



**Manor Farm, Copseys, Denvilles
Foul Water Pump Station**

**Xylem Water Solutions UK Ltd
Ref: PR18423**



a xylem brand

**Xylem Water Solutions UK Limited.
Unit 1
106 Hawley Lane
Farnborough
Hampshire GU14 8JE**

**Tel: 01252 513366
Fax: 01252 516404**

**Project:
Manor Farm, Copseys, Denvilles
Foul Water Pump Station**

Client: Barratt David Wilson Southampton

Issue	Reason For Revision	Date	Issued	Approved
A	Draft issued for discussion	02.10.13	P. Warner	P. Warner
B	Modified in line with Southern Water comments	04.03.14	P. Warner	P. Warner
C	Rising main and pump station pipework size amended	03.04.14	P. Warner	P. Warner

Prepared by:

**Paul Warner
Technical Director
Tel : 01252 533395
Fax : 01252 532695
Email : paul.warner@pimsgroup.co.uk**

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1: Specification

This proposal is based on equipment providing compliance with the Southern Water Services MED 4006 Issue 1 Supplementary Addendum to the Sewers for Adoption 7th (SFA7) Edition specification as obtained from the WRC Website at the time of this submission.

2: Hazardous Area Applications

Application - Pumping Station

The proposed pumping station is designed to serve the domestic foul inflow only from 191 residential dwellings.

Sewage enters the pump station wet well via a foul water gravity network as designed by the developer's drainage consultants MJA Consulting Limited. Details of the foul water drainage including location of the foul water pumping station can be found on the MJA Consulting Limited drainage layouts supplied under separate cover by them.

Surface water run-off from impermeable areas is being handled by a separate storm water drainage system.

The pumping station transfers the sewage/foul water via a rising main discharging to a break manhole prior to entering the Southern Water network.

Then pumping station compound will have an area designed for the parking of maintenance vehicles/tankers.

Flammable atmospheres

Decomposition of raw sewage is not considered a source of explosive atmosphere. The worst-case flammable atmosphere that may exist in a sewage pumping station is hydrocarbon contamination from industrial discharges or tanker spillages. As the actual contaminant is not known the content of the flammable atmosphere cannot be specific, but will typically be the lighter more volatile hydrocarbons such as pentane from petrol.

The pumping station compound surface is designed to drain away from the wet well and will not be provided with a surface/run off drain in to the pump chamber.

Hazardous area classification

The pumping station is designated as a hazardous area, due to the risk of contaminated sewage entering. The inlet chamber and pump have been classified as zone 2 internally in accordance with the Southern Water MED4006 guidelines. In line with the same document we have zoned the Valve Chamber as Unclassified.

A Zoning Plan is shown on drawing A5746-05

Equipment category and certification

All new equipment intended to be located in an area classified as zone 1, has to be certified as equipment **group II category 2 G** equipment (or better). For zone 2 the new equipment shall be certified as equipment **group II category 3 G** equipment (or better). Please refer to Appendix D for the manufacturer's certificates for the equipment within the Hazardous Area as defined

3: Peak Inflow and Proposed Discharge

The overall development comprises of 191 dwellings.

Based on the 4000l/day/dwelling criteria detailed in the Sewers for Adoption 7th Edition specification this equates to a design flow of 8.84l/s.

Clause D4.6 of the SFA7 specification details that the pump discharge rate is to be at least half the design flow which would equate to 4.42l/s.

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We have a copy of a Southern Water letter dated 7 March 2013 to MJA Consulting limited which indicates spare capacity at the receiving foul network of 4.8l/s. In order to accommodate this we are proposing the use of an 80mm nominal rising main and similar sized pump station pipework.

The MED4006 document requests a higher velocity in the pump station pipework of between 1.2m/s and 2m/s (Min 6.1/s). It is on this discharge rate our duty calculations and pump selection is made

4: Emergency Storage

The emergency storage requirement has been calculated in accordance with SFA7 Clause D4.5.3 at a rate of 160 litres dwelling. For the 191 dwellings on this site this equates to a requirement of 30.560 Cubic Metres

It is proposed to contain this with a combination of the wet well and incoming sewer network above high level alarm and below the invert level of the lowest connected inspection chamber which is off main manhole F4 and has a site specific level of 12.190m.

We have calculated that there is 15.881 Cubic Metres of storage in the main manholes and 7.654 Cubic Metres in the pipe runs which gives a total of 23.535 Cubic Metres. We have sized the wet well to provide the residue resulting in a chamber 2.4m internal Diameter x 4.900m Deep

We have enclosed our emergency storage calculations within Appendix C.

5: Rising Main and Surge Analysis

We are proposing the use of an 80mm nominal bore rising main.

The Rising Main has a high point at which location an air valve would be installed.

As the rising main is 259.5m long we do not propose to prepare a surge analysis report in this instance.

6: Pump Duty Requirements and Selection

From the site data available we calculate the pump duty from bottom water level to be a minimum 6.1l/s against a total head of 10.12m for which we have selected submersible sewage pumps from the Xylem NP3085SH range fitted with 256 impellers and 2.4kw explosion proof motors.

They are however the most suited to the hydraulic characteristics of the system and are fitted with an N Type impeller which is the preferred choice to comply with MED4140 which relates solely to the pump units and is referred to in the Southern Water SFA7 addendum.

Please note these pumps operate at a 2 pole motor speed. They are however the most suited to the hydraulic characteristics of the system and have been selected to provide an N impeller which is the preferred impeller to comply with MED4140 which is referred to in the Southern Water Addendum and relates specifically to the pump.

With a sewage pump solids handling becomes the key criteria and the ability of the pump to handle solids and not block outweighing any small percentage improvement on efficiency. As detailed we have selected a pump that is fitted with an N impeller that falls within the top category.

These pumps would actually discharge 6.4l/s from pump start and a maximum of 7.2l/s at the upper storage level which should only occur in an emergency scenario.

Each pump will be provided with the SWS 6mm diameter nylon rope lifting system and would be fitted with sensors to prevent overheating of the motor winding insulation. As the pumps are rated less than the 7.5kw rating detailed in clause F2.3.16 of the SFA7 specification we do not propose to fit the pumps with a seal leakage detection system.

We propose that the benching in the Wet Well is laid with a self cleaning profile and as such it is not proposed to fit a Flush Valve to the Pumps.

We have attached our hydraulic calculations, system curves and pump performance details in Appendix B

Within Appendix B we have also attached a statement from the pump manufacturer concerning operating the pumps on snore. There is a facility in ultrasonic which will be programmed to prevent the pumps from operating on snore for a period not exceeding 3 seconds after the pump stop level has been reached.

7: Pump Station Layout

The pumps, pipework and valves would be installed within concrete chambers constructed by others to a layout as shown on Xylem Water Solutions drawings A5746-01,02, 03, 04 & 05. Please refer to Appendix E.

The non return valves would be fitted with levers, weights and guards and the gate valves with extension spindles.

Xylem Water Solutions contract would terminate a short distance outside the valve chamber in a 80mm nominal bore plain ended pipe from where provision of the rising main and connecting it to the pump station pipework would be the responsibility of others.

A 100mm valve chamber drain would be installed by others and a flap valve would be fitted over this pipe in the wet well.

8: Retention Time and Septicity

Based on a half developed site the retention time within the system is 1.67 hours and for a fully developed site 0.83 Hours.

Both of these are below the 6 hour figure after which septicity is considered to be a problem and as such we do not propose to install any permanent or temporary septicity control equipment.

9: Pump and Level Control Cabling

Pumps would be wired back to the control panel via intermediate junction box systems mounted on a rack and levels controls would be wired back directly all as illustrated on drawings A5746-02 & 03.

We have allowed for sealing the two 150mm pump cable ducts and one 100mm level control cable duct with a RISE cable transit system.

10: Control Equipment

Automatic level control would be via a Siemens Hydromanager Plus ultrasonic level controller augmented by 2 separate float switches for high level and back up control, all wired back to a multi compartment control panel complying with the SWS MED4006 Issue 1 Addendum to the Sewers for Adoption 7th Edition Specification.

The control panel would be installed within a floor fixing GRP kiosk of dimensions 2000mm wide x 1750mm high x 750mm deep. The GRP kiosk has a meter compartment with a separate lockable door

Please refer to Appendix F for wiring diagrams and kiosk layout

11: Telemetry Equipment

We have included for a CSE Servelec S250 Telemetry Outstation. Configuration on to the Southern Water network will need to be organised by the developer, at their expense direct with Southern Water.

12: Access Covers

We are proposing Steelway Stamp Lock Pro Lift Facta B access covers in compliance with SFA7 D6.7 for the inlet manhole, wet well and valve chamber. The wet well cover would be of the twin lid design and the valve chamber cover would be multi lid.

The access covers have torsion spring assisted lift lids, internal safety grids for fall protection and demountable barriers and posts.

13: Lifting Equipment

We propose that a REID Porta lifting davit be provided complete with a single cast in type davit socket all rated for 500kg SWL with the davit socket in the position as shown on drawings A5746- 01 & 02

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14: Penstock Valve.

We have included for a wall mounting penstock valve for installation over the incoming 150mm foul sewer within the inlet manhole. The penstock will be complete with a non rising spindle, spindle support brackets, tee key and top box.

15: Baffle Plate

We have included for a galvanised steel baffle plate to be fitted over the 150mm diameter incoming sewer.

16: Appendices

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Appendix A
Summary

**Manor Farm, Copseys, Denvilles
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FOUL WATER PUMP STATION

No. of Pumps	:	TWO
Pump Type	:	NP3085SH.256
Liquid Handled	:	Unscreened sewage
Capacity per Pump L/Sec	:	6.1
Head Generated m	:	10.12
Impeller Design	:	N
Motor Rating kW.	:	2.4 EXP
Speed r.p.m.	:	2840
Electric Supply	:	230/400V, 50Hz, 3 phase
Full Load Amps	:	4.7
Length of Cable, Metres	:	20
Method of Starting	:	Direct On Line
Level Controls	:	Hydroranger Plus ultrasonics with float switch back-up
Chamber Diameter mm	:	2400
Chamber Depth, Metres	:	4.9
Pipes and Valves mm	:	80
Final Discharge mm	:	80
Pipe Material	:	Ductile iron
Access Cover (s)	:	Steelway Prolift FACTA B for inlet manhole, wet well and valve chamber
Inlet Connection (s)	:	Penstock valve and baffle plate
Layout Drg./Design Sheet	:	A5746-01 ,02 , 03, 04 & 05

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**FOUL WATER PUMPING STATION
SPECIFICATION FOR
GUIDERAIL MOUNTED SEWAGE PUMPS & ACCESSORIES**

**SEWERS FOR ADOPTION 7TH EDITION SPECIFICATION
INCLUDING SWS SUPPLEMENTARY ADDENDUM MED4006 ISSUE 1**

PUMP:

Single stage fully submersible pump with cast iron case and impeller which is securely locked to the fully protected motor shaft extension. Impeller as data section.

SEAL CHAMBER:

Buffer chamber between pump and motor, charged with oil retained by opposing seals.

MOTOR:

Squirrel cage induction motor of watertight IP68 enclosure suitable for continuous service and having Klixon lock out circuit for over-temperature protection on Explosion Proof motors.

CABLE:

Suitable length(s) of multi-core VRI PCP sheathed flexible cable connected through watertight gland(s) to the motor windings.

DUCKFOOT:

Cast iron floor fixing duckfoot bend incorporating guiderail socket(s) and self-locating bottless pump quick release coupling.

GUIDERAILS:

Stainless steel rail(s) for attachment to cover slab or ground level steelwork and extending to duck foot sockets. Complete with necessary location brackets.

LIFTING CHAINS:

Nylon Rope Lifting System

REFLUX VALVE:

Fullway pattern delivery non-return valve.

SLUICE VALVE:

Fullway pattern isolating sluice valve with non-rising spindle and hand wheel.

PIPES:

From duckfoot through to defined point for rising main connection, incorporating the valves and, in case of multi-pump system, an appropriately sized manifold. All fitting connections appropriate to materials employed.

LEVEL CONTROLS:

Hydroranger Plus ultrasonic level control unit as data sheet complete with submersible transducer, bracket and cable to control panel, with float switches for ultrasonic backup control and high-level alarm functions.

ACCESS COVERS:

Inlet Chamber – Steelway Stamp Lock Pro Lift Access Cover and Frame providing a clear opening of 1000mm x 750mm complete with torsion spring assisted lift galvanised steel lids, self locating safety stays, recessed pad lock facility, 2 no turn catch locking devices, hinged internal safety grids for fall protection, demountable barriers and posts.

Pump Chamber – Steelway Stamp Lock Pro Lift Access Cover and Frame providing a clear opening of 1500mm x 900mm complete with torsion spring assisted lift TWIN galvanised steel lids, self locating safety stays, recessed pad lock facility, 2 no turn catch locking devices, hinged internal safety grids for fall protection, demountable barriers and posts.

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Valve Chamber – Steelway Stamp Lock Pro Lift Access Cover and Frame providing a clear opening of 2400mm x 1800mm complete with torsion spring assisted lift galvanised steel lids, self locating safety stays, recessed pad lock facility, 2 no turn catch locking devices, hinged internal safety grids for fall protection, demountable barriers and posts.

LIFTING EQUIPMENT:

- 1 - Reid type ADV500 lifting davit
- 1 - Reid davit socket to suit the above lifting davit

KIOSK:

GRP, floor fixing three door weatherproof lockable enclosure in deep green textured finish, provisional dimensions 1750H x 2000W x 750D containing a full sized backboard on which would be mounted / provided:-

- a) Control panel as specified.
- b) Anti condensation heater and thermostat.
- c) Interior light and switch.
- d) Set of suitably rated double insulated cable tails for connection to Electricity Board meters.
- e) Minimum 600 x 450 clear space for the mounting of Electricity Board meters.
- f) CSE Servelec S250 Telemetry.

The whole of the above being suitably interconnected and earth bonded extended to all non-conductive steelwork within the pump station in 16mm² cable to provide a complete P.M.E system.

GENERATOR EARTH:

Comprising a copper electrode to be driven into the ground adjacent to the control kiosk, a concrete inspection pit and interconnecting cable to the panel.

ANCILLARY EQUIPMENT:

- 1. Lever arm and weights on non-return valves
- 2. Guards on non-return valves
- 3. Pressure tappings on valve chamber pipe work
- 4. 100mm Bauer coupling on over pumping tee
- 5. Rubber matting in control panel kiosk
- 6. Three copies of Operating and Maintenance Manuals plus drawings to Pims Pumps standard format.
- 7. 150mm NB Inlet Penstock Valve C/w Extension Spindle, brackets, tee key and surface box.
- 8. 150mm Baffle Plate

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Appendix B

Hydraulic Calculations, System Curves and Performance Curves and Dimensional Data

Clients Name MJA Consulting		Quote Ref PR18423
Site Address Denvilles Havant		Date 03.04.14

Adopting Authority Southern Water Station Type Foul / Storm Foul Number of Dwellings 191 Impermeable Area Number of Pumps 2 Number of Duty Pumps 1	Rainfall Intensity Per Hour mm	
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Cover Level 13.400 VC Outlet 12.260 Flood Level 12.190 Inlet 9.900 HLA 9.700 P2 Start 9.550 P1 Start 9.400 Mid Water 9.100 Stop Level 8.800 Dead Area 300 Base Level 8.500	Depth to Outlet 1.140 Inlet To Stop 1.100 Depth Below Inlet 1.400 Take Duty From 8.800	High Point 12.600 Length to High Point 170.0 Rising Main Length 259.5 Discharge 11.700 FALL -0.560 <table style="width:100%; margin-top: 10px;"> <tr> <td>Design Flow Discharge</td> <td>8.84</td> <td>4.42</td> </tr> <tr> <td>Calc Discharge Rate</td> <td>6.1</td> <td></td> </tr> <tr> <td>Design Discharge Rate</td> <td>80</td> <td></td> </tr> <tr> <td>Rising Main I.D</td> <td>1.21</td> <td></td> </tr> <tr> <td>Velocity in Main</td> <td></td> <td></td> </tr> <tr> <td>Storage at 160L / Dwelling</td> <td>30560</td> <td></td> </tr> <tr> <td>Capacity In Sewers Only</td> <td>30560</td> <td></td> </tr> <tr> <td>Above Inlet and Below Spill</td> <td></td> <td></td> </tr> <tr> <td>Capacity Above HLA & Below Inlet</td> <td>904.7787</td> <td></td> </tr> </table> <table style="width:100%; margin-top: 10px;"> <tr> <td>Wet Well Diameter</td> <td>2400 mm</td> <td>Volume Per M</td> <td>4523.893 litres</td> </tr> <tr> <td>Calc Chamber Depth</td> <td>4.412 m</td> <td>Depth Between Starts</td> <td>150 mm</td> </tr> <tr> <td>Actual Chamber Depth</td> <td>4.900 m</td> <td></td> <td></td> </tr> <tr> <td>Max Theoretical Starts</td> <td>7.50</td> <td>Theoretical Op Volume</td> <td>732.00 litres</td> </tr> <tr> <td>Actual Starts</td> <td>2.06</td> <td>Actual Op Volume</td> <td>2714.34 litres</td> </tr> <tr> <td></td> <td></td> <td>Rising Main Volume</td> <td>1304.42</td> </tr> <tr> <td></td> <td></td> <td>Combined Main and Op Vol</td> <td>4018.76</td> </tr> </table> <table style="width:100%; margin-top: 10px;"> <tr> <td>Dwf Inflow Per Day</td> <td>115757.58</td> <td></td> <td></td> </tr> <tr> <td>No. of Main Clears per Day</td> <td>28.80</td> <td></td> <td></td> </tr> <tr> <td>Retention Hrs Full Usage</td> <td>0.83</td> <td></td> <td></td> </tr> <tr> <td>Retention Hrs Half Usage</td> <td>1.67</td> <td></td> <td></td> </tr> </table>	Design Flow Discharge	8.84	4.42	Calc Discharge Rate	6.1		Design Discharge Rate	80		Rising Main I.D	1.21		Velocity in Main			Storage at 160L / Dwelling	30560		Capacity In Sewers Only	30560		Above Inlet and Below Spill			Capacity Above HLA & Below Inlet	904.7787		Wet Well Diameter	2400 mm	Volume Per M	4523.893 litres	Calc Chamber Depth	4.412 m	Depth Between Starts	150 mm	Actual Chamber Depth	4.900 m			Max Theoretical Starts	7.50	Theoretical Op Volume	732.00 litres	Actual Starts	2.06	Actual Op Volume	2714.34 litres			Rising Main Volume	1304.42			Combined Main and Op Vol	4018.76	Dwf Inflow Per Day	115757.58			No. of Main Clears per Day	28.80			Retention Hrs Full Usage	0.83			Retention Hrs Half Usage	1.67		
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Retention Calcs Assume Ascending Main

