Unitywater

Report details	Summary of Changes to Pr9693 Specification for Mechanical Installations
Report writer	Infrastructure Standards & Assurance Manager
References	Pr9693 – Specification for Mechanical Installations

Summary of amendments to Pr9693 - Specification for Mechanical Installations

Changes to Revision 12 August 2024 to Revision 13 - Feb 2026 are shown in the table below. This document attempts to show how the document structure was renumbered and re-formatted. Revision 13 document has had many amendments (some quite minor, others large) and readers are advised to confirm the requirement before relying on prior knowledge of revision 12.

Whole document changes: Paragraph numbers have been removed from the document.

Revision 12 Section No. & Title	Summary of change Rev 12	Revision 13 Section No.& Title
1 Purpose	Amended	**1 Purpose**
2 Scope	Amended	**2 Scope**
	New	2.1 Technical departures
3 References	Amended & moved to Appendix A	
3.1. General		
3.2. Applicable Legislation and Regulation		
3.3. Codes of Practice (ratified by Legislation)		
3.4. Codes of Practice (not ratified by Legislation)		
4 Definitions / Abbreviations	Amended & moved to Appendix B	
5 General Requirements	Name change & changes to sub-sections	**3 Planning**
5.1. Language and Units of Measurement	Moved to 3.1	3.1 Language and Units of Measurement
	New	3.2 Documentation
	New	3.3 SEQCode compliance and WSAA specifications
	New	3.4 Condition Assessments of existing asset(s)
	New	3.5 Deliverables from the planning stage

Revision 12 Section No. & Title	Summary of change Rev 12	Revision 13 Section No.& Title
	New Section	**4 Design**
5.2. Design Criteria		
5.2.1 General	Amended & renamed	4.1 General Design Aspects
5.2.2 Operating Conditions	Amended & renamed	4.2 Site and Service Conditions
5.2.3 Design Life	Amended	4.3 Design Life
5.2.4 Design Loads		4.4 Design Loads
5.2.5 Fatigue	Amended	4.5 Fatigue
5.3. Quality and Standards	Removed	
5.3.1 Applicable Standards	Appendix A	
5.3.2 Contractor Quality Systems	Removed	
5.3.3 Manufacturer's Experience	Removed	
6 Technical Mechanical Requirements	requirements moved to relevant sections in document	
6.1. General		
6.2. Noise	Amended & moved to 4.7, new subsections	4.7 General Noise Requirements
6.3. Vibration	Amended & moved to 4.6	4.6 General Vibration Requirements
	new	4.8 Design for Safety
	Moved from 6.4.12 & 6.4.13	4.9 Lifting Facilities
	Moved from 6.4.19 & 6.4.20 Additional requirements	4.10 Access to Equipment
	New	4.11 Preferred Equipment and Standardisation
	New	4.12 Environmental Design Aspects
		5 General Installation
	New	5.1 Statutory and Regulatory Requirements
	Moved from 6.4.7, 6.4.8	5.2 Equipment Installation
6.4. Materials		
6.4.1 General	requirements moved to relevant sections in document	

Revision 12 Section No. & Title	Summary of change Rev 12	Revision 13 Section No.& Title
6.4.2 Shipping and Handling Protection	Moved to 5.5	5.3 Workmanship and Welding
6.4.3 Workmanship	modified moved to 5.3	5.4 Installation in Hazardous Areas
6.4.4 Casting	Moved to 20.1	5.5 Shipping and Handling Protection for Equipment
6.4.5 Stainless Steel	Moved to 20.2, amended	
6.4.6 Carbon Steel	Moved to 20.3, amended	
6.4.7 Frames and Mountings	Moved to 5.2, amended	
6.4.8 Packers and Shims	Moved to 5.2, amended	
6.4.9 Nuts, Screws, Washers, Bolts, Fixings and Fasteners	Moved to 6	**6 Nuts, Screws, Washers, Bolts, Fixings and Fasteners**
6.4.10 Tolerances	Moved to 5.2.6	
6.4.11 Limits and Fits	removed	
6.4.12 Equipment Positioning and Placement	Moved to 4.9	
6.4.13 Eyebolts and Lifting Lugs	Moved to 4.9	
6.4.14 Lifting Equipment	Moved to 4.9	
6.4.15 Flexible Connections	Moved to 11.8.5	
6.4.16 Keys and Keyways	Moved to 5.2, amended	
6.4.17 Lubrication and Lubrication Systems	lubrication for each equipment type included within the section for that equipment	
6.4.18 Welding	Moved to 5.3 & 11.8.8	
6.4.19 Guardrails, Fixed Platforms, Walkways, Ladders, Grating and Scaffolding	Moved to 4.10	
6.4.20 Void Protection and Fall Arrest Systems for Pit Openings	Moved to 4.10	
6.4.21 Pressure Gauges and Pressure Gauge Connection Points	Moved to 21	
6.4.22 Plant and Equipment Identification	Moved to 7 Pipeline identification 11.23, Valve identification 13.3	**7 Plant and Equipment Identification and Labelling**

