dwp suters

architecture + interior design

Specification -

Village Oval Jordan Springs Amenities Building Stage 2 for

Lend Lease

Control*

Form: PF-070s Issue D
File: 302673_Specification Cover sheet.docx

Issue	Description	Date	Check	Authorised
1	Construction Issue	22.06.15	HS	HS

*Refer to individual sections for their current revision details. Additions are shown in red italics while deletions are shown in grey with a strikethrough. e.g. *Additions* ~~Deletions~~

Date 22.06.2015
Project No 302673
Issue 1

dwp suters

contacts

For further information or clarification of information contained within this document please contact the following:

Hilary Spiers– Principal
Registered Architect - NSW ARB 6201
Email: h.spiers@dwpsuters.com

Suters Architects Pty Ltd trading as dwp|suters
Suite 2, 19 Harris Street
Pyrmont NSW 2009
T 02 8569 5000 - F 02 8569 5001
Nominated Architect - Robert Macindoe NSW ARB 4699
www.dwpsuters.com

Contents

Appendix

Door Schedule

Finishes Schedule

Sanitary, Fixtures & Fittings Schedule.

0171B GENERAL REQUIREMENTS

1 GENERAL

1.1 RESPONSIBILITIES

Design

Design by contractor: If the contractor provides design, use only appropriately qualified persons and conform to all statutory requirements.

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.

Noise levels

General: Install systems in conformance with the **Noise level schedule** and within the limits of the contract design and documented equipment performance. Refer to DA Consent conditions.

1.2 PRECEDENCE

General

Worksections and referenced documents:

- The requirements of other worksections of the specification override conflicting requirements of this worksection.
- The requirements of the worksections override conflicting requirements of their referenced documents.
- The requirements of the referenced documents are minimum requirements.

1.3 CROSS REFERENCES

General

Requirement: Conform to the following worksection(s):

- *Demolition.*
- *Service trenching.*

Common requirements

Requirement: Conform to the following:

- *Adhesives, sealants and fasteners.*
- *Fire-stopping.*
- *Metals and prefinishes.*
- *Termite management.*
- *Timber products, finishes and treatment.*
- *Building IT components.*

Cross referencing styles

Within the text:

- Worksection titles are indicated by *Italicised* text.
- Subsection titles are indicated by **BOLD** text.
- Clause titles are indicated by **Bold** text.

1.4 REFERENCED DOCUMENTS

Contractual relationships

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

Current editions

General: Use referenced documents which are the editions, with amendments, current 3 months before the closing date for tenders, except where other editions or amendments are required by statutory authorities.

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.
- EMC: Electromagnetic compatibility.
- MSDS: Material safety data sheets.
- 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.
- VOC: Volatile organic compound.

Definitions

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

- Attendance: Attendance, provide attendance and similar expressions mean give assistance for examination and testing.
- Contractor: Contractor has the same meaning as builder and is the person or organisation bound to carry out and complete the work under the contract.
- Contract administrator: Contract administrator has the same meaning as architect' or superintendent' and is the person appointed by the owner' or principal under the contract.
- Default: Specified value, product or installation method which is to be provided unless otherwise documented.
- Design life: The period of time for which it is assumed, in the design, that an asset will be able to perform its intended purpose with only anticipated maintenance but no major repair or replacement being necessary.
- Documented: Documented, as documented and similar terms mean contained in the contract documents.
- Economic life: The period of time from the acquisition of an asset to 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.
- 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.
- IP: 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.
  - Control joint: An unreinforced joint between or within discrete elements of construction which allows for relative movement of the elements.
  - 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.

  - 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.
  - Isolation joint: A joint between elements of a structure designed to isolate structural movement while permitting horizontal and/or vertical movement between abutting elements.
  - 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.
  - Structural control joint: A control joints (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.
  - 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.
- Local government authority: 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: A person who undertakes the piped distribution of drinking water or natural gas for supply or is the operator of a sewerage system or a stormwater system.
- Obtain: Obtain, seek and similar expressions mean obtain (seek) in writing from the contract administrator.
- Practical completion or Defects free completion: The requirements for these stages of completion are defined in the relevant building contract for the project.
- Pipe: Includes pipe and tube.
- 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: As defined by the BCA.
- Proprietary: Proprietary means identifiable by naming manufacturer, supplier, installer, trade name, brand name, catalogue or reference number.
- Provide: Provide and similar expressions mean supply and install and include development of the design beyond that documented.
- Readily accessible: To AS/NZS 3000.
- Record drawings: Record drawings has the same meaning as as-installed drawings, as-built drawings and work-as-executed drawings.
- Registered testing authority:
  - An organisation registered by the National Association of Testing Authorities (NATA) to test in the relevant field; or
  - An organisation outside Australia registered by an authority recognised by NATA through a mutual recognition agreement; or
  - An organisation recognised as being a Registered Testing Authority under legislation at the time the test was undertaken.
- Required: Means required by the documents, the local council or statutory authorities.
- If required: A conditional specification term for work which may be shown in the documents or is a legislative requirement.
- Samples: Includes samples, prototypes and sample panels.

- Statutory authority: A public sector entity created by a specific law of the Commonwealth State of Territory.
- Supply: Supply, furnish and similar expressions mean supply only.
- Tests:
  - Pre-completion tests: Tests carried out before completion tests.
    - Type tests: Tests carried out on an item identical with a production item, before delivery to the site.
    - Production tests: Tests carried out on a purchased item, before delivery to the site.
    - Progressive tests: Tests carried out during installation to demonstrate performance in according with this specification.
    - Site tests: Tests carried out on the site.
  - Completion tests: Tests carried out on completed installations or systems and fully resolved before the date for, to demonstrate that the installation or system, including components, controls and equipment, operates correctly, safely and efficiently, and meets performance and other requirements. The contract administrator may direct that completion tests be carried out after the date for practical completion.
- Tolerance: The permitted difference between the upper limit and the lower limit of dimension, value or quantity.
- Verification: Provision of evidence or proof that a performance requirement has been met or a default exists.

1.6 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.

1.7 INSPECTION

Notice

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

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

Minimum notice for inspections to be made and for witnessing of tests: Conform to the **Notices schedule**.

Light level requirements: to AS/NZS 1680.2.4.

Attendance

General: Provide attendance for documented inspections and tests.

1.8 SUBMISSIONS

General

Submit to: Lend Lease

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

Program: Allow in the construction program for at least the following times for response to submissions:

Shop drawings: 10 Days

Samples and prototypes: 5 Days

Product/design substitution or modification: 5 days

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

General: Identify the project, contractor, subcontractor or supplier, manufacturer, applicable product, model number and options, as appropriate and include pertinent contract document references. Include service connection requirements and product certification.

Non-compliance: Identify proposals for non-compliance with project requirements, and characteristics which may be detrimental to successful performance of the completed work.

Errors

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

Submissions - electronic copies

File format: pdf

Submissions - hard copy

- Loose documents larger than A3: One transparency on heavyweight plastic film the same size as the standard contract drawings.
- Loose documents up to and including A3: One copy.

Standard contract drawing size: A1

Authorities

Authorities' approvals: Submit documents showing approval by the authorities whose requirements apply to the work.

Correspondence: Submit copies of correspondence and notes of meetings with authorities whose requirements apply to the work.

Building penetrations

General: If it is proposed to penetrate or fix to the following, submit details of the methods proposed to maintain the required structural, fire and other properties:

- 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.

Certification

General: Submit certification that the plant and equipment submitted meets all requirements of the contract documents.

Execution details

General: Before starting the installation of building services, submit 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.

Inspection and testing

General: Submit an inspection and testing plan which is consistent with the construction program. Include particulars of test stages and procedures.

Test reports: Submit written reports on nominated tests.

Materials and components

Product certification: If products must conform to product certification schemes, submit evidence of conformance.

Product data: For proprietary equipment, submit the manufacturer's product data as follows:

- Technical specifications and drawings.
- Type-test reports.
- Performance and rating tables.

- Recommendations for installation and maintenance.

Substitutions

Identified proprietary items: Identification of a proprietary item does not necessarily imply exclusive preference for the item so identified, 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:

- Evidence that the performance is equal to or greater than that specified.
- Evidence of conformity to a cited standard.
- 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.

Samples

Submission: Submit nominated samples.

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

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

Shop drawings

General: 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 submit dimensioned set-out drawings.

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

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

Checking: Make sure that the drawings have been checked before submission.

Building work drawings for building services: Submit detailed dimensioned drawings showing all:

- 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.

2 PRODUCTS

2.1 GENERAL

Manufacturers' or suppliers' recommendations

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

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

Project modifications: Advise of activities that supplement, or are contrary to, manufacturers' or suppliers' written recommendations and instructions.

Sealed containers

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

Prohibited materials

Do not provide the following:

- Materials listed in the Safe Work Australia Hazardous Substances Information System (HSIS).
- Materials that use chlorofluorocarbon (CFC) or hydro chlorofluorocarbon (HCFC) in the manufacturing process.

2.2 TESTS

Attendance

General: Provide attendance on tests.

Testing authorities

General: Except for site tests, have tests carried out by a Registered testing authority and submit test reports.

- Reports: Submit copies of test reports, including certificates for type tests, showing the observations and results of tests and conformance or non-conformance with requirements.
- Site tests: Use instruments calibrated by authorities accredited by a Registered testing authority.

2.3 MATERIALS AND COMPONENTS

Consistency

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

Corrosion resistance

General: Conform to the following atmospheric corrosivity category as defined in AS/NZS 2312.

Galvanizing

Severe conditions: Galvanize mild steel components (including fasteners) to AS 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 EXECUTION

3.1 OFF SITE DISPOSAL

Removal of material

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

3.2 WALL CHASING

Holes and chases

General: If holes and chases are required in masonry walls, provide proposals to demonstrate that the structural integrity of the wall is maintained. Do not chase walls nominated as fire or acoustic rated. Parallel chases or recesses on opposite faces of a wall: Not closer than 600 mm to each other.

Chasing of blockwork: Only in core-filled hollow blocks or in solid blocks which are not designated as structural and to the **Concrete blockwork chasing table**.

Concrete blockwork chasing table

Block thickness (mm)	Depth of chase (maximum mm)
190	35
140	25
90	20

3.3 FIXING

General

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

Fasteners

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

3.4 SERVICES CONNECTIONS

Connections

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

Network distributors' requirements

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

3.5 SERVICES INSTALLATION

General

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

Installation: Install equipment and services plumb, fix securely and organise reticulated services neatly. Allow for movement in both structure and services.

Concealment: Unless otherwise documented, conceal all cables, ducts, trays and pipes except where installed in plant spaces, ceiling spaces and riser cupboards. If possible, do not locate on external walls.

Lifting: Provide heavy items of equipment with permanent fixtures for lifting as recommended by the manufacturer.

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

Arrangement: Arrange services so that services running together are parallel with each other and with adjacent building elements.

Dissimilar metals

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

Vibration: Arrange and support piping so that it remains free from vibration whilst permitting necessary movements. Minimise the number of joints.

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

General: If pipes that operate under pressure are to be embedded in concrete or surfacing material conform to AS 2896 clause 4.3.3.3. Pressure test and rectify leaks before the concrete is poured.

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.

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.

3.6 BUILDING PENETRATIONS

Penetrations

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

Non-fire rated 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 or conduit penetrates building elements, provide metal or PVC sleeves formed from pipe sections as follows:

- Movement: Arrange to permit normal pipe or conduit movement.
- Diameter (for non fire-rated building elements): Sufficient to provide an annular space around the pipe or pipe insulation of at least 12 mm.
- Prime paint ferrous surfaces.
- Terminations:
  - If cover plates are fitted: Flush with the finished building surface.
  - In fire-rated and acoustic-rated building elements: 50 mm beyond finished building surface.
  - In floors draining to floor wastes: 50 mm above finished floor.
  - Elsewhere: 5 mm beyond finished building surface.
  - Termite management: To AS 3660.1.
- Thickness:
  - Metal: ≥ 1 mm.
  - PVC: ≥ 3 mm.

Sleeves for cables: For penetrations of cables not enclosed in conduit through ground floor slabs, beams and external walls provide sleeves formed from PVC pipe sections.

3.7 CONCRETE PLINTHS

Construction

General: Provide concrete plinths as documented.

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

- Concrete: Grade N20.
- Finish: Steel float flush with the surround.
- Reinforcement: Single layer of F62 fabric.
- Surround: Provide galvanized steel surround at least 75 mm high and 1.6 mm thick. Fix to the floor with masonry anchors. Fill with concrete.

3.8 SUPPORT AND STRUCTURE

General

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

3.9 PIPE SUPPORTS

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 to balance the mass of the pipe and its contents.

Saddles: Do not provide saddle type supports for pipes > DN 25.

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 fixings 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

Cold and heated water pipes: To AS/NZS 3500.1 Table 5.2. Provide additional brackets, clips or hangers to prevent pipe movement caused by water pressure effects.

Sanitary plumbing: To AS/NZS 3500.2 Table 9.1.

Fuel gas: To AS/NZS 5601.1 Table 5.5.

Other pipes: To AS/NZS 3500.1 Table 5.2.

Hangers

Conform to the **Hanger size table**.

Hanger size table

Nominal pipe size (DN)	Minimum hanger diameter (mm) for single hangers
≤ 50	9.5
65 to 90	12.7
100 to 125	15.8
150 to 200	19.0

3.10 PLANT AND EQUIPMENT ACCESS

General

Services and equipment: Locate and arrange all services and equipment so that:

- They comply with the relevant requirements of the appropriate Work Health and Safety regulations.
- Failure of plant and equipment (including leaks) does not create a hazard for the building occupants.
- Failure of plant and equipment (including leaks) cause a minimum or no damage to the building, its finishes and contents including water sensitive equipment or finishes.
- Instruments, gauges and the like are located so they can be easily read.
- Safe tray and an overflow pipe are provided to each tank, hot water heater and storage vessel.
- Piping: Provide access and clearance at fittings which require maintenance or servicing, including control valves and joints intended to permit pipe removal. Arrange piping so that it does not interfere with the removal or servicing of associated equipment or valves or block access or ventilation openings.
- Services and equipment are readily accessible for inspection and maintenance and arranged so that inspection and maintenance can be carried out in a safe and efficient manner. Include the following:
  - Minimise inconvenience and disruption to building occupants or damage to the building structure or finishes.
  - Locate plant (including high level tanks) requiring regular inspection and maintenance so it is either safely and readily accessible from floor level or provide permanent access platforms and ladders.
  - Conform to the relevant requirements of AS 1470, AS 1657, AS/NZS 1892.1, AS 2865 and AS/NZS 3666.1 for relevant requirements.
- In false ceilings, locate items of equipment that require inspection and 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.

- Modify manufacturer's standard equipment when necessary to provide the plant access in the contract documents.

3.11 VIBRATION SUPPRESSION

Standard Rotating and reciprocating machinery noise and vibration: Vibration severity in Zone A to AS 2625.1 and AS 2625.4.

General

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

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 so that no stress is placed 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 conforming as follows:

- Construction: Steel or steel-framed reinforced concrete. 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.

3.12 SEISMIC RESTRAINT OF BUILDING SERVICES

Provisions

General: Arrange all components, other than service items exempted in AS 1170.4, to resist seismic loads determined in conformance with AS 1170.4. Securely fix all plant and equipment to the building structure. Do not rely on gravity and/or friction to resist seismic forces.

Anti-vibration mounts: Use horizontally restrained type.

Components: Do not use components that will be damaged by earthquake conditions. Protect systems against the adverse effects of components such as mercury switches that, although not damaged by earthquake, may malfunction.

3.13 FINISHES TO BUILDING SERVICES

General

General: If exposed to view (including in plant rooms), paint new building services and equipment. Surfaces painted or finished off-site: Conform to the *Metals and prefinishes* worksection.

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

General: Conform to the recommendations of AS/NZS 2311 Sections 3, 6 and 7 or AS/NZS 2312 Sections 5, 8 and 10, as applicable.

Powder coating

Standard:

- Aluminium for architectural applications: To AS 3715.
- Other metals: To AS 4506.

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

Corrosion protection: Provide corrosion protection for the following:

- Underground ferrous piping.
- Underground non-ferrous metal piping in corrosive environments.

Protection methods: 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.

Low VOC emitting paints

Provide the following low odour/low environmental impact paint types with the following VOC limits:

- Primers and undercoats: < 65 g/litre.
- Low gloss white or light coloured latex paints for broadwall areas: < 16 g/litre.
- Coloured low gloss latex paints: < 16 g/litre.
- Gloss latex paints: < 75 g/litre.

3.14 MARKING AND LABELLING

General

General: Mark services and equipment to provide a ready means of identification and as follows:

- Locations exposed to weather: Provide durable materials.
- Pipes, conduits and ducts: Identify and label 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.

Electrical accessories

General: Label isolating switches and outlets to identify circuit origin.

Equipment concealed in ceilings

Location: Provide a label on the ceiling indicating the location of each concealed item requiring access for routine inspection, maintenance and/or operation. In tiled ceilings locate the label on the ceiling grid closest to the item access point. In flush ceilings locate adjacent to closest access panel. Items to be labelled include but are not limited to:

- Fan coil units and terminal equipment (e.g. VAV boxes).
- Fire and smoke dampers.
- Isolating valves not directly connected to items otherwise labelled.
- Motorised dampers.
- Wall mounted equipment in occupied areas: 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. Store in a pocket on the door of the panel. Lists to include terminal numbers, point addresses, short and long descriptors.

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.

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 ≥ 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.

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.

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

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: ≥ 10 mm for main heading, ≥ 5 mm for remainder.
- Equipment labels within cabinets: ≥ 3.5 mm.
- Equipment nameplates: ≥ 40 mm.
- Identifying labels on outside of cabinets: ≥ 5 mm.
- Isolating switches: ≥ 5 mm.
- Switchboards, main assembly designation: ≥ 25 mm.
- Switchboards, outgoing functional units: ≥ 8 mm.
- Switchboards, sub assembly designations: ≥ 15 mm.
- Valves: ≥ 20 mm.
- Self-adhesive flexible plastic labels:
- Labels < 2000 mm above floor: 3 mm on 6 mm wide tape.
  - Labels ≥ 2000 mm above floor: 8 mm on 12 mm wide tape.
  - Other locations: ≥ 3 mm.

Operable devices: Mark to provide a ready means of identification. Include the following:

- Controls.
- Indicators, gauges, meters.
- Isolating switches.

Vapour barriers: Do not penetrate vapour barriers.

3.15 SOFTWARE

General

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

3.16 WARRANTIES

General

General: If a warranty is documented or if a manufacturer's standard warranty extends beyond the end of the defects liability period, name the principal as warrantee. Register with manufacturers as necessary. Retain copies delivered with components and equipment.

Commencement: Commence warranty periods at practical completion or at acceptance of installation, if acceptance is not concurrent with practical completion.

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.

3.17 OPERATION AND MAINTENANCE MANUALS

General

General: Submit operation and maintenance manuals for the whole of the work.

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 technical worksections require that manuals be submitted, include corresponding material in the operation and maintenance manuals.

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

Format – electronic copies

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

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

Quantity and format: Conform to **Submissions – electronic copies**.

Format – hard copy

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

Date for draft submission: The earlier of the following:

- 2 weeks before the date for practical completion.
- Commencement of training on services equipment.

Date for final submission: Within 2 weeks after practical completion.

3.18 CLEANING

Final cleaning

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

Labels: Remove all labels not required for maintenance.

3.19 PERIODIC MAINTENANCE OF SERVICES

General

General: During the maintenance period, carry out periodic inspections and maintenance work as recommended by manufacturers of supplied equipment, and promptly rectify faults.

Emergencies: Attend emergency calls promptly.

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

Maintenance period: The greater of the defects liability period and the period nominated in the **Maintenance requirements schedule**.

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 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.

Service visits: Record comments on the functioning of the systems, work carried out, items requiring corrective action, adjustments made and name of service operator. Obtain the signature of the principal's designated representative.

Site control

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

3.20 POST-CONSTRUCTION MANDATORY INSPECTIONS AND MAINTENANCE

General

General: For the duration of the defects liability period, provide inspections and maintenance of safety measures required by the following:

- The Building Code of Australia.
- 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. Submit certification.

Annual inspection: Provide an annual inspection and maintenance immediately prior to the end of the defects liability period.

0181 ADHESIVES, SEALANTS AND FASTENERS

1 GENERAL

1.1 RESPONSIBILITIES

General

Fitness for purpose: Provide adhesives, sealants and fasteners capable of transmitting imposed loads, sufficient to make sure the rigidity of the assembly, or integrity of the joint.

Finished surface: Provide adhesives and sealants that will not cause discolouration.

Compatibility: Do not use sealants or adhesives that are incompatible with the products to which they are applied.

Sealant replacement: Use sealants that can be safely removed without compromising the application of the replacement sealant for future refurbishment.

Selections: Conform to the **SELECTIONS**.

1.2 PRECEDENCE

General

Worksections and referenced documents:

- The requirements of other worksections of the specification override conflicting requirements of this worksection.
- The requirements of this worksection overrides conflicting requirements of its referenced documents.
- The requirements of the referenced documents are minimum requirements.

1.3 CROSS REFERENCES

General

Requirement: Conform to the following worksection(s):

- *General requirements.*

1.4 SUBMISSIONS

Installed sealant tests

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

Testing: Submit the results of tests to the **Installed sealant tests schedule**.

Reinstatement: Make good the joints from which the samples were taken.

Installed sealant tests schedule

Item to be tested	Property to be tested	Applicable standard

Sealants

Samples: Submit colour samples of visible joint sealants.

Documents: Submit technical data sheets.

1.5 INSPECTION

Notice

Inspection: Give notice so that inspection may be made of joints and penetrations prepared for the application of sealants to the **Installed sealant tests schedule**.

1.6 PERFORMANCE

Adhesives and sealants

General: Provide adhesives and sealants capable of transmitting imposed loads, sufficient to make sure the rigidity of the assembly, or integrity of the joint and which will not cause discolouration of finished surfaces.

Compatibility: Do not use sealants or adhesives that are incompatible with the products to which they are applied.

Movement: Where an adhered or sealed joint may be subject to movement, select a system accredited to accommodate the projected movement under the conditions of service.

Refurbishment: Use sealants that can be safely removed and prepared for refurbishment.

Fasteners

Provide fasteners accredited for the particular use, capable of transmitting imposed loads and maintaining the rigidity of the assembly.

2 PRODUCTS

2.1 ADHESIVES

Standards

Mastic adhesive: To AS 2329.

Polymer emulsion adhesive for timber: To AS 2754.2, not inferior to Type 3.

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: Make sure product suitability for the following substrates:

- Firm high strength foam tapes for high energy surfaces including most bare metals such as stainless steel and aluminium.
- Conformable high strength foam for medium energy surfaces including many plastics and paints, and bare metals.
- Conformable high strength foam for 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.

2.2 SEALANTS

Standards

General: To ISO 11600.

External masonry joints

General: Provide sealant and bond breaking backing materials compatible with each other and the substrate and 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.

Fire rated control joints

General: Provide sealant materials that maintain the nominated fire-resisting rating.

- Fire stopping: To AS 4072.1.

Light weight building element joints

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

Floor control joints

General: Provide trafficable sealants for that are compatible with the contact materials.

Bond breaking backing:

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

2.3 FASTENERS

General

Masonry anchors: Proprietary expansion or chemical type.

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.

Powder-actuated fasteners: To AS/NZS 1873.4.

Stainless steel fasteners: To ASTM A240/A240M.

Steel nails: To AS 2334.

- Length: At least 2.5 x the thickness of the member being secured, and at least 4 x the thickness if the member is plywood or building board < 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 the *General requirements* worksection.

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 categories A and B to AS/NZS 2312

Situation	Self drilling screws to AS 3566.2 Class	Threaded fasteners and anchors		Powder actuated fasteners	
		Material	Minimum local metallic-coating thickness (µm)	Material grade	Minimum local metallic-coating thickness (µm)
Internal	1	Electroplated zinc	4	Electroplated zinc	4
External	3	Electroplated zinc or Hot-dip galvanized	30	Stainless steel 316	

Corrosion resistance table – Atmospheric corrosivity category C to AS/NZS 2312

Situation	Self drilling screws to AS 3566.2 Class	Threaded fasteners and anchors		Powder actuated fasteners	
		Material	Minimum local metallic-coating thickness (µm)	Material grade	Minimum local metallic-coating thickness (µm)
Internal	2	Electroplated zinc	12	Electroplated zinc	12
External	4	Hot-dip galvanized	50	Stainless steel 316	

Corrosion resistance table – Atmospheric corrosivity categories D and F to AS/NZS 2312

Situation	Self drilling screws to AS 3566.2 Class	Threaded fasteners and anchors		Powder actuated fasteners	
		Material	Minimum local metallic-coating thickness (µm)	Material grade	Minimum local metallic-coating thickness (µm)
Internal	3	Electroplated zinc or Hot-dip	30	Stainless steel 316	

Situation	Self drilling screws to AS 3566.2 Class	Threaded fasteners and anchors		Powder actuated fasteners	
		Material	Minimum local metallic-coating thickness (µm)	Material grade	Minimum local metallic-coating thickness (µm)
		galvanized			
External	Stainless steel 316 [1]	Stainless steel 316		Stainless steel 316	
[1] Avoid organic coating in Category F zones.					

Finishes

Electroplating:

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

Galvanizing:

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

Mild steel fasteners: Galvanize if:

- Embedded in masonry.
- In external timbers.
- 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 and AS/NZS 1421.

Machine screws: To AS/NZS 1427.

Self-drilling screws: To AS 3566.1 and AS 3566.2.

Self-tapping screws:

- Crossed recessed countersunk (flat – common head style): To AS/NZS 4407.
- Crossed recessed pan: To AS/NZS 4406.
- Crossed 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 colourbond coated 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.

Performance

Loads: Provide fasteners capable of transmitting the loads imposed, and sufficient to make sure the rigidity of the assembly.

3 EXECUTION

3.1 ADHESIVES

Preparation

Substrates: Make sure substrates are:

- Clean and free of any deposit or finish which may impair adhesion.
- If framed or discontinuous, support members are in full lengths without splicing.
- If solid or continuous, excessive projections are removed.
- If previously painted, cracked or flaking paint is removed and the surface lightly sanded.

Contact adhesive

Precautions: Do not use 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.

Follow the recommendations of the manufacturer for application to the following: Copper, brass, plasticized vinyl and hydrophilic surfaces such as glass and ceramics in a high humidity environment.

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

Application temperature: Generally above 10°C, consult the manufacturer.

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

3.2 JOINT SEALING

Joint preparation

Cleaning: Cut flush joint surface protrusions and make good. 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 < 12 mm.
- 2:1 for joint widths > 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: < 5 °C or > 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.

Protection

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

0183B METALS AND PREFINISHES

1 GENERAL

1.1 RESPONSIBILITIES

Metals

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

1.2 PRECEDENCE

General

Worksections and referenced documents:

- The requirements of other worksections of the specification override conflicting requirements of this worksection.
- The requirements of this worksection override conflicting requirements of its referenced documents.
- The requirements of the referenced documents are minimum requirements.

1.3 CROSS REFERENCES

General

Requirement: Conform to the following worksection(s):

- *General requirements.*

1.4 SUBMISSIONS

Samples

General: Submit samples of the following:

- Stainless steel: One sample of every mill grade and finish process.
- Anodising: One sample of every colour and finishing option.

2 PRODUCTS

2.1 METALS

Coated steel

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

Hot-dip galvanizing (zinc):

- 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.
- Metallic-coated steel sheet: To AS 1397. Metal thicknesses specified are base metal thicknesses.

Steel wire: To AS/NZS 4534.

Stainless steel

Bars: To ASTM A276.

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: 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 separation layer such as polyethylene film, adhesive tape, or bituminous felt.

Incompatible fixings: Do not use.

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

Brazing

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

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

Filler metal: To AS/NZS 1167.1.

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.

Priming steel surfaces: If site painting is specified 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.

Welding

Aluminium: To AS 1665.

Stainless steel: To AS/NZS 1554.6.

Steel: To AS/NZS 1554.1.

3.2 STAINLESS STEEL FINISHES

Sample

General: Provide a finish to match the sample in terms of the mill grade and finish process.

Preassembly

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

Bead blasted finish: Provide a uniform non-directional low reflective surface by bead blasting. Do not use sand, iron or carbon steel shot. Blast both sides of austenitic grades or stainless steel to eqalise 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 for external installations: Provide an electro-chemical process to stainless steel grade 316.

Brushed electropolish finish: Conform to the following:

- Preassembly finish: No. 4 brushed finish.
- Post assembly finish: Provide an electro-chemical processed finish to achieve a No. 7 to No. 8 brushed finish.

Mirror electropolish finish:

- Pre assembly finish: Mill finish 2B or mirror polished finish.
- Post assembly finish: Provide an electro-chemical processed finish 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.

3.3 ELECTROPLATING

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.

3.4 PREPAINTING

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 as noted in AS/NZS 2728: Not lower than the type appropriate to the field of application.

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.

3.5 COMPLETION

Damage

General: If prefinishes are damaged, including damage caused by unauthorised site cutting or drilling, remove and replace the damaged item.

Repair

General: If a 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.

0184 TERMITE MANAGEMENT

1 GENERAL

1.1 RESPONSIBILITIES

General

General: Provide termite management materials and systems to the whole of the works described in the contract.

Objective: Achieve building protection.

Selections: As documented.

1.2 CROSS REFERENCES

General

Requirement: Conform to the following worksection(s):

- *General requirements.*

1.3 STANDARD

General

Termite barriers: To AS 3660.1.

1.4 INSPECTION

Notice

Inspection: Give sufficient notice so that inspection may be made of the completed termite barriers.

1.5 SUBMISSIONS

Tests

Woven stainless steel barriers: Provide certification that 725 Grade stainless steel has been used to the manufacturer's specification.

Chemical soil barriers: Submit a Registered testing authority laboratory analysis certificate to AS 3660.1 Appendix E.

2 PRODUCTS

2.1 NON-CHEMICAL BARRIERS

Concrete slab barrier

Standard: To AS 3660.1 Section 4.

Woven stainless steel mesh barriers

Standard: To AS 3660.1 Section 6.

Grade: 725 stainless steel.

Graded stone particles barriers

Standard: To AS 3660.1 Section 7.

2.2 CHEMICAL SOIL BARRIERS

General

Standard: To AS 3660.1 Section 8.

Type testing: To AS 3660.1 Appendix E.

2.3 NON-SOIL MATRIX BARRIERS

Concrete slab barrier

Description: Composite membrane incorporating a termiticide.

Brickwork

Description: Bedding mortar incorporating a termiticide.

Application: Brick bed and perpends as follows:

- Cavity walls built off a concrete slab on ground.
- Buildings with typical raft infill (footing) or formed void slab construction.
- Permanent barrier in sub-floor brickwork and brick piers.

Assessment criteria
Standard: To AS 3660.3.

3 EXECUTION

3.1 NON-CHEMICAL BARRIERS

Concrete slab barrier
Standard: To AS 3660.1 Section 4.

Termite cap and strip shields
Standard: To AS 3660.1 Section 5.

Woven stainless steel mesh barriers
Standard: To AS 3660.1 Section 6.

Graded stone particles barriers
Standard: To AS 3660.1 Section 7.

3.2 CHEMICAL SOIL BARRIERS

General
Standard: To AS 3660.1 Section 8.

Non-soil matrix barriers
Installation: In conformance with the manufacturer's recommendations.

3.3 COMPLETION

Termite barrier notice
General: Provide a durable notice permanently fixed in a prominent location to BCA B1.4(i)(ii) or BCA 3.1.3.2(b) and AS 3660.1 Appendix A.