	Rising Main	Common 2	Common 1	Individual 3	Individual 2	Individual 1
Flow Rate (l/sec)	6.10	6.10	6.10	6.10	6.10	6.10
Static Head (M)	2.90					
Pipe Diameter (mm)	80.00	80	80	80	80	80
Velocity (M/sec)	1.21	1.21	1.21	1.21	1.21	1.21
Roughness Factor	0.15	0.15	0.15	0.15	0.15	0.15
Pipe length (M)	259.506				8	
Duckfoot Bend						1
Short Radius Bends					1	
Long Radius Bends					1	
Tee Straight through		1			2	
Tee through branch						
Radial Tee thro Branch						
Sluice Valve					1	
Non Return Valve					1	
Bellmouth inlet						
Sharp Taper						
Standard Taper						
Equivalent Pipe Length (M)	259.506	0.88	0	0	18.08	2.72
Reynolds Number	8.5E+04	8.5E+04	8.5E+04	8.5E+04	8.5E+04	8.5E+04
Darcy-Weisbach Friction Factor	0.0251	0.0251	0.0251	0.0251	0.0251	0.0251
Velocity Head	0.075	0.075	0.075	0.075	0.075	0.075
Hydraulic (Piezometric) gradient	0.0235	0.0235	0.0235	0.0235	0.0235	0.0235
Friction Head Loss	6.633	0.021	0.000	0.000	0.425	0.064

Calc Duty Point 6.10 L/S	Total Head 10.12 M	Static Head 2.90 M
Pump Selection NP3085SH	Impeller 256	Kw Rating 2.4
Actual Duty 6.20 L/S	Head 10.30 M	
Surge Analysis NOT REQUIRED		



PERFORMANCE CURVE

PRODUCT

NP3085.092

TYPE

SH

DATE

2014-04-03

PROJECT

Manor Farm, Copseys, Denvilles

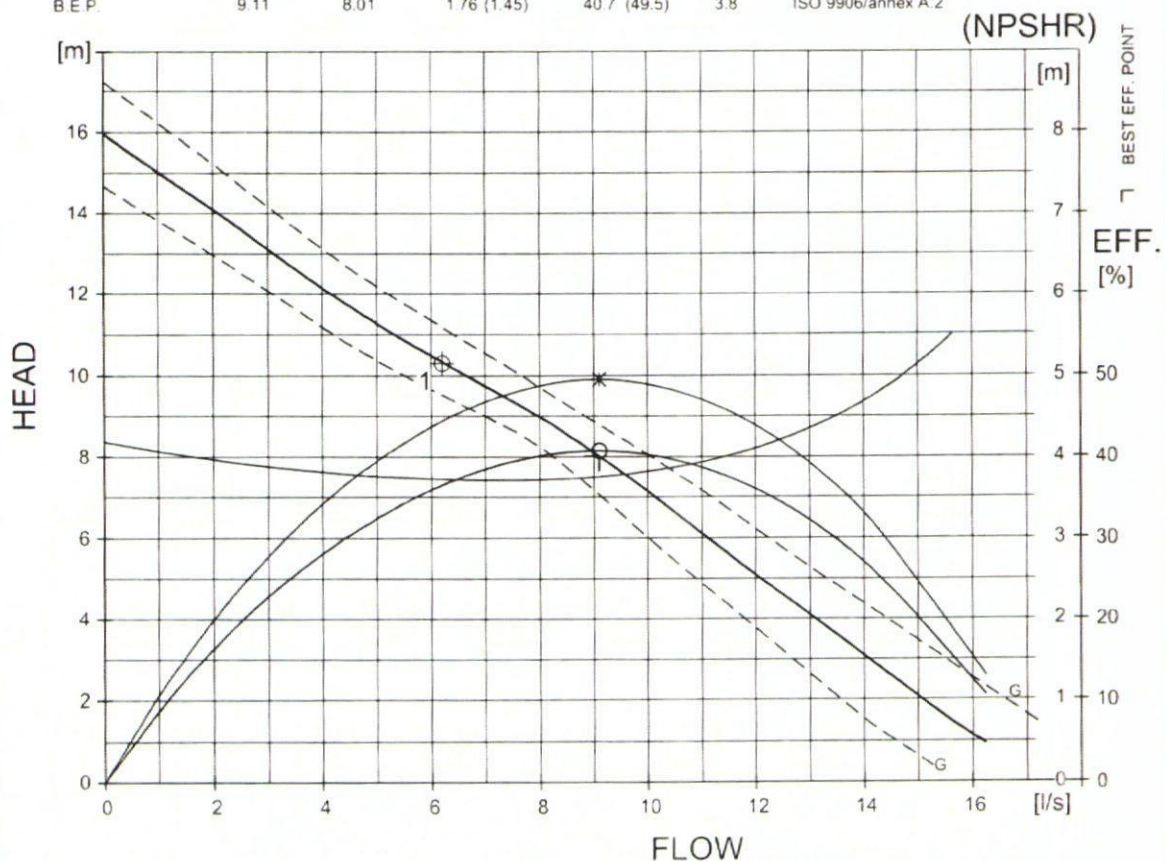
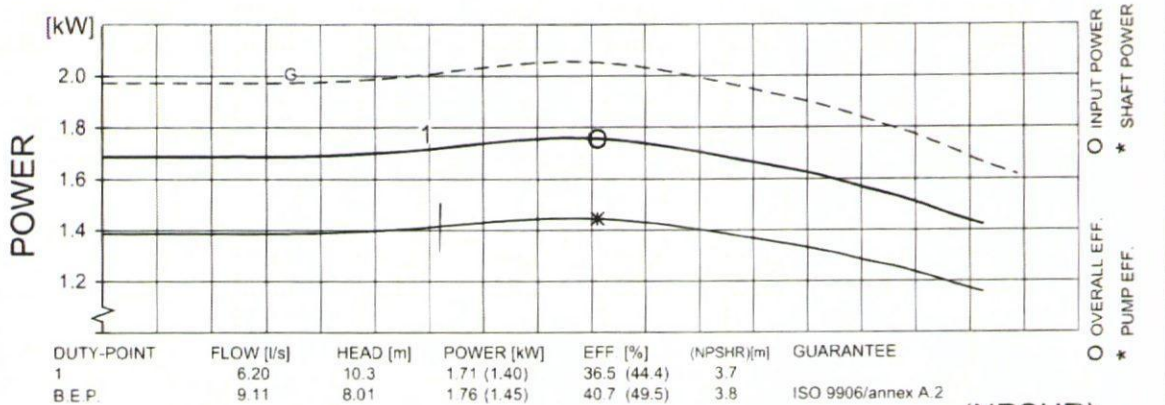
CURVE NO

53-256-00-2456

ISSUE

1

	1/1-LOAD	3/4-LOAD	1/2-LOAD	RATED POWER	2.4 kW	IMPELLER DIAMETER		
POWER FACTOR	0.92	0.89	0.82	STARTING CURRENT	28 A	116 mm		
EFFICIENCY	80.5 %	82.5 %	82.0 %	RATED CURRENT	4.7 A	MOTOR #	STATOR	REV
MOTOR DATA	---	---	---	RATED SPEED	2840 rpm	15-09-2AL	31Y	11
COMMENTS	INLET/OUTLET			TOT. MOM OF INERTIA	0.0060 kgm2	FREQ.	PHASES	VOLTAGE
	- / 80 mm			NO. OF BLADES	2	50 Hz	3	400 V
	IMP. THROUGHLET					GEARTYPE	RATIO	
	---					---	---	

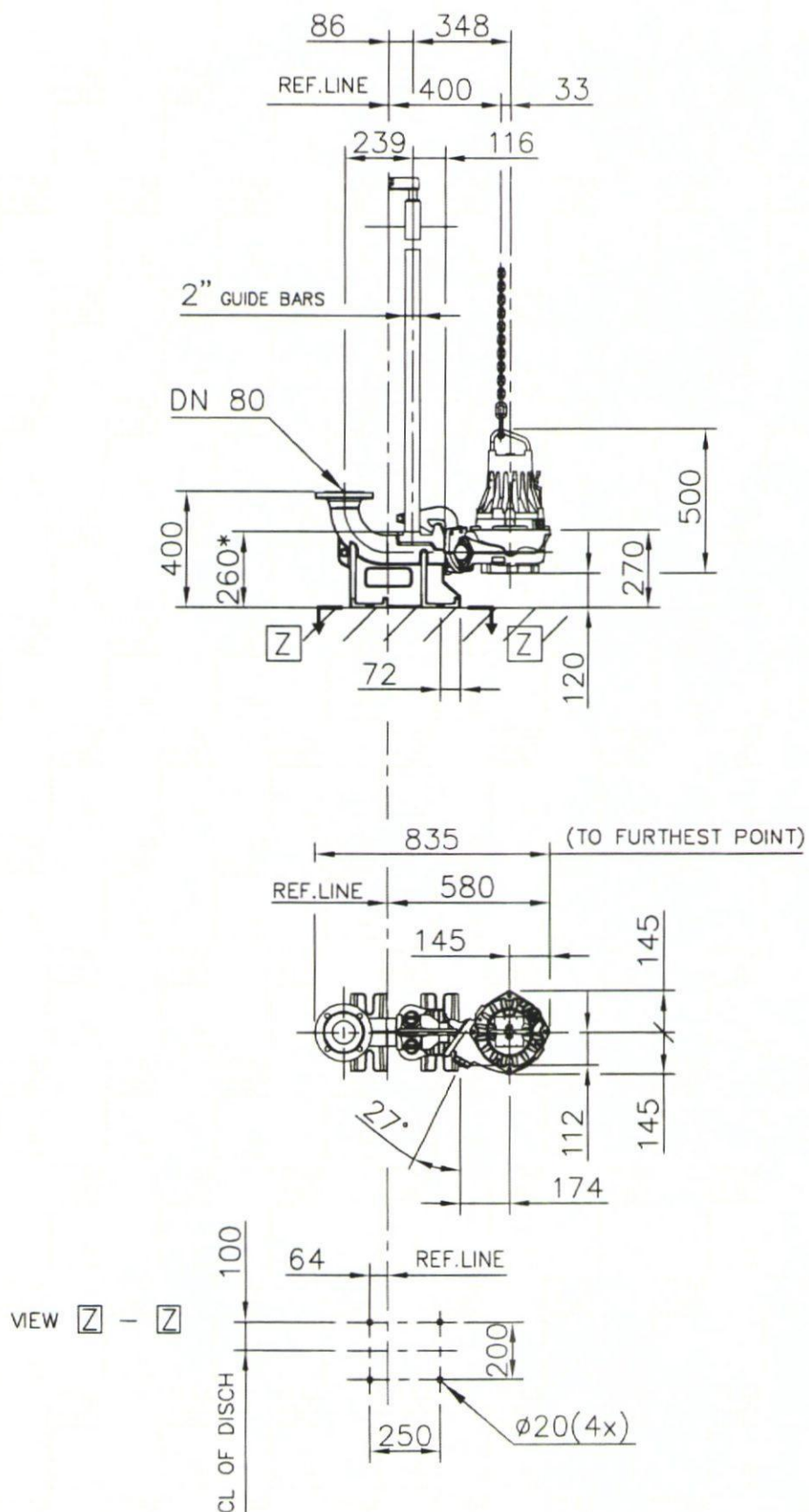


(NPSHR) = (NPSH3) + margins

Performance with clear water and ambient temp 40 °C

GUARANTEE BETWEEN LIMITS (G) ACC TO

ISO 9906/annex A.2



* DIMENSION TO ENDS OF GUIDE BARS

Weight (kg)	
Pump	Disch
68	35

AUTOCAD
DRAWING

Dimensional drwg
NP 3085 SH
DN 80

Drawn by NK
Scale 1:20
7332300

Checked by RB
Date 100316
Reg no 5399

1

Xylem Water Solutions AB
Gesällvägen 33, SE-174 87 Sundbyberg
Tel +46 8 475 60 00 Fax +46 8 475 69 00



To whom it may concern

November 22, 2012

Flygt products for use in pump stations

According to a statement made by the European Pump Manufacturer's Association (Europump), a submersible pump shall not run dry. This has been determined based on risk analyses made for the directive on "Products for use in potentially explosive environment" (ATEX).

In the care of maintenance manuals for our Ex products, we state that the stop level in an installation with regards to our products should be above the pump housing.

However, in certain installations, it is safe to run the "Ex" pump to a stop level equal to the pump inlet level "snore" for a short period, not exceeding 3 seconds, to perform a cleaning function in the pump sump.

The reason for this statement is that during such short periods there is always the presence of liquid around and in the inlet to the pump thus making it safe from the emergence of sparks and heat.

It is not however, permissible to allow a pump to run for extended periods on "snore". The control system should initiate a stop condition once "snore" has been detected.

Xylem Water Solutions AB
Approval Coordinator

Anders Edh



Duty Analysis - Duty conditions



Project: Manor Farm, Copseys, Denvilles
Created by: Paul Warner

Client's Name	MJA Consulting	Quote Ref	PR18423
Site Address	Denvilles Havant	Date	03.04.14

Adopting Authority

Southern Water

Station Type Foul / Storm

Foul

Number of Dwellings

191

Impermeable Area

Number of Pumps

2

Number of Duty Pumps

1

Rainfall Intensity Per Hour

mm

High Point

12.600

Discharge

11.700

FALL

-0.560

Cover Level

13.400

VC Outlet

12.260

Flood Level

12.190

Inlet

9.900

HLA

9.700

P2 Start

9.550

P1 Start

9.400

Mid Water

9.100

Stop Level

8.800

Dead Area

300

Base Level

8.500

Depth to Outlet

1.140

Inlet To Stop

1.100

Depth Below Inlet

1.400

Take Duty From

8.800

Length to High Point

170.0

Rising Main Length

259.5

Calc Discharge Rate

8.84

4.42

Design Discharge Rate

6.1

Rising Main I.D

80

Velocity in Main

1.21

Storage at 160L / Dwelling

30560

Capacity In Sewers Only

30560

Above Inlet and Below Spill

Capacity Above HLA & Below Inlet

904.7787

Wet Well Diameter

2400

mm

Calc Chamber Depth

4.412

m

Actual Chamber Depth

4.900

m

Max Theoretical Starts

7.50

Actual Starts

2.06

Dwf Inflow Per Day

115757.58

No. of Main Clears per Day

28.80

Retention Hrs Full Usage

0.83

Retention Hrs Half Usage

1.67

Volume Per M

4523.893

litres

Depth Between Starts

150

mm

Theoretical Op Volume

732.00

litres

Actual Op Volume

2714.34

litres

Rising Main Volume

1304.42

Combined Main and Op Vol

4018.76

Retention Calcs Assume Ascending Main

Flow Rate (l/sec)

6.10

6.10

6.10

6.10

6.10

6.10

Static Head (M)

2.90

Pipe Diameter (mm)

80.00

80

80

80

80

80

Velocity (M/sec)

1.21

1.21

1.21

1.21

1.21

1.21

Roughness Factor

0.15

0.15

0.15

0.15

0.15

0.15

Pipe length (M)

259.506

8

Duckfoot Bend

1

Short Radius Bends

1

Long Radius Bends

1

Tee Straight through

1

2

Tee through branch

Radial Tee thro Branch

Sluice Valve

1

Non Return Valve

1

Bellmouth inlet

Sharp Taper

Standard Taper

Equivalent Pipe Length (M)

