Assets Planning and Delivery Group
Engineering

Strategic Product Specification

SPS 292
Screw Down Fire Hydrants

VERSION 1
REVISION 4

FEBRUARY 2025

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, Mechanical Section, 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.

Manager, Engineering

REVISION STATUS

The revision status of this specification is shown section by section below:

REVISION STATUS						
SECT.	**VER./ REV.**	**DATE**	**PAGES REVISED**	**REVISION DESCRIPTION (Section, Clause, Sub-Clause)**	**RVWD.**	**APRV.**
0	0	16.03.01	All	New Edition	EJP	AAK
0	1	22.01.03		Revised numeric format		
0	2	9.04.14		Reformatted, Revised	GWR	SE
All	**4**	**10.02.25**	**n/a**	**Full document review, no required changes to content**	**SE**	**SE**
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1	2	9.04.14		Reformatted, Revised	GWR	SE
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2	2	9.04.14		Reformatted, Revised	GWR	SE
2	3	4.02.22	2.1	Gland flange now with integral seal housing, materials changed	SE	SE
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12	2	9.04.14		New Section	GWR	SE
12	3	10.02.22	28	Stainless Steel Gland Flange with Gunmetal Integral Seal Housing added to MMR description	IP	SE
13	3	18.08.20	30	Appendix C Added Attach Drawing BD22-01-01	BC	SE

Strategic Product Specification
SPS 292
Screw Down Fire Hydrants

CONTENTS

1 Scope and General

1.1 Scope

This Specification sets out requirements for the design, manufacture, production testing, handling and delivery of screw down fire hydrants intended for use in potable water installed in below ground covered pits. The screw down hydrant is of the type that provides positive shut off when not in operation. The design also incorporates a large floating jumper valve that acts as an automatic single backflow preventer in negative head situations during operation.

The Specification also details the means by which compliance shall be demonstrated, and the criteria for acceptance of Product.

1.2 Referenced Documents

The following documents are referenced in this Specification:

Water Corporation "Strategic Product Appraisal Process Manual" (Internally controlled)

AS

1111.1	ISO metric hexagon bolts and screws – Product grade C - Bolts
1112.3	ISO metric hexagon nuts - Product grade C
1275	Metric screw threads for fasteners
1565	Copper and copper alloys - Ingots and castings
1646	Elastomeric seals for waterworks purposes
1646.1	General requirements
1646.2	Material requirements for pipe joint seals used in water and wastewater
1646.3	Material requirements for pipe joint seals used in water and wastewater with the exception of natural rubber and polyisoprene compounds
1831	Ductile cast iron
2074	Steel castings
2345	Dezincification resistance of copper alloys
2550.1	Cranes, hoists and winches – Safe use – General requirements
2550.3	Cranes, hoists and winches – Safe use – Bridge, gantry, portal (including container cranes), jib and monorail cranes
2550.5	Cranes, hoists and winches – Safe use – Mobile
2550.11	Cranes, hoists and winches – Safe use – Vehicle loading
2638	Gate valves for waterworks purposes
2738	Copper and copper alloys – Compositions and designations
3894.1	Site testing of protective coatings – Method 1: Non-conductive coatings – Continuity testing – High voltage ('brush') method
4087	Metallic flanges for waterworks purposes
B202	General purpose Acme screw threads

AS/NZS

1567	Copper and copper alloys – Wrought rods, bars and sections
4020	Products for use in contact with drinking water
4158	Thermal-bonded polymeric coatings on valves and fittings for water industry purposes

AS/NZS ISO

9001	Quality management systems – requirements

ASTM

A276	Standard specification for stainless steel bars and shapes
A380	Standard practice for cleaning, descaling and passivation of stainless steel parts, equipment and systems
B127	Standard specification for nickel-copper alloy (UNS N04400) plate, sheet and strip
B164	Standard specification for Nickel-copper alloy rod, bar and wire

ISO

4288	Geometrical product specifications (GPS) – Surface texture: Profile method – Rules and procedures for the assessment of surface texture

ISO/IEC

17000	Conformity assessment – Vocabulary and general principles
17025	General requirements for the competence of testing and calibration laboratories

