Assets Planning and Delivery Group
Engineering

Strategic Product Specification

SPS 802
Assisted-Lift Access Covers

VERSION 1
REVISION 4

JUNE 2026

FOREWORD

Each Strategic Product Specification has been prepared to inform Water Corporation staff, consultants, contractors and land developers of the requirements for selecting and acquiring a manufactured product to be used in strategic Corporation infrastructure. The definition of 'Product' includes items that comprise assembled components, equipment or plant for mechanical, electrical and civil infrastructure applications.

The objective of a Strategic Product Specification is to specify fit-for-purpose Product which will contribute to the provision of effective water services at least whole-of-life cost and with least risk to service standards and safety. A Strategic Product Specification also provides uniform standards for compatibility of new water infrastructure with existing water assets.

Many Strategic Product Specifications have drawn on the design, asset management and operational experience of Product performance in live service gained by the Corporation over time. Some Strategic Product Specifications have drawn on the experience of the water industry nationally by referencing Australian or WSAA standards.

Strategic Product Specifications are intended for reference and use in the following typical procurement scenarios:

- Capital funded infrastructure design and construction work;
- Private developer funded subdivision infrastructure for takeover by the Corporation;
- Operationally funded infrastructure design and construction work;
- Corporation period contracts for Product purchases;
- Product purchases for stock or for miscellaneous minor work.

A published Strategic Product Specification will, in some cases, comprise technical content that is typical of a range of products of the same type (type specification) but may exclude specific requirements that should apply to a particular project or application. In such cases, the project designer is required to document the supplementary project specific requirements in the 'Project Specific Requirements' Appendix of the Specification.

The text of a published Specification should not be directly modified. In the event that a text variation is considered necessary to accommodate the needs of a particular project or application, the text modification should be documented in the appropriate Clause of a 'Project Specific Requirements' Appendix.

Enquiries relating to the technical content of this Specification should be directed to the Principal Engineer, Wastewater Conveyance, Infrastructure Design Branch to whom all enquiries relating to the technical content of the Specification should be directed. Future Specification changes, if any, will be issued to registered Specification users as and when published.

Head of Engineering

This document is prepared without the assumption of a duty of care by the Water Corporation. The document is not intended to be nor should it be relied on as a substitute for professional engineering design expertise or any other professional advice.

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SPS 802
Assisted-Lift Access Covers

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1 Scope and General

1.1 Scope

This Specification sets out requirements for the design, manufacture, production testing, handling and delivery of assisted-lift access cover, cover frame, safety grate and concrete surround assemblies for use in Corporation wastewater and other selected conveyance systems. The Specification also details the means by which compliance with the Specification shall be demonstrated and the acceptance criteria for cover assembly components.

The assisted lift access cover assembly types and nominal clear opening sizes covered by this specification are:

Type 1. Rectangular 1500 mm x 760 mm;
Type 2. Square 760 mm x 760 mm;
Type 3. Circular 950 mm;
Type 4. Rectangular (prototype) 1950 mm x 1000 mm.

NOTES:

1 Typical applications for Types 1, 2 and 4 assisted lift, together with a range of non-assisted lift, cover assemblies are shown in Table 1.1 of SPS 801.
2 Type 4 cover assembly configuration and dimensions, as described in Sub-clauses 3.2 to 3.5, are of a prototype nature and remain subject to final agreed manufacturing configurations.
3 Type 3 cover assemblies are intended for special project applications where larger (single part access cover) openings are justified on a project by project business case basis. Where justified, project drawings should clearly specify all opening, cover assembly and RC surround slab configuration and dimensional details.

No cover, frame, assisted lift or locking mechanism shall infringe existing patent rights

1.2 Referenced Documents

The following documents are referenced in this Specification or are provided for the purposes of design and installation context relevant to the Product:

Water Corporation

DS 50	Design and construction requirements for gravity sewers DN 150 to DN 600
DS 51	The Design and Construction of Wastewater Pumping Stations and Pressure Mains 4.5 to 180 Litres Per Second Capacity
DS 95	Standard for the selection, preparation, application, inspection and testing of protective coatings on Water Corporation assets
S151	Prevention of Falls
	Strategic Products Register

WSAA

WSA 132	Industry standard for ductile iron access covers for water supply and sewerage
WSA 133	Industry standard for lightweight macro-composite access covers and compatible frames for water supply and sewerage

AS

1110.1	ISO metric hexagon bolts and screws - Product grades A and B - Bolts
1111.1	ISO metric hexagon bolts and screws - Product grade C - Bolts
1112.1	ISO metric hexagon nuts Style 1 - Product grades A and B
1112.3	ISO metric hexagon nuts Style 1 - Product grade C
1170	Structural Design Actions – Parts 0 to 4
1192	Electroplated coatings - Nickel and chromium
1199.1	Sampling procedures for inspection by attributes - Sampling schemes indexed by acceptance quality limit (AQL) for lot-by-lot inspection
1214	Hot-dip galvanized coatings on threaded fasteners (ISO metric coarse thread series)
1231	Aluminium and aluminium alloys - Anodic oxidation coatings
1379	Specification and supply of concrete
1397	Continuous hot-dip metallic coated steel sheet and strip - Coatings of zinc and zinc alloyed with aluminium and magnesium

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1565	Copper and copper alloys—Ingots and castings
1646	Elastomeric seals for waterworks purposes (Performance requirements in AS 681 Parts 1 to 4)
681.1	Elastomeric seals - Material requirements for pipe joint seals used in water and drainage applications - Vulcanized rubber
681.2	Elastomeric seals - Material requirements for pipe joint seals used in water and drainage applications - Thermoplastic elastomers
681.3	Elastomeric seals - Material requirements for pipe joint seals used in water and drainage applications - Cellular materials of vulcanized rubber
681.4	Elastomeric seals - Material requirements for pipe joint seals used in water and drainage applications - Cast polyurethane sealing elements
1831	Ductile cast iron *(Identical to ISO 1083)*
1874	Aluminium and aluminium alloys - Ingots and castings
2074	Cast steels
2205.10.1	Methods of destructive testing of welds in metal - Corrosion test for welded austenitic stainless steel
2345	Dezincification resistance of copper alloys
3600	Concrete Structures
3754	Safe application of powder coatings by electrostatic spraying
3996	Access covers and grates
4291.1	Mechanical properties of fasteners made of carbon steel and alloy steel - Bolts, screws and studs
5054	Ausferritic spheroidal graphite cast irons – Classification *(Identical to ISO 17804)*
5056	Metallic coatings-Powder metal (and composites) applied by mechanical means at ambient temperature
5100.2	Bridge Design – Design Loads
EN	
124	Gully tops and manhole tops for vehicular and pedestrian areas – Design requirements, type testing, marking, quality control
AS/NZS	
1390	Cup head bolts with ISO metric coarse pitch threads
1554.6	Structural steel welding - Welding stainless steels for structural purposes
1594	Hot-rolled steel flat products
1664.1	Aluminium structures Part 1: Limit state design
3862	External fusion-bonded epoxy coating for steel pipes
4158	Thermal-bonded polymeric coatings on valves and fittings for water industry purposes
4291.2	Mechanical properties of fasteners made of carbon and allow steel - Nuts with specified proof load values - Coarse thread
4321	Fusion-bonded medium-density polyethylene coating and lining for pipes and fittings
4680	Hot-dip galvanized (zinc) coatings on fabricated ferrous articles
ISO	
3506-1	Mechanical properties of corrosion-resistant stainless-steel fasteners Bolts, screws and studs
3506-2	Mechanical properties of corrosion-resistant stainless-steel fasteners -Nuts
6507-1	Metallic materials—Vickers hardness test - Test method
7089	Plain washers—Normal series—Product grade A
7091	Plain washers—Normal series—Product grade C
8839	Mechanical properties of fasteners—Bolts, screws, studs and nuts made of non-ferrous metals
AS/NZS ISO	
9001	Quality management systems – requirements
AS/NZS ISO/IEC	
17065	Conformity assessment – Requirements for bodies certifying products, processes and services
17067	Conformity assessment – Fundamentals of product certification and guidelines for product certification schemes

