CONOR FUREY & ASSOCIATES LTD
Consulting Engineers and Project Managers

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Olde World Cottage,
Rathasker Road,
Naas,
Co. Kildare

PRELIMINARY SERVICES SPECIFICATION

Project : Development at
Clonuff,
Co. Kildare

Client : Liam Knowles

Ref : 18-D7

Date : 1st October 2018

Report By : Emmet Furey

INTRODUCTION

1.1 Proposed Development Details

Conor Furey & Associates Ltd. have been appointed by Liam Knowles to prepare a water services design proposal for a development at Clonuff, Co. Kildare.

The development will consist of construction of 15 no. new detached dwellings on a 2 no. greenfield sites divided by an existing site access. The development proposes to connect to and upgrade an existing wastewater treatment system within 400m of the site serving a cluster of 14 no. dwellings. Surface water drainage will be catered for within the confines of the development.

This report details the proposed methodology of surface water drainage and wastewater disposal as well as outlining the existing water services infrastructure in the area.

SURFACE WATER DRAINAGE

2.1 Proposed Surface Water Drainage

In order to reduce surface water run-off and to minimise the risk of flooding, all surface water run-off from the proposed development will be controlled and managed in accordance with CIRIA Report C753 "The SUDS Manual" (2015) and Greater Dublin Strategic Drainage Study (2005). The proposal will incorporate Sustainable Urban Drainage Systems (SuDS).

Surface water discharge generated within the confines of each individual dwelling site will discharge to appropriately designed and sized individual infiltration soakpits.

Surface water discharge generated by the remaining hard areas such as roads and footpaths will pass through filter strips and drains and finally discharge to appropriately designed and sized soakpits.

2.2 Rainfall Data

Rainfall return period data associated with the subject site will be sourced from Met Éireann and is based on a depth duration frequency (DDF) model generated from

rainfall station data which was analysed, interpolated and mapped on a 2km grid. Please see Appendix A for the tabulated Met Éireann rainfall results.

2.3 Climate Change

All surface water hydraulic calculations wil be assessed with an additional allowance included for 20% increase for climate change as set out in the GDSDS Technical Document, Climate Change. See below in figure 2.1 extract from Table 6.2 of GDSDS Volume 2 showing the climate change factor required for rainfall data.

Climate Change Category	Characteristics
River flows	20% increase in flows for all return periods up to 100 years
Sea level	400+mm rise (see Climate Change policy document for sea levels as a function of return period)
Rainfall	10% increase in depth (factor all intensities by 1.1)
	Modify time series rainfall in accordance with the GDSDS climate change policy document

Fig 2.1 – Climate Change Factors to be Applied to Drainage Design

2.4 Storm Return Period

Storm return periods have been chosen in accordance with Criterion 3 of Section 16.3 of "Greater Dublin Regional Code of Practice v.6.0". It is proposed to design soakpits for the 30 year storms flows within the development site which will result in no flooding on the site.

FOUL DRAINAGE

3.1 Foul Drainage Proposal

It is proposed to discharge foul water within the site to a new Condor Effluent Pump Station located at the entrance to the development. The pump station will pump effluent via rising main to an existing wastewater treatment plant to the north of the site which appears to serve 14 no. existing dwellings. The existing wastewater treatment plant is under the ownership of Kildare County Council.

For the purposes of calculating the development PE loading, the following parameters were followed:

For dwellings, as a rule, 1 person (PE) produces 200lts of wastewater per day.

- Dwelling with 4 bedrooms = minimum 6 PE (5+1) = 1,200lts

The total loading associated with the proposed development is as follows;

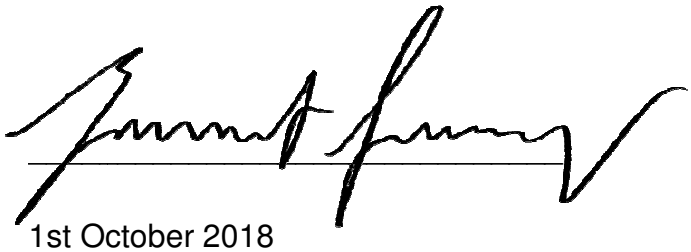
- 15 No. proposed 5 bed dwellings at 6 PE = 18,000lts (provisionally)
- 14 No. existing 4 bed dwellings at 6 PE = 16,800lts (assumed)

Total = 34,800 l/day or 0.40 l/sec

A dry weather flow factor (DWF) must be applied to insure that any infiltrations of ground or storm water or peak flows throughout the day are accounted for. A DWF Factor of 6 is applied to the above loading.