Standards Australia Guides

HB 18.23	Guidelines for third-party certification and accreditation - Guide 23-Methods of indicating conformity with standards for third-party certification systems (ISO/IEC Guide 23)
HB 18.28	Conformity assessment - Guidance on a third-party certification system for products (ISO/IEC Guide 28)

1.3 Referenced Drawings

The following drawing is referenced in this Specification and is included in Appendix C:

BD22-01-01 Screw Down Fire Hydrant – General Arrangement

1.4 Definitions and Notation

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

1.4.1 Allowable Operating Pressure

The allowable internal pressure, excluding surge, that the hydrant can safely withstand in service.

1.4.2 Australian Standards®

Standards that are developed, published and maintained by Standards Australia

1.4.3 Certificate

A formal certificate issued by a Certification Body in accordance with the third party product certification system described in HB 18.28, including associated Product licence schedules.

1.4.4 Certification Body

An independent (or third party) organisation duly accredited by the Joint Accreditation System of Australia and New Zealand (JAS-ANZ) to operate product Certification Schemes.

1.4.5 Certification Mark

A proprietary mark of product conformity issued in accordance with HB 18.23.

1.4.6 Certification Scheme

A third party product certification system operated in accordance with HB 18.28.

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.

1.4.7 Coating

A corrosion inhibiting medium applied to the surface of a valve.

1.4.8 Coating Defect

A detectible weakness or discontinuity in a coating which deems it to be suspect in its ability to protect the substrate from corrosion during its normal service life.

1.4.9 Compliant Product

Product that has been assessed, by means of Product Appraisal, as conforming with standards and specifications that are specified by the Corporation.

1.4.10 Corporation

The Water Corporation of Western Australia.

1.4.11 Distortion

Any permanent deformation.

1.4.12 Hydrant

Hydrant shall mean screw down type fire hydrant complete with yoke.

1.4.13 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.

1.4.14 Nominal Size (DN)

An alphanumeric designation of size for components of a pipework system, which is used for reference purposes. It comprises the letters DN followed by a dimensionless whole number, which is indirectly related to the physical size, in millimetres, of the bore, or outside diameter of the end connections.

1.4.15 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.

1.4.16 Officer

A duly authorised representative or appointed agent of the Corporation.

1.4.17 Pressure Class (PN)

A classification of pressure by PN number based on the allowable operating pressure expressed in Megapascals (PN = 10 x AOP).

1.4.18 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.

1.4.19 Product Appraisal

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

1.4.20 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.

1.4.21 Product Certification

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

1.4.22 Product Verification Report

A formal report wherein a Product Assessor evaluates the extent of Product compliance 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.

1.4.23 Product Warranty

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

1.4.24 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.

1.4.25 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.

1.4.26 Standards Australia

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

1.4.27 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.

1.4.28 Strategic Product Appraisal Process

The process described in the Strategic Product Appraisal Process Manual whereby manufactured products and equipment are evaluated and, where they comply with specified requirements, authorised for use in Corporation infrastructure.

1.4.29 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.

1.4.30 Testing

The determination of Product characteristics by inspection and by the application of specified test procedures.

1.4.31 Yoke

Yoke shall mean the fitting on the outlet of the hydrant incorporating lugs to accept bayonet type standpipes.

1.5 Designation of Size

Hydrant size shall be designated as DN 100.

2 Materials and Components

2.1 General

The hydrants shall be constructed from materials in accordance with Table 2.1 below. The materials shown are the minimum standard required. Materials of an equivalent or higher standard will be acceptable.

Table 2.1: Materials Specification

Hydrant Component	Material	Standard	Grade
Body, yoke, Bonnet, Spindle Cap	Ductile cast iron	AS 1831	400-15
Gland Flange with integral Seal Housing (1)	Stainless steel Gunmetal	ASTM A276 AS 2345	316 C83600
Spindle nut	Gunmetal	AS 1565	C83600
Jumper valve, seats	Gunmetal	AS 1565	C83600
Spindle	Stainless steel	ASTM A276	316
O-rings	EPDM or NBR	AS 1646	40±3 IRHD
Gaskets	EPDM or NBR	AS 1646	55-75 IRHD
Jumper valve seal	EPDM or NBR	AS 1646	90 IRHD
Fasteners	Carbon steel (1) Stainless steel	AS 1111.1 ASTM A276	4.6 316

Notes:

1. Due to the availability of, and preference for, hydrants incorporating a corrosion resistant Gland Flange with an integral machined seal housing; hydrants incorporating a Ductile Iron gland flange and a copper alloy insert seal housing are no longer permitted.

