



Australia | New Zealand

Installation Design Services Survey Report

CLIENT

FACILITY

Project line 1

Project line 2

Document No.:

Prepared by:

Date:

EXAMPLE REPORT ONLY



CONTENTS

SWAGELOK INSTALLATION DESIGN SERVICES	3
INTRODUCTION	3
SCOPE OF WORK	3
TEAM MEMBERS	4
EVALUATION OF EXISTING SYSTEM	4
DESIGN PROPOSAL	4
INSTALLATION PROPOSAL	6
PROPOSAL CLARIFICATIONS	7
PROPOSAL COMMERCIAL SUMMARY	7
ADDENDUM CONTENTS	8
ADDENDUM 1: Condition Report	
ADDENDUM 2: Engineering Drawings	
ADDENDUM 3: Bill of Materials	
ADDENDUM 4: Installation Photo Report	
ADDENDUM 5: Commercial Documentation	

Note:

This report is an example of an Installation Design Services Report. This report demonstrates a typical installation design proposal and explains the sections of the report and the general information provided to the client.



SWAGELOK INSTALLATION DESIGN SERVICES

Swagelok Installation Design Services is a service offered by Swagelok in which we use our industry expertise in fluid system design to develop a design solution for installation and hook-up of small bore tube fluid systems.

Swagelok are experts in fluid systems; having a Swagelok Field Engineer listen to your needs, evaluate the requirements and survey your site, we can provide an installation design for field hook-ups of new and existing equipment, modification of existing systems, and provide site support during installation. Services can include;

- Tube routing and support design
- System panel designs for modular integrated installation
- Bill of Material development
- Supply of pre-bent tube
- Site supervision and installation assurance

The Installation design process begins with a discussion with key client personnel to understand the scope of work, the issues presented and the requirements of the client. The documentation is then reviewed by the Swagelok Field Engineering team to develop an approach to the design and prepare for the scope of work. In most cases, Swagelok Field Engineers will conduct a site survey to record and confirm vital information for the design proposal. The final result is an Installation Design Report which details the installation design proposal and provides all the relevant design documentation.

INTRODUCTION

The introduction describes the objective of the required installation as understood by Swagelok and the factors that are to be considered in the design proposal;

- Introduction to the purpose of the service
- A background of the issues the client is facing and the reasons for the service
- Compliances and considerations for the design as advised by the client
- Summary of the design intent

SCOPE OF WORK

This section details the scope of work that was completed;

- Details the scope of work conducted on site
- Sets out the objectives that were to be achieved
- Details the deliverables on completion of the survey

Example Only (extract)

The Swagelok Engineering Team were engaged to carry out an assessment onsite of the current 25 Deluge Monitor Stations and produce a proposal for the conversion of these stations from the existing water pilot operation to Instrument air piloted operation.

The scope of work includes;

- Identification and detailing of appropriate tube routes from the nearest air source to the respective deluge station/s.
- Development of a detailed Bill of Materials required for the conversion; including selection of appropriate materials and components and detailing lengths and quantities.
- Identifying an economic solution that provides a cost effective conversion and minimal site disruption, while ensuring safety, reliability of operation and maintainability.



TEAM MEMBERS

Swagelok works closely with your organisation to understand your pain points, how they affect your operation, the criticality of your systems and what you want to achieve. The Swagelok team and your personnel involved in this evaluation are listed below.

Client Personnel

Name
Company
Position

Swagelok Personnel

Name
Company
Position
Email

EVALUATION OF EXISTING SYSTEM

For installations where the new installation modifies, replaces or interfaces with existing installed equipment, a brief system evaluation will be conducted to report on the system equipment that will remain or interface with the new installation. The objective of the evaluation is to provide;

- A brief condition report on the existing system/s, interfaces and or integrating systems.
- Details on the suitability of existing or remaining equipment that will interface with the new installation and provides recommendation for out of scope issues that may affect the new installation.

DESIGN PROPOSAL

The design proposal is an explanation of the overall design summarising the information in the Addendum documentation. The design proposal details;

- Installation scope including panels and interconnecting tube
- Design of tube routing and support
- Purpose and operation of any panels or design solutions
- Technical detail on the products and materials selected
- How design / installation issues have been addressed.
- How the design has been economised by reducing materials and installation time.

