General Notes

Hold Point Matrix Definitions	
Hold Point	Mandatory verification point where work cannot proceed without the designated authority's approval.
Witness Point	Verification point where the designated authority may inspect or witness the works.
Surveillance Point	Random site attendance where designated authority may inspect or witness works.
Review Point	Specific documentation is evidenced to verify requirements met in accordance with specifications and technical standards.
Designated authority	
SA Water	SA Water's appointed representative, Construction Services Technical Officer for the development works.
Superintendent	Competent person appointed by developer in accordance with Develop Agreement Formal Instrument & Annexure D Role of Superintendent.
Contractor	Civil constructor appointed by developer who is accredited by SA Water to undertake land development works.

Potable Water Main

Item	Activity	Minimum Acceptance Criteria	Reference Doc		Hold Point Matrix		
			Drawing or document number	Reference Note	SA Water	Superintendent	Contractor
1	**Quality Requirements**						
1.1	Inspection and Test Plan(s) to be provided to Superintendents Rep .	ITP(s) to be submitted to Superintendent for review and endorsement prior to being forwarded to SA Water Rep at least 10 working days before work activity commences.	TS-0105 - Quality Requirements	Section 3.8		Hold Point	
1.1.1	Inspection and Test Plan(s) to be provided to SAW Rep.	ITP(s) to be submitted to SAW Rep for review and acceptance prior to construction commencement and/or start up meeting.	TS-0105 - Quality Requirements		Hold Point		
2	**Safety Documentation**						
2.1	SiD Register - IFC	SiD Register issued to construction team with all relevant documentation. Changes to design or operation outside of design specification, are to be managed such there is systematic identification of the impact of the changes, identification of hazards and controls of the hazards using the SFAIRP principle.	TS-101 - Safety In Design			Hold Point	
3	**Preconstruction Requirements**						
3.1	Start up meeting	DAFI agreement and contract payment received by SA Water. IFC documentation signed, ITP(s) accepted, SiD register and report issued to constructor.			Hold Point		
4	**Materials Inspection & Materials Conformance**						
4.1	Pipes (DICL, PVC, PE, MSCL)	All pipes shall be in accordance with TS-0503 PVC pipes shall be Blue. DI pipes shall be wrapped with blue or black sleeving. PE pipes shall be black with blue strip or all blue.	TS-0503 Authorised Products Water Systems	Section 3	Hold Point		
4.1.1	Pipes (DICL, PVC, PE, MSCL)	All pipes shall be in accordance with IFC design specifications.	Design specification		Review Point	Witness Point	Hold Point
4.2	Rubber Sealing Rings	Rubber sealing rings shall comply with TS-0503 and TS-0800	TS-0503 Authorised Products Water Systems TS-0800 Materials in Contact with Drinking Water	Section 3.6	Hold Point		
4.3	Fittings	All fittings shall be in accordance with TS-0503 Fittings shall be inspected for damage	TS-0503 Authorised Products Water Systems		Hold Point		
4.3.1	Fittings	All fittings shall be in accordance with design specifications	Design specification		Review Point	Witness Point	Hold Point
4.4	Fittings (PE)	Butt welded fittings shall only be fabricated by welders who have attained the PMWELD301B qualification. Electrofusion welding shall only be fabricated by welders who have attained the PMBWELD302B qualification. Upon completion, the fabrication company shall provide the SA Water Representative with a Identification form.	TS-0503 Authorised Products Water Systems Technical Bulletin Supplement to TS-0503	Section 4.2	Hold Point		
4.4.1	PE Specials	PE specials shall only be fabricated by authorised manufactures / suppliers & provided with weld certificates	TS-0503 Authorised Products Water Systems		Review Point	Witness Point	Hold Point