2.2 Contamination of Water

Components in contact with potable water shall comply with AS/NZS 4020.

2.3 Dezincification Resistant Materials

All copper alloys shall be dezincification resistant alloys in accordance with AS 2345.

2.4 Corrosion Resistant Materials

Corrosion resistant materials shall be to a minimum or equivalent standard to the following:

(a) Copper alloys – AS 1565, AS/NZS 1567

(b) Austenitic stainless steels – ASTM A 276 grade 316

(c) Phosphor bronze – AS 2738 C51800

(d) Nickel-copper-iron alloys - AS 2738 Alloy 713; ASTM B 127; ASTM B 164;

(e) Copper nickel alloy - AS 2738 Alloy 706; AS 2738 Alloy 715;

Stainless steel castings, plate and bar subjected to welding during the manufacture of any component shall be a low carbon or stabilised grade. Stainless steel castings shall be heat treated in accordance with AS 2074. All stainless steel components except fasteners shall be passivated in accordance with ASTM A380.

2.5 O-rings (Elastomeric toroidal sealing rings)

O-rings shall be made of a material that is not injuriously affected by the fluid, temperature or environmental conditions to which the O-rings will be subjected in service.

3 Design

3.1 General

The hydrant design shall comply with the following:

3.2 General

(a) The hydrants shall be suitable for operation within the ambient temperature range of 5°C to 45°C and a relative humidity of 5% to 95%.

(b) The allowable operating pressure shall be 1600 kPa. The pressure class shall be PN16.

(c) The hydrant shall be of robust design in order to accommodate the severe forces that are to be expected during operation in emergency conditions, without suffering failure, flexing or distortion.

(d) The hydrant shall be constructed to the dimensions shown on the Drawing BD22-01-01 (Appendix C) and shall have an integral isolating valve incorporating a screwed spindle, two independent O ring spindle seals and a jumper valve.

(e) The hydrant inlet shall be 80 mm nominal bore.

(f) The inlet flange shall be DN 100 in accordance with AS 4087, Fig. B5 for PN16. The bolt holes shall be slotted to allow connection to mating flanges with slotted bolt holes as shown on the Drawing BD22-01-01 (Appendix C).

(g) The design shall incorporate a large floating jumper valve that acts as an automatic single backflow preventer in negative head situations during operation. The jumper valve shall have a resilient seal and shall close against a machined valve seat. Means shall be provided to guide the jumper valve centrally onto the seat. The jumper valve guide system shall be located in the chamber above the valve seat.

(h) Where the jumper valve resilient seal is held in position by means of a nut, the nut shall be secured in a manner to prevent it being dislodged while the hydrant is in service.

(i) The spindle shall incorporate square or Acme form threads in accordance with AS B202 Class 2G or equivalent and shall rotate in a clockwise direction to close the valve. The diameter and lead of the screw shall be designed to be 'self-locking' to ensure that the valve remains in any position under static and dynamic operating conditions.

(j) The spindle seal housing shall be integral to the gland flange and manufactured entirely from the corrosion resistant material alternatives specified in Table 2.2. A separate seal housing inserted in the flange is not permitted.

(k) Spindle sealing shall incorporate at least two O-rings and shall be designed to allow the O-rings to be replaced with the valve under pressure and in the fully closed position. The spindle seals shall be of the toroidal sealing ring (O-ring) type. The surface roughness of all parts of the spindle in contact with O-rings shall not exceed 3.2 μm Ra when measured in accordance with ISO 4288. The surface roughness of all parts of the spindle seal housing in contact with the O-rings shall not exceed an average value of 6.3 μm Ra with no single measurement exceeding 8.5 μm Ra.

(l) The spindle cap shall be designed and constructed in accordance with the requirements of AS 2638.