259.506

0.88

0

0

18.08

2.72

Reynolds Number

8.5E+04

8.5E+04

8.5E+04

8.5E+04

8.5E+04

8.5E+04

Darcy-Weisbach Friction Factor

0.0251

0.0251

0.0251

0.0251

0.0251

0.0251

Velocity Head

0.075

0.075

0.075

0.075

0.075

0.075

Hydraulic (Piezometric) gradient

0.0235

0.0235

0.0235

0.0235

0.0235

0.0235

Friction Head Loss

6.633

0.021

0.000

0.000

0.425

0.064

Calc Duty Point

6.10

L/S

Total Head

10.12

M

Static Head

2.90

M

Pump Selection

NP3085SH

Impeller

256

Kw Rating

2.4

Actual Duty

6.20

L/S

Head

10.30

M

Surge Analysis

NOT REQUIRED



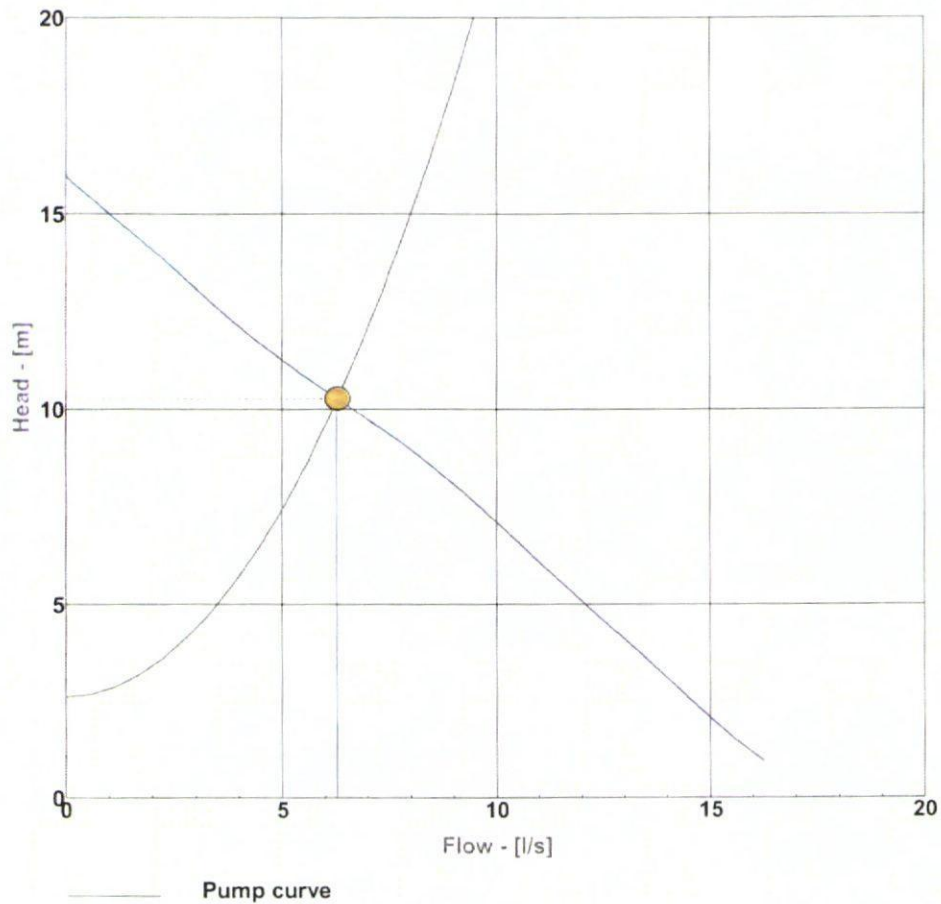
Duty Analysis - Duty conditions



Project: Manor Farm, Copseys, Denvilles

Created by: Paul Warner

MID WATER LEVEL



1 NP 3085 53-256-00-2456

PRODUCT DATA

Rat. pow.: 2.4 kW

Imp.diam.: 116 mm

Vanes: 2

Throughlet: 0 mm

DUTY CONDITIONS

No of pumps: 1

Flow: 6.3 l/s

Head: 10.3 m

Shaft power: 1.4 kW

Hydraulic efficiency: 44.7 %

Specific energy: 0.0761 kWh/m³

(NPSHR): 3.7 m

Flygt



ITT Industries



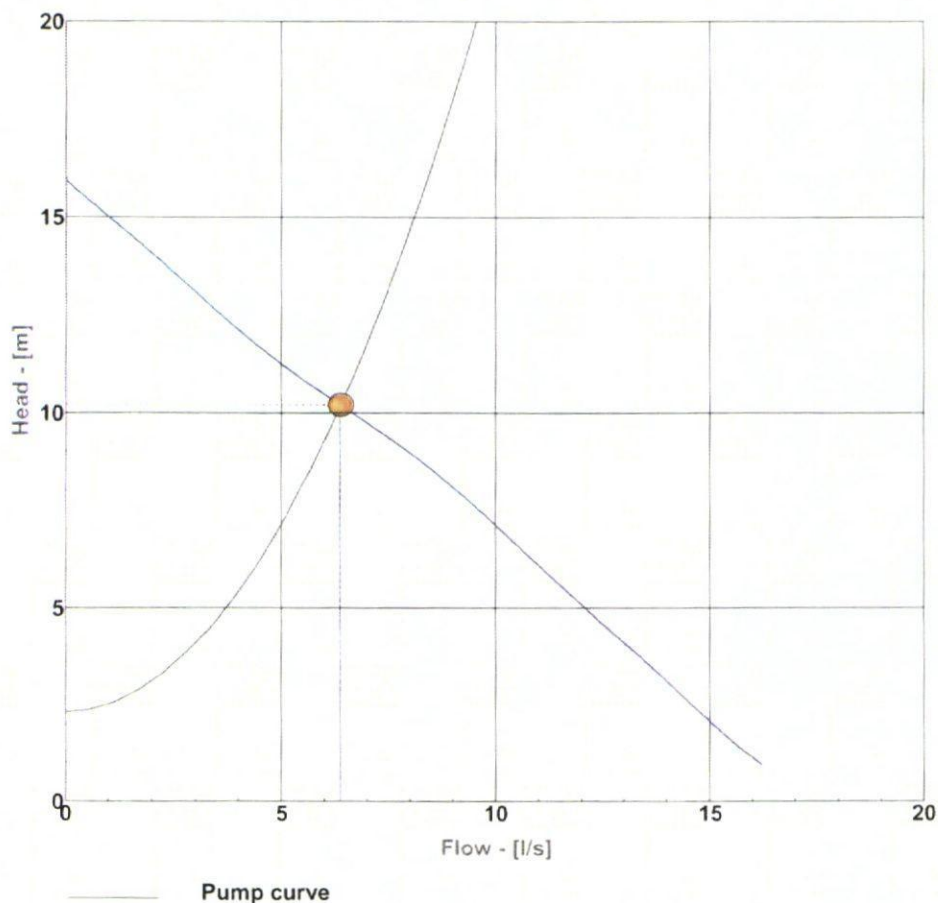
Duty Analysis - Duty conditions



Project: Manor Farm, Copseys, Denvilles

Created by: Paul Warner

DUTT PUMP START



1 NP 3085 53-256-00-2456

PRODUCT DATA

Rat. pow.: 2.4 kW

Imp.diam.: 116 mm

Vanes: 2

Throughlet: 0 mm

DUTY CONDITIONS

No of pumps: 1

Flow: 6.4 l/s

Head: 10.2 m

Shaft power: 1.4 kW

Hydraulic efficiency: 45.0 %

Specific energy: 0.0751 kWh/m³

(NPSHR): 3.7 m

Flygt





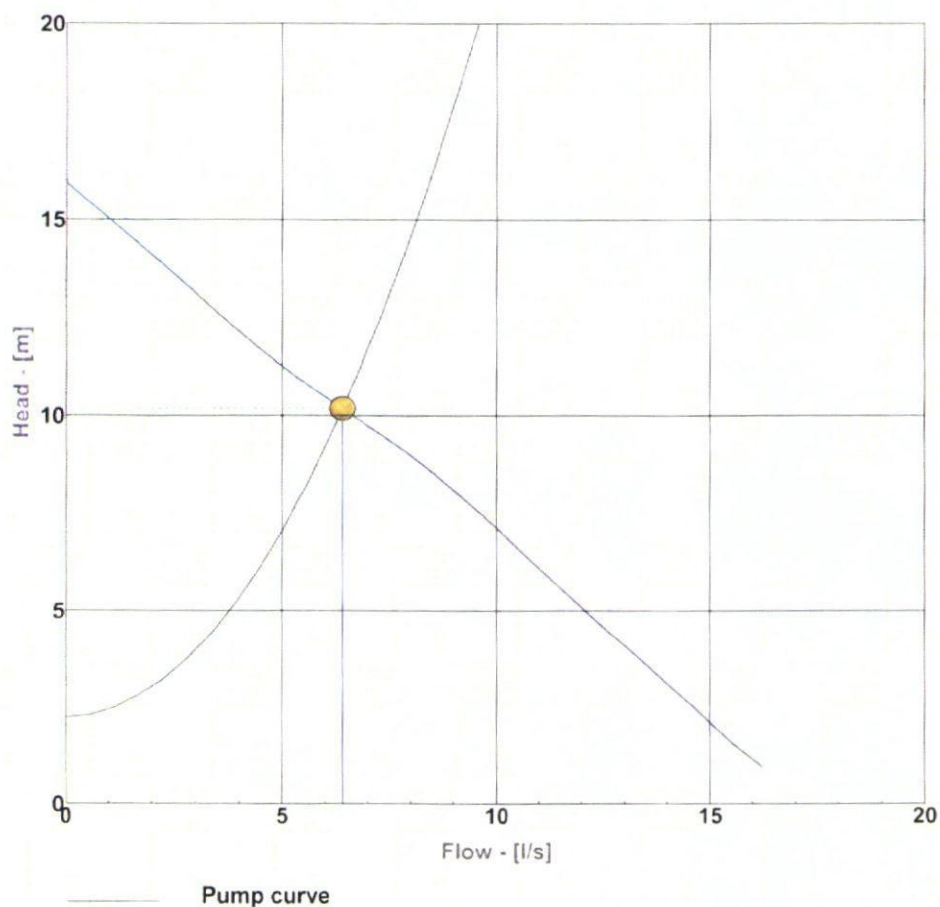
Duty Analysis - Duty conditions



Project: Manor Farm, Copseys, Denvilles

Created by: Paul Warner

STANDBY PUMP START



1 NP 3085 53-256-00-2456

PRODUCT DATA

Rat. pow.: 2.4 kW

Imp.diam.: 116 mm

Vanes: 2

Throughlet: 0 mm

DUTY CONDITIONS

No of pumps: 1

Flow: 6.4 l/s

Head: 10.2 m

Shaft power: 1.4 kW

Hydraulic efficiency: 45.1 %

Specific energy: 0.0747 kWh/m³

(NPSHR): 3.7 m

Flygt



ITT Industries



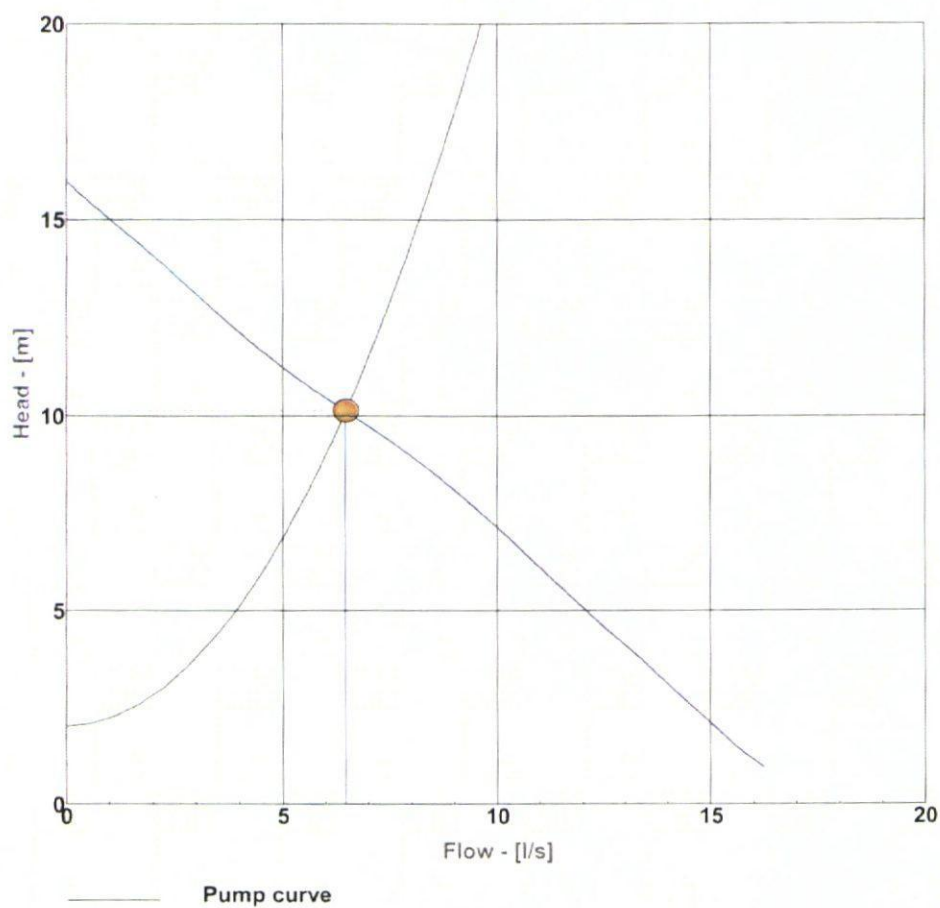
Duty Analysis - Duty conditions



Project: Manor Farm, Copseys, Denvilles

Created by: Paul Warner

HIGH LEVEL MATH



1 NP 3085 53-256-00-2456

PRODUCT DATA

Rat. pow.: 2.4 kW

Imp.diam.: 116 mm

Vanes: 2

Throughlet: 0 mm

DUTY CONDITIONS

No of pumps: 1

Flow: 6.5 l/s

Head: 10.1 m

Shaft power: 1.4 kW

Hydraulic efficiency: 45.3 %

Specific energy: 0.0741 kWh/m³

(NPSHR): 3.7 m

Flygt



ITT Industries



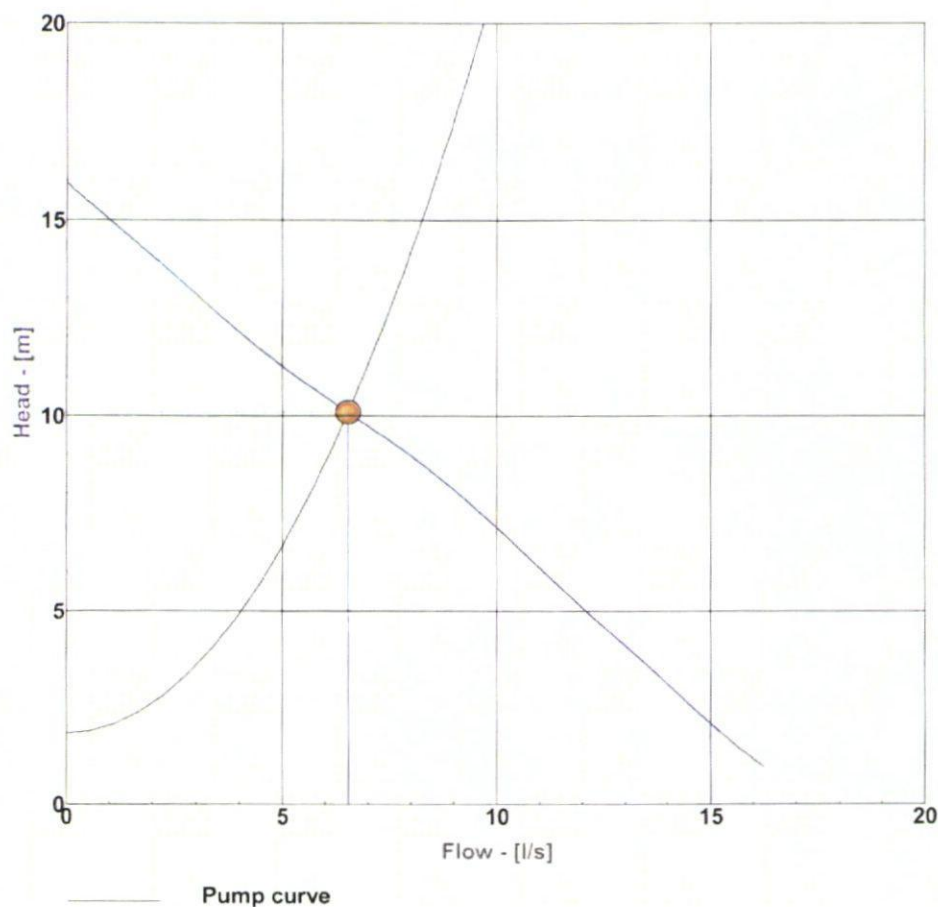
Duty Analysis - Duty conditions



Project: Manor Farm, Copseys, Denvilles

Created by: Paul Warner

INLET



1 NP 3085 53-256-00-2456

PRODUCT DATA

Rat. pow.: 2.4 kW

Imp.diam.: 116 mm

Vanes: 2

Throughlet: 0 mm

DUTY CONDITIONS

No of pumps: 1

Flow: 6.5 l/s

Head: 10.1 m

Shaft power: 1.4 kW

Hydraulic efficiency: 45.5 %

Specific energy: 0.0735 kWh/m³

(NPSHR): 3.7 m

Flygt





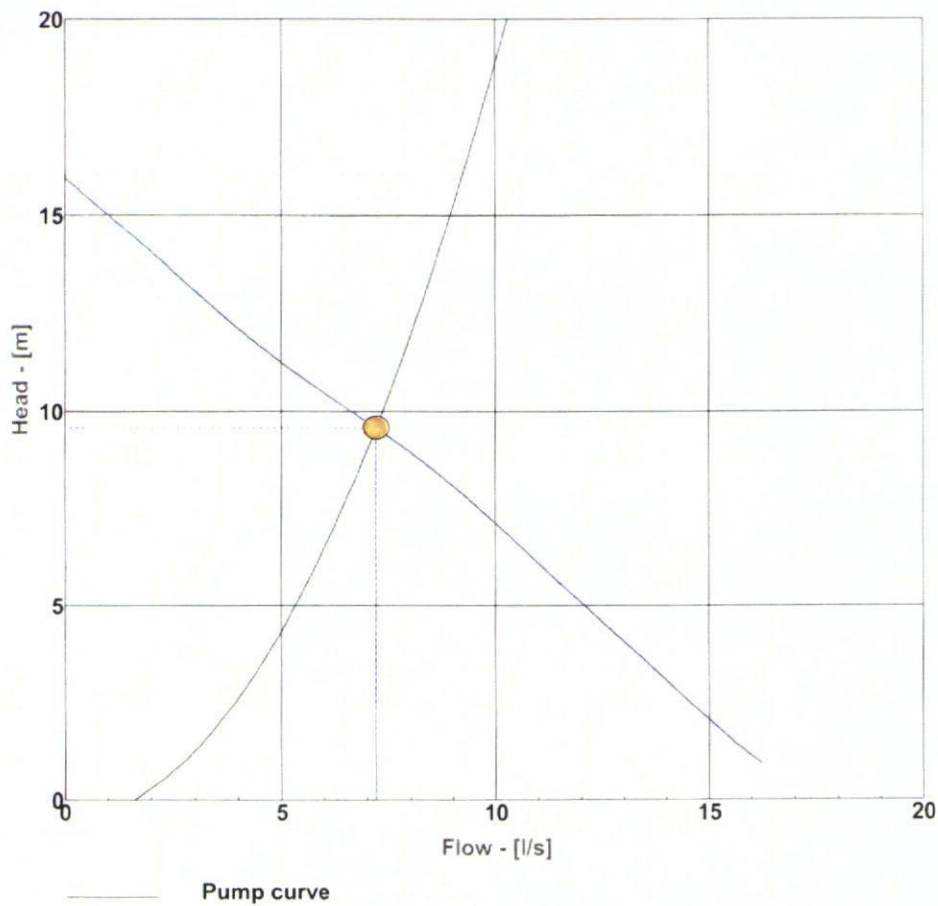
Duty Analysis - Duty conditions



Project: Manor Farm, Copseys, Denvilles

Created by: Paul Warner

MAY SURCHARGE LEVEL 12.193M



1 NP 3085 53-256-00-2456

PRODUCT DATA

Rat. pow.: 2.4 kW

Imp.diam.: 116 mm

Vanes: 2

Throughlet: 0 mm

DUTY CONDITIONS

No of pumps: 1

Flow: 7.2 l/s

Head: 9.6 m

Shaft power: 1.4 kW

Hydraulic efficiency: 47.3 %

Specific energy: 0.0671 kWh/m³

(NPSHR): 3.7 m

Flygt



ITT Industries

Manor Farm, Copseys, Denvilles
Foul Water Pump Station

Xylem Water Solutions UK Ltd
Ref: PR18423

Appendix C
Storage Calculations

Storage

PIMS Pumps Limited
106 Hawley Lane
Farnborough
Hampshire GU14 8QE
Tel: 01252 513366
Fax: 01252 516404