Waste materials
Progressive cleaning: Make sure that no waste materials which could attract termites remain on the site.

Warranty
Type: Renewable.

Warranty: Provide a warranty on completion of building

Minimum period: 12 months

Certificate of installation
General: To AS 3660.1 Appendix A.

Completion inspection
Report: At the end of the defects liability period, inspect the termite control systems and submit a report on their efficacy and status.

4 SELECTIONS

4.1 SCHEDULE

Termite barriers schedule
Provide a compliant termite barrier from the sections above for the building with appropriate certification to meet Consent/ Compliance erequirements.

0193 ROOF ACCESS SAFETY SYSTEMS

1 GENERAL

1.1 RESPONSIBILITIES

General

General: Provide the fall protection system in conformance with **SELECTIONS**.

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

Supply

Design: The design, supply, installation, testing, certification, user manuals and training.

Delivery: Deliver the fall protection assembly ready for installation as follows:

- Clearly labelled to show the intended location.
- In a separate dust and moisture proof package.
- Including the necessary templates, fixings and fixing instructions.

1.2 CROSS REFERENCES

General

Requirement: Conform to the following worksection(s):

- *General requirements.*

1.3 DESIGN BY CONTRACTOR

General

Designer: Provide a compliant roof fall arrest system to meet requirements of relevant Australian standards.

Requirements

Performance requirements: To AS/NZS 1891.2 Section 4 System acceptance criteria.

Access: Make provision for three workers to access the system at any one time, and provide access as follows:

- Full extent of gutters.
- Roof areas within 2.5 m of fall hazards not otherwise protected by parapets or guard rails.

Means of access: Nominate permanent means of access as appropriate.

Documentation

Provide shop drawing for signoff by Lend Lease for fall arrest system and location of items.

1.4 STANDARDS

General

Standard: To AS/NZS 1891.

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.
- 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.

1.6 SUBMISSIONS

Design

Documentation: Submit design documentation.

Samples
N/A

Product data sheets
Installation: Submit the manufacture's Installation Data Sheets/Specification Manual.

2 PRODUCTS

2.1 FALL PROTECTION SYSTEMS

Fall restraint systems
Description: Cable based systems positioned so that the user cannot reach a fall hazard when continuously connected to the system using a standard 2 m shock absorbing lanyard. Adjustment of the Personnel Protective Equipment (PPE) is not required whilst connected to the system.

Demonstrators: Use only manufacturer's representatives competent in connecting the appropriate travelling device to and from the cable.

Fall arrest systems
Description: Either cable based where the user is continuously attached to the system, rope based series of anchor points or a single anchor point from which the users can attach themselves when working at height. Whilst attached to these systems they are at risk of falling. The system relies on a rescue plan being in place.

Ladder access
Product: Vertical systems comprising top, intermediate and bottom anchor sets and 8 mm 1 x 19 grade 316 stainless steel cables.

Personal protective equipment (PPE)
Harness: Supply two full body harnesses with shock absorbing lanyards to AS/NZS 1891.1.

Cable attachment:

Storage: PPE storage holdall supplied by the manufacturer.

3 EXECUTION

3.1 INSTALLATION

Standard
Installation: To AS/NZS 1891.2.

Contractor
Installer: Registered Installer approved by the manufacture.

3.2 MAINTENANCE

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

Check list for all inspections: To AS/NZS 1891.2 Table 8.

The installer/competent person: To AS/NZS 1891.2 clause 1.3.1.

Routine inspections
Standard: To AS/NZS 1891.2 clause 9.2.

Completion certificate:

- Provide inspection, testing and certification by an Accredited Installer and/or Accredited Height Safety Inspector:
  - Upon completion of the installation
  - 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.
- Note 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 1891.2 clause 9.3.

Proof testing of drilled-in anchorages
Standard: To AS/NZS 1891.2 clause 9.4.

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

4 SELECTIONS

4.1 ROOF FALL PROTECTION

Fall protection system
Type: To Designers system, to be submitted for Approval. To be installed neatly and to ensure the weatherproofing of the building is maintained.

Roof anchorage device

4.2 ROOF ACCESS

Ladder application
Permanent ladder eaves bracket: Supply eaves ladder bracket as part of system with appropriate signage.

0223 SERVICE TRENCHING

1 GENERAL

1.1 RESPONSIBILITIES

General

General: Provide trenching for underground services that service the amenities building.

Design

Steel shoring and trench lining systems: To AS 4744.1.

Hydraulic shoring and trench lining equipment: To AS 5047.

1.2 CROSS REFERENCES

General

Requirement: Conform to the following worksection(s):

- *General requirements.*

1.3 STANDARDS

General

Earthworks: To AS 3798.

1.4 INTERPRETATION

Abbreviations

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

- CBR value: California Bearing Ratio value.

1.5 INSPECTION

Notice

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

- Service trenches excavated before laying the service.
- Services laid in trenches and ready for backfilling.

1.6 TOLERANCES

General

Earthworks: To **Tolerances** in the *Earthwork* worksection.

1.7 SUBMISSIONS

General

Extent: Submit a plan of trench works noting the location and type of service.

Notice: Advise proposed duration of open excavation.

Construction: Submit details of proposed equipment and method of excavation.

Stability: If shuttering and/or bracing of the sides of a trench is required for safety and stability, provide proposals.

Geotechnical data: Provide a geotechnical report supporting the procedures proposed for trenching and/or boring.

Hazards: Identify OH&S hazards that may be encountered with deep trenches including toxic gases and liquids.

Boring: Submit 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.

Off site disposal

Disposal location: Submit the locations and evidence of compliance with the relevant authorities for the disposal of material required to be removed from the site.

2 PRODUCTS

2.1 FILL MATERIALS

General

Requirement: Provide fill materials including borrow or imported fill to **Fill materials** and **Borrow or imported fill** in the *Earthwork* worksection.

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

Grass

Method: Neatly cut grass turf between trench set out lines into 300 mm squares. If the grass is suitable for re-use, take up and store the turf and water during the storage period, otherwise remove and dispose of it off-site.

Small plants, shrubs and trees

Storage: If required for re-planting, take up small plants and store. Wrap the root ball 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 EXCAVATING

Site preparation

As found site conditions: To **Geotechnical** in the *Earthwork* worksection.

Records of measurement: If Records of measurement are required, to **Records of measurement** in the *Earthwork* worksection.

Remove topsoil: To **Removal of topsoil** in the *Earthwork* worksection.

Excavation

General: 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.
- To a width tolerance of ± 50 mm unless constrained by adjacent structures.
- Excavation: To the *Earthwork* worksection **Excavation** and **Adjacent structures**.

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.

Adjacent to footings: If excavation is necessary below the zone of influence of the underside of adjacent footings, give notice, and provide support for the footings as instructed.

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.

Tree protection: To AS 4970.

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

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 backfill material to **Backfill material.**

Boring

Subcontractor: If under road boring is required in lieu of trenches, engage a suitably qualified subcontractor to do the work.

3.4 TRENCH BACKFILL

General

Timing: Backfill service trenches as soon as possible after laying and bedding the service, if possible on the same working day.

Marking services: Underground marking tape to AS/NZS 2648.1.

Place fill: To **Placing fill** in the *Earthwork* worksection.

Bedding, haunch, side and overlay zones

Installation and material: To the particular utility authority or utility service requirements. Secure pipes against floatation.

Overlay zone thickness: Maximum of 300 mm immediately over the utility service.

Topsoil areas: Complete the backfilling with at least 100 mm of topsoil.

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 ± 1% of that of the adjoining in situ clay.

Selected material zone

Extent: The section of trench within the zone, if applicable.

Backfill material: Selected material free from stones larger than 100 mm maximum dimension and the fraction passing a 19 mm Australian Standard sieve to have a 4 day soaked CBR value, in conformance with AS 1289.6.1.2, and not less than that of the adjacent selected material zone.

Trees

General: Backfill at trees, for a minimum 300 mm thickness, around tree roots with a topsoil mixture, placed and compacted in layers of 150 mm minimum depth to a dry density equal to that of the surrounding soil.

Backfill level: Do not place backfill material 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 **Fill moisture control** in the *Earthwork* worksection.

Layers: Compact all material in layers not exceeding 150 mm compacted thickness. Compact each layer to the relative compaction specified before the next layer is commenced.

Compaction: To **Compaction requirements for fill and subgrade** in the *Earthwork* worksection and AS 3798 Section 5.

Frequency of testing: To AS 3798 clause 8.7.

Precautions: If compacting adjacent to utility services, use compaction methods which do not cause damage or misalignment.

Density tests

Testing authority: Have density tests of pipe bedding and backfilling carried out by a Registered testing authority.

Test methods:

- Compaction control tests: To AS 1289.5.4.1 or AS 1289.5.7.1.
- Field dry density: AS 1289.5.3.2 or AS 1289.5.3.5.
- Standard maximum dry density: AS 1289.5.1.1.
- Dry density ratio: AS 1289.5.4.1.
- Density index: AS 1289.5.6.1.

3.5 SURFACE RESTORATION

Refer to the Landscape documentation for information on the new surfaces adjacent to the building.

0310B CONCRETE – COMBINED

1 GENERAL

1.1 RESPONSIBILITIES

General

General: Provide cast concrete as documented and as follows:

- Conforming to the design details and Structural Engineers details.
- Satisfying quality and inspection requirements.
- Compatible with following finishes.

Design

Formwork: The design of the formwork, other than profiled steel sheeting composite formwork, is the contractor's responsibility.

1.2 CROSS REFERENCES

General

Requirement: Conform to the following worksection(s):

- *General requirements.*

1.3 STANDARDS

General

Formwork design and construction, formed surfaces: To AS 3610 and AS 3610.1.

Plywood formwork: To AS 6669.

Profiled steel sheeting, including shear connectors: To AS 2327.1.

Specification and supply of concrete: To AS 1379.

Concrete materials and construction: To AS 3600.

Residential ground slabs and footings: To AS 2870.

Concrete structures for retaining liquids: To AS 3735.

Structural design: To AS 3600.

1.4 INTERPRETATION

Definitions

General: For the purposes of this worksection the following definitions 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 relevant period at a site.
- Batch: A quantity of concrete containing a fixed quantity of ingredients and produced in a discrete operation.
- Concrete class:
  - . Normal: Concrete which is specified primarily by a standard compressive strength grade and otherwise conforming to AS 1379 clause 1.5.3.
- Early age strength: A mean compressive strength at 7 days exceeding the values shown in AS 1379 Table 1.2.
- Formwork:
  - . Lost formwork: Sacrificial formwork left in place.
  - . Slip formwork: Continuously slipped or moving formwork.
- Green concrete: Concrete which has set but not appreciably hardened.
- Production assessment: An assessment procedure for concrete specified by strength grade, carried out by the supplier on concrete produced by a specific supplying plant and based on the statistical assessment of standard compressive strength tests on concrete.
- Sample: A portion of the material used in the works, or to take such a sample.

- Specimen: A portion of a sample which is submitted for testing.
- Weather:
  - Cold: Ambient shade temperature < 10°C.
  - Hot: Ambient shade temperature > 30°C.

1.5 INSPECTION

Notice

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

- Base or subgrade before covering.
- Membrane or film underlay installed on the base or subgrade.
- Completed formwork and reinforcement, tendons, cores, fixings and embedded items fixed in place.
- Used formwork, after cleaning and before re-use.
- Surfaces or elements to be concealed in the final work before covering.
- Commencement of concrete placing.
- Evaluation of the off-form finishes.
- Evaluation of surface finish.

1.6 TOLERANCES

Formwork

Plumb of elements > 8 m high: 1 in 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 and the **Formwork dimensional deviation schedule**.

Reinforcement

Fabrication and fixing: To AS 3600 clause 17.2.

Reinforcement and tendon position: To AS 3600 clause 17.5.3.

Finishes

Surface quality of formed surfaces: Conforming to the surface finish requirements of AS 3610.1 Table 3.3.2 for the surface class nominated in the **Formed surface finishes schedule**.

Flatness of unformed surfaces: Conforming to the **Flatness tolerance class table** for the class of finish nominated using a straight edge placed anywhere on the surface in any direction.

Flatness tolerance class table

Class	Measurement	Maximum deviation (mm)
A	3 m straight edge	3
B	3 m straight edge	6
C	600 mm straight edge	6

1.7 SUBMISSIONS

Calculations

Design: Submit structural performance calculations.

Certification

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

Loading: Submit details of proposed construction systems, loads and procedures, including propping and re-shoring.

Execution details

Re-shoring: If re-shoring is intended, submit proposals.

Stripping single storey suspended work: If the requirements of AS 3610.1 cannot be met, give notice.

Surface repair method: If required, submit details of the proposed method before commencing repairs.

Concrete: Submit proposals for mixing, placing, finishing and curing concrete including the following:

- Changes to the concrete mix.
- Curing and protection methods.
- Curing period for low-pressure steam curing, if proposed.
- Cutting or displacing reinforcement, or cutting 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.
- Site storage, mixing and transport methods and equipment, if applicable.
- Temperature control methods.

Cutting or coring: If cutting or coring of hardened concrete is proposed, provide details.

Loading: If proposed construction systems, loads and procedures, including propping and re-shoring, differ from submitted design documentation, submit details.

Sequence of concrete placement: If sequential placement of slab segments is proposed, provide details.

Sawn joints: Submit proposed methods, timing and sequence of sawing joints.

Reinforcement: Submit the following:

- General: If changes are proposed to reinforcement shown on the drawings, proposed details.
- Damaged galvanizing: If repair is required, proposals to AS/NZS 4680 Section 8.
- Mechanical splices: If mechanical bar splices are proposed or required, details and test certificates for each size and type of bar to be spliced.
- Provision for concrete placement: If spacing or cover of reinforcement does not conform to AS 3600, give notice.
- Splicing: If undocumented splicing is proposed, proposed details.
- Welding: Give notice before welding reinforcement.

Pre-mixed supply delivery dockets: For each batch, submit a docket listing the information required by AS 1379, and the following information:

- For special class performance concrete: Specified 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.

Materials

Product conformity: Submit current assessments of conformity, as appropriate, as follows:

- Certificate of conformity by a JAS-ANZ accredited third party.
- Mark of conformity of a JAS-ANZ accredited third party applied to the product.
- Report by a NATA accredited 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.

Curing compounds: If it is proposed to use a liquid membrane-forming curing compound, submit the following information:

- Certified test results for water retention to AS 3799 Appendix B.
- 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.

Coloured concrete: Using the same mix and method used in the works, submit sample blocks of concrete before colouring with mineral oxides.

- Number: 4.
- Size (nominal): 300 x 300 x 50 mm.

Void formers: Test void formers under laboratory conditions. 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. Submit certified test results to verify conformance with the following requirements:

- 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.
- Collapse and loss of load carrying capacity occurs not more than 48 hours after flooding with water, creating a void at least 60% of the original depth of the void former.

Reinforcement: Submit type-test reports to verify conformance for each reinforcement type as follows:

- Strength and ductility: To AS 3600 Table 3.2.1.

Shop drawings

Cores, fixings and embedded items: If the locations of these items are not shown or are shown diagrammatically, submit shop drawings showing the proposed locations, clearances and cover. Indicate proposed repositioning of reinforcement.

Subcontractors

Pre-mixed supply: Submit names and contact details of proposed pre-mixed concrete suppliers and alternative source of supply in the event of breakdown of pre-mixed or site mixed supply.

2 PRODUCTS

2.1 MATERIALS

General

Stockpile: If uniform, consistent colour is required, stockpile sand, cement and aggregates for the project.

Aggregates

Standard: To AS 2758.1.

Aggregate properties: Conform to the **Aggregate property schedule**.

Special aggregates: Stockpile special aggregates at the beginning of the project to minimise colour and other variations.

Cement

Standard: To AS 3972.

Age: Less than 6 months old.

Storage: Store cement bags under cover and above ground.

Water

Standard: To AS 1379.

Requirement: Provide clean water, free from oil, acid, alkali, organic or vegetable matter and including not more than 500 mg/l of chloride ions.

Polymeric film underlay

Vapour barriers and damp-proofing membranes: To AS 2870 clause 5.3.3.

Chemical admixtures

Standard: To AS 1478.1.

Contents: Free of chlorides, fluorides and nitrates.

Curing compounds

Curing compounds: To AS 3799.

Coloured concrete

Standard: To AS 3610.1.

2.2 CONCRETE

Properties

Concrete mix and supply: Conform to the following:

- Normal-class: To AS 1379 clause 1.5.3.
  - Properties: Conform to the **Concrete properties schedule - performance**.

Cover

Concrete cover generally: To AS 3600.

Concrete cover for structures for retaining liquids: To AS 3735.

Concrete cover for residential ground slabs and footings: To AS 2870.

2.3 TESTING

General

Test authority: Concrete supplier or NATA registered laboratory.

Reports and records of test results: To AS 1012. Retain results on site.

Assessment process of test results

Standard: To AS 1379.

Method of assessment: Project assessment.

Sampling

Method of sampling: AS 1012.1.

Sampling locations: To AS 1012.1 and the following:

- Sample the concrete on site, at the point of discharge from the agitator.
- For compressive strength tests: Spread the site sampling evenly throughout the pour.

Frequency of sampling: To AS 1379 and the following:

- For slump tests: Take at least one sample from each batch.
- For compressive strength tests: Sample 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	
	Columns and load bearing wall elements per batch	Other elements per day
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. If aggregate size exceeds 20 mm, nominally 300 x 150 mm diameter.

Testing

Test methods: To AS 1012.

Acceptance criteria:

- General: To **Concrete properties schedule – performance**.
- Early age compressive strength: To **Control tests schedule**.

Slump tests: Assess slump for every batch. Perform slump test on each strength sample.

Drying shrinkage at 56 days: To AS 1012.13.

Embedded pressure pipes
General: Complete leak tests before embedding pipes.

Liquid retaining structures
Testing for liquid tightness: To AS 3735.

2.4 FORMWORK

General
Linings, facings and release agents: Compatible with finishes applied to concrete.

Lost formwork: Not to contain timber or chlorides, and not to impair the structural performance of the concrete members.

Void formers: Material capable of maintaining rigidity and shape until the concrete has set, capable of withstanding construction loads and non-collapsible on absorption of moisture.

Profiled steel sheeting composite formwork
Material: Hot-dipped zinc-coated sheet steel to AS 1397.

Minimum steel grade: G550.

Accessories: Adopt material and corrosion protection to match the profiled steel sheeting.

Plywood formwork
Material: Plywood sheeting to AS 6669.

Grade: To meet the design dimensions, loading and surface quality specified to AS 3610 and AS 3610.1.

Joints: Seal the joints consistent with the surface finish class.

Tolerances: To AS 3610.1 Section 3.

2.5 REINFORCEMENT

Steel reinforcement
Standard: To AS/NZS 4671:

- Refer to Engineers details.

Surface condition: Free of loose mill scale, rust, oil, grease, mud or other material which would reduce the bond between the reinforcement and concrete.

Protective coating
Corrosion protection: To AS 3600 clause 4.10.3.

General: 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.

- Thickness: 200 µm minimum.

Galvanizing: To AS/NZS 4680, as follows:

- Sequence: If fabrication is to occur after galvanizing, submit proposals for galvanizing repair and coating of cut ends.
- Zinc-coating (minimum): 600 g/m^2.

Tie wire
General: Annealed steel 1.25 mm diameter (minimum).

External and corrosive applications: Galvanized.

2.6 MISCELLANEOUS

Surface hardeners, sealants and protectors
Supply: If documented, provide proprietary products conforming to the manufacturer's recommendations.

Slip resistance treatment
Slip resistance classification: To AS/NZS 4663.

3 EXECUTION

3.1 POLYMERIC FILM UNDERLAY

Location

General: 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

General: According to base type, as follows:

Concrete working base: Remove projections above the plane surface, and loose material.

Graded prepared subgrade: Blind with sufficient 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.

General: 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

General: Conform to the **Formed surface finishes schedule.**

Preparation

Cleaning: Before placing concrete, remove free water, dust, debris and stains from the formwork and the formed space.

Bolt holes

Removable bolts: Remove tie bolts without causing damage to the concrete.

Cover: Position formwork tie bolts left in the concrete so that the tie does not project to within 50 mm of finished surface.

Bold hole filling: Provide material with durability and colour matching the concrete.

Recessed filling: Fill or plug the hole to 6 mm below the surface.

Corners

Work above ground: Fillet at re-entrant angles, and chamfer at corners.

- Face of bevel 25 mm.

Embedments

General: Fix embedments through formwork to prevent movement, or loss of slurry or concrete, during concrete placement.

Openings

General: In vertical formwork 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 linings and facings.

Slip formwork

Provision for inspection: Provide access below the moving formwork for surface treatment and inspection.

Profiled steel sheeting composite formwork

Fixing: If sheeting cannot be fixed to structural steel supports with puddle welds, or with welded shear studs in composite construction, provide details.

Steel linings

Rust: Clean off any rust and apply rust inhibiting agent prior to re-use.

Visually important surfaces

General: For concrete of 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, place them on a firm level surface and place reinforcement and concrete with minimum delay.

3.3 REINFORCEMENT

Dowels

Fixing: If a dowel has an unpainted half, embed in the concrete placed first.

Tolerances:

- Alignment: 2 mm in 300 mm.
- Location: ± half the diameter of the dowel.

Grade: 250 N.

Supports

General: Provide proprietary concrete, metal or plastic supports to reinforcement in the form of chairs, spacers, stools, hangers and ties, as follows:

- Adequate 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.

Minimum spacing:

- Bars: ≤ 60 diameters.
- Mesh: ≤ 800 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

General: 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 incorporated into subsequent work.

Tying

General: Secure the reinforcement against displacement by tying 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: Tie bundled bars in closest possible contact. Provide tie wire of 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 ties at every intersection.

Mats: For bar reinforcement in the form of a mat, secure each bar at alternate intersections.

Welding

General: If welding of reinforcement is proposed, provide details.

3.4 CONCRETE

General

General: Provide concrete conforming to the **Concrete properties schedule – performance**.

Elapsed delivery time

General: Make sure the elapsed time between the wetting of the mix and the discharge of the mix at the site conforms to 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 delivered concrete within the range 5°C to 35°C.

Elapsed delivery time table

Concrete temperature at time of discharge (°C)	Maximum elapsed time (minutes)
10 – 24	120
24 – 27	90

Concrete temperature at time of discharge (°C)	Maximum elapsed time (minutes)
27 – 30	60
30 – 32	45

Pre-mixed supply

Addition of water: If adding water, conform to AS 1379 clause 4.2.3.

Transport method: Prevent segregation, loss of material and contamination of the environment, and do not 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.

3.5 CORES, FIXINGS AND EMBEDDED ITEMS

Adjoining elements

Fixings: Provide fixings for adjoining elements including any temporary fixings that are required.

Protection

General: Grease threads. Protect embedded items against damage.

Compatibility: Make sure inserts, fixings and embedded items are compatible with each other, with the reinforcement and with the concrete mix to be used and surface finish requirements.

Corrosion: If in external or exposed locations, galvanize anchor bolts and embedded fixings or submit proposed alternate materials.

Structural integrity

Position: Fix cores and embedded items to prevent movement during concrete placing. In locating cores, fixings and embedded items, reposition but do not cut reinforcement, and maintain cover to reinforcement.

Isolation: Isolate embedded items to prevent water tracking to concrete providing minimum cover to reinforcement.

Tolerances

General: Maximum deviation from correct positions:

- Anchor bolt groups for structural steel: To AS 4100.
- Cores and embedded items generally: 10 mm.
- Other fixing bolts: 3 mm.

3.6 PLACING AND COMPACTION

Placing

Horizontal transport: Use suitable conveyors, clean chutes, troughs, hoppers or pipes.

Methods: Avoid segregation and loss of concrete, and minimise plastic settlement. Maintain a nominally vertical and plastic concrete edge during placement.

Layers: Place concrete in layers ≤ 300 mm thick. Compact succeeding layer into previous layer before previous layer has taken initial set.

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

General: 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

General: During placement and before setting, protect the surface from damage.

Time between adjacent placements

General: Conform to the **Minimum time delay schedule.**

Vertical elements

General: Limit the free fall of concrete to maximum of 2000 mm.

Placing in cold weather

Cement: Do not use high alumina cement.

Placing concrete: Maintain the temperature of the freshly mixed concrete at ≥ 5°C.

Formwork and reinforcement: Before and during placing maintain temperature at ≥ 5°C.

Severe weather: If severe weather conditions are predicted, use high early strength cement.

Temperature control: Heat the concrete materials, other than cement, to the minimum temperature necessary to make sure the temperature of the placed concrete is within the limits specified.

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 formwork, materials, and equipment coming in contact with the concrete.

Maximum temperature of water: 60°C when placed in the mixer.

Concrete: Prevent concrete from freezing, without using salts or chemicals.

Placing in hot weather

Handling: Prevent premature stiffening of the fresh mix and reduce water absorption and evaporation losses. Mix, transport, place and compact the concrete conforming to the **Elapsed delivery time table**.

Placing concrete: Maintain the temperature of the freshly mixed concrete conforming to the **Hot weather placing table**.

Evaporation control barriers: Erect barriers to protect freshly placed concrete from drying winds.

Formwork and reinforcement: Before and during placing, maintain temperature at ≤ 35°C.

Temperature control: Select one or more of the following methods of maintaining the specified temperature of the placed concrete at < 35°C:

- 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.

Hot weather placing table

Concrete element	Temperature limit
Normal concrete in footings, beams, columns, walls and slabs	35°C
Concrete in sections ≥ 1 m in all dimensions except for concrete of strength 40 MPa or greater, in sections exceeding 600 mm in thickness	27°C

Placing under water

Condition: If placing in the dry is practicable by pumping or other means of dewatering, do not place under water.

Minimum cement content for the mix: Increase by 25%.

Method: If required, submit proposals.

3.7 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 until the 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 the following, unless accelerated curing is adopted:
  - Fully enclosed internal surfaces/Early age 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

Application: Provide a uniform continuous flexible coating without visible breaks or pinholes, which remains unbroken at least for 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.

Hot weather curing

Curing compounds: If curing compounds are proposed, provide details.

Protection: Select a protection method from the following:

- If the concrete temperature > 25°C or if not protected against drying winds, protect the concrete using a fog spray application of aliphatic alcohol evaporation retardant.
- If ambient shade temperature is > 35°C, protect from wind and sun using an evaporative retarder until curing is commenced.
- Immediately after finishing, either cover exposed surfaces using an impervious membrane or hessian kept wet until curing begins, or apply a curing compound.

Water curing

General: Select a method of ponding or continuously sprinkling to prevent damage to the concrete surface during the required curing period.

3.8 JOINTS

Construction joints

Location: Do not relocate or eliminate construction joints, or make construction joints not documented. 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.

Preparation: Roughen and clean the hardened concrete joint surface. Remove loose or soft material, free water, foreign matter and laitance. Dampen the surface just before placing the fresh concrete and coat with a neat cement slurry.

Expansion joints

Joint filling: Fill with jointing materials as documented. Finish visible jointing material neatly flush with adjoining surfaces.

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 types not water absorbing.

Slip joints

Requirement: If concrete slabs are supported on masonry, provide proprietary slip joints.

3.9 SURFACE MODIFIERS

General

Application: Apply to clean surfaces conforming to the manufacturer's recommendations.

3.10 FORMED SURFACES

General

Surface finish: Provide formed concrete finishes conforming to the **Formed surface finishes schedule.**

Damage: Do not damage concrete works through premature removal of formwork.

Curing

General: If formwork is stripped before the minimum curing period for the concrete has elapsed, continue curing the exposed faces as soon as the stripping is completed.

Evaluation of formed surfaces

General: If evaluation of formed surface tolerance or colour is required, complete the evaluation before surface treatment.

Surface repairs

Method: If surface repairs are required, submit proposals.

Finishing methods

General: If soffits of concrete elements or faces of concrete columns are to have a finish other than an off-form finish, provide details of proposed procedures.

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: Remove the vertical face formwork while the concrete is green. Wet the surface and scrub using stiff fibre or wire brushes, using clean water freely, until the aggregate is uniformly exposed. Do not use acid etching. Rinse the surface with clean water.

Floated finishes:

- Sand floated finish: Remove the vertical face formwork 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: Remove the vertical face formwork 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: Remove the vertical face formwork 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.

3.11 UNFORMED SURFACES

General

Surface finish: Provide surface finishes conforming to the **Unformed surface finishes schedule**.

Finished levels: Strike off, screed and level slab surfaces to finished levels, to and the flatness tolerance class documented.

Surface repairs

Method: If surface repairs are required, submit proposals.

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, 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.

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.

3.12 COMPLETION

Formwork removal

Extent: Remove formwork, other than profiled steel sheeting composite formwork and lost formwork, including formwork in concealed locations.

Timing: Do not disturb formwork until concrete is hardened enough 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 B Table B1.
- 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.

Loading

General: Give notice before loading the concrete structure.

Protection

General: Protect the concrete from damage due to construction load, physical and thermal shocks, and excessive vibrations, particularly during the curing period.

Surface protection: Protect finished concrete surfaces and applied finishes from damage.

4 SELECTIONS

4.1 SCHEDULES

Refer to the Finishes Schedule for finish of concrete to floor.

0331B BRICK AND BLOCK CONSTRUCTION

1 GENERAL

1.1 RESPONSIBILITIES

General

General: Provide brick and block construction as documented.

1.2 CROSS REFERENCES

General

Requirement: Conform to the following worksection(s):

- *General requirements.*

1.3 STANDARDS

General

Materials and construction: To AS 3700.

1.4 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.

1.5 TOLERANCES

Brick and block construction

Standard: To AS 3700 Table 12.1.

2 PRODUCTS

2.1 DURABILITY

General

Exposure locations: To AS 3700 clause 5.4.

2.2 MATERIALS

Brick and block units

Selections: To **Brick and block construction schedule.**

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 ≤ 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 BS EN 12878, and as follows:

- Quantity: Less than 10% of the mass of cement in the mix.

Proportions: Conform to the **Mortar mix table.**

Mortar mix table

Mortar class to AS 3700	**Cement, lime, sand ratios (by volume)**			**Water thickener**
	Clay	**Concrete**	**Calcium silicate**	
Masonry cement				
M3	1:0:4	1:0:4	n/a	Yes
M4	1:0:3	n/a	n/a	Yes
Cement (GP/GB)				
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.

2.3 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/NZS 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/NZS 2699.1.

Corrosion protection: To AS/NZS 2699.1.

Connectors and accessories

Standard: To AS/NZS 2699.2.

Corrosion protection: To AS/NZS 2699.2.

Flashings and damp-proof courses

Standard: To AS/NZS 2904.

Slip joints

Standard: To AS 3700 clause 4.13.

3 EXECUTION

3.1 GENERAL

Mortar mixing

General: Measure volumes accurately to the documented proportions. Machine mix for at least six minutes.

Protection from contamination

General: Protect masonry materials and components from ground moisture and contamination.

Bond

Type: Stretcher bond.

Building in

Embedded items: Build in wall ties and accessories as the construction proceeds. If it is not practicable to obtain the required embedment wholly in the mortar joint in 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 brick veneer construction, leave clearances between window frames and brick sill and between roof frames and the brick veneer as follows:

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

Construction at different rates or times

Monolithic structural action: 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 so that monolithic structural action is obtained in the completed work.

Mortar joints

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.

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.
- Thickness: 10 mm.

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

Monolithic structural action

Header units: Except in stretcher bond facework, provide brick and block 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.

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.

Protection

General: Cover the top surface of brickwork and blockwork to prevent the entry of rainwater and contaminants.