Revision 12 Section No. & Title	Summary of change Rev 12	Revision 13 Section No.& Title
6.4.23 Balancing and Critical Speed	Moved to 12.6	7.1 General
6.4.24 Bearings	Moved to 12.7	7.2 Manufacturer Nameplates
6.4.25 Seals – General Requirements	Moved to 22 & amended	7.3 Site-Specific Equipment ID Tag
6.4.26 Seals - O-Rings	Moved to 22.2 & amended	
6.4.27 Mechanical Seals	Moved to 22.3 & amended	
6.4.28 Couplings	Moved to 12.1 & amended	
6.4.29 Alignments	Moved to 12.3 & amended	
6.4.30 Belt Drives	Moved to 12.4	
6.4.31 Gearboxes and Casings	Moved to 12.5 & amended	
6.5. Safeguarding of Machinery	Moved to 8 & amended	**8 Safeguarding of Machinery**
6.5.1 General Requirements	Moved to 8 .1 & amended	8.1 General
6.5.2 Hazard Analysis and Risk Assessment	Moved to 8.2 & amended	8.2 Hazard Analysis and Risk Assessment
6.5.3 Guidelines for Safeguarding	Moved to 8.3 & amended	8.3 Guidelines for Safeguarding
6.5.4 Guards	Moved to 8.4 & amended	8.4 Guards
6.5.5 Fixed Guards	Moved to 8.5 & amended	8.5 Fixed Guards
6.5.6 Interlocking Guards	Moved to 8.6 & amended	8.6 Interlocking Guards
6.5.7 Documentation	Moved to 8.7 & amended	8.7 Documentation
6.6. Installation		
6.6.1 General	Moved to 5.2	
6.6.2 Installation Activities	Moved to 5.2	
6.6.3 Spacing between Equipment	Moved to 4.10 & amended	
6.6.4 Installation in Hazardous Areas	Moved to 5.4 & amended	
6.7. Inspection, Testing and Commissioning		
6.7.1 Factory Inspection Tests	Moved to 5.2, 11.22.10	
6.7.2 Installation and Pre-Commissioning Checks		

Revision 12 Section No. & Title	Summary of change Rev 12	Revision 13 Section No.& Title
6.7.3 Hydrostatic Pressure Testing	Pump testing requirements 16.7.	
6.7.4 Flushing, Disinfection and Quality Testing of Mains		
	New	**9 Plant Building Ventilation**
	New	9.1 General
	New	9.2 Ventilation Fans
	New	9.3 Dampers
	New	9.4 Vibration
		10 Painting and corrosion protection
		10.1 General Requirements
		10.1.1 Approvals
		10.1.2 Colour Code
		10.1.3 Operating Conditions
		10.1.4 Material painting requirements
		10.2 Surface Preparation
		10.2.1 General
		10.2.2 Abrasive blast cleaning
		10.2.3 Hand and power tool cleaning
		10.2.4 Post cleaning inspection
		10.3 Painting
		10.3.1 Handling and storage
		10.3.2 Application
		10.3.3 Prime coating
		10.3.4 Reinstatement of damaged coatings
		10.3.5 Quality control

Revision 12 Section No. & Title	Summary of change Rev 12	Revision 13 Section No.& Title
		10.3.6 Surface cleanliness
		10.3.7 Profile
		10.3.8 Wet film thickness
		10.3.9 Dry film thickness
		10.3.10 Identification
		10.3.11 Pinholes
		10.3.12 Handling and packaging
		10.3.13 Reporting
		10.4 Corrosion Protection Systems
		10.4.1 Summary table
		10.4.2 System 1: Structural steel – Mildly corrosive environment, not H2S, decorative top coat
		10.4.3 System 2: Structural Steel – Exposed or damp corrosive environment, not H2S
		10.4.4 System 3: Structural steel – Highly corrosive environment, coastal, not H2S, decorative top coat
		10.4.5 System 4: Structural Steel – Immersed in Sewage, open to atmosphere
		10.4.6 System 5: Steel or Cast Iron – External, not H2S, light grey epoxy top coat
		10.4.7 System 6: Steel or Cast Iron – External, not H2S, decorative top coat
		10.4.8 System 7: Steel or Cast Iron - Highly corrosive H2S environment open to atmosphere, pipes internally coated, not potable water

