice and obtain instructions.

Concrete slabs

General: Using a diamond saw, neatly cut back or trim to new alignment with a clean true face existing concrete slabs to be partially demolished or penetrated. Do not overcut at corners.

Material below grade

Remaining voids: Stabilise and provide barriers.

Explosives

General: Do not use explosives.

3.6 DEMOLITION – BUILDING SERVICES

General

Requirement: Decommission, isolate, demolish and remove from the site all equipment and associated components that become redundant as a result of the demolition.

Breaking down: Disassemble or cut up equipment where necessary to allow removal.

Demolition of refrigeration systems

Standard: To AS/NZS 5149.4.

Components for re-use

General: Before returning to service, clean components and test for conformance to Australian Standards, as required.

3.7 COMPLETION

Notice of completion

General: Give at least 5 working days' notice of completion of demolition so that 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 owner of each adjoining property of the completeness and standard of the rectification work.

Temporary support

General: Remove at completion of demolition.

0221 SITE PREPARATION

1 GENERAL

1.1 RESPONSIBILITIES

General

Requirement: Provide site preparation, as documented.

Performance

Areas for protection: Along existing building walls and retaining walls along East, South and West boundary. Refer floor plan for detail location. Please also refer to structural documentations for any protection along site boundary towards existing neighbouring structural elements.

1.2 CROSS REFERENCES

General

Requirement: Conform to the following:

- 0171 General requirements.
- 0172 Environmental management.

1.3 INTERPRETATION

Definitions

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

- Authority: Any organisation with statutory authority relating to the project, including clearances.
- Clearances: A formal certificate, approval or condition issued by a statutory authority allowing work in a particular area.
- Plant establishment period: The period between the date of practical completion and the end of the defects liability period.

1.4 SUBMISSIONS

Certification

Vermin: Submit pest exterminator's certification as evidence that the completed site works are free from vermin.

Execution details

Requirement: Submit details of methods and equipment proposed for the following:

- Clearing and grubbing.
- Tree removal and transplanting.
- Protecting ground within and adjacent to tree driplines from compaction by proposed earthworks machinery.

1.5 INSPECTION

Notice

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

- Enclosures around trees requiring protection.
- Trees requiring removal.
- Trees for transplanting to determine final orientation.

2 EXECUTION

2.1 COMMUNITY LIAISON

Notification

General: Notify residents about construction activities which will affect access to, or disrupt the use of, their properties.

Notice: Minimum 5 working days, unless the work is of an urgent nature with safety implications.

Notification content:

- Description of the work.
- The reason for the work.
- The expected duration.
- Changes to traffic arrangements and property access.
- The 24-hour contact number of the representative responsible.

2.2 EXISTING SERVICES

General

Requirement: Before starting earthworks, locate and mark existing underground services in the areas affected by the earthworks operations including clearing, excavating and trenching.

Utility services: Contact DIAL BEFORE YOU DIG to identify location of underground utility services pipes and cables.

Excavation: Do not machine excavate within 1000 mm of existing services.

Existing service lines: If required, divert services detected during excavation, clear of the building, and reconnect to the utility service provider requirements.

2.3 SITE CLEARING

Extent

Requirement: Clear only areas occupied by works such as structures, paving, excavation, regrading and landscaping or other areas documented for clearing.

Contractor's site areas: If not included within the areas documented above, clear only to the extent necessary for the performance of the works.

Clearing and grubbing

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

Grubbing: Grub out stumps and roots over 75 mm diameter to a minimum depth as follows:

- Below subgrade under buildings, embankments or paving: 500 mm.
- Below finished surface in unpaved areas: 300 mm.

Backfilling: Fill holes remaining after grubbing with sand material to prevent ponding of water.

Compact the material to the relative density of the existing adjacent ground material.

Redundant/decommissioned works: Remove works no longer required, including slabs, foundations, paving, drain, and access chambers and covers within the works zone.

Batters

Temporary protection: If the change in level between crest and toe is more than 1500 mm, protect from erosion with geofabric, hessian and tar or heavy duty black polythene sheet cover. Securely fix down at crest and toe.

Surplus material

Topsoil and excavated material: Remove unwanted stripped soil and other material from the site as the work proceeds, including any material dropped on footpaths or roadways.

2.4 STORMWATER AND SEDIMENT CONTROL

General

Erosion and sediment control measures: To 0172 Environmental management.

Waterways and drains

Waterways: If required, temporarily divert ditches, field drains and other waterways affected by excavation and reinstate on completion.

Stormwater drains: Divert drains detected during excavation, clear of the building, and reconnect as documented or obtain approval.

2.5 EXISTING WORKS TO REMAIN

Marking

Requirement: Identify existing works to remain with 1000 mm high, 50 x 50 mm timber stakes connected by yellow plastic tape to prevent accidental damage.

2.6 TREE PROTECTION

General

Warning signs: In a prominent position at each entrance to the site, display warnings that trees and plantings require protection during the contract. Remove on completion.

Lettering: Road sign type sans serif letters, 100 mm high to AS 4970 Appendix C. Protection measures: Provide before starting the earthworks.

Trees to remain

Extent: Trees not marked for removal.

Tree protection

Tree protection zone (TPZ): To AS 4970 Section 3.

Tree protective measures: To AS 4970 Section 4.

Monitoring and certification: To AS 4970 Section 5.

Work near trees

Materials placement: Conform to the following:

- Keep the area within the dripline of trees free of sheds and paths, construction material and debris.
- Do not place bulk materials and harmful materials within the dripline of trees.
- Do not place spoil from excavations against tree trunks.
- Prevent wind-blown materials such as cement from harming trees and plants.

Damage: Prevent damage to tree bark. Do not attach stays, guys and similar material to trees.

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

Excavation: If excavation is required near trees, give notice. Minimise period and extent of excavation within the dripline.

Hand methods: Use hand methods to locate, expose and cleanly remove the roots on the line of excavation. If excavation is required within the dripline, use hand methods so that root systems remain intact and undamaged.

Roots: Do not cut tree roots exceeding 50 mm diameter. If required to cut tree roots, use cutting methods that do not excessively disturb the remaining root system. Immediately after cutting, water the tree and apply a liquid rooting hormone to stimulate the growth of new roots.

Backfilling: Backfill excavations around tree roots. Place the backfill in layers of 300 mm maximum depth and compact to a dry density similar to that of the original or surrounding soil. Do not backfill around tree trunks to a height greater than 200 mm above the original ground surface. Immediately after backfilling, thoroughly water the root zone surrounding the tree.

Backfill material:

- Mix proportions (topsoil: well-rotted composts) by volume: 3:1.
- Neutral pH value.
- Free from weed growth and harmful materials.

Compacted ground: Do not compact the ground or use skid-steer vehicles under the tree dripline. If compaction occurs, give notice.

Compaction protection: Protect ground adjacent to the tree dripline.

Watering: Water trees as necessary, including where roots are exposed at ambient temperature more than 35°C.

Mulching: Spread 100 mm thick organic mulch to the whole of the area within the dripline of all existing trees to remain.

2.7 TEMPORARY LANDSCAPE FENCING

Fence dimensions

Height: 1200 mm.

Maximum post spacing: 5000 mm.

Component sizes

Corner and gate posts: Hardwood or preservative-treated softwood, 250 mm diameter.

Intermediate posts: Star picket.

Gate: Provide a suitable hinged gate with a gate latch.

Wire: Top, intermediate and bottom rows of 3.2 mm plain galvanized steel wire. Thread the top wire through pieces of plastic tube and through corner posts.

Removal

Completion: Remove the fence at the end of the planting establishment period.

2.8 TREE TRANSPLANTING

General

Conditions: Select a time for transplanting based on the following criteria:

- Seasonal conditions.
- Length of operation.
- Rootball diameter and depth.
- Lifting methods.
- Weather conditions.

Preparation

Watering: Establish a temporary drip irrigation system, or manually water the identified trees for two weeks before ball excavation work.

Fertilising: Apply one application of liquid fertiliser mix, appropriate to the species, to the foliage and roots. Apply sufficient fertiliser to allow the spray to drip from foliage and soak into the rootball. Do not apply fertiliser on excessively hot, dry or windy days.

Rootball

General: Minimise the cutting of roots. Use only sharp tools, water blasting or water cutting.

Initial cut: Conform to the following:

- Cut manually or using chain trenching machine. Do not excavate using a backhoe or an excavator.
- Cut 250 mm beyond the required finished rootball dimension to allow trimming of damaged roots to final dimensions before sealing.

Hand trimming: To 100 mm less than the required finished rootball dimension. Cut back all roots greater than 25 mm diameter.

Rootball cutting: Conform to the following:

- Symmetrical about the trunk and in proportion to the overall size of the tree except where the limitations of individual tree planter openings require specific tailoring of the rootball dimension.
- Cut the rootball to a size that maximises the rootball for each specimen.

Trench: Backfill and lightly compact with clean sand, free of any foreign matter, pathogens or any substances that may be harmful to future root growth. Apply root inducing formulation to the manufacturer's recommended concentration, to saturate the backfill in the trench.

Maintenance of on-site plant material

Watering: Maintain a temporary drip irrigation system around each tree, located within the trenched rootball perimeter. Program the system to supply water at an optimum rate to encourage growth and avoid drying out through excessive transpiration following the cutting of the roots. Monitor the system continuously until the tree is lifted and transplanted.

Pruning: If pruning of branches is required to balance root loss, obtain approval. Prune only as directed and as documented in **TREE MAINTENANCE**.

Fertilising: Apply fertiliser at regular intervals during this period to maintain healthy growth.

Responsibility: Safeguard the health and well-being of all on-site plant material as required, before lifting and transplanting.

Execution

Lifting: Two days before transplanting each specimen, thoroughly irrigate to the full depth of the rootball. Do not disturb the soil around the root system. Maintain rootball in firm condition during transplanting by wrapping in hessian or other appropriate open weave material, securely tied.

Storage: Transport trees to a designated nursery site. Store and maintain until ready for planting.

Planting: Avoid disturbing the rootball during moving and planting. After placement, remove the rootball wrapping and ties by cutting.

Watering: After transplanting, water the rootball thoroughly and continue to water until established.

2.9 SITE NURSERY

2.10 TREE MAINTENANCE

General

Notice: Give notice before starting tree maintenance.

Pruning: To AS 4373 using a fully qualified and experienced arborist. Carry out all required works in a safe manner.

Execution

Requirement: Rectify any damage to existing trees to remain.

Operations: Remove dead and decayed wood or damaged limbs. Make all cuts at branch collars. If trees show signs of deterioration after the work is completed, ameliorate the soil by soil aeration, irrigation or incorporation of organic material. Continue this program until the end of the plant establishment period.

Root pruning: Do not excessively disturb the remaining root system. Cut off damaged roots cleanly inside the exposed or damaged area. Cover exposed root area with soil immediately after pruning, do not leave roots exposed.

Wetting and new root stimulation: Form a water collecting basin and apply a rooting hormone and wetting agent to the rootball.

Precautions: Avoid damage to trees being treated and to nearby trees and surroundings. Do not use trees as anchors for winching operations or bracing. Provide bracing as necessary before cutting to prevent uncontrolled breakages and damage to surroundings.

Failure: If repair work is impracticable, or is attempted and is rejected, remove the tree and root system and make restitution.

2.11 COMPLETION

Site restoration

Requirement: Reinstate undeveloped ground surfaces to the condition existing at the commencement of the contract.

Clean up

Progressive cleaning: Keep the works clean and tidy, and regularly remove from the site, waste and surplus material arising from execution of the work.

Waste disposal: To 0172 Environmental management.

Vermin management

Requirement: Employ a suitably qualified pest exterminator to remove vermin found during site preparation.

0222 EARTHWORK

1 GENERAL

1.1 RESPONSIBILITIES

General

Requirement: Provide earthworks to the dimensions and tolerances, as documented.

1.2 DESIGN

General

Geotechnical and environmental reports provided: Client or builder to engage Geotechnical Engineer to provide site investigation report.

Requirements

General: To DESIGN in 0171 *General requirements*.

Design of footing or pier depths: Builder to coordinate design with the structural engineer and geotechnical engineer.

Contract depths: The footing or pier depths shown on the drawings are provisional.

1.3 CROSS REFERENCES

General

Requirement: Conform to the following:

- 0171 *General requirements*.
- 0172 *Environmental management*.

1.4 STANDARDS

General

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

Description and classification of soils: To AS 1726.

1.5 INTERPRETATION

Abbreviations

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

- GITA: Geotechnical inspection and testing authority.
- GTA: Geotechnical testing authority.

Definitions

General: For the purposes of this worksection, the definitions given in AS 3798 and the following apply:

- Bad ground: Ground unsuitable for the works, including fill liable to subsidence, ground containing cavities, faults or fissures, ground contaminated by harmful substances and ground that is, or becomes, soft, wet or unstable.
- Rock: Monolithic material with volume greater than 0.3 m³ that cannot be removed until broken up by rippers or percussion tools.
- Site topsoil: Natural soil, excavated from the site, that contains organic matter, supports plant life, conforms generally to the fine-to-medium texture classification to AS 4419 and is free from the following:
 - . Stones more than 25 mm diameter.
 - . Clay lumps more than 50 mm diameter.
 - . Weeds and tree roots.
 - . Sticks and rubbish.
 - . Material toxic to plants.

- Subgrade: The trimmed or prepared earth material on which the pavement, footing or slab is constructed. Generally taken to relate to the upper line of the earth material.
- Zone of influence: A foundation zone bounded by planes extending downward and outward from the bottom edge of a footing, slab or pavement and defining the extent of foundation material having influence on the stability or support of the footings, slab or pavement.

1.6 TOLERANCES

General

Finish: Finish the surface to the required level, grade and shape within the following tolerances:

- Under building slabs and load bearing elements: + 0, - 25 mm.
- Pavement subgrades: + 0, - 40 mm.
- Batters: No steeper than the slope shown on the drawings. Make sure flatter slopes do not impact on boundaries or required clearances to buildings, pavements or landscaping.
- Other ground surfaces: ± 50 mm, provided the area remains free draining and matches adjacent construction where required. Provide smoothness as normally produced by a scraper blade.

1.7 SUBMISSIONS

Design documentation

Calculations: Submit calculations by a professional engineer showing the stability and safety of proposed excavations and temporary supports, including supports required for adjacent structures.

Execution details

Report: Submit a time-based schedule detailing the methods and equipment proposed for the earthworks, including the following:

- Dewatering and groundwater control and disposal of surface water.
- Excavation methods, stages, clearances, batters and temporary supports.
- Stockpiles and borrow pits.
- Placing and compaction methods and stages.

Geotechnical site investigations: Provide a geotechnical report supporting the methods proposed for excavation.

Disposal location: Submit details of the locations and evidence of compliance with the appropriate authority requirements for the disposal of material requiring removal from site.

Temporary shoring: Submit a proposal for any temporary shoring required, including the progressive removal.

Proof rolling: Submit details of proposed method and equipment for proof rolling.

Records of measurement: Submit a certified copy of the agreed records of measurement.

Site records: Submit the following to AS 3798 clause 3.4 and Appendix B:

- Geotechnical site visit record.
- Earthworks summary report.

Products and materials

Imported fill: Submit certification or test results by a GTA registered laboratory of the imported fill as evidence of conformity with the contract, including the source.

Tests

Compaction: Submit certification and/or test results in conformance with the documented level of inspection and testing to AS 3798.

1.8 INSPECTION

Notice

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

- Items to be measured as listed in **RECORDS OF MEASUREMENT**.
- Areas to be cleared and/or stripped of topsoil.
- Areas stripped of topsoil.
- Excavation completed to contract levels or founding material.
- Proof rolled subgrade before placing fill.

- Filling completed to contract levels.
- Stockpiled topsoil before spreading.

2 PRODUCTS

2.1 FILL MATERIALS

General

Suitable material: To AS 3798 clause 4.4 including inorganic, non-perishable material suitably graded and capable of compaction to the documented density.

Unsuitable materials: To AS 3798 clause 4.3.

Sulfur content: Do not provide material with sulfur content exceeding 0.5% within 500 mm of cement bound elements (for example concrete structures or masonry) unless the elements are protected by impermeable membranes or equivalent means.

Re-use of excavated material: Only re-use suitable material to AS 3798 clause 4.4.

Stockpiles

General: Segregate the earth and rock material and stockpile for re-use in backfilling operations.

Location: Do not stockpile excavated material against tree trunks, buildings, fences or obstruct the free flow of water along drainage channels.

2.2 BORROW OR IMPORTED FILL

General

Borrow or imported material: Use only when suitable excavated material from site is not available.

- Suitable material: To AS 3798 clause 4.4.

2.3 GEOTEXTILE

General

Material: UV stabilised, permeable, polymeric, woven or non-woven textile material used in contact with soil/rock material.

Identification and marking: To AS 3705.

3 EXECUTION

3.1 SITE PREPARATION

Erosion and sedimentation control

Requirement: To 0172 *Environmental management*.

3.2 GEOTECHNICAL

As found site conditions

General: If the following are encountered, give notice and obtain instructions before carrying out any further work in the affected area:

- Bad ground.
- Discrepancy in expected conditions.
- Rock.
- Springs, seepages.
- Topsoil more than 100 mm deep.

Inspection and testing

Frequency of testing: To AS 3798 Table 8.1.

3.3 RECORDS OF MEASUREMENT

Excavation and backfilling

Agreed quantities: If a schedule of rates applies, provisional quantities are documented, or there are variations to the contract levels or dimensions of excavations, do not backfill or place permanent works in the excavation until the following have been agreed and recorded:

- Depths of excavations related to the datum.

- Final plan dimensions of excavations.
- Quantities of excavations in rock.

Method of measurement: By registered surveyor.

Rock

Level and class: If rock is measured for payment purposes, either as extra over excavation of material other than rock or for adjustment of provisional measurements, do not remove the rock until the commencing levels and the classes of rock have been determined.

3.4 REMOVAL OF TOPSOIL

General

Extent: Areas of cut or fill and areas occupied by structures, pavements and embankments.

Maximum depth: 200 mm.

Disposal: Remove topsoil unsuitable for re-use from the site to AS 3798 clause 6.1.8.

Topsoil stockpiles

General: Stockpile site topsoil intended for re-use.

Stockpile maximum height: 1.5 m.

Identification: Mark and label stockpiles of different soil types.

Vegetation: Do not burn off or remove plant growth that occurs during storage.

Protection: Conform to the following:

- Provide drainage and erosion protection.
- Do not allow traffic on stockpiles.
- If a stockpile is to remain for more than four weeks, sow with temporary grass.
- Protect the topsoil stockpiles from contamination by other excavated material, weeds and building debris.

3.5 EXCAVATION

Extent

Site surface: Excavate the site to the levels and profiles required for the documented structures, pavements, filling and landscaping. Make allowance for compaction, settlement or heaving.

Footings, pits, wells and shafts: Excavate to the required sizes and depths. Confirm that the foundation conditions meet the design bearing capacity.

Bearing surfaces

Requirement: Provide even plane bearing surfaces for loadbearing elements including footings. Step to accommodate level changes. If supporting masonry, make the steps appropriate to the courses.

Rock

General: Do not use explosives.

Existing footings

Requirement: If excavation is required within the zone of influence of an existing footing, provide supports to the footing sufficient to prevent damage arising from the works. Use methods including temporary shoring or underpinning.

Existing services

Location: Before starting earthworks, locate and mark existing underground services in the areas that will be affected by the earthworks operations including clearing, excavating and trenching.

Utility services: Contact DIAL BEFORE YOU DIG to identify location of underground utility services pipes and cables.

Excavation: Do not excavate by machine within 1000 mm of existing services.

Proof rolling

Extent: Proof roll excavations for pavements, filling and non-spanning slabs on ground to determine the presence of bad ground.

Proof rolling method and equipment: To AS 3798 clause 5.5.

Requirement: If excessive settlement, rebound or heaving is encountered, provide test pits or trenching to determine the extent of bad ground.

Disposal of excess excavated material

General: Remove excess excavated material from site not required or unsuitable for fill.

Standard: To AS 3798 clause 6.1.8.

3.6 REINSTATEMENT

Deterioration of bearing surfaces

Requirement: If the bearing surface deteriorates because of water or other cause, excavate to a sound surface before placing the loadbearing element.

Subgrades affected by moisture

Requirement: If, due to high moisture content, the subgrade cannot support construction equipment or the overlying pavement cannot be compacted, perform one or more of the following:

- Allow the subgrade to dry until it provides support for equipment and allows compaction.
- Scarify the subgrade to a depth of 150 mm, work as necessary to accelerate drying, and recompact when the moisture content is satisfactory.
- Excavate the wet material and remove to spoil, and backfill excavated areas.

Over excavation

Requirement: If excavation exceeds the required depths, reinstate to the correct depths, levels and bearing capacity.

Zone of influence: Within the zone of influence of footings, beams, or other structural elements, use concrete of strength equal to the structural element, minimum 15 MPa. Make sure that remedial concrete does not create differential bearing conditions.

Below slabs or pavements: Rectify the over excavation as follows:

- Generally: Provide selected fill compacted to the documented density.
- Less than 100 mm: Do not backfill. Increase the thickness of the layer above.

Rock depressions and subsoil drains: Backfill rock depressions and over excavation of subsoil drains using coarse subsoil filter.

3.7 SUPPORTING EXCAVATIONS

Removal of supports

General: Remove temporary supports progressively as backfilling proceeds.

Voids

General: If voids occur outside sheeting or sheet piling, fill and compact voids to a dry density similar to that of the surrounding material.

3.8 ADJACENT STRUCTURES

Temporary supports

General: If required, provide supports to adjacent structures, sufficient to prevent damage arising from the works.

Lateral supports: Provide lateral support with shoring.

Vertical supports: If required, provide vertical support with piling or underpinning or both.

Permanent supports

General: If permanent supports for adjacent structures are required and are not documented, give notice and obtain instructions.

Encroachments

General: If encroachments from adjacent structures are encountered and are not documented give notice and obtain instructions.

Zone of influence

Angle from horizontal: Defined here for the site determination. Typical angles are 30° for granular material, 45° for stiff clay. Consult with the geotechnical engineer in relation to the angle of influence.

3.9 ROCK BOLTING

General

Requirement: For temporary or permanent support of rock faces, provide proprietary high strength steel bars or tubes anchored into holes drilled in the rock and tensioned against plates bearing on the

rock face. Schedule the installation to conform to systematic bolting or calculated relief, as documented.

Standard: To AS 4678.

Protection

General: Protect permanent rock bolts by grouting the drilled hole with cement grout after tensioning the rock bolt. Protect the bearing plate and the exposed portion of rock bolt and anchorage with a protective coating or by embedment in concrete.

3.10 GEOTEXTILE

General

Preparation: Trim the ground to a smooth surface free from cavities and projecting rocks.

Installation: Lay the fabric flat, not stretched tight, and secure with anchor pins. Overlap joints 300 mm minimum.

3.11 PREPARATION FOR FILLING

Preparation

Stripping: Prepare the ground surface before placing fill (including topsoil fill), ground slabs or load bearing elements to AS 3798 clause 6.1.5. Remove material that inhibits or prevents satisfactory placement of fill layers, loose material, debris and organic matter.

Foundation preparation: To AS 3798 clause 6.1.7.

Compaction: Compact the ground exposed after stripping or excavation, to a minimum depth of 150 mm, to the minimum relative compaction in AS 3798 Table 5.1.

Ground treatment or improvement methods:

- Scarify method: Loosen exposed excavation by scarifying to a minimum of 150 mm, moisture-condition and compact to AS 3798 Section 5.
- Impact roller and impact compaction: Use an approved method.

Slope preparation: If fill is placed on a surface steeper than 4:1 (horizontal:vertical), bench the surface to form a key for the fill. As each layer of fill is placed, cut the existing ground surface progressively to form a series of horizontal steps more than 1 m in width and more than 100 mm deep. Recompack the excavated material as part of the filling. Shape to provide free drainage.

Under earth mounds

General: Cultivate the ground to a depth of 200 mm before mound formation.

Under slabs, paving and embankments

General: If required, loosen the ground to a depth of more than 200 mm and adjust the moisture content before compaction to a density consistent with subsequent filling.

Rock ledges

General: Remove overhanging rock ledges.

3.12 PLACING FILL

General

Extent: Place fill to the documented dimensions, levels, grades, and cross sections so that the surface is always self-draining.

Layers: Place fill in near-horizontal layers of uniform thickness, deposited systematically across the fill area.

Edges: At junctions of fill and existing surfaces, do not feather the edges.

Mix: Place fill in a uniform mixture.

Previous fill: Before placing subsequent fill layers, make sure that previously accepted layers still conform to requirements, including moisture content.

Protection: Protect the works from damage due to compaction operations. If required, limit the size of compaction equipment or compact by hand.

Protective covering to membranes: Do not disturb or damage during backfilling.

Placing at structures

Fill adjacent structures and trenches: To AS 3798 clause 6.2.6.

Requirement: Place and compact fill in layers simultaneously on both sides of structures, culverts and pipelines to avoid differential loading. Commence compacting each layer at the structure and proceed away from structure.

Over the top of structures: Carefully place first layers of fill.

Retaining walls: Do not place fill against concrete retaining walls until the concrete has been in place for 28 days unless the structure is supported by struts.

Compaction

General: Compact the subgrade and each layer of fill to the required depth and density, as a systematic construction operation. Shape surface to provide drainage and prevent ponding.

Maximum rock and lump size in layer after compaction: To AS 3798 clause 6.2.2.

Fill batter faces: Either compact separately, or overfill and cut back. Form roughened surfaces to the faces.

Minimum relative compaction: To AS 3798 Table 5.1.

3.13 PLACING TOPSOIL

Stockpiled topsoil

Cultivation: Rip subgrade to a depth of 100 mm or to the depth of rippable subgrade if less. Cultivate around services and tree roots by hand. Trim to allow for the required topsoil depth.

Herbicide: Apply before placing topsoil.

Placing: Spread and grade evenly.

Compaction: Lightly compact topsoil so that the finished surface is smooth, free from lumps of soil, at the required level, ready for cultivation and planting.

Edges: Finish topsoil flush with abutting kerbs, mowing strips and paved surfaces. Feather edges into adjoining undisturbed ground.

Disposal of excess topsoil

Off-site: Remove excess topsoil from the site and dispose of legally.

3.14 FILL MOISTURE CONTROL

General

Moisture content: Adjust the moisture content of fill during compaction within the range of 85% to 115% of the optimum moisture content determined by AS 1289.5.1.1 or AS 1289.5.2.1, as appropriate, to achieve the required density.

3.15 TESTING

Site tests

Compaction control tests: To AS 1289.5.4.1 or AS 1289.5.7.1.

Test frequency: To AS 3798 Table 8.1.

3.16 COMPLETION

Geotechnical report

Inspection and testing report: Required. The reporting for each level is as follows:

- Level 1: Statement of compliance of work.
- Level 2: Statement of sampling and testing at each site visit to site.

Grading

External areas: Grade to give falls away from buildings, minimum 1:100.

Subfloor areas: Grade the ground surface under suspended floors to drain ground or surface water away from buildings without ponding.

Site restoration

Requirement: If variation of existing ground surfaces is not required as part of the works, restore surfaces to the condition existing at the commencement of the contract.

0223 SERVICE TRENCHING

1 GENERAL

1.1 RESPONSIBILITIES

General

Requirement: Provide trenching for underground services, as documented by civil and services engineer as required.

1.2 DESIGN

Requirements

General: To DESIGN in *0171 General requirements*.

Responsibility: Design and coordinate all trenching required for proposed inground services, as documented.

Existing services: Where possible, design to avoid all existing services. Locate existing services to EXECUTION, **EXISTING SERVICES**.

1.3 CROSS REFERENCES

General

Requirement: Conform to the following:

- *0171 General requirements*.

1.4 STANDARDS

Trenching

Earthworks: To AS 3798.

Electrical services: To AS/NZS 3000.

Hydraulic services: To the AS/NZS 3500 series.

Communication services: To AS/CA S009.

1.5 TOLERANCES

Surface levels

Earthworks: Finish the surface to the required level, grade and shape within the following tolerances:

- Under building slabs and load bearing elements: + 0, - 25 mm.
- Pavement subgrades: + 0, - 40 mm.
- Batters: No steeper than the slope shown on the drawings. Make sure flatter slopes do not impact on boundaries or required clearances to buildings, pavements or landscaping.
- Other ground surfaces: ± 50 mm, provided the area remains free draining and matches adjacent construction where required. Provide smoothness as normally produced by a scraper blade.

Pavement base and subbase: Finish the surface to the required level, grade and shape within the following tolerances:

- Subbase: + 10 mm, - 25 mm.
- Base: + 10 mm, - 5 mm.

Finished pavement or paving surface: Conform to the documented level within the following tolerances:

- Asphalt: ± 10 mm.
- Concrete: + 10 mm, - 0 mm.
- Paving:
 - . Finished level: ± 8 mm.
 - . Height deviation between adjacent units (lippage): ± 2 mm.
- Granular surfaces: ± 10 mm.
- Lippage between restored surface and adjacent existing surface: ± 5 mm.

1.6 SUBMISSIONS

Execution details

Excavation method: Submit details of proposed equipment and method of excavation, including the following:

- Service location and type: A plan of the trench works showing the location and type of service.
- Open excavation: Proposed duration.
- Shuttering and/or bracing of trench sides: If required for safety and stability, provide proposals.
- Geotechnical data: Geotechnical report supporting the procedures proposed for trenching and/or boring.
- Boring: Proposals for the following:
 - . Limits on length.
 - . Existence of other services and method of protection.
 - . Pressure grouting to voids.
 - . The effect of pressure grouting on other services, ground heave and proposals for minimising such effects.
 - . Access to properties outside the site.
 - . Council permits.
 - . Service interruptions including a plan for minimising unintended interruptions.
- Hazards: Identify WHS hazards that may be encountered with deep trenches including toxic gases and liquids.

Off-site disposal location: Submit details of the proposed disposal locations and evidence of conformance with the relevant authorities for the disposal of material required to be removed from the site.

Records

As-built location: Upon completion submit to the relevant authority, as-built documentation to show the location of the installed services.

1.7 INSPECTION

Notice

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

- Items to be measured as listed in **GROUND CONDITIONS, Records of measurement**.
- Service trenches excavated before laying the service.
- Services laid in trenches and ready for backfilling.
- Completed surface restoration.

2 PRODUCTS

2.1 FILL MATERIALS

General

Suitable material: To AS 3798 clause 4.4 including inorganic, non-perishable material suitably graded and capable of compaction to the documented density.

Unsuitable materials: Do not use unsuitable material for fill in conformance with AS 3798 clause 4.3.

Sulfur content: Do not provide filling with sulfur content exceeding 0.5% within 500 mm of cement bound elements (for example concrete structures or masonry) unless such elements are protected by impermeable membranes or equivalent means.

Re-use of excavated material: Only re-use suitable material in conformance with AS 3798 clause 4.4.

Material in reactive clay areas: In sites classified M, M-D, H1, H1-D, H2, H2-D, E or E-D to AS 2870, re-use excavated site material at a moisture content within $\pm 1\%$ of that of the adjoining in situ clay.

2.2 SURFACE RESTORATION MATERIALS

General

Re-use: If possible re-use the existing surface materials that were removed during trench excavation, whilst conforming to the documented material requirements.

Subbase and base

Requirement: Provide crushed rock material configured in layers and depths to match existing and adjacent work, as follows:

- Base: 20 mm nominal size.
- Subbase: 40 mm nominal size.

Pathways and paved surfaces generally

Requirement: Provide materials consistent with those of the existing surface before service trenching works commenced.

Concrete surfaces

Material requirements: Normal-class to AS 1379.

Concrete strength grade: N25.

Slump: Maximum 100 mm.

Asphalt surfaces

Aggregate: To AS 2758.5 or to AS 2758.2 for sprayed bituminous surfaces.

Asphalt: To AS 2150.

Medium cut back bitumen: To AS 2157.

Bitumen emulsion: To AS 1160.

Bitumen binder: Class 170.

Pavers

Concrete and clay pavers: To AS/NZS 4455.2.

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

Stone pavers and setts: Provide sound stone pavers and setts of uniform quality. Reject any with defects liable to affect strength and durability.

Bedding mortar mix (cement:sand): Select from the range 1:3 to 1:4 to obtain satisfactory adhesion. Provide minimum water.

3 EXECUTION

3.1 EXISTING SERVICES

Location

Requirement: Before commencing service trenching, locate and mark existing underground services in the areas which will be affected by the service trenching operations.

Utility services: Contact DIAL BEFORE YOU DIG to identify location of underground utility services pipes and cables.

Excavation

General: Do not excavate by machine within 1 m of existing underground services.

3.2 EXISTING SURFACES

Concrete and asphalt pavements

Method: Sawcut trench set out lines for the full depths of the bound pavement layers except where the set out line is located along expansion joints.

Removal of concrete and asphalt: Break out concrete or asphalt pavement material between the trench set out lines, remove and dispose of off-site.

Paving

Removal: Take up paving units both full and cut by hand, between the trench set out lines, and neatly stack on wooden pallets.

Concrete edging: Break out, remove and dispose of off-site.

Concrete subbase: If present, sawcut along the trench set-out lines.

Grass

Removal method: Neatly cut grass turf between trench set-out lines into 300 mm squares.

Grass suitable for re-use: Take up and store the turf and water during the storage period.

Unsuitable grass: Remove and dispose of off-site.

Small plants, shrubs and trees

Remove for re-planting: Take up and store. Wrap the rootball in a hessian or plastic bag with drain holes and water during the storage period.

Unsuitable vegetation: Remove and dispose of off-site.

3.3 GROUND CONDITIONS

As found site conditions

Unexpected conditions: If the following are encountered, give notice immediately and obtain instructions before carrying out any further work in the affected area:

- Bad ground.
- Discrepancies to expected ground conditions.
- Rock.
- Springs, seepages.
- Topsoil > 100 mm deep.

Records of measurement

Excavation and backfilling: If a schedule of rates applies, provisional quantities are specified, or there are variations to the contract levels or dimensions of excavations, do not commence backfilling or place permanent works in the excavation until the following have been agreed and recorded:

- Depths of excavations related to the datum.
- Final plan dimensions of excavations.
- Quantities of excavations in rock.

3.4 EXCAVATION

General

Requirement: Excavate for underground services in conformance with the following:

- To required lines and levels, with uniform grades.
- Straight between access chambers, inspection points and junctions.
- With stable sides.
- Width tolerance: ± 50 mm, unless constrained by adjacent structures.
- Tree protection: To AS 4970.

Adjacent structures

Existing footings: If excavation is required within the zone of influence of an existing footing, use methods including (temporary) shoring or underpinning that maintain the support of the footing and make sure that the structure and finishes supported by the footing are not damaged.

Temporary supports: Provide supports to adjacent structures where necessary, sufficient to prevent damage arising from the works, as follows:

- Lateral supports: Provide lateral support using shoring.
- Vertical supports: Provide vertical support where necessary using piling or underpinning or both.

Permanent supports: If permanent supports for adjacent structures are necessary and are not described, give notice and obtain instructions.

Encroachments: If encroachments from adjacent structures are encountered and are not shown on the drawings, give notice and obtain instructions.

Trench widths

General: Keep trench widths to the minimum, consistent with the laying and bedding of the relevant service and construction of access chambers and pits.

Trench depths

General: As required by the relevant service and its bedding method.

Obstructions

General: Clear trenches of sharp projections. Cut back roots encountered in trenches to at least 600 mm clear of services. Remove other obstructions including stumps and boulders which may interfere with services or bedding.

Dewatering

General: Keep trenches free of water. Place bedding material, services and backfilling on firm ground, free of surface water.

Pumping: Provide pump-out from adjacent sumps or install well points.

Adjacent subsidence: Provide recharge points to isolate the dewatering zone.

Excess excavation

General: If trench excavation exceeds the correct depth, reinstate to the correct depth and bearing value using compacted bedding material or sand stabilised with 1 part of cement to 20 parts of sand by volume.

Stockpiles

Topsoil removal: Stockpile topsoil intended for re-use to a maximum height of 1500 mm.

Excavated material for backfill: If required, segregate the earth and rock material and stockpile, for re-use in backfilling operations.

Locations: Do not stockpile excavated material against tree trunks, buildings, fences or obstruct the free flow of water along gutters where stockpiling is permitted along the line of the trench excavation.

Disposal: If stockpiling is not permitted, dispose of excavated material off-site.

Unsuitable material

Disposal: Remove unsuitable material from the bottom of the trench or at foundation level and dispose of off-site. Replace with trench backfill material.

Boring

Subcontractor: If boring is required instead of trenches, engage a suitably qualified subcontractor to do the work.

3.5 TRENCH BACKFILL

General

Place fill: To AS 3798 clauses 6.2.2 and 6.2.6.

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

Removal of supports: Remove temporary supports progressively as backfilling proceeds.

Marking services

Marking tape: Provide marking tape above service, with appropriate labelling, to AS/NZS 2648.1 and as follows:

- Non-metallic services: Provide tape capable of being detected by inground scanning devices.
- Location: Locate tape approximately half the depth of the service being marked, to a maximum depth of 200 mm below the finished ground level.

Boring: If boring techniques are used to install the service, provide permanent on site labelling at the start and end of the service run and record on the as-built documentation.

Bedding, haunch, side and overlay zones

Installation and material: To the particular utility authority or utility service requirements. Secure pipes against floatation.

Bedding of services: Surround pipes or conduits on all sides with a minimum of 75 mm compacted bedding sand, or as documented.

Overlay zone thickness: Maximum 300 mm immediately over the utility service.

Trees

Backfill at trees: Backfill minimum 300 mm thick, around tree roots with a topsoil mixture. Place and compact in layers of 150 mm minimum depth to a dry density equal to that of the surrounding soil.

Original surface level: Do not place backfill above the original ground surface around tree trunks or over the root zone.

Watering: Thoroughly water immediately after backfilling the tree root zone.

Compaction

Control moisture within backfill: To AS 3798 clause 6.2.3.

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

Compaction: To AS 3798 Section 5.

Frequency of testing: To AS 3798 clause 8.7.

Precautions: Use compaction methods which do not cause damage or misalignment to utility services.

Density tests

Testing authority: Carry out density tests of pipe bedding and backfilling by an Accredited Testing Laboratory.

Test methods: Conform to the following:

- Compaction control tests: To AS 1289.5.4.1 or AS 1289.5.7.1.
- Field dry density: To AS 1289.5.3.2 or AS 1289.5.3.5.
- Standard maximum dry density: To AS 1289.5.1.1.
- Dry density ratio: To AS 1289.5.4.1.
- Density index: To AS 1289.5.6.1.

3.6 SURFACE RESTORATION

Subbase and base

Compaction: Uniformly compact each layer of the subbase and base courses over the full area and depth within the trench to a relative compaction of 100% when tested in conformance with AS 1289.5.4.1.

Compacted layer thickness:

- Maximum: 200 mm.
- Minimum: 100 mm.

Compaction test frequency: Minimum 1/every second layer/50 m² of restoration surface area.

Concrete surfaces

Construction: Conform to the following:

- Prime coat the cut edges of the existing surfaces with cement slurry. Lay and compact concrete so that the edges are flush and the centre is cambered 5 mm above the adjoining existing surfaces.
- Surface finish and pattern: Match existing adjoining work.
- Minimum thickness: 75 mm or the adjacent pavement thickness, whichever is thicker.
- Reinforcement and dowels: If required, provide steel reinforcement with dowels into the adjacent concrete.
- Expansion joints: 15 mm thick preformed jointing material of bituminous fibreboard placed in line with joints in existing concrete.
- Control joints:
 - . Form control joints strictly in line with the control joints in existing concrete.
 - . Around service poles: Terminate the concrete paving 200 mm from the pole and fill the resulting space with cold mix asphalt.

Weather: Do not place concrete in ambient temperatures above 30°C or below 10°C, without adequate precautions. Protect surface from rain damage, if required.

Compaction: Compact as follows:

- Thickness 100 mm or less: Compact by placing, screeding and finishing processes. If required use a hand-held vibrating screed at the surface. Do not use immersion vibrators.
- Thickness more than 100 mm and downturns: Use an immersion vibrator.

Curing: Cure by keeping continuously wet for 7 days.

Asphalt surfaces

Placement: To AS 2150.

Operations: Spread the asphalt mix in layers covering the full width of the trench.

Thickness: Match the adjoining asphalt surface.

Finish: Compact to a smooth even surface.

Sprayed bituminous surfaces: To AS 3727.1 Section 8.

Pavers

Bedding: Replicate the bedding used for the original paved surface. Use bedding methods and materials which are appropriate to the paver, the substrate, the conditions of service, and which leave the paver firmly and solidly bedded in the bedding material.

Laying: Re-lay to match the pattern and surface levels of the existing paving.

Damaged pavers unsuitable for relaying: Replace with new pavers of the same material, type, size and colour as the existing.

Landscaped areas

In topsoil areas: Complete the backfilling with topsoil for at least the top 100 mm.

Grass: Re-lay stockpiled turf. If existing turf is no longer viable, re-sow grass over the trench and other disturbed areas.

Planted areas: Overfill to allow for settlement.

3.7 COMPLETION**General**

As-built documentation: Upon completion, record the location of all installed services on the as-built documentation.

0224 STORMWATER – SITE

1 GENERAL

1.1 RESPONSIBILITIES**General**

Requirement: Provide stormwater drainage, as documented.

1.2 DESIGN**General**

Designer: Civil Engineer

Requirements

General: To DESIGN in 0171 General requirements.

1.3 CROSS REFERENCES**General**

Requirement: Conform to the following:

- 0171 General requirements.

1.4 STANDARDS**Stormwater drainage**

Standard: To AS/NZS 3500.3.

1.5 INTERPRETATION**Definitions**

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

- Pipe surround: Includes pipe overlay, pipe side support, side zone and haunch zone.

1.6 SUBMISSIONS**Certification**

Requirement: Submit certificate stating that network is leak free upon completion.

Samples

General: Submit samples of the following:

- Each type of imported pipe bedding material.
- Each type of filter material.

Tests

Results: Submit results from pre-completion leak testing.

1.7 INSPECTION**Notice**

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

- Excavated surfaces prior to placing bedding material.
- Underground services, or services to be concealed, before being covered.
- Pipe joints before covering.
- Placing of concrete.
- Upon completion.

2 PRODUCTS

2.1 MATERIALS**Concrete and mortar**

Concrete: To AS/NZS 3500.3 clause 2.9 and the following:

- Grade: Minimum N15.

- Cement: To AS 3972.
 - . Type: GP, GL or GB.

Steel reinforcement:

- Bars and machine welded mesh: To AS/NZS 4671.

Joints

Solvent cement and priming fluid: To AS 3879.

Rubber ring joints/elastomeric seals: To AS 1646.

Pipes and fittings

Fibre reinforced cement (FRC): To AS 4139 and the following:

- ≤ 450 mm diameter: Rubber ring joints to AS 4139.
- > 450 mm diameter: With a purpose machined internal spigot and socket system within the pipe wall.

Glass-reinforced plastic (GRP): To AS 3571.1.

Access covers and grates: To AS 3996.

Polyvinyl chloride (PVC): To AS/NZS 1254, AS/NZS 1260 or AS 1273, as appropriate.

Polyethylene (PE): To AS/NZS 4129, AS/NZS 4130, ISO 8770 or AS/NZS 2033, as appropriate.

Precast concrete: To AS 3850.3 and AS/NZS 4058.

Plastic pipe for subsoil drainage: To AS 2439.1.

Vitrified clay or ceramic: To AS 1741.

Bedding material

Bed and haunch zones: Provide granular material graded to the AS 1141 series.

Bedding material grading table

Sieve size (mm)	Weight passing %	
	Bed and haunch	Side zones
75.0	-	100
19.0	100	-
9.5	-	50 - 100
2.36	50 - 100	30 - 100
0.60	20 - 90	15 - 50
0.30	10 - 60	-
0.15	0 - 25	-
0.075	0 - 10	0 - 25

Filter material

Requirement: Materials consisting of natural clean washed sands and gravels and screened crushed rock, to AS/NZS 3500.3 clause 2.13.1.

2.2 GEOTEXTILES

General

Material: UV stabilised, permeable, polymeric, woven or non-woven textile material used in contact with soil/rock material.

Identification and marking: To AS 3705.

Subsoil drainage

Filter: Conform to AS/NZS 3500.3 clause 2.13.2.

2.3 PREFABRICATED PITS

General

Requirement: Precast or prefabricated pits conforming to AS/NZS 3500.3 clauses 2.12.8 and 7.5, and AS 3850.3.

Access covers and grates

Cover finish and load classification: Provide access cover and grate with the documented finish, slip resistance and load class.

3 EXECUTION

3.1 PIPING

Installation

Laying: Lay lengths separately with the barrel bearing evenly on the prepared bedding.

Sockets: Lay with socket ends pointing upstream.

Cleaning: Clean pipe interior of dirt, debris, mortar and other foreign matter.

Protection: Provide temporary caps over the ends of incomplete sections to prevent the entry of foreign matter.

3.2 TOLERANCES

Pipeline tolerances table

	Permissible angular deviation from the documented alignment	Permissible displacement from the documented positions
Horizontal	1:300	15 mm
Vertical	1:500	5 mm

Note: These tolerances are conditional on falls to outlets being maintained and no part of a pipeline having less than the documented gradient.

3.3 STORMWATER DRAINS

Location

General: Provide stormwater drains to connect surface drains, subsoil drains and drainage pits to the outlet point or point of connection. Make sure location of piping will not interfere with other services and building elements not yet installed or built. Subject to the preceding and documented layouts, follow the most direct route with the least number of changes in direction.

Laying

Installation: Lay in straight lines between changes in direction or grade. If other pipes are adjacent, set each pipe true to line and complete each joint before laying the next pipe. If work is not continuous, cap open ends to prevent entry of foreign matter.

Identification

Requirement: Lay a detectable strip or plastic tape in the trench after pipe laying, testing and initial backfilling.

Pipe underlay

General: Bed piping on a continuous underlay of bedding material, minimum 75 mm and maximum 150 mm thick after compaction. Grade the underlay evenly to the gradient of the pipeline.

Chases: If required, form chases to prevent projections such as sockets and flanges from bearing on the trench bottom or underlay.

Pipe surrounds

General: Place the material in the pipe surround in layers, maximum 200 mm loose thickness, and compact without damaging or displacing the piping.

Trench backfill

General: Backfill the remainder of the trench to the underside of the subgrade with fill material placed in layers, maximum 200 mm loose thickness and compacted to minimum 90%, or 95% under pavements, of the standard maximum dry density.

Lifting holes

Sealing: Seal lifting holes in all pipes with plastic preformed plugs or 3:1 (sand:cement) mortar, before the commencement of backfilling.

Anchor blocks

Restraint: If required to restrain lateral and axial movement of the stormwater pipes, provide reinforced concrete anchor blocks at junctions and changes of grade or direction conforming to AS/NZS 3500.3 clause 7.9.

3.4 SUBSOIL DRAINS

General

Requirement: Provide subsoil drains to intercept groundwater seepage and prevent water build-up behind walls and under pavements. Connect subsoil drains to surface drains or to the stormwater drainage system as applicable.

Piping: As documented.

Trench width: Minimum 450 mm.

Trench floor: Grade the trench floor evenly to the gradient of the pipeline. If the trench floor is rock, correct any irregularities with compacted bedding material.

Pipe depth: Provide the following minimum clear depths, measured to the crown of the pipe, where the pipe passes below the following elements:

- Formation level of the pavement, kerb or channel: 100 mm.
- Average gradient of the bottom of footings: 100 mm.
- Finished surface of unpaved ground: 450 mm.

Jointing

General: At junctions of subsoil pipes, provide tees, couplings or adaptors to AS 2439.1.

Pipe underlay

Bedding: Bed piping on a continuous underlay of bedding material, minimum 75 mm and maximum 150 mm thick after compaction. Grade the underlay evenly to the gradient of the pipeline.

Chases: If required, form chases to prevent projections such as sockets and flanges from bearing on the trench bottom or underlay.

Pipe surrounds

General: Place the material in the pipe surround in layers, maximum 200 mm loose thickness, and compact without damaging or displacing the piping.

Depth of overlay:

- To the underside of the bases of overlying structures such as pavements, slabs and channels.
- To within 150 mm of the finished surface of unpaved or landscaped areas.

Geotextiles

Marking: To AS 3705.

Laying: Place geotextile, as documented.

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

Filter socks

General: Provide permeable polyester socks, capable of retaining particles 0.25 mm and greater. Securely fit or join the sock at each joint.

3.5 PITS

Installation

General: Prepare foundation, install pit and connect pipes, to manufacturer's recommendations.

Location: At junctions, changes of gradient and changes of direction of stormwater drains, as documented.

Finish to in situ exposed surfaces

General: Provide a smooth, seamless finish, using steel trowelled render or concrete cast in steel forms.

Corners: Cove or splay internal corners.

Metal access covers and grates

Cover levels: Top of cover or grate, including frame:

- In paved areas: Flush with the paving surface.

- In landscaped areas: 25 mm above finished surface.
- Gratings taking surface water runoff: Locate to receive runoff without ponding.

3.6 TESTING

Site tests

General: Before backfilling or concealing, carry out an air or water pressure test to AS/NZS 3500.3 Section 9.

Leaks: If leaks are found, rectify and re-test.

3.7 COMPLETION

Cleaning

General: Clean and flush the whole installation.

0241 LANDSCAPE – WALLING AND EDGING**1 GENERAL****1.1 RESPONSIBILITIES****General**

Requirement: Provide landscape walling and edging, as documented.

1.2 CROSS REFERENCES**General**

Requirement: Conform to the following:

- *0171 General requirements.*

1.3 SUBMISSIONS**Samples**

Submit samples as follows: masonry units (precast concrete sleepers, brick and render surface).

1.4 INSPECTION**Notice**

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

- Set-out before starting construction.
- Geotextiles and subsurface drainage in place before backfilling.

2 PRODUCTS**2.1 STEEL****Steel tubes**

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

- Grade: C350L0.

Wire

Chainwire, cable wire, tie wire and barbed wire: To AS 2423.

2.2 CONCRETE**General**

Standard: To AS 1379.

Exposure classification: To AS 3600 Table 4.3.

Grade, if there are cast-in metal items: To AS 3600 Table 4.4.

2.3 SLEEPER WALLS**Sleepers**

Concrete: Proprietary system of concrete sleepers and concrete or galvanized steel posts.

Source of supply: Refer to FF&E schedule and specification as per structural engineer's documentation.

2.4 EARTH REINFORCEMENT**General**

Type: Proprietary system of galvanized steel strips or steel mesh strips placed in layers with compacted selected fill and connected to precast concrete facing panels to form vertical retaining walls. Provide the necessary accessories including levelling pad, bearing pads, and joint fillers or covers to keep the selected fill material out of the panel joints.

Product: [complete/delete]

2.5 GEOTEXTILES

General

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

Identification and marking: To AS 3705.

2.6 EDGING

Sleeper

Concrete

Standard: To AS 1379 – Grade N20.

Edge strip profile: Refer to FF&E schedule [complete/delete]

Steel

Product: Compatible with the selected precast sleepers

Size and profile: As specified by structural engineer.

Finish: Hot-dip galvanized.

3 EXECUTION

3.1 GENERAL

Set-out

General: Set out the position of walls and edging and mark the position of furniture.

Clearing

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

Excavation

Extent: Excavate for foundations and footings.

Geotextiles

Storage and handling: Store clear of the ground and out of direct sunlight. During installation do not expose the filter fabric to sunlight for more than 14 days.

3.2 SLEEPER WALLS

Construction

Concrete sleeper wall: To manufacturer's recommendations.

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

3.3 EARTH REINFORCEMENT

Construction

Requirement: Construct walls to the manufacturer's written recommendations.

3.4 EDGING

Sleeper

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

Concrete

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

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

Steel

Fixing:

- Angle section: Fixed in place by the mass of surrounding soil works.

- Flats: Fix in place with 250 mm long x 10 mm galvanized steel spikes driven through 50 x 50 mm fixing plates. Weld holed plates at right angles to the face of the flat at 1000 mm centres on alternate sides set parallel and 25 mm below the top of the edging.

Spade edge

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

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

Brick

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

Joints: 3 mm struck flush.

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

Cleaning: Wash off mortar progressively.

0242B LANDSCAPE – FENCES AND BARRIERS

1 GENERAL

1.1 RESPONSIBILITIES**General**

Requirement: Provide fences and barrier 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.*

1.3 SUBMISSIONS**Shop drawings**

Custom-built items: Submit shop drawings to a scale that best describes the details, showing methods of construction, assembly and installation, with dimensions and tolerances.

Warranties

Requirements: Submit the manufacturer's published product warranties.

1.4 INSPECTION**Notice**

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

- Boundary survey location.
- Set-out before construction.
- Foundation conditions after excavation.
- Completion of installation.

2 PRODUCTS

2.1 GENERAL**Storage and handling**

General: Deliver, unload and store components and accessories in unbroken manufacturer's packaging.

2.2 TIMBER**Durability**

Durability Class to AS 5604 clause 7: Class 1

Posts and rails

Hardwood: To AS 2082.

Softwood: To AS 2858.

Pickets and palings

Hardwood: To AS 2796.1 Section 8.

- Grade to AS 2796.2: Select.

Softwood: To AS 4785.1 Section 7.

Seasoned cypress pine: To AS 1810 Section 5.

Preservative treatment

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

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

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

2.3 STEEL**Steel tubes**

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

- Grade: C350L0.

Post and rail finish: Hot-dip galvanized.

2.4 CONCRETE**General**

Standard: To AS 1379.

Exposure classification: To AS 3600 Table 4.3.

3 EXECUTION**3.1 CONSTRUCTION GENERALLY****Set-out**

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

Property boundaries: Confirm by survey.

Clearing

Fence line: Except for trees or shrubs to be retained, clear vegetation within 1 m of the fence alignment. Grub out the stumps and roots of removed trees and shrubs, and trim the grass to ground level. Do not remove the topsoil.

Excavation

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

Earth footings

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

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

Concrete footings

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

On slabs: Provide welded and drilled post base flanges for fixing with masonry anchors to the concrete.

Erection

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

3.2 GATES**Hardware**

General: Provide the following:

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

Hand access

Requirement: Where required, provide hand holes to give access from outside to reach locking provision.

3.3 TIMBER FENCING

Hardwood paling fencing

General: As documented.

Footing type: Earth or compacted fine crushed rock, gravel or cement stabilised earth.

Installation

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

Picket fence: Nail twice to each rail.

Plain paling fence: Provide 2 rails for fences up to 1800 mm high, and locate 200 mm from the tops and bottoms of the palings. Close butt palings and nail twice to each rail.

Lap and cap paling fence: Provide 2 rails for fences up to 1800 mm high, and locate 200 mm from the bottoms of the palings and abutting the tops of palings. Close-butt larger palings and nail twice to each rail. Fix smaller palings over joints and nail twice to each rail. Nail capping to the top rail.

3.4 TEMPORARY LANDSCAPE FENCING

Fence dimensions

Height: 1200 mm.

Maximum post spacing: 5000 mm.

Component sizes

Corner and gate posts: Hardwood or preservative-treated softwood, 250 mm diameter.

Intermediate posts: Star picket.

Gate: Provide a suitable hinged gate with a gate latch.

Wire: Top, intermediate and bottom rows of 3.2 mm plain galvanized steel wire. Thread the top wire through pieces of plastic tube and through corner posts.

Removal

Completion: Remove the fence at the end of the planting establishment period.

3.5 COMPLETION

Cleaning

Requirement: Remove excess debris, metal swarf and unused materials. Clean all visible metal surfaces with soft clean cloth or brush and clean water or approved cleanser, finishing with a clean cloth. Do not use abrasive or alkaline materials.

Powder coated aluminium architectural applications: Clean completed assembly to AS 3715 Appendix C.

Powder coated metal, other than aluminium, architectural applications: Clean completed assembly to AS 4506 Appendix D.

Protection: Remove protective coatings using methods required by the manufacturer after completion.

Warranties

Requirement: Cover materials and workmanship in the form of interlocking warranties from the manufacturer and the installer.

0271B PAVEMENT BASE AND SUBBASE**1 GENERAL****1.1 RESPONSIBILITIES****General**

Requirement: Provide base and subbase courses as documented.

Performance

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

1.2 CROSS REFERENCES**General**

Requirement: Conform to the following:

- 0171 General requirements.
- 0222 Earthwork.

1.3 INTERPRETATION**Definitions**

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

- Base: One or more layers of material, forming the uppermost structural element of a pavement and on which the surfacing may be placed.
- Subbase: Material laid on the subgrade below the base either for the purpose of making up additional pavement thickness required, to prevent intrusion of the subgrade into the base, or to provide a working platform.

1.4 TOLERANCES**Surface level**

Subbase: + 10 mm, - 25 mm.

Base: + 10 mm, - 5 mm.

Base abutting gutters: ± 5 mm from the level of the lip of the gutter, minus the design thickness of the wearing course.

Surface deviation

Base: ≤ 5 mm from a 3 m straightedge laid on the surface.

1.5 SUBMISSIONS**Products and materials**

Source of material: Submit the supplier name, material type (crushed rock, natural gravel, recycled concrete aggregate) and source quarry or recycling site.

Tests

Compaction tests: Submit results of compaction testing to **TESTING, Site tests**.

1.6 INSPECTION**Notice**

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

- Prepared subgrade.
- Proof rolling of subbase before spreading of base.
- Proof rolling of base before sealing.

2 PRODUCTS

2.1 BASE AND SUBBASE MATERIAL

Granular material

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

Crushed rock

Requirement: Provide crushed rock as follows:

- Base: 20 mm nominal.
- Subbase: 40 mm nominal.

Recycled materials

Requirement: Provide recycled materials as follows:

- Base and subbase: Conform to the **Limits on use of recycled and manufactured materials as constituent materials table** and the **Undesirable material properties table**.

Natural gravel

Requirement: Provide unbound natural gravel materials as follows:

- Base: 20 mm nominal.
- Subbase: 40 mm nominal.

Subbase material properties and test methods table

Property and test method	Differentiating criteria	Material requirements	
		Crushed rock	Natural gravel
Particle size distribution or grading (% passing through sieve) to AS 1289.3.6.1	Sieve size (mm)	—	—
	53.0	100	100
	37.5	90 - 100	95 - 100
	26.5	74 - 96	80 - 97
	19.0	62 - 86	—
	13.2	—	—
	9.5	42 - 66	48 - 85
	4.75	28 - 50	35 - 73
	2.36	20 - 39	25 - 58
	0.425	8 - 21	10 - 33
Maximum dry compressive strength on fraction passing 19 mm sieve (only applies if plasticity index is less than 1) to AS 1141.52	—	min 1.0 MPa	min 1.0 MPa
	—	—	—
4 day soaked CBR (98% modified compaction) to AS 1289.6.1.1	—	min 30%	min 30%

Limits on use of recycled and manufactured materials as constituent materials table

Recycled material	Unbound or modified base and subbase	Bound base and subbase
Iron and steel slag	100%	100%
Crushed concrete*	100%	100%
Brick	20%	10%
RAP	40%	40%
Fly ash**	10%	10%

Recycled material	Unbound or modified base and subbase	Bound base and subbase
Furnace bottom ash	10%	10%
Crushed glass fines	10%	10%
Notes:		
* For pavements using high percentages of crushed concrete, take into account the amount of available cement which will rehydrate when subjected to moisture to create rigid or semi-rigid pavement and result in subsequent shrinkage cracking.		
** For pavements using fly ash, take into account the possibility of hydration and binding when subject to moisture to create rigid or semi-rigid pavement and result in subsequent shrinkage cracking.		

Undesirable material properties table

Property and test method	Differentiating criteria	Material requirements		
		Crushed rock	Recycled material	Natural gravel
Undesirable constituent materials (% retained on a 4.75 mm sieve) to RMS T276	Material type	—	—	—
	Type I - Metal, glass, stone, ceramics and slag	—	max 2.0 %	—
	Type II - Plaster, clay lumps and other friable material	—	max 0.5%	—
	Type III - Rubber, plastic, paper, cloth, paint, wood and other vegetable matter	—	max 0.1%	—

Base material properties and test methods table

Property and test method	Differentiating criteria	Material requirements		
		Crushed rock	Recycled material	Natural gravel
Particle size distribution or grading (% passing through sieve) AS 1289.3.6.1	Sieve size (mm)	—	—	—
	26.5	100	100	100
	19.0	95 - 100	95 - 100	93 - 100
	13.2	77 - 93	78 - 92	—
	9.5	63 - 83	63 - 83	71 - 87
	4.75	44 - 64	44 - 64	47 - 70
	2.36	29 - 49	30 - 48	35 - 56
	0.425	13 - 23	13 - 21	14 - 32
	0.075	5 - 11	5 - 9	6 - 20
CBR (98% modified compaction) to AS 1289.6.1.1	—	min 80%	min 80%	min 80%
Unconfined compressive strength to AS 5101.4	—	max 1.0 MPa	max 1.0 MPa	—

3 EXECUTION

3.1 SUBGRADE PREPARATION

General

Requirement: Prepare the subgrade to 0222 Earthwork.

3.2 PLACING BASE AND SUBBASE

General

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

Spreading: Spread material in uniform layers without segregation.

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

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

Joints

General: Plan spreading and delivery to minimise the number of joints. Offset joints in successive layers by a minimum of 300 mm.

Start of shift: Remix last 2 m of previous days' work for continuity of compaction.

Final trimming

General: Trim and grade the base course to produce a tight even surface with no loose stones or slurry of fines.

3.3 BASE AND SUBBASE COMPACTION

General

Construction operation: Compact each layer of fill to the required depth and density, as a systematic construction operation.

Unstable areas: If unstable areas develop during rolling or are identified by proof rolling, open up, dry back and recompact, to the requirements of this worksection. If dry back is not possible, remove for the full depth of layer, dispose of and replace with fresh material.

Minimum relative compaction table

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

Compaction requirements

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

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

Moisture content

General: During spreading and compaction, maintain material moisture content within the range of -2% to +1% from the optimum moisture content (modified compaction).

Spraying: Use water spraying equipment to distribute water uniformly, in controlled quantities, over uniform lane widths.

Dry back: Allow materials to dry to 60 to 80% of the optimum moisture content before applying the seal or wearing course.

Rectification

General: If a section of the pavement material fails to meet the required density or moisture content after compaction, remove the non-conforming material, dispose of off-site or rectify for re-use, replace with fresh material, re-compact and test.

Level corrections

General: Rectify incorrect levels as follows:

- High areas: If the area can be rectified by further trimming to produce a uniform, hard surface by cutting without filling, trim so that the rectified area conforms to **TOLERANCES**.
- Low areas and high areas not rectifiable by further trimming: Remove layers to a minimum depth of 75 mm and replace with new material and re-compact.

3.4 TESTING

Site tests

Compaction control tests: To AS 1289.5.4.1 and AS 1289.5.4.2.

Frequency of compaction control tests: Not less than the following (whichever requires the most tests):

- 1 test per layer per 100 lineal metres for two-lane roads.
- 1 test per layer per 2000 m² for carparks.
- 3 tests per layer.
- 3 tests per visit.

0279 PAVING – ON PEDESTALS

1 GENERAL

1.1 RESPONSIBILITIES

General

Requirement: Provide paving, as documented.

Performance

Requirements:

- Consistent in colour and finish.
- Resistant to expected loads in use.
- Pavers capable of spanning between pedestal supports when subjected to imposed loads.
- Resistant to any wind uplift forces.
- Set out with joints accurately aligned in both directions.
- Within documented level tolerances.

1.2 CROSS REFERENCES

General

Requirement: Conform to the following:

- 0171 General requirements.
- 0222 Earthwork

1.3 STANDARDS

Slip resistance

Classification: To AS 4586.

1.4 INTERPRETATION

Definitions

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

- Absolute level tolerance: Maximum deviation from design levels.
- Lippage: Height deviation between adjacent units.
- Pavers: Units made from concrete, clay, stone and/or other inorganic raw materials, generally over 20 mm thick, used as coverings for horizontal surfaces.
- Pedestal: The structure directly supporting the pavers, including head, base, column, any adjustment and any locking devices.
- Relative level tolerance: Maximum deviation from a 3 m straightedge laid on the surface.

1.5 TOLERANCES

Completed paving

Level tolerance:

- Absolute: ± 8 mm.
- Relative: 8 mm.

Lippage: Less than 2 mm.

1.6 SUBMISSIONS

Execution details

Margins: If it appears that an alternative set out, spacing widths between pavers or minor variations in overall dimensions will avoid cut pavers, submit a proposal.

Operation and maintenance manuals

General: Submit a manual describing care and maintenance of the paving and pedestals, including procedures for future height adjustment to maintain installation tolerances and for maintaining the slip-resistance classification stating the expected life of the slip-resistance classification.

Products and materials

Pavers: Submit evidence from paving manufacturer of paver suitability for installation on pedestals, being supported only on the corners of the paver.

Type tests: Submit results, as follows:

- Slip resistance of pavers.
- Accelerated wear test of pavers.
- Stone paver properties.

Waterproof membrane: Submit evidence of the waterproofing membrane's suitability for pedestals and pavers to be installed over and that it is also UV resistant/stable.

Samples

Pavers: Submit labelled samples of pavers, showing the range of variation in colour and finish.

Pedestals: Submit a sample of each component of the pedestal support system.

Subcontractors

Substrate acceptance: Submit evidence of the installer's acceptance of the substrate before commencing installation.

Tests

Site tests: Submit results, as follows:

- Slip resistance test of completed installations.

Warranties

Requirement: Submit warranties to **COMPLETION, Warranties**.

1.7 INSPECTION

Notice

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

- Substrate immediately before installing pedestals.
- Set-out of grids for placement of pedestals.
- Installation of any bracing to pedestals.
- Completed paving.

2 PRODUCTS

2.1 GENERAL

Storage and handling

Pedestals: Deliver and store in the manufacturer's original sealed packaging in a dry environment. Inspect for damage upon delivery.

2.2 PEDESTAL SYSTEM

Description

Description: Proprietary system to support pavers.

2.3 STONE PAVERS

Natural stone

Description: Natural stone pavers of uniform quality and sound. Reject stone pavers with any of the following defects liable to affect strength and durability:

- Vents.
- Cracks.
- Fissures.
- Seams.
- Porous inclusions.
- Foreign material.
- Loose surface material.
- Discolouration.

Matching: Select for optimum matching of colour and pattern.

Split flagging thickness: Minimum 50 mm, maximum 75 mm.

Face size: Use smaller sizes for pathways and larger sizes for open areas and maintain traditional stone flagging appearance.

Cast stone

Description: Reconstituted stone manufactured from selected aggregates and cement.

Other pavers

Requirement: Provide sound pavers of uniform quality, as documented.

Tests

2.4 OTHER MATERIALS

Tactile ground surface indicators

Standard: To AS/NZS 1428.4.1.

3 EXECUTION

3.1 PREPARATION

Substrates

Drying and shrinkage: Before installing any waterproof membrane or locating pedestals, allow at least the following times to elapse (for curing and initial shrinkage) for these substrates:

- Concrete slabs: 28 days.
- Toppings on slabs: A further 21 days.

Preparation: Before starting the installation of pedestals, make sure substrates are as follows:

- Broom clean and free from any oil, deposit, finish or projection which may impair the performance of the pedestal system or any waterproofing membrane that has been installed.
- Complete, including the installation of any documented waterproofing membrane, drainage mat, insulation or protection board.
- Sloped to provide positive and adequate drainage.

Extent of protection: If protection to any documented waterproof membrane is only required under each pedestal, extend protection a minimum of 25 mm beyond the edge of each pedestal base.

Compressive strength of insulation placed beneath a pedestal: Sufficient to support the loads transmitted through the pedestal upon completion.

Perimeter

Containment: Provide adequate restraint to all assemblies of insulation, protection board, drainage mat, pedestals and pavers to the perimeter of the paving area.

Fixtures

General: Before paving make sure that fixtures interrupting the surface are accurately positioned in their designed or optimum locations relative to the paving layout. Allow for movement between paving and fixtures.

3.2 INSTALLATION

Set-out

Level: Establish and mark the support system level (finished paving elevation less the paver thickness) around the perimeter of the paving area.

Grid: Establish a grid on the substrate from the set-out point. The grid will reflect the joint lines in the completed paving. Use grid lines to check paver layout during installation.

Expansion joints: Do not locate pedestals directly over expansion joints in the substrate. Locate pedestals on one side or the other of any expansion joint in the substrate.

Margins: Provide whole or purpose-made pavers at margins where practicable, otherwise set out to give equal margins of cut pavers. If margins less than half paver width are unavoidable, locate the cut pavers where they are least conspicuous.

Pedestal installation

General: Install pedestals to the manufacturer's recommendations in complete rows, starting at one side of the perimeter, installing pavers and adjusting to the correct level as each subsequent row of pedestals are installed.

Location: Locate a pedestal at each intersection of grid lines.

Perimeter edge: Locate pedestal on grid line that meets perimeter, as close to the perimeter edge as possible.

Irregular cut pavers: Locate pedestals so any irregular shaped cut pavers are supported on, or as close as possible to, each corner of the paver.

Pedestal height adjustment

General: For adjustable height pedestals, set the pedestal to the required height before placing pavers onto pedestal. After placing pavers make fine vertical adjustments, as required.

Compensation for substrate slope

General: If required to install paving at a different slope to that of the substrate, compensate for the substrate slope to the manufacturer's recommendations.

Variations

General: If necessary, distribute variations in hue, colour, or pattern uniformly, by mixing pavers or paving batches before laying.

Thickness: Accommodate variations in paver thickness by placing shims under a paver corner on top of the pedestal head, to the manufacturer's recommendations.

3.3 TESTING

Site tests

Slip resistance of completed installation: To AS 4663.

3.4 COMPLETION

Spare pavers

General: Supply spare matching pavers of each type for future replacement purposes. Store the spare materials on site.

Quantity: At least 1% of the quantity installed.

Cleaning

General: Leave pavements clean on completion.

Warranties

Installation: As per manufacturer

Pavers: Refer to Finishes Schedule. Refer to Landscape Architects for selection of permeable pavers.

Pedestals: Refer to FF&E schedule.

0310 CONCRETE – COMBINED

1 GENERAL

1.1 RESPONSIBILITIES

General

Requirement: Provide cast in situ reinforced concrete, as documented.

Performance

Requirements:

- Conforming to the design details and performance criteria.
- Satisfying quality and inspection requirements.
- Compatible with documented applied finishes.

1.2 DESIGN

General

Formwork: The design of formwork, other than permanent composite form systems, is the contractor's responsibility. Allow for dimensional changes, deflections and cambers resulting from the following:

- Imposed actions.
- Concrete shrinkage and creep.
- Temperature changes.
- The application of prestressing forces (if any).

Structural design: To AS 3600.

Post-tensioned concrete: To AS 3600.

Concrete structures retaining liquids: To AS 3735.

Requirements

General: To DESIGN in 0171 General requirements.

1.3 CROSS REFERENCES

General

Requirement: Conform to the following:

- 0171 General requirements.

1.4 STANDARDS

General

Formwork design and construction: To AS 3610.1.

Plywood formwork: To AS 6669.

Composite steel-concrete construction, including profiled steel sheeting and shear connectors: To AS/NZS 2327.

Reinforced concrete construction: To AS 3600.

Specification and supply of concrete: To AS 1379.

Residential ground slabs and footings: To AS 2870.

Post-tensioned concrete: To AS 3600.

Concrete structures for retaining liquids: To AS 3735.

Strand, bar and wire: To AS 4672.1.

Design, installation and testing of post-installed and cast-in fastenings: To AS 5216.

Formed surfaces: To AS 3610.1.

Slip resistance

Classification: To AS 4586.

1.5 INTERPRETATION

Definitions

General: For the purposes of this worksection, the definitions given in AS/NZS 1314, AS 1379, AS 3600, AS 3610.1 and the following apply:

- Ambient temperature: The air temperature at the time of mixing and placing of concrete.
- Anti-burst reinforcement: Reinforcement cage surrounding anchorages to control the tensile bursting stresses.
- Early age strength: A mean compressive strength at 7 days exceeding the values shown in AS 1379 Table 1.2.
- Green concrete: Concrete which has recently set but has not achieved any design strength.
- 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.
- Specimen: A portion of a sample which is submitted for testing.
- Weather – cold: Ambient shade temperature less than 10°C.
- Weather – hot: Ambient shade temperature greater than 30°C.

1.6 TOLERANCES

Formwork

Plumb of elements > 8 m high: 1:1000.

Plumb of elements ≤ 8 m high: To AS 3610.1.

Position: Construct formwork so that finished concrete conforms to AS 3600 clause 17.5, AS 3610.1 clause 3.3 and as documented.

Reinforcement

Fabrication: To AS 3600 clause 17.2.

Reinforcement and tendon position: To AS 3600 clause 17.5.3.

Formed surfaces

Form face deflections: To AS 3610.1 Table 3.3.4.1.

Straight elements: To AS 3610.1 Table 3.3.5.1.

Unformed surfaces

Flatness: To the **Flatness tolerance class table**, using a straightedge placed anywhere on the surface in any direction, for the documented class of finish.

Flatness tolerance class table

Class	Measurement	Maximum deviation (mm)
A	2 m straightedge	4
B	3 m straightedge	6
C	600 mm straightedge	6

1.7 SUBMISSIONS

Certification

Formwork design certification: For other than permanent composite form systems, submit certification by a professional engineer experienced in formwork design verifying conformance of the design.

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

Design documentation

Formwork calculations: Submit calculations by a professional engineer experienced in formwork design to show that allowable concrete stresses will not be exceeded and formwork capability will be maintained if the following is proposed:

- Formwork procedures or loadings that differ from those documented.
- Props above a floor that do not coincide with the props below.
- Undocumented formwork shoring or stripping procedures.

- Loadings from stacked materials.

Post-tensioned calculations: Submit the following:

- Calculations of tendon jacking forces, theoretical extensions and losses for each stressing stage and at final stressing, before stressing operations begin.
- Amount of draw-in expected in seating anchorages, friction along tendon (wobble) coefficient and friction curvature coefficient for tendons and duct-forming material.

Execution details

Moveable formwork: Provide the following details on the formwork drawings:

- Table form and climbing formwork: Proposed method and sequence of moving the formwork to provide concrete of the documented quality and surface finish.
- Continuously climbing formwork (Slipform): The average rate of movement.

Formwork removal: Submit formwork removal procedures.

Reshoring: Submit details of any proposed reshoring.

Concrete: Submit proposals for mixing, placing, finishing and curing concrete including the following:

- Changes to the concrete mix.
- Changes to documented joint locations.
- Curing and protection methods.
- Curing period for low-pressure steam curing.
- Cutting or displacing reinforcement, or cutting or coring hardened concrete.
- Handling, placing, compaction and finishing methods and equipment, including pumping.
- Placing under water.
- Sequence and times for concrete placement, and construction joint locations and relocations. Include any proposed sequential placement of slab segments.
- Site storage, mixing and transport methods and equipment, if applicable.
- Temperature control methods to suit hot or cold atmospheric conditions during concrete placement.
- Sawn joints: Submit details of proposed methods, timing and sequence of sawing joints.

Reinforcement: Submit the following:

- General: Details of any proposed changes to documented reinforcement.
- Damaged galvanizing: Details of proposed repair to AS/NZS 4680 Section 8.
- Mechanical bar splices: Details and test certificates for each size and type of bar to be spliced.
- Provision for concrete placement: Details of spacing or cover to reinforcement that does not conform to AS 3600.
- Splicing: Details of any proposed changes to documented requirements.
- Welding: Details of any proposed welding of reinforcement to AS/NZS 1554.3.

Post-tensioning: Submit the following:

- Details of the proposed post-tensioning system tested and certified to AS/NZS 1314, including performance test certificates for each type and size of anchorage and coupler.
- Safe work method statements including the name and contact details of the subcontractor.
- Details of proposed gauging, stressing and grouting equipment and current calibration certificates for tensioning and tension measuring equipment.
- Concrete strength early age test results.

Loading: Submit details of proposed construction systems, loads and procedures, including propping, re-shoring and any proposals for early application of superimposed loads.

Surface repairs: If surface repairs are required, submit proposed methods.

Products and materials

Void formers: Submit type-test results as evidence of conformity to requirements of **FORMWORK, Void formers**.

Reinforcement strength and ductility: Submit type-test reports as evidence of conformity to AS 3600 Table 3.2.1 for each reinforcement type.

Post-tensioning: Submit the following:

- Grout: Proposed grout mix and certified test results (including grading, proportions, compressive strength, shrinkage and additives if any).
- Epoxy grout: If required, proposed formulation.
- Duct-forming material: Samples of proposed material.
- Prestressing steel: Test certificates to AS/NZS 4672.2 for every delivery of strand, bar or wire proposed.

Product conformity: Submit evidence of conformity, as appropriate, as follows:

- Certification by a JAS-ANZ accredited third party.
- Report by an Accredited Testing Laboratory describing tests and giving results which demonstrate that the product conforms.

Concrete mixes: Submit details, for each grade and type of concrete including any proposed use of special-purpose cement types.

Pre-mixed supply delivery dockets: For each batch, submit a docket listing the information required by AS 1379, and the following:

- For special-class performance concrete: Documented performance and type of cement binder.
- For special-class prescription concrete: Details of mix, additives, and type of cement binder.
- Method of placement and climate conditions during pour.
- Name of concrete delivery supervisor.
- Project assessment carried out each day.
- The concrete element or part of the works for which the concrete was ordered, and where it was placed.
- The total amount of water added at the plant and the maximum amount permitted to be added at the site.

Curing compounds: Submit details of any proposed curing compounds, including the following:

- Dosage rates.
- Certified type-test results by an Accredited Testing Laboratory for water retention to AS 3799 Appendix B for liquid membrane-forming compounds.
- Evidence of compatibility with concrete, and with applied finishes including toppings and render, if any, including methods of obtaining the required adhesion.
- For visually important surfaces, evidence that an acceptable final surface colour will be obtained.

Admixtures: Submit details of any proposed admixtures, including the following:

- Brand name.
- Place of manufacture.
- Basic chemical composition.

Prototypes

Test panels: Provide test panels to AS 3610.1 clause 3.7 and as documented.

Manufacture: Cast the panels using the form, concrete, compaction equipment, form release agents, curing and formwork removal methods which are to be used in the final work.

Storage: Once accepted, maintain the panels on site undamaged and protected from the weather, as reference prototypes for evaluation of completed work.

Surface treatment: Do not proceed with the related work until the acceptable range of surface treatments has been determined.

Records

Post-tensioning: Submit the following:

- Post-tensioning record.
- Post-tensioning stressing schedule.
- Post-tensioning grouting record.

Samples

Coloured concrete: Submit sample blocks of coloured concrete produced using the proposed mix and casting method before casting final concrete, as follows:

- Number: 4.

- Size (nominal): 300 x 300 x 50 mm.

Shop drawings

Formwork: Submit shop drawings including details of proposed forms, falsework, form liners, bolt positions, release agents and, where applicable, re-use of formwork.

Post-tensioned drawings: Submit shop drawings showing the following:

- Profiles, sizes and details of tendons, tendon numbers, anchorages, ducts, duct formers, splicing, sheathing, end block reinforcement and other associated components.
- Stressing requirements including sequence of stressing, jacking forces and the basis of assumed loss calculations.
- Number, size and position of grout openings, vents and drain holes in the ducts.

Cores, fixings and embedded items: Submit the proposed locations, clearances and cover and show any proposed repositioning of reinforcement.

Tests

Requirement: Submit test results, as follows:

- Concrete and grout compressive strength test results to AS 1012.9.
- Slip resistance test of completed installations.
- Drying shrinkage test results.

1.8 INSPECTION

Notice

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

- Used forms, after cleaning and before re-use.
- Base or subgrade before covering.
- Membrane or film underlay installed on the base or subgrade.
- Completed formwork with all dust and debris removed from forms and reinforcement, tendons, cores, fixings and embedded items fixed in place before placing concrete.
- Concealed surfaces or elements before covering.
- Commencement of concrete placement and compaction.
- Finishing and curing of concrete.
- Evaluation of the off-form finishes.
- Evaluation of surface finish.

2 PRODUCTS

2.1 CONCRETE

General

Stockpile: If uniform, consistent colour is documented, stockpile sand, cement and aggregates.

Properties

Concrete mix and supply: Conform to the following:

- Normal-class: To AS 1379 clause 1.5.3.
 - . Properties: As documented.
- Special-class: To AS 1379 clause 1.5.4.
 - . Performance properties: As documented.
 - . Prescription properties: As documented.

Aggregates

Standard: To AS 2758.1.

Storage: Store in silos or on a hardstand located away from surface and ground water runoff. Allow for free drainage of rainwater and prevent contamination and intermixing of aggregates.

Cement

Standard: To AS 3972.

Age: Less than 6 months old.

Storage: Store cement bags in a dry, under cover and above ground environment.

Supplementary cementitious materials:

- Fly ash: To AS/NZS 3582.1.
- Slag: To AS 3582.2.
- Amorphous silica: To AS/NZS 3582.3.

Water

Standard: To AS 1379 clause 2.4.

Requirement: Clean, free from oil, acid, alkali, organic or vegetable matter and including not more than 500 mg/l of chloride ions.

Concrete colour

Standard: To AS 3610.1.

Chemical admixtures

Standard: To AS 1478.1, used to manufacturer's recommendations and free from chlorides, or other substance detrimental to concrete or reinforcing steel.

2.2 FORMWORK

General

Form face, linings and release agents: Compatible with documented concrete surface finish and any proposed applied finishes to concrete.

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

Void formers

Requirement: Material capable of maintaining rigidity and shape until the concrete has set, capable of withstanding construction loads and non-collapsible on absorption of moisture.

Laboratory testing: Use void formers tested under laboratory conditions for conformance with the following:

- Deflection during placing and compaction of the concrete does not exceed beam or slab span/1000.
- Additional deflection between initial set and 7 days does not exceed span/400.

Test method: Place formers on damp sand and load with a mass of wet concrete at least equal to the mass of the beams or slabs to be supported.

Profiled steel sheeting composite forms

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

Minimum steel grade: G550.

Accessories: Use materials and corrosion protection compatible with the profiled steel sheeting.

Plywood forms

Material: To AS 6669.

Grade: Use appropriate grade for the documented design dimensions, loading and surface quality.

Joints: Seal the joints consistent with the documented surface finish class.

Tolerances: To AS 3610.1 Section 3.

2.3 REINFORCEMENT

Fibre reinforcement

Steel fibres: To AS 3600 clause 16.7.1.

Synthetic fibres: To EN 14889-2.

Steel reinforcement

Standard: To AS/NZS 4671.

Fabrication tolerances: To AS 3600 clause 17.2.2.

Surface condition: Free of loose mill scale, rust, oil, grease, mud or other material which would reduce the bond between the reinforcement and concrete.

Storage: Store reinforcement above the surface of the ground and protect from damage and from deterioration by exposure.

Protective coating

Standard: To AS 3600 clause 17.2.1.2.

Requirement: For concrete elements containing protective coated reinforcement, provide the same coating type to all that element's reinforcement and embedded ferrous metal items, including tie wires, stools, spacers, stirrups, plates and ferrules, and protect other embedded metals with a suitable coating.

Epoxy coating: High-build, high solids, chemically resistant coating to AS/NZS 3750.14.

- Thickness: 200 µm minimum.

Galvanizing: To AS/NZS 4680, as follows:

- Sequence: If fabricating after galvanizing, repair damaged galvanizing and coat cut ends.
- Zinc-coating (minimum): 600 g/m².

Tie wire

General: Annealed steel 1.25 mm diameter (minimum).

External and corrosive applications: Galvanized.

Supports

Standard: To AS/NZS 2425.

2.4 POST-TENSIONING

Grout properties

Standard: To AS 3600 clause 17.1.8.

Maximum shrinkage: 1% by volume after 24 hours.

Maximum water:cement ratio: 0.45 (by weight).

Compressive strength: 32 MPa at 7 days.

Grout materials

Fine aggregates: Do not use aggregates for post-tensioning grout unless cross sectional area of ducts is 5 times the cross sectional area of the tendon.

Cement: To AS 3972 and free from calcium chloride and less than two months old.

Admixtures: To AS 1478.1. Include an anti-bleed additive.

Fly ash: To AS/NZS 3582.1 and proportioned according to early strength requirements.

Water: To AS 1379. Clean, free from oil, acid, alkali, organic or vegetable matter and including not more than 500 mg/l of chloride ions.

Epoxy grout type: Commercial epoxy formulation of compressive strength exceeding 40 MPa.

Ducts

Robustness: Provide ducts with sufficient strength to retain their shape, resist damage during construction, and prevent deterioration or electrolytic action due to cement paste or water from the concrete entering the duct.

Wall thickness: To allow for abrasion during stressing of the tendon.

Size: To allow feeding of tendons and grouting.

Tendon material

Prestressing steel: Type and grade of strand, wire or bar, to AS 4672.1.

Type: 7 wire, stress relieved, high tensile steel and strand.

Quality: Make sure tendons have no nicks, pitting, indents, damage or foreign matter such as mud and dirt. Inspect at delivery and store the prestressing steel on supports clear of the ground.

Straightening of tendons: Not permitted. Supply tendons in coils large enough to self-straighten.

High tensile steel bars: Inspect individually and reject any bars with surface imperfections more than 0.40 mm deep.

Other steel

Anchor plates: Hot-dip galvanized to AS/NZS 4680.

Anchorage: To AS/NZS 1314.

Reinforcement: To AS/NZS 4671.

2.5 MISCELLANEOUS

Polymeric film underlay

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

Curing compounds

Liquid membrane-forming compounds: To AS 3799.

Surface modifiers

Hardeners, sealants and protectors: If documented, proprietary products conforming to the manufacturer's recommendations.

Slip resistance treatment: If documented, proprietary products conforming to the manufacturer's recommendations.

3 EXECUTION

3.1 POLYMERIC FILM UNDERLAY

Location

Requirement: Under slabs on ground, including integral ground beams and footings, provide a vapour barrier or, in areas prone to rising damp or salt attack, a damp-proofing membrane.

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 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.

3.2 FORMWORK

General

Requirement: As documented.

Bolt holes

Formwork tie bolts left in the concrete: Position more than 50 mm from the finished surface.

Corners

Work above ground: Bevel with a chamfer at re-entrant angles, and a fillet at corners.

Face of bevel: 25 mm.

Embedments

Fixing: Fix embedments through formwork to prevent movement, or loss of slurry or concrete, during concrete placement.

Openings

Requirement: In vertical forms provide openings or removable panels for inspection and cleaning, at the base of columns, walls and deep beams.

Access: For thin walls and columns, provide access panels for placing concrete.

Release agents

Application: Before placing reinforcement, apply a release agent to form face and linings. Spread the coating uniformly in a thin film and remove any surplus before placing concrete.

Staining: If oil or grease is used, make sure that surfaces to be exposed will not be stained or discoloured.

Unlined timber forms: Thoroughly wet timber before oiling.

Climbing formwork

Provision for inspection: Provide access below the movable formwork, from which surface treatment and inspection may be carried out.

Profiled steel sheeting composite formwork

Fixing: If sheeting cannot be fixed to structural steel supports with puddle welds, or with welded shear studs, provide details of proposed fixings.

Steel linings

Rust: Clean off any rust and apply rust inhibiting agent prior to re-use.

Visually important surfaces

Surface finish classes 1, 2 or 3: Set out the formwork to give a regular arrangement of panels, joints, bolt holes, and similar visible elements in the formed surface.

Void formers

Protection: Keep void formers dry until use, install on a firm level surface and place reinforcement and concrete with minimum delay.

3.3 REINFORCEMENT

General

Fixing: To AS 3600 clause 17.2.5 and as documented.

Dowels

Fixing: If a dowel has an unpainted half, embed that half in the concrete placed first.

Tolerances:

- Alignment: 1:150.
- Location: \pm half the diameter of the dowel.

Grade: 250 N.

Cover

Concrete cover generally: To AS 3600 clause 4.10.

Concrete cover for structures for retaining liquids: To AS 3735 clause 4.4.

Concrete cover for residential ground slabs and footings: To AS 2870.

Supports

Concrete, metal or plastic supports: Provide as follows:

- Able to withstand construction and traffic loads.
- With a protective coating if they are ferrous metal, located within the concrete cover zone, or are used with galvanized or zinc-coated reinforcement.

Spacing:

- Bars: \leq 60 bar diameter.
- Mesh: \leq 600 mm.

Supports over membranes: Prevent damage to waterproofing membranes or vapour barriers. If appropriate, place a metal or plastic plate under each support.

Projecting reinforcement

Protection: If starter or other bars extend beyond reinforcement mats or cages, through formwork or from cast concrete, provide a plastic protective cap to each bar until it is cast into later work.

Bending

Restriction: Use only bars with bends as documented. If required to bend or straighten bars on site, do not use heat and use only methods that will not damage the steel and its structural properties, to AS 3600 clause 17.2.3.2.

Tying

Requirement: Secure the reinforcement against displacement at intersections with either wire ties, or clips. Bend the ends of wire ties away from nearby faces of formwork or unformed faces to prevent the ties projecting into the concrete cover.

Beams: Tie stirrups to bars in each corner of each stirrup. Fix other longitudinal bars to stirrups at 1 m maximum intervals.

Bundled bars: If required, tie bundled bars in closest possible contact. Provide tie wire at least 2.5 mm diameter and spaced not more than 24 times the diameter of the smallest bar in the bundle.

Columns: Secure longitudinal column reinforcement to all fitments (or helical reinforcement) at every intersection.

Mats: For bar reinforcement in the form of a mat, secure each bar at alternate intersections.

Fibre-reinforced concrete

Steel fibres: To AS 3600 Section 16.

Synthetic fibres: To EN 14889-2.

3.4 POST-TENSIONING

General

Protection: Protect post-tensioning tendons, anchorages, ducts, supports and grout from damage or contaminants, including from swarf, loose grease, oil and paint.

Tolerances: To AS 3600 clause 17.5.3.

Minimum concrete cover: As documented.

Post-tensioning record: Provide details of the following:

- Concrete mix.
- Concrete placing and curing methods, including dates.
- Placing of reinforcement and tendons.
- Dates of post-tensioning operations.
- Name of operator.
- Identification of tendons.
- Stressing method (single or double end, monostrand or multistrand).
- Early age test results for strength.
- Tendon breakage and non-conformance reports.

Ducts

Standard: To AS 3600 clause 17.3.

Placement: Locate and secure to positions, as documented.

Supports: Support and fix at regular intervals. Protect from collapse and other damage.

Sheathing: If ducts are formed with sheaths, provide sheathing material capable of transferring the tendon stresses into the body of the concrete.

Sequence: Assemble tendons on site by installing strand, bar or wire within the duct before concreting.

Damage: If damaged, repair ducts as follows:

- Small holes: Waterproof adhesive tape.
- Larger holes: Metal strips wrapped around the duct, with 100 mm overlap and sealed by a waterproof adhesive tape.

Crossover points: If ducts running in opposite directions clash, consult the professional engineer. Do not relocate ducts without approval.

Anchorage

Anti-burst reinforcement: As documented.

Tendons

Care: Do not weld tendons. Do not expose tendons to sparks, ground current or excessive temperatures such as flame or oxyacetylene cutting.

Grout fittings and ducts: For bonded construction, protect from collapse and other damage.

Conformance: Provide tendons as documented.

Protection: Make sure tendons are not displaced by heavy and prolonged vibration, the pressure of the concrete being placed, workmen or construction traffic.

Temperature: Maintain concrete around grouted tendons at 5°C or more for at least 3 days after grouting.

Slab marking: If there is possibility for future slab penetrations, mark the tendon locations, either on the slab surface or the soffit.

Gauges and jacks

Standard: To AS 1349.

Maximum error in pressure indication: 1% of the maximum scale (concentric) value.

Period: Calibrate gauges and jacks at intervals not exceeding 6 months, after re-sealing of jack or gauge, or if any inaccuracy in the gauges is suspected.

Sets: Calibrate and use jacks and gauges as a set.

Stressing

Post-tensioning: To AS 3600 clause 17.3.4.5.

Stressing procedure: Carry out stressing after early age tests results indicate concrete has attained the required strength.

Stressing stages: As documented.

Marking: Mark strands after wedges are installed and before initial stress.

Slip: Check markings whilst stressing to make sure there is no slip of strands.

Stress records: Measure gross extensions on site and include initial and final stress extensions.

Site extensions: Submit the site extensions on the same day as measured for review and approval by the structural engineer.

Non-conformance: If the difference between theoretical and measured extensions is greater than 10%, provide an explanation of the cause.

Cutting tendons: Do not cut tendons until the actual extensions are approved.

Re-stress or de-stress: Adjust stress in tendons if necessary, after the theoretical and site extensions are compared.

Post-tensioning stressing schedule: Provide a stressing schedule, including the following information.

- Setting out, elongation and jacking forces.
- Identification number of dynamometers, gauges, pumps and jacks.
- Initial stressing force (or pressure) when tendons are marked for measurement of elongation, but not marked at nil load.
- Force applied (dynamometers).
- Pump or jack pressure and area of the piston.
- Elongation before anchoring.
- Elongation remaining after anchoring.

Grouting

Timing: Grout tendons as soon as practicable after stressing and within the time limits applicable to the atmospheric corrosivity category, as documented:

- C1 or C2: Three weeks.
- C3: Two weeks.
- C4: One week.
- C5 or CX: Seek specialist advice.

Exterior and interior corrosivity categories: To **CORROSION RESISTANCE, Atmospheric corrosivity category** in *0171 General requirements*.

Procedure: Prevent damage to grout vents and fittings during grouting. Do not use manually powered grouting machines. Completely fill the duct during grouting. Inject grout into voids between tendons, ducts and anchorages, until grout flows from vents without air bubbles. Close vents as they fill, progressively in the direction of flow. If there is a blockage or interruption, completely flush grout from the duct using water.

Grout caps: Provide at each anchorage and seal for grouting and venting operations.

Post-tensioning grouting record: For each duct grouted, provide the following:

- Duct and tendon identification.
- Grouting date.
- Composition of the grout (water:cement ratio, admixtures).
- Grout tests, including air tests of ducts.
- Details of grouting (including pumping or supply interruptions, topping up).

Protection

Grout ducts: Do not subject grouted ducts to shock, vibration, construction traffic or similar loads until 24 hours after completion of grouting.

Permanent protection

Tendons and anchorages: On completion of stressing and grouting, permanently protect anchorage and tendons. Provide at least 40 mm of cover over the cut tendons when the recesses are concreted. Keep anchorages free of foreign matter (rust, grease, oil, paint).

3.5 CONCRETE SUPPLY

Elapsed delivery time

General: Make sure that the elapsed time between the wetting of the mix and the discharge of the mix at the site is in conformance with the **Elapsed delivery time table**. Do not discharge at ambient temperature below 10°C or above 30°C unless approved heating or cooling measures are taken to deliver concrete within the range 5°C to 35°C.

Elapsed delivery time table

Concrete temperature at time of discharge (°C)	Maximum elapsed time (minutes)
5 – 24	120
24 – 27	90
27 – 30	60
30 – 35	45

Pre-mixed supply

Addition of water: To AS 1379 clause 4.2.3.

Transport method: Select to prevent segregation, loss of material and contamination of the environment, and not to adversely affect placing or compaction.

Site mixed supply

Emergencies: If mixing by hand, provide details.

Plant: Mix concrete in a plant located on the construction site.

3.6 TESTING

General

Test authority: Concrete supplier or an Accredited Testing Laboratory.

Reports and records of test results: To the relevant parts of the AS 1012 series. Keep results on site.

Assessment process of test results

Standard: To AS 1379.

Method of assessment: Project assessment.

Sampling

Method of sampling: To AS 1012.1.

Sampling locations: To AS 1012.1 and the following:

- Slump and spread tests: On site, at the point of discharge from the agitator.
- Compressive strength tests: Spread the site sampling evenly throughout the pour.

Frequency of sampling: To AS 1379 Sections 5 and 6 and the following:

- Slump and spread tests: Take at least one sample from each batch.
- Compressive strength tests: To the **Project assessment strength grade sampling table**.

Project assessment strength grade sampling table

Number of batches for each type and grade of concrete per day	Minimum number of samples per batch: Columns and load bearing wall elements	Minimum number of samples per day: Other elements
1	1	1
2-5	1	2
6-10	1	3
11-20	1	4
each additional 10	1	1 additional

Making and curing of specimens

General: To AS 1012.8.1 and AS 1012.8.2.

Specimens for compressive strength tests: Make and cure at least two specimens from the sample of each grade.

Specimen size:

- Aggregate size ≤ 20 mm: Nominally 200 x 100 mm diameter.
- Aggregate size > 20 mm: Nominally 300 x 150 mm diameter.

Test methods

General: To the relevant parts of the AS 1012 series.

Acceptance criteria:

- Concrete properties: As documented by the Structural Engineer.
- Early age compressive strength: As documented.

Drying shrinkage at 56 days: To AS 1012.8.4 and AS 1012.13.

Early strength testing for post-tensioned concrete

Requirement: Complete early strength testing before each stage of stressing.

Sampling frequency: For each post-tensioned element, make and cure at least 3 cylinder specimens for testing at the age of each intended stage of stressing plus at least 3 reserve cylinder specimens. Take at least one sample every 2 batches.

Sampling locations: Distribute sampling locations randomly, include anchorage area and the final concrete placement area. Reference the structural element from which the sample is taken.

Curing: Site cure all test cylinders for early age testing. For slab samples, maintain exposure to the same weather and temperature by curing the samples on the adjacent deck. Retain test cylinders on site until the morning of the test.

Liquid retaining structures

Testing for liquid tightness: To AS 3735.

Site tests

Slip resistance of completed installation: To AS 4663.

3.7 CORES, FIXINGS AND EMBEDDED ITEMS

General

Requirement: Install fasteners to manufacturer's recommendations and the assumptions of AS 5216 Appendix G.

Adjoining elements

Fixings: Provide fixings for adjoining elements. If required, provide temporary support to the adjoining elements during concreting, to prevent movement.

Protection

General: Grease threads. Protect embedded items against damage.

Compatibility: Provide inserts, fixings and embedded items that are compatible with each other, with the reinforcement and with the documented concrete mix and surface finish.

Corrosion protection: In external or exposed locations, galvanize anchor bolts and embedded fixings.

- All threaded products: To AS/NZS 1214.
- All non-threaded products: To AS/NZS 4680.

Structural integrity

Position: Fix cores and embedded items to prevent movement during concrete placement. In locating cores, fixings and embedded items, displace but do not cut reinforcement, and maintain documented cover to reinforcement.

Isolation: Isolate embedded items to prevent water tracking to concrete that provides minimum cover to reinforcement.

Tolerances

General: Maximum deviation from correct positions:

- Anchor bolt groups for structural steel: To AS/NZS 5131.
- Cores and embedded items generally: 10 mm.
- Other fixing bolts: 3 mm.

3.8 CONCRETE WORKING BASE

Finish

Membrane support: Wood float finish or equivalent.

Installation

General: Lay over the base or subgrade and screed to the required level.

Surface flatness tolerance

Maximum deviation: 6 mm from a 3 m straightedge.

3.9 PLACING AND COMPACTION

Preparation

Cleaning: Before placing concrete remove free water, dust, debris and stains from the form face and the formed space.

Placing

Horizontal transport:

- Use suitable conveyors, clean chutes, troughs, hoppers or pipes.
- Minimise jolting and vibration of concrete whilst transporting around site.
- Discharge vertically in a controlled manner into forms or further distribution equipment.

Methods: Avoid segregation and loss of concrete, and minimise plastic settlement. Maintain a nominally vertical and plastic concrete edge during placement.

Horizontal elements: Place concrete in layers not more than 300 mm thick. Compact the following layer into previous layer before previous layer has taken initial set.

Vertical elements: Limit the free fall of concrete to maximum of 2 m.

Fibre-reinforced concrete: For pumped concrete use a screen (100-150 mm mesh) on the pump hopper to catch fibre balls.

Compaction

Methods: Use immersion and screed vibrators accompanied by hand methods as appropriate to remove entrapped air and to fully compact the mix.

Vibrators: Do not allow vibrators to contact set concrete, reinforcement or items including pipes and conduits embedded in concrete. Do not use vibrators to move concrete along the formwork. Avoid causing segregation by over-vibration.

Placing records

Log book: Keep on site and make available for inspection a log book recording each placement of concrete, including the following:

- Date.
- Specified grade and source of concrete.
- Slump measurements.
- The portion of work.
- Volume placed.

Rain

Protection: During placement and before setting, protect the surface from damage.

Time between adjacent placements

Minimum time delay: As documented.

Placing in cold weather

Cement: Do not use high alumina cement.

Temperature limits: Maintain the following:

- Freshly mixed concrete: $\geq 5^{\circ}\text{C}$.
- Forms and reinforcement before and during placing: $\geq 5^{\circ}\text{C}$.
- Water: Maximum 60°C when placed in the mixer.

High early strength cement: If deteriorating weather conditions are predicted, use high early strength cement.

Temperature control: Heat the concrete materials, other than cement, to the minimum temperature necessary so that the temperature of the placed concrete is $\geq 5^{\circ}\text{C}$.

Admixtures: Do not use calcium chloride, salts, chemicals or other material in the mix to lower the freezing point of the concrete.

Frozen materials: Do not allow frozen materials or materials containing ice to enter the mixer, and keep free of frost and ice any forms, materials, and equipment coming in contact with the concrete.

Freezing: Prevent concrete from freezing.

Placing in hot weather

Handling: Prevent premature stiffening of the fresh mix and reduce water absorption and evaporation losses.

Temperature limits: Maintain the following:

- Normal concrete in footings, beams, columns, walls and slabs: $\leq 35^{\circ}\text{C}$.
- For concrete strength grade less than 40 MPa with section thickness $\geq 1\text{ m}$ in all dimensions: $\leq 27^{\circ}\text{C}$.
- For concrete strength grade 40 MPa or greater with section thickness $\geq 600\text{ mm}$ in all dimensions: $\leq 27^{\circ}\text{C}$.
- Forms and reinforcement before and during placing: $\leq 35^{\circ}\text{C}$.

Evaporation control barriers: Erect barriers to protect freshly placed concrete from drying winds.

Evaporation rate limit: $\leq 0.50\text{ kg/m}^2/\text{h}$.

Temperature control: Select one or more of the following methods of maintaining the temperature of the placed concrete at 35°C or less:

- Cool the concrete using liquid nitrogen injection before placing.
- Cover horizontal transport containers.
- Spray the coarse aggregate using cold water before mixing.
- Use chilled mixing water.

Placing under water

General: Do not place under water unless conditions prevent dewatering.

Minimum cement content for the mix: Increase by 25%.

3.10 JOINTS

Construction joints

Location: Do not relocate or eliminate construction joints, or form undocumented construction joints. If emergency construction joints are made necessary by unforeseen interruptions to the concrete pour, submit a report on the action taken.

Finish: Butt join the surfaces of adjoining pours. In visually important surfaces make the joint straight and true, and free from blemishes impermissible for its surface finish class.

Joint preparation: Scabble hardened concrete joint surface to a minimum 3 mm amplitude. Remove loose or soft material, foreign matter and laitance. Dampen the surface just before placing the fresh concrete and coat with a neat cement slurry.

Expansion and isolation joints

Joint filling: Fill with jointing materials as documented. Finish visible jointing material neatly, flush with adjoining surfaces.

Expansion joint dowels: Install dowels along the joint, as documented.

Preparation: Before filling, dry and clean the joint surfaces, and prime.

Watertightness: Apply the jointing material so that joints subject to ingress of water are made watertight.

Jointing materials: Provide jointing materials compatible with each other, and non-staining to concrete in visible locations.

Bond breaking: Provide back-up materials for sealants, including backing rods, which do not adhere to the sealant.

Foamed materials (in compressible fillers): Closed-cell or impregnated, not water absorbing.

Slip joints

Requirement: If concrete slabs are supported on masonry, provide proprietary slip joints.

Slab-on-grade control joints

General: Provide control joints, as documented.

Tooled and sawn joints: Form joints within the concrete surface with either a grooving tool or a mechanical circular saw.

Timing: Form joints as early as possible after placement of concrete. Make sure the concrete has hardened sufficiently to prevent dislodging aggregate.

Joint width: 3 to 5 mm wide.

Joint depth: A minimum of (0.25 - 0.33) x depth of the concrete.

3.11 SURFACE MODIFIERS

General

Application: Apply to clean surfaces, to the manufacturer's recommendations.

3.12 FORMED SURFACES

General

Surface finish: To AS 3610.1 Table 3.3.3.1 and as documented.

Damage: Do not damage concrete works through premature removal of formwork.

Curing

Requirement: 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, within an hour of exposure.

Evaluation of formed surfaces

General: If evaluation of formed surface is required, complete the evaluation before surface treatment.

Finishing methods

Requirement: If soffits of horizontal concrete elements or faces of vertical concrete elements are to have a finish other than an off-form finish, provide finishes as documented.

Form removal: If vertical face formwork needs to be removed for finishing methods, while the concrete is green, make sure the concrete has sufficiently set to prevent slump.

Blasted finishes:

- Abrasive: Blast the cured surface using hard, sharp graded abrasive particles until the coarse aggregate is in uniform relief.
- Light abrasive: Blast the cured surface using hard, sharp graded abrasive particles to provide a uniform matt finish without exposing the coarse aggregate.

Bush hammered finish: Remove the minimum matrix using bush hammering to expose the coarse aggregate, recessing the matrix no deeper than half the aggregate size, to give a uniform texture.

Exposed aggregate finish: While the concrete is green, wet the surface and scrub with stiff fibre or wire brushes, flushing continuously with clean water, until the aggregate is uniformly exposed. Do not use acid etching. Rinse the surface with water.

Floated finishes:

- Sand floated finish: While the concrete is green, wet the surface and rub using a wood float. Rub fine sand into the surface until a uniform colour and texture are produced.
- Grout floated finish: While the concrete is green, dampen the surface and spread a slurry, using hessian pads or sponge rubber floats. Remove surplus slurry and work until a uniform colour and texture are produced.

Smooth rubbed finish: While the concrete is green, wet the surface and rub using a carborundum or similar abrasive brick until a uniform colour and texture are produced.

3.13 UNFORMED SURFACES

General

Surface finish: As documented.

Finished levels: Strike off, screed and level slab surfaces to finished levels and to the flatness tolerance class documented.

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:

- Use power or hand steel trowels to produce a smooth surface relatively free from defects.
- When the surface has hardened sufficiently, re-trowel to produce the final consolidated finish free of trowel marks and uniform in texture and appearance.

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

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

Broom finish: After machine floating and steel trowelling use a broom or hessian belt drawn across the surface to produce a coarse even-textured transverse-scored surface.

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

Sponge finish: After machine floating and steel trowelling, use a damp sponge to wipe the surface to produce an even textured sand finish.

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

Finishing methods – supplementary finish

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

Coloured applied finish: After machine floating, apply a proprietary liquid or dry shake material to the manufacturer's recommendations and trowel to achieve the required appearance.

Stamped and coloured pattern finish: Provide a proprietary finishing system.

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

3.14 CURING

General

Requirements: Taking into account the average ambient temperature at site over the relevant period affecting the curing, adopt procedures to make sure of the following:

- Curing: Cure continuously from completion of finishing, when the concrete has set sufficiently not to be damaged by the curing process, until the minimum total cumulative number of days or fractions of days, during which the air temperature in contact with the concrete is above 10°C, conforms to AS 3600 clause 17.1.5 and the following, unless accelerated curing is adopted:
 - . Fully enclosed internal surfaces/Early age strength concrete: 3 days.
 - . Other concrete surfaces: 7 days.
- End of curing period: Prevent rapid drying out at the end of the curing period.
- Protection: Maintain at a reasonably constant temperature with minimum moisture loss, during the curing period.

Curing compounds

Liquid membrane-forming compounds: Provide a uniform continuous flexible coating without visible breaks or pinholes, which remains unbroken for at least the required curing period after application.

Substrates: Do not use wax-based or chlorinated rubber-based curing compounds on surfaces forming substrates to applied finishes, concrete toppings and cement-based render.

Self-levelling toppings: If used also as curing compounds, conform to AS 3799.

Visually important surfaces: Apply curing compounds to produce uniform colour on adjacent surfaces.

Water curing

Method: Select a method of ponding or continuously sprinkling to prevent damage to the concrete surface during the required curing period.

Wet hessian curing

Method: Place wet hessian sheets/bags over concrete surface. Keep hessian wet during the required curing period by regularly sprinkling with water. Protect from wind and traffic.

Impermeable sheet curing

Method: Place impermeable sheets, to ASTM C171, over concrete surface. Anchor down and tape joints in material to retain concrete moisture. Keep the concrete surface covered for the required curing period.

Cold weather curing

Temperature: Maintain concrete surface temperatures above 5°C for the duration of the curing period.

Hot weather curing

Requirement: If the concrete temperature exceeds 25°C, or the ambient shade temperature exceeds 30°C, protect from drying winds and sun by using an evaporative retarder until curing is commenced.

3.15 COMPLETION**Early loading**

Prohibition: Submit proposals for the application of any superimposed load (including backfilling), to any part of what will become a load bearing structure, within 21 days of placing concrete. Do not apply superimposed loads unless it can be demonstrated that 95% of the design strength of the concrete has been achieved.

Formwork removal

Extent: Remove formwork, other than permanent forms and trapped forms, including formwork in concealed locations.

Timing: Do not disturb formwork until concrete has reached sufficient hardness to withstand formwork movements and removal without damage.

Stripping:

- General: To AS 3600 where it is more stringent than AS 3610.1.
- Vertical formwork: To AS 3610.1 Appendix C Table C2.
- Multi-storey work: Remove formwork without disturbing props supporting succeeding floors.
- Post-tensioned concrete: Remove formwork supporting post-tensioned concrete members to AS 3600 clause 17.6.2.7.

Removable bolts: Remove tie bolts without damaging the concrete.

Bolt hole filling: Provide material with durability and colour matching the concrete.

Recessed filling: Fill or plug the hole to 6 mm below the finished surface.

Curing: 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, within an hour of exposure.

Protection

General: Protect the concrete from damage due to construction loads, physical and thermal shocks, and excessive vibrations, particularly during the curing period.

Surface protection: Protect finished concrete surfaces and applied finishes from damage.

0315 CONCRETE FINISHES

1 GENERAL

1.1 RESPONSIBILITIES

General

Requirement: Provide finishes to formed and unformed concrete surfaces, as documented.

Performance

Requirement: Compatible with documented applied finishes.

1.2 CROSS REFERENCES

General

Requirement: Conform to the following:

- *0171 General requirements.*

1.3 STANDARDS

General

Formed surfaces: To AS 3610.1.

Slip resistance

Classification: To AS 4586.

1.4 INTERPRETATION

Definitions

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

- Green concrete: Concrete which has recently set but has not achieved any design strength.

1.5 TOLERANCES

Formed surfaces

Form face deflections: To AS 3610.1 Table 3.3.4.1.

Straight elements: To AS 3610.1 Table 3.3.5.1.

Unformed surfaces

Flatness: To the **Flatness tolerance class table**, using a straightedge placed anywhere on the surface in any direction, for the documented class of finish.

Flatness tolerance class table

Class	Measurement	Maximum deviation (mm)
A	2 m straightedge	4
B	3 m straightedge	6
C	600 mm straightedge	6

1.6 SUBMISSIONS

Execution details

Surface repairs: If surface repairs are required, submit proposed methods.

Prototypes

Test panels: Provide test panels to AS 3610.1 clause 3.7 and as documented.

Manufacture: Cast the panels using the form, concrete, compaction equipment, form release agents, curing and formwork removal methods which are to be used in the final work.

Storage: Once accepted, maintain the panels on site undamaged and protected from the weather, as reference prototypes for evaluation of completed work.

Surface treatment: Do not proceed with the related work until the acceptable range of surface treatments has been determined.

Tests

Site tests: Submit test results, as follows:

- Slip resistance test of completed installations.

1.7 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 the off-form finishes.
- Evaluation of surface finish.

2 PRODUCTS

2.1 MATERIALS

Surface modifiers

Hardeners, sealants and protectors: If documented, proprietary products conforming to the manufacturer's recommendations.