Quote Reference PR18423

Date 28.02.14

Client: MJA Consulting
Scheme: Denvilles Havant

Location Of First Flood: OFF F4
Level of First Flood (M): 12.19

Number of Dwellings: 191
Storage in Cu M: 30.560 160L / Dwelling

Storage In Manholes

Manhole Reference	Manhole Diameter (mm)	First Flood Level (M)	Cover Level (M)	Invert Level (M)	Effective Volume (Cu M)
F34 INLET	1200	12.190	13.400	9.950	2.533
F1	1200	12.190	13.430	10.050	2.420
F2	1200	12.190	13.870	10.185	2.268
F3	1200	12.190	13.870	10.385	2.041
F4	1200	12.190	13.870	10.528	1.880
F5	1200	12.190	13.850	10.835	1.532
F6	1200	12.190	14.040	11.210	1.108
F25	1200	12.190	14.425	11.720	0.532
F26	1200	12.190	14.410	11.850	0.385
F27	1200	12.190	14.874	12.038	0.172
F35	1200	12.190	14.877	12.245	0.000
F28	1200	12.190	14.687	12.425	0.000
F29	1200	12.190	14.602	12.711	0.000
F30	1200	12.190	14.772	12.878	0.000
F31	1200	12.190	14.519	13.065	0.000
F36	1200	12.190	14.633	13.205	0.000
F37	1200	12.190	14.601	13.341	0.000
F38	1200	12.190	14.645	13.645	0.000
F33	1200	12.190	14.223	13.225	0.000
F32	1200	12.190	14.615	11.960	0.260
F41	1200	12.190	14.735	13.374	0.000
F39	1200	12.190	14.510	13.574	0.000
F40	1200	12.190	14.200	12.540	0.000
F7	1200	12.190	14.420	12.673	0.000
F8	1200	12.190	14.470	12.843	0.000
F9	1200	12.190	14.500	12.970	0.000
F10	1200	12.190	14.584	13.235	0.000
F11	1200	12.190	14.669	13.305	0.000
F12	1200	12.190	14.790	13.480	0.000
F21	1200	12.190	14.070	12.167	0.026
F22	1200	12.190	14.120	12.327	0.000
F23	1200	12.190	14.440	12.500	0.000
F13	1200	12.190	13.870	11.740	0.509
F15	1200	12.190	13.870	12.000	0.215
F16	1200	12.190	14.070	12.198	0.000
F17	1200	12.190	14.170	12.278	0.000
F18	1200	12.190	14.250	12.505	0.000
F19	1200	12.190	14.250	12.642	0.000
F20	1200	12.190	14.230	12.800	0.000

Storage

Total Storage Available In Manholes Below Flood Level Detailed Above					15.881
Storage In Gravity Sewers					
Gravity Run	Gravity Drain Diameter(mm)	First Flood Level (M)	Length (M)	Upper Invert (M)	Effective Volume (Cu M)
F38-F37	100	12.190	19.900	13.645	0.000
F37-F36	150	12.190	20.400	13.341	0.000
F36-F31	150	12.190	21.100	13.205	0.000
F31-F30	150	12.190	28.000	13.065	0.000
F30-F29	150	12.190	24.800	12.878	0.000
F29-F28	150	12.190	12.800	12.711	0.000
F33-F28	100	12.190	60.000	13.225	0.000
F28-F35	150	12.190	26.900	12.425	0.000
F35-F27	150	12.190	31.100	12.245	0.000
F27-F26	150	12.190	27.800	12.038	0.491
F26-F25	150	12.190	18.700	11.850	0.330
F40-F32	100	12.190	42.100	12.540	0.000
F39-F41	100	12.190	16.000	13.650	0.000
F41-F32	100	12.190	27.700	13.450	0.000
F32-F25	150	12.190	28.700	11.960	0.507
F25-F6	150	12.190	76.200	11.720	1.347
F12-F11	150	12.190	26.000	13.480	0.000
F11-F10	150	12.190	10.400	13.305	0.000
F10-F9	150	12.190	39.900	13.235	0.000
F9-F8	150	12.190	18.600	12.970	0.000
F8-F7	150	12.190	25.400	12.843	0.000
F7-F6	150	12.190	61.100	12.673	0.000
F6-F5	150	12.190	55.700	11.210	0.984
F5-F4	150	12.190	45.800	10.835	0.809
F23-F22	150	12.190	25.900	12.500	0.000
F22-F21	150	12.190	24.000	12.327	0.000
F21-F4	150	12.190	24.600	12.167	0.000
F4-F3	150	12.190	51.200	10.528	0.905
F3-F2	150	12.190	51.200	10.385	0.905
F20-F19	150	12.190	23.600	12.800	0.000
F19-F18	150	12.190	20.400	12.642	0.000
F18-F17	150	12.190	34.000	12.505	0.000
F17-F16	150	12.190	12.000	12.278	0.000
F16-F15	150	12.190	29.600	12.198	0.000
F15-F13	150	12.190	39.000	12.000	0.689
F13-F2	150	12.190	9.400	11.740	0.166
F2-F1	150	12.190	18.400	10.185	0.325
F1-INLET	150	12.190	10.000	10.050	0.177
INLET-WW	150	12.190	1.000	9.950	0.018
Total Storage Available In Gravity Pipes Below Flood Level Detailed Above					7.654
Storage In Wet Well					
	Wet Well Diameter(mm)	First Flood Level (M)		High Level Alarm (M)	Effective Volume (Cu M)
Pump Station	2400	12.190		9.700	11.264
Total Storage Available In Wet Well Below Flood Level Detailed Above					11.264
Total Volume Required in Cu M		30.560	Total Volume Available in Cu M		34.799

**Manor Farm, Copseys, Denvilles
Foul Water Pump Station**

**Xylem Water Solutions UK Ltd
Ref: PR18423**

**Appendix D
Hazardous Area Certification**



INERIS

INSTITUT NATIONAL DE L'ENVIRONNEMENT
INDUSTRIEL ET DES RISQUES

Parc Technologique ALATA
B.P. N° 2 - 60550 Verneuil-en-Halatte - France
Tel : (33) 03 44 55 66 77 - Fax : (33) 03 44 55 67 04
E-mail : ineris@ineris.fr

(2) **Equipments and protection systems intended for use in potentially explosive atmospheres
Directive 94/9/CE**

(1) **EC-TYPE EXAMINATION CERTIFICATE**

(3) Number of the EC type examination certificate: **INERIS 00ATEX0044 X**

(4) Protection apparatus or system:

PUMP TYPE 596 98 00

(5) Manufacturer: **ITT FLYGT AB**

(6) Address: **Svetsarvägen 12,
Box 1309
17125 SOLNA
SWEDEN**

(7) This protection system or equipment and any other acceptable alternative of this one are described in the annex of this certificate and the descriptive documents quoted in this annex.

(8) The INERIS, notified body and identified under number 0080, in accordance with article 9 of Council Directive 94/9/CE 23 the Mars 1994, certifies that this protection system or equipment fulfills the Essential of Health and Safety Requirements relating to the design and construction of equipments and protection systems intended for use in potentially explosive atmospheres, described in appendix II of the Directive.

The examinations and the tests are consigned in official report N° 15938/00.

(9) The respect of the Essential Health and Safety Requirements is ensured by:

- conformity with:

EN 50 014 of June	1997
EN 50 018 of August	1994
EN 1127-1 of June	1997

- specific solutions adopted by the manufacturer to meet the Essential Health and Safety Requirements described in the descriptive documents.

(10) Sign X, when it is placed following the Number of the EC type examination certificate, indicates that this equipment and protection system is subjected to the special conditions for safe use, mentioned in the annex of this certificate.

- (11) This certificate of examination EC of the type refers only to the design and the construction of the apparatus or protection system specified. If necessary, other requirements of this Directive will be imposed on the manufacture and the supply of this apparatus or protection system.
- (12) The marking of the equipment or the protection system will have to contain:

 II 2 G

EEx d IIB T4

Verneuil-en-Halatte, 2000 12 20



X. LEFEBVRE

Engineer at the Laboratory for Certification of
ATEX equipment



The Director of the Organisation Certified,
By delegation
B. PIQUETTE
Deputy manager of Certification



(13)

ANNEX

(14)

EC TYPE EXAMINATION CERTIFICATE n° INERIS 00ATEX0044 X

(15)

DESCRIPTION OF THE EQUIPMENT OR THE PROTECTION SYSTEM

Electric pump motor type 596 98 00 intended to equip a submersible mixer or pump. The motor is fitted with thermal probes in windings which ensure its temperature classification.

Connection with the external electric circuits is ensured by the intermediary of cable entries having a certificate of equipment or/and a certificate of component Ex.

Parameters relating to the safety

- . Supply voltage : up to 1000 Volts.
- . Power according to version : from 1.3 kW to 3.8 kW

Characteristics of protections :

Limit of release of the probe : 125°C $\pm 6\%$ for a class T4

MARKING

Marking must be readable and indelible ; it must comprise the following indications:

- ITT FLYGT AB
Svetsarvägen 12,
Box 1309
17125 SOLNA
SWEDEN
- 596 98 00
- INERIS 00ATEX0044 X
- (serial number, if any)
- (year of construction)
-  II 2 G EEx d IIB T4
- Tamb : -20 °C to 90 °C
- DO NOT OPEN WHEN AN EXPLOSIVE GAS ATMOSPHERE MAY BE PRESENT
- DO NOT OPEN WHEN ENERGIZED
- CONNECT THERMAL PROBES

The whole of marking can be carried out in the language of the country of use.

The protection apparatus or system must also carry the marking normally envisaged by the standards of construction which relate to it.

ROUTINE EXAMINATIONS AND TESTS

The equipment is exempted of the routine test in accordance with 16.2 of the standard EN50018. The prototype having successfully undergone a static overpressure test of 46 bar.

(16) DESCRIPTIVE DOCUMENTS

The technical report is composed of the documents quoted hereafter, constituting the descriptive file of the apparatus, object of this certificate.

- | | |
|---|----------------------|
| - Descriptive notice (2 pages) | signed on 2000.11.28 |
| - Instructions | signed on 2000.11.28 |
| - Drawing n° 596 98 00 of the 2000.05.23 Rev. 6 | signed on 2000.10.02 |
| - Drawing n° 657 87 00 of the 2000.04.17 | signed on 2000.10.02 |

(17) SPECIAL CONDITIONS FOR SAFE USE

In order to respect the classification in temperature, the thermal contacts equipping the engine must be connected to a device cutting of the voltage supply of the engine when the probes reach their limit of operation, defined above.

The maximum possible temperature of 124 °C at the input cable entry is present in case of use in dry conditions.

The yield stress of the fastener elements of the envelope must be in conformity with the regulations of approval drawing n° 596 98 00 rev.6.

(18) ESSENTIAL REQUIREMENTS OF SAFETY AND HEALTH

The respect of the Essential Health and Safety Requirements is ensured by:

- conformity to the European standards EN 50 014, 50 018 and EN 1127-1,
- the whole of the provisions adopted by the manufacturer and described in the descriptive documents.

ADDITION

INERIS 00ATEX0044 X/01

PUMP TYPE 596 98 00

Made by ITT FLYGT AB

(15) - PURPOSE OF THE ADDITION

Update of descriptive documents in view to introduce a mechanical modification.

As a variation, the equipment shall be fitted with the cable entry type 597 63 00 X, INERIS 02ATEX9008 U.

Description of non-electrical part.

MARKING

Marking defined in the basic certificate is unchanged.

ROUTINE EXAMINATIONS AND TESTS

The routine verifications and tests stipulated by the basic certificate are unchanged.

(16) - DESCRIPTIVE DOCUMENTS

Documents referred to below, constitute the file describing the modifications of the apparatus and forming the subject of the present addition.

- Drawing n° 594 77 01 X Rev.01 of 2002.05.24 signed on 2002.05.24
- Drawing n° 596 98 00 Rev.07 of 2002.05.23 signed on 2002.05.23
- Drawing n° 597 63 00 X Rev.07 of 2002.05.07 signed on 2002.05.07

(17) - SPECIAL CONDITIONS FOR SAFE USE

The special conditions for safe use defined in the basic certificate are unchanged.

Verneuil-en-Halatte, 2002 12 17



X. LEFEBVRE

Engineer at the Laboratory of Certification
of Materials ATEX



Director of the Certifying Body,
By delegation
B. PIQUETTE
Deputy manager of Certification



ADDITION

INERIS 00ATEX0044 X/02

PUMP TYPE 596 98 00

Made by ITT FLYGT AB

(15) - PURPOSE OF THE ADDITION

Update of descriptive documents in view to introduce mechanical modifications.

PARAMETERS RELATING TO THE SAFETY

The parameters relating to the safety are modified as follow :

- . Supply voltage : until 1000 Volts,
- . Power according to version : until 3.8 kW.

MARKING

Marking defined in the basic certificate and its addition is unchanged.

ROUTINE EXAMINATIONS AND TESTS

The routine verifications and tests stipulated by the basic certificate and its addition are unchanged.

(16) - DESCRIPTIVE DOCUMENTS

The documents referred to below, constitute the file describing the modifications of the apparatus and forming the subject of the present addition.

- Drawing N° 597 63 00 X rev. 8 of 2003.06.30. signed on 2003.06.30
- Drawing N° 597 63 35 X rev. 0 of 2003.06.03. signed on 2003.06.03
- Drawing N° 597 63 70 X rev. 0 of 2003.06.05. signed on 2003.06.03

(17) - SPECIAL CONDITIONS FOR SAFE USE

The special conditions for safe use defined in the basic certificate and its addition are unchanged.

(18) - ESSENTIAL REQUIREMENTS OF SAFETY AND HEALTH

The respect of the Essential Health and Safety Requirements is ensured by:

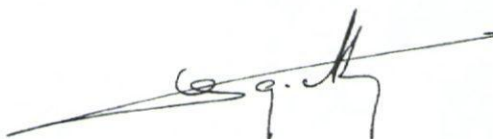
- Conformity to the European standards EN 50 014, EN 50 018, EN 1127-1 and EN 13463-1.
- The whole of the provisions adopted by the manufacturer and described in the descriptive documents.

Vernueil-en-Halatte, 2003 11 07



X. LEFEBVRE

Engineer at the Laboratory of Certification
of Materials ATEX



Director of the Certifying Body,
By delegation
B. PIQUETTE
Deputy manager of Certification



ADDITION

INERIS 00ATEX0044 X/03

PUMP TYPE 596 98 00

Made by ITT FLYGT AB

(15) - PURPOSE OF THE ADDITION

Possibility of using a new $125^{\circ}\text{C} \pm 6^{\circ}\text{C}$ thermal contact type 84 50 49.

New address wich become SE-174 87 SUNDBYBERG.

PARAMETERS RELATING TO THE SAFETY

The parameters relating to the safety defined in the basic certificate and its additions are unchanged.

MARKING

Marking defined in the basic certificate and its additions is unchanged.

ROUTINE EXAMINATIONS AND TESTS

The routine verifications and tests stipulated by the basic certificate and its additions are unchanged.

(16) - DESCRIPTIVE DOCUMENTS

The document referred to below, constitutes the file describing the modifications of the apparatus and forming the subject of the present addition.

- Drawing No 596 98 00 rev. 8 of 2004.03.15 signed on 2004.03.15

(17) - SPECIAL CONDITIONS FOR SAFE USE

The special conditions for safe use defined in the basic certificate and its additions are unchanged.

(18) - ESSENTIAL REQUIREMENTS OF SAFETY AND HEALTH

The respect of the Essential Health and Safety Requirements defined in the basic certificate and its additions is unchanged.

Verneuil-en-Halatte, 2004 11 19

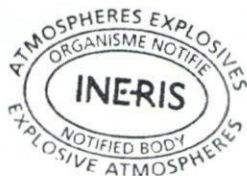


X. LEFEBVRE

Engineer at the Laboratory of Certification of ATEX
Equipment



Director of the Certifying Body,
By delegation
B. PIQUETTE
Deputy manager of Certification



ADDITION

(3) INERIS 00ATEX0044 X/04

(4) PUMP TYPE 596 98 00

(5) Made by ITT FLYGT AB

(15) - PURPOSE OF THE ADDITION

Update of descriptive documents.

PARAMETERS RELATING TO THE SAFETY

The parameters relating to the safety defined in the basic certificate and its additions are unchanged.

MARKING

Marking defined in the basic certificate and its additions is unchanged.

ROUTINE EXAMINATIONS AND TESTS

The routine verifications and tests stipulated by the basic certificate and its additions are unchanged.

(16) - DESCRIPTIVE DOCUMENTS

The document referred to below, constitute the file describing the modifications of the apparatus and forming the subject of the present addition.

- Drawing n° 630 68 00 rev. 5 of 2005.01.14. signed on 2005.01.14

(17) - SPECIAL CONDITIONS FOR SAFE USE

The special conditions for safe use defined in the basic certificate and its additions are unchanged.

(18) - ESSENTIAL REQUIREMENTS OF SAFETY AND HEALTH

The respect of the Essential Health and Safety Requirements defined in the basic certificate and its additions is unchanged.