Revision 12 Section No. & Title	Summary of change Rev 12	Revision 13 Section No.& Title
		10.4.9 System 8: Steel or Cast Iron – Immersed, internally coated, potable water
		10.4.10 System 9: Steel or Cast Iron - Highly corrosive environment, damp H2S
		10.4.11 System 10: Steel or Cast Iron, Highly corrosive environment, damp H2S - Rapid application
		10.4.12 System 11: Cast Iron Ceramic Coating, for abrasion resistance
		10.4.13 System 12: Cast Iron Coating, for erosion-corrosion resistance
		10.4.14 System 13: Steel or Cast Iron Equipment – Thermal Bonded Polymeric Coating
		10.4.15 System 14: Steel or Cast Iron Equipment – Fusion-bonded Epoxy
		10.4.16 System 15: Steel Pipe – External Surfaces (buried)
		10.4.17 System 16: Steel or Cast Iron Pipes – Cement Mortar Lining
		10.4.18 System 17: Electrical Machines
		10.4.19 System 18: Electrical Switchgear Cubicles
		10.4.20 System 19: PVC Pipes
		10.4.21 System 20: Minor Metallic Piping Systems – External Surfaces
		10.4.22 System 21: Stainless Steel Surfaces

Revision 12 Section No. & Title	Summary of change Rev 12	Revision 13 Section No.& Title
		10.4.23 System 22: Stainless Steel Surfaces – Electropolished
		10.4.24 System 23: Stainless Steel – External, decorative top coat
	New	10.4.25 System 24: Hot-dip Galvanising
		10.4.26 System 25: Electroplated Metal Coatings
		10.4.27 System 26: Wax-based Anticorrosion Coating
7. Pipework		**11 Pipework**
7.1. Design Life of Pipework	Moved to 11.1 & amended, also 4.3	11.1 Design Life
7.2. Pipework Design	Moved to 11.2 & amended	11.2 Pipework Design
7.3. Pipe Loads	Moved to 11.3 & amended	11.3 Pipe Loads
7.4. Pipe Supports	Moved to 11.4 & amended	11.4 Pipe Supports
7.5 Pipe sleeves	In 11.8.4 & 11.8.5	
7.6 Tank connection piping	Moved to 11.5 & amended	11.5 Pipework penetrating structures
7.7 Flushing connections	Moved to 11.6 & amended	11.6 Flushing Connections – Sludge Pipework
7.8 Drains and Vents	Moved to 11.7 & amended	11.7 Drains and Vents
7.9 Mechanical Jointing	Moved to 11.8 & amended	11.8 Mechanical Jointing
7.9.1 Grooved Pipe Couplings		11.8.1 Grooved Pipe Couplings
7.9.2 Victaulic Pressfit Pipe Couplings		11.8.2 Pressfit Pipe Couplings
7.9.3 Flanges .	amended	11.8.3 Flanges .
7.9.4 Fixed Couplings and Dismantling Joints		11.8.4 Fixed Couplings and Dismantling Joints
7.9.5 Expansion Joints	amended	11.8.5 Flexible Couplings and Dismantling Joints
7.9.6 Tapping Bands		11.8.6 Tapping Bands

Revision 12 Section No. & Title	Summary of change Rev 12	Revision 13 Section No.& Title
7.9.7 Screwed Joints		11.8.7 Screwed Joints
	NEW	11.8.8 Pipe Welding
	NEW	11.8.9 Pipe brazing / soldering (copper)
	NEW	11.8.10 Uni flanges
7.9.8 Fasteners	amended	11.8.11 Fasteners
7.9.9 Gaskets	Moved to 22 & amended	11.8.12 Gaskets
7.9.10 Instrument Fittings	Moved to 23 & amended	11.8.13 Instrument fittings
		11.9 Ductile Iron Cement Lined (DICL) pipes
7.10 GRP Pipes and fittings	Moved to 11.19 (including sub-clauses) & amended	11.9.1 General
7.10.1 Standards .		11.9.2 Pipe Class Specifications
7.10.2 Raw Materials		11.10 Carbon Steel Pipes
7.10.3 Pressure Design Basis		11.10.1 General
7.10.4 Pipe Stiffness		11.10.2 Pipe Class Specifications
7.10.5 Pipe Construction		11.11 Stainless Steel (GR 316L) Seamless and ERW Pipes
7.10.6 Flanges		11.11.1 General
7.10.7 Fittings		11.11.2 Pipe Class Specifications
7.10.8 Jointing System and Procedures		11.12 Spiral Welded Stainless Steel (GR 316L) Pipes
7.10.9 Corrosion Barriers		11.12.1 General
7.10.10 Tolerances		11.12.2 Pipe Class Specifications
		11.13 Polyethylene (PE) Pipes and Fittings
7.11. Polyethylene Pipes and Fittings	Moved to 11.13 & amended	11.13.1 General
7.12. Potable Water Fittings	Moved to 11.21 & amended	11.13.2 Pipe Class Specifications
7.13. Flexible Piping	Moved to 11.20 & amended	11.14 Acrylonitrile Butadiene Styrene (ABS) Pipes