Slip resistance treatment: If documented, proprietary products conforming to the manufacturer's recommendations.

3 EXECUTION

3.1 SURFACE MODIFIERS

General

Application: Apply to clean surfaces, to the manufacturer's recommendations.

3.2 FORMED SURFACES

General

Surface finish: To AS 3610.1 Table 3.3.3.1 and as documented.

Damage: Do not damage concrete works through premature removal of formwork.

Curing

Requirement: 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, within an hour of exposure.

Evaluation of formed surfaces

General: If evaluation of formed surface is required, complete the evaluation before surface treatment.

Finishing methods

Requirement: If soffits of horizontal concrete elements or faces of vertical concrete elements are to have a finish other than an off-form finish, provide finishes as documented.

Form removal: If vertical face formwork needs to be removed for finishing methods, while the concrete is green, make sure the concrete has sufficiently set to prevent slump.

Blasted finishes:

- Abrasive: Blast the cured surface using hard, sharp graded abrasive particles until the coarse aggregate is in uniform relief.
- Light abrasive: Blast the cured surface using hard, sharp graded abrasive particles to provide a uniform matt finish without exposing the coarse aggregate.

Bush hammered finish: Remove the minimum matrix using bush hammering to expose the coarse aggregate, recessing the matrix no deeper than half the aggregate size, to give a uniform texture.

Exposed aggregate finish: While the concrete is green, wet the surface and scrub with stiff fibre or wire brushes, flushing continuously with clean water, until the aggregate is uniformly exposed. Do not use acid etching. Rinse the surface with water.

Floated finishes:

- Sand floated finish: While the concrete is green, wet the surface and rub using a wood float. Rub fine sand into the surface until a uniform colour and texture are produced.

- Grout floated finish: While the concrete is green, dampen the surface and spread a slurry, using hessian pads or sponge rubber floats. Remove surplus slurry and work until a uniform colour and texture are produced.

Smooth rubbed finish: While the concrete is green, wet the surface and rub using a carborundum or similar abrasive brick until a uniform colour and texture are produced.

3.3 UNFORMED SURFACES

General

Surface finish: As documented.

Finished levels: Strike off, screed and level slab surfaces to finished levels and to the flatness tolerance class documented.

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:

- Use power or hand steel trowels to produce a smooth surface relatively free from defects.
- When the surface has hardened sufficiently, re-trowel to produce the final consolidated finish free of trowel marks and uniform in texture and appearance.

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

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

Broom finish: After machine floating and steel trowelling use a broom or hessian belt drawn across the surface to produce a coarse even-textured transverse-scored surface.

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

Sponge finish: After machine floating and steel trowelling, use a damp sponge to wipe the surface to produce an even textured sand finish.

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

Finishing methods – supplementary finish

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

Coloured applied finish: After machine floating, apply a proprietary liquid or dry shake material to the manufacturer's recommendations and trowel to achieve the required appearance.

Stamped and coloured pattern finish: Provide a proprietary finishing system.

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

3.4 TESTING

Site tests

Slip resistance of completed installation: To AS 4663.

0318 SHOTCRETE

1 GENERAL

1.1 RESPONSIBILITIES

General

Requirement: Provide shotcrete, as documented.

Performance

Requirement:

- Conforming to the design details and performance criteria.
- Satisfying quality and inspection requirements.
- Readily sprayable into corners and around reinforcement and built-in items without segregation, vertical slumping or sag.
- Compatible with documented applied finishes.

1.2 DESIGN

General

Structural design: To AS 3600.

Concrete structures retaining liquids: To AS 3735.

Requirements

General: To DESIGN in 0171 General requirements.

1.3 CROSS REFERENCES

General

Requirement: Conform to the following:

- 0171 General requirements.

1.4 STANDARDS

General

Specification and supply of concrete: To AS 1379.

Reinforced concrete construction: To AS 3600.

Concrete structures for retaining liquids: To AS 3735.

Design, installation and testing of post-installed and cast-in fastenings: To AS 5216.

1.5 INTERPRETATION

Definitions

General: For the purposes of this worksection, the definitions given in CIA Z5 and the following apply:

- Ambient temperature: The air temperature at the time of mixing and placing of concrete.
- Average ambient temperature: Average value of the daily maximum and minimum ambient temperatures over the defined period at a site.
- Batch: A quantity of concrete containing a fixed amount of ingredients and produced in a discrete operation.
- 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.
- Shotcrete: Cement concrete, containing aggregate up to 13 mm in size, applied from a spray nozzle by means of compressed air.
- Specimen: A portion of a sample which is submitted for testing.
- Weather – cold: Ambient shade temperature less than 10°C.
- Weather – hot: Ambient shade temperature greater than 30°C.

1.6 TOLERANCES

Reinforcement

Fabrication: To AS 3600 clause 17.2.

Reinforcement position: To AS 3600 clause 17.5.3.

Finishes

Flatness: To the **Flatness tolerance class table**, using a straightedge placed anywhere on the surface in any direction, for the documented class of finish.

Flatness tolerance class table

Class	Measurement	Maximum deviation (mm)
A	2 m straightedge	4
B	3 m straightedge	6
C	600 mm straightedge	6

1.7 SUBMISSIONS

Execution details

General: Submit proposals for placing, finishing and curing shotcrete including the following:

- Changes to concrete mix.
- Changes to documented joint locations
- Curing and protection methods.
- Cutting or displacing reinforcement, or cutting or coring hardened concrete.
- Finishing methods and shotcreting equipment.
- Temperature control methods to suit hot or cold atmospheric conditions during concrete placement.

Control of water: Submit proposals for the temporary and permanent control of ground water flows and seepage, if encountered.

Reinforcement: Submit the following:

- General: Details of any proposed changes to documented reinforcement.
- Damaged galvanizing: Details of proposed repair to AS/NZS 4680 Section 8.
- Provision for concrete placement: Details of spacing or cover to reinforcement that does not conform to AS 3600.
- Welding: Details of any proposed welding of reinforcement to AS/NZS 1554.3.

Safety plan: Submit a full safety plan to include the following minimum requirements:

- Equipment prestart checks and maintenance.
- Housekeeping.
- Job safety and environmental analysis.
- Moving equipment.
- Product SDS requirements.
- Risk assessments.
- Safe work method statements.
- Toolbox talks.
- Unsupported groundwork procedures.
- Workplace inspections.

Surface repairs: If surface repairs are required, submit proposed methods.

Products and materials

General: Submit details of proposed sources of materials.

Alternative supply: Submit an alternate source in the event of breakdown of supply.

Mix: Submit proposed concrete mix for shotcrete.

Pre-mixed supply delivery dockets: For each batch, submit a docket listing the information required by AS 1379, and the following:

- Climate conditions during spraying.

- Name of concrete delivery supervisor.
- The concrete element or part of the works for which the concrete was ordered, and where it was placed.
- The total amount of water added at the plant and the maximum amount permitted to be added at the site.

Curing compounds: Submit details of any proposed curing compounds, including the following:

- Dosage rates.
- Certified test results by an Accredited Testing Laboratory for water retention to AS 3799 Appendix B for liquid membrane-forming compounds.
- Evidence of compatibility with shotcrete, and with applied finishes including toppings and render, if any, including methods of obtaining the required adhesion.

Admixtures: Submit details of any proposed admixtures, including the following:

- Brand name.
- Place of manufacture.
- Basic chemical composition.
- Accelerating admixture initial set time.
- Accelerating admixture final set time.

Fibre reinforcement: Submit details of any fibre reinforcement proposed for use.

Subcontractors

Requirement: Submit the name, contact details and experience of proposed sprayers.

Tests

Requirement: Submit test results, as follows:

- Concrete compressive strength test results to AS 1012.9.
- Liquid tightness tests for liquid retaining structures.
- Drying shrinkage test results.

1.8 INSPECTION

Notice

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

- Excavated or exposed faces before covering.
- Membrane or drainage strips installed against excavated or exposed faces.
- Reinforcement, fixings and embedded items fixed in place before placing shotcrete.
- Concealed surfaces or elements before covering.
- Commencement of shotcreting.
- Evaluation of surface finish.

2 PRODUCTS

2.1 CONCRETE

Aggregates

Standard: To AS 2758.1.

Storage: Store in silos or on a hardstand located away from surface and ground water runoff. Allow for free drainage of rainwater and prevent contamination and intermixing of aggregates.

Individual aggregates in mix: Consistent grading within allowable variation to AS 2758.1 clause 8.

Cement

Standard: To AS 3972.

Age: Less than 6 months old.

Storage: Store cement bags in a dry, under cover and above ground environment.

Supplementary cementitious materials:

- Fly ash to AS/NZS 3582.1.
- Slag: To AS 3582.2.

- Amorphous silica: To AS/NZS 3582.3.

Water

Standard: To AS 1379 clause 2.4.

Requirement: Clean, free from oil, acid, alkali, organic or vegetable matter and including not more than 500 mg/l of chloride ions.

Accelerating admixture

Standard: To AS 1478.1, used to manufacturer's recommendations.

Purpose: Use where required to develop quick set and high early strength to suit site requirements and finishing. Do not use calcium chloride based accelerators.

Other chemical admixtures

Standard: To AS 1478.1, used to manufacturer's recommendations and free from chlorides, or other substance detrimental to concrete or reinforcing steel.

2.2 SHOTCRETE MIX

Shotcrete wet-mix design table

Constituent materials	Mix design per m³
Cement (kg)	335
Fly ash (kg)	85
Coarse aggregate (kg)	610
Coarse sand (kg)	585
Fine sand (kg)	530
Water reducer (litres)	1.6
Superplasticiser (litres)	1.0
Air entraining agent (litres)	0.1
Water (litres)	200
Slump (mm)	60

2.3 REINFORCEMENT

Fibre reinforcement

Steel fibres: To AS 3600 clause 16.7.1.

Synthetic fibres: To EN 14889-2.

Steel reinforcement

Standard: To AS/NZS 4671.

Fabrication tolerances: To AS 3600 clause 17.2.2.

Surface condition: Free of loose mill scale, rust, oil, grease, mud or other material which would reduce the bond between the reinforcement and concrete.

Storage: Store reinforcement above the surface of the ground and protect from damage and from deterioration by exposure.

Protective coating

Standard: To AS 3600 clause 17.2.1.2.

Requirement: For concrete elements containing protective coated reinforcement, provide the same coating type to all that element's reinforcement and embedded ferrous metal items, including tie wires, stools, spacers, stirrups, plates and ferrules, and protect other embedded metals with a suitable coating.

Epoxy coating: High build, high solids, chemically resistant coating to AS/NZS 3750.14.

- Thickness: 200 µm minimum.

Galvanizing: To AS/NZS 4680, as follows:

- Sequence: If fabricating after galvanizing, repair damaged galvanizing and coat cut ends.
- Zinc-coating (minimum): 600 g/m².

Tie wire

General: Annealed steel 1.25 mm diameter (minimum).

External and corrosive applications: Galvanized.

Supports

Standard: To AS/NZS 2425.

2.4 MISCELLANEOUS

Curing compounds

Liquid membrane-forming compounds: To AS 3799.

3 EXECUTION

3.1 REINFORCEMENT

Cover

Concrete cover generally: To AS 3600 clause 4.10.

Concrete cover for structures for retaining liquids: To AS 3735 clause 4.4.

Supports

Concrete, metal or plastic supports: Provide as follows:

- Able to withstand construction and traffic loads.
- With a protective coating if they are ferrous metal, located within the concrete cover zone, or are used with galvanized or zinc-coated reinforcement.

Spacing:

- Bars: \leq 60 diameters.
- Mesh: \leq 600 mm.

Projecting reinforcement

Protection: If starter or other bars extend beyond reinforcement mats or cages or from cast concrete, provide a plastic protective cap to each bar until it is cast into later work.

Bending

Restriction: Use only bars with bends as documented. If required to bend or straighten bars on site, do not use heat and use only methods that will not damage the steel and its structural properties, to AS 3600 clause 17.2.3.2.

Tying

Requirement: Secure the reinforcement against displacement at intersections with either wire ties, or clips. Bend the ends of wire ties to prevent the ties projecting into the concrete cover.

Fibre-reinforced concrete

Steel fibres: To AS 3600 Section 16.

Synthetic fibres: To EN 14889-2.

3.2 TESTING

General

Test authority: Concrete supplier or Accredited Testing Laboratory.

Reports and records of test results: To the relevant parts of the AS 1012 series. Keep results on site.

Assessment process of test results

Standard: To AS 1379.

Method of assessment: Project assessment.

Sampling

Method of sampling: To AS 1012.1.

Sampling locations: To AS 1012.1 and the following:

- Slump and spread tests: On site, at the point of discharge from the agitator.
- Compressive strength tests: Spread the site sampling evenly throughout the spray.

Frequency of sampling: To AS 1379 Sections 5 and 6, and the following:

- Slump and spread tests: Take at least one sample from each batch.
- Compressive strength tests: To the **Project assessment strength grade sampling table**.

Project assessment strength grade sampling table

Number of batches for each type and grade of concrete per day	Minimum number of samples per batch: Columns and load bearing wall elements	Minimum number of samples per day: Other elements
1	1	1
2-5	1	2
6-10	1	3
11-20	1	4
each additional 10	1	1 additional

Making and curing of specimens

General: To AS 1012.8.1 and AS 1012.8.2.

Specimens for compressive strength tests: Make and cure at least two specimens from the sample of each grade.

Specimen size: Nominally 200 x 100 mm diameter.

Test methods

General: To the relevant parts of the AS 1012 series.

Acceptance criteria:

- Average strength of all samples must equal or exceed the required value.
- Strength of any one sample must be at least 0.85 of the required value.

Slump tests: Assess slump for every batch. Perform slump test on each strength sample to AS 1012.3.1.

Spread tests: Assess the spread for every batch if the slump is greater than 200 mm for high flowable mixes. Preform spread test on each strength sample to AS 1012.3.5.

Liquid retaining structures

Testing for liquid tightness: To AS 3735.

3.3 CORES, FIXINGS AND EMBEDDED ITEMS

General

Requirement: Install fasteners to manufacturer's recommendations and the assumptions of AS 5216 Appendix G.

Protection

General: Grease any threads. Protect embedded items against damage.

Compatibility: Provide inserts, fixings and embedded items that are compatible with each other, with the reinforcement, with the documented concrete mix and surface finish.

Corrosion: In external or exposed locations, galvanize anchor bolts and embedded fixings.

Structural integrity

Position: Fix cores and embedded items to prevent movement during shotcreting. In locating cores, fixings and embedded items, displace but do not cut reinforcement, and maintain documented cover to reinforcement.

Tolerances

General: Maximum deviation from correct positions:

- Anchor bolt groups for structural steel: To AS/NZS 5131.
- Cores and embedded items generally: 10 mm.
- Other fixing bolts: 3 mm.

3.4 SHOTCRETING

Preparation

Requirement: Clean loose material and other foreign matter from surfaces to receive shotcrete and compact earth surfaces.

Equipment: Use clean delivery hoses and provide back-up equipment to allow continuous application of shotcrete to all surfaces in the event of equipment breakdown.

Mixing

Timing: Use mixed materials within 60 minutes of the addition of cement to the mix.

Admixture: Add any accelerating admixture at the nozzle of delivery hose immediately before placing shotcrete.

Spraying

Technique: Minimise rebound by directing the nozzle perpendicular to the surface to be covered at all times, unless varying angle to encapsulate reinforcement. Apply shotcrete in a circular motion to build up the required thickness in layers, starting at the lower sections and moving upwards.

Sprayer: Use a sprayer with previous experience in the application of coarse aggregate shotcrete, or they must work under the immediate supervision of a sprayer or instructor with such experience.

Joints: Provide construction or control joints as required, or as documented, to the details shown in CIA Z5 clause 12.5.4.

Adverse weather

Rain: Do not place shotcrete during rain, unless adequate shelter can be provided. Protect all exposed faces of fresh shotcrete from rain.

Strong winds: Provide for screening of nozzle, jet and surface if shotcreting in windy conditions. Protect all exposed faces of fresh shotcrete with screening.

Control of water

General: If water flows and seepage occur, submit proposals for their control, to avoid detrimental effects.

Acceptance

General: Provide dense uniform shotcrete without discernible weakness of bond (between layers).

Consistency: Provide a uniform consistency in order to maximise binding, bonding, cohesion and density, minimise rebound and prevent sagging of the applied shotcrete.

Soundness: Remove all laitance, loose material and rebound. Sound the surface with a hammer to locate any voids, aggregate pockets or unbonded areas.

Defective work: If dummy areas are found or if probing, drilling or other observations indicate non-conformance with thickness or strength requirements, core to determine and replace such defective areas.

Removal: Remove defective shotcrete from site.

Shotcreting in cold weather

Cement: Do not use high alumina cement.

Temperature limits: Maintain the following:

- Freshly mixed concrete: $\geq 5^{\circ}\text{C}$.
- Substrates and reinforcement before and during placing: $\geq 5^{\circ}\text{C}$.
- Water: Max 60°C when placed in mixer.

Temperature control: Heat the concrete materials, other than cement, to the minimum temperature necessary so that the temperature of the shotcrete is $\geq 5^{\circ}\text{C}$.

Admixtures: Do not use calcium chloride, salts, chemicals or other material in the mix to lower the freezing point of the concrete.

Frozen materials: Do not allow frozen materials or materials containing ice to enter the mixer, and keep free of frost and ice any materials, substrates and equipment coming in contact with the concrete.

Freezing: Prevent shotcrete from freezing.

Shotcreting in hot weather

Handling: Prevent premature stiffening of the fresh mix and reduce water absorption and evaporation losses.

Temperature limits: Maintain temperature at 35°C or less.

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

Evaporation rate limit: $\leq 0.50 \text{ kg/m}^2/\text{h}$.

Evaporation control barriers: Erect barriers to protect fresh shotcrete from drying winds.

Temperature control: Select one or more of the following methods of maintaining the temperature of the shotcrete at 35°C or less:

- Cool the concrete using liquid nitrogen injection before placing.
- Spray the coarse aggregate using cold water before mixing.
- Use chilled mixing water.

3.5 FINISHING

General

Surface finish: As documented.

Finished surface: Unless an off-nozzle finish has been documented, strike off, screed and level surfaces to the documented position or level and the flatness tolerance class documented.

Finishing methods

Off-nozzle finish: No additional finishing required to the natural textured surface left by spraying.

Screed finish: Trim, slice or screed surface to a true line and grade to produce a surface which may exhibit defects such as drag marks from aggregate.

Steel trowel finish: After screeding finish, as follows:

- Use power or hand steel trowels to produce a smooth surface relatively free from defects.
- When the surface has hardened sufficiently, re-trowel to produce the final consolidated finish free of trowel marks and uniform in texture and appearance.

Pattern finish: After screeding, produce the final consolidated pattern finish free of float marks and uniform in texture and appearance.

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

Wood float finish: After screeding, 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 screeding and steel trowelling use a broom or hessian belt drawn across the surface to produce a coarse even-textured transverse-scored surface.

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

Sponge finish: After screeding and steel trowelling, use a damp sponge to wipe the surface to produce an even textured sand finish.

3.6 CURING

General

Requirements: Taking into account the average ambient temperature at site over the relevant period affecting the curing, adopt procedures to make sure of the following:

- Curing: Cure continuously from completion of finishing, when the concrete has set sufficiently not to be damaged by the curing process, until the minimum total cumulative number of days or fractions of days, during which the air temperature in contact with the shotcrete is above 10°C, is at least 7 days and conforms to AS 3600 clause 17.1.5.
- End of curing period: Prevent rapid drying out at the end of the curing period.
- Protection: Maintain at a reasonably constant temperature with minimum moisture loss, during the curing period.

Curing compounds

Liquid membrane-forming compounds: Provide a uniform continuous flexible coating without visible breaks or pinholes, which remains unbroken for at least 7 days after application.

Substrates: Do not use wax-based or chlorinated rubber-based curing compounds on surfaces forming substrates to subsequent shotcrete layers, applied finishes, concrete toppings and cement-based render.

Cold weather curing

Temperature: Maintain shotcrete surface temperature above 5°C for the duration of the curing period.

Hot weather curing

Requirement: If the concrete temperature exceeds 25°C, or the ambient shade temperature exceeds 30°C, protect from drying winds and sun by using an evaporative retarder until curing is commenced.

Water curing

Method: Select a method of ponding or continuously sprinkling to prevent damage to the shotcrete surface during the required curing period.

0331B BRICK AND BLOCK CONSTRUCTION

1 GENERAL

1.1 RESPONSIBILITIES**General**

Requirement: Provide brick and block construction, as documented.

1.2 CROSS REFERENCES**General**

Requirement: Conform to the following:

- *0171 General requirements.*

1.3 STANDARDS**General**

Materials and construction: To AS 3700.

1.4 TOLERANCES**General**

Requirement: To AS 3700 Table 12.1.

1.5 INSPECTION**Notice**

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

- Set-out.
- Unit type, colour and texture.
- Bottoms of cavities, after cleaning out.
- Bottoms of core holes, before grouting.
- Reinforcement type and diameter.
- Positioning of reinforcing before grouting.
- Control joints, ready for insertion of joint filler.
- Damp-proof courses, in position.
- Flashings, in position.
- Lintels, in position.
- Structural steelwork, including bolts and shelf angles, in position.

2 PRODUCTS

2.1 FIRE PERFORMANCE**Fire-resistance of building elements**

Fire-resistance level: Tested to AS 1530.4.

2.2 DURABILITY

Exposure locations: To AS 3700 clause 5.4.

2.3 MATERIALS**Masonry units**

Selections: As documented.

Standard: To AS/NZS 4455.1 and AS/NZS 4455.3.

Salt attack resistance grade: To AS 3700 Table 5.1.

Minimum age of clay bricks: 7 days.

Mortar materials

Mortar class: To AS 3700 Table 5.1.

Cement: To AS 3972.

White cement: With not more than 1% iron salts content.

Lime: To AS 1672.1.

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

Water: Clean and free from any deleterious matter.

Admixtures: To AS 3700 clause 11.4.2.4.

Pigment: To EN 12878, and as follows:

- Integral pigment mix proportion: Not more than 10% by weight of cement.

Masonry cement mortar mix proportions table (cement:lime:sand), by volume

Mortar class to AS 3700	Clay	Concrete	Calcium silicate	Water thickener
M3	1:0:4	1:0:4	N/A	Yes
M4	1:0:3	N/A	N/A	Yes

Cement (GP/GB) mortar mix proportions table (cement:lime:sand), by volume

Mortar class to AS 3700	Clay	Concrete	Calcium silicate	Water thickener
M2	1:2:9	N/A	N/A	No
M3	1:1:6	1:1:6	N/A	Optional
M3	1:0:5	1:0:5	1:0:5	Yes
M4	1:0.5:4.5	1:0.5:4.5	N/A	Optional
M4	1:0:4	1:0:4	1:0:4	Yes
M4	1:0-0.25:3	1:0-0.25:3	N/A	Optional

Grout

Standard: To AS 3700 clause 11.7.

Minimum characteristic compressive strength: 12 MPa.

2.4 BUILT-IN COMPONENTS**General**

Durability class of built-in components: To AS 3700 Table 5.1.

Steel lintels

Angles and flats: To AS/NZS 3679.1.

Cold formed proprietary lintels: Designed to AS/NZS 4600.

Corrosion protection: To AS 2699.3.

Galvanizing: Do not cut after galvanizing.

Reinforcement

Standard: To AS/NZS 4671.

Corrosion protection: To AS 3700 clause 5.9.

Minimum cover: To AS 3700 Table 5.1.

Wall ties

Standard: To AS 2699.1.

Type: A.

Corrosion protection: To AS 2699.1.

Connectors and accessories

Standard: To AS 2699.2.

Corrosion protection: To AS 2699.2.

Flashings and damp-proof courses

Standard: To AS/NZS 2904.

Slip joints

Standard: To AS 3700 clause 4.14.

Air vents

Blockwork: Select from the following:

- Concrete framed: Bronze wire mesh in concrete frame, 390 x 190 mm.
- Vent blocks: Purpose-made vent blocks.

Brickwork: Select from the following:

- Concrete framed: Bronze wire mesh in concrete frame, 470 x 160 mm.
- Cut brick: Two cut bricks laid vertically and evenly spaced in a 230 mm wide x two course high opening, backed with bronze wire mesh built in.
- Terracotta: Perforated, 230 x 160 mm.

3 EXECUTION

3.1 GENERAL**Mortar mixing**

General: Measure volumes accurately to the documented proportions. Machine mix for at least six minutes.

Protection

Masonry materials and components: Protect from ground moisture and contamination.

During construction: Cover the top surface of masonry to prevent the entry of rainwater and contaminants.

Bond

Type: Stretcher bond.

AAC units: Running 100 mm stagger bond.

Building in

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

Steel door frames: Fill the backs of jambs and heads solid with mortar as the work proceeds.

Clearance for timber frame shrinkage

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

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

Monolithic structural action

Construction at different rates or times: If two or more adjoining sections of masonry, including intersecting walls, are constructed at different rates or times, rake back or tie the intersections between those sections to obtain monolithic structural action in the completed work.

Header units: Except in stretcher bond facework, provide masonry header units, to AS 3700 clause 4.11.2.

- Spacing: 600 mm maximum.
- Location: Provide header units in the following locations:
 - . At engaged piers.
 - . At engagement of diaphragms with the leaves in diaphragm walls.
 - . At intersections of flanges with shear walls.
 - . At intersections with supporting walls and buttresses.
 - . Between leaves in solid masonry construction.

Joining to existing

General: Provide a control joint where joining to existing structures. Do not tooth new masonry into existing work unless approved by a professional engineer.

Mortar joints

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

Solid and cored units: Lay on a full bed of mortar. Fill perpends solid. Cut mortar flush.

Face-shell bedded hollow units: Fill perpends solid. Cut mortar flush.

Joint thickness: 10 mm.

Finish: Conform to the following:

- Externally: Tool to give a dense water-shedding finish.
- Internally: If wall is to be plastered, do not rake more than 10 mm to give a key.

Rate of construction

General: Regulate the rate of construction to eliminate joint deformation, slumping or instability.

Rods

Set-out: Construct masonry to the following rods:

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

Temporary support

General: If the final stability of the masonry is dependent on construction of (structural) elements after the masonry is completed, provide proposals for temporary support or bracing.

3.2 FACEWORK

Cleaning

General: Clean progressively as the work proceeds to remove mortar smears, stains and discolouration. Do not erode joints if using pressure spraying.

Acid solution: Do not use.

Colour mixing

Distribution: In facework, distribute the colour range of units evenly to prevent colour concentrations and banding.

Below ground

Facework: Commence facework at least one full course for blockwork, or two full courses for brickwork, below adjacent finished surface level.

Double face walls

Selection: Select face units for uniform width and double-face qualities in single-leaf masonry with facework both sides.

Preferred face: Before starting, obtain approval of the preferred wall face, and favour that face should a compromise be unavoidable.

Perpends

General: If other than vertically aligned perpends in alternate courses are proposed, provide details.

Sills and thresholds

General: Solidly bed sills and thresholds and lay them with the top surfaces draining away from the building.

Minimum size of cut unit: Three quarters full width.

3.3 SUBFLOOR WORK

Access openings

General: In internal walls, provide door-width openings beneath doorways to give access to underfloor areas.

Air vent locations

Minimum subfloor openings and ground clearance: To BCA F1.12.

Cavity walls: Provide matching vents in the internal leaves located as near as practicable to the vents in the external leaves.

Location: Below damp-proof course to internal and external walls.

Underpinning

Requirement: Install underpinning, without causing damage to the building.

Grouting: Pack dry mix M4 mortar between underpinning and existing structure at the completion of each panel of underpinning.

3.4 CAVITY WORK

Cavity clearance

General: Keep cavities clear at all times.

Cavity fill

General: Fill the cavity with mortar to one course above the adjacent finished (ground) level. Fall the top surface towards the outer leaf.

Cavity width

General: Construct minimum cavity widths in conformance with the following:

- Masonry walls: 50 mm.
- Masonry veneer walls: 40 mm between the masonry leaf and the load bearing frame and 25 mm minimum between the masonry leaf and sheet bracing.

Openings

Jambs of external openings: Do not close the cavity.

Wall ties, connectors and accessories

Protection: Install to prevent water passing across the cavity.

3.5 DAMP-PROOF COURSES

Location

General: Locate damp-proof courses, as follows:

- Timber floors: In the first course below the level of the underside of ground floor timbers in internal walls and inner leaves of cavity walls.
- Cavity walls built off slabs on ground: In the bottom course of the outer leaf, continuous horizontally across the cavity and up the inner face bedded in mortar, turned 30 mm into the inner leaf one course above. Project 10 mm beyond the external slab edge and turn down at 45°.
- Internal walls built off slabs on ground: In the first course above floor level.
- Masonry veneer construction built off slabs on ground: In the bottom course of the outer leaf, continuous horizontally across the cavity. Fasten to the inner frame 75 mm above floor level.
- Walls adjoining infill floor slabs on membranes: In the course above the underside of the slab in internal walls and inner leaves of cavity walls. Project 40 mm and dress down over the membrane turned up against the wall.

Height: Not less than:

- 150 mm above the adjacent finished ground level.
- 75 mm above the finished paved or concrete area.
- 50 mm above the finished paved or concreted area and protected from the direct effect of the weather.

Installation

General: Lay in long lengths. Lap full width at angles and intersections and at least 150 mm at joints. Step as necessary, but not exceeding two courses per step for brickwork and one course per step for blockwork. Sandwich damp-proof courses between mortar.

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

Lap sealing: Seal with a bituminous adhesive and sealing compound.

3.6 FLASHINGS

Location

General: Locate flashings, as follows:

- Floors: Full width of outer leaf immediately above slab or shelf angle, continuous across cavity and up the inner face bedded in mortar, turned 30 mm into the inner leaf two courses above for brick

and one course above for block. If the slab supports the outer skin and is not rebated, bed the flashing in a suitable sealant.

- Under sills: 30 mm into the outer leaf bed joint one course below the sill, extending up across the cavity and under the sill in the inner leaf or the frame for masonry veneer. Extend at least 150 mm beyond the reveals or each side of the opening.
- Over lintels to openings in cavity walls: Full width of outer leaf immediately above the lintel, continuous across cavity, turned 30 mm into the inner leaf two courses above for brick and one course above for block or turned up against the inner frame and fasten to it. Extend at least 150 mm beyond the lintels.
- At abutments with structural frames or supports: Vertically flash in the cavity using 150 mm wide material, wedged and grouted into a groove in the frame opposite the cavity.
- At jambs: Vertically flash jamb, extending 75 mm into the cavity, interleaved with the sill and head flashing at each end. Fix to jambs.
- At roof abutments with cavity walls: Cavity flash immediately above the roof and over-flash the roof apron flashing.

Installation

General: Sandwich flashings between mortar except where on lintels or shelf angles. Bed flashings, sills and copings in one operation to maximise adhesion.

Laps: If required, lap full width at angles and intersections and at least 150 mm at joints. Step as necessary, but not exceeding two courses per step for brickwork and one course per step for blockwork.

Lap sealing: Seal with a bituminous adhesive and sealing compound.

Pointing: Point up joints around flashings, filling voids.

Weepholes

Requirement: Locate weepholes to external leaves of cavity walls in the course immediately above flashings, and cavity fill, and at the bottoms of unfilled cavities.

Form: Open perpends.

Maximum spacing: 1200 mm.

3.7 WALL TIES

Location

General: Space wall ties in conformance with AS 3700 clause 4.10 and at the following locations:

- Not more than 600 mm in each direction.
- Adjacent to vertical lateral supports.
- Adjacent to control joints.
- Around openings.

Installation

Embedment: At least 50 mm into mortar. Make sure that mortar cover is 15 mm minimum to the outside face of the mortar.

Fixing of masonry veneer ties:

- To timber frames: Screw fix to outer face of timber frames with fasteners to AS 3566.1.
- To concrete: Masonry anchors.
- To steel frames: Screw fix to outer face of steel studs with fasteners to AS 3566.1.

3.8 CONTROL JOINTS

General

Location and spacing: Provide control joints to AS 3700 clause 4.8.

Control joint filling

Filler material: Provide compatible sealant and bond breaking backing materials which are non-staining to masonry. Do not use bituminous materials with absorbent masonry units.

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

Installation: Clean the joints thoroughly and insert an easily compressible backing material before sealing.

Sealant depth: Fill the joints with a gun-applied flexible sealant for a depth of at least two-thirds the joint width.

Fire-resisting control joints

General: If a control joint is located in an element of construction required to have a fire-resistance level (FRL), construct the control joint with fire-stopping materials which maintain the FRL of the element.

Fire-stopping: To AS 4072.1.

3.9 BRICKWORK AND BLOCKWORK DUCT RISERS

General

Location: Build a one-piece corrosion-resistant metal tray to the masonry duct risers at roof level to shed water from the duct above roof flashing level.

Installation

General: Cut an opening for the riser. Turn tray edges up 25 mm around the opening 13 mm clear of the walls. Externally turn the tray up 100 mm under the stepped flashing and down 100 mm over the apron flashing. Lap and solder joints.

Weepholes

General: Provide two weepholes through the masonry duct riser walls on opposite sides immediately above the tray.

3.10 BRICKWORK BED JOINT REINFORCEMENT

Location

General: Locate as follows:

- In two bed joints below and above head and sill flashings to openings.
- In two bed joints below and above openings.
- In third bed joint above bottom of wall.
- In second bed joint below top of wall.

Maximum vertical intervals: 500 mm.

Installation

General: Lap 450 mm at splices. Fold and bend at corners so that the longitudinal wires are continuous. Stop 50 mm short of control joints. Extend 450 mm beyond each side of openings.

Reinforcement

Material: Galvanized welded wire mesh.

Width: Equal to the width of the leaf, less 15 mm cover from each exposed surface of the mortar joint.

3.11 REINFORCED AND GROUTED BLOCKWORK

Cleaning core holes

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

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

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

Grouting

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

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

Compaction: Compact by vibration or by rodding.

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

3.12 LINTELS

Location

General: Install one lintel to each wall leaf, as documented.

Installation

General: Do not cut on site. Keep lintels 10 mm clear of heads of frames.

Steel lintels: Pack mortar between any vertical component and supported masonry units. For angles, install the long leg vertically.

Minimum bearing each end:

- Span not more than 1000 mm: 100 mm.
- Span more than 1000 mm and not more than 3000 mm: 150 mm.
- Span more than 3000 mm: To structural drawings.

Propping: Provide temporary props to lintels to prevent deflection or rotation.

- Minimum propping period: 7 days.

3.13 CONNECTORS AND ACCESSORIES

Slip joints

General: Install slip joints to top of all unreinforced masonry walls supporting concrete slabs and other concrete elements.

Protection: Keep the slip joints in place and protect from displacement.

Flexible masonry ties

General: Install stabilising ties at control joints and abutting structural elements, including columns, beams and slab soffits.

Locations and details: As documented.

3.14 ARCHES

Arch voussoirs

General: Cut units using a masonry saw.

Shapes and dimensions

General: Form arches using solid or cored (not hollow) masonry units.

3.15 BAGGING

Preparation

General: Cut joints flush before bagging.

Dry bagging

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

Textured bagging

Application: Apply laying mortar to the surface using a sponge float. Flush up irregularities, but leave approximately 2 mm of mortar on the surface. When initial set is reached, texture using a hand bristle brush.

0341 STRUCTURAL STEELWORK

1 GENERAL

1.1 RESPONSIBILITIES

General

Requirement: Provide structural steelwork, as documented.

Performance

Adjoining elements: Provide for the fixing of adjoining building elements that are to be connected to or supported on the structural steel.

1.2 CROSS REFERENCES

General

Requirement: Conform to the following:

- *0171 General requirements.*
- *0344 Steel – hot-dip galvanized coatings.*
- *0345 Steel – protective paint coatings.*

1.3 STANDARDS

General

Materials and design: To AS 4100.

Materials and design of cold-formed decking, purlins and girts: To AS/NZS 4600.

Composite steel-concrete construction including profiled steel sheeting and shear connectors: To AS/NZS 2327.

Fabrication and erection: To AS/NZS 5131.

1.4 INTERPRETATION

Abbreviations

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

- AESS: Architecturally Exposed Structural Steelwork.
- CC: Construction Category.
- NDE: Non-Destructive Examination.

Definitions

General: For the purposes of this worksection, the definitions given in AS/NZS 5131 apply.

1.5 TOLERANCES

General

Requirement: To AS/NZS 5131 Section 12 and Appendix F.

Tolerance class: 1.

AESS: As documented.

1.6 SUBMISSIONS

Execution details

Anchor bolts: If anchor bolts do not meet documented location tolerances, submit proposals for rectification before proceeding.

Bolting connections: For connections not documented, submit proposals.

Bolt tensioning procedure: Submit details of procedure, equipment to be used and calibration of the process.

Site base plate holing: If hand cutting of bolt holes in column base plates are required, submit details.

Purlins and girts: If purlins and girts support components other than roofing or cladding, submit details.

Site modifications: Submit details of proposed on-site modifications or rectifications to any steel member, connection component, mechanical fastener, weld or corrosion protection.

Splices: If variations to documented splice locations or additional splices are proposed, submit details.

Temporary connections or attachments: If not documented, submit details.

Undocumented weld types: Submit proposals for weld type and electrodes.

Welding plan: Submit a welding plan to AS/NZS 5131 clause 7.2.

Work method statement: Before any erection work commences, submit a work method statement to AS/NZS 5131 clause 11.2.3.

Fabrication details

Distortions: Submit proposals for the following:

- Preventing or minimising distortion of galvanized components, welded components or welded and galvanized components.
- Restoration to the designed shape.

Identification marks: If members and/or connections will be exposed to view, submit details of proposed marking.

Program: Submit a fabrication program showing the proposed sequence of operations and time required.

Products and materials

Steel members and sections: Submit test reports or test certificates conforming to AS 4100 clause 2.2.2.

Bolts, nuts and washers: Submit test reports or test certificates conforming to AS/NZS 1252.1 Section 6.

Verification testing of bolt assemblies: Submit test reports or certificates conforming to AS/NZS 1252.2 Section 2, together with the Supplier Declaration of Conformity (SDoC).

Anchor bolts: If anchors, other than those documented, are required or proposed for supporting or fixing structural steel, submit evidence of the anchor capacity to carry the load.

Substitution: If alternative sections or connections are proposed, submit details.

Records

Survey: Submit survey of erected structural steel to verify components have been installed as documented.

Drawings: Submit as-built structural drawings, upon completion.

Samples

AESS: Submit samples of AESS, as documented.

Special finishes: Submit samples of finished steel, as documented.

Minimum sample size: 0.1 m².

Shop detail documentation

General: Submit shop detail documentation to a scale that best describes the detail, conforming to AS/NZS 5131 clause 4.4.

Drawing format: PDF, 3D CAD, 3D Revit, 3D IFC

Review of shop detail documentation: MGS Architects and Stantin Consulting

Subcontractors

General: Submit names and contact details of proposed fabricator, detailer and installer.

Responsibilities: Submit names and contact details corresponding to the person/organisation assigned responsibility to the items listed in AS/NZS 5131 Table B3.

Tests

Requirement: Submit test results, as follows:

- Bars and sections: Non-destructive tests.
- Plates: Ultrasonic tests.
- Welds: Non-destructive examinations.

1.7 INSPECTION

Notice – off-site

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

- Materials including welding consumables before fabrication.

- Testing of welding procedures and welder qualification tests.
- Commencement of shop fabrication.
- Commencement of welding.
- Complete penetration butt welds before the placement of root runs.
- High-strength bolt tensioning (when completed off-site).
- Completion of fabrication before surface preparation.
- Surface preparation before protective coating.
- Completion of protective coating before delivery to site.

Notice – on-site

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

- Steelwork on-site before erection.
- Anchor bolts in position before casting in.
- Steelwork and column bases erected on site, before grouting, encasing, site protective coating or cladding.
- Tensioning of bolts in categories 8.8/TB, 8.8/TF, 10.9/TB and 10.9/TF.
- Reinforcement and formwork in place before any encasement.
- Completed grouting, encasement, fire protection or site applied protective coating.

2 PRODUCTS

2.1 GENERAL

Materials

Requirement: To AS/NZS 5131 Section 5.

Storage and handling

Requirement: Pack, support, transport and handle members and components without overstressing, deforming or damaging them or their protective coating.

Damaged items: Rectify or replace. Do not assemble into the structure without approval.

Protection: Wrap or otherwise protect members or components to prevent damage to surface finishes during handling and erection.

Storage: Store off the ground.

Lifting points: Do not allow steel slings to come into direct contact with coated steelwork.

Purchasing and traceability

Purchasing documentation and procedure: To AS/NZS 5131 clause 4.6.

Level of traceability: To AS/NZS 5131 clause 5.2.3 and the types defined in AS/NZS 5131 clause 4.7.

2.2 STRUCTURAL STEEL

Steel members and sections steel grade table

Type of steel	Minimum grade
Hot-rolled sections to AS/NZS 3679.1 and SA TS 102	300
Welded sections to AS/NZS 3679.2	300
Hot-rolled plates, floor plates and slabs to AS/NZS 3678 and SA TS 102	250
Hot-rolled flat products to AS/NZS 1594	HA250
Hollow sections to AS/NZS 1163 and SA TS 102: Circular sections less than 166 mm nominal outside diameter	C250
Hollow sections to AS/NZS 1163 and SA TS 102: Sections other than circular sections less than 166 mm nominal outside diameter	C350
Cold-formed purlins and girts to AS 1397	G450 or Z350

Certification

Steel: Minimum requirements for test and inspection certificates, to the following:

- Hot-rolled bars and sections: To AS/NZS 3679.1 clause 11.2.4.
- Welded I sections: To AS/NZS 3679.2 clause 11.2.4.
- Hot-rolled plates: To AS/NZS 3678 clause 11.2.4.
- Cold-formed hollow sections: To AS/NZS 1163 clause 11.2.4.

Testing

Requirement: As documented.

2.3 MECHANICAL FASTENERS

Standards

Bolts: To AS 1110.1, AS 1111.1 and AS/NZS 1252.1.

Nuts: To AS 1112.1, AS 1112.2, AS 1112.3, AS 1112.4 and AS/NZS 1252.1.

Bolting category

Requirement: To the **Bolting category schedule**.

Certification

High-strength bolt assemblies: Minimum requirements for test reports, to AS/NZS 1252.1 clause 6.4.2.

Finish

Bolts, nuts and washers: Hot-dip galvanized to AS/NZS 1214, corrosion-free, and in serviceable condition.

Anchor bolts

Hexagonal bolts: To AS 1111.1.

Hexagonal nuts: To AS 1112.3.

Plain washers: To AS 1237.1.

Requirement: Provide each anchor bolt with 2 nuts and 2 oversize washers with sufficient thread for the levelling nut and washer to sit below the base plate.

Mechanical and chemical anchors: To AS 5216, installed to manufacturer's recommendations.

2.4 OTHER MATERIALS

Welding consumables

Requirement: To the relevant part of the AS/NZS 1554 series.

Studs and shear connectors

Requirement: To AS/NZS 5131 clause 5.6.

Grout

Requirement: To AS/NZS 5131 clause 5.8.

3 EXECUTION

3.1 PREPARATION, ASSEMBLY AND FABRICATION

Identification

Traceability: To AS/NZS 5131 clause 5.2.3.

Marking: Provide marks or other means of identifying each member compatible with the finish, for setting out, locating, erecting and connecting the steelwork to the marking plans.

High-strength bolting: If the work includes more than one bolting category, mark high-strength structural bolted connections with a 75 mm wide flash of colour, clear of holes.

Cold-formed members: Clearly mark material thickness.

Monorail beams: Identify and mark rated capacity in conformance with AS 1418.18 clause 5.12.6.

Natural beam camber

General: If steel beams have a natural camber, within the straightness tolerance, fabricate the steelwork element with the camber up.

Cutting

Shearing: Do not shear edges of a connection or parts of a member that have been designated as areas of plastic deformation.

Punching: Do not punch fastener holes in locations designated as areas of plastic deformation.

Shaping

Requirement: Where forming, shaping or correcting distorted members, avoid damage and conform to AS/NZS 5131 clause 6.6.

Holing

Slotted holes: Do not use slotted holes for connections, other than those documented.

Tolerances

Measurement: Check tolerances by measurement after fabrication and application of corrosion protection.

3.2 WELDING**General**

Requirements: To AS/NZS 5131 Section 7.

Standard: To AS/NZS 1554.1.

Weld category

Weld categories not documented: Category GP.

Weld type

Weld type not documented: Submit proposals for weld type and electrodes.

Non-destructive weld examination (NDE)

Requirement: To AS/NZS 5131 clause 13.6.2.

Non-visual NDE: By a third party testing authority.

Repairs: Repair welds revealed as faulty by NDE and repeat the examination.

Site welds

Completion: Weld only when correct alignment and preset or camber have been achieved.

3.3 MECHANICAL FASTENING**Connection contact surfaces**

General: To AS/NZS 5131 clause 8.4.1.

Bolting categories 8.8/TF and 10.9/TF: Clean, as rolled and free from applied finishes.

Washers

Requirement: Place one washer under the part rotated during tightening process (nut or bolt head).

Method of tensioning TB and TF bolting categories

8.8/TB and 8.8/TF: Use part-turn method or a direct tension indicator device.

10.9/TB and 10.9/TF: Use a direct tension indicator device.

Permanent bolting

Completion: Bolt only when correct alignment and preset or camber has been achieved.

3.4 SURFACE PREPARATION AND TREATMENT**General**

Requirement: Conform to *0344 Steel – hot-dip galvanized coatings* and/or *0345 Steel – protective paint coatings*, as appropriate.

3.5 SPECIAL FINISHES**General**

Requirement: Apply special finishes, as documented.

3.6 METAL SPRAYING**General**

Standard: To ISO 2063-2.

Requirement: Apply sprayed metal, as documented.

Process: Electric arc.

Application: Apply the coating as soon as possible after blasting.

3.7 FIRE PROTECTION COATINGS

General

Requirement: Apply fire protection to structural steelwork to *0346 Structural fire protection systems*.

3.8 ARCHITECTURALLY EXPOSED STRUCTURAL STEELWORK

General

Requirement: Provide AEES to AS/NZS 5131 Section 10 and as documented.

AEES category

AEES category to AS/NZS 5131 clause 10.2: AEES 4

Fabrication

Additional requirements: To AS/NZS 5131 clause 10.4.

Corners and edges: Grind smooth sharp, marred, or roughened corners and edges.

Rough surfaces: Deburr and grind smooth.

Erection

Additional requirements: To AS/NZS 5131 clause 10.5.

3.9 ERECTION

General

Execution: Make sure every part of the structure has sufficient design capacity and is stable under construction loads produced by the construction procedure.

Temporary work

General: Provide all necessary temporary bracing or propping.

Temporary connections: Detail required cleats, if not shown on shop detail documentation.

Temporary members: If temporary members are required, fix so as not to weaken or deface permanent steelwork.

Anchor bolts

General: For each group of anchor bolts, provide a template with set-out lines clearly marked for positioning the bolts when casting in.

Beam camber

Requirement: If beam elements have a camber (natural or induced), erect them with the camber up.

Site work

General: Other than work shown on the shop detail documentation as site work, do not fabricate, modify or weld structural steel on-site.

Purlins

Trimming members: Provide to support edges of roof sheeting along hips, valleys and roof penetrations.

Movements

General: Allow for thermal movements during erection.

Grouting at supports

Preparation: Before grouting steelwork supported by concrete or masonry, set steelwork on packing or wedges.

- Permanent packing or wedges: Form with solid steel or grout of similar strength to the permanent grout.
- Temporary packing or wedges: Remove before completion of grouting.

Timing: Grout at supports before constructing supported floors, walls and roofing.

Temperature: Do not grout if the temperature of the base plate or the footing surface exceeds 35°C.

Drifting

Limitation: Use drifting only to bring members into position, without enlarging holes or distorting components.

3.10 REPAIRS

General

Requirement: Repair finishes to restore the full integrity of any coating.

3.11 COMPLETION

Tolerances

Conformance: After completing erection, verify conformance with AS/NZS 5131 Section 12 and Appendix F.

Temporary connections

General: Remove temporary cleats on completion and restore the surface.

0342P TRUECORE® STEEL LIGHT STEEL FRAMING**1 GENERAL****1.1 RESPONSIBILITIES****General**

Requirement: Provide TRUECORE® steel light steel framing for enclosed intermediate floors, walls, roofs and trusses, as documented.

Performance

Requirements:

- Suitable for having flooring, linings, cladding and roofing fixed to it.
- Conforming to the documented performance criteria.
- Conforming to the requirements of NASH-1 or NASH-2.

1.2 COMPANY CONTACTS**BlueScope technical contacts**

Website: www.steel.com.au/support.

1.3 CROSS REFERENCES**General**

Requirement: Conform to the following:

- *0171 General requirements.*

1.4 STANDARDS**General**

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

Residential and Low-rise steel framing: To NASH-1 (National Association of Steel Housing) and NASH-2.

1.5 MANUFACTURER'S DOCUMENTS**Technical manuals**

Website: www.steel.com.au/library.

1.6 INTERPRETATION**Definitions**

General: For the purposes of this worksection, the definitions given in the NASH-1 and NASH-2 Standards apply.

1.7 TOLERANCES**General**

Manufacturing, assembly and installation tolerances: To NASH-1 Appendix D and NASH-2 Appendix A.

1.8 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 or NASH-1: Independent design, documentation and certification from a professional engineer.
- To NASH-2: Certification of conformance to the requirements of NASH-2.

Reactions: Submit the location and magnitude of reactions that are to be accommodated by the support structure.

Floor and wall frame member sizes: Submit a schedule of proposed member sizes, certified as meeting stated project, and AS/NZS 4600 or NASH-2 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 roof trusses: Include the following:

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

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.

Prefabricated floor frames/cassettes: Include the following:

- Plan: Level of installation, arrangement of members, and size and section type of each member, including prefabricated floor joists.
- Method of assembly, connection, holding down and bracing.

Warranties

Requirement: On completion, apply for and submit the applicable TRUECORE® steel product warranty obtained from BlueScope.

1.9 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

Product substitution

Other products: Conform to **SUBSTITUTIONS** in *0171 General requirements*.

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 and trusses: 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 or AS/NZS 2904.

TRUECORE® steel enclosed framing

General: Cold-formed sections from steel, hot-dipped aluminium/zinc/magnesium alloy (Activate® technology) coated to AS 1397.

Marking: Evidence of conformity to AS 1397 branding visible on all elements.

Corrosion protection: Activate® technology and the requirements of NASH-2 Section 8.

Product name: TRUECORE® steel.

Grade: Light Steel Framing Contractor/Fabricator to specify appropriate grade.

Framing members

TRUECORE® steel enclosed framing for proprietary systems: To NASH-1 or NASH-2.

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 centre third span of the element, conforming to the requirements of NASH-2.

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. 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 FLOOR FRAMING

General

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

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

3.3 WALL FRAMING

Wall studs

General: Provide studs in single lengths without splices. Place a stud 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.

Vermin barriers

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

Damp-proof course

Requirement: Provide damp-proof courses under the bottom plate of perimeter stud walls built off slabs, to the requirements of BlueScope TB-34, if not documented otherwise.

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.

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

3.4 ROOF AND CEILING FRAMING**Beam framing**

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

Additional support

Requirement: Provide additional frame members at the following locations:

- Hanging light fittings.
- Ceiling fans.
- Access panels.
- Any other hanging services or fixtures and fittings.

Water tank or heater in roof space: Provide a support platform to AS/NZS 3500.4 clause 5.5.1.

Battens

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

Anti-ponding boards

Standard: To AS 4200.2.

3.5 TRUSSES**Fabrication**

Assembly: Factory assemble trusses.

Supports for in roof services

General: If walkways, mechanical plant or other services are to be supported within the roof space, provide support and make sure trusses have been designed to carry the loads.

Water tank and heater: If a water tank or heater is located in the roof space, provide a support platform to AS/NZS 3500.4 clause 5.5.1 and make sure trusses have been designed to carry the loads.

Marking

General: Permanently mark each truss to show:

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

Installation

Support: Support and fix trusses to the truss fabricator's recommendations.

Vertical movement: Over internal walls not providing support to trusses, provide at least 10 mm vertical clearance and use wall bracing methods which allow for vertical movements, to the truss fabricator's recommendations.

3.6 ROOF TRIM

Fascia, valley and barge boards

Requirement: Fix fascia, valley gutter boards and barge boards in conformance with the manufacturer's recommendations.

3.7 COMPLETION

Cleaning

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

Warranties

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

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

0344B STEEL – HOT-DIP GALVANIZED COATINGS

1 GENERAL

1.1 RESPONSIBILITIES

General

Requirement: Provide hot-dip galvanized coatings, 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.

1.3 STANDARDS

General

Coating: To AS/NZS 4680.

Coating on fasteners: To AS/NZS 1214.

Durability: To AS/NZS 2312.2.

Metal finishing

Coating mass/thickness minimum: To AS/NZS 4680.

Threaded fasteners coating mass/thickness minimum: To AS/NZS 1214.

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.

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.

Acid pickling: To AS 1627.5.

- Inhibitor: Required.

Coating process

General: To AS/NZS 4680 Section 6.

Threaded fasteners: To AS/NZS 1214 Section 5.

Post treatment

General: Passivate.

Drilling after completion of hot-dip galvanizing

Repair: Prime drill hole surfaces to AS/NZS 4680 Section 8 before the surfaces begin to corrode.

Surface finish

Standard: To AS/NZS 4680 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.
- Slip factor test: To AS 4100 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 Section 8, reject the galvanizing.

Extent and methods: To AS/NZS 4680 Section 8.

Preparation of galvanized 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 microns.
- Abrasive grade (range): 150 to 180 microns.
- 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 SITE WORK**Site welding**

Grinding of edges: Permitted.

Weld areas: Reinstate coating to AS/NZS 4680 Section 8.

Site coating reinstatement

Rejection: If any item has damaged areas exceeding the limits specified for repair in AS/NZS 4680 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 Section 8.

0345P DULUX STEEL PROTECTIVE PAINT COATINGS

1.1 RESPONSIBILITIES

General

Requirement: Provide Dulux protective paint coatings for the protection of steel products and structural steelwork against interior and exterior atmospheric corrosion, as documented.

Performance

Requirement: Control atmospheric corrosion to structural steelwork and steel products until the first scheduled maintenance.

1.2 COMPANY CONTACTS

DuluxGroup/Dulux technical contacts

Architects and Specifiers' Hotline: 13 23 77.

Website: www.duluxprotectivecoatings.com.au/contact-us.

1.3 CROSS REFERENCES

General

Requirement: Conform to the following:

- *0171 General requirements.*

1.4 STANDARDS

General

Surface preparation and coating: To AS/NZS 5131 Section 9 and the recommendations of AS 2312.1.

Site testing of protective coatings

Test methods: To AS 3894.

1.5 MANUFACTURER'S DOCUMENTS

Technical manuals

Duspec PDS, SDS, paint system selection: Duspec.

1.6 INTERPRETATION

Abbreviations

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

- ACA: Australasian Corrosion Association.
- DFT: Dry Film Thickness.
- ITP: Inspection and Test Plan.
- MIO: Micaceous Iron Oxide.
- NACE: National Association of Corrosion Engineers (USA).
- PDS: Product Data Sheet.
- SDS: Safety Data Sheet.
- SSPC: The Society for Protective Coatings (USA).
- μm : Micron (10-6m).

Definitions

General: For the purposes of this worksection, the definitions given in AS/NZS 2310 and the following apply:

- Coating contractor: The protective coatings application contractor conducting the on or off-site coating application works.
- Coating manufacturer: Dulux Protective Coatings.
- 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.

- Safety data sheet (SDS): Prepared in conformance with Safe Work Australia's requirements and distributed by the coating manufacturer to provide information on the safe handling, storage, personal protective equipment requirements, use and disposal of a coating product. Previously called a material safety data sheet (MSDS).

1.7 QUALITY ASSURANCE

General

Standard: Applicator Quality Assurance system to AS/NZS ISO 9001.

Applicator's quality assurance officer: Nominate a qualified NACE Certified Coating Inspector or a ACA Certified Coatings Technician under direction of a NACE inspector.

Records: Maintain records:

- Access: Have records available for inspection.

Verification: Nominate an independent NACE Certified Coating Inspector to carry out quality audits.

Defects: Provide written inspector reports.

1.8 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

Existing steelwork: Identify, itemise and submit details of areas of corrosion, damage and other degradation.

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, AS 3894.11, AS 3894.12, AS 3894.13 and AS 3894.14.
- 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 half of each sample for comparison during coating 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: Submit evidence of applicator's acceptance of the coating substrate before starting installation.

Warranties

General: Submit details of the proposed warranty terms, form and period.

1.9 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.

2 PRODUCTS

2.1 GENERAL

Product substitution

Other products: Conform to **SUBSTITUTIONS** in 0171 General requirements.

Storage and handling

General: Store in a cool shady place.

Care: Handle, store, mix and apply all protective coatings in conformance with Dulux recommendations.

Original containers: Deliver coating products to site in manufacturer's labelled and sealed containers.

Ambient temperature range for storage: 15°C to 25°C.

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 clause 9.9.3.

Proprietary products

Substitution: Dulux paint products and specified coatings systems have been selected for this project and unauthorised product substitution will jeopardise or void the Warranties.

Product data sheets (PDS): Keep on site copies of all relevant Dulux technical data sheets.

Safety data sheets (SDS): Keep on site copies of all relevant Dulux SDS's.

Recording: To AS/NZS 5131 clause 9.9.5.

3 EXECUTION

3.1 GENERAL

Product warnings

Requirement: Conform to the requirements and recommendations of the relevant Dulux SDS.

Qualifications

Requirement: All work is to be completed by suitably qualified professionals holding TAFE or other recognised qualifications.

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 clauses 9.3, 9.4 and 9.5.

Surface cleansing: Wash and degrease all surfaces to be coated, to AS 1627.1, with a free-rinsing, alkaline detergent, such as Gibson F310B or Gamlen CA No. 1 used in conformance with the manufacturer's written instructions and all safety warnings.

Bolts: Provide washers at heads and nuts at replacement bolts.

Galvanized, aluminium and zinc primed surfaces

Requirement: Remove grease, oil and other solvent-soluble contaminants to AS 1627.1. 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. 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 clause 9.12.2.

Shop priming

Requirement: Dust off and apply a coat of primer, according to the technical specification.

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 and AS 1627.9.

Minimum acceptance class: Sa 2.5.

Mechanical cleaning

Assessment: To AS 1627.9 and ISO 8501-2.

Minimum acceptance class: St 2.

Surface profile

General: To AS 3894.5 Method A.

Acceptable profile range: 35 to 65 µm.

Surface dust from abrasion

General: To AS 3894.6 Method C.

Chloride level testing

Test: To AS 3894.6 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 clause 9.9.6.

Powered agitators: Mix package sizes larger than 4 litres using powered agitators driven by air motors.

Multi-component coatings: Combine as whole pack units before application.

Thinner: If addition of thinner is proposed, conform to the Dulux PDS 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 the Dulux PDS, the Dulux specification and AS/NZS 5131 clause 9.9.

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 clause 9.9.10 exist or if 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 of each protective paint coating system, as documented.

Subsequent coats: Make sure that before any subsequent coating layer is applied, the surface condition of the preceding coat is complete and correct in all respects, including its DFT achievement, cleanliness and freedom from defects. These are detailed on the Dulux Protective Coating specification. Depending on the applicators chosen method additional coats may be required to achieve the nominated minimum DFT.

Conformance: To AS 2312.1 for the specified film thickness of individual coats.

Correction: Correct any defect in a coating layer before the subsequent coating layer is applied.

Wet film thickness (WFT)

Method of measurement: To AS 3894.3 Appendix C using an approved wet film gauge continuously during application.

Dry film thickness (DFT)

Method of measurement: To AS 3894.3 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 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.

Defects for rejection: [complete/delete]

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 Dulux Protective Coating system within 4 hours of blast cleaning or in any case before visual tarnishing of the steel occurs.

Cleaning: Provide, at no additional cost, surface treatment as follows:

- Surfaces left longer than four hours: Re-blast cleaning before coating.
- Surfaces that develop visual tarnishing (red rust or black spots) at any time before coating: Wash down with clean water then blast clean before coating. There are commercially available chloride reducing solutions that may assist.

3.8 COMPLETION**General**

Joints: On completion, seal all joints and mating surfaces with a compatible polyurethane sealant.

Warranties

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

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

4 SELECTIONS

4.1 PROTECTIVE PAINT COATING SYSTEMS

Protective paint coating systems

There are decorative finish options for architectural and structural steel. The most common coating types are:

Gloss polyurethane

Inland AS 2312.1 Categories C1 and C2: Polyurethane

Location	Primer	Second Coat	Third Coat	Duspec No.
Interior non-decorative	75 µm DULUX Durepon EZP AU_DC02462	Nil	Nil	AU_DC02462
Interior decorative	75 µm DULUX Durepon EZP AU_DC02462	75 µm DULUX Weathermax HBR DI1156	Nil	AU_SC13708
Exterior non-decorative	125 µm DULUX Duremax GPE ZP DI1116	75 µm DULUX Weathermax HBR DI1156	Nil	AU_SC16384
Exterior decorative	125 µm DULUX Duremax GPE ZP DI1116	75 µm DULUX Weathermax HBR DI1156	Nil	AU_SC16384

Coastal AS 2312.1 Categories C3, C4 and C5: Polyurethane

Location	Primer	Second Coat	Third Coat	Duspec No.
Interior non-decorative	75 µm DULUX Zincanode 402 DI0539	Nil	Nil	SI2770
Interior decorative equivalent to AS 2312.1 PUR2a	75 µm DULUX Zincanode 402 DI0539	75 µm DULUX Weathermax HBR DI1156	Nil	AU_SC13711
Exterior non-decorative equivalent to AS 2312.1 EHB4	75 µm DULUX Zincanode 402 DI0539	200 µm DULUX Duremax GPE DI1115	Nil	SI2837
Exterior decorative	75 µm DULUX Zincanode 402 DI0539	200 µm DULUX Duremax GPE DI1115	75 µm DULUX Weathermax HBR DI1156	AU_SC13710

Micaceous Iron Oxide (MIO)

Inland AS 2312.1 Categories C1 and C2: Micaceous iron oxide

Location	Primer	Second Coat	Third Coat	Duspec No.
Interior non-decorative	75 µm DULUX Luxaprime ZP DI1136	Nil	Nil	SI2580
Interior decorative	75 µm DULUX Durepon EZP AU_DC02462	100 µm DULUX Ferreko 3 PC560	Nil	SI1435
Exterior non-decorative	75 µm DULUX Zincanode 402 DI0539	100 µm DULUX Ferreko 3 PC560	Nil	SI1400
Exterior decorative	75 µm DULUX Zincanode 402 DI0539	100 µm DULUX Ferreko 3 PC560	Nil	SI1400

Coastal AS 2312.1 Categories C3, C4 and C5: Micaceous iron oxide

Location	Primer	Second Coat	Third Coat	Duspec No.
Interior non-decorative	75 µm DULUX Zincanode 402 DI0539	Nil	Nil	SI2770
Interior decorative	75 µm DULUX Zincanode 402 DI0539	100 µm DULUX Ferreko 3 PC560	Nil	SI1400
Exterior non-decorative equivalent to AS 2312.1 EHB6	75 µm DULUX Zincanode 402 DI0539	125 µm DULUX Ferreko 3 PC560	125 µm DULUX Ferreko 3 PC560	SI1395
Exterior decorative equivalent to AS 2312.1 EHB6	75 µm DULUX Zincanode 402 DI0539	125 µm DULUX Ferreko 3 PC560	125 µm DULUX Ferreko 3 PC560	SI1395

0381 STRUCTURAL TIMBER

1 GENERAL

1.1 RESPONSIBILITIES

General

Requirement: Provide structural timber, as documented.

1.2 DESIGN

General

Designer: Professional engineer.

Requirements

General: To DESIGN in 0171 *General requirements*.

1.3 CROSS REFERENCES

General

Requirement: Conform to the following:

- 0171 *General requirements*.
- 0181 *Adhesives, sealants and fasteners*.
- 0185 *Timber products, finishes and treatment*.

1.4 STANDARDS

General

Design: To AS 1720.1.

1.5 INTERPRETATION

Definitions

General: For the purposes of this worksection, the definitions given in AS 1720.1 apply.

1.6 SUBMISSIONS

Certification

Design: Submit independent certification by a professional engineer of the design and documentation (including shop drawings), and of the erected work, for conformance to AS 1720.1 and the project performance criteria.

Fire performance

Fire-resistance level: Submit evidence of conformity to **FIRE PERFORMANCE, Fire-resistance of building elements**.

Products and materials

Identification:

- Supply: Submit supplier's evidence of conformity (which may be included on an invoice or delivery docket) verifying that the timber conforms to the specification, including moisture content.
- Inspection: Submit the inspection authority's certificate verifying that the timber conforms to the specification.

Moisture content: Submit records of moisture content.

Preservative treatment: Submit a test certificate from an independent testing authority confirming that the required preservative retention has been achieved for every member. Include details of the treatment and a copy of the charge sheet.

CCA treated timber: If proposed, submit details of treatment.

Shop drawings

General: Submit shop drawings showing the following:

- Marking plans.
- Arrangement of members.
- Location of the members in the building.

- Loading parameters and bracing lengths assumed in the design.
- Species, stress grade, strength group and joint group of timber.
- Size of each member.
- Tolerances on member sizes.
- Joint details including connector plates.
- Lifting points.
- Method of fixing and bracing.
- Preservative treatment, if any.
- Long-term deflection.
- Moisture content at time of manufacture.
- Method of fabrication.
- Precamber.
- For pole construction: Pole footing hole diameter and pole embedment length.

Drawing format: 2D and 3D CAD drawings, or digital model.

Timber portal frames: Show the following additional information:

- Size and specification of gussets.
- Gusset fastenings (nail size and arrangement).
- Base plate details.
- Fixings for purlins, girts and bracing.
- Method of handling and erection, including temporary bracing required, if any.

Glued laminated timber: Show the following additional information:

- Design stresses.
- Appearance grade.
- Service class.
- Strength grade.

Contractor design: For items designed by the contractor, submit independent certification of shop details by a professional engineer for conformance to AS 1720.1 and the project performance criteria.

Subcontractors

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

Prefabricated items: Submit name and contact details of proposed prefabricator.

1.7 INSPECTION

Notice

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

- Prefabricated items before priming or water-repellent treatment.
- Structural timberwork after erection but before being concealed.
- On site preservative treated members before being concealed.
- Post holes/foundations before placing concrete.
- Bolts after final tightening.

2 PRODUCTS

2.1 FIRE PERFORMANCE

Fire-resistance of building elements

Standard: Tested to AS/NZS 1720.4.

Fire-resistance level (FRL): Refer to wall type drawings and as per Fire Engineering Report Requirements.

2.2 PRESERVATIVE TREATMENT

General

Requirement: To *0185 Timber products, finishes and treatment*, including for termite treatments.

2.3 TIMBER

Structural timber

Material requirements: As documented.

Structural timber characteristic values: To AS/NZS 4063.1 and AS/NZS 4063.2.

Timber grading methods:

- Hardwood: To AS 1720.1 Table H2.3 strength group classification.
- Softwood: To AS 1720.1 Table H2.4 strength group classification.
- F-grades: To AS 1720.1 Table H2.1.
- MGP grade: To AS 1720.1 Table H3.1.
- Visually graded F-grade: To AS 2082 or AS 2858.

Recycled timber

Grit blasted or re-machined: Remove all nails and screws.

Identification

Method: Identify timber using branding, certification or both.

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 which 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.

Certification: Forest certification, chain of custody and product labelling to *0185 Timber products, finishes and treatment*.

2.4 FINGER JOINTED STRUCTURAL TIMBER

General

Performance: To AS/NZS 8008 (Int).

Production and service class: To AS 5068.

Material requirements: As documented.

2.5 FASTENERS

General

Requirements: To the fasteners requirements in *0181 Adhesives, sealants and fasteners*.

Joint type and jointing method: To AS 1720.1.

Materials

Type: Galvanized steel.

Fastener type

Metal fasteners: Select fastener as appropriate for the documented atmospheric category and the life of the structure.

Fastener configuration: If timber elements experience tension perpendicular to the grain, use the appropriate fastener configuration to accommodate the tension.

Nails and screws

Nail diameter: to AS 1720.1 Tables 4.1(A), 4.1(B), 4.2(A) and 4.2(B)

Nail spacings and edge and end spacing: to AS 1720.1 Table 4.4

Bolts

Thread: Provide thread length at least four times the bolt diameter.

Holes: Drill bolt holes 2 mm larger than the bolt diameter.

Washers

Standard: To AS 1720.1 Table 4.11.

- Thickness: [complete/delete]

3 EXECUTION

3.1 TRANSPORT AND DELIVERY

General

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

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

Appearance products: Store under cover.

3.2 STRUCTURAL TIMBER

General

Preservative treatment: If holes are drilled in treated timber, apply a saturation coating of preservative to the sides of the holes before inserting fixings.

Outdoor structures

Sealing: Seal the ends of members with wax emulsion or petroleum jelly immediately after sawing.

Anti splitting plates: Plate the ends of members 250 x 75 mm or larger with pressed or hammer-on galvanized nail plates equal to 50% of the cross-sectional area.

Bolt holes: Treat bolt holes with a protective treatment before inserting the bolt.

Coating: After completion of fabrication, notching and machining, coat joints, holes and notches with a protective coating.

Heart: Place the heart side of bracing members on the inside of joints. Place the heart side of other members on the downside wherever possible.

Minimum bolt size: M20.

Minimum washer size: 5 mm thick and 65 mm square or 75 mm diameter.

Bolt protection: Coat bolts with a bituminous coating before insertion in the bolt hole.

Recessed fixing: For fixings punched or sunk below the surface, fill the recess with a suitable wood filler or mastic.

Finishing: If a protective or decorative finish is required apply one coat of primer and one finishing coat all around before fixing.

Camber

Orientation: Install cambered members with the camber up.

Protection from weather

Duration: Provide temporary protection for glued laminated timber members until permanent covering is in place.

Exposed applications: Paint glued products or otherwise protect them with a moisture-excluding envelope.

3.3 COMPLETION

Tightening

Initial: Retighten bolts, screws and other fixings so that joints and anchorages are secure at the date of practical completion.

Subsequent: If unseasoned timber is used, retighten all bolts, screws and other fixings again after 6 months.

0411B WATERPROOFING – EXTERNAL AND TANKING

1 GENERAL

1.1 RESPONSIBILITIES

General

Requirement: Provide external waterproofing and tanking systems to substrates, as documented.

Performance

Requirements:

- Graded to falls to dispose of stormwater without ponding above the depth of lapped seams.
- Able to accommodate anticipated building movements.
- Able to accommodate its own shrinkage over the warranty life of the roofing system.
- Able to resist water under hydrostatic pressure.

1.2 CROSS REFERENCES

General

Requirement: Conform to the following:

- *0171 General requirements.*

1.3 STANDARDS

Below ground waterproofing

Membrane design and installation: To BS 8102.

External waterproofing

Membrane materials: To AS 4654.1.

Membrane design and installation: To AS 4654.2.

Stormwater drainage

Standard: To AS/NZS 3500.3.

Slip resistance

Classification: To AS 4586.

1.4 INTERPRETATION

Definitions

General: For the purposes of this worksection, the definitions given in AS 4654.1 and AS 4654.2 and the following apply:

- Bitumen: A viscous material from the distillation of crude oil comprising complex hydrocarbons, which is soluble in carbon disulphide, softens when it is heated, is waterproof and has good powers of adhesion. It is produced as a refined by-product of oil.
 - . APP bitumen: Bitumen modified with atactic (meaning non-crystalline or amorphous) polypropylene wax to form a plastomeric sheet. The membrane is reinforced with fibreglass or non-woven polyester (NWP).
 - . SBS bitumen: Bitumen modified with styrene-butadiene-styrene, a thermoplastic rubber that undergoes a phase inversion at elevated temperature and converts to an elastomeric material. The membrane is reinforced with fibreglass or non-woven polyester (NWP).
- Bond breaker: A system preventing a membrane bonding to the substrate, bedding or lining.
- Double detail joint: A joint formed by turning up and bonding the horizontal membrane to a vertical substrate and adding an overflashing of membrane material bonded to the vertical substrate and folded over and bonded to the horizontal membrane. In certain situations the double detail can be achieved by bonding an angle profile of membrane material to the junction prior to laying the membrane.
- Liquid applied: A water-based formulation which cures to form an elastomeric membrane.
- Polyurethane: Water or solvent-based formulations which moisture cure to form an elastic rubber membrane.

- PVC membrane: Flexible plastic sheet membrane (vinyl).
- Slip sheet: A sheet used to isolate the membrane system from the supporting substrate or from the topping or mortar bedding. The most common material is polyethylene.
- Substrate: The surface to which a material or product is applied.
- Waterproofing system: Combinations of membranes, flashings, drainage and accessories which form waterproof barriers and which may be:
 - . Loose-laid.
 - . Bonded to substrates.

1.5 SUBMISSIONS

Operation and maintenance manuals

Requirement: On completion, submit the manufacturer's maintenance recommendations, including the following:

- Preventative maintenance procedures.
- Instructions and procedures for the repair of the membrane.

Records

General: Submit photographic records of application and protection of membranes. Label photographs with date, location and weather during application or curing.

Timing: Record at the following stages:

- After substrate preparation.
- After primer application.
- After membrane installation.
- After protection from traffic provided.

Liquid applied membranes:

- Record wet film thickness once every 10 m² and compare to the manufacturer's requirements.
- On completion of every 100 m² of each coat, compare the amount of membrane used with the manufacturer's application rate and record the result.

Flood tests: Submit photographic records of flooded areas and adjacent areas noted in **TESTING, Flood test**. Label photographs with date and location.

Subcontractors

General: Submit names and contact details of proposed suppliers and installers as recommended by the manufacturer.

Tests

Site tests: Submit results, as follows:

- Substrate moisture content test.
- Flood tests, including records of retesting after rectification.

Warranties

Requirement: Submit warranties to **COMPLETION, Warranties**.

1.6 INSPECTION

Notice

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

- Substrates prepared and ready for installation of the waterproofing and tanking systems.
- Secondary layers prepared and ready for subsequent layers.
- Membranes after installation and before concealment.
- Underflashings after installation and before installation of overflashings.
- After flood testing, if applicable.

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

Membrane system

Requirement: Proprietary membrane system suitable for the intended external waterproofing.

Tanking system

Requirement: Proprietary membrane system suitable for the intended below ground tanking.

2.3 ACCESSORIES

Internal roof outlets

General: Proprietary funnel shaped sump cast into the roof slab, set flush with membrane, with a removable grating and provision for sealing the membrane into the base of the outlet.

Bond breakers

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

Material: Purpose-made bond breaker tapes and closed cell foam backing rods 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.

Adhesives

Requirement: Waterproof and compatible with the waterproofing system.

Control joint covers

Proprietary item: vehicular

Corners, crossovers, tees and bends: Factory mitred, welded and provided with 50 mm legs.

End closures: Factory folded and sealed to match joint cover profile.

Fixing hobs: Concrete or timber.

2.4 THERMAL INSULATION

Insulation boards

Description: Refer to wall types drawing.

2.5 DRAINAGE CELL PANELS

Walls

Material: Plasterboard Panels

3 EXECUTION

3.1 PREPARATION

Substrates

General: Prepare substrates as follows:

- Clean and remove any deposit or finish which may impair adhesion of membranes.
- Remove excessive projections.
- Fill voids and hollows in concrete substrates with a concrete mix not stronger than the substrate.
- Fill cracks in substrates wider than 1.5 mm with a filler compatible with the membrane system.
- Remove all traces of a concrete curing compound if used.

Concrete substrates: Cure for more than 28 days.

Moisture content

Requirement: Verify that the moisture content of the substrate is compatible with the water vapour transmission rate of the membrane system by testing to **TESTING, Substrate moisture tests**.

Falls

Requirement: Verify that falls in substrates are greater than 1:100.

Joints and fillets

Internal corners:

- Liquid applied membranes: Provide 15 x 15 mm 45° fillets.
- Sheet membranes: Provide 40 x 40 mm 45° fillets.

Fillet material: Cement or plastic.

External corners: Round or arris edges.

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

Priming

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

3.2 INSTALLATION

Ambient conditions

Requirement: Do not install in conditions outside the manufacturer's recommendations.

Protection

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

Drains

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

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

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

Sheet membrane joints

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

End laps generally: Stagger end lap joints.

Bituminous sheet membranes:

- Side laps: ≥ 75 mm.
- End laps: ≥ 150 mm.
- Method: Heat welded.

Synthetic rubber membranes:

- Factory-vulcanized laps: ≥ 40 mm.
- Field side laps: ≥ 50 mm.
- Field end laps: ≥ 100 mm.

PVC membranes:

- Factory-welded laps: ≥ 40 mm.
- Field-welded laps:
 - . If used over insulation boards: ≥ 100 mm.
 - . Other instances: ≥ 75 mm.

Movement and control joints

General: Install membranes to accommodate control joints in the substructure.

Bond breakers: Size to allow the membrane to accommodate movement.

Joint backing gutter: Fix a formed metal gutter to one side of the soffit directly below the joint and fall to a suitable disposal or drainage point.

Control joint covers: Install after fixing hobs and membranes..

Membrane terminations

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

- Height: To AS 4654.2 Table A1.
- Anchoring: Secure sheet membranes along the top edge.
- Edge protection: Protect edges of the membrane.

Waterproofing above vertical upward terminations: Waterproof the structure above the termination to prevent moisture entry behind the membrane using cavity flashings, capping, waterproof membranes or waterproof coatings.

Vertical upward terminations:

- Liquid applied membranes: Terminate under an overflashing, or provide an overflashing of liquid applied membrane.
- Sheet membranes: Terminate under an overflashing, or provide a pressure seal overflashing or an overflashing fixed into a cast-in reglet.

Membrane downturns: Provide downturns for sheet membrane systems as follows:

- Roofs or similar structures: Extend minimum 100 mm from the junction of the structure.
- Balconies with a fully bonded membrane: Terminate at the drip groove.

Vertical downward terminations:

- Liquid applied membranes: Extend membrane to the underside of a horizontal return.
- Sheet membranes: Provide a pressure seal overflashing.

Horizontal terminations: Do not provide. Use vertical terminations.

Membrane penetrations

Vertical penetrations: Provide overflashing fixed to the substrate for vertical penetrations including pipes, ducts and vents.

Horizontal penetrations: Provide SBS bitumen flange to seal to membrane to rigid PVC-U conduits and pipes without burning the PVC-U. Do not use high density polyethylene (HDPE), polypropylene (PP) pipes or flexible PVC conduit.

Membrane at balcony doors and windows

Requirement: Install membrane before fixing door or window frames.

Upturn height above external finished floor level: To AS 4654.2 Table A1.

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

Membrane around skylights and hatches

Requirement: Install membranes to upstands before the installation of the skylight or hatch.

Upturn height above roof surface: To AS 4654.2 Table A1.

Membrane at parapets

Requirement: Terminate membrane upturns under parapet flashing or capping with at least 75 mm overlap. Do not top fix parapet cappings. Seal heads of fasteners against capping.

Membrane at gutters

Requirement: Terminate membrane over a corrosion-resistant metal angle fixed to the gutter support substrate with the vertical leg of the angle turned down into the gutter at least 35 mm.

Membrane at post supports

Post supports fixed before membrane:

- Fix post support to substrate with countersunk fasteners and seal the perimeter of the base plate to the substrate.
- Lay out membrane sheets to minimise cuts around the post support vertical member.
- Dress the membrane closely around the post support and seal the edge of the penetration to the vertical member.
- Fix an overflashing so that any joint is staggered as much as possible relative to joints in the base membrane, and overlap at least 150 mm beyond the perimeter of the base plate.

Post supports fixed after membrane:

- Fix post support to substrate with countersunk fasteners over a waterproof resilient gasket cut to match the shape of the base plate, and seal the perimeter of the base plate to the membrane.
- Dress the overflashing closely around the post support and seal the edge of the penetration to the vertical member.
- Fix an overflashing and overlap at least 150 mm beyond the perimeter of the base plate.

Membrane to planter boxes

Membrane: Extend root-resistant membrane at least 100 mm vertically above the soil or fill level and secure.

Drainage: Grade the base of the planter to adequately sized drainage outlets and terminate the membrane in the outlets.

Drainage riser: Install a riser with drainage slots that extend from the membrane level to the top of the drainage cell. Extend the riser above the soil fill level and finish with a screw cap to provide access for drain clearing.

Protection board: Provide protection board to the full extent of the membrane including areas between soil level and the underside of flashings and cappings.

Drainage cell: Provide geo-filter fabric wrapped drainage cell to the base of the planter and turn geo-filter fabric up drainage riser at least 100 mm above drainage slots.

Cappings and flashings: Provide capping to the tops of planter walls to protect the membrane. Extend the capping to overlap the top of the protection board on the inside face of the planter wall. Where planter walls abut other walls, provide a flashing over the top of the membrane.

Membrane to below ground structures

Membrane: Externally apply membrane to all walls and return to horizontal surfaces to prevent water tracking around structure at joints and corners.

Reinforcement: Provide reinforcement to the membrane at junctions, corners and over joints to the manufacturer's recommendations.

Protection board: Provide protection board to the full extent of the membrane.

Drainage cell: Provide geo-filter fabric wrapped drainage cell to vertical surfaces of the structure.

Curing of liquid membrane systems

General: To the manufacturer's instructions.

Overlaying finishes on membranes

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

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

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

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

3.3 TESTING

Substrate moisture tests

Moisture content of concrete substrate: Test substrate in-slab relative humidity to ASTM F2170. Perform three tests for the first 100 m² of subfloor area and an additional test for each additional 100 m².

Moisture content of timber, plywood and particleboard substrate: Test substrate to AS/NZS 2098.1 for plywood substrates or to AS/NZS 1080.1 for timber and particleboard substrates.

Flood test

Application: Perform a flood test before the installation of surface finishes.

Moisture content measurement method: To **Substrate moisture tests**.

Set-up:

- Measure the wall/floor junction of adjacent spaces and of the slab soffit below for dryness.

- Record the result for each area.
- Dam the access openings and seal drainage outlets.
- Provide temporary overflows of the same capacity as the outlets.
- Fill space with clean water as follows:
 - . Minimum water level: 25 mm.
 - . Maximum water level: 100 mm.
 - . Minimum dimension below perimeter flashings: 25 mm.
- Test duration: Minimum 24 hours and maximum 72 hours.

Evaluation:

- Visual test: Drain the water. After 2 hours, visually inspect the wall/floor junction of adjacent spaces and of the slab soffit below for water or moisture.
- Moisture meter test: If there is no visual evidence of water, test the same areas for dryness using a moisture meter, and compare the results to the measurements taken before flooding.

Conformance:

- Evidence of water from the visual test: Failure.
- Test results indicating an increase in moisture after flooding: Failure.
- Failure: If required, remedy defects and retest.

Records: Submit records of all flood tests.

3.4 COMPLETION

Reinstatement

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

Warranties

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

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

0423 ROOFING – PROFILED SHEET METAL**1 GENERAL****1.1 RESPONSIBILITIES****General**

Requirement: Provide a profiled sheet metal roofing system and associated work, as documented.

Ambient climatic conditions

Design rainfall intensity (mm/h) to AS/NZS 3500.3: [complete/delete]

Corrosion resistance

Material: To the manufacturer's recommendations for distance from marine influence.

Distance from marine influence: [complete/delete]

Roof access

Type: [complete/delete]

1.2 CROSS REFERENCES**General**

Requirement: Conform to the following:

- 0171 General requirements.

1.3 TOLERANCES**Sheet metal roofing**

Supporting members: To AS 1562.1 clause 4.2.3.

1.4 SUBMISSIONS**Operation and maintenance manuals**

On completion: Submit a manual of 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.

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 clause 5.4 for resistance to concentrated load and to AS 1562.1 clause 5.5 for resistance to wind pressure.
- Metal roofing in AS/NZS 1170.2 cyclonic regions: Roof sheeting and fastenings to AS 1562.1 clause 5.6.

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.

Shop drawings

General: Submit shop drawings to a scale that best describes the detail, showing the following:

- [complete/delete]

Tests

Site tests: Submit results as follows:

- Internal downpipe hydrostatic testing: [complete/delete]

Warranties

Requirement: Submit the following:

- [complete/delete]

Roofing materials: Submit the manufacturer's product warranties.

1.5 INSPECTION

Notice

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

- Roof supports before covering up or concealing.
- 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 and masonry, on a level base and not in contact with other materials that cause staining, denting or other surface damage.

Handling 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.

Safety mesh

Standard: To AS/NZS 4389.

2.2 PROFILED SHEET METAL ROOFING

Standards

Design and materials: To AS 1562.1.

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.

Insulation spacers

Description: Proprietary spacer system to prevent excessive compression of insulation between roof sheeting and framing.

2.3 ROOF PLUMBING

General

Description: Flashings, cappings, gutters, rainheads, outlets, downpipes and accessories necessary to complete the roofing system.

Flashing and capping: Notched to match profile of roof sheeting.

Matching fascia/barge capping: If the selected eaves gutter is a proprietary high front pattern forming part of a combined system of gutter, fascia and barge, provide matching proprietary fascias and barge cappings to roof verges and edges.

Standards

Roof drainage: To AS/NZS 3500.3.

Metal rainwater goods: To AS/NZS 2179.1.

Flashings and cappings: To AS/NZS 2904.

2.4 SKYLIGHTS

General

Standard: To AS 4285.

Description: A proprietary skylight system including framing, fixing, trim, seals, accessories and flashings.

2.5 ROOF HATCHES

General

Description: A proprietary roof hatch system including framing, fixing, trim, seals, accessories and flashings.

2.6 ROOF WINDOWS

General

Standard: To AS 4285.

Description: A proprietary window system designed for non-vertical installation in roofs pitched between 15° and 85°, consisting of the following:

- Timber frame and sash, shop clear primed or prefinished.
- External anodised aluminium protective profiles.
- Sealed double glazing.
- Horizontally pivoted sash, 180° reversible, on patent friction hinges.
- Opening and locking by patent control bar.
- Ventilation flap.

2.7 ROOF VENTILATORS

General

Description: A proprietary roof ventilator system including framing, fixing, trim, seals, accessories and flashings.

2.8 ROOF ACCESS

Walkways

Description: A proprietary roof walkway system including fixings.

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 PROFILED SHEET METAL ROOFING

Roof sheet installation

Standard: To AS 1562.1.

Set-out point: To be coordinated on site.

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.

Expansion joints: Provide expansion joints every 35m in sheet length for roofs with concealed fixings and 24m in sheet length for roofs with exposed fixings.

Pan type sheets

Removal: Install sheets so that individual sheets can be removed without damage.

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.

3.3 ROOF PLUMBING

Jointing sheet metal rainwater goods

Butt joints: Make joints over a backing strip of the same material.

Soldered joints: Do not solder aluminium or aluminium/zinc-coated steel.

Sealing: Seal fasteners and mechanically fastened joints. Fill the holes of blind rivets with silicone sealant.

Jointing system: Blind rivet and seal as follows:

- Pre-painted stainless: Stainless steel blind rivets with stainless steel mandrels.
- Pre-painted or zinc-aluminium alloy coated steel: Aluminium blind rivets

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 8 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.

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

- In masonry walls, planked cladding or concrete: Step in courses to the roof slope. Interleave with damp proof course, if any.
- Raking in masonry: Build into the full width of the outer leaf. Turn up within cavity, slope inward across the cavity and fix to or build into the inner leaf at least 75 mm above the roofing line.
- Raking in concrete: Turn 25 mm into joints or grooves, wedge at 200 mm centres with compatible material and point up.

Fixing to pipes: Solder or 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

Gutter and sump support: Provide framing and lining to support valley gutters, box gutters and sumps. Line the whole area under the gutters and sumps.

Support: Proprietary metallic-coated adjustable strap and channel system.

Lining: Square corrugated profiled metal roof sheeting.

Box gutter: Prefabricate box gutters to the required section and shape as follows:

- Form stop ends, downpipe nozzles, bends and returns.
- Dress downpipe nozzles into outlets.
- Hail guards: Install grating over the whole of the box gutter, over all box gutter sumps and over the edges of roofing sheeting entering box gutters.
- Overflows: Provide overflows to prevent back-flooding. Size to pass 100% of the design rainfall. Discharge overflows in visible locations and so water does not enter the building or cause damage to the building.
- Sumps: Minimum 150 mm deep and the full width of the box gutter. Coordinate with the Hydraulic Engineer.

Valley gutters: Profile to suit the valley boarding. Turn back both edges 180 x 6 mm radius. Nail or screw to the valley boarding at the top end to prevent the gutter creeping downwards.

Expansion joints in guttering longer than 30 m: Provide as follows:

- Type: Proprietary system.

Gratings: Install removable gratings over rainheads and sumps.

Leaf guard location: All gutter outlets.

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

Jointing method: Sealant joint

Access: Provide access openings as follows:

- At each junction and bend.
- At the foot of each stack.
- At every second floor level.

Type of access opening: Coordinate with the Hydraulic Engineer.

Acoustic insulation: Mineral fibre pipe insulation 50 mm thick, spirally bound on with 1.5 mm wire at 150 mm pitch.

Building in: If pipes are built into masonry or concrete, spiral wrap the pipe (and insulation, if any) with building paper.

Rainwater disposal

System: Refer and coordinate with the Hydraulic Engineer.

3.4 SKYLIGHTS

Installation

Standard: To AS 4285.

Fixing: Detail to the recommendations of the skylight manufacturer.

3.5 ROOF HATCHES

Installation

Fixing: Detail to the recommendations of the roof hatch manufacturer (SAYFA).

3.6 ROOF VENTILATORS

Roof ventilators

Fixing: Detail to the recommendations of the roof hatch manufacturer. Refer and coordinate with Mechanical Engineer.

3.7 ROOF ACCESS

Walkway

Installation: Refer to Worksection 0552 Metalwork – fabricated and 0193 Building access safety systems.

3.8 TESTING

Site tests

Internal downpipes: Test each stack hydrostatically in stages, each test to run over two storeys high for two hours. Remedy defects and retest if necessary.

3.9 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.

Damage to prepainted finish: Replace panels with scratches in the prepainted finish greater than 2 mm in width visible from the ground.

Fasteners: Make sure weathertight and external panel facings are not distorted.

Cleaning

Roofing and rainwater drainage system: Remove debris, metal swarf, solder, sealants and unused materials.

Exposed metal surfaces: Clean surfaces of substances that interfere with uniform weathering or oxidisation.

Roof plumbing: Clean out spoutings, gutters and rainwater pipes after completion of roof installation.

Warranties

Requirement: Provide warranties for materials and workmanship warranties in the form of interlocking warranties as follows:

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

4 SELECTIONS

4.1 PRODUCT

Profiled sheet metal roofing schedule

	A	B	C
Location	Refer to Material and Finishes Schedule.		
Product			
Profile			
Material			
Base metal thickness (BMT) (mm)			
Finish			
Colour			
Fasteners			
Insulation spacer type			

4.2 ROOF PLUMBING

Flashing and capping schedule

	A	B	C
Type	Refer to finishes schedule and coordinate with the Hydraulic Engineer.		
Product			
Material			
Thickness and grade			
Colour			

Roof plumbing schedule

Item	Type	Product	Material	Thickness/Grade	Colour/Shape/Size
Eaves gutter	Refer to finishes schedule and coordinate with the Hydraulic Engineer.				
Valley gutter					
Box gutter					
Rainhead					
Sump					
Downpipe					
Vent					
Hail guard					
Grate					
Leaf guard					

4.3 ROOF ACCESSORIES**Skylight schedule**

	A	B	C
Product	600x600 skylight system on metal roof. Refer specification on Appendix.		
Type			
Size (mm)			
Light shaft			
Ceiling diffuser			
Total system solar heat gain coefficient (SHGC)			
Total system U-Value (W/m ² .K)			
WERS for Skylights energy rating % heating			
WERS for Skylights energy rating % cooling			
Hail guard			

Roof hatch schedule

	A	B	C
Product	Refer to SAYFA specification.		
Size (mm)			

0431 CLADDING – COMBINED

1 GENERAL

1.1 RESPONSIBILITIES

General

Requirement: Provide external wall cladding and associated work, as documented.

Corrosion resistance

Material: To the manufacturer's recommendations for distance from marine influence.

1.2 CROSS REFERENCES

General

Requirement: Conform to the following:

- *0171 General requirements.*

1.3 INTERPRETATION

Abbreviations

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

- AAC: Autoclaved aerated concrete.
- CFC: Compressed fibre cement.
- FC: Fibre cement.
- GRP: Glass fibre reinforced polyester.
- MW: Mineral wool.
- PVC-U: Unplasticised polyvinyl chloride.

1.4 TOLERANCES

Permitted deviations

Flat sheet and panel cladding: To the manufacturer's recommendations.

Insulated panel systems: To the manufacturer's recommendations.

Plank and weatherboard cladding: 5 mm from a 1.8 m straightedge or to manufacturer's recommendations.

Profiled metal sheet cladding: To AS 1562.1 clause 4.2.3.

Structural steelwork for wall cladding: ± 5 mm between bearing planes of adjacent supports.

1.5 SUBMISSIONS

Fire performance

Combustibility: Submit evidence of conformity to PRODUCTS, **FIRE PERFORMANCE, Combustibility**.

Fire hazard properties: Submit evidence of conformity to PRODUCTS, **FIRE PERFORMANCE, Fire hazard properties**.

Fire-resistance level: Submit evidence of conformity to PRODUCTS, **FIRE PERFORMANCE, Fire-resistance of building elements**.

Operation and maintenance manuals

General: Submit manufacturer's published use, care and maintenance requirements.

Products and materials

Type tests: As appropriate for the project, submit results of facade testing as follows:

- Water penetration to AS/NZS 4284 .
- Structural testing to AS/NZS 4284 .
- Resistance to wind pressure:
 - . For non-cyclone regions to AS 4040.2.
 - . For cyclone regions to AS 4040.3 .

- Resistance to impact to AS/NZS 4040.5.

Prototypes

General: Erect a prototype of each panel type, including at least one example of each component in the system to verify selections submitted as samples, to demonstrate aesthetic effects, to set quality standards for materials and execution, and to verify performance, including wind loading.

Inclusions:

- Typical components, attachments to building structure and methods of installation.
- Window opening with cladding panel, trim and returns.
- Sealant filled joint.

Samples

Finish: Submit samples of the cladding material showing the range of variation available.

Sample size: 300 x 300 mm.

Shop drawings

General: 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.
- Coordination requirements with other work.
- Schedule of materials, finishes, componentry, hardware and fittings.

Subcontractors

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

Seamed sheet metal cladding: Submit evidence of experience with non-ferrous cladding installation.

Warranties

Requirement: Submit warranties to **COMPLETION, Warranties**.

Cladding materials: Submit the manufacturer's product warranties.

1.6 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.
- Completion of a prototype.

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.
- AAC panels: Stack on edge, support off the ground and level to avoid sagging and damage to ends, edges and surfaces.

- Composite panels: Store unpacked panels by size in racks and protect from scratching, warping or bending.
- Sheeting: Stack flat and off the ground on at least 3 evenly placed bearers.
- Store metal materials away from uncured concrete and masonry on a level base.
- Do not store metal materials in contact with other materials which may cause staining, denting or other surface damage.
- Use gloves when handling precoated metal cladding material.

General

Cladding support: Provide components, as documented.

2.2 FIRE PERFORMANCE

Combustibility

Cladding: Tested to AS 1530.1. Provide data sheet and certificate.

Fire hazard properties

Group number: To AS 5637.1. Provide data sheet and certificate. Non-sprinklered buildings: Wall and ceiling linings must either have an average specific extinction area less than 250m²/kg or a smoke growth rate index not more than 100 as determined by AS 5637.1.

Bonded laminated materials: Tested to AS/NZS 1530.3. Fire hazard indices, as follows:

- Spread-of-Flame Index: 0.
- Smoke-Developed Index: ≤ 3.

Insulation materials: Tested to AS/NZS 1530.3. Fire hazard indices as follows:

- Spread-of-Flame Index: ≤ 9.
- Smoke-Developed Index: ≤ 8 if Spread-of-Flame Index > 5.
- Refer BCA Spec C1.10 Table 4.

Fire-resistance of building elements

Fire-resistance level: Tested to AS 1530.4.

Fire-stops

Requirement: Where fire-stops and smoke flashings are placed between inner faces of the cladding and building elements (such as beam, slab or column faces), install and seal to meet fire test requirements.

Product: Contractor to provide datasheet of the proprietary product.

2.3 AERATED AUTOCLAVED CONCRETE (AAC) PANELS

General

Requirement: Proprietary AAC panels.

Standard: To AS 5146.1.

Joint adhesive: Proprietary adhesive to the manufacturer's recommendations.

Sealant: Flexible sealant to the manufacturer's recommendations.

2.4 COMPRESSED FIBRE CEMENT (CFC) SHEETS

General

Requirement: Proprietary compressed fibre cement sheets.

Standard: To AS/NZS 2908.2 and the following:

- Type A Category 5.

Finish: Smooth and even with factory sealed edges, free of imperfections such as chips.

Edge profile: Square.

Sealant and bond breaking tape: To the manufacturer's recommendations.

2.5 EXTERIOR INSULATION AND FINISH SYSTEM (EIFS)

General

Requirement: Proprietary system comprising rigid insulation panels, fixed to a subframe and finished on one or both sides with a cementitious base coat and finish coat.

2.6 FIBRE CEMENT (FC) PLANKS

General

Requirement: Proprietary single faced fibre cement building planks.

Standard: To AS/NZS 2908.2 and the following:

- Type A Category 3.

Corners: Preformed metal joining pieces.

2.7 FIBRE CEMENT (FC) SHEETS

General

Requirement: Proprietary single faced fibre cement sheets.

Standard: To AS/NZS 2908.2 and the following:

- Type A Category 3.

Finish: Smooth and even, free of imperfections such as chips.

Sealant and bond breaking tape: To the manufacturer's recommendations.

2.8 HARDBOARD PLANKS

General

Requirement: Proprietary wet process fibreboard planks.

Standard: To AS/NZS 1859.4.

Classification: Exterior.

Plank thickness: 9.5 mm.

External corners: Preformed metal joining pieces.

Internal corners: Scribed.

2.9 PROFILED SHEET METAL

General

Requirement: Proprietary profiled sheet metal cladding.

Design and installation: To AS 1562.1.

3 EXECUTION

3.1 GENERAL

Preparation

Substrates or framing: 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.

Installation

Standard: To AS 1562.1.

Requirement: Install cladding as follows:

- Fix sheeting 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.

Corner flashing for profiled and seamed metal sheets: Finish off at corners with purpose-made folded flashing strips.

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, chipped, scratched, abraded or broken members.

Damaged parts: Remove and replace damaged parts during installation.

3.2 AAC PANEL CLADDING

Installation

Standard: To AS 5146.3.

Joint adhesive: Apply to vertical and horizontal joints. Remove excess adhesive from the face after panels are butted together.

Sealant: Caulk control joints, gaps between panels and infill or penetration framing with flexible sealant.

Vertical joints: Finish flush.

Cracking: For render finishes, minimise cracking at joints to the manufacturer's recommendations.

Use mesh at external corners, corners of plays and joints other than control joints.

3.3 CFC SHEET CLADDING

Joints

Control joint:

- Locate between the panel and fixing system and the supporting structure, as documented.
- Sheet edges: Square cut.
- Sealant: Do not apply finish coating over joint sealants.

Prefinished metal backing/jointing strip: Fix proprietary backing strip to the rear face of the panel with proprietary closed cell self-adhering foam and horizontal gasket.

- Seal the joint with a 3 mm epoxy fillet.

Vertical joints: Vertical gasket or prefinished jointing strip to framing member.

Arrangement: Set out in even panels with joints coinciding with framing or as documented.

Fixing

General: Screw fix to proprietary framing supports at centres to the manufacturer's recommendations.

Concealed fixings:

- Predrill oversized holes.
- Countersink so that the top of the screw is 2 to 3 mm below the surface.
- Finish: Stop screw heads with epoxy filler. Smooth and level upon application and sand flush after curing.

3.4 FC SHEET CLADDING

Joints

Control joints:

- Locate between the panel and fixing system and the supporting structure, as documented.
- Sheet edges: Square cut.
- Sealant: Do not apply finish coating over joint sealants.

Arrangement: Set out in even panels with joints coinciding with framing or as documented.

Fixing

General: Corrosion-resistant nails or screws to the manufacturer's recommendations.

Eaves and soffit lining: Fix at 150 mm centres to soffit bearers at a maximum of 450 mm centres.

3.5 PROFILED SHEET METAL CLADDING

General

Installation: To AS 1562.1.

Ground clearance: Maintain documented clearance.

Cutting sheets: Wherever possible, factory cut to length. Do not use an abrasion disc.

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

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

Joints

Expansion joints: Refer to manufacturer's recommendation.

3.6 COMPLETION

Fasteners

Requirement: Adjust for weathertightness 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 prepainted finish: Replace panels with scratches in the prepainted finish.

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 oxidisation.

Protection: Remove protective coatings using methods required by the manufacturer after completion.

Panels: Clean surfaces with soft, clean cloths and clean water to the manufacturer's recommendations.

Warranties

Requirement: Cover materials and workmanship in the form of Back-to-Back warranties from the supplier and installer.

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

4 SELECTIONS

4.1 PRODUCT

FC sheet cladding schedule

	A	B	C
Product	Refer to Material and Finishes Schedule.		
Fixing system			
Thickness (mm)			
Length (mm)			
Width (mm)			
Finish			

	A	B	C
Colour			
Joints			
Edge profile			
Panel edge treatment			
Corners			
Soffit lining perforations			
Trims			
Control joint width			
Flashings and cappings			
Fasteners			

Profiled sheet metal cladding schedule

	A	B	C
Product	Refer to Material and Finishes Schedule.		
Fixing system			
Profile			
Material type			
Thickness (mm)			
Colour			
Trims			
Flashings and cappings			
Fasteners			

0451P AWS ALUMINIUM WINDOWS AND DOORS**1 GENERAL****1.1 RESPONSIBILITIES****General**

Requirement: Provide AWS aluminium windows and doors, as documented.

1.2 COMPANY CONTACTS**AWS Architectural Window Systems technical contacts**

Website: www.awsaustralia.com.au/blog/contact-us/.

1.3 CROSS REFERENCES**General**

Requirement: Conform to the following:

- 0171 General requirements.

1.4 STANDARDS**General**

Selection and installation: To AS 2047.

Building classification: Residential: BCA Class 2

Glazing

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

Materials and installation: To AS 1288.

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

1.5 MANUFACTURER'S DOCUMENTS**Technical manuals**

Commercial: **Elevate Aluminium Systems** – www.elevatealuminium.com.au.

Specifiers' Guides and CAD drawings: www.specifyaws.com.au.

1.6 INTERPRETATION**Abbreviations**

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

- AGWA: Australian Glass and Window Association (formerly Australian Window Association (AWA)).
- WERS: Window Energy Rating Scheme.

Definitions

General: For the purposes of this worksection, the definitions given in AS/NZS 4668 and the following apply:

- Aluminium joinery: The collective term used for aluminium framed and glazed windows and doors.
- Hardware: To AS 4145.1 Section 2.
- Total system SHGC: Solar heat gain coefficient as defined by the NCC and tested in conformance with NFRC 200.
- Total system U-value: Thermal transmittance as defined by the NCC and tested in conformance with NFRC 100.

1.7 SUBMISSIONS**Certification**

Conformance: Submit evidence that window and door assemblies conform to AS 2047.

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.

Protection of openable windows: Submit a certificate of on-site fall prevention testing.

Fire performance

Fire-resistance level: Submit evidence of conformity to PRODUCTS, **FIRE PERFORMANCE, Fire-resistance of building elements**.

Operation and maintenance manuals

AWS operation and maintenance manual: Submit on completion.

Products and materials

Safety glazing materials: Submit evidence of conformity to AS/NZS 2208 Appendix A.

Type tests: Submit results, as follows:

- Acoustic performance of windows and doors.
- Protection of openable windows.

Prototypes

Sample installations: Install the designated typical aluminium joinery assemblies in their final position incorporating at least one example of each component in the system, including attachments to the structure, flashing, caulking, sealing, glazing, operating hardware, locks and keys.

Required prototypes: Window type W11a (Awning with Fire Attenuation Screen to internal face)

Samples in prototypes: Required samples may form part of prototypes.

Samples

Window and door framing: Submit the following:

- Colour samples of prefinished production materials showing the limits of the range of variation in the documented colour.
- Joints made by proposed techniques.
- Sections for frames, sashes, louvres and slats.

Glazing: Submit samples of glazing materials, each at least 200 x 200 mm, showing the visual properties and range of variation, if any, for each of the following:

- Tinted or coloured glass or glazing plastics.
- Surface modified or surface coated glass.
- Patterned or obscured glass or glazing plastics.
- Ceramic-coated glass.
- Wired glass.
- Mirror glass.

Hardware and accessories: Submit samples of the following:

- Window manufacturer's standard hardware and accessories including locks, latches, handles, catches, sash operators, anchor brackets and attachments, masonry anchors and weatherseals (pile or extruded).
- Generic hardware: Submit samples of generic hardware not documented as proprietary items.

Labelling: Label each sample, with the series code reference and date of manufacture.

Shop drawings

General: Submit shop drawings to a scale that best describes the detail, showing the following:

- Full size sections of members.
- Hardware, fittings and accessories including fixing details.
- Junctions and trim to adjoining surfaces.
- Layout (sectional plan and elevation) of the window assembly.
- Lubrication requirements.
- Methods of assembly.
- Methods of installation, including fixing, caulking and flashing. To be in accordance with BCA 3.12.. and BCA J3.4.
- Provision for vertical and horizontal expansion.
- Method of glazing, including the following:
 - . Rebate depth.

- . Edge restraint.
- . Clearances and tolerances.
- . Glazing gaskets and sealant beads.

Subcontractors

General: Submit names and contact details of proposed subcontractors endorsed by AWS Architectural Window Systems Pty Ltd.

Warranties

Requirement: Submit AWS warranty.

1.8 INSPECTION

Notice

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

- Openings prepared to receive windows.
- 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

Product substitution

Other products: Conform to **SUBSTITUTIONS** in *0171 General requirements*.

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 plaster, mortar, paint and welding splatter.

Handling: Handle frames to the manufacturer's recommendations and the following:

- 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.

Acoustic performance

Windows and doors: Rating to AS/NZS ISO 717.1.

Protection of openable windows

Fall prevention: To BCA D2.24 and BCA 3.9.2.

Testing: To AS 5203.

Product identification

General: Marked to show the following:

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

Marking

Window assemblies: To AS 2047 Section 8.

2.2 FIRE PERFORMANCE

Fire-resistance of building elements

Fire-resistance level: Tested to AS 1530.4.

2.3 GLASS AND GLAZING

Performance

Glass: Free from defects which detract from appearance or interfere with performance under normal conditions of use.

Glazing plastics: Free from surface abrasions, and warranted by the manufacturer for 10 years against yellowing or other colour change, loss of strength and impact resistance, and general deterioration.

Heat soaking

Requirement: Heat soak the following:

- Toughened glass.
- Heat strengthened glass with a surface compression greater than 52 MPa tested to ASTM C1279.

Standard: To EN 14179-1.

Marking: To EN 14179-1 or certified by the manufacturer to AS 1288 clause 3.8.2.

Marking: To AS/NZS 2343 clause 8.

Heat strengthened glass

Requirement: Heat strengthened annealed glass that requires extra strength and thermal resistance.

Standard: To ASTM C1048.

Opacified glass

Description: Glass with an opacifier permanently bonded to the inner face.

Insulating glass units (IGUs)

Manufacture, testing and installation: To AS 4666.

Glass thickness selection: To AS 1288.

2.4 GLAZING MATERIALS

General

Requirement: Putty, glazing compounds, sealants, gaskets, glazing tapes, spacing strips, spacing tapes, spacers, setting blocks and compression wedges appropriate for the conditions of application and required performance.

Jointing materials

Requirement: Provide jointing and pointing materials to manufacturer's recommendations that 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 compound (polyurethane, polysulfide, acrylic): To ASTM C920 or ISO 11600.

Sealing compound (silicone): To ASTM C920 or ISO 11600.

Sealing compound (butyl): To ASTM C1311.

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.

2.5 INSECT SCREENS

Fixed screens

General: Provide fixed screens fitted to the window frames with a clipping device that permits removal for cleaning.

Aluminium framed screens

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

Mesh: Bead the mesh into the frame channel with a continuous resilient gasket, so that the mesh is taut and free of distortion.

2.6 ALUMINIUM FRAME FINISHES

Powder coatings

Standard: To AS 3715.

Product: Commercial grade powder coated system (Dulux Duratec or AkzoNobel Interpon D2525)

Powder coat thickness: ≥ 50 microns to 90 microns.

Colour: Refer to Material and Finishes Schedule

Gloss level: Refer to Material and Finishes Schedule

2.7 ANCILLARY COMPONENTS AND FITTINGS

Trims

General: Provide trims, shadow gaps and architraves as documented.

Extruded gaskets and seals

General: Provide seals, as documented and recommended by manufacturer to achieve relevant Australian Standards water proofing requirement.

Materials: Non-cellular (solid) elastopressive seals as follows:

- Flexible polyvinyl chloride (PVC): To BS 2571, 100% solids with high consistency, ultraviolet stabilised.
- Rubber products (neoprene, ethylene propylene diene monomer (EPDM) or silicone rubber): To BS 4255-1.

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.

Nylon brush seals

General: Dense nylon bristles locked into steel 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 instructions.

Pile weather strips

Standard: To AAMA 701/702.

Location: To all external windows and doors.

Materials: Polypropylene or equivalent pile and backing, low friction silicone treated, ultraviolet stabilised.

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: A weather bar for hinged external doors, located under the centres of closed doors.

Type: Junction between sill and door leaf or in place of a sill.

Threshold drain

General: If the frame includes a threshold member, provide a self-draining section with anti-slip surface.

2.8 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 4145.3.

Performance:

- Durability: DW2
- Physical security: SW1

- Keying security: K1

Window catches: Provide 2 catches per sash to manually latched awning or hopper sashes over 1000 mm wide.

Sash balances

Requirement: Match the spring strength of the balances to the sash weight they support.

Sash operators

Requirement: Provide sash operators, as documented.

2.9 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

Requirement: Keying system, as documented.

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 table

Code	Key type	Minimum number of keys
KD	Locks keyed to differ	2 for each lock
KA#	Locks keyed alike:	
	- 2 locks in code group	4
	- 3-10 locks in code group	6
	- 11-40 locks in code group	10
	- 41 and over locks in code group	1 for every 4 locks or part thereof

3 EXECUTION

3.1 GLASS PROCESSING

General

Processing: Perform required processes on glass, including cutting, obscuring, silvering and bending. Form necessary holes, including for fixings, equipment, access openings and speaking holes. Process exposed glass edges to a finish not inferior to ground arrised.

3.2 INSTALLATION

Glazing

Requirement: 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 glass and glazing materials.
- No transfer of building movements to the glass.
- Watertight and airtight for external glass.

Temporary marking: Use a method which does not harm the glass. Remove marking on completion.

Toughened glass: Do not cut, drill, edge-work or permanently mark after toughening. Use installation methods which 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

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

Windows and glazed doors

General: Install windows and glazed doors 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 penetrating the building between the window frame and the building structure under the prevailing service conditions, including normal structural movement of the building.

Fixing

Fasteners and fastener spacing: Conform to AWS Architectural Window Systems manuals available at their relevant website:

- Commercial: **Elevate Aluminium Systems**.
- Residential: **Vantage Design**.

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

Fasteners: Conceal fasteners.

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.

Trim

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

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 fasteners: Provide a corrosion-resistant finish.
- Exposed fasteners: Match exposed fasteners to the material being fixed.

Support: Provide appropriate back support (for example lock stiles, blocking, wall noggings and backing plates) for hardware fasteners.

- 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.

Proprietary window systems

Requirement: Provide the standard hardware and internal fixing points for personnel safety harness attachment, if required by and conforming to the governing regulations.

