

**SAFETY IN DESIGN
HAZARD IDENTIFICATION & WORKSHOP
PARTICIPANT DETAILS**

Site:	<i>Maintenance Standard Design Relates to drawings STD-06-00001 through STD-06-00025</i>	
Details:	<i>Suite of standard drawings for pipework construction and maintenance.</i>	
Project Number (if applicable):	<i>N/A</i>	
Maximo Asset Number:		

Date	Phase	Project Details (If Applicable)	Attendees
	Lessons Learned	N/A	
<i>20-Apr-22</i>	HAZID	Preliminary HAZID undertaken internally by GHD prior to finalisation of detailed design	
	SiD Hazard Review 1 - Concept	N/A	
<i>27-Apr-22</i>	SiD Hazard Review 2 - Detailed / Construction	Typical design drawing review	Refer SiD 2 Workshop Attendees Tab
<i>09-Jun-22</i>	SiD Hazard Review 2 - Detailed / Construction	Reviewed actions and updated accordingly	P O'Neill, T Mzungu, M White
	SiD Hazard Review 3 - Post Construction		
<i>20-Mar-23</i>	SiD Hazard Review 3 - Post Construction	Format change	Matthew Davis
	Operations		

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
Unique Hazard ID number for reference	Point of reference for hazard	Date identified	F-0 HAZID Lessons learned SID Review 1 SID Review 2 SID Review 3 HAZOP CHAZOP Commissioning etc. Design review	In which phase/s is the hazard present?	Detail the activity taking place where interface and hazard exist. Activity (Operations, maintenance, outage, construction) schedules and plans can be used to identify interfaces. Can include environment and plant interfaces	Is the task a one-off, set/omn completed activity or an often performed or routine task	Name the Hazard (expressions in cell dropdown below)	Details of the hazard such that someone not present at the workshop can comprehend.	Is this a credible hazard? Ask: Is there a cause and consequence? If there is no cause here can be no consequence, the cause is irrelevant	What is already in place to address this (if known)?	Describe design changes required (or further controls) to be applied using the hierarchy of control	Hierarchy of controls applied: Elimination, Substitution, Engineering, less effective, Administrative, PPE	a) Just do it, because it is inexpensive and provides safety benefit b) the means is grossly disproportionate to the safety benefit throughout life of asset. c) further analysis required to make judgement, more information required.	Details of actions required, any findings and information on the action taken	Recording date when the hazard and action were last visited	Company responsible for the action	Person / Role responsible for execution of the action	Specific date or phase of project action to be completed by: e.g. 14/1/2018 Detail design phase (30%)	Status of action -not started -open -closed	Has the hazard been reduced SFARP? Yes / No	Name of persons
0.00	DW XXX VV-ZZZ # FT1004 Chlorine dosing system flow meter FT1004	01/01/2018	Operator comment and Issues Register	Outage / Maintenance	Cleaning flow meter FT1004	Routine	Access and Egress	When accessing flowmeter FT1004 to rod out during maintenance / outages the adjacent pipework is too close imposing workers to impact or pinching hazards on adjacent pipework.	Yes	Cleaning tool has retractable / extendable handle, with minimum length of 25cm.	Pipework layout adjustment to allow 30cm between discharge of flow meter and pipework	Engineered	a) Just do it	Pipe layout around FT1004 to be modified to allow for the extra clearance between flowmeter discharge and adjacent pipework. Pipework cannot be completely removed due to limited possible routes. 3/1/2018 (B): Pipe work layout adjusted to allow clearance (1m) for cleaning of flowmeter.	01/01/2018	SA Water	Lead Designer- Jo Blogs	90% Design (15/1/2018)	Closed	Yes	Jo Blogs
Hazard Identification (HAZID, Lessons Learned etc.)																					
0.01			HAZID	Construction	Excavation of site for underground works and surface preparations	Non-Routine	Excavation	Excavation hazards, deep excavations for buried pipework, collapse etc.	Yes		RA to be undertaken for each site prior to starting works and appropriate actions taken	Administrative	c) Further investigation	Site specific assessment to be undertaken by staff completing works at each individual site	27/04/2022	-SAW/Contractor undertaking works		Pre-Construction	Open		
0.02			HAZID	Construction	Site access issues relating to existing pipeline location	Non-Routine	Access and Egress	Inability to safely access pipework	Yes		RA to be undertaken for each site prior to starting works and appropriate actions taken	Administrative	c) Further investigation	Site specific assessment to be undertaken by staff completing works at each individual site	27/04/2022	-SAW/Contractor undertaking works		Pre-Construction	Open		
0.03			HAZID	Construction	Access within pipeline as required	Non-Routine	Confined spaces	Entry/access into pipework or manholes to undertake works	Yes	RA undertaken for each site Safe retrieval	RA to be undertaken for each site prior to starting works and appropriate actions taken	Administrative	c) Further investigation	Site specific assessment to be undertaken by staff completing works at each individual site	27/04/2022	-SAW/Contractor undertaking works		Pre-Construction	Open		
0.04			HAZID	Construction	Corrosion of pipework due to inappropriate protection measures	Non-Routine	Corrosion	Pipe corrosion causes leakage or deterioration of asset	Yes		RA to be undertaken for each site prior to starting works and appropriate actions taken	Administrative	c) Further investigation	Site specific assessment to be undertaken by staff completing works at each individual site	27/04/2022	-SAW/Contractor undertaking works		Pre-Construction	Open		
0.05			HAZID	Construction	Field repairs of live mains- appropriate isolations	Non-Routine	Flow	Failure of pipe isolation causes engulfment or damage	Yes	Shutdowns / Full isolation in some instances repairs can be done whilst main remains live	RA to be undertaken for each site prior to starting works and appropriate actions taken	Administrative	c) Further investigation	Site specific assessment to be undertaken by staff completing works at each individual site	27/04/2022	-SAW/Contractor undertaking works		Pre-Construction	Open		
0.06			HAZID	Construction	Maintenance works associated relate to existing assets	Non-Routine	Damage to existing assets	Existing assets damaged when undertaking maintenance works	Yes		RA to be undertaken for each site prior to starting works and appropriate actions taken	Administrative	c) Further investigation	Site specific assessment to be undertaken by staff completing works at each individual site	27/04/2022	-SAW/Contractor undertaking works		Pre-Construction	Open		
