



**ACT**  
Government

# MUNICIPAL INFRASTRUCTURE TECHNICAL SPECIFICATION

## Part 05A Sportsground Pavilions

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# 1. SPORTSGROUND PAVILIONS

## 1.1 General

This Specification comprises the minimum materials and requirements for the construction of Sportsground Pavilions within the jurisdiction of and to be handed over to for ownership and maintenance by ACT Government Agency, or ACT Government Directorate who will own the asset.

**Value for money:** The ACT government is looking for best value for money as the most advantageous combination of cost, quality and sustainability to meet the required outcomes. This must consider the whole life cost, be fit for purpose and sufficient to meet the outcomes desired. It must include economic, social and environmental considerations and the materials, fixtures and fittings selected must be based on maximising durability and minimising maintenance requirements. The facilities must adhere to all applicable legislative requirements, standards and codes.

### 1.1.1 Responsibility

Requirement: The contractor shall provide for all works and activities associated with the supply and installation of Sportsground Pavilions (either Sportsground Toilet Block, Local Sportsground Pavilion, Regional Sportsground Pavilion – refer Design Brief) to meet the requirements of the project and shall meet industry best practice.

### 1.1.2 Cross reference

#### 1.1.2.1 Legislation

General: Include all Commonwealth and ACT Legislation but not limited to consideration of the following:

- > *Australia Capital Territory (Planning and Land Management) Act 1988* (Commonwealth).
- > *Building Act 1972* (ACT Government).
- > The Building Code of Australia: National Construction Code (NCC, formally the BCA), applicable at the time a Construction Certificate is applied for.
- > The National Code of Practice for the Construction Industry and the Australian Government Implementation Guidelines for the Code (Commonwealth).
- > National Standard for Construction Work document, National Occupational Health and Safety Commission, NOHSC: 1016 (Commonwealth).
- > *Disability Discrimination Act 1992* (Commonwealth).
- > *Discrimination Act 1991* (ACT Government).
- > The Human Rights and Equal Opportunity Commission (HREOC): Advisory notes (Commonwealth).
- > *The Environmental Protection and Biodiversity Conservation Act, 1999* (Commonwealth).
- > *Land (Planning and Environment) Act, 1991* (ACT Government).
- > The Territory Plan, Planning and Land Management, Department of Urban Services, Canberra, 2008.
- > National Capital Plan, National Capital Authority, Canberra, February 2001.
- > *Tree Protection (interim Scheme) Act 2001* (ACT Government).
- > *Utility Networks (Public Safety) Regulations 2001* (ACT Government).
- > *Work Health and Safety Acts, 2011* (Commonwealth).
- > *Work Health and Safety Act, 2011* (ACT Government).
- > *Food Act 2001* (ACT Government).
- > *Food Regulations 2002* (ACT Government).
- > *Signs General Code 2008* (ACT Government).

### **1.1.2.2 Policy and standards**

Requirement: The following relevant policies but not limited to consideration of the following are related to this specification:

- > ACT Crime Prevention and Urban Design Resource Manual, Planning and Land Management, ACT Department of Urban Services, 2000 (ACT Government).
- > ACT Planning Guidelines for Access and Mobility, PALM, Draft 2001 (ACT Government).
- > Water Sensitive Urban Design, Guidelines for Sustainable Development in Canberra, Urban Services, (ACT Government).
- > Water and Sewerage Standards, ACTEW Corporation, 2000 (ACT Government).
- > Australian New Zealand Food Standards Code.
- > Signage Policy for Urban Parks and Places, Minale Tattersfeild Bryce & Partners, 2001.
- > Basic Specification for Urban Infrastructure, Department of Urban Services, 2001 (ACT Government).

### **1.1.2.3 Design standards**

Requirement: The following relevant design standards but not limited to consideration of the following are related to this specification:

- > MIS 01 Street Planning and Design (ACT Government).
- > MIS 02 Earthworks and Site Grading (ACT Government).
- > MIS 03 Pavement Design (ACT Government).
- > MIS 04 Subsurface Drainage (ACT Government).
- > MIS 05 Active Travel (ACT Government).
- > MIS 06 Verges (ACT Government).
- > MIS 07 Driveways (ACT Government).
- > MIS 08 Stormwater (ACT Government).
- > MIS 09 Bridges and Related Structures (ACT Government).
- > MIS 10 Fences Guardrails and Barriers (ACT Government).
- > MIS 11 Off Street Parking (ACT Government).
- > MIS 12 Guide Signs (ACT Government).
- > MIS 13 Traffic Control Devices (ACT Government).
- > MIS 14 Public Lighting (ACT Government).
- > MIS 15 Urban Edge Management Zone (ACT Government).
- > MIS 16 Urban Open Space (ACT Government).
- > MIS 17 Shopping Centres and Other Public Urban Spaces (ACT Government).
- > MIS 18 Irrigation (ACT Government).
- > MIS 19 Sportsground Design (ACT Government).
- > MIS 20 Street and Park Furniture and Barbeques (ACT Government).
- > MIS 21 Playgrounds and playground equipment (ACT Government).
- > MIS 22 Signage for Urban Parks and Open Space (ACT Government).
- > MIS 23 Public Toilets (ACT Government).
- > MIS 24 Soft Landscape Design (ACT Government).
- > MIS 25 Plant Species for Urban Landscape Projects (ACT Government).

### **1.1.2.4 ACT Government Reference documents**

General: The following ACT Government reference documents are related to this specification:

- > Design Standards for Urban Infrastructure, series (ACT Government).
- > Standard Specification for Urban Infrastructure Works, series (ACT Government)
- > TCCS Standard Drawings, Series (ACT Government).
- > TCCS Reference Documents, Series (ACT Government).

> ACT Government Technology Reference Manual (ACT Government).

### 1.1.3 Interpretation

#### 1.1.3.1 Abbreviations:

General: For the purpose of this Specification the following abbreviations apply:

AS:	Australian Standard.
BIM:	Building Information Modelling.
CAD:	Computer Aided Design.
ESD:	Ecologically sustainable development.
ICSM:	Intergovernmental Committee on Surveying and Mapping.
NATA:	National Association of Testing Authorities.
NZS:	New Zealand Standard.
TBS:	To Be Supplied.
WHS:	Work Health and Safety.

#### 1.1.3.2 Definitions

General: For the purpose of this work the definitions given below applies:

**Authorities:** Includes service agencies and Road Authorities.

**Documented:** Documented, as documented and similar terms mean contained in the contract documents.

**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.

**Hold point:** A mandatory verification position in the contract beyond which work cannot proceed without the designated authorisation.

**Local (government) authority:** A body established for the purposes of local government by or under a law applying in a state or territory.

**Manufacturers' and suppliers' recommendations:** Recommendations, instructions, requirements, specifications (and similar expressions) provided in written or other form by the manufacturer relating to the suitability, use, installation, storage and/or handing of a product.

**Obtain:** Obtain, seek and similar expressions mean obtain (seek) in writing from the contract administrator.

**Permanent marks:** Survey control marks that are permanent by nature and are uniquely defined in the state control survey. Also known as State survey marks (SSM) or Bench marks (BM).

**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:** A person who is

- . If legislation is applicable: A registered professional engineer in the relevant discipline who has appropriate experience and competence in the relevant field.
- . If legislation is not applicable: Registered in relevant discipline on the National Engineering Register (NER) a corporate member of Engineers Australia or eligible to become a corporate member registered on NER and has appropriate experience and competence in the relevant field.

**Progressive inspections:** Inspections that are required progressively on a component during the course of the project.

**Proprietary:** Identifiable by naming the manufacturer, supplier, installer, trade name, brand name, catalogue or reference number.

**Provide:** Provide and similar expressions mean supply and install and include development of the design beyond that documented.

**Registered testing authority:**

- . NATA accredited laboratory: An organisation accredited by the National Association of Testing Authorities (NATA) to test in the relevant field; or
- . An organisation outside of 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:** Required by the contract 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.

**Road authority:** As defined by the *Roads Act* in the state where the road is located.

**Statutory authority:** A public sector entity created by legislation, that is, a specific law of the Commonwealth, State or Territory.

**Superintendent:** Superintendent has the same meaning as contract administrator or principal's representative unless the contract requires otherwise.

**Supply:** Supply, furnish and similar expressions mean supply only.

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

**Tests – completion:** Tests carried out on completed installations or systems and fully resolved before the date for practical completion, to demonstrate that the installation or system, including components, controls and equipment, operates correctly, safely and efficiently, and meets performance and other requirements. The superintendent may direct that completion tests be carried out after the date for practical completion.

**Tests – pre-completion:** Tests carried out before completion tests, including:

- . Production: Tests carried out on a purchased item, before delivery to the site.
- . Progressive: Tests carried out during installation to demonstrate performance in conformance with this specification.
- . Site: Tests carried out on site.
- . Type: Tests carried out on an item identical with a production item, before delivery to the site.

**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.

**Witness point:** A nominated position, in the different stages of the Contract, where the option of attendance may be exercised by the Superintendent, after notification of the requirement.

## **1.1.4 General requirements**

### **1.1.4.1 Submission times**

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

### **1.1.4.2 Notice**

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

- Existing utility services: Discrepancies from documented location.
- Relocation and alterations to existing utility services: Proposed removal, diversion or cutting into existing service.
- Supplied survey setting out information: Transfer of survey marks.

### **1.1.4.3 Manufacturers' or suppliers' recommendations**

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

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

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

### **1.1.4.4 Substitution**

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

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

- Evidence of conformity to a cited standard.
- Evidence that the performance and durability is equal to or greater than that specified.
- Samples.
- Essential technical information, in English.
- Reasons for the proposed substitutions.
- Statement of the extent of revisions to the contract documents.
- Statement of the extent of revisions to the construction program.
- Statement of cost implications including costs outside the contract.
- Statement of consequent alterations to other parts of the Works.

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

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

- Is of net enhanced value to the principal.

- Is consistent with the contract documents and is as effective as the identified item, detail or method.

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

#### **1.1.4.5 Existing utility services**

Subsurface utilities: Information shown on the drawings relating to underground or submerged utilities is accurate to the following quality level, to AS 5488:

Quality level: A

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

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

Discrepancies: If there is any conflict between the actual location or elevation of any service and the location or elevation of any service shown on the drawings, give notice.

Sensitivity of utilities: Identify those utilities such as optical fibre cables sensitive to the vibration from heavy duty compaction rollers.

Excavation adjacent to utility services: Use only utility authority approved methods of excavation.

Limitations to work methods: Include in work method procedures, any restrictions required by the relevant authority, such as vibrations in the vicinity of underground and overhead facilities.

#### **1.1.4.6 Alternative construction**

Requirement: If the use of alternative materials, design or methods of construction is permitted, prepare detailed working drawings, design calculations and specifications for the alternative.

Documentation: Provide 2 sets of CAD working drawings and any supporting calculations.

Revisions: Attend to any required revisions to drawings or calculations and resubmit 2 sets of the revised drawings and calculations.

Certification: Provide certification by a Professional Engineer experienced in the alternative construction design, verifying conformance of the design.

Submission timing: At least four weeks before construction of the relevant part of the work is scheduled to commence.

Approval to proceed: Do not commence the Works until an endorsed set of working drawings has been returned.

#### **1.1.4.7 Shop drawing**

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

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

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

#### **1.1.4.8 Warranties**

Requirement: Name the Principal as warrantee. Register with manufacturers as necessary. Retain copies delivered with components and equipment.

Warranty period: Start warranty periods at acceptance of installation.

Work-as-executed drawings recording: Keep one set of drawings, CAD or BIM files on site at all times, expressly for the purpose of marking changes made during the progress of the Works.

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

#### **1.1.4.9 Operation and maintenance manuals**

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

Referenced documents: If referenced documents require that manuals be submitted, include corresponding material in the operation and maintenance manuals.

#### **1.1.4.10 Summary of hold and witness points**

Clause title: Submissions (HOLD POINT), Execution details – working area and site facilities.

Requirement: Positioning of all units and services for site facilities.

Notice for inspection / time: 1 week before installation.

Process held / Release by: Installation of site facilities.

Clause title: Submissions (HOLD POINT), Execution details – working area and site facilities.

Requirement: Alternative site facilities in existing buildings.

Notice for inspection / time: 2 weeks before installation.

Process held / Release by: Installation of site facilities.

Clause title: Inspection (WITNESS POINT), Notice, Existing utility services.

Requirement: Discrepancies from documented location.

Notice for inspection / time: 1 week.

Process held / Release by: Authorised person.

Clause title: Inspections (WITNESS POINT), Notice, relocation and alterations to existing utility services.

Requirement: Relocation and alterations to existing utility services.

Notice for inspection / time: 1 week.

Process held / Release by: Authorised person.

Clause title: Inspections (WITNESS POINT), Notice, supplied survey setting out information.

Requirement: Transfer of survey marks.

Notice for inspection / time: 2 days.

Process held / Release by: Authorised person.

#### **1.1.4.11 Reference documents**

The following documents are incorporated by reference:

- AS 5488 – 2020: Classification of Subsurface Utility Information (SUI).
- ASMM – 1998: ASSM - Civil engineering measurement.
- Austroads AGPD: Guide to project delivery.
- Austroads AGPD03 – 2014: Contract management.
- Austroads AP-C87 – 2015: Austroads glossary of terms. 2015 edition.
- ICSM QA Specification G71 – 2009: Intergovernmental Committee on surveying and mapping – Road construction surveys.

- Safe Work Australia: Hazardous chemical information system.

## **1.1.5 Adhesives, sealants and fasteners**

### **1.1.5.1 Responsibilities**

Requirement: Provide adhesives, sealants and fasteners, as required to complete the works.

### **1.1.5.2 Performance**

Requirements: Conform to the following:

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

## **1.1.6 Metals and prefinishes**

### **1.1.6.1 Responsibilities**

Requirements: Provide metal and prefinishes, as required to complete the works.

### **1.1.6.2 Performance**

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

### **1.1.6.3 Coated steel**

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

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

- 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.

### **1.1.6.4 Stainless steel**

Bars: To ASTM A276/A276M.

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

Welded pipe (plumbing applications): To AS 1769.

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

### **1.1.6.5 Metal separation**

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

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

Incompatible fixings: Do not use.

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

## **1.1.7 Termite management**

### **1.1.7.1 Responsibilities**

Requirement: Provide termite management systems, as required to complete the works.

### **1.1.7.2 Performance**

Objective: To achieve building protection.

Termite management systems: To AS 3660.1.

### **1.1.7.3 Certification**

Certificate of installation: Submit certificate to AS 3660.1 Appendix A3.

## **1.1.8 Timber products finishes and treatment**

### **1.1.8.1 Responsibilities**

Requirement: Provide timber products with finishes and treatments, as required to complete the works.

### **1.1.8.2 Performance**

Requirements:

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

### **1.1.8.3 Standards**

Sawn and milled products:

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

Plywood:

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

Glued laminated timber: To AS/NZS 1328.1.

Laminated veneer lumber: To AS/NZS 4357.0.

### **1.1.8.4 Timber source certification**

Requirement: Provide forest certification, chain of custody certification and corresponding product labelling for all timber applications documented as requiring source certification.

### **1.1.8.5 Timber product certification and branding**

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

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

### **1.1.8.6 Durability**

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

Natural durability class: To AS 5604.

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

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

Lyctid susceptible timbers: Do not provide untreated timbers containing lyctid susceptible sapwood. Untreated sapwood: If used, place to the outside of joints or in locations exposed to higher levels of ventilation.

## **1.1.9 Sundry items**

### **1.1.9.1 Responsibilities**

Requirement: Provide sundry items, as required to complete the works.

### **1.1.9.2 Performance**

Requirements: Installation as follows:

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

### **1.1.9.3 Items connected to hydraulic services - tapware**

Tapware – Timed Lever: To be *Britex Timed Flow* Level Piller Tap (TW-9103), or *RBA Inox* Water Saving Tap Self-Closing Tap (RBA1083), or similar polished stainless-steel water saving self-closing pillar tap.

Installation to manufacturer's directions and to comply with AS1428.1. Generally installed to all stainless-steel fixtures – wall and vanity basins.

Tapware – Food Servery Area Wall Basin: To be *Enware Oras Viva* Series Basin Mixer (SLM306A), or similar wall mounted wall basin set, commercial quality, highly vandal resistant with heavy duty chrome plated finish. Installation to manufacturer's directions and connected to multi knee hands free activation stainless steel wall basin.

Tapware – First Aid / Medical Room Wall Basin: To be *Enware Oras Viva* Series Basin Mixer (SLM306A), or similar wall mounted wall basin set, commercial quality, highly vandal resistant with heavy duty chrome plated finish. Installation to manufacturer's directions and connected to multi knee hands free activation stainless steel wall basin.

Tapware – Food Servery Area Sink: To be *Modella Vegr* Spray Coil Sink Mixer (5003389), or *Britex* Pre-rinse Sprays Hob Mounted Dual Mixer with Pot Filler (TW-PR-HMP), or similar with hot and cold control taps with 100mm levers, stainless-steel flexible hose connections and 1000mm long high-pressure hose

with swivel ends, stainless-steel spring, vibration-resistant wall bracket and premium quality robust hand trigger spray. Installation to manufacturer's directions.

Tapware – Cleaners Sink: To be *Britex* Wall Mounted Sink Set with Gooseneck Swivel Spout (TW-Set-05), or similar wall mounted high arc gooseneck sink set, commercial quality, highly vandal resistant with heavy duty chrome plated finish. Installation to manufacturer's directions.

Tapware – Shower Handles: To be *RBA* Vandal and Ligature Resistant Shower Handles, or similar highly polished chrome finish with blue or red indicator to each handle. Installation to manufacturer's direction.

Shower Rose: To be *RBA* Vandal and Ligature Resistant Conical Shower Rose, or similar highly polished chrome finish shower rose. Installation to manufacturer's direction.

Floor Waste: To be *3Monkeez* In-floor (for concrete and epoxy chip floor areas) or Vinyl Clamp-down (to Food Servery Area with sheet vinyl flooring) Bucket Trap Stainless-steel Floor Waste Outlet with removable strainer basket and fixed secondary strainer, or similar. Floor waste outlet grate to be stainless-steel Heel grate for areas / rooms with Accessible and Ambulant access provisions requirements to AS1428.1. To be installed to manufacturer's directions.

#### **1.1.9.4 Items connected to hydraulic services - fixtures**

Cleaners Sink: *Britex* Stainless-steel Cleaners Sink (CCB – Wall Brackets), or similar heavy-duty grade 304 satin stainless-steel, heavy duty grade 304 stainless-steel hinged bucket grate, concealed wall brackets, additional 600mm high upstand to rear. Installed to manufacturer's directions.

Food Servery Stainless-steel Wall Basin: To be *Britex* Knee Operated Hand Basin (HBKO), or similar heavy-duty grade 304 satin stainless-steel, concealed wall brackets, blade upstand to rear and multi knee hands-free activation to spout and basin. Installed to manufacturer's directions.

Vanity Stainless-steel Insert Basin: To be *Britex* *Vanity* Insert Basin (HBV1), or similar heavy-duty grade 304 satin stainless-steel, concealed wall brackets, blade upstand to rear with single tap hole. Installed to manufacturer's directions.

Vanity Basin – Stainless-steel: To be *Britex* *Grandeur* Hand Basin (NBSU), or similar heavy-duty grade 304 satin stainless-steel, concealed fixings with integrated security concealed plumbing, upstand to rear with single tap hole. Installed to manufacturer's directions.

Double Bowl Wall Basins – Stainless-steel: To be *Britex* Stainless-steel Double Wall Basin (HBMV), or *RBA* Stainless-steel Curvalinear Double Basin Wall Mounted (RBA8889-286), or similar double wall basin. Fully shrouded in heavy-duty gauge grade 304 satin stainless steel, with completely concealed plumbing, integral splashback and vandal resistant fixing. Installation to manufacturer's directions, with water saving self-closing vanity mounted taps.

Wall Basin, Accessible – Stainless-steel: To be *Britex* Stainless-steel Disabled Hand Basin (HBDA), or *RBA* Stainless-steel Benefit Basin Wall Mounted (RBA8867-100), or similar accessible wall basin. Fully shrouded in heavy duty gauge grade 304 satin stainless steel, with completely concealed plumbing, integral splashback and vandal resistant fixing. Installation to manufacturer's directions and to comply with AS1428.1 with water saving self-closing vanity mounted tap.