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 window 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 contract administrator 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 or alkaline materials.

Extent: All frames and glass surfaces inside and out.

Warranties

Aluminium joinery excluding hardware:

- Form: Against failure of materials and execution under normal environment and use conditions.
- Period: 6 years, conditional on compliance with the AGWA Code of Conduct.

Powder coating:

- Dulux Duratec:
 - . Film integrity: 20 years.
 - . Colour integrity: 15 years.
- AkzoNobel Interpon D 2525:
 - . Film integrity: 25 years.
 - . Colour integrity: 15 years.

Hardware supplied by Vantage: AWS MIRO and AWS TRUT Awning Winder

Hardware supplied separately: Consult with AWS.

4 SELECTIONS**4.1 COMMERCIAL WINDOWS AND DOORS – ELEVATE ALUMINIUM SYSTEMS****Commercial window and sliding door schedule**

Type	Description	Series	Glazing	Hardware
	Commercial Door – Double glazed 50 mm thick Hinged/Sliding	52	Refer to Window Elevation Drawing and Material Finishes Schedule	MIRO

Commercial/Architectural window and sliding door schedule

Type	Description	Series	Glazing	Hardware
	Architectural Awning Casement Window - High performance dedicated awning/casement window utilising commercial sashes	466	Refer to Window Elevation Drawing and Material Finishes Schedule	TRUTH
	High Performance SlideMASTER™ Sliding Door - Extra strong multi-stacking sliding doors specifically designed for high wind and water loads and the ability for a flush transition threshold	704	Refer to Window Elevation Drawing and Material Finishes Schedule	MIRO
	High Performance SlideMASTER™ Sliding Door. Series 704 B is a bottom rolling sliding door with minimal sill recesses.	704 B	Refer to Window Elevation Drawing and Material Finishes Schedule	MIRO

Commercial/Shopfront framing schedule

Type	Description	Series	Glazing	Hardware
	FrontGLAZE™ Double Glazed (102 mm x 60 mm) Framing – Fixed framing compatible with all commercial and architectural series systems	426	Refer to Window Elevation Drawing and Material Finishes Schedule	MIRO

4.2 TRICKLE VENTILATION SYSTEM - AWS VENTIENT**Ventilation schedule**

	A	B	C	D
Window type	All apartment sliding doors			
Ventilator type	Standard sub-head 100mm. To be coordinated.			

4.3 PERFORMANCE**Window and glazed door performance schedule**

	A	B	C
Total system U-Value (W/m ² .K)	Refer to Window elevation drawing and Material Finishes Schedule.		
Total system SHGC			
Airborne sound insulation			

	A	B	C
Visible transmittance (T _{vis})			
Reflectance (%)			
WERS Energy rating%: Heating			
WERS Energy rating%: Cooling			
AGWA Compliance Certificate			
Water penetration resistance (Pa)			
Fire-resistance level (FRL)			
Ultimate limit state (ULS) wind pressure (Pa)			
Serviceability limit state (SLS) wind pressure (Pa)			
Openable (free) area (m ²)			

4.4 SCREENS

Screen schedule

	A	B	C
Product name	GREENFIRE Fire Attenuation Screen		
Generic description	Fire Attenuation Screen as specified in Window Elevation drawing.		
Frame material			
Frame finish			
Mesh type			

Glass schedule

	A	B	C
Glass type	Refer to Window elevation drawing and Material Finishes Schedule. Contractor to submit all glazing specification and ensure they meet Section J Requirement as nominated by ESD Engineer.		
Glass thickness (mm)			

4.5 ANCILLARY COMPONENTS AND FITTINGS

Window and glazed door seal schedule

	A	B	C
Product	As per manufacturer's recommendation and to meet Fire Engineering Requirement.		
Function			
Carrier material and finish			
Seal insert type and material			

	A	B	C
Complementary seal			

Threshold drain schedule

	A	B	C
ACO FlowTHRU Integrated Stainless Steel Threshold Drain	Refer to FF&E Schedule for Series AWS704 Sliding door at ground level.		

0453B DOORS AND ACCESS PANELS**1.1 CROSS REFERENCES****General**

Requirement: Conform to the following:

- 0171 General requirements.
- 0185 Timber products, finishes and treatment.
- 0455 Door hardware.

1.2 STANDARDS**General**

Timber and composite doors: To AS 2688.

1.3 INTERPRETATION**Definitions**

General: For the purposes of this worksection, the definitions given in AS 2688 and the following apply:

- Fire-resisting doorset: A doorset which retains its integrity, provides insulation and limits, if required, the transmittance of radiation in a fire.
- Smoke-doorset: A doorset which restricts the passage of smoke.

1.4 SUBMISSIONS**Products and materials**

Type tests: Submit results, as follows:

- Fire-resisting and smoke doorsets.
- Acoustic performance of doorsets.

Warranties

Requirement: Submit warranties to **COMPLETION, Warranties**.

1.5 INSPECTION**Notice**

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

- Door frames in place before building in to masonry.
- Door frames installed before fixing trim.

2 PRODUCTS**2.1 FRAMES****Aluminium frames**

Construction: 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 slip-resistant surface.

Steel frames

Construction: Continuously welded from metallic-coated steel sheet sections, including accessories such as buffers, strike plates, spreaders, mortar guards, 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 (minimum):

- General: 1.1 mm.
- Fire-resisting doorsets: 1.5 mm.

- Security doorsets: 1.6 mm.

Metallic-coating class to AS 1397 interior: 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.

Timber frames

Hardwood: To AS 2796.1:

- Grade: Select.

Softwood: To AS 4785.1:

- Grade: Select.

Joints:

- Morticed head and through tenons.
- Trenched head:
 - . Bare faced tenons on jambs.
 - . Full let-in jambs.

Construction: Assembled from timber sections, with provision for fixing documented hardware including rebates for door seals, where documented.

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.
- Wet process fibreboard (including hardboard): To AS/NZS 1859.4.
- Dry process fibreboard (including medium density fibreboard): To AS/NZS 1859.2.
- Particleboard: To AS 1859.1.
- Plywood and blockboard for interior use: To AS/NZS 2270.
- Plywood and blockboard for exterior use: To AS/NZS 2271.
- Seasoned cypress pine: To AS 1810.
- Timber – hardwood: To AS 2796.1.
- Timber – softwood: To AS 4785.1.

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.

Joinery doors

General: Provide joinery doors, as documented.

Flush panel doors

General: Provide flush panel doors of balanced construction, as documented.

Medium density fibreboard doors: Single thickness of moisture resistant general purpose medium density fibreboard with the same surface finish to both sides, for internal use.

Construction

General: To AS 2688.

Adhesives:

- Internal: To AS/NZS 2270.
- External: To AS/NZS 2271.

Door thickness:

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

Cut-outs: If openings are required in flush panel doors (e.g. for louvres or glazing), do not make cut-outs closer than the width of the stiles at the edges of the doors.

Edge strips: 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 the external edges of door after the facings are bonded to the door framing/core and finish flush with outside surface of the facings.

Louvre grilles: Construct by inserting the louvre blades into a louvre frame, and fix the frame into the door.

Double doors

Square edged doors: Bevel as necessary to prevent binding between the leaves.

Rebated meeting stiles: If not double acting doors, provide rebated meeting stiles or fix equivalent metal T stop to one leaf where documented. Form rebates to suit standard rebated hardware.

2.3 DOORSETS

Marking and labelling

Fire-resisting doorsets: To AS 1905.1, Section 6.

Doors and doorsets: To AS 2688, clause 2.5.

Acoustic performance

Doorsets: Rating to AS/NZS ISO 717.1.

Automatic door assemblies

Standard: To AS 5007.

Control systems: To *0455 Door hardware*.

Cavity sliding doors

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

Duct access panels

General: Proprietary products comprising metal-faced doors side-hung to steel door frames, including hardware and accessories such as hinges and lock and installation lugs.

Fire-resisting doorsets

Standard: To AS 1905.1 and BCA Spec C3.4.

Floor access panels

Frame: Weld from 50 x 50 x 6 mm angle, with two 40 mm cogged fixing lugs each side and shop prime.

Covers: 6.5 mm checker floorplate, on 40 x 40 x 6 mm angle welded frame with 32 x 6 mm diagonal stiffening flats. Cut, radius and grind off 100 x 25 mm lifting slots in each end of covers.

Security screen doorsets

Standard: To AS 5039.

Smoke doorsets

Construction: Solid core doors not less than 35 mm thick.

Standard: To AS 6905 and BCA Spec C3.4.

2.4 ANCILLARY MATERIALS

Trims

General: Provide trims, shadow gaps and architraves as documented.

Extruded gaskets and seals

Materials: Non-cellular (solid) elastopressive seals as follows:

- Flexible polyvinyl chloride (PVC): To BS 2571, 100% solids with high consistency, ultraviolet stabilised.
- Rubber products (neoprene, ethylene propylene diene monomer (EPDM) or silicone rubber): To BS 4255-1.

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.

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 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.

Pile weather strips

General: Polypropylene or equivalent pile and backing, low friction silicone treated, ultraviolet stabilised, fixed to the door or frame to the manufacturer's instructions.

Standard: To AAMA 701/702.

Weather bars

General: Provide a weather bar under hinged external doors, locate under the centres of closed doors.

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.

Depth of fixing for building into masonry:

- Brackets: Minimum 200 mm.
- Expansion anchors: Minimum 50 mm.
- Plugs: Minimum 50 mm.
- Rods: Minimum 60 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

Building into masonry: Screw galvanized steel brackets twice to jambs and build in.

Fixing to masonry openings: Use proprietary expansion anchors and screw twice through jambs at each fixing.

Fixing to stud frame openings: Screw once to studs at each fixing.

Steel frames

Building into masonry: Attach galvanized steel rods to jambs, build in and grout up.

Fixing to masonry openings: Build in hairpin anchors and install locking bars, or use proprietary expansion anchors and screw twice through jambs at each fixing.

Fixing to stud frame openings: Attach galvanized steel brackets to jambs and screw twice to studs at each fixing.

Timber frames

Building into masonry: Screw galvanized steel brackets twice to jambs and build in.

Fixing to masonry openings: Use proprietary expansion anchors and screw twice through jambs at each fixing.

Fixing to stud frame openings: Back screw twice to jambs at each fixing.

Fixing to thresholds: Dowel external door frames to thresholds other than timber with 10 mm diameter brass dowels, 100 mm long.

Heads of fasteners: Conceal if possible, otherwise sink the head below the surface and fill the sinking flush with a material compatible with the surface finish.

Finishing

Trim: Provide mouldings, architraves, reveal linings, and other internal trim using materials and finishes matching the door frames 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

Priming

General: Prime timber door leaves on top and bottom edges before installation.

Tolerances

Installation: To AS 2688, Section 7.

3.3 DOORSETS

General

Installation: To AS 2688 Section 7.

Security screen doorsets

Standard: To AS 5040.

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.

Opening force performance: To AS 1428.1.

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.

Warranties

General: Provide warranties as offered by the manufacturer.

Test certificates: Provide type test certificates for fire-resisting, smoke and acoustic doors and doorsets.

4 SELECTIONS

4.1 DOOR TYPES SCHEDULE

Flush panel doors construction schedule

	A	B	C
Door type	Refer to door elevation drawing and schedule.		
Door thickness (mm)			
Core material			
Facing material			
Face veneers: Matching arrangement			
Face veneers: Timber species or group			

	A	B	C
Face veneers: Veneer quality			
Edge strip thickness (mm)			
Inset panels: Type			
Inset panels: Clear opening size (mm)			
Finish			
Floor clearance			

Joinery doors construction schedule

	A	B	C
Door type	Refer to door elevation drawing and schedule.		
Door thickness (mm)			
Adhesive			
Timber species or group			
Timber grade			
Finished sizes (mm): Top rails and stiles			
Finished sizes (mm): Intermediate rails			
Finished sizes (mm): Bottom rails			
Finished sizes (mm): Muntins			
Panels: Material			
Panels: Thickness (mm)			
Finish			
Floor clearance			

Door seal schedule

	A	B	C
Product	Door seal as required based on door type.		
Function			
Carrier material and finish			
Seal insert type and material			
Complementary seal			

4.2 DOORSETS SCHEDULE**Doorsets performance schedule**

	A	B	C
Fire-resistance level (FRL)	Refer to door elevation drawing and schedule.		

	A	B	C
Airborne sound insulation			

Fire-resisting doorsets construction schedule

	A	B	C
Automatic closure: Action	As required based on door type. Refer to Door elevation drawing and schedule.		
Edge strip thickness (mm)			
Face veneers: Matching arrangement			
Face veneers: Timber species or group			
Face veneers: Veneer quality			
Fire-resistance level (FRL)			
Glazing			
Hardware: Item			
Hardware: Material			
Hardware: Finish			
Door seals			

Automatic doorset schedule

	A	B	C
Pedestrian traffic	As required based on door type. Refer to Door elevation drawing and schedule.		
Door configuration			
Drive type			
Drive location			
Motion sensor control device			
Proprietary door suite			
Glazing			
Safety markings			
Aluminium frame finish			
Powder coating: Service condition category			
Powder coating: Coating performance			
Powder coating: Coating type			
Powder coating: Polyester coating grade			
Powder coating: Product			

	A	B	C
Powder coating: Gloss level			
Colour			
Design wind pressure			
Lock type			
Door seals			

0453P CS CAVITY SLIDERS IN DOORS AND ACCESS PANELS

1 GENERAL

1.1 RESPONSIBILITIES

General

Requirement: Provide CS Cavity Sliders sliding pockets, doors and associated hardware, as documented.

1.2 COMPANY CONTACTS

CS Cavity Sliders technical contacts

Website: www.cavitysliders.com.au/Contact-Us.

1.3 CROSS REFERENCES

General

Requirement: Conform to the following:

- *0171 General requirements.*
- *0185 Timber products, finishes and treatment.*
- *0455 Door hardware.*

1.4 STANDARDS

General

Timber and composite doors: To AS 2688.

1.5 MANUFACTURER'S DOCUMENTS

Technical manuals

Products: www.cavitysliders.com.au/products.

Specifier's guide: www.cavitysliders.com.au/architects.

1.6 INTERPRETATION

Definitions

General: For the purposes of this worksection, the definitions given in AS 2688 and the following apply:

- Fire-resisting doorset: A doorset which retains its integrity, provides insulation and limits, if required, the transmittance of radiation in a fire.
- Smoke-doorset: A doorset which restricts the passage of smoke.

1.7 SUBMISSIONS

Operation and maintenance manuals

Recommendations: Submit CS Cavity Sliders published recommendations for service use.

Products and materials

Type tests: Submit results, as follows:

- Fire-resisting and smoke doorsets.
- Acoustic performance of doorsets.

Samples

General: Submit 2 samples as follows:

- Colour range from prefinished production material (e.g. anodised or organic coated extrusions and sheet). Following the colour selection, submit 5 sets of samples showing the colour range.
- Door manufacturer's standard hardware items.
- Finishes to prepared surfaces (e.g. timber stains or veneers).
- Joints using proposed techniques.
- Proposed sections for frames, louvres and slats.

Warranty

Requirement: Submit CS Cavity Sliders warranty.

1.8 INSPECTION

Notice

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

- Door frames in place before building in to masonry.
- Door frames installed before fixing trim.

2 PRODUCTS

2.1 GENERAL

Product substitution

Other products: Conform to **SUBSTITUTIONS** in *0171 General requirements*.

Product identification

General: 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 FRAMES

Aluminium frames

Construction: 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 slip-resistant surface.

Steel frames

Construction: Continuously welded from metallic-coated steel sheet sections, including accessories such as buffers, strike plates, spreaders, mortar guards, 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 (minimum):

- General: 1.1 mm.
- Fire-resisting doorsets: 1.5 mm.
- Security doorsets: 1.6 mm.

Metallic-coating class to AS 1397 interior: 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.

Timber frames

Hardwood: To AS 2796.1:

- Grade: Select.

Softwood: To AS 4785.1:

- Grade: Select.

Joints:

- Morticed head and through tenons.

- Trenched head:
 - . Bare faced tenons on jambs.
 - . Full let-in jambs.

Construction: Assembled from timber sections, with provision for fixing documented hardware including rebates for door seals, where documented.

2.3 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.
- Wet process fibreboard (including hardboard): To AS/NZS 1859.4.
- Dry process fibreboard (including medium density fibreboard): To AS/NZS 1859.2.
- Particleboard: To AS 1859.1.
- Plywood and blockboard for interior use: To AS/NZS 2270.
- Plywood and blockboard for exterior use: To AS/NZS 2271.
- Seasoned cypress pine: To AS 1810.
- Timber – hardwood: To AS 2796.1.
- Timber – softwood: To AS 4785.1.

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.

Joinery doors

General: Provide joinery doors, as documented.

Flush panel doors

General: Provide flush panel doors of balanced construction, as documented.

Medium density fibreboard doors: Single thickness of moisture resistant general purpose medium density fibreboard with the same surface finish to both sides, for internal use.

Construction

General: To AS 2688.

Adhesives:

- Internal: To AS/NZS 2270.
- External: To AS/NZS 2271.

Door thickness:

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

Cut-outs: If openings are required in flush panel doors (e.g. for louvres or glazing), do not make cut-outs closer than the width of the stiles at the edges of the doors.

Edge strips: 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 the external edges of door after the facings are bonded to the door framing/core and finish flush with outside surface of the facings.

Louvre grilles: Construct by inserting the louvre blades into a louvre frame, and fix the frame into the door.

Double doors

Square edged doors: Bevel as necessary to prevent binding between the leaves.

Rebated meeting stiles: If not double acting doors, provide rebated meeting stiles or fix equivalent metal T stop to one leaf where documented. Form rebates to suit standard rebated hardware.

2.4 CS CAVITY SLIDERS PRODUCTS

CavitySliders™

General: Proprietary product comprising architectural grade extruded aluminium top track, back stud, bottom plate, and vertical split jambs and incorporating 2-wheel or 4-wheel fully enclosed carriages with fully ground bearings, guides, stops and timber jamb linings including closing jamb.

CS TimberFormed™: Extruded aluminium frame and track with timber jambs.

2.5 DOORSETS

Marking and labelling

Fire-resisting doorsets: To AS 1905.1, Section 6.

Doors and doorsets: To AS 2688, clause 2.5.

Acoustic performance

Doorsets: Rating to AS/NZS ISO 717.1.

Automatic door assemblies

Standard: To AS 5007.

Control systems: To 0455 Door hardware.

Duct access panels

General: Proprietary products comprising metal-faced doors side hung to steel door frames, including hardware and accessories such as hinges and lock and installation lugs.

Fire-resisting doorsets

Standard: To AS 1905.1 and BCA Spec C3.4.

2.6 ANCILLARY MATERIALS

Trims

General: Provide trims, shadow gaps and architraves as documented.

Extruded gaskets and seals

Materials: Non-cellular (solid) elastopressive seals as follows:

- Flexible polyvinyl chloride (PVC): To BS 2571, 100% solids with high consistency, ultraviolet stabilised.
- Rubber products (neoprene, ethylene propylene diene monomer (EPDM) or silicone rubber): To BS 4255-1.

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.

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 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.

3 EXECUTION

3.1 FRAMES

General

Frames: Install the frames are 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: ≥ 25 mm.

- Thickness: ≥ 1.5 mm.

Depth of fixing for building into masonry:

- Brackets: ≥ 200 mm.
- Expansion anchors: ≥ 50 mm.
- Plugs: ≥ 50 mm.
- Rods: ≥ 60 mm.

Jamb fixing centres: ≤ 600 mm.

Joints

General: Make accurately fitted joints where fasteners, pins, screws, adhesives and pressure indentations are not visible on exposed surfaces.

Aluminium frames

Building into masonry: Screw galvanized steel brackets twice to jambs and build in.

Fixing to masonry openings: Use proprietary expansion anchors and screw twice through jambs at each fixing.

Fixing to stud frame openings: Screw once to studs at each fixing.

Steel frames

Building in to masonry: Attach galvanized steel rods to jambs, build in and grout up.

Fixing to masonry openings: Build in hairpin anchors and install locking bars, or use proprietary expansion anchors and screw twice through jambs at each fixing.

Fixing to stud frame openings: Attach galvanized steel brackets to jambs and screw twice to studs at each fixing.

Timber frames

Building into masonry: Screw galvanized steel brackets twice to jambs and build in.

Fixing to masonry openings: Use proprietary expansion anchors and screw twice through jambs at each fixing.

Fixing to stud frame openings: Back screw twice to jambs at each fixing.

Fixing to thresholds: Dowel external door frames to thresholds other than timber with 10 mm diameter brass dowels, 100 mm long.

Heads of fasteners: Conceal if possible, otherwise sink the head below the surface and fill the sinking flush with a material compatible with the surface finish.

Finishing

Trim: Provide mouldings, architraves, reveal linings, and other internal trim using materials and finishes matching the door frames 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.

3.2 DOORS

Priming

General: Prime timber door leaves on top and bottom before installation.

Tolerances

Installation: To AS 2688, Section 7.

3.3 CS CAVITY SLIDERS

Installation

Requirement: Conform to CS Cavity Sliders installation recommendations and standard construction drawings.

3.4 DOORSETS

General

Installation: To AS 2688 Section 7.

Security screen doorsets

Standard: To AS 5040.

3.5 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.

Opening force performance: To AS 1428.1.

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.

Warranties

CS Cavity Sliders: Provide manufacturer's warranties as follows:

Product: Cavity Sliders, Track Systems

Period: 10 years

4 SELECTIONS

4.1 DOOR TYPES SCHEDULE

CS Cavity Sliders cavity sliding door schedule

	A	B	C
Product type	Refer appendix and to door elevation drawing and schedule.		
Location			
Wall framing size (mm)			
Wall lining thickness (mm)			
Leaf size (mm)			
Jamb finish			
Door type			
Door thickness (mm)			
Door finish			
Detail options			
Lock type			
Handle type			
Handle height (mm)			
Automatic units			

CS Cavity Sliders track systems schedule

	A	B	C
Product type	Refer to appendix and Door Elevation drawing and schedule.		
Number of tracks			
Stacking system			
Pelmet			
Pelmet finish			
Door type			
Door hardware			

0455P ASSA ABLOY DOOR HARDWARE**1 GENERAL**

1.1 RESPONSIBILITIES**General**

Requirement: Provide door hardware, as documented.

1.2 COMPANY CONTACTS**ASSA ABLOY technical contacts**

Website: www.assaabloy.com.au/en/local/au/contact/

Lorient door seals: www.lorient.com.au/contact

1.3 CROSS REFERENCES**General**

Requirement: Conform to the following:

- 0171 General requirements.
- ASSA ABLOY door hardware schedule.

1.4 MANUFACTURER'S DOCUMENTS**Technical manuals**

ASSA ABLOY materials and installation manuals:

www.assaabloyopeningsolutions.com.au/en/local/au/

Lorient door seal data sheets, installation manuals and CAD downloads: www.lorient.com.au

1.5 INTERPRETATION**Abbreviations**

General: For the purposes of this worksection, the abbreviations given in AS 4145.1 Appendix D apply.

Definitions

General: For the purposes of this worksection, the general definitions given in AS 4145.1 Section 2 and Appendix E apply.

1.6 SUBMISSIONS**Execution details**

Door hardware schedule: Submit a door hardware schedule, prepared by ASSA ABLOY Australia.

- Information sources: This worksection and the contract drawings.

Re-use of recovered hardware: Submit a proposal describing the standard of cleaning, repair and testing of recovered items and the location where each is to be reused.

Key control system:

- New works: 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.

Re-use of recovered hardware: Submit a proposal describing the standard of cleaning, repair and testing of recovered items and the location where each is to be reused.

Key control system:

- New works: 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

Automatic door operators: Submit the installer's proposal for continuing maintenance after completion on an annual renewal basis.

Manual: Submit the manufacturer's published recommendations for use, care and maintenance of the hardware provided.

Records

Door hardware schedule: Submit an amended schedule, prepared by ASSA ABLOY Australia or their designated door hardware supplier, showing changes to the contract door hardware schedule resulting from the following:

- Approval of a hardware sample.
- Acceptance of an ASSA ABLOY alternative to the specification.
- 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

Generic items: Submit samples of nominated hardware items.

Reconditioned items: Submit samples of hardware items offered as meeting the standard of cleaning, repair and testing of recovered items.

Particular samples required: Handle, Night latch, Closer

Subcontractors

Automatic door operators: Submit names and contact details of proposed supplier and installer.

Warranties

Requirement: Submit warranties, as documented.

2 PRODUCTS

2.1 GENERAL**Product substitution**

Other products: Conform to **SUBSTITUTIONS** in *0171 General requirements*.

Product identification

General: Marked to show the following:

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

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: 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.

Replacement items

Door hardware: Replacement items to match existing, or as documented.

Hinges: If required, upgrade hinges to conform to **Hinges for timber doors table** and **Hinges for aluminium doors table**.

2.2 LOCKS AND LATCHES

Standard

General: To AS 4145.2.

Padlocks

Standard: To AS 4145.4.

Lock and latch classification

Rating systems: To AS 4145.1 Section 3.

Performance requirements: To AS 4145.2 Section 3.

Commercial Project requirements:

- Key Latch Retraction.
- Universal Functionality.
- Australian Made.

Multi-Residential Project requirements:

- Rating systems: To AS 4145.1 Section 3.

2.3 HINGES

Butt hinge materials

Timber doors in timber or steel frames:

- Material: Stainless Steel
- Product: Lockwood series.

Aluminium framed doors in aluminium frames:

- Material: Stainless Steel
- Product: Interfold stainless steel or high tensile aluminium with fixed stainless steel pins in nylon bushes, and with nylon washers to each knuckle joint.

Heavy Duty doors: Provide severe duty hinges with phosphorus bronze bushings.

Doors fitted with closers: Provide low friction ball bearing hinges.

Fire-resisting doors: To AS 1905.1.

Power transfer hinges: Do not load and install with other compatible hinges.

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.

Timber solid core doors

Number of hinges: Determine the number of hinges required based on the nominated door leaf size 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 doors fitted with door closers with backcheck, add 20 kg to door weight.

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: To the door hardware schedule.
- For alternative hinge calculations, use ASSA ABLOY hinge calculator.

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, provide 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

Nominal door leaf size (L x W x T) (mm)	Door leaf weight (kg)	Number of hinges
2040 x 400 x 35	≤ 19	2
2040 x 600 x 35	≤ 29	2
2040 x 720 x 35	≤ 35	3
2040 x 820 x 35	≤ 39	3

Nominal door leaf size (L x W x T) (mm)	Door leaf weight (kg)	Number of hinges
2040 x 920 x 35	≤ 44	3
2040 x 1020 x 35	≤ 49	4
2040 x 720 x 40	≤ 37	3
2040 x 820 x 40	≤ 42	3
2040 x 920 x 40	≤ 48	3
2040 x 1020 x 40	≤ 52	4
2040 x 720 x 50	≤ 45	3
2040 x 820 x 50	≤ 50	3
2040 x 920 x 50	≤ 57	3
2040 x 1020 x 50	≤ 68	4
2400 x 720 x 40	≤ 50	4
2400 x 820 x 40	≤ 52	4
2400 x 920 x 40	≤ 55	4
2400 x 1020 x 40	≤ 60	4
2400 x 1220 x 50	≤ 72	5
2040 x 920 x 70	≤ 88	Pivot hinges

Aluminium doors

Application: Aluminium hinges for aluminium doors, or for doors of other materials in aluminium frames of a weight of 40 kg or less.

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 DOOR HANGING SYSTEMS

General

Requirement: Provide sliding door tracks and guides, as documented.

2.5 ANCILLARIES

Bolts

General: Barrel bolts, flush bolts and tower bolts with keepers, including lock plates, staples, ferrules or floor sockets.

Mortar guards

General: For steel door frame installations, provide mortar guards designed to allow the full extension of the lock tongue or similar devices and the correct operation of the locking mechanism.

Rebated doors

General: For mortice locks or latches to rebated doors, provide purpose-made rebated pattern items.

Strike plates

General: For steel door frame installations, provide strike plates designed to allow the full extension of the lock tongue or similar devices and the correct operation of the locking mechanism.

2.6 DOOR CONTROLLERS

Standard

General: To AS 4145.5.

Performance

Requirement: Door controllers, pivots, floor or overhead door closers, and automatic door operators, suitable for the door type, size, weight, sliding action and swings required and the operating conditions, including wind and air conditioning pressure.

Automatic doors

Glazed sliding:

- Proprietary item: ASSA ABLOY Entrance Systems.

Glazed revolving:

- Proprietary item: ASSA ABLOY Entrance Systems.

Glazed swinging:

- Proprietary item: ASSA ABLOY Entrance Systems.

Automatic door operators

General: Complete automatic door operators for opening and closing doors, including door hanging (hinges, pivots or sliding gear) and electrical connection to distribution board.

Requirement: Conform to the following:

- Access key switch: Refer to electrical drawing
- Automatic activation options: Push button.
- Manually adjustable function: Speed and Time (Holding Stay Open)
- Operation mode: Automatic: Normal Automatic operation.
- Power failure: Manual: Doors may be opened and closed manually with an operating force of not more than 110 N.

Installation: Provide necessary recesses and core-holes, grout in components where required, and repair any damage. Provide cover plates for access to units in door heads, frames or transoms.

Automatic adjustable function: If the door opening angle or width is manually set below the maximum possible, under conditions of continuous traffic the doors must automatically creep to full opening, returning to reduced opening on the next cycle.

Radio remote door controllers: Provide a device, comprising a radio receiver and separate transmitter, for activating a motorised door operator so as to open and close the door by remote radio signal.

Key switch: If there is no separate access to the enclosure, provide a key switch mounted externally for opening and closing the door from outside the enclosure without the transmitter. Provide two keys.

Light: Provide an internal light that turns on for not less than 2 minutes before switching off automatically.

Receiver: House within a wall unit incorporating a push-button switch permanently illuminated. Mount within the enclosure and connect to power.

Transmitter: Portable battery-powered unit sending a coded signal effective up to not less than 12 m from the receiver.

Pressure floor mats: Automatic door activating system consisting of a mat which when deflected by foot pressure operates a switch which activates the door or doors.

Floor mat mounting: Flush: Set in recess to finish flush with finished floor. with fixing and trim and sealant.

Closers

Hinged and pivot doors:

- Fire-resisting doors: Closers tested and certified for use as components of fire-resisting door assemblies:
 - . Standard: To AS 1905.1.

2.7 ELECTRONIC CONTROL DEVICES

General

Requirement: Electric strikes, electric locks, drop bolts and/or similar devices to suit door construction and hardware.

Electromagnetic hold-open devices: To AS 1905.1 and AS 1670.1.

Fail-safe: Connect door control devices in a fail-safe mode to permit egress in the event of power failure.

Fail-secure: Connect door control devices in a fail-secure mode to prevent egress in the event of power failure.

Glass doors: Tumbler, drop bolts or magnetic holders.

Double leaf doors (solid frame): Electric strike or lock on the inactive leaf, connected to the door frame by concealed flexible wiring.

Activation

Activation device: Keypads, card readers or other activation devices located next to entry points.

External: Weatherproof (IP56) hoods or housings for external units.

Mounting height: 900 to 1100 mm from floor level and not less than 500 mm from internal corners.

2.8 PANIC EXIT DEVICES

General

Standard: To EN 1125.

Requirements:

- Field sizable.
- Keyed dogging.

2.9 KEYING

Keying requirements

Standard: To AS 4145.2 for keying security

Requirement: Provide door hardware and keys, as documented.

Temporary construction keys and cylinders

Requirement: Provide one of the following:

- Loan cylinder, if specified: 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.

Locks keyed to differ and locks keyed alike: Check the quantity against key records, and deliver keys to the contract administrator at practical completion.

Group keying

Keying platform: TBC by client.

Key control level: Serviced level.

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 table

Key code	Key type	Minimum number of keys
GGMK	Great grandmaster keys	2
GMK	Grandmaster keys	2
MK	Master keys	2 per code group
KD	Locks keyed to differ	2 per lock

Key code	Key type	Minimum number of keys
KA	Locks keyed alike:	
	- 2 locks in code group	4
	- 3 to 10 locks in code group	6
	- 11 to 40 locks in code group	10
	- 41 and over locks in code group	1 per 4 locks or part thereof

2.10 DOOR SEALS

Standards

Quality management for manufacture: To ISO 9001.

Acoustic applications minimum standard: To BCA F5.5.

Acoustic applications: Tested to EN ISO 10140-2 and rated to AS/NZS ISO 717.1.

Fire door assemblies: To AS 1530.4 and in conformance with AS 1905.1.

Smoke door assemblies: To BCA Spec C3.4.

Smoke door assemblies: Performance based: Tested to AS 1530.7 and leakage in conformance with AS 6905.

Combined fire and smoke door assemblies: To BCA Spec C3.4, AS 1530.4, AS 1905.1 and AS 1530.7.

Doors for buildings in bushfire-prone areas: To AS 3959, AS 1530.4, AS 1530.8.1 and AS 1530.8.2.

Weather and energy sealing applications: To AS 4420.1 and AS 2047.

Access doors for people with disability: To AS 1428.1.

Aluminium extrusions

Material: Commercial grade alloy 6060 T5.

Finish to visible extrusions: Satin clear anodising, or as documented.

Thickness:

- Perimeter seal extrusions: Minimum 15 µm.
- Threshold plates and threshold plate seals: Minimum 20 µm.

PVC gaskets

Lorient proprietary grade PVC extrusions:

- Food grade with integral antimicrobial additive.
- Service temperature: -5° C to +70° C.

Silicone rubber gaskets

Lorient proprietary flame-retarded silicone rubber extrusions:

- Service temperature: -60° C to + 230° C.

Fasteners

Unexposed applications: Zinc-plated self-drilling/self-tapping fasteners supplied with each product.

External coastal exposure applications: Substitute the standard fasteners supplied with equivalent stainless steel versions.

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: [complete/delete]

Locks

Cylinders: Fix vertically and with consistent key alignment.

Door stops

Fixing: Fix on the floor, skirting or wall, as appropriate, to prevent the door or door furniture striking the wall or other surface.

Fasteners

Materials: Provide materials compatible with the item being fixed, and of sufficient strength, size and quality to perform their function.

- Concealed fasteners: Provide a corrosion-resistant finish to concealed fasteners.
- Exposed fasteners: Match exposed fasteners to the material being fixed.

Security: Locate exposed fasteners to lock furniture on the inside faces of external doors and on the inside faces of internal doors to lockable rooms.

Support: Provide appropriate back support (for example lock stiles, blocking, wall noggings and backing plates) for hardware fasteners.

- 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.

Door seals

Backset: Consider appropriate back set clearance requirements for hinging, latching furniture and automatic closers.

Installation: To the manufacturer's recommendations for each product.

Door assembly preparations: Mortise, semi-rebate or groove door assemblies to match the dimensions recommended in installation instructions.

Door seals for external doors in bushfire-prone areas table

BAL Level	Requirements
Low	None
12.5, 19, 29	Side hung doors: Install weather strips, draught excluders or draught seals at the base of doors.
40	Side hung doors: Install weather strips, draught excluders or draught seals at the base of doors. Seals to stiles, head and bottom to be silicone rubber. Sliding doors: Seals to stiles, head and sills or thresholds to be silicone rubber.
FZ	Side hung doors: Install weather strips, draught excluders or draught seals at the base of doors. Seals not to compromise the door fire resistance level. Side-hung external doors, including french doors, panel fold and bi-fold doors to have a fire resistance level of at least 30 minutes when tested in conformance with AS 1530.4.

Door seals for garage doors in bushfire-prone areas table

BAL Level	Requirements
Low	None
12.5, 19, 29, 40, FZ	Panel lift, tilt doors or side-hung doors: Fit with suitable weather strips, draught excluders, draught

BAL Level	Requirements
	seals or guide tracks, as appropriate to the door type, with a gap no greater than 3 mm. Roller doors: Guide tracks to have a gap no greater than 3 mm. Fit with a nylon brush that is in contact with the door.

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.

Automatic door operators: Maintain and adjust the system throughout the defects liability period.

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.

Warranties

Automatic door operators: Provide interlocking warranties from the supplier and installer covering materials and workmanship.

Mechanical Products: 25 Years

- Exception, Yale Mechanical Products: 10 Years.

4 SELECTIONS

4.1 PRODUCT FINISHES

General

Requirement: All hardware finishes to be Satin Chrome, or like finish depending on the availability and base material of the specified items.

Satin Chrome finishes: Plated using trivalent process.

- Exceptions for approval: Lockwood Velocity Series.

Hardware locations

Door hardware schedule: The following schedules describe the selected hardware item but do not indicate the locations or quantities. A door hardware schedule is required.

4.2 LOCK AND LATCH CLASSIFICATION

Durability rating

Door type	Durability designation to AS 4145.2 Table 3.2

Keying security

Door type	Keying security designation to AS 4145.2 Table 3.6

Cylinder security

Door type	Cylinder security designation to AS 4145.2 Table 3.3

Physical security of locks

Door type	Physical security designation of locks to AS 4145.2 Table 3.4

Physical security of locksets

Door type	Physical security designation of locksets to AS 4145.2 Table 3.5

Corrosion classification

Door type	Corrosion category to AS 4145.2 Table 3.7

4.3 ASSA ABLOY LOCKS AND LATCHES**Locks and latches schedule**

Door type	Brand / Product series	Comments
Generally		Refer to door hardware schedule in Appendix.

4.4 ASSA ABLOY FURNITURE**Furniture schedule**

Backplate Type	Brand/Product series	Comments
Rose	Lockwood 1360 Round Rose	

Door closer type:

- A: High performance.
- B: Medium performance.
- C: Low performance.

Door closer Type A location: [complete/delete]

Door closer Type B location: [complete/delete]

Door closer Type C location: [complete/delete]

Automatic door operators schedule

Brand	Item	Comments
ASSA ABLOY Entrance Systems		

4.5 MULTI-RESIDENTIAL HARDWARE KITS**Multi-residential hardware kits schedule**

Door type	Brand/Product series	Kit contents
Apartment Entry Door (Fire Door)	Simplicity Lever Kit	Simplicity Mortice Lock Simplicity Door Closer Size 3 Simplicity Passage lever Simplicity Cylinder Escutcheon
Apartment Entry Door (Fire Door)	Simplicity Lever Kit with Turn	Simplicity Mortice Lock Simplicity Door Closer Size 3 Simplicity Passage lever Simplicity Cylinder Escutcheon Simplicity Turnknob Escutcheon
Stairwell (Fire Door)	Simplicity Stairwell Kit	Simplicity Mortice Lock Simplicity Door Closer Y2600 Simplicity Passage lever Simplicity Cylinder Escutcheon

4.6 ASSA ABLOY ANCILLARY HARDWARE**Bolts schedule**

Type	Brand/ Product series	Size
Barrel		To suit door height
Flush timber		To suit door height
Flush aluminium		To suit door height
Skeleton		To suit door height
Auto		
Top latch		To suit door height

4.7 ASSA ABLOY DOOR HANGING SYSTEMS**Sliding track schedule**

Door type	Brand	Product series	Description	Accessories
	Henderson	Husky Sliding 50		
	Henderson	Husky Sliding 100		
	Henderson	Solitaire 120		
	Henderson	Solitaire 180		
	Henderson	Solitaire 250		

Door seal schedule

Function	Brand	Product series	Description	Finish

Door stop schedule

Type	Brand	Product series	Description	Finish

Coat hook schedule

Type	Brand	Product series	Description	Finish

Door protection schedule

Type	Brand	Material	Finish	Size (mm x mm)

4.8 PADLOCKS**Padlock schedule**

	Room or space group 1	Room or space group 2	Room or space group 3
Room or space type			
Security			
Keying security			
Durability			
Corrosion resistance			

4.9 DOOR SEALS**Acoustic door seal schedule**

Delete products not required for the project.

Door type	Rating	Lorient product	Comments
Single leaf 35 mm solid core door	Rw30	LAS1212 Batwing + LAS8001si LAS7001si + LAS8001si	Concealed fixing: Fit LAS1212 Batwing to head and sides of door frame and fully mortise LAS8001si into door bottom. Surface mounted: Fit LAS7001si to head and sides of door frame and fully mortise LAS8001si into door bottom. Optional LAS4000 aluminium threshold may be used as required.
Single leaf 40 mm solid core door	Rw32	LAS1212 Batwing + LAS8001si	Concealed fixing: Fit LAS1212 Batwing to

Door type	Rating	Lorient product	Comments
		LAS7001si + LAS8001si	head and sides of door frame and fully mortise LAS8001si into door bottom. Surface mounted: Fit LAS7001si to head and sides of door frame and fully mortise LAS8001si into door bottom. Optional LAS4000 aluminium threshold may be used as required.
Single leaf Fire rated door	Rw32	LAS1212 Batwing + LAS8001si LAS1812LSS + LAS8001si LAS7001si + LAS8001si	Concealed fixing: Fit LAS1212 Batwing to head and sides of door frame and fully mortise LAS8001si into door bottom OR Fit LAS1812LSS combined fire/smoke/acoustic seal to head and jambs and fully mortise LAS8001si into door bottom. Surface mounted: Fit LAS7001si to head and sides of door frame and fully mortise LAS8001si into door bottom. Optional LAS4000 aluminium threshold may be used as required.
Single leaf proprietary acoustic door	>Rw50	Check manufacturers reports	
Double leaf 35 mm solid core door	Rw30	LAS1212 Batwing + LAS8001si LAS7001si + LAS8001si + AAS7506 astragal	Concealed fixing: Fit LAS1212 Batwing to head and sides of door frame and fully mortise LAS8001si into door bottom. Surface mounted: Fit LAS7001si to head and sides of door frame and fully mortise LAS8001si into door bottom. Fit AAS7506 to meeting stile. Optional LAS4000 aluminium threshold may be used as required.
Double leaf 40 mm solid core door	Rw32	LAS1212 Batwing + LAS8001si LAS7001si + LAS8001si + AAS7506 astragal	Concealed fixing: Fit LAS1212 Batwing to head and sides of door frame and fully mortise LAS8001si into door bottom.

Door type	Rating	Lorient product	Comments
			Surface mounted: Fit LAS7001si to head and sides of door frame and fully mortise LAS8001si into door bottom. Fit AAS7506 to meeting stile. Optional LAS4000 aluminium threshold may be used as required.
Double leaf fire door	Rw32	LAS1212 Batwing + LAS8001si + FDMS T-Bar LAS7001si + LAS8001si + FDMS T-Bar	Concealed fixing: Fit LAS1212 Batwing to head and sides of door frame and fully mortise LAS8001si into door bottom. Fit FDMS T-BAR set to meeting stiles. Surface mounted: Fit LAS7001si to head and sides of door frame and fully mortise LAS8001si into door bottom. Fit FDMS T-BAR set to meeting stiles. Optional LAS4000 aluminium threshold may be used as required.
Double leaf proprietary acoustic door	>Rw50	Check manufacturers reports	

Smoke door seal schedule (DTS)

Door type	Lorient product	Comments
Single leaf single swing 35 mm solid core door DTS solution	LAS7004si + LAS8001si LAS1011 + LAS8001si LP1504DS + LAS8001si	Fit LAS7004si to top and sides of door leaf and fully mortise LAS8001si into door bottom. Fit LAS1011 to top and sides of door leaf and fully mortise LAS8001si into door bottom. Rebate LP1504DS combined fire/smoke/acoustic seal into top and sides of door leaf and fully mortise LAS8001si into door bottom. Optional LAS4000 aluminium threshold may be used as required.
Double leaf single swing 35 mm solid core door DTS solution	LAS7004si + LAS8001si + AAS7506 astragal LAS1011 + LAS8001si + AAS7506 astragal LP1504DS + LAS8001si + AAS7506 astragal	Fit LAS7004si to top and sides of door leaf and fully mortise LAS8001si into door bottom. Fit AAS7506 to meeting stile. Kerf-fit LAS1011 to top and sides of door leaf and fully mortise LAS8001si into door bottom. Fit AAS7506 to meeting stile.

Door type	Lorient product	Comments
		Rebate LP1504DS combined fire/smoke/acoustic seal into top and sides of door leaf and fully mortise LAS8001si into door bottom. Fit AAS7506 to meeting stile. Optional LAS4000 aluminium threshold may be used as required.
Single leaf double swing 35 mm solid core door DTS solution	LAS7004si + LAS3009si + LAS4010 LAS1011 + LAS3009si + LAS4010	Fit LAS7004si to top and sides of door leaf and LAS3009si to door bottom. Fit LAS4000 aluminium plate to threshold. Kerf-fit LAS1011 to top and sides of door leaf and LAS3009si to door bottom. Fit LAS4000 aluminium plate to threshold.
Double leaf double swing 35 mm solid core door DTS solution	LAS7004si + LAS3009si + LAS4010 LAS1011 + LAS3009si + LAS4010	Fit LAS7004si to top and sides of door leaf and LAS3009si to door bottom. Fit LAS4000 aluminium plate to threshold. Kerf-fit LAS1011 to top and sides of door leaf and LAS3009si to door bottom. Fit LAS4000 aluminium plate to threshold.

Smoke door seal schedule

Door type	Leakage rating	Lorient product	Comments
Single leaf fire rated door	>10m³/hr	LAS1212 Batwing + LAS8001si LAS1812LSS + LAS8001si LAS1212 Batwing + LAS8002si LAS1812LSS + LAS8002si LAS1212 Batwing + LAS8003si LAS1812LSS + LAS8003si LAS1212 Batwing + LAS8006si LAS1812LSS + LAS8006si	Fit LAS1212 Batwing to head and sides of door frame and fully mortise LAS8001si into door bottom. Fit LAS1812LSS combined fire/ smoke/ acoustic seal to head and sides of door frame and fully mortise LAS8001si into door bottom. Fit LAS1212 Batwing to head and sides of door frame and surface mount LAS8002si on door bottom Fit LAS1812LSS combined fire/ smoke/ acoustic seal to head and sides of door frame and surface mount LAS8002si on door bottom. Fit LAS1212 Batwing to head and sides of door frame and surface mount LAS8006si on door bottom. Fit LAS1812LSS combined fire/ smoke/ acoustic seal to head and sides of door frame and surface mount LAS8006si on door bottom. Fit LAS1212 Batwing to head and sides of door frame and surface mount

Door type	Leakage rating	Lorient product	Comments
			<p>LAS8003si on door bottom.</p> <p>Fit LAS1812LSS combined fire/ smoke/ acoustic seal to head and sides of door frame and surface mount</p> <p>LAS8003si on door bottom.</p> <p>Fit LAS1212 Batwing to head and sides of door frame and surface mount</p> <p>LAS 8006si on door bottom.</p> <p>Fit LAS1812LSS combined fire/ smoke/ acoustic seal to head and sides of door frame and surface mount</p> <p>LAS8006si on door bottom.</p> <p>Optional LAS4000 aluminium threshold may be used as required.</p>

Fire door seal schedule

Door type	Rating	Lorient product	Comments
Perimeter seals	Up to - /240/30	LAS1812LSS combined fire/ smoke/ acoustic seal LAS1212 smoke/ acoustic seal LAS1515 smoke/ acoustic seal LAS7001si stop mounted acoustic compression seal LAS7005si stop mounted acoustic compression seal AAS7501si stop mounted acoustic compression seal AAS7503 stop mounted acoustic compression seal	
Door bottom seals	Up to - /240/30	LAS8001si fully rebated (concealed) drop seal LAS8002si semi rebated or surface mounted drop seal LAS8003si semi rebated or surface mounted drop seal LAS8005si fully rebated (concealed) drop seal	

Door type	Rating	Lorient product	Comments
		LAS8006si semi rebated or surface mounted drop seal LAS8007si fully rebated (concealed) drop seal LAS8008si surface mounted drop seal LAS8009si surface mounted drop seal	
Thresholds & ramps	Up to - /240/30	LAS4002 40 mm wide threshold plate LAS4010 75 mm wide x 6 mm high threshold plate LAS4011 100 mm wide x 6 mm high threshold plate LAS4012 125 mm wide x 6 mm high threshold plate LAS4013 150 mm wide x 6 mm high threshold plate AAS4551 100 mm wide threshold ramp 12.5 mm rise AAS4552 150 mm wide threshold ramp 12.5 mm rise AAS4553 150 mm wide threshold ramp 19 mm rise	
Meeting Stiles for double leaf fire doors – Single swing	Up to - /120/30	LDMS T-Bar fire door meeting stile set	
Meeting Stiles for double leaf fire doors – Double swing	Up to - /120/30	LDMS-BB bullnose meeting stiles	

Bushfire-prone area door seal schedule

BAL Level	Lorient product	Comments
Low	N/A, No sealing requirement	
12.5, 19, 29	LAS3004si surface mounted silicone rubber blade	Fit to door bottom.
40	LAS7001si silicone perimeter seal + LAS3004si silicone rubber blade	Fit LAS7001si to head and sides of door and LAS3004si to door bottom
FZ	LAS7001si or LAS7005si silicone perimeter seal + LAS3004si silicone rubber blade.	Fit LAS7001si to head and sides of door and LAS3004si to door bottom.

Bushfire-prone area garage door seal schedule

BAL Level	Lorient product	Comments
Low	N/A, No sealing requirement	
12.5, 19, 29, 40, FZ	LAS5035 40 mm brush LAS5040 60 mm brush seal LAS5045 80 mm brush seal LAS5050 100 mm brush seal LAS5055 150 mm brush LAS5070H 45 mm 90°angled brush LAS5085 45 mm 45°angled brush AAS3530si silicone bulb LAS4000 series threshold plate may be used as required.	Fit LAS5035, LAS5040, LAS5045, LAS5050, LAS5055, LAS5070H or LAS5085 to head and/ or sides of garage door and AAS3530si to door bottom.

Weather, draft, dust and insect door seal schedule

Door type	Lorient product	Comments
Single leaf door	LAS7001si + LAS8001si LAS1212 + LAS8001si LAS7005si + LAS8006si	Surface mounted: Fit LAS7001si to head and sides of door frame and fully mortise LAS8001si into door bottom. Concealed fixing: Fit LAS1212 to head and sides of door frame and fully mortise LAS8001si into door bottom. Surface mounted: LAS7005si to head and sides of door frame and surface mount LAS8006si on door bottom
Double Leaf door	LAS7001si + LAS8001si + AAS7506 astragal LAS1212 + LAS8001si + AAS7506 astragal	Surface mounted: Fit LAS7001si to head and sides of door frame and fully mortise LAS8001si into door bottom. Fit AAS7506 to meeting stiles. Concealed fixing: Fit LAS1212 to head and sides of door frame and fully mortise LAS8001si into door bottom. Fit AAS7506 to meeting stiles.

Door threshold plates and ramps schedule

Door type	Lorient product	Comments
Single leaf door	LAS4002 40 mm wide threshold plate LAS4010 75 mm wide x 6 mm high threshold plate LAS4011 100 mm wide x 6 mm high threshold plate LAS4012 125 mm wide x 6 mm high threshold plate LAS4013 150 mm wide x 6 mm high threshold plate AAS4551 100 mm wide threshold ramp with 12.5 mm rise AAS4552 150 mm wide threshold ramp with 12.5 mm	

Door type	Lorient product	Comments
	rise AAS4553 150 mm wide threshold ramp with 19 mm rise	
Double Leaf door	LAS4002 40 mm wide threshold plate LAS4010 75 mm wide x 6 mm high threshold plate LAS4011 100 mm wide x 6 mm high threshold plate LAS4012 125 mm wide x 6 mm high threshold plate LAS4013 150 mm wide x 6 mm high threshold plate AAS4551 100 mm wide threshold ramp with 12.5 mm rise AAS4552 150 mm wide threshold ramp with 12.5 mm rise AAS4553 150 mm wide threshold ramp with 19 mm rise	

0457 EXTERNAL SCREENS

1 GENERAL

1.1 RESPONSIBILITIES

General

Requirement: Provide external screens, as documented.

Performance

Requirement: Conform to the following:

- Plumb, level, straight and true within the building tolerances of the structural system.
- Undamaged and free of surface defects or distortions.
- Fixed or fastened to the building structure.
- Able to resist wind and other actions without vibration or permanent distortion.

1.2 CROSS REFERENCES

General

Requirement: Conform to the following:

- 0171 General requirements.

1.3 STANDARDS

General

Aluminium framed sunscreens, awnings and shutters:

- Stress analysis of members: To AS/NZS 1664.1 or AS/NZS 1664.2.

Horizontal screen loadings: To AS/NZS 1170.1.

Electrically operated external louvres and blinds:

- Drive motors: To AS/NZS 60335.2.97.

Access for maintenance: To AS 1657.

1.4 INTERPRETATION

Abbreviations

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

- BMS: Building Management System.
- PVC-U: Unplasticised polyvinylchloride.

Definitions

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

- Louvres - continuous: Louvres that run continuously past, and are supported by, concealed framing or brackets.
- Louvres - horizontal: Louvres that span horizontally between frame stiles, mullions or vertical supports.
- Louvres - vertical: Louvres that span vertically between frame heads and sills, or horizontal supports.
- Membrane: A thin and flexible sheet of fabric material.
- Screen: Includes sunscreens, trafficable sunscreens, external louvres and blinds, shutters, awnings and pergolas fixed to building facades or openings; to control sunlight and/or provide privacy, to screen plant and equipment, or to provide an architectural feature. It applies to fixed, adjustable, operable and automatically controlled types.
- Shade fabric: A fabric designed to prevent a proportion of sunlight or other light from reaching the area beyond the shade fabric.
- Tensioned membrane: A thin cloth or sheet that is held in a predetermined 2- or 3-dimensional shape under permanent tension. The shape and the tension are interrelated and designed to safely carry the permanent and imposed loads (such as those resulting from wind actions) in a predictable manner.

1.5 SUBMISSIONS

Certification

Sealant compatibility: Submit statements from all parties to the installation that certify the compatibility of sealants with screen components, finishes and all substrates.

Execution detail

Embedded fixings: Submit details of any proposed alternative methods of fixing.

Fire performance

Combustibility: Submit evidence of conformity to PRODUCTS, FIRE PERFORMANCE, Combustibility.

Fire hazard properties: Submit evidence of conformity to PRODUCTS, FIRE PERFORMANCE, Fire hazard properties.

Operation and maintenance manuals

Requirement: At completion, submit the screen manufacturer's recommendations for operation, care and maintenance.

Prototypes

General: Erect a prototype of each screen assembly, including at least one example of each component in the system, including attachments to the structure, flashing, caulking, sealing and infill materials.

Samples

General: Submit samples of the following:

- Sections proposed for frame members, louvres, accessories, cover panels and trim.
- Joints made, using proposed techniques.
- Colour samples of prefinished production material (e.g. anodised or thermoset powder coated extrusions or sheet, glazing, infill panel material or fabric), each at least 200 x 200 mm, showing the limits of the range of variation in the selected colour, if any, for each component of the screens specified.
- Accessory and hardware items documented descriptively or by performance (i.e. not proprietary items). Include handles, operators, controls, switches, sensors, motors, fixing clips, anchor brackets and attachments, fixings, gaskets and weather seals.

Labelling: Label each sample, giving the brand and product name, manufacturer's code reference, date of manufacture and intended building location.

Shop drawings

General: Submit shop drawings to a scale that best describes the detail, calculations and specifications conveying the following information:

- Layout of the screen assembly (sectional plans, vertical sections, and elevations of each building face where screens are to be installed).
- Full size sections of typical members including mullions, transoms, subheads, sills, subsills, louvres, infill panel material or fabric, beads, bearings, linkages, exposed fixings, sealant beads, glazing gaskets, splice plates, trays and cover strips, with notes specifying the proposed materials.
- Lubrication requirements for adjustable or operable screens.
- Method of assembly, including isometric or axonometric and exploded views of typical framing junctions, showing panel to panel joints (for modular systems).
- Method of installation, including the following:
 - . Location and magnitude of reactions to be accommodated by the support structure.
 - . Type and location of fasteners and other attachments to be cast or otherwise built into the building structure.
 - . Erection tolerances.
 - . Accurate locations and full size details of machined slots, keyholes and other penetrations in frame extrusions for lifting and installing the units.
 - . Junctions and trim to adjoining surfaces.
 - . Caulking and flashing.
 - . Locations of visible heads of fasteners.
- Provision for differential vertical or horizontal movements, including the following:

- . Thermal expansion and contraction.
- . Frame deflections.
- Details of motor and operating mechanism enclosures.
- Method of draining the assembly, including details showing the following:
 - . Pressure equalised drained joints.
 - . Location, number and size of weepholes.
- Connection points to rainwater or stormwater systems.
- Hardware, fittings and accessories including window cleaning restraints and visible heads of fasteners.
- Infill panel stiffening.
- Location and power requirements of motors, sensors and controls.
- Wiring diagrams of control systems BMS interface details.
- Scale drawings and descriptions of prototype external screens.

Subcontractors

General: Submit names and contact details of the proposed manufacturers and, if the manufacturer is not the installer, the installers recommended by the manufacturers.

Warranties

Requirement: Submit warranties as documented.

1.6 INSPECTION

Notice

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

- Fabricated screen assemblies at the factory ready for delivery to the site.
- Fabricated screen assemblies delivered to the site, before installation.
- Prototypes.
- Commencement of installation of screen assemblies.
- Completion of installation.

2 PRODUCTS

2.1 GENERAL

Storage and handling

General: Deliver, unload and store external screens, components and accessories in unbroken manufacturer's packaging.

Marking

Requirement: Before the separate parts of the screens are delivered to the site, provide suitable and sufficient marks or other means for identifying each part, and for showing its correct location and orientation, when installed.

2.2 FIRE PERFORMANCE

Combustibility

Cladding: Tested to AS 1530.1.

Fire hazard properties

Bonded laminated materials: Tested to AS/NZS 1530.3. Fire hazard indices, as follows:

- Spread-of-Flame Index: 0.
- Smoke-Developed Index: ≤ 3 .

Awning, sunshade, canopy, blind or shading hood: Tested to AS/NZS 1530.3. Fire hazard indices, as follows:

- Spread-of-Flame Index: ≤ 9 .
- Smoke-Developed Index: ≤ 8 , if Spread-of-Flame index is > 5 .

2.3 MATERIALS GENERALLY

Structural steel

Design and materials: To AS 4100.

Welding: To the AS/NZS 1554 series.

Galvanizing: To AS/NZS 4680.

Wire rope cables

Materials: Stainless steel Type 316 or galvanized steel.

Fabric

Supply: Supply fabric by a single manufacturer as part of a single batch.

Inspection: Check each roll of material for flatness, faults in the fabric and the coatings, by visual inspection in directional sunlight at a distance of 4 m and by passing the membrane over a uniformly illuminated surface.

Stitching: Use UV stabilised polyester thread with a minimum tensile strength of 180 N. Use lock type stitching with a twin needle machine.

Perimeter reinforcing: Reinforce the perimeter of each fabric panel with UV stabilised polyester rope, coated with PVC-U and incorporating pockets for the tension cables.

2.4 METAL FINISHES

Anodising

Standard: To AS 1231.

Thickness: \geq 15 microns to 20 microns.

Hot-dip galvanizing

Minimum coating mass/thickness: To AS/NZS 4680.

Powder coating

Application to aluminium and aluminium alloy substrates for architectural applications: To AS 3715 and as appropriate AAMA 2603, AAMA 2604 and AAMA 2605.

Application to metal substrates other than aluminium for architectural applications: To AS 4506.

2.5 FIXED PANEL TYPE SCREENS

General

Requirement: Provide infill panel materials mounted in a metal perimeter frame or subframe as follows:

- To withstand imposed actions and wind actions for the location without failure or permanent distortion, and without panel flutter.
- To shed water without pooling.

Expansion joints

Requirement: Allow for expansion and contraction in continuous sections at spacings not exceeding the manufacturer's recommendations, or 6 m, whichever is the lesser.

Fixing: Provide a fixing system appropriate to the panel material that will retain the panel without distortion or dislocation.

Framing materials

Requirement: Frames fabricated from solid or hollow metal sections.

Fixing: Provide fastener brackets or arms mounted on the face of the building, and brace as necessary with stays, including tensile elements such as wire cables and turnbuckles.

2.6 LOUVRE TYPE SCREENS

General

Requirement: Provide louvre screen assemblies able to withstand the permissible-stress-design wind pressure for that location without failure or permanent distortion of members, and without blade flutter.

Expansion joints

Requirement: Allow for expansion and contraction in continuous sections (e.g. continuous louvres, interlocking mullions) at spacings not exceeding those recommended by the manufacturer, or 6 m, whichever is the lesser.

Fixed metal louvres

Requirement: Metal louvre blades mounted in a metal perimeter frame or subframe, or on carrier frames, installed horizontally or vertically.

Blades: Rolled or extruded metal, or extruded metal blades swaged together with cross bars to form self-supporting panels.

Adjustable louvres

Requirement: Adjustable louvre system including louvre blades clipped or fixed into blade holders pivoted to stiles or coupling mullions, linked together in banks, installed horizontally or vertically.

Operation: Provide an operating system, incorporating a locking or latching device for each bank of louvres.

Pergolas

Supports: Support wide horizontal louvre assemblies on posts mounted on terraces and balconies to form pergolas. Maintain the integrity of waterproofing membranes when fixing posts or brackets to terraces and balconies.

3 EXECUTION

3.1 FABRICATION

Aluminium fabrication and construction

Standard: To AS/NZS 1664.1 or AS/NZS 1664.2.

Fasteners

Requirement: Provide fasteners of sufficient strength and quality to perform their required function.

Joints

Requirement: Make accurately fitted tight joints so that neither fasteners nor fixing devices create pressure indentations that are visible on exposed faces. Where heads of fasteners are unavoidably visible, finish them to match the adjacent surface.

Protection

Corrosion protection: Provide protection against corrosion that may be caused in metals by products or processes normally employed on a building site or by normal atmospheric or other ambient conditions and by-products including rainwater, drinking and drinking water, airborne salt and airborne pollution.

Durability: Provide materials resistant to exposure to weather and UV radiation so that their colour, surface finish, flexibility and water resistance are maintained.

Temporary measures: Do not use adhesive tape, film or paper, or applied coatings liable to bond to the substrate, when exposed to sunlight or weather, as temporary measures to protect screen components during the course of the works. If temporary measures are used, remove all traces, particularly from contact mating surfaces before joining up.

Operation

Requirement: Provide moving parts which operate freely and smoothly, without vibration, rattling, binding or sticking, and at correct tensions or operating forces. Lubricate if appropriate.

3.2 WELDING

General

Quality: Provide finished welds descaled and free of surface and internal cracks, slag inclusion and porosity. Provide continuous welding unless permanently concealed.

Restrictions: Do not weld as follows:

- On site.
- On finished surfaces.
- Next to a finished surface or glass, unless the adjacent surface is protected from damage.

3.3 EMBEDDED FIXINGS

General

Fixing: Fix screens to the building structure by one of the following methods, and as documented:

- Fasteners cast into the concrete of the building structure. Do not displace reinforcement, when locating embedded items.

- Chemical fixings, expanding bolt sockets.
- Bolting or welding to brackets or structural framing.

Standard for embedment

For concrete: To AS 3600.

For masonry: To AS 3700.

Fixing brackets

Requirement: Provide fasteners and other methods of attachment of the screens to the structure with the following characteristics:

- Three-way adjustment to accommodate fabrication and construction tolerances.
- Provision for building movements while fixing the screens in their correct positions.
- Adequacy for structural design actions.

Protection

Cast-in items: Prevent the entry of concrete slurry into bolt holes, channels, and other openings for the fasteners. Fill the openings using an easily removed water repellent material before casting in.

Placement

Tolerance:

- Maximum deviation from correct position: 13 mm.

Fastener channels embedded parallel or perpendicular to the edge of a concrete structural member:

- Minimum length of embedded anchor: 200 mm.
- Minimum distance from the concrete edge to the nearest part of the anchor: 100 mm.

3.4 INSTALLATION

Installation tolerance

Alignment:

- Maximum deviation of any member from its true alignment (plumb, level, or line of slope): 1:1000, up to a maximum of 10 mm in a continuous run of members in one direction.
- Maximum misalignment between adjoining members: 1 mm.

Position:

- Maximum deviation of any part from its true position: 10 mm

Reference lines and marks

Requirement: Provide on each floor, in agreed locations, accurate perimeter offset reference lines, plumb with corresponding lines on other floors, and height benchmarks.

Wire rope cables

Requirement: Preload cables by cyclic loading to achieve a uniform modulus of elasticity and a linear stress/strain relationship within the working range. Use a swaging system to achieve a breaking strength of terminals not lower than the minimum design strength of the cable system.

Cleaning

Requirement: During erection, promptly remove foreign matter from the screens without damage to finishes. Do not use abrasive cleaners or acid.

3.5 COMPLETION

Cleaning

Method: Clean all visible surfaces with soft clean cloths and clean water or approved cleanser, finishing with a clean cloth. Do not use abrasive or alkaline materials.

Warranties

Requirement: Cover materials and workmanship in the terms of the warranty from the manufacturer.

4 SELECTIONS

4.1 PERFORMANCE

4.2 EXTERNAL SCREENS

Fixed panel type screen schedule

	A	B	C
Manufacturer	SUNEX		
Product name			
Description	Refer to architectural drawings for location and type of external screen.		
Frame material			
Frame finish			
Frame colour			
Infill panel material			
Infill panel colour			
Accessories			

Louvre type screen schedule

	A	B	C
Manufacturer	SUNEX		
Product name			
Description	Refer to architectural drawings for location and type of external screen.		
Frame material			
Frame finish			
Frame colour			
Louvre blade material			
Louvre blade finish			
Louvre blade colour			
Operation			
Automatic controls			
Accessories			

0461B 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.*

1.3 STANDARDS

Glazing

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

Materials and installation: To AS 1288.

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

Roof glazing: To AS 1288 Section 6.

1.4 SUBMISSIONS

Certification

Design: Submit an engineer's certificate confirming conformance to AS 1288.

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 manufacturers' published recommendations for in-service use.

Products and materials

Safety glazing materials: Submit evidence of conformity to AS/NZS 2208 Appendix A.

Samples

General: Submit samples of glazing materials, each at least 200 x 200 mm, showing specified visual properties and the range of variation, if any, for each of the following:

- Tinted or coloured glass or glazing plastics.
- Surface modified or surface coated glass.
- Patterned or obscured glass or glazing plastics.
- Ceramic-coated glass.

- Wired glass.
- Insulating glass units.
- Mirror glass.

Shop drawings

Requirement: Submit shop drawings showing the following:

- Method of glazing
- Rebate depth.
- Edge restraint.
- Clearances and tolerances.
- Glazing gaskets and sealant beads.

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, mortar, paint and welding splatter.

Handling: Handle glass to the manufacturer's recommendations.

2.2 GLASS AND GLAZING

Performance

Glass: Free from defects which detract from appearance or interfere with performance under normal conditions of use.

Glazing plastics: Free from surface abrasions, and warranted by the manufacturer for 10 years against yellowing or other colour change, loss of strength and impact resistance, and general deterioration.

Heat soaking

Requirement: Heat soak the following:

- Toughened glass.
- Heat strengthened glass with a surface compression greater than 52 MPa tested to ASTM C1279.

Standard: To EN 14179-1.

Marking: To EN 14179-1 or certified by the manufacturer to AS 1288 clause 3.8.2.

Safety glazing materials

Standard: To AS/NZS 2208.

Type: Grade A to AS 1288.

Certification: Required.

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

Marking: To AS 1288 clause 5.23.

Heat strengthened glass

Requirement: Heat strengthened annealed glass that requires extra strength and thermal resistance.

Standard: To ASTM C1048.

Insulating glass units (IGUs)

Manufacture, testing and installation: To AS 4666.

Glass thickness selection: To AS 1288.

Noise reducing glazed assemblies

Identification: Label each panel with a legible non-permanent mark, self-destroying when removed, stating and certifying the R_w rating, and identifying the testing authority. Remove when directed.

2.3 GLAZING MATERIALS

General

Requirement: 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 required performance.

Primer

Compatibility: Apply the manufacturer's recommended primer to the surfaces in contact with sealant materials.

2.4 ANCILLARY COMPONENTS AND FITTINGS

Extruded gaskets and seals

General: Provide seals, as documented.

Location or function: [complete/delete]

Materials: Non-cellular (solid) elastopressive seals as follows:

- Rubber products (neoprene, ethylene propylene diene monomer (EPDM) or silicone rubber): To BS 4255-1.
- Flexible polyvinyl chloride (PVC): To BS 2571, E type compounds, colour fastness grade B.

Pile weather strips

Standard: To AAMA 701/702.

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 glass, including cutting, obscuring, silvering and bending. Form necessary holes, including for fixings, equipment, access openings and speaking holes. Process exposed glass edges to a finish not inferior to ground arrised.

3.2 INSTALLATION

Glazing

Requirement: 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 glass and glazing materials.
- No transfer of building movements to the glass.
- Watertight and airtight for external glazing.

Temporary marking: Use a method which does not harm the glass. Remove marking on completion.

Toughened glass: Do not cut, work, or permanently mark after toughening. Use installation methods which 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

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

Curtain walls: Supply inclusive of glazing, shop preglazed.

Site glazing

Minimum dimensional requirements: Edge clearance, edge cover, front clearance and back clearance to AS 1288.

External timber framed glazing: Glaze with putty.

3.3 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 or alkaline materials.

Extent: All frames and glass surfaces inside and out.

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.

Toughened glass warranty: Provide a manufacturer's warranty that toughened glass supplied for use in curtain walls has been subjected to a heat soaking process that has converted at least 95% of the nickel sulfide content to the stable beta-phase.

4 SELECTIONS

4.1 PERFORMANCE

Glass performance schedule

	A	B	C
U-Value (thermal transmittance, W/m ² .K)	Refer to Material and Finishes Schedule		
Solar heat gain coefficient (SHGC)	Refer to Material and Finishes Schedule		
Airborne sound insulation			
Visible transmittance (T _{vis})			
Reflectance (%)			
AGWA certification			

4.2 GLAZING

Glass schedule

	A	B	C
Glass type	Refer to Material and Finishes Schedule		
Glass thickness (mm)			
Body tint colour			
Interlayer colour			
Surface coating			
Surface coating: Colour			

	A	B	C
Reflective coating: Colour			
Reflective coating: % reflectance			
Surface pattern			
Surface processing			
Surface processing: Pattern			
Surface processing: Colour			
Edge processing			
Number of edges processed			
Fire-resistance level (FRL)			
Safety markings			
Digitally printed film			

0471 THERMAL INSULATION AND PLIABLE MEMBRANES

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

Requirement: Provide thermal insulation and pliable membrane systems, as documented.

1.2 CROSS REFERENCES**General**

Requirement: Conform to the following:

- *0171 General requirements.*

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 wool (glass and rock fibre) or polyester fibre.
- Blankets: Flexible insulation supplied as factory cut rolls and composed of mineral wool (glass and rock fibre) or polyester fibre, and may be combined with reflective facings.
- Bio-soluble: A product that dissolves in bodily fluids and is quickly cleared from the lungs.
- Fire hazard properties: To NCC Schedule 3.
- Pliable building membrane: To AS/NZS 4200.1 and equivalent to sarking-type materials as defined in the NCC.
- Thermal insulation terminology: To AS/NZS 4859.1.
- 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 and AS/NZS 4859.2.

Warranties

Manufacturer's published product warranties: Submit warranties to **COMPLETION, Warranties**.

1.5 INSPECTION**Notice**

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

- Insulation or pliable membrane materials after installation and before concealment.

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

Labelling: Deliver mineral wool 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. 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 and the recommendations of Appendix A6.

Pliable membranes: Flammability Index ≤ 5 tested to AS 1530.2.

2.3 MATERIALS

Thermal insulation

Standard: To AS/NZS 4859.1.

Wet process fibreboard (softboard): To AS/NZS 1859.4.

Mineral wool insulation: Bio-soluble and not listed as a hazardous material in the Safe Work Australia *Hazardous Chemical Information System (HCIS)*.

Pliable building membranes

Standard: To AS/NZS 4200.1.

Vapour control membranes:

- Vapour barrier:
 - . Vapour control classification: Class 1 or Class 2, as documented.
- Vapour permeable (breathable) membrane:
 - . Vapour control classification: Class 3 or Class 4, as documented.

Water control (sarking) membrane (other than walls and gables):

- Water control classification: Water barrier.

2.4 COMPONENTS

Fasteners and supports

General: Metallic-coated steel.

Mesh support to roof insulation

Welded safety mesh: To AS/NZS 4389.

Thermal break strips

Product: Proprietary item.

R-Value ($m^2 \cdot K/W$): ≥ 0.2.

3 EXECUTION

3.1 GENERAL

Thermal insulation

Requirement: To AS 3999 and BCA J1.2 or BCA 3.12.1.1, as appropriate.

Installation: Firmly butt together with no gaps except as follows:

- Access openings and vents: Do not obstruct.
- Light fittings: To AS/NZS 3000 clause 4.5.
- Electrical cables: To AS 3999 clause 2.6.

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.

Pliable building membrane

Installation: To AS 4200.2 and BCA J1.2 or BCA 3.12.1.1, as appropriate.

3.2 FLOORS

Under suspended framed floors

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

Rigid cellular insulation boards:

- Installation: Fix to the underside of timber strip flooring. Butt tightly to joists.
- Fixing: Adhesive or mechanical fasteners.

Over suspended framed floors

Rigid cellular insulation boards:

- Installation: Over sheet flooring and between battens supporting a final flooring finish.

Below concrete slab on ground

Preparation: Sand blinding or working slab, as documented.

Rigid cellular insulation boards:

- Laying pattern: Stretcher bond, with edges tightly butted.
- Damp-proof membrane: Lay over insulation.

Over concrete slab on ground

Substrate preparation: Prepare substrate as follows:

- Clean and remove any deposit or finish which may impair adhesion or location of insulation.
- Remove excessive projections.
- Voids and hollows > 10 mm with abrupt edges: Fill with a cement:sand mix not stronger than the substrate or weaker than the bedding.

Rigid cellular insulation boards:

- Laying pattern: Stretcher bond, with edges tightly butted.
- Fixing: Adhesive fix directly to the concrete floor slab.

Under suspended concrete slab

Fibre batts:

- Fixing: Mechanical fasteners and support mesh or nylon twine.

Rigid cellular insulation boards:

- Fixing: Adhesive or mechanical fasteners.
- Joints: Apply reinforced foil tape to all joints.

3.3 WALLS

Framed walls

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

Thermal break strips: Provide to steel framing with lightweight external cladding:

- Screw fixing: Button head screws at 1 m centres.
- Adhesive fixing: Wallboard adhesive walnuts at 1 m centres.

Masonry veneer cavity walls

Rigid cellular insulation boards:

- Installation: Fix boards horizontally with the tongue to the top edge, pushed over prefixed wall ties and held firmly against the wall frame. Keep boards clean, dry and free from mortar and grout. Do not bridge the cavity.
- Fixing: Hex head screws at 450 mm centres.

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

Full masonry cavity walls – external face of internal leaf

Rigid cellular insulation boards:

- Installation: Fix boards horizontally with the tongue to the top edge and firmly against the inner masonry skin. Keep boards clean, dry and free from mortar and grout. Do not bridge the cavity.
- Fixing: Proprietary plastic clips on pre-installed wall ties.

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

Full masonry cavity walls – internal face of internal leaf

Substrate preparation: Conform to the following:

- Clean and remove any deposit or finish which may impair adhesion or location of insulation.
- Remove excessive projections and fill voids and hollows with plaster.
- Maximum surface deviation from a 2400 mm straightedge: 6 mm.

Substrate correction: Skim plaster.

Rigid cellular insulation boards:

- Installation: Fix boards horizontally with staggered vertical joints, all close butted and without crushing.
- Fixing: Proprietary adhesive compatible with the insulation. Apply sufficient pressure to evenly distribute adhesive.

Vapour permeable (breathable) membrane

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

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

Installation: Run the vapour permeable membrane horizontally on the outer face of external wall framing, over the flashing, from the bottom plate up. Pull 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 laps: 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 airtight 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.
- Steel or aluminium frames: Hex head screws, with either 20 mm diameter washers or through hardboard strips.
- Plywood: Alternatives:
 - . Metallic-coated clouts, 20 mm long 6 to 8 mm staples or punched multi-point metallic-coated steel brads at minimum 300 mm centres.
 - . Water based contact adhesive with a 50% adhesive cover.

3.4 CEILINGS

Cathedral ceilings

Rigid cellular insulation boards:

- Installation: Lay boards with their long edges at right angles to the rafters and with the tongue pointing up the slope. Start laying at eaves and progress towards the ridge. Cut boards and tightly fit to abutments and penetrations.
- Fixing: Secure temporarily by occasional nailing to the rafters. Fix permanently by nailing counter battens to the rafters.
- Sealing: Seal gaps with polyurethane foam.

Suspended ceilings

Fibre batts and blankets: Lay batts/blankets over the ceiling system close butted to each other and to the suspension rods.

3.5 ROOFS

General

Requirement: Provide insulation to the whole of the roof area including skylight shaft walls, except the following:

- Eaves, overhangs, skylights, vents and openings.
- Roofs to outbuildings, garages, and semi-enclosed spaces such as verandahs, porches and carports.

Mesh support to roof insulation

Requirement: Provide support to the following:

- Water control (sarking), vapour barrier or reflective thermal insulation membranes laid over roof framing members that are spaced at more than 900 mm centres.
- Blanket type thermal insulation laid over roof framing members as sound insulation to metal roofing.

Installing welded safety mesh: To AS/NZS 4389.

Metal roofs

Fibre batts: Fit tightly between framing members.

Fibre blanket for sound insulation: Install over the roof framing, reflective thermal insulation (if any), and mesh support, so that the blanket is in continuous contact with the underside of the metal roofing sheets.

Combined fibre blanket and reflective insulation: Lay facing reflective insulation face downwards over safety mesh.

Thermal break strips: Provide to steel framing supporting metal sheet roofing.

- Screw fixing: Button head screws at 1 m centres.
- Adhesive fixing: Wallboard adhesive walnuts at 1 m centres.

Waterproof membrane roofs

Preparation: Make sure membrane is clean and free of loose material. Lay separation layer over membrane with edges lapped 300 mm and turned up at upstands and penetrations.

Rigid cellular insulation boards: Lay boards in brick pattern with shiplap edges pushed together firmly, cut neatly around penetrations and extend up upstands.

Pliable building membranes

Vapour barrier: Lay over the roof framing with sufficient sag to allow the bulk insulation to achieve its full thickness. Overlap all edges 150 mm and seal all joints with pressure sensitive adhesive tape.

Water control (sarking) membrane: Provide sarking under tile and shingle roofing.

3.6 COMPLETION

Warranties

Requirement: Provide warranties for materials and workmanship warranties in the form of interlocking warranties as follows:

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

4 SELECTIONS

4.1 THERMAL INSULATION

Thermal insulation schedule

	A	B	C
Application			
Type/Product	Refer to Materials and Finishes Schedule and Insulation Plan.		
R-Value ($m^2.K/W$)			
Thickness (mm)			
Airborne sound insulation			
Compressive strength (kPa)			
Rigid cellular sheet class			

Pliable membranes schedule

	A	B	C
Application			

	A	B	C
Product	Refer to Materials and Finishes Schedule and Insulation Plan.		
Location			
Electrical conductivity classification			
Duty classification			
Surface emittance classification			
Membrane emittance category			
Vapour control membrane classification			
R-Value (m ² .K/W)			

0472 ACOUSTIC INSULATION

1 GENERAL

1.1 RESPONSIBILITIES

General

Requirement: Provide acoustic insulation, as documented.

1.2 CROSS REFERENCES

General

Requirement: Conform to the following:

- *0171 General requirements.*

1.3 INTERPRETATION

Definitions

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

- Acoustic insulation: Materials or methods of construction to reduce the transmission of airborne and structure-borne sound through floors, walls and ceilings or other enclosing elements in buildings.
- Acoustic underlayment: A resilient material laid between the subfloor and the flooring material to provide sound isolation.
- Airborne sound: Sound radiated directly from a source, such as a loudspeaker or machine, into the surrounding air.
- Batts: Flexible insulation supplied as factory cut pieces and composed of glass wool.
- 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 glass wool, and may be combined with reflective facings.
- Fire hazard properties: To NCC Schedule 3.
- Impact sound: Sound caused by impacts on building structure. Typical sources include footsteps, dropped objects on horizontal surfaces and the slamming of doors.
- Sound insulation (isolation): Reduction of sound energy passing through building elements.
- Structure-borne sound: Sound waves transmitted within the building structure and re-radiated into other spaces as airborne sound. Typical sources include direct impact from dropped objects and vibrating machinery.

1.4 SUBMISSIONS

Fire performance

Fire hazard properties: Submit evidence of conformity to PRODUCTS, FIRE PERFORMANCE, Fire hazard properties.

Products and materials

Acoustic insulation properties: Submit evidence of conformity to documented requirements for insulation.

Warranties

Manufacturer's published product warranties: Submit on completion.

1.5 INSPECTION

Notice

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

- Insulation after installation and before concealment.

2 PRODUCTS

2.1 GENERAL

Storage and handling

Labelling: Deliver mineral wool 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. Fire hazard indices as follows:

- Spread-of-Flame Index: ≤ 9 .
- Smoke-Developed Index: ≤ 8 if Spread-of-Flame Index > 5 .

Facing materials: Tested to AS 1530.2: Flammability Index ≤ 5 .

2.3 MATERIALS

General

Mineral wool insulation: Bio-soluble and not listed as a hazardous material in the Safe Work Australia *Hazardous Chemical Information System* (HCIS).

Bulk insulation

Mineral wool blankets and batts: Glass wool or rock wool bonded with thermosetting resin.

Polyester blankets and batts: Thermally bonded polyester fibres.

Board insulation

Mineral wool panels: High density glass wool or rock wool bonded with thermosetting resin.

Wet process fibreboard (including softboard): To AS/NZS 1859.4.

Composite plasterboard panels: Proprietary items.

Flexible sheet insulation

Impregnated vinyl: Lead impregnated vinyl sheeting.

Recycled rubber/cork: Recycled rubber granules and/or cork bound with polymers.

2.4 COMPONENTS

Fasteners and supports

General: Metallic-coated steel.

Resilient mounts: Proprietary fixing clips with rubber or acrylic pads.

Adhesives

General: Compatible with the substrate and the insulation and conforming to the insulation manufacturer's recommendations.

Sealants

Acoustic sealant: Non-hardening sealant compatible with the substrate materials.

Fire-resisting sealant: Non-hardening sealant compatible with the substrate materials and having a fire-resistance rating equal to that of the building element it seals.

Sealant strips: Closed cell resilient foam.

3 EXECUTION

3.1 GENERAL

Bulk insulation

General: Firmly butt together with no gaps except as follows:

- Access openings and vents: Do not obstruct.
- Light fittings: To AS/NZS 3000 clause 4.5.
- Electrical cables: To AS 3999 clause 2.6.

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*.

3.2 FLOORS

Under suspended framed floors

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

Mineral wool panels:

- Installation: Fix to the underside of timber strip flooring. Butt tightly to joists.
- Fixing: Adhesive or mechanical fasteners.

Over concrete slab

Substrate preparation: Prepare substrate as follows:

- Clean and remove any deposit or finish which may impair adhesion or location of insulation.
- Remove excessive projections.
- Voids and hollows > 10 mm with abrupt edges: Fill with a cement:sand mix not stronger than the substrate or weaker than the bedding.

Mineral wool panels:

- Laying pattern: Stretcher bond, with edges tightly butted.
- Fixing: Adhesive fix directly to the concrete floor slab.

Under suspended concrete slab

Fibre batts:

- Fixing: Mechanical fasteners and support mesh or nylon twine.

Mineral wool panels:

- Fixing: Adhesive or mechanical fasteners.

Acoustic underlays

Handling: Store horizontally and keep dry.

Conditioning: Roll out underlay and leave in place for a minimum of 12 hours to acclimatise.

Installation: Adhesive fixed or loose laid, as documented.

3.3 WALLS

Framed walls and partitions

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

Mineral wool panels: Fix to face of studs with adhesive and temporarily fasten with single screw until plasterboard installed.

Full masonry cavity walls – external face of internal leaf

Mineral wool panels:

- Installation: Fix panels firmly against the inner masonry skin. Keep boards clean, dry and free from mortar and grout. Do not bridge the cavity.
- Fixing: Proprietary plastic clips on pre-installed wall ties.
- Sheet size: Select or cut to suit wall tie spacing.

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

Full masonry cavity walls – internal face of internal leaf

Substrate preparation: Conform to the following:

- Clean and remove any deposit or finish which may impair adhesion or location of insulation.
- Remove excessive projections and fill voids and hollows with plaster.
- Maximum surface deviation from a 2400 mm straightedge: 6 mm.

Substrate correction: Skim plaster.

Mineral wool panels:

- Installation: Fix boards horizontally with staggered vertical joints, all close butted and without crushing.
- Fixing: Proprietary adhesive compatible with the insulation. Apply sufficient pressure to evenly distribute adhesive.

3.4 CEILINGS

Framed ceilings

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

Suspended ceilings

Fibre batts and blankets: Lay batts/blankets over the ceiling system close butted to each other and to the suspension rods.

3.5 FLANKING SOUND INSULATION

Baffles

General: Install plenum baffles tightly butted to building structure, service ducts, pipes and conduits and to the top of the partition or to the top of the suspended ceiling structure directly above the line of the partition. Seal joints, penetrations and intersections and maintain the required performance.

Bulk insulation: Install individual layers to fill space between building structure and the top of the partition or the top of the suspended ceiling.

Flexible sheet insulation: Fix to soffit through a continuous furring channel, hang to meet the top of the partition and extend horizontally 900 mm over the suspended ceiling.

Abutments

Trims: Install over sealant. Allow for movement at abutting surfaces.

Cable management

Power outlets: Do not install general purpose socket outlets back to back. Separate adjoining socket outlets with a continuous layer of the documented wall insulating material.

Ducted skirtings: If a ducted skirting extends continuously across an abutment, pack the cavities firmly with bulk insulating material for 300 mm each side of the abutment, and scribe and seal the joint.

4 SELECTIONS

4.1 SCHEDULES

Acoustic insulation schedule

	A	B	C
Application			
Type/Product	Refer to Materials and Finishes Schedule and Insulation Plan.		
Thickness (mm)			
Airborne sound insulation			
Density (kg/m ³)			
Surface weight (kg/m ²)			

0473P DAMTEC ACOUSTIC FLOOR UNDERLAYS**1 GENERAL****1.1 RESPONSIBILITIES****General**

Requirement: Provide DAMTEC acoustic floor underlay systems, as documented.

1.2 COMPANY CONTACTS**DAMTEC technical contacts**

Website: www.damtec.com.au/contact-us.

1.3 CROSS REFERENCES**General**

Requirement: Conform to the following:

- 0171 General requirements.

1.4 MANUFACTURER'S DOCUMENTS**Technical manuals**

DAMTEC Product Data-Sheets, Safety Data Sheets and installation instructions: www.damtec.com.au.

General brochure: www.damtec.com.au/files/uploaded/DAMTEC_Brochure_080226.pdf.

Additional documents

Requirement: Conform to DAMTEC installation manuals and details.

1.5 INTERPRETATION**Definitions**

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

- Acoustic insulation: Materials or methods of construction to reduce the transmission of airborne and structure-borne sound through floors, walls and ceilings or other enclosing elements in buildings.
- Acoustic material: Building material with specific acoustic properties to achieve sound transmission loss, sound absorption, damping of resonance or resilience against impact noise.
- Acoustic underlay: A resilient material laid between the structural floor and the flooring material to provide sound isolation.
- Airborne sound: Sound radiated directly from a source, such as a loudspeaker or machine, into the surrounding air.
- Bio-soluble: A product that dissolves in bodily fluids and is quickly cleared from the lungs.
- Fire hazard properties: Terminology to BCA A5.5.
- Impact sound: Sound caused by impacts on building structure. Typical sources include footsteps, dropped objects on horizontal surfaces and the slamming of doors.
- Sound insulation (isolation): Reduction of sound energy passing through building elements.
- Structure-borne sound: Sound waves transmitted within the building structure and re-radiated into other spaces as airborne sound. Typical sources include direct impact from dropped objects and vibrating machinery.

1.6 SUBMISSIONS**Fire performance**

Fire hazard properties: Submit evidence of conformity to PRODUCTS, FIRE PERFORMANCE, Fire hazard properties.

Products and materials

Acoustic insulation properties: Submit evidence of conformity to documented acoustic insulation values.

Samples

General: Submit one sample of each underlay.

Warranties

DAMTEC warranties: Submit on completion.

1.7 INSPECTION**Notice**

Inspection: Give notice so inspection may be made of the insulation installed before it is covered up or concealed.

2 PRODUCTS

2.1 GENERAL**Product substitution**

Other products: Conform to PRODUCTS, **GENERAL, Substitutions** in *0171 General requirements*.

2.2 FIRE PERFORMANCE**Fire hazard properties**

Underlay materials: Tested to AS/NZS 1530.3. Fire hazard Indices as follows:

- Spread-of-Flame Index: ≤ 9.
- Smoke-Developed-Index: ≤ 8 if Spread-of-Flame Index > 5.

Critical radiant flux: To BCA Spec C1.10 tested to AS ISO 9239.1.

2.3 INSULATION MATERIALS**VOC limits**

Total VOC limit: 0.5 mg/m² generally.

Sealants

Acoustic sealant: Non-hardening sealant compatible with the adhering surface material, with specific gravity of 1.5 gm/cm³ minimum.

Fire-resisting: Non-hardening sealant compatible with the adhering surface material, with fire-resistance level equal to that of the partition it seals.

Sealant strips: Closed cell resilient foam.

2.4 DAMTEC ACOUSTIC FLOOR UNDERLAYS**General**

Description: DAMTEC products are engineered and manufactured using high quality rubber granules, recycled from the medical and automotive industries, and natural cork bound together by high grade polymers and mass produced under ISO 9001-2008 Quality Management Systems.

Compliance: DAMTEC products meet the Deemed-to-Satisfy BCA F5 provisions and have been tested with results calculated to AS ISO 717.2, as required by BCA F5.3.

DAMTEC® Standard

Description: An impact sound insulation underlay, comprising of fine granules of recycled rubber and cork, with polyurethane elastomer bonding agent suitable for use under all tile, timber and carpet floor finishes.

Width: 1000 mm.

Thicknesses: 2 mm, 3 mm and 4 mm.

DAMTEC® Estra

Description: An impact sound insulation underlay, comprising of granules of recycled rubber, with polyurethane elastomer bonding agent for use in floating screed/concrete slab systems or under rigid floor elements on timber subfloors. This product has high dynamic rigidity qualities.

Width: 1250 mm.

Thicknesses: 4 mm.

DAMTEC® Color

Description: An impact sound insulation underlay specifically formulated with granules of recycled medical grade rubber and cork, with polyurethane elastomer bonding agent suitable for use under timber, carpet and all resilient floor finishes.

Width: 1000 mm.

Thicknesses: 2 mm, 3 mm and 4 mm.

DAMTEC® System

Description: A high specification impact sound insulation underlay for exceptional applications demanding very high performance.

2.5 ADHESIVES

Standards

Ceramic, stone and terrazzo tiling: To AS ISO 13007.1.

Carpet: To AS 2455.1.

Type

Requirement: Provide adhesives, compatible with the adhering surface materials, to **DAMTEC INSULATION SELECTION**.

Prohibited uses: Do not provide the following combinations:

- Cement-based adhesives on wood, metal or painted surfaces.
- Organic solvent-based adhesives on painted surfaces.
- Organic PVC-based adhesives and organic natural rubber latex adhesives in damp or wet conditions.
- PVA (polyvinyl acetate) based adhesives in wet areas or externally.

3 EXECUTION

3.1 GENERAL

Installation

Requirement: Install all DAMTEC products to DAMTEC's recommendation.

3.2 PREPARATION

Substrates

Drying and shrinkage: Allow at least 21 days to elapse (for initial drying out and shrinkage), after toppings are placed before fixing floor tiles.

Standard: To AS 3958.1 Section 4.

Substrate tolerance table

Property	Length of straightedge laid in any direction	Max. deviation under the straightedge
Flatness Class A	3 m	3 mm
Smoothness	150 mm	1 mm
Projections	50 mm	0.5 mm

Cleaning concrete surfaces: Mechanically remove the following surface treatments:

- Sealers and hardeners.
- Curing compounds.

Cleaning timber surfaces: Remove oil, grease and traces of applied finishes.

Concrete substrate correction: Remove projections and fill voids and hollows with a levelling compound compatible with the adhesive.

Timber substrate correction: Remove projections. If conformance to the **Substrate tolerance table** cannot be achieved, fix a sheet underlay in brick pattern, with joints avoiding substrate joints.

Moisture content: Do not commence installation unless:

- Concrete: The moisture content of the concrete has been tested to AS 2455.1 Appendix B and the values in clause 2.4.2 (c) have been obtained.
- Plywood and timber: The moisture content of battens/joists or plywood background has been tested to AS/NZS 1080.1 and values obtained conform to the following:
 - . Air conditioned buildings: 8 to 10%.
 - . Intermittently heated buildings: 10 to 12.5%.

- . Unheated buildings: 12 to 15%.

Working environment

General: Do not start work before the building is enclosed, wet work is complete and dry, and good lighting is available. Protect adjoining surfaces.

Conditioning

General: Stabilise the room temperature for seven days prior to, and two days after installation of floor finishes, as follows:

- Areas with air conditioning installed: Run air conditioning at operational temperature.
- Air conditioned areas not operational: Maintain room temperature range of 18°C to 30°C.
- Underfloor heating: Turn off heating and allow background to stabilise at the temperature recommended by the floor finish manufacturer.
- Non-air conditioned areas: Install at 18°C to 30°C.

Sheet underlay: Expose both faces of each sheet of underlay for minimum 24 hours before fixing.

DAMTEC acoustic floor underlay storage: Store horizontally and keep dry.

DAMTEC acoustic floor underlay conditioning: Roll out, loose lay and butt joint the underlay. Make sure it is slightly larger than the area to be covered. Loose lay the underlay perpendicular to the direction of the final floor finish. Leave the underlay in place for minimum 12 hours, to allow the underlay to acclimatise and relax (allow internal stresses to dissipate). Allow 50 mm extra material to run up the walls at the perimeter of the space, so that underlay can be trimmed to the exact size after the relaxation period.

3.3 INSTALLATION

DAMTEC acoustic underlay – adhesive fixed systems

Trimming: At the end of the material relaxation period, trim the underlay to the exact dimensions of the area covered with a straightedge and sharp knife.

Adhesive application: Apply as follows:

- Pull back a panel of underlay to about halfway, trowel adhesive with a 2.4 mm V-Notch trowel onto the substrate to the manufacturer's recommendations.
- Lay the underlay carefully onto the adhesive whilst still wet.
- Move to the opposite end of the panel and carry out the same process. Once the first panel is complete, move onto the next adjacent panel, check that each panel is tightly butted to the other with no overlaps or gaps.

Working method: Begin bonding the underlay from the part of the room furthest from the entry, and to work back towards the entry to minimise the need to step on the installation once completed.

DAMTEC acoustic underlay – loose laid systems

Trimming: At the end of the material relaxation period, run the underlay 50 mm up the wall. Cut the upstand at the floor/wall junction and leave a strip of underlay against the wall. Butt underlay on wall and floor together to form a square junction. After installation of floor finishes, trim the underlay flush with the finished floor level with a straightedge and sharp knife.

Membrane installation (for under screed applications): Install as follows:

- Loose lay polyethylene sheet at least 0.2 mm thick over the entire area of underlay, including the upturns/isolation strips to the wall.
- Overlap sheets without gaps so that any in situ screed placed on it does not penetrate the acoustic underlay and make contact with the substrate, potentially creating sound bridges.
- After installation of floor finishes, trim membrane and underlay flush with the finished floor level with a straightedge and sharp knife. Seal gap between flooring and walls with sealant.

3.4 FLANKING SOUND INSULATION

4 SELECTIONS

4.1 DAMTEC INSULATION SELECTION

DAMTEC Acoustic floor insulation – Carpets

Location: Refer to architectural floor plan for all carpet location inside apartments.

Substrate: Concrete Slab

Product: DAMTEC Standard

Thickness: Refer to DAMTEC for advice on the most appropriate thickness.

Installation method: Direct stick

Underlay adhesive: Acrylic or pressure sensitive adhesive recommended by the manufacturer as suitable for use with DAMTEC acoustic underlay.

Carpet adhesive: Acrylic adhesive recommended by the manufacturer as suitable for use on top of the DAMTEC acoustic underlay.

DAMTEC Acoustic floor insulation – Engineered Timber Flooring – Floating

Location: Refer to architectural floor plan for all engineered timber floor location inside apartments.

Substrate: Concrete slab

Product: DAMTEC Standard

Thickness: Refer to DAMTEC for advice on the most appropriate thickness.[complete/delete]

Installation method: Loose lay both DAMTEC acoustic underlay and floating timber flooring.

Underlay adhesive: One-part polyurethane adhesive.

Engineered panel flooring or solid timber floor adhesive: one-part polyurethane adhesive recommended by the manufacturer as suitable for use on top of the DAMTEC acoustic underlay.

0511B LINING

1 GENERAL

1.1 RESPONSIBILITIES

General

Requirement: Provide internal lining systems, as documented.

Performance

Requirement: Provide lining system with a surface that is:

- Resistant to impacts expected in use.
- Resistant to moisture encountered under expected environmental conditions.
- Free of irregularities.
- A suitable substrate for the nominated final finish.

1.2 CROSS REFERENCES

General

Requirement: Conform to the following:

- 0171 General requirements.

1.3 INTERPRETATION

Definitions

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

- Decorative overlaid wood panels: Particleboard or fibreboard with a bonded decorative finishing surface such as thermosetting resin (low pressure melamine), PVC film, paper foils or wood veneer.
- 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%.
- Fibre cement sheet linings: Treated cellulose fibre in a matrix of cement and sand autoclaved sheet, sealed on one side.
- High pressure decorative laminates (HPDL):
 - . Panels consisting of core layers impregnated with phenolic and/or aminoplastic resins and a surface layer(s) impregnated with aminoplastic resins (mainly melamine resins).
 - . Sheets consisting of a decorative face and layers of fibrous sheet material (e.g. paper) impregnated with thermosetting resins and bonded together under heat and pressure of at least 5 MPa.
- 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%.

1.4 TOLERANCES

Permitted deviations

Bearing surface of finished framing:

- Gypsum lining: To AS/NZS 2589 clause 4.2.2.
- Other lining: 4 mm from a 1.8 m straightedge.

1.5 SUBMISSIONS

Fire performance

Fire hazard properties: Submit evidence of conformity to PRODUCTS, FIRE PERFORMANCE, Fire hazard properties.

Warranties

Requirement: Submit warranties to COMPLETION, Warranties.

1.6 INSPECTION

Notice

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

- Substrate or framing before installation of linings.
- Finished surface of installation before applying:
 - . Sealer.
 - . Finish coatings or decorative papers.

2 PRODUCTS

2.1 GENERAL

Storage and handling

Requirement: Store lining stacked in pallets horizontally on a smooth, level surface. Prevent distortion or moisture ingress.

Timber or fibreboard panels: Store off the ground in a well-ventilated area.

Handling: Do not drag sheets across each other or across other materials. Protect edges, corners and surface from damage.

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 label on faces or edges that will be concealed in the works.

2.2 FIRE PERFORMANCE

Fire hazard properties

Group number: To AS 5637.1.

2.3 PLASTERBOARD

General

Standard: To AS/NZS 2588.

2.4 FIBRE CEMENT

General

Standard: To AS/NZS 2908.2.

Wall and ceiling linings: Type B category 2.

Minimum thickness: 4.5 mm.

2.5 PARTICLEBOARD

General

Standard: To AS 1859.1.

2.6 ADHESIVES, SEALANTS AND FASTENERS

Adhesives

For wallboards: Gunnable synthetic rubber/resin based mastic contact adhesive formulated for bonding flooring and wallboards to a variety of substrates.

Sealants

Fire-resisting sealant: Non-hardening sealant, compatible with the materials to be sealed and having a fire-resistance rating equal to that of the building element it seals.

Acoustic sealant: Non-hardening sealant compatible with the materials to be sealed.

Fasteners

Steel nails: Hot-dip galvanized.

3 EXECUTION

3.1 CONSTRUCTION GENERALLY

Conditions

Requirement: Do not start lining work until the building or installation area is enclosed and weathertight, and all wet trades have been completed.

Preparation

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

Substrate: Make sure substrates are plumb, level, in true alignment and to the lining manufacturer's recommendations.

Timber, steel framing and battened masonry: To AS/NZS 2589 clause 4.2.

Pre-conditioning

General: Acclimatise timber panels in the in-service conditions for 2 to 3 weeks before installing.

Battens

General: Fix at each crossing with structural framing members, to solid walls or ceiling support. Provide wall plugs in solid substrates.

Ceiling linings

General: Do not install until the timber roof structure is fully loaded for at least 14 days.

Accessories and trim

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

Adhesives

General: Provide adhesive types appropriate for the purpose, and apply them so they transmit the loads imposed without causing discolouration of the finished surfaces.

Fire-resisting and acoustic rated installations

Sealing: 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.

3.2 PLASTERBOARD

Installation

Gypsum plasterboard and fibre reinforced gypsum lining: To AS/NZS 2589.

Level of finish and jointing: To AS/NZS 2589 clause 3.1.

Supports

General: Install timber battens or proprietary cold-formed galvanized steel furring channels as follows:

- Where framing member spacing exceed the recommended spacing.
- Where direct fixing of plasterboard is not possible, due to the arrangement or alignment of the framing or substrate.
- Where the lining is the substrate for tiled finishes.
- If required for penetrations for services, including mechanical grilles and lighting fixtures.
- If required to support fixtures.

Multiple sheet layers

Application: Fire-resisting and acoustic rated walls.

Joints: Fill and flush up all joints and fasteners 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 provide back blocking.

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

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

Control joints: Provide purpose-made metallic-coated control joint beads at not more than 12 m centres in walls and ceilings and to coincide with structural control joints.

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

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

3.3 FIBRE CEMENT

Installation

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

Supports

General: Install timber battens or proprietary cold-formed galvanized steel furring channels as follows:

- Where framing member spacing exceed the recommended spacing.
- Where direct fixing of fibre cement is not possible, due to the arrangement or alignment of the framing or substrate.
- Where the lining is the substrate for tiled finishes.
- If required for penetrations for services, including mechanical grilles and lighting fixtures.
- If required to support fixtures.

Fixing

Timber framed construction: Nail only or combine with adhesive.

Steel framed construction: Screw only or combine with adhesive.

Wall framing: Conform to the following:

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

Masonry wall construction: Conform to the following:

- Direct fixing: Adhesive fix to the masonry except where lining forms a substrate for tiled finish.
- Furring channels: Fix using screw and/or adhesive.

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

- Ceiling battens: Fix at 600 mm maximum centres.

Wet areas: Do not use adhesive fixing alone.

Multiple sheet layers

Application: Fire-resisting and acoustic rated walls.

Joints: Fill and flush up all joints and fasteners in each layer and caulk up perimeters and penetrations before installing following layers. Stagger all sheet joints by minimum 200 mm.

Joints

Joint width:

- Butt joints: 1 to 2 mm.
- Expressed joints: 10 mm maximum.

Joint backing for expressed joints: Black self-adhesive polyurethane tape.

Flush joints: Provide recessed edge sheets and finish flush using perforated paper reinforcing tape.

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

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

Control joints: Provide control joints to coincide with structural control joints and as follows:

- Walls: ≤ 7.2 m centres.
- Ceilings: To divide into bays not larger than 10.8 x 7.2 m.
- Soffit linings: To divide into bays not larger than 4.2 x 4.2 m or 5.6 x 3.6 m.

- Control joint beads: Purpose-made metallic-coated.
- Support: Provide framing parallel to the joint on each side. Do not fix the lining to abutting building surfaces.

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

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

- Control joints: Not more than 4.2 m centres and space to suit joints required in tiling.
- Internal corners: Reinforce with metallic-coated steel angles. In corners subject to continuous moisture, flash over the angle and under the sheeting with continuous bitumen coated aluminium flashing.

3.4 COMPLETION

General

Damaged or marked lining and components: Replace.

Exposed surfaces: Touch up shop applied finishes and restore damaged or marked areas.

Timber panels: If appearance is not uniform, replace panels.

Cleaning: Clean completed surfaces to remove irregularities and leave panels smooth and clean, to the manufacturer's recommendations. If required, sand with fine paper to remove irregularities and refinish panel surface.

- Debris and unused material: Remove from site.

Warranties

Requirement: Warrant against defective materials and installation.

4 SELECTIONS

4.1 SHEET LINING

Sheet lining schedule

	L1	L2	L3
Location	Refer to wall type schedule/drawings		
Material			
Thickness (mm)			
Configuration			
Edge type			
Joint type			
Fixing			
Level of finish			
Fire hazard properties: Group number			
Battens: Size (mm)			
Battens: Spacing			
Lining trim: Re-entrant corners			
Lining trim: Salient angles			
Lining trim: Edge trim			
Airborne sound insulation			
Impact sound insulation			

0522P RONDO IN PARTITIONS - FRAMED AND LINED

1 GENERAL

1.1 RESPONSIBILITIES

General

Requirement: Provide framed and lined partitions comprising RONDO wall framing system and linings, as documented.

Performance

Strength and stability: To remain stable, and without permanent deformation under the following imposed loads:

- Wind loads to AS/NZS 1170.2, but not less than:
 - . Ultimate load = 0.375 kPa.
 - . Serviceability load = 0.25 kPa.
 - . Seismic Loads: To AS 1170.4.
- Impact Loads: 0.70 kN applied at 1500 mm above floor level or, mid height for partitions less than 3000 mm high.

Deflection limit: Partitions are to support all imposed 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 lined with flexible material.
- The lesser of H/360 or 20 mm for partitions lined with brittle materials.
- H/500 for eccentric loads.
- The lesser of H/200 or 12 mm for impact loads.

1.2 COMPANY CONTACTS

RONDO technical contacts

Website: www.rondo.com.au/contact-us/

1.3 CROSS REFERENCES

General

Requirement: Conform to the following:

- *0171 General requirements.*

1.4 MANUFACTURER'S DOCUMENTS

Technical manuals

Resources: www.rondo.com.au/resources

Products: www.rondo.com.au/products/walls/

Product manual: www.rondo.com.au/resources/installation/product-manuals/

1.5 TOLERANCES

Framed and lined partitions

Finished framing: To AS/NZS 2589 clause 4.2.2.

1.6 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).

Fire performance

Fire hazard properties: Submit evidence of conformity to PRODUCTS, FIRE PERFORMANCE, Fire hazard properties.

Fire-resistance level: Submit evidence of conformity to PRODUCTS, FIRE PERFORMANCE, Fire-resistance of building elements.

Products and materials

Manufacturer's data: Submit manufacturer's standard product literature for each system 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.

Warranty

Requirement: Submit RONDO warranty.

1.7 INSPECTION

Notice

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

- Set-out before installation.
- Partition framing before installation of linings and finishes.
- Framed and lined partitions ready to receive framed and glazed components.
- Completion of installation.

2 PRODUCTS

2.1 GENERAL

Product substitution

Other products: Conform to **SUBSTITUTIONS** in 0171 General requirements.

Product identification

General: Marked to show the following:

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

2.2 FIRE PERFORMANCE

Fire hazard properties

Group number: To AS 5637.1.

Fire-resistance of building elements

Fire-resistance level: Tested to AS 1530.4.

2.3 TESTING

General

Impact resistance, lightweight partitions: To withstand impact without permanent deformation, damage, failure of fastenings.

- Test method: Use the apparatus and procedure of the sand-bag test of ASTM E695.

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: ASTM E72.

2.4 RONDO FRAMING

Light steel framing

General: RONDO framing system of cold formed metallic-coated steel studs, channel track sections and noggings to the **RONDO light steel framing schedule**.

Sections and members: To AS/NZS 4600.

Base metal and coating to AS 1397: Z275.

Partition systems:

- RONDO Steel stud and track framing system.
- RONDO MAXIFRAME® External wall framing system.
- RONDO QUIET STUD® Acoustic wall system.
- RONDO DUPLEX® Internal stud framing system.
- RONDO SHAFTWALL system.

Accessories

General: Provide accessories necessary to complete the installation including the following:

- Screw anchors for concrete.
- Suitable metal pins, bolts or screws for fixing to structural steelwork.
- Self-tapping and drilling screws for general metal framing connections.
- RONDO standard brackets for jamb studs and concentrated load positions.

2.5 LININGS

Plasterboard

Standard: To AS/NZS 2588.

Fibre cement

Standard: To AS/NZS 2908.2.

Wall and ceiling linings: Type B category 2.

Minimum thickness: 4.5 mm.

Accessories

General: Provide accessories necessary to complete the installation including the following:

- Corner beads.
- Stop beads.
- Shadowline.
- Control joints.
- Sheet metal and MDF partition end caps.

Adhesives

General: Adhesive types appropriate to their purpose and substrates, applied to transmit the loads imposed without causing discolouration of finished surfaces.

Sealants

General: Sealant types appropriate for the partition's acoustic documented rating and fire-resistance level, and compatible with partition materials and building substrate.

2.6 PLENUM BAFFLES

General

Requirement: Plenum baffles that maintain the documented fire-resistance level and acoustic performance of the partitions.

Types

Bulk insulation: Layers of bulk insulation batts compressed between the top of the partition and the slab soffit.

Impregnated vinyl: Lead impregnated vinyl sheeting hung as a curtain from the slab soffit.

Plasterboard: Plasterboard sheets bonded together (if more than one layer).

3 EXECUTION

3.1 GENERAL

Preparation

Substrate: Prepare the substrate to receive the partitions.

Carpet: Fix bottom tracks over polyethylene film. Prevent carpet threads from pulling if drilling or installing fasteners.

Protection

General: Protect existing work from damage during the installation and rectify any damage. Provide temporary coverings if required.

Set-out

General: Set out the partition grid on the centreline of framing members, and to coincide with the ceiling grid and other major building grid, as applicable.

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 fire-resistance levels or acoustic ratings are required, provide a resilient foam or mastic seal with 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. Install to RONDO's recommendations.

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 fire-resisting and 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 RONDO LIGHT STEEL FRAMES

RONDO partition system

Requirement: To the RONDO Professional Design Manual.

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 masonry: Provide masonry anchors of screw fasteners or chemical grout type. Do not use explosive-driven fastenings.

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: Conform to the following:

- Provide studs in single lengths without splices, or as documented.
- Rotate studs into tracks for friction fixing.

- Accurately position studs as required along the wall length.
- Select stud gauge and size for the required performance and documented wall height.

Staggered stud framing: Stagger studs to RONDO's recommendations in oversized top and bottom plates so that each face has stud fixings at 600 mm maximum centres.

Stud fixing: Screw fix corner studs and wall intersection studs to base tracks and abutting studs, as required.

Noggings: Fix noggings to RONDO's recommendations and for skirtings and wet area lining. Make sure that faces of noggings and studs are accurately aligned.

Lintels: Provide lintels as required, conforming to the following:

- Fix to jamb studs.
- Allow for vertical structural movement over openings.
- Where rigidly attached to the structure, allow for deflection in the glazing unit and vertical control joints either side of the opening.

Jambs

General: Conform to the following:

- Openings: Install RONDO DUPLEX® internal stud framing system at jambs and heads to openings.
- Structural soffits: Fix slotted deflection heads at the top of jamb studs and screw fix to RONDO's recommendations. If blocking is used, maintain minimum clearances.
- Additional track fixings: Fix track within 100 mm of jamb stud, or as documented.

Curved partitions

RONDO flexible tracks: Set out the curve and lay tracks, installing temporary fixings for a regular and uniform curve.

Track fixing: Fix head and base tracks to the supporting structure at each stud location through the pre-punched fixing hole in the track web.

Stud spacing: Conform to the sheeting manufacturer's recommendations for curved partitions.

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 grabrails and handrails.

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 RONDO light and medium gauge studs with pre-punched flared service holes.

Additional service holes:

- Punched or drilled on the centreline of the member.
- Fitted with 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: If required, conform to AS/NZS 3000.