Design Flow, Q_D = 0.44 * 6 = 2. 4 l/sec

All foul sewer connections to be in accordance with "Recommendations for Site Development Works for Housing Areas" and Irish Water requirements and specification.

Signed : 

Date : 1st October 2018

Print Name : Emmet Furey

Qualifications : B.E. (Structural), M.I.E.I.

CONOR FUREY & ASSOCIATES LTD.
CONSULTING ENGINEERS

APPENDIX A

CONDOR SAF BROCHURE

Conder® SAF

SUBMERGED AERATED FILTER

THE PARTNER OF CHOICE

PREMIER TECH AQUA

40 years OF PASSION

Sewage treatment plant for small and large scale projects

The Conder SAF Package Sewage Treatment Plant is the perfect solution for small and large scale projects, where a population range exceeds 25 and mains drainage is unavailable.

From housing developments and other small scale projects right up to larger commercial applications including caravan parks, leisure facilities, hotels, schools, offices and industrial situations, the plant will serve a population from 30 - 600 PE as a single stream unit.

Larger populations can be accommodated with multiple stream plants.

Conder®
SAF

Superior Technical Performance

The highly successful Conder SAF is designed and tested in accordance with BS EN 12566-3, the British Water Code of Practice for Flows and Loads as well as being CE approved.

In standard configuration the plant offers treatment better than a 20mg/L BOD:30mg/L SS: 20mg/L NH_3 effluent quality standard with options for 10 or 5mg/L NH_3 effluent quality and improved BOD and SS quality.

Complete Below Ground Installation

Premier Tech Aqua has designed the Conder SAF to have a minimal visual impact on site location. This includes complete below ground installation, though the range is adaptable and can provide an above ground treatment solution when needed. The plant also offers a quiet, odourless operation which is assisted by a compact design with no below ground moving parts.

Low Costs

The Conder SAF offers superior technical performance at a competitive price, offering real value for money without compromising on quality. The plant is particularly quick and easy to install which results in low initial costs, but also uses reliable, cost effective and energy efficient blowers, for operation with an integral flow management system, providing an overall competitively priced product for the duration of its lifetime.

Quality, Adaptable Design

Premier Tech Aqua has been the manufacturer of hundreds of Conder SAF installations across the world and has pioneered the development of package sewage treatment plants. The Conder SAF utilises a proven Submerged Aerated Filter (SAF) technology for optimum performance and dependability. The adaptable design offers the availability of pumped influent or effluent, deeper inverts and the availability of high nitrification options.

