

Site:	Cathodic Protection Standard Design Relates to SA Water standard drawings STD-04-00001_01-26 only.
Details:	Suite of standard cathodic protection drawings. SiD register broken up into drawing subpackages.
Project Number (if applicable):	N/A
Change Register:	Maintained by SA Water Principal Engineer, Materials Science for standard drawing set.

Date	Phase	Project Details (If Applicable)	Attendees
15-Nov-21	SiD Hazard Review 1 - Concept	Typical Design drawing review Set of designs broken up and represented on separate Tabs within this workbook.	See attendance list
11-Feb-22	SiD Hazard Review 1 - Concept	Typical Design drawing review Set of designs broken up and represented on separate Tabs within this workbook.	See attendance list
10-Mar-22	SiD Hazard Review 1 - Concept	Typical Design drawing review Set of designs broken up and represented on separate Tabs within this workbook.	See attendance list
05-Jul-22	SiD Hazard Review 1 - Concept	Reviewed actions and updated accordingly	LH and RS
03-Aug-22	SiD Hazard Review 1 - Concept	Reviewed actions and updated accordingly	LH and RS

HAZARD DETAILS										Hazard Elimination / Reduction SFAIRP				Action Required							
Hazard ID	Reference Information (e.g. Drawing)	Date Identified	Source (SID Review)	Life Cycle Phase	Activity / Task	Routine / Non-routine	Hazard Category	Details of Hazard Exposure	Do credible cause and consequence exist for this hazard? (Yes/No)	Current Controls	Proposed Controls	Control Method (Hierarchy)	Reasonably Practicable Category	Action Details / Options Considered / Status	Date Last Reviewed/Updated	Responsible Company	Responsible Individual (or Role)	Due For Completion	Action Status (not started, open, closed)	Hazard Reduced SFAIRP (Y/N)	Responsible Authority
Hazard Identification (HAZID, Lessons Learned etc.)																					
SID Review 1																					
1.01		29-Nov-19	HAZID / SID 1	Whole of life	System in place	Routine		Surge diverter being installed in new panel.	Yes	Surge diverter being installed in new panel.	This project is refreshing the design of the cabinet. 5/7/22 (RM): Done	Engineering		Ensure surge included in cabinet design 5/7/22 (RM):done	05-Jul-22	SAW	Design	Prior to Issuing Standard	Closed	Y	Senior Engineer Materials
1.02		22-Dec-20	Project Service Level Agreement Doc V0.2	Construction Maintenance	All life cycle phases	Non-Routine	Asbestos	Work involving removing or disturbing asbestos	Yes	The site asbestos registers or Aquamap will show asbestos locations, implement appropriate safety measures to manage or safely remove & dispose if required.		Administrative	a) Just do it		05-Jul-22	Constructor	Construction Manager	Prior to Construction	Open		
1.03		22-Dec-20	Project Service Level Agreement Doc V0.2	Construction Maintenance	All life cycle phases	Non-Routine	Asbestos	Work involving removing coatings or wraps	Yes		Include comment in technical specification that wraps and coatings to be analysed for Asbestos.	Administrative	a) Just do it	Include Asbestos wrap/coating in the technical specification. (template being used that currently includes this comment)	05-Jul-22	SAW	Design	Concept Design	Closed	Y	Senior Engineer Materials
1.04		29-Nov-19	HAZID / SID 1	Operations	Testing of earth stake	Routine	Electrical	Testing of earth stake. Have to disconnect the earth stake to test earth route exposing to electrical hazards	Yes	Commissioning and maintenance SOP. Isolate incoming 240V supply prior to installing meter / resistor for testing and then re-energise for testing only.	Look into options for doing testing without disconnecting (Principal Electrical Eng)	Administrative	a) Just do it	Look into options for doing testing without disconnecting (Principal Electrical Eng) Action: Engage with SAW Specialist for status and follow up	03-Aug-22	Concept Designer	Concept Design Manager	Concept design	Open		
1.05			HAZID / SID 1	Operations	Network Maintenance	Routine	Electrical	Maintenance of main with CP. If the CP unit is not isolated then there is voltage on the main.	Yes		Aquamap plans show the mains that are covered with CP. Work practice includes requirement to isolate CP on main when exposing / cutting pipe.	Administrative	a) Just do it	Ensure CP system is updated and shown on aquamap update 22/08/22: Note added in TS 0400	05-Jul-22	SAW	Project Manager	Prior to certificate of Practical completions	Closed	Y	Senior Engineer Materials
1.06	STD-04-00001_01	15-Nov-21	Typical Design SID 1	Design	Design of CP process	Non-Routine	Body impact	If designers don't apply SAW standard to design it will result in hazards to the workforce	Yes	Tech standard is developed and includes standards requirements		Administrative		Update standards to reflect new drawing numbers 5/7/22 RM: drawing numbers update, need to update TS0440 to reflect new drawing numbers 11/08/22: TS 0400 with updated drawings numbers submitted for approval	11-Aug-22	Designer	Senior Engineer Materials	Prior to Design (ASAP).	Closed	Y	Senior Engineer Materials
1.07	STD-04-00001_01	15-Nov-21	Typical Design SID 1	Design	Anode junction box design	Non-Routine	Electrical	CP design does not include anode junction box which may result in a variety of design methods exposing workers to differences	Yes	5/7/22 (RS)Typical design for the anode junction box		Substitution		1)Review the anode junction box design and apply SID process 2)Develop typical design for anode junction box 3)Utilise the Port Lincoln & Mambrey creek CP upgrade 5/7/22 RM: done	05-Jul-22	Designer	SAW CP specialist	Prior to Issuing Standard	Closed	Y	Senior Engineer Materials
1.08	STD-04-00001_01	15-Nov-21	Typical Design SID 1	Design	Anode junction box design	Non-Routine	Design	Terminology is inconsistent and confusion of terminology may result in human error incident	Yes	Abbreviation table included Pg 1 of drawings. Increased consistency of wording		Administrative	a) Just do it	1) Confirming terminology to be used for anode junction box. 2)update drawings, SID register, Technical Standard and other to reflect terminology and prevent confusion 5/7/22 RS: Done	06-Jul-22	Designer	Senior Engineer Materials	Prior to Issuing Standard	Closed	Y	Senior Engineer Materials
1.09	STD-04-00001_01	15-Nov-21	Typical Design SID 1	Design	Reading design drawings	Non-Routine	Design	Confusion of terminology may lead to human error incident	Yes	Abbreviation table included Pg 1 of drawings. Increased consistency of wording		Administrative	a) Just do it	include abbreviation table and identification of out of scope (Transformer cabinet and internal design) these are being handled as a project specific requirement. Connection of transformer to electrical source. Individual components e.g. surge arresters) 5/7/22 RS: Done	07-Jul-22	Designer	Senior Engineer Materials	Prior to Issuing Standard	Closed	Y	Senior Engineer Materials
1.10	STD-04-00001_01	15-Nov-21	Typical Design SID 1	Design	Reading design drawings	Routine	Design	The Typical CP design, TS0440 and TGD0440 all contain information relating to the design. If only one or the other is sourced requirements may not be met.	Yes	5/7/22 RS: Typical design set, TS0440 and TGD0440 are all cross referenced within each other.		Administrative		Add cross references to typical drawings (on cover page), TS and TG 0440. 5/7/22 RS: Done	05-Jul-22	Designer	Senior Engineer Materials	Prior to Issuing Standard	Closed	Y	Senior Engineer Materials
1.11	STD-04-00001_02	15-Nov-21	Typical Design SID 1	Design	Single test point design	Routine	Stress/strain	Wooden post requires frequent maintenance (e.g. painting) and use when alternative lower	Yes	5/7/22 RS: Comment added to drawings (e.g. of timber post for single test points not to be used		Substitution		Review validity of use of timber post for single test points 5/7/22 RS: Done	05-Jul-22	Designer	Senior Engineer Materials	Prior to Issuing Standard	Closed	Y	Senior Engineer Materials
1.12	STD-04-00001_02	15-Nov-21	Typical Design SID 1	Design	ID of test point	Routine	Identification	Incorrect identification of test point exposing people to electrical hazards. Incorrect testing procedures performed	Yes	ID label is shown on drawings	Include standard label template on drawg	Administrative	a) Just do it	Develop a Standard design of label including material and include in Typical Design Set 5/7/22 RS: details not finalised. 11/08/22: Details completed and sent to drafter for updating drawing	11-Aug-22	Designer	Senior Engineer Materials	Prior to Issuing Standard	Closed	Y	Senior Engineer Materials