Temporary earthing: If permanent earthing is required, provide temporary earthing during erection until the permanent earthing is installed.

Cavity walls

General: If bridging is nominated, provide to the manufacturer's recommendations.

3.4 PLASTERBOARD

Installation

Gypsum plasterboard and fibre reinforced gypsum lining: To AS/NZS 2589.

Multiple sheet layers

Application: Fire-resisting and acoustic rated partitions.

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: Use joint reinforcing tape bedded in joint compound with recessed edge sheets and finish flush.

Butt joints: Make joints over framing members or provide back blocking.

External corner joints: Bed purpose fabricated perforated metallic-coated steel corner beads in joint compound.

Ceiling junctions: Install purpose fabricated perforated metallic-coated steel shadowline to top of partition.

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 perforated metallic-coated control joint beads at not more than 12 m centres in partitions and to coincide with structural control joints. Bed in joint compound.

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

Joints in tiled areas: Bed reinforcing tape in joint compound. Do not apply a topping coat.

3.5 FIBRE CEMENT

Installation

General: Install as follows:

- Run sheets across the framing members.
- In flush jointed applications, stagger end joints in a brick pattern and locate joints on framing members, away from the corners of large openings.
- Provide supports at edges and joints.
- Do not fix to top and bottom plates or noggings.

Timber framing: Nail only or combined with adhesive.

Steel framing: Screw only or combined with adhesive.

Tiled and wet areas: Provide an extra row of noggings immediately above wall-to-floor flashings. Fix sheet at 150 mm centres to each stud and around the perimeter of the sheet. Do not use adhesive fixing alone.

Multiple sheet layers

Application: Fire-resisting and acoustic rated partitions.

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: Use joint reinforcing tape bedded in joint compound with recessed edge sheets and finish flush.

External corner joints: Bed purpose fabricated perforated metallic corner beads in joint compound.

Ceiling junctions: Install purpose fabricated perforated metallic-coated steel shadowline to top of partition.

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: Use square edged sheet and finish with a PVC-U joining section.

Control joints: Provide control joints to coincide with structural control joints and as follows:

- Walls: ≤ 7.2 m centres.
- Control joint beads: Purpose-made metallic-coated.
- Support: Provide framing parallel to the joint on each side. Do not fix the lining to abutting building surfaces.

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

Joints in tiled areas: Bed reinforcing tape in joint compound. Do not apply a topping coat.

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

3.6 PLENUM BAFFLES

Baffles

General: Install plenum baffles tightly butted to building structure, service ducts, pipes and conduits and to the top of the partition or to the top of the suspended ceiling directly above the line of the partition. Seal joints, penetrations and intersections and maintain the required performance.

Bulk insulation: Install individual layers to fill space between building structure and the top of the partition or the top of the suspended ceiling.

Flexible sheet insulation: Fix to soffit through a continuous furring channel, hang to meet the top of the partition and extend horizontally 900 mm over the suspended ceiling.

Fire-resisting partitions

General: If a suspended ceiling of equivalent fire-resistance is not provided, either extend the partitions to the underside of the structural soffit, or provide plenum baffles of equivalent fire-resistance level.

Acoustic rated partitions

General: If a suspended ceiling of equivalent sound insulation rating is not provided, either extend the partitions to the underside of the structural soffit, or provide acoustic rated plenum baffles. The ceiling and baffle to provide a combined rating equivalent to the partition rating.

3.7 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.

0531P RONDO IN SUSPENDED CEILINGS – COMBINED

1 GENERAL

1.1 RESPONSIBILITIES

General

Requirement: Provide suspended ceilings using RONDO ceiling support system, as documented.

1.2 COMPANY CONTACTS

RONDO technical contacts

Website: www.rondo.com.au/contact-us/

1.3 CROSS REFERENCES

General

Requirement: Conform to the following:

- *0171 General requirements.*
- *0453p RONDO in doors and access panels.*

1.4 STANDARDS

General

Suspended ceilings: To AS/NZS 2785.

1.5 MANUFACTURER'S DOCUMENTS

Technical manuals

Resources: www.rondo.com.au/resources

Product: www.rondo.com.au/products/ceilings/

Product manual: www.rondo.com.au/resources/installation/product-manuals/

1.6 INTERPRETATION

Definitions

General: For the purposes of this worksection, the definitions given in AS/NZS 2785 and the following apply:

- Ceiling unit: Tile, panel, plank, strip or open grid supported within or to a suspended ceiling system.

1.7 TOLERANCES

Ceiling 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 Table 2.4.5.

Setting out and levelling: To AS/NZS 2785 Appendix D.

Sheeted or flush ceiling suspension system

Suspension system bearing surface for flush lined ceiling: To AS/NZS 2589 Table 4.2.2.

Deflection: To AS/NZS 2589 Table 3.5.1.2.

1.8 SUBMISSIONS

Fire performance

Fire hazard properties: Submit evidence of conformity to PRODUCTS, FIRE PERFORMANCE, Fire hazard properties.

Fire-resistance level: Submit evidence of conformity to PRODUCTS, FIRE PERFORMANCE, Fire-resistance of building elements.

Operation and maintenance manuals

General: On completion, submit manufacturer's recommendations for the care and maintenance of the ceiling, and operating instructions for demounting, if applicable.

Products and materials

Type tests: Submit results as follows:

- Weighted suspended ceiling normalized level difference: To AS/NZS ISO 717.1.
- Weighted sound absorption coefficient: To AS ISO 11654, as tested to AS ISO 354.
- Weighted sound reduction index: To AS/NZS ISO 717.1.

Prototypes

General: Provide a prototype of the ceiling system, including at least one example of each of the specified components, including services terminals.

Size: At least 10 m².

Samples

General: Submit samples as follows:

- Suspension system: Sections proposed for the suspension system, including suspension rods, clips and wall angles.
- Accessories including access panels and wall trim.
- Ceiling material: Lining or ceiling units, with insulation, showing the extremes and mean of variation in colour, pattern, or texture of the proposed finish.

Shop drawings

Set-out drawings: Submit proposed set-out, indicating the grid module, type and ceiling unit layout, before installation. Coordinate with plenum services layouts, building structure and other factors affecting the layout.

Warranties

Requirement: Submit warranties to **COMPLETION, Warranties**.

1.9 INSPECTION

Notice

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

- The suspension system before the installation of ceiling units or lining.
- The ceiling assembly before the installation of fittings and site painting, if applicable.
- The completed ceiling.

2 PRODUCTS

2.1 GENERAL

Product substitution

Other products: Conform to **SUBSTITUTIONS** in *0171 General requirements*.

Storage and handling

Requirement: Store suspended ceiling components in a dry and secure area, and to the manufacturer's recommendations.

Product identification

General: Marked to show the following:

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

2.2 FIRE PERFORMANCE

Fire hazard properties

Group number: To AS 5637.1.

Fire-resistance of building elements

Fire-resistance level: Tested to AS 1530.4.

2.3 SUSPENSION SYSTEM

RONDO ceiling systems

General: As documented.

Ceiling systems:

- RONDO KEY-LOCK® Concealed ceiling system.
- Accessories: To RONDO's recommendations.

Materials

Protective coatings for steel components: To AS/NZS 2785 Appendix F.

2.4 LININGS

Ceiling linings

General: As documented.

Plasterboard

Standard: To AS/NZS 2588.

Minimum thickness: 10 mm.

Fibre cement

Standard: To AS/NZS 2908.2.

Ceiling linings: Type B Category 2.

Minimum thickness: 4.5 mm.

Sealants

Fire-resisting sealant: Non-hardening sealant compatible with the ceiling materials and to the documented fire-resistance level.

Acoustic sealant: Non-hardening sealant compatible with the ceiling materials and rated to match the ceiling system's acoustic performance.

3 EXECUTION

3.1 SUBCONTRACTORS

General

Requirement: Use specialist installers recommended by the ceiling system manufacturer.

3.2 GENERAL

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.

Bracing: Brace partitions attached to the ceiling at concentrated load points such as window and door openings and shelving.

Stability

General: Install the ceilings level, to the nominated plane 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.

Curtain recesses

General: Provide curtain recesses, including the following:

- Lining.
- Curtain track support.
- Accommodation for motors and cabling.

3.3 SUSPENSION SYSTEM

Installation of RONDO ceiling support systems

Requirement: To the RONDO Professional Design Manual.

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. Maintain a consistent and uniform grid set-out conforming to RONDO's span tables, or as documented.

Clearances: Allow for adequate clearance between ceiling grid and building facade elements.

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 access panels or air registers to prevent distortion, overloading or excessive vertical deflection.
- Allow for access for maintenance of services.

Alignment: Align suspension system with ceiling grid members.

- Vertical misalignment: < 5° (9H in 100V) in either direction.

Clearances: Provide minimum clearance between suspension system and services in the plenum space, to RONDO's recommendations.

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 lay flat on the perimeter trim.

- Minimum bearing length: 7 mm.

Restriction: Do not attach the suspension system to the lip or flange of purlins.

Services

Support: Conform to the following:

- Do not fix suspension members to services
- If services obstruct the ceiling supports, provide bridging and suspension on each side of the services.
- Do not support services terminals on ceiling units.
- Clearances: Maintain clearance between services and the suspension system to RONDO's recommendations.

RONDO DUO ceiling grids: If the weight of the service exceeds 7.5 kg, provide independent suspension to the service.

Bracing

General: If the ceiling grid is unable to transfer sufficient load at the perimeter junction, provide plenum bracing to RONDO's recommendations to prevent lateral movement of the ceiling grid 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 the resulting seismic force within the bulkhead bracing.

External suspended soffits

RONDO KEY-LOCK® ceiling grid system: Provide rigid down-strutting members as documented, at each suspension point to prevent ceiling uplift.

Fasteners

General: Provide concealed fasteners to the manufacturer's recommendations. If material supporting hangers is less than 1.2 mm thick, do not use single screw fasteners in tension.

3.4 CEILING UNITS

Installation

Fitting: Fit ceiling units accurately and neatly, without distortion.

Tile hold down clips: If ceiling units are required to be restrained for security or to prevent dislodgement of the ceiling tile under seismic actions, insert tile hold down 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, or as documented.

Service penetrations

General: Provide openings for all services elements, including light fittings, ventilation outlets, detectors, sprinklers and loudspeakers. If services pass through ceiling grid members, provide additional grid members and support.

Cut ceiling unit edges

General: Conceal, or finish to match prefinished edges, including at openings for services elements.

3.5 PLASTERBOARD

Installation

Gypsum plasterboard and fibre-reinforced gypsum plaster: To AS/NZS 2589.

Suspended flush ceilings: Fix using screws or screws and adhesive to ceiling members or support frame.

Multiple sheet layers

Application: Fire-resisting and acoustic rated ceilings.

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 in both directions.

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 RONDO P01 corner beads.

Control joints and movement joints: Align lining control joints with structural movement joints and as follows:

- Ceilings:
 - . Internal: At maximum 12 m centres.
 - . External: At maximum 6 m centres.
- Control joint beads: RONDO P35 expansion joint.
- Seismic joint: RONDO sliding joint.
- Location: Position joints to intersect light fixtures, vents or air diffusers.

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

3.6 FIBRE CEMENT

Installation

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

Suspended flush ceilings: Fix using screws or screws and adhesive to ceiling members or support frame.

External areas: Close up ceiling grid spacing to the manufacturer's recommendations for fibre cement, as appropriate.

Multiple sheet layers

Application: Fire-resisting and acoustic rated ceilings.

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 in both directions.

Joints

Flush joints: Provide recessed edge sheets and finish flush using perforated paper reinforcing tape.

External corner joints: Make joints over RONDO P01 corner beads.

Dry joints: Provide square edged sheet and join with a RONDO Extreme PDM joining section.

Control and movement joints: Align lining control joints with structural control joints and for flush jointing as follows:

- Control joint beads: RONDO P35 expansion joint.
- Seismic joint: RONDO sliding joint.
- Support: Provide framing parallel to the joint on each side. Do not fix the lining to abutting building surfaces.
- Location: Position joints to intersect light fixtures, vents or air diffusers.

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

3.7 ACCESS PANELS

General

Requirement: Provide RONDO access panels to *0453p RONDO in doors and access panels*.

Finish

General: Match the access panels to the ceiling in appearance and performance.

Identification

General: Provide each access panel with an identification mark.

Non-demountable ceilings

General: Provide access panels supported and anchored to permit ready removal and refixing.

Reinforcement

Frames: Frame the ceiling opening on all sides to allow fixing of the access panel. Provide independent suspension to the framing, as required.

3.8 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.

Plasterboard cornices

Fixing: Mitre at corners and adhesive fix with cornice cement. Pin in place at cornice edges until adhesive sets, remove pins and fill holes.

Vertical movement: If minor vertical movement of the ceiling is anticipated, use flexible mastic to joints to vertical surfaces.

Fibrous plaster cornices and roses

Fixing: Pin or prop in place and fix with wet gypsum plaster and scrim straps over framing members.

Fire-resisting walls

Requirement: Seal to soffit with sealant with an equivalent fire-resistance level before fixing decorative cornices, if any.

3.9 COMPLETION

Spares

General: Provide spare matching ceiling components, as follows, and store the spare materials on site where directed:

- Supporting system: One spare supporting member (hanger or framework member) for every 100 members or part thereof of the same type installed in the ceiling.
- Ceiling units: One spare unit for every 50 units or part thereof installed in the ceiling.
- Accessories: One spare of each type for every 50 units or part thereof installed in the ceiling.

Warranties

Requirement: Provide warranties for materials and workmanship in the form of interlocking warranties from the supplier and the installer.

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

4 SELECTIONS

4.1 LININGS
Sheet lining schedule

	A	B	C
Location	Refer to architectural drawings.		
Material			
Thickness (mm)			
Configuration			
Plasterboard: Grade			
Plasterboard: Level of finish to AS/NZS 2589			
Plasterboard cornice			
Fibrous plaster cornice			
Fibrous plaster rose			
Control joint			
Access panels			

0551B 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.*

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

Operation and maintenance manuals

General: Submit manufacturer's published recommendations for service use.

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.

Shop drawings

General: Submit shop drawings to a scale that best describes the detail, showing the following:

- Overall dimensions.
- 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.
- Locations of benchtop joints.
- Stone benchtop layout including joint arrangement and penetrations.
- Locations of sanitary fixtures, stoves, ovens, sinks, and other items 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.

Timing: Before fabrication.

Subcontractors

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

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 GENERAL

Storage and handling

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

Visible work

Clear finished timber and veneer: Make sure all visible surfaces are free of branding, crayon or chalk marks and of blemishes caused by handling.

Joinery timber

Hardwood for trim: To AS 2796.1.

Hardwood for furniture: To AS 2796.3.

Seasoned cypress pine: To AS 1810.

Softwood for trim: To AS 4785.1.

Softwood for furniture: To AS 4785.3.

Finished sizes 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.

Non-structural glued laminated timber

Wet process fibreboard (including hardboard)

Particleboard

Standard: To AS 1859.1.

Melamine overlaid particleboard: Particleboard overlaid on both sides with low pressure melamine.

Dry process fibreboard (including medium density fibreboard)

Standard: To AS/NZS 1859.2.

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.

High-pressure decorative laminate (HPDL) sheets

Standard: To AS/NZS 2924.1.

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, including to studs: 3.0 mm.
- For edge strips: 0.4 mm.

Stone facings

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

2.3 VENEERS

Timber veneer

Requirement: Provide veneers slip matched and flitch batched and falling within the visual range of the approved samples.

Veneer quality: To AS/NZS 2270.

Minimum grade:

- 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.

Vinyl veneer

Type: Proprietary unbacked vinyl fabric factory-bonded to the designated surface.

2.4 JOINERY ASSEMBLIES

General

Standard: To AS 4386.

Plinths

Thickness: 16 mm.

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

Thickness: 16 mm.

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

Thickness: 16 mm.

Door size: Not exceeding 1.5 m² on face, with 2400 mm maximum height or 900 mm maximum width.

Drawer fronts: Rout for drawer bottoms.

Drawer backs and sides

Material: PVC film wrapped particleboard.i

Thickness: 12 mm.

Installation: Mitre corners leaving outer skin of foil intact, finish with butt joints, glue to form carcass and screw to drawer front. Rout for drawer bottoms.

Drawer bottoms

Material: PVC film laminated hardboard.

Thickness: 3 mm.

Drawer and door hardware

Hinge types: Concealed metal hinges with the following features:

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

Piano hinges: Chrome plated steel, extending full height of doors.

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

- 30 kg loading capacity.
- Integrated soft and self-closing action.
- Closure retention.
- White thermoset powder coating or nickel plated.

2.5 WORKING SURFACES

Laminated benchtops

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

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.

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

Stone benchtops

Material:

- Type: Refer to Material and Finishes Schedule.

Balance underside: Laminate undersides of benchtops.

2.6 OTHER MATERIALS

Tactile ground surface indicators

Tactile ground surface indicators to stairs: To AS/NZS 1428.4.1.

3 EXECUTION

3.1 JOINERY

General

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

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

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.

Fixing to substrate: 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.

Glass splashbacks

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

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

Labelling

General: Permanently mark each unit of furniture with the manufacturer's name, on an interior surface.

3.2 TRIM

General

Requirement: Provide trims such as architraves, beads, mouldings, stops and skirtings to make neat junctions to openings and between lining components, finishes and adjacent surfaces.

Fixing

To masonry walls: Screw with wall plugs at 600 mm centres maximum.

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

3.3 COMPLETION

Protection

Timber treads: Provide full timber or plywood casing.

Cleaning

Requirement: Remove all dust, marks and rubbish from all surfaces and internal spaces. Clean and polish all self-finished surfaces such as anodised and powder coated metals, sanitary ware, glass, tiles and laminates.

Temporary coatings: On or before completion of the works, or before joining up to other surfaces, remove all traces of temporary protective coatings.

4 SELECTIONS

4.1 TRIM

Trim schedule

	T1	T2	T3
Door architraves: Size (h x t) (mm)	Refer to architectural details.		

	T1	T2	T3
Door architraves: Finish	Paint Finish		
Skirtings: Size (h x t) (mm)	13mm THK x 90mm H		
Skirtings: Profile	Square edge		
Skirtings: Finish	Paint Finish		

0552B METALWORK - FABRICATED

1 GENERAL

1.1 RESPONSIBILITIES

General

Requirement: Provide metal fixtures, as documented.

Performance

Requirements:

- Undamaged, plumb, level and straight or as documented.
- Free of surface defects or distortions or as documented.

1.2 CROSS REFERENCES

General

Requirement: Conform to the following:

- *0171 General requirements.*

1.3 STANDARDS

General

Access for maintenance: To AS 1657.

1.4 TOLERANCES

General

Requirement: ± 2 mm from design dimensions.

1.5 SUBMISSIONS

Operation and maintenance manuals

General: Submit manufacturer's published recommendations for service use.

Products and materials

Proprietary items: Submit the manufacturer's standard drawings and details showing:

- Methods of construction.
- Assembly and fixing, with dimensions and tolerances.

Stainless steel: For each batch of stainless steel supplied to the works, submit the certificate of conformance or test certificate to the applicable standard, as documented.

Stainless steel welding: Before fabrication commences, submit evidence of qualification of the welding procedure by testing to AS/NZS 1554.6 clause 4.7 or evidence of prequalification to AS/NZS 1554.6 clause 4.12.

Shop drawings

General: Submit shop drawings to a scale that best describes the detail, showing the following information:

- Overall and detail dimensions.
- Details of fabrication and components.
- Details of fabrication involving other trades or components.
- Information necessary for site assembly.
- Proposals for the break-up of large items as required for delivery to the site.
- Proposed method of joining the modules of large items.

Subcontractors

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

1.6 INSPECTION

Notice

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

- Arrival of materials on site or in workshop.
- Shop fabricated or assembled items ready for delivery to the site.
- Commencement of shop or site welding.
- Site erected assemblies on completion of erection, before covering up by cladding and encasing.
- Steel surfaces prepared for, and immediately before, site applied finishes.

2 PRODUCTS

2.1 GENERAL

Storage and handling

Requirement: Store and handle fabricated metalwork, as follows:

- Deliver to site in unbroken wrapping or packing.
- Store on a level base, away from uncured concrete and masonry and areas of wet plaster.
- Do not store in contact with other materials that may cause staining, denting or other surface damage.
- Use gloves when handling precoated finishes.
- Keep storage time to minimum by delivering items only when required for installation.

Marking

General: Provide suitable and sufficient marks or other means for identifying each member of site-erected assemblies, and for their correct setting out, location, erection and connection. Mark bolted connections to show the bolting category. Do not mark stainless steel by notching.

2.2 MATERIALS

Metals and components

Performance: Provide metals and components in quantity, lengths and cross-sections of strength and stiffness suited to their required function, finish, fabrication and method of installation.

Fasteners

Performance: Provide fasteners to resist galvanic corrosion in materials of structural and mechanical strengths and corrosion resistance at least equal to that of the lowest resistant metal in the connection.

Materials: Provide fasteners as follows:

- To copper and copper alloys: Copper or copper-alloy fixing devices only.
- To aluminium and aluminium alloys: Aluminium alloy or non-magnetic stainless steel fixing devices only.
- To stainless steel: Appropriate stainless steel materials only.

2.3 OTHER MATERIALS

Tactile ground surface indicators

Tactile ground surface indicators to stairs: To AS/NZS 1428.4.1.

3 EXECUTION

3.1 CONSTRUCTION GENERALLY

Aluminium structures

Standard: To AS/NZS 1664.1 or AS/NZS 1664.2.

Metals

Incompatible metals: Separate using concealed layers of suitable materials in appropriate thicknesses.

Fabrication

Workshop: Fabricate and pre-assemble items in the workshop wherever practicable.

Edges and surfaces: Keep clean, neat and free from burrs and indentations. Remove sharp edges without excessive radiusing.

Tube bends: Form bends in tube without deforming the cross section and the material thickness.

Colour finished work: Match colours of sheets, extrusions and heads of fasteners.

Thermal movement: Accommodate thermal movement in joints and fastenings.

Joints

General: Fit joints to an accuracy appropriate to the class of work. Finish visible joints made by cutting, drilling, welding, brazing or soldering using grinding, buffing or other methods appropriate to the class of work, before further treatment.

Self-finished metals: Free of surface colour variations, after jointing.

Joints: Fit accurately to a fine hairline or as documented.

Splicing

General: Provide structural members in single lengths.

3.2 WELDING AND BRAZING

Welding

Quality: Provide finished welds which are free of surface and internal cracks, welding slag, and porosity.

Site welds: Avoid site welding wherever possible. If required, locate site welds in positions for down hand welding.

Butt weld quality level: Not inferior to the appropriate level recommended in AS/NZS 1554.1 Section 6, AS/NZS 1554.6 Section 6 or AS/NZS 1665 Section 6, as appropriate.

Brazing

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

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

3.3 STAINLESS STEEL FABRICATION

Welding stainless steel

Certification of welders: To AS 1796.

Riveting

General: Use only to join stainless steel sheet or strip less than 1 mm thick. Drill (not punch) the rivet hole, and drive the rivet cold. On completion, clean and passivate the riveted assembly.

Soldering

General: Do not solder stainless steel.

3.4 CUSTOM-BUILT STEEL STAIRS

General

Materials, design and construction: To AS 1657.

Nosing strip: To BCA D2.13 and BCA D2.14.

Fabrication

Method: Welding.

Joints: Produce smooth unbroken surfaces at joints or as documented. Scribe the joints to all steel members. Make end-to-end joints over an internal sleeve.

Bends: Make changes of direction in rails by evenly curved pipe bends.

Free ends: Seal the free ends of pipes with fabricated or purpose-made end caps.

Fixing to structure

General: Provide fabricated predrilled or purpose-made brackets, anchors or post bases, and attach the steel member to the building structure with fixings, including bolts into masonry anchors, and coach screws or bolts into timber, of metal compatible with the steel member.

Galvanizing

General: If possible, complete fabrication before galvanizing; otherwise apply a zinc-rich primer to affected joint surfaces.

Other protective coatings

General: Apply other protective coatings as documented and to the manufacturer's recommendations.

3.5 PROPRIETARY STAIR SYSTEMS

General

Materials, design and construction: To AS 1657.

Nosing strip: To BCA D2.13 and BCA D2.14.

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

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

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

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

3.6 FIXED STEEL LADDERS

Assembly

Materials, design and construction: To AS 1657.

Fixing: Fix ladder stiles securely to the building structure at tops and bottoms of flights, and at intermediate points.

3.7 PIPE RAIL BALUSTRADES

Fabrication

Method: Welding.

Joints: Produce smooth unbroken surfaces at joints. Scribe the joints between posts and rails. Make end-to-end joints over an internal sleeve.

Bends: Make changes of direction in rails by evenly curved pipe bends.

Free ends: Seal the free ends of pipes with fabricated or purpose-made end caps.

Fixing to structure

General: Provide fabricated predrilled or purpose-made brackets or post bases, and attach the piping to the building structure with fixings, including bolts into masonry anchors, and coach screws or bolts into timber, of metal compatible with the piping.

Galvanizing

General: If possible, complete fabrication before galvanizing; otherwise apply a zinc-rich primer to affected joint surfaces.

Other protective coatings

General: Apply other protective coatings as documented and to the manufacturer's recommendations.

3.8 PROPRIETARY BALUSTRADES

General

Balustrades: A proprietary system, pre-assembled and fixed in place, comprising the following:

- Posts, rails and balusters.
- Infill frame and panels.
- Handrails, if required.

3.9 CORNER GUARDS

Guards

General: Where salient corners of the structure require protection from mechanical damage, provide metal corner guards as follows:

- Consisting of rolled angle sections or sections fabricated from metal sheet bent to the radius or angle of the corner.
- Fitting close to adjoining surface finishes.
- Solidly grouted up at the back as necessary to eliminate voids.

- Securely fixed by a method which does not cause distortion in the guard surface, and consists of either concealed built in lugs, or flush countersunk head fixings into appropriate anchors.

3.10 COMPLETION

Cleaning

Temporary coatings: On or before completion of the works, or before joining up to other surfaces, remove all traces of coatings used as temporary protection.

4 SELECTIONS

4.1 RETRACTABLE CEILING ACCESS STAIRS

Retractable ceiling access stair assembly schedule

	A1	A2	A3
Product	Refer to SAYFA		
Height (mm)			
Material			
Finish			
Ceiling access panel finish			

4.2 BALUSTRADES

Steel balustrade components schedule

Member	Sizes (mm)	Spacing	Material/Finish
Posts	40mm dia		Stainless Steel
Handrail/top rail	40mm dia		Stainless Steel

4.3 TACTILE GROUND SURFACE INDICATORS

Tactile ground surface indicators schedule

	A	B	C
Product	Refer to Material and Finishes Schedule.		
Type			
Edge protector			
Material			
Colour			

0581B 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.
- With characters and symbols contrasting 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.*
- *0921 Low voltage power systems.*

1.3 STANDARDS

Signs

Safety signs - design and use: To AS 1319.

Signs and graphics for disability access: To AS 1428.1 and AS 1428.2.

Tactile wayfinding signs: To AS 1428.4.2.

2 PRODUCTS

2.1 MATERIALS

Standards

Aluminium:

- Plate for engraving: Alloy and temper designation 6063-0 to AS 2848.1.
- For casting: To AS 1874.
- Finishes:
 - . Anodising: To AS 1231.
 - . Powder coating: To AS 3715 and AAMA 2604.

Stainless steel:

- External: Type 316. Mirror 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, class VH for cut-out shapes.

Brass and bronze: Plate, sheet and strip: To AS 1566.

- Finish: Patinated.

Glass type and thickness: To AS 1288.

Photoluminescent exit signs: To BCA E4.8(b).

Adhesive

General: Proprietary solvent based contact adhesive compatible with the substrate and signage material.

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.

Aluminium and stainless steel signs

Pin fixing: Epoxy fix to substrate.

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. Install signs and conceal cabling to *0921 Low voltage power systems*.

3.3 COMPLETION

Cleaning

General: Remove protective coverings, replace damaged signage and leave the work clean, polished, free from defects, and in good condition.

Warranties

Requirement: Warrant against defective materials and incorrect installation.

4 SELECTIONS

4.1 GENERAL SIGNS

Signage schedule

Sign No.	Sign type	Location	Message	Notes
By others				

4.2 STATUTORY SIGNS

Required fire door and required smoke door

Location	On or adjacent to the door, on the side of the door that faces a person seeking egress, and if the door is in the held open position, on either the wall adjacent the doorway or both sides of the door.
Message if auto door with auto hold open device	FIRE SAFETY DOOR – DO NOT OBSTRUCT
Message if self-closing door	FIRE SAFETY DOOR DO NOT OBSTRUCT DO NOT KEEP OPEN
Message if door discharging from a fire isolated exit	FIRE SAFETY DOOR – DO NOT OBSTRUCT
Letter height (minimum)	20 mm
Sign type	
Conformance	BCA D2.23

Exit signs, Class 2 or 3 buildings and Class 4 parts, in lieu of illuminated exit signs

Location	On, above, or adjacent every door described in BCA E4.5, BCA E4.6 and BCA E4.7.
Message	EXIT (with arrow in the direction of egress, if required)
Letter height (minimum)	25 mm
Sign type	
Conformance	BCA E4.5, BCA E4.6 and BCA E4.7

Braille and tactile exit signage

Location	To BCA Spec D3.6 for every door described in BCA E4.5
Message	Exit (and) Level (followed by the floor level number) (Braille and tactile signage)
Letter height (minimum)	BCA Spec D3.6
Mounting height	Braille and tactile signage between 1200 mm and 1600 mm above finished floor level
Sign type	
Conformance	BCA E4.5, BCA D3.6 and BCA Spec D3.6

Fire hose reels and fire hydrants

Location	Cupboard door or adjacent the FHR
Message	FIRE HYDRANT (and/or) FIRE HOSE REEL
Letter height (minimum)	50 mm
Sign type	Adhesive backed vinyl
Conformance	AS 2441 clause 10.4.4 AS 2419.1 clause 11.3.5

Fire hose reel – Location sign

Location	Above or adjacent the FHR if located in a recess, cavity or obscure location
Message	To AS 2441 Figure 10.1
Letter height (minimum)	16 mm
Mounting height (minimum)	2000 mm above finished floor level or at a height visible to a person approaching the fire hose reel location
Sign type	Adhesive backed vinyl
Conformance	AS 2441 clause 4.1

Fire brigade booster assembly cabinet – Location sign

Location	Cabinet doors
Message if fire hydrant booster is installed	FIRE HYDRANT BOOSTER ASSEMBLY
Message if fire hydrant booster and sprinkler booster are installed	FIRE HYDRANT BOOSTER AND SPRINKLER BOOSTER ASSEMBLY
Message if combined fire hydrant and sprinkler booster is installed	COMBINED FIRE HYDRANT AND SPRINKLER BOOSTER ASSEMBLY
Message if a feed fire hydrant is enclosed in the cabinet	(Symbol FH within a 100 mm circle of thickness and colour to match lettering)
Letter height (minimum)	50 mm
Sign type	Adhesive backed vinyl
Conformance	AS 2419.1 clause 11.3.1 AS 2118.6 clause 2.2.3

Fire brigade booster assembly – Attack fire hydrant

Location	Behind or adjacent to attack fire hydrant
Message	ATTACK HYDRANT
Letter height (minimum)	25 mm
Sign type	
Conformance	AS 2419.1 clause 11.3.1

Fire brigade booster assembly – Notice of pressure

Location	Within the cabinet or enclosure
Message	TEST PRESSURE: ◊ kPa BOOST PRESSURE: ◊ kPa
Letter height (minimum)	25 mm
Sign type	
Conformance	AS 2419.1 clause 11.3.4

Boosters in series with pumps

Location	Adjacent to the pressure gauge
Message	<p>WARNING</p> <p>THIS BOOSTER IS CONNECTED IN SERIES (RELAY) WITH THE FIXED ON-SITE FIRE PUMPS WHICH MAY BE RUNNING.</p> <p>THIS GAUGE SHOWS THE DISCHARGE PRESSURE AT THE OUTLET OF THE FIXED ON-SITE PUMP</p>
Letter height (minimum)	25 mm (title), 15 mm (remainder)
Sign type	
Conformance	AS 2419.1 clause 11.3.7.1

Block plan

Location	At booster assembly cabinet or enclosure, and in fire control room or pump room, if applicable.
Message	(Block plan to AS 2419.1 clause 11.5 or AS 2118.1 clause 8.3)
Letter height (minimum)	
Sign type	
Conformance	AS 2419.1 clause 11.5 AS 2118.1 clause 8.3

Portable fire extinguishers – Cabinet

Location	Cabinet
Message	FIRE EXTINGUISHER
Letter height (minimum)	32 mm
Sign type	Adhesive backed vinyl
Conformance	AS 2444 clause 3.6

Portable fire extinguishers – Location sign

Location	As nominated in AS 2444 clause 3.2 at every installed extinguisher nominated in BCA Table E1.6
Message	FIRE EXTINGUISHER (and prescribed graphic)
Letter height (minimum)	16 mm
Mounting height (minimum)	2000 mm above finished floor level
Sign type	Computer generated adhesive backed vinyl graphic
Conformance	AS 2444 clause 3.3

Fire blankets

Location	As nominated in AS 2444 clause 6.4 at every blanket location nominated in AS 2444 clause 6.3
Message	FIRE BLANKET (and prescribed graphic)
Letter height (minimum)	16 mm
Mounting height (minimum)	2000 mm above finished floor level
Sign type	Computer generated adhesive backed vinyl graphic
Conformance	AS 2444 clauses 6.3, 6.4 and Figure 6.1

Regulatory carpark signs – Low clearance

Location	Entry to overhead obstruction where clearance is: - 3 m or less – car and light van use only - 4.6 m – all other cases
Message	LOW CLEARANCE (measured minimum clearance rounded down to the nearest 0.1 m)
Sign type	AS/NZS 2890.1 R6-11 or R6-16
Conformance	AS/NZS 2890.1 clause 4.3.4

Regulatory carpark signs – Stop and Give Way

Location	As required for traffic control
Message	Graphic nominated in AS/NZS 2890.1 clause 4.3.4(b)
Sign type	AS/NZS 2890.1 R1-1 (Stop), R1-2 (Give Way)
Conformance	AS/NZS 2890.1 clause 4.3.4

Regulatory carpark signs – Speed limit

Location	As required for traffic control
Message	Graphic nominated in AS/NZS 2890.1 clause 4.3.4(c)
Sign type	AS/NZS 2890.1 R4-1
Conformance	AS/NZS 2890.1 clause 4.3.4

Regulatory carpark signs – Steep grade warning

Location	As required for traffic control
Message	Graphic nominated in AS/NZS 2890.1 clause 4.3.4(e)
Sign type	AS/NZS 2890.1 W5-12 (Down), W5-13 (Up)
Conformance	AS/NZS 2890.1 clause 4.3.4

Hearing augmentation

Location	Where hearing augmentation is installed to BCA D3.7
Message	Braille and tactile signage incorporating the international symbol of deafness in white on a blue background. Identify: - Type of hearing augmentation. - Area covered within the room. - If receivers are being used and where the receivers can be obtained.
Letter height (minimum)	BCA Spec D3.6
Symbol size	AS 1428.2 clause 16, Table 1
Sign type	
Conformance	AS 1428.1 clause 5.2.2 BCA D3.7 BCA Spec D3.6

Main switchboard – Main entry, excluding Class 1 dwellings

Location	Each entry that may be used by emergency services or at Fire detection control and indicating equipment (FDCIE)
Message	Indicate location of main switchboard. Incorporate the term Main Switchboard into notice
Letter height (minimum)	
Sign type	
Conformance	AS/NZS 3000 clause 2.10.2.4

Main switchboard – Room or enclosure, excluding Class 1 dwellings

Location	The room or enclosure containing the main switchboard
Message	MAIN SWITCHBOARD
Letter height (minimum)	
Sign type	
Conformance	AS/NZS 3000 clause 2.10.2.4

0611 RENDERING AND PLASTERING**1 GENERAL****1.1 RESPONSIBILITIES****General**

Requirement: Provide plaster finishes as documented.

Performance

Requirements:

- Resistant to impacts expected in use.
- Free of irregularities.
- Consistent in texture and finish.
- Firmly bonded to substrates for the expected life of the application.
- Without obvious shrinkage cracks.
- As a suitable substrate for the nominated final finish.

1.2 CROSS REFERENCES**General**

Requirement: Conform to the following:

- 0171 General requirements.

1.3 INTERPRETATION**Abbreviations**

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

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

Definitions

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

- Base coat: A plaster coat applied before the application of the finish coat.
- Bonding treatment: A treatment of a substrate which improves adhesion of a plaster system.
- Finish coat (rendering and plastering): The final coat of a coating system.
- Finishing treatment (plastering): The treatment applied to a finish coat which may include processes and results.
- Plaster: A mixture of binders, aggregate and water which is applied to substrates in a plastic state and dries and cures to a hard surface which may subsequently be decorated:
 - . Cement plaster: Contains Portland cement as the principal binder.
 - . Gypsum plaster: Contains hydrated or anhydrous calcium sulfate as the principal binder.
- Plastering: The process of coating the framing or solid surfaces of a building with a plastic material which hardens and then may be decorated or remain self-finished.
- Plastering system: One or more coats of plaster and associated treatments comprising some or all of the following in sequence:
 - . Base coat 1 or 2.
 - . Bonding treatment.
 - . Finish coat.
 - . Finishing treatment.
- Render, rendering: Plaster, plastering, usually single coat and usually cement:lime:sand.
- Substrate: The surface to which a material or product is applied.

1.4 TOLERANCES

Tolerances table

Description	Alignment	Tolerance
Walls and other vertical structures	Vertical	6 mm in 2400 mm
Reveals sides	Vertical	3 mm in 1800 mm
Reveals head up to 1800 mm	Horizontal	3 mm in 1800 mm
Reveals head over 1800 mm	Horizontal	5 mm max
Reveals, piers, beams, wall stop ends up to 300 mm	Square	3 mm max
Reveals, piers, beams, wall stop ends over 300 mm	Square	5 mm max
Radius of corners	Round	Should not vary by more than ± 10% over the length of the arris.

1.5 SUBMISSIONS

Prototype

Plaster systems: Prepare prototypes of each plaster system complete with beads and other embedded items:

- Size: 1200 x 2400 mm.

1.6 INSPECTION

Notice

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

- Prototypes ready for inspection.
- Substrates immediately before applying base coats.
- Finish treatments before decoration.

2 PRODUCTS

2.1 GENERAL

Storage and handling

General: Store materials in a dry, well-ventilated and secure storage area, unaffected by weather.

2.2 MATERIALS AND COMPONENTS

Accessories

Beads: Provide metal proprietary sections manufactured for fixing to substrates and/or embedding in the plaster to form and protect plaster edges and junctions.

Metal lath: Provide a proprietary product manufactured from raised expanded metal for use with plaster:

- Mass/unit area: 1.84 kg/m² or greater.
- Material thickness: 0.70 mm or greater.
- Mesh size: 9.5 x 28.6 mm.

Metallic-coatings to AS 1397: For beads or lath in cement plaster: To the **Corrosion resistance and durability table**.

Admixtures

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

Aggregates

Sand: Fine, sharp, well-graded sand with a clay content between 1% and 5% tested to AS 1141.12, and free from efflorescing salts.

Sand grading for base coat plaster table

Sieve size (mm)	Percent passing	
	Minimum	Maximum
4.75	100	100
2.36	90	100
1.18	60	90
0.6	35	70
0.3	10	30
0.15	0	5
0.075	0	3

Plaster for autoclaved aerated concrete

General: Proprietary product manufactured for use with the wall system.

Bonding products

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

Cement

Standard: To AS 3972.

Type: GP.

Colouring products

General: Provide proprietary products manufactured for colouring cement plaster.

Integral pigment proportion: 5% maximum weight of cement.

Cornice cement

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

Cornices

Cast plaster: Proprietary item.

Corrosion resistance and durability

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

- Galvanize: To AS/NZS 4680.

Corrosion resistance and durability table

Atmospheric corrosivity category to AS 4312	Metal lath, beads and embedded items	Minimum cement content (mix type) above damp-proof course
C1 and C2	Galvanize after fabrication 300 g/m ² Stainless steel Type 316	CRW
	Powder coated aluminium	CRM
C3	Stainless steel Type 316 Powder coated aluminium	CRM
C4	Stainless steel Type 316 Powder coated aluminium	CRS

Note: For categories C5 and CX seek specialist advice.

Curing products

General: Provide proprietary products manufactured for use with the plaster system.

Gypsum plaster

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

Lime

Limes for building: To AS 1672.1.

Lime putty

General: Prepare lime putty as follows:

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

Mixes

General: Select a mix proportion to suit the conditions of application.

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

Plaster mixing: Machine mix for 3 to 6 minutes.

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

Mix proportion table – Cement render, by volume

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

Mix proportion table – Gypsum finish coat, by volume

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

Mix proportion table – Gypsum finish coat, by weight

Gypsum plaster (kg)	Lime putty (kg)
17	25
34	50
51	75

Control joint products

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

Water

General: Clean and free from any deleterious matter.

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

General: Provide substrates as follows:

- Clean and free from any deposit or finish which may impair adhesion of plaster.

- If framed or discontinuous, support members in full lengths without splicing.
- If solid or continuous, remove excessive projections and fill voids and hollows with plaster stronger than the first coat and not weaker than the substrate.

Absorbent substrates: If suction is excessive, control it by dampening without over-wetting, and do not plaster substrates showing surface moisture.

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

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

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

Beads

Location: Fix beads as follows:

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

Joints in beads: Provide dowels to maintain alignment.

Mechanical fixing to substrate: ≤ 300 mm centres.

Bonding treatment

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

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

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

Thickness: ≥ 3 mm and < 6 mm.

Embedded items

General: To the **Corrosion resistance and durability table**. If there are water pipes and other embedded items, sheath them to permit thermal movement.

Lath

Location: Provide lath as follows:

- Chases: If chases or recesses are 50 mm wide or greater, fix metal lath extending 75 mm or more beyond each side of the chase or recess.
- Masonry and concrete substrates: If mechanical key cannot be attained by scabbling and bonding, fix metal lath.
- Metal and other non-porous substrates: Fix metal lath to provide a key.

Installation: Fix lath as follows:

- General: Run the long way of the mesh across supports with strands sloping downwards and inwards from the intended face of the plaster.
- Fixing: Mechanically fix at centres of 150 mm or less.
- Laps: Tie with 1.25 mm galvanized wire at centres of 150 mm or less. Do not stop edges of sheets at corners but bend around.
- On solid substrates: Space the lath 5 mm or more clear of the substrate.
- Support spacing: ≤ 400 mm.

3.2 APPLICATION

Plastering

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

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

Incidental work

General: Return plaster into reveals, beads, sills, recesses and niches. Plaster faces, ends, and soffits of projections in the substrate, such as string courses, sills, pilasters and corbels. Run neatly finished

throating on soffits of external projections. Trim around openings. Plaster exposed internal surfaces of built-in cupboards.

Joining up

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

Control joints

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

Size:

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

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

Plastering on metal lath: Provide control joints to divide the plastering area into rectangular panels of 10 m² or less.

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

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

Cornices

General: Accurately cut and mitre corners. Match and align ornament. Do not make butt joints in the length of a cornice unless required, or if full lengths are not available.

Installation: Butter edges, mitres and joins for the full length of the cornice with adhesive.

Mechanical fixing: If cornice projects across a ceiling 400 mm or more, provide additional mechanical fixing as follows:

- Fixing centres: ≤ 600 mm.

Decorative joints

Plaster thickness table

Substrate	Cement render, total thickness of single or multi-coat work (mm)	Gypsum/lime plaster (mm)
Dense concrete walls	15 max	3 max
Dense concrete ceilings	9 max	3 max
Brickwork and blockwork	12 min	3 max
Lightweight concrete and blocks	12 min	3 max
Metal lath measured from the face of the lath.	18 min	3 max

Temperature

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

3.3 FINISHES

Finishing treatments

Plain even surfaces: Work the hardening plaster as follows:

- Bag: Rub the finish coat when set firm with a hessian bag or similar.
- Carborundum stone: Rub the finish coat when set hard with a carborundum stone to achieve a finish free from sand.
- Foam float: Float finish coat on application with a wood or plastic float to an even surface and finish with a foam float to achieve a fine sand textured finish.
- Steel trowel: Steel trowel finish coat to a smooth dense surface which is not glass-like and is free from shrinkage cracks and crazing.

- Wood or plastic float: Float the finish coat on application to an even surface with a wood or plastic float.

Ornamental patterned surfaces: Work the hardening plaster with a trowel or other tool for the documented type.

Sprayed textured surfaces: Spray plaster onto a substrate using a purpose-designed machine.

Stippled textured surfaces: Work the hardening plaster with a stiff brush.

Rough thrown surfaces: Throw plaster onto a substrate or pebbles onto a plastic plaster base for the documented type.

Specialist plaster finishes

Polymer modified render:

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

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

Polished plaster: In situ applied plaster system incorporating selected stone dust in a proprietary matrix producing a smooth polished surface with visual patterning.

Glass bead coatings: Glass beads bound in a proprietary matrix.

3.4 COMPLETION

Curing

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

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

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

4 SELECTIONS

4.1 SCHEDULES

Plastering construction schedule

	A	B	C
Substrate material			
Base coat(s)			
Finish coat			
Finishing treatment			

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.*

1.3 STANDARDS

Waterproofing wet areas

Standard: To AS 3740.

1.4 INTERPRETATION

Definitions

General: For the purposes of this worksection, the definitions given in AS 3740 and the following apply:

- Membranes (waterproof): Impervious barriers to liquid water which may be:
 - . Installed below floor finishes.
 - . Installed behind the wall sheeting or render.
 - . Installed to the face of the wall sheeting or render.
 - . Applied in liquid or gel form and air cured to form a seamless film.
 - . Applied in sheet form with joints lapped and sealed.
- Waterproofing system: Combinations of membranes, flashings, drainage and accessories which form waterproof barriers and which may be:
 - . Loose-laid.
 - . Bonded to substrates.
- Wet area: An area within a building supplied with a floor waste.

1.5 SUBMISSIONS

Products and materials

Manufacturer's data: Submit product data sheets.

Type tests: Submit certificates verifying conformance to AS/NZS 4858 Table 8.1.

Prototypes

General: Apply waterproofing to 10 m² of substrate to demonstrate surface preparation, crack and joint treatment, corner treatment, and execution quality. Install final surface finish to demonstrate aesthetic affects, physical properties, and quality of materials and execution as applicable.

Records

General: Submit photographic records of application and protection of membranes. Label photographs with date and location.

Timing: Record at the following stages:

- After substrate preparation.
- After primer application.
- After membrane installation.

- After protection from traffic provided.

Liquid applied membranes:

- Record wet film thickness once every 10 m² and compare to the manufacturer's requirements.
- On completion of every 100 m² of each coat, compare the amount of membrane used with the manufacturer's application rate and record the result.

Membrane continuity tests: Submit reports:

- Flood test, including photographic records of flooded areas and adjacent areas. Label photographs with date and location.
- Electronic leak detection test.
- Seam probe test.

Shop drawings

Requirement: Submit shop drawings showing the following:

- Junctions with vertical surfaces and upstands.
- Junctions at perimeters.
- Drainage details.
- Control joints.
- Flashings.
- Penetrations.
- Corners.
- Terminations and connections.
- Membrane layers.

Subcontractors

General: Submit names and contact details of proposed suppliers and installers as recommended by the manufacturer.

Tests

Site tests: Submit results, as follows:

- Substrate moisture content test.
- Membrane continuity tests, including records of retesting after rectification:
 - . Flood tests.
 - . Electronic leak detection tests.
 - . Seam probe tests.

Warranties

Requirement: Submit warranties to **COMPLETION, Warranties**.

1.6 INSPECTION

Notice

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

- Substrates prepared and ready for installation of the wet area waterproofing systems.
- Secondary layers prepared and ready for subsequent layers.
- Membranes after installation and before concealment.
- After flood testing, if applicable.

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

Standards

Standard: To AS/NZS 4858.

Membrane system

Requirement: Proprietary membrane system suitable for the intended internal wet area waterproofing.

Total VOC limits

Requirement: Conform to the following maximum TVOC content:

- Waterproof membrane: 250 g/L.

2.3 ACCESSORIES

Shower tray

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

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 or water resistant, 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 PREPARATION

Substrates

General: Prepare substrates as follows:

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

Concrete substrates: Cure for more than 28 days.

External corners: Round or arris edges.

Moisture content

Requirement: 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 Appendix F.

Falls

Membrane applied to substrate: Make sure the fall in the substrate conforms to the fall documented for the finish.

Sheet substrate fastening

Requirement: Provide fasteners compatible with the substrate. Mechanically fasten to the supporting structure.

Waterstop angles

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

Sizing: Size the vertical leg of the waterstop angle to conform to the requirements of AS 3740.

Corners: Cut the horizontal leg and bend the vertical leg at corners instead of forming vertical joints between separate lengths of angle.

Fixing: Fix waterstop angles to the substrate with compatible sealant or adhesive and corrosion-resistant countersunk or wafer head screws.

Priming

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

Bond breakers

Requirement: After the priming of surfaces, provide bond breakers at wall/floor junctions, 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 Table 4.10.

3.2 INSTALLATION

Ambient conditions

Requirement: Do not install in conditions outside the manufacturer's recommendations.

Protection

Damage: 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 F1.7 or BCA 3.8.1.2, as applicable.

Sheet membrane joints

Bituminous sheet membranes:

- Side laps: ≥ 75 mm.
- End laps: ≥ 150 mm.

Synthetic rubber membranes:

- Factory-vulcanized laps: ≥ 40 mm.
- Field side laps: ≥ 50 mm.
- Field end laps: ≥ 100 mm.

PVC membranes:

- Factory-welded laps: ≥ 40 mm.
- Field-welded laps: ≥ 75 mm.

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 to at least 1800 mm above finished floor level of the shower or base of the bath or tray, or 50 mm above the shower rose, whichever is the higher.

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.

Vertical sheet flashings:

- Return legs at least 50 mm on each wall.
- Overlap shower tray upstands at least 50 mm.
- Do not penetrate flashing with wall lining fasteners.

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.

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.

Floor wastes in shower trays: Provide drainage of the tile bed and a waterproof connection between the tray and the drain.

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.

Vertical membrane terminations

Upstands:

- Shower areas with hobs and step-downs: Minimum 150 mm above the highest finished tile level of the shower area or 25 mm above the maximum retained water level, whichever is the greater.
- Shower areas without hobs: Minimum 150 mm above the highest finished tile level of the floor within the shower area.
- Shower areas with ceiling mounted shower rose: To the full height of the wall.
- Bath without an integral upstand edge without showers over: Minimum 150 mm above the shower rose connection.
- Bath with an integral upstand edge, bath with a shower over or bath adjoining an unenclosed shower: Minimum 150 mm above the bath edge.

Anchoring: Secure sheet membranes along the top edge.

Edge protection: Protect edges of the membrane.

Showers with step-downs

Level of shower area: At least 15 mm below the finished floor level outside the shower.

Framed shower screens:

- Terminate the membrane directly below the floor tiles below the shower screen sill mounted on the upper level of the step-down.
- Support and adhere the membrane to a waterstop angle fixed securely to the substrate.

Frameless shower screens:

- Install a waterstop angle where the base of the shower screen will be installed and across the opening of the shower.
- Install membranes on both sides of the waterstop angle and turn the membranes up against the angle. Extend the membrane at least 50 mm into the adjacent area
- Finish membrane flush with the underside of tiles.
- Provide a sealant joint between the waterstop angle and tiles.

- Install the shower screen with the inside face flush with the step-down.

Showers without hobs or step-downs

Frameless shower screens:

- Install a waterstop angle directly below where the base of the shower screen will be installed.
- Support and adhere the membrane over the waterstop angle and extend the membrane at least 50 mm in to the adjacent area.
- Install a capping angle over the membrane and vertical leg of the waterstop angle to protect the exposed membrane.
- Install the shower screen over the capping angle.

Unenclosed showers

Requirement: Extend membrane at least 1500 mm into the room from the shower rose outlet, on the walls and floor.

Baths and spas

Baths with integral upstands:

- Recess bath edges into walls or batten off wall lining sufficiently to allow water resistant wall finishes to overlap the integral upstands.
- Maintain the structural integrity of walls that are rebated.

Baths without integral upstands or with showers over:

- Form a rebate in the wall to receive the bath edge.
 - . Rendered masonry walls: Form or chase in the render.
 - . Framed and lined walls: Form in the wall lining with a corrosion-resistant lipped channel.
- Waterproof the wall above and below the rebate, including the rebate, and the floor area under the bath.
- Seal the edge of the bath into the rebate.

Taps and spouts

Requirement: Waterproof penetrations for taps and spouts with preformed flange systems or a sealant.

Provision for servicing: Install taps so tap washers or ceramic discs can be serviced without damaging the waterproofing or seal.

Wall recesses

Requirement: Support all faces of the recess and line with the same sheet material as the adjacent wall. Fall base of recess towards the shower area. Flash all junctions and waterproof all surfaces.

Curing of liquid membrane systems

General: To the manufacturer's instructions.

Curing: Allow membrane to fully cure before tiling.

Overlaying finishes on membranes

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

Suitable materials: Conform to AS 3740.

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

3.3 TESTING

Substrate tests

Moisture content: Test substrate for suitability for the installation of membranes to AS 3740 Appendix F.

- Maximum relative humidity of concrete or cementitious screeds: To AS 3740 Appendix F2.4.
- Moisture content of timber and plywood substrates: To AS 3740 Appendix F2.3.

Membrane continuity tests

Flood test: To AS 3740 Appendix C2.

Electronic leak detection test: To AS 3740 Appendix C3.

Seam probe test: To AS 3740 Appendix C4.

3.4 COMPLETION

Reinstatement

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

Warranties

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

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

4 SELECTIONS

4.1 SYSTEMS

Liquid membrane system schedule

	A	B	C
Proprietary system	Refer to Material and Finishes Schedule and Appendix		
Material type			
Tensile stress at break (MPa)			
Tensile strain (elongation at break) (%)			
Method of application			
Number of coats			
Application rate (L/m ²)			
Dry film thickness (total) (mm)			
Reinforcement			
Primer			
Base layer			
Top layer			
Waterstop angles			
Bond breakers			

Single layer sheet membrane system schedule

	A	B	C
Proprietary system	Refer to Material and Finishes Schedule and Appendix		
System type			
Sheet type			
Sheet thickness (mm)			
Base weight (kg/m ²)			
Tensile strength (MPa)			
Tensile strain (elongation at break) (%)			
Method of application			
Primer			
Bonding agent			

	A	B	C
Waterstop angles			
Bond breakers			

0631B CERAMIC TILING

1 GENERAL

1.1 RESPONSIBILITIES

General

Requirement: Provide tiling systems to walls, floors and other substrates, as documented.

Performance

Requirements:

- Consistent in colour and finish.
- Firmly bonded to substrates for the expected life of the installation.
- Set out with joints accurately aligned in both directions and wall tiling joints level and plumb.
- Direct all water flowing from supply points to drainage outlets without leakage to the substrate or adjacent areas.

1.2 CROSS REFERENCES

General

Requirement: Conform to the following:

- 0171 General requirements.

1.3 STANDARDS

Tiling

General: Conform to the recommendations of those parts of AS 3958.1 referenced in this worksection.

Slip resistance

Classification: To AS 4586.

1.4 TOLERANCES

Completed tiling

Requirement: To the recommendations of AS 3958.1 clause 5.4.6.

1.5 SUBMISSIONS

Operation and maintenance manuals

General: Submit a manual describing care and maintenance of the tiling, including procedures for maintaining the slip-resistance classification stating the expected life of the slip-resistance classification.

Products and materials

Type tests: Submit results, as follows:

- Slip resistance of tiles to AS 4586.

Samples

General: Submit labelled samples of tiles, including fittings, accessories, grout and sealants, illustrating the range of variation in colour and finish.

Sample panels: Prepare a sample panel of each type of tiling system as follows:

- Size: > 2 m².
- Include samples of junction details and trim.
- Preserve the panel until related work is complete.

Tests

Site tests: Submit results, as follows:

- Slip resistance test of completed installation.
- Impact sound insulation rating.

1.6 INSPECTION

Notice

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

- Substrate immediately before tiling.
- Trial set-outs before execution.
- Control joints before sealing and grouting.
- Grout and sealant colours before application.

2 PRODUCTS

2.1 UNDERLAY

Fibre cement underlay

Standard: To AS/NZS 2908.2, Type B, category 2 minimum.

Thickness: 5 mm minimum.

Acoustic underlay

General: Provide a proprietary product recommended by the manufacturer as compatible with the tiling system.

2.2 TILES AND ACCESSORIES

Tiles

Standard: To AS 13006.

Coves, nosings and skirtings: Provide matching stop-end and internal and external angle tiles moulded for that purpose.

Exposed edges: Purpose-made border tiles with the exposed edge (whether round, square or cushion) glazed to match the tile face. If such tiles are not available, mitre tiles on external corners.

Accessories

General: Provide tile accessories which match the composition, colour and finish of the surrounding tiles.

Tactile ground surface indicators

Standard: To AS/NZS 1428.4.1.

2.3 ADHESIVES

General

Standard: To AS ISO 13007.1.

Type

General: Provide adhesives compatible with the materials and surfaces to be adhered, and as documented.

Prohibited uses: Do not provide the following combinations:

- Cement-based adhesives on wood, metal, painted or glazed surfaces, gypsum-based plaster.
- Organic solvent-based adhesives on painted surfaces.
- Organic PVC-based adhesives and organic natural rubber latex adhesives in damp or wet conditions.
- PVA (polyvinyl acetate) based adhesives in wet areas or externally.

2.4 MORTAR

Materials

Cement type to AS 3972: GP.

- White cement: Iron salts content $\leq 1\%$.
- Off-white cement: Iron salts content $\leq 2.5\%$.

Lime: To AS 1672.1.

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

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

Bedding mortar

Mix proportion (cement:sand), by volume: Select proportions from the range 1:3 to 1:4 for satisfactory adhesion. Provide minimum water.

Terracotta tiles: Use proprietary polymer modified mortar.

Mixing: To AS 3958.1 clause 2.15.

Water

General: Clean and free from any deleterious matter.

2.5 GROUT

Type

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

Terracotta tiles: Use proprietary polymer modified grout.

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

Mix proportions (cement:sand), by volume:

- For joints < 3 mm: 1:2.
- For joints \geq 3 mm: 1:3.

Pigments

Pigments for coloured grout: Provide colourfast fillers compatible with the grout material. For cement-based grouts, provide lime-proof natural or synthetic metallic oxides compatible with cement.

2.6 CONTROL JOINTS

Control joint materials

Control joint strip: A proprietary control joint consisting of a neoprene core sandwiched between metal 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 finished surface.

- Floors: Trafficable, shore hardness greater than 35.

Backing rod: Compressible closed cell polyethylene foam with a bond breaking surface.

3 EXECUTION

3.1 SUBSTRATES

Drying and shrinkage

General: Before tiling, allow at least the following times to elapse (for initial drying out and shrinkage) for these substrates:

- Concrete slabs: 42 days.
- Concrete blockwork: 28 days.
- Toppings on slabs and rendering on brick or blockwork: A further 21 days.
- Rendering swimming pool shell: A further 21 days minimum.

3.2 PREPARATION

Standard

Preparation: To the recommendations of AS 3958.1 Section 4.

Ambient temperature

General: If the ambient temperature is less than 5°C or greater than 35°C, do not lay tiles.

Substrates without wet area membranes

General: Make sure substrates are as follows:

- Clean and free of any deposit or finish which may impair adhesion or location of tiles.

- If framed or discontinuous, support members are in full lengths without splicing.
- If solid or continuous:
 - . Remove excessive projections.
 - . Fill voids and hollows greater than 10 mm with abrupt edges with a cement:sand mix not stronger than the substrate or weaker than the bedding.
 - . Fill depressions less than 10 mm with a latex modified cementitious product and eliminate feathering by scabbling the edges.

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

Dense concrete: If not sufficiently rough to provide a mechanical key, roughen by scabbling or the like to remove 3 mm of the surface and expose the aggregate; then apply a bonding treatment.

Substrates with wet area membranes

General: Make sure substrates are as follows:

- Clean and free of any deposit or finish which may impair adhesion or location of tiles.
- Compatible with all components of the floor system.

3.3 FIXING UNDERLAY

Installation

Requirement: Lay in staggered (brick) pattern, perpendicular to the direction of the subfloor, with joins in the underlay not coinciding with joints in the subfloor. Fix with fasteners and fastener spacing to the manufacturers recommendations.

3.4 TILING GENERALLY

Cutting and laying

Cutting: Cut tiles neatly to fit around fixtures and fittings and at margins where necessary. Drill holes without damaging tile faces. Cut recesses for fittings such as soap holders. Rub edges smooth without chipping.

Laying: Return tiles into sills, reveals and openings. Butt up to returns, frames, fittings, and other finishes. Strike and point up beds where exposed. Remove tile spacers before grouting.

Variations

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

Protection

Floor tiles: Keep traffic off floor tiles until the bedding has set and attained its working strength.

Cleaning: Keep the work clean as it proceeds and protect finished work from damage.

Bath ventilation

General: If required, ventilate the space below fully enclosed baths with at least 2 vermin proof ventilating tiles.

3.5 SETTING OUT

Tile joints

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

- Floors:
 - . Dry pressed tiles: 3 mm.
 - . Extruded tiles: 6 mm.
 - . Vitrified: 3 to 5 mm.
 - . Quarry tiles: 6 to 12 mm.
 - . Chemical resistant epoxy jointed tiling: 5 to 6 mm.
- Large and/or irregular floor tiles: 6 to 12 mm.
- Mounted mosaics: To match mounting pattern.
- Walls:
 - . Dry pressed tile: 1.5 mm.
 - . Extruded tile: 6 mm.

Joint alignment: Set out tiling with joints accurately aligned in both directions and wall tiling joints level and plumb.

Joint position: Set out tiles from the centre of the floor or wall to be tiled.

Margins

General: Provide whole or purpose-made tiles at margins where practicable, otherwise, set out to give equal margins of cut tiles. If margins less than half a tile width are unavoidable, locate the cut tiles where they are least conspicuous.

Fixtures

General: If possible, position tiles so that holes for fixtures and other penetrations occur at the intersection of horizontal and vertical joints or on the centre lines of tiles. Continue tiling fully behind fixtures which are not built in to the tiling surface. Before tiling make sure fixtures interrupting the tile surfaces are accurately positioned in their designed or optimum locations relative to the tile layout.

3.6 FALLS AND LEVELS

Grading

Requirement: Grade floor tiling 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 the following:

- General: 1:100 minimum.
- Shower areas to a central waste outlet: 1:80 minimum.
- Sanitary facility to a linear drain: 1:90 minimum.

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

3.7 BEDDING

Standard

Cement mortar: To AS 3958.1 clause 5.5.

Adhesive: To AS 3958.1 clause 5.6.

Preparation of tiles

Adhesive bedding: Fix tiles dry; do not soak.

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

Terracotta tiles: Use pre-sealed tiles or apply a breathable sealer and lay dry. If a final sealed finish is selected, use a compatible laying sealer.

Bedding

General: Use bedding methods and materials which are appropriate to the tile, the substrate, the conditions of service, and which leave the tile firmly and solidly bedded in the bedding material and adhered to the substrate. Form falls integral with the substrate.

Thin adhesive beds

General: Provide only if the substrate deviation is less than 3 mm, tested with a 3 m straightedge. Cover the entire tile back with adhesive when the tile is bedded.

Thickness: 1.5 to 3 mm.

Thick adhesive beds

General: Provide on substrates with deviations up to 6 mm, tested with a 3 m straightedge, and with tiles having deep keys or frogs.

Nominal thickness: 6 mm.

Adhesive bedding application

General: Apply adhesive by notched trowel to walls and floors and direct to tiles if required, to provide evenly distributed coverage after laying as follows:

- Domestic internal walls: > 65%.
- Domestic internal floors: > 80%.
- Other walls and floors: > 90%.
- Wet areas and benchtops: 100%.

Pattern of distribution of adhesive: To the recommendations of AS 3958.1 clause 5.6.4.3. Verify by examining one tile in ten as work proceeds.

Wall tile spacers: Do not use spacer types that inhibit the distribution of adhesive.

Curing: Allow the adhesive to cure for the period nominated by the manufacturer before grouting or allowing foot traffic.

Mortar beds

For floor tiles: Either lightly dust the screeded bed surface with dry cement and trowel level until the cement is damp, or spread a thin slurry of neat cement, or cement-based thin bed adhesive, on to the tile back. Do not use mortar after initial set has occurred.

- Nominal thickness: 20 to 40 mm.

Thick reinforced beds: Place mortar bed in two layers, and incorporate the mesh reinforcement in the first layer.

3.8 CONTROL OF MOVEMENT

General

Requirement: Provide control joints carried through the tile and the bedding to the recommendations of AS 3958.1 clause 5.4.5 and as follows:

- Floor 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 tiled areas into bays.
 - . At abutments with the building structural frame and over supporting walls or beams where flexing of the substrate is anticipated.
- Wall location:
 - . Over structural control joints.
 - . At junctions with different substrate materials when the tiling is continuous.
 - . At vertical corners in shower compartments.
- 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.

3.9 GROUTED AND SEALANT JOINTS

Grouted joints

General: Commence grouting as soon as practicable after bedding has set. Clean out joints as necessary before grouting.

Face grouting: Fill the joints solid and tool flush. Clean off surplus grout. Wash down when the grout has set. When grout is dry, polish the tiled surface with grout film remover and a clean cloth.

Edges of tiles: Grout exposed edge joints.

Epoxy grouted joints: Make sure tile edge surfaces are free of extraneous matter such as cement films or wax, before grouting.

Mosaic tiles

Grouting mosaics: If paper faced mosaics are to be bedded in cement mortar, pre-grout the sheeted mosaics from the back before fixing. After fixing, rub grout into the surface of the joints to fill any voids left from pre-grouting. Clean off surplus grout. When grout has set, wash down. If necessary, use a proprietary cement remover.

Sealant joints

General: Provide joints filled with sealant and finished flush with the tile surface as follows:

- Where tiling is cut around sanitary fixtures.
- At internal corners of walls in showers.
- Around fixtures interrupting the tile surface, for example pipes, brackets, bolts and nibs.
- At junctions with elements such as window and door frames and built-in cupboards.

Material: Anti-fungal modified silicone.

Width: 5 mm.

Depth: Equal to the tile thickness.

3.10 JOINT ACCESSORIES

Floor finish dividers

General: Finish tiled floors at junctions with differing floor finishes with a corrosion-resistant metal dividing strip fixed to the substrate using mechanical fixings, with top edge flush with the finished floor. If changes of floor finish occur at doorways, make the junction directly below the closed door. Grout up underneath to provide continuous support.

Stepping: Less than 5 mm.

Adjustments

Requirement: Check that the height of the floor finish divider is sufficient for the topping and tile thickness. Adjust as required with a matching flat bar adhesive fixed to the divider angle.

Weather bars

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

3.11 TESTING

Site tests

Slip resistance of completed installation: To AS 4663.

Impact sound insulation rating of completed installation: To AS ISO 717.2.

3.12 COMPLETION

Cleaning

General: Clean tiled surfaces using an appropriate tile cleaning agent, and polish.

Spare tiles

General: Supply spare matching tiles and accessories of each type for future replacement purposes. Store the spare materials on site.

Quantity: At least 1% of the quantity installed.

4 SELECTIONS

4.1 SCHEDULES

Wall tiling schedule

	A	B	B
Tile: Type	Refer to Material and Finishes Schedule		
Tile: Size (mm)			
Tile: Colour			
Tile: Surface			
Adhesive bedding: Type			
Adhesive bedding: Thickness			
Tile pattern			
Mechanical fixing			
Grout: Type			
Grout: Colour			
Grout: Pigment proportions			
Grout: Special properties			

Floor tiling schedule

	A	B	C
Tile: Type	Refer to Material and Finishes Schedule		
Tile: Size (mm)			
Tile: Colour			
Tile: Surface			
Tile: Edge			
Slip resistance classification			
Water absorption group to AS 13006			
Airborne sound insulation			
Impact sound insulation			
Acoustic underlay: Product			
Acoustic underlay: Manufacturer			
Separation layer: Location			
Separation layer: Type			
Adhesive bedding: Type			
Adhesive bedding: Thickness			
Mortar bedding: Thickness (mm)			
Mortar bedding: Reinforcement			
Grout: Type			
Grout: Colour			
Grout: Pigment proportions			
Grout: Special properties			

0632 STONE AND TERRAZZO TILING

1 GENERAL

1.1 RESPONSIBILITIES

General

Requirement: Provide tiling systems to walls, floors and other substrates, as documented.

Performance

Requirements:

- Consistent in colour and finish.
- Firmly bonded to substrates for the expected life of the installation.
- Set out with joints accurately aligned in both directions and wall tiling joints level and plumb.
- Direct all water flowing from supply points to drainage outlets without leakage to the substrate or adjacent areas.

1.2 CROSS REFERENCES

General

Requirement: Conform to the following:

- 0171 General requirements.

1.3 STANDARDS

Tiling

General: Conform to the recommendations of those parts of AS 3958.1 referenced in this worksection.

Slip resistance

Classification: To AS 4586.

1.4 INTERPRETATION

Definitions

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

- Acoustic underlay: A resilient material laid between the subfloor and the flooring material to provide sound isolation.
- Adhesives - cementitious (C): Adhesive in which the binders are hydraulic, e.g. General purpose cement, with aggregates and organic additives.
- Adhesives - dispersion (D): Adhesives in which the binders are in the form of aqueous polymer dispersion with mineral fillers and organic additives.
- Adhesives - reaction resin (R): Adhesives in which the binders are synthetic resins with mineral fillers and organic additives. The curing occurs by chemical reaction.
- Bedding: Mixtures of materials which are applied to substrates in a plastic state and which dry, cure and adhere tiles to substrates:
 - . Adhesive bedding: Paving/tiling adhered by adhesives.
 - . Mortar bedding: Paving/tiling adhered in a cementitious mortar bed.
- Lippage: Height deviation between adjacent units.
- Stepping: The relative surface level of adjacent paving elements within the expanse of the main pavement.
- Substrate: The surface to which a material or product is applied.
- Tile: Thin slab made from clay and/or other inorganic raw materials used generally as coverings for floors and walls and adhered to continuous supporting substrates.
- Tiles – cementitious: Cement based prefinished tiles.
- Tiles – industrial cast: Tile products of reconstituted stone. Also known as manufactured stone.
- Tiles – natural stone: Tiles cut from natural stone.

- Tiles – terrazzo – cementitious: Manufactured cementitious terrazzo tiles formed in a suitable machine to give sufficient compaction and density to the finished surface, and moisture cured before grinding and honed at the place of manufacture. Thickness usually 35 mm.
- Tiles – terrazzo – resin: Manufactured terrazzo tiles with the facing aggregate in a resin matrix and pre polished. Thickness usually up to 22 mm.
- Wet area: An area within a building supplied with a floor waste.

1.5 TOLERANCES

Completed tiling

Requirement: To the recommendations of AS 3958.1 clause 5.4.6.

1.6 SUBMISSIONS

Execution details

Grouting: Submit proposals for grouting methods and materials.

Margins: If it appears that minor variations in joint widths or overall dimensions will avoid cut tiles, submit a proposal.

Operation and maintenance manuals

General: Submit a manual describing care and maintenance of the tiling, including procedures for maintaining the slip-resistance classification stating the expected life of the slip-resistance classification.

Products and materials

Product conformity: Submit evidence of conformity to the following:

- Marking and classification of tile adhesive to AS ISO 13007.1.
- Weighted normalised impact sound pressure level to AS ISO 717.2 as measured for the acoustic underlay as part of the entire tiling system.

Type tests: Submit results, as follows:

- Slip resistance of tiles.
- Accelerated wear test.
- Stone tile properties.

Samples

General: Submit labelled samples of tiles, including fittings, accessories, grout and sealants, illustrating the range of variation in colour and finish.

Sample panels: Prepare a sample panel of each type of finish as follows:

- Size: $\geq 2 \text{ m}^2$.
- Include samples of junction details and trim.
- Preserve each panel until related work is complete.

Subcontractors

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

Tests

Site tests: Submit results, as follows:

- Slip resistance test of completed installation
- Impact sound insulation rating.

1.7 INSPECTION

Notice

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

- Substrate immediately before tiling.
- Trial set-outs before execution.
- Control joints before sealing and grouting.
- Grout and sealant colours before application.

2 PRODUCTS

2.1 UNDERLAY

Fibre cement underlay

Standard: To AS/NZS 2908.2, Type B, category 2 minimum.

Thickness: 5 mm minimum.

Acoustic underlay

General: Provide a proprietary product recommended by the manufacturer as compatible with the tiling system.

2.2 TILES AND ACCESSORIES

Stone tiles

General: Repair mud veins or lines of separation that are integral to the selected pattern with resin fillers and applied back lining.

Resin terrazzo

General: Provide colouring material which is permanent, stable, compatible with the matrix, and factory-dispersed into the resin by the manufacturer.

Tactile ground surface indicators

Standard: To AS/NZS 1428.4.1.

2.3 ADHESIVES

General

Standard: To AS ISO 13007.1.

Type

General: Provide adhesives compatible with the materials and surfaces to be adhered, and as documented.

Prohibited uses: Do not provide the following combinations:

- Cement-based adhesives on wood, metal, painted or glazed surfaces, gypsum-based plaster.
- Organic solvent-based adhesives on painted surfaces.
- Organic PVC-based adhesives and organic natural rubber latex adhesives in damp or wet conditions.
- PVA (polyvinyl acetate) based adhesives in wet areas or externally.

2.4 MORTAR

Materials

Cement type to AS 3972: GP.

- White cement: Iron salts content $\leq 1\%$.
- Off-white cement: Iron salts content $\leq 2.5\%$.

Lime: To AS 1672.1.

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

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

Bedding mortar

Mix proportion (cement:sand), by volume: Select proportions from the range 1:3 to 1:4 for satisfactory adhesion. Provide minimum water.

Mixing: To AS 3958.1 clause 2.15.

Water

General: Clean and free from any deleterious matter.

2.5 GROUT

Type

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

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

Mix proportions (cement:sand), by volume:

- For joints < 3 mm: 1:2.
- For joints ≥ 3 mm: 1:3.

Grout to resin terrazzo tiles: Resinous material supplied by the tile supplier.

Pigments

Pigments for coloured grout: Provide colourfast fillers compatible with the grout material. For cement-based grouts, provide lime-proof natural or synthetic metallic oxides compatible with cement.

2.6 CONTROL JOINTS

Control joint materials

Control joint strip: A proprietary control joint consisting of a neoprene core sandwiched between metal 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 finished surface.

- Floors: Trafficable, shore hardness greater than 35.

Backing rod: Compressible closed cell polyethylene foam with a bond breaking surface.

3 EXECUTION

3.1 SUBSTRATES

Drying and shrinkage

General: Before tiling, allow at least the following times to elapse (for initial drying out and shrinkage) for these substrates:

- Concrete slabs: 42 days.
- Concrete blockwork: 28 days.
- Toppings on slabs and rendering on brick or blockwork: A further 21 days.

3.2 PREPARATION

Ambient temperature

General: If the ambient temperature is less than 5°C or greater than 35°C, do not lay tiles.

Substrates without wet area membranes

General: Make sure substrates are as follows:

- Clean and free of any deposit or finish which may impair adhesion or location of tiles.
- If framed or discontinuous, support members are in full lengths without splicing.
- If solid or continuous:
 - . Remove excessive projections.
 - . Fill voids and hollows greater than 10 mm with abrupt edges with a cement:sand mix not stronger than the substrate or weaker than the bedding.
 - . Fill depressions less than 10 mm with a latex modified cementitious product and eliminate feathering by scabbling the edges.

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

Dense concrete: If not sufficiently rough to provide a mechanical key, roughen by scabbling or the like to remove 3 mm of the surface and expose the aggregate; then apply a bonding treatment.

Substrates with wet area membranes

General: Make sure substrates are as follows:

- Clean and free of any deposit or finish which may impair adhesion or location of tiles.
- Compatible with all components of the floor system.

Trial set-out

General: Prepare a trial tile set-out of each area, as follows:

- Maximise the size of equal margins of cut tiles.
- Locate control joints.
- Note minor variations in joint widths to eliminate cut tiles at margins.
- Locate fittings on walls.

3.3 FIXING UNDERLAY

Installation

Requirement: Lay in staggered (brick) pattern, perpendicular to the direction of the subfloor, with joins in the underlay not coinciding with joints in the subfloor. Fix with fasteners and fastener spacing to the manufacturers recommendations.

3.4 TILING GENERALLY

Sequence

Cutting and laying

Cutting: Cut tiles neatly to fit around fixtures and fittings and at margins where necessary. Drill holes without damaging tile faces. Cut recesses for fittings such as soap holders. Rub edges smooth without chipping.

Laying: Return tiles into sills, reveals and openings. Butt up to returns, frames, fittings, and other finishes. Strike and point up beds where exposed. Remove tile spacers before grouting.

Resin terrazzo tiles: Apply to thin-bed adhesive.

Variations

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

Protection

Floor tiles: Keep traffic off floor tiles until the bedding has set and attained its working strength.

Cleaning: Keep the work clean as it proceeds and protect finished work from damage.

Bath ventilation

General: If required, ventilate the space below fully enclosed baths with at least 2 vermin proof ventilating tiles.

3.5 SETTING OUT

General

Joint widths: Set out tiles to give uniform joint widths as follows:

- Floors:
 - . Stone tiles 400 x 400 mm or less and with sawn edges: 3 mm.
 - . Stone tiles greater than 400 x 400 mm and all tiles with irregular edges: 6 mm or less than 12 mm.
 - . Terrazzo tile joints: 1.5 mm or gauged by the thickness of the trowel.
- Walls:
 - . Stone tiles: 1.5 mm or less than 4.5 mm.

Margins

General: Provide whole or purpose-made tiles at margins where practicable, otherwise, set out to give equal margins of cut tiles. If margins less than half a tile width are unavoidable, locate the cut tiles where they are least conspicuous.

Fixtures

General: If possible, position tiles so that holes for fixtures and other penetrations occur at the intersection of horizontal and vertical joints or on the centre lines of tiles. Continue tiling fully behind fixtures which are not built in to the tiling surface. Before tiling make sure fixtures interrupting the tile surfaces are accurately positioned in their designed or optimum locations relative to the tile layout.

3.6 FALLS AND LEVELS

Grading

Requirement: Grade floor tiling 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 the following:

- General: 1:100 minimum.
- Shower areas to a central waste outlet: 1:80 minimum.
- Sanitary facility to a linear drain: 1:90 minimum.

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

3.7 BEDDING

Preparation of tiles

Adhesive bedding: Fix tiles dry; do not soak.

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

Bedding

General: Use bedding methods and materials which are appropriate to the tile, the substrate, the conditions of service, and which leave the tile firmly and solidly bedded in the bedding material and adhered to the substrate. Form falls integral with the substrate.

Thin adhesive beds

General: Provide only if the substrate deviation is less than 3 mm, tested with a 3 m straightedge. Cover the entire tile back with adhesive when the tile is bedded.

Thickness: 1.5 to 3 mm.

Thick adhesive beds

General: Provide on substrates with deviations up to 6 mm, tested with a 3 m straightedge, and with tiles having deep keys or frogs.

Nominal thickness: 6 mm.

Adhesive bedding application

General: Apply adhesive by notched trowel to walls and floors and direct to tiles if required, to provide evenly distributed coverage after laying as follows:

- Domestic internal walls: > 65%.
- Domestic internal floors: > 80%.
- Other walls and floors: > 90%.
- Wet areas and benchtops: 100%.

Pattern of distribution of adhesive: To the recommendations of AS 3958.1 clause 5.6.4.3. Verify by examining one tile in ten as work proceeds.

Wall tile spacers: Do not use spacer types that inhibit the distribution of adhesive.

Curing: Allow the adhesive to cure for the period nominated by the manufacturer before grouting or allowing foot traffic.

Mortar beds

For floor tiles: Either lightly dust the screeded bed surface with dry cement and trowel level until the cement is damp, or spread a thin slurry of neat cement, or cement-based thin bed adhesive, on to the tile back. Do not use mortar after initial set has occurred.

- Nominal thickness: 20 to 40 mm.

Thick reinforced beds: Place mortar bed in two layers, and incorporate the mesh reinforcement in the first layer.

Mechanical fixing

General: Provide a proprietary system of support and fixing appropriate to the type of tile and the substrate conditions.

3.8 CONTROL OF MOVEMENT

General

Requirement: Provide control joints carried through the tile and the bedding to the recommendations of AS 3958.1 clause 5.4.5 and as follows:

- Floor 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 tiled areas into bays.
 - . At abutments with the building structural frame and over supporting walls or beams where flexing of the substrate is anticipated.
- Wall location:
 - . Over structural control joints.
 - . At junctions with different substrate materials when the tiling is continuous.
 - . At vertical corners in shower compartments.
- 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.

3.9 GROUTED AND SEALANT JOINTS

Grouted joints

General: Commence grouting as soon as practicable after bedding has set. Clean out joints as necessary before grouting.

Face grouting: Fill the joints solid and tool flush. Clean off surplus grout. Wash down when the grout has set. When grout is dry, polish the tiled surface with grout film remover and a clean cloth.

Edges of tiles: Grout exposed edge joints.

Epoxy grouted joints: Make sure tile edge surfaces are free of extraneous matter such as cement films or wax, before grouting.

Grouting cementitious terrazzo tiles: Thoroughly work grout into tile joints by flood grouting.

Sealant joints

General: Provide joints filled with sealant and finished flush with the tile surface as follows:

- Where tiling is cut around sanitary fixtures.
- At internal corners of walls in showers.
- Around fixtures interrupting the tile surface, for example pipes, brackets, bolts and nibs.
- At junctions with elements such as window and door frames and built-in cupboards.

Material: Anti-fungal modified silicone.

Width: 5 mm.

Depth: Equal to the tile thickness.

3.10 JOINT ACCESSORIES

Floor finish dividers

General: Finish tiled floors at junctions with differing floor finishes with a corrosion-resistant metal dividing strip fixed to the substrate using mechanical fixings, with top edge flush with the finished floor. If changes of floor finish occur at doorways, make the junction directly below the closed door. Grout up underneath to provide continuous support.

Floor finish divider strips for resin terrazzo tiles: A proprietary neoprene T section.

Stepping: Less than 5 mm.

Adjustments

Requirement: Check that the height of the floor finish divider is sufficient for the topping and tile thickness. Adjust as required with a matching flat bar adhesive fixed to the divider angle.

Weather bars

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

3.11 TESTING**Site tests**

Slip resistance of completed installation: To AS 4663.

Impact sound insulation rating of completed installation: To AS ISO 717.2.

3.12 COMPLETION**Cementitious terrazzo tiled surfaces**

General: In situ grind and polish the completed installation with equipment nominated by the tile supplier.

Cleaning

General: Clean tiled surfaces using an appropriate tile cleaning agent, and polish.

Spare tiles

General: Supply spare matching tiles and accessories of each type for future replacement purposes. Store the spare materials on site.

Quantity: At least 1% of the quantity installed.

4 SELECTIONS**4.1 SCHEDULES****Wall tiling schedule**

	A	B	C
Tile: Type	Refer to Material and Finishes Schedule		
Tile: Size (mm)			
Tile: Colour			
Tile: Surface			
Adhesive bedding: Type			
Adhesive bedding: Thickness			
Tile pattern			
Mechanical fixing			
Grout: Type			
Grout: Colour			
Grout: Pigment proportions			
Grout: Special properties			

0652B CARPETS

1 GENERAL

1.1 RESPONSIBILITIES

General

Requirement: Provide textile floor coverings and underlays to subfloors, as documented.

1.2 CROSS REFERENCES

General

Requirement: Conform to the following:

- *0171 General requirements.*

1.3 STANDARDS

Slip resistance

Classification: To AS 4586.

1.4 TOLERANCES

General

Requirement: To AS/NZS 1385.

1.5 SUBMISSIONS

Fire performance

Fire hazard properties: Submit evidence of conformity to PRODUCTS, FIRE PERFORMANCE, Fire hazard properties.

Operation and maintenance manuals

Contents: Submit maintenance manuals with 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.
- The names and address of the supplier and manufacturer of each component.

Products and materials

Manufacturer's documentation: Submit copies of the following data:

- Product data sheets.

Evidence of delivery

Slip resistance classification: Submit 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 each documented carpet type.

Sample size: Submit the following:

- Carpet: Manufacturer's standard swatch.
- Tiles: 4 x tile size.
- Edge strip, trims, extrusions, and stair and landing nosings: Submit a 300 mm length of each type.
- Underlay: Submit one labelled sample at least 600 x 600 mm.
- Stitched seam: Submit one sample, minimum 1000 mm length.

Penetrations: Submit one production carpet sample with a penetration access cut as documented in EXECUTION, INSTALLATION - CARPET.

Sample installation: Lay a sample area of each type of carpet with underlay, minimum 10 m², including accessories, and 3000 mm of typical seam.

Subcontractors

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

Substrate acceptance: Submit evidence of installer's acceptance of the substrate before starting installation.

Warranties

General: Submit the manufacturer's product warranties.

1.6 INSPECTION

Notice

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

- Each batch of material upon delivery.
- Substrate immediately before fixing underlay.
- Fixings, edge strips, and underlay 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.

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 and underlays 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 yarn during wet processing at the manufacturing stage.

Insect resist treatment of wool: Application Level 4 to the recommendations of Woolmark Specification CP-4.

Stain and soil resistance

Requirement: Carpet with one or more of the following:

- Fluoro-treatments: Fluorochemical soil and liquid repelling chemical treatment applied during manufacturing.
- Stain blockers: Colourless acid-based dye stainblocker applied to dyed fibres.

Total VOC

Total VOC emission tested to ISO 10580: < 0.5 mg/m²/h.

2.4 CARPET TILES

General

Type: Non-stick, non-curling 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 MATS**General**

Requirement: Provide a mat made to fit each designated mat recess.

2.6 UNDERLAYS**Application**

Performance: To AS 2455.1 clause 1.5.2.

Cementitious

General: Polymer modified cementitious smoothing and self-levelling compound.

Thickness: 3 mm minimum.

Fibre cement hard underlay

Standard: To AS/NZS 2908.2.

Thickness: 5 mm minimum.

Dry process fibreboard (MDF) hard underlay

Standard: To AS/NZS 1859.2.

Classification: Moisture resistant Medium density fibreboard (MR MDF).

Thickness: 5.5 mm.

Wet process fibreboard (hardboard) underlay

Standard: To AS/NZS 1859.4.

Classification: General purpose medium board, manufactured specifically as flooring underlay.

Thickness: 5.5 mm.

Soft underlay

Standard: To AS 4288.

2.7 OTHER MATERIALS**Adhesives**

General: Compatible with the floor covering material, and suitable for bonding it to the subfloor to AS 2455.1 clause 1.5.3.

Friction compound: Suitable for holding carpet tiles in position without permanent sticking.

Hot-melt adhesive tapes

General: Commercial grade glass fibre and cotton thermoplastic adhesive-coated tape 60 mm wide on a 90 mm wide metal foil base and backed with silicone-coated release paper.

Preformed carpet grippers

General: Architectural plywood carpet grippers with 3 rows of corrosion-resistant angled pins of length appropriate to the carpet type to AS 2455.1 clause 1.5.4.

Size (minimum): 33 mm wide x 7 mm thick.

Location: At edges, except where edge strips are used. Provide double grippers to edges where recommended by the manufacturer.

Edge strips

Type: Heavy duty edge strip appropriate to the floor covering type (tackless or adhesive fixed), capable where necessary of accommodating different levels of adjacent floor finishes.

Form: Metal moulding or extrusion, with vinyl inserts.

Location: At exposed edges of the carpet, and at junctions with differing floor finishes or finishes of a different thickness. Where edge strips occur at doorways, locate the junctions directly below the closed door.

Tactile ground surface indicators

Standard: To AS/NZS 1428.4.1.

3 EXECUTION

3.1 PREPARATION

General

Pre-installation requirements: To AS 2455.1 Section 2.

- Carpet tiles: Pre-laying requirements including access panel floors to AS 2455.2 clause 4.

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.

Substrate

General: Conform to the following:

- To AS 2455.1 or AS 2455.2, as appropriate.
- 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.

Timber substrate rectification: Remove projections. If conformance with the **Substrate tolerance table** cannot be achieved, fix a hard underlay in brick pattern. Make sure joints do not coincide with substrate joints.

Moisture content: Do not start installation unless:

- Concrete: The moisture content of the concrete has been tested to AS 2455.1 Appendix B and the values in AS 2455.1 Appendix B and AS 2455.2 Appendix B as appropriate have been obtained.
- Timber, plywood or particleboard substrates: The moisture content of the substrate has been tested to AS 1080.1 for timber and particleboard or AS/NZS 2098.1 for plywood and values are obtained as follows:
 - . Air conditioned buildings: 8 to 10%.
 - . Intermittently heated buildings: 10 to 12.5%.
 - . Unheated buildings: 12 to 15%.

Alkalinity: Do not start installation unless:

- Concrete: The alkalinity of the concrete has been tested to AS 2455.1 Appendix B and the values in AS 2455.1 Appendix B and AS 2455.2 Appendix B as appropriate have been obtained.

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	Max. deviation under the straightedge
Flatness Class B	3 m	6 mm
Smoothness	150 mm	1 mm
Planar	2000 mm	4 mm

3.2 INSTALLATION - CARPET

General

Requirement: To AS 2455.1 Section 3 and the manufacturer's recommendations.

Batching

Requirement: In a single area and for each documented type, quality, or colour, use carpet from one manufacturing batch and dye lot.

Setting out

Joints in underlay: Make sure joints in underlay do not coincide with carpet joints. Do not carry underlay over carpet grippers or edge strips.

Partition layout: Confirm that permanent partitions have been installed before starting carpet laying.

Seaming methods

Woven carpet: Machine or hand sew. Do not provide glued taped seams unless selvages are woven to suit and recommended by manufacturer.

Tufted carpet: Seam with hot-melt adhesive tape.

Seam sealing: Apply appropriate seam sealer to each cut edge.

Cutting laid carpet

Method: If penetrations through laid carpet are necessary for electrical, telephone or other outlets, cut the carpet either by cross cutting or by cutting rectangular or circular openings.

Cutting holes in concrete floors: Protect the carpet and remove concrete particles and dust on completion. Replace the cut carpet over the opening without any signs of fraying or other damage, and fix with a peel-up adhesive, or resew.

3.3 INSTALLATION - CARPET TILES

General

Installation: To AS 2455.2 and the manufacturer's recommendations.

3.4 COMPLETION

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.

4 SELECTIONS

4.1 SCHEDULES

Carpet and laying schedule by ACCS/ECS

	A	B	C
Carpet type	Refer to Material and Finishes Schedule.		
Generic type			
Product			
Slip resistance classification			
Colour and pattern			
Recycled material content			
Pile: Composition			
Pile: Finish			
Pile: Length			
Pile: Thickness			
Backing thickness			
ACCS Grade			
ECS			
Suitable for Stairs Icon			
Treatments: For insect resistance			

	A	B	C
Treatments: Electrostatic protection			
Critical radiant flux			
Dimensions (mm)			
Fixing method			
Seaming method			
Edge strip: Finish and colour			

0655 TIMBER FLOORING

1 GENERAL

1.1 RESPONSIBILITIES

General

Requirement: Provide timber strip and parquet flooring systems to subfloors, as documented.

Performance

Requirements:

- Securely fixed.
- Smooth and flat, suitable for intended use.
- Pattern as documented.
- Structurally adequate.
- Able to accommodate expected shrinkage or expansion.
- Suitable for the applied finish.

1.2 CROSS REFERENCES

General

Requirement: Conform to the following:

- 0171 General requirements.
- 0185 Timber products, finishes and treatment.
- 0656 Floor sanding and finishing.

1.3 STANDARD

General

Timber flooring: To the recommendations of ATFA *Solid Timber Flooring Industry Standard*.

1.4 INTERPRETATION

Abbreviations

General: For the purposes of this worksection the following abbreviation applies:

- MDF: Medium density fibreboard.

Definitions

General: For the purposes of this worksection the definitions in the AS 1684 series, the AS 1860 series and the following apply:

- Acoustic underlay: A resilient material laid between the subfloor and the flooring material to provide sound isolation.
- Butt joints (flooring): Floor boards cross cut square with plain ends for joining over battens or joists.
- End-matched joints (flooring and decking): Floor boards tongue and grooved at the ends to allow jointing between supports.
- Feature: The grade will determine the level of feature present. Natural characteristics of the wood including gum veins, past borer activity and knots present in the flooring.
- Flooring - continuously-supported: Flooring which is supported by, and directly fixed to, continuous structural supporting surfaces, including concrete slabs and sheet flooring subfloors.
- Flooring - fitted: Flooring fitted between the walls of each room i.e. not platform floors.
- Flooring - intermittently-supported: Flooring which is supported by, and spans across joists or battens.
- Flooring - strip flooring: Flooring made from machined timber with tongues and grooves along the length of the strips.
- Grade: The grade is an indication of the number and size of features in the flooring.
- Moisture content: The percentage by mass of water present in the material.

- Parquet: Timber mosaic parquet panels or wood block parquet bonded to a subfloor either directly or over an underlay, as follows:
 - . Mosaic parquet panels: Pre-assembled timber finger modules held together to form tiles or panels.
 - . Wood block parquet: Rectangular blocks of timber with length a multiple of width (e.g. 260 x 65 mm, 300 x 60 mm and 400 x 80 mm) laid individually to produce a pattern.
- Subfloor: The structure that supports the flooring.
- Underlay: A non-structural layer of rubber, cork, plywood or in situ levelling compound to provide a smooth and flat surface for flooring installation. Rubber and cork underlays have acoustic sound absorbing properties.

1.5 SUBMISSIONS

Certification

Requirement: Submit evidence of conformity to documented requirements for grading, species and board size. Evidence may be in any of the following forms:

- 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 manufactured moisture content of timber flooring products.

Fire performance

Fire hazard properties: Submit evidence of conformity to PRODUCTS, FIRE PERFORMANCE, Fire hazard properties.

Samples

General: Submit samples representative of the timber flooring being supplied, illustrating the range of variation in colour, grade features and figure.

Tests

Site tests: Submit results, as follows:

- Moisture content test of the flooring and subfloor.

1.6 INSPECTION

Notice

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

- Subfloor and any subfloor space before installation of flooring material.
- Trial set-out of parquet flooring before execution.
- Flooring material on site, before installation.
- Control and expansion joints, after installation.
- Perimeter expansion allowance, before concealing.
- Completed installation before sanding and application of finishing coatings.

2 PRODUCTS

2.1 GENERAL

Storage and handling

General: Deliver timber flooring to site in unbroken plastic wrapping or packs. Store in dry conditions preferably in the installation location, a minimum 100 mm above the subfloor to the supplier or manufacturer's recommendations. Storage conditions are to be equivalent to those suitable for the installation of the floor. Do not store in areas of wet plaster or paint.

Adhesive

Requirement: A flooring adhesive (polyurethane or polymer) to the flooring manufacturer's recommendations, compatible with the subfloor, underlay and documented flooring.

Adhesive fixed flooring acoustic underlay

General: Provide proprietary acoustic underlay, if required, compatible with the subfloor, any levelling compound and the documented flooring, fixed to subfloor with compatible adhesive.

Levelling compound

General: Self-smoothing levelling compound applied to subfloor, compatible with the subfloor, any underlay and the documented flooring, including any adhesive.

Slab moisture vapour barrier protection

Applied barrier: Provide a moisture vapour retarding barrier applied to the subfloor surface, compatible with the subfloor, adhesive, any levelling compound and the documented flooring.

Polyethylene barrier: 200 µm high-impact resistant polyethylene film.

2.2 FIRE PERFORMANCE

Fire hazard properties

Critical radiant flux: Tested to AS ISO 9239.1.

2.3 SHEET SUBFLOOR

Plywood

Standard: To AS/NZS 2269.0.

Formaldehyde emission class to AS/NZS 2269.0: Class E₁.

Surface grade: CD.

Bond: Type A to AS/NZS 2754.1.

Particleboard

Particleboard: To AS/NZS 1860.1, Class 1.

Formaldehyde emission class to AS/NZS 1860.1: Class E1.

2.4 STRIP AND PARQUET FLOORING

New hardwood

Standard: To AS 2796.1.

Grading: To AS 2796.2.

New softwood

Standard:

- Seasoned cypress pine: To AS 1810.
 - . Grade: 1.
- Softwood – pinus ssp: To AS 4785.2.
 - . Grade: Appearance.
- Softwood – other: To AS 4785.2.
 - . Grade: Select.

Recycled timber

Standard: To FWPA PN06.1039.

- Product requirements: To Section 3.
- Grading: To Section 5.1.

2.5 OTHER MATERIALS

Cork and filler

Provide cork and filler compatible with, and matching, the documented flooring.

3 EXECUTION

3.1 GENERAL

Floor sanding and finishing

Requirement: To 0656 *Floor sanding and finishing*.

3.2 PREPARATION

Clean subfloor

Requirement: Before installation remove loose material and dust and any deposits or existing finishes from the subfloor that may impair adhesive performance or floor performance.

Floors over enclosed subfloor spaces

Requirement: The ground beneath is to be dry and to remain dry after floor installation. If dry conditions cannot be achieved and maintained, it may be necessary to provide one or more of the following:

- Sealed drainage systems beneath and at the perimeter of the building.
- Soil membranes beneath the building, such as 200 µm builders plastic.

Subfloor flatness

Flatness of concrete subfloor:

- Floors laid on plywood or battens: Not greater than 3 mm deviation of the surface under a 1.5 m straightedge laid in any direction.
- Floors laid by direct adhesive fix: Not greater than 3 mm deviation of the surface under a 3 m straightedge laid in any direction.

Flatness of joist and sheet flooring subfloor:

- Not greater than 3 mm deviation of the surface under a 1.5 m straightedge laid in any direction.

Subfloor preparation

Concrete subfloors: Remove excessive projections by abrasion or grinding and fill hollows and depressions with a levelling compound. Feather the levelling compound at all edges to make sure that any primer used beneath the leveling compound has been covered or removed, before flooring installation.

Plywood and particleboard subfloors: Rough sand particleboard subfloors to remove the wax surface layer and flat surface. Clean plywood subfloors may only need sheet joints sanded. Make sure that the subfloor is soundly fixed and free of squeaks.

Existing timber flooring subfloors: Sand to a flat and smooth surface. Make sure that the subfloor is sound, soundly fixed and free of squeaks.

Subfloor moisture content

Concrete subfloor: Test the in-slab relative humidity of the concrete slab to **TESTING, Subfloor moisture tests**. If 80-90% RH, provide slab moisture vapour barrier protection. If above 90% RH, the suitability of the slab needs further consideration and special precautions are required. Do not start installation of the flooring until testing is complete.

Timber, plywood or particleboard flooring subfloors: Do not start installation of the flooring until the moisture content of the subfloor, tested to **TESTING, Subfloor moisture tests**, is within 2% of the expected average in-service moisture content of the floor.

Timber flooring: Confirm that the moisture content of the timber flooring, as delivered, is within the range set by the manufacturer.

Acclimatisation

Requirement: If the moisture content of the supplied flooring differs significantly from its expected in-service moisture content then acclimatisation or extra provision for expansion will be required.

3.3 FIXING SHEET SUBFLOORS

Plywood subfloor adhesive fixed on concrete slabs

Vapour barrier: A liquid applied moisture vapour barrier compatible with the adhesive system, as documented.

Subfloor sheet layout: Fix sheets in a stretcher bond or at 45° to the floor board direction.

Adhesive fix: Apply adhesive with a notched trowel to the adhesive manufacturer's recommendations. Provide downward pressure during curing.

Control joints: Provide joint widths as follows:

- Against vertical building elements: 10 mm.
- Between sheets: 6 mm.

Plywood subfloor mechanically fixed on concrete slabs

Vapour barrier: As documented.

Subfloor sheet layout: Fix sheets in a stretcher bond or at 45° to the floor board direction.

Mechanical fixing: Provide fixings as follows:

- 15 mm thick plywood: 4 rows of 5 fixings down the sheet length, minimum 75 mm from edges. Use spike fixings. Do not use nylon sleeve anchors.

- 12 mm thick plywood: 4 rows of 7 fixings down the sheet length, minimum 75 mm from edges. Use spike fixings. Do not use nylon sleeve anchors.

Control joints: Provide joint widths as follows:

- Against vertical building elements: 10 mm.
- Between sheets: Loosely butt sheets together.

Sheet subfloor fixed on joists

Installation: Lay the length of the sheets at right angles to the supports so that their top surfaces are aligned. Stagger the end joints and locate them centrally over joists. If sheets are not tongue and grooved, provide noggings or trimmer joists to support the edges.

Fixing centres: As provided in the AS 1684 series or to the sheet manufacturer's instructions.

Particleboard and plywood sheet flooring:

- Timber joists and battens: Adhesive and mechanically fix.
- Steel joists: Fix with adhesive and countersunk self-drilling winged screws.

3.4 FIXING TIMBER FLOORING

Battens for strip flooring on concrete slabs

General: Make sure support members align over the full width of the floor.

Framing fixed direct: Fix seasoned battens to the concrete slab so that their top surfaces are aligned.

- Battens: 70 x 35 mm (min) seasoned timber or 60 x 19 mm (min) seasoned high density hardwood.
- Spacing of fasteners: < 900 mm with spike fixings. Do not use nylon sleeve anchors.

Vapour barrier under battens: 200 µm high-impact resistant polyethylene film. Lap 300 mm, seal the laps with water-resistant plastic tape and return up the vertical surfaces and trim at the level of the flooring.

Battens for strip flooring on steel joists

General: Fix seasoned battens along the steel joists with countersunk screws so that their top surfaces are aligned.

- Batten size: Minimum 35 mm thick.
- Spacing of fasteners: < 600 mm.

Span table for strip flooring on battens or joists

Strip flooring timber (average species density)	Standard	Grade	Flooring thickness (mm)	Acceptable batten/joist spacings (mm)		Maximum board span (mm)	
				Butt jointed	End matched	Butt jointed	End matched
Australian hardwood	AS 2796.1	Select	19	450 or 600	450	630	500
		Medium feature - Standard	19	450	450	570	450
Cypress	AS 1810	Grade 1	19	450	450	510	410
		Grade 2	20	450	450	510	410
Softwood: Slash pine	AS 4785.1	Select and standard	19	450	450	510	410
Softwood: Other pinus species		Select and standard	19	450	350	470	350
Softwood: Araucaria (Hoop pine)		Manufacturer grade	20	450	450	510	410

Minimum board length: Equivalent length of two joist spacings.

Angled board span: Not to exceed the maximum board span nominated. Decrease batten spacings to account for increased length of angled boards.

Room environment

Requirement: The internal environment at the time of laying is to be suitable for installation, and as follows:

- Building enclosed and weathertight.
- Intense sunlight screened.
- Wet trades complete.
- Conditions close to the expected average in-service conditions.

Control joints

Requirement: Unless otherwise specified by the flooring manufacturer:

- Perimeters: Provide 10 mm wide expansion joints against vertical building elements.
- Strip flooring (and parquetry where block edges are parallel): For floors greater than 6000 mm (measured at right angles to the run of the boards), allow for intermediate expansion using one of the following methods:
 - . Regular spaced gaps: Allow a gap of 1.5 mm every 800 mm.
 - . Intermediate expansion joints: Include 12 mm wide cork filled expansion joints at maximum widths of 6000 mm. Cork is left 2 mm proud of floor and sanded flat with the floor.
- Fixing: Use a flooring adhesive in addition to mechanical fixing with staples, nails or cleats.

Parquet flooring: If joints are required, place in inconspicuous locations and cut a 12 mm wide joint to the full depth of the parquet that is to be cork filled.

Strip flooring

General: Blend floor boards to make sure of a relatively even distribution of the colour range and grade features throughout the floor.

Installation: Lay in straight and parallel lines with each board firmly butted to the next and firmly in contact with the subfloor. If laid over joists or battens cramp as required to bring the boards tight at edges. Secret nailing will generally pull board edges tight.

Strip flooring mechanically fixed to sheet subfloor:

- To plywood or particleboard on joists or battens: Nail through sheeting to joists or battens or secret fix into sheeting only.
- To plywood or particleboard over concrete slab: Secret fix only, as follows:
 - . Boards up to 85 mm wide: Mechanically fix at up to 450 mm spacing over either a full trowel bed of flooring adhesive or with beads of adhesive, 6 - 10 mm, in a zigzag pattern placed midway between and at fixing points.
 - . Boards over 85 mm wide: Mechanically fix at up to 450 mm spacing over a full trowel bed of flooring adhesive and in compliance to flooring manufacturer instructions.

Strip flooring direct mechanically fixed to joists:

- Fix in accordance with AS 1684.
- Top nail or secretly fix boards up to 85 mm wide. Top nail wider boards.
- When top nailing, boards 80 mm to 135 mm require 2 nails at each joist crossing. Punch nails 3 mm below finished surfaces.
- With plain end flooring, if nails are to be less than 12 mm from ends of boards, pre-drill nail holes 0.8 mm undersize.
- When secret fixing use one staple or cleat angled at 45° through the base of the tongue. For boards of 130 mm cover width or greater, consult the flooring manufacturer.
- For both secret fixing and top nailing use a 6 to 10 mm bead of polyurethane adhesive along each joist.

Strip flooring direct mechanically fixed to battens:

- Top nail or secretly fix boards up to 135 mm. Top nail wider boards to 35 mm (min) thick seasoned battens.
- When top nailing, boards 80 mm to 135 mm require 2 nails at each batten crossing. Punch nails 3 mm below finished surfaces. Wider boards require 3 nails.

- With plain end flooring, if nails are to be less than 12 mm from ends of boards, pre-drill nail holes 0.8 mm undersize.
- When secret fixing use one staple or cleat angled at 45° through the base of the tongue. For boards of 130 mm cover width or greater, consult the flooring manufacturer.
- For both secret fixing and top nailing use a 6 to 10 mm bead of polyurethane adhesive along each batten.

Parquet

Vapour barrier under adhesive fixed flooring: A liquid applied membrane compatible with the adhesive system.

Trial set-out: Prepare a trial block parquet or mosaic panel set-out to:

- Demonstrate arrangement for more complex patterns.
- Maximise the size of equal margins of cut parquet blocks or panels.
- Locate control joints. Provide control joints where all blocks run parallel to each other and for large or more complex floors .

Orientation: Refer to Architectural Drawings.

Laying method: To the flooring manufacturer's instructions.

Performance: Spread adhesive and lay blocks or panels to achieve the following:

- Lay in documented pattern.
- Blend blocks for colour and feature.
- Use a full trowel bed of flooring adhesive over the subfloor in conformance with the adhesive manufacturer's instructions.
- Make sure contact between adhesive and subfloor to address possible hollow sounds.
- If laying over acoustic underlays, make sure the correct firmer underlay is used to prevent movement at board edges after completion.
- If laying over a less stable subfloor (e.g. solid timber direct to joists), provide a 6 mm plywood underlay. Fix with adhesive beads at 100 mm intervals, staples at 75 mm around sheet perimeter, 12 mm in from edges and at 100 mm intervals through the body of the sheets.

3.5 TESTING

Subfloor moisture tests

Moisture content of concrete subfloor: Test subfloor in-slab relative humidity to ASTM F2170. Perform three tests for the first 100 m² of subfloor area and an additional test for each additional 100 m². An alternative test method, should in-slab relative humidity not be possible, is testing by impedance meter.

Moisture content of timber, plywood and particleboard subfloors: Test subfloors to AS/NZS 2098.1 for plywood and AS/NZS 1080.1 for timber and particleboard. Moisture meters in plywood and particleboard are less accurate and if of concern, oven dry moisture content testing is required.

3.6 COMPLETION

Protection

General: Provide protection as follows:

- Floors: With MDF taped at all butt joints. Do not cover with sheet plastic.
- Stair treads: Full MDF or plywood casing.

Spare flooring products

General: Supply an extra 5% of flooring products, to be stored on site as spares.

4 SELECTIONS

4.1 PRODUCT

Sheet flooring schedule

	A	B	C
Product	Refer to Material and Finishes Schedule.		

	A	B	C
Material			
Sheet size (width x length x thickness) (mm)			
Fixing method			
Adhesive			
Levelling compound			
Vapour barrier			

0671P DULUX PAINTING

1 GENERAL

1.1 RESPONSIBILITIES

General

Requirement: Provide DuluxGroup/Dulux coating systems to substrates, as documented.

Performance

Requirement:

- 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 COMPANY CONTACTS

DuluxGroup/Dulux technical contacts

Architects and Specifiers' Hotline (Paint, Acratex, Protective Coatings): 13 23 77.

Powder Coatings Technical Advice Hotline: 13 24 99.

Website: www.dulux.com.au/contact-us/architects-and-specifiers

1.3 CROSS REFERENCES

General

Requirement: Conform to the following:

- *0171 General requirements.*

1.4 STANDARDS

Painting

General: To the recommendations of those parts of AS/NZS 2311 referenced in this worksection.

1.5 MANUFACTURER'S DOCUMENTS

Technical manuals

Product Guide: www.dulux.com.au/specifier/products

Duspec Product Data Sheets, SDS, paint system selection: www.dulux.com.au/specifier/duspec

1.6 INTERPRETATION

Abbreviations

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

- ASU: Acrylic sealer undercoat multipurpose combo product.
- DFT: Dry film thickness.
- OFC: Off form concrete.
- PDS: Product data sheet.
- PRN: Paint reference number.
- PSU: Primer sealer undercoat multipurpose combo product.
- WFT: Wet film thickness.

Definitions

General: For the purposes of this worksection, the definitions given in AS/NZS 2310 and the following apply:

- Gloss: The optical property of a surface, characterised by its ability to reflect light specularly.

- 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 is defined as follows:
 - . Full gloss: Over 85 gloss units.
 - . Gloss: Over 50 and up to 85 gloss units.
 - . Semi-gloss (satin): Over 20 and up to 50 gloss units.
 - . Low gloss (low sheen): Over 5 and up to 20 gloss units.
 - . Flat finish (matt): Up to 5 gloss units.
- Opacity: The ability of a paint or textured and membrane coating to obliterate the colour difference of a substrate.
- Paint or coating system: A product in liquid form, which 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 painting system that helps bind subsequent coats to the substrate and which may inhibit its deterioration.
- Sealer: A product used to seal substrates to prevent the following:
 - . Materials from bleeding through to the surface.
 - . Reaction of the substrate with incompatible top coats.
 - . Undue absorption of the following coat into the substrate.
- 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.

1.7 SUBMISSIONS

Products and materials

General: Dulux coatings systems have been selected for this project. Submit the following details at least 3 weeks before the paint is required:

- Paint brand name and product range quality statement.
- Safety data sheets (SDS) showing the health and safety precautions to be taken during application.
- The published recommendations for maintenance.

Samples

Clear finish coatings: Submit labelled samples of timber or timber veneer matching those to be used in the works as follows:

- Label for identification and prepare, putty, stain, seal and coat, as documented.
- Size: Minimum 500 x 500 mm.

Opaque coatings: Submit labelled samples of each coating system, on representative substrates, showing surface preparation, colour, gloss level, texture, and physical properties.

Coated samples schedule

Substrate	Paint system	Colour	Sample size
e.g. Plasterboard	P1	Dulux Vivid White	A4

Subcontractors

Specialist applicators: Submit name and contact details of proposed specialist applicators.

Wet samples

General: Submit two clearly labelled, 500 mL samples of each type of coating required to be tested.

Wet samples schedule

Coating type	Colour
e.g. Dulux Acratex Acrashield Low Gloss	Garden Picket (S15.F3)

Coating type	Colour

Warranties

Material warranty: Submit the manufacturer's material warranty as follows:

- Extent: Paintwork generally.
- Terms: Paint systems are suitable for their intended use.
- Warranty period: As defined by the manufacturer.
- Terms: Submit the performance criteria as defined by the manufacturer.
- Measure: As defined by the manufacturer.
- Warranty period: As defined by the manufacturer.