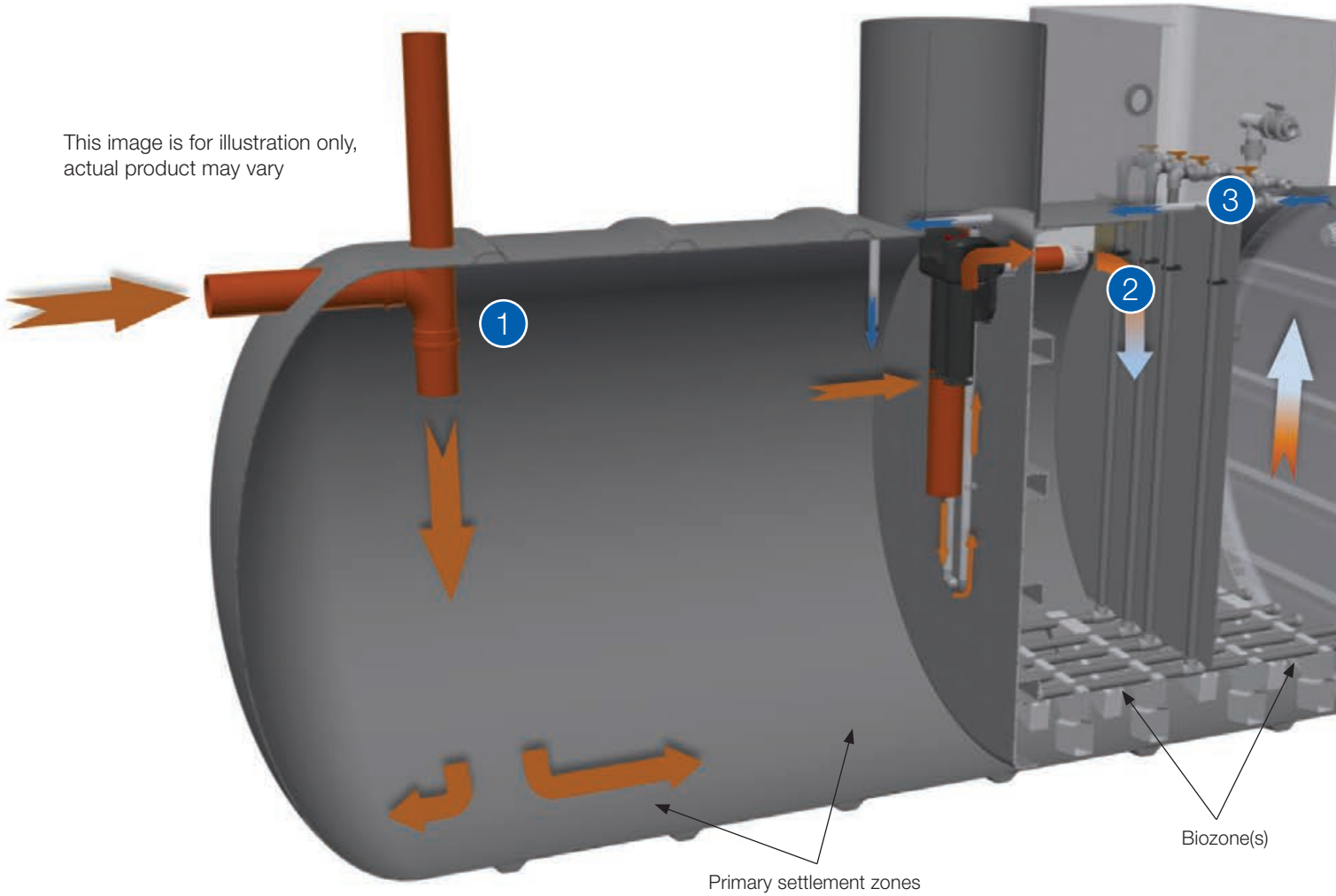
How the Conder SAF Works

The Conder SAF Treatment Plant comes in four variations, dependant upon population size and application parameters.

- Unitank (singular tank)
- Semi Modular Tank (two tank system)
- Modular (three tank system)
- Multi Stream Systems (bespoke application design)

The tank(s) form three treatment stages; primary settlement, biological treatment (biozone) and humus settlement. Flow through all of the treatment stages from inlet to outlet occurs through gravity and integral airlift.

This image is for illustration only, actual product may vary



Step 1

The incoming wastewater is received in the primary settlement zone which has two purposes;

- To remove the majority of the incoming settleable material
- To store this material (primary sludge) along with humus sludge until it is periodically removed by desludging.

Step 2

Flow from the primary zone then passes through a built in impingement pre-filter, that prevents suspended solids from entering the biozone combined with forward flow entering the biozone. This is combined with forward flow into the biozone via an airlift which is controlled by a solenoid valve and timer. The biozone contains a number of sections, which contain loose plastic media. The high surface area of the media encourages growth of the bacteria and other organisms (biomass) which treat the wastewater.

Step 3

Air is then introduced below the media, by means of above ground blowers. This air fulfils the requirements for oxygen and also scours the media which removes excess biomass.