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ISO/IEC

17000	Conformity assessment – Vocabulary and general principles
17025	General requirements for the competence of testing and calibration laboratories
17026 (TR)	Conformity assessment – Example of a certification scheme for tangible products
17030	Conformity assessment – General requirements for third party marks of conformity
Guide 28	Conformity assessment — Guidance on a third-party certification system for products

ASTM (USA)

A240M	Standard specification for chromium and chromium-nickel stainless steel plate, sheet, and strip for pressure vessels and for general applications
A276	Standard specification for stainless steel bars and shapes
A380	Standard practice for cleaning, descaling and passivation of stainless steel parts, equipment and systems
F593	Standard specification for stainless steel bolts, hex cap screws, and studs
F594	Standard specification for stainless steel nuts
F844	Standard specification for washers, steel, plain (flat), unhardened for general use

WRc (UK) Water Industry Specifications (WIS)

4-52-03	Specification for anti-corrosion coatings on threaded fasteners

WTIA

TN13	Stainless steels for corrosive environments

1.3 Definitions and Notation

The following definitions are intended to clarify the terminology used in this Specification.

1.3.1 Australian Standards®

Standards that are developed, published and maintained by Standards Australia

1.3.2 Certificate

A formal certificate issued by a Conformity Assessment Body as an outcome of a compliance audit in accordance with a Certification System.

1.3.3 Certification Mark

A proprietary mark of product conformity issued in accordance with ISO/IEC 17030.

1.3.4 Certification System

An impartial third party product certification scheme or combination of schemes, as exemplified in ISO/IEC TR 17026, that are in accordance with the fundamentals of AS/NZS ISO/IEC 17067 and with the guiding principles of ISO/IEC Guide 28.

NOTE: The effect of this is to require maintenance by the manufacturer of effective production control planning in addition to full type testing from independently sampled production and subsequent verification of conformity with specified standards.

1.3.5 Conforming Product

Product that demonstrably conforms with standards and specifications nominated by the Corporation, where assessed by means of Product Appraisal.

1.3.6 Conformity Assessment Body (CAB)

A third party organisation that has been duly accredited as meeting the requirements of AS/ANZ ISO/IEC 17065 by a signatory member of the International Accreditation Forum (IAF) Multilateral Arrangement (MLA), previously known as a Certification Body.

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1.3.7 Corporation

The Water Corporation of Western Australia.

1.3.8 Manufacturer

An entity or combination of entities that are responsible for selection, processing and control of Product constituent materials or compounds and for the processing equipment that collectively result in the manufactured product.

1.3.9 Notation

Statements governed by use of the word 'shall' are mandatory or 'normative' requirements of the Specification. Statements expressed by use of the words 'should' or 'may' are 'informative' but not mandatory and are provided for information and guidance. Notes in Specification text are informative. Notes that form part of Specification Tables are normative. An Appendix to the Specification that is designated 'normative' contains mandatory requirements. An Appendix that is designated 'informative' is provided for information and guidance only. The term 'specified' includes requirements of the Specification and requirements stated or referenced in other project documentation.

1.3.10 Officer

A duly authorized representative or appointed agent of the Corporation.

1.3.11 Product

A single unit or multiple units of manufactured end product or an assembly of manufactured component products, materials or equipment. This Specification and accompanying Purchasing Schedule define the nature and details of Product to be supplied.

NOTE 1: An end product is most commonly an output of manufacturing processes that result in finished end products having the same features and characteristics and can be the result of a single or multiple production batches.

NOTE 2: Manufactured equipment and assemblies of Product components or materials are commonly procured for mechanical, electrical and civil infrastructure applications.

1.3.12 Product Appraisal

A formal process whereby Product is subjected to systematic engineering assessment to determine Product fitness for prescribed end uses and to evaluate its conformity with specified standards and requirements. Product Appraisal includes verification of the extent of conformity in accordance with the requirements of a relevant 'Technical Compliance Schedule'.

1.3.13 Product Assessor

An organization, Officer or other person who, having demonstrated specialist product knowledge and competence acceptable to the Corporation, is appointed to evaluate Product, appraises the Product and issues one or more Product Verification Reports.

1.3.14 Product Certification

A formal process whereby the production and management systems for the manufacture of Product, are assessed by a Conformity Assessment Body to evaluate conformity of these systems with specified product standards and tests, in accordance with Certification System rules.

1.3.15 Product Verification Report

A formal report wherein a Product Assessor evaluates the extent of Product conformity with the specified product standards and specifications.

NOTE: Verification may be on a project-by-project basis or at agreed intervals, as appropriate to the scope of a Purchasing Schedule and Product end use, subject to determination by the Corporation.

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1.3.16 Product Warranty

A formal express undertaking by a Supplier that indemnifies the Corporation against the consequences of supplied Product failure to conform with specified fitness for application and in-service life expectancy performance requirements.

1.3.17 Purchasing Schedule

A Corporation purchase order, tender, schedule of prices, bill of quantities, or specification that details the nature, quantity and other characteristics of Product to be supplied, purchased or installed.

1.3.18 Quality System

A management system that establishes, documents, implements and maintains organizational structures, resources, responsibilities, processes and procedures for the manufacture of Product and provision of Product related services in accordance with the requirements of AS/NZS ISO 9001.

1.3.19 Standards Australia

The peak non-government standards development body in Australia which develops Australian Standards®.

1.3.20 Strategic Product

An essential infrastructure component whose performance is critical to the elimination of risk to the safe and effective provision of water services, which are functions of the Corporation under the Water Corporation Act as licensed under the Water Services Coordination Act.