Toilet Pan & Seat, Standard – Stainless-steel: To be *Britex* Stainless-steel Centurion Toilet Pan (PCP – P-trap preferred), or *RBA* Stainless-steel Toilet Pan (RBA8851-100, P-trap preferred), or similar standard toilet pan. Fully shrouded in heavy duty gauge grade 304 satin stainless steel, with concealed fixings, blockage resistant trap. With *Britex* Economy Closed Front Toilet Seat (STB), or *RBA* Commercial Closed

Front Toilet Seat (RBA8186-012), or similar Standard Toilet Seat in colour Navy. Installation to manufacturer's directions.

Toilet Pan & Seat, Accessible – Stainless-steel: To be *Britex* Stainless-steel Centurion Disabled Toilet Pan (PCDP – P-trap preferred); or *RBA* Accessible Stainless-steel Toilet Pan (RBA8851-428-304 – P-trap preferred), or similar accessible toilet pan. Fully shrouded in heavy duty gauge grade 304 satin stainless steel, with concealed fixings, blockage resistant trap. With *Britex* Vandal Resistant Closed Front Toilet Seat (SVRC-N), or *RBA* Vandal Resistant Closed Front Accessible Toilet Seat (RBA8186), or similar Accessible Toilet Seat in colour Navy. Installation to manufacturer's directions and to comply with AS1428.1.

Toilet Pan & Seat, Ambulant – Stainless-steel: To be *Britex* Stainless-steel Centurion Ambulant Toilet Pan (PCAMP – P-trap preferred), or *RBA* Ambulant Stainless-steel Toilet (RBA8851-156-304 – P-trap preferred), or similar ambulant toilet pan. Fully shrouded in heavy duty gauge grade 304 satin stainless steel, with concealed fixings, blockage resistant trap. With *Britex* Vandal Resistant Closed Front Toilet Seat (SVRC-N), or *RBA* Commercial Toilet Seat (RBA8186-012), or similar Ambulant Toilet Seat, in colour Navy. Installation to manufacturer's directions and to comply with AS1428.1.

Toilet Pan, Cistern: To be *Britex* In-wall Dual Flush highly vandal resistant toilet pan flushing option for in-wall, in-duct installation cistern (FIX) with large / small button mechanical direct access actuator plate, stainless steel backing plate and buttons (FXI-M63), or similar. Raised buttons to suit Disabled access pan and to AS1428.1. Installation to manufacturer's directions.

Drinking Fountain and Bottle Refill Station: To be Aquafil Flexi Fountain 1500BF drinking fountain and bottle refill station, or similar with stainless-steel housing frame and graphic panels, anodised aluminium housing unit. Installation on concrete slab / plinth to manufacturer's directions.

#### **1.1.9.5 Items connected to electrical services**

Electric Hand Dryer: To be *Britex* Stainless Steel Ecojet Electric Hand Dryer (BTX-01-012), or *RBA* Trimline Electric Dryer (B7128E), or similar. Stainless-steel surface mounted electric hand dryer, with fixed connection. Installation to manufacturer's directions.

#### **1.1.9.6 Items not connected**

Baby Change Table: To be *Koala Kare Products* Horizontal Wall Mounted Stainless Steel Finish Baby Changing Table (KB110-SSWM), or *Britex* Stainless-steel Surface Mounted Baby Change Station (BTX-09-012), or similar. Concealed fixings in 18 gauge grade 304 satin stainless-steel exterior finish with blow moulded high-density grey polyethylene with antimicrobial interior. Reinforced full-length steel-on-steel hinge mechanism. Complete with nylon safety straps and bag hooks. Installation to manufacturer's directions.

Grab Rails 840 / 140 degree: To be *Caroma Virtu Comfort* Grab Rail (8478477440), or *RBA* Grab Rail Wraparound 90 Degree, or similar stainless-steel corner and return grab rail. Satin stainless-steel with concealed fixings to mounting flanges behind snap flange covers. Installation to manufacturer's directions and to comply with AS1428.1.

Grab Rails 300mm Long: To be *Caroma Virtu Comfort* Grab Rail (84730040), or *RBA* Grab Rail Straight (RBA4000), or similar straight 300mm long stainless-steel grabrail. Satin stainless-steel with concealed fixings to mounting flanges behind snap flange covers. Installation to manufacturer's directions and to comply with AS1428.1.

Grab Rails 450 / 90 degree: To be *Caroma Virtu Comfort* Grab Rail (8474545440), or *RBA* Grab Rail Wraparound 90 Degree (RBA4090), or similar stainless-steel corner and return grab rail. Satin stainless-steel with concealed fixings to mounting flanges behind snap flange covers. Installation to manufacturer's directions and to comply with AS1428.1.



Grab Rail with Back Rest: To be *RBA 90 Degree Wraparound with Integrated Back Rest (RBA4150)*, or similar stainless-steel corner and return wraparound with integrated back rest grab rail system. Satin stainless-steel with concealed fixings to mounting flanges behind snap flange covers. Installation to manufacturer's directions and to comply with AS1428.1.

Shower Grabrail & Mixer Set: To be *RBA Shower T-rail Set & Lever Mixer (RBAS4110-928/929)*, or *RBA Shower T-rail with Kit (RBA4110)*, or similar stainless-steel shower T-rail, mixer, slider, handset and hose. Satin stainless-steel with concealed fixings to mounting flanges behind snap flange covers. Installation to manufacturer's directions and to comply with AS1428.1.

Mirror Stainless-steel: To be *Britex SMIR Security Mirror (SMIR)*, or *Bobrick Frameless Stainless-steel Mirror (B-1556 Series)*, or similar stainless-steel mirror. From premium quality #8 true mirror finish stainless-steel, bonded to MR substrate, with concealed fixing bracket and fixings. Size to suit application and AS1428.1. Installation to manufacturer's directions.

Stainless-steel Kitchen Benchtops: To be 1.2mm thick grade 316 satin stainless-steel finish with 2.0mm thick corrosion resistant zinc plated steel substrata, stainless-steel tube legs with adjustable feet. 150mm high integrated splashback and solid stainless-steel channel reinforced undershelves.

Bike Rack: To be *Street Furniture Australia, Semi-hoop (BST03) Surface Mounted Bike Rack*, or similar. Installation to manufacturer's directions.

Bench Seating: To be made from *Replas* recycled plastic slats, or similar. Slats to be 40 x 90mm or 45 x 95mm in long lengths bolted to stainless steel support frame and legs – refer ACT Government Municipal Infrastructure Standards, Part 19a Sportsground Pavilions.

Toilet Roll Holders: To be made to match the standard ACT Government Four (4) Roll Toilet Roll Holder with Shroud. In powdercoated galvanised steel with lockable spindle fixed to wall – refer ACT Government Municipal Infrastructure Standards, Part 19a Sportsground Pavilions.

## **1.1.10 Building access safety system**

### **1.1.10.1 Responsibilities**

Requirement: Provide the building access safety system, as required to complete the works.

### **1.1.10.2 Performance**

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

### **1.1.10.3 Design requirements**

Performance requirements: To AS/NZS 1891.2 Section 4.

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

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

### **1.1.10.4 Standards**

Industrial fall-arrest system: To AS/NZS 1891.1, AS/NZS 1891.2, AS/NZS 1891.3 and AS/NZS 1891.4.

Industrial rope access system: To AS/NZS 4488.1 and AS/NZS 4488.2.

#### **1.1.10.5 Product identification**

General: Mark to show the following:

- Manufacturer's identification.
- Installer's contact details.
- Intended location.
- Load rating and direction.
- Current inspection/service date.
- Batch number or serial number of the components.

#### **1.1.10.6 Maintenance**

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

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

The installer/competent person: To AS/NZS 1891.2 clause 1.2.1.

#### **1.1.10.7 Periodic 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 at the date for practical completion.
- . Upon the expiry of the Defects Liability period or 12 months after completion of the installation whichever is the lesser, and valid for a further 12 months period.
- Record the date of the next system inspection and period of validity and display the certificate at the access points of the work area or on the individual system components where provision is made.

#### **1.1.10.8 Regular scheduled periodic 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 at the date for practical completion.
  - . Upon the expiry of the Defects Liability period or 12 months after completion of the installation whichever is the lesser, and valid for a further 12 months period.
- Record the date of the next system inspection and period of validity and display the certificate at the access points of the work area or on the individual system components where provision is made.

#### **1.1.10.9 Inspection after a fall or other event**

Standard: To AS/NZS 1891.2 Supp 1 clause 9.3.

#### **1.1.10.10 Proof testing of drilled-in anchorages**

Standard: To AS/NZS 1891.2 Supp 1 clause 9.4.

#### **1.1.10.11 On-going maintenance**

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

## **1.1.11 Site preparation**

### **1.1.11.1 Responsibilities**

Requirement: Provide site preparation, as required to complete the works.

### **1.1.11.2 Existing services**

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

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

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

Existing service lines: If required, divert services detected during excavation to new routes, clear of the building, and reconnect to the Network Utility Operator's requirements.

### **1.1.11.3 Site clearing**

Requirement: Clear only areas to be occupied by works such as structures, paving, excavation, regrading and landscaping or other areas designated to be cleared.

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

### **1.1.11.4 Clearing and grubbing**

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

Grubbing: Grub out stumps and roots over 75 mm diameter to a minimum depth of 500 mm below subgrade under buildings, embankments or paving, or 300 mm below finished surface in unpaved areas. Backfill holes remaining after grubbing with sand material to prevent ponding of water. Compact the material to the relative density of the existing adjacent ground material.

Redundant/decommissioned works: Remove works, including slabs, foundations, pavings, drains and access chambers covers found on the surface.

### **1.1.11.5 Batters**

Temporary protection: Where change in level between crest and toe is more than 1.5 m, protect from erosion with geofabric, a hessian and tar or heavy-duty black polythene sheet waterproof cover. Seal joints and securely fix down at crest and toe.

### **1.1.11.6 Surplus material**

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

### **1.1.11.7 Stormwater and sediment control**

Waterways: Temporarily divert, as necessary, ditches, field drains and other waterways affected by excavation and reinstate on completion.

Stormwater drains: Divert drains detected during excavation to new routes, clear of the building, and reconnect to the Network Utility Operator's requirements.

#### **1.1.11.8 Clean up**

Progressive cleaning: Keep the work included in the contract clean and tidy as it proceeds and regularly remove from the site waste and surplus material arising from execution of the work, including any work performed during the Defects Liability period or the plant establishment period.

Removal of plant: Within 10 working days of the date of practical completion, remove temporary works, construction plant, buildings, workshops and equipment which does not form part of the works, except what is required for work during the Defects Liability period or the plant establishment period. Remove these on completion.

Waste disposal: To ACT Government requirements.

#### **1.1.11.9 Vermin management**

Requirement: Employ an approved firm of pest exterminators and provide a certificate from the firm stating that the completed works is free of vermin.

### **1.1.12 Earthworks**

#### **1.1.12.1 Responsibilities**

Requirement: Provide earthworks to the dimensions and tolerances, as required to complete the works.

#### **1.1.12.2 Standards**

Earthworks: Conform to the recommendations of those parts of AS 3798.

### **1.1.13 Landscape Works**

#### **1.1.13.1 Responsibility**

Requirement: Provide landscaped planting, as documented.

Plants: Grown to a standard that allows rapid establishment and growth to maturity.

Maintenance: Encourage and maintain healthy growth for the duration of the contract.

#### **1.1.13.2 Interpretation**

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

- Imported topsoil: Similar to naturally occurring local topsoil, suitable for the establishment and ongoing viability of the selected vegetation, free of weed propagules and of contaminants, and classified by texture to AS 4419 Appendix K Table KI, as follows:
  - . Fine: Clay loam, fine sandy clay loam, sandy clay loam, silty loam, loam.
  - . Medium: Sandy loam, fine sandy loam.
  - . Coarse: Sand, loamy sand.
- Plant establishment period: The period between the date of practical completion and the end of the Defects Liability period.
- Site topsoil: Natural soil excavated from the site which contains organic matter, supports plant life, conforms generally to the fine-to-medium texture classification to AS 4419 and free from the following:
  - . Stones more than 25 mm diameter.
  - . Clay lumps more than 50 mm diameter.
  - . Weeds and tree roots.
  - . Sticks and rubbish.
  - . Material toxic to plants.

### 1.1.13.3 Inspection

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

- Subgrades cultivated or prepared for placing topsoil.
- Topsoil spread before planting.
- Grassing bed prepared before turfing, seeding, or temporary grassing.
- Grassing or turfing completed.
- Plant holes excavated and prepared for planting.
- Plant material set out before planting.
- Planting, staking and tying completed.
- Completion of planting establishment work.

### 1.1.13.4 Topsoil

Site and imported topsoil: To AS 4419.

Potting mixes: To AS 3743.

Composts, soil conditioners and mulches: To AS 4454.

Source: If the topsoil of documented quality cannot be provided from material recovered from site, provide imported topsoil.

Imported topsoil: Provide imported topsoil, as documented.

#### Imported topsoil particle size table (% passing by mass)

Sieve aperture (mm)	Fine texture	Medium texture	Coarse texture
2.36	100	100	100
1.18	90 – 100	90 – 100	90 – 100
0.60	75 – 100	75 – 100	70 – 90
0.30	57 – 90	55 – 85	30 – 46
0.15	45 – 70	38 – 55	10 – 22
0.075	35 – 55	25 – 35	5 – 10
0.002		2 – 15	2 – 8

#### Imported topsoil nutrient level table

Nutrient	Unit	Sufficiency range
Nitrate-N (NO <sub>3</sub> )	mg/kg	> 25
Phosphate-P (PO <sub>4</sub> ) – P tolerant	mg/kg	43 - 63
Phosphate-P (PO <sub>4</sub> ) – P sensitive	mg/kg	< 28
Phosphate-P (PO <sub>4</sub> ) – P very sensitive	mg/kg	< 6
Potassium (K)	mg/kg	178 - 388
Sulphate-S (SO <sub>4</sub> )	mg/kg	39 - 68
Calcium (Ca)	mg/kg	1200 - 2400
Magnesium (Mg)	mg/kg	134 - 289
Iron (Fe)	mg/kg	279 - 552
Manganese (Mn)	mg/kg	18 - 44
Zinc (Zn)	mg/kg	2.6 - 5.1

Nutrient	Unit	Sufficiency range
Copper (Cu)	mg/kg	4.5 - 6.3
Boron (B)	mg/kg	1.4 - 2.7

#### **Method References**

pH in H<sub>2</sub>O (1:5), pH in CaCl<sub>2</sub> (1:5) and Electrical Conductivity (EC) by Rayment & Higginson (1992) method 4A2, 4B2, 3A1

Soluble Nitrate-N by APHA 4500

Soluble Chloride by Rayment and Lyons 2011 modified method 5A2

Extractable P by Mehlich 3 – ICP

Exchangeable cations – Ca, Mg, K, Na by Mehlich 3 – ICP

Extractable S by Mehlich 3 – ICP

Extractable trace elements (Fe, Mn, Zn, Cu, B) by Mehlich 3 - ICP

Site topsoil: Provide site topsoil, as documented.

Soil blend: If required, stripped natural soil with sand and/or organic matter and recommended ameliorants.

#### **1.1.13.5 Grass**

Seed mixture description: Fresh, clean, uncoated new seed, thoroughly pre-mixed with a bulking material such as safflower meal.

Unacceptable seed: Wet, mouldy or otherwise impaired.

Purity (minimum): 98%.

Germination viability (minimum): 86%.

Age (maximum) from date of harvest: 2 years.

Handling: Deliver to the site in bags marked to show weight, seed species and supplier's name.

Turf description: Cultivated turf of even thickness, free from weeds and other foreign matter.

Supplier: A specialist grower of cultivated turf.

#### **1.1.13.6 Fertiliser**

Type: Proprietary fertilisers, delivered to the site in sealed bags marked to show manufacturer or supplier, weight, fertiliser type, N:P:K ratio, recommended uses and application rates.

Application rate: Vary the application rate to allow for the plant-available immediate fertilizer equivalence value of the soil conditioning compost.

#### **1.1.13.7 Plants**

Supply trees to AS 2303 and with the following properties:

- Stress: Free from stress resulting from inadequate watering, excessive shade or excessive sunlight experienced at any time during their development.
- Site environment: Grown and hardened off to suit anticipated site conditions at the time of delivery.
- Pests and disease: Free from attack by pests or disease.

- Native species with a history of attack by native pests: Restrict plant supply to those with evidence of previous attack to less than 15% of the foliage and make sure actively feeding insects are absent.

Labelling general: To AS 2303 clause 4.2.1.

Label type: To withstand transit without erasure or misplacement.

Root system requirement: Supply plant material with a root system that is:

- Well-proportioned in relation to the size of the plant material.
- Conducive to successful transplantation.
- Free of any indication of having been restricted or damaged.

Root inspection: If inspection is by the removal of soil test, such as investigative inspection, sample as follows:

- For > 100 samples: Inspect 1%.
- For < 100 samples: Inspect 1 sample.

Sample plants: Replace plants used in investigative inspection.

Rejection: Do not provide root bound stock.

#### **1.1.13.8 Preparation**

Weed eradication herbicide: Eradicate weeds using environmentally acceptable methods, such as a non-residual glyphosate herbicide in any of its registered formulae, at the maximum application rate.

Manual weeding: Regularly remove weed growth by hand throughout grassed, planted and mulched areas. Remove weed growth from an area of 750 mm diameter around the base of the trees in grassed areas. Continue weeding throughout the course of the works and during the planting establishment period.

Vegetative spoil disposal: Remove vegetative spoil from site. Do not burn.

#### **1.1.13.9 Rock work**

Existing rock: Protect existing rock, rock shelves and rock outcrops from mechanical damage, surface defacement and other works.

Rock surfaces: Report damage or defacement occurring to any rock faces during the course of the works.

Replacement: If restoration is not feasible, repair the rock face with replacement rocks from site or imported rocks of similar type.

New rock work erosion control: Bury rock two thirds by volume, with weathered faces exposed. Protect the weathered faces from damage.

Site rock: Stockpile for future placement and accessibility for lifting. Dispose of other rock off site.

Imported rock: Provide rock which has been selected before delivery.

Placing rock: Place while ground formation work is being carried out, as documented.

#### **1.1.13.10 Earth mounds**

Construction and placing: Place clean fill in layers approximately 150 mm thick compacted to 85% of the dry density ratio of the surrounding soil tested to AS 1289.5.4.1. Minimise slumping and further compacting.

Edges: Construct changes in grade over a minimum width of 500 mm to smooth, gradual and rounded profiles with no distinct joint.

Existing trees: Maintain the natural ground level under the canopy.

Pipes, culverts and associated structures: Construct mounding to avoid unbalanced loading.

Drainage: Construct mounds to allow free drainage of surface water and to eliminate ponding.

#### **1.1.13.11 Subsoil**

Ripping: Rip parallel to the final contours. Do not rip when the subsoil is wet or plastic. Do not rip within the dripline of trees and shrubs to be retained.

Ripping depths: Rip the subsoil to the following typical depths:

- Compacted subsoil: 300 mm.
- Heavily compacted clay subsoil: 450 mm.

Planting beds excavated: Excavate to reduce the subsoil level to at least 300 mm below finished design levels. Shape the subsoil to fall to subsoil drains, if required. Break up the subsoil to a further depth of 100 mm.

Unexcavated: Remove weeds, roots, rubbish and other debris. Reduce the planting bed level to 75 mm below finished design levels.

Cultivation minimum depth: 100 mm.

Services and roots: Do not disturb services or tree roots. If required, cultivate these areas by hand.

Cultivation: Cultivate manually within 300 mm of paths or structures. Remove stones exceeding 25 mm, clods of earth exceeding 50 mm, and weeds, rubbish or other deleterious material brought to the surface during cultivation. Trim the surface to design levels after cultivation.

Additives: Apply additives after ripping or cultivation and incorporate into the upper 100 mm layer of the subsoil as documented.

Gypsum: Incorporate at the rate of 0.25 kg/m<sup>2</sup>.

#### **1.1.13.12 Topsoil**

Spreading: Spread the topsoil on the prepared subsoil and grade evenly, making allowances, if appropriate, for the following:

- Required finished levels and contours after light compaction.
- Grassed areas finished flush with adjacent hard surfaces such as kerbs, paths and mowing strips.

Steep batters: If using a chain drag, make sure there is no danger of batter disturbance.

Finishing: Feather edges into adjoining undisturbed ground.