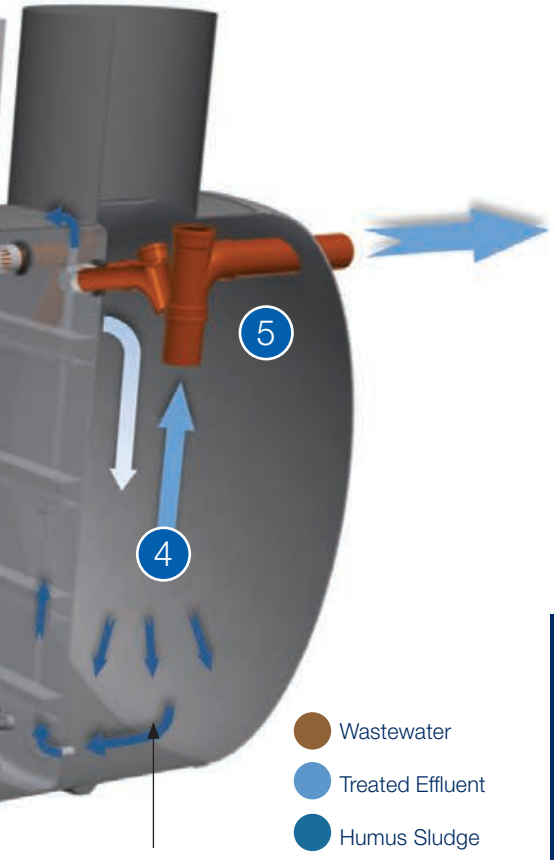
Step 4

The combination of treated wastewater and excess solids is then transferred forward into the humus settlement zone.

Here, the humus solids settle to the bottom of the tank with the treated water being discharged at the top. These heavier solids are recycled into the primary zone for an airlift which is control by a solenoid valve and timer.

Step 5

The treated (final) effluent subsequently leaves the plant via the dipped outlet pipe. The movement of the fluid through the whole system is by gravity displacement. The option for a final clear effluent pumped discharge is available.



Humus settlement zone

Plant Kiosk

Conder SAF products are provided with a mild steel kiosk. This kiosk houses the aeration blowers, timer valves and the electrical control panel.

The electrical control panel provides all the required electrical equipment for the starting, running and monitoring of the plant. The control panel can be adapted to accommodate other mechanical and electrical devices associated with the plant, for example a final effluent pump station or UV disinfection.

This image is for illustrative purposes only, actual product may vary.

The kiosk is fitted with an alarm beacon as standard and can be provided with telemetry for remote plant monitoring. Other innovative features include thermostatic cut off controls and air filter monitoring to extend blower life.

Standard Features Include:

- Integrated air filter – draws in fresh air from the outside and filters any particles to protect the blower
- Pressure switch - air filter benefits from a pressure switch which monitors any pressure drop across the filter
- Blower pressure monitoring and protection – if a high pressure if detected, the blower will shut down and the alarm beacon will flash to notify the operator
- Automatic shut down and restart when high temperature is detected

Specifications

The tables below can be used as a specification guide in choosing the correct Conder SAF Treatment Plant for your project.

All applications should be specified to comply with the British Water Code of Practice for Flows and Loads.
Further advice and assistance is available from our experienced internal and external sales teams prior to installation. Site visits and assessments are recommended for all plants to ensure the correct equipment is proposed for each application.

Unitank SAF System

	Primary Settlement/ Biozone/Humus Tank			Max Load Per Day		
Product Reference	Tank Diameter (m)	Overall Length (m)	Dry Weather Flow (DWF) (m^3/day)	BOD (kg/day)	NH_3 (kg/day)	Desludging Interval
CSAF 30 N20	1.8	4.79	6.0	1.8	0.24	120
CSAF 35 N20	1.8	5.40	7.0	2.1	0.28	120
CSAF 40 N20	1.8	6.10	8.0	2.4	0.32	120
CSAF 50 N20	1.8	7.50	10.0	3.0	0.40	120
CSAF 60 N20	2.5	4.25	9.0	3.6	0.48	90
CSAF 60 N10	2.5	4.85	9.0	3.6	0.48	90
CSAF 60 N05	2.5	5.46	9.0	3.6	0.48	90
CSAF 75 N20	2.5	4.81	11.3	4.5	0.60	90
CSAF 75 N10	2.5	5.57	11.3	4.5	0.60	90
CSAF 75 N05	2.5	6.32	11.3	4.5	0.60	90
CSAF 100 N20	2.5	6.28	15.0	6.0	0.80	90
CSAF 100 N10	2.5	7.28	15.0	6.0	0.80	90
CSAF 100 N05	2.5	8.28	15.0	6.0	0.80	90
CSAF 125 N20	2.5	7.78	18.8	7.5	1.00	90
CSAF 125 N10	2.5	9.03	18.8	7.5	1.00	90
CSAF 125 N05	2.5	10.29	18.8	7.5	1.00	90
CSAF 150 N20	2.5	9.26	22.5	9.0	1.20	90
CSAF 150 N10	2.5	10.77	22.5	9.0	1.20	90
CSAF 150 N05	2.5	12.27	22.5	9.0	1.20	90
CSAF 200 N20	2.5	11.00	30.0	12.0	1.60	60
CSAF 200 N10	2.5	13.00	30.0	12.0	1.60	60
CSAF 200 N05	3.0	10.66	30.0	12.0	1.60	60
CSAF 250 N20	2.5	13.67	37.5	15.0	2.00	60
CSAF 300 N20	3.0	11.81	45.0	18.0	2.40	60