4.5	Mains Tapping Fittings	All fittings shall be in accordance with TS-0503	TS-0503 Authorised Products Water Systems	Section 5	Hold Point		
4.6	Valves and hydrants	All fittings shall be in accordance with TS-0503	TS-0503 Authorised Products Water Systems	Section 7 & 8	Hold Point		
4.6.1	Valves and hydrants	All fittings shall be in accordance with IFC design specifications	Design specification		Review Point	Witness Point	Hold Point
4.7	Bolts and Jointing Kits	All components shall be in accordance with TS-0503	TS-0503 Authorised Products Water Systems	Section 10	Hold Point		
4.8	Access Cover Assemblies	All fittings shall be in accordance with TS-0503	TS-0503 Authorised Products Water Systems	Section 11	Hold Point		
4.9	Pipe Storage	An appropriate seal must be used to prevent contamination of pipes, ends of pipe must be sealed when pipes are stored outside and when exposed pipe is left in trench unattended or during a rain event, any dirt, sand, sediment must be removed prior to link up and disinfection.	WSCM 4005-30002-02 General Notes	Note 11	Surveillance Point	Witness Point	Hold Point
4.10	PM1/20	Material Certificate to be provided to SA Water prior to works commencing and if retested if required. Pavement material to be in accordance with Grading as per table 4.	TS-0630 - Course Aggregate for Civil Works	Section 5.4	Review Point	Witness Point	Hold Point
4.11	PM2/20	Material Certificate to be provided to SA Water prior to works commencing and if retested if required. Pavement material to be in accordance with Grading as per table 6.	TS-0630 - Course Aggregate for Civil Works	Section 5.5	Review Point	Witness Point	Hold Point
4.12	TS0631a Sand Embedment (TS4)	Material Certificate to be provided to SA Water prior to works commencing and if retested if required. Sand material to be in accordance with table 1 and figure 2	TS 0631 - Fine Materials for Pipe Embedment	Section 5.1	Review Point	Witness Point	Hold Point
5	**Pipe laying**						
5.1	Pipe Installation and Jointing	1st 50 metres of pipework inspected and verified to be laid centrally in trench on authorised bedding material in accordance with IFC drawings and specification references	WSCM 4005-30003 Excavation embedment & trenching WSCM 4005-30005-02 Pipe Jointing & Deflection AS/NZS 2566.2.2002 Buried flexible pipelines Part 2. Section 4 Excavation Section 5 Installation WSA 03-2011-3.1-15 Pipe Laying, jointing, and connecting TS 0136 Minimum clearance		Hold Point	Surveillance Point	
5.2	Pipe Installation Survey	Pipework, fittings and connections surveyed for As Constructed documentation issue	TS 0103 Survey Requirements Specification		Review Point	Witness Point	Hold Point
6	**Installation of Thrust Blocks - in Accordance with Soil Classification**						
6.1	Horizontal & Vertical Bends, Tees & Permanent Dead End	Block dimensions as per table 1 of WSCM 4005-30003-06 Concrete grade shall be minimum N25	WSCM 4005-30003-06 Horizontal & Vertical Bends, Tees & Permanent Dead End		Hold Point	Surveillance Point	
6.2	In-Line Thrust Blocks < DN250	Block dimensions as per table 1 of WSCM 4005-30003-07 Concrete grade shall be minimum N25	WSCM 4005-30003-07 In-Line Thrust Blocks < DN250		Hold Point	Surveillance Point	
6.3	In-Line Thrust Blocks < DN300 & DN375	Block dimensions as per table 1 of WSCM 4005-30003-09 Concrete grade shall be minimum N25	WSCM 4005-30003-09 In-Line Thrust Blocks < DN300 & DN375		Hold Point	Surveillance Point	

6.4	Pre Pour Inspection	All steel reinforcement material shall conform to AS/NZS 4671 and TS-0710. Reinforcement shall be adequately tied together such as to form a rigid cage. All steel reinforcement in position shall be inspected and approved by SA Water's Representative before the concrete placement commences.	TS-0710 - Concrete	Section 29	Hold Point	Surveillance Point	
7	**Bolt Tightening**						
7.1	Calibration of Torque Device	Torque device shall be calibrated and used together with procedures for bolt tightening.	• TS 27 Bolt Torque/ Manufacture specification - Procedure for Mechanical Plant • WSA 109 • TN 38 All Bolts to be Lubricated Molycoat P74 Molybdenum Grease. Power tools not permitted. Torque device shall be the only tool permitted to tightening bolts. Criss cross pattern tightening sequence	Section 4	Witness Point	Review Point	Hold Point
8	**Field Welding for PE Documentation**						
8.1	Submission of QA Plan	Constructor submission of QA plan to be provided to SAW Rep prior to commencement of works. QMP/QMS Temporary Authorisation - Acceptance	TP003 - Specifying Butt Welding of Polyethylene Pipe Systems Technical Bulletin Supplement to TS-0503		Hold Point		
9	**MSCL Welding Documentation**						
9.1	Non Approved Fabricator	Prior to commencement of works welding documentation shall be provided to SA Water for approval. Documentation to be submitted shall be as per section 3 of TS-042.	TS-0420 - Welding Requirement (Metals)	Section 3	Hold Point		
10	**Pressure Testing of Pipelines**						
10.1	Gauge calibration	Before any gauges are used, it shall be checked independently and dated certificate of its accuracy shall be provided. Certificate of calibration issued within the last 12 months by an approved NATA registered laboratory. or Receipt of purchase within the past 12 months	TS-900 - Pressure Testing of Pipelines	Section 6.1.10	Witness Point	Review Point	Hold Point
10.2	On-Site Testing of Pressure Pipe Systems	Testing to be carried out in accordance with requirements of TS-0900 depending on pipe material. Contractor to provide ITC for review prior to testing	TS-900 - Pressure Testing of Pipelines	Section 6	Hold Point	Review Point	
10.3	Repairs to Pipeline	All repairs carried out by the constructor shall be inspected and passed by SA Water's Owners Engineer or Superintendent's Representative before backfilling is continued. Review and acceptance of Repair Procedures.	TS-900 - Pressure Testing of Pipelines TS-0105 - Quality Requirements	Section 6.1.15 Section 3.12.1	Hold Point	Review Point	
10.4	Testing against a closed valve	Confirmation of requirement to test against a closed valve.	TS-900 - Pressure Testing of Pipelines	Section 6.1.4	Hold Point	Review Point	