1.13	STD-04-00001_02	15-Nov-21	Typical Design SID 1	Design	Installing junction box	Routine	Crush injury	When installing junction box type of screw requires hammer use?? exposing worker to crush injury risk	Yes	5/7/22 RS: Design uses screw so drill can be used to attach.		Substitution		Update drawing to reflect use of 25mm screw 5/7/22 RS: Done	15-Nov-21	Designer	Senior Engineer Materials	Prior to Issuing Standard	Closed	Y	Senior Engineer Materials
1.14	STD-04-00001_02	15-Nov-21	Typical Design SID 1	Operations & Maintenance	Performing tests and other maintenance activities	Routine	Ergonomics	Height of post may lead to awkward bending when performing tests and other maintenance activities	Yes	5/7/22 RS, Drawing indicated junction box at 2m.		Substitution		NOTE: Discussion around post height. Junction box at ~1m height was considered suitable. 5/7/22 RS: this is on the drawing.	15-Nov-21	Designer	Senior Engineer Materials	Prior to Issuing Standard	Closed	Y	Senior Engineer Materials
1.15	STD-04-00001_02	15-Nov-21	Typical Design SID 1	Maintenance	Replacing a broken post	Routine	Manual Handling	Depth of installation at 500mm below ground exposes worker to manual handling risks to dig hole to that depth.	Yes		Awareness in safe manual handling practices. Consider use of mechanical aid (borer/post hole digger).	c) Further investigation		NOTE: Discussion around post height. It was decided to not change the depth of the post. Workers to self manage manual handling risks when digging. Consider use of mechanical aid (borers/post hole digger).	15-Nov-21	Constructor	Construction Manager	Prior to Construction	Open		
1.16	STD-04-00001_02	15-Nov-21	Typical Design SID 1	Construction	Installation of multiple new post	Routine	Manual Handling	Depth of installation at 500mm below ground exposes worker to manual handling risks to dig hole to that depth.	Yes		Mechanical aide (borer/posthole digger) used for multiple installations.	Engineering	a) Just do it	Use of mechanical aid to be noted in construction methodology	03-Aug-22	Constructor	Construction Manager	Prior to Construction	Open		
1.17	STD-04-00001_02	15-Nov-21	Typical Design SID 1	Design	Material selection for conduit	Routine	Material	Conduit that is not UV protected can expose of cable due to conduit UV breakdown	Yes	5/7/22 RS. Drawings indicate use of UV Stabilised conduit.		Substitution		Update drawings to reflect 'grey UV stable' conduit 5/7/22 RS: Done	05-Jul-22	Designer	Senior Engineer Materials	Prior to Issuing Standard	Closed	Y	Senior Engineer Materials

Hazard ID		HAZARD DETAILS								Hazard Elimination / Reduction SFAIRP				Action Required							
Hazard ID	Reference Information (e.g. Drawing)	Date Identified	Source (SID Review)	Life Cycle Phase	Activity / Task	Routine / Non-routine	Hazard Category	Details of Hazard Exposure	Do credible cause and consequence exist for this hazard? (Yes/No)	Current Controls	Proposed Controls	Control Method (Hierarchy)	Reasonably Practicable Category	Action Details / Options Considered / Status	Date Last Reviewed/Updated	Responsible Company	Responsible Individual (or Role)	Due For Completion	Action Status (not started, open, closed)	Hazard Reduced SFAIRP (Y/N)	Responsible Authority
1.18	STD-04-00001_02	15-Nov-21	Typical Design SID 1	Demolition / Disposal	Disposal of timber posts	Routine	Toxic	The timber of the posts is treated to protect against rot, moisture and insect damage and should not be burned or used for purposes where people come into frequent contact.	Yes	Posts are reused if possible or disposed of in licensed land fill. Posts are NOT to be burned		Administrative	a) Just do it	Action: Confirm disposal practices	03-Aug-22	Designer	Design Manager	Prior to Construction	Open		
1.19	STD-04-00001_03	15-Nov-21	Typical Design SID 1	Maintenance	Replacing single broken post	Routine	Manual Handling	Depth of installation at 600mm below ground exposes worker to manual handling risks to dig hole to that depth.	Yes		Digging method to consider mechanical aid and include in JHA or equivalent		a) Just do it	NOTE: Digging method to be included in the JHA or equivalent. Discussion around post height. It was decided to not change the height of the post. Workers to assess use of mechanical aid for digging and self manage manual handling risks when digging.	15-Nov-21	Maintenance super	Site manager	Ops/Maint	Open		
1.20	STD-04-00001_02	15-Nov-21	Typical Design SID 1	Construction	Installation of multiple new post	Routine	Manual Handling	Depth of installation at 600mm below ground exposes worker to manual handling risks to dig hole to that depth.	Yes	Mechanical aide (borer) used for multiple installations.		Engineering	a) Just do it	Digging method to be included in the construction methodology and risk assessment.	15-Nov-21	Constructor	Construction Manager	Prior to Construction	Open		
1.21	STD-04-00001_03	15-Nov-21	Typical Design SID 1	Design	ID of test point	Routine	Wrong ID	Incorrect ID of test point exposing people to electrical hazards; incorrect testing procedures performed	Yes		to be determined	Administrative	c) Further investigation	Standardise and update test point label and include in drawing. Including incorporating post number on label keep the existing grey painted label 11/08/22: label details finalised	08-Nov-22	Designer	Senior Engineer Materials	Prior to issuing Standard	Closed	Y	Senior Engineer Materials
1.22	STD-04-00001_03	15-Nov-21	Typical Design SID 1	Design	Design of tube	Routine	Material	Supplied white painted Aluminium tube material is not to the specification on drawings.	Yes		to be determined	Administrative	c) Further investigation	Review of new product and confirm suitability and updating drawings. 5/7/21: Aluminium test post is only used for CP now. Need to confirm posts. 11/08/22: Design has not been modified	08-Nov-22	Designer	Senior Engineer Materials	Prior to issuing Standard	Closed	Y	Senior Engineer Materials
1.23	STD-04-00001_03	15-Nov-21	Typical Design SID 1	Demolition / Disposal	Management of posts and equipment at end of life.	Routine	Environment	Equipment at end of life can minimise sustainability/environmental impact if disposed of effectively.	Yes	Metal is recycled through the recycle metal bin at depot or equivalent.			c) Further investigation	include in technical specification Management plan to include disposal method of removed equipment including reuse, repurpose, recycling. 5/7/22 RS: Look at including end of life method in the technical standard. Currently there is a section in the technical specification - demolition that includes this information. 11/08/22: To be included in the next revision	05-Jul-22	Designer	Senior Engineer Materials	Prior to issuing Standard	Closed		
1.24	STD-04-00001_04	15-Nov-21	Typical Design SID 1	Design	UV paint coating on PVC pipe	Routine	Material	Protection against UV results in less breakdown in equipment and subsequent exposure to "unknown" wires and any hazard, real or perceived.	Yes	5/7/22 RS: Material to be PVC UV rated or painted for UV protection		Substitution	a) Just do it	Updating note 2 - Material to be PVC UV rated or UV protection. 5/7/22 RS: Done	15-Nov-21	Designer	Senior Engineer Materials	Prior to issuing Standard	Closed	Y	Senior Engineer Materials
1.25	STD-04-00001_04	15-Nov-21	Typical Design SID 1	Design	Installation of multiples cables or anodes on terminal board.	Routine	Misinformation	Confusion and exposure of workers due to multiple cables that might not be clearly identifiable.	Yes		TBC		c) Further investigation	Identify methodology to clearly ID cables. Record on drawing and in SID register. 11/08/22: Drawing updated with plastic sleeve and cable markers	11-Aug-22	Designer	Senior Engineer Materials	Prior to issuing Standard	Closed	Y	Senior Engineer Materials