Single leaf and solid walls: Moisture protection to AS 3700 clause 4.7.4.

Temporary support

General: If the final stability of the masonry is dependent on construction of(structural) elements after the brickwork and blockwork 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.

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 DAMP-PROOF COURSES

Location

General: Provide damp-proof courses as follows:

- Masonry veneer construction: 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 2 courses per step for brickwork and 1 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.

3.4 FLASHINGS

Location

General: Provide 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 2 courses above for brick and 1 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 1 course below the sill, extending up across the cavity and under the sill in the inner leaf or the frame.
- Over lintels to openings: Full width of outer leaf immediately above the lintel, continuous across cavity, turned 30 mm into the inner leaf 2 courses above for brick and 1 course above for block or turned up against the inner frame and fasten to it. Extend at least 150 mm beyond the lintels. Extend at least 50 mm beyond the lintels.

- At abutments with structural frames or supports: Vertical 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 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 2 courses per step for brickwork and 1 course per step for blockwork.

Lap sealing: Seal with a bituminous adhesive and sealing compound.

Pointing: Point up joints around flashings, filling voids.

Weepholes

Location: Provide 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.

3.5 WALL TIES

Location

General: Space wall ties in conformance with AS 3700 clause 4.10 or AS 4773.2, as appropriate, 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

Fixing of masonry veneer ties:

- To timber frames: Screw fix to outer face of timber frames with AS 3566 fixings.
- To concrete: Masonry anchors.
- To steel frames: Screw fix to outer face of steel studs with AS 3566 fixings.

3.6 CONTROL JOINTS

General

Location and spacing: Provide contraction joints, expansion joints or articulation 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 brickwork and blockwork. 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.

3.7 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 to 30 min, and vibrate or rod to mix with the previous pour.

3.8 LINTELS

Location

General: Provide 1 lintel to each wall leaf in conformance with the **Lintel schedule**.

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 vertical.

Minimum bearing each end:

- Span ≤ 1000 mm: 100 mm.
- Span > 1000 mm ≤ 3000 mm: 150 mm.
- Span > 3000 mm: To structural drawings.

Propping: Provide temporary props to lintels to prevent deflection or rotation.

- Minimum propping period: 7 days.

3.9 CONNECTORS AND ACCESSORIES

Slip joints

General: Provide 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: Provide stabilising ties at control joints and abutting structural elements, including columns, beams and slab soffits.

Locations and details: To structural drawings.

4 SELECTIONS

4.1 SCHEDULES

Refer to the Finishes Schedule in the appendix for details.

0341B STRUCTURAL STEEL

1 GENERAL

1.1 RESPONSIBILITIES

General

General: Provide structural steelwork that is integrated into the building construction.

1.2 CROSS REFERENCES

General

Requirement: Conform to the following worksection(s):

- *General requirements.*

1.3 STANDARDS

General

Materials, construction, fabrication and erection: To AS 4100.

Cold-formed steel: To AS/NZS 4600.

1.4 INTERPRETATION

Abbreviations

ILAC: International Laboratory Accreditation Cooperation.

1.5 ADJOINING ELEMENTS

General

Fixing: Provide for the fixing of adjoining building elements that are to be connected to or supported on the structural steel.

1.6 INSPECTION

Notice – on site

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

- Anchor bolts in position before casting in.
- Steelwork and column bases erected on site, before grouting, encasing, site painting or cladding.
- Tensioning of bolts in categories 8.8/TB and 8.8/TF.
- Reinforcement and formwork in place before any encasement.
- Completed grouting, encasement, fire protection or site painting.

1.7 SUBMISSIONS

Origin of steel

Requirement: If it is proposed to use steel not of Australian origin, submit documentation which demonstrates that the steel complies and is suitable for fabrication to Australian standards.

Bolts

Compliance: Submit a manufacturer's compliance/test certificate from an ILAC accredited testing organization confirming compliance with AS/NZS 1252.

Independent certification: Provide a local NATA-accredited laboratory independent compliance certificate based on appropriate testing and verification.

Shop drawings

General: Submit shop drawings showing the following information:

- Marking plans.
- Identification.
- Steel type and grade.
- Dimensions of items.
- Required camber, where applicable.
- Connection details

- Orientation of members.
- Surface preparation methods and coating system if shop applied.
- Breather holes for hollow sections (with seal plates) being hot-dip galvanized.
- Location of and preparation for site welds.
- Temporary works such as lifting lugs, support points, temporary cleats and bracing which are required for transport and erection of the structural steelwork, and the procedure for final removal.
- Required fixings for adjoining building elements.

Materials and components

Concrete or masonry anchors: If masonry anchors other than as shown on the drawings are required or proposed for the support or fixing of structural steel, submit evidence of the anchor capacity to carry the load.

Execution

Splicing: If splicing of structural members is intended, submit proposals.

Distortions: Submit proposals for preventing or minimising distortion or galvanized components, welded components or welded and galvanized components; and proposals for restoration to design shape.

2 PRODUCTS

2.1 STEEL TYPE AND GRADE

Material

Steel members and sections: Conform to the **Steel grade (minimum) table** and or the **Steel grade schedule**. Refer to Engineers details.

Steel grade (minimum) table

Type of steel	Grade
Universal beams and columns, parallel flange channels, large angles to AS/NZS 3679.1	300
Flat, small angles, taper flange beams and columns to AS/NZS 3679.1	250
Welded sections to AS/NZS 3679.2	300
Hot rolled plates, floor plates and slabs to AS/NZS 3678	250
Hollow sections to AS/NZS 1163: -Circular sections less than 165 mm nominal outside diameter -Sections other than the above	C250/C350 C350/C450
Cold formed purlins and girts to AS 1397	G550 Z350 or Z450 G450 Z350 or Z450

Steel grade (minimum) schedule

Type of steel	Grade
Cast steel to AS 2074	
Hot-rolled plate to AS/NZS 1594	
Steel rails to AS 1085.1	

2.2 BOLTS

Bolts, nuts and washers

General: Hot-dip galvanized, corrosion-free, and in serviceable condition.

3 EXECUTION

3.1 FABRICATION AND ERECTION

General

Substitution: If substitution of members is proposed, provide details.

Beam camber

General: If beam members have a natural camber within the straightness tolerance, fabricate and erect them with the camber up.

Straightening

Care: If correcting distorted members, conform to the submitted procedures and avoid damage.

Work exposed to view

Welds: Grind smooth but do not reduce the weld below its nominal size.

Shearing, flame cutting and chipping: Perform carefully and accurately.

Corners and edges: Grind fair those corners and edges which are sharp, marred, or roughened.

Site work

General: Other than work shown on the shop drawings as site work, do not fabricate, modify or weld structural steel on site.

Identification marks

General: Provide marks or other means of identifying each member compatible with the finish, for the setting out, location, erection and connection of the steelwork in conformance with the marking plans.

Monorail beams: Identify and mark rated capacity in conformance with AS 1418.18 clause 5.12.6.

Tolerances

Measurement: Tolerances are to be checked by measurement after fabrication when corrosion protection has been applied.

Conformance: To AS 4100 clause 14.4.

3.2 WELDING

General

Standard: To AS/NZS 1554.1.

Weld category

Weld categories not shown on the drawings: Category GP.

Weld type

Weld type not shown on the drawings: Submit proposals for weld type and electrodes.

3.3 BOLTING

General

Standards: To AS 1110.1, AS 1111.1 and AS/NZS 1252.

Anchor bolts

General: Provide each anchor bolt with 2 nuts and 2 oversize washers and provide sufficient thread to permit the levelling nut and washer to be set below the base plate.

Galvanizing: Galvanize all components.

Hexagonal bolts: To AS 1111.1.

Hexagonal nuts: To AS 1112.3.

Plain washers: To AS 1237.1.

Set out: Set out bolt groups using templates and subjected to survey check.

Lock nuts

General: Provide lock nuts for bolts in moving parts or parts subject to vibration and for vertical bolts in tension.

Tensioning of bolting categories 8.8/TB and 8.8/TF

Method: Use part-turn-of-nut or load indicating washers.

3.4 SURFACE PREPARATION AND TREATMENT

General

General: Conform to the *Engineers details, all steel to be hot dipped galvanised.*

General: Coat structural steelwork not encased in concrete.

Standards: To AS 1627.4 and AS/NZS 2312 Section 1.

Surface preparation: Class 1 blast.

Coating: Coat prepared steelwork as follows:

- Primer: Zinc phosphate primer.
- Thickness: 70 µm.
- Requirement: Verify and record thickness.
- Concrete encasing: Where members are part concrete encased extend the priming 25 mm into the surface to be encased.
- Inaccessible surfaces: Where surfaces will be in contact or near contact after fabrication or erection, apply the finish and allow it to dry before assembly.

Shop work: Apply the primer coat or protective system to the structural steel before delivery to the site.

Transport and handling: Do not damage the paintwork.

Site work: After erection, repair damage to the shop coating and apply coating omitted at site connections.

3.5 ERECTION

Temporary work

General: Provide all necessary temporary bracing or propping.

Temporary connections: If cleats not shown on shop drawings are required, submit details.

Cold-formed purlins

Trimming members: Provide to support edges of roof sheeting along hips, valleys and roof penetrations.

Site welds

Completion: Weld only when correct alignment and preset or camber have been achieved.

Overhead welding: If overhead welding is required, submit proposals.

Anchor bolts

General: For each group of anchor bolts provide a template with setting out lines clearly marked for positioning the bolts when casting in.

Grouting at supports

Preparation: Before grouting steelwork to be supported by concrete, masonry and the like, set steelwork on packing or wedges.

Handling

Care: Handle members or components without overstressing or deforming them.

Protection: Wrap or otherwise protect members or components to prevent damage to surface finishes during handling and erection.

3.6 REPAIRS

General

General: Repair finishes to make sure the full integrity of each phase and each coating.

3.7 COMPLETION

Temporary connections

General: Remove temporary cleats on completion and restore the surface.

0344B STEEL – HOT-DIP GALVANIZED COATINGS

1 GENERAL

1.1 RESPONSIBILITIES

General

General: Provide hot-dip galvanized coatings that controls atmospheric corrosion to structural steelwork or steel products in the time to first maintenance.

1.2 CROSS REFERENCES

General

Requirement: Conform to the following worksection(s):

- *General requirements.*

1.3 STANDARDS

General

Coating: To AS/NZS 4680.

Coating on fasteners: To AS 1214.

Durability: To AS 2309 and AS/NZS 2312.

Metal finishing

Steel preparation methods: To AS 1627.

Coating mass/thickness minimum: To AS/NZS 4680.

Threaded fasteners coating mass/thickness minimum: To AS 1214 Table 2.

1.4 INSPECTION

Notice

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

- Coating appearance and thickness, at the galvanizing plant.

1.5 SUBMISSIONS

Holes and lifting lugs

General: If holes and lifting lugs are required to facilitate handling, filling, venting and draining during galvanizing, submit details on size and location.

Detailing features

General: If design and fabrication features of the items to be galvanized leads to difficulties during galvanizing, identify these and submit details for improvement.

2 EXECUTION

2.1 GENERAL

Care

Dimensional change: If design and fabrication features of items to be galvanized are likely to lead to dimensional change or distortion, identify these and submit proposals for its minimisation.

Embrittlement: Take due care to avoid embrittlement of susceptible steels.

Mechanical properties: Avoid mechanical damage. Ensure 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.

Post treatment
General: Passivate.

Drilling after completion of hot-dip galvanizing
Repair: Prime drill hole surfaces to AS/NZS 4680 clause 8 before the surfaces begin to corrode.

Coating
Threaded fasteners: To AS 1214.

Structural sections
Cold worked items: Except for hollow sections, anneal to 650°C before galvanizing.

Hollow sections: Provide seal plates with breather holes.

Surface finish
Standard: To AS/NZS 4680 clause 7.

Coating quality: Continuous, adherent, smooth or evenly textured and uniform, free from defects detrimental to the end use of the finished article, such as lumps, blisters, gritty areas, uncoated spots, acids and black spots, dross and flux.

- Silicon killed steels: Dull grey is acceptable.

Friction-type bolted connections: Treat coated contact surfaces to achieve the required design slip factor, without removing excessive coating thickness.

- Contact surface preparation: To GAA After-fabrication hot dip galvanizing Chapter 4.

Slip factor test: To AS 4100 Appendix J.

Surplus zinc on fastener threads: Remove.

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 clause 8, reject the galvanizing.

Extent and methods: To AS/NZS 4680 clause 8.

Preparation for paint finishes
Coarse preparation: Remove spikes, and ensure edges are free from lumps and runs.

Light sweep blasting before painting: Required.

- Maximum zinc removal: 10 µm.
- Abrasive grade (range): 150 – 180 µm.
- Abrasive type - clean ilmenite or garnet.
- Blasting angle to surface: 45° maximum.
- Blast pressure (maximum): 275 kPa.
- Distance of nozzle from surface (range): 350 – 400 mm.
- Nozzle type: 10 – 13 mm minimum diameter venturi type.

2.2 SITE WORK

Site welding
Grinding of edges: Permitted.

Weld areas: Reinstate coating to AS/NZS 4680 clause 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 object.

Extent: Areas damaged by transport, site welding, site flame cutting, site handling, or erection.

Method: To AS/NZS 4680 clause 8.

3 SELECTIONS

3.1 STRUCTURAL STEEL

Hot-dip galvanized steel schedule
Refer to Engineers details for type. All steelwork to be hot dipped glavanised.

0421 ROOFING – COMBINED

1 GENERAL

1.1 RESPONSIBILITIES

General

General: Provide a roofing system and associated work as documented and which satisfies the product performance requirements as documented.

1.2 PERFORMANCE CRITERIA

Roof access

See roof access safety section.

1.3 CROSS REFERENCES

General

Requirement: Conform to the following worksection(s):

- *General requirements.*
- *Roof access safety systems*

1.4 INSPECTION

Notice

Inspection: Give sufficient notice so that inspection may be made of:

- Roof supports.
- Those parts of the roofing, sarking, vapour barrier, insulation and roof plumbing installation which will be covered up or concealed.

1.5 SUBMISSIONS

Tests

General: Submit results of type tests as follows:

- Metal roofing general tests: Roof sheeting and fastenings to AS 1562.1 for resistance to concentrated load and to wind pressure.
- Metal roofing in cyclonic regions AS/NZS 1170.2: Roof sheeting and fastenings to AS 1562.1 clause 5.6.
- Fibre cement roofing: Type test the roof sheeting and fixings to AS/NZS 1562.2 for resistance to wind forces.

Internal downpipes: Submit results of site tests to each stack hydrostatically in stages 2 storeys high for two hours. Remedy defects and retest if necessary.

Samples

Requirement: Submit samples of the following showing the range of variation available:

- Sheet metal finishes showing the range of variation available.
- Custom profiled flashings and cappings.

2 PRODUCTS

2.1 COMPONENTS

Fasteners

Finish: Prefinish exposed fasteners with an oven baked polymer coating to match the roofing material.

Fastenings to timber battens: Provide fastenings just long enough to penetrate the thickness of the batten without piercing the underside.

Profiled fillers

Type: Purpose-made closed cell polyethylene foam profiled to match the roofing profile.

Location: Provide profiled fillers under flashings to the following:

- Ridges.
- Eaves.
- Lapped joints in roof sheeting.

Safety mesh
Standard: To AS/NZS 4389.

2.2 SHEET METAL ROOFING

Standards
Design and installation: To AS 1562.1.

Pre-painted and organic film/metal laminate products: To AS/NZS 2728.

Roofing product
Refer to finishes schedule in appendix for details.

Insulation/ Sarking:

Refer to section 0471.

Security Mesh:

Install under the roof sheeting a security mesh as follows:

Galvanised SL72 steel reinforcing mesh. Install under the roof purlins throughout, above the rafters as a preference. Install securely to the frame.

2.3 ROOF PLUMBING

General
Standard: To AS/NZS 3500.3.

General: Provide the flashings, cappings, gutters, rainwater heads, outlets and downpipes necessary to complete the roof system.

Materials
Metal rainwater goods: To AS/NZS 2179.1.

PVC rainwater goods and accessories: To AS/NZS 3500.3.

Flashings and cappings
Standard: To AS/NZS 2904.

Material and colour: Match roof sheeting.

Rib notching: Match roof sheeting.

Ridge and barge cappings
Material and colour: Match roof sheeting.

Eaves gutters
Refer to details on drawings, custom galvanised steel gutter and quad gutters.

Material and colour: HDG finish and colorbond finish- refer finishes schedule.

Matching fascia/barge: If the selected eaves gutter is a proprietary high front pattern forming part of a combined system of gutter, fascia and barge, provide the matching proprietary fascias and barge cappings to roof verges and edges.

Downpipes
Refer to drawings and Finishes schedule.

Internal downpipes

Vents
Match vent pipes to the colour of the roof sheeting.

Gratings
Gratings: Provide removable gratings over rainwater heads and sumps:

3 EXECUTION

3.1 INSTALLATION

Protection

General: Keep the roofing and rainwater system free of debris and loose material during construction, and leave them clean and unobstructed on completion. Repair damage to the roofing and rainwater system.

Touch up: If it is necessary to touch up minor damage to prepainted metal roofing, do not overspray onto undamaged surfaces.

Thermal movement

Requirement: Provide for thermal movement in the roof installation and the structure, including movement in joints and fastenings.

Pan type sheets

Removal: Capable of being de-indexed and removed without damage.

Curved corrugated sheet

General: Form by rolling from material recommended for curving or bullnosing. Minimise crimping or creasing across the face of the sheet. Trim off crimped or creased edges and ends.

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:

- Applying an anti-corrosion, low moisture transmission coating to contact surfaces.
- Inserting a separation layer.

Tolerances

Requirement: Conform to the **Tolerances table**.

Tolerances table

Property	Tolerance criteria: Permitted deviation (mm)
Spacing of supporting members	± 5 mm on the nominated support member spacing
Vertical or horizontal misalignment at the abutting ends of sheets	≤ 2 mm
Tops of supporting members in a plane parallel to the nominated roof slope	≤ 7 mm smooth deviation per metre length of supporting member

3.2 SHEET METAL ROOFING

Roof sheet installation

Eaves: Treat ends of sheets as follows:

- Generally: Close off ribs at tops and bottoms of sheets by mechanical means or with purpose-made fillers or end caps.
- At gutters: Project sheets 50 mm into gutters.

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

Accessories: Provide material with the same finish as roofing sheets.

3.3 BUILDING ELEMENTS

Ridges and eaves

Treat ends of sheets 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.

Ridge and barge

Capping: Finish off along ridge and verge lines with purpose-made ridge capping or barge rolls.

3.4 COMPLETION

Warranties

Roofing materials: Submit the manufacturer's published product warranties.

Maintenance manual

On completion: Submit a manual of recommendations from the roof manufacturer or supplier for the maintenance of the roofing system including, frequency of inspection and recommended methods of access, inspection, cleaning, repair and replacement.

0431B CLADDING – COMBINED

1 GENERAL

1.1 RESPONSIBILITIES

General

General: Provide lightweight external wall cladding and associated work which is as follows:

- Satisfies the product performance requirements.

1.2 CROSS REFERENCES

General

Requirement: Conform to the following worksection(s):

- *General requirements.*

1.3 INSPECTION

Notice

Inspection: Give sufficient notice so that the framing, sarking, vapour barrier and insulation may be inspected before they are covered up or concealed.

2 PRODUCTS

2.1 SHEET METAL CLADDING

Standards

Design and installation: To AS 1562.1.

Prepainted and organic film/metal laminate products: To AS/NZS 2728.

Cladding product

Refer to the Finishes Schedule for details.

2.2 FIBRE CEMENT CLADDING

Fibre cement

Standard: To AS/NZS 2908.2.

Cladding, eaves and soffit linings: Type A Category 3 (modulus of rupture ≥ 7 MPa).

Compressed cladding: Type A Category 5 (modulus of rupture ≥ 18 MPa).

- Edges: Square. Refer details.

Sheet cladding

General: Provide a proprietary system of single faced compressed fibre cement sheets- Vitrapnel.

Arrangement: Set out in even panels with joints as shown on elevations and finishes schedule.

Sheet thickness: 12 mm.

Joints, corners and edges: Set joints with express control joints where indicated.

Eaves and soffit lining

Sheets: Single faced compressed fibre cement.

Sheet thickness: 6 mm compressed fibre cement sheet cladding.

Joints: Set joints.

2.3 COMPONENTS

Flashings

Standard: To AS/NZS 2904.

3 EXECUTION

3.1 TOLERANCES

Tolerances
Requirement: Conform to the **Tolerances table**.

Tolerances table

Property	Tolerance criteria: Permitted deviation (mm)
Spacing of supporting members	± 5 mm on the nominated support member spacing
Vertical or horizontal misalignment at the abutting ends of cladding	≤ 2 mm

3.2 CONSTRUCTION GENERALLY

Substrates or framing
Requirement: Before fixing cladding check and, if necessary, adjust the alignment of substrates or framing.

Fixing
Method: Nail to timber framing, screw to steel framing.

Accessories and trim
Provide accessories and trim necessary to complete the installation.

Fixing eaves and soffit lining
Nailing: 150 mm centres to bearers at maximum 450 mm centres.

Metal separation
Requirement: Prevent direct contact between incompatible metals, and between green hardwood or chemically treated timber and aluminium or coated steel, by either:

- Applying an anti-corrosion, low moisture transmission coating to contact surfaces.
- Inserting a separation layer.

3.3 PROPRIETARY SYSTEMS OR PRODUCTS

Fixing
Product fixing: Fix the following proprietary systems in conformance with the current written recommendations and instructions of the manufacturer or supplier:

- Compressed Fibre cement cladding.
- Zinc sheet cladding system to door faces.

3.4 COMPLETION

Warranties
Cladding materials: Submit the manufacturer's published product warranties.

0453B DOORS AND ACCESS PANELS

1 GENERAL

1.1 RESPONSIBILITIES

General

General: Provide doors, frames, doorsets, security screen doors and fire doorsets as documented.

1.2 CROSS REFERENCES

General

Requirement: Conform to the following worksection(s):

- *General requirements.*
- *Door hardware schedule.*

1.3 INTERPRETATION

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

- Balanced construction: Flush door construction where the facings on one side of the core are nominally equal in thickness, grain direction, properties and arrangement to those on the other side of the core, such that uniformly distributed changes in moisture content will not cause warpage.
- Door frame: Includes jamb linings.
- Doorset: An assembly comprising a door or doors and supporting frame, guides and tracks including the hardware and accessories necessary for operation.
  - Fire-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.
- Flush door: A door leaf with two plane faces which entirely cover and conceal its structure. It includes doors with intermediate rail, cellular, blockboard, medium density fibreboard (MDF) and particleboard cores.
  - Solid core door: A flush door with a solid core continuous between stiles and rails or edge strips and fully bonded to the faces.
- Joinery door: A door leaf with either stiles and rails, or stiles, rails and muntins, framed together. A joinery door may also incorporate glazing bars.
  - Louvred door: A joinery door with spaces filled in with louvre blades.
  - Panelled door: A joinery door with spaces filled in with panels including glass.

1.4 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.

1.5 SUBMISSIONS

Type tests

General: Submit type-test certification conforming to the following standards to verify conformance with the **Doorsets performance schedule**:

- Fire and smoke doors: To AS 1905.1 and BCA Spec C3.4.
- Weighted sound reduction index (R_w): To AS/NZS ISO 717.1.

2 PRODUCTS

2.1 FRAMES

Steel frames

General: 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.

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.

Base metal thickness:

- General: ≥ 1.1 mm.
- Fire rated doorsets: ≥ 1.5 mm.
- Security doorsets: ≥ 1.6 mm.

Metallic-coated steel sheet: To AS 1397.

- Coating class interior: ZF100.

Sliding Door sets

Provide to the sliding doors the following tracksystem:

Cowdroy 'Maxi-roller' sliding door track system, heavy Duty rated to 227kg per door

Door substrate to be 40mm soildcore door, external grade timber and ensure top and bottom of door is sealed with 2 coats of external paint.

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 processed fibreboard (including hardboard): To AS/NZS 1859.4.
- Dry processed fibreboard (including medium density fibreboard): To AS/NZS 1859.2.
- Particleboard: To AS/NZS 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.

Certification

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

Flush doors

General: Provide flush doors of balanced construction.

Cellular core and intermediate rail core flush doors:

- Provide a subframe of 25 mm minimum width timber around openings for louvres and glazing.
- Provide additional material to take hardware, fastenings and grooves.

Solid core: Solid flush doors as follows:

- Flush door with blockboard: Core plate of timber strips laid edge to edge, fully bonded to each other and to facings each side of no less than two sheets of timber veneer.
- Flush doors with particleboard: Core plate of particleboard fully bonded to facings each side of no less than two sheets of timber veneer.

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

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 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.

Tolerance

Squareness: The difference between the lengths of diagonals of a door: ≤ 3 mm.

Twist: The difference between perpendicular measurements taken from diagonal corners: ≤ 3 mm.

Nominal size (mm):

- Height: + 2, - 2.
- Width: - 0, + 2.

2.3 DOORSETS

Fire-resistant doorsets

Standard: To AS 1905.1 and BCA Spec C3.4.

2.4 ANCILLARY MATERIALS

Trims

Timber: Solid timber at least 19 mm thick, mitred at corners.

Extruded gaskets and seals

General: Provide seals to the **Door seal schedule**.

Materials: Non cellular (solid) elastopressive seals as follows:

- Flexible polyvinyl chloride (PVC): To BS 2571, 100% solids with high consistency, ultra-violet 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.

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.

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.

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 edges before installation.

3.3 COMPLETION

Operation

General: Ensure moving parts operate freely and smoothly, without binding or sticking, at correct tensions or operating forces and that they are lubricated where appropriate.

Protection

Temporary coating: On or before the date for practical completion, or before joining up to other surfaces, remove all traces of temporary coatings used as a means of protection.

4 SELECTIONS

4.1 DOOR TYPES SCHEDULE

Refer to Door schedule in the appendix.

0455 DOOR HARDWARE

1 GENERAL

1.1 RESPONSIBILITIES

General

General: Provide door hardware as documented.

Handing: Before supply, verify on site, the correct handing of hardware items.

Hardware specified generically: Provide hardware of sufficient 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.

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.

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, fixings and fixing instructions.

Replacement items

Door hardware: Match items being replaced with existing unless documented otherwise. Upgrade hinges as necessary to conform to **Hinges table A** and **Hinges table B**.

1.2 CROSS REFERENCES

General

Requirement: Conform to the following worksection(s):

- *General requirements.*
- *Door schedule*

1.3 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 apply.

Lock function: For the purposes of this worksection the general definitions given in AS 4145.1 Appendix E apply.

1.4 SUBMISSIONS

Door-by-door schedule

General: Submit a door-by-door hardware schedule.

Information sources: This worksection and the contract drawings.

Refurbishment and alteration work

Reuse 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.

Samples

Generic items: Submit samples of hardware items offered as meeting the description of items not specified as proprietary items.

Refurbished items: Submit samples of hardware items offered as meeting the standard of cleaning, repair and testing of recovered items.

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). To suit Penrith Councils keying requirements.

Alterations and additions: Submit details to extend the existing key control security system for locks required to accept a group key.

Subcontractors

Automatic door operators: Submit names and contact details of proposed supplier and installer.

Pressure floor mat: Submit names and contact details of proposed supplier and installer.

Record documents

Door hardware schedule: Submit an amended schedule, prepared by the door hardware supplier, showing changes to the contract door hardware schedule caused as follows:

- By the approval of a hardware sample.
- By the acceptance of an equivalent to a specified proprietary item.
- By a contract variation to a door hardware requirement.

Keys

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.

Keys: For locks keyed to differ and locks keyed alike, verify quantities against key records, and deliver to the contract administrator at practical completion.

2 PRODUCTS

2.1 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.

2.2 HINGES

Butt hinge sizes

Size for door types: Conform to tables as follows:

- Timber doors in timber or metal frames: **Hinge table A**.
- Aluminium framed doors in aluminium frames: **Hinge table B**.
- Cupboard doors: Not included in hinge tables.

Measurement: 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.

Butt hinge materials

Timber doors in timber or steel frames:

- Material: Stainless steel

Doors fitted with closers: Provide low friction ball bearing hinges.

2.3 HINGE TABLES

Solid core doors

Application: Provide hinges to solid core doors to **Hinges table A**. The table can be used to determine the quantity of hinges required for the nominated door leaf sizes and weights only. For door leaf sizes not specified or with applied finishes use the weight of the door to determine the quantity of hinges required. For door leafs over 80 kg, nominate pivot hinges.

The size of the hinge is determined by the door leaf thickness:

- 35 - 43 mm thick door: 100 x 75 mm # butt hinges with a minimum thickness of 2.5 mm.

- 44 - 55 mm thick door: 100 x 100 mm # butt hinges with a minimum thickness of 2.5 mm.
- > 55 mm thick door: Refer to the door by door hardware schedule.

Hinge pin: The symbol # refers to the pin type. Supply fixed pins to doors opening out or designated as a security doors.

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.

Hinge table A

Nominal door leaf size (H x W x T) (mm)	Door leaf weight (kg - approx)	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
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	Nominate pivot hinges

2.4 DOOR HANGING SYSTEMS

General

General: Provide sliding door tracks in conformance with the **Sliding track itemised in section 0453b.**

2.5 ANCILLARIES

Bolts

General: Provide bolts including 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 enable 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: Use strike plates provided with the locks or latches. Do not provide universal strike plates.

2.6 KEYING

Temporary construction keys and cylinders

Requirement: Provide one of the following:

- Loan cylinder: Install for construction locks and replace at practical completion.

- Construction keyed master key cylinder: Keep up-to-date records of keys issued including recipient's name, company and contact details, date issued and date returned.

Delivery of keys

Great grandmaster, grandmaster and master keys: Arrange for the manufacturer or supplier to deliver direct to the principal.

Number of keys: Conform to the **Number of keys table**.

Group keying

Keying system: Provide a group keying system in conformance with the **Key codes schedule**.

Existing system: Obtain the details of existing group or master key systems to which a new system is required to be an extension.

Future extensions: Provide master and grandmaster group keying systems which are capable of accommodating future extensions.

Keying control security system: If cylinder or pin-tumbler locks accept a group key (e.g. master key, maison key) provide to those locks a proprietary keying control security system.

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

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
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

3 EXECUTION

3.1 INSTALLATION

Mounting height

Locks and latches: Centreline of the door knob or lever spindle above finished floor: 100mm AFFL

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 fixings: Provide a corrosion resistant finish to concealed fixings.
- Exposed fixings: Match exposed fixings to the material being fixed.

Security: Locate exposed fixings to lock furniture on the inside faces of external doors and on the inside faces of internal doors to lockable rooms.

Support: Provide appropriate back support (for example lock stiles, blocking, wall noggings and backing plates) for hardware fixings.

- Hollow metal sections: Provide backing plates drilled and tapped for screw fixing, or provide rivet nuts with machine thread screws. Do not use self tapping screws or blind rivets.

Hinges

Metal frames: Fix hinges using metal thread screws.

Timber doorsets: Install butt hinges in housings equal in depth to the thickness of the hinge leaf (except for hinges designed for mounting without housing), and fix with countersunk screws.

3.2 COMPLETION

Adjustment

General: Leave the hardware properly adjusted with working parts in working order, and clean, undamaged, properly adjusted, and lubricated where appropriate.

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 and make sure the exclusion of the contractor's keys.

Maintenance

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.

Product warranties

Warranty: Cover materials and workmanship in the terms of the warranty in the form of interlocking warranties from the manufacturer or distributor and the applicator.