Revision 12 Section No. & Title	Summary of change Rev 12	Revision 13 Section No.& Title
7.14. Fabrication and Installation	Moved to 11.22, renamed Fabrication and Installation of Carbon and Stainless Steel & amended Sub-clauses 7.14.1 to 7.14.13 also moved under 11.22	11.14.1 General
7.14.1 Workshop Requirements		11.14.2 Pipe Class Specifications
7.14.2 Preparation and Welding of (Stainless) Steel Pipework		11.15 Unplasticised Polyvinyl Chloride (PVC-U)
7.14.3 Misalignment Tolerance		11.15.1 General
7.14.4 Slip-on Flanges		11.15.2 Pipe Class Specifications
7.14.5 Socket Welding		11.16 Oriented Polyvinyl Chloride (PVC-O)
7.14.6 Threaded Connections		11.16.1 General
7.14.7 Branch Connections		11.16.2 Pipe Class Specifications
7.14.8 Cold Bending		11.17 Modified Polyvinyl Chloride (PVC-M)
7.14.9 Mitre Bends		11.17.1 General
7.14.10 Preheat and Treatment		11.17.2 Pipe Class Specifications
7.14.11 Post-Welding Treatment – Stainless Steel		11.18 Copper Tube
7.14.12 Stainless Steel		11.18.1 General
7.14.13 Painting of Piping		11.18.2 Pipe Class Specifications
7.14.14 Pipeline Identification	Moved to 11.23 & amended	11.19 Glass Reinforced Plastic (GRP) Pipes and Fittings
7.14.15 Material and Pipe Spool Identification .	Moved to 11.23 & amended	11.19.1 General
7.14.16 Factory Inspection and Testing	Moved to 11.24 & amended	11.19.2 Raw Materials
7.15. Storage and Handling		11.19.3 Pressure Design Basis
7.15.1 General		11.19.4 Pipe Stiffness
7.15.2 Stainless Steel Materials		11.19.5 Pipe Construction

Revision 12 Section No. & Title	Summary of change Rev 12	Revision 13 Section No.& Title
7.15.3 Lined Steel Pipes		11.19.6 Flanges
7.15.4 Repair of Coatings and Linings		11.19.7 Jointing System and Procedures
7.16. Pipe Class Specifications		11.19.8 Corrosion Barriers
7.16.1 Ductile Iron Cement Lined (DICL) pipes	Moved to 11.9 & amended	11.19.9 Tolerances
7.16.2 Carbon Steel Pipes	Moved to 11.10 & amended	11.19.10 Pipe Class Specifications
7.16.3 Stainless Steel (GR 316L) and ERW Pipe (Butt Welded) Pipes	Moved to 11.11 & amended	11.20 Flexible Piping
7.16.4 Spiral Welded Stainless Steel (GR 316L) Pipes	Moved to 11.12 & amended	11.21 Potable Water Fittings
7.16.5 Copper Tube	Moved to 11.18 &amended	11.22 Fabrication and Installation of Carbon and Stainless Steel
7.16.6 Polyethylene (PE) Pipes	Moved to 11.13 & amended	11.22.1 Workshop Requirements
7.16.7 Acrylonitrile Butadiene Styrene (ABS) Pipes	Moved to 11.14 & amended	11.22.2 Stainless Steel
7.16.8 Unplasticised Polyvinyl Chloride (uPVC)	Moved to 11.14 & amended	11.22.3 Misalignment Tolerance
7.16.9 Oriented Polyvinyl Chloride (oPVC)	Moved to 11.14 & amended	11.22.4 Slip-on Flanges
7.16.10 Modified Polyvinyl Chloride (mPVC)	Moved to 11.14 & amended	11.22.5 Socket Welding
7.16.11 Glass Reinforced Plastic (GRP)	Moved to 11.19 (including sub-clauses) & amended	11.22.6 Threaded Connections
		11.22.7 Branch Connections
		11.22.8 Cold Bending
		11.22.9 Mitre Bends
		11.22.10 Factory Inspection and Testing
		11.23 Pipeline Identification
		11.23.1 Material and Pipe Spool Identification
		11.24 Storage and Handling