1.26	STD-04-00001_04	15-Nov-21	Typical Design SID 1	Operations	Performing potential readings	Routine	Stress/strain	High number of units that will require maintenance, caps need to be removed repetitively to do potential readings which may result in repetitive strain due to position of hands and twisting action.	Yes		Tooling (strap wrench) should be used to prevent repetitive twisting	Engineering	a) Just do it	Source appropriate tooling and supply to team. include in work instruction	15-Nov-21	Operator/Maintaine	Project Manager	Prior to Practical Complitions	Open		
1.27	STD-04-00001_04	15-Nov-21	Typical Design SID 1	Operations & Maintenance	Unauthorised access to CP point	Non-Routine	Security	Unauthorised access to and contents of assembly	Yes	Add Security screw to the design as an added security protection measure.		Engineering	a) Just do it	Update drawings with security screw reference. 11/08/22: completed	11-Aug-22	Designer	Senior Engineer Materials	Prior to issuing Standard	Closed	Y	Senior Engineer Materials
1.28	STD-04-00001_04	15-Nov-21	Typical Design SID 1	Construction	Installation of post	Routine	Damage	Post current design sits on cable and could cause damage during construction.	Yes	5/7/22 RS:50mm cable hole to enable side entrance of cable.		Engineering	a) Just do it	Update drawing to reflect cable hole as per drawing STD-04-00001_03	05-Jul-22	Designer	Senior Engineer Materials	Prior to issuing Standard	Closed	Y	Senior Engineer Materials
1.29	STD-04-00001_04	15-Nov-21	Typical Design SID 1	Maintenance	Replacing single broken post	Routine	Manual Handling	Depth of installation at 400mm below ground exposes worker to manual handling risks to dig hole to that depth.	Yes		Digging method to consider mechanical aid and include in JHA or equivalent		a) Just do it	NOTE: Digging method to be included in the JHA or equivalent. Discussion around post height. It was decided to not change the height of the post. Workers to assess use of mechanical aid for digging and self manage manual handling risks when digging.	15-Nov-21	Maintenance super	Site manager	Operations and Maintenance	Open		
1.30	STD-04-00001_04	15-Nov-21	Typical Design SID 1	Construction	Installation of multiple new post	Routine	Manual Handling	Depth of installation at 400mm below ground exposes worker to manual handling risks to dig hole to that depth.	Yes	Mechanical aide (borer) used for multiple installations.		Engineering	a) Just do it	Digging method to be included in the construction methodology and risk assessment.	15-Nov-21	Constructor	Construction Manager	Prior to Construction	Open		
1.31	STD-04-00001_04	15-Nov-21	Typical Design SID 1	Demolition / Disposal	Decommissioning and or removal of posts at end of life	Routine	Environment	Equipment at end of life can minimise sustainability/environmental impact if disposed of effectively.	Yes	Metal is recycled through the recycle metal bin at depot or equivalent.			a) Just do it	Disposal practice included in Technical specification. Confirm disposal practices	15-Nov-21	Maintenance super	Site manager	Prior to Construction	Open		
1.32	STD-04-00001_05	15-Nov-21	Typical Design SID 1	Maintenance	Testing and checking of connections	Routine	Ergonomics	Getting down to low level posture to perform test.	Yes	Assess alternatives to ground box Due to increase ergonomic hazards introduced by ground box.	This design is only used in high foot traffic areas or where there is a lack of ability to touch earth or where post is not practical	Administrative	a) Just do it	Add note to drawing and review in Technical Standard TS0440 5/7/22 RS: drawing updated. TS440 outstanding. 11/08/22: note is in TS 0440	11-Aug-22	Designer	Senior Engineer Materials	Prior to issuing Standard	Closed	Y	Senior Engineer Materials
1.33	STD-04-00001_05	15-Nov-21	Typical Design SID 1	Installation, operations and maintenance	Maintenance in and around the ground boxes and cabling	Routine	Striking a cable	Exposure to cable in possible multiple directions	Yes	Arrows on lid positioned to indicate direction of cable		Engineering	a) Just do it	No further action required	15-Nov-21				Closed	Y	Senior Engineer Materials

Hazard ID		HAZARD DETAILS								Hazard Elimination / Reduction SFARP				Action Required							
Hazard ID	Reference Information (e.g. Drawing)	Date Identified	Source (SID Review)	Life Cycle Phase	Activity / Task	Routine / Non-routine	Hazard Category	Details of Hazard Exposure	Do credible cause and consequence exist for this hazard? (Yes/No)	Current Controls	Proposed Controls	Control Method (Hierarchy)	Reasonably Practicable Category	Action Details / Options Considered / Status	Date Last Reviewed/Updated	Responsible Company	Responsible Individual (or Role)	Due For Completion	Action Status (not started, open, closed)	Hazard Reduced SFARP (Y/N)	Responsible Authority
1.34	STD-04-00001_05	15-Nov-21	Typical Design SID 1	Maintenance	Replacement of whole box	Routine	Manual Handling	Cast iron box is heavy to lift and handling at ground level increasing risk of strain / sprain injury	Yes	Separation of lid and box (separate lifts) Dig around box and "free up" before attempting to move. Multi person lift where required		Administrative	a) Just do it	Box to remain as cast iron surround or unless otherwise approved by SA Water. 1) Update drawing re surround 'unless otherwise approved by SA Water Eng' 2) Determine (and action) if future projects can include investigation to alternative lighter materials. 11/08/22: Drawing updated. CPM project is looking to modify the cast iron box lid to allow remote data transmission.	11-Aug-22	Designer	Senior Engineer Materials	Prior to issuing Standard	Closed	Y	Senior Engineer Materials
1.35	STD-04-00001_06	15-Nov-21	Typical Design SID 1	Operations & Maintenance	Testing reference cells	Routine	Mis-identification of components	Inability to clearly identify reference cell resulting in erroneous results leading to degradation and failure	Yes	S/7/22 RS: Permanent black marker identifier on outside of junction box indicating the structure side stud		Administrative	a) Just do it	Add notation to drawing. S/7/22 RS: Done	05-Jul-22	Designer	Senior Engineer Materials	Prior to issuing Standard	Closed	Y	Senior Engineer Materials
1.36	STD-04-00001_06	15-Nov-21	Typical Design SID 1	Design	Testing reference cells	Routine	Mis-identification of components	Potential to mis-identify wires causing human error incident	Yes	Use different heat shrink sleeves to identify cable and corresponding connection point		Administrative	a) Just do it	S/7/22 RS: Closed	05-Jul-22	Designer	Senior Engineer Materials	Prior to issuing standard	Closed	Y	Senior Engineer Materials
1.37	STD-04-00001_06	15-Nov-21	Typical Design SID 1	Maintenance	Watering tasks	Routine	Manual Handling	Workers need to pour water down piping up to 20kg	Yes		JHA to determine safest method for pouring water down pipe	Administrative	c) Further investigation	Operations to explore means of controlling manual handling risks; identify opportunities for reducing risk.	15-Nov-21	SAW_Operator/MA	Operations & Maintenance	Operations and Maintenance	Open		
1.38	STD-04-00001_06	15-Nov-21	Typical Design SID 1	Operations & Maintenance	Foot traffic in area	Routine	Trip/fall hazard	If the valve chamber box is not installed to be finished at ground level, public and operators are exposed to trip / fall hazard.	Yes	Drawing indicates flush to ground. S/7/22 RS: note included on drawing		Engineering	a) Just do it	Ensure top of valve chamber box to be finished at ground surface level. S/7/22 RS: Technical drawing shows and notes flush to ground level. TS references drawing so not in TS as double up.	05-Jul-22	Designer	Senior Engineer Materials	Prior to issuing Standard	Closed	Y	Senior Engineer Materials
1.39	STD-04-00001_06	15-Nov-21	Typical Design SID 1	Design	Lid design	Routine		No information to indicate the lid detail. Lids are cast iron but not noted on drawing.	Yes	Two part junction box (lid and chamber) to be used to minimise lifting weight.	Top of valve chamber box to be finished at ground surface level.	Eliminate	a) Just do it	Note added to the drawing	11-Aug-22	Designer	Senior Engineer Materials	Prior to issuing Standard	Closed	Y	Senior Engineer Materials