NOTE: Strategic product is a component of permanent Corporation infrastructure. Ancillary operational and safety equipment that does not form part of permanent infrastructure but offers exceptional enhancements in operational performance or personnel safety may also be deemed strategic.

1.3.21 Strategic Product Appraisal Process

The process described in Section 3 of the Strategic Products Register whereby manufactured products and equipment are evaluated and authorized for use in Corporation infrastructure, subject to demonstrated conformity with the nominated product performance requirements.

1.3.22 Supplier

An entity or combination of entities that is responsible for the supply of Product.

NOTE: A Supplier may be a Manufacturer, owner, producer, distributor, vendor, agent, tenderer or contractor for supply of Product or Product related service.

1.3.23 Testing

The determination of Product characteristics by inspection and by the application of specified test procedures in order to determine Product conformity with nominated performance requirements.

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2 Design and Performance Requirements

2.1 Cover Assembly Materials

Table 2.1 outlines performance requirements for cover, frame and concrete surround assembly materials in the required order of preference. Fastener requirements are intended only for application where assembly designers and manufacturers propose to design and incorporate fastener components in assemblies.

Assisted lift component and locking housing compartments shall be sealed from any potential ingress by wastewater system gases and – preferably - rainwater. Where rainwater ingress to assembly component housings proves unavoidable, housings shall incorporate a drainage opening for connection of a compatible standard (e.g. CIOD or ISO OD) diameter drainage pipe. The drainage pipe shall be designed to facilitate unobstructed drainage to the external environment through - and encased in - the RC assembly surround structure and to prevent ingress of wastewater system gases. Acceptability of proposed materials and design shall be subject to demonstration of the required engineering and longevity performances by reference to proven performance test data.

Table 2.1 Access Cover Assembly Material Requirements
Part 1 Assembly Structure

Component	Material and Application (Notes 1 & 2)	Material Standard	Grade/Type (Note 3)
Cover Body, Frame and assisted lift housing	**Polymeric**: Reinforcing fibres/inserts encapsulated in structural polymeric (thermo-set or thermo-plastics) resin matrix	Fibre reinforced polymeric formulation supported by engineering calculations and by objective structural and fatigue performance modelling, test data and test records/certificates	25 year unimpaired performance life
	Stainless steel	ASTM A240/A240M (A380 prepared)	316L, 431
	Ausferritic **Ductile Iron** (Corrosion Protected)	AS 5054	800/10
	Ferritic **Ductile Iron** (Corrosion Protected)	AS 1831 (Silicon alloyed)	ISO 1083 500/10
	Ductile Iron (Corrosion Protected)	AS 1831	600/3; 550/5; 500/7
	Carbon steel (Corrosion Protected)	AS/NZS 1594	HU 250
	Aluminium (Class B load applications only) including AS 3996 Clause 2.4 compliance	An acceptable structural and durability design basis, duly supported by engineering calculations and by objective performance modelling and test data/evidence.	AS 1874: AA 603/AC 603
Assisted lift mechanism	Stainless steel	ASTM A313/A313M and A555/A555M	316L, 431,
Cover Locking Mechanism	Stainless steel	ASTM A240/A240M (A380 prepared)	316L, 431
DI and carbon steel corrosion protection	Fusion bonded or mechanically applied	AS/NZS 4321; AS/NZS 4158; AS 5056 (in accordance with DS 95 specifications D1 & F1)	25 year unimpaired performance life
Composite UV protection	Acceptable UV stabilising agent in formulation	Objective UV resistance performance evidence	EN 124.5/124.6
Ancillary Safety Grating	Stainless steel	ASTM A276 (A380 prepared)	316L
Cover tightness seals	NBR or SBR	AS 1646 and AS 681.1 or 681.2	> 70 IRHD
Cover & Frame Surround	Reinforced Concrete (AS 1379)	Acceptable surround configuration and engineering design basis details and configuration drawings	N 40 (Note 7) B2 (Note 8)

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Table 2.1 (cont.)**:**

(**Part 2**) **Cover Assembly Fasteners** (only where specified)

Fastening Component	Material Composition	Material Standard	Grade or type (Note 3)	Dimensional Standard	Product tolerance grade	Mechanical Standard	Property or hardness class
Bolts (Notes 3 and 4)	Stainless steel	ASTM F593	316	AS 1110.1	A	ISO 3506-1	—
	DZR Copper Alloy (Note5)	AS 1565/2345	C83600A	AS 1110.1	A	ISO 8839	5.6
Nuts	Stainless steel	ASTM F594	316	AS 1112.1	A	ISO 3506-2	—
	DZR Copper Alloy (Note 6)	AS 1565/2345	C83600A	AS 1112.1	A	ISO 8839	6
Anti-galling treatment of stainless steel threads	Molybdenum disulphide or teflon dry film lubricant	—	—	—	—	—	—
Washers	Stainless steel (Note 5)	ASTM F844	316	ISO 7089	A	ISO 6507-1	—

TABLE 2.1 NOTES:

1 Alternative assembly component materials may be considered by agreement between the manufacturer and the Corporation, subject to the achievement of the required cover assembly performance and longevity objectives.

2 Welding of steel components shall comply with AS/NZS 1554. Direct contact between electro-galvanically different metals shall be avoided.

3 Other product material tensile strength and dimensional tolerance grades may be considered where convincing objective evidence of significantly improved longevity performance is provided.

4 Alternative bolt-head configurations, nuts with alternative thicknesses, and oversized washers may be acceptable.

5 The use of stainless steel washers is intended to be restricted to fastener assemblies of compatible metals including copper alloy but excluding carbon steel. Contact between electro-galvanically dissimilar metals (e.g. stainless and carbon steel) shall be prevented by the use of robust durable mechanical isolation barriers or membranes at the potential contact interface.

6 Copper alloy shall be dezincification resistant in accordance with AS 2345

7 Minimum required concrete type and characteristic strength.

8 Minimum required concrete exposure classification (or least severity of liquid/gas environment to which concrete is likely to be exposed), for the purposes of design.

2.2 Corrosion Protection Measures

Where it proves impracticable to engineer cover and frame body compartments from non-corrodible or corrosion protected materials, all horizontal surfaces within cover assembly compartments shall be designed to prevent the accumulation of grit, debris and moisture or shall, as an alternative, be readily accessible for the purposes of routine access and cleansing without the need to open primary (person) access openings. Internal assembly component surfaces that may be exposed to wastewater gas and moisture shall be demonstrably configured so as to prevent liquids from pooling and accumulating.

2.3 Polymeric Material Compliance

Objective evidence shall be provided to demonstrate the conformity of polymeric material with structural loading requirements, requirements for fatigue resistance to cyclic loading - expressed in terms of the rated number of vehicular loading cycles over the nominated product life as well as UV and environmental degradation resistance requirements.