Modular Two Tank System

	Primary Tank			Biozone Tank					
Product	Tank Ref:	Tank Diameter (m)	Length (m)	Tank Diameter (m)	Length (m)	Dry Weather Flow (DWF) (m^3/day)	BOD (kg/day)	NH_3 (kg/day)	Desludging Interval
CSAF 250 N10	PT27	2.5	5.590	3.0	8.26	37.5	15	2.0	60
CSAF 250 N05	PT27	2.5	5.590	3.0	9.94	37.5	15	2.0	60
CSAF 300 N10	PT32	2.5	6.970	3.0	9.80	45.0	18	2.4	60
CSAF 300 N05	PT32	2.5	6.970	3.0	11.82	45.0	18	2.4	60
CSAF 350 N20	PT36	2.5	7.762	2.5	11.95	52.5	21	2.8	60
CSAF 350 N10	PT36	2.5	7.762	3.0	11.33	52.5	21	2.8	60
CSAF 350 N05	PT36	2.5	7.762	3.0	13.69	52.5	21	2.8	60
CSAF 400 N20	PT40	2.5	8.600	3.0	10.17	60.0	24	3.2	60
CSAF 400 N10	PT40	2.5	8.600	3.0	12.87	60.0	24	3.2	60
CSAF 500 N20	PT50	2.5	10.880	3.0	12.58	75.0	30	4.0	60

Modular Three Tank Systems

	Primary Tank			Biozone Tank		Humus Clarifier Tank						
Product	Tank Ref:	Tank Diameter (m)	Length (m)	Tank Diameter (m)	Length (m)	Tank Ref:	Diameter (m)	Length (m)	Dry Weather Flow (DWF) (m^3/day)	BOD (kg/day)	NH_3 (kg/day)	Desludging Interval
CSAF 400 N05	PT40	2.5	8.60	3.0	12.00	HM22	2.5	5.005	60.0	24	3.2	60
CSAF 500 N10	PT50	2.5	10.88	3.0	11.33	HM30	2.5	6.265	75.0	30	4.0	60
CSAF 600 N20	PT60	2.5	12.95	3.0	9.31	HM35	2.5	7.755	90.0	36	4.8	60

Multi Stream Systems

For larger applications Premier Tech Aqua's engineered solutions division offer multi stream systems to meet specific application requirements.

The number and sequence of streams/tanks will be selected by our experienced sales and technical team to meet specific customer requirements. Detailed involvement at an early stage is a must for these applications.

Above Ground Systems

All of the standard and bespoke Conder SAF solutions can be manufactured for above ground installation, please contact the Premier Tech Aqua sales team for more information.

Installation

The Conder SAF Package Sewage Treatment Plant requires a relatively low cost and easy installation process. All Conder SAF plants can be manufactured to allow installation with either granular or concrete backfill, with granual backfill providing significant reductions in installation costs.

Premier Tech Aqua work closely with a nationwide network of installation partners and detailed installation guidelines are provided for each product.

All electrical work should be carried out in accordance with current regulations (for example NIC/EIC/Building Regulations).