Example Only (extract)

The instrument air supply will be sourced from an existing air manifold located in the vicinity of the station/s or from a nearby air header. Where possible, deluge stations that are in close proximity to each other will be grouped together to be supplied by a single air supply. Regulator panels for each deluge station or group of stations will provide pressure reduction and isolation for each station. Grouping and using regulator panels will reduce the number of components and installation time on site. The air manifold will be used as an isolation point for the system. Where the air source is taken directly from a header; an isolation valve will be installed at the tapping point. To maintain pilot pressure to the deluge station in the event of an air compressor failure and header depressurisation, a check valve will be installed at the tapping point (air manifold or header), this will provide maximum volume in the pilot system to maintain pilot pressure.

Tube runs have been minimised by grouping some stations together; a single air supply line will be run from the air source to the Regulator Panel located at one of the stations, the other stations in the vicinity will then be fed from that Regulator Panel. To span the large distances across the open



site, some tube runs have to be run under ground. These tube runs will be run with PVC jacketed SS316 tube directly buried in the soil. The PVC jacket will protect against corrosion and abrasion of the tube underground. All above ground tube will be run in SS316 tube.

Each deluge station will have a Deluge Station Panel which will consist of the new components for conversion of the pilot control. These panels will be pre-assembled and tested before shipment to site. The panels will be mounted to the Deluge Station concrete plinth which will help to provide support to the exiting tube work.

Regulator Panels

There are four types of Regulator Panels, each type dependent on the number of deluge stations they are supplying. The 5 outlet, 3 outlet and 2 outlet panels are of similar design, with duplex air filter/regulators for redundancy and online maintenance, outlet isolation for individual station isolation and individual outlet check valves to prevent inadvertent depressurisation of online stations. Each of these panels will be located near one of the deluge stations with a single air supply from the closest air source. The Regulator Panel will then supply reduced pressure to the Station Panels within the vicinity.

Single Regulator Panels will incorporate the pressure regulator with the new air pilot components of the station on a single panel mounted at the deluge station; see below "Deluge Station Panel" section for detail on the air pilot components.

Tube Runs

All tube runs above ground will be installed with Swagelok SS316 tube and fittings, Stauff tube clamps and Unistrut support components. All tube supports are bolt or clamp on; there is no welding required. Supports will be clamped to structural members of the skid or module wherever possible using the Unistrut system. There are areas where exiting cable trays can be used; tube will be mounted to the cable tray using Stauff clamps.

All tube runs requiring the tube to be buried under ground, will be installed with Swagelok SS316 jacketed tube. The jacketed tube has a PVC coating over the stainless steel tube, which will protect the tube against corrosion and abrasion. The jacketed tube is supplied in coils of 150m, which will allow each underground run to be laid in one continuous run without unions or welding. This will reduce installation time and provide zero leak points underground. There is only one specialised tool required for installation of the jacketed tube which is a larger radius tube bender.

The tube hook-up runs are detailed in drawing 19018-D-001 and 19018-D-003 which show the location of the air source, deluge station, Regulator Panels, Deluge Station Panels; the routing & length of the buried tube runs and routing of the above ground tube runs.

Deluge Station Panels

The Deluge Station Panels will be a common panel design for each station, mounted to the station concrete plinth using Unistrut to allow for the different mounting arrangements. The panel will consist of the dry pilot valve, activation solenoid valve, manual release valve and a bleed valve for maintenance. The existing manual release valve will be replaced to allow an interface of Swagelok tube fittings with the existing tube installed and allow space for the new panel. Swagelok fittings cannot be installed with the existing Hoke fittings; the interface points will be the NPT ports of the deluge valve and shuttle valve. The panel will provide additional support to the remaining existing tube work. Consideration has been made for the existing length of cable available for the solenoid valves on these panels.



INSTALLATION PROPOSAL

The installation proposal is an overview of the installation process which includes details required for planning and scheduling;

- How the materials will be supplied
- The basic process and sequence of the installation
- Special requirements out side of the supplied scope of work, such as lifting or access equipment, specialised personnel/contractors and permits.
- Swagelok site support services

Example Only (extract)

The Regulator Panels and Deluge Station Panels will be supplied fully assembled and FAT tested; the SS316 tube and Unistrut rails will be supplied in 6m lengths, the jacketed tube will be supplied in 150m rolls and the fittings, clamps and associated hardware will be supplied loose.