(m) The outlet shall consist of an integral elbow terminating in a yoke in a vertical position as shown on the Drawing BD22-01-01 (Appendix C).

(n) The yoke shall be manufactured to the details and dimensions shown on the Drawing BD22-01-01 (Appendix C). It shall incorporate bayonet lugs and a machined standpipe seat.

(o) Manufacturing tolerances and component design shall allow interchangeability of components and spare parts between hydrants from the same manufacturer.

(p) The design criteria of the hydrant and fasteners should be based on a minimum life expectancy of 50 years, at the maximum working temperature shown in Table 2.2.

(q) The hydrant shall be capable of operation at the allowable operating pressure, and ambient air temperature shown in Table 2.2 and designed to pass the test requirements in Table 2.2 and section 5.

Table 2.2: Operating and Test Pressure

Pressure Class (PN)	Allowable Operating Pressure kPa	Seat Test Pressure kPa	Hydrostatic Test Pressure kPa	Working Ambient Temperature °C
16	1,600	1,760	2,400	5 – 40

3.3 Fasteners

(a) Bolt dimensions shall conform to AS 1111.1, nuts shall conform to 1112.3 and threads shall conform to AS 1275.

(b) Where flanged joints are used in the construction of the hydrant utilising standard metric hexagon head bolts and nuts, they shall be designed to allow readily available ring spanners for fastener removal. Where capscrews are used they shall be sealed against ingress of moisture to the threads regardless of their material type. Studs shall not be used as flange fasteners.

3.4 Mouldings

Mouldings shall be free from structural defects, laps, porosity, pitting and inclusions.

3.5 Condition

The hydrant shall be in a new unused condition.

4 Protective Coatings

(a) Hydrant ductile iron components shall be internally and externally coated with a thermal-bonded polymeric coating in accordance with AS/NZS 4158. All other hydrant components shall be constructed from corrosion resistant materials. All carbon steel fasteners shall be completely isolated from the environment.

(b) The hydrant shall be designed such that the corrosion protection system specified for the internal wetted surfaces shall be fully effective. All surfaces or interfaces between components that cannot be fully coated and tested shall be of corrosion resistant materials. All corners and edges of the hydrant body, bonnet and yoke shall be rounded to improve adherence of protective coatings.

5 Testing

5.1 General

Product shall be tested in accordance with the test requirements of this Specification. Testing shall be deemed acceptable when test outcomes have been formally verified by a Certification Body or witnessed by a testing Officer. Product for which a test requirement has not been met shall be classified as non-compliant Product.

NOTE 1: Testing should be carried out by an organisation accredited by NATA or in accordance with ISO/IEC 17025.

NOTE 2: A testing Officer should normally be an Officer who has specialist knowledge of or training in product or materials testing appropriate to the Product characteristics to be tested.

5.2 Notification of Testing

The Corporation shall be notified in writing of each formal test proposal, allowing as a minimum seven days' notice, prior to the preparation of Product for testing except where a specified test has been the subject of a current valid Certificate issued by a Certification Body. This notification is required to enable the Corporation to make all necessary arrangements including appointment of a testing Officer in a timely manner.

5.3 Access to the Place of Manufacture

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

5.4 Place of Manufacture other than WA

Where any Product or product component is being manufactured other than in Western Australia the Corporation may appoint a local inspecting Officer to undertake inspections and witnessed testing as required. The testing Officer shall be provided with all due authority and permits required to carry out testing at the place of manufacture.

NOTE 1: The cost of witnessed testing arranged by the Corporation will normally be borne by the Corporation unless otherwise negotiated.

5.5 Test Requirements

5.5.1 General

Each Product item shall be tested by the Supplier in the order of tests shown below. Where the Supplier is not exempted by full Quality Assurance Certification the Principal's Representative shall be present during testing. Any hydrant that does not meet the test requirements shall be made to comply with the specification or shall be rejected and replaced.

5.5.2 Body Hydrostatic Test

With the outlet flange blanked off, a hydrostatic pressure test shall be performed on the body of each hydrant at the hydrostatic test pressure shown in Table 2.2. The test shall be conducted with water as the test fluid at 20°C. The test duration shall be for a minimum of 1 minute, during which time there shall be no signs of leakage through the hydrant body, the joints or the spindle seal, nor shall any part have suffered distortion.