NOTE: Application of the current (low order) cyclic loading and UV exposure tests in AS 3996 would only provide assurance of **short term** cyclic fatigue and UV resistance in WA conditions. A fatigue resistance of at least 5,000,000 vehicular traffic events should be demonstrated for typical Class D (metropolitan vehicular traffic) loading applications and an adequate long term (> 50 year) resistance to UV exposure in WA should be clearly demonstrated, for consideration of polymeric cover acceptance by the Corporation.

2.4 Load Design Requirements

Cover assemblies shall, for exposure to vehicular loads (heavy duty), be designed in accordance with:

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- Load class D as defined in AS 3996 i.e. the ultimate limit state design load rating shall be at least 240 kN in alignment with AS 5100.2 vehicular (W80 or 80 kN wheel) loading requirements ; or
- Load class C 250 (250 kN ultimate limit state design load) as defined in EN 124.

Otherwise, cover assemblies shall be designed in accordance with

- Load class C (150 kN ultimate limit state design load) as defined in AS 3996 where the risk of exposure to vehicular traffic is limited or controlled to light slow-moving traffic, as defined by and agreed with the Corporation, following a project specific analysis of loading needs and risk.
- Load class B (80 kN ultimate limit state design load), as defined in AS 3996 where there is no risk of exposure to vehicular traffic, as defined by and agreed with the Corporation, following a project specific analysis of loading needs and risk.

Any discrete part-cover component, that needs to be lifted to gain routine operational access to the chamber below the cover, shall not exceed 200 kg in mechanically unsupported weight. Safety grates shall be designed to safely support an imposed uniformly distributed loading of at least 2.5 kPa plus grating assembly self-weight or a concentrated load of at least 1.1 kN applied through a 100 mm x 100 mm square bearing area of grating, whichever produces the higher load rating.

NOTE: The static and dynamic load effects imposed on access covers and grates in particular applications should be assessed by a suitably qualified design engineer, prior to the specification of a particular cover load class requirement.

2.5 Dimensions and Tolerances

Cover assemblies and safety grates shall be designed to provide a minimum clear person access opening (CO) size as defined in this specification for the particular cover assembly type (Type 1 to Type 4).

2.5.1 Cover Insertion Depth

Cover and frame design shall assure a cover insertion depth and fit in a mating frame that:

- Complies with cover deflection and permanent set requirements;
- Minimises the capacity or tendency of cover flexure and ‘bounce’ where exposed to frequent, repetitive heavy - particularly multi-wheeled - vehicular traffic;
- Complies with load bearing and lifting weight requirements;
- Does not compromise any performance characteristic requirement at cover assembly locking or other cover component positions, by virtue of strength or dimensional discontinuities.

2.5.2 Dimensional Fit of Covers and Cover Assemblies

Type 4 cover assembly and safety grate component dimensions and dimensional tolerances shall be in accordance with the configuration requirements shown herein. These requirements include details of the reinforced concrete surround into which covers and frames shall be cast for delivery together with top slab (by others) configuration with which cover and RC surround assemblies shall be dimensionally compatible. The clear access cover opening (CO) size specified - to accommodate asset owner emergency bypass pump assemblies - shall be an absolute requirement irrespective of any fixings, brackets or lugs associated with cover, frame and safety grate components and component supports. Assembly component manufacturers and coating applicators shall ensure that finished cover, frame and surround assembly dimensions - including surface coating or finish treatment dry film thickness - do not constrain ease of assembly fit or installation into the top slab configuration specified herein. The opening direction of safety grates and their potential to provide AS 1657 compliant safety barrier protection in the open position without loss of grate removability shall be clearly nominated and shall not compromise the configuration constraints shown herein in any significant way.

2.5.3 Multi-part Cover Configuration for Test Purposes

Each part of a multi-part cover assembly shall be positioned relative to its support frame in accordance with the cover assembly manufacturer installation instructions with no cover-to-cover or cover-to-frame gap exceeding 3 mm. Multi-part cover testing for compliance with sustained load bearing, permanent set and deflection performance requirements (as specified in WSA 132 or EN 124, as applicable) shall be undertaken with a single (typical of all multi) cover part positioned in a test configuration where the cover spans its longest dimension and is unsupported on either of its long ‘sides’. There shall be **no**

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general presumption that the asset owner will provide any structural load bearing support across the access opening under any part of a multi-part cover opening span .

NOTE: Where an access chamber or pit design incorporates one or more intermediate loading support beams, the Corporation may consider acceptance of cover parts that have undergone testing with each part positioned in a shorter span test configuration, subject to engineering justification on a project by project basis.

2.6 Cover Deflection and Permanent Set

Cover deflection and permanent set requirements shall be in accordance with those given in Table 4.2 of AS 3996 except that the permissible deflection capability of Class D covers shall not exceed CO/100. Multi-part cover compliance with deflection and permanent set requirements shall be demonstrated by testing as described under "Multi-part Covers" above.

NOTE: Higher allowable (maximum) cover deflection values may be considered only by specific agreement with the Corporation, on a project by project basis, for applications where a low or nil risk of exposure to moving vehicular traffic has been clearly demonstrated.

The maximum cover permanent set and deflection values shall apply to access cover and frame assemblies when subjected to the serviceability and ultimate limit state design loads nominated in AS 3996 Table 3.1 for load testing in accordance with AS 3996 Clause 4.2.

2.7 Cover Skid Resistance

The upper surfaces of access covers shall have a raised pattern in accordance with WSA 132. The raised pattern and finish for all cover load classes of shall be slip-resistant in accordance with the requirements shown in WSA 132 Table 4.1.

2.8 Cover Lifting, Sealing and Security

2.8.1 Lifting Force

The maximum force required to manually lift, open or close a cover shall not exceed 200 N. The lift weight per cover panel shall not exceed 2000 N in accordance with the safe lifting capacity of Corporation handling, lifting and transportation (e.g. Kervek/Hiab) equipment.

At least two lifting points shall be incorporated into each discrete cover part, duly positioned to facilitate the ready use of unseating tools and lifting equipment for cover opening in the event of mechanical assist component failure. The safe load rating for each lifting point shall be marked in close proximity to the lifting point. Swift lift anchor points shall also be provided in cover concrete surrounds and shall be capable of overcoming debonding forces between concrete surround and concrete top slab, lift weight and lifting forces in accordance with the accepted Australian or equivalent standards.

NOTE: It should be noted that the safe maximum allowable force for manual (non assisted) lifting is 300 N per lifting point (or 600N per cover part for a two person lift).

2.8.2 Mechanical Assisted Lifting

Cover assemblies shall incorporate mechanical lifting mechanisms, designed to safely provide the required maximum lifting force given herein. Mechanical assistance shall be achieved by means of appropriate torsion or compression springs manufactured from materials in accordance with Table 2.1. The use of pneumatic or gas cylinder based equipment to assist lifting shall not be acceptable.