10.5	Cross Connection Check	Dual supply areas require a drinking water cross connection test in accordance with OTR Water Standards and WSA 03-2011 v3.2	• WSA 03 NDW 2.4 • WSCM 4005 – 30004 – 04, Detail B • All Potable and Non-Potable connections to be checked by CSTO before backfill of inlet Risers. • WSA 03-2011-3.1- 15.1.2 Dual water supply areas • WSA 03-2011-3.1- 19.5 Block testing dual water supply systems for connectivity • All Non-Potable meters shall be 300mm Horizontal Left from the potable meter.		Hold Point	Review Point	
11	**Link In - Final Connection**						
11.1	Hand Disinfection	SA Water procedure SAWO-OPS- 0026 Spray Disinfection - Preparation and Application using INSTACHLOR PR1000 tablets shall be used as a guide	WSCM 4005-30005 Main laying – Page - 19		Witness Point	Review Point	Hold Point
11.2	Link into Existing Main	Temporary Authorisation approval required and contractor to request mains shut down to link into a live main. Where a new pipeline or other tested element is to connect to an operational pipeline, the final connection shall be inspected visually under normal operating pressure and there shall be no visible leakage. Removal of paddles to be approved by SA Water	WSCM 4005-30005-10		Hold Point	Review Point	
12	**Compaction**						
12.1	Compaction Testing	For water mains and water connections, there shall be a minimum of one field density test within each one metre depth of trench fill: (a) for each 50 metre length of water main trench and (b) in at least 20% of the trenches for connections, i.e. 1 in each group of 5 connections or part thereof (within the same project). (c) or as otherwise directed by the superintendent's Representative.			Review Point	Review Point	Hold Point
13	**Quality Assurance Documentation**						
13.1	Review and Submission	Contractor to review and submit all quality assurance document package to Superintendent for review					Hold Point
13.2	Review and Endorse	Superintendent to collate all quality assurance package to SA Water for review and acceptance				Hold Point	
13.3	Review and Accept	SA Water CSTO to review and accept all QA documents prior to accepting PC Walkover			Hold Point		
14	**Practical Completion**						
14.1	Pre PC Walkover	To be performed following project construction to identify any defects and undertake correction action prior to requesting PC Walkover with SA Water & Superintendent. Construction work in accordance with Technical Standards and IFC drawings. No defects.					Hold Point

14.2	PC Walkover	All infrastructure inspected to confirm constructed in accordance with specification references and within tolerance. SiD Hazard review 3 (SiD3) completed with all relevant stakeholders No defects. Email Majors team iAuditor documentation.			Hold Point		
15	**Final Completion**						
15.1	Final Walkover	12 month defect liability inspection released with no outstanding defects. CSTO to Email Majors team iAuditor documentation.			Hold Point		