5.5.3 Valve Seat Hydrostatic Test

With the valve closed against the seat, a hydrostatic pressure test shall be performed on the inlet of each hydrant at the seat test pressure shown in Table 2.2, with the other side of the valve open to the atmosphere. The test shall be conducted with water as the test fluid at 20°C(+/-_5C). The test duration shall be for a minimum period of 1 minute, during which time there shall be no signs of leakage past the seat.

5.5.4 Coating Test

All coated surfaces shall be tested in accordance with AS/NZS 4158. The entire coated surface (except for external corners or embossed areas) shall be tested for coating continuity using a fully variable DC high voltage holiday detector in accordance with AS 3894.1. Defects found during testing may be repaired, where allowable, in accordance with AS/NZS 4158. Where a coating defect cannot be repaired, the valve shall be rejected.

5.5.5 Test Certificates

For the purposes of acceptance, each test certificate shall, as a minimum, bear the relevant Product item serial number and shall certify that the Product item has complied with the specified test requirements. If the test certificate is not included with the delivery note accompanying each valve, the Principal's Representative retains the right to test the valves at the Contractor's expense.

Any valve, which does not meet the test requirements shall be made to comply with the Specification or shall be rejected and replaced.

6 Marking and Packaging

6.1 Marking

6.1.1 Body Markings

Each Product shall have the following information clearly marked by casting on the body, or displayed by stamping or engraving on a corrosion resistant plate which shall be permanently secured using corrosion resistant fasteners:

a) Manufacturers name or trademark

b) Nominal size

c) Year of manufacture

d) Working pressure in kPa or pressure class (PN)

Cast lettering shall be as large as practicable.

6.2 Packaging

6.2.1 General

Product shall be packaged with appropriate protection, which shall prevent damage or defects as a result of handling, storage or transportation. Flexible packaging material shall have a minimum expected life in outside storage conditions of 12 months from the date of delivery.

6.2.2 Identification Tag

Wherever requested in the Purchasing *Schedule* each Product item shall be identified using a weatherproof marking pen on a corrosion resistant metal identification tag securely wired to the Product in a conspicuous position using a galvanized tie wire with the following information:

a) Material Master Record number (MMR)

b) Contract number

c) Purchase order number.

6.2.3 Marking of Packaging

Where requested in the purchasing schedule the Product shall be identified by marking on the outside of any protective packaging the same information as shown on the identification tag. The markings shall include the relevant contract number and purchase order number.

7 Manuals

7.1 Format and Language

Where required, Product shall be supplied complete with appropriate installation, operation and maintenance instructions or manuals, in clear diagrammatic and text format, in English

7.2 Content

The manuals shall contain all the relevant information required to commission, operate and maintain the Product in live service, including the following:

a) Principle of operation

b) Details of Product features

c) Operational adjustments

d) Installation and commissioning instructions

e) Preventative maintenance requirements and intervals

f) Testing procedures

g) Trouble shooting guidelines

h) Complete list of parts and associated exploded views or sectional diagrams and reference part numbers

8 Spare Parts and Special Tools

All spare parts shall be interchangeable for hydrants of the same size and model.

Spare parts and servicing facilities for the hydrants shall be readily available in Western Australia.

The Contractor shall supply any special tools required to maintain the hydrants.

9 Transportation, Handling and Storage

9.1 General

Transportation, handling and storage facilities shall be designed to prevent Product damage or defects and to maintain Product free of deleterious matter. Product shall not be dropped off elevated vehicle platforms or sites. Mechanical handling equipment shall be in accordance with AS 2550.1, AS 2550.3, AS 2550.5 and AS 2550.11 and shall be appropriate to the loads to be lifted. Manual handling shall be in accordance with the National Standard for Manual Handling and the National Code of Practice for Manual Handling, published by National Occupational Health and Safety Commission, Australia. Product restraint during transportation shall be in accordance with Load Restraint Guide—Guidelines for Safe Carriage of Loads on Road Vehicles, published jointly by the Federal Office of Road Safety and the National Road Transport Commission, Australia.