Peripherals

- **Access shafts (for deeper pipework inverts)**
- **Acoustically lagged control kiosks**
- **Hot climate kiosk**
- **Client specified control panel**
- **Standby blower**
- **Client specified control kiosk**
- **Sample chamber**
- **Phosphate reduction**
- **UV Disinfection**
- **Scada/Telemetry**
- **GMS Dial Out**
- **Tertiary Treatment with coco filter technology**
- **Heavy-duty covers**
- **Final effluent pump station to overcome discharge level issues**
- **Feed pump stations**

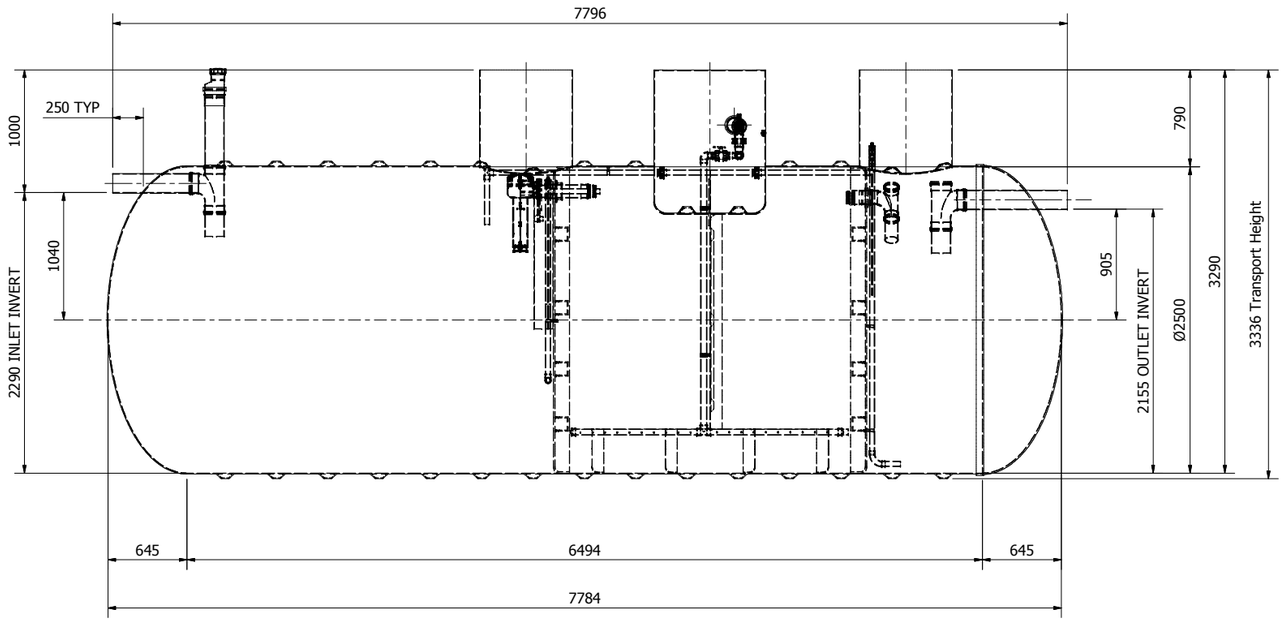
Servicing

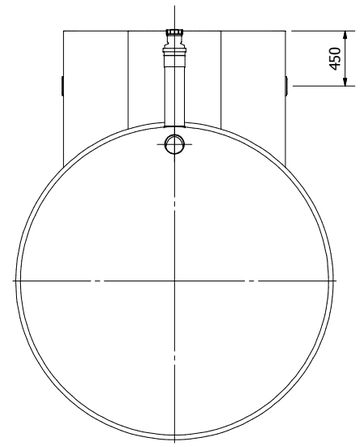
Premier Tech Aqua recommend that a maintenance agreement is taken out to service the plant. Regular desludging (emptying) of the Primary Tank is also needed to ensure consistent operational efficiency. This should take place at intervals between 60 – 120 days, depending on the size of the plant and the plant loading (see tables within specification section). Premier Tech Aqua can provide access to a nationwide network of British Water Accredited service partners who can offer a comprehensive range of servicing including commissioning and on-going service contracts. Please contact the Premier Tech Aqua sales team for further information.