Gravity Sewer

Item	Activity	Minimum Acceptance Criteria	Reference Doc		Hold Point Matrix		
			Drawing or document number	Reference Note	SA Water	Superintendent	Contractor
1	**Quality Requirements**						
1.1	Inspection and Test Plan(s) to be provided to Superintendents Rep .	ITP(s) to be submitted to Superintendent for review and endorsement prior to being forwarded to SA Water Rep at least 10 working days before work activity commences.	TS-0105 - Quality Requirements	Section 3.8		Hold Point	
1.1.1	Inspection and Test Plan(s) to be provided to SAW Rep.	ITP(s) to be submitted to SAW Rep for review and acceptance prior to construction commencement and/or start up meeting.	TS-0105 - Quality Requirements		Hold Point		
2	**Safety Documentation**						
2.1	SiD Register - IFC	SiD Register issued to construction team with all relevant documentation. Changes to design or operation outside of design specification, are to be managed such there is systematic identification of the impact of the changes, identification of hazards and controls of the hazards using the SFAIRP principle.	TS-101 - Safety In Design			Hold Point	
3	**Preconstruction Requirements**						
3.1	Start up meeting	DAFI agreement and contract payment received by SA Water. IFC documentation signed, ITP(s) accepted, SiD register and report issued to constructor.			Hold Point		
4	**Materials**						
4.1	Pipes (DICL, PVC, PE, MSCL)	All pipes shall be in accordance with TS-0502 DI pipes shall be wrapped with cream sleeving marked Sewer. PE pipes shall be black with cream strip or all cream.	TS-0502 Authorised Products Gravity Sewer & Pressure Pumping Systems		Hold Point		
4.1.1	Pipes (DICL, PVC, PE, MSCL)	All pipes shall be in accordance with IFC design specifications.	Design specification		Review Point	Witness Point	Hold Point
4.2	Fittings / Structures	All fittings shall be in accordance with TS-0502 Fittings shall be inspected for damage	TS-0502 Authorised Products Gravity Sewer & Pressure Pumping Systems		Hold Point		
4.2.1	Fittings / Structures	All fittings shall be in accordance with design specifications	Design specification		Review Point	Witness Point	Hold Point
4.3	10mm Single Size Aggregate	Material Certificate to be provided to SA Water prior to works commencing and if retested if required. Pavement material to be in accordance with Grading as per table 1.	TS-0630 - Course Aggregate for Civil Works	Section 5.2	Review Point	Witness Point	Hold Point
4.4	14mm Single Size Aggregate	Material Certificate to be provided to SA Water prior to works commencing and if retested if required. Pavement material to be in accordance with Grading as per table 2.	TS-0630 - Course Aggregate for Civil Works	Section 5.3	Review Point	Witness Point	Hold Point
4.5	PM1/20	Material Certificate to be provided to SA Water prior to works commencing and if retested if required. Pavement material to be in accordance with Grading as per table 4.	TS-0630 - Course Aggregate for Civil Works	Section 5.4	Review Point	Witness Point	Hold Point
4.6	PM2/20	Material Certificate to be provided to SA Water prior to works commencing and if retested if required. Pavement material to be in accordance with Grading as per table 6.	TS-0630 - Course Aggregate for Civil Works	Section 5.5	Review Point	Witness Point	Hold Point

5	**Excavation and Trenching**						
5.1	Geotechnical Reports & Groundwater Control (If Applicable)	All groundwater inflows shall be controlled prior to placing bedding material. Where water is entering the trench slowly, a geotextile wrapped gravel drain on the trench floor may be sufficient, if so, over excavate the trench floor, place geotextile on the floor and up the sides, fill to a depth of 100mm with aggregate, wrapped the geotextile over the aggregate, a drain towards a pump sump in the trench.	SCM 4005-20003-04 - note 2 TG 0631 - General Technical Information for Geotechnical Design – Earthworks		Surveillance Point	Witness Point	Hold Point
6	**Pipe laying**						
6.1	Pipe Installation and Jointing	1st 50 meters of pipes inspected and verified to be laid centrally in trench, joints prepared with marked witness lines to ensure correct depth of pipes inserted into sockets Solvent cement joints prepared in accordance with specification reference & free of excessive priming fluid / solvent cement	SCM 4005-20003-03		Hold Point	Surveillance Point	
7	**Installation of Concrete Maintenance Holes and Shafts**						
7.1	Pre-Cast Base - Non Pre-Benched	Approved bonding agent to be used. Thoroughly roughen and clean base, brush on suitable bonding agent. Benching and gullet shall be formed as per drawings and SCM.			Hold Point		
7.2	Pre Pour Inspection Insitu Base	Pre-pour inspection of maintenance hole excavation, materials and increment support, in accordance with specification references	SCM - 4005-20005-03, 4005-20005-06, 4005-20005-07		Hold Point		
7.3	Poured Insitu Benching and Gullet	Benching to be in accordance with SA Water standards. SA Water to be notified of works and inspect base for compliance. Bench fall from wall to channel = 25mm - 30mm Benching and gullets be trowels with a smooth finish. Concrete poured in situ shall be grade N40	SCM - 4005-20005-03, 4005-20005-06, 4005-20005-07		Hold Point		
7.4	Increment placement	Inspection of first segment to be completed by Superintendent if backfilling prior to testing, requirements as per section 5.3 - Backfilling All joints are sealed using authorised joint sealant.	TS-0600 Water Tightness Testing of Liquid Retaining Structures	Section 5.3	Review Point	Hold Point	
8	**Testing of Liquid Retaining Structures**						
8.1	Maintenance Hole Testing	Testing carried out as per section 5.1.1 Structure filled and held for 2 hrs prior to commencing start of test. Minimum test duration of 24 hrs. Water loss criteria as per section C. Repair procedure to be provided prior to works commencing.	TS-0600 Water Tightness Testing of Liquid Retaining Structures	Section 5 - Sewer Chambers	Review Point	Hold Point	
8.2	Repair Procedures	Procedure provided 10 working days before the relevant work commences.	TS-0600 Water Tightness Testing of Liquid Retaining Structures	Section 3.9.1	Review Point	Hold Point	
8.3	Testing Documentation	ITP's signed within 5 working days of completion of the relevant activity	TS-0600 Water Tightness Testing of Liquid Retaining Structures	Section 3.6	Review Point	Hold Point	
9	**CCTV of Sewer Gravity Main**						
9.1	CCTV Preliminary	SA Water to be notified 15 working days for the actual CCTV inspection. Contractor to pre wash all pipework within 24 hours of CCTV	TS-0524 - CCTV Inspection of Gravity Sewer Infrastructure	Section 5.2	Witness Point		Hold Point