Consolidation: Compact lightly and uniformly in 150 mm layers. Avoid differential subsidence and excess compaction and produce a finished topsoil surface which has the following characteristics:

- Finished to design levels.
- Smooth and free from stones or lumps of soil.
- Graded to drain freely, without ponding, to catchment points.
- Graded evenly into adjoining ground surfaces.
- Ready for planting.

Topsoil depths: Spread topsoil to the following typical depths:

- Excavated planting areas:
  - . For organic mulch: 225 mm.
  - . For gravel mulch: 250 mm.
- Irrigated grassed areas generally: 150 mm.
- Irrigated grassed areas, heavy use (e.g. playing fields, playgrounds, and public parks): 200 mm.
- Non-irrigated grass areas: 100 mm.
- Earth mounds:
  - . Mass planted surfaces: 300 mm.
  - . Grassed surfaces: 100 mm.
- Top dressing: 10 mm.

Surplus topsoil: Spread surplus topsoil on designated areas on site or dispose off-site.

#### **1.1.13.13 Grass seeding**

General: If a prepared area becomes compacted before sowing can begin, rework the ground surface before sowing.

Application ambient conditions: Do not sow in periods of extreme heat, cold or wet or when wind velocities exceed 8 km/h or if frost is likely before the grass is established.

Method: Evenly distribute the seed using purpose-made sowing machinery. Lightly rake the surface to cover the seed.

Rolling: Roll the seed bed immediately after sowing.

- Roller weight (maximum):
  - . Clay and packing (heavy) soils: 90 kg/m width.
  - . Sandy and light soils: 300 kg/m width.

Reseeding: If germination has not occurred within one month, reseed the sown areas.

Watering before germination: Water the seeded area with a fine spray until the topsoil is moistened to its full depth. Until germination, keep the surface damp and the topsoil moist but not waterlogged.

After germination: Water to maintain a healthy condition, progressively hardened off to the ambient climatic conditions.

Establishment: Maintain sown areas until there is a dense continuous sward of healthy grass over the whole of the seeded area, evenly green and of a consistent height.

Protection: Protect the newly sown areas against traffic until established.

Weeding: Remove weeds from the sown areas. If required, spray with a selective herbicide for broad leaved weeds. Do not spray grass seeded areas within 3 months of germination.

Fertilising after germination: As follows:

- Six weeks after germination: Spread fertiliser evenly over the sown area and water in. Do not apply fertiliser to wet grass.
- Ten weeks after grass germination: If the planting establishment period occurs during the summer months, spread pelleted sulphate of ammonia at the rate of 250 kg/ha.

Mowing: Mow to maintain the grass height within the required range. Do not remove more than one third of the grass height at any one time. Carry out the last mowing not more than 7 days before the end of the planting establishment period. Remove grass clippings from the site after each mowing.

#### **1.1.13.14 Turfing**

Elapsed time: Deliver the turf within 24 hours of cutting and lay within 36 hours of cutting. Prevent turf from drying out between cutting and laying. If not laid within 36 hours of cutting, roll turf out on a flat surface with the grass up, and water as required to maintain a good condition.

Application method: Lay the turf as follows:

- Stretcher bond pattern with the joints staggered and close butted.
- Parallel with the long sides of level areas, and with contours on slopes.
- Finish flush, after tamping, with adjacent finished surfaces of ground, paving edging, or grass seeded areas.

Strip turf: Close butt the end joints and space the strips 300 mm apart. Lay top dressing between the turf strips. Finish with an even surface.

Tamping: Lightly tamp to an even surface immediately after laying. Do not use a roller.

Stabilising on steep slopes: Peg the turf to prevent downslope movement. Remove the pegs when the turf is established.

Watering: Water immediately after laying until the topsoil is moistened to its full depth. Maintain moisture to this depth.

Establishment: Maintain turfed areas until there is a dense continuous sward of healthy grass over the whole turfed area, evenly green and of a consistent height.

Failed turf: Lift failed turf and replace with new turf.

Levels: If levels have deviated from the design levels after placing and watering, lift turf and regrade topsoil to achieve design levels.

Fertiliser: Apply lawn fertiliser at the completion of the first and last mowings, and at other times as required to maintain healthy grass cover.

Mowing: Mow to maintain the grass height within the required range. Do not remove more than one third of the grass height at any one time. Carry out the last mowing not more than 7 days before the end of the planting establishment period. Remove grass clippings from the site after each mowing.

Top dressing: Mow the established turf and remove cuttings. Lightly top dress to a depth of 10 mm. Rub the dressing into the joints and correct any unevenness in the turf surface.

#### **1.1.13.15 Planting**

Plant location and spacing: If necessary to vary plant locations and spacings to avoid service lines, or to cover the area uniformly, or for other reasons, give notice.

Planting conditions: Do not plant in unsuitable weather conditions, including extreme heat, cold, wind or rain. In other than sandy soils, suspend excavation when the soil is wet, or during frost periods.

Watering: Thoroughly water the plants before planting, immediately after planting, and as required to maintain growth rates free of stress.

Preparation and individual plantings in grassed areas: Prepare for planting as follows:

- Excavate a hole twice the diameter of the root ball and at least 100 mm deeper than the root ball.
- Break up the base of the hole to a further depth of 100 mm.
- Loosen compacted sides of the hole to prevent confinement of root growth.

Ripline planting: Prepare for planting as follows:

- Rip the row and excavate a plant hole for each plant large enough to accept the root ball plus 0.1 m<sup>3</sup> of backfilling with topsoil.
- Clear weeds and other vegetative material within 300 mm radius of the plants.
- If planting holes are excavated by mechanical means, increase the hole size by 100 mm and loosen compacted sides to prevent confinement of root growth.

Placing: Place plants as follows:

- Remove the plant from the container with minimum disturbance to the root ball. Make sure that the root ball is moist.
- If required, root prune to make sure all circling roots have been either severed or aligned radially into the surrounding soil.
- Place the plant in its final position, in the centre of the hole and plumb, and with the topsoil level of the plant root ball level with the finished surface of the surrounding soil.

If individual locations are not nominated or required, show those areas on the drawings. Root pruning is not appropriate for eucalyptus or proteaceae species.

Fertilising pellets: In planting beds and individual plantings, place fertiliser pellets around the plants at the time of planting.

Backfilling: Backfill with topsoil mixture. Tamp lightly and water to eliminate air pockets. Make sure that topsoil is not placed over the top of the root ball, so the plant stem remains the same height above ground as it was in the container. Avoid mixing mulch with topsoil.

Watering basins for plants in grassed areas, location: To each individual plant not located in irrigated grassed areas or naturally moist areas.

Watering basin: Construct around the base of each individual plant, consisting of a raised ring of soil capable of holding at least 10 L.

#### **1.1.13.16 Mulching**

Placing mulch: Place mulch to the required depth and clear of plant stems, so that after settling it conforms to the following:

- Smooth and evenly graded between design surface levels.
- Flush with the surrounding finished levels.
- Sloped towards the base of plant stems in plantation bed.
- For gravel mulches: Not closer to the stem than 50 mm.

Extent: Provide mulch to 750 mm diameter to surrounds of plants planted in riplines and grassed areas.

Depths:

- Organic mulch: 75 mm.
- Gravel mulch: 50 mm.

Installation:

- In ripline and grassed areas: Place mulch to 750 mm diameter around plants.
- In mass planted areas: Place after the preparation of the planting bed but before planting and other work.
- In smaller areas (e.g. planter boxes): Place after the preparation of the planting bed, planting and other work.

#### **1.1.13.17 Treatment**

Insect attack or disease: If evidence of insect attack or disease of plant material is discovered, immediately give notice.

General: Remove insect infestation and diseased plant material by hand if appropriate.

Pesticide product: Spray with insecticide, fungicide or both, as required.

#### **1.1.13.18 Stakes and ties**

Material: Hardwood, straight, free from knots or twists, pointed at one end.

Installation: Drive stakes into the ground at least one third of their length, avoiding damage to the root system.

Stake sizes and quantities:

- For plants  $\geq$  2.5 m high: Three 50 x 50 x 2400 mm stakes per plant.
- For plants 1 to 2.5 m high: Two 50 x 50 x 1800 mm stakes per plant.
- For plants < 1 m high: One 38 x 38 x 1200 mm stake per plant.

Ties: Provide ties fixed securely to the stakes, one tie at half the height of the main stem, others as necessary to stabilise the plant. Attach ties loosely so as not to restrict plant growth.

Tie types:

- For plants  $\geq$  2.5 m high: Two strands of 2.5 mm galvanized wire neatly twisted together, passed through reinforced rubber or plastic hose, and installed around stake and stem in a figure of eight pattern.
- For plants < 2.5 m high: 50 mm hessian webbing stapled to the stake.

Trunk protection collar guards: 200 mm length of 100 mm diameter agricultural pipe split lengthways.

#### **1.1.13.19 Completion**

Stakes and ties: Remove those no longer required at the end of the planting establishment period.

Temporary fences: Remove temporary protective fences at the end of the planting establishment period.

## **1.1.14 Concrete**

### **1.1.14.1 Responsibilities**

Requirement: Provide cast in situ reinforced concrete, as required to complete the works.

### **1.1.14.2 Performance**

Requirements:

- Conforming to the design details and performance criteria.
- Satisfying quality and inspection requirements.
- Compatible with documented applied finishes.

### **1.1.14.3 Standards**

Structural design: To AS 3600.

Slip resistance classification: To AS 4586.

### **1.1.14.4 Tolerance formed surfaces**

Finish quality: To AS 3610.1 Table 3.3.3.1.

### **1.1.14.5 Inspection**

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 before placing concrete.
- Concealed surfaces or elements before covering.
- Commencement of concrete placing.
- Evaluation of the off-form finishes.
- Evaluation of surface finish.

### **1.1.14.6 Polymeric film underlay**

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

### **1.1.14.7 Polymeric film underlay**

Requirement: Under slabs on ground, including integral ground beams and footings, provide a vapour barrier or, in areas prone to rising damp or salt attack, a damp-proofing membrane.

### **1.1.14.8 Polymeric film underlay, base preparation**

Requirement: Conform to base type, as follows:

- Concrete working base: Remove projections above the plane surface, and any loose material.
- Graded prepared subgrade: Blind with sand to create a smooth surface free from hard projections. Lightly wet the sand just before laying the underlay.

### **1.1.14.9 Polymeric film underlay, installation**

Standard: To AS 2870 clause 5.3.3.

Requirement: Lay underlay over the base, as follows:

- Lap joints at least 200 mm and seal the laps and penetrations with waterproof adhesive tape.
- Face the laps away from the direction of concrete pour.
- Continue up vertical faces past the damp-proof course where applicable, and tape fix at the top.
- Patch or seal punctures or tears before placing concrete.
- Cut back as required after concrete has gained strength and formwork has been removed.

#### 1.1.14.10 Testing

Test authority: Concrete supplier or an Accredited Testing Laboratory.

Reports and records of test results: To the relevant parts of the AS 1012 series. Keep results on site.

#### 1.1.14.11 Assessment process of test results

Standard: To AS 1379.

Method of assessment: Project assessment.

#### 1.1.14.12 Sampling

Method of sampling: AS 1012.1.

Sampling locations: To AS 1012.1 and the following:

- Slump tests: On site, at the point of discharge from the agitator.
- Compressive strength tests: Spread the site sampling evenly throughout the pour.

Frequency of sampling: To AS 1379 Sections 5 and 6 and the following:

- Slump tests: Take at least one sample from each batch.
- Compressive strength tests: To the **Project assessment strength grade sampling table**.

#### Project assessment strength grade sampling table:

Number of batches for each type and grade of concrete per day	Minimum number of samples: Columns and load bearing wall elements/batch	Minimum number of samples: Other elements/day
1	1	1
2-5	1	2
6-10	1	3
11-20	1	4
each additional 10	1	1 additional

### 1.1.15 Structural steelwork

#### 1.1.15.1 Responsibilities

Requirement: Provide structural steelwork, as required to complete the works.

#### 1.1.15.2 Standards

Materials and design: To AS 4100.

Materials and design of cold-formed decking, purlins and girts: To AS/NZS 4600.

Composite steel-concrete construction including profiled steel sheeting and shear connectors: To AS/NZS 2327.

Fabrication and erection: To AS/NZS 5131.

#### 1.1.15.3 Architectural exposed structural steelwork

Requirement: Provide AESS to AS/NZS 5131 Section 10 and the **AESS schedule**.

#### **1.1.15.4 Fabrication**

Additional requirements: To AS/NZS 5131 clause 10.4.

Corners and edges: Grind smooth sharp, marred, or roughened corners and edges.

Rough surfaces: Deburr and ground smooth.

#### **1.1.15.5 Erection**

Additional requirements: To AS/NZS 5131 clause 10.5.

### **1.1.16 Light steel framing**

#### **1.1.16.1 Responsibilities**

Requirement: Provide light steel floor, wall, roof and truss framing, as required to complete the works.

#### **1.1.16.2 Performance**

Requirements:

- Suitable for having flooring, linings, cladding and roofing fixed to it.
- In conformance with the documented performance criteria.
- Independently designed and documented.
- Independently certified by a professional engineer for the design and the erected framing.

#### **1.1.16.3 Standards**

Design, materials and protection: To AS/NZS 4600.

Residential and Low-rise steel framing: To NASH-1 (National Association of Steel Housing) and NASH-2.

#### **1.1.16.4 Wall framing**

General: Provide studs in single lengths without splices. Place a stud under each structural load point from the roof or ceiling (except at openings). Provide multiple studs at points of concentrated load.

Maximum stud spacing: 600 mm.

#### **1.1.16.5 Wall framing ends to openings**

Requirement: Provide lintels appropriate to load and span.

#### **1.1.16.6 Additional support**

General: Provide additional support in the form of noggings, trimmers and studs for support and fixing of lining, cladding, hardware, accessories, fixtures and fittings.

#### **1.1.16.7 Vermin barriers**

Brick veneer barrier: Close nail 10 mm steel wire mesh to the underside of the bottom plate of external stud walls, extending across the cavity for building into brickwork.

#### **1.1.16.8 Wall framing damp-proof course**

Requirement: Provide damp-proof courses under the bottom plate of stud walls built off slabs or masonry dwarf walls, as documented or as follows if not documented otherwise:

- External walls (not masonry veneer): Turn up a minimum of 75 mm on the inside and tack to studs. Project 10 mm beyond the external slab edge or dwarf wall and turn down at 45°.
- Walls of bathrooms, shower rooms and laundries: Turn up a minimum of 150 mm on the wet side and tack to studs.
- Installation: Lay in long lengths. Lap full width at angles and intersections and at least 150 mm at joints.

Junctions: Preserve continuity of damp-proofing at junctions of damp-proof courses, sarking and waterproof membranes.

#### **1.1.16.9 Wall framing flashings**

Location: Provide flashings to external openings sufficient to prevent the entry of moisture. Form trays at the ends of sill flashings.

Veneer construction: Extend across cavities.

#### **1.1.16.10 Roof beam framing**

General: Construct framing for flat or pitched roofs where the ceiling follows the roof line, consisting of rafters or purlins supporting both ceiling and roof covering.

#### **1.1.16.11 Roof additional support**

General: Provide additional frame members at fibre cement or plasterboard sheeting or lining joint locations.

#### **1.1.16.12 Roof battens**

Requirement: Supply and fix battens suitable for span, spacing and proposed roofing material.

#### **1.1.16.13 Fascia, valley and barge boards**

Requirement: Fix fascia, valley gutter boards and barge boards in conformance with the manufacturer's requirements.

### **1.1.17 Steel – hot dipped galvanised coatings**

#### **1.1.17.1 Responsibilities**

Requirement: Provide hot-dip galvanized coatings, as required to complete the works.

#### **1.1.17.2 Performance**

Requirement: Control atmospheric corrosion to structural steelwork or steel products until the first scheduled maintenance.

#### **1.1.17.3 Standards**

Coating: To AS/NZS 4680.

Coating on fasteners: To AS/NZS 1214.

Durability: To AS/NZS 2312.2.

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

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

### **1.1.18 Light timber framing**

#### **1.1.18.1 Responsibilities**

Requirement: Provide light timber wall and roof framing, as required to complete the works.



#### **1.1.18.2 Standards**

Framing: To AS 1684.2, AS 1684.3 or AS 1684.4, as appropriate

Design: To AS 1720.1.

#### **1.1.18.3 Wall framing additional support**

Requirement: Provide additional support in the form of noggings, trimmers and studs for fixing lining, cladding, hardware, accessories, fixtures and fittings, as required.

Spacing of noggings: Maximum 1350 mm centres.

#### **1.1.18.4 Wall framing damp-proof course**

Requirement: Provide damp-proof courses under the bottom plate of stud walls built off slabs or masonry dwarf walls, as documented or as follows if not documented otherwise:

- External walls (not masonry veneer): Turn up at least 75 mm on the inside and tack. Project 10 mm beyond the external slab edge or dwarf wall and turn down at 45°.
- Walls of bathrooms, shower rooms and laundries: Turn up at least 150 mm on the wet side and tack to studs.

Installation: Lay in long lengths. Lap full width at angles and intersections and at least 150 mm at joints.

Junctions: Preserve continuity at junctions of damp-proof courses, sarkings and waterproof membranes.

#### **1.1.18.5 Wall flashings**

Location: Provide flashings to external openings to prevent the entry of moisture. Form trays at the ends of sill flashings.

#### **1.1.18.6 Roof and ceiling framing**

Fixing: Fix timber wall plates to masonry, with straps, bolts or both.

#### **1.1.18.7 Fixing plates**

Requirement: Provide 45 mm minimum thick timber fixing plates to transfer the design loads where timber joists, rafters or purlins bear on or into steel members. Bolt to the steel member at maximum 500 mm centres and at maximum 100 mm from the end of the fixing plate.

#### **1.1.18.8 Roof beam framing**

Ridge straps: Butt ends of rafters together at ridge and strap each pair together with 900 mm long steel strap passing over the ridge, triple nail to each rafter.

Services in roof space: Provide a support platform to AS/NZS 3500.4 clause 5.5.1.

Additional support: Provide a frame member behind every joint in fibre cement sheeting or lining.

#### **1.1.18.9 Anti-ponding boards**

Standard: To AS 4200.2.

#### **1.1.18.10 Roof trusses**

Nail plated prefabricated roof trusses: To AS 4440.

Support: Support trusses on bottom chord at two points only, unless designed for additional support.

Plumb: The lesser of H/50 or 50 mm, where H is the height of the truss at point where plumb is being measured.

Vertical movement: Provide minimum vertical clearance of 10 mm plus ceiling batten depth over internal non-load bearing walls. Use bracing methods which allow for the design vertical movements.

#### **1.1.18.11 Fascia, valley and barge boards**

Requirement: Fix fascia, valley gutter boards and barge boards.

### **1.1.19 Roofing**

#### **1.1.19.1 Responsibilities**

Requirement: Provide a roofing system and associated work, as required for completion of the works.

#### **1.1.19.2 Safety mesh**

Standard: To AS/NZS 4389.

#### **1.1.19.3 Profiled sheet metal roofing standards**

Design and materials: To AS 1562.1.

#### **1.1.19.4 Fasteners**

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

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

#### **1.1.19.5 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.

#### **1.1.19.6 Insulation spacer**

Description: Proprietary spacer system to prevent excessive compression of insulation between roof sheeting and purlins – if insulation is to be installed or required.

#### **1.1.19.7 Roof plumbing**

Description: Flashings, cappings, gutters, rainheads, outlets, downpipes and accessories necessary to complete the roofing system.

Flashing and capping: Notched to match profile of roof sheeting.

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

#### **1.1.19.8 Roof plumbing standards**

Roof drainage: To AS/NZS 3500.3.

Metal rainwater goods: To AS/NZS 2179.1.

Flashings and cappings: To AS/NZS 2904.

#### **1.1.19.9 Plastic seat roofing materials**

Unplasticised polyvinyl chloride (PVC-U) sheet: To AS 4256.2.

Glass fibre reinforced polyester (GRP) sheet: To AS 4256.3.

Polycarbonate: To AS 4256.5.

Sealants: Neutral curing silicone or modified silane (MS) polymer-based sealant to the roofing manufacturer's recommendations.

#### **1.1.19.10 Installation protection**

General: Keep the roofing and rainwater system free of debris and loose material during construction.

#### **1.1.19.11 Thermal movement**

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

#### **1.1.19.12 Pan type sheets**

Removal: Install sheets so that individual sheets can be removed without damage.