NOTE: Where wire ropes or chains are used for loading and unloading, they should not come into direct contact with Product. Lifting elements in direct contact with Product should be of a non-abrasive design eg elastomeric or fabric webbing straps. During transportation, Product restraints should be checked for tension at regular intervals of travel and should not be released until the transporting vehicle is resting in a secure stable disposition on level ground.

9.2 Preservation of Product in Storage

Product shall be stored in original Product packaging in accordance with the published requirements of the manufacturer, prior to installation. Sensitive component materials shall be protected from extended exposure to direct sunlight and high temperatures e.g. elastomeric components shall be stored in accordance with the general principles of AS 1646. Designated Product storage areas shall be of sufficient size to accommodate Product deliveries and shall be flat, reasonably level and free of combustible vegetation, sharp stones or projections that could cause Product damage or defects.

10 Quality Assurance

10.1 Certification

10.1.1 Certification of Product

Wherever this Specification requires compliance with nominated Product and test Standards, conformance shall be certified by means of a Certification Scheme, conducted by a Certification Body. Each Certificate shall expressly attest compliance of all Product items with the nominated Standards. Wherever specified, Certificates shall be submitted to the Officer nominated for this purpose. Product shall be marked in accordance with the requirements of the Certification Body.

NOTE: Compliance of Product including related accessories and services with nominated Standards and specified requirements may be verified by means of a Product Verification Report provided by a Product Assessor. The Product Verification Report should identify all relevant Certificates of Product compliance, duly issued in accordance with Certification Scheme rules.

10.1.2 Quality System

The processes for manufacture, testing, supply, transportation, handling, delivery and storage of Product to be supplied in accordance with this Specification shall form part of a documented Quality System. The System shall be certified by a Certification Body as complying with the requirements of AS/NZS ISO 9001 and shall provide for identification and traceability, control of production and delivery to the specified destination, customer verification and control of documents and records.

10.1.3 Product Re-verification

Product compliance 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, provided that these outcomes have already been reported in a current valid Product Verification Report that is acceptable to the Corporation.

Wherever the requirements of the Specification apply to a Product supply period in excess of three years, continuing acceptance of Product shall be subject to re-verification. The purpose of re-verification shall be to confirm the continuing compliance of Product quality and production control processes with the requirements of the Specification

10.2 Compliance and Acceptance

10.2.1 Means of Demonstrating Compliance

Compliance with this Specification shall be demonstrated by means of Product Appraisal and issue by a Product Assessor of a Product Verification Report that confirms compliance. Otherwise, Product shall be deemed non-compliant and ineligible for registration as Product authorised for use in Corporation infrastructure.

NOTE 1: Where a project includes design work including Product design, Product Appraisal may form part of the project design review process and the Product Assessor may be a member of the project design review team.

NOTE 2: A Product Verification Report should verify the extent of compliance with the Specification including all relevant 'Technical Compliance Schedule' Appendices and the currency of a Certificate where relevant to the Product.

10.2.2 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 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 the Specification includes Technical Compliance Schedules, the nature and extent of all non-compliances should be provided in accordance with the appropriate Schedules.

10.3 Non-compliant Product

10.3.1 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.

Where the Specification includes a 'Technical Compliance Schedule', Product shall be deemed non-compliant except where a Supplier has demonstrated compliance in accordance with the requirements of the 'Technical Compliance Schedule' Appendices of the Specification.

10.3.2 Manufacturing Repairs (In-process)

Welding, the use of fillers and other repairs shall generally not be permissible on Product which is in the course of production. Repairs to custom-built Products such as axially-split pumps and large valves may be considered only if determined by the Corporation to be minor casting repair work in non-strategic locations. Accordingly, details of any defect which the Manufacturer considers can be repaired; together with details of proposed repair procedures shall be submitted in writing for determination by the Corporation.

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

(a) that repair of the non-compliant components in lieu of their replacement is acceptable; and

(b) that proposed repair procedures are acceptable; and

(c) that any proposal to vary the terms of the original Product Warranty as a consequence of the in-process repair is acceptable.

10.3.3 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.