Revision 12 Section No. & Title	Summary of change Rev 12	Revision 13 Section No.& Title
		11.24.1 General
		11.24.2 Stainless Steel Materials
		11.24.3 Lined Steel Pipes
		11.24.4 Repair of Coatings and Linings
		12 Rotating Machines
		12.1 Lubrication
		12.2 Couplings
		12.3 Alignments
		12.4 Belt Drives
		12.5 Gearboxes and Casings
		12.6 Balancing and Critical Speed
		12.7 Bearings
8 Valves and Actuators	**Valves moved to 13 & amended** **Actuators moved to 14 & amended**	
8.1. Valves		**13 Valves**
8.1.1 General Requirements	moved to 13.1	13.1 General Requirements
8.1.2 Material Requirements	moved to 13.2	13.2 Material Requirements
8.1.3 Valve Identification	moved to 13.3	13.3 Valve Identification
8.1.4 Water Services Australia Specifications	moved to 13.4	13.4 Water Services Australia Specifications
8.2. Eccentric Plug Valves	Moved to 13.21 & amended	13.4.1 Isolation requirements
8.2.1 General Requirements		13.5 Types of Valves, Applicability & Functionality
8.2.2 Valve Body		13.6 Valve testing
8.2.3 Valve Plug and Seat		13.6.1 General
8.2.4 Valve Operating Assembly		13.6.2 Valve testing – body tests
8.3. Diaphragm Valves	Moved to 13.11 & amended	13.6.3 Valve testing – gates tests

Revision 12 Section No. & Title	Summary of change Rev 12	Revision 13 Section No.& Title
8.3.1 General Requirements	Moved to 13.11 & amended	13.6.4 Valve testing – operational test
8.3.2 Valve Body	Moved to 13.11 & amended	13.6.5 Valve testing – seat testing
8.3.3 Valve Diaphragm	Moved to 13.11 & amended	13.7 Gate valves – resilient and metal seated
8.3.4 Valve Operating Assembly	Moved to 13.11 & amended	13.7.1 Minimum requirements
8.3.5 Pressure Safety Valves	Moved to 13.23	13.7.2 Function
8.3.6 Reduced Pressure Zone Valves	Moved to 13.24	13.7.3 Operation
8.3.7 Solenoid Valves	Moved to 13.22	13.7.4 Actuator
8.3.8 Valve Testing	Moved to 13.7 & amended	13.7.5 Testing and certification requirements
8.3.9 Valve Testing – Body Tests	Moved to 13.7 & amended	13.8 Knife gate valves
8.3.10 Valve Testing – Gates Tests	Moved to 13.7 & amended	13.8.1 Minimum requirements
8.3.11 Valve Testing – Operational Test	Moved to 13.7 & amended	13.8.2 Function
8.3.12 Valve Testing – Seat Testing	Moved to 13.7 & amended	13.8.3 Operation
		13.8.4 Actuator
		13.9 Butterfly valves
		13.9.1 Minimum requirements
		13.9.2 Function
		13.9.3 Operation
		13.9.4 Actuator
		13.9.5 Resilient Seated
		13.9.6 Metal seated
		13.9.7 Installation
		13.9.8 Testing and certification requirements

Revision 12 Section No. & Title	Summary of change Rev 12	Revision 13 Section No.& Title
		13.10 Automatic control valves – hydraulically operated
		13.10.1 Minimum requirements
		13.10.2 Function
		13.10.3 Actuator
		13.10.4 Valve Control System
		13.11 Diaphragm Valves
		13.11.1 Minimum requirements
		13.11.2 Diaphragm material
		13.11.3 Body coating
		13.11.4 Function
		13.11.5 Operation
		13.11.6 Actuator
		13.11.7 Valve body
		13.11.8 Valve diaphragm
		13.11.9 Valve operating assembly
		13.12 Pinch valves
		13.12.1 Minimum requirements
		13.12.2 Function
		13.12.3 Operation
		13.12.4 Actuator
		13.13 Plug valves
		13.13.1 Minimum requirements
		13.13.2 Function
		13.13.3 Operation
		13.13.4 Actuator

Revision 12 Section No. & Title	Summary of change Rev 12	Revision 13 Section No.& Title
		13.14 Ball valves
		13.14.1 Minimum requirements
		13.14.1.1 Requirements for metal-bodied ball valves for general applications:
		13.14.1.2 Requirements for ball valves for water service connections:
		13.14.2 Function
		13.14.3 Actuator
		13.15 Non-return valves – swing flex type
		13.15.1 Minimum requirements
		13.15.2 Function
		13.15.3 Operation
		13.15.4 Actuator
		13.15.5 Top access port
		13.15.6 Installation
		13.15.7 Swing check valve
		13.16 Non-return valves – other
		13.16.1 Minimum requirements
		13.16.2 Function
		13.16.3 Operation
		13.16.4 Installation
		13.17 Gas release valves for water
		13.17.1 Minimum requirements
		13.17.2 Function
		13.17.3 Operation
		13.17.4 Actuator