Automatic door operators: Submit a warranty (or interlocking warranties) from the supplier and installer for the system and its installation, for a period of at least twelve months from the date of practical completion.

4 SELECTIONS

4.1 SELECTION SCHEDULE

Refer to Door hardware schedule in appendix.

4.2 DOOR-BY-DOOR SCHEDULE

Common door hardware properties
Door hardware schedule

4.3 PADLOCK SCHEDULE

Padlock schedule

Property	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			

4.4 KEYING SCHEDULE

Keying requirements

Requirement: Provide door hardware and keys based on the **Key codes schedule**.

Key codes schedule

Door no.	Door stamping	Room name	Level/ Area	Lock type	Cylinder type	Cam type	Key head colour		Comments
							Key no.	Qty	

0471 INSULATION AND PLIABLE MEMBRANES

1 GENERAL

1.1 RESPONSIBILITIES

General

General: Provide insulation and pliable membrane systems:

- 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 worksection(s):

- *General requirements.*
- *Roofing*

1.3 INTERPRETATION

Definitions

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

- Thermal insulation: To AS/NZS 4859.1.
- Pliable building membrane: To AS/NZS 4200.1 and equivalent to sarking-type materials as defined in the BCA.
- Fire hazard properties: To BCA A2.4.
- Fibre batts: Flexible insulation supplied as factory cut pieces and composed of mineral wool (glass and rock fibre) or polyester fibre.
- FBS-1 (fibre-bio-soluble) mineral wool: Insulation composed of bio-soluble glass or rock fibres.
- Vapour permeable (breathable) membrane: A flexible membrane material, normally used for secondary waterproofing that allows for the transmission of water vapour.
- Breathable (vapour permeable) membrane: A flexible membrane material, normally used for secondary waterproofing, that allows for the transmission of water vapour.

1.4 INSPECTION

Notice

Inspection: Give notice so that inspection may be made of the pliable membrane and insulation before they are covered up or concealed.

1.5 SUBMISSIONS

Fire hazard properties

General: Submit evidence of conformance to **INSULATION AND PLIABLE MEMBRANE MATERIALS**, **Fire hazard properties**.

Thermal properties

General: Submit evidence of conformance with AS/NZS 4859.1 for documented thermal properties.

2 PRODUCTS

2.1 INSULATION AND PLIABLE MEMBRANE MATERIALS

Fire hazard properties

Insulation: Fire hazard indices for all materials when tested in conformance with AS/NZS 1530.3:

- Spread of flame index: ≤ 9.
- Smoke developed index: ≤ 8 if spread of flame > 5.
- Materials with reflective facing: Test to AS/NZS 1530.3 and the recommendations of clause A6.

Pliable membranes: Flammability index < 5 when tested in conformance with AS 1530.2.

Insulation

Cellulosic fibre (loose fill): To AS/NZS 4859.1 Section 5.

Mineral wool blankets and cut pieces: To AS/NZS 4859.1 Section 8.

Polyester: To AS/NZS 4859.1 Section 7.

Polyisocyanurate (rigid cellular sheets RC/PIR): To AS 1366.2.

Polystyrene (extruded rigid cellular sheets RC/PS-E): To AS 1366.4.

Polystyrene (moulded rigid cellular sheets RC/PS-M): To AS 1366.3.

Polyurethane (rigid cellular sheets RC/PUR): To AS 1366.1.

Polyurethane (sprayed): To AS 1366.1 Table 2.

Wet processed fibreboard (including softboard): To AS/NZS 1859.4.

Wool: To AS/NZS 4859.1 Section 6.

Reflective thermal insulation: To AS/NZS 4859.1 Section 9.

Certification: Required.

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

Pliable membranes

Standard: To AS/NZS 4200.1.

Vapour barrier:

- Vapour barrier classification: High.

Sarking membrane (other than walls and gables):

- Water barrier classification: High.

Vapour permeable (breathable) membrane:

Fasteners and supports

General: Metallic-coated steel.

Mesh support to roof insulation

Metallic-coated steel wire netting: To AS 2423 Section 4.

- Size: 45 mm mesh x 1 mm diameter.

Welded safety mesh: To AS/NZS 4389.

3 EXECUTION

3.1 GENERAL

Bulk insulation

Installation: To AS 3999 and BCA J1.2.

General: Make sure fibre blankets or batts are firmly butted 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.

Marking: Deliver mineral wool products to site in packaging labelled FBS-1 BIO-SOLUBLE INSULATION.

Pliable membrane

Installation: To AS/NZS 4200.2.

Vapour permeable (breathable) membrane

Application: Provide a vapour permeable membrane behind external FC sheets facing material which does not provide permanent weatherproofing or which may be subject to condensation forming on the internal face, including the following:

- Boards fixed vertically or diagonally.
- Boards or planks fixed in exposed locations where wind driven rain can penetrate the joints.

- Unpainted or unsealed cladding.
- Behind external cladding in bushfire prone areas to AS 3959.
- 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 taught 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 to be installed. Cut the membrane on a 45° diagonal from each corner of the opening, fold the flaps inside and fix to the inside frame of the opening. If the membrane is used to provide a continuous air tight layer, seal all joints with pressure sensitive adhesive tape.

Fixing: Install as follows:

- Timber frames: Metallic-coated clouts, 20 mm long 6-8 mm staples or punched multi-point metallic-coated steel brads.
- Steel or aluminium: Hex head screws, with either 20 mm diameter washers or through hardboard strips.
- Plywood: Alternatives:
  - Metallic-coated clouts, 20 mm long 6-8 mm staples or punched multi-point metallic-coated steel brads at minimum 300 mm centres.
  - Water based contact adhesive with a 50% adhesive cover.

3.2 ROOF INSULATION

Mesh support to roof insulation

General

Location: 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

Locations: Provide support to the following:

- Sarking, vapour barrier or reflective thermal insulation membranes laid over roof framing members which are spaced at more than 900 mm centres.
- Blanket type thermal insulation laid over roof framing members as sound insulation to metal roofing.

Installing wire netting: Lay over the roof framing providing sufficient slack or sag between members to suit the application.

Fixing wire netting: Staple to timber frame, wire to steel frame.

Installing welded safety mesh: To AS/NZS 4389.

Pliable membranes

Sarking membrane:

- Location: Provide sarking under tile and shingle roofing.

Vapour barrier:

- Installation: 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.

Metal roofs – bulk insulation

Product: Fibre blankets or batts just above raked ceiling.

Installation:

- Batts: Fit tightly between framing members.
- 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 blanket and reflective insulation: Lay facing reflective insulation face downwards over safety mesh.

3.3 COMPLETION

Warranties

Insulation and pliable membranes: Submit the manufacturer's published product warranties.

4 SELECTIONS

4.1 INSULATION

Roof insulation

Property	A	B	C
Application	Directly under metal sheeting	Above raked ceiling	
Type/Product	Foil backed insulation with R1.5 thermal rating	Bulk insulation with R1.5 rating	
Location	Refer drawings	Refer drawings	
R-value	R1.5	R1.5	
Thickness (mm)			
Rw rating			
Rigid cellular sheet class			

0511B LINING

1 GENERAL

1.1 RESPONSIBILITIES

General

General: Provide internal lining systems to the **SELECTIONS.**

1.2 CROSS REFERENCES

General

Requirement: Conform to the following worksection(s):

- *General requirements.*

1.3 INSPECTION

Notice

Inspection: Give sufficient notice so that inspection may be made of substrate or framing before installation of linings.

1.4 TOLERANCES

Surface

Flatness, twist, winding and bow: ≤ 1.5 mm deviation from a 1.5 m straightedge placed in any position.

2 PRODUCTS

2.1 MATERIALS AND COMPONENTS

Compressed Fibre cement

Standard: To AS/NZS 2908.2.

Wall and ceiling linings: Type B category 2.

Minimum thickness: 6 mm or 9mm as shown on the drawings.

Plywood and blockboard

Interior use: To AS/NZS 2270.

Exterior use: To AS/NZS 2271.

Visible surfaces with a clear finish: Veneer quality A.

Other visible surfaces: Veneer quality B.

Back/face veneer: Veneer quality C or D.

Presealed plywood: Plywood pre-sealed both sides and edges with a machine applied sealer.

Certification

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

Fasteners

Steel nails: Hot dip galvanized.

Adhesives

For wallboards: Gunnable synthetic rubber/resin based mastic contact adhesive formulated for bonding flooring and wallboards to a variety of substrates.

Sealants

Fire rated sealant: Non-hardening sealant compatible with the materials to be sealed and having a fire rating equal to that of the partition it seals.

Acoustic sealant: Non-hardening sealant compatible with the materials to be sealed and having a specific gravity of not less than 1.5 gm/cubic centimetre and of 100% polyurethane mastic.

3 EXECUTION

3.1 CONSTRUCTION GENERALLY

Conditions

Commencement: Do not commence lining work until such time as the building or zone in question is enclosed and weathertight and all wet trades have been completed.

Substrates or framing

General: Before fixing linings check and, if necessary, adjust the alignment of substrates or framing.

Battens

General: Fix at each crossing with structural framing members, or direct to solid walls or ceilings. Provide wall plugs in solid substrates.

Ceiling linings

General: Do not install until at least 14 days after the timber roof structure is fully loaded.

Accessories and trim

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

Adhesives

General: Provide adhesives of types appropriate to their purpose, and apply them so that they transmit the loads imposed, without causing discolouration of finished surfaces.

3.2 COMPRESSED FIBRE CEMENT LINING

Supports

General: Install timber battens or proprietary cold-formed galvanized steel furring channels as follows:

- Where framing member spacing exceeds the recommended spacing.
- Where direct fixing of the 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.

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.

Timber framed construction: Nail only or combined with adhesive.

Steel framed construction: Screw only or combined with adhesive.

Wall framing:

- 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:

- Fix using adhesive direct to masonry, but do not fix direct to masonry as a substrate for tiled finish.
- Fix to furring channels using screw or screw and adhesive.

Ceilings: Fix using screw or screw and adhesive to ceiling furring members. Do not fix sheets to the bottom chords of trusses.

Wet areas: Do not use adhesive fixing alone.

Joints

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 UPVC 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: ≤ 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.

3.3 TRIM AND ACCESSORIES

General

General: Provide trim such as beads, mouldings and stops to make neat junctions between lining components, finishes and adjacent surfaces.

Proprietary items: Provide complete with installation accessories.

4 SELECTIONS

Refer to the wall types for details of linings.

0525 CUBICLE SYSTEMS

1 GENERAL

1.1 RESPONSIBILITIES

General

Requirement: Provide cubicles, as documented.

1.2 CROSS REFERENCES

General

Requirement: This work section shall be read in conjunction with Section 0171 *General requirements*, other related sections of this Specification and the Preliminaries.

The *General requirements* worksection contains umbrella requirements for all building and services worksections.

1.3 INTERPRETATION

Abbreviation

General: For the purposes of this worksection the following abbreviation applies:

- ABS: Acrylonitrile-Butadiene-Styrene.

Definitions

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

- Compressed fibre cement sheets: Factory prefinished, double faced, autoclaved high density fibre cement sheets with square stone cut edges ground smooth and arrised.
- Cubicle: A small space or compartment partitioned off, often within a wet area.
- Dry processed fibreboard: A panel manufactured by bonding lignocellulosic fibres (derived from wood or other materials) with a synthetic resin adhesive and curing under heat and/or pressure. The panels are manufactured with a forming moisture content of less than 20%.
- 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 materials (e.g. paper) impregnated with thermosetting resins and bonded together under heat and pressure of at least 5 MPa.
- Metal faced board: Sheet metal (usually stainless steel) adhesive fixed moisture resistant particleboard.
- Particleboard: A panel manufactured under pressure and heat from wood particles and/or lignocellulosic material with the addition of an adhesive.

1.4 INSPECTION

Notice

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

- Set-out before installation.
- Completion of installation.

1.5 TOLERANCES

General

Deviation (from true grid lines and planes): 1:1000 to a maximum of 3 mm.

Misalignment (of adjoining surfaces at panel junctions): 1 mm.

Panel thickness: ± 0.5 mm.

Length and width: 0.1% of the dimension or 0.5 mm, whichever is the greater.

Flatness, twist, winding and bow: 1 mm deviation from a 2.4 m straightedge placed in any position.

Maximum deviation of edges from the intended true line: ± 1 mm.

1.6 SUBMISSIONS

Prototype

General: Erect a prototype of each cubicle type, including at least one example of each component in the system.

- Location and extent: refer to drawings

Samples

General: Submit samples as follows:

- Each selected panel and door finish, at least 300 x 300 mm, with associated selected edgestrips and trims.
- All hardware and metal components in the selected finish.

Shop drawings

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

- Overall layout and dimensions.
- Materials, thicknesses and finishes of elements including doors, divisions, fronts, pedestals and top rail.
- Assembly hardware.
- Door hardware type and location.
- Relationship of assembly to adjacent building elements.

Subcontractors

General: Submit name and contact details of proposed manufacturers and installers.

Tests

Type tests: Submit results as follows:

- Graffiti removal: Removal of spray paint and permanent markers from the nominated surface.

Warranties

Cubicle system assemblies: Submit the manufacturer's published product warranties.

2 PRODUCTS

2.1 MARKING

Identification

General: Deliver materials to the site in the manufacturer's original sealed containers or packaging, legibly 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. Provide technical data sheets if not shown on labels.
- Handling and installation instructions.
- Material safety data sheets.

2.2 PRODUCT SYSTEMS

Acrylic polymer resin panels

Requirement: Chip, crack and scratch resistant acrylic polymer resin with mineral fillers and pigments.

Engineered stone panels

Requirement: Non-porous, homogenous engineered stone consisting of at least 94% natural quartz aggregate, resin and pigments.

Sheet faced reconstituted wood-based panels and doors

Particleboard: Moisture resistant particleboard to AS/NZS 1859.1.

Dry processed fibreboard: Moisture resistant high density fibreboard to AS/NZS 1859.2.

Finishes: Conform to the following:

- Decorative overlay: To AS/NZS 1859.3.
- Edge strip: 2 mm ABS colour matched to decorative overlay.
- High pressure decorative laminates: Sheets made from thermosetting resins to AS/NZS 2924.1.
- Stainless steel: Grade 316.
  - Edge: Adhesive fixed stainless steel folded channel.

High pressure decorative laminate (HPDL) and panels and doors

Material: Compact high pressure decorative laminate panels with an integral surface finish and edges sealed by the manufacturer.

Edge: Factory prefinished square cut, ground smooth and arrised, and oiled by the manufacturer.

Compressed fibre cement panels

Material: Factory prefinished compressed cellulose cement sheets with square stone cut edges ground smooth and arrised.

Standard: To AS/NZS 2908.2.

Panel finish: Factory applied two pack polyurethane.

2.3 ACCESSORIES

Suspension beam

General: For suspended systems, provide a suspension beam consisting of a galvanized mild steel channel, located immediately above the ceiling framing along the line of the partition fronts. Build the ends into masonry structure or provide end fixings to the structure, as necessary, to transfer the load. Drill the bottom flange of the channel for the partition fixing bolts.

Hardware

Fixing hardware: Bolts, dowels, brackets, standards, cappings and stabilising bars supplied to complete the cubicle assembly.

Door furniture: As documented in the **Cubicle schedule.**

3 EXECUTION

3.1 PANELS

Acclimatisation

General: Condition wood-based product components in the anticipated environment for two weeks before assembly.

Manufactured cubicle system installation

Assembly: Attach divisions and nibs to walls and fronts with purpose-made proprietary fixings. Cut nibs and divisions that abut walls, as required, so that assembly is plumb. Seal edges as recommended by the manufacturer.

Floor mounted/overhead braced type: Fix fronts to the floor with proprietary fittings and at the top to a metal channel headrail, supplied as part of the system. Run headrail across the fronts and fix to the walls at each end. Form the channel into a box section over doorways by snapping in a mating channel insert.

Heads of openings: Fix stabilising head channels by screwing to the top of the partitions. Provide an infill strip to the channel across the opening.

Ceiling hung type: Hang the fronts from a suspension beam with attachments incorporating a means of height adjustment, supplied as part of the system.

Freestanding type: Fix fronts to the floor with proprietary fittings.

3.2 ACCESSORIES

Shower seats

Fixing: Fix to structural elements using one of the following methods:

- Anodised aluminium channel to exposed edge, secured to walls at each end.
- Product assembly detail.
- Proprietary wall bracket.

4 SELECTIONS

4.1 SCHEDULES

Cubicle Systems – refer to Sanitary Fixtures Schedule

0531B SUSPENDED CEILINGS – COMBINED

1 GENERAL

1.1 RESPONSIBILITIES

General

- General: Provide suspended ceilings as documented and as follows:
- Consistent in finish treatment.

1.2 CROSS REFERENCES

General

Requirement: Conform to the following worksection(s):

- *General requirements.*

1.3 STANDARDS

General

Suspended ceilings: To AS/NZS 2785.

Luminaire and air diffuser interface: To AS 2946.

1.4 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 a ceiling suspension system.

1.5 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.

1.6 TOLERANCES

Suspension system

Flatness, twist, winding and bow: Maximum 1.5 mm deviation from a 1.5 m straight edge placed in any position.

Sheeted or flush ceiling system

Suspension system bearing surface for flush lined ceiling: To AS/NZS 2589 Table 4.2.2.

1.7 SUBMISSIONS

Samples

General: Submit samples as follows:

- Suspension system: Sections proposed for the suspension system, including suspension rods, clips, wall angles and trim.
- Ceiling material: Lining and ceiling units, with insulation, showing the extremes and mean of variation in colour, pattern, or texture of the proposed finish.
- Methods: Methods of jointing, fixing, height adjustment, retaining and removing ceiling units.

2 PRODUCTS

2.1 SUSPENSION SYSTEM

Proprietary system

General: Provide in conformance with the **Proprietary suspended system schedule**.

Protective coatings for steel components: To AS/NZS 2785 Table F1.

2.2 LINING

Compressed Fibre cement

Standard: To AS/NZS 2908.2.

Wall and ceiling linings: Type B category 2.

Minimum thickness: 6 mm.

Sealants

Fire rated sealant: Non-hardening sealant compatible with the ceiling materials and documented fire rating.

Acoustic sealant: Non-hardening sealant compatible with the ceiling materials to be sealed and rated to R_w 65.

3 EXECUTION

3.1 CONSTRUCTION GENERALLY

Working environment

General: Do not start work before the building is enclosed, wet work is complete and dry, and all work above the ceiling, including services, is complete.

Protection

General: Protect existing work from damage during the installation.

Partitions

General: If partitions are attached to the underside of the ceiling systems, include the partition mass in the seismic mass of the ceiling.

Stability

General: Install the ceilings level and fix to prevent looseness or rattling of ceiling components under normal conditions.

Structure-borne sound

General: Provide a ceiling system which does not amplify structure-borne sound. Provide suitable proprietary products or systems for reducing contact vibrations between structure and ceiling.

Control of movement

Abutments: Install the ceiling to allow for differential movement at abutting surfaces.

Alignment: Align ceiling control joints with the 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.

3.2 SUSPENSION SYSTEM

Suspension system

Support members: Provide support members as follows:

- Space as required by the loads on the system and the type of ceiling.
- Allow for the installation of services and accessories, including ductwork, light fittings and diffusers.
- Provide additional back support or suspension members for the fixing of services and accessories to prevent distortion, overloading or excessive vertical deflection.

Failure: Provide a ceiling system where failure of any one suspension point does not cause a progressive failure of the ceiling.

Height adjustment: Provide height adjustment with a length adjustment device at each suspension point, permitting length variation of at least 50 mm.

Grid members: If required, notch grid members at the junction with the perimeter trim to make sure the ceiling units lie flat on the perimeter trim.

Restriction: Do not attach the suspension system to the lip or flange of purlins.

Services

Support: Conform to the following:

- If the service has not been designed to accept the ceiling load, do not fix suspension members to services (e.g. ductwork).
- If services obstruct the ceiling supports, provide bridging and suspension on each side of the services.
- Do not support services terminals on ceiling units.

Bracing

General: Provide bracing to prevent lateral movement and to resist the imposed horizontal seismic force.

External suspended soffits

General: Support external suspended soffits on rigid members capable of carrying the loads from imposed actions. Install members to minimise any eccentricity, and carry the upward and downward loads from wind actions through to the supporting structure.

Fasteners

General: Provide concealed fasteners. If material supporting hangers is less than 3 mm thick, do not use screw fasteners.

3.3 COMPRESSED FIBRE CEMENT LINING

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: Screw or screw and adhesive fix to ceiling members or support frame.

Joints

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 UPVC joining section.

Control joints: Align lining control joints with structural control joints and as follows:

- 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.
- Location: If possible, position joints to intersect light fixtures, vents or air diffusers.

Wet areas: Install additional supports, flashings, trim and sealants, as required.

3.4 TRIM

General

Trim: Provide trim at junctions with other building elements and surfaces, including walls, beams and penetrations, consistent with the materials and finishes of the ceiling system.

Accessories

General: Provide accessories as part of the proprietary ceiling system necessary to complete the installation.

3.5 COMPLETION

Maintenance manual

General: On completion, submit manufacturer's recommendations for the care and maintenance of the ceiling, and operating instructions for demounting, if applicable.

4 SELECTIONS

4.1 GENERAL

Refer to the drawings for details.

0552B METALWORK - FABRICATED

1 GENERAL

1.1 RESPONSIBILITIES

General

General: Provide metal fixtures that are:

- Undamaged, plumb, level and straight.
- Free of surface defects or distortions.

1.2 CROSS REFERENCES

General

Requirement: Conform to the following worksection(s):

- *General requirements.*

1.3 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.
- Site erected assemblies on completion of erection, before covering up by cladding and encasing.
- Steel surfaces prepared for, and immediately before, site applied finishes.

1.4 SUBMISSIONS

Subcontractors

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

Installation of proprietary items

General: Submit the manufacturer's standard drawings and details showing:

- Methods of construction.
- Assembly and fixing, with dimensions and tolerances.

Tests

Stainless steel: Before fabrication commences, submit satisfactory evidence that relevant procedure test plates have passed the tests specified in AS/NZS 1554.6.

Materials

Manufacturer's data: Submit manufacturer's published product data including standard drawings and details.

Stainless steel: For each batch of stainless steel supplied to the works, submit the certificate of compliance or test certificate specified in the applicable standard.

1.5 STANDARDS

General

Access for maintenance: To AS 1657.

Tactile indicators: To AS/NZS 1428.4.1.

2 PRODUCTS

2.1 MATERIALS AND COMPONENTS

Metals and components

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

3 EXECUTION

3.1 CONSTRUCTION GENERALLY

Aluminium structures

Standard: To AS/NZS 1664.1 or AS/NZS 1664.2.

Metals

Performance: Provide metals so that they transmit the loads imposed and ensure the rigidity of the assembly without causing deflection or distortion of finished surfaces.

Incompatible metals: Separate using concealed layers of suitable materials in appropriate thicknesses.

Fasteners

Performance: Provide non-galvanic corrosion fasteners.

Materials: Provide fasteners in materials of mechanical strength and corrosion resistance at least equal to that of the lowest resistant metal joined.

To copper and copper alloys: Provide copper or copper-alloy fixing devices only.

To aluminium and aluminium alloys: Provide aluminium alloy or non-magnetic stainless steel fixing devices only.

To stainless steel: Provide appropriate stainless steel materials only.

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 visibly deforming the cross section.

Colour finished work: Match colours of sheets, extrusions and heads of fasteners.

Thermal movement: Accommodate thermal movement in joints and fastenings.

Fabrication tolerances

Structural work generally: ± 2 mm from design dimensions.

Joints

General: Fit joints to an accuracy appropriate to the class of work. Finish visible joints made by 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.

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.

Splicing

General: Provide structural members in single lengths.

3.2 WELDING AND BRAZING

General

Quality: Provide finished welds which are free of surface and internal cracks, slag inclusion, 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 1665 Appendix A.

Brazing

General: Ensure brazed joints have sufficient lap to provide a mechanically sound joint. Do not used butt joints relying on the filler metal fillet only.

3.3 METAL FIXTURES

General

General: Provide metal fixtures noted on drawings as follows:

- Components and their location, indicative construction details, scribes and trims, materials, dimensions and thicknesses, and finishes shall be as detailed.
- Confirm on site all dimensions noted on drawings.
- Finishes selections as documented.
- Hardware and equipment.

3.4 COMPLETION

Maintenance manual

General: Submit manufacturer's published recommendations for service use.

Cleaning

Temporary coatings: On or before completion of the works, or before joining up to other surfaces, remove all traces of temporary coatings used as a means of protection.

4 SELECTIONS

Refer to the drawings and Finishes Schedule for details of metal work fixtures.

Refer to the Schedule for the Steel security grilles.

0581B SIGNS AND DISPLAY

1 GENERAL

1.1 RESPONSIBILITIES

General

General: Provide signage systems as documented and as follows:

- Appropriately secured.
- Located within a clear line of vision.
- To contrast with the background.
- With clean, well defined edges or arises, and free from blemishes.

1.2 CROSS REFERENCES

General

Requirement: Conform to the following worksection(s):

- *General requirements.*

1.3 STANDARDS

Signs

Safety signs - design and use: To AS 1319.

Signs and graphics for disabled access: AS/NZS 1428.1 and AS 1428.2.

2 PRODUCTS

2.1 MATERIALS

Materials standards

Aluminium:

- Plate for engraving: Alloy and temper designation 6063-0.
- For casting: To AS 1874.

Stainless steel: Surface finish designation 4 (general purpose polished).

Plastics:

- PVC-U sheet: Semi-rigid sheet.
- Rigid cellular polystyrene: To AS 1366.3, class VH for cut-out shapes.

3 EXECUTION

3.1 WORKMANSHIP

Production

General: Form graphics items accurately with clean, well defined edges or arises, free from blemishes.

Engraving to two layer plastic laminate: Lettering excavated to expose the lower laminate.

Engraved and filled: Lettering precision excavated 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: 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 experience.

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.

Installation

General: Install signage level and plumb, securely mounted, with concealed theft-resistant fixings. Fix self adhesive signs free of bubbles and creases.

4 SELECTIONS

4.1 GENERAL SIGNS

Sign schedule

Refer to signs listed on elevations. Four signs in total. See below.

4.2 STATUTORY SIGNS

Termite protection

Position	In or near meter box or similar
Message	Indicate: The method of protection The date of installation The life expectancy of a chemical barrier as listed on the National Registration Authority label The installer's recommendation for inspections
Sign type	Laminated page(s)
Compliance	BCA 3.1.3.2(b), BCA B1.4(i)(ii) AS 3660.1 Appendix A

Unisex accessible sanitary facilities

Position	To BCA Spec D3.6
Message	-Braille and tactile signage incorporating the international symbol of access. -Indicate suitability for left or right handed use.
Symbol size	AS 1428.2 clause 16, Table 1.
Letter height (minimum)	Braille: BCA Spec D3.6 Raised characters: Helvetica type font 20 mm.
Sign type	3mm stainless steel plate, engraved with lettering as noted, in filled with black paint.
Compliance	AS/NZS 1428.1 BCA D3.6

Ambulant sanitary facilities

Position	To BCA Spec D3.6
Message	Braille and tactile signage incorporating the male/ female ambulant symbol.

Symbol size	AS 1428.2 clause 16, Table 1.
Letter height (minimum)	Braille: BCA Spec D3.6 Raised characters: Helvetica type font 20 mm.
Sign type	3mm stainless steel plate, engraved with lettering as noted, in filled with black paint.
Compliance	AS/NZS 1428.1 BCA D3.6

Main switchboard - room or enclosure, excluding Class 1 dwellings

Position	The room or enclosure containing the main switchboard.
Message	MAIN SWITCHBOARD
Letter height (minimum)	20mm
Sign type	3mm stainless steel plate, engraved with lettering as noted, in filled with black paint.
Compliance	AS/NZS 3000 clause 2.9.2.4

0621 WATERPROOFING – WET AREAS

1 GENERAL

1.1 RESPONSIBILITIES

General

Requirement: Provide wet area waterproofing systems as documented which:

- Are graded to floor wastes to dispose of water without ponding.
- Prevent moisture entering the substrate or adjacent areas.

1.2 CROSS REFERENCES

General

Requirement: This work section shall be read in conjunction with Section 0171 *General requirements*, other related sections of this Specification and the Preliminaries.
The *General requirements* worksection contains umbrella requirements for all building and services worksections.

1.3 STANDARDS

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:

- Substrates: The surface to which a material or product is applied.
- Bond breaker: A system preventing a membrane bonding to the substrate, bedding or lining.
- 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 cured to form a seamless film.
  - . Applied in sheet form with joints lapped and sealed.
- Preformed shower base: A preformed, prefinished vessel (including integral upstands) installed as the finished floor of a shower compartment, and provided with a connection point to a sanitary drainage system.
- Shower tray: An internal or external liquid or sheet membrane system used to waterproof the floor and the wall/floor junctions of a shower area.
- Waterproof (WP): The property of a material that does not allow moisture to penetrate through it.
- Waterproofing systems: Combinations of membranes, flashings, drainage and accessories which form waterproof barriers and which may be:
  - . Loose-laid.
  - . Bonded to substrates.
- Water resistant (WR): The property of a material that restricts moisture movement and will not degrade under conditions of moisture.
- Wet area: An area within a building supplied with a floor waste.

1.5 INSPECTION

Notice

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

- Substrate preparation completed.
- Secondary layers preparation completed.
- Before membranes are covered up or concealed.

1.6 SUBMISSIONS

Execution records

Placing records: Photographically record the application of membranes and information as follows:

- Date.
- Portion of work.
- Substrate preparation.
- Protection provided from traffic.

Products documentation

General: Submit copies of product manufacturers:

- Product technical data sheets.
- Material safety data sheets (MSDS).
- Type tests certificates verifying conformance to AS/NZS 4858.

Samples

General: Submit 300 x 300 mm samples of each type of membrane.

Shop drawings

Submit shop drawings showing:

- Junctions with vertical surfaces and upstands.
- Junctions at perimeters.
- Drainage details.
- Control joints.
- Flashings.
- Penetrations.
- Corners.
- Terminations and connections.

2 PRODUCTS

2.1 PRODUCTS

Membranes

Standard: To AS/NZS 4858.

Membrane systems

Requirement: Provide a proprietary membrane systems certified as suitable for the intended wet area waterproofing.

Certificate: Refer to contract

Shower tray

General: Purpose-made jointless shower tray, with wall upstands at least 50 mm higher than the hob upstands. Set hob masonry on the inside of the tray upstands.

Water stop angles

Material: Rigid, corrosion resistant angles compatible with the waterproof membrane system.

Bond breakers

Requirement: Compatible with the flexibility 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 host materials.

Adhesives

Requirement: Waterproof and compatible with host materials.

3 EXECUTION

3.1 PREPARATION

Substrates

General: Make sure substrates are as follows:

- Clean and free of 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, support members are in full lengths without splicing.
- If floors are solid or continuous:
  - Excessive projections are removed.
  - Voids and hollows greater than 10 mm with abrupt edges are filled with a cement:sand mix not stronger than the substrate nor weaker than the bedding.
  - Depressions less than 10 mm are filled with a latex modified cementitious product with feathering eliminated by scabbling the edges.
  - Cracks in substrates wider than 1.5 mm are filled with a filler compatible with the membrane system.

External corners: Round or arris edges.

Moisture content

Concrete substrates: Cure for at least 21 days.

Moisture content: Verify that the moisture content of the substrate is compatible with the water vapour transmission rate of the membrane system by testing to AS 1884 Appendix A.