1.40	STD-04-00001_07	15-Nov-21	Typical Design SID 1	Operations & Maintenance	Ops and Maintenance activities	Routine	Traffic	Workers may be exposed to traffic hazards performing ops and maintenance tasks on roadways.	Yes	Design is such that wiring and watering pipe is run to footpath off the roadway		Eliminate	a) Just do it	Run wiring off road. Where not possible assess hazards and controls	15-Nov-21	Designer	Design Manager	Prior to issuing Standard	Open		
1.41	STD-04-00001_07	15-Nov-21	Typical Design SID 1	Design	Watering pipe fall	Routine	Quality	If watering pipe is installed with inappropriate gradient dampening earth wont occur and erroneous reading will result or additional manual handling to correct the error.	Yes	S/7/22 RS: Drawings indicated 1:10 PVC watering pipe must have fall / gradient to direct drainage appropriately		Eliminate	a) Just do it	Update drawing that PVC watering pipe must have fall / gradient to direct drainage appropriately S/7/22 RS: Done	05-Jul-22	Designer	Design Manager	Prior to issuing Standard	Closed	Y	Senior Engineer Materials
1.42	STD-04-00001_07	15-Nov-21	Typical Design SID 1	Whole of life	Installation, ops and maintenance activities	Routine	Asbestos	Asbestos may be present in coatings on pipework which presents hazard to workers	Yes		Identify asbestos on coating/wraps prior to disturbing the pipe	Administrative	c) Further investigation	Determine presence of asbestos if present apply organisation working with asbestos procedures/protocols. See also TS 440	03-Aug-22	Designer	Design Manager	Prior design completion	Open		
1.43	All drawings	15-Nov-21	Typical Design SID 1	Whole of life	All tasks performed at CP sites	Routine	Quality	Exposure to electrical hazards if work is undertaken by un-qualified personnel			Must be performed by accredited technician as per TS0440			Check Technical standard reflects this. Does this need to be noted on the drawings. Include note on Page 1 e.g. appropriately qualified personnel only to work on cathodic protection system as per section 3 of TS 0440 11/08/2022. Completed. TS 0440 includes the necessary requirements	11-Aug-22	Designer	Senior Engineer Materials	Prior to issuing Standard	Closed	Y	Senior Engineer Materials

Hazard ID		HAZARD DETAILS								Hazard Elimination / Reduction SFAIRP				Action Required							
Hazard ID	Reference Information (e.g. Drawing)	Date Identified	Source (SID Review)	Life Cycle Phase	Activity / Task	Routine / Non-routine	Hazard Category	Details of Hazard Exposure	Do credible cause and consequence exist for this hazard? (Yes/No)	Current Controls	Proposed Controls	Control Method (Hierarchy)	Reasonably Practicable Category	Action Details / Options Considered / Status	Date Last Reviewed/ Updated	Responsible Company	Responsible Individual (or Role)	Due For Completion	Action Status (not started, open, closed)	Hazard Reduced SFAIRP (Y/N)	Responsible Authority
SID Review 1																					
1.44	STD_04-00001_13 and 14	11-Feb-22	SID 1	Operations & Maintenance	Potable Water Pipeline - Use of Gaskets in pipelines	Routine	Contamination	Gasket - Non conductive EPDM gasket or compressed fibre gasket can be used.	Yes	Use SA Water pipeline Std gaskets. (ST to be referenced)	Larger trunk mains (>325mm confirm)	Substitution	a) Just do it	Note: below ground insulation joints need to be Dense wrap or equivalent. Include in Construction Management Plan	05-Jul-22	Construction	Construction Manager	Prior to construction	Open		
1.45	STD_04-00001_13 and 14	11-Feb-22	SID 1	Maintenance	Potable Water Pipeline - Use of Gaskets in pipelines	Routine	Contamination	In existing services when bolts changed in joints and gasket becomes compromised there is a need to change out the gasket. There has been a change in the Gasket standard and all future gasket change outs need to adhere to the new standard to minimise exposure to contamination hazard.	Yes	Roll out of gasket change out to new standard as works occur.		Administrative	a) Just do it	Inclusion of notification of new gasket standard in Periodic maintenance activities.	05-Jul-22	Designer	Design Manager	Concept Design	Open		
1.46	STD_04-00001_13 and 14	11-Feb-22	SID 1	Operations & Maintenance	Installation	Routine	Electrical	Communications not clear and can introduce electrical hazards. Surge diverters across joints (one side to the other) to protect against AC current to jump across but not DC. The DC voltage difference remains a hazard if present.	Yes	State diverter across joints for protection against AC current. Warning section has note on insulated joint drawing		Administrative	a) Just do it	Work procedure to manage hazard	11-Feb-22	Operations Maintenance	Operations Maintenance	Operations / Maintenance	Open		
1.47	STD_04-00001_13 and 14	11-Feb-22	SID 1	Maintenance	Remove or replace valve	Routine	Failure	Removal of isolation joint and not reinstating after removal causes protection system to be ineffective across the valve/pipe exposing the asset to failure hazards	Yes		Add to drawing that if insulated joints are removed they must be reinstated on the new (temporary) equipment	Administrative	a) Just do it	Update in drawing. 5/7/22 RS: drawing updated but need to include note about reinstating on temporary equipment also. 11/08/22: temporary equipment included	11-Aug-22	Designer	Design Manager (RS)	Prior to issuing standard	Closed	Y	Senior Engineer Materials
1.48	STD_04-00001_13 and 14	11-Feb-22	SID 1	Design Operations	Design and Installation of CP system	Routine	Electrical	Increased cable distances, increases the resistance in the line reducing current and protection the system offers to a point where protection may not occur.	Yes	5/7/22 RS: Note added Minimise route length to minimise cable lengths and current loss		Administrative	a) Just do it	Add note to minimise length of cable or use shortest possible route. reference to drawing 17 and 18. 5/7/22 RS: Done	05-Jul-22	Designer	Design Manager	Prior to issuing standard	Closed	Y	Senior Engineer Materials
1.49	STD_04-00001_13 and 14	11-Feb-22	SID 1	Commissioning Operation	Testing method	Routine	Electrical	Exposure to electrocution hazards while carrying out testing of system	Yes	Test method reference detailed in notes on the drawing. Testing persons need to be competent as per TS 440 and test method as per TG440		Administrative	a) Just do it	Update drawing to include reference of test persons qualifications in line with TS440 and test method as per TG440. Remove existing directions to reference them to the technical standard and guideline. 5/7/22 RS: Done	05-Jul-22	Designer	Design Manager	Prior to issuing standard	Closed	Y	Senior Engineer Materials
1.50	STD_04-00001_13 and 14	11-Feb-22	SID 1	Commissioning Operation	Testing method	Routine	Failure	Error in results or nullification of test resulting in unprotected assets	Yes	Testing persons need to be competent as per TS 440 and test method as per TG440		Administrative	a) Just do it	Testing workorders to specify qualification requirements and test methods as per TS440.	11-Feb-22	Operations & Maintenance	Operations & Maintenance	Operations & Maintenance	Open		
1.51	STD_04-00001_13 and 14	11-Feb-22	SID 1	Design Operations Maintenance	Designing and maintaining joint protectors	Routine	Failure	Incorrect joint protector introduces failure hazards due to risking the protection of the asset	Yes	5/7/22 RS: drawing notes capture joint protector requirements to TS440.		Administrative	a) Just do it	Update drawing as per Proposed control 5/7/22 RS: Done	05-Jul-22	Designer	Design Manager	Prior to issuing standard	Closed	Y	Senior Engineer Materials
1.52	STD_04-00001_13 and 14	11-Feb-22	SID 1	Operations & Maintenance	Contacting both sides of a flange joint simultaneously	Routine	Electrical	Earth fault can cause electrical shock. Current wording on drawing is confusing and people may not be aware of the hazards or misunderstand.	Yes	5/7/22 RS: notes to include label on above ground at joints a label specified as per the drawing. For underground includes protective wrapping (e.g. Denso) and at termination of bond cable add label and wrap with clear plastic/tape or affixed to pipe with plastic band.		Administrative	a) Just do it	Update drawing as per proposed control. See also drawing red line mark up. 5/7/22 RS: done	05-Jul-22	Designer	Design Manager	Prior to issuing standard	Closed	Y	Senior Engineer Materials