Revision 12 Section No. & Title	Summary of change Rev 12	Revision 13 Section No.& Title
		13.17.5 Top access port
		13.17.6 Installation
		13.18 Gas release valves for sewage
		13.18.1 Minimum requirements
		13.18.2 Function
		13.18.3 Operation
		13.18.4 Actuator
		13.18.5 Top access port
		13.18.6 Installation
		13.19 Pressure relief valves
		13.19.1 Minimum Requirements
		13.19.2 Function
		13.19.3 Operation
		13.19.4 Installation
		13.20 Valves - Miscellaneous
		13.21 Eccentric Plug Valves
		13.21.1 General Requirements
		13.21.2 Valve Body
		13.21.3 Valve Plug and Seat
		13.21.4 Valve Operating Assembly
		13.21.5 Materials
		13.22 Solenoid Valves
		13.23 Pressure Safety Valves
		13.24 Reduced Pressure Zone Devices (RPZD)
8.4. Actuators	Moved to 14 & amended	**14 Actuators**

Revision 12 Section No. & Title	Summary of change Rev 12	Revision 13 Section No.& Title
8.4.1 General requirements	Moved to 14.1 & amended	14.1 General requirements
8.4.2 Electric Actuators for Valves	Moved to 14.2 & amended	14.2 Electric Actuators
		14.3 Pneumatic Actuators
		14.3.1 General Requirements
		14.3.2 Material and construction
		14.3.3 Air Supply
		14.3.4 Control, Instrumentation and Condition Monitoring
		14.3.5 Fail-Safe Operation
8.4.3 Manual Gearboxes for Valves	Moved to 14.4 & amended	14.4 Manual Gearboxes
9 Penstocks and Stopboards	**Moved to 15 & amended**	**15 Penstocks and Stopboards**
9.1. Performance Requirements .	Moved to 15.1 & amended	15.1 Performance Requirements
9.2. Technical Requirements - Penstocks	Moved to 15.3 & amended	15.2 Technical Requirements - Penstocks
9.2.1 General requirements for Penstocks		15.2.1 General requirements
9.2.2 Frames		15.2.2 Frames
9.2.3 Gates		15.2.3 Seals and Guides
9.2.4 Seals and Guides		15.2.4 Spindles/Stems
9.2.5 Spindles/Stems		15.2.5 Handwheels and Operating Mechanisms
9.2.6 Handwheels and Operating Mechanisms		15.2.6 Portable Actuators
9.2.7 Other Accessories		15.2.7 Other Accessories
9.2.8 Materials		15.2.8 Materials
9.2.9 Penstocks for Sewage Pump Station Inlet Isolation		15.2.9 Penstocks for Sewage Pump Station Inlet Isolation
9.3. Stopboards .	Moved to 15.2 & amended	15.3 Technical Requirements - Stopboards

Revision 12 Section No. & Title	Summary of change Rev 12	Revision 13 Section No.& Title	
9.4. Portable Actuators	Moved to 15.2.6 & amended		
9.5. Supervision of Installation	Moved to 15.4 & amended	15.4 Supervision of Installation Painting	
9.6. Fastenings			
9.7. Painting	Moved to 15.5 & amended	15.5 Painting	
10 Pumps	**Moved to 16**	**16 Pumps**	
10.1. Performance Requirements	Moved to 16.1	**16.1 General**	
10.1.1 Duty Requirements			
10.1.2 Efficiency and Power Consumption .		**16.2 Types of Pumps and Typical Usage**	
10.2. Technical Requirements	Within specific equipment/pump requirements	**16.3 Electrical and Protection Requirements**	
10.2.1 General		**16.4 Centrifugal Pumps**	
10.2.2 Materials of Constructions		16.4.1General	
10.2.3 Baseplates		16.4.2 Performance Requirements	
10.2.4 Couplings		16.4.3 Horizontal Centrifugal Pumps	
10.2.5 Reverse Rotation		16.4.3.1	General
10.2.6 Casing		16.4.3.2	Materials of Construction
10.2.7 Shaft		16.4.3.3	Baseplates
10.2.8 Impeller		16.4.3.4	Couplings
10.2.9 Wear Rings		16.4.3.5	Reverse Rotation
10.2.10 Bearings.		16.4.3.6	Casing
10.2.11 Seals		16.4.3.7	Shaft
10.2.12 Connections		16.4.3.8	Impeller
10.2.13 Nameplate		16.4.3.9	Wear Rings
10.2.14 Fastenings		16.4.3.10	Bearings
10.2.15 Vibration.		16.4.3.11	Seals
10.2.16 Personal Protection		16.4.3.12	Fasteners