9.2	Water Placement	15 minutes prior to CCTV the mains are to be flushed with amount of water as per 5.3.1.	TS-0524 - CCTV Inspection of Gravity Sewer Infrastructure	Section 5.3	Hold Point		
9.3	CCTV Attributes Review	CCTV attributes (Wincam report, Video footage, Acceptance Test report) to be reviewed by contractor, defects rectified, re-CCTV if required, prior to attributes being provided to superintendent for review and endorsement.					Hold Point
9.3.1	CCTV Attributes Endorse	CCTV attributes reviewed by superintendent. Should rectification works be required, direct contractor accordingly. Rectified works are to be re-CCTV'd. Endorsed attributes to be forwarded to SA Water CSTO				Hold Point	
9.3.2	CCTV Acceptance Report	CCTV attributes reviewed. Should rectification works be required, direct superintendent accordingly. Accepted attributes to be communicated to superintendent and contractor.	TS-0524 - CCTV Inspection of Gravity Sewer Infrastructure	Appendix A	Hold Point	Review Point	
10	**Pressure Testing of Pipelines - Gravity Sewer**						
10.1	Gauge calibration	Before any gauges are used, it shall be checked independently and dated certificate of its accuracy shall be provided. Certificate of calibration issued within the last 12 months by an approved NATA registered laboratory.	TS-0900 - Pressure Testing of Pipelines	Section 6.1.10	Review Point	Witness Point	Hold Point
10.2	Testing of Sewer Gravity Systems	Testing to be carried out as per section 7.2.2 Low Pressure Air Testing Method. Slowly apply pressure to 27 kPa. Close air pump outlet valve, allow pressure to stabilise for at least 3 minutes. Drop pressure to 24 kPa and commence the test. Gauges used shall be independently checked and dated certificates of calibration provided. Repair procedure to be provided prior to works commencing. If pressure drops >7 kPa with minimum test duration, re-apply test pressure to identify leaks.	TS-0900 - Pressure Testing of Pipelines	Section 8	Review Point	Hold Point	
10.3	Repairs to Pipeline	All repairs carried out by the constructor shall be inspected and passed by SA Water's Owners Engineer or Superintendent's Representative before backfilling is continued. Review and acceptance of Repair Procedures.	TS-0900 - Pressure Testing of Pipelines TS-0105 - Quality Requirements	Section 6.1.15 Section 3.12.1	Hold Point	Review Point	
10.4	Testing Documentation	Constructor to provide lot plan and testing record sheets to Superintendent & SA Water representative for sign off.	TS-0900 - Pressure Testing of Pipelines		Review Point	Witness Point	Hold Point
11	**Compaction Testing**						
11.1	Compaction Testing	Compaction testing to be completed in accordance with SCM. For sewer main and connections, there shall be minimum of one field density test within each one meter depth of trench fill, (a) at each maintenance hole, and (b) for each 50 meter length of sewer trench, and (c) in at least 20% of the trenches for connections.	SCM - 4005-20003-01 & 4005-20003-02 AS 1289		Review Point	Witness Point	Hold Point
12	**Quality Assurance Documentation**						