HAZARD DETAILS										Hazard Elimination / Reduction SFARIP				Action Required							
Hazard ID	Reference Information (e.g. Drawing)	Date Identified	Source (SID Review)	Life Cycle Phase	Activity / Task	Routine / Non-routine	Hazard Category	Details of Hazard Exposure	Do credible cause and consequence exist for this hazard? (Yes/No)	Current Controls	Proposed Controls	Control Method (Hierarchy)	Reasonably Practicable Category	Action Details / Options Considered / Status	Date Last Reviewed/ Updated	Responsible Company	Responsible Individual (or Role)	Due For Completion	Action Status (not started, open, closed)	Hazard Reduced SFARIP (Y/N)	Responsible Authority
SID Review 1																					
<i>Insert or delete rows as required</i>																					
1.53	STD-04-00001-8 thru 10,17, 18	10-Mar-22	SID Review 1	Construction	Test point connection	Routine	Electrical	Low frequency induction (LFI) voltage difference causing electric shock when connecting	Yes	Special consultant engaged to carry out LFI study carried out and recommendations to be put in place.		Administrative	c) Further investigation	Implement controls as per LFI Study report	05-Jul-22	Design	Design Manager	Prior to completing design	Open		
1.54	STD-04-00001-9 & 10	10-Mar-22	SID Review 1	Construction	Welding connection points onto pipes underground	Routine	Atmosphere	Welding in pits can result in hazardous atmosphere for persons	Yes	Pre start equipment inspections. Maintained equipment, qualified welder.		Administrative	c) Further investigation	ACTION: Confined space risk assessment	05-Jul-22	Constructor	Construction Manager	Prior to construction	Open		
1.55	STD-04-00001-9 & 10	10-Mar-22	SID Review 1	Construction	Welding connection points onto pipes underground	Routine	Asbestos	Asbestos may be present on seals or pipe material	Yes	Removal of asbestos processes to be followed			c) Further investigation	Apply asbestos management processes as per regulations and standards	05-Jul-22	Constructor	Construction Manager	Prior to construction	Open		
1.56	STD-04-00001-9 & 10	10-Mar-22	SID Review 1	Construction	Welding connection points onto pipes underground	Routine	Access	Excavation size to be able to access positions required to carry out work safely	Yes			Administrative	c) Further investigation	Determine size of excavation to allow safe work to be carried out.	05-Jul-02	Constructor	Construction Manager	Prior to construction	Open		
1.57	STD-04-00001-9 & 10	10-Mar-22	SID Review 1	Construction	Welding connection points onto pipes underground	Routine	Failure	Condition of pipe resulting in failure during spot welding exposing workers to engulfment hazards	Yes		Visual inspection of pipe and tap testing to get indication of pipe integrity.	Administrative	a) Just do it	ACTION: Include inspection and tap testing in work procedure. Risk assessment to be carried out for activity. Do not proceed if condition of pipe is unknown.	05-Jul-02	Constructor	Construction Manager	Prior to construction	Open		
1.58	STD-04-00001_10	10-Mar-22	SID Review 1	Construction	Cad Welding connection	Routine	Failure	Cadwelding is a simple welding method to attach cables and if carried out incorrectly can fail	Yes	Follow installation manual detail methods	Typical charge used is 15gm. Maximum charge to be used is 30gm. Training for users to be given and use of manual. Systems are pre-packaged enclosed systems	Administrative	a) Just do it	ACTION: Verification of competence. Training of installer in Cadwelding	05-Jul-02	Constructor	Construction Manager	Prior to construction	Open		
1.59	STD-04-00001_8 thru 10, 17 & 18	10-Mar-22	SID Review 1	Construction	Cad Welding connection	Routine	Atmosphere	Cadwelding produces smoke as a result of the reaction and can cause breathing discomfort if carried out in confined space or with low ventilation	Yes		Complete risk assessment for confined space. Keep area ventilated when carrying out task.	Administrative		Action: Include risk and controls suitable for work environment in the ISA/ Work Method	05-Jul-02	Constructor	Construction Manager	Prior to construction	Open		
1.60	STD-04-00001_8 thru 10, 17 & 18	10-Mar-22	SID Review 1	All phases	Bond cable arrangement - installed in chamber	Routine	Access	Historic designs often present small chambers resulting in access hazards	Yes	Risk assessment carried out on individual chamber access			c) Further investigation	ACTION: Access risk assessment to be carried out to determine risk and controls for each chamber	05-Jul-02	Constructor	Construction Manager	Prior to construction	Open		
1.61	STD-04-00001-18	10-Mar-22	SID Review 1	All phases	Bond cable arrangements - installed in proximity to flow meter - underground or in pit	Routine	Electrical	Where flow meters insulation joints are present and if not connected there is risk of stray current electrocution	Yes		Test post to run back as first options. Leave bond in pit for protection against electrocution and add surge arrester. Add Sign - Turn off Transformer Rectifier (TR) while working on pipe or flow meter	Administrative	a) Just do it	Action: Work procedure to include isolating transformer rectifier while working on pipe. Include signage as per controls. Update information in MAXIMO	05-Jul-02	Ops/Maintenance	Ops/Maint Lead	Prior to completions	Open		
1.62	STD-04-00001_8 thru 10, 17 & 18	10-Mar-22	SID Review 1	All phases	Bond cable arrangements - installed in pit	Routine	Trip	Loose cabling within a pit can result in trip hazards	Yes	Design to indicate cables to be run against wall minimising entanglement hazards		Engineering	a) Just do it	Action: Include controls in design	05-Jul-02	Designer	Design Manager	Design	Open		
1.63	STD-04-00001_17	10-Mar-22	SID Review 1	All phases	Bond cable arrangements - Test points	Routine	Access	Test points installed in proximity to other assets can result in access restriction if located in poor positions	Yes		Test points installation location to suit requirements but not inhibit access or cause access hazards	Administrative	c) Further investigation	ACTION: Determine location of test points and cable run to prevent generation of additional access hazards	05-Jul-02	Designer	Design Manager	Design	Open		

HAZARD DETAILS										Hazard Elimination / Reduction SFAIRP				Action Required							
Hazard ID	Reference Information (e.g. Drawing)	Date Identified	Source (SID Review)	Life Cycle Phase	Activity / Task	Routine / Non-routine	Hazard Category	Details of Hazard Exposure	Do credible cause and consequence exist for this hazard? (Yes/No)	Current Controls	Proposed Controls	Control Method (Hierarchy)	Reasonably Practicable Category	Action Details / Options Considered / Status	Date Last Reviewed/Updated	Responsible Company	Responsible Individual (or Role)	Due For Completion	Action Status (not started, open, closed)	Hazard Reduced SFAIRP (Y/N)	Responsible Authority
SID Review 1										<i>Insert or delete rows as required</i>											
1.64	STD_04-00001_15 and 16	11-Feb-22	SID Review 1	Design Construction Maintenance	Anode Maintenance - Anode positioning	Routine	Depth	Depth the anode is positioned below the pipe and introduces excavation and depth hazards.	Yes	Minimum horizontal clearance 0.5m and max 5m as per design. Top of anode note to say typically below pipe Depth typically 3m as per design	Minimise Depth of anode but still meeting protection requirements	Engineering	a) Just do It	Apply proposed control	11-Feb-22	Detail Designer	Design Manager	Prior to SID in Detail Design	Open		
1.65	STD_04-00001_15 and 16	11-Feb-22	SID Review 1	Design Construction Maintenance	Anode positioning	Routine	Access	Pipework is often in the middle of the road. If anode placed in middle of road adjacent to the pipe exposes workers to traffic hazards.	Yes		Where road verge/footpath is located within 5m of the pipe, place anode off road where possible	Engineering	a) Just do It	Apply proposed control	11-Feb-22	Detail Designer	Design Manager	Prior to SID in Detail Design	Open		