0.07			HAZID	Construction	Welding of elements	Non-Routine	Hot Works	Welding hazards	Yes		RA to be undertaken for each site prior to starting works and appropriate actions taken	Administrative	c) Further investigation	Site specific assessment to be undertaken by staff completing works at each individual site	27/04/2022	-SAW/Contractor undertaking works		Pre-Construction	Open		
0.08			HAZID	Construction	Cutting metallic pipes	Non-Routine	Electrical safety	Electrocution / electric shock from stray current when a metallic pipe/main is cut.	Yes	Bridging, plumb guard	RA to be undertaken for each site prior to starting works and appropriate actions taken	Administrative	c) Further investigation	Site specific assessment to be undertaken by staff completing works at each individual site	27/04/2022	-SAW/Contractor undertaking works		Pre-Construction	Open		
0.09			HAZID	Construction	Existing live services in the vicinity of the maintenance works	Non-Routine	Live services	Damage to live assets or injury caused by exposure to live service	Yes		RA to be undertaken for each site prior to starting works and appropriate actions taken	Administrative	c) Further investigation	Site specific assessment to be undertaken by staff completing works at each individual site	27/04/2022	-SAW/Contractor undertaking works		Pre-Construction	Open		
0.10			HAZID	Construction	Remote or rural location of pipework	Non-Routine	Location	Remote or rural location of pipework, isolated works, long distance to emergency services in event of incident	Yes		RA to be undertaken for each site prior to starting works and appropriate actions taken	Administrative	c) Further investigation	Site specific assessment to be undertaken by staff completing works at each individual site	27/04/2022	-SAW/Contractor undertaking works		Pre-Construction	Open		
0.11			HAZID	Construction	Traffic or railway interfaces with maintenance works	Non-Routine	Plant / vehicle movements	Works adjacent to highway or rail corridor, injury or damage to assets	Yes		RA to be undertaken for each site prior to starting works and appropriate actions taken	Administrative	c) Further investigation	Site specific assessment to be undertaken by staff completing works at each individual site	27/04/2022	-SAW/Contractor undertaking works		Pre-Construction	Open		
0.12			HAZID	Construction	Asbestos present on existing mains/assets	Non-Routine	Asbestos	Asbestos exposure to staff	Yes		RA to be undertaken for each site prior to starting works and appropriate actions taken	Administrative	c) Further investigation	Site specific assessment to be undertaken by staff completing works at each individual site	27/04/2022	-SAW/Contractor undertaking works		Pre-Construction	Open		
0.13			HAZID	Construction	Site specific plant	Non-Routine	Fixed plant & Equipment	Works undertaken near plant at existing sites	Yes		RA to be undertaken for each site prior to starting works and appropriate actions taken	Administrative	c) Further investigation	Site specific assessment to be undertaken by staff completing works at each individual site	27/04/2022	-SAW/Contractor undertaking works		Pre-Construction	Open		
0.14			HAZID	Construction	Large diameter pipelines included in Maintenance set	Non-Routine	Heavy lifts/carnage	Heavy large pipes and associated flanges, plates, etc	Yes		RA to be undertaken for each site prior to starting works and appropriate actions taken	Administrative	c) Further investigation	Site specific assessment to be undertaken by staff completing works at each individual site	27/04/2022	-SAW/Contractor undertaking works		Pre-Construction	Open		
0.15			HAZID	Construction	Vibrations associated with construction/maintenance works	Non-Routine	Vibration	Construction works	Yes		RA to be undertaken for each site prior to starting works and appropriate actions taken	Administrative	c) Further investigation	Site specific assessment to be undertaken by staff completing works at each individual site	27/04/2022	-SAW/Contractor undertaking works		Pre-Construction	Open		
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SID Review 1																					
<i>Insert or delete rows as required</i>																					
1.00		27-Apr-22	SID Review 1	Construction	Lead coatings / Hazardous Substances	Non-Routine	Hazardous substances/Dangerous Goods	Lead or other hazardous substances - exposure to staff	Yes	Adflow whist grinding / cutting	RA to be undertaken for each site prior to starting works and appropriate actions taken	Administrative	c) Further investigation	Site specific assessment to be undertaken by staff completing works at each individual site	27/04/2022	-SAW/Contractor undertaking works		Pre-Construction	Open		
1.01		27-Apr-22	SID Review 1	Construction	AS4020 compliance of materials/ Commissioning	Non-Routine	Materials of construction	Contamination of potable water supply	Yes		Appropriate/compliant materials to be nominated on drawings and used for all maintenance works	Eliminate	a) Just do it	Appropriate/compliant materials/standard for materials to be nominated on drawings	09/06/2022	GHD		90% Design	Closed	Yes	
1.02		27-Apr-22	SID Review 1	Construction	Lifting	Non-Routine	Heavy lifts/carnage	Incorrect / unspecified lifting points	Yes	Trained personnel with dogging, rigging, tickets etc.	Designated lifting points design for spool pieces based on weight	Engineering	a) Just do it	Typical lifting lug detail to be included in standard drawing set	09/06/2022	GHD		90% Design	Closed	Yes	
1.03		27-Apr-22	SID Review 1	Construction	Excavations / Lifting	Non-Routine	Excavations	Location of crane in relation to trench, area of influence	Yes		RA to be undertaken for each site prior to starting works and appropriate actions taken	Administrative	c) Further investigation	Site specific assessment to be undertaken by staff completing works at each individual site	27/04/2022	-SAW/Contractor undertaking works		Pre-Construction	Open		
1.04		27-Apr-22	SID Review 1	Construction	Welding of elements	Non-Routine	Size/shapes	Inability to undertake weld properly due to insufficient space from edge of pit/lack of clear length	Yes		Minimum clear space to be nominated for standards, with note this can be modified with approval dependant on site conditions	Engineering	a) Just do it	To be included on standard drawing set	09/06/2022	GHD		100% Design	Closed	Yes	
1.05		27-Apr-22	SID Review 1	Construction	Installation of pipe sections	Non-Routine	Position	Misaligned pipework sections	Yes		Designated alignment points to be nominated on drawings and marked on all pipework as required	Eliminate	a) Just do it	To be included on standard drawing set	09/06/2022	GHD		100% Design	Closed	Yes	