10.3.4 Product Repair

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

11 Appendix A: Technical Compliance Schedules (Normative)

11.1 Compliance Schedules

Suppliers shall demonstrate Product compliance with the Specification by completing Technical Compliance Schedule 1 as shown in **TABLE 11.1** on an item by item basis. For acceptance, the extent of scheduled technical item compliance shall be supported by verifiable documentary evidence. Each scheduled item nominates a Specification clause number with which the extent of Product compliance shall be demonstrated.

The Supplier shall denote compliance of an item by ticking the unshaded 'Yes' column appropriate to that item. Where Product does not comply with specified requirements, the Supplier shall tick the 'No' column and shall detail the reasons for non-conformance and any proposed alternatives in the 'Comments' column. The Supplier shall denote acceptance and understanding of a Specification clause by ticking the corresponding 'Noted' column wherever unshaded.

Failure to notify the Corporation of all non-compliant Product components, including the extent of non-compliance, may void an accepted offer to supply or may result in rectification of all non compliant Product elements, at the Supplier's cost.

TABLE 11.1: TECHNICAL COMPLIANCE SCHEDULE 1

Screw Down Fire Hydrants					
Section/Clause		**Noted**	**Compliance**		**Comments**
			Yes	**No**	
1. SCOPE AND GENERAL					
1.1	Scope				
1.2	Referenced Documents				
1.3	Referenced Drawings				
1.4	Definitions and Notations				
1.5	Designation of Size				
2. MATERIALS AND COMPONENTS					
2.1	General				
2.2	Contamination of Water				
2.3	Dezincification Resistant Materials				
2.4	Corrosion Resistant Materials				
2.5	O-rings				
3. DESIGN					
3.1	General				
3.2	Fasteners				
3.3	Mouldings				
3.4	Condition				
4. PROTECTIVE COATINGS					
4.0	Protective Coatings				
5. TESTING					
5.1	General				
5.2	Notification of Testing				
5.3	Access to the Place of Manufacture				
5.4	Place of Manufacture other than WA				
5.5	Test Requirements				
5.5.1	General				
5.5.2	Body Hydrostatic Test				
5.5.3	Valve Seat Hydrostatic Test				
5.5.4	Coating Tests				
5.5.5	Test Certificates				
6. MARKINGS AND PACKAGING					
6.1	Marking				
6.1.1	Body Markings				
6.2	Packaging				
6.2.1	General				
6.2.2	Identification Tag				

6.2.3	Marking of Packaging				
7. MANUALS					
7.1	Format and Language				
7.2	Content				
8. SPARE PARTS & SPECIAL TOOLS					
8	Spare Parts and Special Tools				
9. TRANSPORTATION, HANDLING AND STORAGE					
9.1	General				
9.2	Preservation of Product in Storage				
10. QUALITY ASSURANCE					
10.1	Certification				
10.1.1	Certification of Product				
10.1.2	Quality System				
10.1.3	Product Re-verification				
10.2	Compliance and Acceptance				
10.2.1	Means of Demonstrating Compliance				
10.2.2	Acceptance Criteria				
10.3	Defective and Non-compliant Product				
10.3.1	General				
10.3.2	Manufacturing Repairs				
10.3.3	Product Warranty				
10.3.4	Product Repair				

Name of Supplier:

Signature: Date:

12 Appendix B: Material Master Records (Informative)

The following Material Master Records (MMR) comprise Corporation catalogue numbers that are unique to the particular products described for the purposes of Corporation activities or work.

MMR	PURCHASE ORDER LONG TEXT
2061	Hydrant, Fire; Ductile Cast Iron; Screw Down Type; DN100; PN16; Inlet Flange (DN100) to AS 4087 Figure B5; Slotted Bolt Holes; 80mm Nominal Bore as per Water Corporation Drawing BD22-1-1; Stainless Steel or Gunmetal Gland Flange with Integral Seal Housing; Thermal Bonded Polymeric Coating (Internal and External) to AS/NZS 4158.
2147	Coupling Half, Quick Disconnect; Bayonet Coupling; To Suit Screw Down Fire Hydrant (MMR 2061) with Replacement Bayonet Coupling Facilities; Thermal Bonded Polymeric Coating (Internal & External) to AS/NZS 4158.