Timing: Before the application of the paint system.

1.8 INSPECTION

Notice

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

- Opaque finishing stages:
 - . Completion of surface preparation.
 - . After application of final coat.
- Clear finishing stages:
 - . Before surface preparation of timber.
 - . Completion of surface preparation.
 - . After application of final coat.

2 PRODUCTS

2.1 GENERAL

Product substitution

Other products: Conform to **SUBSTITUTIONS** in 0171 General requirements.

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.

Delivery: Deliver paints to the site in the manufacturer's labelled and unopened containers.

Product identification

General: Marked to show the following:

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

2.2 PAINTING MATERIALS

Combinations

General: Do not combine paints from different manufacturers in a paint system. Dulux paint products and coating systems have been selected and specified for this project. Any unauthorised product substitution will void the warranties.

Clear timber finish systems: Provide only the combinations of putty, stain and sealer recommended by the manufacturer of the top coats.

Tinting

General: Provide only products which are colour tinted by the manufacturer or supplier.

Toxic ingredients

General: To the *Poisons Standard (SUSMP)* Part 2 Section 7.

Standards

Paint types: Conform to the Australian Standard referenced in the **DuluxGroup/Dulux paint type reference table**.

DuluxGroup/Dulux paint type reference table legend**Key:**

ASU = Acrylic Sealer/Undercoat.

NE = No Equivalent.

PSU = Primer/Sealer/Undercoat.

Low VOC products are noted in the Table and the **Low VOC compliance reference table**.

^ Use is discouraged in favour of water based paints because of environmental concerns.

These paints have either limited availability or low requirement in the Building Industry.

DuluxGroup/Dulux paint type reference table

Paint type	DuluxGroup/Dulux material description	Dulux PDS No.	PRN AS/NZS 23 11 (Table 4.2)	Standard
Semi-gloss solvent-borne: interior	Dulux Super Enamel Semi-Gloss	DD0028	B3	AS 3730.5
Semi-gloss water-borne, interior /exterior trim (alt B8b)	Dulux Aquanamel Semi Gloss (low VOC)	DD1281	B41	AS 3730.2
Gloss solvent-borne: aerosols	Dulux Spray Pak	DD0009	B4#	NE
Full gloss solvent-borne: exterior	Dulux Super Enamel Full Gloss Dulux Metalshield Premium UV Resistant High Gloss	DD0026 LI 011	B5a	AS 3730.6
Full gloss solvent-borne: interior	Dulux Super Enamel Full Gloss	DD0026	B5b	AS 3730.6
Full gloss waterborne interior/exterior trim (alt B9b)	Dulux Aquanamel Gloss (low VOC)	DD1282	B42	AS 3730.2
Flat latex: interior ceilings	Dulux White Ceiling Paint (low VOC)	DD0225 1	B6a	AS 3730.1
Flat latex: interior ceilings (tinted colours)	Dulux EnviroO ₂ Tintable Ceiling Flat (low VOC)	DD1466	B6a	AS 3730.1
Low gloss latex: exterior	Dulux Weathershield Low Sheen Acrylic	DD0053	B7b	AS 3730.8
Low gloss latex: interior	Dulux Wash&Wear Low Sheen Acrylic (low VOC)	DD0207 0	B7a	AS 3730.3
	Dulux Wash&Wear +Plus Kitchen & Bathroom Low Sheen (low VOC)	DD0207 4		

Paint type	DuluxGroup/Dulux material description	Dulux PDS No.	PRN AS/NZS 23 11 (Table 4.2)	Standard
Low gloss latex: interior	Dulux Professional Steriguard Acrylic Low Sheen	DD0199 0	B7a	AS 3730.3
Semi-gloss latex: exterior	Dulux Weathershield Semi Gloss Acrylic	DD0037	B8b	AS 3730.9
Semi-gloss latex: interior	Dulux Wash&Wear Semi Gloss Acrylic (low VOC)	DD0207 1	B8a	AS 3730.2
	Dulux Wash&Wear +Plus Kitchen & Bathroom Semi Gloss (low VOC)	DD0207 5		
Semi-gloss waterborne latex: interior	Dulux Professional Steriguard Water Based Enamel Semi Gloss	DD0199 3	B42	AS 3730.2
Gloss latex: exterior	Dulux Weathershield Gloss	DD0054	B9b	AS 3730.10
Gloss latex: interior	Dulux Wash&Wear Gloss	DD0207 2	B9a	AS 3730.12
Gloss waterborne interior/exterior trim (alt B9a/B9b)	Dulux Aquanamel Gloss (low VOC)	DD1282	B42	AS 3730.1
Gloss waterborne latex: interior	Dulux Professional Steriguard Water Based Enamel Gloss	DD0199 2	B42	AS 3730.1
Wood primer, solvent-borne	Dulux 1 Step Oil Based Primer Sealer Undercoat	DD1698	B10	AS 3730.13
Wood primer, latex	Dulux 1 Step Acrylic Primer Sealer Undercoat	DD0247 9	B10a	AS 3730.17
Metal primer for steel – solvent-borne	Dulux Metalshield All Surface Primer	DI1640	B11	AS 3730.21
Metal primer, latex (domestic)	Dulux Precision All Metal Primer (water based, low VOC)	DD0216 6	B11a#	AS 3730.15
Metal primer for zinc-coated surfaces, latex	Dulux Professional Galvanised Iron Primer (water based, low VOC)	DD0156	B12a	AS 3730.15
Metal primer for non ferrous metals (domestic)	Dulux Precision All Metal Primer (water based, low VOC)	DD0216 6	B13	AS 3730.17
Zinc-rich organic binder/primer for steel	Dulux Zinc Rich 1P Primer	DI0541	B14	AS 3730.9
Concrete and masonry sealer	Dulux Sealer Binder Dulux Acratex Acraprime 501/2 Berger Gold Label Acrylic Block Filler	DD0216 5 DA0442	B15	AS 3730.22

Paint type	DuluxGroup/Dulux material description	Dulux PDS No.	PRN AS/NZS 23 11 (Table 4.2)	Standard
		DD0217		
Clear low viscosity paint for concrete	Dulux AquaTread Concrete Sealer (low VOC) Dulux Luxafloor WB Acrylic Dust Sealer Gloss	DD1187 DC0264 3	B15a	NE
Moisture resistant plasterboard sealer binder	Dulux 1 Step Acrylic Primer Sealer Undercoat (low VOC)	DD0247 9	B15a	AS 3730.18
Concrete and masonry, latex wallboard sealer, sealer/undercoat,	Dulux Acrylic Sealer Undercoat (low VOC) Dulux 1 Step Acrylic Primer Sealer Undercoat (low VOC)	DD1402 DD0247 9	B16	AS 3730.18
Undercoat, solvent-borne	Dulux 1 Step Oil Based Primer Sealer Undercoat	DD1698	B17	AS 3730.14
Undercoat, latex: exterior	Dulux 1 Step Acrylic Primer Sealer Undercoat (low VOC) Dulux Acratex Water Based 501/1	DD0247 9 DD0441	B17a	AS 3730.18
Undercoat, latex: interior	Dulux 1 Step Acrylic Primer Sealer Undercoat (low VOC) Dulux Acrylic Sealer Undercoat (low VOC)	DD0247 9 DD1402	B17a	AS 3730.18
Wood Stain - spirit	Feast Watson Proofint	DW0729	B18	NE
Wood Stain - oil	Feast Watson Liming White Cabot's Interior Stain Oil Based	DW0749 DW0661	B18	
Wood Stain - latex	Intergrain UltraDeck® Timber Stain (interior/exterior) (low VOC) Cabot's Interior Stain Water Based	DW0261 3 DW1636	B18a	NE
Interior clear varnish, solvent-based, one-pack	Feast Watson Floorclear – Gloss, Satin Feast Watson Clear Varnish – Gloss, Satin, Matt – not suitable for floors Feast Watson Stain & Varnish – not suitable for floors Feast Watson Stain & Varnish Liming White – Gloss, Satin – not suitable for floors	DW0736 DW0737 DW1611 DW1612 DW1617 DW1295	B19	AS 3730.25 or AS 3730.27 (for floors)

Paint type	DuluxGroup/Dulux material description	Dulux PDS No.	PRN AS/NZS 23 11 (Table 4.2)	Standard
		DW0180 4 DW0180 5		
Interior clear latex varnish, water-based, one-pack	Cabot's Cabothane Clear Water Based Gloss, Satin or Matt (low VOC) – not suitable for floors Feast Watson Liming White Floor Finish Cabot's Stain & Varnish Water Based Gloss, Satin – not suitable for floors	DW1644 DW1645 DW0186 7 DW0180 0 DW1634 DW1635	B19a	NE or AS 3730.27 (for floors)
Floor varnish, solvent based, clear (moisture cure)	Feast Watson Commercial Maxithane – Gloss, Satin	DW0701 DW0703	B20	AS 3730.27
Floor Varnish, water-based, one-pack	Intergrain Enviropro Endure 1 Pack - Matt, Satin, Gloss (low VOC)	DW1418 DW1419 DW1420	B20	AS 3730.27
Floor varnish, clear or tinted, two-pack	Intergrain Enviropro Endure 2 Pack - Gloss, Satin, Matt	DW1421 DW1422 DW1423	B20	AS 3730.27
Exterior latex stain, semi-transparent	Intergrain UltraDeck® Timber Stain (low VOC)	DW0261 3	B22	AS 3730.16
Fence stain, latex paints, opaque	Dulux Weathershield Garden Shades – Low Sheen Cabot's Timbercolour Deck & Exterior Paint	DD0055 DW0225 6	B22b	AS 3730.16
Exterior stain, solvent-borne, opaque	Feast Watson Timber & Deck Stain	DW0189 4	B23#	AS 3730.28
Exterior stain, solvent-borne, semi-transparent	Feast Watson Exterior Stain & Varnish Gloss	DW0246 8	B23a	NE
Paving paint for concrete, solvent	Berger Jet Dry Paving Paint range	DD0081	B24	AS 3730.29
Paving paint for concrete, latex	Berger Jet Dry Aqua Tread Satin	DD1163	B24a	NE

Paint type	DuluxGroup/Dulux material description	Dulux PDS No.	PRN AS/NZS 23 11 (Table 4.2)	Standard
Roofing paint, latex (Solar reflectance)	Dulux AcraTex 962 COOLROOF with InfraCOOL Technology™	DA1471	B25	
Intumescent paints	Dulux Protective Coatings	Protective Coatings link	B28#	NE
Epoxy paint, two-pack, solvent-borne topcoats, interior only	Dulux Durebild STE 2 Pack Epoxy (high build & surface tolerant) Dulux Duremax GPE	DI1109 DI1115	B29	AS/NZS 3750.1
Epoxy paint, two-pack, solvent-borne topcoats, exterior & pools		N/A	B29	AS/NZS 3750.1
Epoxy paint, two-pack, water based, interior only	Dulux Luxafloor ECO2 (low VOC) Dulux Enviroepoxy WBE	I1315 DI1120	B29a	NE
High Build Recoatable two-pack, solvent-borne gloss polyurethane	Dulux Weathermax HBR Luxathane HPX	DI1156 DC02059	B29c B29c	NE
Stain sealer, solvent-borne for water soluble stains	Dulux Precision High Opacity Stain Blocker	DD02065	B30	NE
Stain sealer, water based for oil stains	Dulux Precision Maximum Strength Adhesion Primer	DD02066	B30	
Chalk sealer, surface conditioner	Dulux Sealer Binder Dulux Acraprime Solvent Based Primer	DD02165 DA0442	B31	NE
Anti-mould (treatment or wash for timber)	Intergrain Mould Preventer	DW01967	B32	NE
Water-repellent for masonry	Dulux AquaBan	DD0002	B33	NE
Creosote stain	No longer used	N/A	B35	NE
Paint remover, solvent-borne	Selleys Polystrippa Paint Stripper	Poly	B36a	NE
Paint remover, chemical	Selleys Polystrippa Renovators' Choice	Poly	B36b	NE
Bituminous paints	No longer used	N/A	B37	NE

Paint type	DuluxGroup/Dulux material description	Dulux PDS No.	PRN AS/NZS 23 11 (Table 4.2)	Standard
High build membrane or texture coatings for masonry and concrete: exterior	Dulux Acratex Range	Acratex	B38b	AS/NZS 4548.1 AS/NZS 4548.2 AS/NZS 4548.3 AS/NZS 4548.4
Texture finish latex coatings for masonry and plasterboard: interior only	Dulux Effects Range (interior)	Effects range link	B38a	NE
Clear or colourless coatings (waterborne) for timber, exterior	Intergrain UltraClear Exterior – Gloss, Satin Note: not suitable for decking.	DW1401 DW1400	B39	NE
Clear coatings (waterborne) for timber, interior	Cabot's Cabothane Clear Water Based Gloss, Satin & Matt (low VOC)	DW1644 DW1645 DW0186 7	B39	NE
Clear or colourless coatings (waterborne) for timber, interior floors	Intergrain Enviropro Endure 1 Pack - Matt, Satin, Gloss (low VOC) Intergrain Enviropro Endure 2 Pack - Matt, Satin, Gloss	DW1420 DW1419 DW1418 DW1423 DW1422 DW1421	B39	AS 3730.27
Sanding sealer	Feast Watson Sanding Sealer	DW0744	B40	NE
Semi-gloss latex, interior trim (alt B8b)	Dulux Aquanamel Semi-Gloss (low VOC)	DD1281	B41	NE
Gloss or full gloss latex, interior trim	Dulux Aquanamel Gloss (low VOC)	DD1282	B42	NE
Penetrating tung oil type varnish or wax for timber floors: interior	Intergrain Enviropro Hard Wax Oil Feast Watson Tung Oil	DW0253 3 DW0733	B43	NE
Penetrating tung oil type varnish for timber floors: exterior	Intergrain Nature's Timber Oil Feast Watson Traditional Timber Oil	DW0769 DW0179 5	B43	NE

Paint type	Dulux Group/Dulux material description	Dulux PDS No.	PRN AS/NZS 23 11 (Table 4.2)	Standard
Gloss pigmented polyurethane	Dulux Luxathane R Dulux Luxathane HPX Dulux Weathermax HBR	DD1137 DC0205 9 DI1156	B44	AS/NZS 3750.6
Powder coatings for non-ferrous metals	Dulux Powder Coat Range		B45b	AS 3715
Powder coatings for ferrous metals	Dulux Powder Coat Range (www.duluxpowders.com.au)		B45b	AS 4506

Low VOC compliance reference table

Green Star Interiors	VOC Limits MAX g/litre	DULUX Products compared to the GBCA specification	VOC g/litre Untinted
COMPLIANCE CRITERIA – GBCA specifications (obtain latest figures).			
Walls and ceilings - interior semi-gloss	16	Dulux EnviroO ₂ Interior Semi-Gloss	1
Walls and ceilings - interior semi-gloss	16	Dulux Wash&Wear Semi Gloss Dulux Wash&Wear +Plus Kitchen&Bathroom Semi Gloss	16 16
Walls and ceilings - interior low sheen	16	Dulux EnviroO ₂ Interior Low Sheen	1
Walls and ceilings - interior low sheen	16	Dulux Wash&Wear Low Sheen Dulux Wash&Wear +Plus Kitchen & Bathroom Low Sheen	16 16
Walls and ceilings - interior flat-washable	16	Dulux EnviroO ₂ Interior Matt	1
Ceilings - interior flat	14	Dulux EnviroO ₂ Interior Tintable ceiling Flat	1
Ceilings - interior flat	14	Dulux White Ceiling Paint	14
Trim - interior gloss	75	Dulux Aquanamel Gloss Dulux Professional Steriguard Water Based Enamel Gloss	50 74
Trim - interior semi-gloss	75	Dulux Aquanamel Semi Gloss Dulux Professional Steriguard Water Based Enamel Semi Gloss	53 74
Trim - interior semi-gloss	75	Dulux EnviroO ₂ Water Based Enamel Semi Gloss	1
Timber primer	30	Dulux Acrylic Sealer Undercoat	5

Green Star Interiors	VOC Limits MAX g/litre	DULUX Products compared to the GBCA specification	VOC g/litre Untinted
Latex primer for galvanized iron and zincalume NOT FOR HDG	60	Dulux Professional Total Prep	45
Latex primer for galvanized iron and zincalume NOT for HDG	60	Dulux Professional Galvanised Iron Primer	< 60
Interior latex undercoat	65	Dulux EnviroO ₂ Acrylic Sealer Undercoat (ASU)	1
Interior latex undercoat	65	Dulux Prepcoat Acrylic Sealer Undercoat	< 5
Exterior latex undercoat	65	Dulux 1 Step Acrylic Primer Sealer Undercoat (PSU) Dulux Professional Total Prep	<37 45
Interior sealer	65	Dulux EnviroO ₂ Acrylic Sealer Undercoat (ASU)	1
Interior concrete sealer	65	Dulux Luxafloor Eco2 (clear) + colours Dulux Luxafloor WB (Clear) + colours	10 10
One and two pack performance coatings for floors	140	Dulux Luxafloor Eco2 concrete Dulux Luxafloor WB concrete Intergrain Enviopro Timber Endure One Pack Intergrain Enviopro Timber Endure Two Pack	10 10 <90 <135 (Part A & B)

3 EXECUTION

3.1 PREPARATION

Standard

General: To AS/NZS 2311 Section 3.

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.

Substrate preparation – generally

General: Prepare substrates to receive the documented paint system.

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 nailheads.
- 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.

Iron and steel: Remove weld spatter, slag, burrs, or any other objectionable surface irregularities and radius all edges to a minimum of 2 mm. Degrease by solvent or alkaline cleaning.

Iron and steel blast cleaning: To AS 1627.9 and to the class specified in the specified protective treatment. Provide a surface roughness or profile appropriate for the specified treatment. Where steelwork to be abrasive cleaned includes irregular shapes allow for special equipment to achieve required abrasive cleaning.

Structural steel: All exposed fixings including bolts, screws and the like, are to be painted to match adjacent steelwork paint system.

Concrete and masonry: Before application to very smooth concrete, brick or masonry, either acid etch, mechanically grind or abrasive track blast the surface as appropriate to provide a suitable key for the subsequently applied coating and to remove laitance. Remove loose friable matter before filling surface discontinuities.

Set plaster surfaces: Do not apply solvent borne paint or other impervious coatings if the moisture content at the surface, tested with a moisture meter, exceeds 12%.

Unpainted surfaces

Standard: To AS/NZS 2311 Section 3.

Previously painted surfaces

Preparation of a substrate in good condition: To AS/NZS 2311 clause 7.4.

Preparation of a substrate in poor condition: To AS/NZS 2311 clause 7.5.

Preparation of steel substrates with protective coatings: To AS 2312.1 Section 8 and AS 1627.1.

PVC-U: Clean with methylated spirit and a nylon scouring pad.

Wallcovering: Remove wallcovering and residual paste with clean water. Patch and repair substrate to a uniform surface before painting.

Lime wash paints: Remove by brushing with warm water.

Reconditioned damaged surfaces in galvanized steel: To AS/NZS 4680 clause 8.

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 hand tools. Use sanding blocks to preserve the arrises of masonry and stone details.

Efflorescence: Eliminate the source of salt and water before cleaning. Allow surface to dry for 15 to 30 days before repainting.

New masonry: Allow 30 days for the masonry to cure and pH level to stabilise before painting.

3.2 PAINTING SYSTEMS

Dulux paint systems

Requirement: Apply paint systems as documented in the **Interior painting schedules** and the **Exterior painting schedules**.

General: Apply the paint system nominated for each substrate to the referenced manufacturer's Product Data Sheets (PDS) and Spec Sheets and include:

- The number and order of coats.
- The paint type for each coat.

Additional coats: Apply if necessary to:

- prepare porous or reactive substrates with prime or seal coats consistent with the manufacturer's recommendations;
- achieve the total film thickness or texture specified; or
- achieve a satisfactory opacity, in the specified or required colour.

Painting systems

Standards: The scheduled DuluxGroup/Dulux paint systems override AS/NZS 2311 as follows:

- New unpainted interior surfaces: To AS/NZS 2311 Table 5.1.
- New unpainted exterior surfaces: To AS/NZS 2311 Table 5.2.
- Standard: To AS/NZS 2311 clause 5.2. Provide the following final coats:
 - . High build textured or membrane finishes for concrete and masonry: B38 using products conforming to the AS 4548 series.
 - . Two-pack gloss pigmented polyurethane: B44.
 - . Two-pack epoxy: B29.
 - . Two-pack water based epoxy: B29A.

Paint Reference Number (PRN): The number in brackets against the individual product refers to the Paint Ref. No. (PRN) listed in the **DuluxGroup/Dulux paint type reference table** (See PRODUCTS) and AS/NZS 2311 Table 4.2.

3.3 APPLICATION

Standard

General: To AS/NZS 2311 Section 6.

Light levels

General: During preparation of surfaces, painting and inspection, maintain light levels such that the luminance (photometric brightness) of the surface is equal to the specified permanent artificial illumination conditions or 400 lux, whichever is the greater.

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.

Paint application

General: 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.

Painting conditions

General: Unless the paint is recommended for such conditions, do not paint under the following conditions:

- Dusty conditions.
- Relative humidity: > 85%.
- Surface temperature: < 10°C or > 35°C.

Priming timber before fixing

General: Apply one coat of wood primer, and 2 coats to end grain, to the back of the following before fixing in position:

- External fascia boards.
- Timber door and window frames.

- Bottoms of external doors.
- Associated trims and glazing beads.
- Timber board cladding.

Spraying

General: If the paint application is by spraying, use conventional or airless equipment which 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.

Paint with known health hazards: Provide personal protection, masking, ventilating and screening facilities to AS/NZS 4114.

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 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.

Tinting

General: Tint each coat of an opaque coating system so that each has a noticeably different tint from the preceding coat where possible, except for top coats in systems with more than one top coat.

Windows

Operation: Make sure opening windows function correctly before and after painting.

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.

Wet paint warning

Notices: Place in a conspicuous location and do not remove until the paint is dry.

Exclusions

Exclude the following surfaces from paint systems (unless specifically requested):

- Flexible duct connections, rubber hoses and mountings and other non-metallic flexible fittings.
- Wire rope and machined surfaces.
- Metals plated or specially finished for appearance, bronze, brass, copper and stainless steel (except as specified in the *Pipe identification* clause of the Services worksections).
- Aluminium frames.
- Prefinished aluminium frames to windows and doors, and trim.
- Metal floor duct covers.
- Raised access floors.
- Floors.
- Fair faced brickwork, blockwork, stonework, artificial stone and exposed aggregates.
- Sprayed vermiculite.
- Floors, paving, roads unless otherwise specified.
- Timber roof structure.
- Concealed timber roof structure.
- Timber ceiling and eaves lining.

- Exterior timber sheeting.
- Exterior timber stairs and decking.
- Plastic finishes generally
- Inside of service ducts, heat exchangers, pipes and valves.
- Shower seats, store shelving, work benches.
- Those parts of timber fixtures, such as insides of cupboards, not visible when doors are closed, unless otherwise specified. Insides of bathroom cabinets are not excluded and shall be painted.
- Self-finished surface such as glass and plastic laminates.
- Door hardware, including hinges.

3.4 COMPLETION

General

Protection and masking: Remove masking and protection coverings before paint has dried.

Cleaning: On completion of painting, remove splatters from adjacent finished surfaces 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.

Spares

Spare material: Supply clearly labelled sealed containers of each type, coat and colour of paint/coating from the same batch, for future repair purposes.

4 SELECTIONS

4.1 INTERIOR PAINTING SCHEDULES

Flat and matt latex - Interior

Substrate	1st coat	2nd coat	3rd coat	Manufacturer's Spec Sheet Ref
Plasterboard (low VOC system)	Dulux Acrylic Sealer Undercoat	Dulux Wash&Wear Matt	Dulux Wash&Wear Matt	SD05662
Plasterboard (Ultra low VOC system)	Dulux Enviro ₂ Interior Acrylic Sealer Undercoat	Dulux Enviro ₂ Interior Matt	Dulux Enviro ₂ Interior Matt	SD17107
Plasterboard (ceilings) (low VOC system)	Dulux Acrylic Sealer Undercoat	Dulux White Ceiling Paint	Dulux White Ceiling Paint	SD 0010
Plasterboard (ceilings) (Ultra low VOC system)	Dulux Enviro ₂ Interior Acrylic Sealer Undercoat	Dulux Enviro ₂ Interior Tintable Ceiling Flat	Dulux Enviro ₂ Interior Tintable Ceiling Flat	SD17091
Fibrous/set plaster	Dulux Sealer Binder (solvent based)	Dulux Wash&Wear Matt	Dulux Wash&Wear Matt	SD 05883
Fibrous/set plaster (with glancing light issues)	Dulux Sealer Binder (solvent based)	Dulux Wash&Wear Matt	Dulux Wash&Wear Matt	SD 05883
Fibre cement products (low VOC system)	Dulux Acrylic Sealer Undercoat	Dulux Wash&Wear Matt	Dulux Wash&Wear Matt	SD06059
Timber and veneers	Dulux Professional Total Prep	Dulux Aquanamel Low-Gloss	Dulux Aquanamel Low-Gloss	SD13399

Substrate	1st coat	2nd coat	3rd coat	Manufacturer's Spec Sheet Ref
Cement render (low VOC system)	Dulux Prepcoat Acrylic Sealer Undercoat	Dulux Wash&Wear Matt	Dulux Wash&Wear Matt	SD 06062
Acoustic ceiling tiles, vents & grids Vermiculite	Dulux Professional Acousticoat Flat			SD13203

Low-gloss latex - Interior

Substrate	1st coat	2nd coat	3rd coat	Manufacturer's Spec Sheet Ref
Plasterboard (low VOC system)	Dulux Acrylic Sealer Undercoat	Dulux Wash&Wear Low Sheen	Dulux Wash&Wear Low Sheen	SD 0002
Plasterboard (Ultra low VOC system)	Dulux Enviro ₂ Interior Acrylic Sealer Undercoat	Dulux Enviro ₂ Interior Low Sheen	Dulux Enviro ₂ Interior Low Sheen	SD17086
Plasterboard (Dark colours)	Dulux Enviro ₂ Interior Acrylic Sealer Undercoat	Porter's Aqua Enamel Satin	Porter's Aqua Enamel Satin	SD17198
Fibrous/set plaster	Dulux Precision Sealer Binder	Dulux Wash&Wear Low Sheen	Dulux Wash&Wear Low Sheen	SD0667
Fibre cement products (low VOC system)	Dulux Acrylic Sealer Undercoat	Dulux Wash&Wear Low Sheen	Dulux Wash&Wear Low Sheen	SD 2971
Timber and veneers	Dulux Professional Total Prep	Dulux Aquanamel Low Gloss	Dulux Aquanamel Low Gloss	SD13399
Timber and veneers (walls)	Dulux 1 Step Acrylic Primer Sealer Undercoat	Dulux Wash&Wear Low Sheen	Dulux Wash&Wear Low Sheen	SD 1528
Concrete (low VOC system)	Dulux Acrylic Sealer Undercoat	Dulux Wash&Wear Low Sheen	Dulux Wash&Wear Low Sheen	SD 0901
Cement render (low VOC system)	Dulux 1 Step Acrylic Primer Sealer Undercoat	Dulux Wash&Wear Low Sheen	Dulux Wash&Wear Low Sheen	SD 1128
MDF	Dulux Professional Total Prep	Dulux Aquanamel Low Gloss	Dulux Aquanamel Low Gloss	SD13399
MDF (walls)	Dulux 1 Step Acrylic Primer Sealer Undercoat	Dulux Wash&Wear Low Sheen	Dulux Wash&Wear Low Sheen	SD 1041
Brick and masonry (low VOC system)	Dulux Acrylic Sealer Undercoat	Dulux Wash&Wear Low Sheen	Dulux Wash&Wear Low Sheen	SD 3284
Concrete blockwork (low VOC system)	Berger Gold Label Acrylic Block Filler	Dulux Wash&Wear Low Sheen	Dulux Wash&Wear Low Sheen	SD 07827

Low-gloss latex (mould resistant) – Interior

Substrate	1st coat	2nd coat	3rd coat	Manufacturer's Spec Sheet Ref
Plasterboard (low VOC system)	Dulux Acrylic Sealer Undercoat	Dulux Wash&Wear +Plus Kitchen & Bathroom Low Sheen	Dulux Wash&Wear +Plus Kitchen & Bathroom Low Sheen	SD 4511

Substrate	1st coat	2nd coat	3rd coat	Manufacturer's Spec Sheet Ref
Plasterboard (MR grade) (low VOC system)	Dulux Professional Acrylic Sealer Undercoat	Dulux Wash&Wear +Plus Kitchen & Bathroom Low Sheen	Dulux Wash&Wear +Plus Kitchen & Bathroom Low Sheen	SD13491
Fibrous/set plaster	Dulux Sealer Binder (solvent based)	Dulux Wash&Wear +Plus Kitchen & Bathroom Low Sheen	Dulux Wash&Wear +Plus Kitchen & Bathroom Low Sheen	SD 5008
Fibre cement products (low VOC system)	Dulux Acrylic Sealer Undercoat	Dulux Wash&Wear +Plus Kitchen & Bathroom Low Sheen	Dulux Wash&Wear +Plus Kitchen & Bathroom Low Sheen	SD 4543
Concrete	Dulux Acrylic Sealer Undercoat	Dulux Wash&Wear +Plus Kitchen & Bathroom Low Sheen	Dulux Wash&Wear +Plus Kitchen & Bathroom Low Sheen	SD 5009
Cement render (low VOC system)	Dulux 1 Step Acrylic Primer Sealer Undercoat	Dulux Wash&Wear +Plus Kitchen & Bathroom Low Sheen	Dulux Wash&Wear +Plus Kitchen & Bathroom Low Sheen	SD 5010
MDF	Dulux 1 Step Acrylic Primer Sealer Undercoat	Dulux Wash&Wear +Plus Kitchen & Bathroom Low Sheen	Dulux Wash&Wear +Plus Kitchen & Bathroom Low Sheen	SD 3430
Brick and masonry (low VOC system)	Dulux Acrylic Sealer Undercoat	Dulux Wash&Wear +Plus Kitchen & Bathroom Low Sheen	Dulux Wash&Wear +Plus Kitchen & Bathroom Low Sheen	SD 5018
Concrete blockwork (low VOC system)	Berger Gold Label Acrylic Block Filler	Dulux Wash&Wear +Plus Kitchen & Bathroom Low Sheen	Dulux Wash&Wear +Plus Kitchen & Bathroom Low Sheen	SD 2741

Low-gloss latex (mould and bacteria resistant) - Interior

Substrate	1st coat	2nd coat	3rd coat	Manufacturer's Spec Sheet Ref
Plasterboard (low VOC system)	Dulux Acrylic Sealer Undercoat	Dulux Professional Steriguard Acrylic Low Sheen	Dulux Professional Steriguard Acrylic Low Sheen	SD11373
Plasterboard (MR grade) (low VOC system)	Dulux Professional Total Prep	Dulux Professional Steriguard Acrylic Low Sheen	Dulux Professional Steriguard Acrylic Low Sheen	SD16299
Fibrous/set plaster	Dulux Sealer Binder (solvent based)	Dulux Professional Steriguard Acrylic Low Sheen	Dulux Professional Steriguard Acrylic Low Sheen	SD09836
Timber and veneers	Dulux 1 Step Acrylic Primer Sealer Undercoat	Dulux Professional Steriguard Acrylic Low Sheen	Dulux Professional Steriguard Acrylic Low Sheen	SD11374
Concrete	Dulux Acrylic Sealer Undercoat	Dulux Professional Steriguard Acrylic Low Sheen	Dulux Professional Steriguard Acrylic Low Sheen	SD11376

Substrate	1st coat	2nd coat	3rd coat	Manufacturer's Spec Sheet Ref
MDF	Dulux 1 Step Acrylic Primer Sealer Undercoat	Dulux Professional Steriguard Acrylic Low Sheen	Dulux Professional Steriguard Acrylic Low Sheen	SD09757
Brick and masonry (low VOC system)	Dulux Acrylic Sealer Undercoat	Dulux Professional Steriguard Acrylic Low Sheen	Dulux Professional Steriguard Acrylic Low Sheen	SD11375
Concrete blockwork (low VOC system)	Berger Gold Label Acrylic Block Filler	Dulux Professional Steriguard Acrylic Low Sheen	Dulux Professional Steriguard Acrylic Low Sheen	SD10165

Semi-gloss latex - Interior

Substrate	1st coat	2nd coat	3rd coat	Manufacturer's Spec Sheet Ref
Plasterboard (low VOC system)	Dulux Acrylic Sealer Undercoat	Dulux Wash&Wear Semi Gloss	Dulux Wash&Wear Semi Gloss	SD 0003
Fibrous/set plaster	Dulux Sealer Binder (solvent based)	Dulux Wash&Wear Semi Gloss	Dulux Wash&Wear Semi Gloss	SD 0815
Fibre cement products (low VOC system)	Dulux Acrylic Sealer Undercoat	Dulux Wash&Wear Semi Gloss	Dulux Wash&Wear Semi Gloss	SD 0903
Timber and veneers	Dulux 1 Step Acrylic Primer Sealer Undercoat	Dulux Wash&Wear Semi Gloss	Dulux Wash&Wear Semi Gloss	SD 3410
Concrete (low VOC system)	Dulux Acrylic Sealer Undercoat	Dulux Wash&Wear Semi Gloss	Dulux Wash&Wear Semi Gloss	SD 1065
Cement render (low VOC system)	Dulux Total Prep	Dulux Wash&Wear Semi Gloss	Dulux Wash&Wear Semi Gloss	SD 1066
MDF (low VOC system)	Dulux 1 Step Acrylic Primer Sealer Undercoat	Dulux Wash&Wear Semi Gloss	Dulux Wash&Wear Semi Gloss	SD 3615
Brick and masonry (low VOC system)	Dulux 1 Step Prep Acrylic Primer Sealer Undercoat	Dulux Wash&Wear Semi Gloss	Dulux Wash&Wear Semi Gloss	SD1087
Concrete blockwork (low VOC system)	Berger Gold Label Acrylic Block Filler	Dulux Wash&Wear Semi Gloss	Dulux Wash&Wear Semi Gloss	SD 2797

Semi-gloss latex (mould resistant) - Interior

Substrate	1st coat	2nd coat	3rd coat	Manufacturer's Spec Sheet Ref
Plasterboard (low VOC system)	Dulux Acrylic Sealer Undercoat	Dulux Wash&Wear +Plus Kitchen & Bathroom Semi Gloss	Dulux Wash&Wear +Plus Kitchen & Bathroom Semi Gloss	SD 4523
Plasterboard (MR grade) (low VOC system)	Dulux Enviro _{O₂} Interior Acrylic Sealer Undercoat	Dulux Wash&Wear +Plus Kitchen & Bathroom Semi Gloss	Dulux Wash&Wear +Plus Kitchen & Bathroom Semi Gloss	SD 0632
Fibrous/set plaster	Dulux Sealer Binder (solvent based)	Dulux Wash&Wear +Plus Kitchen &	Dulux Wash&Wear +Plus Kitchen &	SD 5014

Substrate	1st coat	2nd coat	3rd coat	Manufacturer's Spec Sheet Ref
		Bathroom Semi Gloss	Bathroom Semi Gloss	
Fibre cement products (low VOC system)	Dulux Acrylic Sealer Undercoat	Dulux Wash&Wear +Plus Kitchen & Bathroom Semi Gloss	Dulux Wash&Wear +Plus Kitchen & Bathroom Semi Gloss	SD 4512
Concrete (low VOC system)	Dulux Acrylic Sealer Undercoat	Dulux Wash&Wear +Plus Kitchen & Bathroom Semi Gloss	Dulux Wash&Wear +Plus Kitchen & Bathroom Semi Gloss	SD 4522
Cement render (low VOC system)	Dulux 1 Step Acrylic Primer Sealer Undercoat	Dulux Wash&Wear +Plus Kitchen & Bathroom Semi Gloss	Dulux Wash&Wear +Plus Kitchen & Bathroom Semi Gloss	SD 5015
MDF	Dulux 1 Step Acrylic Primer Sealer Undercoat	Dulux Wash&Wear +Plus Kitchen & Bathroom Semi Gloss	Dulux Wash&Wear +Plus Kitchen & Bathroom Semi Gloss	SD 5016
Brick and masonry (low VOC system)	Dulux Acrylic Sealer Undercoat	Dulux Wash&Wear +Plus Kitchen & Bathroom Semi Gloss	Dulux Wash&Wear +Plus Kitchen & Bathroom Semi Gloss	SD 5017
Concrete blockwork (low VOC system)	Berger Gold Label Acrylic Block Filler	Dulux Wash&Wear +Plus Kitchen & Bathroom Semi Gloss	Dulux Wash&Wear +Plus Kitchen & Bathroom Semi Gloss	SD 3333

Semi-gloss water based enamel - Interior

Substrate	1st coat	2nd coat	3rd coat	Manufacturer's Spec Sheet Ref
Plasterboard	Dulux Acrylic Sealer Undercoat	Dulux Aquanamel Semi Gloss	Dulux Aquanamel Semi Gloss	SD 2591
Plasterboard (MR grade)	Dulux Acrylic Sealer Undercoat	Dulux Aquanamel Semi Gloss	Dulux Aquanamel Semi Gloss	SD 2591
Plasterboard (MR grade) (Ultra low VOC system)	Dulux 1 Step Acrylic Primer Sealer Undercoat	Dulux Enviro _{O₂} Interior Enamel Semi Gloss	Dulux Enviro _{O₂} Interior Enamel Semi Gloss	SD 18662
Fibrous/set plaster	Dulux Sealer Binder (solvent based)	Dulux Aquanamel Semi Gloss	Dulux Aquanamel Semi Gloss	SD 3058
Fibre cement products	Dulux Acrylic Sealer Undercoat	Dulux Aquanamel Semi Gloss	Dulux Aquanamel Semi Gloss	SW 5020
Timber and veneers (low VOC system)	Dulux 1 Step Acrylic Primer Sealer Undercoat	Dulux Aquanamel Semi Gloss	Dulux Aquanamel Semi Gloss	SD 2199
Timber and veneers (ultra low VOC system)	Dulux 1 Step Acrylic Primer Sealer Undercoat	Dulux Enviro _{O₂} Interior Enamel Semi Gloss	Dulux Enviro _{O₂} Interior Enamel Semi Gloss	SD17090
Concrete	Dulux Acrylic Sealer Undercoat	Dulux Aquanamel Semi Gloss	Dulux Aquanamel Semi Gloss	SD 5021

Substrate	1st coat	2nd coat	3rd coat	Manufacturer's Spec Sheet Ref
Cement render	Dulux Professional Acrylic Primer	Dulux Aquanamel Semi Gloss	Dulux Aquanamel Semi Gloss	SD 07495
MDF (low VOC system)	Dulux Acrylic Sealer Undercoat	Dulux Aquanamel Semi Gloss	Dulux Aquanamel Semi Gloss	SD 2294
Brick and masonry	Dulux Acrylic Sealer Undercoat	Dulux Aquanamel Semi Gloss	Dulux Aquanamel Semi Gloss	SD 5026
Concrete blockwork	Berger Gold Label Acrylic Block Filler	Dulux Aquanamel Semi Gloss	Dulux Aquanamel Semi Gloss	SD 5045
Zinc-coated metals (zincalume, Galvabond, zincanneal, zincseal, zinc-primed steel) (low VOC system)	Dulux Galvanised Iron Primer (water based)	Dulux Aquanamel Semi Gloss	Dulux Aquanamel Semi Gloss	SD 2523
Shop primed or red oxide primed (ROZP) ferrous metal (low VOC system)	Dulux Metalshield All Surface Primer (water based)	Dulux Aquanamel Semi Gloss Acrylic	Dulux Aquanamel Semi Gloss Acrylic	SD 2279
Non-ferrous metals (incl. aluminium, brass, copper, tin plate) (low VOC system)	Dulux Precision Maximum Strength Adhesion Primer	Dulux Aquanamel Semi Gloss	Dulux Aquanamel Semi Gloss	SD 09798
Plastics (solvent resistant types e.g. FRP, PVC-U) (low VOC system)	Dulux Precision Maximum Strength Adhesion Primer	Dulux Aquanamel Semi Gloss	Dulux Aquanamel Semi Gloss	SD 3960

Semi-gloss water based enamel (mould and bacteria resistant) - Interior

Substrate	1st coat	2nd coat	3rd coat	Manufacturer's Spec Sheet Ref
Plasterboard	Dulux Acrylic Sealer Undercoat	Dulux Professional SteriGuard Water Based Enamel Semi Gloss	Dulux Professional SteriGuard Water Based Enamel Semi Gloss	SA11377
Fibrous/set plaster	Dulux Sealer Binder (solvent based)	Dulux Professional SteriGuard Water Based Enamel Semi Gloss	Dulux Professional SteriGuard Water Based Enamel Semi Gloss	SD10021
Fibre cement products	Dulux Acrylic Sealer Undercoat	Dulux Professional SteriGuard Water Based Enamel Semi Gloss	Dulux Professional SteriGuard Water Based Enamel Semi Gloss	SD11379
Timber and veneers (low VOC system)	Dulux 1 Step Acrylic Primer Sealer Undercoat	Dulux Professional SteriGuard Water Based Enamel Semi Gloss	Dulux Professional SteriGuard Water Based Enamel Semi Gloss	SD11380
Concrete	Dulux Acrylic Sealer Undercoat	Dulux Professional SteriGuard Water	Dulux Professional SteriGuard Water	SD11381

Substrate	1st coat	2nd coat	3rd coat	Manufacturer's Spec Sheet Ref
		Based Enamel Semi Gloss	Based Enamel Semi Gloss	
MDF (low VOC system)	Dulux Acrylic Sealer Undercoat	Dulux Professional SteriGuard Water Based Enamel Semi Gloss	Dulux Professional SteriGuard Water Based Enamel Semi Gloss	D11382
Concrete blockwork	Berger Gold Label Acrylic Block Filler	Dulux Professional SteriGuard Water Based Enamel Semi Gloss	Dulux Professional SteriGuard Water Based Enamel Semi Gloss	SD11384
Zinc-coated metals (zincalume, Galvabond, zincanneal, zincseal, zinc-primed steel) (low VOC system)	Dulux Galvanised Iron Primer (water based)	Dulux Professional SteriGuard Water Based Enamel Semi Gloss	Dulux Professional SteriGuard Water Based Enamel Semi Gloss	SD11385
Shop primed or red oxide primed (ROZP) ferrous metal (low VOC system)	Dulux Metalshield All Surface Primer (water based)	Dulux Professional SteriGuard Water Based Enamel Semi Gloss	Dulux Professional SteriGuard Water Based Enamel Semi Gloss	SD11386
Non-ferrous metals (incl. aluminium, brass, copper, tin plate) (low VOC system)	Dulux Precision Maximum Strength Adhesion Primer	Dulux Professional SteriGuard Water Based Enamel Semi Gloss	Dulux Professional SteriGuard Water Based Enamel Semi Gloss	SD11387
Plastics (solvent resistant types e.g. FRP, PVC-U) (low VOC system)	Dulux Precision Maximum Strength Adhesion Primer	Dulux Professional SteriGuard Water Based Enamel Semi Gloss	Dulux Professional SteriGuard Water Based Enamel Semi Gloss	SD11388

Semi-gloss, solvent-borne - Interior

Substrate	1st coat	2nd coat	3rd coat	Manufacturer's Spec Sheet Ref
Timber and primed hardboard veneers	Dulux 1 Step Oil Based Primer Sealer Undercoat (solvent based)	Dulux Super Enamel Semi Gloss	Dulux Super Enamel Semi Gloss	SD 0041
MDF	Dulux 1 Step Acrylic Primer Sealer Undercoat	Dulux Super Enamel Semi Gloss	Dulux Super Enamel Semi Gloss	SD 1169
Zinc-coated metals (zincalume, Galvabond, zincanneal, zincseal, zinc-primed steel)	Dulux Galvanised Iron Primer	Dulux Super Enamel Semi Gloss	Dulux Super Enamel Semi Gloss	SD 09093
Shop primed or red oxide primed (ROZP) ferrous metal.	Dulux Metalshield All Surface Primer (water based)	Dulux Super Enamel Semi Gloss	Dulux Super Enamel Semi Gloss	SD 08446

Substrate	1st coat	2nd coat	3rd coat	Manufacturer's Spec Sheet Ref
Non-ferrous metals (incl. aluminium, brass, copper, tin plate)	Dulux Precision Maximum Strength Adhesion Primer	Dulux Super Enamel Semi Gloss	Dulux Super Enamel Semi Gloss	SD 3452
Plastics (solvent resistant types e.g. FRP, PVC-U)	Dulux Precision Maximum Strength Adhesion Primer	Dulux Super Enamel Semi Gloss	Dulux Super Enamel Semi Gloss	SD 3340
Plastics (solvent sensitive types e.g. polystyrene)	Dulux Precision Maximum Strength Adhesion Primer	Dulux Aquanamel Semi Gloss	Dulux Aquanamel Semi Gloss	SD 3340

Full gloss water based enamel - Interior

Substrate	1st coat	2nd coat	3rd coat	Manufacturer's Spec Sheet Ref
Plasterboard	Dulux Acrylic Sealer Undercoat	Dulux Aquanamel Gloss	Dulux Aquanamel Gloss	SD 0990
Plasterboard (MR grade)	Dulux Precision Sealer Binder	Dulux Aquanamel Gloss Acrylic	Dulux Aquanamel Gloss	SD331
Fibrous/set plaster	Dulux Sealer Binder (solvent based)	Dulux Aquanamel Gloss	Dulux Aquanamel Gloss	SD 3849
Fibre cement products	Dulux Acrylic Sealer Undercoat	Dulux Aquanamel Gloss	Dulux Aquanamel Gloss	SD 5027
Timber and veneers (low VOC system)	Dulux 1 Step Acrylic Primer Sealer Undercoat	Dulux Aquanamel Gloss	Dulux Aquanamel Gloss	SD 0458
Concrete	Dulux Acrylic Sealer Undercoat	Dulux Aquanamel Gloss	Dulux Aquanamel Gloss	SD 5028
Cement render	Dulux 1 Step Acrylic Primer Sealer Undercoat	Dulux Aquanamel Gloss	Dulux Aquanamel Gloss	SD 2263
MDF (low VOC system)	Dulux 1 Step Acrylic Primer Sealer Undercoat	Dulux Aquanamel Gloss	Dulux Aquanamel Gloss	SD 3298
Brick and masonry	Dulux Acrylic Sealer Undercoat	Dulux Aquanamel Gloss	Dulux Aquanamel Gloss	SD 5046
Concrete blockwork	Berger Gold Label Acrylic Block Filler	Dulux Aquanamel Gloss	Dulux Aquanamel Gloss	SD 1522
Zinc-coated metals (zincalume, Galvabond, zincanneal, zincseal, zinc-primed steel) (low VOC system)	Dulux Galvanised Iron Primer (water based)	Dulux Aquanamel Gloss	Dulux Aquanamel Gloss	SD08559
Shop primed or red oxide primed (ROZP) ferrous metal	Dulux Metalshield All Surface Primer	Dulux Aquanamel Gloss	Dulux Aquanamel Gloss	SD 2279
Non-ferrous metals (incl. aluminium,	Dulux Precision Maximum	Dulux Aquanamel Gloss	Dulux Aquanamel Gloss	SD 3455

brass, copper, tin plate) (low VOC system)	Strength Adhesion Primer			
Plastics (solvent resistant types e.g. FRP, PVC-U) (low VOC system)	Dulux Precision Maximum Strength Adhesion Primer	Dulux Aquanamel Gloss	Dulux Aquanamel Gloss	SD 11228

Full gloss water based enamel (mould and bacteria resistant) - Interior

Substrate	1st coat	2nd coat	3rd coat	Manufacturer's Spec Sheet Ref
Plasterboard	Dulux Acrylic Sealer Undercoat	Dulux Professional SteriGuard Water Based Enamel Gloss	Dulux Professional SteriGuard Water Based Enamel Gloss	SD11389
Fibrous/set plaster	Dulux Sealer Binder (solvent based)	Dulux Professional SteriGuard Water Based Enamel Gloss	Dulux Professional SteriGuard Water Based Enamel Gloss	SD10018
Fibre cement products	Dulux Acrylic Sealer Undercoat	Dulux Professional SteriGuard Water Based Enamel Gloss	Dulux Professional SteriGuard Water Based Enamel Gloss	SD11391
Timber and veneers (low VOC system)	Dulux 1 Step Acrylic Primer Sealer Undercoat	Dulux Professional SteriGuard Water Based Enamel Gloss	Dulux Professional SteriGuard Water Based Enamel Gloss	SD11392
Concrete	Dulux Acrylic Sealer Undercoat	Dulux Professional SteriGuard Water Based Enamel Gloss	Dulux Professional SteriGuard Water Based Enamel Gloss	SD11393
MDF (low VOC system)	Dulux Acrylic Sealer Undercoat	Dulux Professional SteriGuard Water Based Enamel Gloss	Dulux Professional SteriGuard Water Based Enamel Gloss	SD11394
Concrete blockwork	Berger Gold Label Acrylic Block Filler	Dulux Professional SteriGuard Water Based Enamel Gloss	Dulux Professional SteriGuard Water Based Enamel Gloss	SD11395
Zinc-coated metals (zincalume, Galvabond, zincanneal, zincseal, zinc-primed steel) (low VOC system)	Dulux Galvanised Iron Primer (water based)	Dulux Professional SteriGuard Water Based Enamel Gloss	Dulux Professional SteriGuard Water Based Enamel Gloss	SD11396
Shop primed or red oxide primed (ROZP) ferrous metal (low VOC system)	Dulux Metalshield All Surface Primer (water based)	Dulux Professional SteriGuard Water Based Enamel Gloss	Dulux Professional SteriGuard Water Based Enamel Gloss	SD11399
Non-ferrous metals (incl. aluminium,	Dulux Precision Maximum Strength Adhesion Primer	Dulux Professional SteriGuard Water	Dulux Professional SteriGuard Water	SD11397

Substrate	1st coat	2nd coat	3rd coat	Manufacturer's Spec Sheet Ref
brass, copper, tin plate) (low VOC system)		Based Enamel Gloss	Based Enamel Gloss	
Plastics (solvent resistant types e.g. FRP, PVC-U) (low VOC system)	Dulux Precision Maximum Strength Adhesion Primer	Dulux Professional SteriGuard Water Based Enamel Gloss	Dulux Professional SteriGuard Water Based Enamel Gloss	SD11398

Full gloss solvent-borne – Interior

Substrate	1st coat	2nd coat	3rd coat	Manufacturer's Spec Sheet Ref
Timber and primed hardboard veneers	Dulux 1 Step Oil Based Primer Sealer Undercoat	Dulux Super Enamel High Gloss	Dulux Super Enamel High Gloss	SD 0039
MDF (interior only)	Dulux 1 Step Acrylic Primer Undercoat	Dulux Super Enamel High Gloss	Dulux Super Enamel High Gloss	SD 1168
Zinc-coated metals (zincalume, Galvabond, zincanneal, zincseal, zinc-primed steel)	Dulux Galvanised Iron Primer (water based)	Dulux Super Enamel High Gloss	Dulux Super Enamel High Gloss	SD 09093
Shop primed or red oxide primed (ROZP) ferrous metal.	Dulux Metalshield All Surface Primer	Dulux Super Enamel High Gloss	Dulux Super Enamel High Gloss	SD 08446
Non-ferrous metals (incl. aluminium, brass, copper, tin plate)	Dulux Precision Maximum Strength Adhesion Primer	Dulux Super Enamel High Gloss	Dulux Super Enamel High Gloss	SD 3451
Plastics (solvent resistant types e.g. FRP, PVC-U)	Dulux Precision Maximum Strength Adhesion Primer	Dulux Super Enamel High Gloss	Dulux Super Enamel High Gloss	SD 0385
Plastics (solvent sensitive types e.g. polystyrene)	Dulux Precision Maximum Strength Adhesion Primer	Use water based paints, not solvent based.	Use water based paints, not solvent based.	N/A

Full gloss, epoxy primed enamel - Interior

Substrate	1st coat	2nd coat	3rd coat	Manufacturer's Spec Sheet Ref
Zinc-coated metals (zincalume, Galvabond, zincanneal, zincseal, zinc-primed steel)	Dulux Durebild STE to 100 microns DFT	Dulux Metalshield Prem UV Resistant Enamel Topcoat Gloss	Dulux Metalshield Prem UV Resistant Enamel Topcoat Gloss	D11407

Full gloss, epoxy primed two-pack polyurethane - Interior

Substrate	1st coat	2nd coat	3rd coat	Manufacturer's Spec Sheet Ref
Zinc-coated metals (incl. HD Galvanized steel, zincalume, Galvabond, zincanneal, zincseal, zinc-primed steel)	Dulux Duremax GPE Zinc Phosphate to 125 microns DFT	Dulux Duremax GPE to 100 microns DFT	Dulux Weathermax HBR to 75 microns DFT	SI 3359

Clear over stain on timber or veneers - Interior

Substrate	1st coat	2nd coat	3rd coat	Manufacturer's Spec Sheet Ref
Timber and timber veneer (solvent based system)	Cabot's Cabothane (solvent based) Gloss or Satin	Cabot's Cabothane (solvent based) Gloss or Satin	Cabot's Cabothane (solvent based) Gloss or Satin	SW 07479 (gloss) or SW 1202 (satin)
Timber and timber veneer (low VOC water based system)	Cabot's Cabothane Clear Water Based Gloss or Satin Apply 10.8 m ² /litre	Cabot's Cabothane Clear Water Based Gloss or Satin Apply 10.8 m ² /litre		SW 3925 (gloss) or SW 3927 (satin)

Clear coat two-pack polyurethane - Interior

Substrate	1st coat	2nd coat	3rd coat	Manufacturer's Spec Sheet Ref
Timber (low VOC water based system)	Intergrain Enviopro Timberseal	Intergrain Enviopro Endure 2 Pack Matt	Intergrain Enviopro Endure 2 Pack Matt	SW 4050
Timber (low VOC water based system)	Intergrain Enviopro Timberseal	Intergrain Enviopro Endure 2 Pack Satin	Intergrain Enviopro Endure 2 Pack Satin	SW 4243
Timber (low VOC water based system)	Intergrain Enviopro Timberseal	Intergrain Enviopro Endure 2 Pack Gloss	Intergrain Enviopro Endure 2 Pack Gloss	SW 3991

Clear coat single pack polyurethane - Interior

Substrate	1st coat	2nd coat	3rd coat	Manufacturer's Spec Sheet Ref
Timber and timber veneer (low VOC water based system)	Cabot's Cabothane Clear Water Based Gloss or Satin Apply 12 m ² /litre	Cabot's Cabothane Clear Water Based Gloss or Satin Apply 12 m ² /litre		SW 3925 (gloss) or SW 3927 (satin)
Timber and timber veneer (solvent based system)	Feast Watson Satinproof (solvent based)	Feast Watson Satinproof (solvent based)	(Optional) Feast Watson Satinproof (solvent based)	SW 1244

Two pack gloss pigmented polyurethane - Interior joinery

Substrate	1st coat	2nd coat	3rd coat	Manufacturer's Spec Sheet Ref
Timber (Factory applied)	Dulux Luxepoxy 4 White Primer to 50 microns DFT.	Dulux Luxathane SPX Satin		SC13656

Clear finishing oils for timber - Interior

Substrate	1st coat	2nd coat	3rd coat	Manufacturer's Spec Sheet Ref
Timber	Feast Watson Scandinavian Oil Apply at 16 m ² /litre	Feast Watson Scandinavian Oil Apply at 16 m ² /litre		SW 1257
Timber	Feast Watson Tung Oil Apply 12-14 m ² /litre	Feast Watson Tung Oil Apply 12-14 m ² /litre		SW 1258

Tung oil (Semi-gloss finish) - Interior (timber floors)

Substrate	1st coat	2nd coat	3rd coat	Manufacturer's Spec Sheet Ref
Timber (soft wood)	Feast Watson Proofseal	Feast Watson Tung Oil (Commercial)	Feast Watson Tung Oil (Commercial)	SW 1313
Timber (hardwood)	Feast Watson Proofseal	Feast Watson Tung Oil (Commercial)	Feast Watson Tung Oil (Commercial)	SW 1313

Clear single pack polyurethane - Interior (timber floors)

Substrate	1st coat	2nd coat	3rd coat	Manufacturer's Spec Sheet Ref
Timber (floors) (low VOC water based system)	Intergrain Enviropro Endure 1 Gloss, Satin or Matt	Intergrain Enviropro Endure 1 Gloss, Satin or Matt	Intergrain Enviropro Endure 1 Gloss, Satin or Matt	SW4012 (gloss) or SW4014 (satin) or SW4016 (matt)
Timber (floors)	Feast Watson Floorproof (solvent based) Gloss or Satin	Feast Watson Floorproof (solvent based) Gloss or Satin	Feast Watson Floorproof (solvent based) Gloss or Satin	SW 1332

Paving paint for concrete – Interior or exterior

Substrate	1st coat	2nd coat	3rd coat	Manufacturer's Spec Sheet Ref
Concrete (solvent based system)	Berger Jet Dry Non-Slip Paving Paint	Berger Jet Dry Non-Slip Paving Paint	Berger Jet Dry Non-Slip Paving Paint	SD 0643
Concrete (low VOC, water based system)	Berger Jet Dry Aqua Tread Satin	Berger Jet Dry Aqua Tread Satin		SD 1145

Clear sealer for concrete – Interior or exterior

Substrate	1st coat	2nd coat	3rd coat	Manufacturer's Spec Sheet Ref
Concrete (Domestic) (low VOC, water based system)	Berger Jet Dry Aqua Tread Satin	Berger Jet Dry Aqua Tread Satin	Berger Jet Dry Aqua Tread Satin	SD 1145
Concrete (commercial) (low VOC, water based system)	Dulux Luxafloor WB	Dulux Luxafloor WB		SC 11138
Concrete (commercial)	Dulux Protective Coatings Luxafloor WB Sealer Gloss	Dulux Protective Coatings Luxafloor WB Sealer Gloss	Dulux Protective Coatings Luxafloor WB Sealer Gloss	SC16300

Substrate	1st coat	2nd coat	3rd coat	Manufacturer's Spec Sheet Ref
(water based system)				
Concrete (commercial) (solvent based system)	Dulux Luxafloor ACS	Dulux Luxafloor ACS		SI 1574

Substrate	1st coat	2nd coat	3rd coat	Manufacturer's Spec Sheet Ref
e.g. Painted Plasterboard	Dulux ASU	Dulux Wash&Wear Low Sheen	Dulux Wash&Wear Low Sheen	SD0007

4.2 EXTERIOR PAINTING SCHEDULES

Low-gloss latex – Exterior

Substrate	1st coat	2nd coat	3rd coat	Manufacturer's Spec Sheet Ref
Weatherboard - hardboard cladding (Weathertex)	Dulux Professional Acrylic Primer	Dulux Weathershield Low Sheen	Dulux Weathershield Low Sheen	SD 9246
Weatherboard - fibre cement board cladding (Hardiboard)	Dulux Weathershield Low Sheen	Dulux Weathershield Low Sheen	Dulux Weathershield Low Sheen	SD 2539
Fibre cement products (soffits)	Dulux Weathershield Low Sheen	Dulux Weathershield Low Sheen	Dulux Weathershield Low Sheen	SD 1333
Timber and veneers	Dulux Professional Acrylic Primer	Dulux Weathershield Low Sheen	Dulux Weathershield Low Sheen	SD 9246
Concrete (OFC, tilt slab or precast)	Dulux AcraPrime 501/1 Water Based Primer	Dulux Weathershield Low Sheen	Dulux Weathershield Low Sheen	SD 1620
Concrete (OFC, tilt slab or precast) (High-build performance coating system)	Dulux AcraPrime 501/1 Water Based Primer	Dulux AcraTex AcraShield 955 Low Gloss RollerFinish	Dulux AcraTex AcraShield 955 Low Gloss RollerFinish	SA 0770
Cement render (High-build performance coating system)	Dulux AcraPrime 501/1 Water Based Primer	Dulux AcraTex AcraShield 955 Low Gloss RollerFinish	Dulux AcraTex AcraShield 955 Low Gloss RollerFinish	SA 4029
Clay brick and masonry	Dulux Professional Acrylic Primer	Dulux Weathershield Low Sheen	Dulux Weathershield Low Sheen	SD 7507
Concrete blockwork	Berger Gold Label Acrylic Blockfiller	Dulux Weathershield Low Sheen Acrylic	Dulux Weathershield Low Sheen Acrylic	SD 1555
Concrete blockwork (High-build performance coating system)	Dulux AcraTex Green Render Sealer	Dulux AcraTex AcraShield 955 Low Gloss RollerFinish	Dulux AcraTex AcraShield 955 Low Gloss RollerFinish	SA12873

Zinc coated metals (incl. Zincalume, Galvabond, Zincanneal, zincseal, zinc- primed steel)	Dulux Weathershield Low Sheen	Dulux Weathershield Low Sheen	Dulux Weathershield Low Sheen	SD 3275
HD Galvanized steel or zinc- primed steel (Domestic)	Dulux Durebuild STE Two Pack Epoxy	Dulux Weathershield Low Sheen	Dulux Weathershield Low Sheen	SD11541
Shop primed or red oxide primed (ROZP) ferrous metal.	Dulux Luxaprime Zinc Phosphate Primer	Dulux Weathershield Low Sheen	Dulux Weathershield Low Sheen	SD 07815
Plastics (solvent resistant types e.g. FRP, PVC-U) (low VOC)	Dulux Precision Maximum Strength Adhesion Primer	Dulux Weathershield Low Sheen	Dulux Weathershield Low Sheen	SD 3006

Semi-gloss latex – Exterior

Substrate	1st coat	2nd coat	3rd coat	Manufacturer's Spec Sheet Ref
Weatherboard - hardboard cladding Non rebated Jointed (Weathertex)	Dulux Professional Acrylic Primer	Dulux Weathershield Low Sheen	Dulux Weathershield Low Sheen	SD 9246
Weatherboard -fibre cement board cladding Non rebated Jointed (Hardiboard)	Dulux Weathershield Low Sheen	Dulux Weathershield Low Sheen	Dulux Weathershield Low Sheen	SD 2539
Fibre cement products Soffits	Dulux Weathershield Low Sheen	Dulux Weathershield Low Sheen	Dulux Weathershield Low Sheen	SD 1333
Timber and veneers	Dulux Professional Acrylic Primer	Dulux Weathershield Low Sheen	Dulux Weathershield Low Sheen	SD 9246
Concrete (OFC, tilt slab or precast)	Dulux AcraPrime 501/1 Water Based Primer	Dulux Weathershield Low Sheen	Dulux Weathershield Low Sheen	SD 1620
Concrete (OFC, tilt slab or precast) (High-build performance coating system)	Dulux AcraPrime 501/1 Water Based Primer	Dulux Acratex Acrashield 955 Low Gloss RollerFinish	Dulux Acratex Acrashield 955 Low Gloss RollerFinish	SA 0770
Cement render (High-build performance coating system)	Dulux AcraPrime 501/1 Water Based Primer	Dulux Acratex Acrashield 955 Low Gloss Roller Finish	Dulux Acratex Acrashield 955 Low Gloss Roller Finish	SA 4029
Clay brick and masonry	Dulux Professional Acrylic Primer	Dulux Weathershield Low Sheen	Dulux Weathershield Low Sheen	SD 7507
Concrete blockwork	Berger Gold Label Acrylic Blockfiller	Dulux Weathershield Low Sheen Acrylic	Dulux Weathershield Low Sheen Acrylic	SD 1555

Substrate	1st coat	2nd coat	3rd coat	Manufacturer's Spec Sheet Ref
Concrete blockwork (High-build performance coating system)	Dulux AcraPrime 501/1 Water Based Primer	Dulux AcraTex Acrashield 955 Low Gloss Roller Finish	Dulux AcraTex Acrashield 955 Low Gloss Roller Finish	SA 2957
Zinc coated metals (incl. Zincalume, Galvabond, Zincanneal, zincseal, zinc-primed steel)	Dulux Weathershield Low Sheen	Dulux Weathershield Low Sheen	Dulux Weathershield Low Sheen	SD 3275
HD Galvanized steel or zinc-primed steel (Domestic)	Dulux Durebuild TE Two Pack Epoxy	Dulux Weathershield Low Sheen	Dulux Weathershield Low Sheen	SD 11541
Shop primed or red oxide primed (ROZP) ferrous metal.	Dulux Luxaprime Zinc Phosphate Primer	Dulux Weathershield Low Sheen	Dulux Weathershield Low Sheen	SD 07815
Plastics (solvent resistant types e.g. FRP, PVC-U) (low VOC)	Dulux Precision Maximum Strength Adhesion Primer	Dulux Weathershield Low Sheen	Dulux Weathershield Low Sheen	SD 3006

Gloss latex – Exterior

Substrate	1st coat	2nd coat	3rd coat	Manufacturer's Spec Sheet Ref
Fibre cement products Restricted Application	Dulux Weathershield Gloss	Dulux Weathershield Gloss	Dulux Weathershield Gloss	SD 2938
Timber and veneers	Dulux Professional Acrylic Primer	Dulux Weathershield Gloss	Dulux Weathershield Gloss	SD 09362
Concrete (OFC, tilt slab or precast)	Dulux AcraPrime 501/1 Water Based Primer	Dulux Weathershield Gloss	Dulux Weathershield Gloss	SD 1620
Concrete (OFC, tilt slab or precast) (High-build performance coating system)	Dulux AcraPrime 501/1 Water Based Primer	Dulux AcraTex Acrashield 955 Low Gloss Roller Finish	Dulux AcraTex Acrashield 955 Low Gloss Roller Finish	SA 0770
Cement render (High-build performance coating system)	Dulux AcraPrime 501/1 Water Based Primer	Dulux AcraTex Acrashield 955 Low Gloss Roller Finish	Dulux AcraTex Acrashield 955 Low Gloss Roller Finish	SA 4029
Clay brick and masonry	Dulux Professional Acrylic Primer	Dulux Weathershield Gloss	Dulux Weathershield Gloss	SD 7512
Concrete blockwork	Berger Gold Label Acrylic Blockfiller	Dulux Weathershield Gloss	Dulux Weathershield Gloss	SD 5050
Concrete blockwork (High-build performance coating system)	Dulux AcraPrime 501/1 Water Based Primer	Dulux AcraTex Acrashield 955 Low Gloss Roller Finish	Dulux AcraTex Acrashield 955 Low Gloss Roller Finish	SA 2957

Substrate	1st coat	2nd coat	3rd coat	Manufacturer's Spec Sheet Ref
Zinc coated metals (incl. Zincalume, Galvabond, Zincanneal, zincseal, zinc-primed steel)	Dulux Professional Galvanised Iron Primer	Dulux Weathershield Gloss	Dulux Weathershield Gloss	SD12545
HD galvanized steel or zinc-primed steel (Domestic)	Dulux Durebuild STE Two Pack Epoxy	Dulux Weathershield Gloss	Dulux Weathershield Gloss	SI 3762
Shop primed or red oxide primed (ROZP) ferrous metal.	Dulux Luxaprime Zinc Phosphate Primer (solvent based)	Dulux Weathershield Gloss	Dulux Weathershield Gloss	SD 07817
Plastics (solvent resistant types e.g. FRP, PVC-U) (low VOC system)	Dulux Precision Maximum Strength Adhesion Primer	Dulux Weathershield Gloss	Dulux Weathershield Gloss	SD 11231

Acrylic paint system for bagged masonry – Exterior

Substrate	1st coat	2nd coat	3rd coat	Manufacturer's Spec Sheet Ref
Brickwork and concrete	Berger Gold Label Block Filler	Dulux Weathershield Low Sheen	Dulux Weathershield Low Sheen	SD 1555
Brickwork and concrete – flush finish (bagged or sponged) – slight texture	Dulux AcraPrime 501/1 Water Based Primer	Dulux Acratex Acrasand Acrylic (2nd coat Optional)	Dulux Acratex Acrashield	SA 0754
Brickwork and concrete – flush finish – medium texture	Dulux AcraTex Mediterranean Classique	Dulux AcraTex Mediterranean Classique	Dulux AcraTex Acrashield	SA 09533

Textured acrylic paint system – Exterior

Substrate	1st coat	2nd coat	3rd coat	Manufacturer's Spec Sheet Ref
Concrete, blockwork and cement render	Dulux Acraprime 501/1 Water Based Primer	Dulux Acratex Contempo 959 Advance Base Coat	Dulux Acratex Contempo 959 Advance Finish Coat	SA 1868
Concrete, blockwork and cement render	Dulux Acraprime 501/1 Water Based Primer (B15)	Dulux Acratex Roll On 950-00 Low Profile Texture	Dulux Acratex Acrashield 955 Finish	SA 0696
Concrete, masonry, blockwork and cement render	Dulux Acraprime 501/1 Water Based Primer	Dulux Acratex Acrashield 955 Low Gloss Rolana Finish	Dulux Acratex Acrashield 955 Low Gloss Rolana Finish	SA 0770

Semi-gloss water based enamel – Exterior

Substrate	1st coat	2nd coat	3rd coat	Manufacturer's Spec Sheet Ref
Fibre cement products Restricted Application	Dulux Professional Acrylic Primer	Dulux Aquanamel Semi Gloss	Dulux Aquanamel Semi Gloss	SD 7549
Timber and veneers	Dulux Professional Acrylic Primer	Dulux Aquanamel Semi Gloss	Dulux Aquanamel Semi Gloss	SD 07476
Concrete	Dulux Professional Acrylic Primer	Dulux Aquanamel Semi Gloss	Dulux Aquanamel Semi Gloss	SD 11234
Cement render Restricted Application	Dulux Professional Acrylic Primer	Dulux Aquanamel Semi Gloss	Dulux Aquanamel Semi Gloss	SD 07495
Brick and masonry	Berger Gold Label Acrylic Block Filler	Dulux Aquanamel Semi Gloss	Dulux Aquanamel Semi Gloss	SD 5041
Concrete blockwork	Berger Gold Label Acrylic Block Filler	Dulux Aquanamel Semi Gloss	Dulux Aquanamel Semi Gloss	SD 5041
Zinc coated metals Zincalume, Galvabond, Zincanneal, zincseal, zinc-primed steel) (low VOC system)	Dulux Professional Galvanised Iron Primer	Dulux Aquanamel Semi Gloss	Dulux Aquanamel Semi Gloss	SD 11235
Shop primed or red oxide primed (ROZP) ferrous metal	Dulux Metalshield All Surface Primer	Dulux Aquanamel Semi Gloss	Dulux Aquanamel Semi Gloss	SD 07789
Non-ferrous metals (incl. aluminium, brass, copper, tin plate) (low VOC system)	Dulux Precision Maximum Strength Adhesion Primer	Dulux Aquanamel Semi Gloss	Dulux Aquanamel Semi Gloss	SD 09798
Plastics (solvent resistant types e.g. FRP, PVC-U) (low VOC system)	Dulux Precision Maximum Strength Adhesion Primer	Dulux Aquanamel Semi Gloss	Dulux Aquanamel Semi Gloss	SD 7494

Full gloss water based enamel – Exterior

Substrate	1st coat	2nd coat	3rd coat	Manufacturer's Spec Sheet Ref
Fibre cement products Restricted Application	Dulux Professional Acrylic Primer	Dulux Aquanamel Gloss	Dulux Aquanamel Gloss	SD 7548
Timber and veneers	Dulux Professional Acrylic Primer	Dulux Aquanamel Gloss	Dulux Aquanamel Gloss	SD 08475
Concrete	Dulux Professional Acrylic Primer	Dulux Aquanamel Gloss	Dulux Aquanamel Gloss	SD 11236

Substrate	1st coat	2nd coat	3rd coat	Manufacturer's Spec Sheet Ref
Cement render Restricted Application	Dulux Professional Acrylic Primer	Dulux Aquanamel Gloss	Dulux Aquanamel Gloss	SD 07496
Brick and masonry	Berger Gold Label Acrylic Blockfiller	Dulux Aquanamel Gloss	Dulux Aquanamel Gloss	SD 11237
Concrete blockwork	Berger Gold Label Acrylic Blockfiller	Dulux Aquanamel Gloss	Dulux Aquanamel Gloss	SD 11238
Zinc-coated metals (Zincalume, Galvabond, Zincanneal, zincseal, & zinc-primed steel)	Dulux Professional Galvanised Iron Primer	Dulux Aquanamel Gloss	Dulux Aquanamel Gloss	SD 11239
Shop primed or red oxide primed (ROZP) ferrous metal.	Dulux Luxaprime Zinc Phosphate Primer (solvent based)	Dulux Aquanamel Gloss	Dulux Aquanamel Gloss	SD 07570
Non-ferrous metals (incl. aluminium, brass, copper, tin plate)	Dulux Precision Maximum Strength Adhesion Primer	Dulux Aquanamel Gloss	Dulux Aquanamel Gloss	SD 11240
Plastics (solvent resistant types e.g. FRP, PVC-U)	Dulux Precision Maximum Strength Adhesion Primer	Dulux Aquanamel Gloss	Dulux Aquanamel Gloss	SD 11241

Full gloss, solvent borne – Exterior

Substrate	1st coat	2nd coat	3rd coat	Manufacturer's Spec Sheet Ref
Timber and primed hardboard veneers	Dulux 1 Step Oil Based PSU (solvent based)	Dulux Super Enamel High Gloss	Dulux Super Enamel High Gloss	SD 0039
Zinc-coated metals (zincalume, Galvabond, zincanneal, zincseal, zinc-primed steel)	Dulux Professional Galvanised Iron Primer	Dulux Super Enamel High Gloss	Dulux Super Enamel High Gloss	SD 07814
Shop primed or red oxide primed (ROZP) ferrous metal.	Dulux Luxaprime Zinc Phosphate Primer (solvent based)	Dulux Super Enamel High Gloss	Dulux Super Enamel High Gloss	SD 07818
Non-ferrous metals (incl. aluminium, brass, copper, tin plate)	Dulux Precision Maximum Strength Adhesion Primer	Dulux Super Enamel High Gloss	Dulux Super Enamel High Gloss	SD 3451
Plastics (solvent resistant types e.g. FRP, PVC-U)	Dulux Precision Maximum Strength Adhesion Primer	Dulux Super Enamel High Gloss	Dulux Super Enamel High Gloss	SD 0385
Plastics (solvent sensitive types, e.g. polystyrene)	Dulux Precision Maximum Strength Adhesion Primer	Don't use Solvent Based, Use Water Based Paints	Don't use Solvent Based, Use Water Based Paints	N/A

Car parking line marking

Requirement:

- Apply nominally 70 mm wide line marking for car parking spaces nominated on drawings.

Materials:

- Paint System: Dulux Roadmaster WB2, spray applied to manufacturers written recommendations.
- Colour shall be white and shall not be subject to discolouration by the bitumen from the road surface.

Application: Unless approved all paint shall be applied by a mechanical line marking sprayer. The road surface shall be clean and dry at the time of painting. Paint shall be applied at wet thickness in the range of 0.35 to 0.40 mm. Bitumen shall be at least 30 days old before coating.

Standard: To AS/NZS 2890.1.

Paint colours schedule

Substrate	Number of colours
	Refer to Finishes and Material Schedule

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

General

Application to aluminium and aluminium alloy substrates for architectural applications: To AS 3715 and AAMA 2603, AAMA 2604 and AAMA 2605 as appropriate.

Application to metal substrates other than aluminium for architectural applications: To AS 4506.

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 onto 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 coating samples: Submit samples of each coating system on representative substrates, 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

General: Submit the coating manufacturer's warranties, as documented.

2 EXECUTION

2.1 PREPARATION

Substrate pre-treatment

Powder coating to aluminium: To AS 3715 Appendix G.

Powder coating to metals, other than aluminium: To AS 4506 Appendix I.

2.2 COMPLETION

Cleaning

Aluminium architectural applications: Clean completed assembly to AS 3715 Appendix C.

Metal, other than aluminium, architectural applications: Clean completed assembly to AS 4506 Appendix D.

3 SELECTIONS

3.1 ALUMINIUM FOR ARCHITECTURAL APPLICATIONS

Powder coating properties schedule

	A	B	C
Proprietary item	Refer to Material and Finishes Schedule		
Application			
Location			
Substrate			
Service condition category to AS 3715			
Powder coating performance			
Powder coating type			
Polyester coating grade			
Colour			
Gloss level			
Warranty: Film integrity			
Warranty: Colour integrity			

APPENDIX

- 01 Material and Finishes Schedule
- 02 Fixture, Fitting and Equipment Schedule
- 03 Door Hardware Schedule (ASSA ABLOY)
- 04 Safe Roof Access (SAYFA)
- 05 Automated Swing Gate and Garage Doors
- 06 Screen / Louvre (SUNEX)
- 07 Balustrade
- 08 Window system (AWS Australia)
- 09 Fire Screen (GREENE FIRE)
- 10 Pedestal Paver
- 11 Waterproofing Specification (GRACE)

Appendix 01: Material and Finishes Schedule

REVISIONS
T1 16.05.2022 TENDER DOCUMENTATION MGS
T2 XX.05.2022 TENDER DOCUMENTATION MGS

PROJECT
5 CURRAN STREET

PROJECT NUMBER
19124

CLIENT
**mainstone™
PROPERTY DEVELOPMENT**

DRAWING TITLE
**MATERIAL AND FINISHES
SCHEDULE**

DRAWN BY
MGS

CHECKED BY
AF/CJ

DATE
MAY 2022

SCALE

DRAWING NUMBER
A1510

REVISION
T2

TENDER

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CODE	IMAGE	LOCATIONS	PRODUCT DESCRIPTIONS			MANUFACTURER	NOTES
			DETAILS	FINISH / MANUF'S CODE			
			physical material				
0200 LANDSCAPE							
GRC		BALCONY / TERRACE	CUSTOM SIZE GRC PLANTERBOX AS PER SIZE SHOWN ON DRAWINGS.	GRC PLANTERBOX (SIZE AS PER DRAWINGS)	SATUBUMI OR EQ.	INSTALL ON LAYER OF COMPACTED WASHED BEDDING SAND AND COMPACTED CRUSHED ROCK. REFER TO LANDSCAPE ARCHITECT'S DETAIL	
PAV1a		GROUND FLOOR TERRACE	EXTERNAL BLUE STONE PAVER	600x600 EXTERNAL BLUE STONE PAVER, SLIP RATING: R12.	BAMSTONE OR EQ	INSTALL ON SCREED LAID TO FALL AS PER SPECIFICATION AND IN ACCORDANCE TO MANUFACTURER'S RECOMMENDATION.	
PAV1b		GROUND FLOOR TERRACE	EXTERNAL BLUE STONE PAVER	600x600 EXTERNAL BLUE STONE PAVER, SLIP RATING: R12.	BAMSTONE OR EQ	INSTALL ON LAYER OF COMPACTED WASHED BEDDING SAND AND COMPACTED CRUSHED ROCK. REFER TO LANDSCAPE ARCHITECT'S DETAIL	
PAV2a		GROUND FLOOR MAIN ENTRY FOOTPATH	EXTERNAL BLUE STONE PAVER	600x300 EXTERNAL BLUE STONE PAVER, SLIP RATING: R12.	BAMSTONE OR EQ	INSTALL ON SCREED LAID TO FALL AS PER SPECIFICATION AND IN ACCORDANCE TO MANUFACTURER'S RECOMMENDATION.	
PAV2b		GROUND FLOOR MAIN ENTRY FOOTPATH	EXTERNAL BLUE STONE PAVER	600x300 EXTERNAL BLUE STONE PAVER, SLIP RATING: R12.	BAMSTONE OR EQ	INSTALL ON LAYER OF COMPACTED WASHED BEDDING SAND AND COMPACTED CRUSHED ROCK. REFER TO LANDSCAPE ARCHITECT'S DETAIL	
SSC		LOBBY AT ALL LEVELS (EAST GARDEN AREA)	STAINLESS STEEL CABLE FIX USING POINT FITTING SYSTEM BETWEEN UNDERSIDE OF SLAB (TOP) AND TO TOP OF BLOCKWALL (BOTTOM)	JAKOB STAINLESS STEEL GREEN WALL CABLE	JAKOB / tensile.com.au	BUILDER TO PROVIDE SAMPLE AND SHOP DRAWING. INSTALL IN ACCORDANCE TO MANUFACTURER'S SPECIFICATION	
0310 CONCRETE COMBINED							
COS1			COS1			0315_MGS_CONCRETE FINISHES_COS1	
COS2			COS1			0315_MGS_CONCRETE FINISHES_COS1	
0335 BRICK CONSTRUCTION							
BAL6		EXTERNAL WALLS AND BALUSTRADES	FULL BRICK VENEER IN RUNNING BOND PATTERN.	COLOUR: OLD MELBOURNE TOWN	ROBERTSON'S BUILDING PRODUCTS	INSTALL AS PER SPECIFICATION AND IN ACCORDANCE TO MANUFACTURER'S RECOMMENDATION. REFER TO STRUCTURAL SPECIFICATION OF ANY LOAD BEARING BRICK WALLS.	
BRK1		EXTERNAL WALLS	FULL BRICK VENEER IN RUNNING BOND PATTERN.	COLOUR: OLD MELBOURNE TOWN	ROBERTSON'S BUILDING PRODUCTS	INSTALL AS PER SPECIFICATION AND IN ACCORDANCE TO MANUFACTURER'S RECOMMENDATION. REFER TO STRUCTURAL SPECIFICATION OF ANY LOAD BEARING BRICK WALLS.	
0345 STEEL - PROTECTIVE PAINT COATINGS							
PP01		STRUCTURAL STEEL COLUMNS, BEAMS AND PERGOLA AT LEVEL 2, WINDOW SHROUD AND FOOTPATH ENTRY CANOPY	STEEL PROTECTIVE PAINT APPLIED TO METAL FRAME (DOOR FRAMES AND MILD STEEL)	STEEL PROTECTIVE COATING, FINISH: GLOSS, COLOUR: BLACK	DULUX / INTERPON	POWDER COATING TO BE APPLIED IN ACCORDANCE TO MANUF'S SPECIFICATION. CONTRACTOR TO PROVIDE SAMPLE, DATA SHEET FOR REVIEW AND APPROVAL	
PP02		STEEL DOOR FRAME TO ALL FIRE DOORS. (APARTMENT ENTRY AND STAIR)	STEEL PROTECTIVE PAINT APPLIED TO METAL FRAME (DOOR FRAMES AND MILD STEEL)	STEEL PROTECTIVE COATING, FINISH: GLOSS, COLOUR: CLOUD	DULUX / INTERPON	POWDER COATING TO BE APPLIED IN ACCORDANCE TO MANUF'S SPECIFICATION. CONTRACTOR TO PROVIDE SAMPLE, DATA SHEET FOR REVIEW AND APPROVAL	
0411 WATERPROOF - EXTERNAL AND TANKING							
WPM01		LIFT PIT SLAB AND WALLS	WATERPROOF MEMBRANE TO LIFT PIT FLOORS AND WALLS	PREPRUFE 300R PLUS, PREPRUFE TAPE, PREPRUFE CJ TAPE AND BITUTHENE LIQUID MEMBRANE	GCP APPLIED TECHNOLOGIES	INSTALL AS PER MANUFACTURER'S SPECIFICATION	
WPM02		LIFT PIT WALLS CONSTRUCTION JOINTS	WATERPROOF MEMBRANE TO CONSTRUCTION JOINT	HYDROPHILIC WATERSTOP - WATER-BAR XR2010 AND XR2010SW	GCP APPLIED TECHNOLOGIES	INSTALL AS PER MANUFACTURER'S SPECIFICATION	
WPM03		BASEMENT SLAB AND PERIMETER WALLS WITH BORED PIER AND SHORTCRETE	WATERPROOF MEMBRANE TO BASEMENT SLAB	PREPRUFE 300R PLUS, PREPRUFE TAPE, PREPRUFE CJ TAPE AND BITUTHENE LIQUID MEMBRANE	GCP APPLIED TECHNOLOGIES	INSTALL AS PER MANUFACTURER'S SPECIFICATION	
WPM04		RETAINING WALLS (INSITU CONCRETE / BLOCKWORK)	WATERPROOF MEMBRANE TO PERIMETER RETAINIGN WALLS	BITUTHENE LIQUID MEMBRANE, BITUTHENE SOLVENT PRIMER, SINGLE LAYER BITUTHENE 3000, PROTECTOBOARD	GCP APPLIED TECHNOLOGIES	INSTALL AS PER MANUFACTURER'S SPECIFICATION	
WPM05		CONCRETE ROOF PLANT AND EXPOSED TERRACE AND WASTE ROOM	WATERPROOF MEMBRANE TO FLOOR	SILCOR LM PU SEALANT, EPOCOTE F100W (SILCOR PRIMER BW SEALER), ULTRAURE A-80, UNTRAURE A-80 NON-SLIP TOP COAT	GCP APPLIED TECHNOLOGIES	INSTALL AS PER MANUFACTURER'S SPECIFICATION AND IN ACCORDANCE TO AS3740 AND NCC	
WPM06		PLANTER BOXES	WATERPROOF MEMBRANE TO PLANTER BOXES	SILCOR LM PU SEALANT, CHEMSPRAY 117 CLEAR PRIMER, CHEMSPRAY 790 HYBRID POLYUREA, UNTRAURE A-80 NON-SLIP TOP COAT, PROTECTOBOARD	GCP APPLIED TECHNOLOGIES	INSTALL AS PER MANUFACTURER'S SPECIFICATION AND IN ACCORDANCE TO AS3740 AND NCC	
WPM07		DRY PLANT ROOM (MSB ROOM, COMMS ROOM)	WATERPROOF MEMBRANE TO FLOOR	SILCOR LM PU SEALANT, EPOCOTE F100W (SILCOR PRIMER BW SEALER), EPOCOTE F100 HD	GCP APPLIED TECHNOLOGIES	INSTALL AS PER MANUFACTURER'S SPECIFICATION AND IN ACCORDANCE TO AS3740 AND NCC	
WPM08			CONCRETE SLAB SEALANT	CHEMISEAL (DUST PROOF SEALER), SILCOR LM PU SEALANT, AQUAGARD M CLEAR PRIMER, UNTRAURE A-80 NON-SLIP TOP COAT	GCP APPLIED TECHNOLOGIES	INSTALL AS PER MANUFACTURER'S SPECIFICATION AND IN ACCORDANCE TO AS3740 AND NCC	
WPM09			WATERPROOF TO LIFT OVERUN CONCRETE LID	SILCOR LM PU SEALANT, AQUAGARD M CLEAR PRIMER, AQUAGARD M UVR, AQUAGARD M NON-SLIP TOP COAT	GCP APPLIED TECHNOLOGIES	INSTALL AS PER MANUFACTURER'S SPECIFICATION AND IN ACCORDANCE TO AS3740 AND NCC	
WPM10			WATERPROOFING ON CONCRETE SLAB UNDER TILE ON PODS	SILCOR LM PU SEALANT, AQUAGARD M CLEAR PRIMER, ULTRAURE A-80, ULTRAURE A-80 NON-SLIP TOP COAT	GCP APPLIED TECHNOLOGIES	INSTALL AS PER MANUFACTURER'S SPECIFICATION AND IN ACCORDANCE TO AS3740 AND NCC	
0423 PROFILED METAL ROOFING							
DP			ROUND. METAL DOWNPipe. SIZE AS SPECIFIED BY HYDRAULIC ENGINEER.	ROUND. METAL DOWNPipe. SIZE AS SPECIFIED BY HYDRAULIC ENGINEER.	LYSAGHT	DOWN PIPE TO BE INSTALLED IN ACCORDANCE TO AUSTRALIAN STANDARDS.	
FL			METAL ROOF FLASHING. COLOUR TO MATCH ROOF.		LYSAGHT	FLASHING TO BE INSTALLED IN ACCORDANCE TO AUSTRALIAN STANDARDS AND AS PER SPECIFICATION	
MR1		ROOF	COLORBOND®, COLOUR SHALE GREY	TRIMDECK, COLOUR: SHALE GREY	COLORBOND / LYSAGHT	INSTALL AS PER SPECIFICATION AND IN ACCORDANCE TO MANUFACTURER'S RECOMMENDATION	
PL			COLORBOND®, COLOUR TO MATCH ROOF	CUSTOM ORB	LYSAGHT	0423_MGS_ROOFING_PARAPET LINING	

REVISIONS
T1 16.05.2022 TENDER DOCUMENTATION
T2 XX.05.2022 TENDER DOCUMENTATION

PROJECT
5 CURRAN STREET
MGS
MGS

PROJECT NUMBER
19124

CLIENT
mainstone™
PROPERTY DEVELOPMENT

DRAWING TITLE
MATERIAL AND FINISHES
SCHEDULE

DRAWN BY
MGS
CHECKED BY
AF/CJ
DATE
MAY 2022

DRAWING NUMBER
A1510-01
REVISION
T2

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TENDER
COORDINATION



CODE	IMAGE	LOCATIONS	PRODUCT DESCRIPTIONS			MANUFACTURER	NOTES
			DETAILS	FINISH / MANUF'S CODE			
0431 CLADDING COMBINED							
CAP			METAL PARAPET/CLADDING CAPPING. COLOUR TO MATCH METAL CLADDING		LYSAGHT	CAPPING TO BE INSTALLED IN ACCORDANCE TO AUSTRALIAN STANDARDS AND AS PER SPECIFICATION	
FC01		EXTERNAL WALLS AND BALUSTRADES	VERTICAL STRIPE FIBRE CEMENT CLADDING WITH EXPRESSED JOINT	AXON CLADDING, FINISH: PAINT, COLOUR: WOODLAND GREY	JAMES HARDIE OR EQ	INSTALL AS PER SPECIFICATION AND IN ACCORDANCE TO MANUFACTURER'S RECOMMENDATION	
FC02		EXTERNAL WALLS	FIBRE CEMENT CLADDING FINE WITH EXPRESSED JOINT AS SHOWN AND TEXTURED RENDER FINISH	900x1200 EASY LAP, FINISH: PAINT, COLOUR: MONUMENT	JAMES HARDIE OR EQ	INSTALL AS PER SPECIFICATION AND IN ACCORDANCE TO MANUFACTURER'S RECOMMENDATION	
MC1		EXTERNAL WALLS	METAL CLADDING EXPRESSED RIB (STANDING SEAM)	PRODUCT: LYSAGHT LONGLINE 305, COLOUR: MONUMENT, FINISH: MATT	COLORBOND / LYSAGHT	INSTALL AS PER SPECIFICATION AND IN ACCORDANCE TO MANUFACTURER'S RECOMMENDATION. BUILDER TO PROVIDE SAMPLE AND SHOP DRAWING FOR REVIEW	
MC2		EXTERNAL WALLS	METAL CLADDING EXPRESSED RIB (STANDING SEAM)	PRODUCT: LYSAGHT LONGLINE 305, COLOUR: WINDSPRAY, FINISH: MATT	COLORBOND / LYSAGHT	INSTALL AS PER SPECIFICATION AND IN ACCORDANCE TO MANUFACTURER'S RECOMMENDATION. BUILDER TO PROVIDE SAMPLE AND SHOP DRAWING FOR REVIEW	
MC3		BALUSTRADES / PRIVACY SCREEN	PERFORATED ALUMINIUM PANEL (BALUSTRADE SCREEN)	PRODUCT CODE: R03325, 3mm THK. ALUMINIUM, PERFORATION: 25% OPEN, FINISH: POWDERCOATED MATT, COLOUR: BLACK	LOCKERGROUP	BUILDER TO PROVIDE PERFORATED SAMPLE AND DATA SHEET, AND PROVIDE SHOP DRAWINGS FOR REVIEW AND APPROVAL.	
MC4			PERFORATED ALUMINIUM PANEL (BASEMENT OVERHEAD SECTIONAL DOOR)	PRODUCT CODE: 3mm THK. ALUMINIUM, PERFORATION: 30% OPEN, FINISH: POWDERCOATED MATT, COLOUR: BLACK	LOCKERGROUP / AIRPORT DOORS	BUILDER TO PROVIDE PERFORATED SAMPLE AND DATA SHEET, AND PROVIDE SHOP DRAWINGS FOR REVIEW AND APPROVAL.	
MC5			PERFORATED ALUMINIUM PANEL (BASEMENT GARAGE ROLLER DOOR)	PRODUCT CODE: ALUMINIUM, PERFORATION: 30% OPEN, FINISH: POWDERCOATED MATT, COLOUR: BLACK	LOCKERGROUP / AIRPORT DOORS	BUILDER TO PROVIDE PERFORATED SAMPLE AND DATA SHEET, AND PROVIDE SHOP DRAWINGS FOR REVIEW AND APPROVAL.	
0451 WINDOWS AND GLAZED DOORS							
FR1			ALUMINIUM SLIDING DOOR FRAME	AWS SLIDE MASTER 704. POWDER COATED, FINISH: MATT, COLOUR: PC01	AWS WINDOWS	POWDER COATING TO BE APPLIED IN ACCORDANCE TO MANUF'S SPECIFICATION. CONTRACTOR TO PROVIDE SAMPLE, DATA SHEET FOR REVIEW AND APPROVAL	
FR2			ALUMINIUM SLIDING DOOR FRAME	AWS AWNING 466 POWDER COATED, FINISH: MATT, COLOUR: PC01	AWS WINDOWS	POWDER COATING TO BE APPLIED IN ACCORDANCE TO MANUF'S SPECIFICATION. CONTRACTOR TO PROVIDE SAMPLE, DATA SHEET FOR REVIEW AND APPROVAL	
FR3			ALUMINIUM SLIDING DOOR FRAME	AWS FIXED 426 FIXED FRONT GLAZED, POWDER COATED, FINISH: MATT, COLOUR: PC01	AWS WINDOWS	POWDER COATING TO BE APPLIED IN ACCORDANCE TO MANUF'S SPECIFICATION. CONTRACTOR TO PROVIDE SAMPLE, DATA SHEET FOR REVIEW AND APPROVAL	
FR4			ALUMINIUM SLIDING DOOR FRAME	AWS 52 CASEMENT GLAZED DOOR, POWDER COATED, FINISH: MATT, COLOUR: PC01	AWS WINDOWS	POWDER COATING TO BE APPLIED IN ACCORDANCE TO MANUF'S SPECIFICATION. CONTRACTOR TO PROVIDE SAMPLE, DATA SHEET FOR REVIEW AND APPROVAL	
GL1		SLIDING DOOR GLAZING	DOUBLE GLAZED TO MEET SECTION J REQUIREMENT. U value= ≤3.65 and SGHC =0.63 ± 5%	Uvalue=3.4 / SHGC=0.53 (6mm Clear +12 Air Gap + 6mm Energy Tech)	VIRIDIAN	GLAZING TO BE INSTALLED IN ALUMINIUM WINDOWS SUITE IN ACCORDANCE TO MANUFACTURER'S SPECIFICATION	
GL2a		AWNING WINDOW	DOUBLE GLAZED TO MEET SECTION J REQUIREMENT	Uvalue=4.4 / SHGC=0.39 (6.38mm ComfortPlus Clear +12 Air Gap + 6mm Clear / 6mm Clear Toughed)	VIRIDIAN	GLAZING TO BE INSTALLED IN ALUMINIUM WINDOWS SUITE IN ACCORDANCE TO MANUFACTURER'S SPECIFICATION	
GL2b		FIXED GLAZING	DOUBLE GLAZED TO MEET SECTION J REQUIREMENT	Uvalue=2.7 / SHGC=0.56 (6.38mm ComfortPlus Clear +12 Air Gap + 6mm Clear / 6mm Clear Toughened / 6mm Frosted Toughened)	VIRIDIAN	GLAZING TO BE INSTALLED IN ALUMINIUM WINDOWS SUITE IN ACCORDANCE TO MANUFACTURER'S SPECIFICATION	
GL3a		AWNING WINDOW	DOUBLE GLASS (TOUGHENED GLASS AS PER FIRE ENGINEERING REQUIREMENT TO EXTERNAL COMBINED WITH INTERNAL GLAZING) IN ALUMINIUM WINDOW SUITE, TO MEET SECTION J REQUIREMENT	Uvalue=4.4 / SHGC=0.39 (6.38mm ComfortPlus Clear +12 Air Gap + 6mm Frosted Toughened)	VIRIDIAN	GLAZING TO BE INSTALLED IN ALUMINIUM WINDOWS SUITE IN ACCORDANCE TO MANUFACTURER'S SPECIFICATION	
GL3b		FIXED GLAZING	DOUBLE GLASS (TOUGHENED GLASS AS PER FIRE ENGINEERING REQUIREMENT TO EXTERNAL COMBINED WITH INTERNAL GLAZING) IN ALUMINIUM WINDOW SUITE, TO MEET SECTION J REQUIREMENT	Uvalue=2.7 / SHGC=0.56 (6.38mm ComfortPlus Clear +12 Air Gap + 6mm Frosted Toughened)	VIRIDIAN	GLAZING TO BE INSTALLED IN ALUMINIUM WINDOWS SUITE IN ACCORDANCE TO MANUFACTURER'S SPECIFICATION	
GL4		FIXED GLAZING TO LOBBY	DOUBLE GLASS (TOUGHENED GLASS AS PER FIRE ENGINEERING REQUIREMENT TO EXTERNAL COMBINED WITH INTERNAL GLAZING) IN ALUMINIUM WINDOW SUITE, TO MEET SECTION J REQUIREMENT	6mm THK CLEAR GLAZING	VIRIDIAN	GLAZING TO BE INSTALLED IN ALUMINIUM WINDOWS SUITE IN ACCORDANCE TO MANUFACTURER'S SPECIFICATION	
GL5		MAIN BUILDING ENTRY	DOUBLE GLASS (TOUGHENED GLASS AS PER FIRE ENGINEERING REQUIREMENT TO EXTERNAL COMBINED WITH INTERNAL GLAZING) IN ALUMINIUM WINDOW SUITE, TO MEET SECTION J REQUIREMENT	6mm THK CLEAR TOUGHENED GLAZING	VIRIDIAN	GLAZING TO BE INSTALLED IN ALUMINIUM WINDOWS SUITE IN ACCORDANCE TO MANUFACTURER'S SPECIFICATION	
0457 EXTERNAL SCREENS							
SCR1		EAST WINDOWS (EXTERNAL FAÇADE)	ALUMINIUM PRIVACY SCREEN LOUVERS TO WINDOWS	100mm DEEP EXTRUDED ELIPTICAL BLADE FIX TO ALUMINIUM RHS SHROUD USING CHANNEL TRACK AND LOUVRE BRACE. NOM 30DEG. PITCH, T ACHIEVE 75% SCREENING (25% OPEN). POWDER COATED IN BLACK PC01	SUNEX	POWDER COATING TO BE APPLIED IN ACCORDANCE TO MANUF'S SPECIFICATION. CONTRACTOR TO PROVIDE SAMPLE, DATA SHEET FOR REVIEW AND APPROVAL	
SCR2		PLANT ROOM (ROOF PLANT) SCREEN ON EAST FAÇADE	POWDER COATING FINISH APPLIED TO METAL FRAME (ALUMINIUM WINDOW FRAMES, EXTRUSION AROUND WINDOW, BALUSTRADE, SCREENING.)	ULRICH ALUMINIUM UL3103 BLADE PITCHES TO SUIT OPENING. POWDER COATED, FINISH PC01	ULRICH OR EQ	POWDER COATING TO BE APPLIED IN ACCORDANCE TO MANUF'S SPECIFICATION. CONTRACTOR TO PROVIDE SAMPLE, DATA SHEET FOR REVIEW AND APPROVAL	
SCR3		WEST FAÇADE OF MAIN STAIR	64x25 RHS/BLADE SCREEN AT 120 CTRS MAX. FIX ON STEEL SUBFRAMES TO MANUFACTURER'S DETAIL	POWDER COATED, FINISH: MATT, COLOUR: BLACK	ALULINE OR EQUIVALENT	POWDER COATING TO BE APPLIED IN ACCORDANCE TO MANUF'S SPECIFICATION. CONTRACTOR TO PROVIDE SAMPLE, DATA SHEET FOR REVIEW AND APPROVAL	
REVISIONS T1 16.05.2022 TENDER DOCUMENTATION T2 XX.05.2022 TENDER DOCUMENTATION	MGS MGS	PROJECT 5 CURRAN STREET	PROJECT NUMBER 19124	CLIENT mainstone™ PROPERTY DEVELOPMENT	DRAWING TITLE MATERIAL AND FINISHES SCHEDULE	DRAWN BY MGS CHECKED BY AF/CJ DATE MAY 2022 SCALE	DRAWING NUMBER A1510-02 REVISION T2

CODE	IMAGE	LOCATIONS	PRODUCT DESCRIPTIONS			MANUFACTURER	NOTES
			DETAILS	FINISH / MANUF'S CODE			
0461 GLAZING							
SG		BATHROOM	FRAMELESS SHOWER SCREEN. 12mm THK TOUGHENED GLASS . REFER TO DRAWING FOR HEIGHT AND WIDTH.	12mm THK TOUGHENED GLASS SHOWER CREEN WITH PATCH FITTINGS / HINGES.	VIRIDIAN		GLAZING TO BE INSTALLED IN ACCORDANCE TO MANUFACTURER'S SPECIFICATION
0471 INSULATION							
INS1		UNDERSIDE STRUCTURAL GROUND SLAB (IN BASEMENT)	NON-COMBUSTIBLE R1.0 FOAM THERMAL INSULATION	JET SPRAY	PFS GROUP		FOAM INSULATION TO BE SPRAYED UNDERSIDE OF STRUCTURAL SLAB AS PER MANUFACTURER'S SPECIFICATION AND INSTALLATION METHOD
INS2		UNDERSIDE STRUCTURAL SLAB (BALCONY)	R1.0 RIGID BOARD THERMAL INSULATION	K10 G2 SOFFIT BOARD, GROUP 2 NCC FIRE CLASSIFICATION	KINGSPAN		BOARD INSULATION TO BE MECHANICALLY FIXED UNDERSIDE OF STRUCTURAL SLAB AS PER MANUFACTURER'S SPECIFICATION AND INSTALLATION METHOD
INS3		WALL / ROOF	ANTI-GLARE WALL WRAP	WALL WRAP XP THERMOSEAL R.	BRADFORD		ANTI-GLARE WALL WRAP TO BE MECHANICALLY FIXED TO STUD WALL AND UNDER ROOF SHEETING AS PER MANUFACTURER'S SPECIFICATION AND INSTALLATION METHOD
INS4		WALL	NON-COMBUSTIBLE BULK WALL INSULATION R2.5	90mm THK. R2.5 NON-COMBUSTIBLE BULK GLASSWOOL INSULATION	BRADFORD / FLETCHER INSULATION OR EQ.		BULK GLASSWOOL INSULATION TO BE INFILLED BETWEEN WALL STUD AS PER MANUFACTURER'S SPECIFICATION AND INSTALLATION METHOD
INS5		CEILING / ROOF	NON-COMBUSTIBLE BULK CEILING/ROOF INSULATION R3.5	175mm THK. R3.5 NON-COMBUSTIBLE BULK GLASSWOOL INSULATION	BRADFORD / FLETCHER INSULATION OR EQ.		BULK GLASSWOOL INSULATION TO BE INFILLED BETWEEN WALL STUD AS PER MANUFACTURER'S SPECIFICATION AND INSTALLATION METHOD
0520 PARTITIONS - COMBINED							
PBFR			PLASTERBOARD_FIRE RATED	16mm THK FIRE RESISTANT PLASTERBAORD WALL IN SELECTED PAINT FINISH	CSR		REFER TO WALL TYPE DRAWINGS FOR THICKNESS. SELECTED PAINT FINISH
PBMR			PLASTERBOARD_MOISTURE RESISTANT_PAINT FINISH	10mm THK MOISTURE RESISTANT PLASTERBAORD WALL IN SELECTED PAINT FINISH	CSR		REFER TO WALL TYPE DRAWINGS FOR THICKNESS. SELECTED PAINT FINISH
PBS			PLASTERBOARD_STANDARD	10mm THK PLASTERBAORD WALL IN SELECTED PAINT FINISH	CSR		REFER TO WALL TYPE DRAWINGS FOR THICKNESS. SELECTED PAINT FINISH
0531 SUSPENDED CEILINGS - COMBINED							
CPB1			PLASTERBOARD	SURFACE TO BE FLUSHED AND PAINT FINISH	CSR		STANDARD PLASTERBOARD CEILING. SELECTED PAINT FINISH
CPB2		BATHROOM AND WET AREAS	PLASTERBOARD	SURFACE TO BE FLUSHED AND PAINT FINISH	CSR		MOISTURE RESISTANT PLASTERBOARD CEILING. SELECTED PAINT FINISH
FC03		BALCONY SOFFIT	FIBRE CEMENT SHEET	SURFACE TO BE FLUSHED AND PAINT FINISH	JAMES HARDIE OR EQ		INSTALL AS PER SPECIFICATION AND IN ACCORDANCE TO MANUFACTURER'S RECOMMENDATION
0551 JOINERY							
BT1		KITCHEN	STONE BENCHTOP TO KITCHEN AND LAUNDRY BENCHTOP AND SPLASHBACK.	CARRARA WHITE	LITHOSTONE SURFACES		REFER TO JOINERY DRAWINGS FOR LOCATION.
LA1		KITCHEN AND BATHROOM JOINERY	MATT TIMBER LOOK LAMINATE FINISH ON MDF CARCASE	TASMANIAN OAK, WOODMATT FINISH, GRAIN TO RUN VERTICALLY ON VERTICAL SURFACES	POLYTEC		REFER TO JOINERY DRAWINGS FOR LOCATION OF LAMINATE FINISH
LA2		KITCHEN AND BATHROOM JOINERY	MATT LAMINATE FINISH ON MDF CARCASE	OYSTER GREY, MATT FINISH	POLYTEC		REFER TO JOINERY DRAWINGS FOR LOCATION OF LAMINATE FINISH
LA3		ALTERNATIVE FINISH TO ISLAND KITCHEN AND VANITY	MATT LAMINATE FINISH ON MDF CARCASE	FRENCH NAVY, ABSOLUTEMATTE FINISH	LAMINEX		REFER TO JOINERY DRAWINGS FOR LOCATION OF LAMINATE FINISH (OPTIONAL ONLY)
LA4		LAUNDRY DOORS IN CORRIDOR	MATT LAMINATE FINISH ON MDF CARCASE	WHITE LINEN , NATURAL FINISH	LAMINEX		REFER TO JOINERY DRAWINGS FOR LOCATION OF LAMINATE FINISH
MEL1		INTERNAL - ALL APARTMENT & GROUND FLOOR JOINERY CARCASES	WHITE MELAMINE FINISH TO INTERNAL MDF BOARD INSIDE JOINERY	WHITE MELAMINE 18mm THK	LAMINEX		WHITE MELAMINE FINISH TO INTERNAL MDF BOARD INSIDE JOINERY
MIR1		WARDROBE SLIDING DOOR	VIRIDIAN MIRASTAR	6mm THK SMOKE MIRROR	VIRIDIAN		MIRROR - TYPE 1
MIR2		BAR SPLASHBACK, SHAVING CABINET	VIRIDIAN MIRASTAR	6mm THK CLEAR MIRROR	VIRIDIAN		MIRROR - TYPE 1
0552 METALWORKS FABRICATED							
HR1		STAIR HANDRAIL (GROUND TO LEVEL 2)	POWDER COATED CIRCULAR HANDRAIL WITH CIRCULAR STANCHION	40mm DIA. CHS HANDRAIL SUPPORTED WITH 40mm DIA. CHS STANCHION. FINISH: POWDER COATED IN PC01			
HR2		STAIR HANDRAIL (BASEMENT TO GROUND)	GALVANIZED CIRCULAR HANDRAIL WITH CIRCULAR STANCHION	40mm DIA. CHS HANDRAIL SUPPORTED WITH 40mm DIA. CHS STANCHION. FINISH: GALVANIZED			BUILDER TO PROVIDE SHOP DRAWING FOR REVIEW
MET1		ENTRY CANOPY AND WINDOW SHROUD	ALUMINIUM PLATE CANOPY	8mm THK. ALUMINIUM, FINISH: POWDERCOATED MATT, COLOUR: BLACK			METAL EXTRUSION AROUND WINDOW FRAMES AND TO BALCONIES/CANOPY
MET2		FIRE ATTENUATION SCREEN	METAL FIRE ATTENUATION SCREEN FIXED TO OPERABLE PART OF THE ALUMINIUM FRAME	PERFORATED METAL FIRE ATTENUATION SCREEN	GREENE FIRE		METAL FIRE ATTENUATION SCREEN FIXED TO OPERABLE PART OF THE ALUMINIUM FRAME. BUILDER TO PROVIDE SHOP DRAWING FOR APPROVAL.
MSC		STORAGE CAGE AND STORAGE CAGE DOOR IN BASEMENT	WELEDED MESH STORAGE CAGE WITH TUBULAR STEEL FRAME AND SLIDING CAGE DOOR IN POWDER COATED FINISH PC01	WELDED STEEL MESH IN POWEDEER COATED FINISH	STORAGE CAGES MELBOURNE OR EQ		BUILDER TO PROVIDE PERFORATED SAMPLE AND DATA SHEET, AND PROVIDE SHOP DRAWINGS FOR REVIEW AND APPROVAL.
SN1		STAIR NOSING BETWEEN GROUND TO LEVEL 2.	NATURAL ALUMINIUM STAIR NOSING STRIP INSTALL INTO STONE TILE STEP REBATE TO ACHIVE FLUSH FINISH.	INB033	CLASSIC ARCHITECTURAL GROUP		BUILDER TO PROVIDE SAMPLE AND DATA SHEET. INSTALL IN ACCORDANCE TO MANUFACTURER'S SPECIFICATION
SN2		STAIR NOSING BETWEEN BASEMENT TO GROUND	NATURAL ALUMINIUM STAIR NOSING STRIP WITH YELLOW INSERT, INSTALL TO EDGE OF CONCRETE STAIR NOSING	TREDFX DOMAIN SERIES 10X75 (DKR104)	CLASSIC ARCHITECTURAL GROUP		BUILDER TO PROVIDE SAMPLE AND DATA SHEET. INSTALL IN ACCORDANCE TO MANUFACTURER'S SPECIFICATION
TAC1		GROUND TO LEVEL 2 STAIR	STAINLESS STEEL TGSI INDIVIDUAL TACTILE	SS INDIVIDUAL TACTILE SH10P	CLASSIC ARCHITECTURAL GROUP		BUILDER TO PROVIDE SAMPLE AND DATA SHEET. INSTALL IN ACCORDANCE TO MANUFACTURER'S SPECIFICATION