The installation is recommended be completed in two phases;

Phase one:

- Install Regulator Panels on the deluge station concrete plinths.
- Assemble mounting brackets for Deluge Station Panels to suit each station and mark out mounting position. Note that panel cannot be installed until some existing tube is removed.
- Mark out exact buried tube runs for trenches to be dug.
- Install above ground tube from air source (manifold or header) to the Regulator Panel or interface to the underground tube run (whichever is applicable).

Phase two:

- After trenches have been dug, install the buried tube runs.
- Install the hook up tubing between the Regulator Panel and buried tube where applicable.
- Install the Deluge Station Panels on the concrete plinth. Note that this will require isolation of the deluge station to remove exiting tubing.
- Install the hook up tubing between the Deluge Station Panels and the Deluge Station.
- Pressure test installation.
- Function test installation.
- Final inspection of installation.

The digging of the required trenches for the underground tube runs is not included in this scope of work; the client will be required to arrange for this activity to be completed after phase 1. Some areas of the tube installation will require scaffold be erected to safely install the tube, this will need to be organised by the client or installation contractor for phase 1.

The client has elected to use their own contact personnel to carry out the installation with Swagelok field support. Swagelok Field Engineering supervision and support services have been included in this proposal to manage the installation onsite and provide quality assurance on the installation.

The Field Engineering site support will include:

- Supervision and co-ordination of the installation team
- Ensure installation complies with design
- Manage installation issues and design modifications or changes onsite (as and if required)
- Provide installation assurance in accordance with Swagelok and site standards



PROPOSAL CLARIFICATIONS

This section clarifies what is included in the proposal and what may be excluded from the proposal or is outside of the proposed scope of work. All assumptions and design decisions made are stated in the clarifications and outlines what is Swagelok's responsibility and what is considered the client's responsibility.

Example Only (extract)

The below clarifications provide detail on the assumptions made by Swagelok and brings to attention important aspects of the design that the client must be aware of and accept responsibility for.

Design Proposal

- The Bill of Materials supplied is a recommendation by Swagelok for the client's installation, based on the information provided by the client, client specifications and the guidelines of best practice*. It is the responsibility of the client to confirm and accept the recommendation is suitable for their application.
- The client has advised flow calculations are not required for the scope of work and that 1/2" x 1.2mm WT SS316 tube is acceptable for use, therefore flow calculations have not been considered in this proposal. Air consumption of the system is very low and depressurisation of the pilot for activation of the deluge station is local to the station, providing negligible delay. Re-pressurisation time of the system has not been calculated and is considered the clients responsibility.

Installation Proposal

- Digging of the trenches for tube runs will be the responsibility of the client. Swagelok will not be responsible for ensuring trenches are dug in accordance with relevant standards and requirements. Client is to ensure proposed trench locations are acceptable and provide depth requirements.
- Installation personnel must at a minimum have completed and be current on the Swagelok Tube Fitting Installation & Bending Training, for installation of Swagelok components. Swagelok site supervision does not negate this minimum requirement.

PROPOSAL COMMERCIAL SUMMARY

The Proposal Commercial Summary is a high level summary of the costs and lead times of the total design proposal, generally broken down as per the client's requirements.

Example Only

Description	Availability	Cost
Supply of tube, fittings & components	5 Weeks	\$XX.xx
Supply of tube support materials	2 Weeks	\$XX.xx
Supply of assembled panels (31 off panels)	3 Weeks	\$XX.xx
Site support services	2 weeks notice	\$XX.xx
Total Cost		\$XX.xx



ADDENDUM CONTENTS

Contents of all documentation included in the Addendums.

Example Only

Addendum 1: Condition Report

Matrix from the station inspection, showing the types of issues identified on each station.

Addendum 2: Engineering Drawings

Drawing No.	Drawing Title	Revision
19018-D-001	Tube Run Layout Drawing	A
19018-D-002	Control Panel Schematics	A

Addendum 3: Bill of Materials

Comprehensive Bill of Materials, with price breakdown and material lists for each station.