Verneuil-en-Halatte, 2005 11 29



X. LEFEBVRE

Engineer at the Laboratory of Certification of ATEX
Equipment

Director of the Certifying Body,
By delegation
B. PIQUETTE
Deputy manager of Certification

ADDITION

(3) INERIS 00ATEX0044X/05

(4) PUMP TYPE 596 98 00

(5) Made by ITT FLYGT AB

(15) PURPOSE OF THE ADDITION

Mechanical modifications.
Addition of a new version.

PARAMETERS RELATING TO THE SAFETY

The parameters relating to the safety mentioned in the basic certificate are unchanged.

MARKING

The marking defined in the basic certificate is unchanged.

ROUTINE EXAMINATIONS AND TESTS

The routine examinations and tests stipulated by the basic certificate are unchanged.

(16) DESCRIPTIVE DOCUMENTS

The descriptive documents quoted hereafter constitute the technical documentation describing the modification of the equipment, subject of this present addition.

- | | |
|--------------------------------|--------------------------------|
| - Drawing n° 556 15 03_X rev.0 | dated and signed on 2006.04.10 |
| - Drawing n° 596 98 00 rev.9 | dated and signed on 2006.04.25 |
| - Drawing n° 657 87 00 rev.2 | dated and signed on 2006.07.04 |

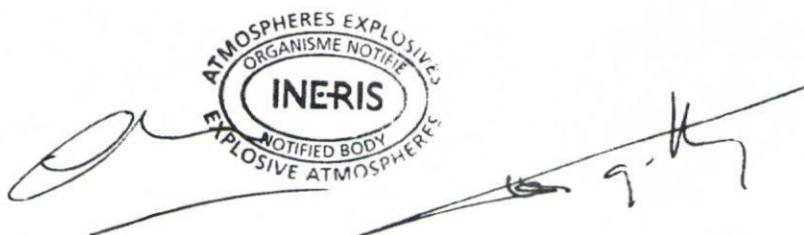
(17) SPECIAL CONDITIONS FOR SAFE USE

The special conditions defined in the basic certificate are unchanged.

(18) ESSENTIAL SAFETY AND HEALTH REQUIREMENTS

The respect of the Essential Health and Safety Requirements defined in the basic certificate is unchanged.

Verneuil-en-Halatte, 2006-09-21



X. LEFEBVRE

Project Manager at the ATEX
Equipment Certification Laboratory

Director of the Certifying Body,
By delegation
B. PIQUETTE

Deputy Manager of Certification

ADDITION

(3) INERIS 00ATEX0044X/06

(4) PUMP TYPE 596 98 00

(5) Made by ITT FLYGT AB

(15) PURPOSE OF THE ADDITION

Minor mechanical modifications.

PARAMETERS RELATING TO THE SAFETY

The parameters relating to the safety are unchanged.

MARKING

The marking is unchanged.

ROUTINE EXAMINATIONS AND TESTS

The routine examinations and tests are unchanged.

(16) DESCRIPTIVE DOCUMENTS

None.

(17) SPECIAL CONDITIONS FOR SAFE USE

The special conditions are unchanged.

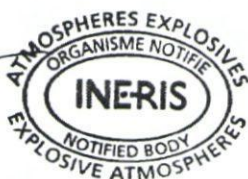
(18) ESSENTIAL SAFETY AND HEALTH REQUIREMENTS

The respect of the Essential Health and Safety Requirements is unchanged.

Verneuil-en-Halatte, 2007 10 24


X. LEFEBVRE

Project Manager at the ATEX
Equipment Evaluation Laboratory





Director of the Certifying Body,
By delegation
T. HOUeix
Certification Officer
Certification Division

ADDITION

(3) INERIS 00ATEX0044X/07

(4) PUMP TYPE 596 98 00

(5) Made by ITT FLYGT AB

(15) PURPOSE OF THE ADDITION

- Mechanical modifications.
- Application of the standards EN 60079-0 : 2006 and EN 60079-1 : 2004.
- Change of the manufacturer name from ITT FLYGT AB to ITT Water & Wastewater AB.
- Change of the manufacturer address : S-17487 Sundbyberg.
- Change of the maximum ambient temperature from +90°C to +60°C.

PARAMETERS RELATING TO THE SAFETY

The parameters relating to the safety are unchanged.

MARKING

The marking is modified as follow :

ITT Water & Wastewater AB

S-17487 Sundbyberg

596 98 00

INERIS 00ATEX0044 X

(serial number)

(year of construction)

 II 2 G Ex d IIB T4

Tamb : -20 °C to +60 °C

WARNINGS :

DO NOT OPEN WHEN AN EXPLOSIVE GAS ATMOSPHERE MAY BE PRESENT

DO NOT OPEN WHEN ENERGIZED

CONNECT THERMAL PROBES

The whole of marking can be carried out in the language of the country of use.

The protection apparatus or system must also carry the marking normally envisaged by the standards of construction which relate to it.

ROUTINE EXAMINATIONS AND TESTS

The routine examinations and tests are unchanged.

(16) DESCRIPTIVE DOCUMENTS

The descriptive documents quoted hereafter constitute the technical documentation describing the modifications of the equipment, subject of this present addition.

- | | |
|---------------------------------|--------------------------------|
| - Descriptive note VPSA09002EDH | dated and signed on 2009.03.03 |
| - Drawing n° 596 98 00 rev.10 | dated and signed on 2008.07.02 |
| - Drawing n° 630 68 00 rev.07 | dated and signed on 2008.08.18 |

(17) SPECIAL CONDITIONS FOR SAFE USE

The special conditions for safe use are unchanged.

(18) ESSENTIAL SAFETY AND HEALTH REQUIREMENTS

The respect of the Essential Health and Safety Requirements is assured by :

- Conformity to the European standards indicated in the paragraph 15 and the standard EN 1127-1 : 1997.
- The whole of the provisions adopted by the manufacturer and described in the descriptive documents.

Verneuil-en-Halatte, 2009 03 27




Director of the Certifying Body,
By delegation
T. HOUEIX
Certification Officer
Certification Division

ADDITION

(3) INERIS 00ATEX0044X/08

(4) PUMP TYPE 596 98 00

(5) Made by ITT WATER & WASTEWATER AB

(15) PURPOSE OF THE ADDITION

- Mechanical modifications.
- Introduction of the new product 3085.190.
- Application of the standard EN 1127-1 : 2007.

PARAMETERS RELATING TO THE SAFETY

The parameters relating to the safety are unchanged.

MARKING

The marking is unchanged.

ROUTINE EXAMINATIONS AND TESTS

None.

(16) DESCRIPTIVE DOCUMENTS

The descriptive documents quoted hereafter constitute the technical documentation describing the modifications of the equipment, subject of this present addition.

- | | |
|---------------------------------|--------------------------------|
| - Descriptive note VPSA10008EDH | dated and signed on 2010.03.15 |
| - Drawing n°596 98 00 rev.11 | dated and signed on 2009.01.28 |

(17) SPECIAL CONDITIONS FOR SAFE USE

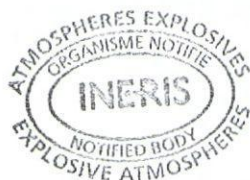
The special conditions for safe use are unchanged.

(18) ESSENTIAL SAFETY AND HEALTH REQUIREMENTS

The respect of the Essential Health and Safety Requirements is assured by :

- Conformity to the standards EN 60079-0 : 2006, EN 60079-1 : 2004 and EN 1127-1 : 2007.
- The whole of the provisions adopted by the manufacturer and described in the descriptive documents.

Verneuil-en-Halatte, 2010 05 10



Director of the Certifying Body,
By delegation
T. HOUeix
Certification Officer
Certification Division

ADDITION

(3) INERIS 00ATEX0044X/09

(4) PUMP TYPE 596 98 00

(5) Made by ITT WATER & WASTEWATER AB

(15) PURPOSE OF THE ADDITION

- Modification of Hydraulic parts.
- Updating of manufacturer documents.
- Removing of drawing 595 01 00.
- The data plate has been redesigned with a new CAD system: adding change 630 69 02.

PARAMETERS RELATING TO THE SAFETY

The parameters relating to the safety are unchanged.

MARKING

The marking is unchanged.

ROUTINE EXAMINATIONS AND TESTS

None.

(16) DESCRIPTIVE DOCUMENTS

The descriptive documents quoted hereafter constitute the technical documentation describing the modifications of the equipment, subject of this present addition.

- | | |
|---|--------------------------------|
| - Change description for EN-approved products | dated on 2010.03.15 |
| - CRITICAL PARTS | dated on 2009.01.28 |
| - Drawing n° 657 87 00 rev 4 | dated and signed on 2010.07.06 |
| - Drawing n° 477 49 00 rev 8 | dated and signed on 2004.06.08 |

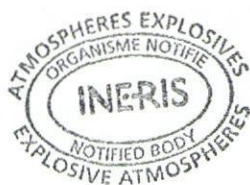
(17) SPECIAL CONDITIONS FOR SAFE USE

The special conditions for safe use are unchanged.

(18) ESSENTIAL SAFETY AND HEALTH REQUIREMENTS

The respect of the Essential Health and Safety Requirements is unchanged.

Verneuil-en-Halatte, 2011.01.20




Director of the Certifying Body,
By delegation
T. HOUËIX
Certification Officer
Certification Division

ADDITION

(3) INERIS 00ATEX0044X/10

(4) PUMP TYPE 596 98 00

(5) Made by Xylem Water Solutions AB

(15) PURPOSE OF THE ADDITION

- Updating of the manufacturer's documents.
- Mechanical modifications.
- New pumps 3085/810/830/910 added.
- New motor, 2 poles 15-09-2AS and 4 poles 15-10-4AS introduced.
- Application of the standards EN 60079-0: 2009, EN 60079-1: 2007, EN 13463-1: 2009 and 13463-5: 2011.
- Change of the manufacturer name from "ITT Water & Wastewater AB" to "Xylem Water solutions AB".
- Possibility to install FLS, Level Sensor inside the flame proof enclosure.
- The range of ambient temperature becomes -20°C to +60°C.

PARAMETERS RELATING TO THE SAFETY

The parameters relating to the safety are unchanged.

MARKING

The marking is modified as follows:

Xylem Water solutions AB

S-17487 Sundbyberg

596 98 00

INERIS 00ATEX0044X

(Serial number)

(Year of construction)

⊕ II 2 G c Ex d IIB T4 Gb

Tamb. : -20°C to +60°C

WARNINGS:

DO NOT OPEN WHEN AN EXPLOSIVE GAZ ATMOSPHERE MAY BE PRESENT.

DO NOT OPEN WHEN ENERGIZED.

CONNECT THERMAL CONTACTS.

The whole of marking can be carried out in the language of the country of use.

The protective system or equipment has also to carry the marking normally stipulated by its construction standards.

ROUTINE EXAMINATIONS AND TESTS

None.

(16) DESCRIPTIVE DOCUMENTS

The descriptive document quoted hereafter constitutes the technical documentation describing the modifications of the equipment, subject of this present addition.

- | | |
|---|---------------------|
| - Change description for EN-approved products | dated on 2012.01.03 |
| - CRITICAL PARTS | dated on 2012.01.03 |
| - REVISION REPORT | dated on 2012.01.03 |
| - FLS Float switch n° RSA12009EDH | dated on 2012.01.30 |
| - DESCRIPTIVE NOTE n° RSA12057EDH | dated on 2012.12.18 |
| - Text in the manual n° RSA12058EDH | dated on 2012.12.18 |
| - RSA11067EDH | dated on 2012.01.03 |
| - Drawing n° 596 98 00 / 12 | dated on 2011.12.13 |
| - Drawing n° 657 87 00 / 6 | dated on 2011.12.13 |

(17) SPECIAL CONDITIONS FOR SAFE USE

The special conditions for safe use are modified as follows:

- The width of flameproof joints is more than the values specified in the tables of the standard EN 60079-1.

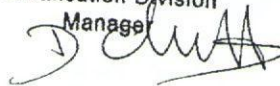
(18) ESSENTIAL SAFETY AND HEALTH REQUIREMENTS

The respect of the Essential Health and Safety Requirements is completed as follows:

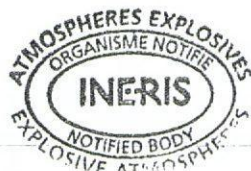
- Conformity to the European standards quoted on clause (15).
- All provisions adopted by the manufacturer and defined in the *descriptive documents*.

Verneuil-en-Halatte, 2013.02.25

Dominique CHARPENTIER
Certification Division
Manager



The Chief Executive Officer of INERIS
By delegation
T. HOUEIX
Ex Certification Officer



ADDITION

(3) INERIS 00ATEX0044X/11

(4) PUMP TYPE 596 98 00, 3085.190, 3085.810, 3085.190, 3085.830 and 3085.910

(5) Made by Xylem Water Solutions AB

(15) PURPOSE OF THE ADDITION

- New pump 3090.890 added.

PARAMETERS RELATING TO THE SAFETY

The parameters relating to the safety are unchanged.

MARKING

The marking is unchanged.

ROUTINE EXAMINATIONS AND TESTS

None.

(16) DESCRIPTIVE DOCUMENTS

The descriptive document quoted hereafter constitutes the technical documentation describing the modifications of the equipment, subject of this present addition.

- | | |
|---|---------------------|
| - Change description for EN-approved products | dated on 2011.09.06 |
| - CRITICAL PARTS | dated on 2011.09.06 |
| - REVISION REPORT | dated on 2011.09.06 |
| - Drawing n° 748 13 00 Rev 0 | dated on 2010.01.12 |
| - Drawing n° 722 65 01 X Rev 0 | dated on 2010.01.12 |

(17) SPECIAL CONDITIONS FOR SAFE USE

The special conditions for safe use are unchanged.

(18) ESSENTIAL SAFETY AND HEALTH REQUIREMENTS

The respect of the Essential Health and Safety Requirements is unchanged.

Verneuil-en-Halatte, 2013.04.03



The Chief Executive Officer of INERIS
By delegation
T. HOUEIX
Ex Certification Officer

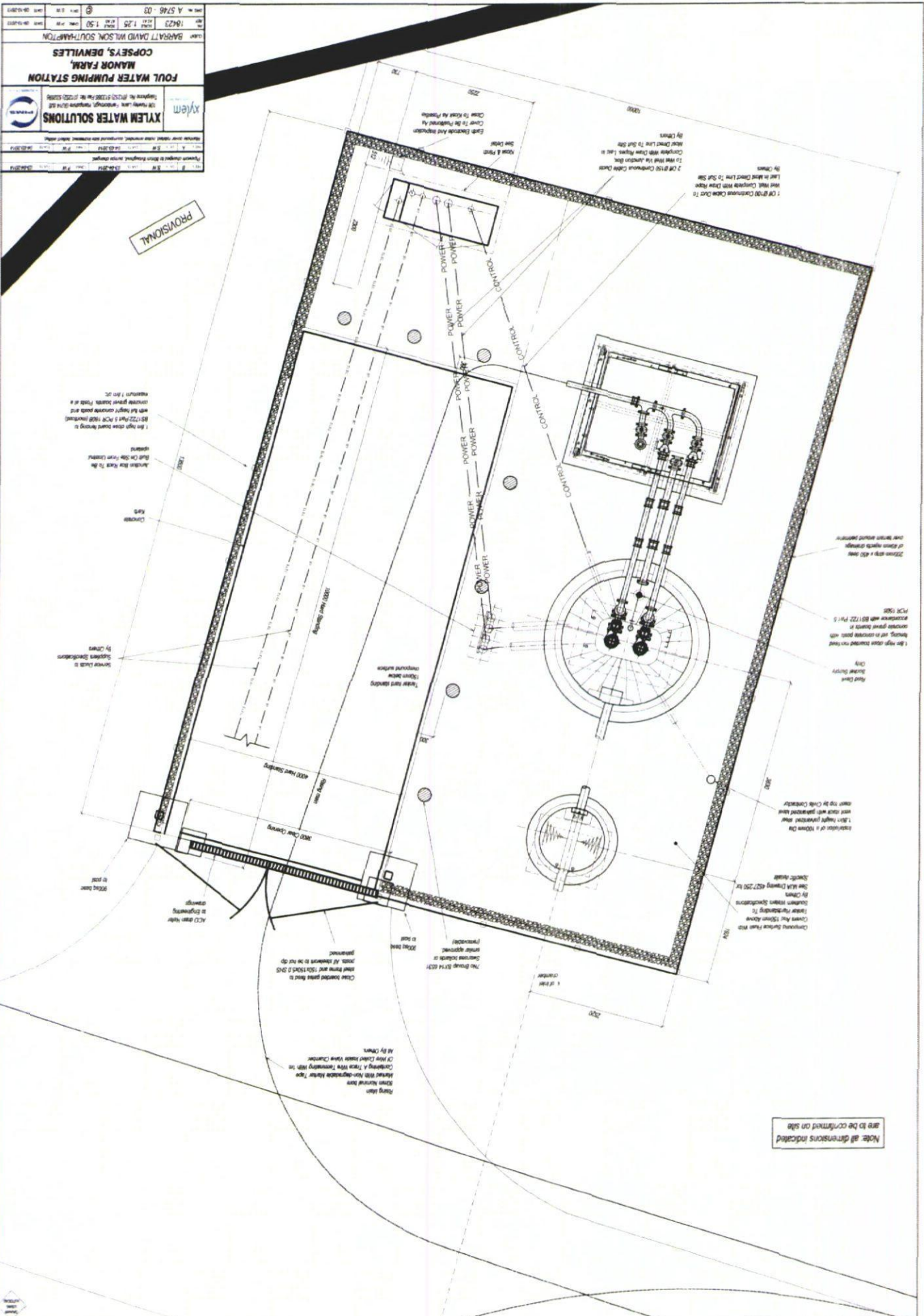
Manor Farm, Copseys, Denvilles
Foul Water Pump Station