#### **1.1.19.13 Metal separation**

Requirement: Prevent direct contact between incompatible metals, and between green hardwood or chemically treated timber and aluminium or coated steel, by one of the following methods:

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

#### **1.1.19.14 Profiled sheet metal roofing installation**

Standard: To AS 1562.1.

Accessories: Provide accessories with the same finish as roofing sheets to complete the roofing installation.

#### **1.1.19.15 Ridges and eaves**

Sheet ends: Treat as follows:

- Project sheets 50 mm into gutters.
- Close off ribs at bottom of sheets using mechanical means or with purpose-made fillers or end caps.
- Turn pans of sheets up at tops and down into gutters by mechanical means.
- Provide pre-cut notched eaves flashing and bird proofing if required.
- Close off ridges with purpose-made ridge fillers or closed cell polyethylene foam.

#### **1.1.19.16 Ridge and barge**

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

#### **1.1.19.17 Sprung curved ridge**

General: Lay the roofing sheets in single lengths from eaves to eaves by naturally curving the sheets over the ridge.

Ridge: Seal side laps at the ridge and extend the sealant to the point where the roof pitch equals the recommended pitch of the roofing profile.

#### **1.1.19.18 End laps**

General: If end laps are unavoidable, and the sheet profile is not suitable for interlocking or contact end laps, construct a stepped type lap.

### **1.1.19.19 Jointing sheet metal rainwater goods**

Butt joints: Make joints over a backing strip of the same material.

Soldered joints: Do not solder aluminium or aluminium/zinc-coated steel.

Sealing: Seal fasteners and mechanically fastened joints. Fill the holes of blind rivets with silicone sealant.

### **1.1.19.20 Flashings**

Installation: Flash roof junctions, upstands, abutments and projections through the roof. Preform to required shapes if possible. Notch, scribe, flute or dress down as necessary to follow the profile of adjacent surfaces. Mitre angles and lap joints 150 mm in running lengths. Provide matching expansion joints at 6 m maximum intervals.

Upstands: Flash projections above or through the roof with two-part flashings, consisting of a base flashing and a cover flashing, with at least 100 mm vertical overlap. Provide for independent movement between the roof and the projection.

Large penetrations in low pitch roofs: Extend the base flashing over the roofing ribs to the ridge to prevent ponding behind the penetrating element.

Wall abutments: Where a roof abuts a wall, provide as follows:

- In masonry walls, planked cladding or concrete: Step in courses to the roof slope. Interleave with damp proof course, if any.
- Raking in masonry: Build into the full width of the outer leaf. Turn up within cavity, slope inward across the cavity and fix to or build into the inner leaf at least 75 mm above the roofing line.
- Raking in concrete: Turn 25 mm into joints or grooves, wedge at 200 mm centres with compatible material and point up.

Fixing to pipes: Solder or seal with neutral cured silicone rubber and either of the following:

- Secure with a clamping ring.
- Provide a proprietary flexible clamping shoe with attached metal surround flashing.

### **1.1.19.21 Gutters**

Note: Gutters are not preferred – refer Design Guidelines Document.

Gutter and sump support: Provide framing and lining to support valley gutters, box gutters and sumps. Line the whole area under the gutters and sumps.

Gratings: Install removable gratings over rainheads and sumps.

Leaf guard location: All gutter outlets.

### **1.1.19.22 External downpipes**

Note: Gutters are not preferred – refer Design Guidelines Document.

General: Prefabricate downpipes to the required section and shape where possible. Connect heads to gutter outlets and, if applicable, connect feet to rainwater drains.

Access cover: Provide a removable watertight access cover at the foot of each downpipe stack.

Downpipe support: Provide supports and fixings for downpipes.

Downpipe security protection: All downpipes at ground level up to 2400mm FFL are to be from 2.0mm minimum thickness material, with minimum 1.5mm thick support straps.

#### **1.1.19.23 Internal downpipes**

Access: Provide access openings as follows:

- At each junction and bend.
- At the foot of each stack. Acoustic insulation: Mineral fibre pipe insulation 50 mm thick, spirally bound on with 1.5 mm wire at 150 mm pitch. Building in: If pipes are built into masonry or concrete, spiral wrap the pipe (and insulation, if any) with building paper.

### **1.1.20 Cladding**

#### **1.1.20.1 Responsibilities**

Requirement: Provide lightweight external wall cladding and associated work, as required to complete the works.

#### **1.1.20.2 Inspection**

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

- Framing, sarking, vapour barrier and insulation before covering up or concealing.

#### **1.1.20.3 Compressed fibre cement (CFC) sheets**

Requirement: Proprietary compressed fibre cement sheets.

Standard: To AS/NZS 2908.2 and the following:

- Type A Category 5.
- Quality: Smooth and even with factory sealed edges, free of imperfections such as chips.

Edge profile: Square.

Sealant and bond breaking tape: To the manufacturer's recommendations.

#### **1.1.20.4 Fibre cement (FC) Sheets**

Requirement: Proprietary single faced fibre cement sheets.

Standard: To AS/NZS 2908.2 and the following:

- Type A Category 3.
- Sealant and bond breaking tape: To the manufacturer's recommendations.

#### **1.1.20.5 Plywood sheets**

Requirement: Proprietary plywood sheets – minimum thickness to be 6.5mm.

Standard: To AS/NZS 2271.

Bond: Type A.

Presealed plywood: Sides and edges presealed with a machine applied sealer.

Visible surfaces with a clear finish: Veneer quality A.

Other visible surfaces: Veneer quality B.

Hidden surfaces: Veneer quality C or D.

#### **1.1.20.6 Plywood sheet fasteners**

LOSP treated timber and non-corrosive timber cladding: Hot-dip galvanized steel.

CCA treated timber and corrosive timber cladding (including western red cedar or redwood): Stainless steel type 316 or silicon bronze.

#### **1.1.20.7 Profiled sheet metal**

Requirement: Proprietary profiled sheet metal cladding.

Design and installation: To AS 1562.1.

#### **1.1.20.8 Substrates or framing**

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

Flexible underlay: Check that the underlay is restrained.

#### **1.1.20.9 Installation**

Fixing method: As documented or to one of the following fixing methods to the manufacturer's recommendations:

- Steel framing: Screw.
- Timber framing: Nail or screw.
- Minimum penetration for profiled metal sheets: 30 mm for timber framing.

Horizontal cladding surface:

- Minimum slope: 1:15.
- Staining: Slope away from visible vertical facade areas to prevent staining.

Defective components: Do not install component parts which are defective, including warped, bowed, dented, abraded or broken members.

Damaged parts: Remove and replace damaged members during installation.

#### **1.1.20.10 Accessories and trim**

Requirement: Provide accessories and trim required to complete the installation, or as documented.

Corner flashing for profiled and seamed metal sheets: Finish off at corners with purpose-made folded flashing strips.

#### **1.1.20.11 Metal separation**

Requirement: Prevent direct contact between incompatible metals, and between green hardwood or chemically treated timber and aluminium or coated steel, by either of the following methods:

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

Incompatible metal fixings: Do not use.

#### **1.1.20.12 CFC sheet cladding**

Requirement: Cut sheets to suit the layout as documented, allowing a joint gap of 10 mm between panels.

#### **1.1.20.13 CFC sheet cladding joints**

Control joint:

- Locate between the panel and fixing system and the supporting structure, as documented.
- Sheet edges: Square cut.

- Sealant: Do not apply finish coating over joint sealants.

Prefinished metal backing/jointing strip: Fix proprietary backing strip to the rear face of the panel with proprietary closed cell self-adhering foam and horizontal gasket.

- Seal the joint with a 3 mm epoxy fillet.

Vertical joints: Vertical gasket or prefinished jointing strip to framing member.

Arrangement: Set out in even panels with joints coinciding with framing or as documented.

#### **1.1.20.14 CFC sheet cladding fixing**

General: Screw fix to proprietary framing supports at centres to the manufacturer's recommendations.

Concealed fixings:

- Pre-drill oversized holes.
- Countersink so that the top of the screw is 2 to 3 mm below the surface.
- Finish: Stop screw heads with epoxy filler. Smooth and level upon application and sand flush after curing.

#### **1.1.20.15 FC sheet cladding**

Requirement: Cut sheets to suit the layout as documented.

#### **1.1.20.16 FC sheet cladding joints**

Control joints:

- Locate between the panel and fixing system and the supporting structure, as documented.
- Sheet edges: Square cut.
- Sealant: Do not apply finish coating over joint sealants.

Arrangement: Set out in even panels with joints coinciding with framing or as documented.

#### **1.1.20.17 FC sheet cladding fixing**

General: Corrosion resistant nails or screws to the manufacturer's recommendations.

Eaves and soffit lining: Fix at 150 mm centres to soffit bearers at a maximum of 450 mm centres.

#### **1.1.20.18 Plywood sheet cladding**

Requirement: Cut sheets to suit the layout, as documented.

Cut edges: Seal before fixing and install facing upwards.

Bottom edges: Prime or pre-coat before fixing.

#### **1.1.20.19 Plywood sheet cladding installation**

Layout for sheets with shiplap joints: Start at a corner and install shiplap joints facing away from the prevailing weather.

Labels: Install panels so that any certification scheme labels are concealed.

#### **1.1.20.20 Plywood sheet cladding joints**

Movement allowances:

- Between sheets: 2 mm minimum gap. Apply elastomeric sealant.
- Between the bottom of sheets and flashings: 5 mm gap.

Control joints:

- Location: To coincide with structural movement joints, as documented.

#### **1.1.20.21 Plywood sheet cladding fixing**

Timber frames: 12 mm thick sheets:

- Nails: 40 x 2.5 mm.
- Screws: No. 8 x 40 mm.

Steel frames: 12 mm thick sheets:

- 1.5 mm steel: 10 gauge to 16 thread pitch x 45 mm screws.
- 2.8 mm steel: 10 gauge to 16 thread pitch x 45 mm screws.

Nail fixing centres:

- Edges: At 150 mm centres and not less than 9 mm from sheet edge.
- Intermediate framing: At 300 mm centres.
- Sheet corners: Not less than 50 mm from corner on vertical edges.

Finish: Flush with surface. Do not punch.

Shiplap joint top lap: Do not nail.

#### **1.1.20.22 Profiled sheet metal cladding installation**

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

Ground clearance: Maintain documented clearance.

Cutting sheets: Wherever possible, factory cut to length. Do not use an abrasion disc.

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

#### **1.1.20.23 Reinstatement**

Extent: Repair or replace damage to the cladding. If the work cannot be repaired satisfactorily, replace the whole area affected.

Touch up: If it is necessary to touch up minor damage to pre-painted metal cladding, do not overspray onto undamaged surfaces.

#### **1.1.20.24 Cleaning**

Requirement: Remove excess debris, metal swarf, solder, sealants and unused materials.

Exposed metal surfaces: Clean surfaces of substances that interfere with uniform weathering or oxidation.

Protection: Remove protective coatings using methods required by the manufacturer after completion.

Composite panels: Clean surfaces with soft, clean cloths and clean water to the manufacturer's recommendations.

#### **1.1.20.25 Warranties**

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

- Form: Against failure of materials and execution under normal environment and use conditions.
- Period: As offered by the supplier.

#### **1.1.20.26 Cladding items - selections**



Prefinished External Panels: To be *VitraPanel Exterior* 8.0mm thick compressed fibre cement sheets and prefinished with *Lumiflow V700* fluoropolymer factor applied finish, or similar. Installed as face fixed with colour coded wafer head screws to top hat furring channel system or concealed fixed to manufacturer's directions with expressed joints.

Post Finished Exterior Panels: To be *James Hardies ExtoTec* 9.0mm thick compressed fibre cement façade panels, or similar. Installed as face fixed with countersunk recessed head screws to top hat furring channel system or concealed fixed to manufacturer's directions with expressed joints. Painted with exterior grade paint to manufacturer's directions with anti-graffiti paint application.

Post Finished Interior Panels: To be *Scyon Matrix Exterior Cladding System*, 8.0mm thick fibre cement expressed joint square edge panels, or similar. Installation face fixed with countersunk recessed head screws over vertical cavity trim strips and horizontal backing strips with continuous beads of joint sealant beside expressed joints over vapour permeable membrane onto steel frame to manufacturer's directions. Painted with exterior grade paint to manufacturer's directions.

Plywood – Smooth Face Finish: To be *Austral Plywood Exterior Grade AC*, 6.5 mm thick with Square Edge plywood exterior grade sheets. Installation to manufacturer's directions with *Satin Cabothene* Water Based Polyurethane Varnish finish to exposed faces.

Plywood – Grooved Face Finish: To be *Austral Plywood Exterior Grade AC*, 9.0 mm thick Grooved face with Square Edge plywood exterior grade sheets. Installation to manufacturer's directions with *Satin Cabothene* Water Based Polyurethane Varnish finish to exposed faces.

## **1.1.21 Doors and access panels**

### **1.1.21.1 Responsibilities**

Requirement: Provide doors, frames, doorsets, security screen doors and fire-resisting doorsets, as required to complete the works.

### **1.1.21.2 Standards**

Timber and composite doors: To AS 2688.

### **1.1.21.3 Inspection**

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.

### **1.1.21.4 Steel frames**

Construction: Continuously welded from metallic-coated steel sheet sections, including accessories such as buffers, strike plates, spreaders, mortar guards, switch boxes, fixing ties or brackets, and cavity flashing with provision for fixing documented hardware and electronic security assemblies, and prefinished with a protective coating.

Base metal thickness (minimum):

- General: 1.1 mm.
- Security doorsets: 2.0 mm.

Metallic-coating class to AS 1397 interior: ZF100.

Finish: Grind the welds smooth, cold galvanize the welded joints and shop prime.

Hardware and accessories: Provide 4 mm backplates and lugs for fixing hardware including hinges and closers. Screw fix the hinges into tapped holes in the backplates.

#### **1.1.21.5 Doors**

Doors: Proprietary products manufactured for interior or exterior applications and for the finish required.

#### **1.1.21.6 Materials**

Standards: Conform to the following:

- Plywood and blockboard for exterior use: To AS/NZS 2271.

#### **1.1.21.7 Flush panel doors**

General: Provide flush panel doors of balanced construction, as documented.

#### **1.1.21.8 Construction**

Door thickness:

- External doors and doors over 900 mm wide: 40 mm.

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.

#### **1.1.21.9 Double doors**

Square edged doors: Bevel as necessary to prevent binding between the leaves.

Rebated meeting stiles: If not double acting doors, provide rebated meeting stiles or fix equivalent metal T stop to one leaf. Form rebates to suit standard rebated hardware.

#### **1.1.21.10 Tolerances**

Standard: To AS 2688 clauses 4.1 and 5.3.

#### **1.1.21.11 Weather bars**

General: Provide a weather bar under hinged external doors, locate under the centres of closed doors.  
Type: Aluminium.

#### **1.1.21.12 Frames**

Frames: Install the frames as follows:

- Plumb, level, straight and true.
- Fixed or anchored to the building structure.
- Isolated from any building loads, including loads caused by structural deflection or shortening.

#### **1.1.21.13 Frame fixing**

Brackets: Metallic-coated steel:

- Width: Minimum 25 mm.
- Thickness: Minimum 1.5 mm.

#### **1.1.21.14 Joints**

General: Make accurately fitted joints where fasteners, pins, screws, adhesives and pressure indentations are not visible on exposed surfaces.

#### **1.1.21.15 Steel frames**

Building into masonry: Attach galvanized steel rods to jambs, build in and grout up.

Fixing to masonry openings: Build in hairpin anchors and install locking bars or use proprietary expansion anchors and screw twice through jambs at each fixing.

Fixing to stud frame openings: Attach galvanized steel brackets to jambs and screw twice to studs at each fixing.

#### **1.1.21.16 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.

#### **1.1.21.17 Seals**

General: Provide the fixings, rebates, grooves, and clearances required for installation and operation of the seals. Allow seals un-wound from coils to settle before use.

#### **1.1.21.18 Weatherproofing**

Flashings and weatherings: Install flashings, weather bars, drips, storm moulds, caulking and pointing to prevent water from penetrating the building between the door frame and the building structure under the prevailing service conditions, including normal structural movement of the building.

#### **1.1.21.19 Priming**

General: Prime timber door leaves on top and bottom edges before installation.

#### **1.1.21.19 Door items - selections**

Metal faced Door: To be *Australian Commercial Doors* Metal faced Solid Core Door, or similar with 2.0mm thick zincalume (painted with selected exterior grade paint) or galvabond sheeting. Edge channel capping all around over solid core exterior grade waterproof plywood faced door with solid edge stripping. Installed to manufacturer's directions in security grade metal rebated door frame, bolted / screwed to the sub-frame.

### **1.1.22 Overhead doors**

#### **1.1.22.1 Responsibilities**

Requirement: Provide overhead doors, as required to complete the works.

#### **1.1.22.2 Standards**

Overhead doors and other large access doors: To AS/NZS 4505.

#### **1.1.22.3 Inspection**

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

- Framing or structure to receive tracks and motor.
- Tracks and guides installed before doors or shutters are hung.

#### **1.1.22.4 Door assembly**

Requirement: Proprietary system complete with the manufacturer's standard operating system, hardware, and accessories.

#### **1.1.22.5 Marking and labelling**

General: To AS/NZS 4505 Section 8.

#### **1.1.22.6 Roller shutter doors**

Requirement: Materials and finishes, as documented.

#### **1.1.22.7 Curtain**

Rolling curtain: Continuous roll formed profiled steel.

Rolling shutter: Individual horizontal interlocking slats with interlocking hinges.

Rolling grille: Articulated curtain formed of horizontal members spaced apart and connected by vertical links.

#### **1.1.22.8 Bottom rail**

Requirement: Provide a stiffening member as follows:

- Interlocking with the bottom edge or lowest part of the curtain.
- Extending between the inner faces of the vertical guides.
- Formed or adapted as required to follow the contour of a sloping floor or threshold.
- Adapted to house a locking device, if required.

#### **1.1.22.9 Wind locks**

General: Provide wind lock end clips and guides to retain the curtain in wide openings or under extreme wind conditions.

#### **1.1.22.10 Drum**

Maximum drum deflection: 1/360th of the span.

Springs: Helical torsion springs housed in the drum and arranged to counterbalance the curtain weight without exceeding the safe working stress of the spring material.

#### **1.1.22.11 Wickets**

General: Provide doors with metal frame and facings to match the curtain, and manufacturer's standard lockset and furniture.

#### **1.1.22.12 Operation method**

General: Method of opening and closing the door:

Manual:

- . Hand stick (for high openings): By a boat hook type pole supplied with the installation.
- . Chain: By pulling on a chain passing over a sprocket on the drum, with reduction gears where necessary.
- . Crank handle: By a removable crank handle inserted into a gearbox mounted above the opening.
- Motorised: If a wicket is fitted to the shutter, provide a limit switch device to prevent motor operation until wicket and the frame are hinged clear of the curtain.

#### **1.1.22.13 Manual operation**

General: Install so that the force required to operate the door manually does not exceed 220 N.

#### **1.1.22.14 Motorised operation**

General: Provide a motorised door operating system incorporating the following:

An electric motor with limit switches, and of adequate capacity to operate the specified door smoothly and without strain.

- Overload cut-out.
- Automatic safety system to stop and reverse door if obstructed while closing or stop door if obstructed while opening.
- Photocell or IR beam safety device.
- Manufacturer's standard light fixture automatically switched on when opener is activated and switched off by timer.

- Manual release handle to disengage door from drive mechanism in the event of a power failure.
- Operation by battery-powered radio remote controller, supplied as part of the system.
- Additional operation by push-button or key switch, located 1500 mm above floor level.

#### **1.1.22.15 Installation**

Requirement: Install overhead doors in conformance with the manufacturer's recommendations and as documented.

#### **1.1.22.16 Installation preparation**

Substrate: Before start of installation, check the alignment of substrates or framing and adjust if required.

#### **1.1.22.17 Frames, guides and tracks**

Requirement: Install frames, guides and tracks as follows:

- Plumb, level, straight, true, and within tolerances and clearances recommended by the manufacturer.
- Fixed or anchored to the building structure using mechanical fixings suitable for the substrate and the imposed loads.
- Isolated from any building loads, including loads caused by structural deflection or shortening.

#### **1.1.22.18 Overhead door items - selections**

Roller Shutter: To be *Austral Monsoon H11 Guardian Security Steel Slat Roller Shutter* with galvanised steel interlocking slats with selected colour powdercoat finish, or similar. Slat thickness is dependent on the opening width and security requirements – high security required. Installation to manufacturer's directions. Bottom rail to include 2 x 40mm x 8mm locking bars with lock handles and internal locking rail with slide bolts and key drive lock handles by *Rivers*, or similar.