Test type:

- Hygrometer test: Seal a hygrometer to the substrate for at least 16 hours and measure the relative humidity of the air between the instrument and the slab.
- Electrical resistance test: Connect a resistance meter to the slab and read the moisture content.

Falls

Substrate: If the membrane is directly under the floor finish, make sure the fall in the substrate conforms to the fall nominated for the finish.

Sheet substrate fastening

Requirement: Fasten or adequately fix to the supporting structure.

Control joints

Finishes: Align control joints in finishes and bedding with control joints or changes in materials in the substrate.

Water stop angles

Requirement: Provide water stop angles at door thresholds and shower enclosures to support the waterproof membrane at junctions between waterproofed and non-waterproofed areas.

Sizing: Size the vertical leg of the water stop angle to conform to the requirements of AS 3740.

Corners: Cut the horizontal leg and bend the vertical leg at corners instead of forming vertical joints between separate lengths of angle.

Fixing: Fix water stop angles to the substrate with compatible sealant or adhesive and corrosion-resistant countersunk or wafer head screws.

Priming

General: If required by the membrane manufacturer, prime the substrates with a primer compatible with the membrane system.

Bond breakers

Requirement: After the priming of surfaces, provide bond breakers at all wall/floor, hob/wall junctions and at control joints where the membrane is bonded to the substrate.

Sealant fillet bond breakers:

- Application: Form a triangular fillet or cove of sealant to internal corners within the period recommended by the membrane manufacturer after the application of the primer.
- Widths: 5 mm x 5 mm to vertical corners. 6 mm x 6 mm – 9 mm x 9 mm to horizontal corners.

Backing rod bond breakers: Retain in position with continuous length of tape pressed firmly in place against the surfaces on each side of the rod.

3.2 APPLICATION

Protection

General: Protect membrane from damage during installation and for the period after installation until the membrane achieves its service characteristics that resist damage.

Extent of waterproofing

Waterproof or water resistant surfaces: To the requirements of BCA F1.7.

Sheet membrane joints

Bituminous sheet membranes:

- Side laps at least 75 mm.
- End laps at least 100 mm.

Synthetic rubber membranes:

- Factory-vulcanized laps at least 40 mm.
- Field side laps at least 50 mm for side laps.
- Field end-laps at least 100 mm for end laps.

PVC membranes:

- Factory welded laps at least 30 mm.
- Field–welded laps at least 75 mm.

Vertical membrane terminations

Upstands: At least 150 mm above the finished tile level of the floor or 25 mm above the maximum retained water level, whichever is the greater.

Anchoring: Secure sheet membranes along the top edge.

Edge protection: Protect edges of the membrane.

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 water stop angles.

Vertical flashings: Provide vertical corner flashings continuous across wall/wall junctions to at least 1800 mm above finished floor level.

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 imbed it in the first flashing coat of membrane with one half of the tape on each side of the corner or joint. Apply a second coat of liquid membrane to seal the fabric.

Door jambs and architraves

Requirement: If the bottom of doorjambs and architraves do not finish above the floor tiling, waterproof their surfaces below tile level to provide a continuous seal between the perimeter flashing to the wall/floor junction and the water stop angle.

Drainage connections

Floor wastes: Provide floor wastes of sufficient height to accommodate the thickness of floor finishes and bedding at the outlet position. Position drainage flange to drain at membrane level. Turn

membrane down 50 mm minimum into the floor waste drainage 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 drainage flanges: Provide a continuous waterproof connection between the membrane and the channel.

Preformed drainage channels without drainage flanges: Provide continuous waterproofing under the channel and terminate the membrane at a floor waste with a recessed drainage flange.

Enclosed showers with hobs

General: Construct from masonry, concrete or corrosion-resistant metal. Fix securely to the floor, seal against walls and make flush all gaps, joints and intersections before applying the membrane.

Autoclaved aerated concrete hobs: Do not use for external membrane systems. Prime before applying the membrane.

Internal membranes: Extend membrane over the hob and into the room at least 50 mm.

External membranes (hob located inside membrane tray): Dress membrane up outside of hob and finish at the underside of tiles capping the top of the hob.

Enclosed showers with step-downs

Levels: Conform to AS 3740 Figure 3.5 and as follows:

- Finish the highest level of the shower area at a level at least 15 mm below the finished floor level outside the shower.
- Extend the membrane at least 10 mm above the maximum retained water level in the area outside the shower or 150 mm above the finished floor level of the shower area, whichever is the greater.

With 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 water stop angle fixed securely to the upper level substrate.

With frameless shower screens: Install the shower screen with the inside face flush with the step-down. Terminate the membrane outside the shower screen at least 1500 mm from the shower rose outlet on the wall. Support and adhere the membrane to a water stop angle fixed securely to the substrate. Finish membrane flush with the underside of tiles.

Enclosed hobless showers with framed shower screens

Requirement: Conform to AS 3740 Figure 3.6 and as follows:

- Turn the membrane up against a water stop angle fixed securely to the substrate directly below the shower screen sill.
- Size the angle so that the vertical leg finishes at least 5 mm above the level of the tiles.

Support and adhere the membrane to the angle and finish it flush with the top of the vertical leg.

Enclosed hobless showers with trench drain located below screen

With framed or frameless shower screens: Install a water stop angle where the outer edge of the trench drain to the perimeter of the shower will be installed. Size the angle so that the vertical leg finishes at the underside of the tiles. Support and adhere the membrane over the water stop angle and terminate the membrane at floor wastes as described in **Drainage connections**. Install the trench drain with the shower screen located vertically above it.

Unenclosed showers

Requirement: Extend membrane at least 1500 mm into the room from the shower rose outlet on the wall.

Preformed shower bases

Support: Fully support shower bases without causing distortion or cracking.

Junction with walls for bases with integral perimeter upstands: Conform to AS 3740 Figure 3.1 and as follows:

- Recess shower base into walls or batten off wall lining sufficiently to allow water-resistant wall finishes to overlap the integral upstands along the top edge of the shower base.
- Maintain the structural integrity of walls that are rebated.

Baths and spas

Junction of walls with baths: Conform to AS 3740 Figure 3.2 and as follows:

- Baths with integral upstands: Recess bath edges into walls or batten off wall lining sufficiently to allow water-resistant wall finishes to overlap the bath's integral perimeter upstands. Maintain the structural integrity of walls that are rebated.
- Baths without integral upstands or with showers over – rendered masonry walls: Form or chase a rebate in the render to receive the bath edge. 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.
- Baths without integral upstands or with showers over – framed and lined walls: Form a rebate in the wall lining with a corrosion-resistant lipped channel to receive the bath edge. 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.

Plinth-mounted insert baths and spas: Conform to AS 3740 Figure 3.2 and as follows:

- Line framed enclosures for insert baths.
- Form an upstand on the inside edge of the enclosure opening to receive the bath with an angle or compressible foam rod.
- Waterproof walls abutting the enclosure, the top of the plinth and the interior and exterior of the enclosure.
- After tiling the walls, outside of the enclosure and plinth top, install the bath with its downturn edge lip outside the upstand formed on the edge of the opening and seal the lip to the tiles.

Taps and spouts

Requirement: Waterproof penetrations for taps and spouts with proprietary flange systems or a sealant.

Provision for servicing: Install taps in a manner that allows tap washers or ceramic discs to be serviced without damaging the waterproofing seal.

Recessed soap holders

Construction: 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.

Membrane horizontal penetrations

Sleeves: Provide a flexible flange for all penetrations, bonded to the penetration and to the membrane.

Membrane vertical penetrations

Pipes, ducts, and vents: Provide separate sleeves for all pipes, ducts, and vents and have fixed to the substrate.

Curing of liquid applied systems

General: To the manufacturers 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 systems: If the topping or bedding mortar is required 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 FLOOD TEST

General

Application: Perform a flood test before the installation of surface finishes.

Moisture measurement method: Conform to AS/NZS 2455.1 Appendix B.

Set-up:

- Measure the wall/floor junction of adjacent spaces and the floor soffit below for dryness.
- Record the result for each area.
- Dam the doorway(s) and seal floor wastes and drainage outlets to allow 50 mm water level.
- Fill space with clean water and leave overnight.

Evaluation:

- Make a visual inspection of the wall/floor junction of adjacent spaces and of the floor soffit below for obvious water or moisture.

- Test the same areas for dryness and compare the results to the measurements taken before flooding.

Compliance:

- Evidence of water from the visual test: Failure.
- No visual evidence of water: Proceed with moisture measurements.
- Test results indicating an increase in moisture before and after flooding: Failure.

Records:

- Submit records of all flood tests.

3.4 COMPLETION

Protection

General: Keep traffic off membrane surfaces until bonding has set or for 24 hours after laying, 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.

Warranty

Waterproofing: 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

Contractor to submit waterproof membrane system for approval by Lend Lease.

0631B CERAMIC TILING

1 GENERAL

1.1 RESPONSIBILITIES

General

General: Provide tiling systems to walls, floors and other substrates as documented and as follows:

- 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.
- To 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 worksection(s):

- *General requirements.*

1.3 STANDARDS

Tiling

General: Comply with the recommendations of those parts of AS 3958.1 which are referenced in this worksection.

Slip resistance

Classification: To AS/NZS 4586 for the classifications noted in **SELECTIONS**.

Slip resistance measurement of existing installations: To AS/NZS 4663.

1.4 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.

1.5 TOLERANCES

Completed tiling

Standard: To AS 3958.1 clause 5.4.6.

1.6 SUBMISSIONS

Samples

General: Submit labelled samples of tiles, including fittings, accessories, grout and sealants, illustrating the range of variation in colour and finish.

Tests

Type tests: Submit results, as follows:

- Type test slip resistance of tiles to AS/NZS 4586.

Site tests: Submit results, as follows:

- Site slip resistance test of completed surface to AS/NZS 4663.

2 PRODUCTS

2.1 MARKING

Identification

General: Deliver materials to the site in the manufacturer's original sealed containers legibly marked to show the following:

- Manufacturer's identification.
- Product brand name.
- Product type.
- Dimensions and quantity.
- Product reference code and batch number.
- Date of manufacture.
- Material composition and characteristics such as volatility, flash point, light fastness, colour and pattern.
- Handling and installation instructions.

2.2 TILES AND ACCESSORIES

Tiles

Standard: To AS 4662.

Tactile ground surface indicators: To AS/NZS 1428.4.1.

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 to the **Accessories schedule** which match the composition, colour and finish of the surrounding tiles.

Accessories schedule

Location			
Type			
Size (mm)			
Colour			

2.3 ADHESIVES

General

Standard: To AS 2358 and AS 4992.1.

Type

General: Provide adhesives to the **Wall tiling schedule** and to the and compatible with the materials and surfaces to be adhered.

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 ≤ 1%.

- Off-white cement: Iron salts content ≤ 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

N/A- concrete slab laid to falls so no bedding.

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.

Terra cotta tiles: Use proprietary polymer modified grout.

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

- For joints < 3 mm: 1 cement: 2 sand (by volume).
- For joints ≥ 3 mm: 1 cement: 3 sand (by volume).

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 expansion joint consisting of a neoprene filler sandwiched between plates with lugs or ribs for mechanical keying. Set flush with the finished surface.

Proprietary slide plate divider strip: An arrangement of interlocking metal plates grouted into pockets formed in the concrete joint edges.

Sealant: One-part self-levelling non-hardening mould resistant, silicone or polyurethane sealant applied over a backing rod. Finish flush with the finished surface.

- Floors: Trafficable, shore hardness > 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 on swimming pool shell: A further 28 days minimum.

3.2 PREPARATION

Standard

Preparation: To AS 3958.1 Section 4.

Ambient temperature

General: If the ambient temperature is < 5 or > 35°C, do not lay tiles.

Substrates without wet area membranes

General: Ensure 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:
  - Excessive projections are removed.
  - Voids and hollows > 10 mm with abrupt edges are filled with a cement:sand mix not stronger than the substrate or weaker than the bedding.
  - Depressions < 10 mm are filled with a latex modified cementitious product with feathering eliminated 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.

3.3 TILING GENERALLY

Sequence

General: Fix wall tiles before floor tiles.

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.

3.4 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 ensure that fixtures interrupting the tile surfaces are accurately positioned in their designed or optimum locations relative to the tile layout.

3.5 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.

Terra cotta 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 when tested with a 3 m straight edge. Cover the entire tile back with adhesive when the tile is bedded.

Thickness: 1.5 – 3 mm.

Thick adhesive beds

General: Provide on substrates with deviations up to 6 mm when tested with a 3 m straight edge, 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 wall and floors: > 90%.
- Wet areas and bench tops: 100%.

Pattern of distribution of adhesive: As described in 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 prior to 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 provide 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.

3.6 CONTROL OF MOVEMENT

General

General: Provide control joints carried through the tile and the bedding to AS 3958.1 clause 5.4.5, the **Control joints schedule** 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 – 25 mm.
- Depth of elastomeric sealant: One half the joint width, or 6 mm, whichever is the greater.

3.7 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 surface with a clean cloth.

Edges of tiles: Grout exposed edge joints.

Epoxy grouted joints: Ensure that tile edge surfaces are free of extraneous matter such as cement films or wax, before 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 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.

3.8 COMPLETION

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.

Cleaning

General: Clean tiled surfaces using an appropriate tile cleaning agent, and polish.

Operation and maintenance manuals

General: Submit a manual describing care and maintenance of the tiling, including procedures for maintaining the slip-resistance grading stating the expected life of the slip-resistance grade.

4 SELECTIONS

4.1 SCHEDULES

Refer to Finishes Schedule in appendix.

0671B PAINTING

1 GENERAL

1.1 RESPONSIBILITIES

General

General: Provide coating systems to new or previously painted substrates as follows:

- With sound adhesion and durability.
- Consistent in colour, gloss level, texture and dry film thickness.
- Free of runs, sags, blisters, or other discontinuities.
- Paint systems fully opaque.
- Clear finishes at the level of transparency consistent with the product.
- Fully adhered.
- Resistant to environmental degradation within the manufacturer's stated life span.

Selections: Conform to the **SELECTIONS**.

1.2 CROSS REFERENCES

General

Requirement: Conform to the following worksection(s):

- *General requirements.*
- *Finishes Schedule*

1.3 STANDARDS

Painting

General: Comply with the recommendations of those parts of AS/NZS 2311 which are referenced in this worksection.

1.4 SUBMISSIONS

Clear finish coated samples

General: Submit pieces of timber or timber veneer matching the timber to be used in the works, prepared, puttied, stained, sealed and coated in conformance with the specified system, of sufficient size so that, each piece can be cut into 4 segments, marked for identification, and distributed as directed.

Opaque coated samples

General: Submit, on representative substrates, samples of each coating system showing surface preparation, colour, gloss level, texture, and physical properties; to the **Coated samples schedule**.

Coated samples schedule

Substrate	Paint system	Colour	Sample size

Paint

General: Submit the selected manufacturer's details at least 3 weeks before the paint is required, as follows:

- Paint brand name and paint line quality statement.
- Material safety data sheets (MSDS) showing the health and safety precautions to be taken during application.
- The published recommendations for maintenance.

2 PRODUCTS

2.1 PAINTS

Paint brand

Quality: If the product is offered in a number of levels of quality, provide premium quality lines.

Combinations

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

Clear timber finish systems: Provide only the combinations of putty, stain and sealer recommended by the manufacturer of the top coats.

Delivery

General: Deliver paints to the site in the manufacturer's labelled and unopened containers.

Putty and fillers

Material: To the recommendation of the paint system manufacturer, as suitable for the substrate and compatible with the primer.

Tinting

General: Provide only products which are colour tinted by the manufacturer or supplier.

Toxic ingredients

General: Comply with the requirements of Appendix I Uniform Paint Standard to the Standard for the Uniform Scheduling of Medicines and Poisons (SUSMP).

3 EXECUTION

3.1 PREPARATION

Order of work

Other trades: Before painting, complete the work of other trades as far as practicable within the area to be painted, except for 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 against dust entry. Use drop sheets and masking to protect finished surfaces or other surfaces at risk of damage during painting.

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

Adjacent surfaces: Protect adjacent finished surfaces liable to damage from painting operations.

Wet paint warning

General: Place notices conspicuously and do not remove them until paint is dry.

Repair

General: Clean off marks, paint spots and stains progressively and restore damaged surfaces to their original condition. Touch up new damaged decorative paintwork or misses only with the paint batch used in the original application.

Substrates

General: Prepare substrates to receive the painting systems.

Cleaning: Clean down the substrate surface. Do not cause undue damage to the substrate or damage to, or contamination of, 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, by methods which may involve 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 (last abrasive no coarser than 220 grit) to show no scratches across the grain.

Unpainted surfaces
Standard: To AS/NZS 2311 Section 3.

3.2 PAINTING

Light levels
General: ≥ 400 lux.

Drying
General: 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
Standard: To AS/NZS 2311 Section 6.

Timing: Apply the first coat immediately after substrate preparation and before contamination of the substrate can occur. Apply subsequent coats after the manufacturer's recommended drying period has elapsed.

Painting conditions
General: Do not paint in dusty conditions, or otherwise unsuitable weather as follows unless the paint is suitable and recommended for such conditions:

- Relative humidity: ≥ 85%.
- Surface temperature ≤ 10 °C or ≥ 35 °C.

Priming before fixing
General: Apply one coat of wood primer (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 does the following:

- Satisfactorily atomises the paint being applied.
- Does not require the 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 masking, ventilating and screening facilities generally to the standards set out for spray painting booths, AS/NZS 4114.1 and AS/NZS 4114.2.

Sanding
Clear finishes: Sand the sealer using the finest possible abrasive (no coarser than 320 grit) and avoid cutting through the colour. Take special care with round surfaces and edges.

Repair of galvanizing
General: For galvanized surfaces which have been subsequently welded, prime the affected area.

Primer: Organic zinc rich coating for the protection of steel to AS/NZS 3750.9 Type 2.

Tinting
General: Tint each coat of an opaque coating system so that each has a noticeably different tint from the preceding coat, except for top coats in systems with more than one top coat.

Services
General: If not embedded, paint new services and equipment including in plant rooms, except chromium, anodised aluminium, GRP, UPVC, stainless steel, non-metallic flexible materials and normally lubricated machined surfaces. Repaint proprietary items only if damaged.

Windows
Operation: Ensure that opening windows function correctly before and after painting.

Door leafs
Drying: Leave doors fixed open to allow drying. Do not allow door hardware, accessories or the like to damage the door finish during the drying process.

4 SELECTIONS

4.1 PAINTING SYSTEMS

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

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

Specialised painting systems
Standard: To AS/NZS 2311 clause 5.2 for the following final coats:

- High build textured or membrane finishes (B38 to AS/NZS 2311).
- 2 pack gloss pigmented polyurethane (B44 to AS/NZS 2311).
- 2 pack epoxy (B29 to AS/NZS 2311).
- 2 pack water based epoxy (B29A to AS/NZS 2311).

4.2 PAINTING SCHEDULES

General
Number of coats: Unless specified as one or two coat systems, each paint system consists of at least 3 coats.
Final coat selection: To the **Finishes schedule**.

4.3 ANTI GRAFFITI COATINGS

Deleted

DOOR SCHEDULE:

	door frame:
	type:
AL	Aluminium frame – apart of glazing
SD	Sliding door frame- custom detail Cavity Slider Ultimate HeavyDuty ceiling mount door frame & track
FD	Fire door frame -/120/120
EX	Existing door
SF	Steel frame
RS	Roller Shutter door frame and track Airport Doors Roller Shutters Series 75 steel powdercoated colour white
SR	Single rebate
DR	Double rebate
NR	No rebate
	finish:
AA	Anodised aluminium
OP	Opaque paint finish full gloss
EX	Existing finish to remain
PC	Powdercoated finish
	note:
OUT	outside of a door is:
	- exterior door on entrance side face
	- room door on corridor face
	- cupboard door on room face
	- joining door - side hinges not seen

	door leaf:
	type:
ALG	Aluminium framed and glazed
FD	Fire door rated to match wall rating
SC-1	Solid core- 40mm thick clad with zinc sheet
SC-2	Solid core- 40mm thick
H C	Hollow core door- 35mm thick
OPW	Operable Wall
CS	Cavity Sliding door
RM	Roller shutter metal door panel
	finish:
AA	Anodised aluminium
OP	Opaque paint finish full gloss
EX	Existing finish to remain
	glazing / grille:
DG	Door grille
FG	Full glazed
HG	Half glazed
VP	Vision panel
VPF	Vision panel with fire rating to door
	protection:
FKP	Facing and kick plates
FP	Facing plate - 450 mm deep
KP	Kick plates

	hardware:
	lock / latch:
CL	Mortice Lock to match existing
ED	Exit door dead lock (always free egress)
EC	Electronic control
ES	Electronic strike-
RC	Roller Catch
MLAK	Accessible Lock
EX	Existing lock made good
IB	Indicator bolt
MNL	Mortice night lock
PA	Passage latch (free both ways)
PB	Panic bolt with external key activation
PD	Part of door system
CA	Door cache
PP	Patch panel lock for frame-less glazing
PR	Privacy latch (key op. from outside)
RB	Roller bolt
SE	Storeroom escape lock
SL	Storeroom dead lock
VL	Vestibule entry dead lock
PL	Pad lock
	closer:
DA	Delayed action
EM	Electromagnetic hold open
EX	Existing closer make good
FB	Floor box concealed closer
FR	Closer for fire rated door
HO	Hold open
OH	Overhead closer concealed
OS	Overhead stay

	hardware:
	hinges:
BB	Broad butt x 4min per door
EX	Existing repair and make good
HPH	Heavy duty parliament hinge
PH	Pivot hinge
WT	Wide throw hinge
RB	Recessed butt
PF	Patch fitting style hinges
SD	Sliding door system
LO	Lift Off Hinges
	handles:
EH	Entrance handle –fixed
LS	Lever Set
FH	Fixed handle to match lever
PH	Pull handle engraved
PP	Push plate engraved
	other:
AS	Acoustic seals
AF	Applied Film
BA	Barrel bolts top and bottom
DS	Door stop
DV	Door viewer
FF	Floor ferrule
LS	Light seals
SS	Smoke seals
TP	Toilet partition accessories
SG	Door Sign
	keying:
EC	Electronic controls
EX	Existing keying cylinder
GM:	Grand master control

PA	Parallel arm door fixed	MLAK	Accessible Key
PA-H	Parallel arm heavy duty	MK	Related to user type
PD	Part of door system	KC	Key cylinder combination as advised
SA	Standard arm door fixed	KD	Keyed to differ

no.	*location*	*door frame*		*door leaf*		*hardware*											*notes*
		type	*finish*	*width*	*height*	*type*	*finish*	*glazing grille*	*protection in*	*protection out*	*lock latch*	*closer*	*hinge*	*handles In*	*handles out*	*Other*	*keying*
DOORS- AMENITY BUILDING																	
D01	FEMALE SHOWERS & CHANGE 1	SFSR	OP	920	2055	SC-1	OP	-	-	-	SL	-	-	EH	-		MK
D02	SERVICE DUCT	SFSR	OP	820	2055	SC-1	OP	-	-	-	SL	-	-	EH	-		MK
D03	MALE SHOWERS & CHANGE 2	SFSR	OP	920	2055	SC-1	OP	-	-	-	SL	-	-	EH	-		MK
D04	MALE SHOWERS & CHANGE 1_ ACCESSIBLE TOILET	SFSR	OP	920	2055	SC-1	OP	-	-	-	MLAK/ PR	PA	LO	PP	PH	DS	MLAK
D05	MALE SHOWERS & CHANGE 2	SFSR	OP	920	2055	SC-1	OP	-	-	-	SL	-	-	EH	-		MK
D06				920	2055												
D07	FEMALE SHOWERS & CHANGE 1	SFSR	OP	920	2055	SC-1	OP	-	-	-	SL	-	-	EH	-		MK
D08	FEMALE SHOWERS & CHANGE 1_ ACCESSIBLE TOILET	SFSR	OP	920	2055	SC-1	OP	-	-	-	MLAK/ PR	PA	LO	PP	PH	DS	MLAK
D09	STORAGE	SFSR	OP	855/8 55	2055	SC-1	OP	-	-	-	SL	-	-	EH	-	BA	MK
D10	UTILITIES	SFSR	OP	920	2055	SC-1	OP	-	-	-	SL	-	-	EH	-		MK
D11	STORAGE	SFSR	OP	855/8 55	2055	SC-1	OP	-	-	-	SL	-	WT	EH	-	BA	MK
D12	KIOSK	SFSR	OP	920	2055	SC-1	OP	-	-	-	SL	-	-	EH	-		MK
D13	KIOSK (STORE)	SFSR	OP	920	2055	SC-1	OP	-	-	-	SL	-	-	EH	-		MK
D14	MEETING ROOM	SFSR	OP	920	2055	SC-1	OP	-	-	-	SL	-	-	EH	-		MK
D15	MALE TOILETS	SFSR	OP	920	2055	SC-1	OP	-	-	-	SL	-	-	EH	-		MK
D16	ACC. WC	SFSR	OP	920	2055	SC-1	OP	-	-	-	MLAK/ PR	PA	LO	PP	PH	DS	MLAK
D17	SERVICE DUCT	SFSR	OP	820	2055	SC-1	OP	-	-	-	SL	-	-	EH	-	B	MK
D18	FEMAL TOILETS	SFSR	OP	920	2055	SC-1	OP	-	-	-	SL	-	-	EH	-		MK
D19	REFEREE 1	SFSR	OP	920	2055	SC-1	OP	-	-	-	SL	-	-	EH	-		MK

D20	REFEREE 2	SFSR	OP	920	2055	SC-1	OP	-	-	-	SL	-	-	EH	-		MK	
D21	FEMALE SHOWERS & CHANGE 1	SD	OP	2210	2055	SC-2	OP	-	-	-	SL	-	-	PH	-	BA	MK	Sliding door Cavity Slider
D22	MALE SHOWERS & CHANGE 1	SD	OP	2210	2055	SC-2	OP	-	-	-	SL	-	-	PH	-	BA	MK	Sliding door Cavity Slider
D23	KIOSK	RS	PC	3610	1830 (opening)	RM	PC	-	-	-								Roller shutter door, track, bottom rail, and lock Hand operate
D24	KIOSK	RS	PC	4750	1830 (opening	RM	PC	-	-	-								Roller shutter door, track, bottom rail, and lock Hand operate

Note:

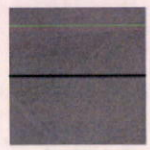
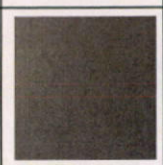
- **Contractor to provide Abloy Master key system to match with council 's requirement for all locks**
- **Contractor to provide ADI locks and shielding to all external doors to match with council's requirement**

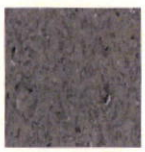
Finishes Schedule

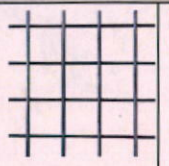
Control*

Issue	Description	Date	Check	Authorised
1	For Construction	22.06.2015	HS	HS

*Refer to individual sections for their current revision details. Additions are shown in red italics while deletions are shown in grey with a strikethrough. e.g. *Additions* ~~Deletions~~

CODE	AREA	SPECIFICATION	IMAGE	QTY	SUPPLIER	COMMENT
PAINT						
PT01	Exposed steel beams	Product: Natural Micaceous Iron Oxide Paint Colour: Carbon 220			Murobond	
PT02	CFC Soffit Linings (external)	Colour 'Lexicon' First coat: One Step acrylic primer Second coat: Weathershield Low Sheen Acrylic x 2 coats			Dulux	Soffit paint (external)
PT03	General internal door colour	Colour 'Lexicon' High Gloss aqua-enamel, 2 top coats over primer			Dulux	
~~**PT04**~~	~~Exposed steel columns, rafters, downpipes and gutters~~	~~Product: Natural Micaceous Iron Oxide Paint Colour: Geo 212~~			~~Murobond~~	NOT USED
PT05	Ceiling Colour to Kiosk/ Kiosk Store	Colour 'Vivid White' Semi gloss Acrylic finish			Dulux	
FLOOR FINISH						
CONC 01	Part wet area floors and main floors throughout	Reinforced Concrete slab laid to falls, with a non-slip finish.		As per drawings		
CERAMIC TILES						
CT01	All internal wet area walls as shown	Product: White Rectified Code: SG57-RGW3x6 Colour: White Finish: Gloss Size: 300 x 600mm Grout colour: colour white		As per drawings	Surface Gallery	Extent as shown on wall elevations
CT02	External walls	Product: Porcelain Tile - Basaltina Code: SG57-basaltina Colour: Basalt Black Finish: Matt Size: 300 x 600mm		As per drawings	Surface Gallery	Extent as shown on building elevations. Lay tile horizontally.

		Grout colour: Epoxy grout, colour dark grey				
CT03	Wet area floors	Product: Floor tile Code: Colour: 'Cement brushed' Finish: Size: 300 x 300mm		As per drawings	Classic Ceramics	Extent as shown on plans- R11 rating for slip resistance
FTI01- deleted	Kiosk- deleted	~~Floor Tile~~ ~~Class Ceramics~~ ~~Collections Lab_21 Mirage colour~~ ~~LB06 LAB Grey~~ ~~Size 600x600~~ ~~Coved skirting tile to match with floor tile in colour.~~		~~As per drawings~~	~~Classic Ceramics~~	~~Slip resistance R11~~
VS01	Kiosk vinyl flooring and integrated coved skirting	Product: Granit Safe.T Homogenous vinyl safety flooring Code: 3052699 Colour: Black Grey Finish: Size:		As per drawings	Tarkett	150mm coved skirting integrated with flooring
METAL CLADDING						
MC01- deleted	External walls- deleted	~~Product: VM Zinc Single Lock Standing Seam~~ ~~Colour: Quartz Zinc~~ ~~Finish: apply anti-graffiti coat after installation (supplier: Graffiti Wipeout)~~ ~~Size: varies~~		~~As per drawings~~	~~VM Zinc~~	~~Extent as shown on building elevations~~
MC02	Not used					
MC03- deleted	~~Doors D01, D03, D05, D08 & D09~~	~~Product: VM Zinc Flat Lock Panel – **vertical joint**~~ ~~Colour: Quartz Zinc~~ ~~Finish: apply anti-graffiti coat after installation (supplier: Graffiti Wipeout)~~		~~As per drawings~~	~~VM Zinc~~	~~Applied to external face and sides of solid core doors.~~ ~~375mm wide panels~~
MC04-	All external Doors- external face	Product: VM Zinc Flat Lock Panel – **horizontal joint** Colour: Quartz Zinc Finish: apply anti-graffiti coat after installation (supplier: Graffiti Wipeout)		As per drawings	VM Zinc	Applied to external face and sides of solid core doors. 300mm wide panels
MS01	Roof cladding	Product: Custom Orb **"Accent 21"** corrugated profile Colour: Monument		As per drawings	Bluescope Steel	Has to be the "Accent 21" product to suit the 3 degree pitch
WALL FINISHES						
BLK		Natural Grey Blockwork, with grey mortar, flush joints. Clean on completion as specified.		Refer to drawings	CSR or equal to	

CEILING TYPES						
CE01		Compressed Fibre Cement ceiling, paint finish with 6mm shadowline cornice' with paint finish **12mm thick for Kiosk and Kiosk store**		Refer to drawings	CSR or equal to	
SECURITY MESH						
MSH	High level mesh panels	Product: Standard Galvanised Weldmesh Size: 25 x 25mm aperture size Finish: Galvanised Code: WG311, 3.15mm dia wire		Refer to drawings	ARC Weldmesh	50x50 angle perimeter frame as per details, weld mesh to frame
BENCHTOPS						
SS	Kiosk Servery's	Stainless Steel 314 grade over 32mm thick plywood substrate		Refer to drawings		
ROLLER SHUTTERS						
RS	Kiosk Servery's	Airport Doors Roller door frame and tracks Powdercoated Steel Colour 'White'		Refer to drawings		
SECURITY GRILLES						
SG	Kiosk Servery's	Both roller shutters require steel security grilles across the external face of them. Bars to be no more than 100mm apart. Frames to have concealed bolts into block walls. Powdercoat finish- 'White'		Refer to drawings - 2 off		Allow 150mm between stainless bench and bottom rail to enable food to be passed through
WALL CLADDING						
WS01	Upper Level walls	12mm thick Vitrapanel prefinished cladding Colour: White		Refer to drawings		
DOWNPIPES/ CUSTOM GUTTERS						
DP1		Hot Dipped Galvanised steel, 150mm dia CHS downpipes to main buildings. Custom HDG gutter as drawn. Colour: Hot Dipped Galvanised		Refer to drawings		
DP2		Hot Dipped Galvanised steel, 100mm dia CHS downpipe to middle lower roof Colour: Hot Dipped Galvanised (sleeve downpipe in colorbond steel into the steel downpipe at high level) Gutter- Colorbond Quad gutter to match roof colour		Refer to drawings		

Note: Images are graphical representations only and may differ to final product. Refer to product specification for codes as well as physical samples where provided.