Xylem Water Solutions UK Ltd
Ref: PR18423

Appendix E
Pump Station Drawings

XYLEM WATER SOLUTIONS 3000 West 10th Avenue, Suite 100 Denver, CO 80202 Phone: (303) 733-1100 Fax: (303) 733-1101 Email: sales@xylem.com	
FOUL WATER PUMPING STATION COPSEYS, DENVER, CO PROJECT NO. 1546-03	
DATE: 10/23/03 DRAWN BY: J. J. JONES CHECKED BY: J. J. JONES	SCALE: 1" = 10'-0" SHEET NO. 1546-03-01

PROVISIONAL



Note: all dimensions indicated are to be confirmed on site



The following actual equipment must be bonded to the earthing terminal:

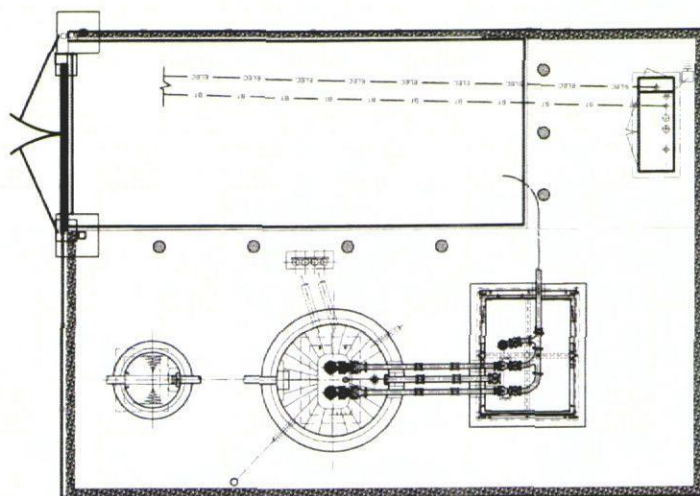
- 1 All case earth connections, i.e., in the knockbuilding.
- 2 Motor ladder (Not applicable)
- 3 Pump delivery piped and auxiliary suction pipe
- 4 Motor rising main and
- 5 Motor cover support frames

The pump casing is connected to the protective multiple earth (PME) earthing terminal via the flexible cable between the pump and the excavating

EARTHING ARRANGEMENTS
IN ACCORDANCE WITH SFA 7.13

PROVISIONAL

[illegible]



LEGEND

New Hauranous Zone

Zone 2

Zone 1

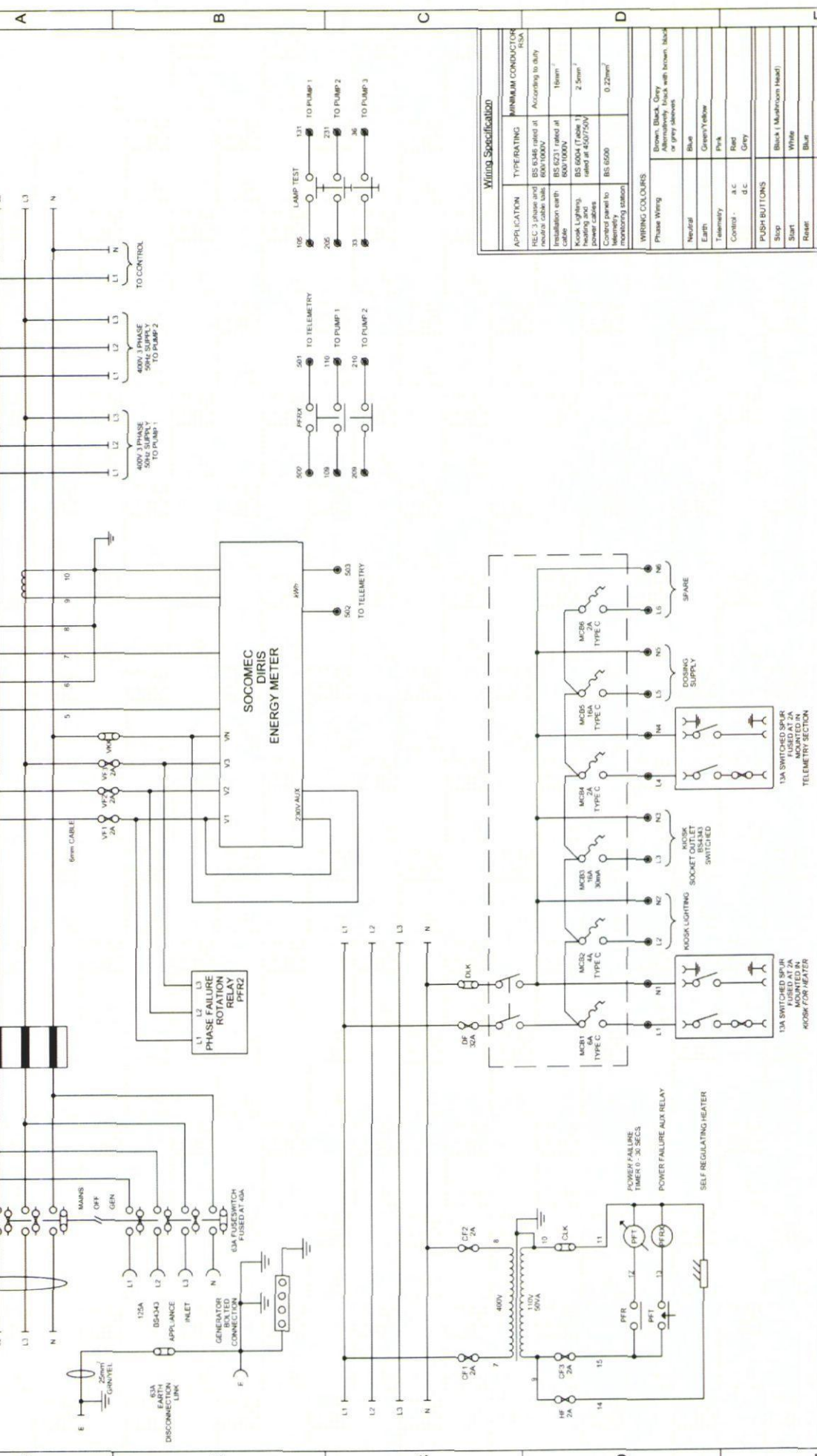
PROVISIONAL

[illegible]

Manor Farm, Copseys, Denvilles
Foul Water Pump Station

Xylem Water Solutions UK Ltd
Ref: PR18423

Appendix F
Wiring Diagrams



Wiring Specification		
APPLICATION	TYPICAL	MINIMUM CONDUCTOR
REC 3 phase and neutral cable tails	BS 6346 rated at 600/1000V	According to duty
Insulation earth cable	BS 6231 rated at 600/1000V	16mm ²
Kiosk Lighting, power cables	BS 6004 (7 core 11 rated at 400/750V)	2.5mm ²
Control panel to telemetry monitoring station	BS 6500	0.22mm ²

WIRING COLOURS	
Phase Wiring	Brown, Black, Grey
Neutral	Alternatively black with brown black or grey sleeves
Earth	Blue
Telemetry	Green/Yellow
Control - a.c	Pink
Control - d.c	Red
PUSH BUTTONS	Grey
Stop	Black (Multigrain Head)
Start	White
Reset	Blue
Test	Yellow

Wiring Specification		
APPLICATION	TYPICAL	MINIMUM CONDUCTOR
REC 3 phase and neutral cable tails	BS 6346 rated at 600/1000V	According to duty
Insulation earth cable	BS 6231 rated at 600/1000V	16mm ²
Kiosk Lighting, power cables	BS 6004 (7 core 11 rated at 400/750V)	2.5mm ²
Control panel to telemetry monitoring station	BS 6500	0.22mm ²

WIRING COLOURS	
Phase Wiring	Brown, Black, Grey
Neutral	Alternatively black with brown black or grey sleeves
Earth	Blue
Telemetry	Green/Yellow
Control - a.c	Pink
Control - d.c	Red
PUSH BUTTONS	Grey
Stop	Black (Multigrain Head)
Start	White
Reset	Blue
Test	Yellow

gemini control systems ltd
designers and manufacturers



106 HAWLEY LANE
FARNBOROUGH
HAMPSHIRE
GU14 8JE
UK
TEL 01252 511346
FAX 01252 516404
www.gemini-controls.com

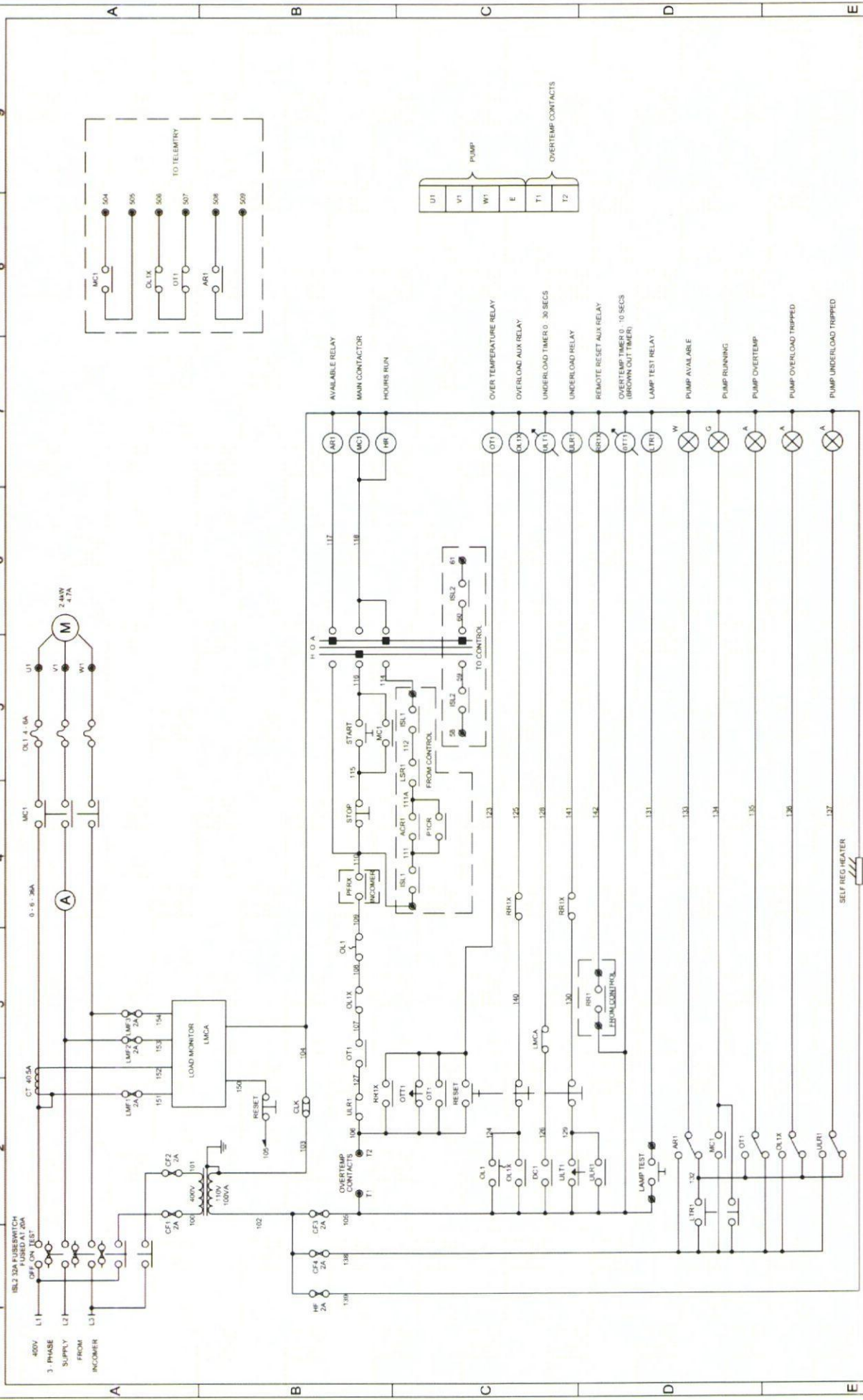
CLIENT
Barrat David Wilson Southampton

PROJECT
Manor Farm, Copseys, Foul Water PS

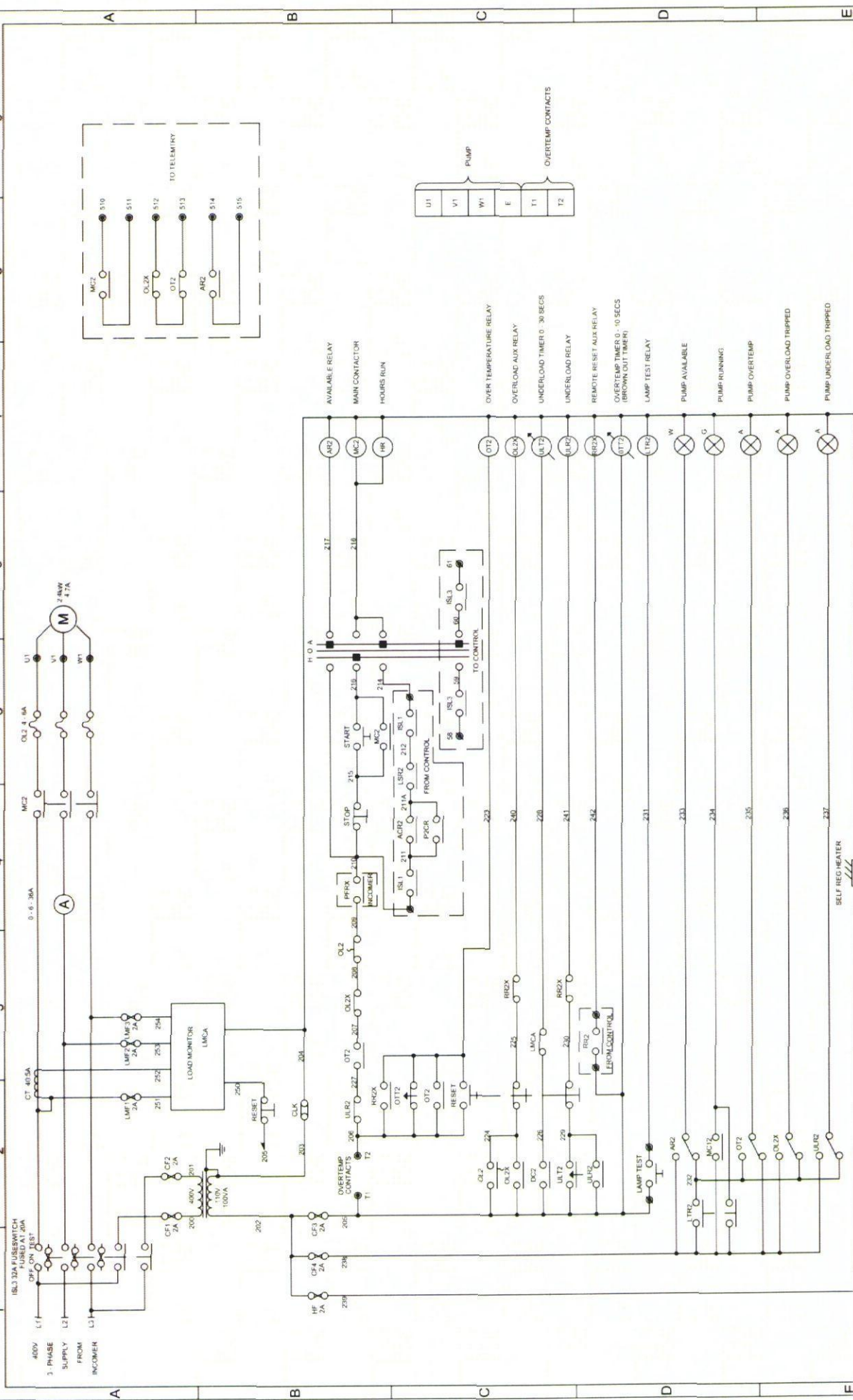
DRAWING TITLE
Incomer / Distribution

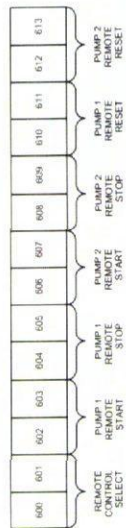
Drawn by	NS	Checked by	SH	Drawing Ref	GD14532-1
Scale	NTS	Date	03/10/13	Sheet	1 of 7
App'd		Date		Job Ref	GC
				Client Ref	PR18423

Rev	Modification	Drawn	Chkd	App'd	Date
1					
2					
3					
4					
5					
6					
7					
8					
9					



--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

[illegible]

[illegible]

ADDITION

(3) INERIS 00ATEX0044X/10

(4) PUMP TYPE 596 98 00

(5) Made by Xylem Water Solutions AB

(15) PURPOSE OF THE ADDITION

- Updating of the manufacturer's documents.
- Mechanical modifications.
- New pumps 3085/810/830/910 added.
- New motor, 2 poles 15-09-2AS and 4 poles 15-10-4AS introduced.
- Application of the standards EN 60079-0: 2009, EN 60079-1: 2007, EN 13463-1: 2009 and 13463-5: 2011.
- Change of the *manufacturer name* from "ITT Water & Wastewater AB" to "Xylem Water solutions AB".
- Possibility to install FLS, Level Sensor inside the flame proof enclosure.
- The range of ambient temperature becomes -20°C to +60°C.

PARAMETERS RELATING TO THE SAFETY

The parameters relating to the safety are unchanged.

MARKING

The marking is modified as follows:

Xylem Water solutions AB

S-17487 Sundbyberg

596 98 00

INERIS 00ATEX0044X

(Serial number)

(Year of construction)

⊕ II 2 G c Ex d IIB T4 Gb

Tamb. : -20°C to +60°C

WARNINGS:

DO NOT OPEN WHEN AN EXPLOSIVE GAZ ATMOSPHERE MAY BE PRESENT.

DO NOT OPEN WHEN ENERGIZED.

CONNECT THERMAL CONTACTS.

The whole of marking can be carried out in the language of the country of use.

The protective system or equipment has also to carry the marking normally stipulated by its construction standards.

ROUTINE EXAMINATIONS AND TESTS

None.

(16) DESCRIPTIVE DOCUMENTS

The descriptive document quoted hereafter constitutes the technical documentation describing the modifications of the equipment, subject of this present addition.