Assisted lift and associated mechanisms shall be isolated from the sealed operating environment below the covered systems. They shall be readily accessible to operators for the purposes of maintenance and replacement from an external location, without any need to lift covers or access the wastewater system.

NOTE: The incorporation of externally accessible grease ports should be considered for the purposes of periodic checking and lubrication of assisted lift mechanisms. It may not be assumed that operational or maintenance inspections of equipment below the RC platform will be undertaken at (or greater than) the frequency required to undertake assisted lift mechanism maintenance and service operations.

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2.8.3 Cover Access and Fixing Security

Cover lifting 'keyhole' and mating (system owner) key design shall be configured to minimise the risk of routine accessibility by passers-by or vandals. Product design drawings shall detail keyhole configuration and their positions relative to all access cover edges

Where a specific application requires fixing in place of an access cover, fixing/fastening arrangements shall be designed and supplied as an integral part of the cover assembly. Fixing and fastening details, load performances and dimensional configuration shall also be nominated on the product design drawings.

Cover and frame design shall ensure that assembly fixing/fastening arrangements will mechanically secure the cover against the frame all round and, where water and gas tightness is required, tightly seal the cover against the frame all round.

The length of fastener thread engagement in solid frame structural components shall not be less than nominal fastener diameters. Fasteners shall not protrude beyond frame undersides.

NOTE: Keyhole customization for optimal visitor and vandal 'proofing' may not be feasible using the arrangement shown in AS 3996 Figure 3.1.

2.8.4 Water and Gas Tightness

For acceptance, access cover/frame assemblies shall be gas and water tight in accordance with the watertightness and gas-tightness requirements of AS 3996. Assembly interface seal design shall incorporate mechanically robust and durable materials, fixings and a configuration whereby seal retention performance is assured for the required cover assembly operating life, notwithstanding the frequency of cover opening for routine periodic maintenance. The use of adhesives alone, without any mechanically proven reinforcement or fixings, to retain seals on a selected assembly surface shall not be permissible.

2.8.5 Operational Accessibility and Safety

Cover and frame assembly design shall incorporate safety grates that are supported all round by the frame in both open and closed grate positions.

Each access cover and grating systems shall be provided with a secure positive latching or fixing system, designed to prevent accidental closure or closure induced by wind speeds > 60 km/hr (in the open position with cover unlocked). Cover/frame and grating systems, whose load resistance and configuration design enables their use as safe AS 1657 compliant guardrails, separately or in combination, shall be preferred.

NOTE: A compliant guardrail system is intended to be in place prior to commencement of any access opening cover or safety grate removal operation (e.g. for inspection, maintenance and repair or replacement of internal equipment), irrespective of cover or grate usability as part of a safety guardrailing system when securely in place in an open position.

2.9 Freedom from Defects

The treatment and acceptability of small cover and frame assembly surface imperfections shall be in accordance with the requirements of WSA 132.

2.10 Product Marking

The marking requirements of AS 3996 Clause 1.6 for an access cover shall apply in principle and shall be supplemented with clear and permanent markings as follows:

- Substitution of the text "AS 3996" with that representing the primary product standard e.g. EN 124, WSA 132, WSA 133 or other (agreed) relevant standard, together with the particular load classification nominated in accordance with the primary product standard;
- The directional orientation of an AS 3996 defined Class D cover relative to traffic flow;
- The safe load rating for each access cover lifting point, in close proximity to the lifting point.

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3 Cover, RC Surround and Safety Grating Configuration

3.1 Type 1 Cover Assembly

DS 51 Drawings CA01-52-2, CA01-52-3, CA01-52-5, CA01-54-3, CA01-54-4 and CA01-54-8 illustrate typical Type 1 cover and RC surround slab arrangements for shallow conveyance pipeline valve pits in locations that are not exposed to vehicular road traffic.

3.2 Type 2 Cover Assembly

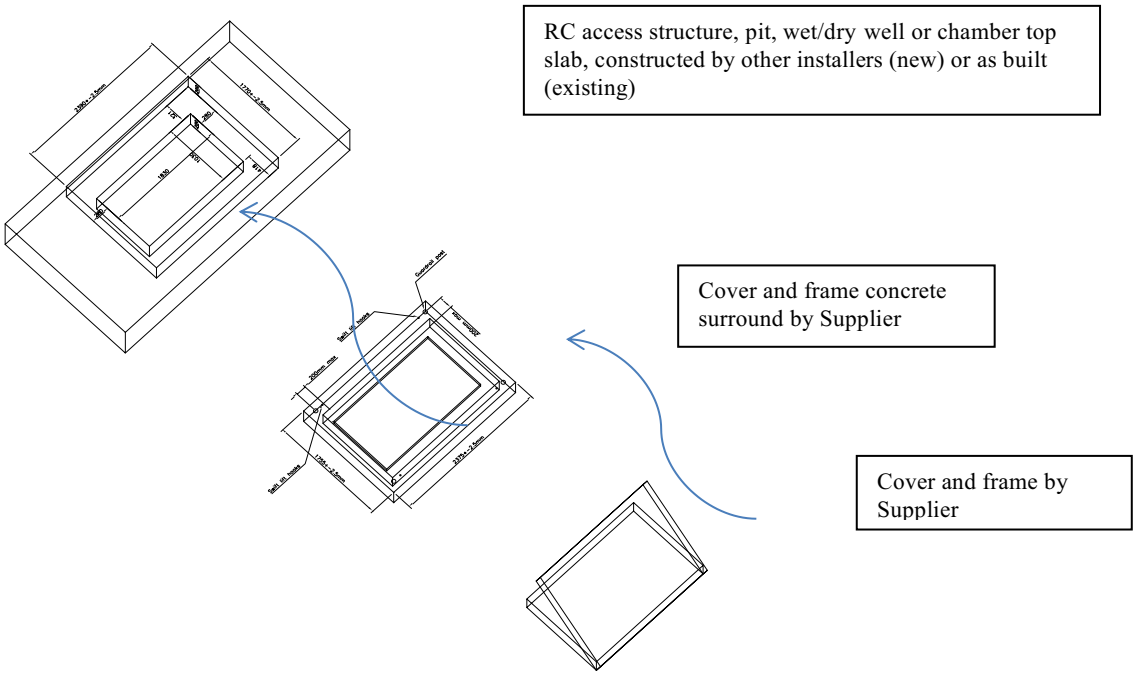
Type 2 cover assemblies are typical selections for person access to Type 90 (shown on DS 51 Drawings CA01-20-8.1/8.3) and Type 180 wastewater pumping station (WWPS) wet wells and Type 180 WWPS valve pits. Type 90 WWPS prevention of falls equipment including guard rails and access opening safety grating details are typified on DS 51 Drawings CA01-20-7-2 to CA01-20-7-5 and CA01-20-23 to CA01-20-26 (valve pits) and CA01-20-8-1 to CA01-20-8-4 and CA01-20-19-1 to CA01-20-19-4 (pump wells).