1.66	STD_04-00001_15 and 16	11-Feb-22	SID Review 1	Design Construction Maintenance	Adding wires within the junction box	Routine	Access	No studs on outside of box. fiddling within box can cause extended duration in awkward position introducing strain hazard.	Yes	5/7/22 RS: Drawing indicates bringing cables into box, use a lug and put bolt through to enable current reading. Seal up bottom of box. Allow sufficient cable length for easy access of testing but not so long that it cant be contained in the box		Engineering	a) Just do It	Update Drawing : Current design is congested and no longer used due to magnetic reed switch for testing. No studs on outside of box. Update drawing to indicate current method of bringing cables into box, use a lug and put bolt through to enable current reading. Include note to seal up bottom of box and. allow sufficient cable length to enable easy access for testing but not so long that it cant be contained in the box Remove colour of fibre washers 5/7/22 RS : Drawing was updated	05-Jul-22	Detail Designer	Design Manager	Prior to SID in Detail Design	Closed	Y	Senior Engineer Materials
1.67	STD_04-00001_15 and 16	11-Feb-22	SID Review 1	Construction Maintenance	Installation - disturbing dirt and changing potentials between back fill and undisturbed dirt.	Routine	Failure	Difference between the disturbed and undisturbed ground potential introducing corrosion hazards	Yes	Use of CP prevents this from occurring.					05-Jul-22				Closed	Y	Senior Engineer Materials
1.68	STD_04-00001_15 and 16	11-Feb-22	SID Review 1	Construction Maintenance	Backfilling hole	Routine	Manual handling	Bentonite and anodes are manually lifted which may introduce lifting hazards	Yes	Bentonite is in 20kg bags. Anodes are approximately 16kg with weight labelled.	None	Administrative	c) Further investigation	Determine multi person lift and or mechanical assistance when carrying out task. Include in JSA or equivalent.	11-Feb-22	Constructor	Construction manager	Prior to construction	Open		
1.69	STD_04-00001_15 and 16	11-Feb-22	SID Review 1	Construction Maintenance	Anode testing	Routine	Ergonomic	There are two junction box test points on the post. Height is 1.5m and 0.45m. lower one may introduce straining/bending hazards	Yes	Bottom test point not on every test post and only when checking for failure. Current method allows to sit on ground and work at good height without introducing confusion on test points.	None			No action required	11-Feb-22				Closed	Y	Senior Engineer Materials
1.70	STD_04-00001_15 and 16	11-Feb-22	SID Review 1	Construction Maintenance	System monitoring and testing	Routine	Access	Various installation locations can introduce hazards when testing or performing maintenance on system e.g. roads, bus stops etc.	Yes		Determine safest location for test points and monitoring in detail design consideration of location hazard		c) Further investigation	Determine safest location for test points and monitoring in detail design consideration of location hazard	11-Feb-22	Detail Designer	Design Manager	Prior to SID in Detail Design	Open		

Hazard ID	HAZARD DETAILS									Hazard Elimination / Reduction SFAIRP				Action Required							
Hazard ID	Reference Information (e.g. Drawing)	Date Identified	Source (SID Review)	Life Cycle Phase	Activity / Task	Routine / Non-routine	Hazard Category	Details of Hazard Exposure	Do credible cause and consequence exist for this hazard? (Yes/No)	Current Controls	Proposed Controls	Control Method (Hierarchy)	Reasonably Practicable Category	Action Details / Options Considered / Status	Date Last Reviewed/ Updated	Responsible Company	Responsible Individual (or Role)	Due For Completion	Action Status (not started, open, closed)	Hazard Reduced SFAIRP (Y/N)	Responsible Authority
SID Review 1																					
<i>Insert or delete rows as required</i>																					
1.71	STD_04-00001_11 & 12	10-Mar-22	SID1	Operations & Maintenance	Coupon - connected to the pipe - connected to CP system. Current flowing from pipe to coupon	Routine	Ergonomic	Bending down to ground box and doing testing resulting in ergonomics hazards	Yes	5/7/22 RS: Standard drawing updated to reflect bringing junction box to plastic test post. (e.g. Morgan)		Substitution	a) Just do it	Determine location and test box post requirements for safe access and use. 5/7/22 : standard drawing updated. Individual designs to select location with safe access.	05-Jul-22	Designer	Design manager	Detail Design	Closed	Y	Senior Engineer Materials
1.72	STD_04-00001_11 & 12	10-Mar-22	SID1	Operations & Maintenance	Public exposure to switches and being turned off	Routine	Public	Installation of switch in public accessible box where they can be turned off causing CP to fail.	Yes		determine viability of enclosing connection point and using loosening of bolt to disconnect coupon.	Isolation	c) Further investigation	Investigate options and determine method in design 05/08/2022 RS: Drawing updated, removing switch and replacing it with a twist cap test point.	05-Aug-22	Designer	Design manager	Design	Closed	Y	Senior Engineer Materials
1.73	STD_04-00001_11 & 12	10-Mar-22	SID1	Operations & Maintenance	Operation and Maintenance activities in vicinity of road/paths	Routine	collision	On the ground - clearances - far back from curve as possible to minimise collisions	Yes		Determine best location for test points	Engineering	c) Further investigation	Implement proposed control	24-Jun-22	Designer	Design manager	Detail Design	Open		
1.74	STD_04-00001_11 & 12	10-Mar-22	SID1	Construction	Running 4 cables - labelling to	Routine	failure	incorrect wiring and false test results.	Yes	Trained personnel to carry out work as per TS400 Colour coding - to help with flow direction as well as testing point		Administrative	a) Just do it	5/7/22 RS: updated drawings to reflect requirements for colour coding following construction.	05-Jul-22	Constructor	Construction manager		Open		
1.75	STD_04-00001_11 & 12	10-Mar-22	SID1	Operations & Maintenance	Testing	Routine	isolation	isolation for testing is not required due to known variables and system.	No	Don't need to isolate to do testing unless there are other hazards present	Add note	Administrative	a) Just do it	Note added to the drawing	05-Aug-22	Designer	Design manager	Design	Closed	Y	Senior Engineer Materials
1.76	STD_04-00001_11 & 12	10-Mar-22	SID1	Commissioning Operations & Maintenance	Calibration	Routine	isolation	isolation is required to calibrate for future testing. If not isolated erroneous readings and results in future test errors	Yes	Isolate CP system during calibration. Access to Transformer rectifier to turn off.	Add note	Administrative	a) Just do it	Trained personnel to apply controls	24-Jun-22	Maintenance	Technician	Operations and Maintenance	Open		

Hazard ID	Reference information (e.g. Drawing)	Date identified	Source (SID Review)	Life Cycle Phase	HAZARD DETAILS			Do credible cause and consequence exist for this hazard? (Yes/No)	Hazard Elimination / Reduction SFAIRP			Action Details / Options Considered / Status	Date Last Reviewed/ Updated	Action Required							
					Activity / Task	Routine / Non-routine	Hazard Category		Details of Hazard Exposure	Current Controls	Proposed Controls			Control Method (Hierarchy)	Reasonably Practicable Category	Responsible Company	Responsible Individual (or Role)	Due For Completion	Action Status (not started, open, closed)	Hazard Reduced SFAIRP (Y/N)	Responsible Authority
SID Review <i>insert or delete rows as</i>																					
1.77	STD_04-00001_20-25	10-Mar-22	SID1	Operation Maintenance	Installation of CP system	Routine	Failure	Structures with metallic penetrations in the vicinity can result in interference with currents in either directions causing failure hazards. Higher stray currents can result in electrocution.	Yes		Design to identify relevant structures and penetrations. Design such to eliminate current interference.	Engineering	c) Further investigation	Apply proposed control	25-May-22	Detail Design	Design Manager	Prior to SID2	Open		
1.78	STD_04-00001_20	10-Mar-22	SID1	Operation Maintenance	Inspecting the connection of rectifier earth stake	Routine	Ergonomic	Rectifier earth stake lift the lid, check connection, solid connection all good.	Yes	Check starter connection when doing TR maintenance. (must be ground box)	Use appropriate tools and manual handling techniques	Administrative	a) Just do it	Apply proposed control	26-May-22	Operations Maintenance	Job Leader		Open		