Security Grille over Roller Shutters: All roller shutters are to have Security Gates from powdercoated galvanised steel sections with no opening greater than 90mm – refer ACT Government Municipal Infrastructure Standards, Part 19a Sportsground Pavilions requirements. Gates to be supplied with slide bolts and pad bolts in security shrouds.

### **1.1.23 Doors hardware**

#### **1.1.23.1 Responsibilities**

Requirement: Provide door hardware as required to complete the works.

#### **1.1.23.2 Locks and latches standard**

General: To AS 4145.2.

#### **1.1.23.3 Padlocks standard**

Standard: To AS 4145.4.

#### **1.1.23.4 Lock and latch classification**

Rating systems: To AS 4145.1 Section 3.

Performance requirements: To AS 4145.2 Section 3.

#### **1.1.23.5 Butt hinge materials timber solid core doors**

Number of hinges: Determine the number of hinges required based on the nominated door leaf size and weight only. For other door leaf sizes or for doors with applied finishes, use the weight of the door to determine the number of hinges required. For a door leaf over 80 kg, use pivot hinges.

Size of hinges: Determine the size of the hinge based on the door leaf thickness:

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

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

Hinge pin: Supply fixed pins to hinges of doors opening out or designated as a security doors. For all other doors, provide loose pins.

Wide throw: If necessary, use wide throw hinges to achieve the required door swings in the presence of obstacles such as nibs, deep reveals and architraves.

#### **1.1.23.6 Bolts**

General: Barrel bolts, flush bolts and tower bolts with keepers, including lock plates, staples, ferrules or floor sockets.

#### **1.1.23.7 Rebated doors**

General: For mortice locks or latches to rebated doors, provide purpose-made rebated pattern items.

#### **1.1.23.8 Strike plates**

General: Use strike plates supplied with the locks or latches. Do not provide universal strike plates.

#### **1.1.23.9 Electronic control devices**

Project specific requirement: Provide door hardware, electronic control devices, locks, latches, padbolts and keys to ACT Government Municipal Infrastructure Standards, Part 19a Sportsground Pavilions requirements.

Requirement: Electric strikes, electric locks, drop bolts and/or similar devices to suit door construction and hardware.

Electromagnetic hold-open devices: To AS 1905.1 and AS 1670.1.

Fail-safe: Connect door control devices in a fail-safe mode to permit egress in the event of power failure.

Fail-secure: Connect door control devices in a fail-secure mode to prevent egress in the event of power failure.

Authorised products: Equipment listed in the *ActivFire* Register of Fire Protection Equipment.

Double leaf doors (solid frame): Electric strike or lock on the inactive leaf, connected to the door frame by concealed flexible wiring.

#### **1.1.23.10 Activation**

Project specific requirement: Provide door hardware electronic control device activation to ACT Government Municipal Infrastructure Standards, part 19a Sportsground Pavilions requirements.

Activation device: Keypads, card readers or other activation devices located next to entry points.

External: Weatherproof (IP56) hoods or housings for external units.

Mounting height: 900 to 1100 mm from floor level and not less than 500 mm from internal corners.

#### **1.1.23.11 Keying requirements**

Requirement: Provide door hardware and keys, to ACT Government Municipal Infrastructure Standards, part 19a Sportsground Pavilions requirements.

#### **1.1.23.12 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.

#### **1.1.23.13 Delivery of keys**

Great grandmaster, grandmaster and master keys: Arrange for delivery direct to the principal.

For locks keyed to differ and locks keyed alike: Check the quantity against key records and deliver keys to the contract administrator at practical completion.

#### **1.1.23.14 Group keying**

Keying system: As documented.

Existing system extension: Obtain the details of existing group or master key systems of the system to be extended.

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

Proprietary keying control security system: Provide for cylinder or pin-tumbler locks that accept a group key (e.g. master key, maison key).

Stamping: Stamp keys and lock cylinders to show the key codes and/or door number as scheduled.

#### **1.1.23.15 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.

#### **1.1.23.16 Key material**

Lever locks: Malleable cast iron or mild steel.

Pin tumbler locks: Nickel alloy, not brass.

#### **1.1.23.17 Installation**

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

Operation: Make sure working parts are accurately fitted to smooth close bearings, without binding or sticking, free from rattle or excessive play, lubricated where appropriate.

#### **1.1.23.18 Mounting height**

Locks and latches: Centreline of the door knob or lever spindle above finished floor: 1100mm FFL.

#### **1.1.23.19 Locks**

Cylinders: Fix vertically and with consistent key alignment.

#### **1.1.23.20 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.

### **1.1.23.21 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.

### **1.1.23.22 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.

## **1.1.24 External screens**

### **1.1.24.1 Responsibilities**

Requirement: Provide external screens as required to complete the works.

### **1.1.24.2 Performance**

Requirements: Provide screens conforming to the following:

- Plumb, level, straight and true within the building tolerances of the structural system.
- Undamaged and free of surface defects or distortions.
- Fixed or fastened to the building structure.
- Able to resist wind and other actions without vibration or permanent distortion.

### **1.1.24.3 Standards**

Aluminium framed sunscreens, awnings and shutters:

- Stress analysis of members: To AS/NZS 1664.1 or AS/NZS 1664.2.

Horizontal screen loadings: To AS/NZS 1170.1 Table 3.2.

### **1.1.24.4 Inspection**

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

- Fabricated screen assemblies delivered to the site, before installation.
- Fabricated screen assemblies at the factory ready for delivery to the site.
- Commencement of installation of screen assemblies.
- Completion of installation.

### **1.1.24.5 Structural steel standards**

Design and materials: To AS 4100.

Welding: To the AS/NZS 1554 series.

Galvanizing: To AS/NZS 4680.



#### **1.1.24.6 Hot-dip galvanizing standards**

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

#### **1.1.24.7 Powder coating standards**

Standard for architectural applications: To AS 3715, AAMA 2604, AAMA 2605 or AS 4506, as appropriate.

#### **1.1.24.8 Aluminium fabrication and construction standards**

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

#### **1.1.24.9 Fasteners**

Requirement: Provide fasteners of sufficient strength and quality to perform their required function.

#### **1.1.24.10 External screens items - selections**

Requirement: Where steel components are necessary they should be hot dipped galvanised after fabrication, with powdercoat finish. Aluminium perforated metal or grille screening are to be designed to restrict over-viewing, to limit footholds for climbing purposes, but to provide adequate natural ventilation and natural light provisions.

### **1.1.25 Thermal insulation and pliable membranes**

#### **1.1.25.1 Responsibilities**

Requirement: Provide thermal insulation and pliable membrane systems, as required to complete the works.

#### **1.1.25.2 Performance**

Requirements:

- Complete for their function.
- Conforming to the detail and location drawings.
- Firmly fixed in position.

#### **1.1.25.3 Inspection**

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

#### **1.1.25.4 Insulation standards**

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 RC/PIR): To AS 1366.2.

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

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

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

Polyurethane (sprayed): To AS 1366.1 Table 2.

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

Wool: To AS/NZS 4859.1 Section 6.

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

#### **1.1.25.5 Pliable building membrane standards**

Standard: To AS/NZS 4200.1.

Vapour barrier:

- Vapour control classification: Class 1.

Sarking membrane (other than walls and gables):

- Water control classification: Water barrier.

Vapour permeable (breathable) membrane: Minimum Class 4.

#### **1.1.25.6 Fasteners and supports**

General: Metallic-coated steel.

#### **1.1.25.7 Mesh support to roof insulation standards**

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.

#### **1.1.25.8 Bulk insulation**

Requirement: To AS 3999 and BCA J1.2. or BCA 3.12.1.1, as appropriate.

Installation: Firmly butt together fibre blankets or batts, with no gaps.

#### **1.1.25.9 Pliable building membrane**

Installation: To AS 4200.2 and BCA J1.2 or BCA 3.12.1.1, as appropriate.

#### **1.1.25.10 Framed walls – thermal break strips**

Product type: Proprietary item.

Application: To steel framing with lightweight external cladding.

R-Value:  $\geq 0.2$ .

Screw fixing: Button head screws at 1 m centres.

Adhesive fixing: Wallboard adhesive walnuts at 1 m centres.

#### **1.1.25.11 Framed walls – bulk insulation**

Product type: Fibre batts.

Installation: Friction fit between framing members. If other support is not provided, staple nylon twine to the framing and stretch tight.

#### **1.1.25.12 Vapour permeable (breathable) membrane**

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

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

Installation: Run the vapour permeable membrane horizontally on the outer face of external wall framing, over the flashing, from the bottom plate up. Pull taut over the framing and fix to framing members. Seal across the wall cavity at the top.

Horizontal laps: At least 150 mm wide, lapped to make sure water is shed to the outer face of the membrane.

End or vertical overlaps laps: At least 150 mm wide made over framing.

#### **1.1.25.13 Roof insulation**

Note: Roof insulation is not preferred to general unconditioned spaces / rooms.

Location: Should insulation be required, install, except to the following areas:

- Eaves, overhangs, skylights, vents and openings.
- Roofs to outbuildings, garages, and semi-enclosed spaces such as verandahs, porches and carports.

#### **1.1.25.14 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 allowing only natural mesh sag between members to suit the application. Staple to timber frame, wire to steel frame.

Installing welded safety mesh: To AS/NZS 4389.

#### **1.1.25.15 Pliable building 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.

#### **1.1.25.16 Metal roofs – bulk insulation**

Note: Roof insulation is not preferred to general unconditioned spaces / rooms.

Product: Fibre blankets or batts.

Installation:

- Batt: 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.

#### **1.1.25.17 Ceiling insulation – bulk insulation**

Note: Ceiling insulation is not preferred to general unconditioned spaces / rooms.

Product type:

- Framed ceilings: Fibre batts.
- Suspended ceiling: Fibre blanket.

Application: Over ceiling lining.

Installation:

- Batt: Fit tightly between framing members.
- Blankets: Butt joint and lay over ceiling panels or lining.

## **1.1.26 Lining**

### **1.1.26.1 Responsibilities**

Requirement: Provide internal lining systems, as required to complete the works.

### **1.1.26.2 Performance**

Requirement: Provide lining system with a surface that is:

- Resistant to impacts expected in use.
- Resistant to moisture encountered under expected environmental conditions.
- Free of irregularities.
- A suitable substrate for the nominated final finish.

### **1.1.26.3 Inspection**

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

- Substrate or framing before installation of linings.
- Finished surface of installation before applying:
  - . Sealer.
  - . Finish coatings or decorative papers.

### **1.1.26.4 Fibre cement**

Standard: To AS/NZS 2908.2.

Wall and ceiling linings: Type B category 2.

Minimum thickness: 6.0 mm.

### **1.1.26.5 Plywood**

General interior use: To AS/NZS 2270.

Areas requiring moisture resistance: 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.

### **1.1.26.6 Substrates or framing**

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

#### **1.1.26.7 Battens**

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

#### **1.1.26.8 Ceiling linings**

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

#### **1.1.26.9 Accessories and trim**

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

#### **1.1.26.10 Fibre cement installation**

Joints and layout: Run sheets across the framing members. In flush jointed applications, stagger end joints in a brick pattern and locate them on framing members, away from the corners of large openings. Provide supports at edges and joints.

#### **1.1.26.11 Supports**

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

- Where framing member spacing exceed the recommended spacing.
- Where direct fixing of fibre cement is not possible, due to the arrangement or alignment of the framing or substrate.
- Where the lining is the substrate for tiled finishes.
- If required for penetrations for services, including mechanical grilles and lighting fixtures.
- If required to support fixtures.

#### **1.1.26.12 Fixing**

Timber framed construction: Nail only or combine with adhesive.

Steel framed construction: Screw only or combine with adhesive.

Wall framing: Conform to the following:

- Do not fix to top and bottom plates or noggings.
- In tiled areas: Provide an extra row of noggings immediately above wall-to-floor flashings. Fix sheet at 150 mm centres to each stud and around the perimeter of the sheet.

Masonry wall construction: Conform to the following:

- Direct fixing: Adhesive fix to the masonry except where lining forms a substrate for tiled finish.
- Furring channels: Fix using screw and/or adhesive.

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

- Ceiling battens: Fix at 600 mm maximum centres.

Wet areas: Do not use adhesive fixing alone.

#### **1.1.26.13 Trims and accessories**

Requirement: 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.

Timber and MDF trim: Fix using full length so that trim is secure and without movement. Where nail or screw fixings are used, make sure fastener finishes sufficiently below face of trim so that stopping piece finishes flush with the face.

#### **1.1.26.14 Lining items - selections**

Prefinished External Lining Panels: To be *VitraPanel Exterior* 8.0mm thick compressed fibre cement sheets and prefinished with *Lumiflow V700* fluoropolymer factory applied finish, or similar. Installed as face fixed with colour coded wafer head screws to top hat furring channel system or concealed fixed to manufacturer's directions with expressed joints.

Post Finished Exterior Lining Panels: To be *James Hardies ExtoTec* 9.0mm thick compressed fibre cement façade panels, or similar. Installed as face fixed with countersunk recessed head screws to top hat furring channel system or concealed fixed to manufacturer's directions with expressed joints. Painted with exterior grade paint to manufacturer's directions with anti-graffiti paint application.

Post Finished Interior Lining Panels: To be *Scyon Matrix Exterior Cladding System*, 8.0mm thick fibre cement expressed joint square edge panels, or similar. Installation face fixed with countersunk recessed head screws over vertical cavity trim strips and horizontal backing strips with continuous beads of joint sealant beside expressed joints over vapour permeable membrane onto steel frame to manufacturer's directions. Painted with exterior grade paint to manufacturer's directions.

Plywood – Smooth Face Finish: To be *Austral Plywood Exterior Grade AC*, 6.5 mm thick with Square Edge plywood exterior grade sheets. Installation to manufacturer's directions with *Satin Cabothene* Water Based Polyurethane Varnish finish to exposed faces.

Plywood – Grooved Face Finish: To be *Austral Plywood Exterior Grade AC*, 9.0 mm thick Grooved face with Square Edge plywood exterior grade sheets. Installation to manufacturer's directions with *Satin Cabothene* Water Based Polyurethane Varnish finish to exposed faces.

### **1.1.27 Partitions**

#### **1.1.27.1 Responsibilities**

Requirement: Provide internal partitions systems, as required to complete the works.

#### **1.1.27.2 Performance**

Strength and stability: To remain stable, and without rattle and signs of deflection or permanent deformation under normal conditions of use, including the slamming of doors.

Imposed loads: To support imposed dead loads, seismic loads, wind loads, including designated eccentric loads and not to deflect in excess of the following, where H is the height of the partition:

- The lesser of H/240 or 30 mm for partitions subjected to wind loads and lined with flexible material.
- The lesser of H/360 or 20 mm for partitions subjected to wind loads and lined with brittle materials.
- H/500 for eccentric loads.

#### **1.1.27.3 Inspection**

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

- Set-out before installation.
- Partition framing before installation of linings and finishes.
- Completion of a prototype.
- Openings prepared to receive internal windows.
- Framed and lined partitions ready to receive the framed and glazed component.
- Completion of installation.

#### **1.1.27.4 Light steel framing**

General: Proprietary framing system of metallic-coated folded steel strip lipped studs and channel section top and bottom tracks and noggings.

Sections and members: To AS/NZS 4600.

#### **1.1.27.5 Timber framing**

Gauging: Provide gauged timbers in studs, noggings and plates for double faced walls.

Timber species or group: Radiata pine.

Seasoning: Required.

Stress grade: F5 to AS/NZS 1748.1.

#### **1.1.27.6 Fibre cement**

Standard: To AS/NZS 2908.2.

Wall and ceiling linings: Type B category 2.

Minimum thickness: 4.5 mm.

#### **1.1.27.7 Accessories**

General: Provide accessories necessary to complete the installation including the following:

- Corner beads.
- Stop beads.
- Shadowline.
- Control joints.
- Sheet metal and MDF partition end caps.

#### **1.1.27.8 Substrate**

General: Prepare the substrate to receive the partitions. On carpet, fix bottom tracks over polyethylene film. Protect carpet from pulling of threads when drilling or installing fasteners.

#### **1.1.27.9 Protection**

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

#### **1.1.27.10 Pre-conditioning**

General: Acclimatise wood-based system components in the in-service conditions for a minimum period of two weeks before assembly.

#### **1.1.27.11 Set-out**

General: Set out the partition grid on the centreline of framing members, and to coincide with the ceiling grid and other major building grid, as applicable.

#### **1.1.27.12 Fibre cement lining installation**

General: Install as follows:

- 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.
- Do not fix to top and bottom plates or noggings.

Timber framing: Nail only or combined with adhesive.

Steel framing: Screw only or combined with adhesive.

Tiled and wet areas: Provide an extra row of noggings immediately above wall-to-floor flashings. Fix sheet at 150 mm centres to each stud and around the perimeter of the sheet. Do not use adhesive fixing alone.

#### **1.1.27.13 Joints and joint treatment**

General: Install joint accessories as documented, in conformance with manufacturer's recommendations. Install plumb, level and true to line.

Flush joints: Provide recessed edge sheets and finish flush using joint reinforcing tape bedded in joint compound.

External corner joints: Provide purpose fabricated perforated metallic corner beads, bedded in joint compound.

Ceiling junctions: Install purpose fabricated perforated metallic coated steel shadowline to top of partition.

Sheet metal partition end caps: Provide purpose fabricated perforated metallic-coated steel end caps, sized for partition thickness and bedded in joint compound.

MDF end caps: Provide recessed edge sheets and finish flush using joint reinforcing tape and joint compound.

Dry joints: Provide square edged sheet and finish with a PVC-U joining section.

Control joints: Provide control joints to coincide with structural control joints and as follows:

- Walls:  $\leq 7.2$  m centres.
- Control joint beads: Purpose-made metallic-coated.
- Support: Provide framing parallel to the joint on each side. Do not fix the lining to abutting building surfaces.

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

Joints in tiled areas: Bed reinforcing tape in joint compound. Do not apply a topping coat.

- Control joints: At maximum 4.2 m centres and spaced to suit joints required in tiling.
- Internal corners: Reinforce with metallic-coated steel angles. In corners subject to continuous moisture, flash over the angle and under the sheeting with continuous bitumen coated aluminium flashing.

#### **1.1.27.14 Partition items - selections**

Prefinished External Partition Panels: To be *VitraPanel* Exterior 8.0mm thick compressed fibre cement sheets and prefinished with *Lumiflow V700* fluoropolymer factor applied finish, or similar. Installed as face fixed with colour coded wafer head screws to top hat furring channel system or concealed fixed to manufacturer's directions with expressed joints.

Post Finished Exterior Partition Panels: To be James Hardies *Extotec* 9.0mm thick compressed fibre cement façade panels, or similar. Installed as face fixed with countersunk recessed head screws to top hat furring channel system or concealed fixed to manufacturer's directions with expressed joints. Painted with exterior grade paint to manufacturer's directions with anti-graffiti paint application.



Post Finished Interior Partition Panels: To be *Scyon Matrix* Exterior Cladding System, 8.0mm thick fibre cement expressed joint square edge panels, or similar. Installation face fixed with countersunk recessed head screws over vertical cavity trim strips and horizontal backing strips with continuous beads of joint sealant beside expressed joints over vapour permeable membrane onto steel frame to manufacturer's directions. Painted with exterior grade paint to manufacturer's directions.

Plywood – Smooth Face Finish: To be *Austral Plywood* Exterior Grade AC, 6.5 mm thick with Square Edge plywood exterior grade sheets. Installation to manufacturer's directions with *Satin Cabothene* Water Based Polyurethane Varnish finish to exposed faces.

Plywood – Grooved Face Finish: To be *Austral Plywood* Exterior Grade AC, 9.0 mm thick Grooved face with Square Edge plywood exterior grade sheets. Installation to manufacturer's directions with *Satin Cabothene* Water Based Polyurethane Varnish finish to exposed faces.

## **1.1.28 Cubicle systems**

### **1.1.28.1 Responsibilities**

Requirement: Provide internal cubicle systems, as required to complete the works.

### **1.1.28.2 Inspection**

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

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

### **1.1.28.3 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 arised and oiled by the manufacturer.

### **1.1.28.4 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.

### **1.1.28.5 Hardware**

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

Door furniture: As documented by the manufacturer.