Revision 12 Section No. & Title	Summary of change Rev 12	Revision 13 Section No.& Title	
10.2.17 Painting - General		16.4.3.13	Vibration
10.2.18 Painting - Dry Mount Pumps		16.4.3.14	Guards
10.2.19 Painting - Submersible Sewage Pumps	Moved to 16.4.5.4	16.4.3.15	Painting
10.2.20 Electrical and Protection Requirements	Moved to 16.3	16.4.4 Vertical Multistage Booster Pump Sets	
10.3. Centrifugal Pumps	Moved to 16.4 & amended	16.4.4.1	General
10.3.1 End suction pumps – Dry mount		16.4.4.2	Baseplate
10.3.2 Grit pumps – Dry mount	moved to 16.	16.4.4.3	Pumping Station Piping
10.3.3 Submersible pumps		16.4.4.4	Diaphragm Tank
10.4. Vertical Multistage Pump Sets	Moved to 16.4.4 & amended	16.4.5 Sewage Submersible pumps	
10.4.1 Baseplate		16.4.5.1	General
10.4.2 Piping		16.4.5.2	Submersible Pumps for Wet Well Installation
10.4.3 Diaphragm Tank .		16.4.5.3	Submersible Sewage Pumps for Dry Well Installation
		16.4.5.4	Painting - Submersible Sewage Pumps
		16.4.6 Grit pumps – Dry mount	
		16.4.7 Self-Priming Sewage Pumps	
10.5. Positive Displacement Pumps	Moved to 16.5 & amended	**16.5 Rotary Positive Displacement Pumps**	
10.5.1 Pump Drive		16.5.1 General	
10.5.2 Dry running		16.5.2	Pump Drive
10.5.3 Solids handling capability		16.5.3	Dry Running
10.5.4 Rotary Lobe-General		16.5.4	Solids Handling Capability
10.5.5 Rotary Lobe - Rotors		16.5.5	Rotary Lobe Pumps
10.5.6 Rotary Lobe- Gears.		16.5.5.1	General
		16.5.5.2	Rotors
		16.5.5.3	Gears

Revision 12 Section No. & Title	Summary of change Rev 12	Revision 13 Section No.& Title	
10.6. Progressive Cavity Pumps .	Moved to 16.5.6 & amended	16.5.6	Progressive Cavity Pumps
10.7. Peristaltic Pumps	Moved to 16.5.7	16.5.7	Peristaltic Pumps
10.8. Dosing and Metering Pumps	Moved to 16.6 & amended	**16.6 Dosing and Metering Pumps**	
10.8.1 General		16.6.1	General
10.8.2 Diaphragm Pumps .		16.6.2	Diaphragm Pumps
10.8.3 Progressive cavity pumps		16.6.3	Progressive cavity pumps for chemical dosing
10.8.4 Peristaltic pumps		16.6.4	Peristaltic pumps for chemical dosing
10.9. Pump Testing and Commissioning Requirements	Moved to 16.7 & amended	**16.7 Pump Testing Requirements**	
10.9.1 Hydrostatic testing		16.7.1	Hydrostatic Testing
10.9.2 Pump performance testing		16.7.2	Pump Performance Testing – Centrifugal pumps
		17	**Surge Vessels**
		17.1	General
		17.2	Installation and Access Requirements
		17.3	Instrumentation
		17.4	Surge Modelling and Vessel Sizing
11 Blowers	**Moved to 18 & amended**	**18 Blowers**	
11.1. General	Moved to 18.1 & 18.2 ; amended	18.1	General
		18.2	Blower Assembly
		18.3	Acoustic Enclosure
11.2. V-Belt Drive	Moved to 18.4 & amended	18.4	V-Belt Drive
11.3. Shafts	Moved to 18 5 & 18.6; amended	18.5	Shafts
		18.6	Bearings
11.4. Accessories	Moved to 18 .7 & amended	18.7	Accessories

Revision 12 Section No. & Title	Summary of change Rev 12	Revision 13 Section No.& Title	
11.5. Air Intake Filter/Silencer	Moved to 18.8 & 18.9; amended	18.8	Air Intake and Exhaust air
		18.9	Filter and Silencer
		18.10	Centrifugal Blowers
		18.10.1	High Speed Turb Blowers
		18.11	Positive Displacement Blowers
		18.11.1	Rotary lobe & rotary screw Blowers
	New	18.12	Air Pipework
	New	18.13	Performance Requirements
12 Compressors .	**Moved to 19 & amended**	**19**	**Compressors**
12.1. General.	Moved to 19.1 & amended	19.1	General
	New	19.2	Acoustic Enclosures
	New	19.3	Filters
	New	19.4	Accessories
	6.4.21	19.5	Centrifugal Compressors
		19.6	Positive Displacement Compressors – Rotary / Screw
		19.7	Performance Requirements (Testing)
	New	19.8	Air Receivers
	New	19.9	Air Dryers
	New	19.10	Compressed Air Pipework
13 Surge Vessels	**Moved to 17 & amended**		
13.1. General..	Moved to 17.1 & amended		
13.2. Instrumentation	Moved to 17.3 & amended		
13.3. Access requirements for water surge vessels	Moved to 17.2 & amended		