Addendum 4: Tube Routing Marked-up Photos

Marked-up photos of full tube routing for each station.

Document No.	Document Title	Revision
19018-DOC-002	Flare KO Drum_ Marked Up Photos	A
19018-DOC-003	Nitrogen Skid_ Marked Up Photos	A

Addendum 5: Proposal Quotation

Formal quotation, detailing the scope of work, commercial details and clarifications.



ADDENDUM 1

Condition Report

Example Only

The below is a brief issues matrix of the existing equipment that will interface with the new installation, to ensure the client is aware of the condition of the remaining system that is outside the scope of work but may affect the new installation.



Deluge Stations	Issues Observed								
	Inter-Mixing of Manufacturers Ref 1.2 & 1.4	Under Tightened Fittings Ref 1.1	Over Tightened Fittings Ref 1.2	Flattened/Bends Ref 1.5 & 1.5	Unsupported Tubing Assembly	Gauge Damaged/Not Readable/Needle Broken or Bent Ref 1.9 & 1.10	Improper Clamping Ref 1.8	Tube Work Damaged/Bent Ref 1.7	Solenoid or Ball Valve Leaking
730.1.SY.001	X		X	X	X	X			
730.1.SY.002				X	X	X			
730.1.SY.003	X	X		X	X	X			
730.1.SY.004	X			X	X	X			
730.1.SY.005				X	X	X			X
730.1.SY.006		X		X	X	X			
730.1.SY.007	X	X		X	X	X			
730.1.SY.008				X	X	X		X	
730.1.SY.009	X	X		X	X	X			
730.1.SY.010	X	X		X	X	X		X	
730.1.SY.011				X	X	X			
730.1.SY.012		X		X	X	X			
730.1.SY.013			X	X	X	X		X	
730.1.SY.014		X		X	X	X		X	
730.1.SY.015		X		X	X	X			
730.1.SY.016		X		X	X	X			X
730.1.SY.017	X	X		X	X	X			
730.1.SY.018	X	X		X	X	X			X
730.1.SY.019				X	X	X		X	
730.1.SY.020	X		X	X	X	X	X		
730.1.SY.021	X			X	X	X			
730.1.SY.022	X		X	X	X	X			
730.1.SY.023				X	X	X			
730.1.SY.024	X	X		X	X	X			X
730.1.SY.025		X		X	X	X			