12.1	Review and Submission	Contractor to review and submit all quality assurance document package to Superintendent for review					Hold Point
12.1.1	Review and Endorse	Superintendent to collate all quality assurance package to SA Water for review and acceptance				Hold Point	
12.1.2	Review and Accept	SA Water CSTO to review and accept all QA documents prior to accepting PC Walkover			Hold Point		
13	**Practical Completion**						
13.1	Pre PC Walkover	To be performed following project construction to identify any defects and undertake correction action prior to requesting PC Walkover with SA Water & Superintendent. Construction work in accordance with Technical Standards and IFC drawings. No defects.					Hold Point
13.2	PC Walkover	All infrastructure inspected to confirm constructed in accordance with specification references and within tolerance. SiD Hazard review 3 (SiD3) completed with all relevant stakeholders No defects. Email Majors team iAuditor documentation.			Hold Point		
14	**Final Completion**						
14.1	Final Walkover	12 month defect liability inspection released with no outstanding defects. CSTO Email Majors team iAuditor documentation.			Hold Point		

Non Potable Water Main

Item	Activity	Minimum Acceptance Criteria	Reference Doc		Hold Point Matrix		
			Drawing or document number	Reference Note	SA Water	Superintendent	Contractor
1	**Quality Requirements**						
1.1	Inspection and Test Plan(s) to be provided to Superintendents Rep .	ITP(s) to be submitted to Superintendent for review and endorsement prior to being forwarded to SA Water Rep at least 10 working days before work activity commences.	TS-0105 - Quality Requirements	Section 3.8		Hold Point	
1.1.1	Inspection and Test Plan(s) to be provided to SAW Rep.	ITP(s) to be submitted to SAW Rep for review and acceptance prior to construction commencement and/or start up meeting.	TS-0105 - Quality Requirements		Hold Point		
2	**Safety Documentation**						
2.1	SiD Register - IFC	SiD Register issued to construction team with all relevant documentation. Changes to design or operation outside of design specification, are to be managed such there is systematic identification of the impact of the changes, identification of hazards and controls of the hazards using the SFAIRP principle.	TS-101 - Safety In Design			Hold Point	
3	**Preconstruction Requirements**						
3.1	Start up meeting	DAFI agreement and contract payment received by SA Water. IFC documentation signed, ITP(s) accepted, SiD register and report issued to constructor.			Hold Point		
4	**Materials Inspection & Materials Conformance**						
4.1	Pipes (DICL, PVC, PE, MSCL)	All pipes shall be in accordance with TS-0503 PVC pipes shall be lilac. DI pipes shall be wrapped with lilac sleeving. PE pipes shall be black with lilac strip or all lilac.	TS-0503 Authorised Products Water Systems	Section 3	Hold Point		
4.1.1	Pipes (DICL, PVC, PE, MSCL)	All pipes shall be in accordance with IFC design specifications.	Design specification		Review Point	Witness Point	Hold Point
4.2	Rubber Sealing Rings	Rubber sealing rings shall comply with TS-0503	TS-0503 Authorised Products Water Systems	Section 3.6	Hold Point		
4.3	Fittings	All fittings shall be in accordance with TS-0503 Fittings shall be inspected for damage	TS-0503 Authorised Products Water Systems		Hold Point		
4.3.1	Fittings	All fittings shall be in accordance with design specifications	Design specification		Review Point	Witness Point	Hold Point
4.4	Fittings (PE)	Butt welded fittings shall only be fabricated by welders who have attained the PMWELD301B qualification. Electrofusion welding shall only be fabricated by welders who have attained the PMBWELD302B qualification. Upon completion, the fabrication company shall provide the SA Water Representative with a Identification form.	TS-0503 Authorised Products Water Systems Technical Bulletin Supplement to TS-0503	Section 4.2	Hold Point		
4.4.1	PE Specials	PE specials shall only be fabricated by authorised manufactures / suppliers & provided with weld certificates	TS-0503 Authorised Products Water Systems		Review Point	Witness Point	Hold Point
4.5	Mains Tapping Fittings	All fittings shall be in accordance with TS-0503	TS-0503 Authorised Products Water Systems	Section 5	Hold Point		