Revision 12 Section No. & Title	Summary of change Rev 12	Revision 13 Section No.& Title	
13.4. Access requirements for sewage surge vessels	Moved to 17.2 & amended		
14 Corrosion Protection	**Renamed, moved to 10 & amended**		
14.1. General Requirements	Moved to 10.1.1 & amended		
14.1.1 Approvals	Moved to 10.1.2 & amended		
14.1.2 Colour Code	Moved to 10.1.3 & amended		
14.1.3 Operating conditions	Moved to 10.1.3 & amended		
14.1.4 Health and Safety .			
14.2. Surface Preparation	Moved to 10.2 & amended		
14.2.1 General			
14.2.2 Abrasive blast cleaning			
14.2.3 Power tool cleaning	Moved to 10.2.3 & amended		
14.2.4 Hand tool cleaning	Moved to 10.2.3 & amended		
14.2.5 Post cleaning	Moved to 10.2.4 & amended		
14.3. Painting	Moved to 10.3 & amended		
14.3.1 Handling and storage			
14.3.2 Application			
14.3.3 Prime coating			
14.3.4 Reinstatement of damaged coatings			
14.3.5 Quality control			
14.3.6 Surface cleanliness			
14.3.7 Profile			
14.3.8 Wet Film thickness			
14.3.9 Dry film thickness			
14.3.10 Identification			
14.3.11 Pinholes			
14.3.12 Handling and packaging			
14.3.13 Reporting			

Revision 12 Section No. & Title	Summary of change Rev 12	Revision 13 Section No.& Title
14.4. Corrosion Protections Systems	Moved to 10.4 (including sub clauses) & amended	
14.4.1 Summary table		
14.4.2 System 1: Structural steel – Mildly corrosive environment, not H2S, decorative top coat		
14.4.3 System 2: Structural Steel – Exposed or damp corrosive environment, not H2S		
14.4.4 System 3: Structural steel – Highly corrosive environment, coastal, not H2S, decorative top coat		
14.4.5 System 4: Structural Steel – Immersed in Sewage, open to atmosphere		
14.4.6 System 5: Steel or Cast Iron – External, not H2S, light grey epoxy top coat		
14.4.7 System 6: Steel or Cast Iron – External, not H2S, decorative top coat		
14.4.8 System 7: Steel or Cast Iron - Highly corrosive H2S environment open to atmosphere, pipes internally coated, not potable water		
14.4.9 System 8: Steel or Cast Iron – Immersed, internally coated, potable water		
14.4.10 System 9: Steel or Cast Iron - Highly corrosive environment, damp H2S		
14.4.11 System 10: Steel or Cast Iron, Highly corrosive environment, damp H2S - rapid application		
14.4.12 System 11: Cast Iron Ceramic Coating, for abrasion resistance		

Revision 12 Section No. & Title	Summary of change Rev 12	Revision 13 Section No.& Title	
14.4.13 System 12: Cast Iron Coating, for erosion-corrosion resistance			
14.4.14 System 13: Steel or Cast Iron Equipment – Thermal Bonded Polymeric coating			
14.4.15 System 14: Steel or Cast Iron Equipment – Fusion-bonded Epoxy .			
14.4.16 System 15: Steel Pipe – External Surfaces (buried)			
14.4.17 System 16: Steel or Cast Iron Pipes – Cement Mortar Lining			
14.4.18 System 17: Electrical Machines			
14.4.19 System 18: Electrical Switchgear Cubicles			
14.4.20 System 19: PVC Pipes			
14.4.21 System 20: Minor Metallic Piping Systems – External Surfaces			
14.4.22 System 21: Stainless Steel Surfaces			
14.4.23 System 22: Stainless Steel Surfaces – Electropolished			
14.4.24 System 23: Hot-dip Galvanising	New, moved 10.4.25		
14.4.25 System 24: Electroplated Metal Coatings	renamed, moved 10.4.26		
14.4.26 System 25: Wax-based Anticorrosion Coating .	renamed, moved 10.4.27		
		20	**Materials**
		20.1	Castings
		20.2	Stainless Steel
		20.3	Carbon Steel
		20.4	Fibre Reinforced Plastic

Revision 12 Section No. & Title	Summary of change Rev 12	Revision 13 Section No.& Title	
		21	**Pressure Gauges and Pressure Gauge Connection Points**
		22	Gaskets and Seals
		22.1	General Requirements
		22.2	O-Rings
		22.3	Mechanical Seals
		23	**Instrumentation**
	New	23.1	General
	New	23.2	Magnetic Flowmeters/Flow Tubes
	Moved from 3 & amended	**Appendix A - References**	
			Applicable Legislation and Regulation:
			Codes of Practice (ratified by Legislation)
			Codes of Practice (not ratified by Legislation)
			Standards directly referenced in this document are tabulated below.
	Moved from 4 & amended	**Appendix B – Definitions and Abbreviations**	