3.3 Type 3 Cover Assembly

Type 3 cover assemblies are intended to address special access configuration requirements that are identified on a project by project justified needs/cost/risk basis. Cover and RC surround slab assembly details and configuration should be detailed and specified on project drawings, in consultation with cover and RC product suppliers.

3.4 Type 4 Cover, RC Surround and Top Slab Geometry

Type 4 cover, frame and concrete surround assemblies shall be supplied complete for incorporation into reinforced concrete top slabs where dimensionally compliant slabs exist or where access cover assemblies may be configured and designed for particular asset projects. An indicative view of the dimensional and spatial connectivity required between the inter-related access assembly components - RC top slab (by other installers), cover/frame RC surround (by the Supplier) and the base cover/frame assembly (also by the Supplier) – is shown below:



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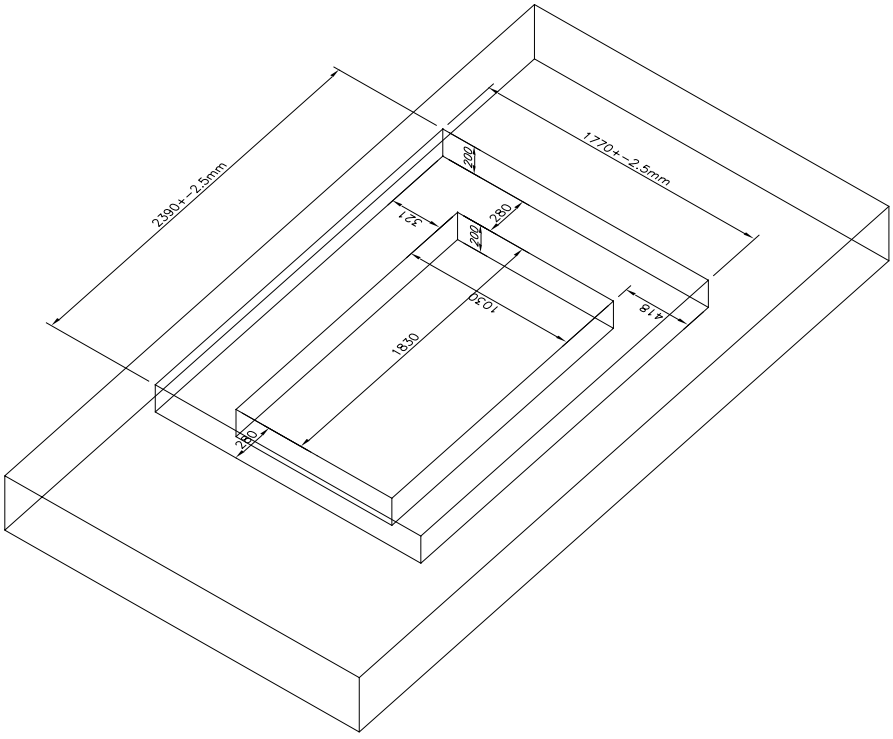
3.4.1 Type 4 Top Slab and Surround Opening Configuration

The toleranced top slab opening dimensions shown below are required to:

- accommodate an integral cover, frame and RC surround assembly together with associated fixing and de-bonding materials into the top slab 'recess';
- provide an opening clearance larger than the absolute minimum 1800 mm x 1000 mm access opening requirement to accommodate unobstructed cover, frame and safety grate features, fixings and projections that may be designed to, for example, secure access grates in a near vertical open position and to facilitate easy cover assembly removal and replacement by operators.



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3.4.2 Type 4 Cover, Frame and RC Surround Configuration

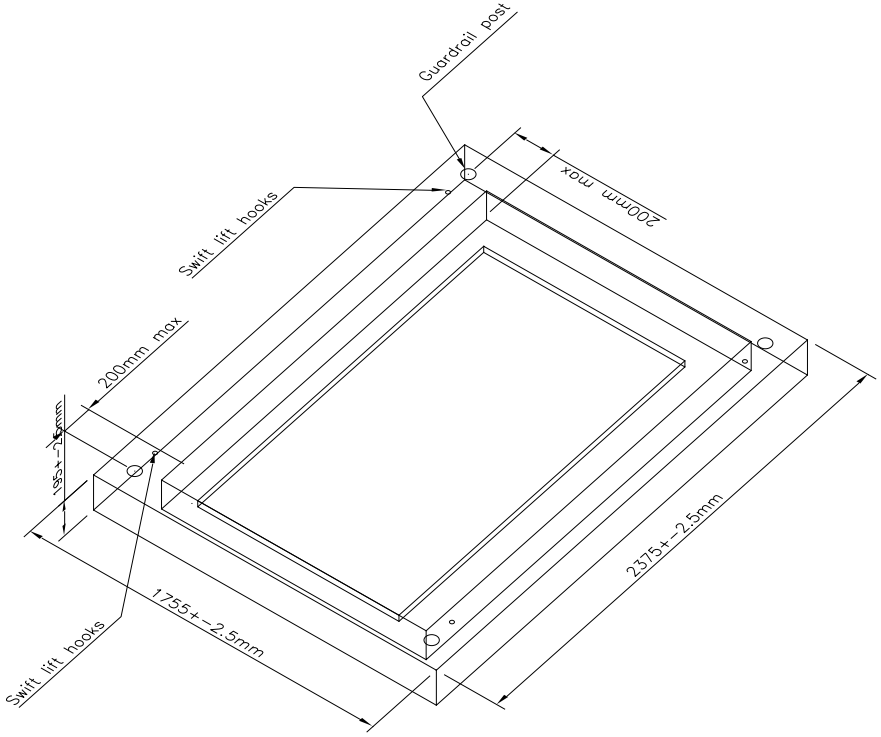
The cover, frame and concrete surround assembly shall be configured as shown below to enable its fit and fixing into the top slab surround 'recess'.

The materials and methodology proposed for de-bonding the joint between cover, frame and concrete surround assembly and the top slab for ease of placement and removal (e.g. bond breaker, low strength grout or joint sealing compound) and the means of removal shall be nominated for consideration prior to initiating an assembly prototype design.

The cover/frame concrete surround shall incorporate four swift-lift anchor points that are capable of safely lifting an integrated surround assembly and are also capable of safely overcoming de-bonding and removal forces as well as internal system gas/air pressures in the closed cover position. The design of assembly lifting and removal components shall comply with the accepted Australian or equivalent standards and component manufacturer recommendations as appropriate. The swift-lift anchor points shall be designed to transfer the lifting forces through the concrete surround to the cover/frame components by appropriate design provisions e.g. shear, keys, torsion or other safe mechanism.