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1.06		27-Apr-22	SID Review 1	Construction	Undertaking pipe repair works and welding	Non-Routine	Ergonomics	Personnel upside-down to undertake works	Yes		RA to be undertaken for each site prior to starting works and appropriate actions taken	Administrative	c) Further investigation	Site specific assessment to be undertaken by staff completing works at each individual site	27/04/2022	SAW/Contractor undertaking works		Pre-Construction	Open		
1.07		27-Apr-22	SID Review 1	Construction	Working near overhead services	Non-Routine	Overhead services	Earthing etc. when nearby transformers or other HV equipment	Yes		RA to be undertaken for each site prior to starting works and appropriate actions taken	Administrative	c) Further investigation	Site specific assessment to be undertaken by staff completing works at each individual site	27/04/2022	SAW/Contractor undertaking works		Pre-Construction	Open		
1.08		27-Apr-22	SID Review 1	Construction	Installation of new pipework	Non-Routine	Temperature	Expansion and contraction of pipework when new sections installed	Yes	Tie in works not to be undertaken in temperatures above 28 degrees Celsius (TS0420)	RA to be undertaken for each site prior to starting works and appropriate actions taken SWMS or equivalent document to be prepared and adhered to prevent associated issues	Administrative	c) Further investigation	Site specific assessment to be undertaken by staff completing works at each individual site Plan to be developed for undertaking site connections/tie-ins	27/04/2022	SAW/Contractor undertaking works		Pre-Construction	Open		
1.09		27-Apr-22	SID Review 1	Construction	Working on/in pipework	Non-Routine	Access and Egress	Distance to manhole is excessive to provide suitable access and egress for requirements	Yes		RA to be undertaken for each site prior to starting works and appropriate actions taken If required, additional manhole may be included or alternative method to be used	Administrative	c) Further investigation	Site specific assessment to be undertaken by staff completing works at each individual site	27/04/2022	SAW/Contractor undertaking works		Pre-Construction	Open		
1.10		27-Apr-22	SID Review 1	Construction	Wastewater pipework maintenance	Non-Routine	Gases	MW potentially has gases that may be flammable or cause other HAZARDS to personnel	Yes		RA to be undertaken for each site prior to starting works and appropriate actions taken	Administrative	c) Further investigation	Site specific assessment to be undertaken by staff completing works at each individual site	27/04/2022	SAW/Contractor undertaking works		Pre-Construction	Open		
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