- | | |
|---|---------------------|
| - Change description for EN-approved products | dated on 2012.01.03 |
| - CRITICAL PARTS | dated on 2012.01.03 |
| - REVISION REPORT | dated on 2012.01.03 |
| - FLS Float switch n° RSA12009EDH | dated on 2012.01.30 |
| - DESCRIPTIVE NOTE n° RSA12057EDH | dated on 2012.12.18 |
| - Text in the manual n° RSA12058EDH | dated on 2012.12.18 |
| - RSA11067EDH | dated on 2012.01.03 |
| - Drawing n° 596 98 00 / 12 | dated on 2011.12.13 |
| - Drawing n° 657 87 00 / 6 | dated on 2011.12.13 |

(17) SPECIAL CONDITIONS FOR SAFE USE

The special conditions for safe use are modified as follows:

- The width of flameproof joints is more than the values specified in the tables of the standard EN 60079-1.

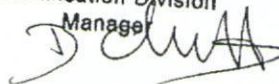
(18) ESSENTIAL SAFETY AND HEALTH REQUIREMENTS

The respect of the Essential Health and Safety Requirements is completed as follows:

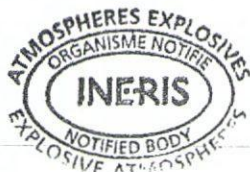
- Conformity to the European standards quoted on clause (15).
- All provisions adopted by the manufacturer and defined in the descriptive documents.

Verneuil-en-Halatte, 2013.02.25

Dominique CHARPENTIER
Certification Division
Manager



The Chief Executive Officer of INERIS
By delegation
T. HOUËIX
Ex Certification Officer



ADDITION

(3) INERIS 00ATEX0044X/11

(4) PUMP TYPE 596 98 00, 3085.190, 3085.810, 3085.190, 3085.830 and 3085.910

(5) Made by Xylem Water Solutions AB

(15) PURPOSE OF THE ADDITION

- New pump 3090.890 added.

PARAMETERS RELATING TO THE SAFETY

The parameters relating to the safety are unchanged.

MARKING

The marking is unchanged.

ROUTINE EXAMINATIONS AND TESTS

None.

(16) DESCRIPTIVE DOCUMENTS

The descriptive document quoted hereafter constitutes the technical documentation describing the modifications of the equipment, subject of this present addition.

- | | |
|---|---------------------|
| - Change description for EN-approved products | dated on 2011.09.06 |
| - CRITICAL PARTS | dated on 2011.09.06 |
| - REVISION REPORT | dated on 2011.09.06 |
| - Drawing n° 748 13 00 Rev 0 | dated on 2010.01.12 |
| - Drawing n° 722 65 01 X Rev 0 | dated on 2010.01.12 |

(17) SPECIAL CONDITIONS FOR SAFE USE

The special conditions for safe use are unchanged.

(18) ESSENTIAL SAFETY AND HEALTH REQUIREMENTS

The respect of the Essential Health and Safety Requirements is unchanged.

Verneuil-en-Halatte, 2013.04.03

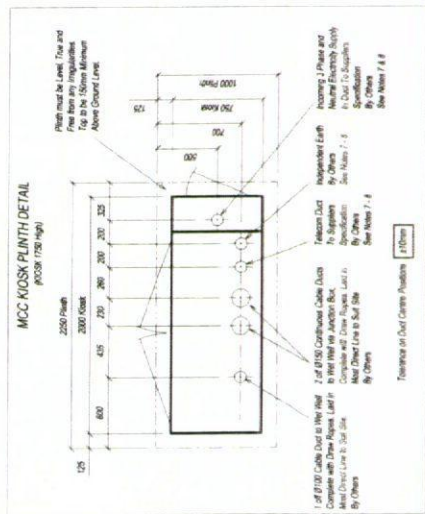
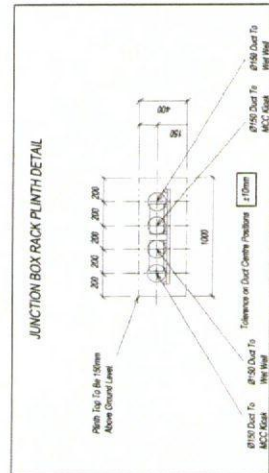
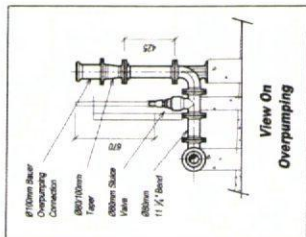


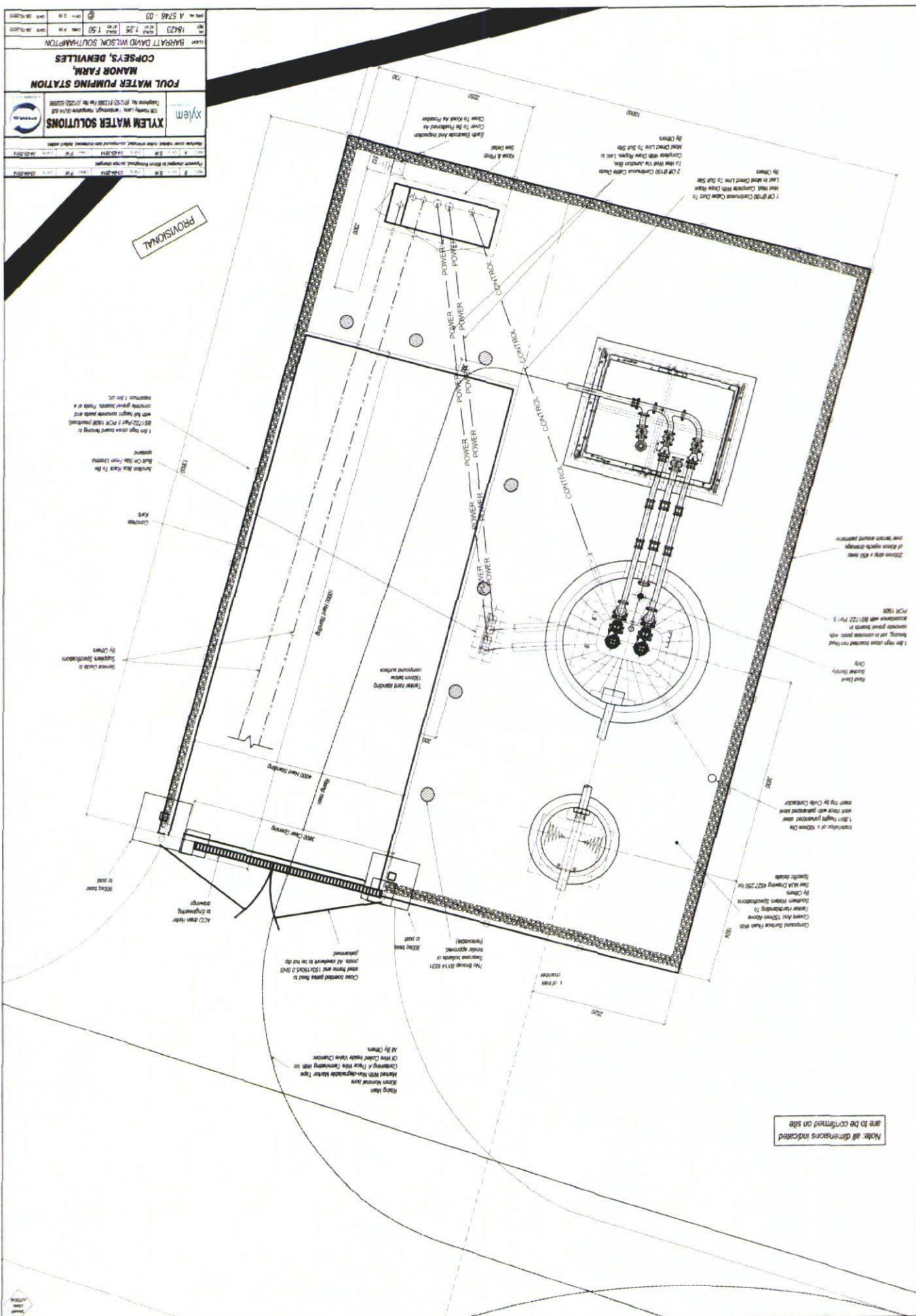
The Chief Executive Officer of INERIS
By delegation
T. HOUEIX
Ex Certification Officer

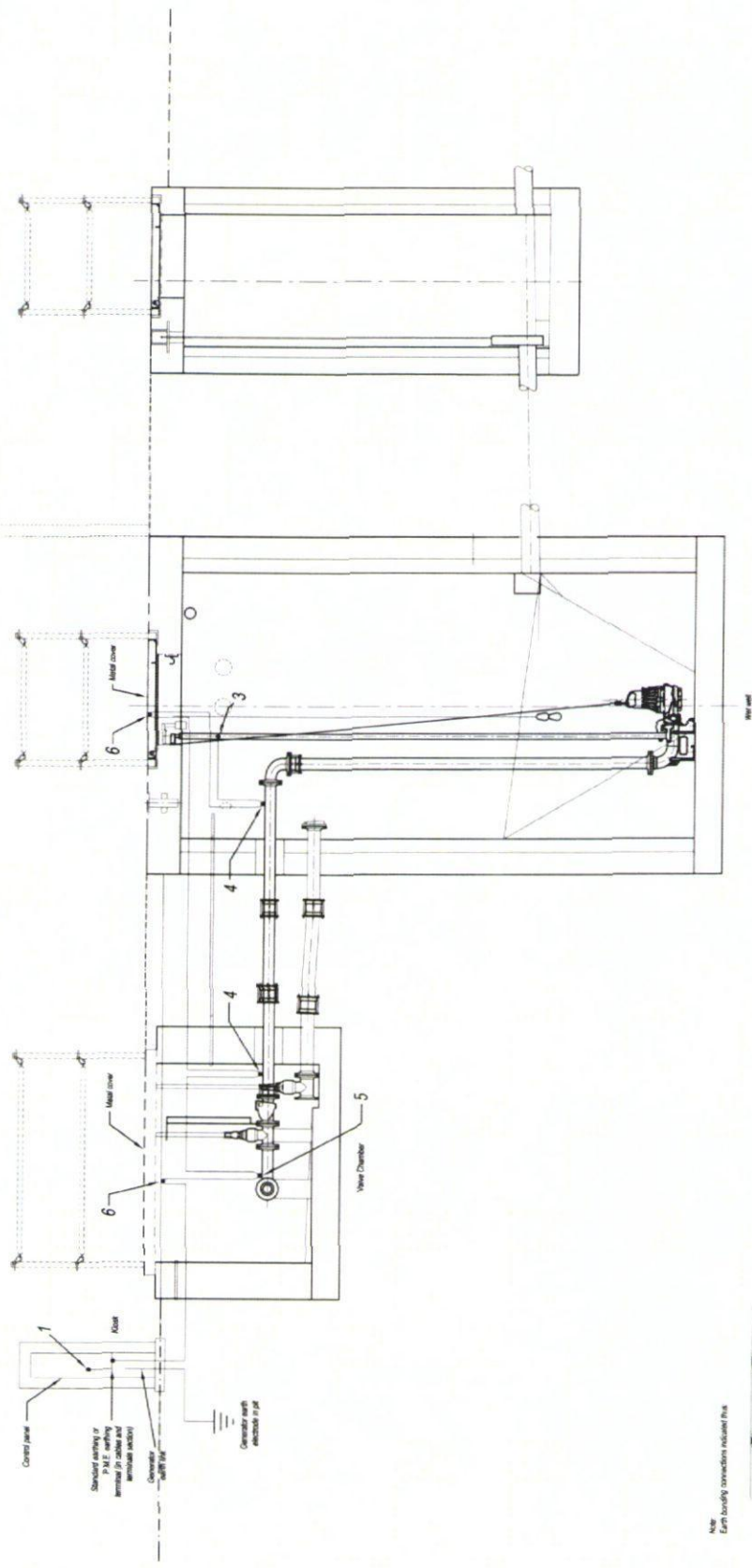
Manor Farm, Copseys, Denvilles
Foul Water Pump Station

Xylem Water Solutions UK Ltd
Ref: PR18423

Appendix E
Pump Station Drawings

[illegible]





Note:
Earth bonding connections indicated this



- The following actual equipment must be bonded to the earthing terminal:
1. All steel earth connections, etc. in the building
 2. Metal ductwork (PVC applicable)
 3. All steel pipes and associated auxiliary supply pipes
 4. Metal main cable and
 5. Metal ductwork supply pipes

The pump station is connected to the protective multiple earth (P.M.E.) earthing terminal at the building within the building and the structure.

EARTHING ARRANGEMENTS IN ACCORDANCE WITH BS 7671

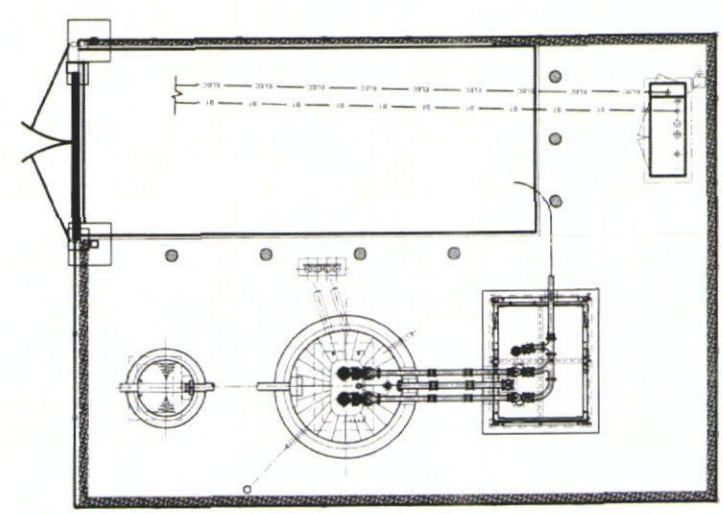
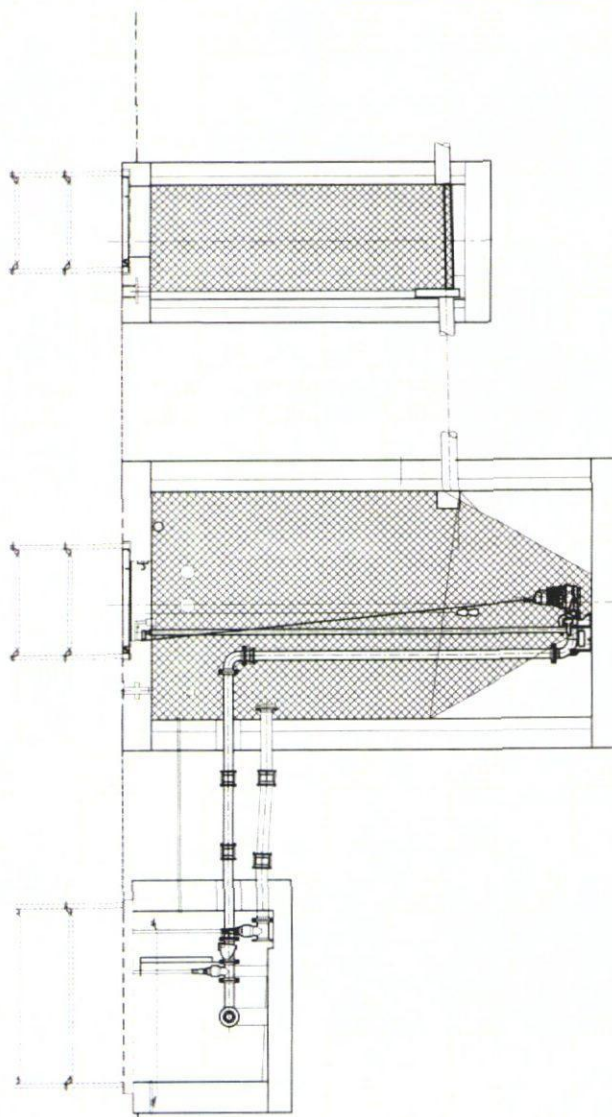
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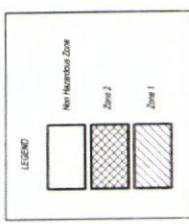
KYLEM WATER SOLUTIONS
WATER TREATMENT & MANAGEMENT
Telephone: 01202 712041 Fax: 01202 712042

FOUL WATER PUMPING STATION
MANOR FARM
COPSEYS, DENVILLES

18423 1.02 1.20 1.40 1.60 1.80 2.00 2.20 2.40 2.60 2.80 3.00 3.20 3.40 3.60 3.80 4.00 4.20 4.40 4.60 4.80 5.00 5.20 5.40 5.60 5.80 6.00 6.20 6.40 6.60 6.80 7.00 7.20 7.40 7.60 7.80 8.00 8.20 8.40 8.60 8.80 9.00 9.20 9.40 9.60 9.80 10.00 10.20 10.40 10.60 10.80 11.00 11.20 11.40 11.60 11.80 12.00 12.20 12.40 12.60 12.80 13.00 13.20 13.40 13.60 13.80 14.00 14.20 14.40 14.60 14.80 15.00 15.20 15.40 15.60 15.80 16.00 16.20 16.40 16.60 16.80 17.00 17.20 17.40 17.60 17.80 18.00 18.20 18.40 18.60 18.80 19.00 19.20 19.40 19.60 19.80 20.00 20.20 20.40 20.60 20.80 21.00 21.20 21.40 21.60 21.80 22.00 22.20 22.40 22.60 22.80 23.00 23.20 23.40 23.60 23.80 24.00 24.20 24.40 24.60 24.80 25.00 25.20 25.40 25.60 25.80 26.00 26.20 26.40 26.60 26.80 27.00 27.20 27.40 27.60 27.80 28.00 28.20 28.40 28.60 28.80 29.00 29.20 29.40 29.60 29.80 30.00 30.20 30.40 30.60 30.80 31.00 31.20 31.40 31.60 31.80 32.00 32.20 32.40 32.60 32.80 33.00 33.20 33.40 33.60 33.80 34.00 34.20 34.40 34.60 34.80 35.00 35.20 35.40 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Design Details in accordance with BS/A 114.4 and BS 5351. The design is based on the latest version of the relevant standards.