Four Kennedy post base systems shall be cast into each cover/frame concrete surround in positions no farther than 200 mm from the nominated access opening. For reference, a cross section of a typical Kennedy post base is shown on Drawing number CA01-10-6.1(Detail 1) and typical guardrail details are shown on Drawing number CA01-10-16.

The cover/frame concrete surround shall be designed to resist guardrailing forces applied through the Kennedy guardrail post base (or cup) system. AS1657 sets out guardrail system configuration and loading requirements. Guardrail post fixings shall be positioned to provide sufficient clearance for secure fixing and operation of covers and grates in fully closed and open positions.



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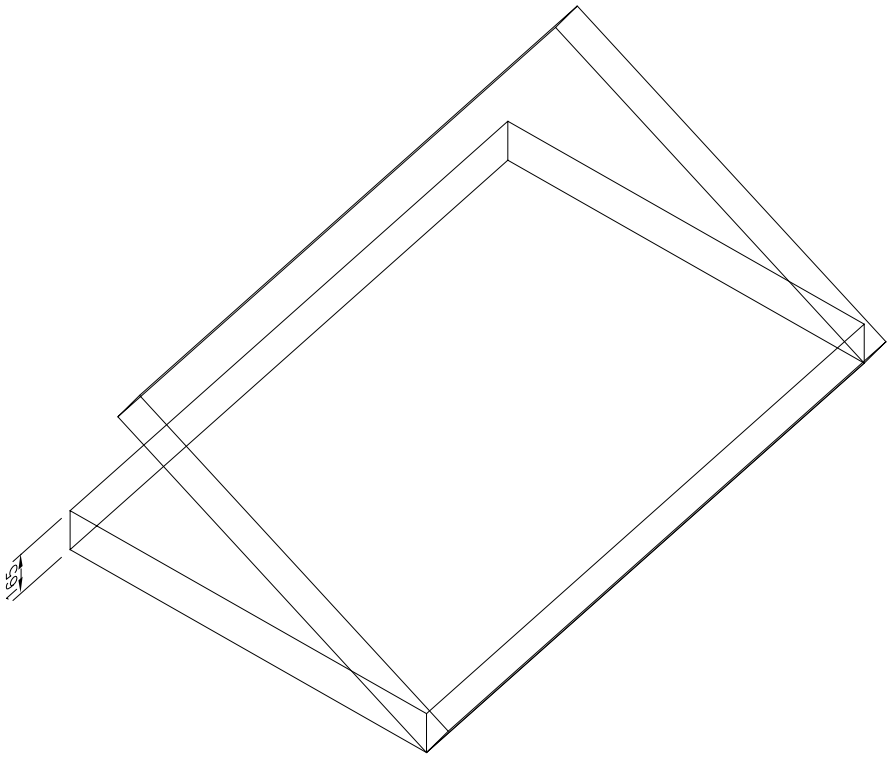
3.4.3 Type 4 Opening Safety Grate

Type 4 covers shall be configured so as to accommodate safety grate assemblies within cover/frame opening and depth envelopes as shown below. Safety grates shall be hinged to the inside of cover assembly frame (or to the surround concrete where feasible) and clear grating openings shall not exceed 200 mm X 200 mm. No part of a safety grate, whether or not hinged, shall encroach into the specified clear access opening area. Safety grates shall be readily removable when in the open position and shall be provided with an appropriately safe and robust mechanical lifting tool. The opening direction of safety grates shall be clearly nominated by cover/grate assembly manufacturers and suppliers, within the configuration constraints shown herein.

NOTE: It may not be assumed that any opened cover latching or fixing arrangement is capable of being supported in an open position by a removable (Corporation supplied) guardrail.



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4 Conformity with Requirements

4.1 General Requirements

Conformity with the requirements of this specification shall be demonstrated in accordance with the conformity testing requirements outlined in Clause 6 "Verification of Conformity with this Standard" of WSA 132 for ductile iron covers and WSA 133 for macro-composite covers.

Product conformity shall be assessed in accordance with WSAA Technical Note WSA TN-08 which sets out the requirements for:

- Conformity of product testing facilities with the requirements of AS/NZS ISO/IEC 17025;
- Product certification system/scheme design in accordance with AS/NZS ISO/IEC 17067 and the scheme criteria in ISO/IEC TR 17026, aimed at ongoing verification of conformity for the duration of the certification period (previously known as ISO Type 5 product certification);
- The provision of assurance that the Conformity Assessment (or Certification) Body (CAB) has been accredited to meet the requirements of AS/NZS ISO/IEC 17065.

Product shall be deemed to conform with requirements where test outcomes have been formally verified by a Product Assessor or certified by a Conformity Assessment Body (CAB) in accordance with the requirements of a product standard acceptable to the Corporation. Otherwise, it shall be classified as non-compliant Product.

NOTE: For acceptance, performance testing and calibration laboratories should be accredited as meeting the requirements of AS/NZS ISO/IEC 17025 by a signatory member of the International Laboratory Accreditation Cooperation (ILAC) Mutual Recognition Arrangement (MRA). The scope of laboratory/facility accreditation should include the competencies and capabilities required to execute the particular product testing and calibration work to be undertaken.

4.2 Requirements for Prototype Product

Where a cover product (e.g. Type 4 cover assembly) is in the prototype development - or pre- production - phase, its use is likely to be limited to Corporation nominated trial projects from which inspection and test data shall be recorded for the limited purpose of refining or agreeing a final product performance specification and drawing details for the purpose of full scale production.

Product acceptance for unrestricted use in Corporation assets shall be subject to the full range of conformity assessment requirements herein, following acceptance of a (final or full scale production phase) performance design specification and drawing details.

4.3 Certification of Product

Products, in respect of which conformity with a particular nominated product Standard(s) is claimed, shall, for acceptance, be assessed in accordance with an acceptable product certification system and shall be subject to the issue of a certificate of conformity with the nominated Standard(s) by a duly accredited CAB.

The certification system or scheme with which product conformity is claimed shall:

- be based on ISO/IEC TR 17026, Conformity assessment -- Example of a certification scheme for tangible products and shall be in accordance with the fundamentals of AS/NZS ISO/IEC 17067 and with the guiding principles of ISO/IEC Guide 28;
- include product type testing from independently sampled production;
- require the manufacturer's production processes and associated controls to be part of a quality management system that has been certified as meeting the requirements of AS/NZS ISO 9001, Quality management systems - Requirements; and shall
- include subsequent verification that the manufacturer routinely continues to maintain effective production control and product conformity with the nominated product Standard(s), at intervals not exceeding 12 months.

NOTE: Evidence of Product conformity with the specified requirements may be by means of a Product Verification Report provided by a Product Assessor including reference to a current relevant water industry appraisal report or certificate issued by WSAA.