### **1.1.28.6 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.

#### **1.1.28.7 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.

#### **1.1.28.7 Partition items - selections**

Toilet Partitions: To be *Laminex XR Grade Standard Compact Laminate Toilet Partition System*, or similar. Divisional, front and nib panels. Doors pre-drilled with concealed gravity hinges, indicator bolts, buffer and rubber tipped coat hook. System included anodised aluminium channel headrails, anodised aluminium foot assemblies with concealed fixings. Installed to suit toilet and shower application to AS1428.1 and NCC/BCA.

### **1.1.29 Suspended ceilings**

#### **1.1.29.1 Responsibilities**

Requirement: Provide suspended ceiling, as required to complete the works.

#### **1.1.29.2 Standards**

Suspended ceilings: To AS/NZS 2785.

#### **1.1.29.3 Inspection**

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.

#### **1.1.29.4 Proprietary system**

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

#### **1.1.29.5 Fibre cement**

Standard: To AS/NZS 2908.2.

Wall and ceiling linings: Type B category 2.

Minimum thickness: 6.0 mm.

#### **1.1.29.6 Suspension system**

Support members: Install support members as follows:

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

Failure: Provide a ceiling system 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 lay flat on the perimeter trim.

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

#### **1.1.29.7 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.

#### **1.1.29.8 Bracing**

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

#### **1.1.29.9 Bulkheads**

General: Integrate bulkheads with the ceiling structure and brace to prevent lateral movement. If the ceiling is terminated at a bulkhead, provide for seismic requirements.

#### **1.1.29.10 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.

#### **1.1.29.11 Fasteners**

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

#### **1.1.29.12 Fibre cement lining**

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.

#### **1.1.29.13 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 PVC-U 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.

#### **1.1.29.14 Access panels**

General: Match the access panels to the ceiling in appearance and performance.

#### **1.1.29.15 Access panels identification**

General: Provide each access panel with an identification mark.

#### **1.1.29.16 Non-demountable ceilings**

General: Provide access panels supported and anchored to permit ready removal and refixing.

#### **1.1.29.17 Access panels reinforcement**

General: Reinforce the back of the access panel to prevent warping and facilitate handling.

#### **1.1.29.18 Trims**

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.

#### **1.1.29.19 Accessories**

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

#### **1.1.29.20 Suspended ceiling items - selections**

Requirements: Note that ceilings are generally not required to unconditioned spaces / rooms, external eaves areas.

Interior suspended ceilings: To be *James Hardies Harditex* 6.0mm thick fibre cement with recessed edge joints, or similar. Installation face fixed with recessed screws onto steel frame. Installed to manufacturer's directions. Painted with interior grade wet area paint to manufacturer's directions.

Post Finished Interior suspended ceilings: To be *Scyon Matrix* Exterior Cladding System, 8.0mm thick fibre cement expressed joint square edge panels, or similar. Installation face fixed with countersunk recessed head screws over vertical cavity trim strips and horizontal backing strips with continuous beads of joint sealant beside expressed joints over vapour permeable membrane onto steel frame to manufacturer's directions. Painted with exterior grade paint to manufacturer's directions.

Plywood – Smooth Face Finish: To be *Austral Plywood* Exterior Grade AC, 6.5 mm thick with Square Edge plywood exterior grade sheets. Installation to manufacturer's directions with *Satin Cabothene* Water Based Polyurethane Varnish finish to exposed faces.

Plywood – Grooved Face Finish: To be *Austral Plywood* Exterior Grade AC, 9.0 mm thick Grooved face with Square Edge plywood exterior grade sheets. Installation to manufacturer's directions with *Satin Cabothene* Water Based Polyurethane Varnish finish to exposed faces.

### **1.1.30 Joinery**

#### **1.1.30.1 Responsibilities**

Requirement: Provide joinery, as required to complete the works.

### **1.1.30.2 Inspection**

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

- Shop fabricated or assembled items ready for delivery to the site.
- Openings prepared to receive assemblies.
- Site erected assemblies on completion of erection, before covering up by cladding and encasing.
- Surfaces prepared for, and immediately before, site applied finishes.
- Completion of installation.

### **1.1.30.3 Visible work**

Clear finished timber and veneer: Make sure all visible surfaces are free of branding, crayon or chalk marks and of blemishes caused by handling.

### **1.1.30.4 Plywood**

Interior use generally: To AS/NZS 2270.

Interior use exposed to moisture: To AS/NZS 2271.

Visible surface with a clear finish: Veneer quality A.

Other visible surfaces: Veneer quality B.

### **1.1.30.5 High-pressure decorative laminate (HPDL) sheets**

Standard: To AS/NZS 2924.1.

Minimum thickness: Conform to the following:

- For horizontal surfaces fixed to a continuous substrate: 1.2 mm.
- For vertical surfaces fixed to a continuous substrate: 0.8 mm.
- For post formed laminate fixed to a continuous substrate: 0.8 mm.
- For vertical surfaces fixed intermittently (e.g. to studs): 3.0 mm.
- For edge strips: 0.4 mm.

### **1.1.30.6 Joinery assemblies**

Standard: To AS 4386.

### **1.1.30.7 Plinths**

Requirement: Plinths not preferred.

### **1.1.30.8 Carcasses**

Material: Select from the following:

- Overlaid high moisture resistant particleboard.
- Overlaid high moisture resistant medium density fibreboard.

Thickness: 16 mm.

Joints: Select from the following:

- Proprietary mechanical connections.
- Dowels and glue.
- Screws and glue.
- Proprietary joining plates and glue.

Adjustable shelves: Support on proprietary pins in holes bored at equal centres vertically.

- Spacing: 32 mm.

Fasteners: Conceal with finish.

Installation: Secure to walls at not more than 600 mm centres.

#### **1.1.30.9 Accessories and trim**

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

#### **1.1.30.10 Benchtops**

Stainless-steel Benchtops: To be 1.2mm thick grade 316 satin stainless-steel finish with 2.0mm thick corrosion resistant zinc plated steel substrata, stainless-steel tube legs with adjustable feet. 150mm high integrated splashback and solid stainless-steel channel reinforced undershelves.

Edge sealing: Seal to walls and carcasses with a sealant, which matches the finish colour.

#### **1.1.30.11 Splashbacks**

Stainless-steel Benchtops: To be 1.2mm thick grade 316 satin stainless-steel finish with 2.0mm thick corrosion resistant zinc plated steel substrata, stainless-steel tube legs with adjustable feet. 150mm high integrated splashback and solid stainless-steel channel reinforced undershelves.

Edge sealing: Seal to walls and carcasses with a sealant, which matches the finish colour.

### **1.1.31 Metalwork fabricated**

#### **1.1.31.1 Responsibilities**

Requirement: Provide metal fixtures, as required to complete the works.

#### **1.1.31.2 Performance**

Requirements:

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

#### **1.1.31.3 Inspection**

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.

#### **1.1.31.4 Surfaces requiring inspection**

Welded components, steel castings and corroded metal surfaces: Visual inspections to AS 3978.

#### **1.1.31.5 Aluminium structures**

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

#### **1.1.31.6 Metals**

Performance: Provide metals capable of transmitting the loads imposed and sufficient for the required performance and behaviour of the assembly without causing deflection or distortion of finished surfaces.

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

#### **1.1.31.7 Welding**

Quality: Provide finished welds which are free of surface and internal cracks, welding slag, and porosity.

Site welds: Avoid site welding wherever possible. If required, locate site welds in positions for down hand welding.

Butt weld quality level: Not inferior to the appropriate level recommended in AS/NZS 1554.1 Section 6, AS/NZS 1554.6 Section 6 or AS 1665 Appendix A, as appropriate.

#### **1.1.31.8 Welding stainless steel**

Certification of welders: To AS 1796.

#### **1.1.31.9 Riveting**

General: Use only to join stainless steel sheet or strip less than 1 mm thick. Drill (not punch) the rivet hole and drive the rivet cold. On completion, clean and passivate the riveted assembly.

#### **1.1.31.10 Soldering**

General: Do not solder stainless steel.

#### **1.1.31.11 Corner guards**

General: Where salient corners of the structure require protection from mechanical damage, provide metal corner guards as follows:

- Consisting of rolled angle sections or sections fabricated from metal sheet bent to the radius or angle of the corner.
- Fitting close to adjoining surface finishes.
- Solidly grouted up at the back as necessary to eliminate voids.
- Securely fixed by a method which does not cause distortion in the guard surface, and consists of either concealed built in lugs, or flush countersunk head fixings into appropriate anchors.

### **1.1.32 Fire extinguishers and blankets**

#### **1.1.32.1 Responsibilities**

Requirement: Provide fire extinguishers and fire blankets, as required to complete the works.

#### **1.1.32.2 Extinguisher standards**

General: Portable fire extinguishers:

- General requirements: To AS/NZS 1841.1.
- Water: To AS/NZS 1841.2.
- Wet chemical: To AS/NZS 1841.3.
- Foam: To AS/NZS 1841.4.
- Powder: To AS/NZS 1841.5.
- Carbon dioxide: To AS/NZS 1841.6.
- Non-rechargeable: To AS/NZS 1841.8.

Selection and location: To AS 2444.

#### **1.1.32.3 Extinguisher maintenance**

Fire extinguishers: To AS 1851.

#### **1.1.32.4 Blanket standards**

Fire blankets: To AS/NZS 3504.

Selection and location: To AS 2444.

#### **1.1.32.5 Blanket maintenance**

Fire blankets: To AS 1851.

### **1.1.33 Signage**

#### **1.1.33.1 Responsibilities**

Requirement: Provide signage systems, as required to complete the works.

#### **1.1.33.2 Performance**

Requirement: Provide signage as follows:

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

#### **1.1.33.3 Sign standards**

Safety signs - design and use: To AS 1319.

Signs and graphics for disability access: AS 1428.1 and AS 1428.2.

#### **1.1.33.4 Materials standards**

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

#### **1.1.33.5 Installation**

Requirement: Install signage and graphic items level and plumb, securely mounted, with concealed corrosion and theft-resistant fixings.

#### **1.1.33.6 Termite protection**

Position: In or near meter box or similar.

Message: Details of termite management system

Indicate:

- The method of protection.
- The date of installation.
- The life expectancy of a chemical barrier as listed on the appropriate authority's pesticides register label.
- The installer's recommendation for inspections.

Sign type: Laminated page(s).

Conformance: BCA 3.1.3.4, BCA B1.4(i)(ii). AS 3660.1 Appendix A.

#### **1.1.33.7 Braille and tactile exit signage**

Position: To BCA Spec D3.6 for every door described in BCA E4.5.

Message: Exit.

Letter height (minimum): BCA Spec D3.6.

Sign type: Stainless steel plate.



Conformance: BCA E4.5, BCA D3.6 and BCA Spec D3.6.

**1.1.33.8 Portable fire extinguishers – cabinet**

Position: Cabinet.

Message: FIRE EXTINGUISHER.

Letter height (minimum): 32 mm.

Sign type: Adhesive backed vinyl.

Conformance: BCA E1.6. AS 2444 clause 3.6. Fire Brigade.

**1.1.33.9 Portable fire extinguishers – location signs**

Position: As nominated in AS 2444 clause 3.2 at every installed extinguisher nominated BCA Table E1.6.

Message: Prescribed graphic.

Letter height (minimum): 16 mm.

Sign type: Computer generated adhesive backed vinyl graphic.

Conformance: BCA E1.6. AS 2444 clause 3.3. Fire Brigade.

**1.1.33.10 Fire blankets**

Position: As nominated in AS 2444 clause 6.4 at every blanket location.

Message: Prescribed graphic.

Letter height (minimum):

Sign type: Computer generated adhesive backed vinyl graphic.

Conformance: BCA E1.6. AS 2444 clauses 6.3, 6.4 and Fig 6.1. Fire Brigade.

**1.1.33.11 Unisex accessible sanitary facilities**

Braille & Tactile Stainless-steel Signs: To be RBA Braille & Tactile Stainless-steel Signs (4330-000 Series), or similar manufactured from a single piece of 1.6mm thick gauge marine grade 316 stainless-steel, incorporate braille and tactile elements raised to comply with AS1428 and NCC/BCA. Vandal and fade resistant, rounded edges and corners and secured to manufacturer's directions.

Braille and tactile Signage from: Male Toilet; Female Toilet; Male Ambulant Toilet, Female Ambulant toilet; Male Toilet & Ambulant Toilet; Female Toilet & Ambulant Toilet; Unisex Toilet LH; Unisex Toilet RH; Parents Room.

Position: To BCA Spec D3.6.

Message: Braille and tactile signage incorporating the international symbol of access; and 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: Sans serif type font 20 mm.

Sign type: Stainless steel plate.

Conformance: AS 1428.1. BCA D3.6

#### **1.1.33.12 Ambulant sanitary facilities**

Braille & Tactile Stainless-steel Signs: To be RBA Braille & Tactile Stainless-steel Signs (4330-000 Series), or similar manufactured from a single piece of 1.6mm thick gauge marine grade 316 stainless-steel, incorporate braille and tactile elements raised to comply with AS1428 and NCC/BCA. Vandal and fade resistant, rounded edges and corners and secured to manufacturer's directions.

Braille and tactile Signage from: Male Toilet; Female Toilet; Male Ambulant Toilet, Female Ambulant toilet; Male Toilet & Ambulant Toilet; Female Toilet & Ambulant Toilet; Unisex Toilet LH; Unisex Toilet RH; Parents Room.

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: Sans serif type font 20 mm.

Sign type: Stainless steel plate.

Conformance: AS 1428.1. BCA D3.6.

#### **1.1.33.13 Non-accessible sanitary facilities**

Braille & Tactile Stainless-steel Signs: To be RBA Braille & Tactile Stainless-steel Signs (4330-000 Series), or similar manufactured from a single piece of 1.6mm thick gauge marine grade 316 stainless-steel, incorporate braille and tactile elements raised to comply with AS1428 and NCC/BCA. Vandal and fade resistant, rounded edges and corners and secured to manufacturer's directions.

Braille and tactile Signage from: Male Toilet; Female Toilet; Male Ambulant Toilet, Female Ambulant toilet; Male Toilet & Ambulant Toilet; Female Toilet & Ambulant Toilet; Unisex Toilet LH; Unisex Toilet RH; Parents Room.

Position: At each bank of sanitary facilities that are not provided with an accessible unisex sanitary facility.

Message: Braille and tactile signage incorporating the international symbol of access; and Indicate location of the nearest accessible unisex sanitary facility.

Letter height (minimum): AS 1428.2 clause 17, Table 2.

Sign type: AS 1428.2 clause 16, Table 1.

Conformance: AS 1428.1. BCA D3.6

#### **1.1.33.14 Non-accessible pedestrian entrance**

Braille & Tactile Stainless-steel Signs: To be RBA Braille & Tactile Stainless-steel Signs (4330-000 Series), or similar manufactured from a single piece of 1.6mm thick gauge marine grade 316 stainless-steel, incorporate braille and tactile elements raised to comply with AS1428 and NCC/BCA. Vandal and fade resistant, rounded edges and corners and secured to manufacturer's directions.

Braille and tactile Signage from: Male Toilet; Female Toilet; Male Ambulant Toilet, Female Ambulant toilet; Male Toilet & Ambulant Toilet; Female Toilet & Ambulant Toilet; Unisex Toilet LH; Unisex Toilet RH; Parents Room.

Position: At each non-accessible pedestrian building entrance.

Message: Signage incorporating the international symbol of access to direct a person to the location of the nearest accessible pedestrian entrance.

Letter height (minimum): AS 1428.2 clause 17, Table 2.

Symbol size: AS 1428.2 clause 16, Table 1.

Sign type:

Conformance: AS 1428.1. BCA D3.6.

## **1.1.34 Waterproofing – wet areas**

### **1.1.34.1 Responsibilities**

Requirement: Provide wet area waterproofing systems, as required to complete the works.

### **1.1.34.2 Performance**

Requirements:

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

### **1.1.34.3 Waterproofing wet areas**

Standard: To AS 3740.

### **1.1.34.4 Inspection**

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

- Substrate preparation completed.
- Secondary layers preparation completed.
- Before membranes are covered up or concealed.
- After flood testing, if applicable.

### **1.1.34.5 Membrane standards**

Standard: To AS/NZS 4858.

### **1.1.34.6 Membrane systems**

Requirement: Provide a proprietary membrane system suitable for the intended internal wet area waterproofing.

### **1.1.34.7 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.

### **1.1.34.8 Flashings**

Requirement: Flexible waterproof flashings compatible with the waterproof membrane system.

### **1.1.34.9 Sealants**

Requirement: Waterproof, flexible, mould-resistant and compatible with host materials.

### **1.1.34.10 Adhesives**

Requirement: Waterproof and compatible with host materials.

#### **1.1.34.11 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.

#### **1.1.34.12 Falls**

Membrane directly under the floor finish: Make sure the fall in the substrate conforms to the fall documented for the finish.

#### **1.1.34.13 Protection**

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

#### **1.1.34.14 Extent of waterproofing**

Waterproof or water-resistant surfaces: To the requirements of BCA F1.7 for Class 2, 3 and 4 buildings, or BCA 3.8.1.2 for Class 1 buildings.

#### **1.1.34.15 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.

#### **1.1.34.16 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.

#### **1.1.34.17 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.

#### **1.1.34.18 Door jambs and architraves**

Requirement: If the bottom of doorjamb 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.

#### **1.1.34.19 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.
- Without drainage flanges: Provide continuous waterproofing under the channel and terminate the membrane at a floor waste with a recessed drainage flange.

#### **1.1.34.20 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.

#### **1.1.34.21 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.

### **1.1.35 Resilient finishes**

#### **1.1.35.1 Responsibilities**

Requirement: Provide resilient floor finishes to substrates, as required to complete the works.

#### **1.1.35.2 Standard**

Installation: To AS 1884.

#### **1.1.35.3 Slip resistance**

Classification: To AS 4586.

#### **1.1.35.4 Inspection**

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

- Substrate immediately before fixing resilient finishes or underlay.
- Completed underlay, if any.
- Finished surface before applying sealers or polishes (if any).
- Completed installation.

#### **1.1.34.5 Sheet vinyl floor finishes - selections**

Sheet Vinyl – Food Servery Area: To be Altro Stronghold 30 – R11 Slip Resistance, or similar sheet vinyl, or similar. Installation to manufacturer's directions and sealed to walls with coved under-door edge angle at access openings and under all doors.

### **1.1.36 Resin-based seamless flooring**

#### **1.1.36.1 Responsibilities**

Requirement: Provide resin-based floor finishes to substrates, as required to complete the works.

#### **1.1.36.2 Performance**

Requirement: Provide resin flooring finish which:

- Forms a strong permanent bond to the floor base.
- Is impermeable to liquids.
- Is hygienic and easily cleaned.
- Slip resistant or chemical resistant.

#### **1.1.36.3 Slip resistance**

Classification: To AS 4586.

#### **1.1.36.4 Inspection**

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

- Completion of substrate preparation.

- Substrate joints, thresholds and perimeter walls.
- Completed priming of base.
- Completion of each coat in the flooring system.
- Completed application.

#### **1.1.36.5 Application**

Coating application: Apply components of the resin flooring system to the manufacturer's recommendations to produce a uniform, monolithic wearing surface.

#### **1.1.36.6 Priming**

Coating application: Apply primer over prepared substrate at the manufacturer's spreading rate with a stiff brush, roller or trowelling. Fully saturate the substrate surface.

Porous or open textured surfaces: If required to minimise pin hole, apply a second coat to achieve full saturation.

Multi-layer, flow applied and heavy duty flowable flooring: Allow primer to reach a tack-free state before applying the resin flooring. If required to assist flooring application, incorporate a light scatter of dry graded aggregate whilst the primer is wet.

Curing: Maximum 48 hours at 15 to 20°C before applying the resin flooring. If curing exceeds 48 hours, mechanically prepare the surface and reapply primer.

#### **1.1.36.7 Resin coatings**

Floor seal, floor coating and high build floor coating: Apply by brush or roller to the manufacturer's recommendations.

Curing: Allow first coat to cure for 16 to 24 hours until it is tack-free before applying second coat.

#### **1.1.36.8 Flow applied systems**

Flow applied and heavy duty flowable flooring: Apply by spreading evenly over the surface, using a serrated trowel, pin rake or squeegee. Immediately follow by rolling with a spiked roller to release entrapped air and assist in smoothing out.

Partially set or thickened areas: Do not use spiked roller on these areas.