HAZARDOUS AREA DETAIL
PUMP STATION

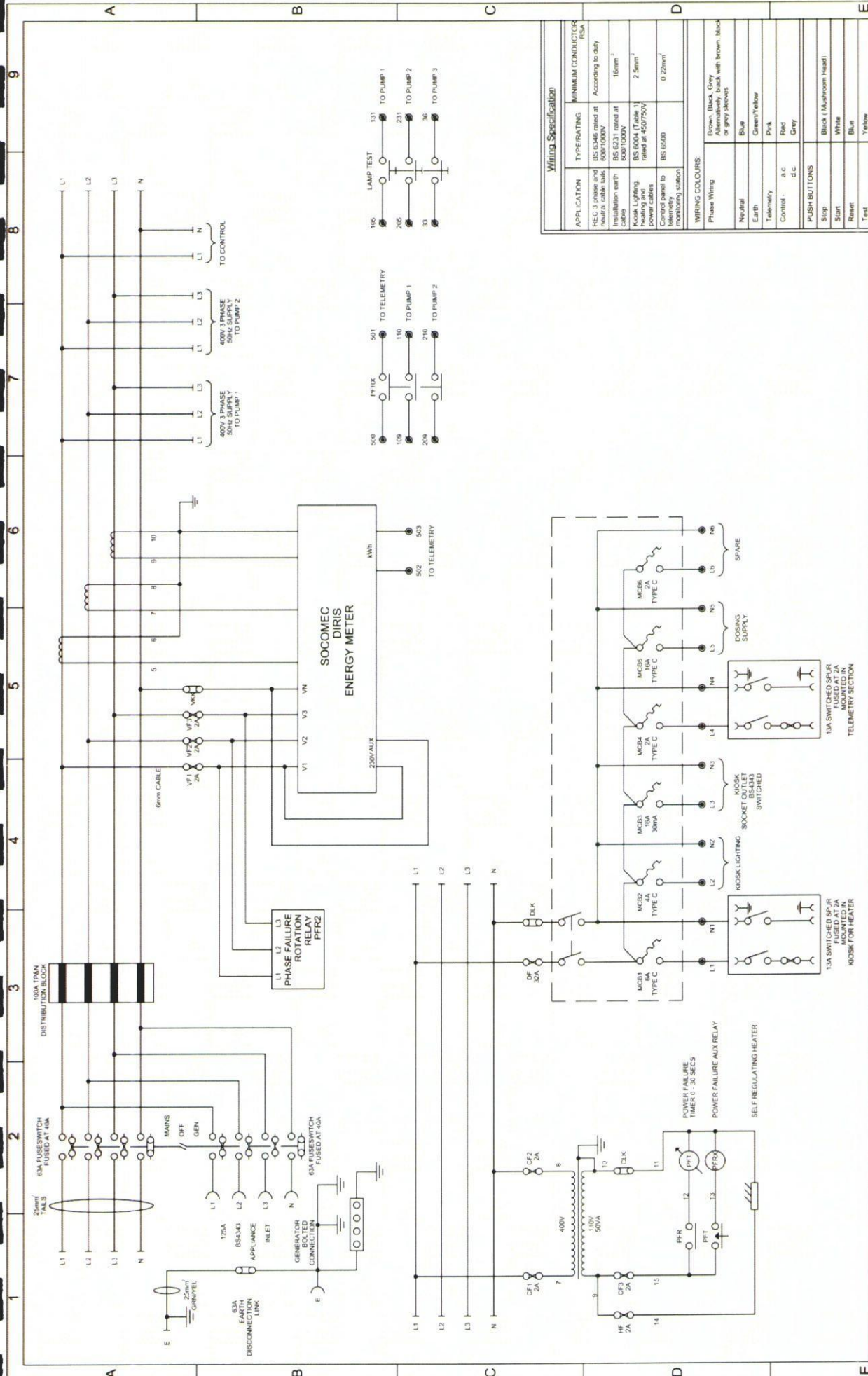
PROVISIONAL

XYLEN WATER SOLUTIONS 100 Years Lane, Farnborough, Hampshire GU14 4LE Telephone: 01252 122851 Fax: 01252 122859		Date: 15.06.2017 Drawn: J.W. Checked: J.W. Approved: J.W. Project: Foul Water Pumping Station
FOUL WATER PUMPING STATION MANOR FARM, COPSEY, DENVILLE		Client: BARRATT DAVID WILSON, SOUTHAMPTON Ref: 16423 Rev: 1.0 Date: 15.06.2017

Manor Farm, Copseys, Denvilles
Foul Water Pump Station

Xylem Water Solutions UK Ltd
Ref: PR18423

Appendix F
Wiring Diagrams



Wiring Specification		
APPLICATION	TYPE/RATING	MINIMUM CONDUCTOR
REC 3 phase and neutral cable tails	BS 6346 rated at 600V/1000V	According to duty
Installation earth cable	BS 6231 rated at 600V/1000V	16mm ²
250V lighting, heating and power cables	BS 6800 (Tinned) rated at 450V/250V	2.5mm ²
Control panel to telemetry monitoring station	BS 6500	0.22mm ²

WIRING COLOURS:	
Phase Wiring	Brown, Black, Grey Alternatively black with brown, black or grey sleeves
Neutral	Blue
Earth	Green/Yellow
Telemetry	Pink
Control - a.c	Red
Control - d.c	Grey

PUSH BUTTONS	
Stop	Black (Multibroom Head)
Start	White
Reset	Blue
Test	Yellow

Rev	Modification	1	2	3	4	5	6	7	8	9



gemini control systems ltd
designers and manufacturers

106 HAWLEY LANE
FARNBOROUGH
HAMPSHIRE
GU14 8PS
01463 81336
FAX 01252 516404

CLIENT
Barrat David Wilson Southampton

PROJECT
Manor Farm, Copseys, Foul Water PS

DRAWING TITLE
Incomer / Distribution

Drawn by
NS

Checked by
SH

Date
03/10/13

Scale
1 of 7

Sheet
PR18423

Job Ref
GC

Client Ref

Drawn
Chad

Appr'd
Date

Modification

1

2

3

4

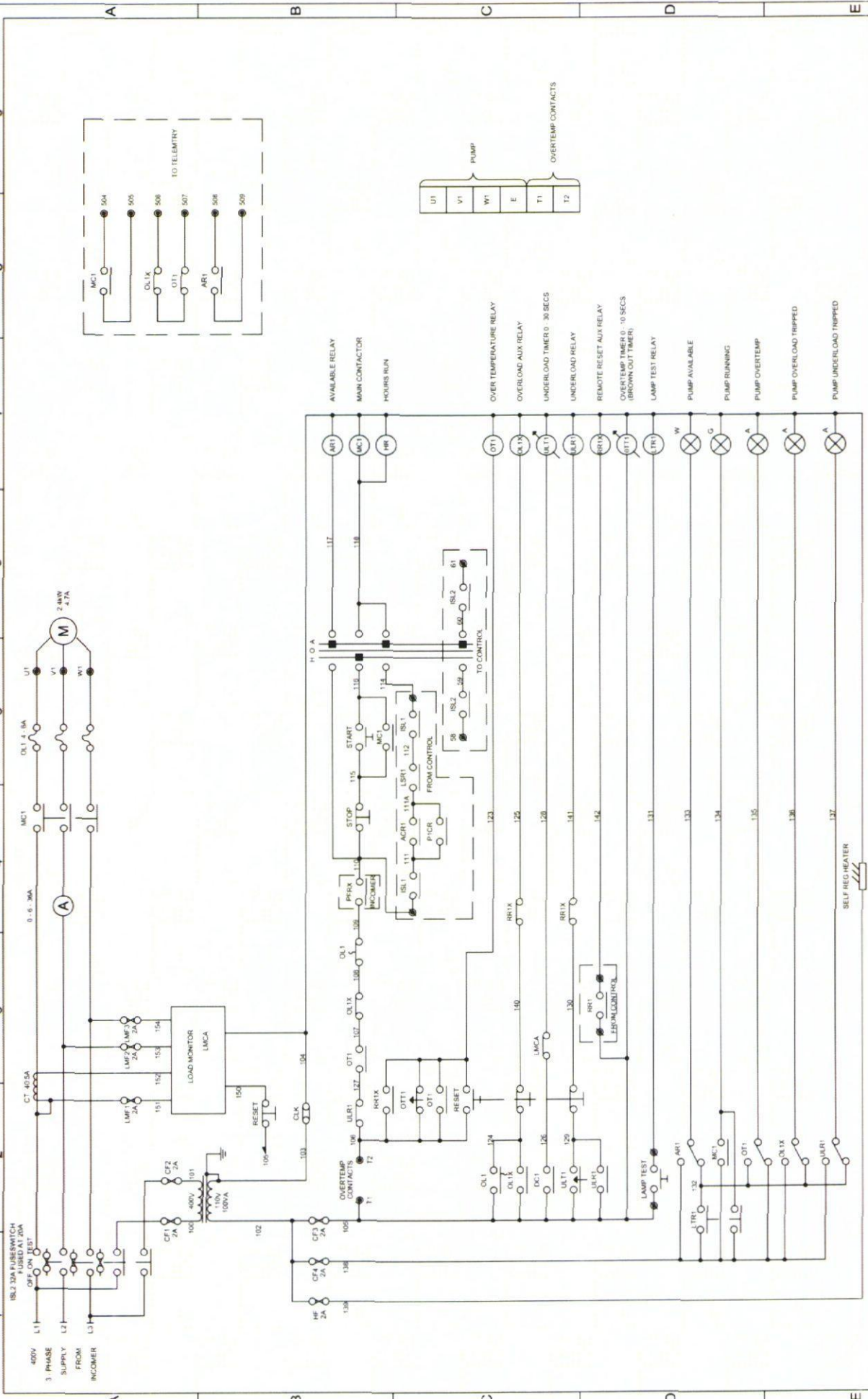
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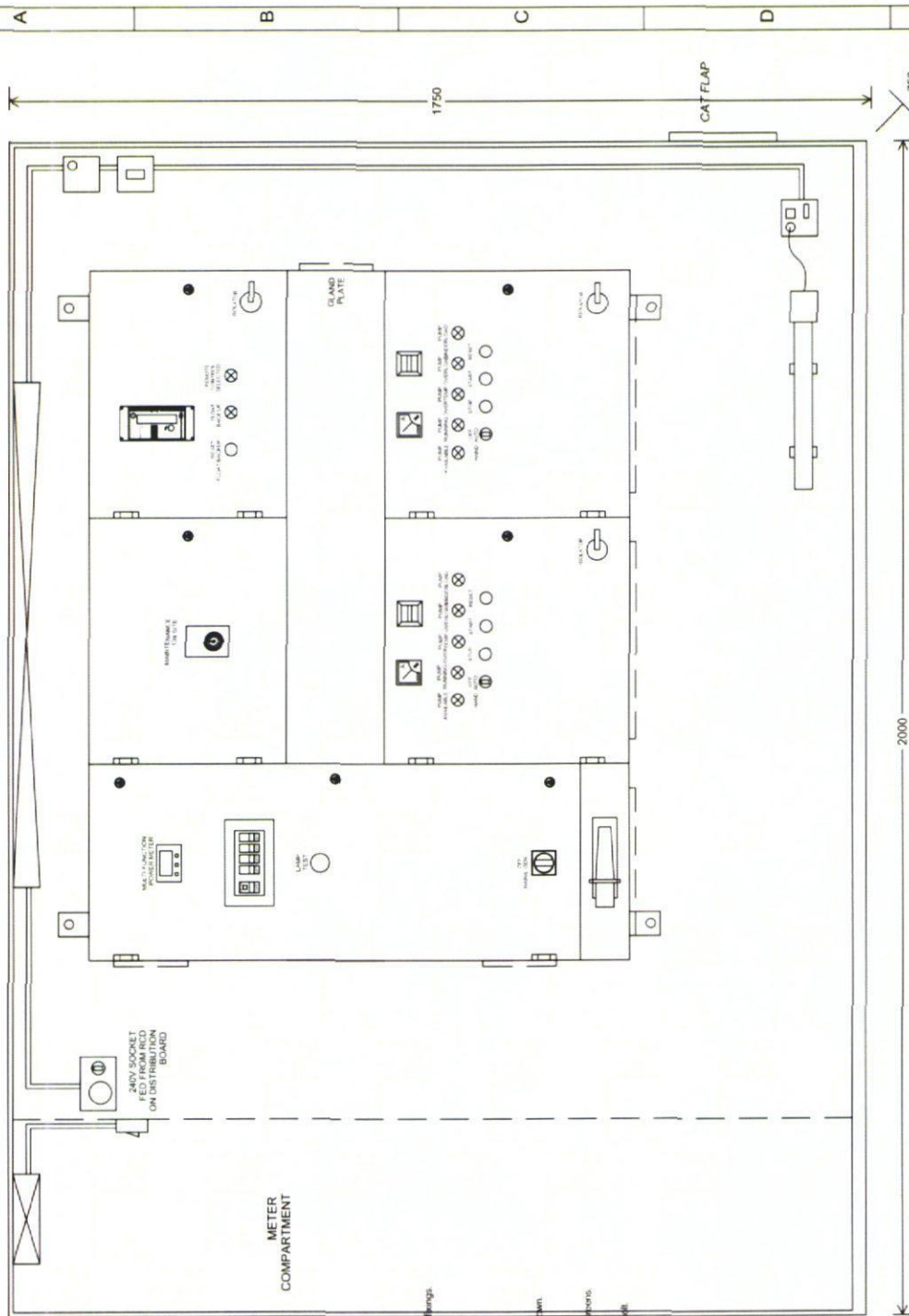


CLIENT Barratt David Wilson Southampton		DRAWING TITLE Pump Starter 1	
PROJECT Manor Farm, Copseys, Foul Water PS		REVISIONS	
Rev 1 Modification	Drawn 2	Checkd 3	Date 31/10/13
Project No NS		Project Ref GC16728	
Issue No 2 of 7		Issue Ref PD054645	

gemi control systems ltd
designers and manufacturers

0944 800 4250
0944 800 4251
www.gemi-controls.com

Xylem Water Solutions UK Ltd
100 HANLEY LANE
FARMINGHAM CH
HAMPSHIRE
GU14 8JE
TEL 01252 513366
FAX 01252 516604



KIOSK LABELS:

WARNING ISOLATE MAIN SUPPLY (150mm x 75mm) shall be positioned on the control panel inside kiosk

ENSURE PUMPS (300mm x 200mm) shall be positioned externally on the kiosk doors

KIOSK SPECIFICATION:

- 7th Edition CONSTRUCTION SPECIFICATION**
- 1 The kiosk shall be constructed from stainless steel hinges and stainless steel tamper proof flaps.
 - 2 The clear opening of the double doors is 1800 mm wide x 1500 mm high.
 - 1 No Yale cylinder rim lock bolts to second opening door leaf.
 - 2 No Stainless steel self locking stays.
 - 2 No GRP / 18 mm Core / GRP partition to form two compartments.
 - 1 No Yale cylinder rim lock sealing the doors to IP55.
 - 1 No Yale cylinder rim lock sealing the doors to IP55.
 - Encapsulated steel sections around the perimeter of the door frame and the edge of each door
 - 90 mm wide internal flange c/w encapsulated drilled 5 mm thick stainless steel plates for hollow chain
 - Construction is GRP : 18 mm Core / GRP With a 'U' value of 1.5 W / m² / °C.
 - Concrete base with replacement stainless steel door.
 - 2 No 12" x 12" Anodised aluminium louvre vents with internal 'hid or mist' flow adjustment and fly screens.
 - 1 No 1830 mm x 200 mm x 18 mm Encapsulated plywood light pad.
 - 1 No 1500 mm W x 1620 mm H x 18 mm thick Varnished plywood back board.
 - 1 No Catflap with a 200 mm x 200 mm clear opening c/w stainless steel hinges & internal shoot bolt.

Xylem Water Solutions UK Ltd

106 HAWLEY LANE
FARNBOROUGH
HAMPSHIRE
GU14 7JF
TEL 01252 511366
FAX 01252 516404

gemini control systems ltd
designers and manufacturers

0844 800 4250
0844 800 4251
www.gemini-controls.com



CLIENT
Barratt David Wilson Southampton

PROJECT
Manor Farm, Copseys, Foul Water PS

DRAWING TITLE
Kiosk Layout

Job Ref
GC

Drawing Ref
GD14532-6

Sheet
6 of 7

Client Ref
PR19423

Drawn by
NS

Checked by
SH

Date
03/10/13

Scale
NTS

Drawn
Chd

Approved
Date

Rev. Modification

1

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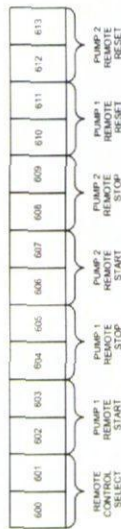
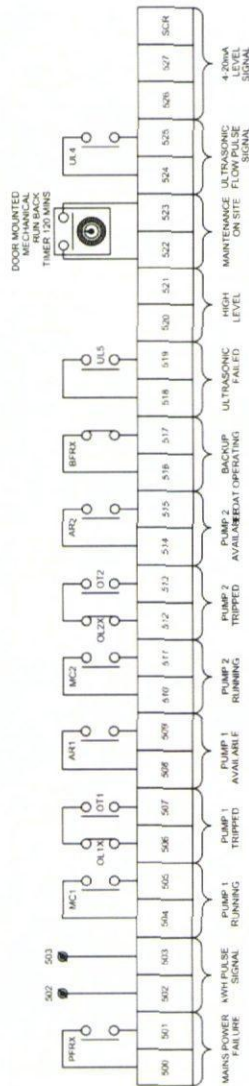
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Rev		Modification		1		2		3		4		5		6		7		8		9					
DRAWING TITLE										TELEMETRY										CLIENT		geminii control systems ltd		Xylem Water Solutions UK Ltd	
																				Barratt David Wilson Southampton		designer's and manufacturers		108 HARLEY LANE	
																				PROJECT		www.geminii-controls.com		HARTLEY ROAD	
																				Manor Farm, Copseys, Foul Water PS		GU14 8LE		HAMPSHIRE	
																				PR18423		0644 900 4251		TEL 01252 513366	
																				7 of 7		0644 900 4250		FAX 01252 516404	
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