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4.4 Product Re-verification

Product conformity with the Specification shall be subject to re-verification by a Product Assessor when, during the agreed Product supply period, there occurs any:

- substantive change in Product design, material formulation or performance
- Product failure to perform in operational service to the nominated performance specification.

Re-verification shall require the issue of a new or supplementary Product Verification Report. Product components and test outcomes that are not significantly affected by the Product change or failure may be excluded from the scope of re-verification where already been reported in a current valid Product Verification Report that is acceptable to the Corporation.

4.5 Acceptance Criteria

For acceptance, Product shall be supplied as specified in the Purchasing Schedule.

Prior to the implementation of any arrangement to supply Product, the Supplier shall, in accordance with specified requirements:

- nominate applicable Product Warranty terms; and
- provide documentary verification in the form of a current valid Certificate, an acceptable inspection and test plan (ITP) or Product Verification Report as appropriate to the Product; and
- detail each element of Product that does not comply with the specified requirements together with the extent of non-compliance.

NOTE: Where a project specification includes Technical Compliance Schedules, the nature and extent of all non-conformances should be provided in accordance with the appropriate Schedules.

4.6 Non-conforming Product

4.6.1 General

Product whose design, workmanship or performance fails to conform to the specified requirements shall be clearly tagged and quarantined by the Supplier as non-compliant and shall be subject to rejection for return to and replacement by the Supplier.

4.6.2 Manufacturing Repairs (In-process)

The Manufacturer shall make provision in its production Quality System and in its ITP for sufficient hold points whenever Product defects are encountered. Production work on non-compliant components shall cease and repair work shall not re-commence until the following details have been confirmed by the Corporation in writing that:

- repair of the non-compliant components in lieu of their replacement is acceptable; and
- proposed repair procedures are acceptable; and
- any proposal to vary the terms of the original Product Warranty as a consequence of the in-process repair is acceptable.

4.6.3 Product Warranty

The Supplier shall replace non-compliant Product with Product that conforms to the acceptance criteria or shall repair or rectify all faults, damage or losses caused by defective Product. Except as may otherwise be specified, the Product Warranty shall indemnify and keep indemnified the Corporation against all losses suffered by the Corporation as a result of non-compliant Product for a period no less than 24 months after Product delivery or 12 months after Product installation, whichever period elapses first.

4.6.4 Product Repair

All reasonable proposals for repair or remedy of defects will be considered, provided that each proposal is accompanied by a methodology statement that accords with the performance objectives of this

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Specification, as determined by the Corporation. For acceptance, a proposal for repair or remedy of Product defects shall not void or otherwise diminish the provisions of the Product Warranty.

4.6.5 Access to the Place of Manufacture

The Corporation shall be afforded access, at all reasonable times, to all places of manufacture of Product and shall be authorised to arrange or undertake such testing there as the Corporation deems appropriate to the agreed design proving or testing regime.

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5 Appendix A

5.1 Material Master Records

The following Material Master Records comprise Corporation catalogue numbers that are unique to the particular products tabulated herein for the purposes of Corporation activities or work.

MMR	Purchase Order Description
21248	Cover, Access; Easylift; 760mm Square; Ductile Cast Iron; Flat Mounted; Spring Assisted Opening; C/W Stainless Steel (316) Grate, Stainless Steel (316) Locking Mechanism and Additional Security Locking Device. All Coatings in Accordance with Specifications A1, D1 and E3 of Water Corporation Design Standard DS95. Used for Installation into Concrete Surrounds and Suitable for Waste Water Pump Stations (WWPS) Wet Wells, Access Chambers, Valve Pits and Similar Assets.
21249	Cover, Access; Easylift; 760mm Square; Ductile Cast Iron; Raised Mounted; Spring Assisted Opening; C/W Stainless Steel (316) Grate, Stainless Steel (316) Locking Mechanism and Additional Security Locking Device. All Coatings in Accordance with Specifications A1, D1 and E3 of Water Corporation Design Standard DS95. Used for Installation into Concrete Surrounds and Suitable for Waste Water Pump Stations (WWPS) Wet Wells, Access Chambers, Valve Pits and Similar Assets.
21259	Cover, Access; Easylift; 950mm Round; Ductile Cast Iron; Flush Mounted; Spring Assisted Opening; C/W Stainless Steel (316) Grate, Stainless Steel (316) Locking Mechanism and Additional Security Locking Device. All Coatings in Accordance with Specifications A1, D1 and E3 of Water Corporation Design Standard DS95. Used for Installation into Concrete Surrounds, Waste Water Pump Stations (WWPS) Wet Wells, Access Chambers, Valve Pits and Similar Assets.
21261	Cover, Access; Easylift; 1500mm x 760mm Rectangular; Ductile Cast Iron; Flush Mounted; Spring Assisted Opening; 1502mm x 762mm Clear Opening; 1732mm x 1130mm Overall Base Dimensions; Manufactured to BS EN124 to Class D400 Structural Integrity; Watertight and Gastight; Used for Installation into Concrete Surrounds and Suitable for Valve Pits and Similar Assets.

MMR	**Ancillary Components** Purchase Order Description
21258	Handle, Manual Control; For Opening all Easylift Cover Types, 760mm Square (MMR's 21248 and 21249), 950mm Round (MMR 21259) and 1500mm x 760mm Rectangular (MMR 21261).
21257	Seal, Nonmetallic, Special Shaped Section; Gasket; Rubber; To Suit 760mm Square Easylift Covers (MMR's 21248 and 21249).
21260	Seal, Nonmetallic, Special Shaped Section; Gasket; Rubber; To Suit 950mm Round Easylift Cover (MMR 21259).
21262	Seal, Nonmetallic, Special Shaped Section; Gasket; Rubber; To Suit 1500mm x 760mm Rectangular Easylift Cover (MMR 21261).
21256	Spring, Helical; Stainless Steel (316); To Suit 760mm Square Easylift Covers (MMR's 21248 and 21249), 950mm Round Easylift Cover (MMR 21259) and 1500mm x 760mm Rectangular Easylift Cover (MMR 21261).

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MMR	**Ancillary Components** **Purchase Order Description**
21763	Screw, Machine; Countersunk Post Torx; Tamper-Proof; Size T40; 304 Stainless Steel; M8 x 40mm; Used with Torx Key Wrench (21719) for Securing all Easylift Cover Types,760mm Square (MMR's 21248 and 21249), 950mm Round (MMR 21259) and 1500mm x 760mm Rectangular (MMR 21261).
21719	Key, Wrench; Torx Tamper-Proof Socket Key; Size T40-K; Steel; 6.65mm Point to Point; 80mm x 30mm; L-Shape; Used with Handle (MMR 21258) for Opening all Easylift Cover Types,760mm Square (MMR's 21248 and 21249), 950mm Round (MMR 21259) and 1500mm x 760mm Rectangular (MMR 21261).

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END OF DOCUMENT

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