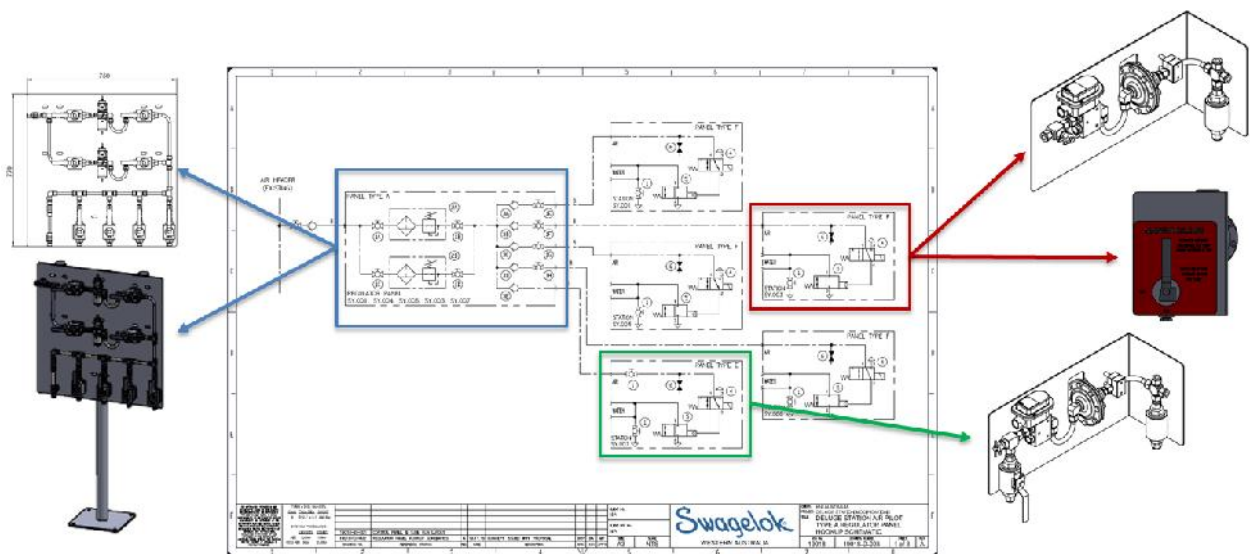
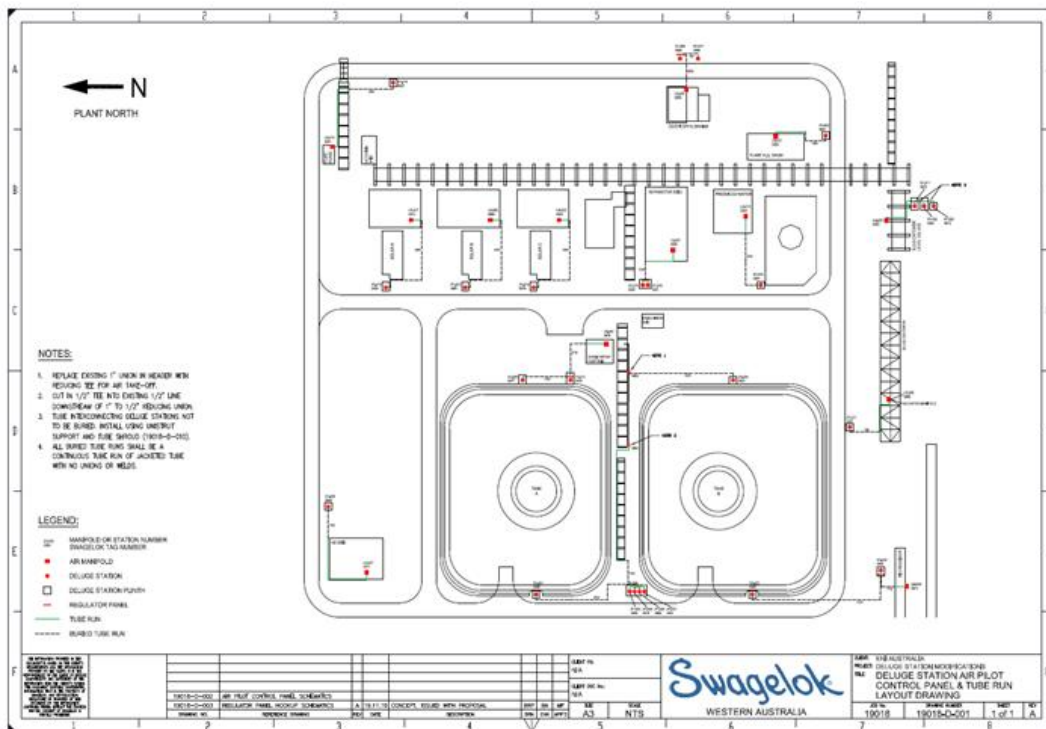


ADDENDUM 2

Engineering Drawings

Example Only

The below are examples of layout drawings, schematics and panel general arrangement drawings.



ADDENDUM 3

Bill of Materials

Example Only

The below Bill of Material (BOM) extracts show a BOM for all required materials for the installation and BOM breakdowns which detail the materials and quantities for each system/section/area of the installation.

