

QA/QC Templates

For

General Mechanical Construction Standard

No. ME

Ver.1

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M1. Safety equipment and safety signs

M1.7 QA/QC template

Quality / Control		Measurement	Certification		
			Document supplied	Site supervisor witness	Engineer witness
1	Safety equipment and signage	Sign-off / certification by qualified inspector			
			Sign-off		

M3. Miscellaneous and non-structural steelwork

M3.6 QA/QC template

Quality / Control		Measurement	Certification		
			Document supplied	Site supervisor witness	Engineer witness
1	Preparation	Work surfaces and joints clean, no rust, scale or other foreign matter			
2	Corrosion protection	Hot dip galvanised to standard. Paint coatings to standard			
3	Specified steel grade confirmed	Steel testing completed to the design specified steel grade in accordance with the recognised standard			
4	Bolting	To applicable specified requirements. Tests completed to Section 10.4			
			Sign-off		

M4. Structural steelwork

M4.7 QA/QC template

Quality / Control		Measurement	Certification		
			Document supplied	Site supervisor witness	Engineer witness
1	Specified steel grade confirmed	Steel testing completed to the design specified steel grade in accordance with the recognised standard			
2	Weld quality management plan	Templates in AS/NZS 1554			
3	Qualification of welding procedure, completed	AS/NZS 1554.1 appendix C			
4	Welding Inspector qualification	AS2214 certified			
5	Welder qualification	AS1796, or AS/NZS2980, or AS/NZS3992, or ISO 9606-1, or ASME 9			
6	Weld test samples tested	NZS3404, alternative NDT by recognised certifying body as required			
7	Welding inspector sign-off	AS/NZS 1554.1 Appendix C Welding record sign-off.			
8	Galvanising inspected for defects (where specified).	As per section M3.4			
9	Base plate bedding as required	Specified			
10	Bolting inspected	Correct bolting size and grade.			
			Sign-off		

M5. Access structures and platforms

M5.6 QA/QC template

Quality / Control		Measurement	Certification		
			Document supplied	Site supervisor witness	Engineer witness
1	Delivery	Material inspected for defects. Certification and data sheets received and confirmed as compliant			
2	Fabrication	Shop drawings received			
		Test certificates received. Compliance with NZS/AS 1657 or equivalent			
3	Corrosion protection	Hot dipped galvanised certification			
4	Installation	Installed as per specific design drawings. – producer statement (PS4)			
			Sign-off		

M6. Steel pipe welding

M6.8 QA/QC template

Quality / Control		Measurement	Certification		
			Document supplied	Site supervisor witness	Engineer witness
1	General	Welding prequalification check to AS/NZS3662			
		Welder qualification provided			
		Weld-maps produced including test plan			
		Weld conditions clean and dry (site and shop)			
2	Pipework	Weld surfaces prepared			
		Correct dimensions			
		Correct location and orientation in assembly			
		Flange alignment correct – typical flange bolt holes straddle centre line			
		Lifting lugs on pipework			
		Lifting lugs on pipework removed where required after installation			
		Temporary pipe supports			
		Welding 100% visually inspected			
3	Pipe access manhole	Backing plate of correct size welded in place			

Quality / Control		Measurement	Certification		
			Document supplied	Site supervisor witness	Engineer witness
		Lid correct size and thickness			
		Lid evenly fitted (weld down type, bolt down type see Section M8)			
4	Air valve stubs	Position confirmed - not spanning any weld seams.			
		Backing plate of correct size welded in place			
		Flange alignment – bolt holes straddling pipe centre line			
5	Weld bands	Correct size and thickness for pipe being welded			
		No packers used to fill gaps			
		Test hole closed on completion of nitrogen test			
6	Weld joint test	Non-destructive test (NDT) completed. Certification provided			
		Nitrogen test passed on pipework \geq 700mm. Test records provided			
7	Lining and external coating	Repaired to standard (Refer civil construction standard). DCVG test on steel pipe.			
			Sign-off		