REVISIONS
T1 16.05.2022 TENDER DOCUMENTATION
T2 XX.05.2022 TENDER DOCUMENTATION

PROJECT
5 CURRAN STREET
MGS
MGS

PROJECT NUMBER
19124

CLIENT
mainstone™
PROPERTY DEVELOPMENT

DRAWING TITLE
MATERIAL AND FINISHES
SCHEDULE

DRAWN BY
MGS
CHECKED BY
AF/CJ
DATE
MAY 2022

DRAWING NUMBER
A1510-03
REVISION
T2

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**TENDER
COORDINATION**



CODE	IMAGE	LOCATIONS	PRODUCT DESCRIPTIONS		MANUFACTURER	NOTES
		DETAILS	FINISH / MANUF'S CODE			
0554 HANDRAILS GUARDRAILS BALUSTRADES						
BAL1		BALUSTRADES	ALUMINIUM BLADE BALUSTRADES / SCREEN	PRODUCT: LYNFIELD SD10-04, FINISH: POWDERCOATED MATT, COLOUR: BLACK	AXIOM GROUP	BUILDER TO PROVIDE SHOP DRAWINGS AND MOCK-UP FOR REVIEW
BAL2		EXTERNAL WALLS AND BALUSTRADES	VERTICAL STRIPE FIBRE CEMENT CLADDING WITH EXPRESSED JOINT	AXON CLADDING, FINISH: PAINT, COLOUR: WOODLAND GREY	JAMES HARDIE OR EQ	INSTALL AS PER SPECIFICATION AND IN ACCORDANCE TO MANUFACTURER'S RECOMMENDATION. BUILDER TO PROVIDE SHOP DRAWING FOR REVIEW
BAL3		BALUSTRADES	PERFORATED ALUMINIUM PANEL (BALUSTRADE / SCREEN)	PRODUCT CODE: R03325, 3mm THK. ALUMINIUM, PERFORATION: 25% OPEN, BALUSTRADE SYSTEM: SD12-01. FINISH: POWDERCOATED MATT, COLOUR: BLACK	LOCKERGROUP / AXIOM GROUP	BUILDER TO PROVIDE PERFORATED SAMPLE AND DATA SHEET, AND PROVIDE SHOP DRAWINGS FOR REVIEW AND APPROVAL.
BAL4		BALCONY	SEMI-FRAMELESS GLASS BALUSTRADE	PRODUCT: SD12-01, FINISH: 10mm THK TOUGHENED GLASS, POWDERCOATED MATT, COLOUR: BLACK	AXIOM GROUP	TOUGHENED GLAZED FRAMELESS BALUSTRADE, BALUSTRADE CONTRACTOR TO PROVIDE SHOP DRAWINGS AND TO MEET RELEVANT STANDARDS.
BAL5		BALCONY BALUSTRADE	FIBRE CEMENT CLADDING WITH EXPRESSED JOINT OUTSIDE STEEL FRAME WITH SIDE FIX GLASS BALUSTRADE SYSTEM TO THE STEEL FRAMES	EASY LAP CLADDING AND TOUGHENED GLASS TO TOP BALUSTRADE, FINISH: RENDER TO FC SURFACE AND CLEAR TOUGHENED GLASS	JAMES HARDIE AND ELITE GLASS SOLUTIONS	INSTALL AS PER SPECIFICATION AND IN ACCORDANCE TO MANUFACTURER'S RECOMMENDATION. BUILDER TO PROVIDE SHOP DRAWING FOR REVIEW
0611 RENDERING AND PLASTERING						
REN01		EXTERNAL WALLS. REFER TO EXTERNAL ELEVATIONS	TEXTURED RENDER FINISH TO AFS WALL / EXTERNAL FC LINING	ACRATEX FINE, COLOUR: SHALE GREY	DULUX	INSTALL AS PER MANUFACTURER'S SPECIFICATION
REN02		EXTERNAL WALLS. REFER TO EXTERNAL ELEVATIONS	TEXTURED RENDER FINISH TO AFS WALL / EXTERNAL FC LINING	ACRATEX FINE, COLOUR: WOODLAND GREY	DULUX	INSTALL AS PER MANUFACTURER'S SPECIFICATION
0621 WATERPROOFING WET AREAS						
WPM11		FLOOR (UNDER TILES) IN BATHROOM, LAUNDRY, LOBBY, FOYER AND TERRACE/BALCONY DOOR THRESHOLD	INTERNAL WATERPROOF MEMBRANE TO FLOOR	SILCOR LM PU SEALANT, EPOCOTE F100W (SILCOR PRIMER BW SEALER), NEWFLEX WAM	GCP APPLIED TECHNOLOGIES	INSTALL AS PER MANUFACTURER'S SPECIFICATION AND IN ACCORDANCE TO AS3740 AND NCC
WPM12		WALLS (BEHIND TILES/PRIOR PAINTING) IN BATHROOM, LAUNDRY, LOBBY, FOYER AND TERRACE/BALCONY DOOR THRESHOLD	INTERNAL WATERPROOF MEMBRANE TO WALLS	SILCOR LM PU SEALANT, EPOCOTE F100W (SILCOR PRIMER BW SEALER), NEWFLEX WAM	GCP APPLIED TECHNOLOGIES	INSTALL AS PER MANUFACTURER'S SPECIFICATION AND IN ACCORDANCE TO AS3740 AND NCC
0630 TILING						
TLF1		CORRIDOR AND BALCONY FLOOR	PORCELAIN TILING TO FLOOR (BLUE STONE LOOK)	600x600 QUARTZ GREY PORCELAIN PAVER	WESTERN DISTRIBUTORS	TILING TO BE INSTALLED ON SCREED IN ACCORDANCE TO MANUFACTURER'S SPECIFICATION
TLF2		BATHROOM FLOOR	STONE TILING TO FLOOR	ENTIVA NORDIKA WHITE 600X600	WESTERN DISTRIBUTORS	TILING TO BE INSTALLED ON SCREED LAID TO FALL TOWARDS WASTE IN ACCORDANCE TO MANUFACTURER'S SPECIFICATION
TLW1		LIFT LOBBY WALL	STONE TILING TO WALL	CEPPO STONE SILVER TILE		STONE TILING INSTALLED ON MASONRY WALL IN ACCORDANCE TO MANUFACTURER'S SPECIFICATION
TLW2		BATHROOM WALL	STONE TILING TO WALL	ENTIVA NORDIKA WHITE 600X600	WESTERN DISTRIBUTORS	TILING TO BE INSTALLED ON STUD WALL IN ACCORDANCE TO MANUFACTURER'S SPECIFICATION
TLW3		BATHROOM WALL	STONE TILING TO WALL	WHITE KIT KAT PORCELAIN MOSAIC TILE 145x15	WESTERN DISTRIBUTORS	TILING TO BE INSTALLED ON STUD WALL IN ACCORDANCE TO MANUFACTURER'S SPECIFICATION
0652 CARPETS						
CA1		INTERNAL CARPET TO APARTMENT	Interior finish	HYCRAFT PEBBLE GRID KIMBERLITE, GREEN SQUARE 4M WINTER SOLSTICE 0740	GODFREY HIRST	
EM1		ENTRY MAT	Interior finish	BIRRUS ULTRAMAT, COCO	BIRRUS / STERLING OR EQ	NON COMBUSTIBLE ENTRY MAT TO BE INSTALLED IN ACCORDANCE TO MANUFACTURER'S SPECIFICATION
0654 TIMBER FLOORING						
TIM1		INTERNAL TIMBER FLOOR TO APARTMENT	ENGINEERED TIMBER FLOOR	RAWMA	PLANK FLOORS	BUILDER TO PROVIDE SAMPLE FOR APPROVAL. TIMBER FLOOR TO BE INSTALLED IN ACCORDANCE TO MANUFACTURER'S SPECIFICATION

REVISIONS
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5 CURRAN STREET

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mainstone™
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DRAWING TITLE
MATERIAL AND FINISHES
SCHEDULE

DRAWN BY
MGS

CHECKED BY
AF/CJ

DATE
MAY 2022

SCALE

DRAWING NUMBER
A1510-04

REVISION
T2

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CODE	IMAGE	LOCATIONS	PRODUCT DESCRIPTIONS		MANUFACTURER	NOTES
			DETAILS	FINISH / MANUF'S CODE		
0671 PAINTING						
AG		EXTERNAL WALL (UP TO 3m ABOVE GROUND LEVEL)	CLEAR ANTI-GRAFFITI COATING	NAME: PRECISION . COLOUR: CLEAR FINISH ON MASONRY, FC PAINT, RENDER AND METAL CLADDING	DULUX	APPLY COATING IN ACCORDANCE TO MANUFACTURER'S SPECIFICATION. BUILDER TO PROVIDE DATA SHEET.
PA01		COMMON AREA (LOBBY AND CORRIDOR WALL)	WASH & WEAR AND SUPER TOUGH LOW SHEEN TWO PACK EPOXY PAINT	NATURAL WHITE SW1F4, SUPER TOUGH LOW SHEEN, 2x COATS	DULUX	BUILDER TO PROVIDE WET PAINT SAMPLE FOR APPROVAL. APPLY PAINT IN ACCORDANCE TO MANUFACTURER'S SPECIFICATION
PA02		APARTMENT INTERIOR WALL (HALLWAY, LIVING, DINING, BEDROOM)	WASH & WEAR INTERIOR LOW SHEEN ACRYLIC, LOW VOC	NATURAL WHITE SW1F4, INTERIOR LOW SHEEN, 2x COATS	DULUX	BUILDER TO PROVIDE WET PAINT SAMPLE FOR APPROVAL. APPLY PAINT IN ACCORDANCE TO MANUFACTURER'S SPECIFICATION
PA03		APARTMENT INTERIOR WALL (KITCHEN, BATHROOM AND LAUNDRY)	WASH & WEAR SEMI GLOSS	NATURAL WHITE SW1F4, INTERIOR SEMI GLOSS, MOULD SHIELD, 2x COATS	DULUX	BUILDER TO PROVIDE WET PAINT SAMPLE FOR APPROVAL. APPLY PAINT IN ACCORDANCE TO MANUFACTURER'S SPECIFICATION
PA04		BASEMENT WALL (SERVICES ROOM, CUPBOARD, WASTE ROOM)	ACRYLIC PAINT FINISH	NATURAL WHITE SW1F4, DUREBILD STE AND WEATHERMAX, 3x COATS	DULUX	BUILDER TO PROVIDE WET PAINT SAMPLE FOR APPROVAL. APPLY PAINT IN ACCORDANCE TO MANUFACTURER'S SPECIFICATION
PA05		COMMON AREA CEILING (LOBBY AND CORRIDOR)	WASH & WEAR SEMI GLOSS	NATURAL WHITE SW1F4, SEMI GLOSS, MOULD SHIELD, 2x COATS	DULUX	BUILDER TO PROVIDE WET PAINT SAMPLE FOR APPROVAL. APPLY PAINT IN ACCORDANCE TO MANUFACTURER'S SPECIFICATION
PA06		INTERNAL APARTMENT WET AREA CEILING (BATHROOM AND LAUNDRY) ON MOISTURE RESISTANT PLASTERBOARD	WASH & WEAR SEMI GLOSS	NATURAL WHITE SW1F4, SEMI GLOSS, MOULD SHIELD, 2x COATS	DULUX	BUILDER TO PROVIDE WET PAINT SAMPLE FOR APPROVAL. APPLY PAINT IN ACCORDANCE TO MANUFACTURER'S SPECIFICATION
PA07		INTERNAL APARTMENT CEILING HALLWAY, LIVING, KITCHEN AND DINING)	WASH & WEAR SEMI GLOSS	NATURAL WHITE SW1F4, FLAT 2x COATS	DULUX	BUILDER TO PROVIDE WET PAINT SAMPLE FOR APPROVAL. APPLY PAINT IN ACCORDANCE TO MANUFACTURER'S SPECIFICATION
PA08		EXPOSED CONCRETE SLAB SOFFIT AND EDGE AT BALCONY/TERRACE	ACRYLIC PAINT FINISH	BLACK, DUREBILD STE AND WEATHERMAX, 3x COATS	DULUX	BUILDER TO PROVIDE WET PAINT SAMPLE FOR APPROVAL. APPLY PAINT IN ACCORDANCE TO MANUFACTURER'S SPECIFICATION
PA09		EXTERIOR BALCONY SOFFIT LINING	WASH & WEAR SEMI GLOSS	WESTERN MYALL S39A3, SEMI GLOSS, 2x COATS	DULUX	BUILDER TO PROVIDE WET PAINT SAMPLE FOR APPROVAL. APPLY PAINT IN ACCORDANCE TO MANUFACTURER'S SPECIFICATION
PA10		APARTMENT ENTRY DOOR AND FIRE EXIT DOOR (PANEL AND ARCHITRAVE)	AQUANAMEL, SEMI-GLOSS, PAINT FINISH	WESTERN MYALL S39A3, SEMI GLOSS, 2x COATS	DULUX	BUILDER TO PROVIDE WET PAINT SAMPLE FOR APPROVAL. APPLY PAINT IN ACCORDANCE TO MANUFACTURER'S SPECIFICATION
PA11		APARTMENT ENTRY DOOR AND FIRE EXIT DOOR (METAL FRAME)	METAL SHIELD, AQUANAMEL, SEMI-GLOSS, PAINT FINISH	WESTERN MYALL S39A3, UNDERCOAT METAL SHIELD, AQUANAMEL SEMI GLOSS, 2x COATS	DULUX	BUILDER TO PROVIDE WET PAINT SAMPLE FOR APPROVAL. APPLY PAINT IN ACCORDANCE TO MANUFACTURER'S SPECIFICATION
PA12		APARTMENT ENTRY DOOR AND FIRE EXIT DOOR (TIMBER FRAME)	AQUANAMEL, SEMI-GLOSS, PAINT FINISH	WESTERN MYALL S39A3, SEMI GLOSS, 2x COATS	DULUX	BUILDER TO PROVIDE WET PAINT SAMPLE FOR APPROVAL. APPLY PAINT IN ACCORDANCE TO MANUFACTURER'S SPECIFICATION
PA13		APARTMENT INTERNAL, MDF RCHITRAVE, SKIRTING)	AQUANAMEL, SEMI-GLOSS, PAINT FINISH	NATURAL WHITE SW1F4, SEMI GLOSS, 2x COATS	DULUX	BUILDER TO PROVIDE WET PAINT SAMPLE FOR APPROVAL. APPLY PAINT IN ACCORDANCE TO MANUFACTURER'S SPECIFICATION
PA14		SERVICES DOOR (PANEL, FRAME AND ARCHITRAVE)	AQUANAMEL, SEMI-GLOSS, PAINT FINISH	NATURAL WHITE SW1F4, SEMI GLOSS, 2x COATS	DULUX	BUILDER TO PROVIDE WET PAINT SAMPLE FOR APPROVAL. APPLY PAINT IN ACCORDANCE TO MANUFACTURER'S SPECIFICATION
0673 POWDER COATED						
PC01		WINDOW FRAMES AND BALUSTRADES	POWDER COATING FINISH APPLIED TO METAL FRAME (ALUMINIUM WINDOW FRAMES, EXTRUSION AROUND WINDOW, BALUSTRADE, SCREENING, ENTRY CANOPY)	POWDER COATED, FINISH: MATT, COLOUR: BLACK	DULUX / INTERPON	POWDER COATING TO BE APPLIED IN ACCORDANCE TO MANUF'S SPECIFICATION. CONTRACTOR TO PROVIDE SAMPLE, DATA SHEET FOR REVIEW AND APPROVAL
PC02		CEILING DIFFUSER	POWDER COATING FINISH APPLIED TO METAL FRAME (ALUMINIUM DIFFUSER ON CEILING AND WALL)	POWDER COATED, FINISH: MATT, COLOUR: WHITE	DULUX / INTERPON	POWDER COATING TO BE APPLIED IN ACCORDANCE TO MANUF'S SPECIFICATION. CONTRACTOR TO PROVIDE SAMPLE, DATA SHEET FOR REVIEW AND APPROVAL

REVISIONS
T1 16.05.2022 TENDER DOCUMENTATION
T2 XX.05.2022 TENDER DOCUMENTATION

PROJECT
5 CURRAN STREET

PROJECT NUMBER
19124

CLIENT
mainstone™
PROPERTY DEVELOPMENT

DRAWING TITLE
MATERIAL AND FINISHES
SCHEDULE

DRAWN BY
MGS

CHECKED BY
AF/CJ

DATE
MAY 2022

SCALE

DRAWING NUMBER
A1510-05

REVISION
T2

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TENDER
COORDINATION



Appendix 02: Fixture, Fitting and Equipment Schedule



PROJECT NAME

5 CURRAN ST NORTH MELBOURNE

PROJECT NUMBER

19124

DESCRIPTION

TENDER

REVISION

T2

DATE ISSUED

1/06/2022

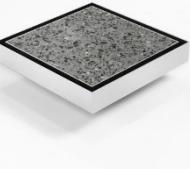
PROJECT NAME 5 CURRAN ST NORTH MELBOURNE
 PROJECT NUMBER 19124
 DESCRIPTION TENDER
 REVISION T2
 DATE 1/06/2022

REVISION	DATE	DESCRIPTION
T1	16.05.22	TENDER COORDINATION
T2	01.06.22	TENDER

NOTES	SUBJECT	DESCRIPTION
1	GENERAL	<p>This schedule to be read in conjunction with architectural, services, civil and landscape documentation & specifications.</p> <p>Comply with relevant Australian Standards and National Construction Code (NCC).</p> <p>Installation to be in accordance with manufacturer's specifications & recommendations - allow for all required structural supports, wall noggings for fixtures, fittings & appliances etc.</p> <p>Provide samples of FF&E as requested by superintendent for approval before ordering/commencing works.</p> <p>Allow for lead/delivery times when ordering FF&E.</p> <p>Unless noted otherwise, allow for access panels to all equipment mounted within floors/walls/ceiling that require periodic access. Panels to be trimless to match adjacent finishes where possible (or stainless steel otherwise).</p> <p>Where not specified elsewhere, allow for concrete plinths to all external plant and equipment.</p> <p>Where not specified by structural engineer, allow for concrete footings to fences as required.</p> <p>Refer to Specifications for all warranty requirements. If not noted, provide warranties as commercially available from the respective manufacturers or suppliers.</p>

A1520 FIXTURES, FITTINGS & EQUIPMENT (FF&E) SCHEDULE							
PROJECT NAME	5 CURRAN ST NORTH MELBOURNE						
PROJECT NUMBER	19124						
DESCRIPTION	ISSUE FOR TENDER						
REVISION	T2						
DATE	30/05/2022						
CODE	IMAGE	ITEM	LOCATION	SUPPLIER	DESCRIPTION	NOTES	REVISION
ALL ITEMS LISTED TO BE SUPPLIED AND INSTALLED BY CONTRACTOR							
APPLIANCES							
CT1		Cooktop - Type 1	All apartments.	Company: Contact: Telephone:	Product: Miele 65cm Natural Gas Cooktop KM2012GSS Size: 650W x 520D x 35H Finish: Stainless steel		
		Cooktop - UPGRADE OPTION	Apartments: - G.01, G.02, G.03, G.04. - 1.01, 1.02. - 2.03.	Company: Contact: Telephone:	Product: Miele 77cm Natural Gas Cooktop KM2334G Size: 770W x 508D x 75H Finish: Stainless steel		
DW1		Dishwasher - Type 1	All apartments.	Company: Contact: Telephone:	Product: Miele Gen 5000 Semi-Integrated Dishwasher G5000BKICLST Size: 599W x 570D x 805H Finish: Semi-Integrated, refer apartment type for front panel finish.		
RH1		Rangehood - Type 1	All apartments.	Company: Contact: Telephone:	Product: Miele 60cm Under Cupboard Rangehood DA3466 Size: 595W x 275D x 34H Finish: Stainless steel	Exhaust fan power to meet mechanical eng's requirement.	
		Rangehood - UPGRADE OPTION	Apartments: - G.01, G.02, G.03, G.04. - 1.01, 1.02. - 2.03.	Company: Contact: Telephone:	Product: Miele 90cm Under Cupboard Rangehood DA3496 Size: 895W x 275D x 34H Finish: Stainless Steel	Exhaust fan power to meet mechanical eng's requirement.	

CODE	IMAGE	ITEM	LOCATION	SUPPLIER	DESCRIPTION	NOTES	REVISION
OV1		Oven - Type 1	All apartments.	Company: Contact: Telephone:	Product: Miele 60cm PureLine Electric Built-In Oven H2860B Size: 595W x 547D x 596H Finish: Stainless steel		
FR1		Fridge - Type 1	All apartments except 103, 104, 105, 201, 202.	Company: Contact: Telephone:	Product: Fisher & Paykel Activesmart Integrated French Door Refrigerator Freezer RS90 With Black Handles (JH1) Size: 890W x 602D x 1798H (Cavity: 904W x 650D x 1802H). Finish: Integrated, refer apartment type for front panel finish.	Allow to powder coat fridge vent grille.	
FR2		Fridge - Type 2 (built-in wine cabinet) - UPGRADE OPTION	All apartments.	Company: Contact: Telephone:	Product: Triomph 28 Bottle Wine Storage Cabinet TCCV28B Size: 450W x 525D x 725H (Cavity: TBC). Finish: Black with Tempered Glass Door		
FR3		Fridge - Type 3	Apartments 103, 104, 105, 201, 202	Company: Contact: Telephone:	Product: Fisher & Paykel Activesmart Integrated French Door Refrigerator Freezer RS80 With Black Handles (JH1) Size: 890W x 602D x 1798H (Cavity: 904W x 650D x 1802H). Finish: Integrated, refer apartment type for front panel finish.	Allow to powder coat fridge vent grille.	
SANITARY FITTINGS & FIXTURES							
BA1		Bath tub - Type 1	Ensuites in apartments: - G.01, G.02, G.03, G.04. - 1.01, 1.02.	Company: Highgrove Bathrooms Contact: Telephone:	Product: Moana Freestanding Bath Gloss White 1500mm Code: Size: 1500W x 700D x 560H Finish: Gloss White		
BA2		Bath tub - Type 2	Ensute in apartment 2.03.	Company: Fienza Contact: Telephone:	Product: Fienza Shinto Cast Stone Solid Surface Freestanding Bath with Overflow Code: Size: 1350DIA x 490H, net weight 210kg Finish: Cast Stone Solid Surface, Matte White		

CODE	IMAGE	ITEM	LOCATION	SUPPLIER	DESCRIPTION	NOTES	REVISION
BS1		Basin - Type 1	All apartment bathrooms and ensuites - TBC	Company: New Concept Bathrooms Contact: Telephone:	Product: Infinity Gloss White Round Basin with Chrome Waste Code: Size: 360DIA x 120H Finish: Gloss White		
CH1		Coat/ Hand Towel Hook - Type 1	All apartments.	Company: Reece Contact: Telephone:	Product: Phoenix Vivid Slimline Robe Hook Code: Size: 26DIA x 35D Finish: Chrome		
FG		Floor Grate - Type 1	All lift lobbies	Company: Stormtech Contact: Telephone:	Product: 100ARi20MTL Linear Drainage System Code: Size: 106W x 23D x Made-to-Length Finish: Stainless Steel	Compatible pipes - DN40, DN50, DN65, DN80, DN100	
FLB1		Flush Button Panel - Type 1	All apartment bathrooms, ensuites and WC/ powder rooms.	Company: Reece Contact: Telephone:	Product: CAROMA INVISI SERIES II Oval Dual Flush Plate & Buttons Code: Size: 210W x 110H x 5.5D Finish: Metal, Chrome		
FW1		Floor Waste - Type 1	All apartment bathrooms, ensuites and WC/ powder rooms.	Company: Stormtech Contact: Telephone:	Product: SQ100Ti20-80 Tile Insert Drain Code: Size: 130W x 130L x 23D Finish: Stainless Steel	Compatible pipes - DN80	
FW2		Floor Waste - Type 2	All apartment laundries	Company: Stormtech Contact: Telephone:	Product: SQ100TR Square Floor Waste with Standard Grate Code: Size: 103W x 103L x 22D Finish: Stainless Steel	Compatible pipes - DN40, DN50, DN80	
MIX1		Mixer tap - Type 1	Kitchens in all apartments.	Company: Reece Contact: Telephone:	Product: Phoenix Vivid Pull Out Sink Mixer Code: Size: 473H, 250mm Clearance, 233mm Reach Finish: Chrome		

CODE	IMAGE	ITEM	LOCATION	SUPPLIER	DESCRIPTION	NOTES	REVISION
MIX2		Mixer tap - Type 2	All apartment bathrooms and ensuites - TBC	Company: Reece Contact: Telephone:	Product: Phoenix Cerchio Wall Basin Mixer Set 180mm Code: Size: 185W x 65H, 179mm Reach Finish: Chrome		
MIX3		Mixer tap - Type 3	All apartment bathrooms and ensuites.	Company: Reece Contact: Telephone:	Product: Phoenix Cerchio Shower/Wall Mixer Code: Size: 65W x 125H Finish: Chrome		
MIX4		Mixer tap - Type 4	Ensuites (with bath tubs) in apartments: - G.01, G.02, G.03, G.04. - 1.01, 1.02.	Company: Reece Contact: Telephone:	Product: Phoenix Cerchio Wall Bath Mixer Set 180mm Code: Size: 185W x 65H, 179mm Reach Finish: Chrome		
MIX5		Mixer tap - Type 5	Laundries in all apartments.	Company: Reece Contact: Telephone:	Product: Phoenix Vivid Pull Out Sink Mixer Code: Size: 473H, 250mm Clearance, 233mm Reach Finish: Chrome Warranty: TBA		
MIX6		Mixer tap - Type 6	Ensuite in apartment 2.03.	Company: Reece Contact: Telephone:	Product: Phoenix Subi Wall Bath Mixer Set 280mm Code: Size: 185W x 65H, 279mm Reach Finish: Chrome		
SHR1		Shower Rail - Type 1	All apartment bathrooms and ensuites.	Company: Reece Contact: Telephone:	Product: PHOENIX VIVID SLIMLINE Twin Shower WELS 3 star - 8 Litres/min Code: Size: TBC Finish: Chrome		
SHS1		Showerscreen - Type 1	Showers in all bathrooms and ensuites except Apt 2.03 ensuite	Company: Stegbar Contact: Telephone:	Product: Stegbar Frameless Showerscreen with Nanoclean, Wall to Wall (overall width varies between apartments, made to measure) with 10mm clear toughened glass Size: 2100mm high, overall width to suit shower opening with 650mm wide door between 2x side fixed panels (refer elevations for fixed panel widths), 10mm clear toughened glass Finish: Chrome Channel Fixings, Hinges and Ribbed Knob.	Allow for horizontal support glass fin to top of shower screen at 2100mm.	T2

Image indicative only.

CODE	IMAGE	ITEM	LOCATION	SUPPLIER	DESCRIPTION	NOTES	REVISION
SHS2		Showerscreen - Type 2	Showers in Apt 2.03 ensuite	Company: Stegbar Contact: Telephone:	Product: Full-height (to ceiling) fixed toughened glass (SG) shower screen, 12mm thick clear toughened glass in recessed/concealed channels Size: 1600W x 2400H Finish: Chrome hinge and fittings.	Apartment 2.03 ensuite only.	
SNK1		Sink - Type 1	Select kitchens in apartments (TBC).	Company: Reece Contact: Telephone:	Product: Franke Maris 1 and 1/4 Undermount Sink Code: MRX 260-34-19 Size: 591W x 436D x 180mm Finish: Stainless Steel		
SNK2		Sink - Type 2	Select kitchens in apartments (TBC).	Company: Reece Contact: Telephone:	Product: Franke Maris Double Undermount Sink Code: MRX 220-40-40 Size: 861W x 436D x 180mm Finish: Stainless Steel		
LT1		Laundry Trough - Type 1	Select laundries in all apartments.	Company: Reece Contact: Telephone:	Product: Franke Maris Single Undermount Sink Code: MRX 210-50 Size: 540W x 440D x 180mm Finish: Stainless Steel		
LT2		Laundry Trough - Type 2	Select laundries in all apartments.	Company: Reece Contact: Telephone:	Product: Franke Maris Single Undermount Sink Code: MRX 210-34 Size: 380W x 440D x 180mm Finish: Stainless Steel		
TRH1		Toilet Roll Holder - Type 1	All apartment bathrooms and ensuites.	Company: Reece Contact: Telephone:	Product: Phoenix Vivid Slimline Toilet Roll Holder Code: Size: 180W x 30D x 85H Finish: Chrome		
TR1		Towel Rail - Type 1	All apartment bathrooms and ensuites.	Company: Reece Contact: Telephone:	Product: Phoenix Vivid Slimline Double Towel Rail 800mm Code: Size: 830W x 124D x 30H (800W fixings) Finish: Chrome		

CODE	IMAGE	ITEM	LOCATION	SUPPLIER	DESCRIPTION	NOTES	REVISION
TR2		Towel Rail - Type 2	All apartment bathrooms and ensuites.	Company: Reece Contact: Telephone:	Product: Phoenix Vivid Slimline Double Towel Rail 600mm Code: Size: 630W x 124D x 30H (600W fixings) Finish: Chrome		
WC1		Toilet Suite - Type 1	All apartment bathrooms, ensuites and WC/ powder rooms.	Company: Reece Contact: Telephone:	Product: CAROMA LUNA Cleanflush Invisi Series II Wall Faced WELS 4 star - 3 Litres Code: Size: 395mm pan height, 610mm depth Finish: White		
WMS1		Washing Machine Stops - Type 1	Laundries in all apartments.	Company: Reece Contact: Telephone:	Product: Phoenix Vivid Pin Lever Washing Machine Stops Code: Size: TBC Finish: Chrome		
OTHER FIXTURES							
BIN1		Kitchen Bin - Type 1	All apartment kitchens.	Company: Hafele Contact: Telephone:	Product: Hailo Tandem Double-Bin Waste Sorter 30L Size: 251mm L x 482mm W x 415mm H Finish: Graphite Grey Plastic Warranty: TBA		
BIN2		Kitchen Bin - Type 2	All apartment kitchens.	Company: Hafele Contact: Telephone:	Product: Hailo Tandem Three-Bin Waste Sorter 1x18L 2x8L Size: 346mm L x 475mm W x 336mm H Finish: Light Grey Plastic Warranty: TBA		
GPO	IMAGE TBC	Typical GPO	All GPOs & switches EXCEPT kitchen splashbacks and kitchen island side panels (refer KGPO)	Company: HPM Contact: Telephone:	Product: HPM Linea Code: Size: Finish: White		

CODE	IMAGE	ITEM	LOCATION	SUPPLIER	DESCRIPTION	NOTES	REVISION
JH1		Joinery Handle/Pull - Type 1	All apartment integrated fridges	Company: Fisher & Paykel Contact: Telephone:	Product: Fisher & Paykel Square Fine BLK for Fisher & Paykel Activesmart Integrated French Door Refrigerator Freezer RS80 (FR3) & RS90 (FR1) Code: Size: Length to suit fridge/freezer model Finish: Black	Builder to provide sample for review	
JH2		Joinery Handle/Pull - Type 2	All apartment full height cupboard doors generally - refer drawings	Company: Kethy Contact: Telephone:	Product: F700 BK Black Furniture Handle Code: F700 BK Size: 8W x 27mm projection, 396mm length, 320mm fixing Finish: Aluminium in Black Anodised colour		
JH3		Joinery Handle/Pull - Type 3	All lobby service cupboard doors generally - refer drawings	Company: Kethy Contact: Telephone:	Product: PM125 Black Furniture Handle Code: PM125 Size: 9W x 26mm projection, 228mm length, 192mm fixing Finish: Die-cast zinc in Matt Silver		
KGPO		Flush GPO	All kitchen splashbacks and kitchen island side panels (external face) only	Company: Zetr Contact: Telephone:	Product: Zetr Flush Double Outlet Code: Size: Finish: White		
RHR1		Robe Hanging Rail - Type 1	All robes	Company: Hafele Contact: Telephone:	Product: Hafele OVA 30x15mm Oval Wardrobe Rail Code: Size: 30H x 15W, Length To Suit Finish: Nickel Plated Steel		T2
W1		LED Wall Mounted Floor Washer (Down Illumination Only), Fixed. IP66	Apartment balconies/terraces	Manufacturer: Cariboni Supplier: Light Project Contact: Telephone:	Product: Sans Serif MQ Medium Quadrato Squared with Integrated Driver, 880-950lm, 6.5W Size: 150W x 150H x 26D Finish: Sable100 Noir (Black) Warranty: TBC Lumens: 950lm Colour Temps: 3000K	Refer to product specification. Builder to submit datasheet and installed in accordance to manufacturer's specification. Mounted 1800mm AFFL	T2
W2		LED Wall Mounted Floor Washer (Down Illumination Only), Fixed. IP66	Landscape wall	Manufacturer: Cariboni Supplier: Light Project Contact: Telephone:	Product: Aplos Wall recessed IP66, 880-950lm, 6.5W, 3000K Size: 193W x 193H x 40D Finish: Sable100 Noir (Black) Warranty: TBC Lumens: 950lm Colour Temps: 3000K	Refer to product specification. Builder to submit datasheet and installed in accordance to manufacturer's specification. Mounted 500mm AFFL	T2

CODE	IMAGE	ITEM	LOCATION	SUPPLIER	DESCRIPTION	NOTES	REVISION
W3		LED Wall Mounted Floor Washer (Down Illumination Only), Fixed. IP66	Driveway	Manufacturer: Cariboni Supplier: Light Project Contact: Telephone:	Product: Aplos Wall recessed IP66, 880-950lm, 6.5W, 3000K Size: 193W x 193H x 40D Finish: Sable100 Noir (Black) Warranty: TBC Lumens: 950lm Colour Temps: 3000K	Refer to product specification. Builder to submit datasheet and installed in accordance to manufacturer's specification. Mounted 500mm AFFL	T2
W4		Wall Sconce - Type 1	All apartment bathrooms and ensuites.	Company: Lighting Collective Contact: Telephone:	Product: CONTEMPORARY LUMINOUS ORB Wall Light IP44 Size: 150 DIA x 110D Finish: White Glass & Chrome Wall Base		
SGN1		Signage - Type 1	All apartment main entry doors	Company: Contact: Telephone:	Product: Anodised Aluminium Disc with Grey Letters/Numbers in select font, concealed fixed to door Code: Size: 200DIA x 3mm thick Finish: Anodised Aluminium Disc with Grey Letters/Numbers	Final fixing location TBC. Apartment letters/numbers font TBC.	T2
SLG		Apartment Sliding Door Grate	All apartment sliding door threshold to external balcony/Terrace at ground level only	Company: ACO Drain	Product: K100 Drain (Type443D and KS100 Drain) Length: To match sliding doors	Refer to product specification. Builder to submit datasheet and installed in accordance to manufacturer's specification	
FG2		Linear Floor Grate	External Lobby at Level 1 and 2	Company: Stormtech	Product: 100ARi20MTL 106mmW x 23mmH Length: As required Outlet Size: DN100 (Hydraulic Engineer to confirm)	Refer to product specification. Builder to submit datasheet and installed in accordance to manufacturer's specification	
GRC		GRC Planter box	External Planterbox and Lobby	Company: Satu Bumi (Aust) Pty Ltd +61 (03) 5292 1001	Product: Custom size GRC planterbox as required. Refer architectural floor plan for location and size.	Refer to product specification. Builder to submit datasheet and installed in accordance to manufacturer's specification	T2
RWS100		Precast Concrete Retaining Wall Sleepers	Retaining walls as shown on ground plan	Company: Gorilla Wall Premium Concrete Sleeper	Product: 200mmW x 100mm THK x 2m Length Premium HD Finish: Timber look (Paint Finish)	Refer to product specification. Builder to submit datasheet and installed in accordance to manufacturer's specification	
Ped		Adjustable Pedestal	Upper level balcony/Terrace	Company: Kekzia 1300 633 099	Product: NM1, NM2 and Star T	Refer to product specification. Builder to submit datasheet and installed in accordance to manufacturer's specification	

CODE	IMAGE	ITEM	LOCATION	SUPPLIER	DESCRIPTION	NOTES	REVISION
BR1		Bike rack - wall mounted	Basement	Secura Bike	Product: Ned Kelly Wall mounted on steel frame	Refer to product specification. Builder to submit datasheet and installed in accordance to manufacturer's specification	
BR2		Bike rack - floor	Basement	Secura Bike	Product Code: Compact CBR2SCTM Floor rack	Refer to product specification. Builder to submit datasheet and installed in accordance to manufacturer's specification	
AUTOMATED DOOR HARDWARE SYSTEM							
GT/B.08		Automated Swing Gate Operator	Basement Entry Gate	Company: CAME Australia	Product: AXO_EN, AX5024. Refer to door schedule drawing A1211 for gate size and material	Refer to product specification and door schedule. Builder to submit datasheet and installed in accordance to manufacturer's specification	
GT/G00.10		Automated Swing Gate Operator	Pedestrian Entry Gate	Company: CAME Australia	Product: STYLO-ME IP Rating: IP54 Refer to door schedule drawing A1211 for gate size and material	Refer to product specification and door schedule. Builder to submit datasheet and installed in accordance to manufacturer's specification	
RD/ B.06 RD/ B.07		Automated Roller Door	Basement Garage Door	Company: B&D Doors	Product: B&D Commercial Roller Door 65 65mm x 1.6mm Aluminium Extrusions 50x30mm Extruded Guide Refer to door schedule drawing A1211 for opening size. Slotted or Perforated slats to achieve 30% Open Free Area	Refer to product specification and door schedule. Builder to submit datasheet and installed in accordance to manufacturer's specification. Vibration from the operation of automatic doors shall be vibration isolated from building structure. Embelton NRD mounts shall be used where the motors are fixed to the structure (slab or columns or walls). Teflon guide shall be installed in all rails. Door guides shall be fitted with vibration isolated fixings where required to prevent door operation from being audible within occupied space. Door motors shall be fitted with a soft start/stop controller to minimise noise. Door shall be stopped approx 5mm from slab/ground.	T2
GD/ G00.1		Automated Swing Door	Ground Floor Main Lobby Entry	Company: Assa Abloy	Product: Integra Single Right Refer to door schedule drawing A1211 for door size and material	Refer to product specification and door schedule. Builder to submit datasheet and installed in accordance to manufacturer's specification	
DOOR HARDWARE							
		Laundry Bi-Fold door track/hardware	All bi-fold laundry door	BRIO	Product: Multifold 30	Install in accordance to manufacturer's specification. Builder to submit data sheet for approval for any substituted product.	

CODE	IMAGE	ITEM	LOCATION	SUPPLIER	DESCRIPTION	NOTES	REVISION
		All Door hardware	All Doors	Assa Abloy		Please refer to door hardware schedule by ASSA ABLOY in the Architectural Specification (Appendix)	
CSH1		Cavity Sliding Door Handle/Pull - Type 1	Apartment 203 Pantry/Laundry Door	Company: Designer Doorware Contact: Telephone:	Product: Montana Flush Pull 400x75mm Code: Size: 400H x 76W x 17D Finish: Satin Black Chrome	To both sides of door.	T2
EDH1		Entry Door Handle/Pull - Type 1	Ground Floor Main Entry Door	Company: Lo & Co Contact: Telephone:	Product: Luna Entry Pull Black Code: Size: 250mm L x 60mm projection, Centre-Centre 95mm (3 screw points) Finish: Solid Brass Base, Electroplated Matte Black Finish	To both sides of door.	T2
SCD/S01-S11		Storage Cage Door	All Storage cage doors in basement	Basement Fitout	Product: Welded Mesh Storage Cage CHS Frame swing door / Welded Mesh storage CHS Frame Cage Enclosure up to 2600 high. Standard proprietary pad bold lock.	Please refer to architectural floor plan for sizes (Width x Length). Builder to install in accordance to manufacturer's specification.	

Appendix 03: Door Hardware Schedule (ASSA ABLOY)



Cover Letter | Door Hardware Schedule

01/05/2022 06:24 PM

Project Name: CURRAN STREET DWELINGS

Project ID: 77202 (01-05-2022)

Revision Note:

Project Address: 5 Curran St NORTH MELBOURNE VIC 3051 AUSTRALIA

Keying System: Lockwood C4 Standard (New)

Architect Company: MGS ARCHITECTS PTY LTD

Architect Project ID: 19124

Consultant: Heath Scott

This schedule is based on the following documentation.

Project Comments:

Spence Doors, an ASSA ABLOY group company, can provide a full compliant solution for rated and non-rated door and frame requirements excluding aluminium solutions.

ASSA ABLOY Hardware specified within this project is compatible with applicable Spence door applications (at time of production of this documentation).

For questions concerning details of the Spence doors and frames, their specifications, and their utilisation, please contact Spence Doors projectenquiry@spencedoors.com.au. Alternatively visit www.spencedoors.com.au.

Door Hardware Schedule

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Project Name: CURRAN STREET DWELINGS
Schedule No: 77202

Item	Qty	Description	Brand	Finish
Mark:	B0.1	To/From Room:	STAIR	
Door Type:	FDV	Frame Type:	STEEL PROTECTIVE PAINT	
LW10000BBSSS	3	HINGES 100X100X2.5 BALL BEARING	LOCKWOOD	SSS
3572X-SCNCYL	1	STOREROOM LOCK	LOCKWOOD	SC
CUTKEYS-MK	1	CUTKEYS TO MATCH CLIENTS SYSTEM	OTHER	NONE
570-2SC6MK	1	570 OVAL X CYLINDER 6MK	LOCKWOOD	SC
1360/1361/166SC	1	1360 SERIES 166 LEVER ON ROUND ROSE FULL SET	LOCKWOOD	SC
1366/ISC	1	1360 SERIES INTERNAL OVAL CYLINDER ESCUTCHEON	LOCKWOOD	SC
Y2600SIL	1	SIZE 2-6 POWER ADJUSTABLE DOOR CLOSER WITH BC, DA & PA BRACKET	YALE	SIL
A300SS	1	A300 WALL MOUNTED DOOR STOP 75MM X 19MM TP	LOCKWOOD	SS
LAS1212/SDS/B	1	BATWING SEAL 12X12 SGL DR SET BLACK	LORIENT	BLK
LAS8001/0920/S	1	DROP SEAL MORTICE 0920 SIL	LORIENT	SIL
Mark:	B0.2	To/From Room:	STORAGE	
Door Type:	FD	Frame Type:	STEEL PROTECTIVE PAINT	
LW10000BBSSS	3	HINGES 100X100X2.5 BALL BEARING	LOCKWOOD	SSS
3572X-SCNCYL	1	STOREROOM LOCK	LOCKWOOD	SC
CUTKEYS-MK	1	CUTKEYS TO MATCH CLIENTS SYSTEM	OTHER	NONE
570-2SC6MK	1	570 OVAL X CYLINDER 6MK	LOCKWOOD	SC
1360/1361/166SC	1	1360 SERIES 166 LEVER ON ROUND ROSE FULL SET	LOCKWOOD	SC
1366/ISC	1	1360 SERIES INTERNAL OVAL CYLINDER ESCUTCHEON	LOCKWOOD	SC
Y2400SIL	1	SIZE 2-4 POWER ADJUSTABLE DOOR CLOSER WITH BC & PA BRACKET	YALE	SIL
A300SS	1	A300 WALL MOUNTED DOOR STOP 75MM X 19MM TP	LOCKWOOD	SS
LAS1212/SDS/B	1	BATWING SEAL 12X12 SGL DR SET BLACK	LORIENT	BLK
LAS8001/0920/S	1	DROP SEAL MORTICE 0920 SIL	LORIENT	SIL
Mark:	B0.3	To/From Room:	BIN ROOM	
Door Type:	FD	Frame Type:	STEEL PROTECTIVE PAINT	
LW10000BBSSS	3	HINGES 100X100X2.5 BALL BEARING	LOCKWOOD	SSS
1360/1361/166SC	1	1360 SERIES 166 LEVER ON ROUND ROSE FULL SET	LOCKWOOD	SC
1366/ISC	1	1360 SERIES INTERNAL OVAL CYLINDER ESCUTCHEON	LOCKWOOD	SC
Y2400SIL	1	SIZE 2-4 POWER ADJUSTABLE DOOR CLOSER WITH BC & PA BRACKET	YALE	SIL
LAS1212/LSDS/B	1	BATWING SEAL 12X12 LNG SGL DR SET BLACK	LORIENT	BLK
LAS8001/0920/S	1	DROP SEAL MORTICE 0920 SIL	LORIENT	SIL
Mark:	B0.4	To/From Room:	COMMS	
Door Type:	SD	Frame Type:	STEEL PROTECTIVE PAINT	
LW10075FPSSS	6	HINGES 100X75X2.5 FIXED PIN	LOCKWOOD	SSS
507SSS	1	507 NIGHTLATCH	LOCKWOOD	SSS
CUTKEYS-MK	1	CUTKEYS TO MATCH CLIENTS SYSTEM	OTHER	NONE
201CYL6PSC6MK	1	LOCKWOOD 201 RIM LOCK CYLINDER EXTRUDED 6MK	LOCKWOOD	SC
FENL201/PULLSC	1	FLUID NL LIP PULL 201CYL SC	LOCKWOOD	SC
791X300SC	2	VISIBLE FIX PANIC BOLT 300MM TP	LOCKWOOD	SC
LAS7004/2750/S	2	SLIM-LINE DOOR PERIMETER SEAL DBL FIN 2750 SIL	LORIENT	SIL
LAS1212/LDDS/B	1	BATWING SEAL 12X12 LNG DBL DR SET BLACK	LORIENT	BLK
LAS8001/0735/S	2	DROP SEAL MORTICE 0735 SIL	LORIENT	SIL

Door Hardware Schedule

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Project Name: CURRAN STREET DWELLINGS
Schedule No: 77202

Item	Qty	Description	Brand	Finish
Mark:	B0.6	To/From Room: GARAGE S12		
Door Type:	RD	Frame Type: POWDERCOATED		
BY MANUFACTURER	1	HARDWARE TO BE SUPPLIED BY DOOR MANUFACTURER	OTHER	
Mark:	B0.7	To/From Room: GARAGE S07		
Door Type:	RD	Frame Type: POWDERCOATED		
BY MANUFACTURER	1	HARDWARE TO BE SUPPLIED BY DOOR MANUFACTURER	OTHER	
Mark:	B0.8	To/From Room: BASEMENT ENTRY		
Door Type:	OD	Frame Type: POWDERCOATED		
BY MANUFACTURER	1	HARDWARE TO BE SUPPLIED BY DOOR MANUFACTURER	OTHER	
Mark:	B.05.A	To/From Room: MSWB		
Door Type:	FD	Frame Type: STEEL PROTECTIVE PAINT		
LW10000BBSSS	6	HINGES 100X100X2.5 BALL BEARING	LOCKWOOD	SSS
507SSS	1	507 NIGHTLATCH	LOCKWOOD	SSS
CUTKEYS-MK	1	CUTKEYS TO MATCH CLIENTS SYSTEM	OTHER	NONE
201CYL6PSC6MK	1	LOCKWOOD 201 RIM LOCK CYLINDER EXTRUDED 6MK	LOCKWOOD	SC
FENL201/PULLSC	1	FLUID NL LIP PULL 201CYL SC	LOCKWOOD	SC
A3000X180 CAN	1	SEQUENCE SELECTOR TO SUIT 1800MM WIDE DOORS	LOCKWOOD	CAN
2024BCSIL	2	2024 SERIES CLOSER STD BACKCHECK WITH PARALLEL ARM BRACKET	LOCKWOOD	SIL
LAS1212/DDS/B	1	BATWING SEAL 12X12 DBL DR SET BLACK	LORIENT	BLK
LAS8001/0735/S	2	DROP SEAL MORTICE 0735 SIL	LORIENT	SIL
MEETING STILE SEAL	1	FIRE RATED MEETING STILE SEAL TO BE SUPPLIED BY FIRE DOOR MANUFACTURER	OTHER	
Mark:	B.05.B	To/From Room: MSWB		
Door Type:	FD	Frame Type: STEEL PROTECTIVE PAINT		
LW10000BBSSS	6	HINGES 100X100X2.5 BALL BEARING	LOCKWOOD	SSS
507SSS	1	507 NIGHTLATCH	LOCKWOOD	SSS
CUTKEYS-MK	1	CUTKEYS TO MATCH CLIENTS SYSTEM	OTHER	NONE
201CYL6PSC6MK	1	LOCKWOOD 201 RIM LOCK CYLINDER EXTRUDED 6MK	LOCKWOOD	SC
FENL201/PULLSC	1	FLUID NL LIP PULL 201CYL SC	LOCKWOOD	SC
A3000X180 CAN	1	SEQUENCE SELECTOR TO SUIT 1800MM WIDE DOORS	LOCKWOOD	CAN
2024BCSIL	2	2024 SERIES CLOSER STD BACKCHECK WITH PARALLEL ARM BRACKET	LOCKWOOD	SIL
LAS1212/DDS/B	1	BATWING SEAL 12X12 DBL DR SET BLACK	LORIENT	BLK
LAS8001/0735/S	2	DROP SEAL MORTICE 0735 SIL	LORIENT	SIL
MEETING STILE SEAL	1	FIRE RATED MEETING STILE SEAL TO BE SUPPLIED BY FIRE DOOR MANUFACTURER	OTHER	
Mark:	G00.1	To/From Room: LOBBY ENTRY		
Door Type:	GD	Frame Type: POWDER COATED		
AH130CAN	1	FAST FIX COMMERCIAL ALUMINIUM HINGE CAN	LOCKWOOD	CAN
ES8000-2	1	ES8000 D/BOLT 12-24VDC FAIL SECURE MONITORED	LOCKWOOD	
146X450SSS	1	146 ENTRANCE HANDLES WITH 450MM CENTRES	LOCKWOOD	SSS
LAS8001/1220/S	1	DROP SEAL MORTICE 1220 SIL	LORIENT	SIL
POWER SWING DOOR OPERATOR	1	REFER TO ASSA ABLOY ENTRANCE SYSTEMS SPECIFICATION	OTHER	

Door Hardware Schedule

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Project Name: CURRAN STREET DWELINGS
Schedule No: 77202

Item	Qty	Description	Brand	Finish
Mark:	G00.2	To/From Room: STAIR FROM BASEMENT		
Door Type:	FDV	Frame Type:	STEEL PROTECTIVE PAINT	
LW10000BBSSS	3	HINGES 100X100X2.5 BALL BEARING	LOCKWOOD	SSS
3572X-SCNCYL	1	STOREROOM LOCK	LOCKWOOD	SC
CUTKEYS-MK	1	CUTKEYS TO MATCH CLIENTS SYSTEM	OTHER	NONE
570-2SC6MK	1	570 OVAL X CYLINDER 6MK	LOCKWOOD	SC
1360/1361/166SC	1	1360 SERIES 166 LEVER ON ROUND ROSE FULL SET	LOCKWOOD	SC
1366/ISC	1	1360 SERIES INTERNAL OVAL CYLINDER ESCUTCHEON	LOCKWOOD	SC
Y2600SIL	1	SIZE 2-6 POWER ADJUSTABLE DOOR CLOSER WITH BC, DA & PA BRACKET	YALE	SIL
A300SS	1	A300 WALL MOUNTED DOOR STOP 75MM X 19MM TP	LOCKWOOD	SS
LAS1212/SDS/B	1	BATWING SEAL 12X12 SGL DR SET BLACK	LORIENT	BLK
LAS8001/0920/S	1	DROP SEAL MORTICE 0920 SIL	LORIENT	SIL
Mark:	G00.4	To/From Room: COMMS RISER		
Door Type:	SD	Frame Type:	CONCEALED FRAME	
LW10075FPSSS	3	HINGES 100X75X2.5 FIXED PIN	LOCKWOOD	SSS
507SSS	1	507 NIGHTLATCH	LOCKWOOD	SSS
CUTKEYS-MK	1	CUTKEYS TO MATCH CLIENTS SYSTEM	OTHER	NONE
201CYL6PSC6MK	1	LOCKWOOD 201 RIM LOCK CYLINDER EXTRUDED 6MK	LOCKWOOD	SC
Mark:	G00.5	To/From Room: HYDRAULIC RISER		
Door Type:	SD	Frame Type:	CONCEALED FRAME	
LW10075FPSSS	6	HINGES 100X75X2.5 FIXED PIN	LOCKWOOD	SSS
507SSS	1	507 NIGHTLATCH	LOCKWOOD	SSS
CUTKEYS-MK	1	CUTKEYS TO MATCH CLIENTS SYSTEM	OTHER	NONE
201CYL6PSC6MK	1	LOCKWOOD 201 RIM LOCK CYLINDER EXTRUDED 6MK	LOCKWOOD	SC
FENL201/PULLSC	1	FLUID NL LIP PULL 201CYL SC	LOCKWOOD	SC
791X300SC	2	VISIBLE FIX PANIC BOLT 300MM TP	LOCKWOOD	SC
LAS1212/DDS/B	1	BATWING SEAL 12X12 DBL DR SET BLACK	LORIENT	BLK
LAS7004/2100/S	2	SLIM-LINE DOOR PERIMETER SEAL DBL FIN 2100 SIL	LORIENT	SIL
LAS8001/0535/S	2	DROP SEAL MORTICE 0535 SIL	LORIENT	SIL
Mark:	G00.6	To/From Room: WATER METER CUPBOARD		
Door Type:	SD-E	Frame Type:	POWDER COATED	
LW10075FPSSS	6	HINGES 100X75X2.5 FIXED PIN	LOCKWOOD	SSS
507SSS	1	507 NIGHTLATCH	LOCKWOOD	SSS
CUTKEYS-MK	1	CUTKEYS TO MATCH CLIENTS SYSTEM	OTHER	NONE
201CYL6PSC6MK	1	LOCKWOOD 201 RIM LOCK CYLINDER EXTRUDED 6MK	LOCKWOOD	SC
FENL201/PULLSC	1	FLUID NL LIP PULL 201CYL SC	LOCKWOOD	SC
791X300SC	2	VISIBLE FIX PANIC BOLT 300MM TP	LOCKWOOD	SC

Door Hardware Schedule

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Project Name: CURRAN STREET DWELINGS
Schedule No: 77202

Item	Qty	Description	Brand	Finish
Mark:	G00.7	To/From Room: WATER METER CUPBOARD		
Door Type:	SD-E	Frame Type:	POWDER COATED	
LW10075FPSSS	6	HINGES 100X75X2.5 FIXED PIN	LOCKWOOD	SSS
507SSS	1	507 NIGHTLATCH	LOCKWOOD	SSS
CUTKEYS-MK	1	CUTKEYS TO MATCH CLIENTS SYSTEM	OTHER	NONE
201CYL6PSC6MK	1	LOCKWOOD 201 RIM LOCK CYLINDER EXTRUDED 6MK	LOCKWOOD	SC
FENL201/PULLSC	1	FLUID NL LIP PULL 201CYL SC	LOCKWOOD	SC
791X300SC	2	VISIBLE FIX PANIC BOLT 300MM TP	LOCKWOOD	SC
Mark:	G00.8	To/From Room: GAS METER CUPBOARD		
Door Type:	SD-E	Frame Type:	POWDER COATED	
LW10075FPSSS	6	HINGES 100X75X2.5 FIXED PIN	LOCKWOOD	SSS
507SSS	1	507 NIGHTLATCH	LOCKWOOD	SSS
CUTKEYS-MK	1	CUTKEYS TO MATCH CLIENTS SYSTEM	OTHER	NONE
201CYL6PSC6MK	1	LOCKWOOD 201 RIM LOCK CYLINDER EXTRUDED 6MK	LOCKWOOD	SC
FENL201/PULLSC	1	FLUID NL LIP PULL 201CYL SC	LOCKWOOD	SC
791X300SC	2	VISIBLE FIX PANIC BOLT 300MM TP	LOCKWOOD	SC
Mark:	G00.9	To/From Room: BOOSTER ASSEMBLY		
Door Type:	GT	Frame Type:	POWDER COATED	
LW10075FPSSS	3	HINGES 100X75X2.5 FIXED PIN	LOCKWOOD	SSS
507SSS	1	507 NIGHTLATCH	LOCKWOOD	SSS
CUTKEYS-MK	1	CUTKEYS TO MATCH CLIENTS SYSTEM	OTHER	NONE
201CYL6PSC6MK	1	LOCKWOOD 201 RIM LOCK CYLINDER EXTRUDED 6MK	LOCKWOOD	SC
Mark:	G00.9	To/From Room: BOOSTER ASSEMBLY		
Door Type:	SD-E	Frame Type:	POWDER COATED	
LW10075FPSSS	6	HINGES 100X75X2.5 FIXED PIN	LOCKWOOD	SSS
507SSS	1	507 NIGHTLATCH	LOCKWOOD	SSS
CUTKEYS-MK	1	CUTKEYS TO MATCH CLIENTS SYSTEM	OTHER	NONE
201CYL6PSC6MK	1	LOCKWOOD 201 RIM LOCK CYLINDER EXTRUDED 6MK	LOCKWOOD	SC
FENL201/PULLSC	1	FLUID NL LIP PULL 201CYL SC	LOCKWOOD	SC
791X300SC	2	VISIBLE FIX PANIC BOLT 300MM TP	LOCKWOOD	SC
Mark:	G00.10	To/From Room: STREET ENTRY		
Door Type:	GT	Frame Type:	POWDER COATED	
AH130CAN	1	FAST FIX COMMERCIAL ALUMINIUM HINGE CAN	LOCKWOOD	CAN
ES8000-2	1	ES8000 D/BOLT 12-24VDC FAIL SECURE MONITORED	LOCKWOOD	
146X450SSS	1	146 ENTRANCE HANDLES WITH 450MM CENTRES	LOCKWOOD	SSS
LAS8001/1220/S	1	DROP SEAL MORTICE 1220 SIL	LORIENT	SIL
POWER SWING DOOR OPERATOR	1	REFER TO ASSA ABLOY ENTRANCE SYSTEMS SPECIFICATION	OTHER	

Door Hardware Schedule

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Project Name: CURRAN STREET DWELINGS
Schedule No: 77202

Item	Qty	Description	Brand	Finish
Mark:	G01.1	To/From Room: APARTMENT ENTRY DOOR		
Door Type:	FD	Frame Type:	STEEL PROTECTIVE PAINT	
LW10000BBSSS	4	HINGES 100X100X2.5 BALL BEARING	LOCKWOOD	SSS
3572WASCNCYL	1	ESCAPE OFFICE LOCK - ANTI-LOCKOUT NO CYLINDER	LOCKWOOD	SC
575-2SC6MK	1	575 OVAL CYLINDER ASSEMBLY SC - W CAM 6MK	LOCKWOOD	SC
CUTKEYS-MK	1	CUTKEYS TO MATCH CLIENTS SYSTEM	OTHER	NONE
1360/1361/166SC	1	1360 SERIES 166 LEVER ON ROUND ROSE FULL SET	LOCKWOOD	SC
1366/ISC	1	1360 SERIES INTERNAL OVAL CYLINDER ESCUTCHEON	LOCKWOOD	SC
1369/INSC	1	1360 SERIES DISABLE TURN ESCUTCHEON - SURFACE FIX	LOCKWOOD	SC
724SRSSIL	1	724 SERIES SIZE 2-4 CLOSER ADJUSTABLE BACKCHECK	LOCKWOOD	SIL
A300SS	1	A300 WALL MOUNTED DOOR STOP 75MM X 19MM TP	LOCKWOOD	SS
LAS1212/LSDS/B	1	BATWING SEAL 12X12 LNG SGL DR SET BLACK	LORIENT	BLK
LAS8001/0920/S	1	DROP SEAL MORTICE 0920 SIL	LORIENT	SIL
Mark:	G01.2	To/From Room: APARTMENT BEDROOM DOOR		
Door Type:	D	Frame Type:	PAINTED	
LW10075LPSSS	3	HINGES 100X75X2.5 LOOSE PIN	LOCKWOOD	SSS
5260/1SFDS	1	5200 SERIES 60MM PASSAGE LATCH SQUARE END FACE PLATE AND D STRIKE	LOCKWOOD	SC
1360/1361/166SC	1	1360 SERIES 166 LEVER ON ROUND ROSE FULL SET	LOCKWOOD	SC
A300SS	1	A300 WALL MOUNTED DOOR STOP 75MM X 19MM TP	LOCKWOOD	SS
Mark:	G01.3	To/From Room: APARTMENT BEDROOM DOOR		
Door Type:	D	Frame Type:	PAINTED	
LW10075LPSSS	3	HINGES 100X75X2.5 LOOSE PIN	LOCKWOOD	SSS
5260/1SFDS	1	5200 SERIES 60MM PASSAGE LATCH SQUARE END FACE PLATE AND D STRIKE	LOCKWOOD	SC
1360/1361/166SC	1	1360 SERIES 166 LEVER ON ROUND ROSE FULL SET	LOCKWOOD	SC
A300SS	1	A300 WALL MOUNTED DOOR STOP 75MM X 19MM TP	LOCKWOOD	SS
Mark:	G01.4	To/From Room: APARTMENT BEDROOM DOOR		
Door Type:	D	Frame Type:	PAINTED	
LW10075LPSSS	3	HINGES 100X75X2.5 LOOSE PIN	LOCKWOOD	SSS
5260/1SFDS	1	5200 SERIES 60MM PASSAGE LATCH SQUARE END FACE PLATE AND D STRIKE	LOCKWOOD	SC
1360/1361/166SC	1	1360 SERIES 166 LEVER ON ROUND ROSE FULL SET	LOCKWOOD	SC
A300SS	1	A300 WALL MOUNTED DOOR STOP 75MM X 19MM TP	LOCKWOOD	SS
Mark:	G01.5	To/From Room: APARTMENT BATHROOM DOOR		
Door Type:	D	Frame Type:	PAINTED	
LW10075LL/RMBK	2	HINGES 100X75X2.5 LIFT OFF	LOCKWOOD	MBK
5260/1SFDS	1	5200 SERIES 60MM PASSAGE LATCH SQUARE END FACE PLATE AND D STRIKE	LOCKWOOD	SC
6260SSS	1	6260 PRIVACY BOLT TP	LOCKWOOD	SS
1360/1361/166SC	1	1360 SERIES 166 LEVER ON ROUND ROSE FULL SET	LOCKWOOD	SC
1369/INSC	1	1360 SERIES DISABLE TURN ESCUTCHEON - SURFACE FIX	LOCKWOOD	SC
1368/INSC	1	1360 SERIES EMERGENCY TURN ESCUTCHEON - SURFACE FIX	LOCKWOOD	SC
A300SS	1	A300 WALL MOUNTED DOOR STOP 75MM X 19MM TP	LOCKWOOD	SS

Door Hardware Schedule

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Project Name: CURRAN STREET DWELINGS
Schedule No: 77202

Item	Qty	Description	Brand	Finish
Mark: G01.6		To/From Room: APARTMENT BATHROOM DOOR		
Door Type: D		Frame Type: PAINTED		
LW10075LL/RMBK	2	HINGES 100X75X2.5 LIFT OFF	LOCKWOOD	MBK
5260/1SFDS	1	5200 SERIES 60MM PASSAGE LATCH SQUARE END FACE PLATE AND D STRIKE	LOCKWOOD	SC
6260SSS	1	6260 PRIVACY BOLT TP	LOCKWOOD	SS
1360/1361/166SC	1	1360 SERIES 166 LEVER ON ROUND ROSE FULL SET	LOCKWOOD	SC
1369/INSC	1	1360 SERIES DISABLE TURN ESCUTCHEON - SURFACE FIX	LOCKWOOD	SC
1368/INSC	1	1360 SERIES EMERGENCY TURN ESCUTCHEON - SURFACE FIX	LOCKWOOD	SC
A300SS	1	A300 WALL MOUNTED DOOR STOP 75MM X 19MM TP	LOCKWOOD	SS
Mark: G01.7		To/From Room: APARTMENT ENTRY GATE		
Door Type: GT		Frame Type: POWDER COATED		
3572X-SCNCYL	1	STOREROOM LOCK	LOCKWOOD	SC
CUTKEYS-MK	1	CUTKEYS TO MATCH CLIENTS SYSTEM	OTHER	NONE
570-2SC6MK	1	570 OVAL X CYLINDER 6MK	LOCKWOOD	SC
1360/1361/166SC	1	1360 SERIES 166 LEVER ON ROUND ROSE FULL SET	LOCKWOOD	SC
1366/ISC	1	1360 SERIES INTERNAL OVAL CYLINDER ESCUTCHEON	LOCKWOOD	SC
GATE HARDWARE	1	HINGES AND LOCKBOX TO BE SUPPLIED BY GATE MANUFACTURER	OTHER	
Mark: G02.1		To/From Room: APARTMENT ENTRY DOOR		
Door Type: FD		Frame Type: STEEL PROTECTIVE PAINT		
LW10000BBSSS	4	HINGES 100X100X2.5 BALL BEARING	LOCKWOOD	SSS
3572WASCNCYL	1	ESCAPE OFFICE LOCK - ANTI-LOCKOUT NO CYLINDER	LOCKWOOD	SC
575-2SC6MK	1	575 OVAL CYLINDER ASSEMBLY SC - W CAM 6MK	LOCKWOOD	SC
CUTKEYS-MK	1	CUTKEYS TO MATCH CLIENTS SYSTEM	OTHER	NONE
1360/1361/166SC	1	1360 SERIES 166 LEVER ON ROUND ROSE FULL SET	LOCKWOOD	SC
1366/ISC	1	1360 SERIES INTERNAL OVAL CYLINDER ESCUTCHEON	LOCKWOOD	SC
1369/INSC	1	1360 SERIES DISABLE TURN ESCUTCHEON - SURFACE FIX	LOCKWOOD	SC
724SRSL	1	724 SERIES SIZE 2-4 CLOSER ADJUSTABLE BACKCHECK	LOCKWOOD	SIL
A300SS	1	A300 WALL MOUNTED DOOR STOP 75MM X 19MM TP	LOCKWOOD	SS
LAS1212/LSDS/B	1	BATWING SEAL 12X12 LNG SGL DR SET BLACK	LORIENT	BLK
LAS8001/0920/S	1	DROP SEAL MORTICE 0920 SIL	LORIENT	SIL
Mark: G02.2		To/From Room: APARTMENT BEDROOM DOOR		
Door Type: D		Frame Type: PAINTED		
LW10075LPSSS	3	HINGES 100X75X2.5 LOOSE PIN	LOCKWOOD	SSS
5260/1SFDS	1	5200 SERIES 60MM PASSAGE LATCH SQUARE END FACE PLATE AND D STRIKE	LOCKWOOD	SC
1360/1361/166SC	1	1360 SERIES 166 LEVER ON ROUND ROSE FULL SET	LOCKWOOD	SC
A300SS	1	A300 WALL MOUNTED DOOR STOP 75MM X 19MM TP	LOCKWOOD	SS
Mark: G02.3		To/From Room: APARTMENT BEDROOM DOOR		
Door Type: D		Frame Type: PAINTED		
LW10075LPSSS	3	HINGES 100X75X2.5 LOOSE PIN	LOCKWOOD	SSS
5260/1SFDS	1	5200 SERIES 60MM PASSAGE LATCH SQUARE END FACE PLATE AND D STRIKE	LOCKWOOD	SC
1360/1361/166SC	1	1360 SERIES 166 LEVER ON ROUND ROSE FULL SET	LOCKWOOD	SC
A300SS	1	A300 WALL MOUNTED DOOR STOP 75MM X 19MM TP	LOCKWOOD	SS

Door Hardware Schedule

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Schedule No: 77202

Item	Qty	Description	Brand	Finish
Mark:	G02.4	To/From Room: APARTMENT BEDROOM DOOR		
Door Type:	D	Frame Type: PAINTED		
LW10075LPSSS	3	HINGES 100X75X2.5 LOOSE PIN	LOCKWOOD	SSS
5260/1SFDS	1	5200 SERIES 60MM PASSAGE LATCH SQUARE END FACE PLATE AND D STRIKE	LOCKWOOD	SC
1360/1361/166SC	1	1360 SERIES 166 LEVER ON ROUND ROSE FULL SET	LOCKWOOD	SC
A300SS	1	A300 WALL MOUNTED DOOR STOP 75MM X 19MM TP	LOCKWOOD	SS
Mark:	G02.5	To/From Room: APARTMENT BATHROOM DOOR		
Door Type:	D	Frame Type: PAINTED		
LW10075LL/RMBK	2	HINGES 100X75X2.5 LIFT OFF	LOCKWOOD	MBK
5260/1SFDS	1	5200 SERIES 60MM PASSAGE LATCH SQUARE END FACE PLATE AND D STRIKE	LOCKWOOD	SC
6260SSS	1	6260 PRIVACY BOLT TP	LOCKWOOD	SS
1360/1361/166SC	1	1360 SERIES 166 LEVER ON ROUND ROSE FULL SET	LOCKWOOD	SC
1369/INSC	1	1360 SERIES DISABLE TURN ESCUTCHEON - SURFACE FIX	LOCKWOOD	SC
1368/INSC	1	1360 SERIES EMERGENCY TURN ESCUTCHEON - SURFACE FIX	LOCKWOOD	SC
A300SS	1	A300 WALL MOUNTED DOOR STOP 75MM X 19MM TP	LOCKWOOD	SS
Mark:	G02.6	To/From Room: APARTMENT BATHROOM DOOR		
Door Type:	D	Frame Type: PAINTED		
LW10075LL/RMBK	2	HINGES 100X75X2.5 LIFT OFF	LOCKWOOD	MBK
5260/1SFDS	1	5200 SERIES 60MM PASSAGE LATCH SQUARE END FACE PLATE AND D STRIKE	LOCKWOOD	SC
6260SSS	1	6260 PRIVACY BOLT TP	LOCKWOOD	SS
1360/1361/166SC	1	1360 SERIES 166 LEVER ON ROUND ROSE FULL SET	LOCKWOOD	SC
1369/INSC	1	1360 SERIES DISABLE TURN ESCUTCHEON - SURFACE FIX	LOCKWOOD	SC
1368/INSC	1	1360 SERIES EMERGENCY TURN ESCUTCHEON - SURFACE FIX	LOCKWOOD	SC
A300SS	1	A300 WALL MOUNTED DOOR STOP 75MM X 19MM TP	LOCKWOOD	SS
Mark:	G02.7	To/From Room: APARTMENT ENTRY GATE		
Door Type:	GT	Frame Type: POWDERCOATED		
3572X-SCNCYL	1	STOREROOM LOCK	LOCKWOOD	SC
CUTKEYS-MK	1	CUTKEYS TO MATCH CLIENTS SYSTEM	OTHER	NONE
570-2SC6MK	1	570 OVAL X CYLINDER 6MK	LOCKWOOD	SC
1360/1361/166SC	1	1360 SERIES 166 LEVER ON ROUND ROSE FULL SET	LOCKWOOD	SC
1366/ISC	1	1360 SERIES INTERNAL OVAL CYLINDER ESCUTCHEON	LOCKWOOD	SC
GATE HARDWARE	1	HINGES AND LOCKBOX TO BE SUPPLIED BY GATE MANUFACTURER	OTHER	

Door Hardware Schedule

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Project Name: CURRAN STREET DWELINGS
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Item	Qty	Description	Brand	Finish
Mark:	G03.1	To/From Room: APARTMENT ENTRY DOOR		
Door Type:	FD	Frame Type: STEEL PROTECTIVE PAINT		
LW10000BBSSS	4	HINGES 100X100X2.5 BALL BEARING	LOCKWOOD	SSS
3572WASCNCYL	1	ESCAPE OFFICE LOCK - ANTI-LOCKOUT NO CYLINDER	LOCKWOOD	SC
575-2SC6MK	1	575 OVAL CYLINDER ASSEMBLY SC - W CAM 6MK	LOCKWOOD	SC
CUTKEYS-MK	1	CUTKEYS TO MATCH CLIENTS SYSTEM	OTHER	NONE
1360/1361/166SC	1	1360 SERIES 166 LEVER ON ROUND ROSE FULL SET	LOCKWOOD	SC
1366/ISC	1	1360 SERIES INTERNAL OVAL CYLINDER ESCUTCHEON	LOCKWOOD	SC
1369/INSC	1	1360 SERIES DISABLE TURN ESCUTCHEON - SURFACE FIX	LOCKWOOD	SC
724SRSSIL	1	724 SERIES SIZE 2-4 CLOSER ADJUSTABLE BACKCHECK	LOCKWOOD	SIL
A300SS	1	A300 WALL MOUNTED DOOR STOP 75MM X 19MM TP	LOCKWOOD	SS
LAS1212/LSDS/B	1	BATWING SEAL 12X12 LNG SGL DR SET BLACK	LORIENT	BLK
LAS8001/0920/S	1	DROP SEAL MORTICE 0920 SIL	LORIENT	SIL
Mark:	G03.2	To/From Room: APARTMENT BEDROOM DOOR		
Door Type:	D	Frame Type: PAINTED		
LW10075LPSSS	3	HINGES 100X75X2.5 LOOSE PIN	LOCKWOOD	SSS
5260/1SFDS	1	5200 SERIES 60MM PASSAGE LATCH SQUARE END FACE PLATE AND D STRIKE	LOCKWOOD	SC
1360/1361/166SC	1	1360 SERIES 166 LEVER ON ROUND ROSE FULL SET	LOCKWOOD	SC
A300SS	1	A300 WALL MOUNTED DOOR STOP 75MM X 19MM TP	LOCKWOOD	SS
Mark:	G03.3	To/From Room: APARTMENT BEDROOM DOOR		
Door Type:	D	Frame Type: PAINTED		
LW10075LPSSS	3	HINGES 100X75X2.5 LOOSE PIN	LOCKWOOD	SSS
5260/1SFDS	1	5200 SERIES 60MM PASSAGE LATCH SQUARE END FACE PLATE AND D STRIKE	LOCKWOOD	SC
1360/1361/166SC	1	1360 SERIES 166 LEVER ON ROUND ROSE FULL SET	LOCKWOOD	SC
A300SS	1	A300 WALL MOUNTED DOOR STOP 75MM X 19MM TP	LOCKWOOD	SS
Mark:	G03.4	To/From Room: APARTMENT BEDROOM DOOR		
Door Type:	D	Frame Type: PAINTED		
LW10075LPSSS	3	HINGES 100X75X2.5 LOOSE PIN	LOCKWOOD	SSS
5260/1SFDS	1	5200 SERIES 60MM PASSAGE LATCH SQUARE END FACE PLATE AND D STRIKE	LOCKWOOD	SC
1360/1361/166SC	1	1360 SERIES 166 LEVER ON ROUND ROSE FULL SET	LOCKWOOD	SC
A300SS	1	A300 WALL MOUNTED DOOR STOP 75MM X 19MM TP	LOCKWOOD	SS
Mark:	G03.5	To/From Room: APARTMENT BATHROOM DOOR		
Door Type:	D	Frame Type: PAINTED		
LW10075LL/RMBK	2	HINGES 100X75X2.5 LIFT OFF	LOCKWOOD	MBK
5260/1SFDS	1	5200 SERIES 60MM PASSAGE LATCH SQUARE END FACE PLATE AND D STRIKE	LOCKWOOD	SC
6260SSS	1	6260 PRIVACY BOLT TP	LOCKWOOD	SS
1360/1361/166SC	1	1360 SERIES 166 LEVER ON ROUND ROSE FULL SET	LOCKWOOD	SC
1369/INSC	1	1360 SERIES DISABLE TURN ESCUTCHEON - SURFACE FIX	LOCKWOOD	SC
1368/INSC	1	1360 SERIES EMERGENCY TURN ESCUTCHEON - SURFACE FIX	LOCKWOOD	SC
A300SS	1	A300 WALL MOUNTED DOOR STOP 75MM X 19MM TP	LOCKWOOD	SS

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Item	Qty	Description	Brand	Finish
Mark: G03.6		To/From Room: APARTMENT BATHROOM DOOR		
Door Type: D		Frame Type: PAINTED		
LW10075LL/RMBK	2	HINGES 100X75X2.5 LIFT OFF	LOCKWOOD	MBK
5260/1SFDS	1	5200 SERIES 60MM PASSAGE LATCH SQUARE END FACE PLATE AND D STRIKE	LOCKWOOD	SC
6260SSS	1	6260 PRIVACY BOLT TP	LOCKWOOD	SS
1360/1361/166SC	1	1360 SERIES 166 LEVER ON ROUND ROSE FULL SET	LOCKWOOD	SC
1369/INSC	1	1360 SERIES DISABLE TURN ESCUTCHEON - SURFACE FIX	LOCKWOOD	SC
1368/INSC	1	1360 SERIES EMERGENCY TURN ESCUTCHEON - SURFACE FIX	LOCKWOOD	SC
A300SS	1	A300 WALL MOUNTED DOOR STOP 75MM X 19MM TP	LOCKWOOD	SS
Mark: G04.1		To/From Room: APARTMENT ENTRY DOOR		
Door Type: FD		Frame Type: STEEL PROTECTIVE PAINT		
LW10000BBSSS	4	HINGES 100X100X2.5 BALL BEARING	LOCKWOOD	SSS
3572WASCNCYL	1	ESCAPE OFFICE LOCK - ANTI-LOCKOUT NO CYLINDER	LOCKWOOD	SC
575-2SC6MK	1	575 OVAL CYLINDER ASSEMBLY SC - W CAM 6MK	LOCKWOOD	SC
CUTKEYS-MK	1	CUTKEYS TO MATCH CLIENTS SYSTEM	OTHER	NONE
1360/1361/166SC	1	1360 SERIES 166 LEVER ON ROUND ROSE FULL SET	LOCKWOOD	SC
1366/ISC	1	1360 SERIES INTERNAL OVAL CYLINDER ESCUTCHEON	LOCKWOOD	SC
1369/INSC	1	1360 SERIES DISABLE TURN ESCUTCHEON - SURFACE FIX	LOCKWOOD	SC
724SRSL	1	724 SERIES SIZE 2-4 CLOSER ADJUSTABLE BACKCHECK	LOCKWOOD	SIL
A300SS	1	A300 WALL MOUNTED DOOR STOP 75MM X 19MM TP	LOCKWOOD	SS
LAS1212/LSDS/B	1	BATWING SEAL 12X12 LNG SGL DR SET BLACK	LORIENT	BLK
LAS8001/0920/S	1	DROP SEAL MORTICE 0920 SIL	LORIENT	SIL
Mark: G04.2		To/From Room: APARTMENT BEDROOM DOOR		
Door Type: D		Frame Type: PAINTED		
LW10075LPSSS	3	HINGES 100X75X2.5 LOOSE PIN	LOCKWOOD	SSS
5260/1SFDS	1	5200 SERIES 60MM PASSAGE LATCH SQUARE END FACE PLATE AND D STRIKE	LOCKWOOD	SC
1360/1361/166SC	1	1360 SERIES 166 LEVER ON ROUND ROSE FULL SET	LOCKWOOD	SC
A300SS	1	A300 WALL MOUNTED DOOR STOP 75MM X 19MM TP	LOCKWOOD	SS
Mark: G04.3		To/From Room: APARTMENT BEDROOM DOOR		
Door Type: D		Frame Type: PAINTED		
LW10075LPSSS	3	HINGES 100X75X2.5 LOOSE PIN	LOCKWOOD	SSS
5260/1SFDS	1	5200 SERIES 60MM PASSAGE LATCH SQUARE END FACE PLATE AND D STRIKE	LOCKWOOD	SC
1360/1361/166SC	1	1360 SERIES 166 LEVER ON ROUND ROSE FULL SET	LOCKWOOD	SC
A300SS	1	A300 WALL MOUNTED DOOR STOP 75MM X 19MM TP	LOCKWOOD	SS
Mark: G04.4		To/From Room: APARTMENT BEDROOM DOOR		
Door Type: D		Frame Type: PAINTED		
LW10075LPSSS	3	HINGES 100X75X2.5 LOOSE PIN	LOCKWOOD	SSS
5260/1SFDS	1	5200 SERIES 60MM PASSAGE LATCH SQUARE END FACE PLATE AND D STRIKE	LOCKWOOD	SC
1360/1361/166SC	1	1360 SERIES 166 LEVER ON ROUND ROSE FULL SET	LOCKWOOD	SC
A300SS	1	A300 WALL MOUNTED DOOR STOP 75MM X 19MM TP	LOCKWOOD	SS

Door Hardware Schedule

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Project Name: CURRAN STREET DWELINGS
Schedule No: 77202

Item	Qty	Description	Brand	Finish
Mark:	G04.5	To/From Room: APARTMENT BATHROOM DOOR		
Door Type:	D	Frame Type: PAINTED		
LW10075LL/RMBK	2	HINGES 100X75X2.5 LIFT OFF	LOCKWOOD	MBK
5260/1SFDSC	1	5200 SERIES 60MM PASSAGE LATCH SQUARE END FACE PLATE AND D STRIKE	LOCKWOOD	SC
6260SSS	1	6260 PRIVACY BOLT TP	LOCKWOOD	SS
1360/1361/166SC	1	1360 SERIES 166 LEVER ON ROUND ROSE FULL SET	LOCKWOOD	SC
1369/INSC	1	1360 SERIES DISABLE TURN ESCUTCHEON - SURFACE FIX	LOCKWOOD	SC
1368/INSC	1	1360 SERIES EMERGENCY TURN ESCUTCHEON - SURFACE FIX	LOCKWOOD	SC
A300SS	1	A300 WALL MOUNTED DOOR STOP 75MM X 19MM TP	LOCKWOOD	SS
Mark:	G04.6	To/From Room: APARTMENT BATHROOM DOOR		
Door Type:	D	Frame Type: PAINTED		
LW10075LL/RMBK	2	HINGES 100X75X2.5 LIFT OFF	LOCKWOOD	MBK
5260/1SFDSC	1	5200 SERIES 60MM PASSAGE LATCH SQUARE END FACE PLATE AND D STRIKE	LOCKWOOD	SC
6260SSS	1	6260 PRIVACY BOLT TP	LOCKWOOD	SS
1360/1361/166SC	1	1360 SERIES 166 LEVER ON ROUND ROSE FULL SET	LOCKWOOD	SC
1369/INSC	1	1360 SERIES DISABLE TURN ESCUTCHEON - SURFACE FIX	LOCKWOOD	SC
1368/INSC	1	1360 SERIES EMERGENCY TURN ESCUTCHEON - SURFACE FIX	LOCKWOOD	SC
A300SS	1	A300 WALL MOUNTED DOOR STOP 75MM X 19MM TP	LOCKWOOD	SS
Mark:	100.1	To/From Room: ELECTRICAL RISER		
Door Type:	SD	Frame Type: PAINTED		
LW10075FPSSS	3	HINGES 100X75X2.5 FIXED PIN	LOCKWOOD	SSS
507SSS	1	507 NIGHTLATCH	LOCKWOOD	SSS
CUTKEYS-MK	1	CUTKEYS TO MATCH CLIENTS SYSTEM	OTHER	NONE
201CYL6PSC6MK	1	LOCKWOOD 201 RIM LOCK CYLINDER EXTRUDED 6MK	LOCKWOOD	SC
Mark:	100.2	To/From Room: COMMS RISER		
Door Type:	SD	Frame Type: PAINTED		
LW10075FPSSS	3	HINGES 100X75X2.5 FIXED PIN	LOCKWOOD	SSS
507SSS	1	507 NIGHTLATCH	LOCKWOOD	SSS
CUTKEYS-MK	1	CUTKEYS TO MATCH CLIENTS SYSTEM	OTHER	NONE
201CYL6PSC6MK	1	LOCKWOOD 201 RIM LOCK CYLINDER EXTRUDED 6MK	LOCKWOOD	SC
Mark:	100.3	To/From Room: HYDRAULIC RISER		
Door Type:	SD	Frame Type: PAINTED		
LW10075FPSSS	6	HINGES 100X75X2.5 FIXED PIN	LOCKWOOD	SSS
507SSS	1	507 NIGHTLATCH	LOCKWOOD	SSS
CUTKEYS-MK	1	CUTKEYS TO MATCH CLIENTS SYSTEM	OTHER	NONE
201CYL6PSC6MK	1	LOCKWOOD 201 RIM LOCK CYLINDER EXTRUDED 6MK	LOCKWOOD	SC
FENL201/PULLSC	1	FLUID NL LIP PULL 201CYL SC	LOCKWOOD	SC
791X300SC	2	VISIBLE FIX PANIC BOLT 300MM TP	LOCKWOOD	SC
LAS1212/DDS/B	1	BATWING SEAL 12X12 DBL DR SET BLACK	LORIENT	BLK
LAS7004/2100/S	2	SLIM-LINE DOOR PERIMETER SEAL DBL FIN 2100 SIL	LORIENT	SIL
LAS8001/0535/S	2	DROP SEAL MORTICE 0535 SIL	LORIENT	SIL

Door Hardware Schedule

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Project Name: CURRAN STREET DWELINGS
Schedule No: 77202

Item	Qty	Description	Brand	Finish
Mark:	101.1	To/From Room: APARTMENT ENTRY DOOR		
Door Type:	FD	Frame Type:	STEEL PROTECTIVE PAINT	
LW10000BBSSS	4	HINGES 100X100X2.5 BALL BEARING	LOCKWOOD	SSS
3572WASCNCYL	1	ESCAPE OFFICE LOCK - ANTI-LOCKOUT NO CYLINDER	LOCKWOOD	SC
575-2SC6MK	1	575 OVAL CYLINDER ASSEMBLY SC - W CAM 6MK	LOCKWOOD	SC
CUTKEYS-MK	1	CUTKEYS TO MATCH CLIENTS SYSTEM	OTHER	NONE
1360/1361/166SC	1	1360 SERIES 166 LEVER ON ROUND ROSE FULL SET	LOCKWOOD	SC
1366/ISC	1	1360 SERIES INTERNAL OVAL CYLINDER ESCUTCHEON	LOCKWOOD	SC
1369/INSC	1	1360 SERIES DISABLE TURN ESCUTCHEON - SURFACE FIX	LOCKWOOD	SC
724SRSSIL	1	724 SERIES SIZE 2-4 CLOSER ADJUSTABLE BACKCHECK	LOCKWOOD	SIL
A300SS	1	A300 WALL MOUNTED DOOR STOP 75MM X 19MM TP	LOCKWOOD	SS
LAS1212/LSDS/B	1	BATWING SEAL 12X12 LNG SGL DR SET BLACK	LORIENT	BLK
LAS8001/0920/S	1	DROP SEAL MORTICE 0920 SIL	LORIENT	SIL
Mark:	101.2	To/From Room: APARTMENT BEDROOM DOOR		
Door Type:	D	Frame Type:	PAINTED	
LW10075LPSSS	3	HINGES 100X75X2.5 LOOSE PIN	LOCKWOOD	SSS
5260/1SFDS	1	5200 SERIES 60MM PASSAGE LATCH SQUARE END FACE PLATE AND D STRIKE	LOCKWOOD	SC
1360/1361/166SC	1	1360 SERIES 166 LEVER ON ROUND ROSE FULL SET	LOCKWOOD	SC
A300SS	1	A300 WALL MOUNTED DOOR STOP 75MM X 19MM TP	LOCKWOOD	SS
Mark:	101.3	To/From Room: APARTMENT BEDROOM DOOR		
Door Type:	D	Frame Type:	PAINTED	
LW10075LPSSS	3	HINGES 100X75X2.5 LOOSE PIN	LOCKWOOD	SSS
5260/1SFDS	1	5200 SERIES 60MM PASSAGE LATCH SQUARE END FACE PLATE AND D STRIKE	LOCKWOOD	SC
1360/1361/166SC	1	1360 SERIES 166 LEVER ON ROUND ROSE FULL SET	LOCKWOOD	SC
A300SS	1	A300 WALL MOUNTED DOOR STOP 75MM X 19MM TP	LOCKWOOD	SS
Mark:	101.4	To/From Room: APARTMENT BEDROOM DOOR		
Door Type:	D	Frame Type:	PAINTED	
LW10075LPSSS	3	HINGES 100X75X2.5 LOOSE PIN	LOCKWOOD	SSS
5260/1SFDS	1	5200 SERIES 60MM PASSAGE LATCH SQUARE END FACE PLATE AND D STRIKE	LOCKWOOD	SC
1360/1361/166SC	1	1360 SERIES 166 LEVER ON ROUND ROSE FULL SET	LOCKWOOD	SC
A300SS	1	A300 WALL MOUNTED DOOR STOP 75MM X 19MM TP	LOCKWOOD	SS
Mark:	101.5	To/From Room: APARTMENT BATHROOM DOOR		
Door Type:	D	Frame Type:	PAINTED	
LW10075LL/RMBK	2	HINGES 100X75X2.5 LIFT OFF	LOCKWOOD	MBK
5260/1SFDS	1	5200 SERIES 60MM PASSAGE LATCH SQUARE END FACE PLATE AND D STRIKE	LOCKWOOD	SC
6260SSS	1	6260 PRIVACY BOLT TP	LOCKWOOD	SS
1360/1361/166SC	1	1360 SERIES 166 LEVER ON ROUND ROSE FULL SET	LOCKWOOD	SC
1369/INSC	1	1360 SERIES DISABLE TURN ESCUTCHEON - SURFACE FIX	LOCKWOOD	SC
1368/INSC	1	1360 SERIES EMERGENCY TURN ESCUTCHEON - SURFACE FIX	LOCKWOOD	SC
A300SS	1	A300 WALL MOUNTED DOOR STOP 75MM X 19MM TP	LOCKWOOD	SS

Door Hardware Schedule

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Item	Qty	Description	Brand	Finish
Mark:	101.6	To/From Room: APARTMENT BATHROOM DOOR		
Door Type:	D		Frame Type:	PAINTED
LW10075LL/RMBK	2	HINGES 100X75X2.5 LIFT OFF	LOCKWOOD	MBK
5260/1SFDS	1	5200 SERIES 60MM PASSAGE LATCH SQUARE END FACE PLATE AND D STRIKE	LOCKWOOD	SC
6260SSS	1	6260 PRIVACY BOLT TP	LOCKWOOD	SS
1360/1361/166SC	1	1360 SERIES 166 LEVER ON ROUND ROSE FULL SET	LOCKWOOD	SC
1369/INSC	1	1360 SERIES DISABLE TURN ESCUTCHEON - SURFACE FIX	LOCKWOOD	SC
1368/INSC	1	1360 SERIES EMERGENCY TURN ESCUTCHEON - SURFACE FIX	LOCKWOOD	SC
A300SS	1	A300 WALL MOUNTED DOOR STOP 75MM X 19MM TP	LOCKWOOD	SS
Mark:	102.1	To/From Room: APARTMENT ENTRY DOOR		
Door Type:	FD		Frame Type:	STEEL PROTECTIVE PAINT
LW10000BBSSS	4	HINGES 100X100X2.5 BALL BEARING	LOCKWOOD	SSS
3572WASCNCYL	1	ESCAPE OFFICE LOCK - ANTI-LOCKOUT NO CYLINDER	LOCKWOOD	SC
575-2SC6MK	1	575 OVAL CYLINDER ASSEMBLY SC - W CAM 6MK	LOCKWOOD	SC
CUTKEYS-MK	1	CUTKEYS TO MATCH CLIENTS SYSTEM	OTHER	NONE
1360/1361/166SC	1	1360 SERIES 166 LEVER ON ROUND ROSE FULL SET	LOCKWOOD	SC
1366/ISC	1	1360 SERIES INTERNAL OVAL CYLINDER ESCUTCHEON	LOCKWOOD	SC
1369/INSC	1	1360 SERIES DISABLE TURN ESCUTCHEON - SURFACE FIX	LOCKWOOD	SC
724SRSIL	1	724 SERIES SIZE 2-4 CLOSER ADJUSTABLE BACKCHECK	LOCKWOOD	SIL
A300SS	1	A300 WALL MOUNTED DOOR STOP 75MM X 19MM TP	LOCKWOOD	SS
LAS1212/LSDS/B	1	BATWING SEAL 12X12 LNG SGL DR SET BLACK	LORIENT	BLK
LAS8001/0920/S	1	DROP SEAL MORTICE 0920 SIL	LORIENT	SIL
Mark:	102.2	To/From Room: APARTMENT BEDROOM DOOR		
Door Type:	D		Frame Type:	PAINTED
LW10075LPSSS	3	HINGES 100X75X2.5 LOOSE PIN	LOCKWOOD	SSS
5260/1SFDS	1	5200 SERIES 60MM PASSAGE LATCH SQUARE END FACE PLATE AND D STRIKE	LOCKWOOD	SC
1360/1361/166SC	1	1360 SERIES 166 LEVER ON ROUND ROSE FULL SET	LOCKWOOD	SC
A300SS	1	A300 WALL MOUNTED DOOR STOP 75MM X 19MM TP	LOCKWOOD	SS
Mark:	102.3	To/From Room: APARTMENT BEDROOM DOOR		
Door Type:	D		Frame Type:	PAINTED
LW10075LPSSS	3	HINGES 100X75X2.5 LOOSE PIN	LOCKWOOD	SSS
5260/1SFDS	1	5200 SERIES 60MM PASSAGE LATCH SQUARE END FACE PLATE AND D STRIKE	LOCKWOOD	SC
1360/1361/166SC	1	1360 SERIES 166 LEVER ON ROUND ROSE FULL SET	LOCKWOOD	SC
A300SS	1	A300 WALL MOUNTED DOOR STOP 75MM X 19MM TP	LOCKWOOD	SS
Mark:	102.4	To/From Room: APARTMENT BEDROOM DOOR		
Door Type:	D		Frame Type:	PAINTED
LW10075LPSSS	3	HINGES 100X75X2.5 LOOSE PIN	LOCKWOOD	SSS
5260/1SFDS	1	5200 SERIES 60MM PASSAGE LATCH SQUARE END FACE PLATE AND D STRIKE	LOCKWOOD	SC
1360/1361/166SC	1	1360 SERIES 166 LEVER ON ROUND ROSE FULL SET	LOCKWOOD	SC
A300SS	1	A300 WALL MOUNTED DOOR STOP 75MM X 19MM TP	LOCKWOOD	SS

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Item	Qty	Description	Brand	Finish
Mark:	102.5	To/From Room: APARTMENT BATHROOM DOOR		
Door Type:	D		Frame Type:	PAINTED
LW10075LL/RMBK	2	HINGES 100X75X2.5 LIFT OFF	LOCKWOOD	MBK
5260/1SFDSC	1	5200 SERIES 60MM PASSAGE LATCH SQUARE END FACE PLATE AND D STRIKE	LOCKWOOD	SC
6260SSS	1	6260 PRIVACY BOLT TP	LOCKWOOD	SS
1360/1361/166SC	1	1360 SERIES 166 LEVER ON ROUND ROSE FULL SET	LOCKWOOD	SC
1369/INSC	1	1360 SERIES DISABLE TURN ESCUTCHEON - SURFACE FIX	LOCKWOOD	SC
1368/INSC	1	1360 SERIES EMERGENCY TURN ESCUTCHEON - SURFACE FIX	LOCKWOOD	SC
A300SS	1	A300 WALL MOUNTED DOOR STOP 75MM X 19MM TP	LOCKWOOD	SS
Mark:	102.6	To/From Room: APARTMENT BATHROOM DOOR		
Door Type:	D		Frame Type:	PAINTED
LW10075LL/RMBK	2	HINGES 100X75X2.5 LIFT OFF	LOCKWOOD	MBK
5260/1SFDSC	1	5200 SERIES 60MM PASSAGE LATCH SQUARE END FACE PLATE AND D STRIKE	LOCKWOOD	SC
6260SSS	1	6260 PRIVACY BOLT TP	LOCKWOOD	SS
1360/1361/166SC	1	1360 SERIES 166 LEVER ON ROUND ROSE FULL SET	LOCKWOOD	SC
1369/INSC	1	1360 SERIES DISABLE TURN ESCUTCHEON - SURFACE FIX	LOCKWOOD	SC
1368/INSC	1	1360 SERIES EMERGENCY TURN ESCUTCHEON - SURFACE FIX	LOCKWOOD	SC
A300SS	1	A300 WALL MOUNTED DOOR STOP 75MM X 19MM TP	LOCKWOOD	SS
Mark:	103.1	To/From Room: APARTMENT ENTRY DOOR		
Door Type:	FD		Frame Type:	STEEL PROTECTIVE PAINT
LW10000BBSSS	4	HINGES 100X100X2.5 BALL BEARING	LOCKWOOD	SSS
3572WASCNCYL	1	ESCAPE OFFICE LOCK - ANTI-LOCKOUT NO CYLINDER	LOCKWOOD	SC
575-2SC6MK	1	575 OVAL CYLINDER ASSEMBLY SC - W CAM 6MK	LOCKWOOD	SC
CUTKEYS-MK	1	CUTKEYS TO MATCH CLIENTS SYSTEM	OTHER	NONE
1360/1361/166SC	1	1360 SERIES 166 LEVER ON ROUND ROSE FULL SET	LOCKWOOD	SC
1366/ISC	1	1360 SERIES INTERNAL OVAL CYLINDER ESCUTCHEON	LOCKWOOD	SC
1369/INSC	1	1360 SERIES DISABLE TURN ESCUTCHEON - SURFACE FIX	LOCKWOOD	SC
724SRSL	1	724 SERIES SIZE 2-4 CLOSER ADJUSTABLE BACKCHECK	LOCKWOOD	SIL
A300SS	1	A300 WALL MOUNTED DOOR STOP 75MM X 19MM TP	LOCKWOOD	SS
LAS1212/LSDS/B	1	BATWING SEAL 12X12 LNG SGL DR SET BLACK	LORIENT	BLK
LAS8001/0920/S	1	DROP SEAL MORTICE 0920 SIL	LORIENT	SIL
Mark:	103.2	To/From Room: APARTMENT BEDROOM DOOR		
Door Type:	D		Frame Type:	PAINTED
LW10075LPSSS	3	HINGES 100X75X2.5 LOOSE PIN	LOCKWOOD	SSS
5260/1SFDSC	1	5200 SERIES 60MM PASSAGE LATCH SQUARE END FACE PLATE AND D STRIKE	LOCKWOOD	SC
1360/1361/166SC	1	1360 SERIES 166 LEVER ON ROUND ROSE FULL SET	LOCKWOOD	SC
A300SS	1	A300 WALL MOUNTED DOOR STOP 75MM X 19MM TP	LOCKWOOD	SS

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Item	Qty	Description	Brand	Finish
Mark:	103.3	To/From Room: APARTMENT BEDROOM DOOR		
Door Type:	D	Frame Type: PAINTED		
LW10075LPSSS	3	HINGES 100X75X2.5 LOOSE PIN	LOCKWOOD	SSS
5260/1SFDS	1	5200 SERIES 60MM PASSAGE LATCH SQUARE END FACE PLATE AND D STRIKE	LOCKWOOD	SC
1360/1361/166SC	1	1360 SERIES 166 LEVER ON ROUND ROSE FULL SET	LOCKWOOD	SC
A300SS	1	A300 WALL MOUNTED DOOR STOP 75MM X 19MM TP	LOCKWOOD	SS
Mark:	103.4	To/From Room: APARTMENT BATHROOM DOOR		
Door Type:	D	Frame Type: PAINTED		
LW10075LL/RMBK	2	HINGES 100X75X2.5 LIFT OFF	LOCKWOOD	MBK
5260/1SFDS	1	5200 SERIES 60MM PASSAGE LATCH SQUARE END FACE PLATE AND D STRIKE	LOCKWOOD	SC
6260SSS	1	6260 PRIVACY BOLT TP	LOCKWOOD	SS
1360/1361/166SC	1	1360 SERIES 166 LEVER ON ROUND ROSE FULL SET	LOCKWOOD	SC
1369/INSC	1	1360 SERIES DISABLE TURN ESCUTCHEON - SURFACE FIX	LOCKWOOD	SC
1368/INSC	1	1360 SERIES EMERGENCY TURN ESCUTCHEON - SURFACE FIX	LOCKWOOD	SC
A300SS	1	A300 WALL MOUNTED DOOR STOP 75MM X 19MM TP	LOCKWOOD	SS
Mark:	103.5	To/From Room: APARTMENT BATHROOM DOOR		
Door Type:	D	Frame Type: PAINTED		
LW10075LL/RMBK	2	HINGES 100X75X2.5 LIFT OFF	LOCKWOOD	MBK
5260/1SFDS	1	5200 SERIES 60MM PASSAGE LATCH SQUARE END FACE PLATE AND D STRIKE	LOCKWOOD	SC
6260SSS	1	6260 PRIVACY BOLT TP	LOCKWOOD	SS
1360/1361/166SC	1	1360 SERIES 166 LEVER ON ROUND ROSE FULL SET	LOCKWOOD	SC
1369/INSC	1	1360 SERIES DISABLE TURN ESCUTCHEON - SURFACE FIX	LOCKWOOD	SC
1368/INSC	1	1360 SERIES EMERGENCY TURN ESCUTCHEON - SURFACE FIX	LOCKWOOD	SC
A300SS	1	A300 WALL MOUNTED DOOR STOP 75MM X 19MM TP	LOCKWOOD	SS
Mark:	104.1	To/From Room: APARTMENT ENTRY DOOR		
Door Type:	FD	Frame Type: STEEL PROTECTIVE PAINT		
LW10000BBSSS	4	HINGES 100X100X2.5 BALL BEARING	LOCKWOOD	SSS
3572WASCNCYL	1	ESCAPE OFFICE LOCK - ANTI-LOCKOUT NO CYLINDER	LOCKWOOD	SC
575-2SC6MK	1	575 OVAL CYLINDER ASSEMBLY SC - W CAM 6MK	LOCKWOOD	SC
CUTKEYS-MK	1	CUTKEYS TO MATCH CLIENTS SYSTEM	OTHER	NONE
1360/1361/166SC	1	1360 SERIES 166 LEVER ON ROUND ROSE FULL SET	LOCKWOOD	SC
1366/ISC	1	1360 SERIES INTERNAL OVAL CYLINDER ESCUTCHEON	LOCKWOOD	SC
1369/INSC	1	1360 SERIES DISABLE TURN ESCUTCHEON - SURFACE FIX	LOCKWOOD	SC
724SRSIL	1	724 SERIES SIZE 2-4 CLOSER ADJUSTABLE BACKCHECK	LOCKWOOD	SIL
A300SS	1	A300 WALL MOUNTED DOOR STOP 75MM X 19MM TP	LOCKWOOD	SS
LAS1212/LSDS/B	1	BATWING SEAL 12X12 LNG SGL DR SET BLACK	LORIENT	BLK
LAS8001/0920/S	1	DROP SEAL MORTICE 0920 SIL	LORIENT	SIL

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Item	Qty	Description	Brand	Finish
Mark: 104.2		To/From Room: APARTMENT BEDROOM DOOR		
Door Type: D		Frame Type: PAINTED		
LW10075LPSSS	3	HINGES 100X75X2.5 LOOSE PIN	LOCKWOOD	SSS
5260/1SFDS	1	5200 SERIES 60MM PASSAGE LATCH SQUARE END FACE PLATE AND D STRIKE	LOCKWOOD	SC
1360/1361/166SC	1	1360 SERIES 166 LEVER ON ROUND ROSE FULL SET	LOCKWOOD	SC
A300SS	1	A300 WALL MOUNTED DOOR STOP 75MM X 19MM TP	LOCKWOOD	SS
Mark: 104.3		To/From Room: APARTMENT BATHROOM DOOR		
Door Type: D		Frame Type: PAINTED		
LW10075LL/RMBK	2	HINGES 100X75X2.5 LIFT OFF	LOCKWOOD	MBK
5260/1SFDS	1	5200 SERIES 60MM PASSAGE LATCH SQUARE END FACE PLATE AND D STRIKE	LOCKWOOD	SC
6260SSS	1	6260 PRIVACY BOLT TP	LOCKWOOD	SS
1360/1361/166SC	1	1360 SERIES 166 LEVER ON ROUND ROSE FULL SET	LOCKWOOD	SC
1369/INSC	1	1360 SERIES DISABLE TURN ESCUTCHEON - SURFACE FIX	LOCKWOOD	SC
1368/INSC	1	1360 SERIES EMERGENCY TURN ESCUTCHEON - SURFACE FIX	LOCKWOOD	SC
A300SS	1	A300 WALL MOUNTED DOOR STOP 75MM X 19MM TP	LOCKWOOD	SS
Mark: 105.1		To/From Room: APARTMENT ENTRY DOOR		
Door Type: FD		Frame Type: STEEL PROTECTIVE PAINT		
LW10000BBSSS	4	HINGES 100X100X2.5 BALL BEARING	LOCKWOOD	SSS
3572WASCNCYL	1	ESCAPE OFFICE LOCK - ANTI-LOCKOUT NO CYLINDER	LOCKWOOD	SC
575-2SC6MK	1	575 OVAL CYLINDER ASSEMBLY SC - W CAM 6MK	LOCKWOOD	SC
CUTKEYS-MK	1	CUTKEYS TO MATCH CLIENTS SYSTEM	OTHER	NONE
1360/1361/166SC	1	1360 SERIES 166 LEVER ON ROUND ROSE FULL SET	LOCKWOOD	SC
1366/ISC	1	1360 SERIES INTERNAL OVAL CYLINDER ESCUTCHEON	LOCKWOOD	SC
1369/INSC	1	1360 SERIES DISABLE TURN ESCUTCHEON - SURFACE FIX	LOCKWOOD	SC
724SRSL	1	724 SERIES SIZE 2-4 CLOSER ADJUSTABLE BACKCHECK	LOCKWOOD	SIL
A300SS	1	A300 WALL MOUNTED DOOR STOP 75MM X 19MM TP	LOCKWOOD	SS
LAS1212/LSDS/B	1	BATWING SEAL 12X12 LNG SGL DR SET BLACK	LORIENT	BLK
LAS8001/0920/S	1	DROP SEAL MORTICE 0920 SIL	LORIENT	SIL
Mark: 105.2		To/From Room: APARTMENT BEDROOM DOOR		
Door Type: D		Frame Type: PAINTED		
LW10075LPSSS	3	HINGES 100X75X2.5 LOOSE PIN	LOCKWOOD	SSS
5260/1SFDS	1	5200 SERIES 60MM PASSAGE LATCH SQUARE END FACE PLATE AND D STRIKE	LOCKWOOD	SC
1360/1361/166SC	1	1360 SERIES 166 LEVER ON ROUND ROSE FULL SET	LOCKWOOD	SC
A300SS	1	A300 WALL MOUNTED DOOR STOP 75MM X 19MM TP	LOCKWOOD	SS
Mark: 105.3		To/From Room: APARTMENT BEDROOM DOOR		
Door Type: D		Frame Type: PAINTED		
LW10075LPSSS	3	HINGES 100X75X2.5 LOOSE PIN	LOCKWOOD	SSS
5260/1SFDS	1	5200 SERIES 60MM PASSAGE LATCH SQUARE END FACE PLATE AND D STRIKE	LOCKWOOD	SC
1360/1361/166SC	1	1360 SERIES 166 LEVER ON ROUND ROSE FULL SET	LOCKWOOD	SC
A300SS	1	A300 WALL MOUNTED DOOR STOP 75MM X 19MM TP	LOCKWOOD	SS

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Item	Qty	Description	Brand	Finish
Mark:	105.4	To/From Room: APARTMENT BATHROOM DOOR		
Door Type:	D	Frame Type: PAINTED		
LW10075LL/RMBK	2	HINGES 100X75X2.5 LIFT OFF	LOCKWOOD	MBK
5260/1SFDSC	1	5200 SERIES 60MM PASSAGE LATCH SQUARE END FACE PLATE AND D STRIKE	LOCKWOOD	SC
6260SSS	1	6260 PRIVACY BOLT TP	LOCKWOOD	SS
1360/1361/166SC	1	1360 SERIES 166 LEVER ON ROUND ROSE FULL SET	LOCKWOOD	SC
1369/INSC	1	1360 SERIES DISABLE TURN ESCUTCHEON - SURFACE FIX	LOCKWOOD	SC
1368/INSC	1	1360 SERIES EMERGENCY TURN ESCUTCHEON - SURFACE FIX	LOCKWOOD	SC
A300SS	1	A300 WALL MOUNTED DOOR STOP 75MM X 19MM TP	LOCKWOOD	SS
Mark:	105.5	To/From Room: APARTMENT BATHROOM DOOR		
Door Type:	D	Frame Type: PAINTED		
LW10075LL/RMBK	2	HINGES 100X75X2.5 LIFT OFF	LOCKWOOD	MBK
5260/1SFDSC	1	5200 SERIES 60MM PASSAGE LATCH SQUARE END FACE PLATE AND D STRIKE	LOCKWOOD	SC
6260SSS	1	6260 PRIVACY BOLT TP	LOCKWOOD	SS
1360/1361/166SC	1	1360 SERIES 166 LEVER ON ROUND ROSE FULL SET	LOCKWOOD	SC
1369/INSC	1	1360 SERIES DISABLE TURN ESCUTCHEON - SURFACE FIX	LOCKWOOD	SC
1368/INSC	1	1360 SERIES EMERGENCY TURN ESCUTCHEON - SURFACE FIX	LOCKWOOD	SC
A300SS	1	A300 WALL MOUNTED DOOR STOP 75MM X 19MM TP	LOCKWOOD	SS
Mark:	200.1	To/From Room: ELECTRICAL RISER		
Door Type:	SD	Frame Type: PAINTED		
LW10075FPSSS	3	HINGES 100X75X2.5 FIXED PIN	LOCKWOOD	SSS
507SSS	1	507 NIGHTLATCH	LOCKWOOD	SSS
CUTKEYS-MK	1	CUTKEYS TO MATCH CLIENTS SYSTEM	OTHER	NONE
201CYL6PSC6MK	1	LOCKWOOD 201 RIM LOCK CYLINDER EXTRUDED 6MK	LOCKWOOD	SC
Mark:	200.2	To/From Room: COMMS RISER		
Door Type:	SD	Frame Type: PAINTED		
LW10075FPSSS	3	HINGES 100X75X2.5 FIXED PIN	LOCKWOOD	SSS
507SSS	1	507 NIGHTLATCH	LOCKWOOD	SSS
CUTKEYS-MK	1	CUTKEYS TO MATCH CLIENTS SYSTEM	OTHER	NONE
201CYL6PSC6MK	1	LOCKWOOD 201 RIM LOCK CYLINDER EXTRUDED 6MK	LOCKWOOD	SC
Mark:	200.3	To/From Room: HYDRAULIC RISER		
Door Type:	SD	Frame Type: PAINTED		
LW10075FPSSS	6	HINGES 100X75X2.5 FIXED PIN	LOCKWOOD	SSS
507SSS	1	507 NIGHTLATCH	LOCKWOOD	SSS
CUTKEYS-MK	1	CUTKEYS TO MATCH CLIENTS SYSTEM	OTHER	NONE
201CYL6PSC6MK	1	LOCKWOOD 201 RIM LOCK CYLINDER EXTRUDED 6MK	LOCKWOOD	SC
FENL201/PULLSC	1	FLUID NL LIP PULL 201CYL SC	LOCKWOOD	SC
791X300SC	2	VISIBLE FIX PANIC BOLT 300MM TP	LOCKWOOD	SC
LAS1212/DDS/B	1	BATWING SEAL 12X12 DBL DR SET BLACK	LORIENT	BLK
LAS7004/2100/S	2	SLIM-LINE DOOR PERIMETER SEAL DBL FIN 2100 SIL	LORIENT	SIL
LAS8001/0535/S	2	DROP SEAL MORTICE 0535 SIL	LORIENT	SIL

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Item	Qty	Description	Brand	Finish
Mark:	200.6	To/From Room: MAINTENANCE ACCESS APT 203		
Door Type:	GT		Frame Type:	POWDER COATED
3572X-SCNCYL	1	STOREROOM LOCK	LOCKWOOD	SC
CUTKEYS-MK	1	CUTKEYS TO MATCH CLIENTS SYSTEM	OTHER	NONE
570-2SC6MK	1	570 OVAL X CYLINDER 6MK	LOCKWOOD	SC
1360/1361/166SC	1	1360 SERIES 166 LEVER ON ROUND ROSE FULL SET	LOCKWOOD	SC
1366/ISC	1	1360 SERIES INTERNAL OVAL CYLINDER ESCUTCHEON	LOCKWOOD	SC
GATE HARDWARE	1	HINGES AND LOCKBOX TO BE SUPPLIED BY GATE MANUFACTURER	OTHER	
Mark:	201.1	To/From Room: APARTMENT ENTRY DOOR		
Door Type:	FD		Frame Type:	STEEL PROTECTIVE PAINT
LW10000BBSSS	4	HINGES 100X100X2.5 BALL BEARING	LOCKWOOD	SSS
3572WASCNCYL	1	ESCAPE OFFICE LOCK - ANTI-LOCKOUT NO CYLINDER	LOCKWOOD	SC
575-2SC6MK	1	575 OVAL CYLINDER ASSEMBLY SC - W CAM 6MK	LOCKWOOD	SC
CUTKEYS-MK	1	CUTKEYS TO MATCH CLIENTS SYSTEM	OTHER	NONE
1360/1361/166SC	1	1360 SERIES 166 LEVER ON ROUND ROSE FULL SET	LOCKWOOD	SC
1366/ISC	1	1360 SERIES INTERNAL OVAL CYLINDER ESCUTCHEON	LOCKWOOD	SC
1369/INSC	1	1360 SERIES DISABLE TURN ESCUTCHEON - SURFACE FIX	LOCKWOOD	SC
724SRSL	1	724 SERIES SIZE 2-4 CLOSER ADJUSTABLE BACKCHECK	LOCKWOOD	SIL
A300SS	1	A300 WALL MOUNTED DOOR STOP 75MM X 19MM TP	LOCKWOOD	SS
LAS1212/LSDS/B	1	BATWING SEAL 12X12 LNG SGL DR SET BLACK	LORIENT	BLK
LAS8001/0920/S	1	DROP SEAL MORTICE 0920 SIL	LORIENT	SIL
Mark:	201.2	To/From Room: APARTMENT BEDROOM DOOR		
Door Type:	D		Frame Type:	PAINTED
LW10075LPSSS	3	HINGES 100X75X2.5 LOOSE PIN	LOCKWOOD	SSS
5260/1SFDS	1	5200 SERIES 60MM PASSAGE LATCH SQUARE END FACE PLATE AND D STRIKE	LOCKWOOD	SC
1360/1361/166SC	1	1360 SERIES 166 LEVER ON ROUND ROSE FULL SET	LOCKWOOD	SC
A300SS	1	A300 WALL MOUNTED DOOR STOP 75MM X 19MM TP	LOCKWOOD	SS
Mark:	201.3	To/From Room: APARTMENT BEDROOM DOOR		
Door Type:	D		Frame Type:	PAINTED
LW10075LPSSS	3	HINGES 100X75X2.5 LOOSE PIN	LOCKWOOD	SSS
5260/1SFDS	1	5200 SERIES 60MM PASSAGE LATCH SQUARE END FACE PLATE AND D STRIKE	LOCKWOOD	SC
1360/1361/166SC	1	1360 SERIES 166 LEVER ON ROUND ROSE FULL SET	LOCKWOOD	SC
A300SS	1	A300 WALL MOUNTED DOOR STOP 75MM X 19MM TP	LOCKWOOD	SS
Mark:	201.4	To/From Room: APARTMENT BEDROOM DOOR		
Door Type:	D		Frame Type:	PAINTED
LW10075LPSSS	3	HINGES 100X75X2.5 LOOSE PIN	LOCKWOOD	SSS
5260/1SFDS	1	5200 SERIES 60MM PASSAGE LATCH SQUARE END FACE PLATE AND D STRIKE	LOCKWOOD	SC
1360/1361/166SC	1	1360 SERIES 166 LEVER ON ROUND ROSE FULL SET	LOCKWOOD	SC
A300SS	1	A300 WALL MOUNTED DOOR STOP 75MM X 19MM TP	LOCKWOOD	SS