#### **1.1.36.9 Multi-layer flooring**

Requirement: Apply to **Resin coatings** and/or **Flow applied systems** to the manufacturer's recommendations.

#### **1.1.36.10 Trowel applied resin flooring**

Resin screed and heavy-duty resin: Spread mixed product over the primed substrate by trowel, screed box, or between screeding laths or bars to achieve uniform overall thickness.

Steel trowels: Keep clean at all times by using a minimum amount of solvent or water.

Hygienic surface: Conform to the following:

- Resin screed: If required, seal surface with one or two coats of compatible resin sealer applied by brush, roller or squeegee after the screed has cured sufficiently.
- Heavy duty resin: If an impervious screed system is used, additional resin seals are not required.

### **1.1.36.11 Reinforcement**

Fibreglass cloth: If reinforcing is required to minimise problems arising from cracks or bay joints in the substrate, after applying the primer and a thin layer of resin, roll in the fibreglass cloth. Overlap the fabric by 50 mm minimum at joins and apply the final resin layer before the first layer fully hardens.

### **1.1.36.12 Curing**

Finished flooring: Allow to cure to the manufacturer's recommendations before trafficking and 3 to 7 days before wet cleaning, heavy trafficking or exposure to chemicals.\

Uncured resin flooring: Maintain minimum 3°C above dew point or below 75% relative humidity to reduce the risk of blooming on the floor finish.

### **1.1.36.13 Junctions**

General: Finish junctions flush with adjoining surfaces. Where changes of floor finish occur at doorways locate the joint on the jamb edge face of the door leaf.

### **1.1.36.14 Control joints**

Location: Provide control joints in resin based seamless flooring as follows:

- Over structural control joints.
- At junctions between different substrates.

Flooring finish: Where possible, carry the seamless finish material over the edges of the control joint in the substrate. Provide a sealant joint as follows:

- Sealant width: 6 to 25 mm.
- Sealant depth: One half the joint width, or 6 mm, whichever is the greater.
- Sealant: Two-pack, self-levelling, non-hardening, mould-resistant polyurethane sealant applied over a backing rod. Finish flush with the seamless flooring surface.
- Trafficable floors: Shore hardness greater than 35.
- Backing rod: Compressible closed cell polyethylene foam with a bond-breaking surface.

### **1.1.36.15 Concrete sealer - selection**

Requirement Concrete Sealed: To be *Parchem* Concrete Sealer, or similar non-yellowing clear non-slip finish sealer to all exposed concrete floor areas. Installation to manufacturer's direction.

## **1.1.37 Painting**

### **1.1.37.1 Responsibilities**

Requirement: Provide coating systems to substrates, as required to complete the works.

### **1.1.37.2 Painting standard**

General: To the recommendations of those parts of AS/NZS 2311.

### **1.1.37.3 Inspection**

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

- Painting stages:
  - . Completion of surface preparation.
  - . After application of final coat.
- Clear finishing stages:
  - . Before surface preparation of timber.
  - . Completion of surface preparation.
  - . After application of final coat.



#### **1.1.37.4 Standards**

Paint types: To AS/NZS 2311 Table 4.2 and the following:

- Metal primer for steel, lead and chromate free: To AS 3730.21 and AS/NZS 3750.19.
- Metal primer, latex: To AS 3730.15.
- Metal primer for metallic-coated surfaces, solvent-borne: To AS 3730.21.
- Zinc-rich organic binder/primer for steel: To AS/NZS 3750.9.

#### **1.1.37.5 Combinations**

General: Do not combine products from different manufacturers in a system.

Clear timber finish systems: Provide only the combinations of putty, stain and sealer recommended by the manufacturer of the topcoats.

#### **1.1.37.6 Putty and fillers**

Material: To the recommendations of the paint system manufacturer, suitable for the substrate and compatible with the primer.

#### **1.1.37.7 Tinting**

General: Provide only products which are colour tinted by the manufacturer or supplier.

#### **1.1.37.8 Toxic ingredients**

General: To the *Poisons Standard - Schedule 1 (SUSMP)* Part 2 Section 7.

#### **1.1.37.9 Substrate moisture content**

Requirement: Use a moisture meter to demonstrate that the moisture content of the substrate is at or below the recommended maximum level for the type of paint and the substrate material.

#### **1.1.37.10 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.

#### **1.1.37.11 Painting conditions**

General: Unless the paint is recommended for such conditions, do not paint under the following conditions:

- Dusty conditions.
- Relative humidity: > 85%.
- Surface temperature: < 10°C or > 35°C.

#### **1.1.37.12 Priming before fixing**

General: Apply one coat of wood primer, and 2 coats to end grain, to the back of the following before fixing in position:

- External fascia boards.
- Timber door and window frames.
- Bottoms of external doors.
- Associated trims and glazing beads.
- Timber board cladding.

#### **1.1.37.13 Spraying**

General: If the paint application is by spraying, use conventional or airless equipment which conforms to the following:

- Satisfactorily atomises paint being applied.
- Does not require paint to be thinned beyond the maximum amount recommended by the manufacturer.
- Does not introduce oil, water or other contaminants into the applied paint.

Paint with known health hazards: Provide personal protection, masking, ventilating and screening facilities to AS/NZS 4114.1 and AS/NZS 4114.2.

#### **1.1.37.14 Sanding**

Clear finishes: Sand the sealer using abrasives no coarser than 320 grit without cutting through the colour. Take special care with round surfaces and edges.

#### **1.1.37.15 Repair**

Requirement: Clean off marks, paint spots and stains progressively and restore damaged surfaces to their original condition.

Maintenance painting: To AS/NZS 2311 Section 8.

#### **1.1.37.16 Repair of galvanizing**

Cleaning: For galvanized surfaces which have been subsequently welded, power tool grind to remove all surface contaminants, including rust and weld splatter. Prime affected area immediately after cleaning.

Primer: Type 2 organic zinc-rich coating for the protection of steel to AS/NZS 3750.9.

#### **1.1.37.17 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.

#### **1.1.37.18 Services**

General: Paint all new services and equipment, including those in plant rooms, if not embedded, except chromium, anodised aluminium, GRP, PVC-U, stainless steel, non-metallic flexible materials and normally lubricated machined surfaces.

Proprietary items: Repaint only if damaged.

#### **1.1.37.19 Doors**

Drying: Maintain door leaf in the open position during drying. Do not allow door hardware or accessories to damage the door finish during the drying process.

#### **1.1.37.20 Windows**

Operation: Make sure opening windows function correctly before and after painting.

#### **1.1.37.21 Painting systems**

Number of coats: Except where one or two coat systems are documented, each paint system consists of at least 3 coats.

#### **1.1.37.22 New unpainted interior surfaces**

Standard: To AS/NZS 2311 Table 5.1.

#### **1.1.37.23 New unpainted exterior surfaces**

Standard: To AS/NZS 2311 Table 5.2.

#### **1.1.37.24 Previously painted surfaces**

Standard: To AS/NZS 2311 Tables 8.2 and 8.3.

### **1.1.37.25 Specialised painting systems**

Standard: To AS/NZS 2311 clause 5.2. Provide the following final coats:

- High build textured, or membrane finishes for concrete and masonry: B38 using products conforming to the AS 4548 series.
- Two-pack gloss pigmented polyurethane: B44.
- Two-pack epoxy: B29.
- Two-pack water-based epoxy: B29A.

## **1.1.38 Sanitary fixtures**

### **1.1.38.1 Responsibilities**

Requirement: Provide sanitary fixtures, as required to complete the works.

### **1.1.38.2 Standards**

Design for access and mobility: AS 1428.1 and AS 1428.2.

### **1.1.38.3 Authorised products**

Standard: Listed in the *WaterMark* Product Database, unless otherwise required by the Network Utility Operator.

### **1.1.38.4 Labelling**

Water efficiency labelling: Provide only products conforming to and labelled to the Water Efficiency Labelling Scheme (WELS).

## **1.1.39 Tapware**

### **1.1.39.1 Responsibilities**

Requirement: Provide tapware, as required to complete the works.

### **1.1.39.2 Standards**

Design for access and mobility: To AS 1428.1 and AS 1428.2.

### **1.1.39.3 Authorised products**

Standard: Listed in the *WaterMark* Product Database, unless otherwise required by the Network Utility Operator.

### **1.1.39.4 Labelling**

Water efficiency labelling: Provide only products conforming to and labelled to the Water Efficiency Labelling Scheme (WELS).

## **1.1.40 Electrical Design and Install**

### **1.1.40.1 Responsibility**

Requirement: Provide the electrical services, as documented.

### **1.1.40.2 Design**

Design for durability: Develop the design so the systems achieve the documented performance, reliability, service life, energy efficiency and safety requirements, and are easily maintainable.

Fault protection: Automatic disconnection to AS/NZS 3000 clause 2.4.

Fire-resisting protection: Provide for switchboards and associated electrical conductors to BCA C2.13.

Maximum demand: Calculation method to AS/NZS 3000 Appendix C.

#### **1.1.40.3 Standards**

Requirement: To AS/NZS 3000, unless otherwise documented.

Electrical design: To AS/NZS 3000 and SA HB 301.

Selection of cables: To AS/NZS 3008.1.1.

Degrees of protection (IP code): To AS 60529.

Electromagnetic compatibility (EMC): To AS/NZS 61000.

Communications systems: To AS/CA S008, AS/CA S009, AS/NZS 3080 and AS/NZS ISO/IEC 14763.2.

#### **1.1.40.4 Submissions**

General: Submit the following:

- Certification of conformance with AS/NZS 3000, for electrical services.
- Telecommunications cabling: Submit product and installation certification for the installation.

Lighting samples: Submit samples of all luminaires and accessories complete with lamp, control gear and three core flex and plug.

Emergency evacuation lighting samples: Submit samples of all luminaires and exit signs.

Lighting shop drawings: Submit shop drawings for the following:

- Lighting columns.
- Lighting column mounting bases.
- Non-proprietary luminaires.
- Non-standard fixing brackets.

Telecommunications cabling shop drawings: Submit the following:

- Layouts of equipment racks.
- Cross-connect layout.
- Cabling diagram for complete system.
- Cable management system.

Products and materials data: Submit technical data for all items of plant and equipment, including the following:

- Assumptions.
- Calculations.
- Model name, designation and number.
- Capacity of all system elements.
- Country of origin and manufacture.
- Materials used in the construction.
- Size, including required clearances for installation.
- Certification of compliance with the applicable code or standard.
- Technical data schedules corresponding to the equipment schedules in the contract documents. If there is a discrepancy between the two, substantiate the change.
- Manufacturers' technical literature.

- Type-test reports.
- Single line diagram(s), including fault levels at switchboards, cable size and type.
- Switchboard layouts.

Lighting: Submit technical data on the following:

- Luminaires.
- Lamps.
- Ballasts.
- Power factor correction equipment.
- Lighting control systems.
- All accessories.

Type test: Submit photometric test results from an Accredited Testing Laboratory as evidence of luminous efficacy for the applicable CCT for the following:

- Light-emitting diode luminaires.
- Light-emitting diode lamp replacement modules.

Telecommunications cabling: Submit technical data including the following:

- System design parameters: Performance.
- Voice and/or data transfer rate.
- Cable type and characteristics.
- Segregation requirements for EMI/EMR.
- Maximum length of cables.
- Cross-connect type and characteristics.
- Cross-connect block.
- Patch cords.
- Fibre optic terminations.
- Patch panel module.
- Cable management for racks.
- Rack.
- Fly leads.

Emergency evacuation lighting: Submit technical data for each type of luminaire and exit sign including the following:

- Maximum luminaire spacing for a given mounting height.
- Luminaire classification to AS/NZS 2293.3.

Type tests: Submit type test data.

#### **1.1.40.5 Low voltage power systems**

Requirement: Provide low voltage power systems, as documented.

Performance: Liaise with the electricity distributor and provide network connection, as documented.

Program: Schedule the works and statutory inspections to suit the construction program.

Prospective fault current: Determine, from the electricity distributor, the prospective fault current and fault protection requirements.

Supply system: 400 V, 3-phase, 4-wire, 50 Hz, multiple earth neutral (MEN) system.

Distribution system: Provide power distribution system elements, as documented.

#### **1.1.40.6 Surge protection devices (SPD)**

Requirement: Provide all mode metal oxide varistor based series connected SPD to protect equipment in racks and cabinets, as documented.

Standard: To AS 4262.1 and AS 4262.2.

Surge rating ( $I_{max}$ ):  $\geq 20$  kA (8/20  $\mu$ s) phase to neutral and 10 kA neutral to earth.

Voltage protection level ( $U_p$ ):

- < 600 V at 3 kA.
- 700 V at 500 A.

Visual indicator: Provide visual indication of SPD status.

Enclosure and installation: House SPD in an electrical switchboard or panel and protect with a suitable rated circuit breaker equal to or less than the load current rating of the SPD.

#### **1.1.40.7 Site electricity supply**

Responsibilities: Provide site electricity supplies, as documented. Connect project electrical facilities to the network distributors external site electricity supply.

Document the cable installation method and protection, poles, conduits, cable trenching and pit requirements and the protection equipment requirements in the relevant worksections or on the drawings or schedules.

#### **1.1.40.8 Consumers mains**

Consumers mains: Provide consumers mains, associated services and all necessary fault and overload current protection equipment to AS/NZS 3000 Section 3, the electricity distributor's standards and the Service and Installation Rules.

Protected consumers mains: Provide short circuit and overload protection, where required by the electricity distributor.

Alternative power supplies: Provide alternative power supplies, as documented.

Metering: To the requirements of the electricity retailer and the electricity distributor.

Private: As documented.

Photovoltaic metering: As documented.

#### **1.1.40.9 Wiring systems**

Requirement: Provide wiring and site cable reticulation systems appropriate to the installation conditions and the function of the load. Include the following:

- Underground services.
- Above-ground services.
- In-building services.

Type: Re-wireable system.

Neutral conductors: Same size as the corresponding active conductors. Rate the neutral conductor size for the maximum harmonic currents.

#### **1.1.40.10 Power cables**

Polymeric insulated cables: To AS/NZS 5000.1.

Aerial cables:

- Copper conductors: To AS 1746.
- Aluminium conductors: To AS 3607 or AS 1531.

Cables requirement: Select multi-stranded copper cables.

Default insulation: V-75.

Default sheathing: 4V-75.

Minimum size: Conform to the following:

- Lighting subcircuits: 1.5 mm<sup>2</sup>.
- Power subcircuits: 2.5 mm<sup>2</sup>.
- Submains: 6 mm<sup>2</sup>.

Voltage drop: Select final subcircuit cables within the voltage drop parameters dictated by the route length and load.

Fault loop impedance: Provide final subcircuit cables to satisfy the requirements for automatic disconnection under short circuit and earth fault/touch voltage conditions.

Underground residential distribution (URD) systems: Cables to AS/NZS 4026.

Distribution cables: To AS/NZS 4961.

Conductor colours: For fixed wiring cables, provide coloured conductor insulation or at least 150 mm of close-fitting coloured sleeving at the termination points of each conductor.

Active conductors in single phase circuits: Red.

Active conductors in polyphase circuits:

- A phase: Red.
- B phase: White.
- C phase: Blue.

Sheath: White.

Cable installation classifications: To AS/NZS 3013.

Handling cables: Report damage to cable insulation, serving or sheathing.

Stress: Do not use installation methods that exceed the cable's pulling tension. Use cable rollers for cable installed on tray/ladders or in underground enclosures.

Straight-through joints: Unless unavoidable due to length or difficult installation conditions, run cables without intermediate straight-through joints.

Cable joints: Locate in accessible positions in junction boxes and/or in pits.

Individual wiring of extra-low voltage circuits: Tie together at regular intervals.

Tagging: Identify multicore cables and trefoil groups at each end with stamped non-ferrous tags clipped around each cable or trefoil group.

Marking: Identify the origin of all wiring by legible indelible marking.

Submains and final sub-circuits installation: Provide the following:

- Cables with diameter less than 13 mm: Run in conduit, cable ducts or support on cable trays or ladders.
- Single core cables of 3 phase circuits of diameter greater than 13 mm: Install unenclosed single core cables laid on cable tray or support systems in trefoil (RWBN) groups.
- Cables for lighting systems: Run in conduit, cable ducts, suspend on catenary systems or support on cable trays or ladders.
- Accessible concealed spaces: Install thermoplastic insulated and sheathed cables.
- Inaccessible concealed spaces: Install cable in PVC-U conduit.
- Roof spaces: Install cable below heat insulation and sarking. If not protected from high ambient roof space temperatures by thermal insulation, derate the cables, to AS/NZS 3008.1.1 Table 27, for an assumed ambient temperature of 55°C.
- Accessible ceiling voids: Support and enclose cables on ceiling surfaces or ceiling suspension systems.
- Plastered or rendered masonry: Install cable in PVC-U conduit.
- Double sided face brick partition: Install cable in PVC-U conduit installed within the brick wall by slotting bricks or using any pathways provided in the brick.
- Stud framed walls with bulk insulation: Install cables in PVC-U conduit.
- Stud framed walls without bulk insulation: Thermoplastic insulated and sheathed cables allowing rewirability.
- Horizontal cable trays or ladders: Fix cables using proprietary nylon cable ties or straps, cable saddles or clips at 2000 mm intervals
- Vertical cable risers: Fix cables using proprietary nylon cable ties or straps, cable saddles or clips at 1000 mm intervals.
- Plant rooms: Install cable in heavy duty PVC-U conduit or on tray or in duct.

#### **1.1.40.11 Earthing**

Protective earthing system with a multiple earth neutral (MEN) connection: To AS/NZS 3000 Section 5 and as documented.

Earth electrodes: Provide electrodes to AS/NZS 3000 clause 5.3.6.

Bonding: Provide equipotential bonding to AS/NZS 3000 clause 5.6.

Earth and bonding clamps: Provide proprietary earthing and bonding clamps.

Standard: To AS 1882.

#### **1.1.40.12 Electrical accessories**

Style: Provide accessories of the same style and from the same manufacturer, as documented.

Socket outlets generally:

- General: To AS/NZS 3112.
- Industrial: To AS/NZS 3123.

Socket outlet properties: Provide sockets conforming to the following or as documented:

- Type: Integral switched socket outlet.
- Material: High impact plastic.
- Size: Standard single gang.
- Current rating: 10 A.
- Pin arrangement: Mount outlets with the earth pins at the 6 o'clock position.

Plastic switched socket outlets colour: White electrical.

Mounting configuration: Horizontal.

Ironclad socket outlets type: Integral switched socket outlet.



Material: Diecast metal or cast iron.

Colour: Grey.

Weatherproof socket outlets colour: Grey.

Combined RCD switched socket outlets type: Integral RCD unit with double switched socket outlet.  
Colour: White electrical.

RCD trip current: Conform to the following:

- General light and power: 30 mA Type II to AS/NZS 3190.
- Patient treatment areas: 10 mA Type I to AS/NZS 3190, as documented. Where used to protect outlets installed in patient treatment areas to AS/NZS 3003, use RCD units with trip currents  $\leq 10$  mA with Type I RCD units.

Multi-switch socket outlets on grid mounted panels type: Separate switch and socket outlets grid mounted on propriety or custom designed panels.

Material: As documented.

Colour: As documented.

Panel finishes: As documented.

Plugs – 230 volt: Insulated type to AS/NZS 3112 with integral pins.

230 volt combination switch and permanently connected cord outlet type: Three terminal flush mounted switch and flex-lock insert assembly.

Colour: White electrical.

Neon Indicator: Provide neon indicator.

Flex-lock assembly: Match and securely grip the size and type of flexible cable used.

Mounting configuration: Horizontal.

Permanently connected equipment: Provide final subcircuit to permanently connected equipment, as documented.

Isolating switch: Locate adjacent to equipment.

Mounting:

- Internal installations: Flush mount.
- External installations: Weatherproof surface mounted.

Coordination: Coordinate with equipment supplier.

Wall/ceiling mounted equipment: Conceal final cable connection to equipment.

Isolating switches standard: To AS/NZS 3133.

Emergency stop switches standard: To AS/NZS IEC 60947.5.5.

Type: Mushroom head with latch and twist releaser.

3-phase outlets standard: To AS/NZS 3123.

Type: Surface mounted Integral switched socket outlet with flap lid on the outlet.

Material: High impact plastic.

IP rating: IP56.

Size: To suit current rating and pin configuration nominated in the project documents.

Colour: Grey.