4.6	Valves and hydrants	All fittings shall be in accordance with TS-0503	TS-0503 Authorised Products Water Systems	Section 7 & 8	Hold Point		
4.6.1	Valves and hydrants	All fittings shall be in accordance with IFC design specifications	Design specification		Review Point	Witness Point	Hold Point
4.7	Bolts and Jointing Kits	All components shall be in accordance with TS-0503	TS-0503 Authorised Products Water Systems	Section 10	Hold Point		
4.8	Access Cover Assemblies	All fittings shall be in accordance with TS-0503	TS-0503 Authorised Products Water Systems	Section 11	Hold Point		
4.9	Pipe Storage	An appropriate seal must be used to prevent contamination of pipes, ends of pipe must be sealed when pipes are stored outside and when exposed pipe is left in trench unattended or during a rain event, any dirt, sand, sediment must be removed prior to link up and disinfection.	WSCM 4005-30002-02 General Notes	Note 11	Surveillance Point	Witness Point	Hold Point
4.10	PM1/20	Material Certificate to be provided to SA Water prior to works commencing and if retested if required. Pavement material to be in accordance with Grading as per table 4.	TS-0630 - Course Aggregate for Civil Works	Section 5.4	Review Point	Witness Point	Hold Point
4.11	PM2/20	Material Certificate to be provided to SA Water prior to works commencing and if retested if required. Pavement material to be in accordance with Grading as per table 6.	TS-0630 - Course Aggregate for Civil Works	Section 5.5	Review Point	Witness Point	Hold Point
4.12	TS0631a Sand Embedment (TS4)	Material Certificate to be provided to SA Water prior to works commencing and if retested if required. Sand material to be in accordance with table 1 and figure 2	TS 0631 - Fine Materials for Pipe Embedment	Section 5.1	Review Point	Witness Point	Hold Point
5	**Pipe laying**						
5.1	Pipe Installation and Jointing	1st 50 metres of pipework inspected and verified to be laid centrally in trench on authorised bedding material in accordance with IFC drawings and specification references	WSCM 4005-30003 Excavation embedment & trenching WSCM 4005-30005-02 Pipe Jointing & Deflection AS/NZS 2566.2.2002 Buried flexible pipelines Part 2. Section 4 Excavation Section 5 Installation WSA 03-2011-3.1-15 Pipe Laying, jointing, and connecting TS 0136 Minimum clearance		Hold Point	Surveillance Point	
5.2	Pipe Installation Survey	Pipework, fittings and connections surveyed for As Constructed documentation issue	TS 0103 Survey Requirements Specification		Review Point	Witness Point	Hold Point
6	**Installation of Thrust Blocks - in Accordance with Soil Classification**						
6.1	Horizontal & Vertical Bends, Tees & Permanent Dead End	Block dimensions as per table 1 of WSCM 4005-30003-06 Concrete grade shall be minimum N25	WSCM 4005-30003-06 Horizontal & Vertical Bends, Tees & Permanent Dead End		Hold Point	Surveillance Point	
6.2	In-Line Thrust Blocks < DN250	Block dimensions as per table 1 of WSCM 4005-30003-07 Concrete grade shall be minimum N25	WSCM 4005-30003-07 In-Line Thrust Blocks < DN250		Hold Point	Surveillance Point	
6.3	In-Line Thrust Blocks < DN300 & DN375	Block dimensions as per table 1 of WSCM 4005-30003-09 Concrete grade shall be minimum N25	WSCM 4005-30003-09 In-Line Thrust Blocks < DN300 & DN375		Hold Point	Surveillance Point	