Approved _____ Date 22.06.2015

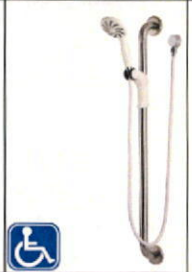
Sanitary Fixtures & Fittings Schedule

Control*

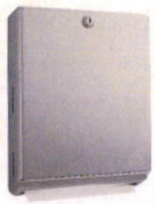
Issue	Description	Date	Check	Authorised
1	Issue for Construction	22.06.2015	HS	HS

*Refer to individual sections for their current revision details. Additions are shown in red italics while deletions are shown in grey with a strikethrough. e.g. *Additions* ~~Deletions~~

CODE	AREA	SPECIFICATION	IMAGE	QTY	SUPPLIER	COMMENT
FIXTURES						
TOILET SUITES						
WC1	**RM01** **RM02** **RM04** **RM05** **RM12** **RM14** **RM15** **RM16**	Wall Face Pan WCWF53 Cistern- Caroma Invisi II Smartflush Dual Flush- wall faced cistern with integrated flush pipe support		14	Stainless Metal Craft (Aust) Pty Ltd	No seat Provide wall mounted cistern to service corridor side
WC2	**RM017** **RM018** **RM019**	Wall Face disabled Pan WCWFD453 Stainless steel back rest WCBR1 Cistern- Caroma Invisi II Smartflush Dual Flush- wall faced cistern with integrated flush pipe support	 	3	Stainless Metal Craft (Aust) Pty Ltd	Provide: -toilet seat colour to comply with AS1428 requirement. -stainless steel backrest WCBR1 Provide wall mounted cistern to service corridor side
UR	**RM12** **Male Toilets**	Wall hung Urinal WH5 Cistern- Caroma Invisi II Smartflush Dual Flush- wall faced cistern with integrated flush pipe support Flushing system: ZIP Direct Injection system as noted on Hydraulic drawings		2	Stainless Metal Craft (Aust) Pty Ltd	Provide wall mounted cistern to service corridor side
BASINS						
BSN1	**RM01**	Security Hand Basin		19	Stainless Metal	

	RM02 **RM01** **RM02** **RM04** **RM05** **RM06** **RM08** **RM09** **RM12** **RM14** **RM15** **RM16**	SWB2			Craft (Aust) Pty Ltd	
BSN2	**RM017** **RM018** **RM019**	Hand Basin for the Disabled WB8		3	Stainless Metal Craft (Aust) Pty Ltd	
TAPWARE						
TAPWARE						
TP1	**RM01** **RM02** **RM04** **RM05** **RM06** **RM08** **RM09** **RM12** **RM14** **RM15** **RM16**	Caroma- Nordic basin mixer		19	Caroma	Chrome plated
TP2	**RM017** **RM018** **RM019**	Caroma- Nordic Care Single Lever Basin Mixer with Extended Handle		3	Caroma	Chrome plated
TP3	**RM018** **RM019**	Accessible shower set White hand held shower and hose with 900mm stainless steel grab rail		2	Enware	
TP4	**RM01** **RM02** **RM04** **RM05** **RM15** **RM16**	Shower set Enware Delabie Tonic Jet Vandal Resistant shower head Enware- Delabvie Tempostop shower valve recessed		10	Enware	

						
FLOOR WASTES						
FW	**RM01** **RM02** **RM04** **RM05** **RM06** **RM07** **RM08** **RM09** **RM12** **RM14** **RM15** **RM16** **M017** **RM018** **RM019**	CentrePoint - Lineaire		As shown on drawings	Quartz by ACO	
FITTINGS						
DISPENSERS						
TRH-1	**RM01** **RM02** **RM04** **RM05** **RM12** **RM14** **RM15** **RM16** **M017** **RM018** **RM019**	Toilet roll holder TRH4 Bobrick B-27313 Classic Seriers Surface-mounted three Roll toilet Tissue Dispenser		To each toilet suite	Bobrick or equal	
DS	**RM01** **RM02** **RM01** **RM02** **RM04** **RM05** **RM06** **RM08** **RM09** **RM12** **RM14** **RM15** **RM16** **M017** **RM018** **RM019**	Soap dispenser Bobrick 818615 Contural Series Surface mounted soap dispenser		To each hand basin	Bobrick or equal	

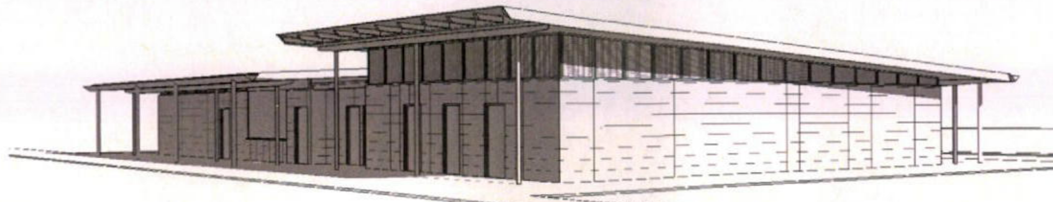
PTD	**RM01** **RM02** **RM01** **RM02** **RM04** **RM05** **RM06** **RM08** **RM09** **RM12** **RM14** **RM15** **RM16** **M017** **RM018** **RM019**	Paper towel dispenser Paper Towel dispenser Stainless steel surface mounted275 x 355 x 100mm		To each wet area	Bobrick or equal	
HAND DRYERS						
GRAB RAILS						
GR	**RM01** **RM04** **RM12** **RM14** **RM17** **RM18** **RM19**	Provide Bradley surface mounted grabrails to all Accessible toilets/shower spaces and ambulant facilities to meet the requirements of AS1428.1 – 2009. Grabrails to be 38mm dia with concealed fixings and cover roses all in grade 304 satin finished stainless steel.		Refer to the drawings	Bradley	Satin stainless steel- Refer to amenities plans and elevations for further details.
MISCELANEOUS						
BCT	**RM012** **RM014**	Surface Mounted Parallel Classic Baby Change Station Polyethylene Code: BCP-JDM		2	JD Macdonald	
SHF	**RM17** **RM18** **RM19**	Stainless steel shelf Bradley 9094		3	Bradley	
CRT	**RM18** **RM19**	Shower curtain track Bradley 953 corner shower curtain rails		2	Bradley	
FS	**RM18** **RM19**	Fold down shower seat Bradley 9562 surface mounted shower seat		2	Bradley	
STB	Accessible shower seat	Interlock Standard bench 600mm wide Length: as shown on the drawings Colour: Tasmanian Oak Solid Timber seats		As shown on the drawings	Interlock	

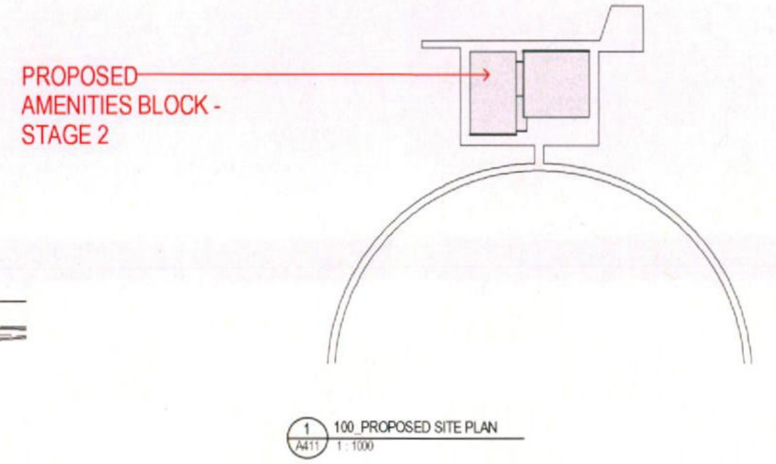
WPT 01	Wall wet area cubical for toilet and shower	Cubicle partition system Laminex Partitioning system FMOB- floor mounted overhead braced toilet and shower partitioning. Colour: General: Laminex Fossil Door: Laminex Baye 007 Natural finish		Refer to drawings	Laminex or equal	Ensure partition between showers and WCs goes to the floor to stop water ingress into WC

Note: Images are graphical representations only and may differ to final product. Refer to product specification for codes as well as physical samples where provided.

Approved Date 22.06.15

Architectural Drawings





WALL TYPES LEGEND

(WM) MASONRY CORE LAYER WALLS

WM2A (NOT USED)

EXTERNAL SIDE

90mm BLOCKWORK

THERMAL INSULATION	N/A
ACOUSTIC INSULATION	N/A
FIRE RESISTANCE LEVEL	
OTHER	*2700mm (FFL TO 2700mm) *=FROM 2700mm THEN SECURE MESH INFILL TO U/S ROOF WHERE INDICATED OR FULL HEIGHT (FFL TO U/S SLAB) ON THE SOUTHERN END OF BUILDING

WM3A

EXTERNAL SIDE

140mm REINFORCE BLOCKWORK AS PER STRUCTURAL ENG'S DETAILS

THERMAL INSULATION	N/A
ACOUSTIC INSULATION	N/A
FIRE RESISTANCE LEVEL	2HR
OTHER	*2700mm (FFL TO 2700mm) *=FROM 2700mm THEN WS01 TO U/S ROOF WHERE INDICATED

*TO U/S OF ROOF IN KIOSK AREA (SHOWN DASHED)

(WS) STUD WALLS

WS01

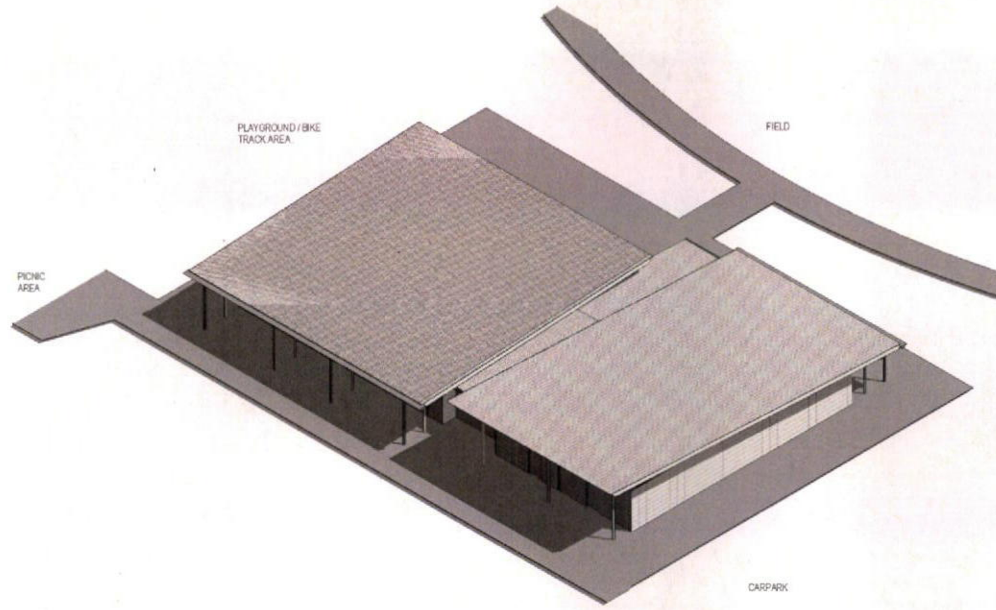
EXTERNAL SIDE

12mm COMPRESSED FIBRE CEMENT SHEET, VITRA PANEL AS SPECIFIED
VAPOUR BARRIER
70x45mm STUDS @ 600 CTS

THERMAL INSULATION	N/A
ACOUSTIC INSULATION	N/A
FIRE RESISTANCE LEVEL	N/A
OTHER	EXTENT 2600 ABOVE FFL TO U/S ROOF)

TAGS

	MATERIAL TAG
COL	COLUMN IDENTIFIER
	MULTI -TAG ABBREVIATION + ID CODE TAG
	WALL TAG
	DOOR TAG
AP	ACCESS PANEL
BC	BARGE CAPPING
BCT	BABY CHANGE TABLE
BLK	BLOCKWORK
BSN1	BASIN TYPE 1
BSN2	BASIN TYPE 2
CE	CEILING TYPE
CJ	CONTROL JOINT
COL	COLUMN
CONC	CONCRETE
CP	CAPPING
CT-01	CERAMIC TILES TYPE 1
CT-02	CERAMIC TILES TYPE 2
D	DOOR
EDB	ELECTRICAL DISTRIBUTION BOARD
EG	EAVES GUTTER
FC	FIBRE CEMENT
FFL	FINISHED FLOOR LEVEL
FW	FLOOR WASTE
GPO#	GENERAL POWER OUTLET / No OF OUTLETS
GR	GRAB RAIL
HD	HAND DRYER
HWU	HOT WATER UNIT
LK	LOCK
LS	LIGHT SWITCH
MC-01	METAL CLADDING TYPE 1
MC-02	METAL CLADDING TYPE 2
MS	METAL SHEET
MSH	MESH
PB	PLASTERBOARD
PT-01	PAINT TYPE 1
PT-02	PAINT TYPE 2
PW	PLYWOOD
RM	ROOM
RS	ROLLER DOOR SHUTTER
SI	SIGNAGE
SLC	SEALER (CONCRETE)
SLD	SLIDING
SOP	SET OUT POINT
TOW	TOP OF WALL
TP1	TAPWARE TYPE 1
TPH	TOILET PAPER HOLDER
UB	UNIVERSAL BEAM
VP	VENT PIPE
WC1	WATER CLOSET TYPE 1
WC2	WATER CLOSET TYPE 2



HS REVIEW 22.06.15

JORDAN SPRINGS AMENITIES BUILDING - STAGE TWO

General Notes

Verify all dimensions and levels on site and report any discrepancies to dwp|suters for direction prior to the commencement of work.

Drawings are to be read in conjunction with all other contract documents. Use figured dimensions only. Do not scale from drawings. dwp|suters cannot guarantee the accuracy of content and format for copies of drawings issued electronically.
The completion of the Issue Details Checked and Authorised section is confirmation of the status of the drawing. The drawing shall not be used for construction unless endorsed 'For Construction' and authorised for issue.

Location Plan

Consultants

Client
CLOUSTON ASSOCIATES

dwp|suters

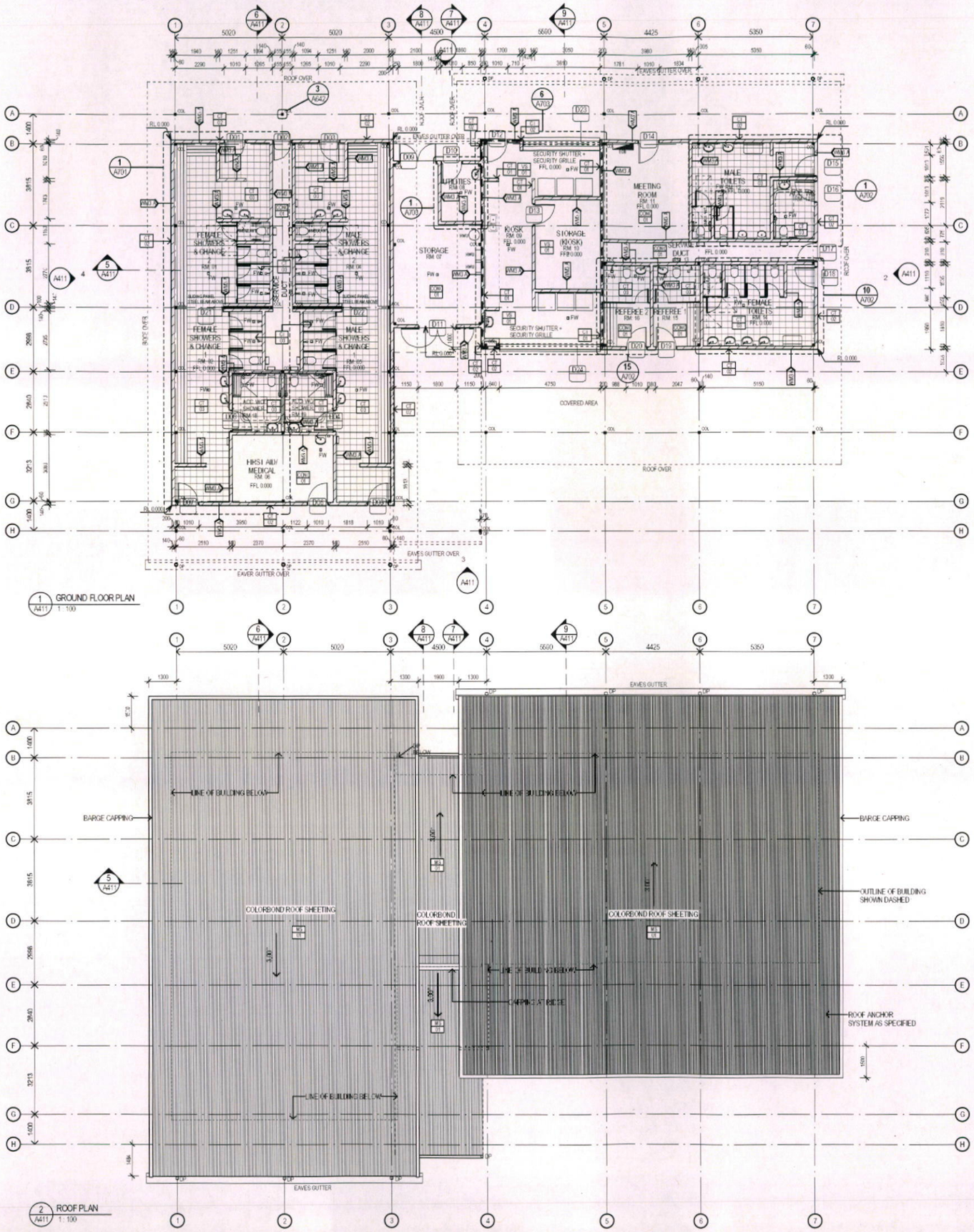
australia · bahrain · china · hongkong · india
malaysia · singapore · thailand · uae · vietnam

Project
JORDAN SPRINGS AMENITIES BUILDING - STAGE TWO

Project Address
VILLAGE OVAL - JORDAN SPRINGS

COVER PAGE

Project Number	Drawing Number	Issue
302673	A010	1



1 A411 GROUND FLOOR PLAN 1:100

2 A411 ROOF PLAN 1:100

Notes:
The information contained in this document is copyright and may not be used or reproduced for any other project or purpose.

Verify all dimensions and levels on site and report any discrepancies to dwp|suters for direction prior to the commencement of work.

Drawings are to be read in conjunction with all other contract documents.

Use figured dimensions only. Do not scale from drawings. dwp|suters cannot guarantee the accuracy of content and format for copies of drawings issued electronically.
The completion of the Issue Details Checked and Authorised section is confirmation of the status of the drawing. The drawing shall not be used for construction unless endorsed 'For Construction' and authorised for issue.

Registered Business Name dwp|suters ABN 37 169 328 018
Robert Macombe Nominated Architect NSW ARB 4699

NOTE:

DIMENSIONS UNLESS OTHERWISE NOTED ARE TO:
- FACE OF BLOCKWORK / CONCRETE
- FACE OF BLOCKWORK OPENING & CENTRE OF MULLIONS EXCEPT WHERE MULLIONS FORM THE EDGE OF OPENING.
- FACE OF FRAME WORK TO STUD WALLS.
- "COS" DIMENSION TO BE CHECKED ON SITE

North

FOR CONSTRUCTION
FOR USE DURING CONSTRUCTION

Issue	Description	Date	Chk	Auth
1	CONSTRUCTION ISSUE	22/06/15	MS	RS

Architect
dwp|suters
www.dwpsuters.com

Project
JORDAN SPRINGS AMENITIES BUILDING - STAGE TWO

Location
VILLAGE OVAL - JORDAN SPRINGS

Client
CLOUSTON ASSOCIATES

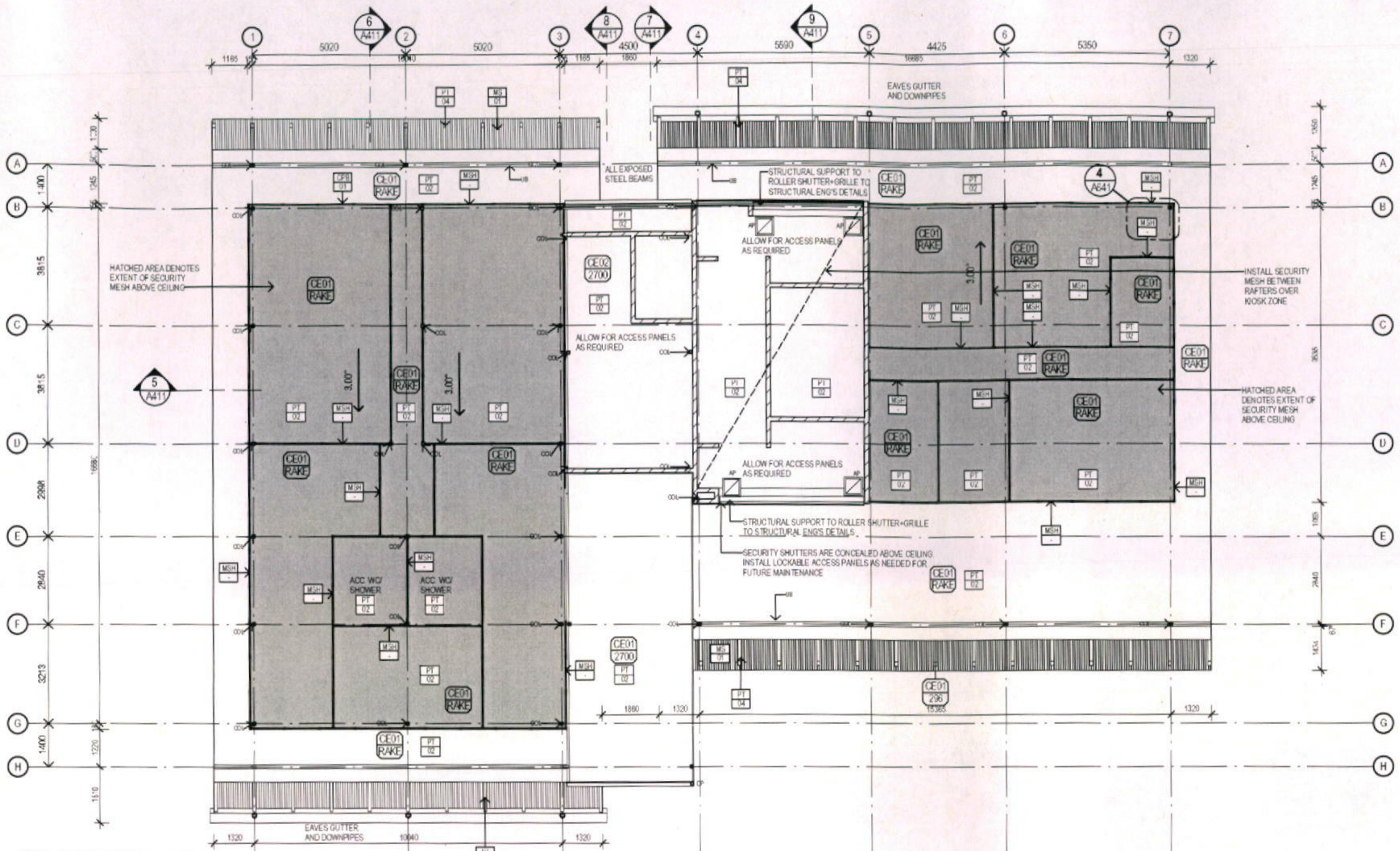
Drawing
GENERAL ARRANGEMENT PLAN / ROOF PLAN

Scale	Date Printed
1 : 100 @ A1	23/06/2015 4:26:56 PM

Project Number	Drawing Number	Issue
302673	A211	1

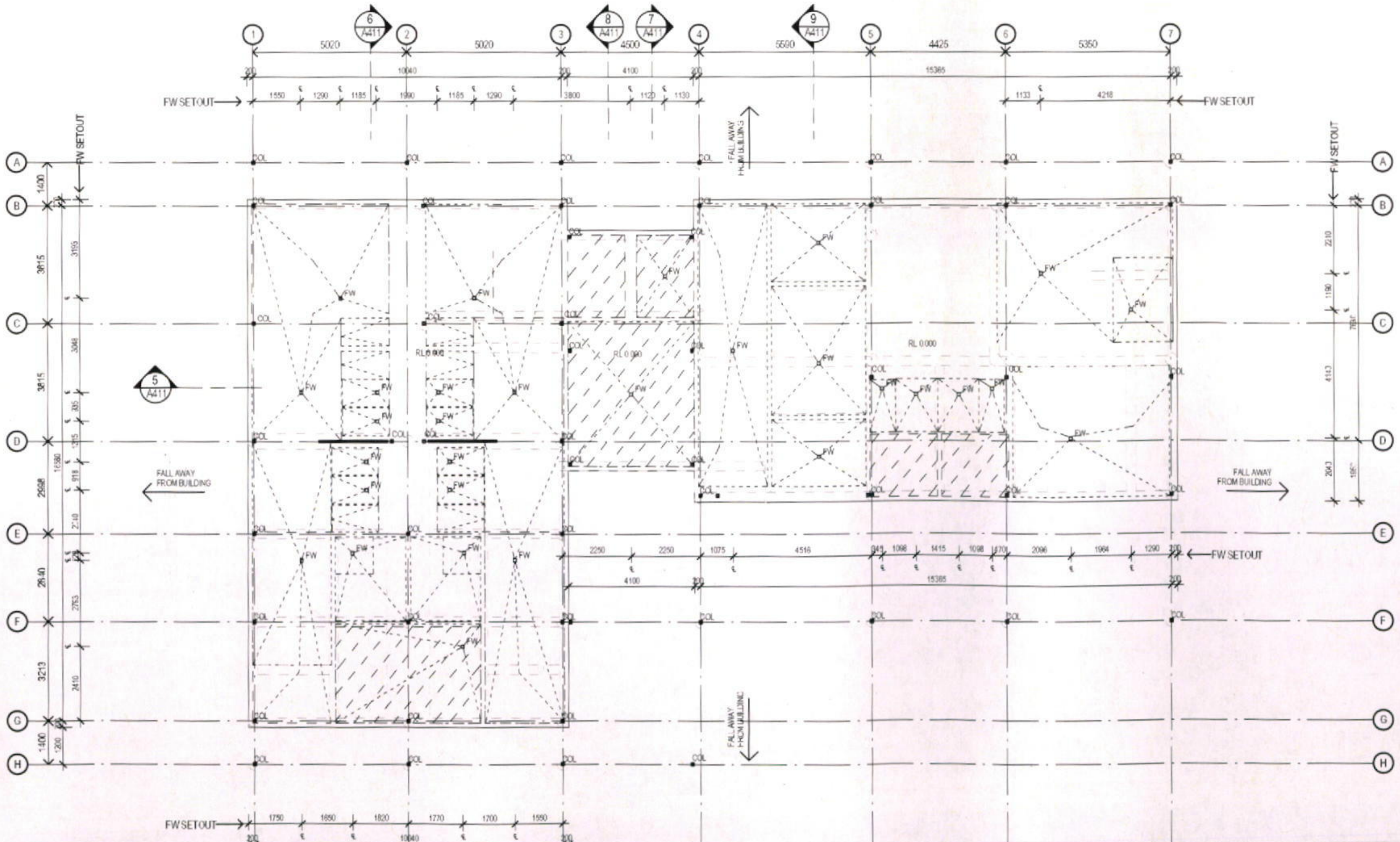
File Name: C:\Projects\302673_JORDAN SPRINGS AMENITIES BUILDING - STAGE TWO_v15_MS.pln

dwp suters



1 200_REFLECTED CEILING PLAN
A411 1 : 100

NOTE: FOR LIGHTING LAYOUT REFER TO ES 103 BY HARON ROBSON.



2 GROUND FLOOR PLAN
A411 1 : 100

TOPPING SCREED - STEEL TROWEL FINISH

50mm SETDOWN FOR TILES OR VINYL LAID TO FALLS

NOTE:
REFER TO ENG'S DRAWINGS FOR STRUCTURAL BEAMS SETOUT AND DETAILS

Notes

Verify all dimensions and levels on site and report any discrepancies to dwp|suters for direction prior to the commencement of work.

Drawings are to be read in conjunction with all other contract documents.

Use figured dimensions only. Do not scale from drawings. dwp|suters cannot guarantee the accuracy of content and format for copies of drawings issued electronically.
The completion of the Issue Details Checked and Authorised section is confirmation of the status of the drawing. The drawing shall not be used for construction unless endorsed 'For Construction' and authorised for issue.