1.79	STD_04-00001_20	10-Mar-22	SID1	Operation Maintenance	Inspecting the connection of rectifier earth stake	Routine	Ergonomic	Lifting lid from ground level exposing workers to ergonomic hazards.	Yes	Use of key lid with extension handle		Administrative	a) Just do it	Use appropriate tooling to be included in ISA	27-May-22	Operations Maintenance	Job Leader	Construction	Open		
1.80	STD_04-00001_20	10-Mar-22	SID1	Construction Installation	Installing earth stake (~1.2m long)	Routine	Ergonomic	Driving earth stake requires force and introduces ergonomic hazards - Earth contact back fill - (as per design) compact down then drive earth stake - use hammer or mechanical aid	Yes	Use of mechanical aid such as star dropper driver or similar mechanical aid for task. Sledge hammer for last section.		Administrative	a) Just do it	Details to be included the ISA or similar.	28-May-22	Operations Maintenance	Job Leader	Prior to activity executing task	Open		
1.81	STD_04-00001_20	10-Mar-22	SID1	Construction Installation Operation Maintenance	Carrying out tasks within the various wires	Routine	Electrical	Various cables/wires present and not knowing which cable is which or which is the main earth cable introduces electrical hazards.	Yes	Requirement main earth to have label visible to workers.		Administrative	a) Just do it	Construction team to install labels	29-May-22	Construction	Construction Manager	Prior to completions	Open		
1.82	STD_04-00001_20	10-Mar-22	SID1	Construction Maintenance	Installation of transformer - rectifier earth stakes	Routine	Failure	Installation of earth stake in proximity of transformer or other stray current sources can result in corrosion and failure of earth stake functionality.	Yes	Installation carried out by qualified persons. Use of earth stake casing and install as per instruction on drawing STD-04-0001_20		Engineering	a) Just do it	Ensure installation carried out by qualified persons.	30-May-22	Construction	Construction Manager	Construction	Open		
1.83	STD_04-00001_21	10-Mar-22	SID1	Operation Maintenance	Horizontal anode Bed - installation	Routine	Ergonomic	Street Box collects the cables from the bed and can introduce ergonomic and access hazards.	Yes	Install box above ground in elevated cabinet. See notes on drawing		Engineering	a) Just do it	Note on drawing give requirements for Box positioning: 5/7/22 RS: done	05-Jul-22			Prior to issue documents	Closed	Y	Senior Engineer Materials
1.84	STD_04-00001_21	10-Mar-22	SID1	Operation Maintenance	System Checks - monitoring and testing system	Routine	Environmental	Workers are exposed to spiders, snakes and other animal when the vegetation, grass, tree, bush etc, around the test locations are not maintained.	Yes	PM's to maintain vegetation levels in and around the cathodic protection test locations.		Administrative		Include vegetation maintenance in the PM's for the asset. Clearance to occur prior to CP technicians going to site.	01-Jun-22	SAW Maintenance	Maintenance	Practical completions input into Maximo	Open		
1.85	STD_04-00001_21	10-Mar-22	SID1	Operation Maintenance	Breather pipes	Routine	Access	Breather pipes become congested and ineffective in the event of think vegetation growth or movement of dirt from local flooding introducing access hazards	Yes	Breather pipes designed such as to withstand minor overgrowth.		Engineering	c) Further investigation	Determine balance between minimising interference from undergrowth and trip hazards.	02-Jun-22	Detail Design	Design Manager		Open		
1.86	STD_04-00001_21	10-Mar-22	SID1	Construction Future works Operation Maintenance	Horizontal anode Bed - location	Routine	Strike	CP infrastructure not known to be in the area - connection with excavation and exposure to hazards	Yes	Information listed in Maximo and included on the GIS system for Dial before you Dig information		Administrative	a) Just do it	Action: Have information uploaded into Maximo and have get Cathodic protection information uploaded into GIS for dial before you dig.	03-Jun-22	SA Water	Project Manager	Prior to close out	Open		
1.87	STD_04-00001_21	10-Mar-22	SID1	Construction Future works Operation Maintenance	Horizontal anode Bed location - watering and exhaust discharge	Routine	Strike	Not knowing where anode bed is located	Yes	Install tube posts at beginning and end of sections		Engineering	a) Just do it	Action: determine location of indicator/watering/exhaust posts (see below)	04-Jun-22	Detail Design	Design Manager	Prior to SID2	Open		
1.88	STD_04-00001_21	10-Mar-22	SID1	Construction Future works Operation Maintenance	Horizontal anode Bed location - watering and exhaust discharge	Routine	Failure	System not kept moist or reaction gas opportunity to dissipate resulting in ineffective CP system and failure to protect assets	Yes	Install tube posts at beginning and end of sections to use for water and reaction gas dissipation.		Engineering	a) Just do it	Action: determine location of indicator/watering/exhaust posts.	05-Jun-22	Detail Design	Design Manager	Prior to SID2	Open		
1.89	STD_04-00001_22	10-Mar-22	SID1	Construction Operation Maintenance	Testing - Measure current	Routine	ergonomic	Currently have to open pit to measure at ground. Introducing ergonomic hazard to workers	Yes	Bring cables to junction box on post.		Administrative	c) Further investigation	Determine use of junction box as preferred location for cable termination	06-Jun-22	Detail Design	Design Manager	Prior to SID2	Open		
1.90	STD_04-00001_22	10-Mar-22	SID1	Operation Maintenance	Opening Pits for testing or maintenance activities	Routine	Environment	Often snakes and other creatures like the pit environment and can be present when doing inspection. Opening pit frighten person or snake resulting in injury	Yes	Long handle dead lifter used to open pits. If snake present walk away and notify supervisor/snake catcher. Wearing of long pants with boots offers some protection from bites Use of junction box on post will reduce number of exposures		PPE	a) Just do it	Induction to workers of hazards relating to snakes and other insects/creatures that may be present. Inclusion of Snake and other creature hazards in work procedure.	07-Jun-22	SA Water Maintenance	SA Water Maintenance super	Prior to completing task.	Open		
1.91	STD_04-00001_22 & 23	10-Mar-22	SID1	Construction	Installation of vertical anodes within pipe (mixed metal oxide tubular anodes)	Routine	Position	For anode system to be functional the anodes need to be kept in the centre of the pipe during installation to prevent rework and exposure to hazards again or a failure of unit	Yes	Use of spacers for positioning of units within middle or pipe prior to backfilling. Detail drawing for pipe construction and installation requirements		Engineering	a) Just do it	Construction methodology	08-Jun-22	Constructor	Construction Manager	During construction	Open		
1.92	STD_04-00001_22 & 23	10-Mar-22	SID1	Maintenance	Disconnecting or connecting anodes	Routine	Electrical	Connection joint has become current path and joint disintegrates.	Yes	Connection - resin or similar on the joint. Sufficient cable length from the anodes to the junction box for connection and maintenance/testing activities.		Isolation	a) Just do it	ACTION: Note added to the drawing regarding sufficed cable length from anode to the junction box to allow suitable activities. 5/7/22 RS: Done	05-Jul-22	SAW	Designer Ramon RS	Prior to issue documents	Closed	Y	Senior Engineer Materials
1.93	STD_04-00001_22 & 23	10-Mar-22	SID1	Demolition/replacement	Removal or decommissioning test point	Routine	Trip Slip Fall	Maintenance doesn't occur on these units. If falls or reaches end of life if not decommissioned correctly can result in a trip or other hazard	Yes	Maintenance doesn't occur on unit. When falls leave it in the ground and build new in the proximity. Remove any boxes, or surface equipment, back fill as required and reinstate paving or similar.		Administrative	c) Further investigation	Apply requirements from technical specification that specify removal of redundant equipment that causes trip/obstruction hazards and make safe.	10-Jun-22		Constructor	Construction Management Plan	Open		