M8. Installation of flanged components in pipelines

M8.7 QA/QC template

Quality / Control		Measurement	Certification		
			Document supplied	Site supervisor witness	Engineer witness
1	Flanges	Correct size, pattern and class			
		Gasket face undamaged			
		Alignment correct			
2	Fasteners	All bolts present			
		Correct size, length (within protrusion range) and grade			
		All washers/nuts present – corresponding grade to bolts			
		Isolation sleeves and washers (where required)			
		Bolt thread lubrication – well lubricated as per Section M2.7.2			
		Correct bolt torque rating selected for flange type and gasket type			
		Star pattern followed for assembly – number sequence marked on back of flange			
3	Gaskets	Correct selection for flange size and type			
		Correctly stored			
		Inspected for defects			

Quality / Control		Measurement	Certification		
			Document supplied	Site supervisor witness	Engineer witness
4	Insulated joints	Flange holes factory drilled to accept standard bolt size with insulation kit.			
		Location confirmed			
		Insulation test value > 1 mega-ohm			
5	Components/equipment being assembled	Correct size with corresponding flange patterns and class rating			
		Correct position in assembly			
		Correct orientation			
		Valve opened before bolting			
6	Handling and delivery	Correctly loaded and supported – no load transferred onto joints during assembly, handling and installation			
		Final torque values confirmed before installation			
7	Hot bolting / Retrofit	Pre-inspection by qualified engineer.			
		Specific methodology developed (hot bolting) – Pressure < 60% MAWP Min 8 bolt flange			
		Correct bolt selection and torque range for retrofit			
			Sign-off		

M9. Actuators

M9.2 QA/QC template

Quality / Control		Measurement	Certification		
			Document supplied	Site supervisor witness	Engineer witness
1	General	Actuator stroked before installation			
		Actuator specifications comply with specific operational requirements and working environment			
		Inspect mounting surfaces, fit and alignment			
		Valve travel limits correct			
		Limit switch calibrated			
			Sign-off		

M10. Magnetic flowmeter installation

M10.5 QA/QC template

Quality / Control		Measurement	Certification		
			Document supplied	Site supervisor witness	Engineer witness
1	Meter	Correct size			
		Correct location in assembly			
		Correct orientation for flow			
		Internal lining undamaged			
		Gasket face undamaged			
		Earthing rings			
		Gaskets (two per flange joint)			
2	Sensor unit	Cable potted			
		Glands correctly installed			
		Unused cable entries blanked			
		Matching serial numbers			
3	Electrical Isolation	Bonding cables (minimum 6mm copper)			
		Insulation kit fitted			

Quality / Control		Measurement	Certification		
			Document supplied	Site supervisor witness	Engineer witness
4	Bolting	Compliant with Section M8.6			
		Lining not deformed			
			Sign-off		

M11. Installation of pumping units and motors

M11.4 QA/QC template

Quality / Control		Measurement	Certification		
			Document supplied	Site supervisor witness	Engineer witness
1	Preparation	Base and plinth clean			
		Baseplate dressed			
2	Setting out	Plinth true, sized and located per design			
3	Alignment	Proprietary shimming material sized to loading surface			
		Connecting pipework self-supporting and correctly aligned			
		Footing true (check for angular or parallel soft foot)			
		Grout depth 20-40mm			
		Anchor size correct size and grade. Correct washer type and size			
		Alignment – tolerance to manufacturer spec; or: <ul style="list-style-type: none"> • Max 0.03mm for flex coupled shafts • No tolerance for rigid coupling Alignment record provided			
			Sign-off		

M12. Installation of gearboxes

M12.3 QA/QC template

Quality / Control		Measurement	Certification		
			Document supplied	Site supervisor witness	Engineer witness
1	Gearbox type and model	Correct model, matching application and torque requirements			
2	Installation position	Correct orientation. Oil level confirmed for orientation			
		Input and output direction confirmed			
3	Preparation	Mounting surfaces cleaned and lubricated with acceptable product			
4	Installation	Alignment procedures followed as per section M11			
		Manufacturer bolting and torque requirements followed			
		Safety covers installed such as to allow air circulation as specified by the manufacturer			
			Sign-off		

M13. Drives and couplings

M13.5 QA/QC template

Quality / Control		Measurement	Certification		
			Document supplied	Site supervisor witness	Engineer witness
1	Coupling	Torque rating suitable			
		Coupling balanced – record			
		Mounting arrangement with hub facing shaft end			
		Belt/Chain selection compliant – record			
2	Alignment	Laser alignment. Alignment record provided			
3	Belt tension	To manufacturer specification - record			
4	Safety covers	Fitted and inspected by qualified H&S inspector			
			Sign-off		