13 Appendix C: Screw Down Fire Hydrant (General Arrangement)

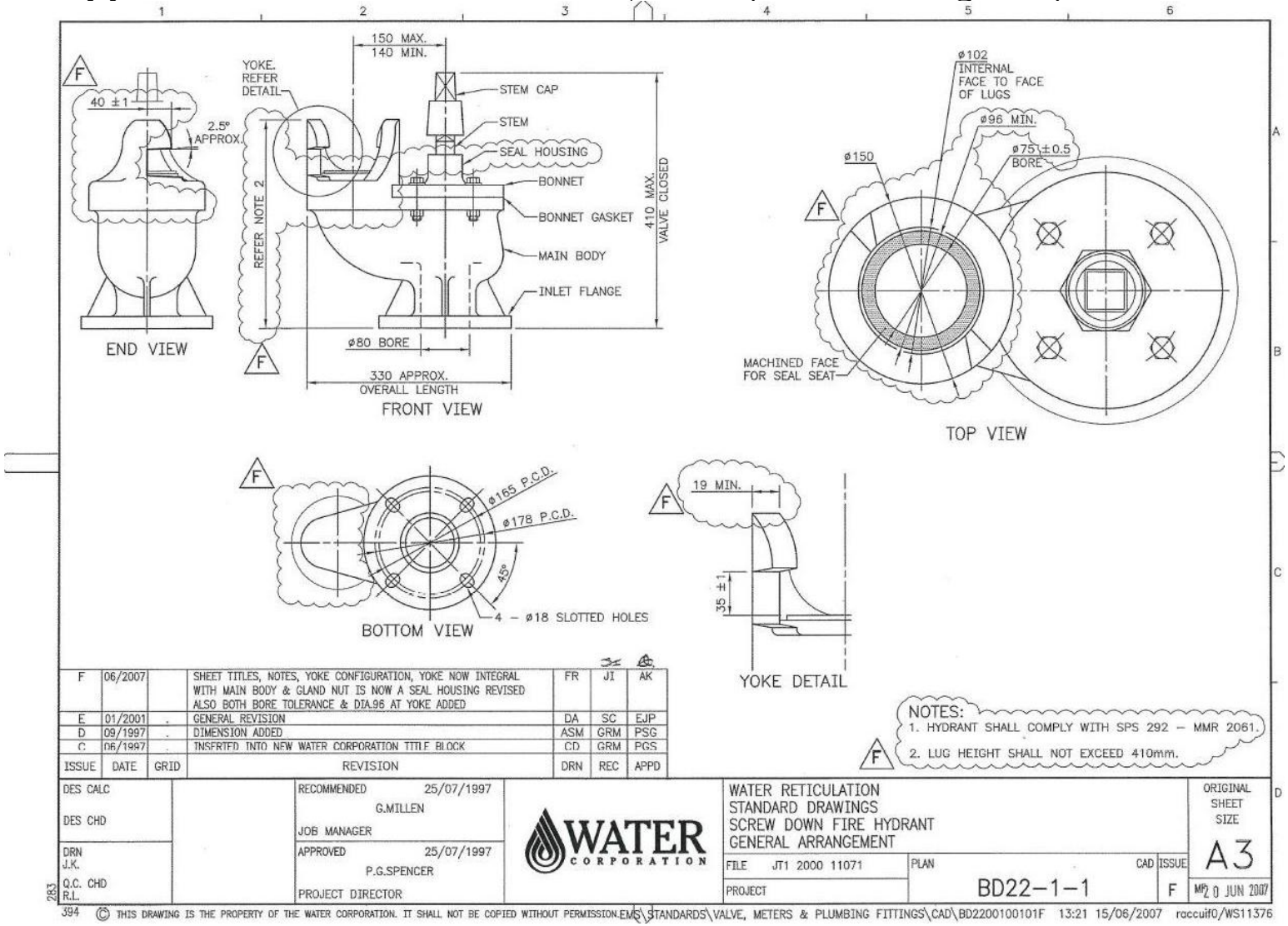

Figure 13.1 – Drawing BD22-01-01

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