Registered Business Name dwp|suters ABN 37 169 328 018
Robert Macindoe Nominated Architect NSW ARB 4699

North

FOR CONSTRUCTION
FOR USE DURING CONSTRUCTION

Issue	Description	Date	Chk	Auth
1	CONSTRUCTION ISSUE	22/06/15	MC	HS

Architect
dwp|suters
www.dwpsuters.com

Project
JORDAN SPRINGS AMENITIES BUILDING - STAGE TWO

Location
VILLAGE OVAL - JORDAN SPRINGS

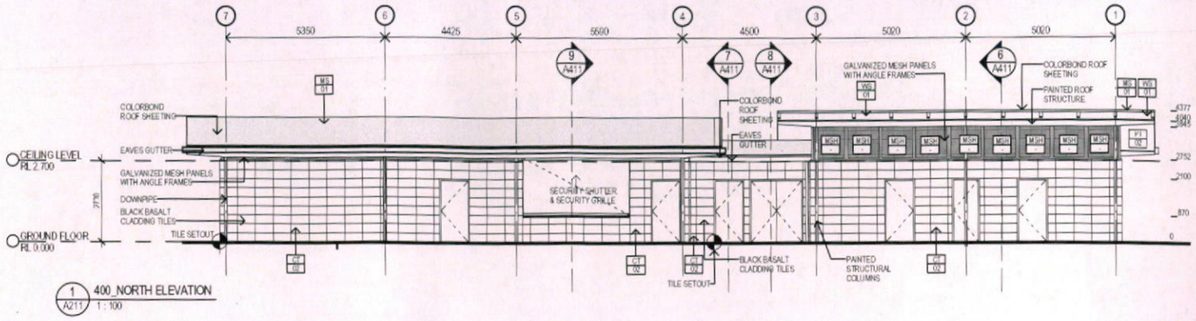
Client
CLOUSTON ASSOCIATES

Drawing
REFLECTED CEILING PLAN / SLAB SETOUT PLAN

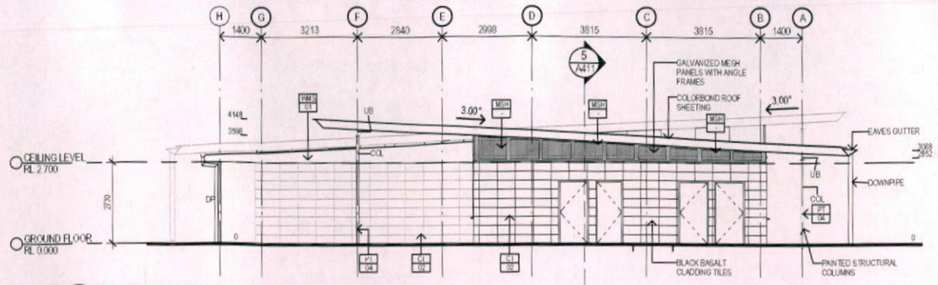
Scale: 1 : 100 @ A1
Date Printed: 23/06/2015 4:28:59 PM

Project Number: 302673
Drawing Number: A212
Issue: 1

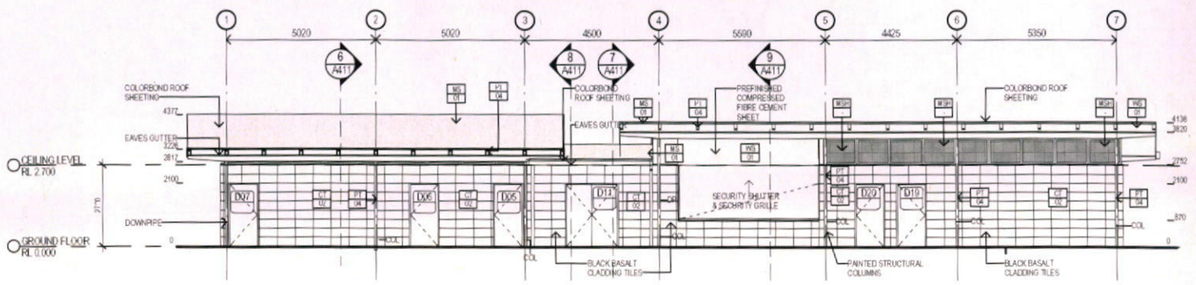
dwp|suters



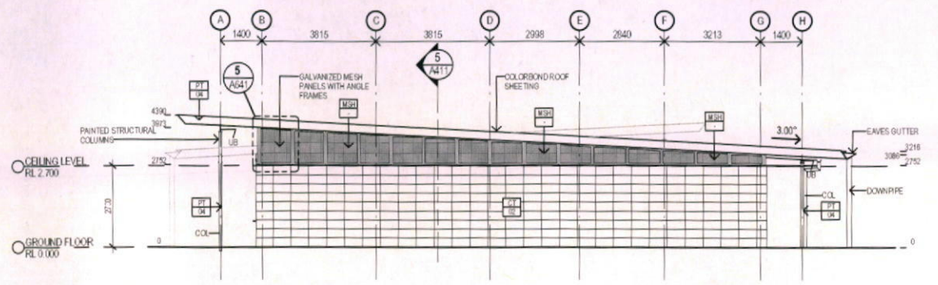
1 A211 400_NORTH ELEVATION
1 : 100



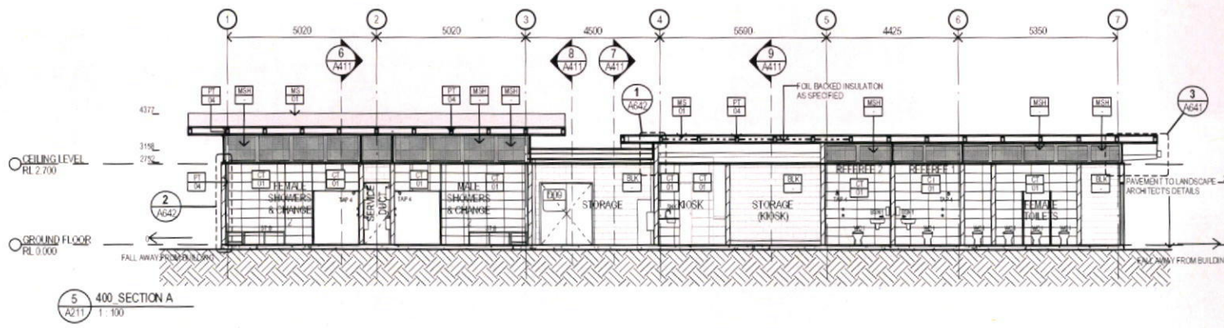
2 A211 400_EAST ELEVATION
1 : 100



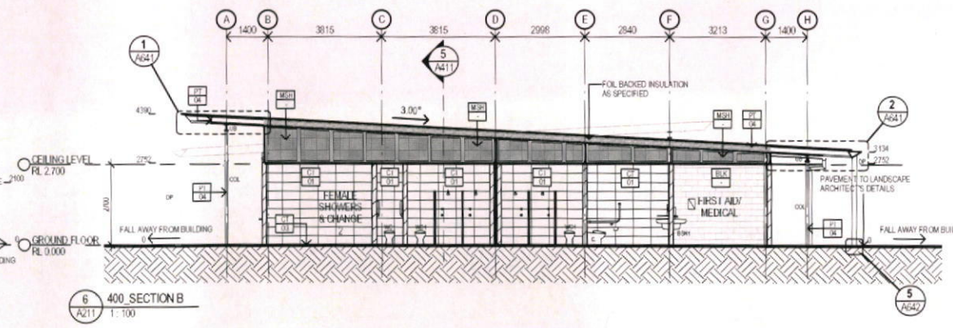
3 A211 400_SOUTH ELEVATION
1 : 100



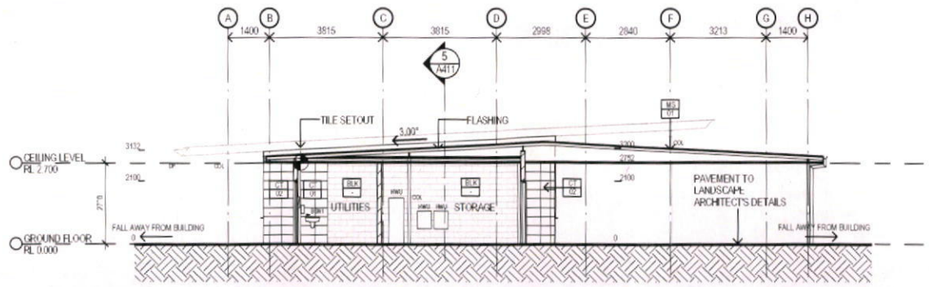
4 A211 400_WEST ELEVATION
1 : 100



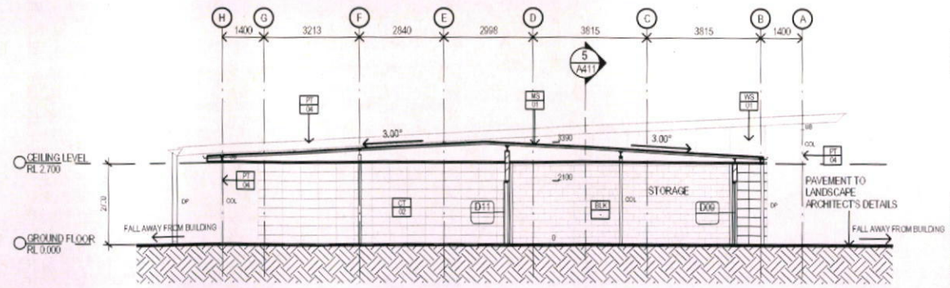
5 A211 400_SECTION A
1 : 100



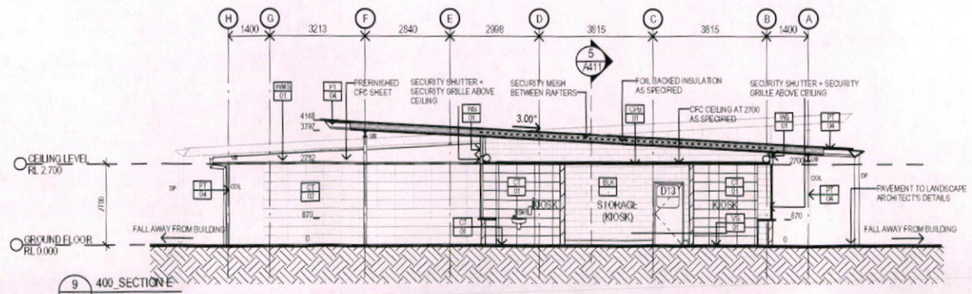
6 A211 400_SECTION B
1 : 100



7 A211 400_SECTION C
1 : 100



8 A211 400_SECTION D
1 : 100



9 A211 400_SECTION E
1 : 100

FOR CONSTRUCTION
FOR USE DURING CONSTRUCTION

Issue	Description	Date	Chk	Auth
1	CONSTRUCTION ISSUE	22/06/15	MC	HS

Architect
dwp|suters
www.dwpsuters.com

Project
JORDAN SPRINGS AMENITIES BUILDING - STAGE TWO

Location
VILLAGE OVAL - JORDAN SPRINGS

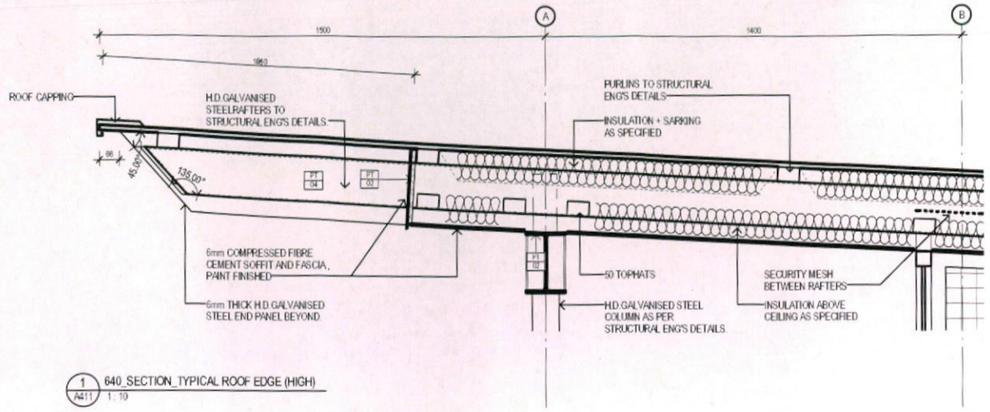
Client
CLOUSTON ASSOCIATES

Drawing
BUILDING ELEVATIONS AND SECTIONS

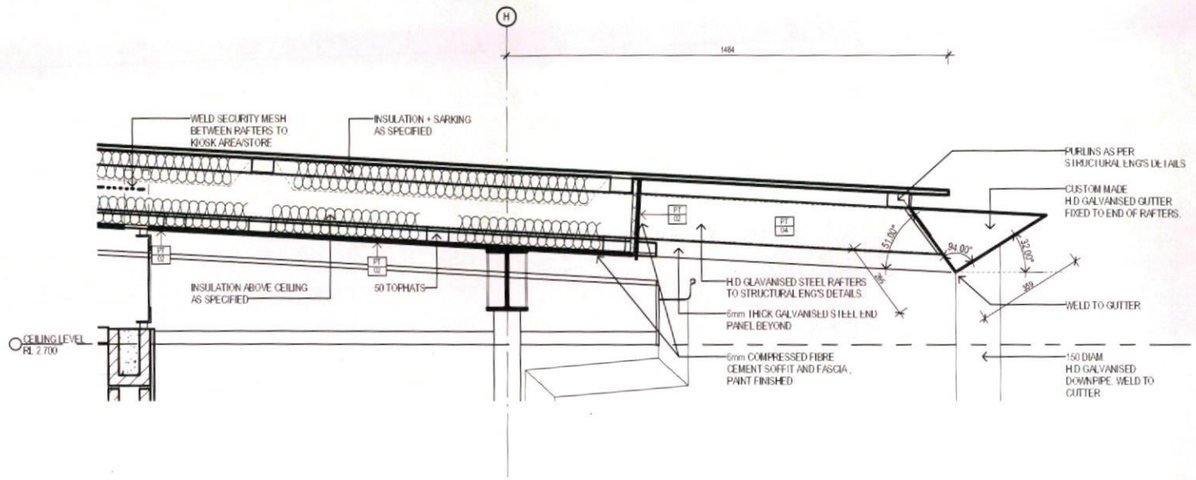
Scale	Date Printed
1 : 100 @ A1	23/06/2015 4:27:04 PM

Project Number	Drawing Number	Issue
302673	A411	1

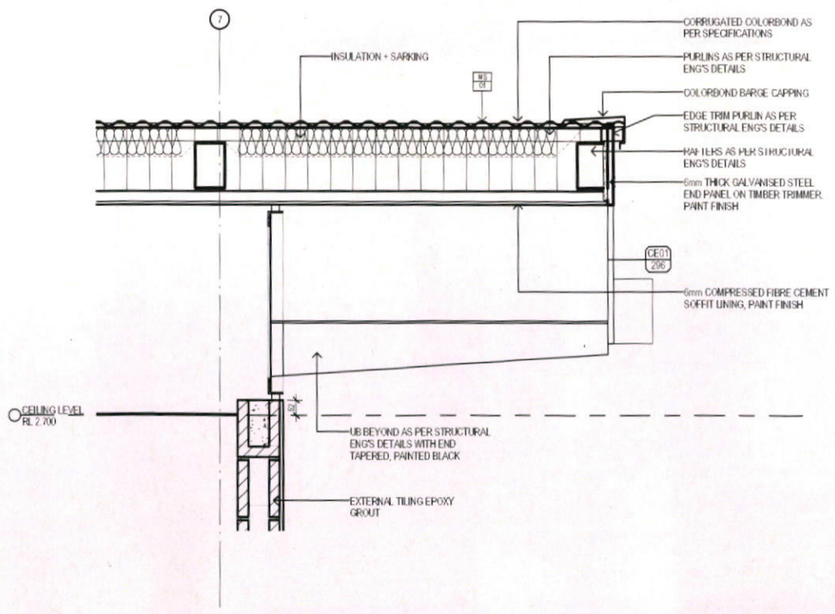
dwp suters



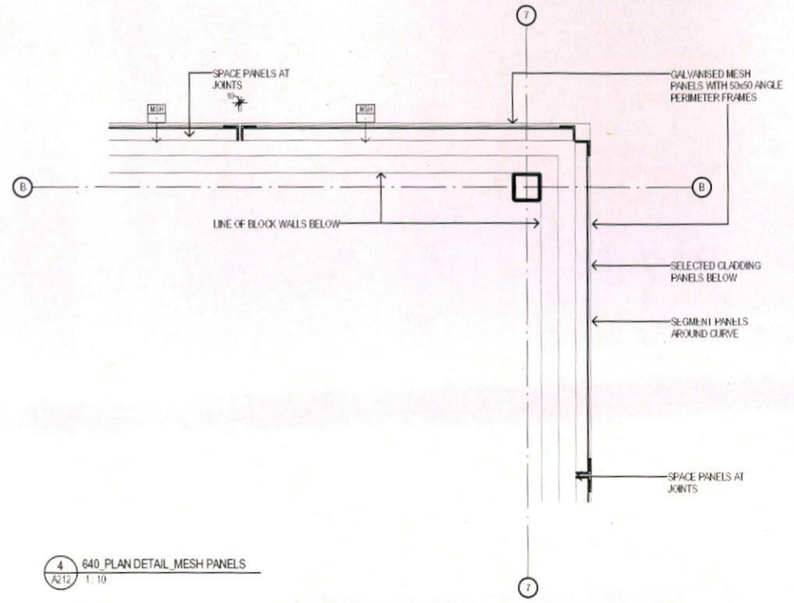
1 A411 640_SECTION_TYPICAL ROOF EDGE (HIGH)
1 : 10



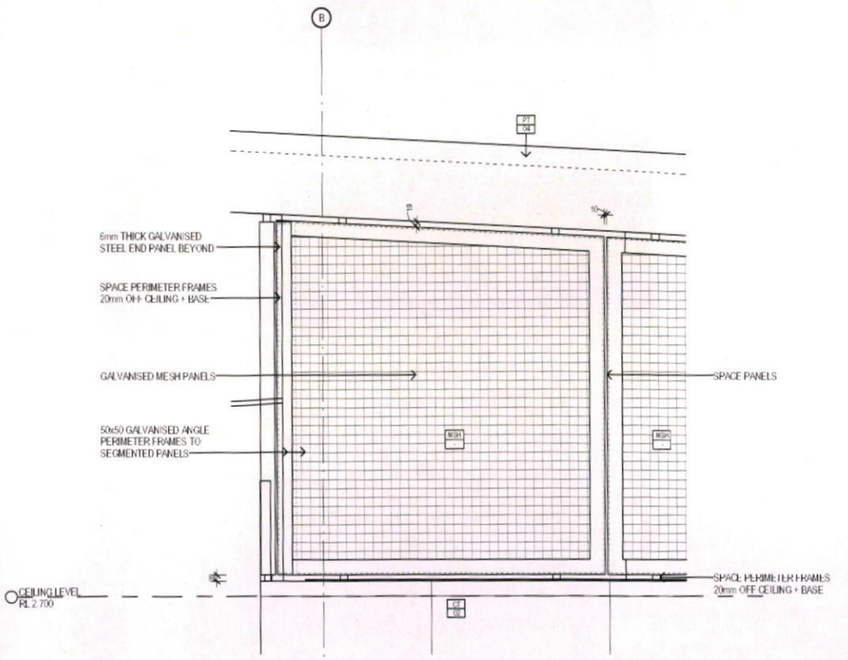
2 A411 640_SECTION_TYPICAL ROOF EDGE (LOW)
1 : 10



3 A411 640_SECTION_TYPICAL BARGE DETAIL
1 : 10



4 A212 640_PLAN DETAIL_MESH PANELS
1 : 10



5 A411 640_TYPICAL MESH PANEL ELEVATION
1 : 10

FOR CONSTRUCTION
FOR USE DURING CONSTRUCTION

Issue	Description	Date	Chk	Auth
1	CONSTRUCTION ISSUE	22/06/15	MC	HS

Architect
dwp|suters
www.dwpsuters.com

Project
JORDAN SPRINGS AMENITIES BUILDING - STAGE TWO

Location
VILLAGE OVAL - JORDAN SPRINGS

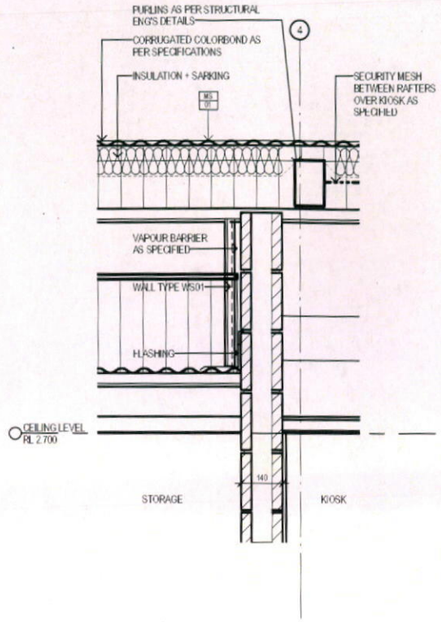
Client
CLOUSTON ASSOCIATES

Drawing
CONSTRUCTION DETAILS - SHEET 1

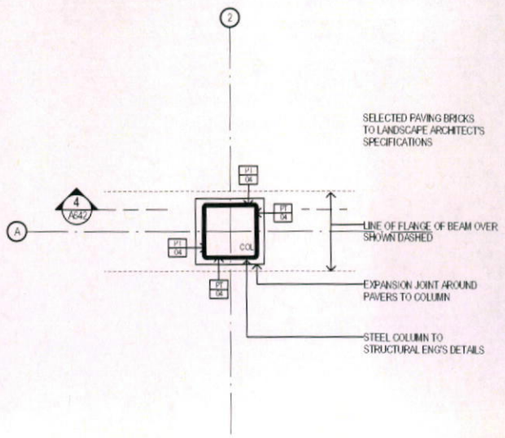
Scale	Date Printed
1 : 10 @ A1	23/06/2015 4:27:06 PM

Project Number	Drawing Number	Issue
302673	A641	1

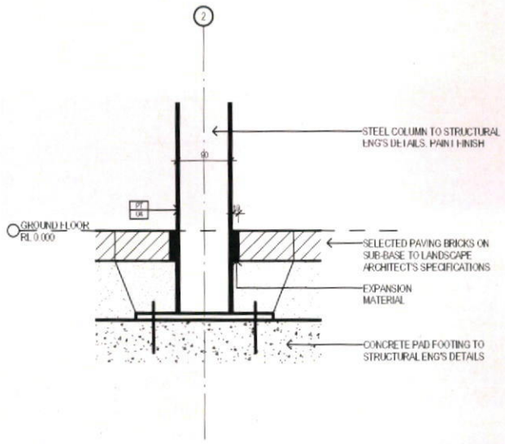
dwp suters



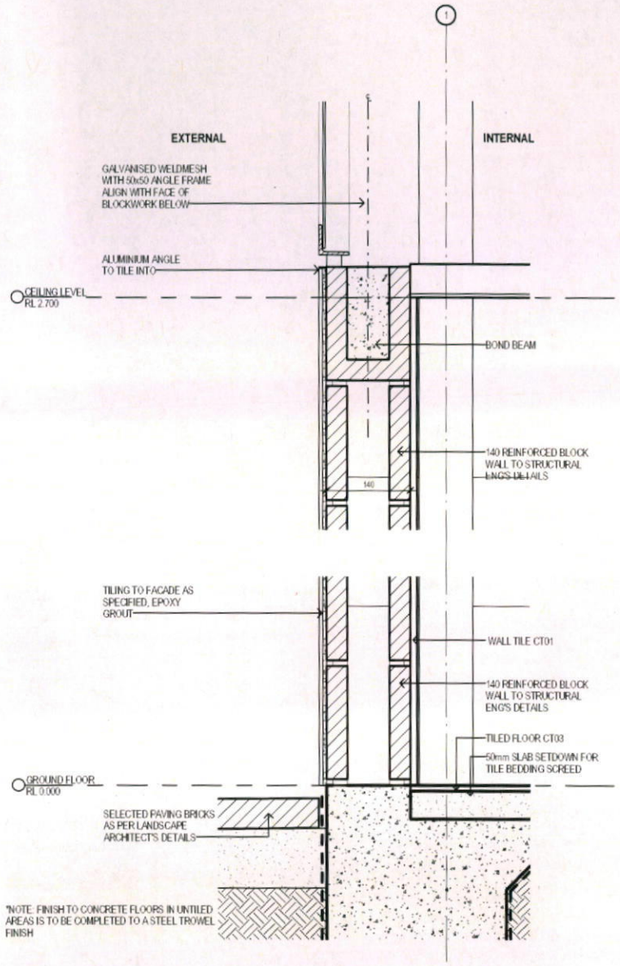
1 A411 640_SECTION_TYPICAL KIOSK AREA WALL (TOP) 1 : 10



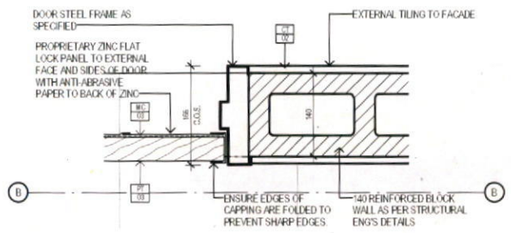
3 A211 640_PLAN_EXTERNAL COLUMN BASE DETAIL 1 : 5



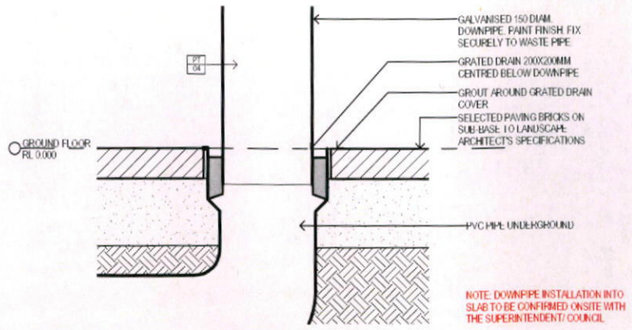
4 A642 640_SECTION_EXTERNAL COLUMN BASE DETAIL 1 : 5



2 A411 640_SECTION_TYPICAL ZINC CLADDING DETAILS 1 : 5



6 A701 640_PLAN_TYPICAL STEEL FRAMED DOOR DETAIL 1 : 5



5 A411 640_SECTION_TYPICAL DOWNPIPE BOTTOM DETAIL 1 : 5

FOR CONSTRUCTION
FOR USE DURING CONSTRUCTION

Issue	Description	Date	Chk	Auth
1	CONSTRUCTION ISSUE	22/06/15	MC	HS

Architect
dwp|suters
www.dwpsuters.com

Project
JORDAN SPRINGS AMENITIES BUILDING - STAGE TWO

Location
VILLAGE OVAL - JORDAN SPRINGS

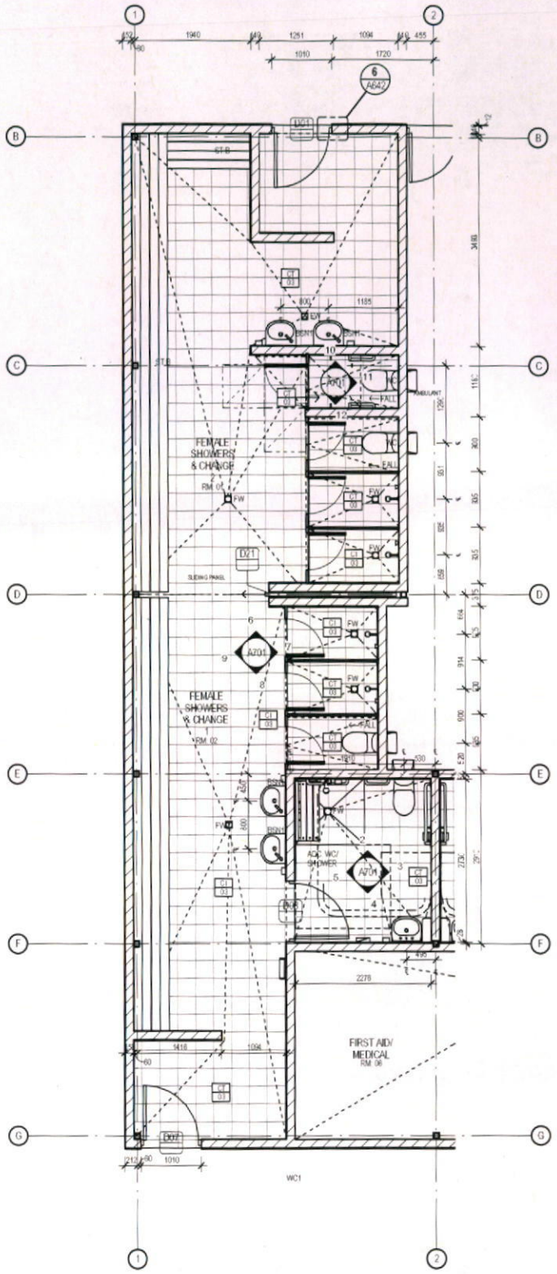
Client
CLOUSTON ASSOCIATES

Drawing
CONSTRUCTION DETAILS - SHEET 2

Scale	Date Printed
As indicated @ A1	23/06/2015 4:27:08 PM

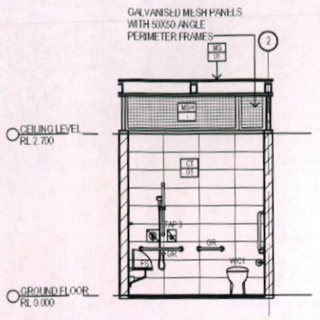
Project Number	Drawing Number	Issue
302673	A642	1

dwp suters

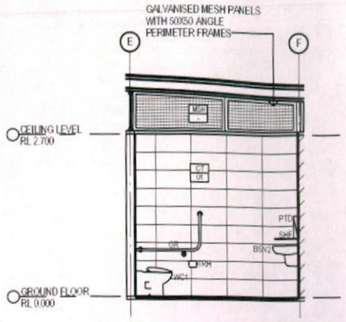


1 / A211 — 700_FEMALE SHOWERS, CHANGE & ACC WC SHOWER - FLOOR PLAN — 1 : 50

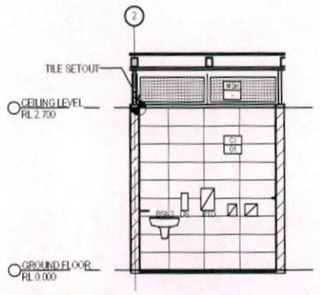
* NOTE : MALE SHOWERS AND CHANGE ROOM SIMILAR BUT MIRROR REVERSED



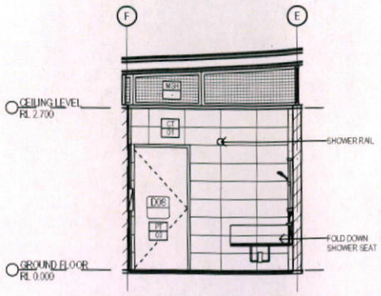
2 / A701 — 700_ACC WC / SHOWER (TYPICAL) - ELEVATION 1 — 1 : 50



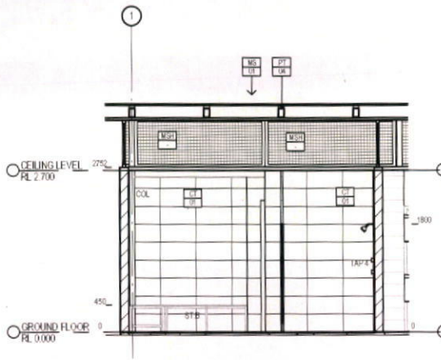
3 / A701 — 700_ACC WC / SHOWER (TYPICAL) - ELEVATION 2 — 1 : 50



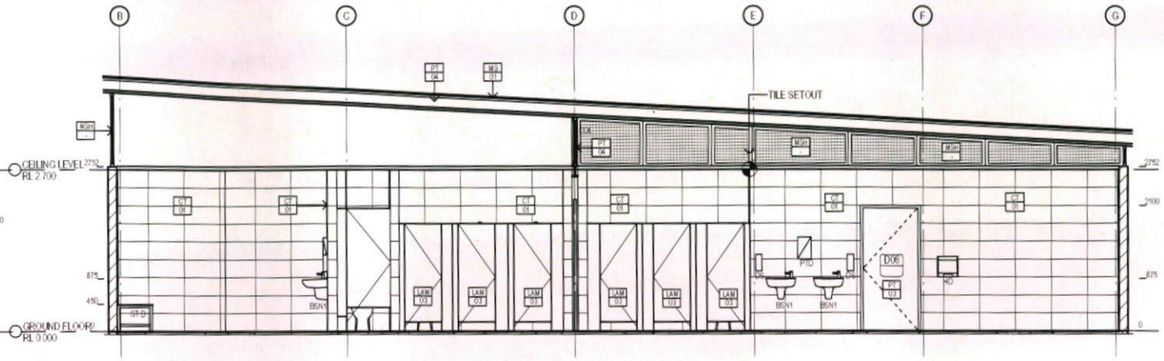
4 / A701 — 700_ACC WC / SHOWER (TYPICAL) - ELEVATION 3 — 1 : 50



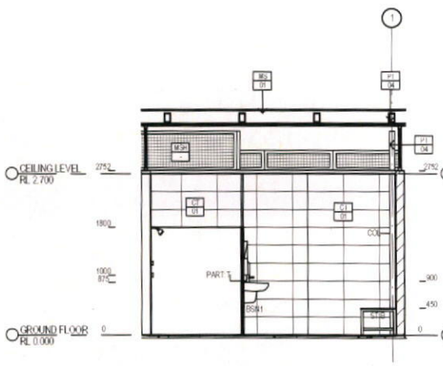
5 / A701 — 700_ACC WC / SHOWER (TYPICAL) - ELEVATION 4 — 1 : 50



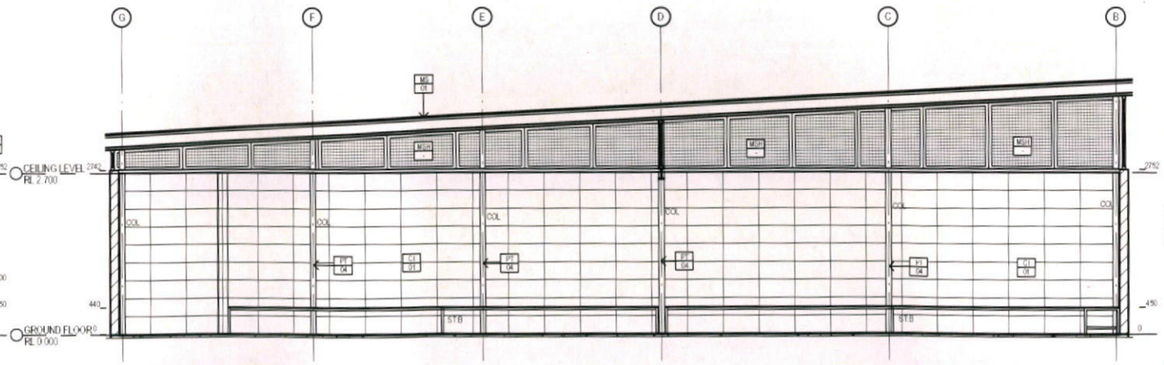
6 / A701 — 700_FEMALE SHOWERS & CHANGE - ELEVATION 1 — 1 : 50



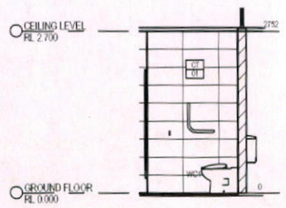
7 / A701 — 700_FEMALE SHOWERS & CHANGE - ELEVATION 2 — 1 : 50



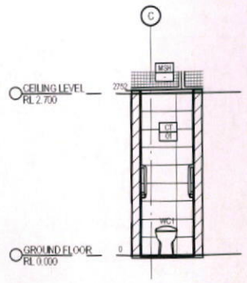
8 / A701 — 700_FEMALE SHOWERS & CHANGE - ELEVATION 3 — 1 : 50



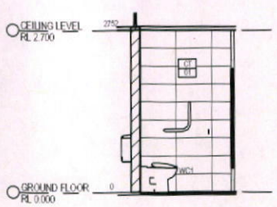
9 / A701 — 700_FEMALE SHOWERS & CHANGE - ELEVATION 4 — 1 : 50



10 / A701 — 700_AMBULANT WC (TYPICAL) - ELEVATION 1 — 1 : 50



11 / A701 — 700_AMBULANT WC (TYPICAL) - ELEVATION 2 — 1 : 50



12 / A701 — 700_AMBULANT WC (TYPICAL) - ELEVATION 3 — 1 : 50

Notes
The information contained in this document is copyright and may not be used or reproduced for any other project or purpose.