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Item	Qty	Description	Brand	Finish
Mark:	201.5	To/From Room: APARTMENT BATHROOM DOOR		
Door Type:	D	Frame Type: PAINTED		
LW10075LL/RMBK	2	HINGES 100X75X2.5 LIFT OFF	LOCKWOOD	MBK
5260/1SFDSC	1	5200 SERIES 60MM PASSAGE LATCH SQUARE END FACE PLATE AND D STRIKE	LOCKWOOD	SC
6260SSS	1	6260 PRIVACY BOLT TP	LOCKWOOD	SS
1360/1361/166SC	1	1360 SERIES 166 LEVER ON ROUND ROSE FULL SET	LOCKWOOD	SC
1369/INSC	1	1360 SERIES DISABLE TURN ESCUTCHEON - SURFACE FIX	LOCKWOOD	SC
1368/INSC	1	1360 SERIES EMERGENCY TURN ESCUTCHEON - SURFACE FIX	LOCKWOOD	SC
A300SS	1	A300 WALL MOUNTED DOOR STOP 75MM X 19MM TP	LOCKWOOD	SS
Mark:	201.6	To/From Room: APARTMENT BATHROOM DOOR		
Door Type:	D	Frame Type: PAINTED		
LW10075LL/RMBK	2	HINGES 100X75X2.5 LIFT OFF	LOCKWOOD	MBK
5260/1SFDSC	1	5200 SERIES 60MM PASSAGE LATCH SQUARE END FACE PLATE AND D STRIKE	LOCKWOOD	SC
6260SSS	1	6260 PRIVACY BOLT TP	LOCKWOOD	SS
1360/1361/166SC	1	1360 SERIES 166 LEVER ON ROUND ROSE FULL SET	LOCKWOOD	SC
1369/INSC	1	1360 SERIES DISABLE TURN ESCUTCHEON - SURFACE FIX	LOCKWOOD	SC
1368/INSC	1	1360 SERIES EMERGENCY TURN ESCUTCHEON - SURFACE FIX	LOCKWOOD	SC
A300SS	1	A300 WALL MOUNTED DOOR STOP 75MM X 19MM TP	LOCKWOOD	SS
Mark:	202.1	To/From Room: APARTMENT ENTRY DOOR		
Door Type:	FD	Frame Type: STEEL PROTECTIVE PAINT		
LW10000BBSSS	4	HINGES 100X100X2.5 BALL BEARING	LOCKWOOD	SSS
3572WASCNCYL	1	ESCAPE OFFICE LOCK - ANTI-LOCKOUT NO CYLINDER	LOCKWOOD	SC
575-2SC6MK	1	575 OVAL CYLINDER ASSEMBLY SC - W CAM 6MK	LOCKWOOD	SC
CUTKEYS-MK	1	CUTKEYS TO MATCH CLIENTS SYSTEM	OTHER	NONE
1360/1361/166SC	1	1360 SERIES 166 LEVER ON ROUND ROSE FULL SET	LOCKWOOD	SC
1366/ISC	1	1360 SERIES INTERNAL OVAL CYLINDER ESCUTCHEON	LOCKWOOD	SC
1369/INSC	1	1360 SERIES DISABLE TURN ESCUTCHEON - SURFACE FIX	LOCKWOOD	SC
724SRSL	1	724 SERIES SIZE 2-4 CLOSER ADJUSTABLE BACKCHECK	LOCKWOOD	SIL
A300SS	1	A300 WALL MOUNTED DOOR STOP 75MM X 19MM TP	LOCKWOOD	SS
LAS1212/LSDS/B	1	BATWING SEAL 12X12 LNG SGL DR SET BLACK	LORIENT	BLK
LAS8001/0920/S	1	DROP SEAL MORTICE 0920 SIL	LORIENT	SIL
Mark:	202.2	To/From Room: APARTMENT BEDROOM DOOR		
Door Type:	D	Frame Type: PAINTED		
LW10075LPSSS	3	HINGES 100X75X2.5 LOOSE PIN	LOCKWOOD	SSS
5260/1SFDSC	1	5200 SERIES 60MM PASSAGE LATCH SQUARE END FACE PLATE AND D STRIKE	LOCKWOOD	SC
1360/1361/166SC	1	1360 SERIES 166 LEVER ON ROUND ROSE FULL SET	LOCKWOOD	SC
A300SS	1	A300 WALL MOUNTED DOOR STOP 75MM X 19MM TP	LOCKWOOD	SS

Door Hardware Schedule

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Project Name: CURRAN STREET DWELLINGS
Schedule No: 77202

Item	Qty	Description	Brand	Finish
Mark:	202.3	To/From Room: APARTMENT BEDROOM DOOR		
Door Type:	D	Frame Type: PAINTED		
LW10075LPSSS	3	HINGES 100X75X2.5 LOOSE PIN	LOCKWOOD	SSS
5260/1SFDSC	1	5200 SERIES 60MM PASSAGE LATCH SQUARE END FACE PLATE AND D STRIKE	LOCKWOOD	SC
1360/1361/166SC	1	1360 SERIES 166 LEVER ON ROUND ROSE FULL SET	LOCKWOOD	SC
A300SS	1	A300 WALL MOUNTED DOOR STOP 75MM X 19MM TP	LOCKWOOD	SS
Mark:	202.4	To/From Room: APARTMENT BEDROOM DOOR		
Door Type:	D	Frame Type: PAINTED		
LW10075LPSSS	3	HINGES 100X75X2.5 LOOSE PIN	LOCKWOOD	SSS
5260/1SFDSC	1	5200 SERIES 60MM PASSAGE LATCH SQUARE END FACE PLATE AND D STRIKE	LOCKWOOD	SC
1360/1361/166SC	1	1360 SERIES 166 LEVER ON ROUND ROSE FULL SET	LOCKWOOD	SC
A300SS	1	A300 WALL MOUNTED DOOR STOP 75MM X 19MM TP	LOCKWOOD	SS
Mark:	202.5	To/From Room: APARTMENT BATHROOM DOOR		
Door Type:	D	Frame Type: PAINTED		
LW10075LL/RMBK	2	HINGES 100X75X2.5 LIFT OFF	LOCKWOOD	MBK
5260/1SFDSC	1	5200 SERIES 60MM PASSAGE LATCH SQUARE END FACE PLATE AND D STRIKE	LOCKWOOD	SC
6260SSS	1	6260 PRIVACY BOLT TP	LOCKWOOD	SS
1360/1361/166SC	1	1360 SERIES 166 LEVER ON ROUND ROSE FULL SET	LOCKWOOD	SC
1369/INSC	1	1360 SERIES DISABLE TURN ESCUTCHEON - SURFACE FIX	LOCKWOOD	SC
1368/INSC	1	1360 SERIES EMERGENCY TURN ESCUTCHEON - SURFACE FIX	LOCKWOOD	SC
A300SS	1	A300 WALL MOUNTED DOOR STOP 75MM X 19MM TP	LOCKWOOD	SS
Mark:	202.6	To/From Room: APARTMENT BATHROOM DOOR		
Door Type:	D	Frame Type: PAINTED		
LW10075LL/RMBK	2	HINGES 100X75X2.5 LIFT OFF	LOCKWOOD	MBK
5260/1SFDSC	1	5200 SERIES 60MM PASSAGE LATCH SQUARE END FACE PLATE AND D STRIKE	LOCKWOOD	SC
6260SSS	1	6260 PRIVACY BOLT TP	LOCKWOOD	SS
1360/1361/166SC	1	1360 SERIES 166 LEVER ON ROUND ROSE FULL SET	LOCKWOOD	SC
1369/INSC	1	1360 SERIES DISABLE TURN ESCUTCHEON - SURFACE FIX	LOCKWOOD	SC
1368/INSC	1	1360 SERIES EMERGENCY TURN ESCUTCHEON - SURFACE FIX	LOCKWOOD	SC
A300SS	1	A300 WALL MOUNTED DOOR STOP 75MM X 19MM TP	LOCKWOOD	SS

Door Hardware Schedule

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Schedule No: 77202

Item	Qty	Description	Brand	Finish
Mark:	203.1	To/From Room: APARTMENT ENTRY DOOR		
Door Type:	FD	Frame Type: STEEL PROTECTIVE PAINT		
LW10000BBSSS	4	HINGES 100X100X2.5 BALL BEARING	LOCKWOOD	SSS
3572WASCNCYL	1	ESCAPE OFFICE LOCK - ANTI-LOCKOUT NO CYLINDER	LOCKWOOD	SC
575-2SC6MK	1	575 OVAL CYLINDER ASSEMBLY SC - W CAM 6MK	LOCKWOOD	SC
CUTKEYS-MK	1	CUTKEYS TO MATCH CLIENTS SYSTEM	OTHER	NONE
1360/1361/166SC	1	1360 SERIES 166 LEVER ON ROUND ROSE FULL SET	LOCKWOOD	SC
1366/ISC	1	1360 SERIES INTERNAL OVAL CYLINDER ESCUTCHEON	LOCKWOOD	SC
1369/INSC	1	1360 SERIES DISABLE TURN ESCUTCHEON - SURFACE FIX	LOCKWOOD	SC
724SRSSIL	1	724 SERIES SIZE 2-4 CLOSER ADJUSTABLE BACKCHECK	LOCKWOOD	SIL
A300SS	1	A300 WALL MOUNTED DOOR STOP 75MM X 19MM TP	LOCKWOOD	SS
LAS1212/LSDS/B	1	BATWING SEAL 12X12 LNG SGL DR SET BLACK	LORIENT	BLK
LAS8001/0920/S	1	DROP SEAL MORTICE 0920 SIL	LORIENT	SIL
Mark:	203.2	To/From Room: APARTMENT BEDROOM DOOR		
Door Type:	D	Frame Type: PAINTED		
LW10075LPSSS	3	HINGES 100X75X2.5 LOOSE PIN	LOCKWOOD	SSS
5260/1SFDS	1	5200 SERIES 60MM PASSAGE LATCH SQUARE END FACE PLATE AND D STRIKE	LOCKWOOD	SC
1360/1361/166SC	1	1360 SERIES 166 LEVER ON ROUND ROSE FULL SET	LOCKWOOD	SC
A300SS	1	A300 WALL MOUNTED DOOR STOP 75MM X 19MM TP	LOCKWOOD	SS
Mark:	203.3	To/From Room: APARTMENT BEDROOM DOOR		
Door Type:	D	Frame Type: PAINTED		
LW10075LPSSS	3	HINGES 100X75X2.5 LOOSE PIN	LOCKWOOD	SSS
5260/1SFDS	1	5200 SERIES 60MM PASSAGE LATCH SQUARE END FACE PLATE AND D STRIKE	LOCKWOOD	SC
1360/1361/166SC	1	1360 SERIES 166 LEVER ON ROUND ROSE FULL SET	LOCKWOOD	SC
A300SS	1	A300 WALL MOUNTED DOOR STOP 75MM X 19MM TP	LOCKWOOD	SS
Mark:	203.4	To/From Room: APARTMENT BEDROOM DOOR		
Door Type:	D	Frame Type: PAINTED		
LW10075LPSSS	3	HINGES 100X75X2.5 LOOSE PIN	LOCKWOOD	SSS
5260/1SFDS	1	5200 SERIES 60MM PASSAGE LATCH SQUARE END FACE PLATE AND D STRIKE	LOCKWOOD	SC
1360/1361/166SC	1	1360 SERIES 166 LEVER ON ROUND ROSE FULL SET	LOCKWOOD	SC
A300SS	1	A300 WALL MOUNTED DOOR STOP 75MM X 19MM TP	LOCKWOOD	SS
Mark:	203.5	To/From Room: APARTMENT STUDY DOOR		
Door Type:	D	Frame Type: PAINTED		
LW10075LPSSS	3	HINGES 100X75X2.5 LOOSE PIN	LOCKWOOD	SSS
5260/1SFDS	1	5200 SERIES 60MM PASSAGE LATCH SQUARE END FACE PLATE AND D STRIKE	LOCKWOOD	SC
1360/1361/166SC	1	1360 SERIES 166 LEVER ON ROUND ROSE FULL SET	LOCKWOOD	SC
A300SS	1	A300 WALL MOUNTED DOOR STOP 75MM X 19MM TP	LOCKWOOD	SS

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Project Name: CURRAN STREET DWELINGS
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Item	Qty	Description	Brand	Finish
Mark:	203.6	To/From Room: APARTMENT BATHROOM DOOR		
Door Type:	D	Frame Type: PAINTED		
LW10075LL/RMBK	2	HINGES 100X75X2.5 LIFT OFF	LOCKWOOD	MBK
5260/1SFDSC	1	5200 SERIES 60MM PASSAGE LATCH SQUARE END FACE PLATE AND D STRIKE	LOCKWOOD	SC
6260SSS	1	6260 PRIVACY BOLT TP	LOCKWOOD	SS
1360/1361/166SC	1	1360 SERIES 166 LEVER ON ROUND ROSE FULL SET	LOCKWOOD	SC
1369/INSC	1	1360 SERIES DISABLE TURN ESCUTCHEON - SURFACE FIX	LOCKWOOD	SC
1368/INSC	1	1360 SERIES EMERGENCY TURN ESCUTCHEON - SURFACE FIX	LOCKWOOD	SC
A300SS	1	A300 WALL MOUNTED DOOR STOP 75MM X 19MM TP	LOCKWOOD	SS
Mark:	203.7	To/From Room: APARTMENT BATHROOM DOOR		
Door Type:	D	Frame Type: PAINTED		
LW10075LL/RMBK	2	HINGES 100X75X2.5 LIFT OFF	LOCKWOOD	MBK
5260/1SFDSC	1	5200 SERIES 60MM PASSAGE LATCH SQUARE END FACE PLATE AND D STRIKE	LOCKWOOD	SC
6260SSS	1	6260 PRIVACY BOLT TP	LOCKWOOD	SS
1360/1361/166SC	1	1360 SERIES 166 LEVER ON ROUND ROSE FULL SET	LOCKWOOD	SC
1369/INSC	1	1360 SERIES DISABLE TURN ESCUTCHEON - SURFACE FIX	LOCKWOOD	SC
1368/INSC	1	1360 SERIES EMERGENCY TURN ESCUTCHEON - SURFACE FIX	LOCKWOOD	SC
A300SS	1	A300 WALL MOUNTED DOOR STOP 75MM X 19MM TP	LOCKWOOD	SS
Mark:	203.8	To/From Room: APARTMENT BATHROOM DOOR		
Door Type:	D	Frame Type: PAINTED		
LW10075LL/RMBK	2	HINGES 100X75X2.5 LIFT OFF	LOCKWOOD	MBK
5260/1SFDSC	1	5200 SERIES 60MM PASSAGE LATCH SQUARE END FACE PLATE AND D STRIKE	LOCKWOOD	SC
6260SSS	1	6260 PRIVACY BOLT TP	LOCKWOOD	SS
1360/1361/166SC	1	1360 SERIES 166 LEVER ON ROUND ROSE FULL SET	LOCKWOOD	SC
1369/INSC	1	1360 SERIES DISABLE TURN ESCUTCHEON - SURFACE FIX	LOCKWOOD	SC
1368/INSC	1	1360 SERIES EMERGENCY TURN ESCUTCHEON - SURFACE FIX	LOCKWOOD	SC
A300SS	1	A300 WALL MOUNTED DOOR STOP 75MM X 19MM TP	LOCKWOOD	SS
Mark:	203.9	To/From Room: WALK-IN ROBE		
Door Type:	CS	Frame Type: PAINTED		
SDT	1	REFER ARCHITECTS SPEC	OTHER	NONE
FP2-120SS	2	FP2 FLUSH PULL STAINLESS STEEL 120X50MM	LOCKWOOD	SSS
Mark:	203.1	To/From Room: WALK-IN PANTRY / LAUNDRY		
Door Type:	CS	Frame Type: PAINTED		
SDT	1	REFER ARCHITECTS SPEC	OTHER	NONE
FP2-120SS	2	FP2 FLUSH PULL STAINLESS STEEL 120X50MM	LOCKWOOD	SSS

Door Hardware Schedule

Project Name: CURRAN STREET DWELINGS
Schedule No: 77202

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Schedule No: 77202

Brand	Item	Description	Qty	Finish	
LOCKWOOD	LW10000BBSSS	HINGES 100X100X2.5 BALL BEARING	72	SSS	
LOCKWOOD	LW10075FPSSS	HINGES 100X75X2.5 FIXED PIN	66	SSS	
LOCKWOOD	LW10075LL/RMBK	HINGES 100X75X2.5 LIFT OFF	48	MBK	
LOCKWOOD	LW10075LPSSS	HINGES 100X75X2.5 LOOSE PIN	99	SSS	
LOCKWOOD	AH130CAN	FAST FIX COMMERCIAL ALUMINIUM HINGE CAN	2	CAN	
OTHER	SDT	REFER ARCHITECTS SPEC	2	NONE	
LOCKWOOD	3572WASCNCYL	ESCAPE OFFICE LOCK - ANTI-LOCKOUT NO CYLINDER	12	SC	
LOCKWOOD	5260/1SFDS	5200 SERIES 60MM PASSAGE LATCH SQUARE END FACE PLATE AND D STRIKE	57	SC	

Door Hardware Schedule

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Schedule No: 77202

Brand	Item	Description	Qty	Finish	
LOCKWOOD	3572X-SCNCYL	STOREROOM LOCK	6	SC	
LOCKWOOD	507SSS	507 NIGHTLATCH	16	SSS	
LOCKWOOD	6260SSS	6260 PRIVACY BOLT TP	24	SS	
LOCKWOOD	ES8000-2	ES8000 D/BOLT 12-24VDC FAIL SECURE MONITORED	2		
LOCKWOOD	575-2SC6MK	575 OVAL CYLINDER ASSEMBLY SC - W CAM 6MK	12	SC	
OTHER	CUTKEYS-MK	CUTKEYS TO MATCH CLIENTS SYSTEM	34	NONE	
LOCKWOOD	201CYL6PSC6MK	LOCKWOOD 201 RIM LOCK CYLINDER EXTRUDED 6MK	16	SC	
LOCKWOOD	570-2SC6MK	570 OVAL X CYLINDER 6MK	6	SC	
LOCKWOOD	1360/1361/166SC	1360 SERIES 166 LEVER ON ROUND ROSE FULL SET	76	SC	

Door Hardware Schedule

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Schedule No: 77202

Brand	Item	Description	Qty	Finish
LOCKWOOD	1366/ISC	1360 SERIES INTERNAL OVAL CYLINDER ESCUTCHEON	19	SC
				
LOCKWOOD	1369/INSC	1360 SERIES DISABLE TURN ESCUTCHEON - SURFACE FIX	36	SC
LOCKWOOD	1368/INSC	1360 SERIES EMERGENCY TURN ESCUTCHEON - SURFACE FIX	24	SC
				
LOCKWOOD	FENL201/PULLSC	FLUID NL LIP PULL 201CYL SC	10	SC
LOCKWOOD	146X450SSS	146 ENTRANCE HANDLES WITH 450MM CENTRES	2	SSS
				
LOCKWOOD	FP2-120SS	FP2 FLUSH PULL STAINLESS STEEL 120X50MM	4	SSS
				
LOCKWOOD	791X300SC	VISIABLE FIX PANIC BOLT 300MM TP	16	SC
				
LOCKWOOD	A3000X180 CAN	SEQUENCE SELECTOR TO SUIT 1800MM WIDE DOORS	2	CAN
				

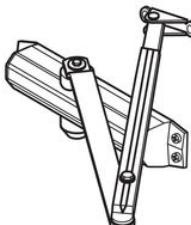
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Brand	Item	Description	Qty	Finish
LOCKWOOD	724SRSIL	724 SERIES SIZE 2-4 CLOSER ADJUSTABLE BACKCHECK	12	SIL
				
YALE	Y2600SIL	SIZE 2-6 POWER ADJUSTABLE DOOR CLOSER WITH BC, DA & PA BRACKET	2	SIL
				
YALE	Y2400SIL	SIZE 2-4 POWER ADJUSTABLE DOOR CLOSER WITH BC & PA BRACKET	2	SIL
				
LOCKWOOD	2024BCSIL	2024 SERIES CLOSER STD BACKCHECK WITH PARALLEL ARM BRACKET	4	SIL
				
LOCKWOOD	A300SS	A300 WALL MOUNTED DOOR STOP 75MM X 19MM TP	72	SS
				
LORIENT	LAS1212/LSDS/B	BATWING SEAL 12X12 LNG SGL DR SET BLACK	13	BLK
				

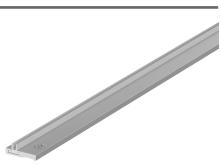
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Schedule No: 77202

Brand	Item	Description	Qty	Finish	
LORIENT	LAS1212/SDS/B	BATWING SEAL 12X12 SGL DR SET BLACK	3	BLK	
LORIENT	LAS1212/DDS/B	BATWING SEAL 12X12 DBL DR SET BLACK	5	BLK	
LORIENT	LAS7004/2100/S	SLIM-LINE DOOR PERIMETER SEAL DBL FIN 2100 SIL	6	SIL	
LORIENT	LAS7004/2750/S	SLIM-LINE DOOR PERIMETER SEAL DBL FIN 2750 SIL	2	SIL	
LORIENT	LAS1212/LDDS/B	BATWING SEAL 12X12 LNG DBL DR SET BLACK	1	BLK	
LORIENT	LAS8001/0920/S	DROP SEAL MORTICE 0920 SIL	16	SIL	

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Project Name: CURRAN STREET DWELLINGS
Schedule No: 77202

Brand	Item	Description	Qty	Finish
LORIENT	LAS8001/0535/S	DROP SEAL MORTICE 0535 SIL	6	SIL
				
LORIENT	LAS8001/0735/S	DROP SEAL MORTICE 0735 SIL	6	SIL
				
LORIENT	LAS8001/1220/S	DROP SEAL MORTICE 1220 SIL	2	SIL
				
OTHER	MEETING STILE SEAL	FIRE RATED MEETING STILE SEAL TO BE SUPPLIED BY FIRE DOOR MANUFACTURER	2	
OTHER	BY MANUFACTURER	HARDWARE TO BE SUPPLIED BY DOOR MANUFACTURER	3	
OTHER	GATE HARDWARE	HINGES AND LOCKBOX TO BE SUPPLIED BY GATE MANUFACTURER	3	
OTHER	POWER SWING DOOR OPERATOR	REFER TO ASSA ABLOY ENTRANCE SYSTEMS SPECIFICATION	2	

Door Hardware Schedule

Project Name: CURRAN STREET DWELINGS
Schedule No: 77202

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ASSA ABLOY is represented in all major regions, in both mature and emerging markets, with leading positions in Australia, Europe and North America.

As the world's leading lock group, ASSA ABLOY offers a more complete product range of door opening solutions than any other company in the market.



Openings Studio™

Openings Studio is a suite of BIM software tools for creating and visualising 3D doors, frames, and hardware objects for use in design, construction, and facility management. This program enables our consultants to write schedules with greater efficiency and contains built-in workflow tools for RFI's, change management, and collateral material.

Download Openings Studio

Visit assaabloy.com.au/openings to download a copy.

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Appendix 04: Safe Roof Access (SAYFA)

PROJECT PROPOSAL

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SAYFA
GROUP

PROJECT REF NO: 20869

REVISION NO: EST39784

DATE: 23/05/2022

PROJECT: 5 CURRAN STREET, NORTH MELBOURNE – APARTMENTS



INTRODUCTION

SAYFA®
GROUP

PROJECT:	5 CURRAN STREET, NORTH MELBOURNE – APARTMENTS
PROJECT REF NO:	20869
REVISION NO:	EST39784
PROJECT STAGE:	PLANNING STAGE

Welcome to Sayfa,

Thank you for the opportunity to present this proposal.

The reputation of your company and ours is at stake should we fail to provide adequate safety for persons involved in maintenance where work at heights is required. It is our priority to provide you and your client with solutions that are safe, cost effective, easy to manage and able to save maintenance personnel from injury and even death. We will assist you and the needs of your client:



WE KNOW THE REGULATIONS

Giving you peace of mind is what we are about. System design, installation, operation, maintenance and system management; we are able to provide a complete solution.



WE ARE THE ORIGINAL EQUIPMENT MANUFACTURER

Product quality with ISO 9001 accreditation, compatibility and traceability are all carefully controlled with availability for '**outside the square**' solutions.



OUR SYSTEMS ARE COST EFFECTIVE AND SIMPLE TO USE

The modular design concept allows on-site flexibility and ensures compliance with reduced labour and transport expenses.



WE PROVIDE VERY IMPORTANT AFTER SALES CARE

A good system is only half the story. Effective management, use and maintenance of the system is essential to saving lives. The **Hi-Care Management System** offers a complete data storage and management platform for the building manager.

Regards,

Sayfa Design Team

Rick Voss -Projects Co-ordinator | **Michael Soth** - Design Co-ordinator | **Leng Kuoch** - Estimating Co-ordinator

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SCOPE OF WORKS



PROJECT:	5 CURRAN STREET, NORTH MELBOURNE – APARTMENTS
PROJ REF NO:	20869
REVISION NO:	EST39784
PROJECT STAGE:	PLANNING STAGE

Qty	Code	Description
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Second Floor

2	AP115.2000	2.0m Anchor Point Strrops with Quicklink
2	AP127	XPLORA Removable Concrete Mount (with Stainless Insert) Fall Arrest Anchors
1	SL200 + SL223A	18.5m TRAVEL8 Custom Top Mount (Concrete Mount End Stanchion on One End) Static Line (2 x 90° Corners)
1	SL2.008	4.5m TRAVEL8 Concrete Mount Static Line
2	SL227	PILOT Horizontal Static Line Shuttles
1	LD461	2.7m VISTA COMMERCIAL Fold Down Ladder
1	LD465.1000	VISTA COMMERCIAL Fold Down Ladder Suspender Kit (Up to 1000mm)
1	LD24	0.6m KATT Ceiling Ladder
1	SD975	SPEKTRA System Information Signboard

- Notes:**
- Narrow roof area to be maintained from adjacent roof areas with the use of an extension pole. Refer to system layout plan for locations.
 - Removable floor tile for access to fall arrest anchor, by others. Location to be coordinated with Sayfa Group.
 - Access gate in aluminium perforated screen and apartment 2.02 balcony balustrade, by others. Design and locations to be coordinated with Sayfa Group.
 - Cut out in parapet between grid lines A1 and B for roof access, by others. Location to be coordinated with Sayfa Group.

Roof

2	AP115.2000	2.0m Anchor Point Strrops with Quicklink
5	AP135A	3SIXTY RAPID Top Mount Fall Arrest Anchors
1	SL1.032 + SL223A	25.5m TRAVEL8 Top Mount Static Line (5 x 90° Corner)
1	SL1.040 + SL223A + SL200	38.5m TRAVEL8 Top Mount Static Line (2 x 90° Corners & 1 x <90° Corner)
2	SL227	PILOT Horizontal Static Line Shuttles
3.5m	GW1	SENTRY Concrete Base Mount Guardrail
1	GW1.CNR	SENTRY Concrete Base Mount Guardrail Corner
5.0m	GW3.006	SENTRY Guardrail
1	GW394D	SENTRY Access Hatch Guardrail/Grabrail
1	LD21.1350	0.8m KATT Mini Ladder with Angled Handrails
1	LD22.1350	800mm/500mm KATT Parapet Ladder
1	LD494T	SKYDORE Roof Access Hatch (1000mm x 800mm)

- Notes:**
- Narrow roof area to be maintained from adjacent roof areas with the use of an extension pole. Refer to system layout plan for locations.
 - Opening and hob in concrete for roof access hatch, by others.
 - Maintenance of solar panels not be completed with use of fall arrest system, including cleaning of them. Cleaning of solar panels to be completed from safe zone of roof area with the use of extension pole. As advised by the architect, all major maintenance of solar panels to be completed via temporary fall protection ie. temporary guardrail, scaffolding, as it is not a frequent occurrence.

Accessories

2	HR040.15	ZERO Multipurpose Roofers Harness Kits (15m Rope Line)
1	HR048	ZERO Lockable Harness Equipment Cabinet (Large)

DESIGN CRITERIA



PROJECT: **5 CURRAN STREET, NORTH MELBOURNE – APARTMENTS**
PROJ REF NO: **20869**
REVISION NO: **EST39784**
PROJECT STAGE: **PLANNING STAGE**

DESIGN REVISION

Date	Project Stage	Project Issued By:	Written	Drawn	System Design By:
28/04/2022	Planning	MGS Architects		✓	Sayfa Group
20/05/2022	Planning	MGS Architects		✓	Sayfa Group

DESIGN NOTES

- Based on current regulations, SAYFA GROUP recommends fall protection to all fall edges.
- WORKSAFE classifies skylights as fall hazards, therefore the investment of skylight protectors is strongly recommended by SAYFA GROUP.
- System Design has been based on criteria provided by the project coordinator. Any changes made to the system design must be authorised by SAYFA GROUP prior to commencement of installation. Failure to do this may result in a non-compliant installation and possible litigation exposure.
- Any changes made to the system design must be authorised by SAYFA GROUP prior to commencement of installation. Failure to do this may result in a non-compliant installation and possible litigation exposure.

This Scope of Works is based on:

System design request form based on Drawing Nos: A0204 Rev. P7 and A0205 Rev. T1

Methods of Access & Fall Protection is based on the following:

- ACCESS - Existing roof access in place
- ACCESS - Fixed rung type ladder(s)
- ACCESS - Fold down ladder through ceiling space to roof access hatch
- FALL PROTECTION - To all fall edges

AUSTRALIAN STANDARDS

Installation of proprietary Access & Fall Protection equipment must comply with the following:

- AS/NZS5532:2013 Manufacturing requirements for single point anchor point used for harness based work at height
AS/NZS1891.1:2009 Industrial fall arrest systems and devices/harnesses and ancillary equipment
AS/NZS1891.2:2001 Industrial fall arrest systems and devices/horizontal lifeline and rail systems
AS/NZS1891.3:1997 Industrial fall arrest systems and devices/fall arrest devices
AS/NZS1891.4:2009 Industrial fall arrest systems and devices/selection, use and maintenance
AS1657:2018 Fixed platforms, walkways, stairways and ladders/design, construction, installation

PROJECT NOTES



PROJECT:	5 CURRAN STREET, NORTH MELBOURNE – APARTMENTS
PROJ REF NO:	20869
REVISION NO:	EST39784
PROJECT STAGE:	PLANNING STAGE

INSTALLATION NOTES

- Pricing for installation of equipment defined in this proposal must be confirmed with a recommended Sayfa Installer.
- Installation of Roof Access, Fall Protection and Abseil Systems must be carried out by a recommended Sayfa Installer who is competent and conversant with the relevant Australian Standards and Compliance Codes.
- Exact component locations, support structure integrity, suitability for use and the fixing method must be assessed and approved by a competent person prior to commencement of installation.
- Elevated work platforms or craneage may be required for safe installation of the system.

CERTIFICATION NOTES

- On completion of installation, certification must be carried out by a recommended **Sayfa Installer** in accordance with Sayfa's installation guidelines.
- A System Handover Manual must be provided on completion of installation of Roof Access, Fall Protection and Abseil Systems. This manual will include the following:
 - Product Specifications
 - As-built layout plan
 - Installation Certification
 - System Operating Instructions
 - Annual Recertification Schedule
 - Product Warranties
 - Product Certificate
 - Working at heights management template

SAFE USE AND MAINTENANCE NOTES

- Fall Arrest systems and equipment must only be operated by competent persons trained to use and maintain fall arrest equipment.
- All Fall Arrest and Abseil equipment requires periodical maintenance by a competent person in accordance with Sayfa's specifications and the requirement of Australian Standard AS/NZS1891.4.2009 (Section 9), and AS/NZS4488.
- If you are unsure or require help regarding this proposal, you can contact our help line on **1300 301 755** or EMAIL info@sayfa.com.au
- Any attempt to change the design during installation renders both our compliance and responsibility null and void. The person who authorises any changes holds himself responsible for all actions and decisions made.

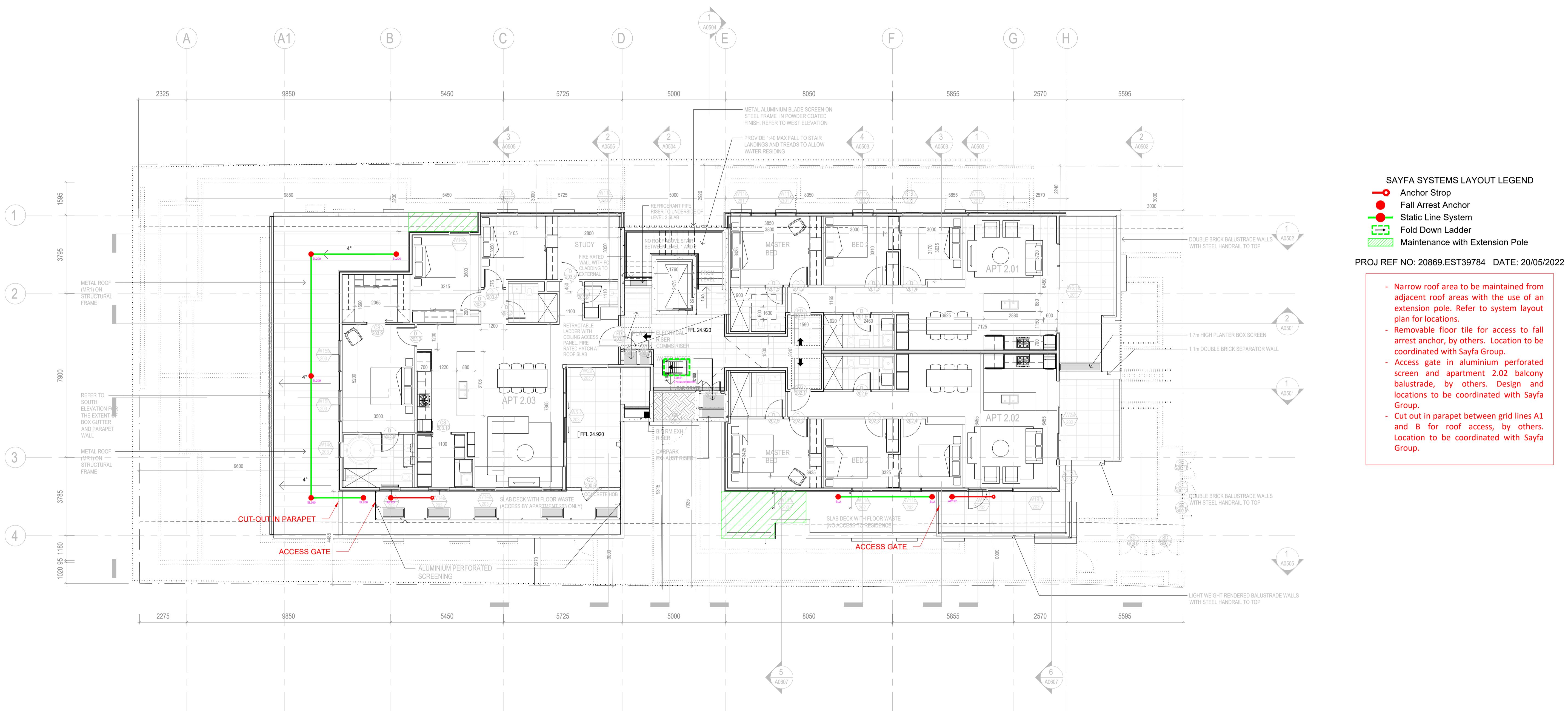
Project Co-ordinators:

Architect:

MGS ARCHITECTS

Tel No:

03 9291 9946



1 LEVEL 2
A0401 SCALE: 1:100 @

REVISIONS	DATE	DESCRIPTION
P1	16.09.2021	PRELIMINARY
P2	08.10.2021	PRELIMINARY, FOR COORDINATION
P3	11.10.2021	PRELIMINARY, FOR COORDINATION
P4	26.10.2021	PRELIMINARY, FOR COORDINATION
P5	03.11.2021	PRELIMINARY, FOR COORDINATION
P6	05.11.2021	PRELIMINARY, FOR COORDINATION
P7	28.03.2022	REVISED DESIGN DEVELOPMENT SET

PROJECT:
5 CURRAN STREET
NORTH MELBOURNE 3051 VIC
FOR CONTRACT OF SALES

PROJECT NUMBER
19124

CLIENT
mainstone
PROPERTY DEVELOPMENT

DRAWING TITLE
SECOND FLOOR PLAN

DRAWN BY
MGS

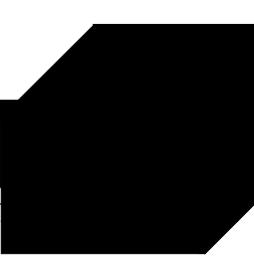
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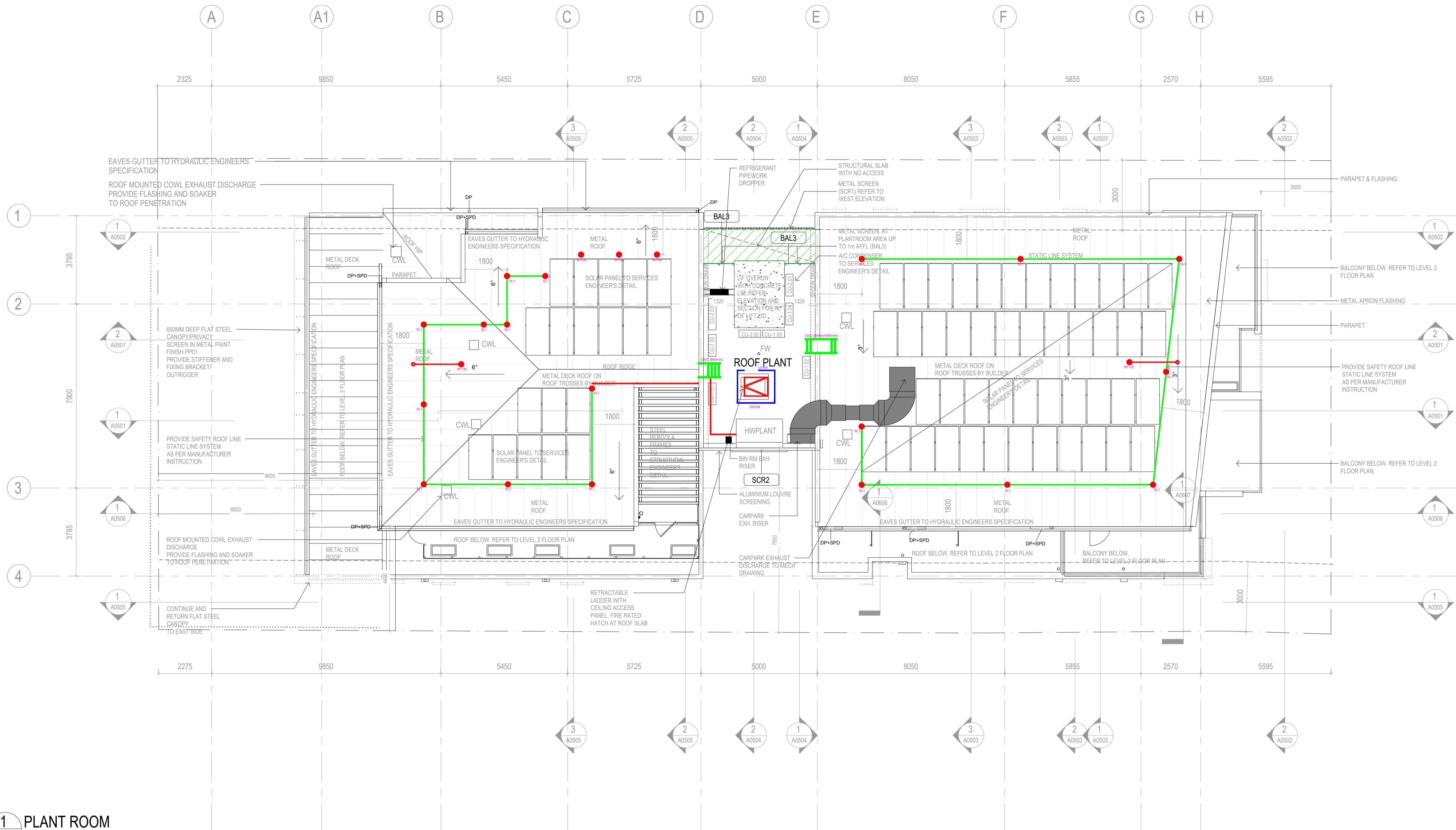
DATE

SCALE
1:100 @ A1 SIZE
@ A3 SIZE

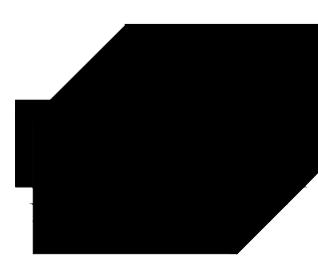
DRAWING NUMBER
A0204

REVISION
P7





- PROJ REF NO: 20869.EST39784 DATE: 20/05/2022
- Narrow roof area to be maintained from adjacent roof areas with the use of an extension pole. Refer to system layout plan for locations.
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Appendix 05: Automated Swing Gate and Garage Doors

Automatic Swing Door System

ASSA ABLOY Integra

ASSA ABLOY

ASSA ABLOY Entrance Systems

The global leader in
door opening solutions



ASSA ABLOY Integra swing door system is the perfect choice where high performance and superior safety is of extra importance.

Energy-efficiency

ASSA ABLOY automated door systems are sustainable by nature and automatically convenient as they ensure opening only when needed to pass, eliminating unnecessary air infiltration and keeping climate zones separate. The innovative electronics in the ASSA ABLOY Integra swing door system ensure minimal energy consumption for optimal door performance.

Safety

The ASSA ABLOY Integra is safe to use for all, despite age and physical ability. In case of an obstruction by a person or object, the obstruction control ensures stop on stall and reverse operation. Our round back edge profile ensures finger trap protection.

Furthermore, the system is fully compliant with European standards.

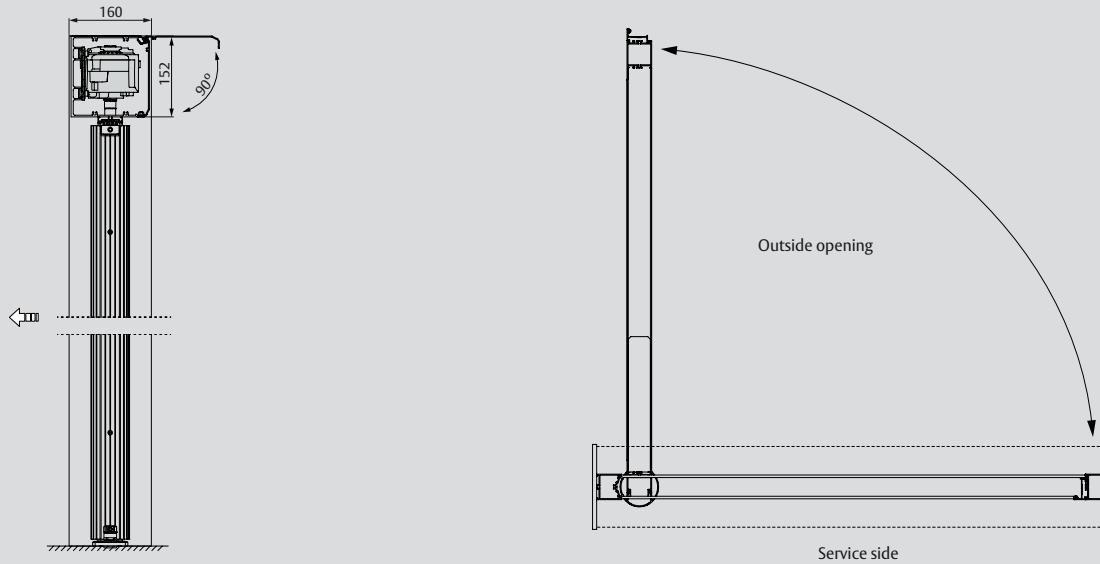
Technical specifications

Power supply	100-240 VAC +10/-15%, 50/60 Hz, mains fuse max 10A (building installation)
Power consumption	Max. 300 W
Auxiliary voltage	24 V DC, max. 700 mA
Monitored battery backup unit	24 V DC
Electromechanical locking connection	12 V DC, max. 1200 mA or 24 V DC, max. 600 mA
Ambient temperature	-20 °C to +45 °C
Relative humidity (non condensing)	95%
Recommended max. door weight and door width Inertia J = Door Weight x (door width) ² /3 Concealed = 80 kgm ²	
Class of protection IP20 - To be installed internally or externally with suitable weather protection	
Comply with	EN 16005

Convenience

An entrance equipped with a ASSA ABLOY Integra swing door system is always accessible with the optional battery backup. The system also monitors the battery for power and function, and gives an electronic indication if it is not working properly and needs to be replaced.

The operator is truly reliable during all weather conditions as it is not affected by stack pressure and wind load when opening and/or closing. Also, for your convenience, safety and quick exit, the system can easily be manually opened when needed; despite extended closing torque, thanks to sensor detection ensuring lowest manual opening force.



Security

The ASSA ABLOY Integra's intelligent locking features are designed for your peace of mind. For example, double doors are precisely controlled to prevent jamming and increase security. The system can also sense when the door has not closed completely and will prompt the door to open again and close fully, even under heavy wind load and stack pressure.

Aesthetics

The ASSA ABLOY Integra swing door system will be equipped with SW200 Overhead concealed operator. The system will be providing an aesthetic look as the drive unit is connected direct to the top of the door showing no arm system.

Models

ASSA ABLOY Integra-L – Left hand door; a complete unit consisting of jamb/header assembly and door leaf

ASSA ABLOY Integra-R – Right hand door; a complete unit consisting of jamb/header assembly and door leaf

ASSA ABLOY Integra-2 – Double doors; a complete unit consisting of jamb/header assembly and door leaves

Sizes

Type	FW min	FW max	FH min	FH max
ASSA ABLOY Integra-L	1000	1250	2100	2600
ASSA ABLOY Integra-R	1000	1250	2100	2600
ASSA ABLOY Integra-2	1250	2500	2100	2600

Clear opening width (COW) =
FW-197.5 (ASSA ABLOY Integra-L/R) and
FW-257 (ASSA ABLOY Integra-2)

All dimensions in millimetres

Standard equipment

Control unit CU-200 with EXU-SI and EXU-SA included
- with possibility to connect manual and automatic activation units, position switches, el. locks, presence sensors, battery, kill, open/close etc.

Push and go

Power assist

Sync cable – Used on double doors to select the opening and closing order

Swing door operator ASSA ABLOY SW200

Accessories and Options

Programme selectors

Battery backup unit

Impulse and presence detection sensors

Midrail (70 or 150 mm)

Bottom rail (178mm)

Top rail (174 mm)

Mechanical hook bolt lock on the door leaf

Electromechanical lock

Flush bolt lock

Glass types

- 6, 8 or 10 mm laminated

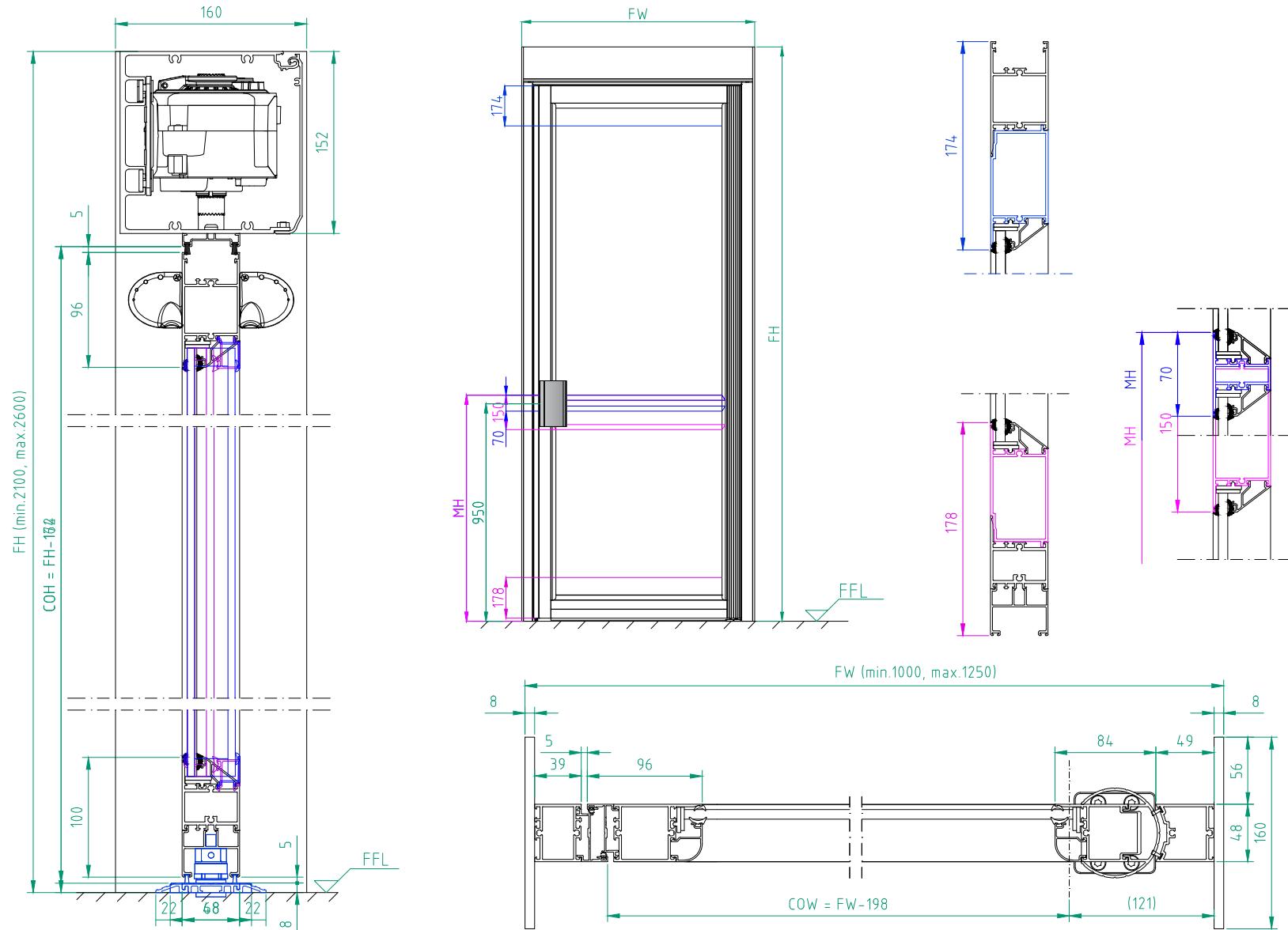
- 22 or 40 mm insulated

Infill panel

Combination of glass and infill panel

Threshold

This equipment should be installed, regularly inspected, maintained and serviced by trained and authorized personnel. Preventive maintenance plans are highly recommended for a proper and safe operation. Talk to your ASSA ABLOY Entrance Systems representative to learn more about our service offering!



State when ordering

FW=.....mm
FH=.....mm
COW=.....mm
COH=.....mm

Options see layers

- Without threshold
- With threshold
- Midrail 70, MH=.....mm
- Midrail 150, MH=.....mm
- Bottom rail
- Top rail

Surface treatment

- Silver anodized
- Special anodized.....
- RAL.....
- Special powder coating

Glass

- 6 mm laminated glass
- 8 mm laminated glass
- 10 mm laminated glass
- 22 mm insulated glass
- 40 mm insulated glass

Infill panel (alternative to glass)

- 8 mm
- 22 mm
- 40 mm

Combination of glass and infill panel

Note: Midrail must be selected and the infill panel will be placed below the midrail. Choose glass type above. The thickness of the infill panel will correspond with the glass thickness, 6 or 10 mm glass will generate 8 mm panel

Lock

- Lock Euro cylinder
- 2xLock Euro cylinder
- Lock ASSA
- Lock Adams rite

Handle

- Handle, inside
- Handle, outside
- No handle

Customer:

Door id:

Project No:

Ref:

Date:

Sign:

Automatic Swing Door system
ASSA ABLOY Integra
Single Right
Art. No. 1016269

ASSA ABLOY

3.0 1016461-en



External operator for swing gates of up to
3 - 4 - 5 - 7 m
10 - 13 - 16 - 23 ft
long gate leaves



Gate operators tested
in compliance with
European
Standards on the
subject of impact
force.



Axo

**When reliability is a matter
of principle.**

Axo is the new electromechanical operator designed for long life and utmost safety even with very large gates. The impact force developed by the gate movement conforms to current European standards.



Axo 230V 24V

Came dependability and experience at the touch of your fingertips

The gearmotor has bearing semi-shells in die-cast aluminium of excellent quality and silent running. Axo is equipped with adjustable mechanical stop to memorize the gate run. Available also in the 24V version with the simplified connection system with only one single three-wired cable and with the innovative 230V technology, which gives very efficient and simple control of slowing down movements.



A design to serve technology.
Came innovation has designed an excellent versatile bearing structure. The two stems in the versions up to 3 and 7 m per leaf, engage smoothly into a single semishell structure.



Encoder management.
The slow-down speed of the 230V A.C. gearmotor is also controlled by encoder technology which keeps the generated force under control as well.



En Tested safety.
Axo technology conforms to the current European standards relative to impact force.

True comfort.

The electronics of the 24V version can be equipped with a device that, in the event of a black-out, activates the emergency back-up function that uses batteries. In industrial and other intensive use settings, Ati can also be connected to an emergency generator.

EN12445 - EN12453 compliant.

The dedicated panels (ZM3E and ZLJ24) constantly control the gate leaves' movement allowing for safe thrust, and is EU standard compliant.



Electromechanical is better.

Axo is an electromechanical operator in line with Came tradition. It is designed to always work, even in the severest of climatic conditions.

Choose among 6 models.

The Axo range features 6 different models each thought up to meet every need in terms of use and application.

New technology inside.

The revolutionary double-threaded worm-screw drastically reduces wear on the axle box.

The 230V electronics

Besides the usual control and safety functions, Axo's new 230V electronics provide certain details that allow for total control of the operator and optimal working conditions of the same. Here are some examples:

- > **Total control of the gate from the transmitter**
control including the possibility of immediately stopping the movement of the gate leaves.
- > **Possibility of programming the gate to partially open**
Ideal for all entrances that don't have a specific pedestrian gate.
- > **System's active safety-devices test**
performed prior to each gate opening and closing cycle.

Axo is EN TESTED



When total comfort, performance and safety are needed, Axo's technology elevates the potential to the highest standards, meaning:

> Controlled impact forces

Thanks to laboratory testing carried out on a door sample, all versions of Axo are European standard EN12445 and EN12453 compliant, in terms of impact forces.

> No more blackouts

Axo's 24V electronics automatically detect any absence of power and immediately activate the emergency back-up batteries, to always open and close the gate (optional).

> Frequent passages

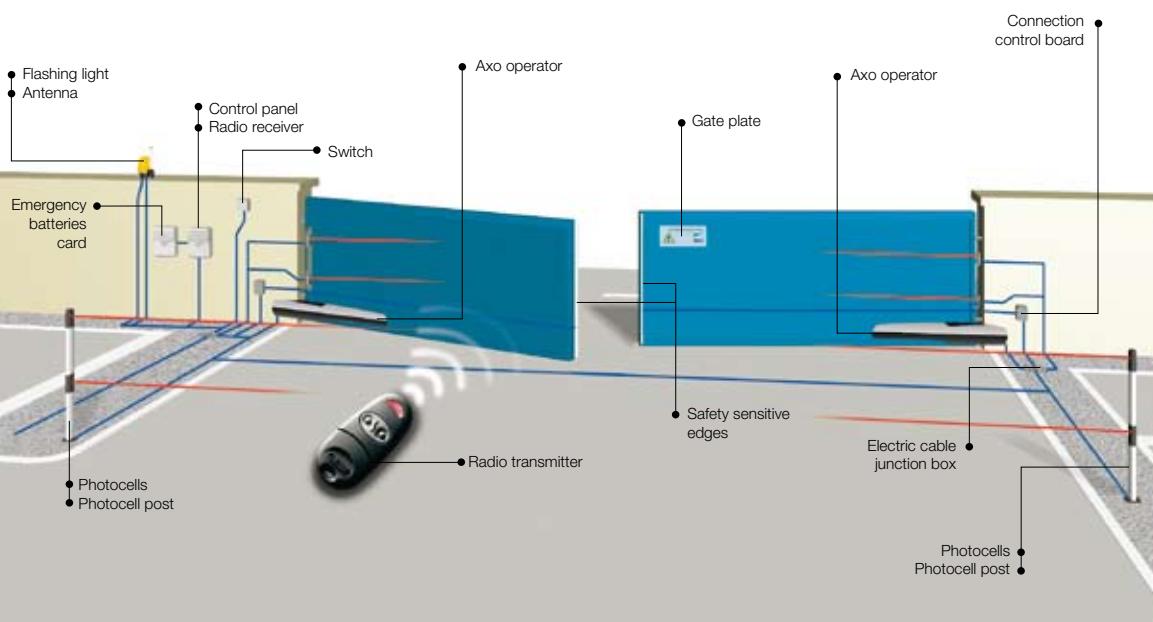
The low-voltage gearmotor guarantees functioning even in the harshest of working conditions, such as in apartment blocks and industrial facilities.

> Obstacle detection

A special electronic circuit constantly sweeps for any obstacles to the gate leaves, and if needed stops or inverts the direction of motion.



Standard installation



In the event a careful analysis of the automated gate's risks were to require it, the use of sensitive safety infrared or contact edges becomes indispensable. In the event of panel gates, and very windy conditions, we suggest installing the 230V version.



For its quality processes management Came Cancelli Automatici is ISO 9001:2000 certified, and for its environmental management it is ISO 14001 certified. Came designs and manufactures entirely in Italy.

ISO 14001
TÜV
SÜD
ISO 9001



The range

External 230V A.C. operators and control panel

AX302304	Self-locking operator for gate leaves up to 3 m / 10 ft. (Opening time 90°: 20s)
AX402306	Self-locking operator for gate leaves up to 4 m / 13 ft. (Opening time 90°: 28s)
AX412306	Reversible operator for gate leaves up to 4 m / 16 ft. (Opening time 90°: 28s)
AX71230	Reversible operator for gate leaves up to 7 m / 23 ft. (Opening time 90°: 40s)
ZM3E	Multifunction control panel with signalling display, self-diagnosis of safety devices and built-in radio decoding.

24V D.C. external operators and control panel

AX3024	Self-locking operator for gate leaves up to 3 m / 10 ft. (Opening time 90°: adjustable)
AX5024	Self-locking operator for gate leaves up to 5 m / 16 ft. (Opening time 90°: adjustable)
ZLJ24	Control panel for two-leaf swing gates with built-in radio decoder.



Accessories

LB180	Card for connecting two 12V - 1.2Ah emergency batteries with rack
--------------	---



LOCK81

Electric lock with single cylinder.

LOCK82

Electric lock with double cylinder.

Technical features

Type	AX302304	AX402306-AX412306	AX71230	AX3024	AX5024
Protection rating	IP44	IP44	IP44	IP44	IP44
Power supply (V) (50/60Hz)	230 A.C.	230 A.C.	230 A.C.	230 A.C.	230 A.C.
Motor power supply (V)	230 A.C. 50/60 Hz	230 A.C. 50/60 Hz	230 A.C. 50/60 Hz	24 D.C.	24 D.C.
Current draw (A)	1,5	1,5	1,5	10 Max	10 Max
Power (W)	175	175	175	120	120
90° opening time (s)	20	28	40	ADJUSTABLE	ADJUSTABLE
Duty cycle (%)	50	30	30	INTENSIVE USE	INTENSIVE USE
Thrust (N)	500 ÷ 4500	500 ÷ 4500	500 ÷ 4500	500 ÷ 4500	500 ÷ 4500
Operating temperature (°C/°F)			-20 - +55 / -4 - +131		
Motor's thermo-protection (°C/F)	150 / 302	150 / 302	150 / 302	-	-
120V A.C. - 60 Hz PRODUCTS, PLEASE CHECK OUR PRICE LIST				230V A.C.	24V D.C.

Limits to use

Model	AX302304 - AX3024			
Max width of gate leaf (m/ft)	2/6.56	2.5/ 8.20	3/10	
Max weight of gate leaf (Kg/lb)	800/1.770	600/1.330	500/1.102	
Model	AX402306 - AX412306			
Max width of gate leaf (m/ft)	2/6.56	2.5/ 8.20	3/10	4*/13.12
Max weight of gate leaf (Kg/lb)	800/1.770	600/1.330	500/1.100	300/661
Model	AX5024			
Max width of gate leaf (m/ft)	2/6.56	2.5/ 8.20	3/10	4*/13.12
Max weight of gate leaf (Kg/lb)	1000/2.204	800/1.770	700/1.543	500/1.100
Model	AX71230			
Max width of gate leaf (m/ft)	2/6.56	2.5/ 8.20	3/10	4*/13.12
Max weight of gate leaf (Kg/lb)	1000/2.204	800/1.770	700/1.543	500/1.100
				5*/16.40
				6° °/19.68
				7° °/22.96
				350/772
				300/661

● 230V A.C. ● 24V D.C.

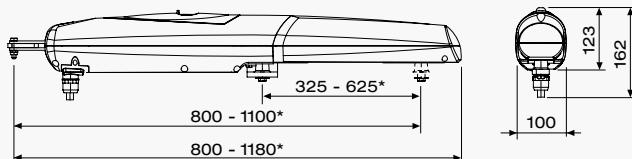
Note:

* If it is larger than 3 meters, the blocking electric lock must be installed on the leaf.

◦ If it is larger than 5 meters, panels must not be fitted.

Attention must be paid when there is strong wind with the reversible versions if the gate is open as it could slam shut.

Dimensions



* AX71230 - AX5024

© Came KDEP#CEN79A3S10409 - 4/09

Came
cancelli automatici
S.p.A.

via Martiri della Libertà, 15
31030 Dosson di Casier
Treviso - ITALY
www.came.com - info@came.it



operator
for
swing gates

EXTERNAL
OPERATOR FOR
SMALL AND
MEDIUM SWING
GATES



CAME



Stylo

**Small in size
but great in
performance**



Narrow, compact with an exclusive design, Stylo is the new solution for small and medium size swing gates. Easy to install even on pre-existing gates or without any prior preparation, and on very narrow pillars. The best of Came technology and safety concentrated in just a few centimetres.



Reasons to choose **Stylo**

MAXIMUM POWER IN JUST 8 CM.

Easy to install on pre-existing or new gates, Stylo is ideal to automate pedestrian or driveway gates up to 1.8 m per leaf.

Tested in compliance with European regulations relative to impact force, it can be installed on small and medium sized pillars, from just 10 cm wide.

It is easily installed without any hidden costs, making the installer's work easier and speeding up the issue of the Compliance Certification.

STRONG POINTS:

Faster work **for the installer** with no need for any structural work. Stylo occupies a minimum amount of space and is very flexible and adaptable to the majority of small and medium size gates: it is easily installed even on narrow pillars without any masonry work required. The exclusive EN Tested technology guarantees high safety standards in compliance to the strict European regulations. This enables professional installers to streamline certification procedures, offering a totally safe automation.

Users are guaranteed maximum comfort and reliability, and are able to automate their gates in complete safety without any invasive or costly jobs to perform, even in unsuitable conditions. The appearance of the gate remains unchanged and its movements are always modern and efficient.

ARTICULATED OR STRAIGHT, PERFECT RESULTS.

Two different types of arm are available depending on the type of application. Stylo is available with an articulated or straight "slide" transmission arm. Came suggests this alternative where there is very little space available, especially against lateral walls and fences.

STYLO, THE SIMPLE
MODERN AUTOMATION
FOR GATES.



External motor that is ideal for even small pillars.

WITH STYLO, RESTRICTED SPACES ARE NO LONGER A PROBLEM.



Stylo electronics and technology

In addition to its standard command and safety functions, Stylo's new electronics bring numerous new features that enable total control of the automation and unique optimisation of the service.

Display to view function programming.

Warning **leds** built-into the control board provide quick diagnosis of the system.

Self-diagnosing of safety devices.

ENCODER-based **electronics manage** for obstacle detection.

ENCODER-based **endstop control** to easily management movement and slow-down phases.

Simplified installation: requires only one four-conductor cable to handle power source and slow-downs.

Memorisation of the transmitters using different codes (up to 250 users).

INTENSIVE USE, BLACKOUTS GOODBYE.

The 24 V motor is perfect for intensive use conditions. Not only: in case of blackouts Stylo's ZL92 electronics automatically detect the power cut and activate the auxiliary, optional emergency batteries, which always guarantee that the gate can be opened or closed.

EN TESTED: NO COMPROMISE WHEN IT COMES TO SAFETY.

Stylo is EN Tested automation, that is, it has been manufactured and tested according to the rigorous criteria set out by current European Regulations concerning impact force. Thanks to this, the device can readily be certified on site by installers.

Essentially, the electric lock incorporated in the motor guarantees safe closing and can only be released using the customised key.

Stylo also has an additional safety system which monitors gate-leaf movement via the ENCODER electronics (Hall sensor and polarised magnet).

Any contact with possible obstacles, immediately inverts the direction of movement.

MADE IN ITALY, MADE IN CAME.

The 100% Made in Italy originality mark testifies that Stylo, like the rest of the Came product range, stems from a quality manufacturing process, engineered to generate technologically reliable and efficient products. These are tested for wear and tear for an equivalent period of 10 to 15 years of intense activity. They are also tested for extreme temperature resistance (lows of -40°C to highs of +80°C). Specific tests also check how the device functions with any electromagnetic interference.

That is why, if properly installed, Stylo lasts longer and is problem-free even in severe weather conditions.

All this means authority and prestige to the installer, and safety and peace of mind to the user.



The Stylo range

24 V DC external operator and control panel - tested in compliance with EN 12453 - EN 12445

001STYLO-ME

Self-locking operator with encoder for gate leaves of up to 1.8 m / 6 ft.



002ZL92

Control panel for two-leaf swing gates with function programming display, self-diagnosing safety devices and built-in radio decoder

Accessories for: 002ZL92

002LB90

Card for connecting n. 2 12V – 1.2 Ah emergency batteries.



Accessories

001STYLO-BS

Articulated transmission arm.

001STYLO-BD

Straight transmission arm and slide guide.



Limits to use

MODEL	STYLO-ME		
Max width of gate leaf (m/ft)	1,8/6	1,293.9	0,8/2.6
Max weight of gate leaf (Kg/lb)	100/220	125/275	150/330
Max opening of gate leaf (°)		120 (with 001STYLO-BS) 135 (with 001STYLO-BD)	

● 24 V DC

Technical features

TYPE	STYLO-ME
Protection rating	IP54
Power supply (V - 50/60 Hz)	230 AC
Motor power supply (V - 50/60 Hz)	24 DC
Current draw (A)	5 MAX
Power (W)	48
90° opening time (s)	ADJUSTABLE
Duty cycle (%)	INTENSIVE USE
Thrust (Nm)	100
Operating temperature (°C)	-20 ÷ +55
Motor's thermo-protection (°C)	-

● 24 V DC

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or from came.com



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PRODUCTS



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Via Martiri della Libertà, 15
31030 Dossone di Casier
Treviso - Italy
Tel. (+39) 0422 4940
Fax (+39) 0422 4941
info@came.it
www.came.com



CAME

65

**65mm x 1.6mm
ALUMINIUM EXTRUSION**

EXTRUDED GUIDES: 50mm x 30mm

BEST FOR

Retail shop fronts, arcades, clubs and bars

An interlocking flat curtain designed to provide an attractive appearance. The door curtain can be slotted to create a different design or increase ventilation

OPENINGS

From 1000mm to 4000mm (High) and up to 6000mm (Wide) to a maximum of 16m²

ROLLER DRUM

148mm or 229mm spiral drum rotating on 34mm heavy duty shaft, fitted with high speed industrial bearing and helical springs

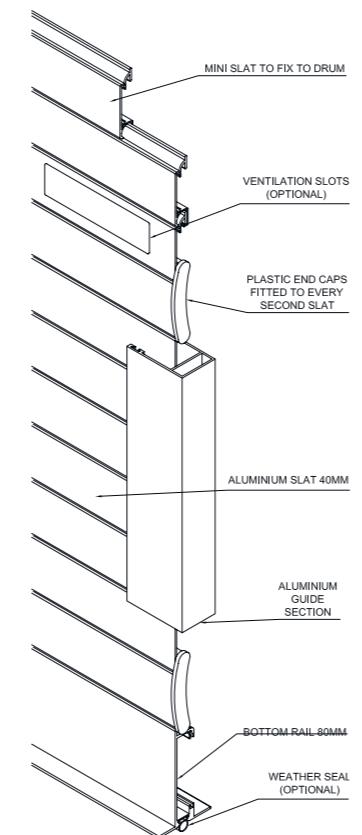
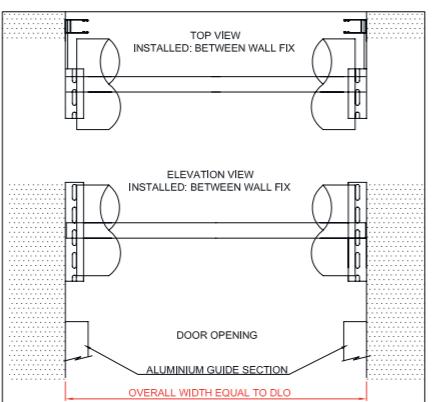
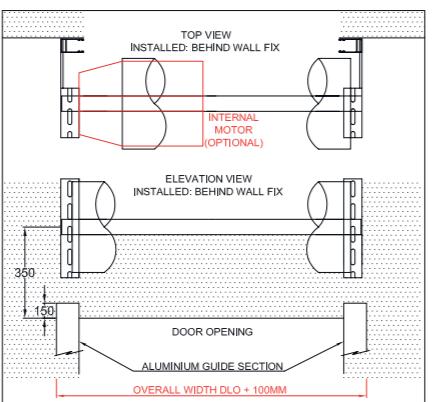
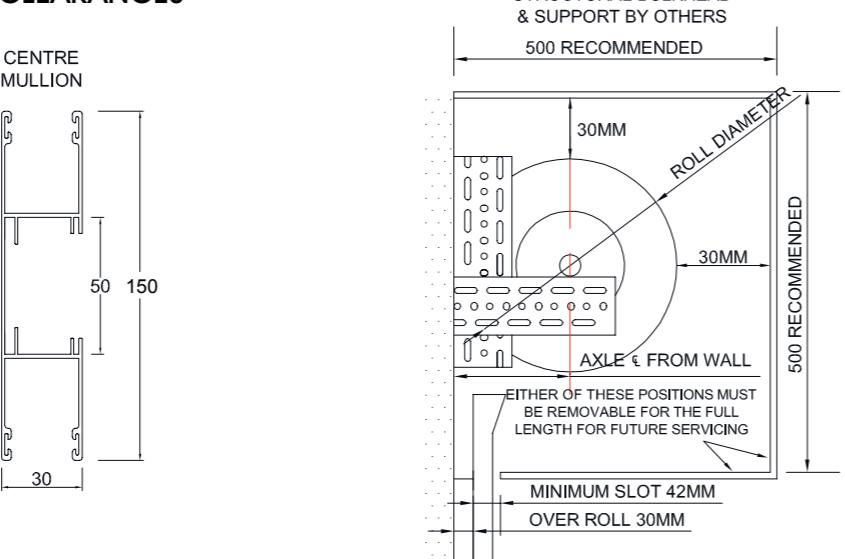
RECOMMENDED OPENER

Central Motor or ATA GDO-12 and Smart Phone Control Kit

DIMENSIONS

DOOR HEIGHT	DRUM 150MM		DRUM 229MM	
	ROLL DIAMETER	CENTRE AXLE FROM WALL	ROLL DIAMETER	CENTRE AXLE FROM WALL
900	260	140	305	162
1200	260	140	305	162
1500	260	140	320	170
1800	270	145	330	175
2100	270	145	350	185
2400	280	150	350	185
2700	300	160	360	190
3000	300	160	370	195
3300	340	180	380	200
3600	360	190	395	207

CLEARANCES



90

**90mm x 1.4mm
ALUMINIUM EXTRUSION**

EXTRUDED GUIDES: 100mm x 38mm

BEST FOR

Shop fronts, secure parking structures, arcades, clubs and bars.

Heavy duty aluminium extrusion curtain, ensures maximum security. Built using solid aluminium interlocking sections and can be slotted or perforated

OPENINGS

From 1000mm to 4500mm (High) and up to 8000mm (Wide)

ROLLER DRUM

165mm or 229mm spiral drum rotating on 34mm heavy duty shaft, fitted with high speed industrial bearing and helical springs

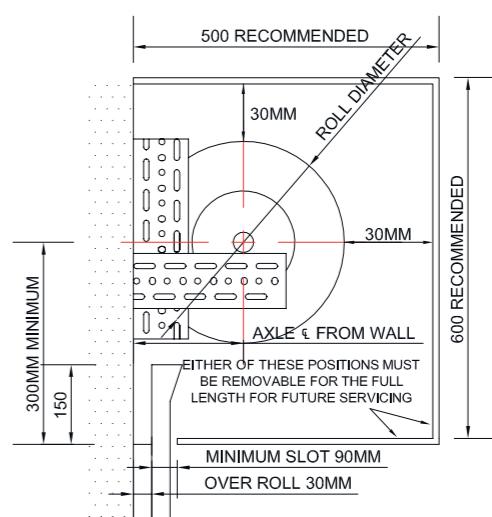
RECOMMENDED OPENER

Axess Pro 3300 and 3100 or GFA Springless

DIMENSIONS

DOOR HEIGHT	DRUM 150MM		DRUM 229MM	
	ROLL DIAMETER	CENTRE AXLE FROM WALL	ROLL DIAMETER	CENTRE AXLE FROM WALL
1000	260	140	325	173
1500	275	148	346	183
2000	325	173	356	188
2500	360	190	380	200
3000	360	190	392	206
3500	390	205	400	210
4000	410	215	420	220
4500	420	215	420	220

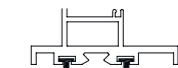
CLEARANCES



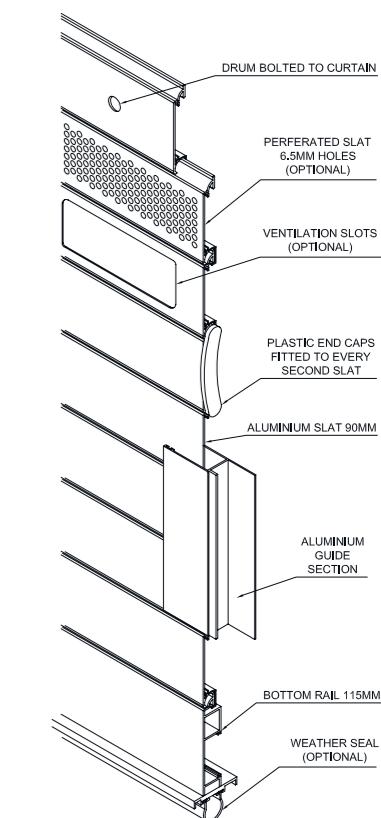
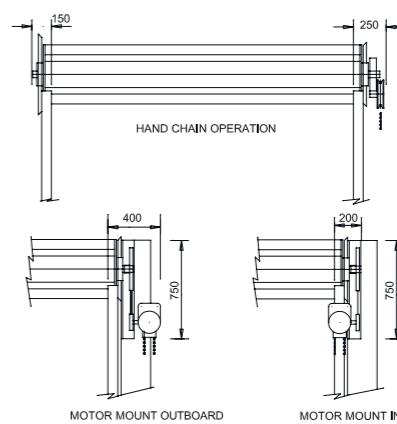
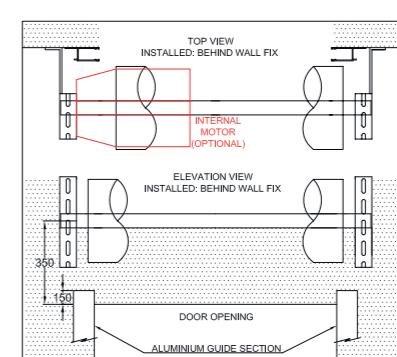
WEATHER SEAL OPTIONS



INTERNAL



EXTERNAL



Appendix 06: Screen / Louvre (SUNEX)

LOUVRE SYSTEM



LOUVRE SYSTEMS



PRODUCT
CATALOGUE



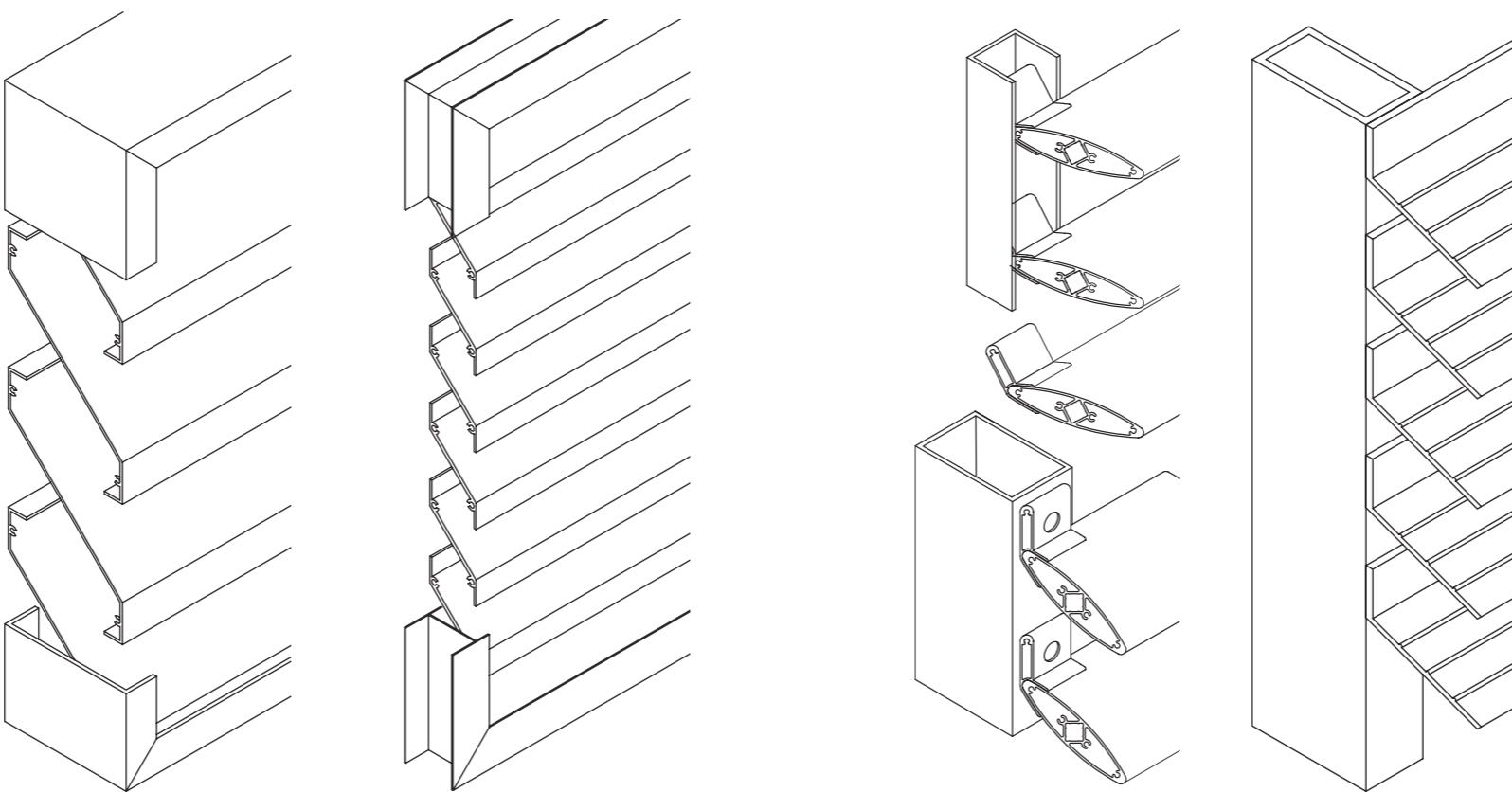
ULLRICH ALUMINIUM



We design and construct clever, robust Aluminium Louvre Systems

Ullrich Aluminium is Australia's premier supplier to the building industry and your partner for specialist extrusion solutions.

We specialise in the very best louvre solutions to suit your needs and application.



Quality / Service / Integrity

Ullrich Aluminium Louvre Systems

Where do you want to go >

[MODEL UL3101 & UL3102](#)

[MODEL UL1368](#)

[MODEL UL1089](#)

[MODEL UL1661](#)

[MODEL UL7173](#)

[MODEL UL1572B](#)

[MODEL UL3101B/UL3102B](#)

[MODEL UL5354V/UL5354H](#)

[TYPICAL FIXING DETAILS](#)

more information

View more of our extensive range on our website
www.ulrich.com.au

MODEL UL3101B/UL3102B

MODEL

UL3101B & UL3102B

APPLICATION

General ventilation and screening not suitable for heavy rain areas

MATERIAL

All blades are extruded from 6000 series aluminium alloy.
All screws and rivets are stainless steel.

FINISH

Louvre components can be supplied in either mill, anodised or powder-coated finish.

SIZES

Can be manufactured to suit opening up to 6000mm high x 2000mm wide. Width can be increased by adding stiffener bar.
(See fabrication drawing)

TO SPECIFY

Louvres shall be Ullrich Aluminium model UL3101B or UL3102B complete with bird screen (as required), blade pitches to suit opening.

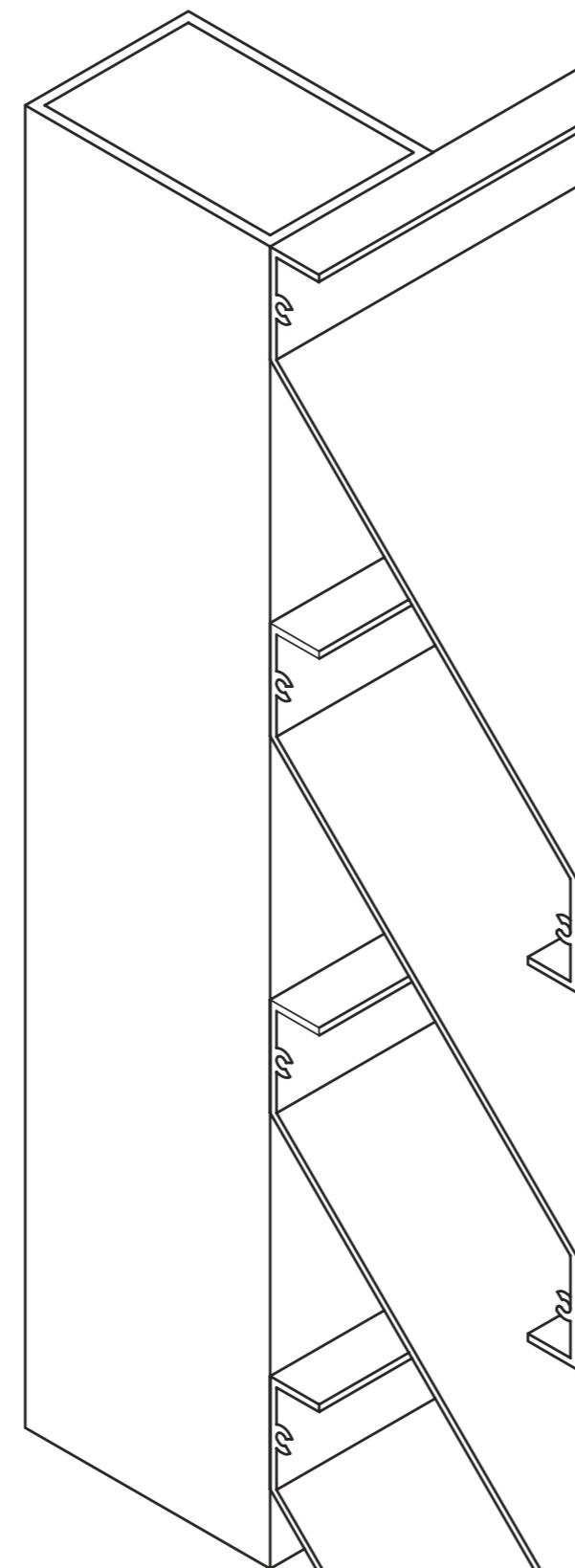
Finishing - see above.

Installation shall be as per manufacturers recommendations.

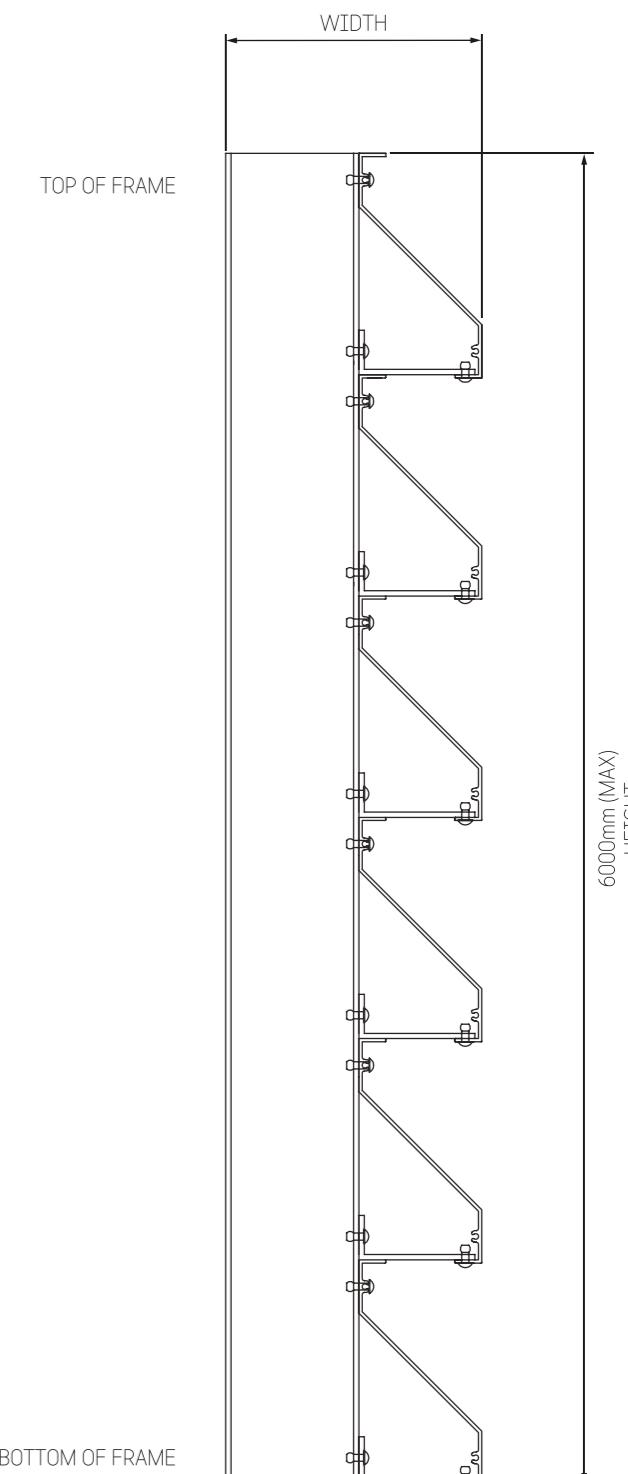
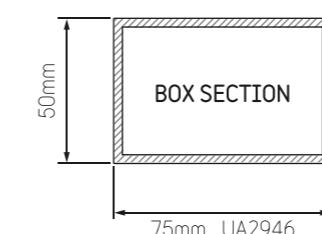
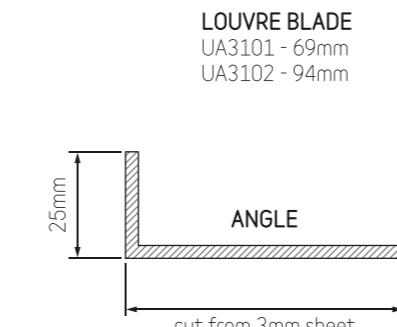
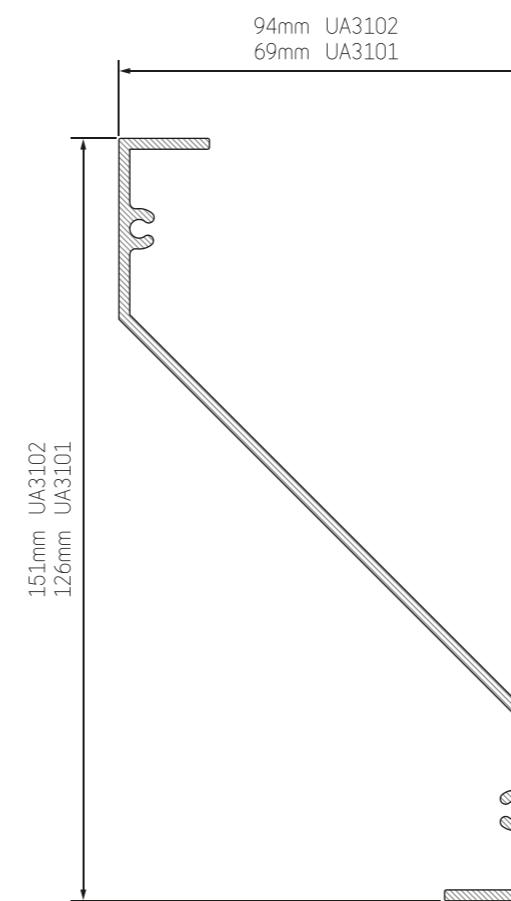
- For typical fixing details see page 21

FREE AIR

UL3101B = 31%
UL3102B = 42%



MODEL UL3101B/UL3102B



NOTE

- > Pitch can be varied to suit height
- > Louvre blade can either be screw fixed or riveted
- > 2000mm max width
- > Width can be increased by using stiffener bar
See fabrication drawings.

MODEL UL5354V/UL5354H

MODEL

UL5354V & UL5354H

APPLICATION

Vertical or horizontal sunscreen commercial buildings, hospitals and covered paths.

MATERIAL

All blades are extruded from 6000 series aluminium alloy.

All screws and rivets are stainless steel.

FINISH

Louvre components can be supplied in either mill, anodised or powder-coated finish.

SIZES

Can be manufactured to suit opening up to 6000mm high x 2000mm wide.

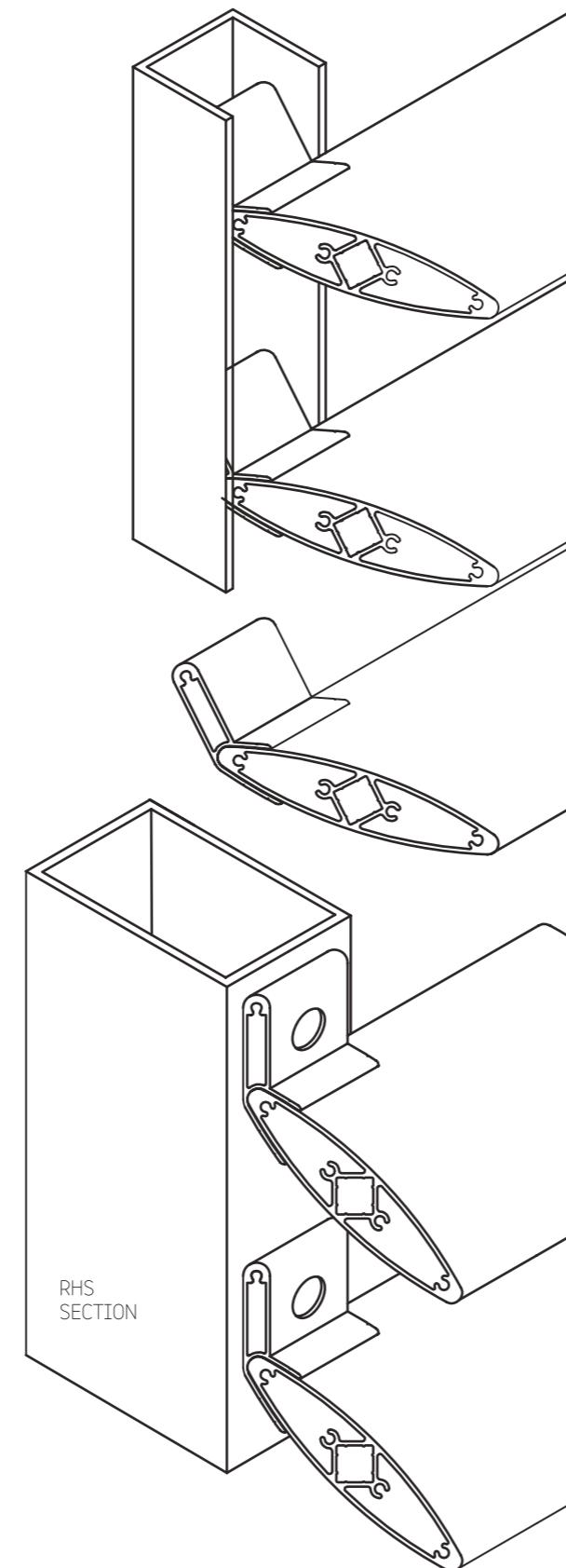
TO SPECIFY

Louvres shall be Ullrich Aluminium model UL5354H or UL5354V, blade pitches to suit opening.

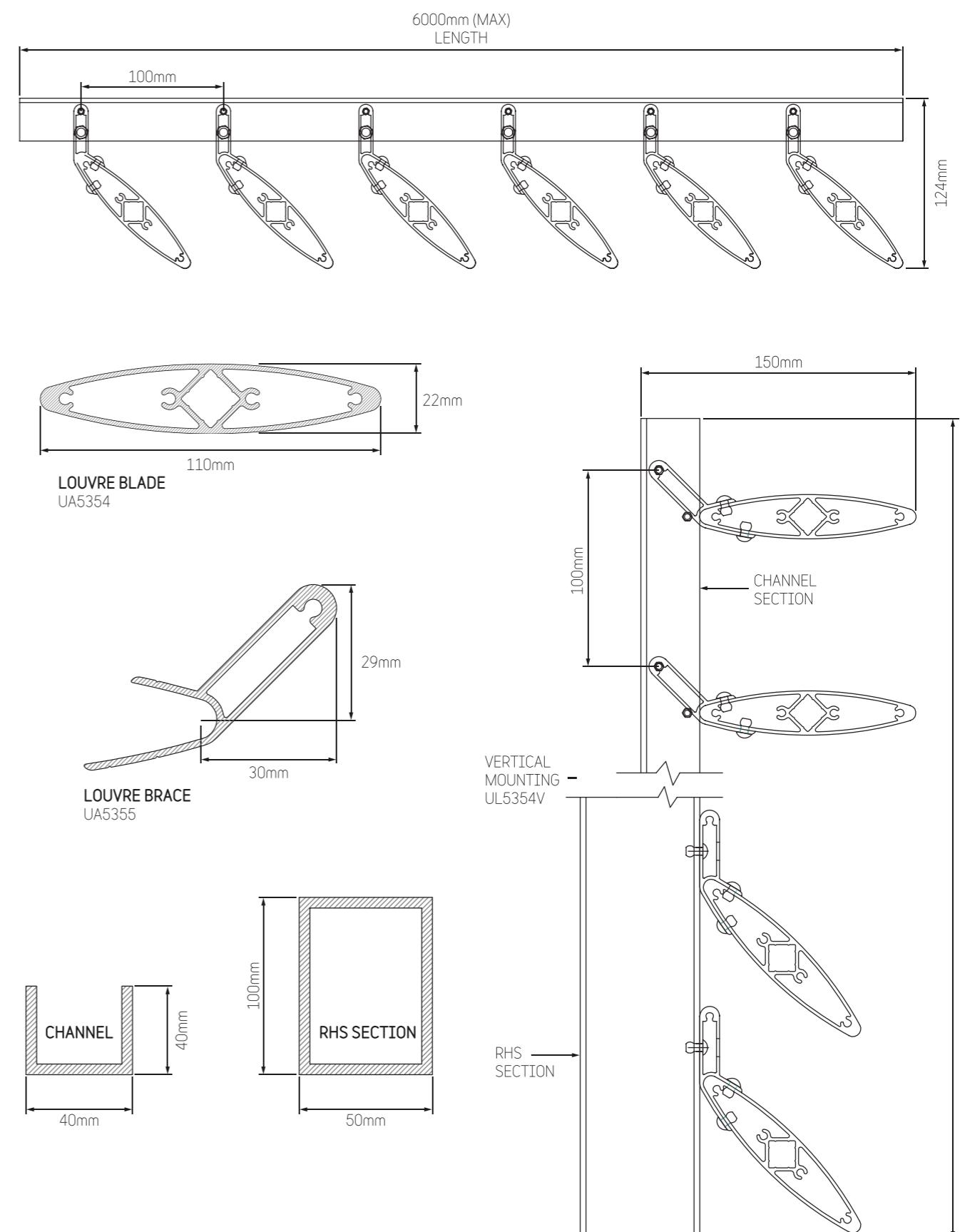
Finishing - see above.

Installation shall be as per manufacturers recommendations.

- For typical fixing details see page 21



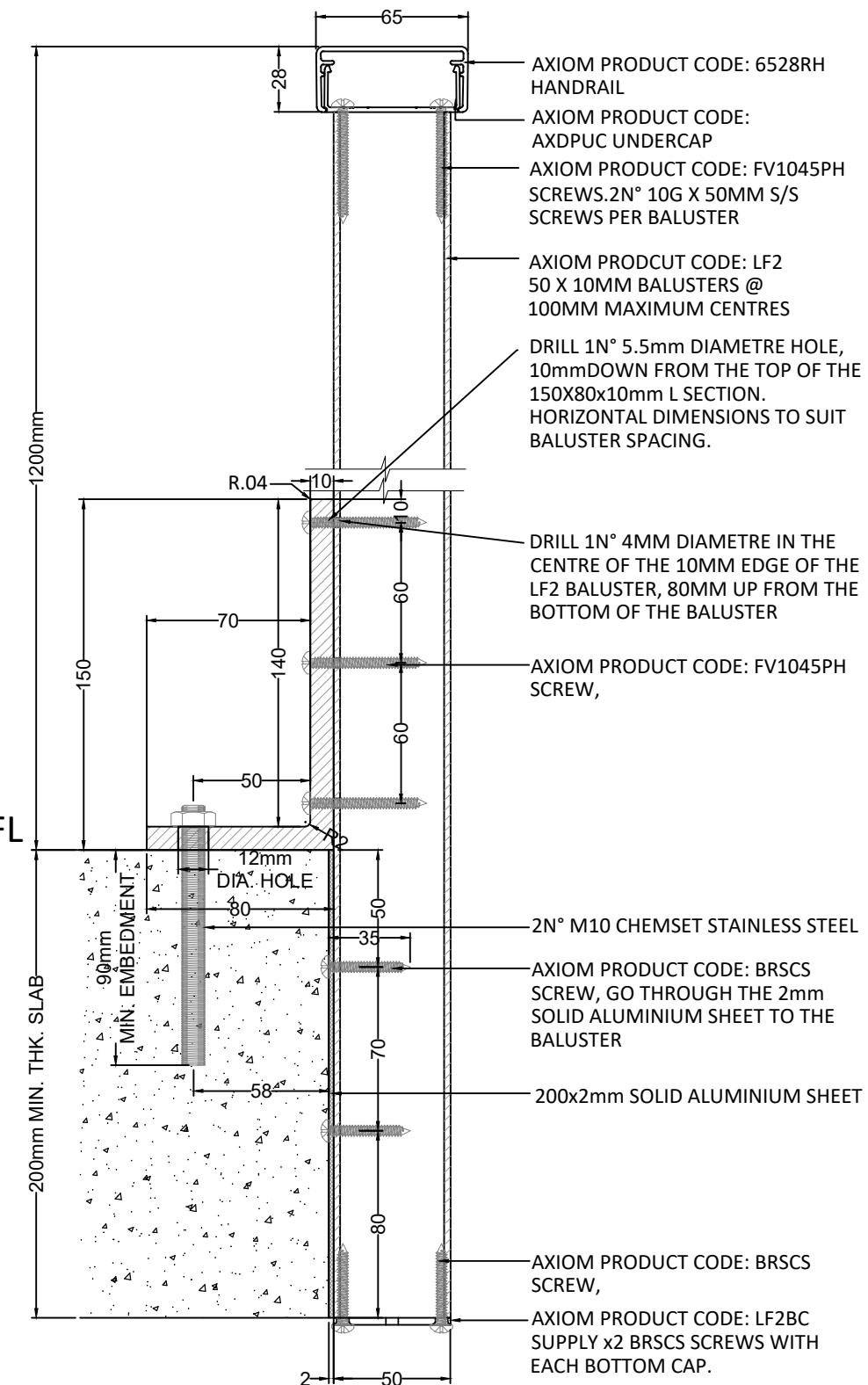
MODEL UL5354V/UL5354H



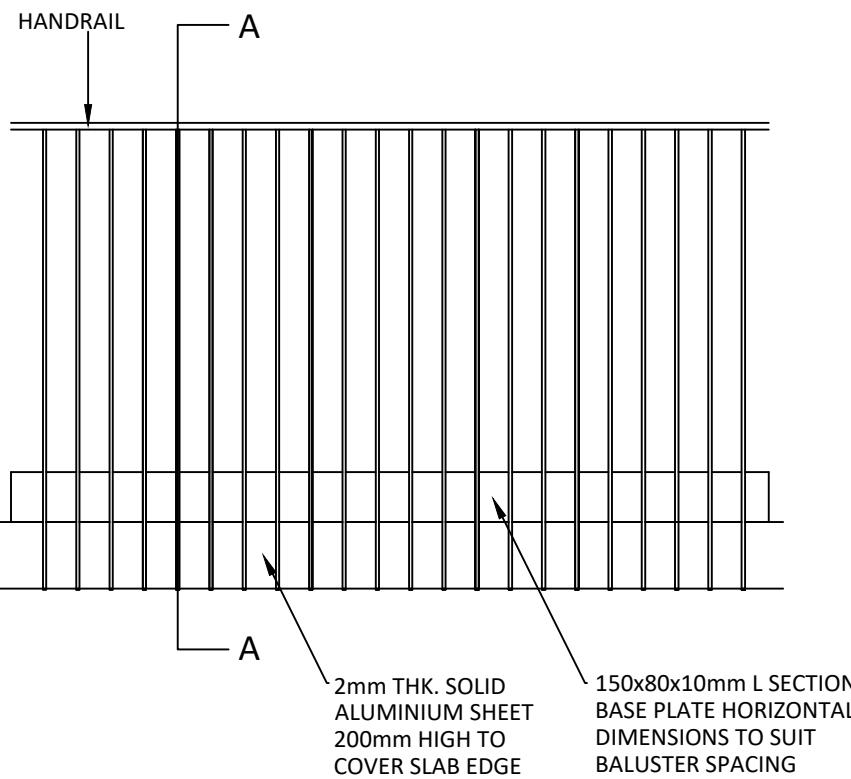
NOTE

- > Pitch can be varied to suit height
- > Louvre blade can either be screw fixed or riveted
- > 2000mm max width

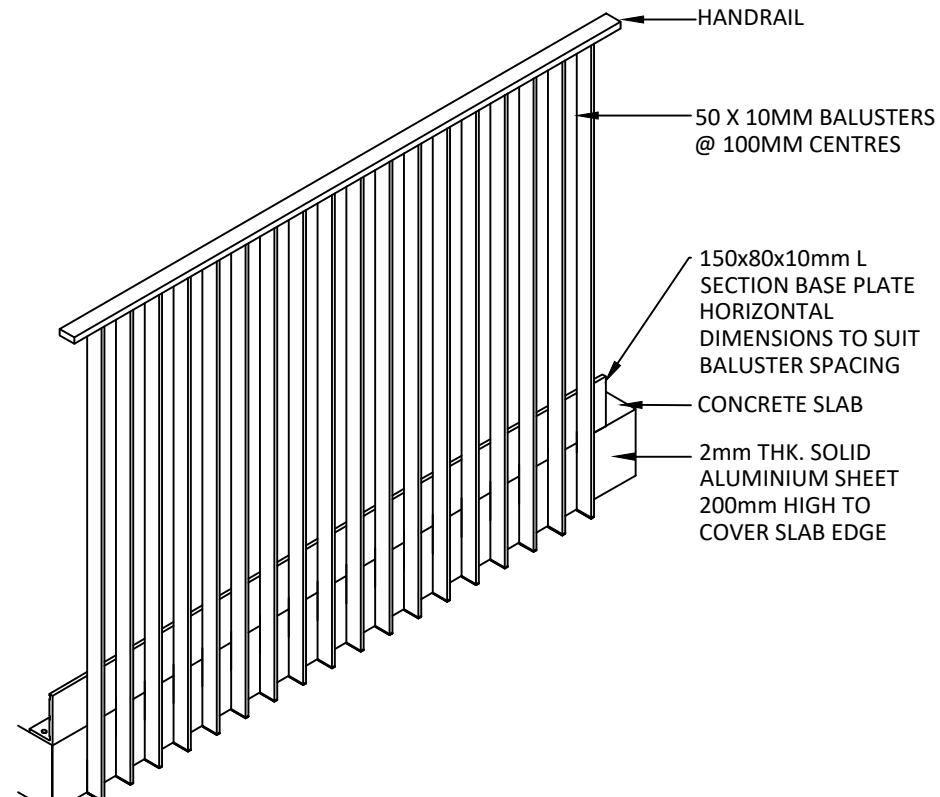
Appendix 07: Balustrade



SECTION A-A
SCALE: 1:2



ELEVATION
SCALE: 1:16



ISOMETRIC VIEW
SCALE: 1:16

- NOTES:**
1. N/A
 2. ELEVATIONS ARE FOR ILLUSTRATION PURPOSE ONLY. DO NOT USE ELEVATION DRAWINGS FOR MATERIAL ORDERING.
 3. N/A
 4. N/A
 5. CHANNEL TO FULLY BEAR HARD ON CONCRETE, FULL LENGTH, PACK HARD WITH NON SHRINK GROUT AS REQUIRED.
 6. **HANDRAIL JOINING:**
 - a. THE HANDRAIL MUST BE IN ONE CONTINUOUS LENGTH IF THE STRAIGHT RUN OF BALUSTRADE IS MADE UP FROM TWO PANELS OR LESS.
 - b. IF THE STRAIGHT RUN OF BALUSTRADE HAS MORE THAN THREE PANELS THAT MAKE UP THE OVERALL LENGTH REQUIRED, ANY CUT LENGTH OF HANDRAIL MUST BE NO LESS THAN 1.5 TIMES THE LENGTH OF THE INDIVIDUAL PANEL WIDTH. HANDRAIL MUST BE JOINED IN THE CENTRE OF AN INDIVIDUAL PANEL.

LOADING CASE (ULS)	BENDING MOMENT (M*)	SHEAR FORCE (V*)	DIRECTION
	kN.M/M	kN/M	
BARRIER			(-)
WIND			(+)

NOTE: LOADS ARE APPLIED ON THE CONNECTION POINT TO THE CONCRETE.