Part Type	Part Description	Part No.	Manufacture	Total Quantity	Unit Sell	Total Sell	Lead Time
Tube	1/2" x 0.049" WT, SS316 Tube, 6m Lengths	SS-T8-S-049-6ME	Swagelok	86	\$0.00	\$0.00	2-3 Days
	1/2" x 0.049" WT, SS316 Jacketed Tube, 500ft Roll	SS-JT8-S-049-500	Swagelok	4	\$0.00	\$0.00	5 weeks
	1/2" x 0.049" WT, SS316 Jacketed Tube, 250ft Roll	SS-JT8-S-049-250	Swagelok	1	\$0.00	\$0.00	5 weeks
	1" x 0.049" WT, SS316 Tube, 6m Lengths	SS-T16-S-065-6ME	Swagelok	1	\$0.00	\$0.00	2-3 Days
	Heat Shrink Jacket	MS-HSB-S100	Swagelok	42	\$0.00	\$0.00	7-10 Days
Fittings & Valves	1/2" Nut & Ferrule Set	SS-810-NFSET	Swagelok	20	\$0.00	\$0.00	7-10 Days
	1/2" Cap	SS-810-C	Swagelok	10	\$0.00	\$0.00	7-10 Days
	1/2" Plug	SS-810-P	Swagelok	10	\$0.00	\$0.00	7-10 Days
	1/2" Union	SS-810-6	Swagelok	103	\$0.00	\$0.00	7-10 Days
	1/2" Tee	SS-810-3	Swagelok	1	\$0.00	\$0.00	7-10 Days
	1/2" Elbow	SS-810-9	Swagelok	6	\$0.00	\$0.00	7-10 Days
	1" x 1/2" Reducing Branch Tee	SS-1610-3-16-8	Swagelok	1	\$0.00	\$0.00	7-10 Days
	1" Union	SS-1610-6	Swagelok	1	\$0.00	\$0.00	7-10 Days
	1/2" to 1/2"NPT(M) Adaptor	SS-810-1-8	Swagelok	74	\$0.00	\$0.00	7-10 Days
	1/2" Bulkhead	SS-810-61	Swagelok	6	\$0.00	\$0.00	7-10 Days
	1/2" Check Valve	SS-8C-1	Swagelok	15	\$0.00	\$0.00	7-10 Days
1/2" Ball Valve	SS-8GEP38	Swagelok	2	\$0.00	\$0.00	7-10 Days	
Single Tube	G2 - 1/2" Single Tube Support Kit (Shells, top plate, bolts)	212-T-PP-DP-AS-M-W5	Stauff	133	\$0.00	\$0.00	2 weeks
Single Tube	G2 - 1/2" Stacking Single Tube Support Kit (Shells, lock plate, bolts)	212-T-DD-SIC-2-F-M-W5	Stauff	20	\$0.00	\$0.00	2 weeks

Section Number	Tube Run	Tube				Swagelok Nuts & Ferrule Set	Swagelok Caps & Plugs			Swagelok Unions		
		1/2" x 0.049" WT, SS316 Tube	1/2" x 0.049" WT, SS316 Jacketed Tube	1" x 0.049" WT, SS316 Tube (per m)	Heat Shrink Jacket	1/2" Nut & Ferrule Set	1/2" Cap	1/2" Plug	1/2" Union	1/2" Tee	1/2" Elbow	
	Part Number	SS-T8-S-049-6ME	SS-JT8-S-049-500	SS-T16-S-065-6ME	MS-HSB-S100	SS-810-NFSET	SS-810-C	SS-810-P	SS-810-6	SS-810-3	SS-810-9	
	Supplier	Swagelok	Swagelok	Swagelok	Swagelok	Swagelok	Swagelok	Swagelok	Swagelok	Swagelok	Swagelok	
1	Regulator Panel ta 730.1.SY.001	4	60		2				2			
2	Regulator Panel ta 730.1.SY.002	4	77		2							
3	Regulator Panel ta 730.1.SY.003	2	0						0			
4	Regulator Panel ta 730.1.SY.004	2	0						0			
5	Regulator Panel ta 730.1.SY.005	2	15		2				2			
6	Regulator Panel ta 730.1.SY.006	2	0						0			
7	Regulator Panel ta 730.1.SY.007	2	0						0			
8	Air Header ta 730.1.SY.008	4	52	6	2				2			
9	Air Manifold ta 730.1.SY.009	42	15		2				10			
10	Regulator Panel ta 730.1.SY.010	4	0						0			
11	Regulator Panel ta 730.1.SY.011	4	0						0			