Verify all dimensions and levels on site and report any discrepancies to dwp|suters for direction prior to the commencement of work.

Drawings are to be read in conjunction with all other contract documents.

Use figured dimensions only. Do not scale from drawings. dwp|suters cannot guarantee the accuracy of content and format for copies of drawings issued electronically.
The completion of the Issue Details Checked and Authorised section is confirmation of the status of the drawing. The drawing shall not be used for construction unless endorsed 'For Construction' and authorised for issue.

Registered Business Name dwp|suters ABN 37 169 329 018
Robert Macaddo Nominated Architect NSW ARB 4656

NOTE:

DIMENSIONS UNLESS OTHERWISE NOTED ARE TO:
- FACE OF BLOCKWORK / CONCRETE.
- FACE OF BLOCKWORK OPENING & CENTRE OF MULLIONS EXCEPT WHERE MULLIONS FORM THE EDGE OF OPENING.
- FACE OF FRAME WORK TO STUD WALLS.
- "COS" DIMENSION TO BE CHECKED ON SITE

FOR CONSTRUCTION
FOR USE DURING CONSTRUCTION

Issue	Description	Date	Chk	Auth
1	CONSTRUCTION ISSUE	23/06/15	MC	KS

Architect
dwp|suters
www.dwpsuters.com

Project
JORDAN SPRINGS AMENITIES BUILDING - STAGE TWO

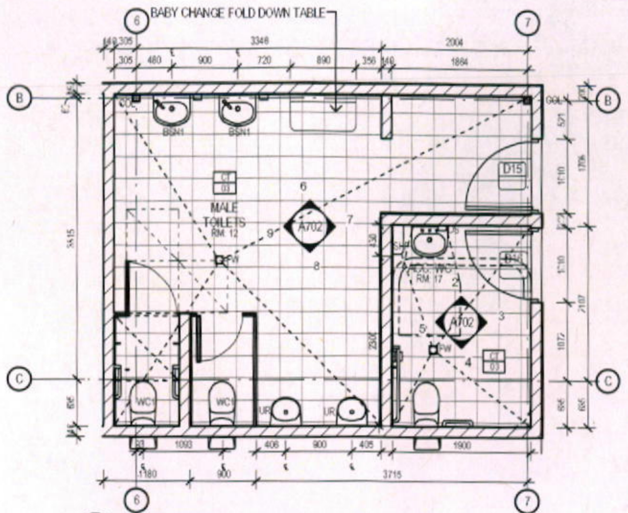
Location
VILLAGE OVAL - JORDAN SPRINGS

Client
CLOUSTON ASSOCIATES

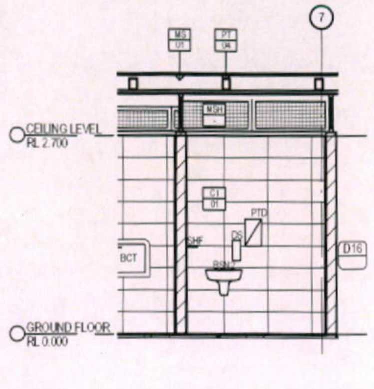
Drawing
WET AREAS DETAILS - SHEET 1

Scale: 1 : 50 @ A1
Date Printed: 23/06/2015 4:27:13 PM
Project Number: 302673
Drawing Number: A701
Issue: 1

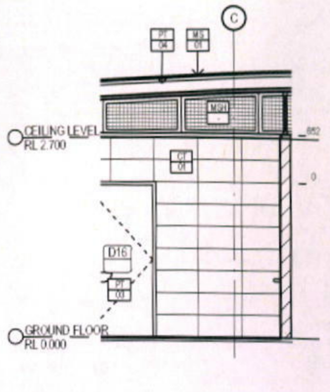
dwp suters



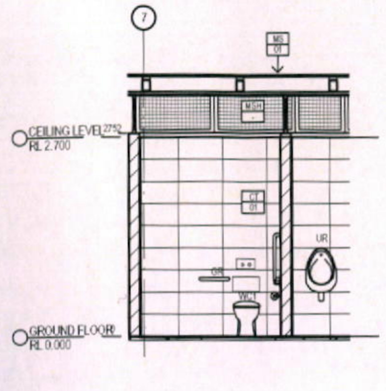
1 700_MALE TOILETS & ACC. WC - FLOOR PLAN
A711 1 : 50



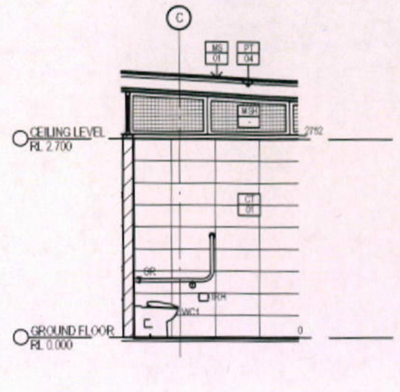
2 700_ACC WC - ELEVATION 1
A702 1 : 50



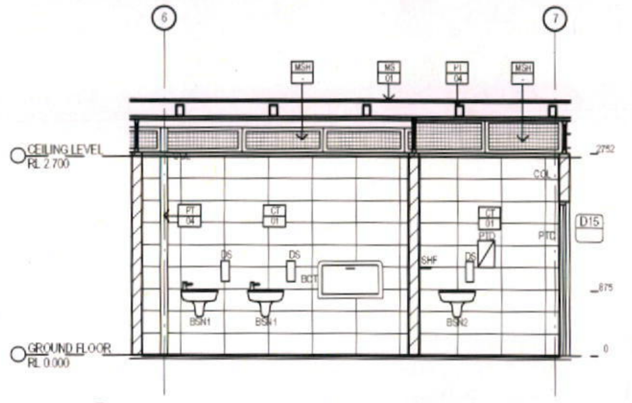
3 700_ACC WC - ELEVATION 2
A702 1 : 50



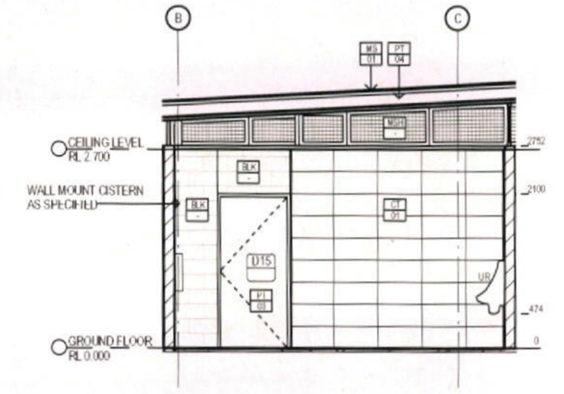
4 700_ACC WC - ELEVATION 3
A702 1 : 50



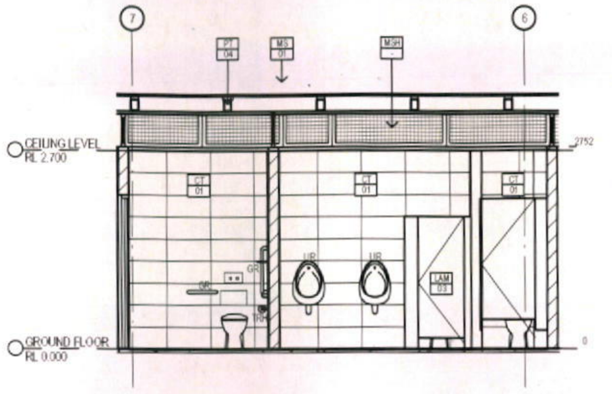
5 700_ACC WC - ELEVATION 4
A702 1 : 50



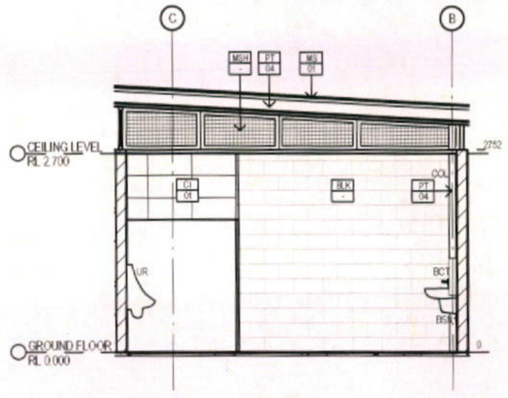
6 700_MALE TOILETS - ELEVATION 1
A702 1 : 50



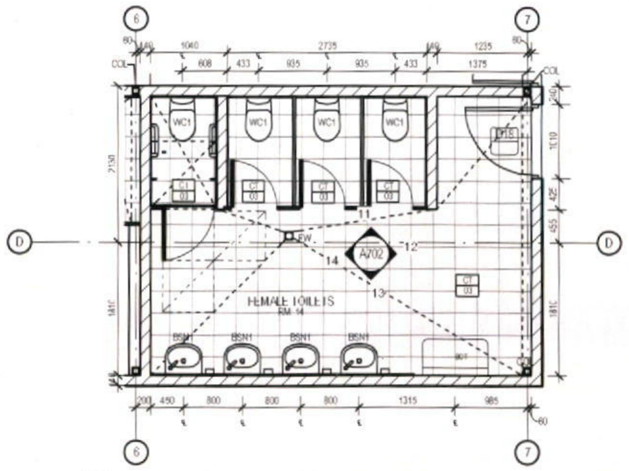
7 700_MALE TOILETS - ELEVATION 2
A702 1 : 50



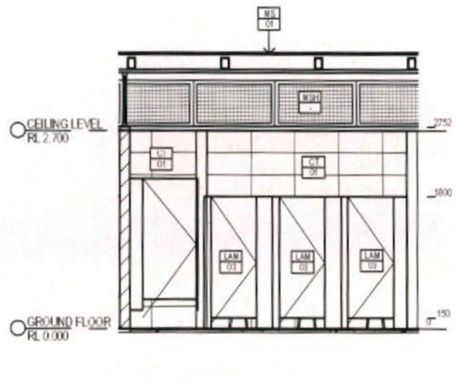
8 700_MALE TOILETS - ELEVATION 3
A702 1 : 50



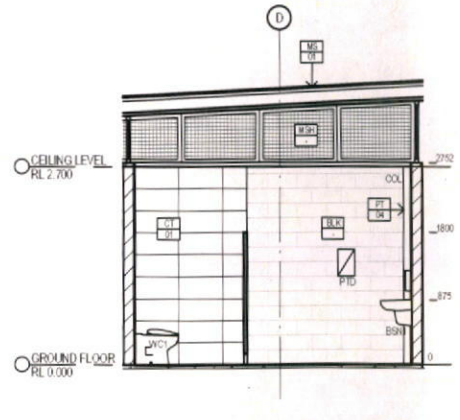
9 700_MALE TOILETS - ELEVATION 4
A702 1 : 50



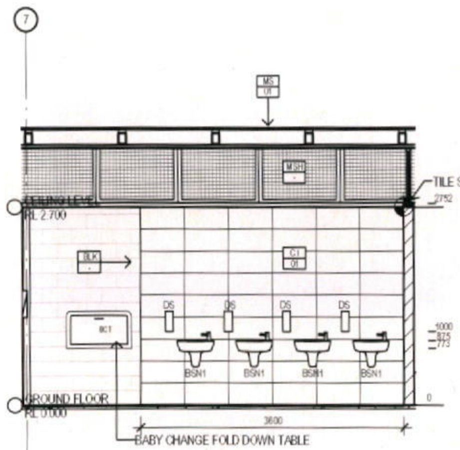
10 700_FEMALE TOILETS - FLOOR PLAN
A711 1 : 50



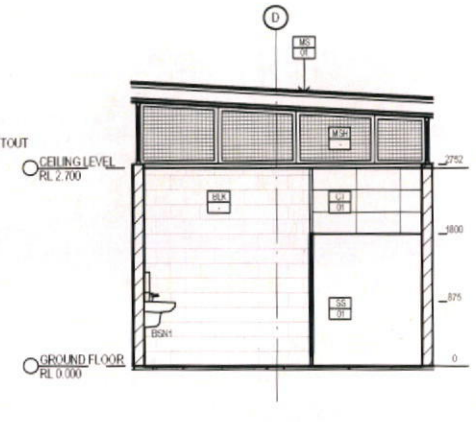
11 700_FEMALE TOILETS - ELEVATION 1
A702 1 : 50



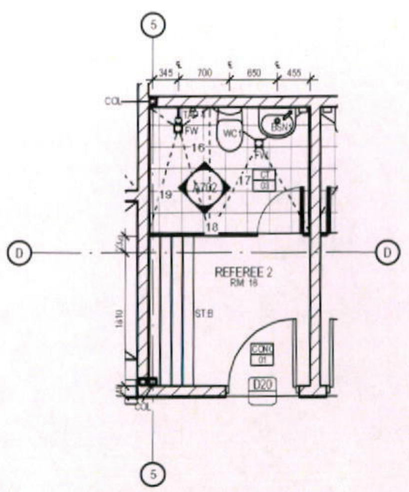
12 700_FEMALE TOILETS - ELEVATION 2
A702 1 : 50



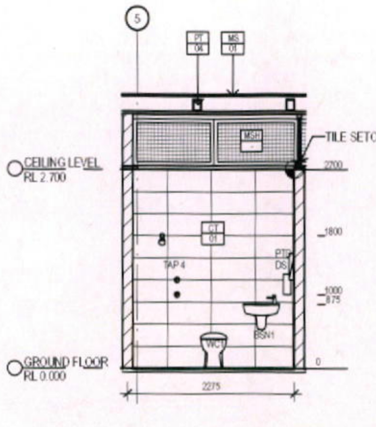
13 700_FEMALE TOILETS - ELEVATION 3
A702 1 : 50



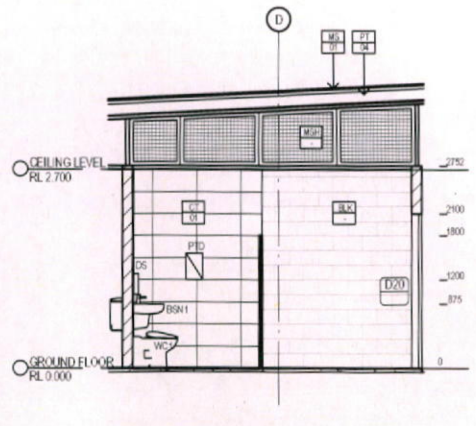
14 700_FEMALE TOILETS - ELEVATION 4
A702 1 : 50



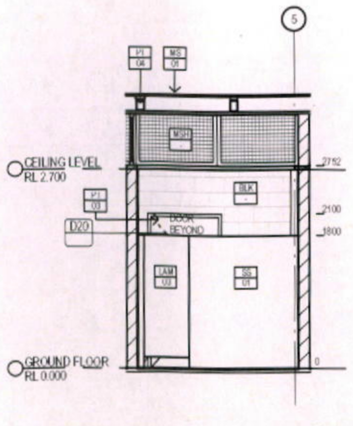
15 700_REFERRE 2 (TYPICAL) - FLOOR PLAN



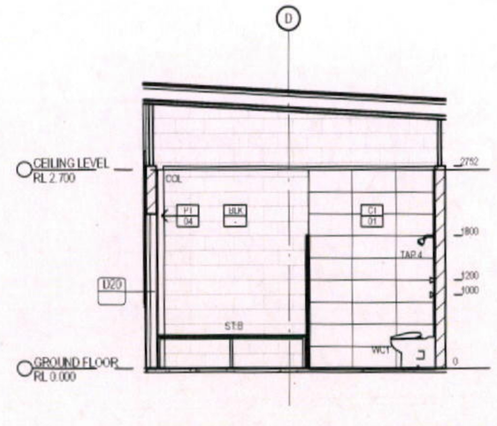
16 700_REFEREE 2 (TYPICAL) - ELEVATION 1
A702 1 : 50



17 700_REFEREE 2 (TYPICAL) - ELEVATION 2
A702 1 : 50



18 700_REFEREE 2 (TYPICAL) - ELEVATION 3
A702 1 : 50



19 700_REFEREE 2 (TYPICAL) - ELEVATION 4
A702 1 : 50

NOTE:
DOOR LEAF SIZES SPECIFIED IN THE SCHEDULE ARE EXCLUSIVE OF FRAMES OR LININGS AND INSTALLATION TOLERANCES.
ALL DOOR SIZES SHOULD BE CHECKED ON SITE FOR TRUE DIMENSIONS.
HEIGHTS AND SPECIFICATIONS MAY VARY IN DIFFERENT AREAS, PARTICULARLY WHERE RAISED ACCESS FLOORS ARE INSTALLED.
REFER TO PLANS FOR DOOR SWINGS.
FRAME DEPTH VARIES TO SUIT FINISHED WALL THICKNESS.
UNLESS NOTED OTHERWISE, ALL HINGES TO BE HIGH QUALITY STAINLESS STEEL HINGES.

NOTE:

DIMENSIONS UNLESS OTHERWISE NOTED ARE TO:
- FACE OF BLOCKWORK / CONCRETE.
- FACE OF BLOCKWORK OPENING & CENTRE OF MULLIONS EXCEPT WHERE MULLIONS FORM THE EDGE OF OPENING.
- FACE OF FRAME WORK TO STUD WALLS.
- "COS" DIMENSION TO BE CHECKED ON SITE

FOR CONSTRUCTION
FOR USE DURING CONSTRUCTION

Issue	Description	Date	Chk	Auth
1	CONSTRUCTION ISSUE	22/06/15	MC	HS

Architect
dwp|suters
www.dwpsuters.com

Project
JORDAN SPRINGS AMENITIES BUILDING - STAGE TWO

Location
VILLAGE OVAL - JORDAN SPRINGS

Client
CLOUSTON ASSOCIATES

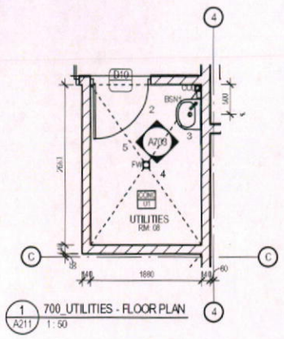
Drawing
WET AREAS DETAILS - SHEET 2

Scale: 1 : 50 @ A1
Date Printed: 23/06/2015 4:27:17 PM

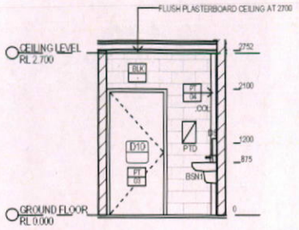
Project Number: 302673
Drawing Number: A702
Issue: 1

dwp|suters

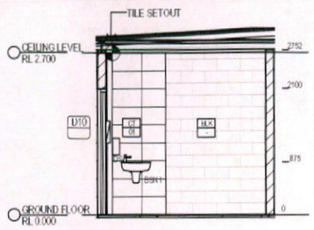
Document Set ID: 6719197
Version: 1, Version Date: 13/07/2015



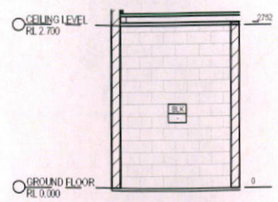
1 A211 700_UTILITIES - FLOOR PLAN 1 : 50



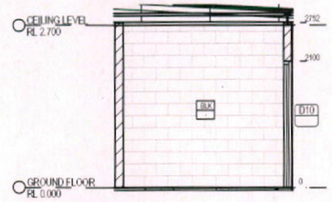
2 A703 700_UTILITIES - ELEVATION 1 1 : 50



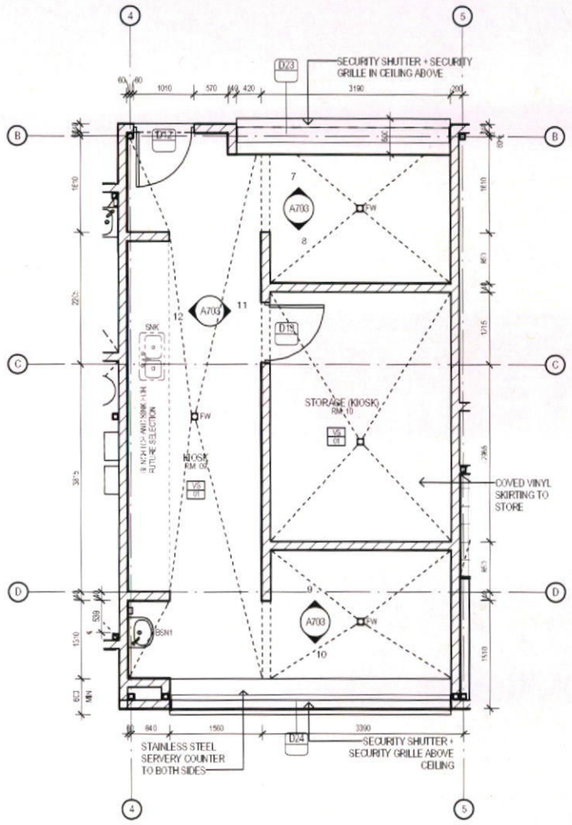
3 A703 700_UTILITIES - ELEVATION 2 1 : 50



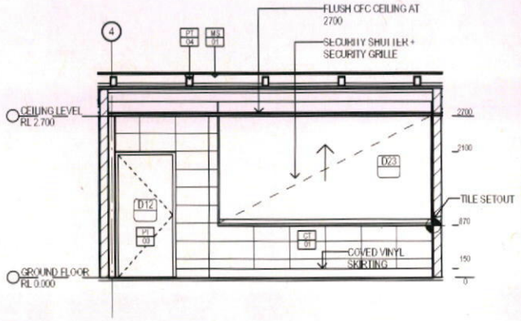
4 A703 700_UTILITIES - ELEVATION 3 1 : 50



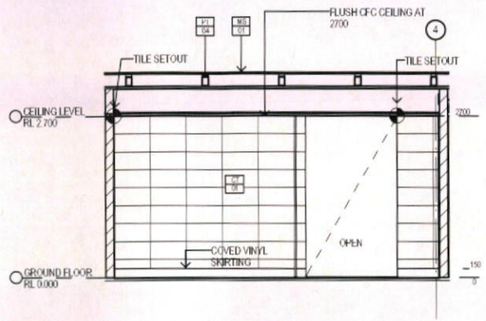
5 A703 700_UTILITIES - ELEVATION 4 1 : 50



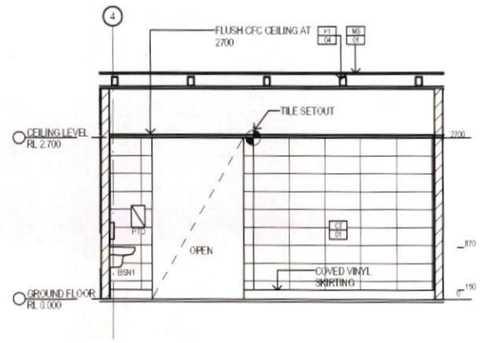
6 A211 700_KIOSK - FLOOR PLAN 1 : 50



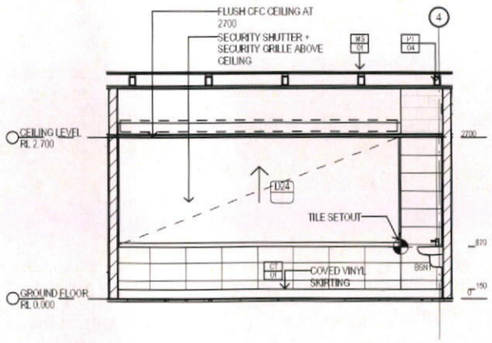
7 A703 700_KIOSK - ELEVATION 1 1 : 50



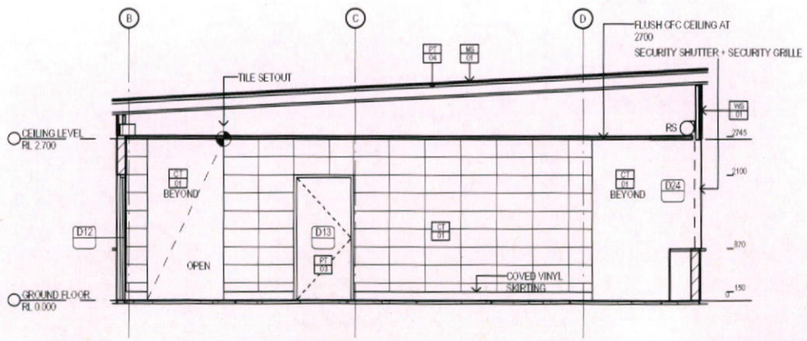
8 A703 700_KIOSK - ELEVATION 2 1 : 50



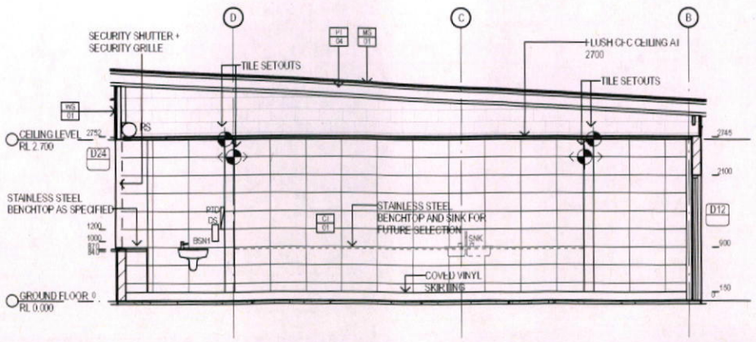
9 A702 700_KIOSK - ELEVATION 3 1 : 50



10 A702 700_KIOSK - ELEVATION 4 1 : 50



11 A703 700_KIOSK - ELEVATION 5 1 : 50



12 A703 700_KIOSK - ELEVATION 6 1 : 50

Notes
The information contained in this document is copyright and may not be used or reproduced for any other project or purpose.

Verify all dimensions and levels on site and report any discrepancies to dwp|suters for direction prior to the commencement of work.

Drawings are to be read in conjunction with all other contract documents.

Use figured dimensions only. Do not scale from drawings. dwp|suters cannot guarantee the accuracy of content and format for copies of drawings issued electronically.
The completion of the Issue Details Checked and Authorised section is confirmation of the status of the drawing. The drawing shall not be used for construction unless endorsed 'For Construction' and authorised for issue.
©dwp Australia Pty Ltd
Registered Business Name dwp|suters ABN 37 169 328 018
Robert Macindoe Nominated Architect NSW ARB 4899

GENERAL NOTES

1. REFER TO STRUCTURAL ENGINEER'S DOCUMENTS
2. REFER TO GA PLANS FOR LOCATIONS OF WALL TYPES
3. REFER TO FINISHES PLANS FOR APPLIED FINISHES
4. REFER TO SMOKE, FIRE & ACOUSTIC COMPARTMENT PLANS
5. STUD CENTRES ARE TO SUIT WALL HEIGHT REQUIREMENTS UNLESS NOTED OTHERWISE
6. REFER TO ELEVATIONS FOR SET OUT OF EXPANSION JOINTS

NOTE:

DIMENSIONS UNLESS OTHERWISE NOTED ARE TO:
- FACE OF BLOCKWORK / CONCRETE.
- FACE OF BLOCKWORK OPENING & CENTRE OF MULLIONS EXCEPT WHERE MULLIONS FORM THE EDGE OF OPENING.
- FACE OF FRAME WORK TO STUD WALLS.
- "COS" DIMENSION TO BE CHECKED ON SITE

FOR CONSTRUCTION
FOR USE DURING CONSTRUCTION

Issue	Description	Date	Chk	Auth
1	CONSTRUCTION ISSUE	22/06/15	MC	HS

Architect
dwp|suters
www.dwpsuters.com

Project
JORDAN SPRINGS AMENITIES BUILDING - STAGE TWO

Location
VILLAGE OVAL - JORDAN SPRINGS

Client
CLOUSTON ASSOCIATES

Drawing
WET AREAS DETAILS - SHEET 3

Scale	Date Plotted
As indicated @ A1	23/06/2015 4:27:19 PM

Project Number	Drawing Number	Issue
302673	A703	1

dwp suters