6.4	Pre Pour Inspection	All steel reinforcement material shall conform to AS/NZS 4671 and TS-0710. Reinforcement shall be adequately tied together such as to form a rigid cage. All steel reinforcement in position shall be inspected and approved by SA Water's Representative before the concrete placement commences.	TS-0710 - Concrete	Section 29	Hold Point	Surveillance Point	
7	**Bolt Tightening**						
7.1	Calibration of Torque Device	Torque device shall be calibrated and used together with procedures for bolt tightening.	• TS 27 Bolt Torque/ Manufacture specification - Procedure for Mechanical Plant • WSA 109 • TN 38 All Bolts to be Lubricated Molycoat P74 Molybdenum Grease. Power tools not permitted. Torque device shall be the only tool permitted to tightening bolts. Criss cross pattern tightening sequence	Section 4	Review Point	Surveillance Point	Hold Point
8	**Field Welding for PE Documentation**						
8.1	Submission of QA Plan	Constructor submission of QA plan to be provided to SAW Rep prior to commencement of works. QMP/QMS Temporary Authorisation - Acceptance	TP003 - Specifying Butt Welding of Polyethylene Pipe Systems Technical Bulletin Supplement to TS-0503		Hold Point		
9	**MSCL Welding Documentation**						
9.1	Non Approved Fabricator	Prior to commencement of works welding documentation shall be provided to SA Water for approval. Documentation to be submitted shall be as per section 3 of TS-042.	TS-0420 - Welding Requirement (Metals)	Section 3	Hold Point		
10	**Pressure Testing of Pipelines**						
10.1	Gauge calibration	Before any gauges are used, it shall be checked independently and dated certificate of its accuracy shall be provided. Certificate of calibration issued within the last 12 months by an approved NATA registered laboratory. or Receipt of purchase within the past 12 months	TS-900 - Pressure Testing of Pipelines	Section 6.1.10	Review Point	Witness Point	Hold Point
10.2	On-Site Testing of Pressure Pipe Systems	Testing to be carried out in accordance with requirements of TS-0900 depending on pipe material. Contractor to provide ITC for review prior to testing	TS-900 - Pressure Testing of Pipelines	Section 6	Hold Point	Review Point	
10.3	Repairs to Pipeline	All repairs carried out by the constructor shall be inspected and passed by SA Water's Owners Engineer or Superintendent's Representative before backfilling is continued. Review and acceptance of Repair Procedures.	TS-900 - Pressure Testing of Pipelines TS-0105 - Quality Requirements	Section 6.1.15 Section 3.12.1	Hold Point	Review Point	
10.4	Testing against a closed valve	Confirmation of requirement to test against a closed valve.	TS-900 - Pressure Testing of Pipelines	Section 6.1.4	Hold Point	Review Point	

10.5	Cross Connection Check	Dual supply areas require a drinking water cross connection test in accordance with OTR Water Standards and WSA 03-2011 v3.2	• WSA 03 NDW 2.4 • WSCM 4005 – 30004 – 04, Detail B • All Potable and Non-Potable connections to be checked by CSTO before backfill of inlet Risers. • WSA 03-2011-3.1- 15.1.2 Dual water supply areas • WSA 03-2011-3.1- 19.5 Block testing dual water supply systems for connectivity • All Non-Potable meters shall be 300mm Horizontal Left from the potable meter.		Hold Point		
11	**Link In - Final Connection**						
11.1	Hand Disinfection	SA Water procedure SAWO-OPS- 0026 Spray Disinfection - Preparation and Application using INSTACHLOR PR1000 tablets shall be used as a guide	WSCM 4005-30005 Main laying – Page - 19		Witness Point		Hold Point
11.2	Link into Existing Main	Temporary Authorisation required to link into a live main. Where a new pipeline or other tested element is to connect to an operational pipeline, the final connection shall be inspected visually under normal operating pressure and there shall be no visible leakage. Removal of paddles to be approved by SA Water	WSCM 4005-30005-10		Hold Point		
12	**Compaction**						
12.1	Compaction Testing	For recycled water mains and connections, there shall be a minimum of one field density test within each one metre depth of trench fill: (a) for each 50 metre length of water main trench and (b) in at least 20% of the trenches for connections, i.e. 1 in each group of 5 connections or part thereof (within the same project). (c) or as otherwise directed by the superintendent's Representative.			Review Point	Witness Point	Hold Point
13	**Quality Assurance Documentation**						
13.1	Review and Submission	Contractor to review and submit all quality assurance document package to Superintendent for review					Hold Point
13.2	Review and Endorse	Superintendent to collate all quality assurance package to SA Water for review and acceptance				Hold Point	
13.3	Review and Accept	SA Water CSTO to review and accept all QA documents prior to accepting PC Walkover			Hold Point		
14	**Practical Completion**						
14.1	Pre PC Walkover	To be performed following project construction to identify any defects and undertake correction action prior to requesting PC Walkover with SA Water & Superintendent. Construction work in accordance with Technical Standards and IFC drawings. No defects.					Hold Point

14.2	PC Walkover	All infrastructure inspected to confirm constructed in accordance with specification references and within tolerance. SiD Hazard review 3 (SiD3) completed with all relevant stakeholders No defects. Email Majors team iAuditor documentation.			Hold Point		
15	**Final Completion**						
15.1	Final Walkover	12 month defect liability inspection released with no outstanding defects. CSTO to Email Majors team iAuditor documentation.			Hold Point		