Section Number	Tube Run	Single Clamps										
		G2 - 1/2" Single Tube Support Kit (Shells, top plate, bolts)	G2 - 1/2" Stacking Single Tube Support Kit (Shells, lock plate, bolts)	G2 Single Strut Nut, M6 (SS316)	G3 - 1" Single Tube Support Kit (Shells, top plate, bolts)	Bolt, Hex Head, M6 x 50mm SS316	Bolt, Hex Head, M6 x 85mm SS316	Nyloc Nut, M6, SS316	Flat Washer, M6, SS316	G2 - 1/2" Twin Tube Support Kit (Shells, top plate, bolts)	G2 Twin Weld Plate (SS316)	G2 - 1/2" S Twin Tube Support Kit (Shells, lock plate, bolts)
	Part Number	212-T-PP-DP-AS-M-W5	212-T-DD-SIC-2-F-M-W5	CRA-18/ID-M-W5	225-APP-DP-KS-W5	STSM6X50-316	STSM6X85-316	STSM6NYL-316	STSM6FW-316	212-T12-T-PP-DP-KS-W5	SP-2D-M-W5	212-T12-T-PP-DP-KS-W5
	Supplier	Stauff	Stauff	Stauff	Stauff	Stauff	Stauff	Stauff	Stauff	Stauff	Stauff	Stauff
1	Regulator Panel ta 730.1.SY.001	1		2								
2	Regulator Panel ta 730.1.SY.002	1		2								
3	Regulator Panel ta 730.1.SY.003			0						2		
4	Regulator Panel ta 730.1.SY.004			0						2		
5	Regulator Panel ta 730.1.SY.005	1		2						2		
6	Regulator Panel ta 730.1.SY.006			0						2		
7	Regulator Panel ta 730.1.SY.007			0						2		
8	Air Header ta 730.1.SY.008	1		2	1	2		2	2			
9	Air Manifold ta 730.1.SY.009	3		6						32	3	4
10	Regulator Panel ta 730.1.SY.010	0		0								
11	Regulator Panel ta 730.1.SY.011	1		2								
12	Air Manifold ta 730.1.SY.012	6		12						2	2	
13	Air Manifold ta 730.1.SY.013			12						2	2	



ADDENDUM 4

Installation Photo Report

Example Only

The below are marked up photos showing the tube routing and intended support points.



ADDENDUM 5

Commercial Documentation

Example Only

The below are extracts of sections from the quotation document.

1 Scope of Work

1.1 Introduction and Background Information

Two Swagelok Field Engineers attend the out an assessment of the current 25 Deluge Monitor Stat conversion of these stations from the existing water pilot operation. From this survey, a detail Bill of Materials (BOM) and an installation design proposed.

1.2 Scope of Work – Materials & Support Services

The scope of work will include supply of materials specified mobilisation and Field Engineering support on site to super.

2 Scope of Supply

Item	
2.1	Supply of Personnel: <ul style="list-style-type: none"> One of Field Engineer on site f
2.2	Supply of Materials: <ul style="list-style-type: none"> Materials in accordance with st
2.3	Supply of Hire Equipment: <ul style="list-style-type: none"> Tube bender for jacketed tube

4 Proposal Clarifications

- This quotation only covers phase two of the project; supply of materials and onsite support services.
- All labour costs are an estimate only, based on the information provided by the client. Actual labour and materials expended will be charge for, justified by signed timesheets.
- Day rates are applicable for any day attending site, for any period. Travel rates are charged only for days where travel is incurred without attending site, unless travel and site attendance exceeds 12

3 Commercial Details

3.1 Reimbursable Costs (Estimate Only)

Item	Description
Personnel Labour	
3.1.1	Field Engineer - Travel
3.1.2	Field Engineer
Hire Equipment	
3.1.3	Tube bender for jacketed tube
Travel and Accommodation	
3.1.4	

3.2 Fixed Lump Sum Costs

Item	Description
Documentation	
3.2.1	Bill of Materials

3.3 Progress Payment Milestones

Milestone No.	Line Item	
1	3.1	All reimburse mobilisation
2	3.1.3	All hire costs

5 Schedule

Materials will be made available as p- dispatched on receipt of the longest k- Two phases of installation supervision phases and number of swings and du notice for mobilisation; personnel will

6 Validity

This quotation shall remain valid for 3

7 Goods and Services Tax

Goods and Services tax is not includ

8 Terms & Conditions

Swagelok standard terms & condition website www.Swagelok.com/Perth or

9 Commercial in Confidence

The technical, pricing and other inf

TOTAL QUOTAION ESTIMATE

Note: Total Quotation Estimate includes the lump sum total and