1.94	STD_04-00001_22 & 23	10-Mar-22		Construction	Column of anode and wire installation - backfilling	Routine	Ergonomic	Back filling is carried out through lifting and manually pouring fill in the pipe or cavity. This can result in exposure to manual handling hazards	Yes	Use of 22kg bags. Two people carry.	To be determined	Administrative	c) Further investigation	ACTION 1: back fill - Investigate method for local storage and discharge in to lighter weights and easier to handle containers. Action 2: investigate if prefabrication of canister anodes can be done and used. Confirm PPE and handling requirements with MSDS and include in any work instructions	11-Jun-22	Designer	Detail designer	prior to IFC	Open		

Hazard ID	Reference information (e.g. Drawing)	Date identified	Source (SID Review)	HAZARD DETAILS				Hazard Elimination / Reduction SFAIRP				Action Required									
				Life Cycle Phase	Activity / Task	Routine / Non-routine	Hazard Category	Details of Hazard Exposure	Do credible cause and consequence exist for this hazard? (Yes/No)	Current Controls	Proposed Controls	Control Method (Hierarchy)	Reasonably Practicable Category	Action Details / Options Considered / Status	Date Last Reviewed/ Updated	Responsible Company	Responsible Individual (or Role)	Due For Completion	Action Status (not started, open, closed)	Hazard Reduced SFAIRP (Y/N)	Responsible Authority
1.95	STD_04-00001_22 & 23	10-Mar-22	SID1	Design Construction	Installation of tubular anodes near over head power lines	Routine	Electrical	Tubular anodes and their holes can require depths of 12m or more for installation exposing grilling/drilling equipment to striking of power line hazards	Yes	Dial before you dig information for design. Min 5 m clearance required from powerlines	Local hazard identification Adjustment of design in situ (with correct authority) for site install to meet local conditions	Administrative	c) Further investigation	Action: Clearance for installation adhered to.	12-Jun-22	Constructor	Construction Manager	Construction Management Plan	Open		
1.96	STD_04-00001_22 & 23	10-Mar-22	SID1	Construction	Deep excavation / drilling of installation holes	Routine	Manual Handling	Some tubular anodes require deep installations sometimes 6-12 m introducing manual handling hazards for such depths	Yes	Use of mechanical aid and drill rigs		Administrative	c) Further investigation	ACTION: Identify installation methodology with assessment of drill rigs	13-Jun-22	Constructor	Construction Manager	Construction Management Plan	Open		
1.97	STD_04-00001_22 & 23	10-Mar-22	SID1	Construction	Inserting anode into hole	Routine	rework	Off centre installation of the anode in the hole effects performance of the anode. Rework required to centralise anodes exposing worker to all the hazards again.	Yes	Use of centralising guides as per standard drawing			a) Just do it	Determine redesign of std drawing for manufacturing 5/7/22: new design finalised and included in CP Standard drawing pack	05-Jul-22	SA Water	CP Specialist RRS Lex	Prior to finalising drawings	Closed	Y	Senior Engineer Materials
1.98	STD-04-00001-25 Dripper system	10-Mar-22	SID1	Operation	Irrigation- Installed dripper system for Cathodic protection systems	Routine	Environmental	Smaller dripper systems are susceptible to chlorine disinfection which the cathodic protection system is designed to discharge resulting in failure of the water system and waste of water or uneven surfaces	Yes		None identified			Engage irrigation and CP specialist to carry out improved design and consider controls and actions ACTION: review materials available for use in the dripper system application that may be resistant to chlorine gas degradation. PVC - not Chlorine gas affected but brittle and ground movement causes splitting of the glued joints or other PPE - flexible but is affected by chlorine gas. 3/8/22 (RS): Action is to contact SA Water CP specialists to get latest approach for Dripper Systems	03-Aug-22	Concept Designer	Design Manager	Concept Design	Open		
1.99	STD-04-00001-25 Dripper system	10-Mar-22	SID1	Operation	Irrigation - Water connection for Cathodic protection systems dripper system	Routine	Environmental	Water connection failure and potable water/filtered water lost to environment and may cause local erosion or poor surface hazards	Yes		None identified			Engage irrigation and CP specialist to carry out improved design and consider controls and actions ACTION: review connection requirements materials available for use in the dripper system application that may be resistant to chlorine gas degradation. 3/8/22 (RS): Action is to contact SA Water CP specialist to get latest approach for Dripper Systems	03-Aug-22	Concept Designer	Design Manager	Concept Design	Open		
2.00	STD-04-00001-25 Dripper system	10-Mar-22	SID1	Operation	Irrigation - Water distribution for Cathodic protection systems dripper system	Routine	Failure	Low volumes of water encourage blockage of tap and fittings resulting in failure of system and hazard of asset failure and hazards associated with that	Yes		Use of ratio valves to control flow and minimise blockages.			Engage irrigation and CP specialist to carry out improved design and consider controls and actions ACTION: Determine applicability of ratio valves and update design accordingly 3/8/22 (RS): Action is to contact SA Water CP specialists to get latest approach for Dripper Systems	17-Jun-22	Concept Designer	Design Manager	Concept Design	Open		
2.01	STD-04-00001-25 Dripper system	10-Mar-22	SID1	Design	Irrigation - Installation of dripper system in locations not required	Routine	Environmental	In some areas there is local ground water or sufficient conductivity in the soil/earth to not require dripper resulting in environmental waste of water.	Yes		Determine requirement for dripper systems			Engage irrigation and CP specialist to carry out improved design and consider controls and actions ACTION: Determine requirement for dripper system. 3/8/22 (RS): Action is to contact SA Water CP specialists to get latest approach for Dripper Systems	18-Jun-22	Concept Designer	Design Manager	Concept Design	Open		
2.02	STD-04-00001-25 Dripper system	10-Mar-22	SID1	Design	Irrigation - Maintenance of irrigation or moisture of local ground	Routine	Failure	Water pipes need to impress a lot of current to CP systems. Which require more moisture in the soil. Anodes are running at a higher rate and there are issues with seeping water away causing problems with cathode.	Yes		PM for monitoring/manual irrigation	Administrative		Engage irrigation and CP specialist to carry out improved design and consider controls and actions ACTION: Determine irrigation system of required systems. Assessment of Run to fail systems Deep anode well to get ground water Bring to a point with access to tap and manually water with PM	19-Jun-22	Designer	Design Manager	Concept Design	Open		
2.03	STD-04-00001-25 Dripper system	10-Mar-22	SID1	Operation	Irrigation - leaking water systems	Routine	Failure	Leaking water system cause lakes/local wet spots and damage infrastructure / local pipework	Yes		Determine requirement for dripper system or manual PM for irrigation		c) Further investigation	Engage irrigation and CP specialist to carry out improved design and consider controls and actions ACTION: Determine requirement for irrigation and delivery method.	20-Jun-22	Designer	Design Manager	Concept Design	Open		
2.04	STD-04-00001-24 Bore casing	10-Mar-22	SID1	Construction	Bore casing requiring CP- Installation/construction	Routine	Excavation	Installation is difficult once bore casing in place exposing excavation and other hazards	Yes	Drilling company tack welds CP system on well casing during drilling activities.			c) Further investigation	Safe work methods developed for control	22-Jun-22	Constructor	Construction Manager	During construction	Open		
2.05	STD-04-00001-24 Bore casing	10-Mar-22	SID1	Construction	Bore casing requiring CP- Installation/construction	Routine	Movement	Water pressure pushing casing out of the ground	Yes	Casing has predrilled slots in the sides to prevent water pressure pushing them out of the ground.		Engineering		As per design	23-Jun-22	Constructor	Construction Manager	Pre-Construction activities	Open		