REVISIONS:

A

REV	ISSUE	DATE:
A	PRELIMINARY	22/07/2021

CLIENT:

PROJECT:



PROPRIETARY AND CONFIDENTIAL
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DRAWING TITLE:
L SECTION CUSTOM BASE PLATE LF2
BALUSTRADE LYNNFIELD SUITE

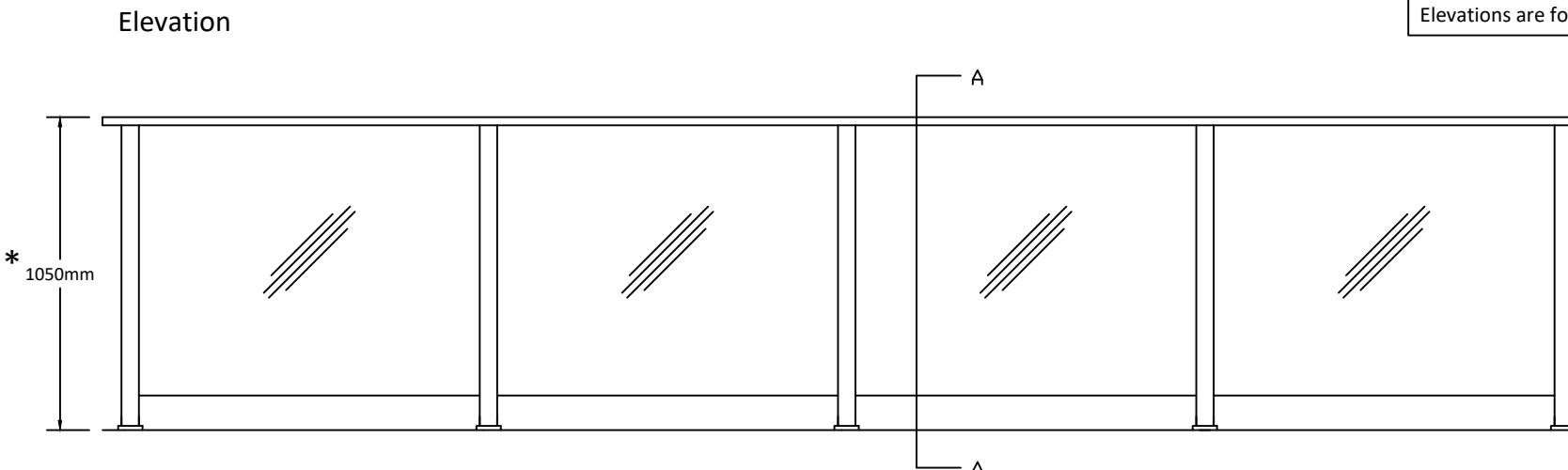
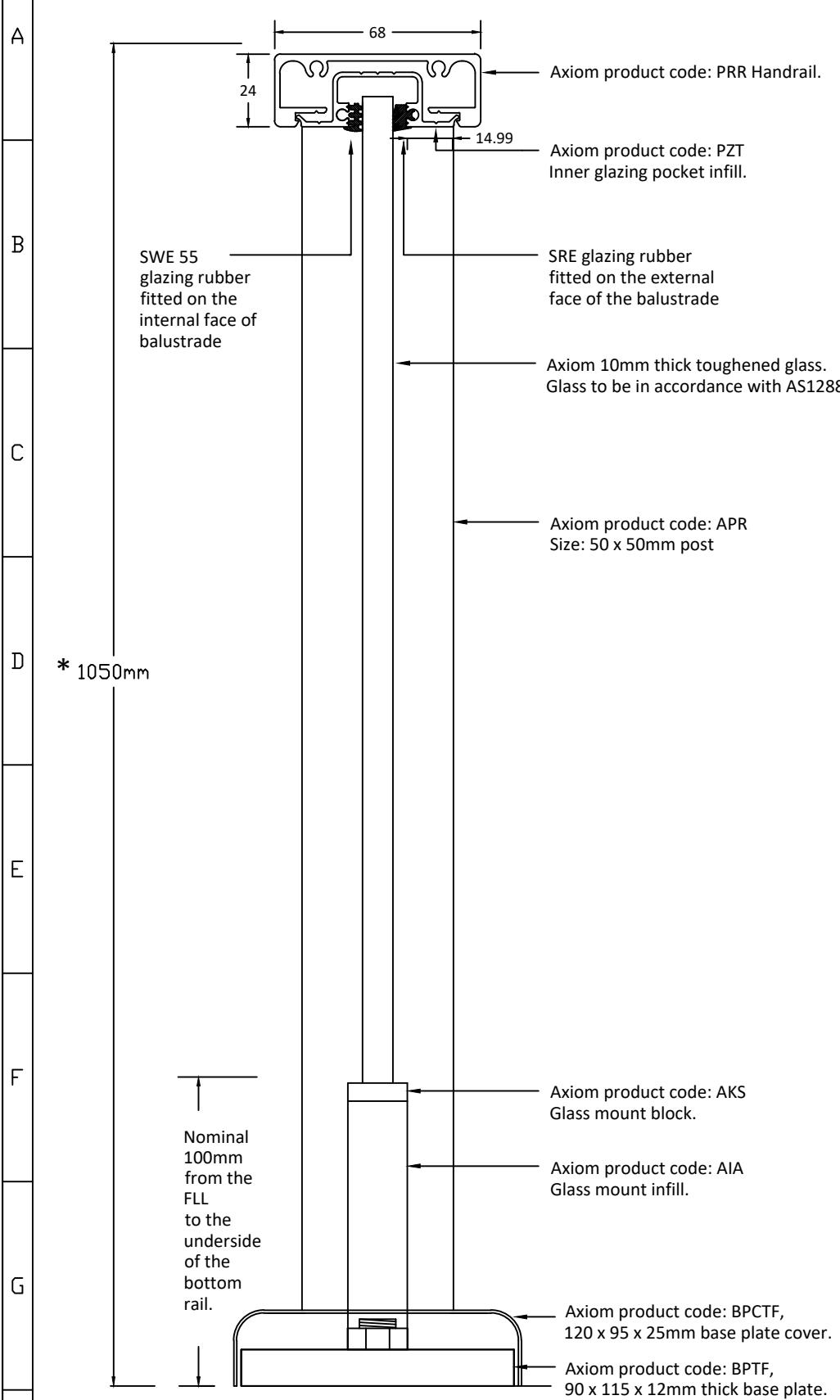
DRAWING NO.:	DESIGNED BY:	HB
SD10-04	DRAWN BY:	JAY

1 2 3 4 5 6 7 8 9 10 11 12

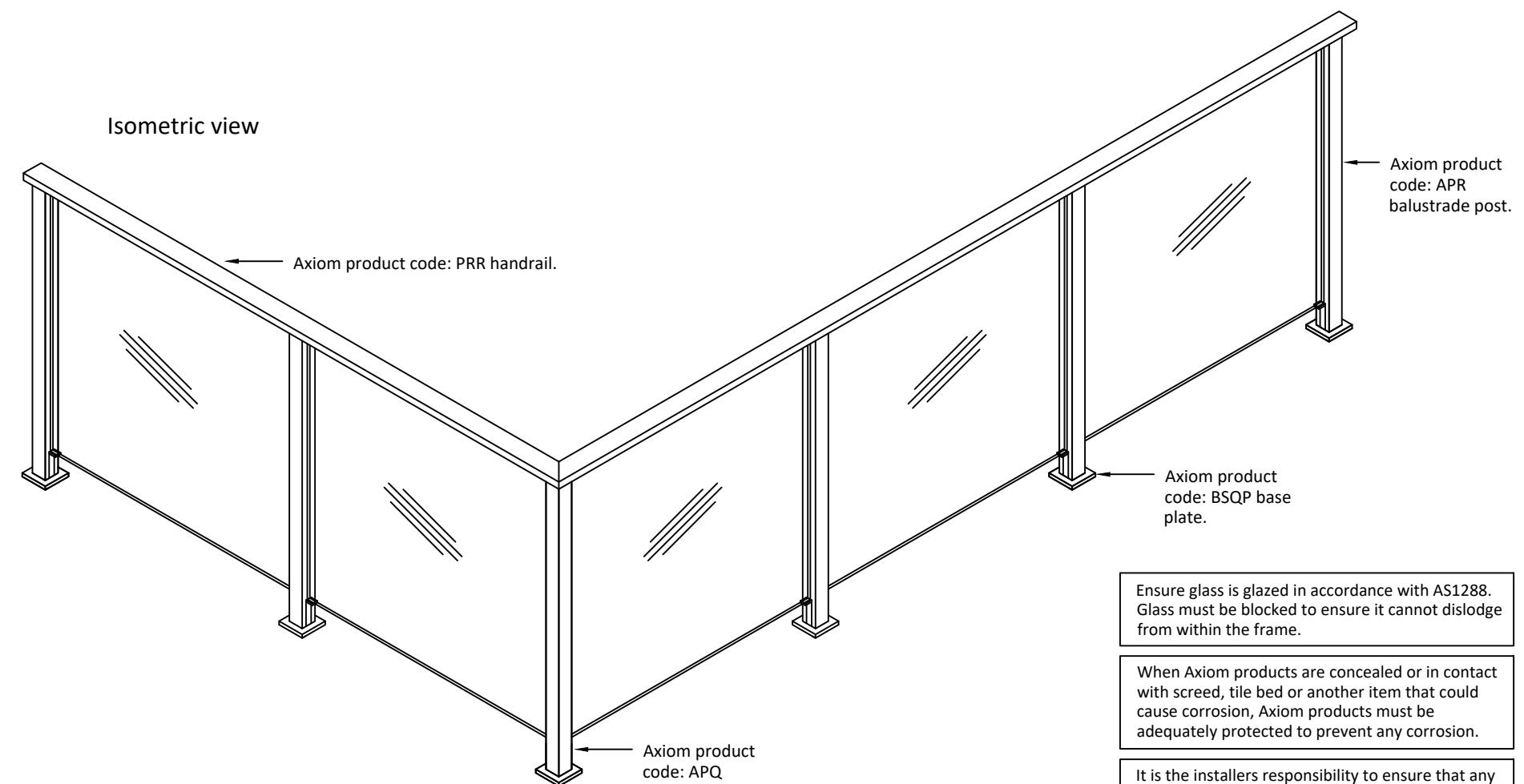
Section A - A

Elevation

Elevations are for illustration purpose only.



Isometric view



* Ensure glass is glazed in accordance with AS1288. Glass must be blocked to ensure it cannot dislodge from within the frame.

* When Axiom products are concealed or in contact with screed, tile bed or another item that could cause corrosion, Axiom products must be adequately protected to prevent any corrosion.

* It is the installers responsibility to ensure that any dissimilar metals are kept separated. Axiom Group recommends the use of nylon washers to keep dissimilar metals separated.

* * Read this drawing in conjunction with the relevant engineering drawings. All products must be installed as specified by the engineer.



Style: AxiLume Semi Frameless Balustrade

Scale as shown @ A1

Drawing n°. SD12-01

Checked by: CM

Job N°.

Proprietary and Confidential

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E & O E

Suite: Neo Suite

Paper Size: A1

Drawn by: C. Richardson

Revision: A

Drawing type: Suite drawing

Product: APR post and BPTF base plate with PRR handrail.

Unless otherwise stated all dimensions are in MM

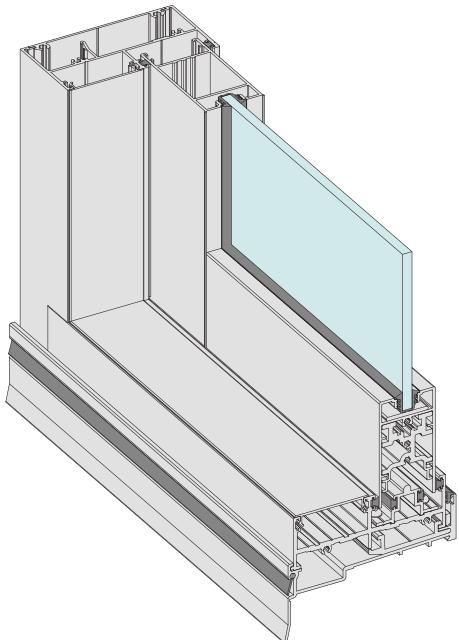
Date:
24 / 11 / 2015

Baseplate changed
Revision: B

This drawing has been produced using AutoCAD LT 2015

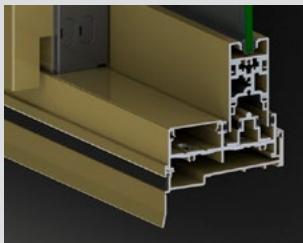
1 2 3 4 5 6 7 8 9 10 11 12

Appendix 08: Window system (AWS Australia)

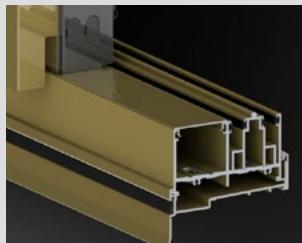


KEY FEATURES

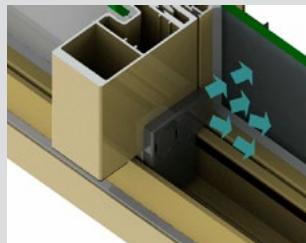
- Bottom rolling sliding door with minimal sill recesses.
- Tested for compliance with relevant Australian Standards.
- The extra strong multi-hollow meeting stiles allow large sliding doors to be fabricated in high wind load areas.
- These panels are always fabricated with low bottom rail and rail stiffeners.
- There are a large variety of door combinations (XF, FX, FXXF, XXXF, FXX, FXXXXF, FX^XF, FXX^XXXF and cavity sliding doors).
- Compatible with Centor SIE roller screens up to 7500mm wide, alternative sliding stacking flydoor system available.
- Bottom rolling doors run on heavy duty double or quad bogey wheel carriages.
- Sub-sills are fitted with integrated co-extruded Santoprene drainage hole cover flap to prevent blow-back.
- Optional AWS Ventient passive ventilation system can be fitted into tubular sub-head on 102mm and 150mm



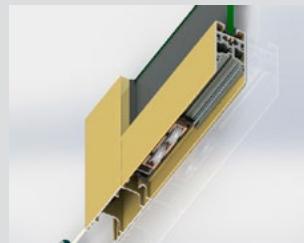
The 35mm sill is rated at 300Pa water resistance based on tests carried out on a similar door/sill configuration.



This door achieved a high water resistance of 450Pa with 55mm high sill.



Patented moulded nylon turbulence diverters protect the meeting stile junction at sill, guiding air and turbulence away from the inside.



Bottom rolling doors run on heavy duty double or quad bogey wheel carriages

GENERAL

Max Panel Height*
3300mm

Max Panel Width*
2500mm

Max Glass Thickness
28mm

Frame Depth
Various

ENERGY

UW Range
3.0-6.2

SHGC Range
0.15-0.59

WEATHER

Maximum Water
300 Pa. (35mm Sill)
450 Pa. (55mm Sill)

ACOUSTICS

6.38mm Lam
30 (0;-1)

10.38mm Lam
31 (-1;-1)

10.5mm VLam Hush™
33 (0;-2)



elevatealuminium.com.au/704B

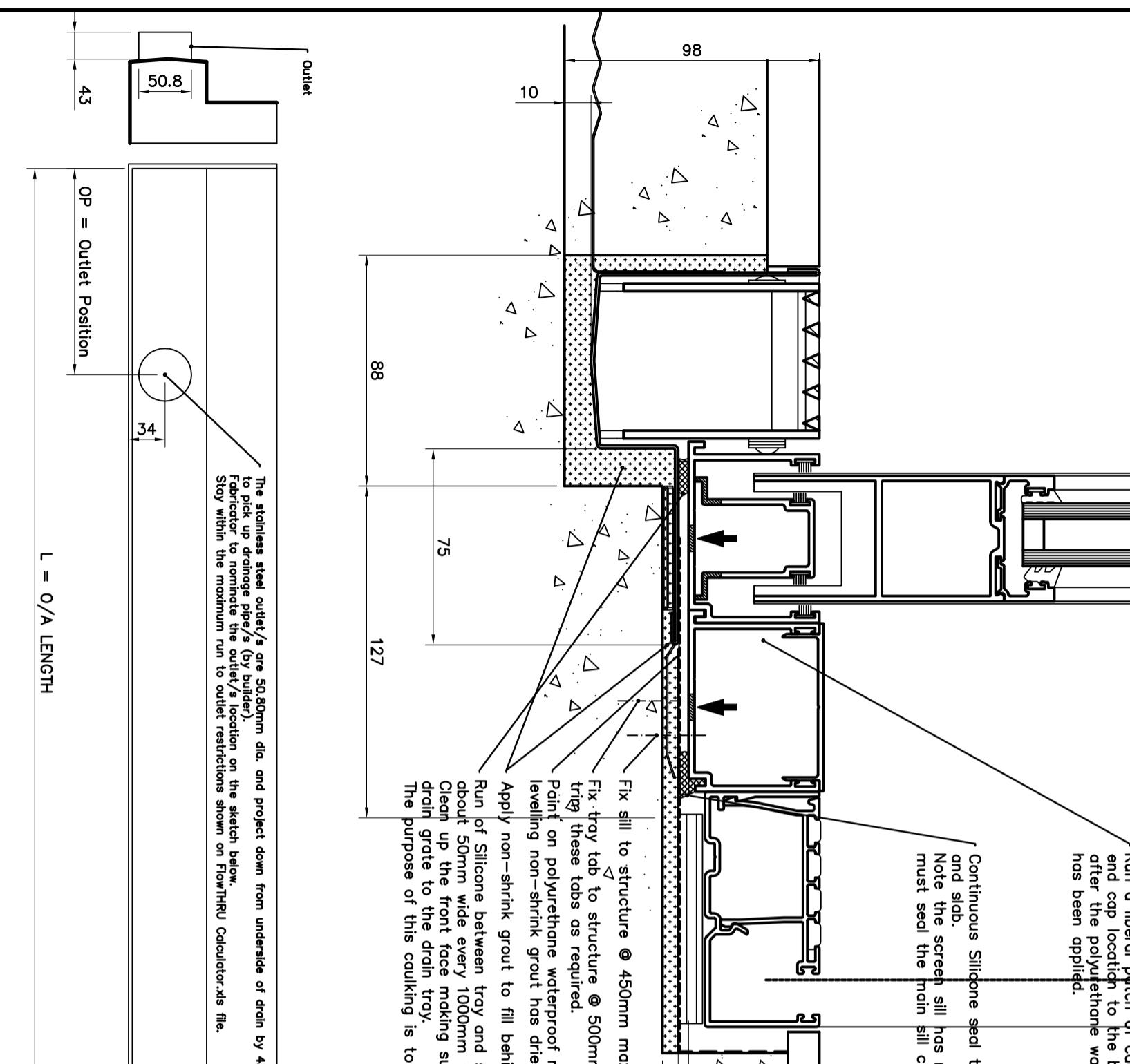
*Dimensions subject to individual site conditions.

BAL-40 compliance may limit glass options. Maximum glass size for BAL-40 products is 4.5m².

Run a liberal patch of caulking from the drain end cap location to the back concrete upstand, after the polyurethane waterproof membrane has been applied.

Installation Stages :

- Step.1 Make sure this drawing matches the door being used on your project, this drawing suits the door Series and sill type shown below.
- Step.2 Builder to create the recess in slab as shown left.
- Step.3 Builder to fit drain outlet/s at the required locations.
- Step.4 Install the the FlowTHRU drain taking care to make sure the top of the drain is at the required finished level. If possible use the fixing tabs that are welded to the drain to fix the drain in position.
- Step.5 Connect the drain outlets to drainage piping.
- Step.6 Builder to apply non-shrink grout to fill behind and around the tray, create a flat level platform for the door sill to sit on. The top of the grout to align with the 75mm drain platform as shown left.
- Step.7 After the grout has cured (dried) paint on polyurethane waterproof membrane as shown left.
- Step.8 Door installer to run a liberal continuous run of Silicone between tray and sill, leave drainage holes about 50mm wide every 1000mm to drain the back sill area. Clean up the front face making sure it doesn't seal/glue the drain grate to the drain tray. The purpose of this caulking is to support the front of sill.
- Step.9 Install the door sill channels into the drain with nylon shims under the sill to get the top of sill up to the required height (this should be in line with the top of drain).
- Step.10 Fix the door sill channels down to the slab @ 450mm max. cts. An alternative to the screw fixing would be liberal Sikaflex patches @ 450mm max. cts.
- Step.11 Run backing rod then top with Silicone across the back of sill.
- Step.12 Builder to lay floor tiles, top of tiles should be top of door sill and drain if these items have been installed correctly.
- Step.13 Builder to point off the gap between tiles and sill on the inside and tiles and drain on the outside.



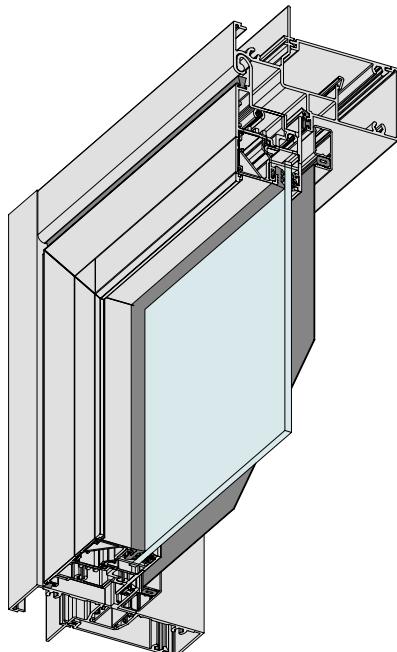
Series 400/52 E3 Top Hung T2 Sliding Door FlowTHRU Drain and Centor S1E Screen



Drawn
D.McCleary
Checked
Date
22.8.15

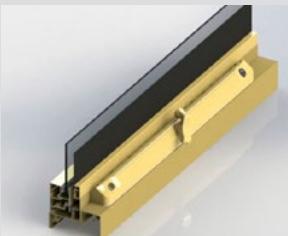
SERIES 400/52 with FlowTHRU DRAIN
TOP HUNG E3 SLIDING DOORS

Rev	Date	Description	Scales	Cad Reference
			1:2	FLW52
			Drawing N°	FLW400/52.3

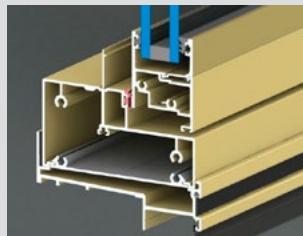


KEY FEATURES

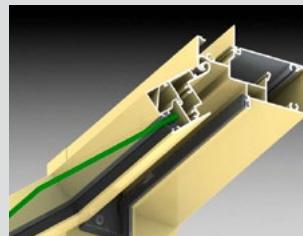
- Series 466 sashes can be fabricated as awning, casement or fixed lights.
- 102mm wide perimeter frame designed to make installation into brick veneer and cavity brick easier with built-in nailing fins.
- Awnings with manual or concealed electric winders have integrated hinge incorporated into sash top rail and head. No stays required.
- The strong sashes allow large opening sash windows to be fabricated for high wind load areas.
- Successfully tested to resist 600 Pa water externally or internally beaded and is suitable for air-conditioned buildings.
- When glazed internally we use square glazing beads. On the externally glazed sash we can also offer splayed beads.
- Awning sashes can be fitted with cam handles (this hardware requires friction stays), manual chain winders or concealed electric winders. The winder options suit fixed flyscreen installation.



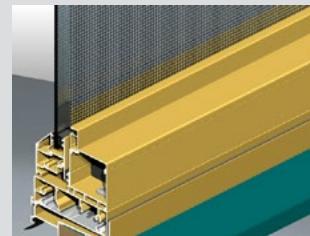
Dual chain chainwinder is fitted where awning sashes are wider than 1200mm to ensure wide sashes are supported



Custom sill design accepts manual chain winder without adaptors. Sill has an up-stand to suit flyscreen.



Integrated aluminium hook hinge gives us higher water resistance and strength.



Custom sub-sill (flashing tray) standard on 466 windows. This sill detail shows our custom concealed electric winder box. Winder box recessed to accept flyscreen as shown above.

GENERAL

NB: Maximum panel height and width of Awning sashes are interdependent.

Max Panel Height*
A/ @2400w = 800H
C/ 1800mm

Max Panel Width*
A/ @2100h = 900w
C/ 1000mm

Max Glass Thickness
24mm

Frame Depth
102mm

ENERGY
UV Range
4.2-7.0

SHGC Range
0.14-0.57

WEATHER

Maximum water
600 Pa.

ACOUSTICS

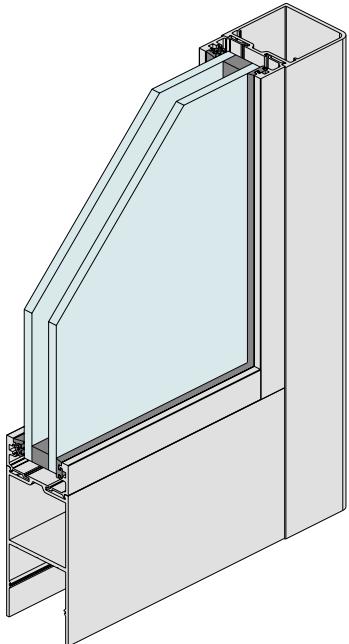
6.5mm VLam Hush™
/10mm Air/8.5mm VLam Hush™
41 (-1;-5)

6mm Tgh/12mm Air/
6.5mm VLam Hush™
40 (-1;-5)

6.5mm VLam Hush™
35 (-1;-4)

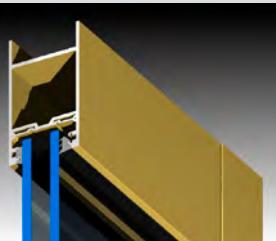


COMMERCIAL SERIES | SERIES 52
DOOR (DOUBLE GLAZED, SPIGOTED)

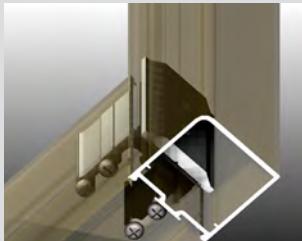


KEY FEATURES

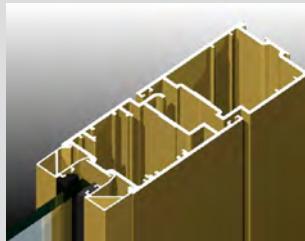
- Series 52 doors are 50mm thick for added strength.
- Series 52 doors have removable glazing beads on horizontals and verticals (both sides).
- Stile to rail joint is securely fixed with custom spigot assembly.
- Horizontal rails can be fitted with square or splayed beads.
- 19mm high glazing beads ensure good glass bite.
- Can be security glazed with captive external glazing wedge.
- Heavy duty bottom rolling running gear or alternative Centor E3 top-hung rollers deliver smooth reliable operation.
- External wet top silicone glazing also available.
- Two midrail options 50mm and 115mm deep with single external bead – suitable for single glazing. Plus 125mm and 200mm midrails with four glazing beads – suitable for double glazing.
- Rebated French meeting stiles.



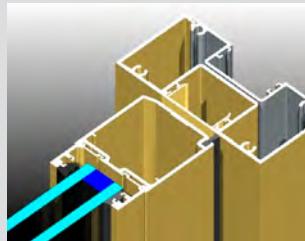
Series 52 doors will accept a variety of glazing beads including beads to accept double glazing as shown above.



The transparent image above shows the heavy duty spigot and backing plate door corner joinery package used on Series 52 doors.



True French meeting stiles available. Series 52 doors will also accept single 6.38mm thick glazing as shown above.



The image above shows a double glazed door panel installed into a framing system (Series 424) that will also accept double glazing.

GENERAL

Max Panel Height*
H/S 3000mm

Max Panel Width*
H/I200mm
S/2500mm

Max Glass Thickness
28mm

ENERGY

UW Range
3.1-4.0

SHGC Range
0.14-0.54

WEATHER

Weather performance of this system will depend upon selected framing, configuration and sill. For more information contact AWS.

ACOUSTICS

This product has not been acoustics tested.

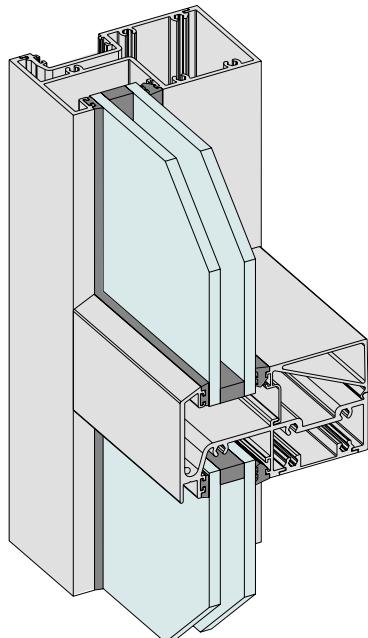


elevatealuminium.com.au/52



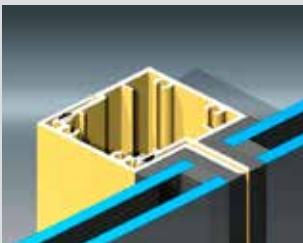
*Dimensions subject to individual site conditions. H = Hinged Configuration. S = Sliding Configuration.

NOTE: BAL-40 rating applies to Hinged Configuration only. BAL-40 compliance may limit glass options. Maximum glass size for BAL-40 products is 4.5m².



KEY FEATURES

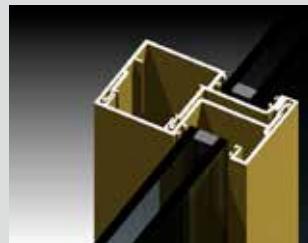
- Series 426 FrontGLAZE™ shopfront framing 102mm x 60mm with the glazing pocket close to the front face.
- The 28mm deep glazing pocket caters for glass installation and 12mm bite as required by IGU manufacturers.
- Reinforced tall glazing beads at sill.
- We can fit a true captive glazing wedge on one side. In elevated installations this allows you to glaze and reglaze from inside, with no need for scaffolding when internally beaded sill/transom is selected.
- External wet top Silicone glazing also available.
- The drainage holes along the front face are concealed.
- There are numerous custom designed extrusions to cater for specific applications. A range of sub-sills cover most installations. Sub-head and two piece sub-jams.
- Numerous door thresholds including weather resisting thresholds for external and internal swing doors.
- Compatible with Series 52 doors.



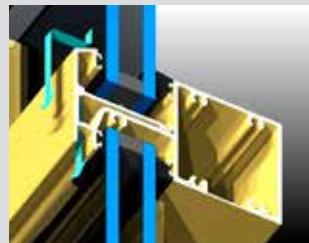
426 framing offers a structurally glazed option.



Full captive wedge glazing is a feature of 426 framing. We can use silicone wet top on the outside in lieu of the captive wedge.



Various mullion details for site wind load conditions. We recommend expansion mullions on long runs of framing (over 6m).



Concealed drainage designed to shed water more efficiently and improve aesthetics without runs of visible holes along the face. Very high water performance > 600 Pa.

GENERAL

Max Panel Height
Various

Max Panel Width
Various

Max Glass Thickness
28mm

Frame Depth
101.2mm

ENERGY

UW Range
2.7-3.6

SHGC Range
0.18-0.66

WEATHER

Maximum Water
600 Pa.

ACOUSTICS

This product has not been acoustics tested. AWS anticipates this products acoustic performance will be inline with Series 424.



elevatealuminium.com.au/426

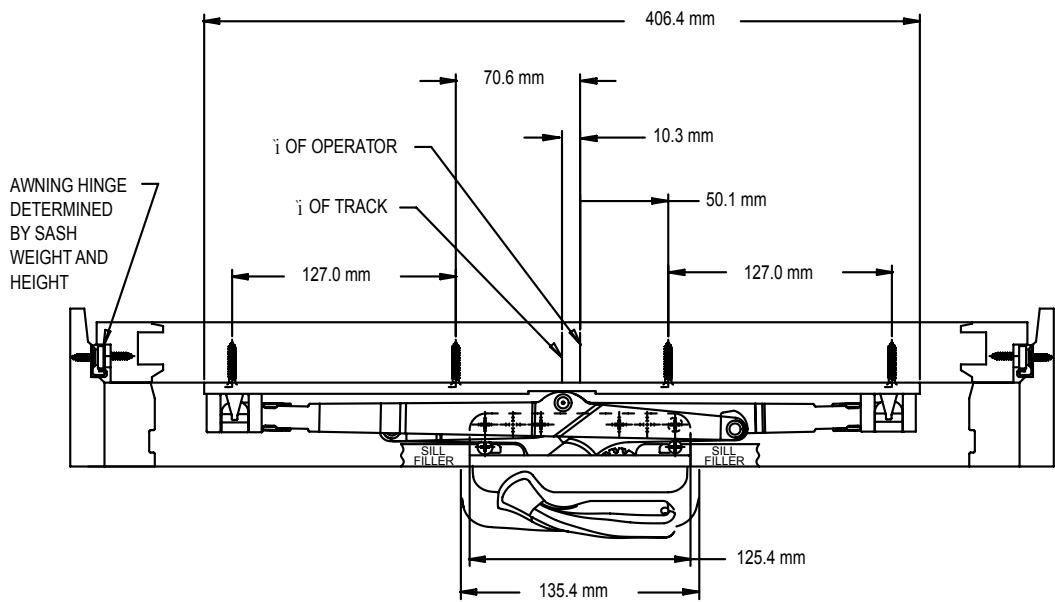
TRUTH™ | AWNING OPERATOR

Key Features

- Truth™ awning winders can be used to operate large awning windows.
- Scissor type winders used in conjunction with stile latches to secure sash.
- Compatible with series 824 & 826.
- Provides for maximum opening (approx 370mm) combined with wide “pull-in” connection to sash.
- 33% less effort to operate than previous Truth operators and 50% less than conventional chain winders.
- Operates sash sizes from 550mm to 1200mm wide and 2100mm high.
- Sash weights up to 85kg when used with Truth Awning Stays.
- Fully operable with fly screens.
- Stainless steel components are available for coastal applications.
- Covered by Truth's Lifetime Warranty.



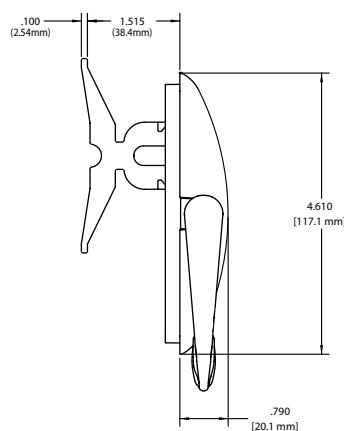
Key lockable option
available



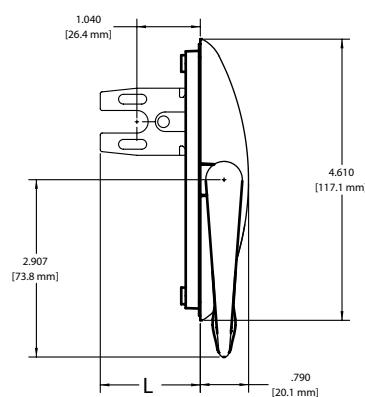
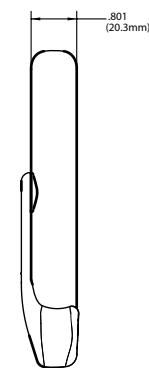
TRUTH™ | MAXIM SASH LOCKS

Key Features

- Solid and secure locking for Truth™ casement window system.
- Single & Multi Point latching system.
- This advanced locking system complements Truth™ casement winders.
- Whether a right or left hand window, this system utilises a nonhanded design to help reduce inventory.
- “Zippered locking effect” assures engagement of the top lock point.
- With 16mm of reach out / pull in capability, the window can be locked without being completely closed.
- Fully operable with fly screens.
- Covered by Truth's Lifetime Warranty.



Single Point Lock



Multi Point Lock

HARDWARE

MIRO™ | SLIDING DOOR LOCK



KEY FEATURES

- Gentle curves and ergonomic design, this single point sliding door lock is ideal for residential applications.
- Single point locking.
- Compatible with the Adaptek™ keying solution, this lock can be configured to match existing Whitco, Gainsborough or Onyx keying systems.
- Matt finish with Enduratec™ delivers up to 10 times the corrosion resistance compared to traditional powder coating.
- Available in black, white and silver.



FINISHING

MIRO™ sliding door lock is available in matt finish with AWS' Enduratec™ technology for exceptional corrosion resistance in harsh environments.



ADAPTEK™ KEYING SOLUTION

MIRO™ sliding door locks can be configured to match existing Whitco, Gainsborough or Onyx keying systems.



ERGONOMIC DESIGN

Modern and ergonomic curved design delivers a high end finish for residential applications.



MULTIPLE APPLICATIONS

MIRO™ sliding door locks can be used across a wide range of Vantage® and Elevate™ sliding door systems for various applications.

DIMENSIONS

Height	235mm
Width	120mm
Depth	47mm

SUITABLE FOR USE WITH

- Series 541 Residential Sliding Door
- Series 542 DStacker
- Series 618 MAGNUM Sliding Door
- Series 442 Commercial Staking Sliding Door
- Series 642 Commercial Staking Sliding Door
- Series 471 Apartment Sliding Door

- Series 704 SlideMASTER
- Series 704T SlideMASTER (Top Hung)
- Series 704B SlideMASTER (Bottom Rolling)
- Series 704R SlideMASTER (Recessed)

Subject to individual site conditions and wind loads. Contact AWS Technical Support for more information, e-mail techsupport@awsaustralia.com.au

HARDWARE

MIRO™ | HINGED DOOR LOCK



KEY FEATURES

- With a sleek, comfortable grip common to all MIRO™ hardware, the lever door lock is available in several locking options, including keyed both sides or with interior snib.
- Used in conjunction with lever compression locking, an upward handle movement activates four-point locking.
- Compliant with AS2047, ASI428: 2009 Section 13.5 (Disability Access) and Liveable Housing Guidelines.
- Textured matt finish with AWS' Enduratec™ technology has been tested to last 10 times longer than traditional powder coat finishes in independent, neutral salt bath testing.
- Available in black, white and silver.



FINISHING

MIRO™ hinged lock is available in matt finish with AWS' Enduratec™ technology for exceptional corrosion resistance in harsh environments.



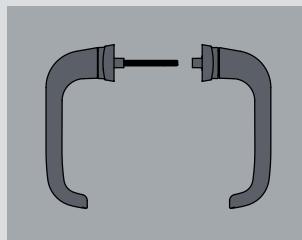
DUMMY LOCK

The dummy lock can be operated from inside, the handle retracts the shoot bolts top and bottom.



MATCHING HARDWARE

For bi-fold doors we have a matching MIRO™ bi-fold operator.



ACCESSIBILITY COMPLIANT

Designed specifically to meet compliance with Disability Access and Liveable Housing Guidelines in accordance with ASI428:2009 Section 13.5.

DIMENSIONS

Height	210mm
Width	130mm
Depth	56mm

SUITABLE FOR USE WITH

- Series 546 Bi-fold Window
- Series 548 High Performance Bi-fold Door
- Series 549 Hinged Entry Door
- Series 729 Thermally Broken Hinged Door
- Series 730 Thermally Broken Hinged Door
- Series 50/52 Commercial Door
- Series 410 FoldMASTER Bi-fold Door
- Series 411 ViewMASTER Bi-fold Door
- Series 412 ViewMASTER Bi-fold Door
- Series 650 Architectural Hinged Door
- Series 852 ThermalHEART Hinged Door

Appendix 09: Fire Screen (GREENE FIRE)



PRODUCT SPECIFICATION

MicroLouvre Attenuation Screen

1 GENERAL

1.1 Scope

MicroLouvre Attenuation Screens ("Fire Screens") are to be designed, fabricated, delivered, installed and maintained as outlined in this specification.

1.2 Submittals

Shop drawings

Detailing the location, size and requirements 'by others' of the Fire Screens shall be submitted to the General Contractor and the drawings approved prior to the commencement of the manufacture process.

Completion certificate

Issue a completion certificate at the completion of the works confirming that the installation has been completed in accordance with this specification, the fire engineering report and the tested prototypes for the Fire Screens.

1.3 Warranty

Greene Fire Pty Limited warrants that its MicroLouvre Attenuation Screen is free from manufacturing defects for a period of not less than 12 months from installation when installed, maintained and used in accordance with this specifications and operational manuals.

2 Product

2.1 Manufacturer

Greene Fire Pty Limited – Level 2, 381 Port Hacking Road, Caringbah NSW 2229, Australia
Tel: (02) 9526 3100 (Int'l +61 2 9526 3100), Fax: (02) 9526 3111 (Int'l +61 2 9526 3111)
Email: sales@greenefire.com.au, Web: www.greenefire.com.au

2.2 Product Description

MicroLouvre Attenuation Screen

MicroLouvre Attenuation Screen is a bronze woven mesh that is installed to openings on buildings that are near the property boundary. The Fire Screen will limit the radiant heat from a fire, protecting the building and adjacent properties from fire spread.

2.3 System Components

Frame

Screen frames are 6063-T6 extruded aluminium exclusively designed for framing MicroLouvre mesh. The corners of the frames have concealed internal reinforcing members inserted in such a manner as to secure all corners neatly and firmly together. Top and bottom frame are pre-bowed as required to reduce to a minimum the deflection due to screen tension. The frames are designed to receive continuous EPDM strip in each side frame and a continuous 316 stainless steel lacer wire in each horizontal frame, all correctly assembled to ensure screen tautness and to maintain the angle of the louvres.

The aluminium frame is mill finish. This can be powder coated to any standard Dulux Duralloy colour.

Mesh

MicroLouvre mesh is made from miniature woven bronze louvres that are paper thin. The weft (louvre) is made from C220 commercial bronze alloy and the Warp is C655 high silicone bronze alloy. The overall thickness of the mesh is 1.4mm and the distance between each louvre is 1.49mm. The mesh is powder coated black.



The paper thin louvres are only 0.32mm thick which provides an overall open area of 80%.

Screen dimensions

Two frame profile sizes are available; standard 38mm and 51mm for larger size screens. The overall thickness of the frame is 12.7mm. The maximum screen dimensions are 1,800mm wide x 3,000mm high.

2.4 Product Performance:

The complete MicroLouvre Fire Screen is tested to AS1530.4 Appendix B.7 and AS1530.8.1 to achieve heat attenuation of at least 43%. Testing must demonstrate performance of the fixing of the frame to a lightweight wall construction.

2.5 Labelling

The MicroLouvre Fire Screen must be labelled with a metal tag riveted to the frame clearing showing the Fire Screen details, manufacturer and installation date. The metal tag must also state "DO NOT REMOVE".

3 EXECUTION

3.1 Installation

MicroLouvre Attenuation Screens must be fixed with suitable metal anchors to masonry, brick, steel or lightweight fire rated wall. Fixings must be installed within 200mm of the corner of the screen and at maximum 350mm pitching.

Any gaps larger than 1.5mm between the frame and the substrate must be sealed with fire rated sealant.

All Fire Screens shall be carefully located in the positions indicated on the approved Shop Drawings.

3.2 Maintenance

The Fire Screens should be inspected annually to ensure that they are still correctly secured in place and have not been removed.

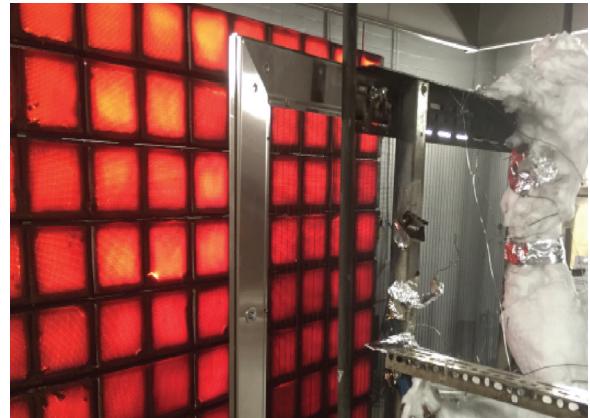
The mesh should be cleaned annually to remove any dirt and debris. Cleaning is suitable with water only and can be applied with a high pressure hose.

microlouvre™ attenuation screen

MicroLouvre™, the most efficient solar shading product, has now been tested and proven to have market leading fire performance. The specially angled, bronze louvres are the perfect solution for reflecting heat, as was shown by the industry leading 49.4% attenuation achieved when tested at CSIRO.

Not only does MicroLouvre™ provide the highest amount of heat attenuation, it also has twice the open area of other screens. This makes MicroLouvre™ almost invisible from the inside, giving perfect outward vision.

Used as a fire engineered solution to protect openings close to property boundaries, make sure to specify MicroLouvre™ Attenuation Screen to get the most benefits for your building.



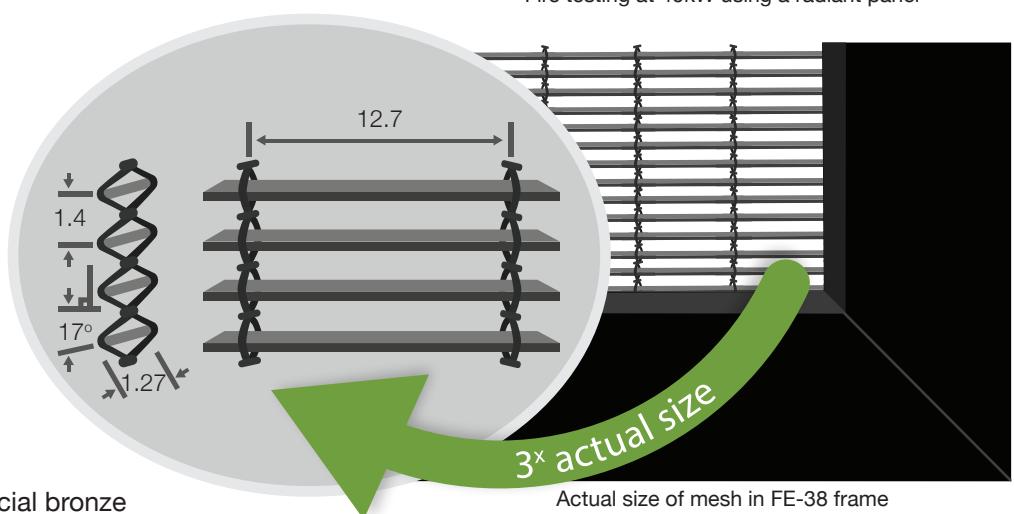
Fire testing at 40kW using a radiant panel

Don't compromise!

- Get the best fire attenuation
- Get the best solar shading
- Get the best visibility
- Get the best ventilation
- Get total shading



FE-38 Frame
13mm x 35mm



Louvre material: C220 commercial bronze

Warp material: C655 high silicon bronze

	microlouvre™ attenuation screen	competitor screens	1	2	3	4
attenuation	49.4%		37%	19%	31%	25%
irradiance at 365mm*	10.9kW/m ²		13.8	17.7	15	16.3
open area	80%		44%	41%	44%	44%
solar heat gain coefficient	0.14		0.39	0.37	0.36	0.39
high visibility						

* Results based on 40kW/m² incident irradiance

attenuation - ətĕnjū'ēij(ə)n
noun

1. the reduction of the force, effect, or value of something

Oxford Dictionary (2016)

Attenuation screens are usually compared by the percentage that the screen reduces heat. This means that 49.4% attenuation would reduce the heat at the location of the screen by 49.4%. Sounds obvious.

However, testing and proving this is not so straight forward. As there is not a standard test methodology, some claim the percentage attenuation as the reduction in heat at the screen, measured 365mm behind the screen. In reality, the heat has already reduced even without the screen in place at that position!

where would a microlouvre™ attenuation screen be used?

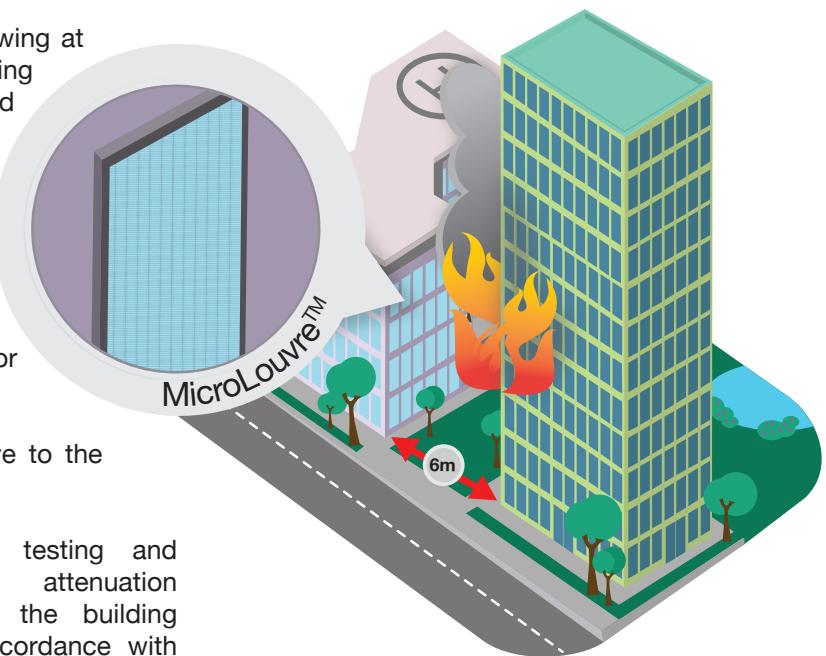
The population density within our cities is growing at a rapid rate. This means that we are constructing our buildings closer to the property boundary and each other. Class 2 to Class 9 buildings that are built within 6 meters of the property boundary require fire protection to the external walls.

Openings in the external walls are required to be fire protected in accordance with C3.4 of the NCC. The options include using 60 minute fire rated doors, fire windows, fire shutters or external wall wetting sprinklers.

MicroLouvre™ offers a cost effective alternative to the NCC Deemed-to-Satisfy (DTS) requirements.

A fire engineer can use the extensive testing and high performance of MicroLouvre™ attenuation screens to determine a design where the building can withstand a minimum heat flux in accordance with Verification Methods CV1 and CV2 as defined in the NCC.

Installing MicroLouvre™ attenuation screens to your Class 1 building (domestic dwellings) meets the requirements for screening in bushfire areas as required in AS3959-2018 up to BAL-40 & BAL-FZ.

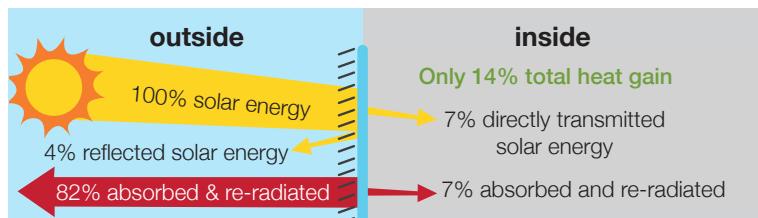


location		heat flux (kW/m ²)
from boundary	between buildings	
0m	0m	80
1m	2m	40
3m	6m	20
6m	12m	10

Tables CV1 and CV2

other benefits of microlouvre

sun and light control



- 86% reduction of solar heat gain
- 100% shading at sun angle of more than 40°
- Increase the comfort level within buildings by reducing the internal temperature near windows up to 10°C
- Save up to 60% on air conditioning costs
- 80% open area allowing natural light and ventilation
- Highly durable and weatherproof – 40+ year installations and still going strong
- Capable of withstanding wind speeds of 190km/hr
- 50% noise reduction
- Compliant screening for bushfire up to BAL-40 & BAL-FZ
- Privacy screening to address overshadowing
- Insect and pest protection
- Powder coat mesh and frame to any colour
- Very light weight easy to install/retro fit
- Ease of maintenance

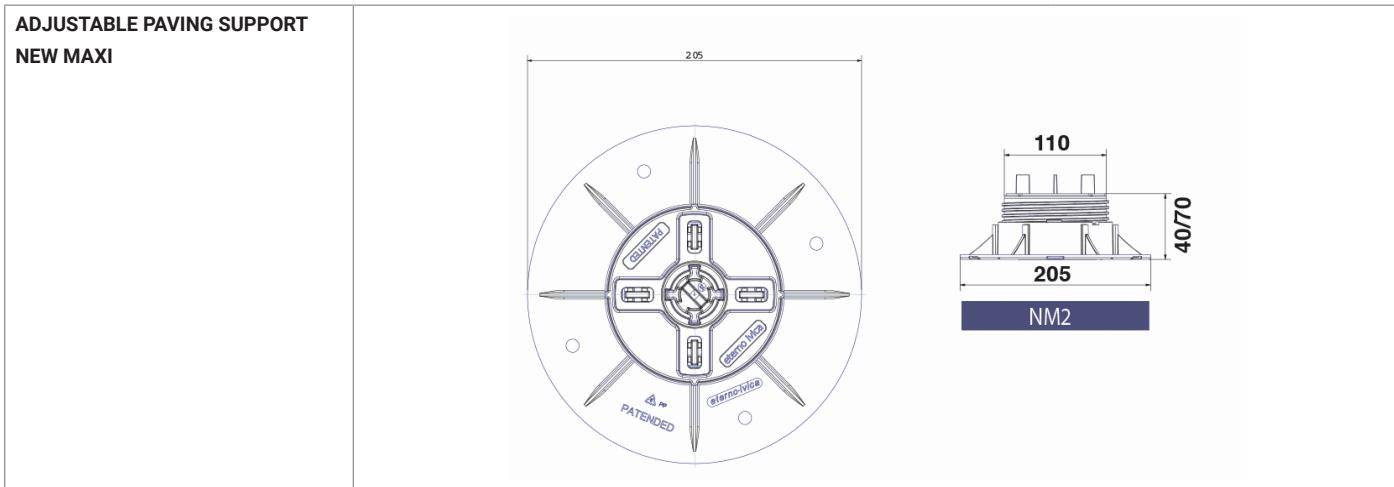
near perfect visibility



Appendix 10: Pedestal Paver

NM 2

CODE: E014040070	REV 00	27.06.2013	
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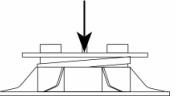
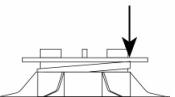
ITEM SPECIFICATION	"New Maxi" pedestal for raised floors have an adjustable height that ranges from 40 mm to 70 mm and are provided with a bi-component head with an anti noise and non slip rubber top. The pedestals feature a 205 mm diameter cylindrical base element to be position on the substrate of choice, an intermediate screw with a security locking system, and a top head element with four 12 mm high and 2, 3 or 4 mm thick pre-cut tabs for easy removal. The base element features water drainage holes and 4 pre-cut lines to facilitate any cutting if required. Adjustment in height is made with the exclusive regulation key which acts on the screw independently from both the head and the base.
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PRODUCT RANGE	PEDESTAL
PRODUCT NAME	NM 2
TECHNICAL FEATURES	Adjustable in height. Bicomponent material (PP and rubber) self leveling head Regulation key for height adjustment Easy removable tabs Security lock system to prevent unlocking
RAW MATERIAL	Polypropylene and rubber (head top finishing)
ENVIRONMENTAL IMPACT	Recyclable material - non dangerous
APPLICATIONS SURFACES	On any waterproofing membrane, insulating panel or compact and solid surface
APPLICATIONS AREA	Usable with any prefabricated self sustaining element for exterior flooring

CHARACTERISTICS	UNIT	VALUE	TOLERANCE
BASE DIAMETER	mm	205	+/- mm 1,0
BASE THICKNESS	mm	2	+/- mm 0,2
HEAD DIAMETER	mm	110	+/- mm 0,8
LAYING SURFACE OF THE BASE	cmq	330	+/- cmq 5
MINIMUM HEIGHT	mm	40	+/- mm 1,0
MAXIMUM HEIGHT	mm	70	+/- mm 1,5
TABS THICKNESS	mm	2-3-4	+/- mm 0,2
TABS HEIGHT	mm	12	+/- mm 0,2
WEIGHT	kg	0,275	+/- 5 %

TECHNICAL DATA SHEET

KEKSIÄ
+ Specify Stability

TECHNICAL PROPERTIES		UNIT	VALUE
CENTRAL COMPRESSION LOADING LIMIT RESISTANCE* (calculated at medium height, between minimum and maximum extension)		KN	38,67
ECCENTRIC COMPRESSION LOAD- ING LIMIT RESISTANCE* (calculated at medium height, between minimum and maximum extension)		KN	21,48
SLOPE CORRECTION		%	0 - 5
SHORE *Tests made by Civil and Environmental Department of University of Padova. 1 KN = 98,6 Kg		Shore d	70 (+/- 3)

PHYSICAL PROPERTIES	METHOD	UNIT	VALUE
FIRE REACTION*	UNI EN 13501-1:2009	class	E
LOW TEMPERATURES REACTION *Tests made by Giordano S.p.A. Institute of Bellaria-Igea Marina (RN)-Italy			-40°

PACKAGING AND STORAGE	
PIECES PER BOX	35
PIECES PER PALLET	30
BOX DIMENSION	cm 40x40x42
BOX WEIGHT	kg 10,4
PALLET DIMENSION	cm 80 x 120

The packing of the supports is made of boxes. The final pallets are wrapped with a polyethylene film. We recommend to store indoor, pallets to be protected from the rain.

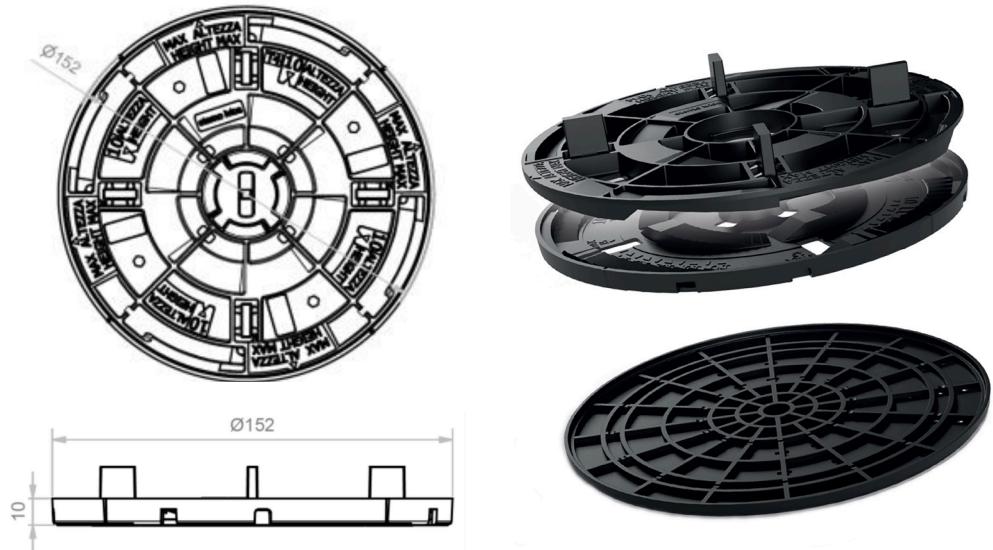
LAYING OF THE PRODUCT	The product is simply laid on the substrate of choice, with no need of any glue or fixing
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<p>The above data are relevant to current production and may be changed or updated by Eterno Ivica at any time without notice. Given the many possible uses and the possible interference of external elements, we do not assume responsibility for the results. The buyer is required to establish under their own responsibility the suitability of the product for the intended use. This document is property of Eterno Ivica. All rights reserved.</p>
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Star.T

CODE: E003010015

REV 00

ADJUSTABLE SUPPORT STAR.T**ITEM SPECIFICATION**

"Star.T" pedestal for raised floors have an adjustable height that ranges from 10 mm to 15 mm. The pedestals feature a 152 mm diameter cylindrical base element to be position on the substrate of choice and a top head element with four 12 mm high and 2, 3 or 4 mm thick pre-cut tabs for easy removal. The base element features water drainage holes. Adjustment in height is made possible by rotating the base element, which is independent from the head piece.

PRODUCT RANGE	PEDESTAL
PRODUCT NAME	Star.T – tabs 4 mm thick
TECHNICAL FEATURES	Adjustable in height from 10 to 15 mm. Regulation key for height adjustment Easy removable tabs
RAW MATERIAL	PP Polypropylene
ENVIRONMENTAL IMPACT	Recyclable material – non dangerous
APPLICATIONS SURFACES	On any waterproofing membrane, insulating panel or compact and solid surface.
APPLICATIONS AREA	Usable with any prefabricated self sustaining element for exterior flooring.

TECHNICAL DATA SHEET



CHARACTERISTICS	UNIT	VALUE	TOLERANCE
BASE DIAMETER	mm	152	+/- mm 1,0
BASE THICKNESS	mm	10	+/- mm 0,2
HEAD DIAMETER	mm	152	+/- mm 0,8
LAYING SURFACE OF THE BASE	cmq	181	+/- cmq 5
MINIMUM HEIGHT	mm	10	+/- mm 1,0
MAXIMUM HEIGHT	mm	15	+/- mm 1,5
TABS THICKNESS	mm	2-3-4	+/- mm 0,2
TABS HEIGHT	mm	12	+/- mm 0,2
WEIGHT	kg	0,1	+/- 5%

TECHNICAL PROPERTIES		UNIT	VALUE
CENTRAL COMPRESSION LOADING LIMIT RESISTANCE*		KN	130
(calculated at medium height, between minimum and maximum extension)			
ECCENTRIC COMPRESSION LOADING LIMIT RESISTANCE*		KN	58
(calculated at medium height, between minimum and maximum extension)			
SLOPE CORRECTION		%	0 – 5
SHORE		Shore d	70 (+/- 3)
*Tests made by Civil and Environmental Department of University of Padova. 1 KN = 98,6 Kg			

PHYSICAL PROPERTIES	METHOD	UNIT	VALUE
REACTION TO FIRE*	UNI EN 13501-1:2009	class	E
LOW TEMPERATURES REACTION			-40°
*Tests made by Giordano S.p.A. Institute of Bellaria-Igea Marina (RN)-Italy			

PACKAGING AND STORAGE	
PIECES PER BOX	250 (5 bags of 50 pieces each)
PIECES PER PALLET	6000
BOX DIMENSION	79 x 16 x 59 cm
BOX WEIGHT	24,5 kg
PALLET DIMENSION	120 x 80 x h230 cm

The packing of the supports is made of boxes. The final pallets are wrapped with a polyethylene film. We recommend to store indoor, protected from the rain.

LAYING OF THE PRODUCT	The product is simply laid on the substrate of choice, with no need of any glue or fixing
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The above data are relevant to current production and may be changed or updated by Eterno Ivica at any time without notice. Given the many possible uses and the possible interference of external elements, we do not assume responsibility for the results. The buyer is required to establish under their own responsibility the suitability of the product for the intended use. This document is property of Eterno Ivica. All rights reserved.

Appendix 11: Waterproofing (GRACE)



SPECIFICATION - GCP WATERPROOFING – EXTERNAL, TANKING & INTERNAL

Date: *26 April, 2022*

Project: *Curran Street, South Melbourne VIC*

Issued to: *MGS Architects*

Contact: *Steve Sutedja - Associate*

GCP Contact: *Nicholas Coad – Specification Manager ANZ*

1 SELECTIONS – WATERPROOF MEMBRANE SCHEDULE

Project Area	Membrane Type	Location and Description	Waterproofing System	Product Warranty
Lift Pit	WPMXX	Pre-applied membrane to minimum 50mm concrete blinding under lift pit slabs.	Membrane Preprufe 300R Plus For all concrete section thicknesses (mm) Turn up lift pit slab edges to allow 150mm overlap by lift pit wall membrane.	20 Years
Base Slab		Turn membrane up formwork to allow an overlap with wall membrane.	Detailing Preprufe Tape To end laps, cut edge overlaps and around penetrations. Preprufe CJ Tape To clean Preprufe membrane surface, positioned centrally over location of wall construction joints. Used where joint shrinkage/movement between 1.0mm and maximum 5.0mm is expected. Bituthene Liquid Membrane Around penetrations as 20 x 20mm fillet, plus 2.5mm minimum DFT extending minimum 100mm around penetration.	
Lift Pit Walls - Insitu Form Concrete - Inaccessible Blindsides Application	WPMXX	For “Blindsight” application where lift wall external surface is not accessible after pouring. Pre-applied membrane to sacrificial formwork. Membrane to lap over lift pit base slab membrane turn-up by 150mm.	Membrane Preprufe 300R Plus For all concrete section thicknesses (mm) Overlap to lift pit slab membrane by 150mm. Extend to above maximum water table and 1-in-100 year flood level by minimum 500mm or to underside of ground level floor slab, whichever is greater. Detailing Preprufe Tape To end laps, cut edge overlaps and around penetrations. Preprufe CJ Tape To clean Preprufe membrane surface, positioned centrally over location of wall construction joints. Used where joint shrinkage/movement between 1.0mm and maximum 5.0mm is expected. Bituthene Liquid Membrane To slab membrane overlap termination to 2.5mm minimum DFT extending minimum 100mm either side of termination. Around penetrations as 20 x 20mm fillet, plus 2.5mm minimum DFT extending minimum 100mm around penetration.	20 Years
Lift Pit	WPMXX	For where lift wall external	Initial Detailing Bituthene Liquid Membrane	20 Years

Project Area	Membrane Type	Location and Description	Waterproofing System	Product Warranty
Walls <ul style="list-style-type: none"> - Insitu Form Concrete or - Blockwork - Accessible 		<p>surface is accessible after pouring.</p> <p>Post-applied membrane to poured concrete walls.</p> <p>Membrane to lap over lift pit base slab membrane turn-up by 150mm.</p> <p>Extend to above maximum water table and 1-in-100 year flood level by minimum 500mm or to underside of ground level floor slab, whichever is greater.</p>	<p>Minimum 40 x 40mm fillet to substrate internal corners.</p> <p>Priming Bituthene Solvent Primer or Solvent Primer Vertical Grade Minimum 0.20kg/m² (5m²/litre) application rate to prime & seal surface and surface pin holes. Porous substrates may require more than one application. Allow to cure to tack free condition. Within 24 hours, apply membrane.</p> <p>Membrane Single layer Bituthene 3000 Fix and seal upper membrane termination edge with Protectoflash bedded in Bituthene LM. Overlap to lift pit slab membrane by 150mm.</p> <p>Final Detailing Bituthene Liquid Membrane To slab membrane overlap termination to 2.5mm minimum DFT extending minimum 100mm either side of termination. Around penetrations as 20 x 20mm fillet, plus 2.5mm minimum DFT extending minimum 100mm around penetration.</p> <p>Membrane Protection Protectoboard or Rapid-Drain Fix to membrane with Bitustik Tape Super and tape all laps, prior to backfilling with graded fill.</p> <p>UV Protection Cover & protect UV exposed membrane using suitable metal flashings.</p>	
Lift Pit CONSTRUCTION JOINTS <ul style="list-style-type: none"> - Freshwater Environments Or - Salt or Brackish Water Environments 	WPMXX	Hydrophilic waterstops to slab-wall and wall-wall construction joints.	<p>Hydrophilic Waterstop Water-Bar XR-2010 (ADCOR XR-2010 FW) Water-Bar XR-2010SW (ADCOR XR-2010SW)</p> <p>Securely pin to smooth concrete surface at ~300mm centers, ensuring a minimum 75mm concrete cover.</p> <p>On rough concrete, bed waterstop into bead of Swellseal Mastic WA before pinning to concrete.</p> <p>Where Water-Bar XR-2010 installation is not possible, substitute for 10mm x 10mm continuous bead of Swellseal Mastic WA hydrophilic mastic to each joint, ensuring a minimum 100mm concrete cover. Allow to cure 24 hours.</p>	10 Years
Lift Pit Base Slab & Wall	WPMXX	Hydrophilic waterstops to penetrations in	Hydrophilic Waterstop Swellseal Mastic WA	10 Years

Project Area	Membrane Type	Location and Description	Waterproofing System	Product Warranty
PENETRATIONS - Fresh, Salt or Brackish Water Environments		lift pit slab and base slabs.	Apply as a 10 x 10mm continuous bead of Swellseal Mastic WA hydrophilic mastic around each penetration prior to concrete placement, ensuring a minimum 100mm concrete cover.	
BASE SLAB: Full Plan Area - On Ground or - Below Grade	WPMXX	Pre-applied membrane to concrete blinding under slabs on ground. Turn membrane up formwork to 50mm below slab top surface, to waterproof slab edge and allow an overlap with wall membrane.	Membrane Preprufe 300R Plus For all concrete section thicknesses (mm) Turn up lift pit slab edges to allow 200mm overlap by lift pit wall membrane. Detailed Preprufe Tape To end laps and cut edge overlaps. Preprufe CJ Tape To clean Preprufe membrane surface, positioned centrally over location of wall construction joints. Used only where joint shrinkage/movement between 1.0mm and 5.0mm is to be experienced. Bituthene Liquid Membrane Around penetrations to 2.5mm minimum DFT extending minimum 100mm around penetration, plus 20 x 20mm fillet around penetration.	20 Years
Below Ground Hydrostatic Walls - Inaccessible Blindsides Application - Insitu form & Pour Concrete OR - Basement perimeter retaining wall with Bored pier and shotcrete infill.	WPMXX	For "Blindsight" application where wall external surface is not accessible after pouring. Pre-applied membrane to sacrificial formwork or smooth shotcrete. Membrane to lap over base slab membrane turn-up by 150mm.	Membrane Preprufe 300R Plus For all concrete section thicknesses (mm) Overlap to base slab membrane by 150mm. Extend to above maximum water table and flood level by minimum 500mm or to underside of ground level floor slab, whichever is greater. Detailed Preprufe Tape To end laps and cut edge overlaps. Preprufe CJ Tape To clean Preprufe membrane surface, positioned centrally over location of wall construction joints. Used only where joint shrinkage/movement between 1.0mm and 5.0mm is to be experienced. Bituthene Liquid Membrane To slab membrane overlap to 2.5mm minimum DFT extending minimum 100mm either side of termination. Around penetrations to 2.5mm minimum DFT extending minimum 100mm around penetration, plus 20 x 20mm fillet around penetration.	20 Years
	WPMXX	Hydrophilic waterstops to	Hydrophilic Waterstop Water-Bar XR-2010 (ADCOR XR-2010 FW)	10 Years

Project Area	Membrane Type	Location and Description	Waterproofing System	Product Warranty
CONSTRUCTION JOINTS - Freshwater Environments Or - Salt or Brackish Water Environments		non-moving slab-wall, slab-column, slab-slab and wall-wall construction joints.	Water-Bar XR-2010SW (ADCOR XR 2010-SW) Securely pin to smooth concrete surface at ~300mm centers, ensuring a minimum 75mm concrete cover. On rough concrete, bed waterstop into bead of Swellseal Mastic WA before pinning to concrete. Where Water-Bar XR-2010 installation is not possible, substitute for 10mm x 10mm continuous bead of Swellseal Mastic WA hydrophilic mastic to each joint, ensuring a minimum 100mm concrete cover. Allow to cure 24 hours.	
EXPANSION JOINTS - Freshwater Environments Or - Salt or Brackish Water Environments	WPMXX	Twin-seal, hydrophilic tipped, PVC waterstops for external joint placement at slab-wall, slab-slab and wall-wall expansion joints. Used in conjunction with continuous waterproof membrane.	PVC Waterstop Water-Bar PHX-230 (ADCOR PHX-230FW) Water-Bar PHX-230 (ADCOR PHX-230SW) Position and fix correctly and securely to split formwork. Cast into concrete pours at expansion joint. Joint design based on structural movement limits to be confirmed by structural engineer.	10 Years
PENETRATIONS	WPMXX	Hydrophilic waterstops to penetrations in lift pit slab and base slabs.	Hydrophilic Waterstop Swellseal Mastic WA Apply as a 10 x 10mm continuous bead of Swellseal Mastic WA hydrophilic mastic around each penetration prior to concrete placement, ensuring a minimum 100mm concrete cover.	10 Years
Retaining Walls - Insitu Form Concrete OR - Flush Pointed Blockwork - NOT applicable for 'Sleeper' wall construction.	WPMXX	Membrane to positive pressure side of retaining walls prior to backfilling etc. Extends from above maximum finished landscape level to top of footing/slab and 150mm down edge of footing/slab.	Initial Detailing Bituthene Liquid Membrane Minimum 40 x 40mm fillet to substrate internal corners. Priming Bituthene Solvent Primer or Solvent Primer Vertical Grade Minimum 0.20kg/m ² (5m ² /litre) application rate to prime & seal surface and surface pin holes. Porous substrates may require more than one application. Allow to cure to tack free condition. Within 24 hours, apply membrane. Membrane Single layer Bituthene 3000 Fix and seal upper membrane termination edge with Protectoflash bedded in Bituthene LM. Overlap to lift pit slab membrane by 150mm.	20 Years

Project Area	Membrane Type	Location and Description	Waterproofing System	Product Warranty
			<p>Final Detailing Bituthene Liquid Membrane To slab membrane overlap termination to 2.5mm minimum DFT extending minimum 100mm either side of termination. Around penetrations as 20 x 20mm fillet, plus 2.5mm minimum DFT extending minimum 100mm around penetration.</p> <p>Membrane Protection Protectoboard or Rapid-Drain Fix to membrane with Bitustik Tape Super and tape all laps, prior to backfilling with graded fill.</p> <p>UV Protection Cover & protect UV exposed membrane using suitable metal flashings.</p>	
RC Roof Deck - With Unbonded Wearing/Topping Slab Over (Not applicable for Metal Roof Deck)	WPMXX	Membrane to podium slab set to falls prior to installation of unbonded topping slab over membrane. To prepared concrete podium, hobs, drainage channels. Turn-up walls, columns etc. a minimum 150mm above finished surface level.	<p>Detailing Silcor LM PU Sealant Minimum 15 x 15mm fillet to all internal corners, penetrations and drainage outlets. Seal expansion joints, chased construction joints and chased concrete cracks. Allow sealant to cure a minimum 24 hours.</p> <p>Priming Aquagard M Clear Primer or Epocote F100W (Silcor Primer BS or Silcor Primer BW Clear) Minimum 0.30kg/m² application rate to prime & seal surface and surface pin holes. Porous substrates may require more than one application. Allow to cure to tack free condition. Within 24 hours, apply membrane.</p> <p>Detailing Apply 50mm wide, single sided, self-adhesive slip tape centred across all construction joints. Apply 100mm wide, single sided, self-adhesive slip tape centred across all expansion joints.</p> <p>Membrane Aquagard M UVR (Silcor 575) Minimum 2.4 kg/m² application rate to primed surfaces, to produce a minimum 1.5mm DFT, in one or more applications. Allow to cure 48 hours.</p> <p>Membrane Protection Protectoboard or 2 x Layers 250 Micron Polyethylene Plastic Sheet Fix to membrane with Bitustik Tape Super and tape all laps, prior to installation of reinforced topping slab.</p> <p>Topping Slab Set to Falls</p>	15 Years

Project Area	Membrane Type	Location and Description	Waterproofing System	Product Warranty
			<p>Topping slab to be reinforced and designed to resist cracking, breakup or degradation in use. Finished as per architectural requirements.</p> <p>UV Protective Top Coat Aquagard M Non-Slip Top Coat (Silcor Top Coat 75) Minimum 0.3kg/m² application rate to give minimum 150µm DFT. Apply to all permanently exposed membrane.</p>	
RC Roof Deck - With Bonded Wearing/Topping slab set to Falls, and Tiles/Pavers Over (Not applicable for Metal Roof Deck)	WPMXX	<p>Membrane to slab set to falls prior to installation of bonded screed and tiles over membrane.</p> <p>To prepared concrete podium, hobs, drainage channels. Turn-up walls, columns etc. a minimum 150mm above finished surface level.</p>	<p>Detailing Silcor LM PU Sealant Minimum 15 x 15mm fillet to all internal corners, penetrations and drainage outlets. Seal expansion joints, chased construction joints and chased concrete cracks. Allow sealant to cure a minimum 24 hours.</p> <p>Priming Aquagard M Clear Primer or Epcote F100W (Silcor Primer BS or Silcor Primer BW Clear) Minimum 0.30kg/m² application rate to prime & seal surface and surface pin holes. Porous substrates may require more than one application. Allow to cure to tack free condition. Within 24 hours, apply membrane.</p> <p>Detailing Apply 50mm wide, single sided, self-adhesive slip tape centred across all construction joints. Apply 100mm wide, single sided, self-adhesive slip tape centred across all expansion joints.</p> <p>Membrane Aquagard M UVR (Silcor 575) Minimum 2.4 kg/m² application rate to primed surfaces, to produce a minimum 1.5mm DFT, in two or more applications. Allow to cure 24 hours.</p> <p>Tie Coat Aquagard M UVR (Silcor 575) To 0.4mm WFT, to all membraned areas receiving topping slab. Sand broadcast wet membrane to excess with clean, kiln dried, sharp quartz sand 0.4 to 1.2mm size. Sand coverage to be 100% with no membrane showing. Allow to cure 48 hours.</p> <p>Screeed Set to Falls Applied screed to be high quality, external grade, polymer modified cementitious type. Sand-cement screeds are unsuitable. Screeed must be designed to resist breakup or degradation in use.</p>	15 Years

Project Area	Membrane Type	Location and Description	Waterproofing System	Product Warranty
			<p>Install tiles to screed using high quality, external grade, polymer modified cementitious type.</p> <p>UV Protective Top Coat Aquagard M Non-Slip Top Coat (Silcor Top Coat 75) Minimum 0.3kg/m² application rate to give minimum 150µm DFT. Applied to all permanently exposed membrane.</p>	
Planter Boxes <ul style="list-style-type: none"> - Concrete or Flush Pointed Block Work - NON Aggressive Root Plant species 	WPMXX	<p>Membrane to internal wall surfaces and, slab set to falls prior to installation of landscaping media.</p> <p>To prepared concrete and flush pointed block work and drainage outlets. Turn-up walls, parapets etc. a minimum 100mm above finished soil level.</p> <p>Note: Slab to be waterproofed prior to construction of planter walls to ensure waterproofing continuity under planter walls.</p>	<p>Detailing Silcor LM PU Sealant Minimum 15 x 15mm fillet to all internal corners, penetrations and drainage outlets. Seal expansion joints, chased construction joints and chased concrete cracks. Allow sealant to cure a minimum 24 hours.</p> <p>Priming Aquagard M Clear Primer or Epoctote F100W (Silcor Primer BS or Silcor Primer BW Clear) Minimum 0.30kg/m² application rate to prime & seal surface and surface pin holes. Porous substrates may require more than one application. Allow to cure to tack free condition. Within 24 hours, apply membrane.</p> <p>Detailing Apply 50mm wide, single sided, self-adhesive slip tape centred across all construction joints. Apply 100mm wide, single sided, self-adhesive slip tape centred across all expansion joints.</p> <p>Membrane Aquagard M 40R (Silcor 560 HB) Minimum 3.2 kg/m² application rate to primed surfaces, to produce a minimum 2.0mm DFT, in three or more applications. Allow to cure 48 hours.</p> <p>UV Protective Top Coat Aquagard M Non-Slip Top Coat (Silcor Top Coat 75) Minimum 0.3kg/m² application rate to give minimum 150µm DFT. Applied to all exposed membrane.</p> <p>Membrane Protection and Drainage Protectoboard or Rapid-Drain Fix to membrane with Bitustik Tape Super prior to backfilling with landscaping media.</p>	20 Years
Planter Boxes <ul style="list-style-type: none"> - Concrete or Flush Pointed Block Work 	WPMXX	Membrane to internal wall surfaces and, slab set to falls prior to	<p>Detailing Silcor LM PU Sealant Minimum 15 x 15mm fillet to all internal corners, penetrations and drainage outlets.</p>	20 Years

Project Area	Membrane Type	Location and Description	Waterproofing System	Product Warranty
- AGGRESSIVE Root Plant species		<p>installation of landscaping media.</p> <p>To prepared concrete and flush pointed block work and drainage outlets. Turn-up walls, parapets etc. a minimum 100mm above finished soil level.</p> <p>Note: Slab to be waterproofed prior to construction of planter walls to ensure waterproofing continuity under planter walls.</p>	<p>Seal expansion joints, chased construction joints and chased concrete cracks. Allow sealant to cure a minimum 24 hours.</p> <p>Priming <i>Chemspray 117 Clear Primer (Silcor Primer BS 117)</i> Minimum 0.30kg/m² application rate to prime & seal surface and surface pin holes. Porous substrates may require more than one application. Allow to cure to tack free condition. Within 6 hours, apply membrane</p> <p>Detailing Apply 50mm wide, single sided, self-adhesive slip tape centred across all construction joints. Apply 100mm wide, single sided, self-adhesive slip tape centred across all expansion joints.</p> <p>Membrane <i>Chemspray 790 Hybrid Polyurea (Silcor 790 HI)</i> Minimum 3.3 kg/m² application rate to primed surfaces, to produce a minimum 3.0mm DFT, in one or more applications. Allow to cure 2 to 12 hours.</p> <p>UV Protective Top Coat <i>Ultraure A-80 Non-Slip Top Coat (Silcor Top Coat 80)</i> Minimum 0.3kg/m² application rate to give minimum 150µm DFT. Applied to all membrane.</p> <p>Membrane Protection and Drainage <i>Protectoboard or Rapid-Drain</i> Fix to membrane with Bitustik Tape Super prior to backfilling with graded fill.</p>	
Wet Plant Rooms	WPMXX	<p>Membrane to slab set to falls.</p> <p>To prepared concrete balcony deck, hobs, plinths and drainage outlets. Turn-up walls, parapets etc. a minimum 150mm above finished surface level.</p>	<p>Detailing <i>Silcor LM PU Sealant</i> Minimum 15 x 15mm fillet to all internal corners, penetrations and drainage outlets. Seal expansion joints, chased construction joints and chased concrete cracks. Allow sealant to cure a minimum 24 hours.</p> <p>Priming <i>Aquagard M Clear Primer or Epocone F100W (Silcor Primer BS or Silcor Primer BW Clear)</i> Minimum 0.30kg/m² application rate to prime & seal surface and surface pin holes. Porous substrates may require more than one application. Allow to cure to tack free condition. Within 24 hours, apply membrane.</p> <p>Detailing</p>	20 Years

Project Area	Membrane Type	Location and Description	Waterproofing System	Product Warranty
			<p>Apply 50mm wide, single sided, self-adhesive slip tape centred across all construction joints.</p> <p>Apply 100mm wide, single sided, self-adhesive slip tape centred across all expansion joints.</p> <p>Membrane <i>Ultraure A-80 (Silcor 580)</i> Minimum 2.4 kg/m² application rate to primed surfaces, to produce a minimum 1.5mm DFT, in one or more applications. Allow to cure 12 hours.</p> <p>UV Protective Top Coat <i>Ultraure A-80 Non-Slip Top Coat (Silcor Top Coat 80)</i> Minimum 0.3kg/m² application rate to give minimum 150µm DFT. Applied to all membrane.</p>	
Dry Plant Rooms - Internal Exposed Coating Only - Light Maintenance Foot Traffic - NON Waterproof	WPMXX	<p>Membrane to slab set to falls.</p> <p>To prepared concrete balcony deck, hobs, plinths and drainage outlets.</p> <p>Turn-up walls, parapets etc. a minimum 150mm above finished surface level.</p>	<p>Detailing <i>Silcor LM PU Sealant</i> Minimum 15 x 15mm fillet to all internal corners, penetrations and drainage outlets. Seal expansion joints, chased construction joints and chased concrete cracks. Allow sealant to cure a minimum 24 hours.</p> <p>Priming <i>Epocote F100W (Silcor Primer BW Clear)</i> Minimum 0.30kg/m² application rate to prime & seal surface and surface pin holes. Porous substrates may require more than one application. Allow to cure to tack free condition. Within 24 hours, apply membrane.</p> <p>Detailing Apply 50mm wide, single sided, self-adhesive slip tape centred across all construction joints. Apply 100mm wide, single sided, self-adhesive slip tape centred across all expansion joints.</p> <p>Coating <i>Epocote F100W HD (Solacir EP410)</i> Minimum 0.6 kg/m² application rate to primed surfaces, to produce a minimum 150 micron DFT, in two or more applications</p>	10 Years
Window & Door Reveals, Rebates & Returns - Non-Exposed Membrane - Compatible with Polyurethane	WPMXX	Membrane to prepared concrete or block work reveals, rebates and returns.	<p>Detailing <i>Silcor LM PU Sealant</i> Minimum 15 x 15mm fillet to all internal corners, penetrations and drainage outlets. Seal expansion joints, chased construction joints and chased concrete cracks. Allow sealant to cure a minimum 24 hours.</p> <p>Priming</p>	15 Years

Project Area	Membrane Type	Location and Description	Waterproofing System	Product Warranty
Window/Door Frame Sealants - Not to be Used with Silicone Sealants			<p>Aquagard M Clear Primer or Epoctec F100W (Silcor Primer BS or Silcor Primer BW Clear) Minimum 0.30kg/m² application rate to prime & seal surface and surface pin holes. Porous substrates may require more than one application. Allow to cure to tack free condition. Within 24 hours, apply membrane.</p> <p>Detailing Apply 50mm wide, single sided, self-adhesive slip tape centred across all construction joints. Apply 100mm wide, single sided, self-adhesive slip tape centred across all expansion joints.</p> <p>Membrane Aquagard M 40R (Silcor 560 HB) Minimum 2.4 kg/m² application rate to primed surfaces, to produce a minimum 1.5mm DFT, in two or more applications. Allow to cure 24 hours.</p>	
Dust Sealing of Concrete Slabs - Basement Carpark concrete slab floor.	WPMXX	Slab finished with dust proof sealer only, to etched slip resistant concrete surface.	<p>Dust Proof Sealer Chemiseal (Solacir CD 100) Minimum one application at 3m²/litre of diluted Chemiseal (diluted 1 part to 4 parts water). Porous concrete may require 2 – 3 applications.</p>	10 Years
NON-WATERPROOF				
Non-Slip Coating to Car-Park Decks - Basement Carpark concrete slab floor.	WPMXX	Non-Slip top coat to concrete car park deck	<p>Detailing Silcor LM PU Sealant Minimum 15 x 15mm fillet to all internal corners and penetrations. Transition fillet to all drainage outlets where present. Allow sealant to cure a minimum 24 hours.</p> <p>Priming Aquagard M Clear Primer (Silcor Primer BS) Minimum 0.30kg/m² application to prepared surfaces to prime & seal surface and surface pin holes. Porous substrates may require more than one application. Continue primer over sealant fillet and to turn-up extending minimum 100mm above finished deck level. Allow to cure to tack free condition. Within 24 hours, apply membrane.</p> <p>Non-Slip Top Coat Ultraure A-80 Non-Slip Top Coat (Silcor Top Coat 80) Minimum 0.6kg/m² application rate in three or four coats, to give a minimum 200μm DFT. Sand</p>	10 years
NON-WATERPROOF				

Project Area	Membrane Type	Location and Description	Waterproofing System	Product Warranty
			<p>broadcast to wet first coat, to excess. Sand coverage to be 100%.</p> <p>Apply remaining top coat to seal sand broadcast and provide required non-slip surface finish.</p> <p>Allow to cure 7 days before allowing foot or vehicle traffic.</p>	
Internal Wet Area FLOORS <ul style="list-style-type: none"> - M/F Bathrooms & Toilets/Ensuites at each level - Change Rooms - Laundries - Cleaner's Rooms - PWD - Thresholds - Lobby or Foyer 	WPMXX	<p>Membrane to prepared concrete floor slabs, hobs, penetrations and in to drainage outlets.</p> <p>Turn up walls a minimum 100mm above finished floor level.</p> <p>High quality polymer modified bonded screed to membrane.</p> <p>Direct stick tiles to screed.</p> <p>Membrane applied to extents detailed in AS 3740 and BCA sections relevant to internal wet areas for this building type.</p>	<p>Detailing Silcor LM PU Sealant Minimum 12 x 12mm fillet to all internal corners, and penetrations. Transition fillet to drainage outlets. Allow sealant to cure a minimum 24 hours.</p> <p>Priming Epocote F100W (Silcor Primer BW Clear) Minimum 0.30kg/m² application rate to prime & seal surface and surface pin holes. Porous substrates may require more than one application. Allow to cure to tack free condition. Within 24 hours, apply membrane.</p> <p>Membrane Newflex WAM / WAM Fibre (Silcor 145 FB) Minimum 2.2 kg/m² application rate to primed surfaces, to produce a minimum 1.0mm DFT, in two or more applications. Allow to cure a minimum 24 hours.</p> <p>Screed to Falls Premium quality polymer modified screed (by others) to tie coat. Screed to resist shrinkage, breakup or thermal shock in use.</p> <p>Tile or Vinyl over screed.</p>	10 Years
Internal Wet Area WALLS <ul style="list-style-type: none"> - M/F Bathrooms & Toilets at each level - Change Rooms - Laundries - Cleaner's Rooms - PWD - Thresholds - Lobby or Foyer 	WPMXX	<p>Membrane system to internal wet area walls.</p> <p>Membrane applied to extents detailed in AS 3740 and BCA sections relevant to internal wet areas for this building type.</p>	<p>Detailing Silcor LM PU Sealant Minimum 12 x 12mm fillet to all internal corners, and penetrations. Transition fillet to drainage outlets. Allow sealant to cure a minimum 24 hours.</p> <p>Priming Epocote F100W (Silcor Primer BW Clear) Minimum 0.30kg/m² application rate to prime & seal surface and surface pin holes. Porous substrates may require more than one application. Continue primer over floor membrane turn-up. Allow to cure to tack free condition. Within 24 hours, apply membrane.</p>	10 Years

Project Area	Membrane Type	Location and Description	Waterproofing System	Product Warranty
			<p>Membrane Newflex WAM / WAM Fibre (Silcor 145 FB) Minimum 1.4kg/m² application rate to primed surfaces, to produce a minimum 0.8mm DFT, in one or more coats. Continue application to overlap floor membrane turn-up. Allow to cure a minimum 48 hours prior to installation of tiles using high quality, polymer modified cementitious tile adhesive and grout.</p>	
Internal Wet Area FLOORS - M/F Bathrooms & Toilets at each level - Change Rooms - Laundries - Cleaner's Rooms - PWD - Thresholds - Lobby or Foyer	WPMXX	Membrane to prepared concrete floor slabs, hobs, penetrations and in to drainage outlets. Turn up walls a minimum 100mm above finished floor level. High quality polymer modified bonded screed to membrane. Direct stick tiles to screed. Membrane applied to extents detailed in AS 3740 and BCA sections relevant to internal wet areas for this building type.	<p>Detailed Silcor LM PU Sealant Minimum 12 x 12mm fillet to all internal corners, and penetrations. Transition fillet to drainage outlets. Allow sealant to cure a minimum 24 hours.</p> <p>Priming Epocote F100W (Silcor Primer BW Clear) Minimum 0.30kg/m² application rate to prime & seal surface and surface pin holes. Porous substrates may require more than one application. Allow to cure to tack free condition. Within 24 hours, apply membrane.</p> <p>Membrane Aquagard M 40R (Silcor 560 HB) Minimum 3.2kg/m² application rate to primed surfaces, to produce a minimum 2.0mm DFT, in two or more applications. Allow to cure 24 hours.</p> <p>Tie Coat Aquagard M UVR (Silcor 575) To 0.4mm WFT, to all membraned areas receiving screed set to falls. Sand broadcast wet membrane to excess with clean, kiln dried, sharp quartz sand 0.6 to 1.2mm size. Sand coverage to be 100% with no membrane showing. Allow to cure 24 hours. OR Epocote F100W Grey (Silcor Primer BW Grey) To 0.2mm WFT, to all membraned areas receiving screed set to falls. Sand broadcast wet Epocote to excess with clean, kiln dried, sharp quartz sand 0.6 to 1.2mm size. Sand coverage to be 100% with no membrane showing. Allow to cure 24 hours.</p> <p>Screeed to Falls Premium quality polymer modified screed (by others) to tie coat. Screeed to resist shrinkage, breakup or thermal shock in use.</p> <p>Tile or Vinyl over screed.</p>	15 Years

Project Area	Membrane Type	Location and Description	Waterproofing System	Product Warranty
Lift Overrun Concrete Lid - Exposed Membrane	WPMXX	Membrane to slab set to falls. To prepared concrete and drainage outlets. Turn-up walls, hobs, parapets etc. a minimum 150mm above finished surface level.	<p>Detailing Silcor LM PU Sealant Minimum 15 x 15mm fillet to all internal corners, penetrations and drainage outlets. Seal expansion joints, chased construction joints and chased concrete cracks. Allow sealant to cure a minimum 24 hours.</p> <p>Priming Epoch F100W (Silcor Primer BW Clear) Minimum 0.30kg/m² application rate to prime & seal surface, surface pin holes and Chemflex PU Sealant. Porous substrates may require more than one application. Allow to cure to tack free condition. Within 24 hours, apply membrane.</p> <p>Membrane Newflex Grey or Newflex R100 (Silcor 140 or Silcor 140 FB) Minimum 2.4 kg/m² application rate to primed surfaces, to produce a minimum 1.5mm DFT, in two or more applications. Allow to cure 48 hours.</p> <p>UV Protective Top Coat Tuffcote Top Coat (Silcor Top Coat 40) Minimum 0.5kg/m² application rate to give minimum 300μm DFT. Applied to all permanently exposed membrane.</p>	10 Years
Lift Overrun Concrete Lid - Exposed Membrane	WPMXX	Membrane to slab set to falls. To prepared concrete and drainage outlets. Turn-up walls, hobs, parapets etc. a minimum 150mm above finished surface level.	<p>Detailing Silcor LM PU Sealant Minimum 15 x 15mm fillet to all internal corners, penetrations and drainage outlets. Seal expansion joints, chased construction joints and chased concrete cracks. Allow sealant to cure a minimum 24 hours.</p> <p>Priming Aquagard M Clear Primer or Epoch F100W (Silcor Primer BS or Silcor Primer BW Clear) Minimum 0.30kg/m² application rate to prime & seal surface and surface pin holes. Porous substrates may require more than one application. Allow to cure to tack free condition. Within 24 hours, apply membrane.</p> <p>Membrane Aquagard M UVR (Silcor 575) Minimum 2.4 kg/m² application rate to primed surfaces, to produce a minimum 1.5mm DFT, in two or more applications. Allow to cure 24 hours.</p> <p>UV Protective Top Coat</p>	15 Years

Project Area	Membrane Type	Location and Description	Waterproofing System	Product Warranty
			<p>Aquagard M Non-Slip Top Coat (Silcor Top Coat 75) Minimum 0.3kg/m² application rate to give minimum 150µm DFT. Applied to all membrane.</p>	
Fire Sprinkler, Hydraulic and Storm Water Tanks - POTABLE and NON-Potable - ZERO Movement at Joints or cracking.	WPMXX	All internal surfaces, including floor, walls and soffit of concrete non-potable water containment tanks. Soffits / lids to receive membrane to prevent calcium leaching caused by condensation and saturation.	<p>Detailing Silcor LM PU Sealant Minimum 15 x 15mm fillet to all internal corners, penetrations and drainage outlets. Seal expansion joints, chased construction joints and chased concrete cracks. Allow sealant to cure a minimum 24 hours.</p> <p>Priming Pre-dampen all porous substrates with clean water prior to application. Remove any ponded water. Surfaces to be sound, smooth and free from dust, loose matter, oil, grease or other contaminants. All surface defects shall be repaired using CHEMBOND™ modified mortar. See further preparation notes contained within Product Data sheet.</p> <p>Membrane Betec Fastflex (Betec FLX 120) Minimum 5.0kg/m² application rate to primed surfaces, to produce a minimum 3.0mm DFT, in 3 or more applications.</p>	10 Years
Fire Sprinkler, Hydraulic and Storm Water Tanks - Non-Potable Only	WPMXX	All internal surfaces, including floor, walls and soffit of concrete non-potable water containment tanks. Soffits / lids to receive membrane to prevent calcium leaching caused by condensation and saturation.	<p>Detailing Silcor LM PU Sealant Minimum 15 x 15mm fillet to all internal corners, penetrations and drainage outlets. Seal expansion joints, chased construction joints and chased concrete cracks. Allow sealant to cure a minimum 24 hours.</p> <p>Priming Aquagard M Clear Primer or Epcote F100W (Silcor Primer BS or Silcor Primer BW Clear) Minimum 0.30kg/m² application rate to prime & seal surface and surface pin holes. Porous substrates may require more than one application. Do not prime slab membrane turn-up. Allow to cure to tack free condition. Within 24 hours, apply membrane.</p> <p>Detailing Apply 50mm wide, single sided, self-adhesive slip tape centred across all construction joints. Apply 100mm wide, single sided, self-adhesive slip tape centred across all expansion joints.</p>	20 Years

Project Area	Membrane Type	Location and Description	Waterproofing System	Product Warranty
			<p>Membrane Aquagard M 40R (Silcor 560 HB) Minimum 2.4 kg/m² application rate to primed surfaces, to produce a minimum 1.5mm DFT, in two or more applications. Allow to cure 24 – 48 hours.</p> <p>Ultraure A-80 (Silcor 580) Minimum 1.6 kg/m² application rate to Aquagard M 40R surface, to produce a minimum 1.0mm DFT, in two or more applications. Allow to cure a minimum 7 days prior to filling tank with water.</p>	
Exposed Roof Deck Plant Roof Deck - Exposed Membrane - Light Maintenance Foot Traffic	WPMXX	Membrane to slab set to falls. To prepared concrete balcony deck, hobs, plinths and drainage outlets. Turn-up walls, parapets etc. a minimum 150mm above finished surface level.	<p>Detailing Silcor LM PU Sealant Minimum 15 x 15mm fillet to all internal corners, penetrations and drainage outlets. Seal expansion joints, chased construction joints and chased concrete cracks. Allow sealant to cure a minimum 24 hours.</p> <p>Priming Aquagard M Clear Primer or Epoctec F100W (Silcor Primer BS or Silcor Primer BW Clear) Minimum 0.30kg/m² application rate to prime & seal surface and surface pin holes. Porous substrates may require more than one application. Allow to cure to tack free condition. Within 24 hours, apply membrane.</p> <p>Detailing Apply 50mm wide, single sided, self-adhesive slip tape centred across all construction joints. Apply 100mm wide, single sided, self-adhesive slip tape centred across all expansion joints.</p> <p>Membrane Ultraure A-80 (Silcor 580) Minimum 2.4 kg/m² application rate to primed surfaces, to produce a minimum 1.5mm DFT, in one or more applications. Allow to cure 12 hours.</p> <p>UV Protective Top Coat Ultraure A-80 Non-Slip Top Coat (Silcor Top Coat 80) Minimum 0.3kg/m² application rate to give minimum 150µm DFT. Applied to all membrane.</p>	20 Years
Balconies / Terraces Podium Deck Roof Deck	WPMXX	Membrane to slab set to falls prior to installation of pavers on	<p>Detailing Silcor LM PU Sealant Minimum 15 x 15mm fillet to all internal corners, penetrations and drainage outlets. Seal expansion joints, chased construction joints and chased concrete cracks.</p>	20 Years

Project Area	Membrane Type	Location and Description	Waterproofing System	Product Warranty
- With Pavers on Pods		<p>adjustable jack supports.</p> <p>To prepared concrete roof deck, hobs, equipment plinths and drainage outlets. Turn-up walls, parapets etc. a minimum 150mm above finished surface level.</p>	<p>Allow sealant to cure a minimum 24 hours.</p> <p>Priming Aquagard M Clear Primer or Epocote F100W (Silcor Primer BS or Silcor Primer BW Clear) Minimum 0.30kg/m² application rate to prime & seal surface and surface pin holes. Porous substrates may require more than one application. Allow to cure to tack free condition. Within 24 hours, apply membrane.</p> <p>Detailing Apply 50mm wide, single sided, self-adhesive slip tape centred across all construction joints. Apply 100mm wide, single sided, self-adhesive slip tape centred across all expansion joints.</p> <p>Membrane Ultraure A-80 (Silcor 580) Minimum 2.4 kg/m² application rate to primed surfaces, to produce a minimum 1.5mm DFT, in one or more applications. Allow to cure 12 hours.</p> <p>UV Protective Top Coat Ultraure A-80 Non-Slip Top Coat (Silcor Top Coat 80) Minimum 0.3kg/m² application rate to give minimum 150µm DFT. Applied to all membrane.</p>	

NOTES:

- GCP is introducing new product brand names during 2022
- New brand names appear in (brackets) alongside or below existing product names.
- Re: Planter Box specification: Aggressive and Non-aggressive root system plants shall be determined by others.
- Preprufe 160RPLus is no longer held Ex Stock by GCP.
- Wet Plant room specification is suitable for low to mild chemical exposure provided spills are immediately identified, diluted and cleaned. If concern of particular chemical please consult GCP with name and concentration.
- Retaining Wall specification is NOT applicable for 'Sleeper' wall construction.
- Project architect/designer shall determine Podium/Balcony/Roof Deck design:

- Bonded screed over membrane
- Un-bonded topping slab over membrane
- Insulation and ballast over membrane
- Pavers on pedestals over membrane
- Timber structure over membrane
- Exposed membrane subject to foot traffic

- Re: Exposed Membrane Systems: Both Ultraure A-80 Non Slip Top Coat and Aquagard M Non Slip Top Coat both achieve P3 and R10 slip rating from the pail. The top coat is applied in two cross-directional coats at the correct rate of min. 0.15kg/m²/coat.

- Higher slip ratings, P4 /R11 and above, may be achieved with differing treatments – please consult GCP.
- GCP recommends a ‘Trial’ surface be prepared, primed, applied and tested prior to adoption over full surface area to confirm (P or R value) rating is achieved.

- Project Slip rating necessary (P or R value) shall be determined by project architect/designer.
- Actual Slip rating achieved (P or R value) shall be tested and confirmed by independent tester.

- Note the warranty options (years) and DFT (mm) min. offered at each paragraph.

2 GENERAL

2.1 RESPONSIBILITIES

General

Requirement: Provide GCP Australia Pty Ltd (GCP) waterproofing membrane systems for tanking, concrete slabs over below ground spaces, retaining walls, tunnels, landscape and planter boxes, podiums, decks, balconies, plant rooms, green roofs, roof decks and internal wet areas, as documented.

Performance

Requirements: Conform to the following:

- Waterproof for a five minutes duration rainfall intensity, for an average recurrence interval of 100 years, as detailed in AS/NZS 3500.3.
- Substrates graded to falls to dispose of stormwater without ponding.
- Substrates graded to floor wastes, to dispose of water without ponding.

- Able to accommodate building movements encountered in correctly designed structures.
- Prevent moisture entering the substrate or adjacent areas.

2.2 COMPANY CONTACTS

GCP Technical Contact

GCP Australia Pty Ltd
74 Annie Street, Rocklea, QLD, 4106
1800 33 44 44
Website: <https://gcpat.com/construction/en-au>

2.3 CROSS REFERENCES

General

Requirement: Conform to the following:

- Any references to product or recommendations shall be deemed to incorporate reference to all the manufacturer's current technical literature applicable to the product and construction type.
- Industry Association Reference Publications – Work shall be deemed to incorporate any current related Industry Association reference publications and guide standards for relevant work.
- Regulatory Standards – Work shall be deemed to incorporate relevant applicable regulatory standards, including but not limited to the following:
 - Local Council applicable regulations
 - The Building Code of Australia (BCA)

2.4 STANDARDS

Appropriate Australian Standards including but not limited to:

Membrane materials – external above ground

Standard: To AS 4654.1

Membrane materials – internal wet areas

Standard: To AS/NZS 4858

Membrane design and installation – external above ground

Standard: To AS 4654.2.

Membrane design and installation – internal wet areas

Standard: To AS 3740.

Stormwater drainage

Standard: To AS/NZS 3500.3.

Concrete

Standard: To AS 3600.

Masonry

Standard: To AS 3700.

Fibre Cement Sheet

Standard: To AS 2908.2.

Tiling

Standard: To AS 3958.1 & 3958.2.

2.5 MANUFACTURER'S DOCUMENTS

Product Data Sheets

Website: <https://gcpat.com/construction/en-au>

Product Data Sheets, Work Method Statements, Standard Details

GCP Australia Pty Ltd

74 Annie Street, Rocklea, QLD, 4106

1800 33 44 44

2.6 INTERPRETATION

Definitions

General: For the purposes of this work section the definitions given in AS 4654.1, AS 4654.2 and AS 3740 and the following apply:

- Acrylic - liquid applied (membranes): Water-borne formulations which air dry or chemically cure to form plastic membranes.
- Acrylic-Cementitious - liquid applied (membranes): Water-borne formulations which air dry and chemically cure to form polymer modified cement (PMC) membranes.
- Bitumen: A viscous material from the distillation of crude oil comprising complex hydrocarbons, which is soluble in carbon disulphide, softens when it is heated, is waterproof and has good powers of adhesion. It is produced as a refined by-product of oil.
 - SBS bitumen: Bitumen modified with Styrene Butadiene Styrene, a thermoplastic rubber that undergoes a phase inversion at elevated temperature and converts to an elastomeric material. The membrane is reinforced with fibreglass or non-woven polyester (NWP).
 - APP bitumen: Bitumen modified with Atactic (meaning non-crystalline or amorphous) polypropylene wax to form a plastomeric sheet. The membrane is reinforced with fibreglass or non-woven polyester (NWP).
- Bond breaker: A system preventing a membrane bonding to the substrate, bedding or lining.
- Double detail joint: A joint formed by turning up and bonding the horizontal membrane to a vertical substrate and adding an over flashing of membrane material bonded to the vertical substrate and folded over and bonded to the horizontal membrane. In certain situations the double detail can be achieved by bonding an angle profile of membrane material to the junction prior to laying the membrane.
- Elastomer: A polymer having elastic properties similar to rubber.
- Polyurea - liquid applied: 100% solids formulations which chemically cure rapidly to form an elastic rubber membrane.
- Polyurethane - liquid applied: Water-borne, solvent based or solvent free formulations which moisture cure or chemically cure to form an elastic rubber membrane.
- Seamless membranes: Membranes applied in liquid or gel form and air cured to form a seamless film.

- Sheet membrane: Membranes applied in solid sheet form with bonded laps between sheets.
- Slip sheet: A sheet used to isolate the membrane system from the supporting substrate or from the topping or mortar bedding. The most common material is polyethylene.
- 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 are 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.
- Wet area membranes: Impervious barriers to liquid water which may be:
 - Installed below floor finishes.
 - Installed behind the wall sheeting or render and termed External.
 - Installed to the face of the wall sheeting or render and termed Internal.
 - Applied in liquid or gel form and air or chemically cured to form a seamless film.
 - Applied in sheet form with joints lapped and sealed.

2.7 SUBMISSIONS

Products and materials

Manufacturer's documentation: Submit copies of the following data:

- Product technical data sheets.
- Safety data sheets (SDS).
- Preventative maintenance procedures.
- Instructions and procedures for the repair of the membrane.

Prototypes

General: Apply waterproofing to 10m² of deck to demonstrate surface preparation, crack and joint treatment, corner treatment, priming and execution quality. Install final surface finish to demonstrate aesthetic affects and quality of materials and execution.

Records

Pre-installation conference: Meet at project site with main contractor, material installer, material supplier, installers of any related works and other appropriate parties to discuss application and requirements. Provide adequate notice to all. Minute meetings and decisions.

Application records: Traceably complete all sections of Inspection Test Plans (ITPs) and any other quality, testing and safety related documentation required by the main contractor or the material supplier.

Photographically record the application of membranes and label with the following information:

- Date.
- Portion of work.
- Substrate preparation.

- Weather during application and curing.
- Protection provided from traffic and weather.

Samples

Requirement: Submit 300 x 300 mm samples of each type of membrane including the finish of the visible surface.

Shop drawings

Requirement: Subcontractor to submit shop drawings showing the following:

- Junctions with vertical surfaces.
- Drainage details.
- Control joints.
- Flashings.
- Penetrations.
- Corners.
- Terminations and connections.
- Membrane layers.
- Insulation and protection.

Subcontractors

General: Installation shall be only by waterproofing applicators noted in writing by the waterproofing materials supplier as experienced in the installation of the specified systems.

Submit names and contact details of proposed applicators as recommended by GCP.

Warranties

Requirement: Submit warranties to **COMPLETION, Warranties**.

3 PRODUCTS

3.1 GENERAL

Product substitution

Other products: Conform to specification requirements and provide identical waterproof protection for the warranty period required.

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.

4 EXECUTION

4.1 SUBSTRATE QUALITY

Concrete substrates provided to the applicator shall be high quality, sound, well vibrated/compacted during placement and finished by light steel trowel. A low porosity, well densified surface without burnishing shall be provided.

External slabs, internal plant room slabs and similar shall be finished with falls to drainage of greater than 1:100 and shall be free of ponded areas, as per the requirements of AS 4654.2.

Internal wet area concrete shall be finished with falls to drainage of 1:80 to 1:100. Falls within a shower area shall be between 1:60 and 1:80, as per the requirements of Appendix C of AS 3740

Concrete mix design shall not be altered by the concreter/builder by addition of mix water.

Post tension slabs shall be designed and produced with no/minimal concrete cracking.

Masonry substrates, such as blockwork, provided to the applicator shall be structurally sound, fully reinforced, core filled, flush pointed and cured.

The waterproofing applicator shall examine substrates prior to acceptance and commencement of works to ensure substrate suitability. Unsuitable substrates shall be rectified by the main contractor prior to waterproofing works commencing.

4.2 PREPARATION

General

Substrates: Prepare substrates in accordance with waterproofing supplier's instructions, and as follows:

- Chase and fill all shrinkage cracks in substrates wider than 0.5 mm with a filler compatible with the membrane system.
- The builder shall arrange repair of structural cracks or active cracks.
- Fill honeycombing, voids, bugholes and hollows in concrete substrates with a high strength (minimum 25MPa), non-shrink concrete repair mortar (though not stronger than the substrate).
- Remove projections.
- Remove deleterious and loose material.
- Remove all traces of a concrete curing compound if used.
- Leave the surface free of contaminants, clean and dust free.

Moisture content

Concrete substrates: Cure for more than 28 days, or to a moisture content less than 5.0%. Consult waterproofing supplier for higher moisture content scenarios.

Screeds: Cure for more than 7 days, or to a moisture content less than 5.0%. Consult waterproofing supplier for higher moisture content scenarios.

Moisture content: Verify that the moisture content of the substrate is compatible with the water vapour transmission rate of the membrane system or primer used in the membrane system, by testing to AS 1884 Appendix A or an electronic moisture meter calibrated for concrete testing.

Falls

Requirement: Verify that falls in substrates conform to requirements detailed in 3.1 above.

Joints and fillets

Internal corners, penetrations and drainage outlets: Fillets must be installed and cured as per waterproofing supplier's requirements, detailed in supplier literature.

Fillet material: as per waterproofing supplier's requirements, detailed in supplier literature.

External corners: Round or arris edges.

Control joints: Prepare all substrate joints to suit the membrane system and advised structural movements.

Priming

Compatibility: Prime the substrates to penetrate and seal porosity, with compatible primers for adhesion of membrane systems.

4.3 APPLICATION

Protection during installation

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

Drains

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

Drains and cages: Provide removable grates or cages to prevent blockage from debris. If the finished surface is above the level of the membrane, provide a slotted extension piece to bring the grate up to the level of the finished surface. Drainage hardware used must allow screeds and membranes to drain fully.

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

Curing of liquid applied systems

General: To the manufacturers' instructions.

Control of movement

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

Fillets and bond breakers: To the manufacturers' instructions.

Control joint covers: Install after fixing hobs and membranes.

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

Membrane terminations

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

- Height: To AS 4654.2 Appendix A.
- To the manufacturers' instructions.

Membrane vertical penetrations

To the manufacturers' instructions.

Membrane at balcony doors and windows

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

Membrane upturn:

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

Hob less and flush thresholds: Install membrane before the fixing of door or window frames with a continuous grated drain abutting the external face of the door or window sill.

Membrane around skylights and hatches

Requirement: Install membranes to upstands before the installation of the skylight or hatch.

Membrane at parapets

Requirement: Terminate membrane upstands under parapet flashing or capping giving 75 mm overlap. Do not top fix parapet cappings. Seal heads of fasteners against capping.

Membrane at gutters

Requirement: Terminate membrane over a corrosion resistant metal angle fixed to the gutter support substrate with the vertical leg of the angle turned down into the gutter at least 35 mm.

Membrane to planter boxes

Membrane: Extend membrane at least 100 mm vertically above the soil fill level and secure.

Drainage: Grade the base of the planter to adequately sized drainage outlets and terminate the membrane in the outlets.

Drainage riser: Install a riser with drainage slots that extend from the membrane level to the top of the drainage cell. Extend the riser above the soil fill level and finish with a screw cap to provide access for drain clearing.

Protection board: Provide protection board to the full extent of the membrane including areas between soil level and the underside of flashings and cappings.

Drainage cell: Provide geo-filter fabric wrapped drainage cell to the base of the planter and turn geo-filter fabric up drainage riser at least 100 mm above drainage slots.

Cappings and flashings: Provide capping to the tops of planter walls to protect the membrane. Extend the capping to overlap the top of the protection board on the inside face of the planter wall. Where planter walls abut other walls, provide a flashing over the top of the membrane.

Overlaying finishes on membranes

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

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

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

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

4.4 FLOOD TEST

General

Application: Perform a flood test before the installation of surface finishes.

Set-up:

- Measure for dryness the wall/floor junction of adjacent spaces and of the slab soffit below using electrical resistance testing to AS 1884 Appendix A.
- Record the result for each area.
- Dam the access openings and seal drainage outlets to allow 50 mm water level but no higher than 25 mm below the weir level of the perimeter flashings.
- Provide temporary overflows of the same capacity as the roof outlets to maintain the flood level.
- Fill space with clean water and leave a minimum of 12 hours/overnight.

Evaluation:

- Make a visual inspection of the wall/floor junction of adjacent spaces and of the slab soffit below for obvious water or moisture.
- Test the same areas for dryness using a moisture meter, and compare the results to the measurements taken before flooding.

Conformance:

- Evidence of water from the visual test: Failure.
- No visual evidence of water: Proceed with the moisture meter test.
- Increase in test results before and after flooding: Failure.

Records: Submit records of all flood tests.

4.5 COMPLETION

Protection

General: Keep traffic off membrane surfaces after laying until cured or bonded, 24 hours or to GCP's recommendation, whichever period is the longer.

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

Warranties

Waterproofing: Provide to the main contractor warranties, as detailed in the schedule below, from the date of Practical Completion, to cover materials and workmanship in the terms of the warranty in the form of interlocking warranties from the supplier (supplier's product warranty) and the applicator (applicator's installation & workmanship warranty).

- Form: Against failure of materials and execution under normal environment and use conditions.
- Period: As detailed in the schedule below.
- Conditions: The building/structure owner/proprietor must conduct inspection, cleaning and maintenance of installed exposed membranes and coatings in accordance with the supplier's maintenance manuals, provided with warranty on project completion.

Statements, suggestions, designs, details or drawings made or presented in this document are offered for the assistance of our customers. They are based on our experience and judgment, but must be validated by the project design engineer, architect, and/or construction site manager responsible for the project. They must not be regarded as amounting to a legal warranty or transfer of any liability to GCP Australia Pty Ltd, its parent company, or any other subsidiaries. Responsibility for ensuring waterproofing design, product installation, and remedial measures are suitable and adequately conducted lies solely with the project design engineer, architect and/or construction site manager responsible for this project. GCP Australia Pty Ltd reserves its full rights.