Current rating: 5 pin, 20 A, 400 V a.c.

Switch mechanism: Rotating type.

Pin arrangement: Five round pins mounted with earth pins at the 6 o'clock position, neutral pins in the centre and the red, white and blue phases in a clockwise sequence when viewed from the front of the outlet.

Plug: Provide a matching plug top for each outlet.

Installation: Install accessories and conceal cabling in walls in conformance with the following:

- Rendered masonry partition: Flush wall box, with conduit chased into wall.
- Double sided face brick partition: Vertically mounted flush wall box, with conduit concealed in cut bricks.
- Face brick external cavity wall: Flush wall box, with thermoplastic insulated cables in conduit run in cavity and tied against inner brick surface, or thermoplastic sheathed cables run in cavity.
- Stud partition: Flush plate secured to proprietary support bracket or wall box.
- Fire walls: Flush wall box, with conduit built into wall. Provide additional fire protection around wall boxes, where necessary to maintain fire-resistance rating.

Location: Confirm final location of all outlets and equipment on site, before installation.

Spacing from adjacent horizontal surface:  $\geq 75$  mm to the centre of accessory socket.

Default mounting heights to centre of accessory plate:

- Outlets: 300 mm.
- Switches and controls: 1100 mm.

Accessories: Flush mounted, except in plant rooms.

Common face plates: Mount adjacent flush mounted accessories under a common faceplate.

Restricted location: Do not install wall boxes across junctions of wall finishes.

Surface mounting: Proprietary mounting blocks.

Connections for appliances: Flush mounted outlets on the ceiling next to support brackets.

Mounting: Mount appliances independent of ceiling tiles and suspended ceiling suspension system. Fix directly to concrete slab or to roof structure above ceiling.

Connections for fixed equipment: Provide concealed permanent connections.

Fixing: For equipment and appliances heavier than 30 kg, provide support through the suspended ceiling to the building structure. Brace appliances that have excessive bending moments, are heavy or vibrate, to prevent horizontal movement.

#### **1.1.40.13 Switchboards – proprietary**

Requirement: Provide proprietary switchboards, as documented.

Standards: To AS/NZS 3000, and AS/NZS 3439.3 or AS/NZS 61439.3.

#### **1.1.40.14 Switchboards – products**

Switchboard connectors type: Front connected.

Enclosure default material: Metallic-coated sheet steel.

Separation default: Form 1.

Metering retail: To the requirements of the electricity retailer and the electricity distributor.

Private: As documented.

Photovoltaic metering: As documented.

Main switchboard main switches spare capacity: Provide at least 25% spare capacity in the ratings main switch/isolators.

Busbars: Incorporate proprietary insulated busbar systems for the interconnection of isolators, circuit breakers and other circuit protective devices.

Busbar fault rating: Rated to meet the prospective fault current for 1 second or a minimum rating of  $\geq 18\text{kA/second}$ , whichever is the greater.

Spare capacity default spare poles:  $\geq 20\%$ .

Main switchboard incoming busbar:  $\geq 25\%$ .

Earthing: Make provision for the connection of the communications earth terminal (CET) at switchboard earth bar to AS/CA S009.

Doors: Provide lockable doors with a circuit card holder unless enclosed in cupboards or in an area which is not readily accessible to the public.

IP rating default rating: IP42 minimum.

Weatherproof: IP56 minimum.

Finishes external and interior: Orange X15 or the manufacturer's standard colour.

- Installed in cupboards, switch rooms and plant rooms: Orange X15 or the manufacturer's standard powder coated finish.
- Installed elsewhere: Orange X15, the manufacturer's standard power coated finish or to the documented non-standard powder coated colour.

Where orange X15 or manufacturer's standard colour are unsuitable, nominate colour in the **Proprietary switchboard schedule**.

Supporting structure assemblies:

- Wall mounted:  $\leq 2 \text{ m}^2$ .
- Floor mounted:  $> 2 \text{ m}^2$ .

Ventilation: Required to maintain design operating temperatures at full load.

Cable entries: Neatly adapt one or more cable entry plates, if fitted, to accept incoming cable enclosure. Provide the minimum number of entry plates to leave spare capacity for future cable entries. Do not run cables into the top of weatherproof assemblies.

Single core cables: Pass separately through non-ferrous gland plates. Do not provide ferrous metal saddles.

Cable enclosures requirement: Continue cable enclosures to or into assemblies and fit cable entry plates so that the IP rating of the assembly and the fire-resistance level of the cable are maintained.

Cable supports requirement: Support or tie mains and submains cables within 200 mm of terminations. Provide cable supports suitable for stresses resulting from short circuit conditions.

#### **1.1.40.15 Switchboard components**

Requirement: Provide switchboard components, as documented.

Statutory authority's equipment: Liaise with the electricity distributor about the installation and coordinate with their protective and control equipment

Selection: To AS/NZS 3000 clause 1.7 and Section 2.

Rated duty: Uninterrupted.

Rated making capacity (peak):  $\geq 2.1 \times$  fault level (r.m.s.) at assembly incoming terminals.

Utilization category: To AS/NZS IEC 60947.1 clause 4.4 and the recommendations of Annex A.

- Circuits consisting of motors or other highly inductive loads: At least AC-23.
- Other circuits: At least AC-22.

Coordination: Select and adjust protective devices to discriminate under overload, fault current, and earth fault conditions.

Enclosure: IP4X minimum.

#### **1.1.40.16 Switch-isolator and combination fuse-switch units**

Standard: To AS/NZS IEC 60947.1 and AS 60947.3.

Operation: Independent manual operation including positive ON/OFF indicator.

Shrouding: Effective over range of switch positions.

Fault make/fault break switch-isolators rated breaking capacity: To AS 60947.3 Table 3.

Rated short-time withstand current: As defined in AS/NZS IEC 60947.1 clause 4.3.6.1 and the manufacturer's recommendation for the prospective fault current conditions.

Rated short-circuit making capacity: As defined in AS/NZS IEC 60947.1 clause 4.3.6.2, to conform to the manufacturer's recommendation for the prospective fault current conditions.

Rated short-circuit breaking capacity: To AS/NZS IEC 60947.1 clause 4.3.6.3 and the manufacturer's recommendation for the prospective fault current conditions.

Load make/load break switch-isolators rated making and breaking capacity: As defined in AS/NZS IEC 60947.1 clause 4.3.5 to conform to AS 60947.3 Table 3 and the manufacturer's recommendations for the prospective fault current conditions.

Rated short-time withstand current: As defined in AS/NZS IEC 60947.1 clause 4.3.5, to conform to the manufacturer's recommendation for the current conditions.

#### **1.1.40.17 Overlaid and fault protection generally**

Requirement: Provide overload and fault protection devices, including full discrimination and cascade protection, and grade with the electricity distributor's incoming supply protection system and the downstream site protection devices.

#### **1.1.40.18 Fuse switch units**

Requirement: Isolate when switch contacts are open. Provide 3 phase sets of high rupturing capacity (HRC) fuse links.

#### **1.1.40.19 Moulded case and miniature circuit breakers**

Moulded case breakers: To AS/NZS IEC 60947.1 and AS/NZS IEC 60947.2.

Miniature circuit breakers: Interrupting capacity classification to AS/NZS 60898.1 or AS/NZS 3111.

- For general building services: Type C.
- For motor protection: Type D.

Operation: Independent manual operation including positive ON/OFF indicator.

Trip type: Conform to the following:

- Moulded case breakers: Adjustable thermal, fixed magnetic.
- Miniature circuit breakers: Fixed thermal and fixed magnetic.

Isolation facility: Required.

Current limiting: Moulded case breakers required.

Mounting: Mount circuit breakers so that the ON/OFF and current rating indications are clearly visible with covers or escutcheons in position. Align operating toggles of each circuit breaker in the same plane.

Clip tray chassis: For miniature overcurrent circuit breakers, provide clip tray assemblies capable of accepting single, double or triple circuit breakers and related busbars. Provide moulded clip-on pole fillers for unused portions.

Utilisation category: Moulded case breakers:

- Final subcircuits category: Category A.
- Mains and submains: Category B.

Trip settings: Set as documented, seal, and label.

Interchangeable trip units: Connect trip units so that trip units are not live when circuit breaker contacts are open.

Fault current limiting circuit breakers: Select breaker frame sizes from one manufacturer's tested range of breakers to give cascade and discrimination protection within the switchboard and downstream switchboards as required.

#### **1.1.40.20 Electricity distribution's service protection devices**

Low voltage service protective devices: To AS/NZS 3000, the electricity distributor's requirements and the Service and Installation Rules.

Service protective devices > 100 A: Provide fault current limiting circuit breakers with adjustable overload and short circuit current facilities with full discrimination and cascade protection between the incoming supply protection systems and the downstream protection systems.

#### **1.1.40.21 Residual current operated circuit breakers (RCBO)**

Standard: To AS/NZS 3190.

Integral non-overload protection type: To AS/NZS 61008.1.

Integral overload protection type: To AS/NZS 61009.1.

Modular type: To AS/NZS IEC 60947.2.

- Type I for patient treatment areas.
  - . Default tripping current: 10 mA.
  - . Switched neutral: Required.
- Type II.
  - . Default tripping current: 30 mA.

#### **1.1.40.22 Fuses with enclosed fuse links**

Standards: To IEC 60269-1 and IEC 60269-2.

Fuses with fuse links for the protection of semiconductor devices: To IEC 60269-4.

Fuses with fuse links used as fault current limiters: Coordinate fuse type and rating with the protection switchgear manufacturer's recommendation if used downstream of the fault current limiters. Provide labels adjacent to the fuse holder stating FAULT CURRENT LIMITER and fuse size.

Fuse links: Enclosed, high rupturing capacity type mounted in a fuse carrier.

Breaking range and utilisation category:

- Distribution/general purpose: gG.
- Motors: gM.

Fuse holders: Mount fuse holders so that fuse carriers may be withdrawn directly towards the operator and away from live parts. Provide fixed insulation which shrouds live metal when the fuse carrier is withdrawn.

Barriers: Provide barriers on both sides of each fuse link, preventing inadvertent electrical contact between phases by the insertion of screwdriver.

Spare fuse links: Provide 3 spare fuse links for each rating of fuse link on each assembly. Mount spares on clips within the spares cabinet.

Spare fuse holder carriers: Provide 3 spare fuse holder carriers for each size of fuse holder carrier on each assembly. Mount spares on clips within the spares cabinet.

Busbar mounted fuse holders: Provide fuse carriers with retaining clips, minimum fuse holder 32 A.

#### **1.1.40.23 Contractors**

Standard: To AS/NZS IEC 60947.4.1.

Type: Enclosed, block type, air break, electromagnetic.

Poles: 3.

Rated operational current: The greater of:

- Full load current of the load controlled.
- $\geq 16$  A.

Mechanical durability: 10 million cycles to AS/NZS IEC 60947.4.1.

Electric durability:  $\geq 1$  million operations at AC-22 to AS/NZS IEC 60947.4.1.

Mounting: Mount with sufficient clearance to allow full access for maintenance, removal and replacement of coils and contacts, without the need to disconnect wiring or remove other equipment.

Auxiliary contacts: Provide auxiliary contacts with at least one normally-open and one normally-closed separate contacts with rating of 6 A at 230 V a.c., utilisation category AC-1.

Slave relay: If the number of auxiliary contacts exceeds the number which can be accommodated, provide separate slave relays.

#### **1.1.40.24 Lighting**

Requirement: Provide lighting and control systems, as documented.

Energy efficiency for ballasts and lamps: To AS/NZS 4783.2.

Minimal energy performance standards: To AS/NZS 4782.2, AS/NZS 4783.2, AS 4934.2.

Self-ballasted lamps: To AS/NZS 4847.2.

#### **1.1.40.25 Proprietary luminaires**

Requirement: Provide proprietary luminaires complete with lamps, luminaire control equipment, lighting control equipment, and accessories as documented. Provide lamps of the same type from the same brand and country of manufacture.

Self-ballasted lamps: To AS/NZS 60968 and AS/NZS 60969.

#### **1.1.40.26 Fluorescent lamps**

Fluorescent lamps: To AS/NZS 4782.1 and AS/NZS 4782.2.

Compact fluorescent lamps: To AS/NZS 4847.1 and AS/NZS 4847.2.

Single capped fluorescent lamps: To AS/NZS 60901.

Properties CCT: 4000 K.

Colour rendering: Group 1B to AS/NZS 1680.1.

Linear and circular lamp type: T8 (26 mm diameter) or T5 (16 mm diameter), linear lamps, triphosphor, TL84, as documented.

Compact fluorescent lamps types: Four-pin, non-integrated type.

#### **1.1.40.27 Fluorescent lamp ballasts**

Linear and circular lamp types: Provide electronic fluorescent lamp ballasts for fluorescent lamp lighting systems selected for compatibility with the lamp and control method.

Electronic fluorescent lamp ballasts: Conform to the following:

- To AS/NZS 61347.2.3 and AS/NZS 60929.
- Current total harmonic distortion: < 15%.
- Soft start.
- Number of ballasts: Provide separate ballasts for each lamp or integral dual ballasts as an alternative for dual lamp fittings.

Ballast performance measurement – fluorescent lamps: To AS/NZS 4783.1.

CFL lamp types: Provide electronic fluorescent lamp ballasts for CFL lighting systems selected for compatibility with the lamp and control method.

Electronic fluorescent lamp ballasts: To AS/NZS 61347.2.3 and AS/NZS 60929.

Current total harmonic distortion: < 15%.

Number of ballasts: Provide separate ballasts for each lamp or integral dual ballasts as an alternative for dual lamp fittings.

Ballast performance measurement – fluorescent lamps: To AS/NZS 4783.1.

Fluorescent lamp power factor correction: Provide power factor correction on all luminaires to a minimum power factor of 0.9 lagging.

#### **1.1.40.28 Light-emitting diodes (LEDS) luminaires**

Requirement: Provide light emitting diode (LED) luminaires, as documented.

Light-emitting diode: CRI > 80.

CCT: 3000K.

#### **1.1.40.29 Control gear enclosure**

Requirement: Provide control gear support enclosure within the body of the luminaire, except where remotely mounted control gear is documented or required by the manufacturer.

Enclosures and control gear mounting assemblies: Provide heat dissipation facilities to dissipate heat from the luminaire.

Control gear enclosure: Form a barrier against direct contact with live parts of the control gear and the area of the luminaire containing the lamp and lamp support holders.

Separate control gear enclosures: If separate control gear enclosures external to the luminaire are required, conform to the above requirements.

Fixing: Screw fixed.

#### **1.1.40.30 Wiring**

External flexible cords recessed luminaires: Provide flexible cord in conformance with the following:

- Length:  $\geq 1.5$  m.
- Cross sectional area:  $0.75 \text{ mm}^2$ .
- Type: 3-core V75 (minimum) PVC/PVC, connected to a 10 A 3-pin moulded plug to AS/NZS 3112 or multi-pin plug, as documented.

#### **1.1.40.31 Lighting control**



Requirement: Provide the following as documented:

- Lighting switches.
- Dimmers.
- Automatic control systems.

Digital control system: Provide a proprietary, microprocessor-based system to control lighting under automatic and user interface control, as documented.

#### **1.1.40.32 Supports**

Requirement: Install luminaires on proprietary supports by means of battens, trims, noggings, roses and packing material.

Suspended luminaires rods: Steel pipe suspension rods fitted with gimbal joints.

Chains: Electroplated welded link chain.

Levelling wire: Stainless steel.

Levelling: Adjust the suspension system length so that the lighting system is level and even.

Horizontal tolerance:  $\pm 3$  mm between luminaires within the same area.

Surface mounted luminaires: Fit packing pieces to level luminaires and prevent distortion of luminaire bodies. Provide packing strips to align end to end luminaires.

Fixing: Conform to the following:

- Generally: Provide 2 fixings at each end of fluorescent luminaires.
- Luminaires less than 150 mm: A single fixing at each end in conjunction with 1.6 mm backing plates may be used.
- Provide battens and support for the fitting.
- Do not direct fix into plasterboard.

Recessed luminaires: Install recessed luminaires in trimmed openings in the suspended ceiling.

#### **1.1.40.33 Completion**

Requirement: Before the date of practical completion carry out the following:

- Verify the operation of all luminaires.
- Adjust aiming and controls for all luminaires under night time conditions.
- Replace lamps which have been in service for a period greater than 50% of the lamp life as published by the lamp manufacturer.

#### **1.1.40.34 Electronic security and access control**

Requirement: Provide electronic security systems, as documented.

System components: Provide the following components:

- Remote monitoring system.
- Access control system.
- Intruder detection system.
- Closed circuit television system.
- Intercom system.

Security classification: As documented.

System communications: As documented.

Intruder alarm systems: To AS/NZS 2201.1.

Alarm transmission system: To AS/NZS 2201.5.

Internal detection devices: To AS 2201.3.

Wireless systems: To AS 2201.4.

CCTV systems: To AS 4806.2.

Remote monitored systems: To AS 4806.4.

### **1.1.40.35 Security systems**

Alarm system panels or processors capacity: Provide separate sectors for each nominated internal zone, and for normally-closed and normally-open perimeter zones.

Sector time delay: Provide adjustable time delay entry/exit for each sector, with adjustment range 0 to 30 s.

Batteries and chargers:

- Sealed battery: Provide a sealed battery and charger system contained within each control panel with capacity as documented.

Uninterruptible power supply: Provide a dedicated uninterruptible power supply and connect to the security systems.

Capacity: At least 15 minutes, for the complete system in normal operation.

Activation devices: Provide keypads, cards, card readers and other activation devices for access control and intruder alarm systems as documented.

External: Provide weatherproof (IP56) hoods or housings for external units.

Default mounting height: 1100 mm from floor level.

External audible and visual alarms: Provide a corrosion-resistant weatherproof metal enclosures containing sirens and blue strobe lights. Fix in locations not readily accessible without a ladder.

Anti-tamper devices: Provide anti-tamper devices to control panels, external equipment, control and activating devices, and access control devices.

Function: To register an instantaneous alarm if covers are removed or vital wiring is disconnected.

Remote monitoring system: Provide a monitoring system in the alarm panel or processor for transmission of alarms and monitoring of the system by parties responsible for attending to alarms.

### **1.1.40.36 Access control**

Access control processors or panels capacity: Provide separate entry/exit control modules for each designated access point.

Users: Program the system to match the number of authorised users with unique access code s.

Time zones: At least 4 per day, with provision for weekends and public holidays.

Door control devices: Provide door control devices as set out in **DOOR CONTROL DEVICES** and as documented.

Vehicle access control: Provide vehicle access control system combining connection to vehicular doors and boom gates, and interconnection to the main access control system.

Exit loop detection: Provide a buried loop detection system adjacent to the exit point to activate boom gates or vehicular doors on approach by a vehicle. Connect so that doors or gates close after a pre-set time.

Interlock: Provide a photoelectric beam safety interlock.

Interlock function: To prevent door or gate from closing until the vehicle has cleared the exit point.

Mounting of entry access equipment: Where practicable, provide direct wall mounted push-buttons or readers; otherwise provide a robust mounting bollard and extension arm.

Default mounting height: 1000 mm from floor level.

Reed switches: Provide heavy duty reed switches on both sides of vehicle doors to generate a door closed indication at the control panel, where documented.

Intercom base station: Provide intercom base station, interconnected with the individual local stations. Include speakers and microphones.

Entry station construction: Wall mounted flush stainless-steel panel.

Weatherproofing: IP56.

Dial: Digital push-button type.

Schedule: Provide a weatherproof (IP56) schedule holder and card identifying individual local stations. Locate next to the base station intercom panel.

Local station: Provide wall mounted intercom local stations, interconnected with the base stations and external entry points.

Internal station type: Surface mounted, removable handset type.

Operation: Provide an audible tone device to indicate that the individual station is being called, and a press-to-talk switch so that the entry station can communicate with the internal station only when the switch is held down.

Door control: Provide integral momentary action door release switches to operate the door release or opening mechanisms at each external entry point.

#### **1.1.40.37 Equipment power supply**

Permanent power supply: Provide permanent power supply to the following:

- Intruder alarm panels and access control panels including sub panels.
- Electric door strike local panels or control equipment.
- Intercom stations.
- CCTV monitors and cameras.

Marking: Label the switchboard circuit breaker from which power for the security systems is obtained as follows:

SECURITY SYSTEM - Do not switch off.

interconnection to other services: Provide functions and equipment to allow the interconnection to other systems. Provide and connect wiring to the designated services.



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