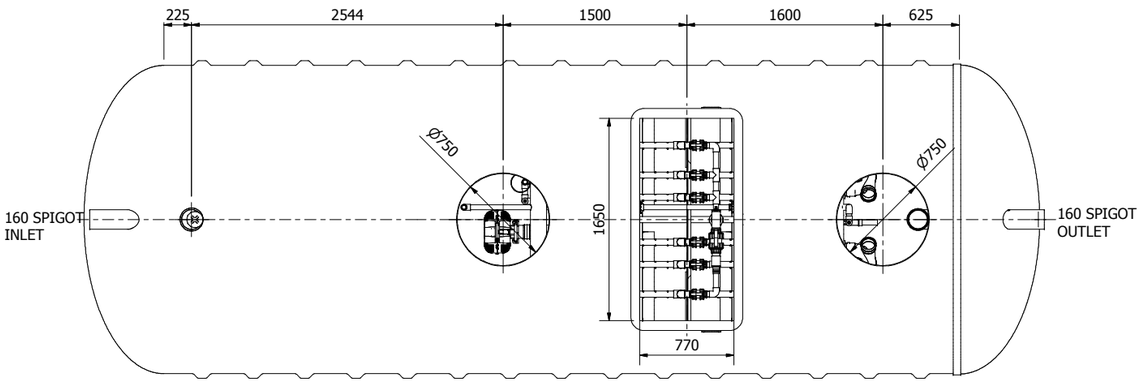
APPENDIX B

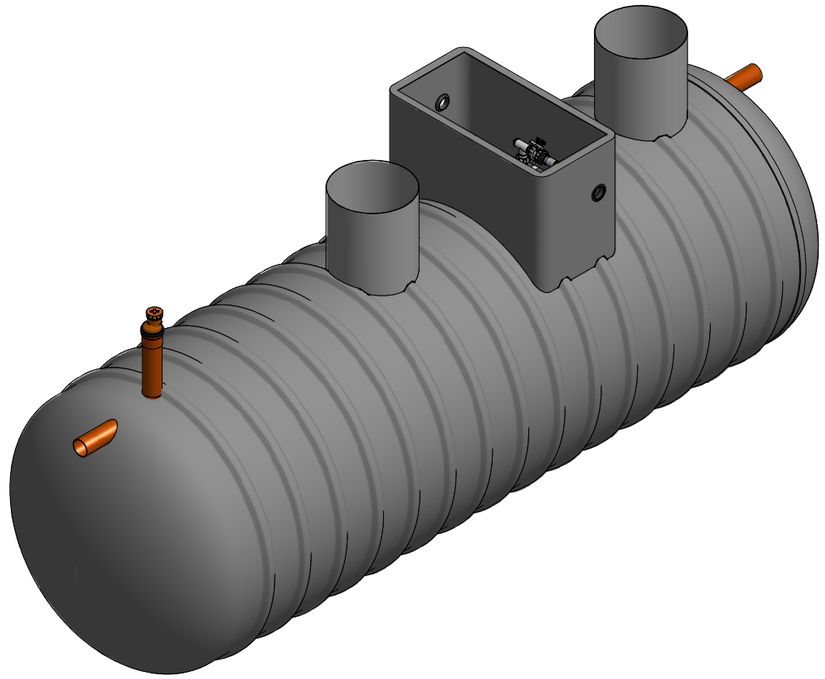
CONDOR CSAF125N20 SPECIFICATION

A Conder® BRANDED PRODUCT









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A	27/01/15	LT	KB	RP	ISSUED FOR INFORMATION

DO NOT SCALE
IF IN DOUBT ASK
ALL DIMENSIONS IN MM

TOLERANCES (unless noted otherwise)
GENERAL LINEAR DIMS : +/- 5mm
ANGULAR DIMENSIONS : +/- 1/2~

Stock Code:902618

Designed by	Checked by	Approved by
LT 27/01/2015	KB 27/01/2015	

PREMIER TECH AQUA

SEWAGE TREATMENT PLANT CSAF125N20

CSAF125N20-SALES

APPENDIX C

ECOFLO TERTIARY TREATMENT SYSTEM BROCHURE

Ecoflo® Coco Filter

Tertiary Treatment Filter

Domestic and commercial applications

WASTEWATER TREATMENT

A final treatment stage to further improve the effluent quality before it is discharged safely to the receiving environment.

Highest Performing

A reliable wastewater treatment system well adapted to all site conditions. Proven performances surpassing the strictest standards.

Sustainable

A permanent and ecological solution – no energy needed for the treatment. Pre-assembled, easy-to-handle units to ensure quality installations and less surplus material transported to sites.

Compact

Minimal final footprint – ideal when the available area for the installation is limited or if separation distances must be reduced.

Low-Cost

Delivered ready to be installed to minimize civil works and eliminate construction on site. No excavation or relocation at the end of the life cycle of the filtering media (up to 15 years).

PREMIER TECH AQUA

Complies with the EPA Code of Practice 2009

CE

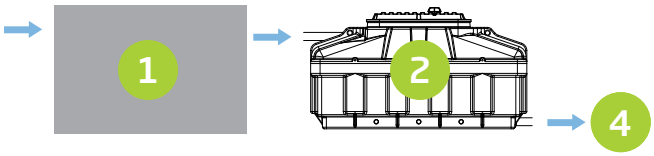
PROTECT
YOUR PROPERTY, YOUR ENVIRONMENT & YOUR INVESTMENT.

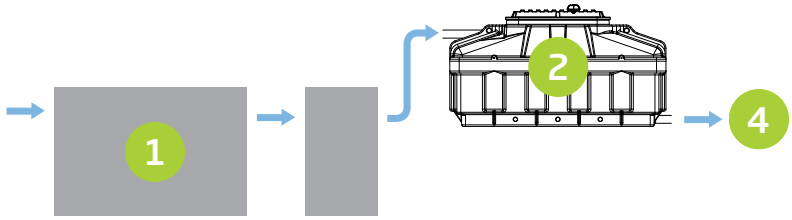
Ecoflo Coco Filter offers all the benefits of a truly proven and reliable tertiary treatment system. Designed for both principal and secondary residences as well as for new housing constructions and faulty system replacement projects. Also recommended for commercial projects.

THE BEST CHOICE MADE SIMPLE

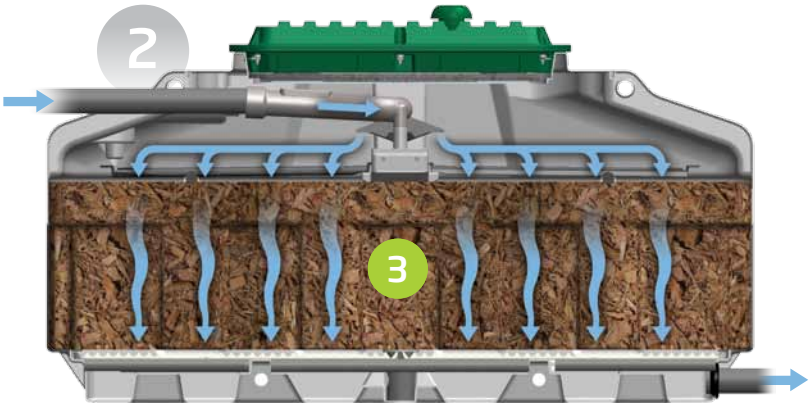
- Send us a copy of your EPA Site Suitability Assessment and we will produce a design for you.
- If you don't have a copy, send us your planning number and we'll look it up for you on your local authority website.
- Send us the name of your engineer and we will liaise with them for you.
- We supply either a full kit of a Wastewater Treatment or only the Ecoflo Coco Filter – Tertiary Treatment Filter along with 15 m of interconnecting pipework and fittings.
- We will liaise with your grounds contractor to ensure proper installation.
- We provide a commissioning certificate for the system for full compliance with your planning.

TYPICAL INSTALLATIONS





Pumping Station



1 Secondary Treatment System
Treats domestic wastewater as per local regulations.

2 Ecoflo Coco Filter
Provides a final treatment stage to further improve the effluent quality before it is discharged to the receiving environment. Spreads out the influent over the surface of the filtering media thanks to a patented distribution system comprised of a feed ramp, a tipping bucket and distribution plates.

3 Filtering Media
The coco fragment-based filtering media is where the water is organically further treated and filtered and where pollutants are retained and degraded.

4 Final Discharge
The treated wastewater is discharged directly to a gravel distribution bed installed below it.

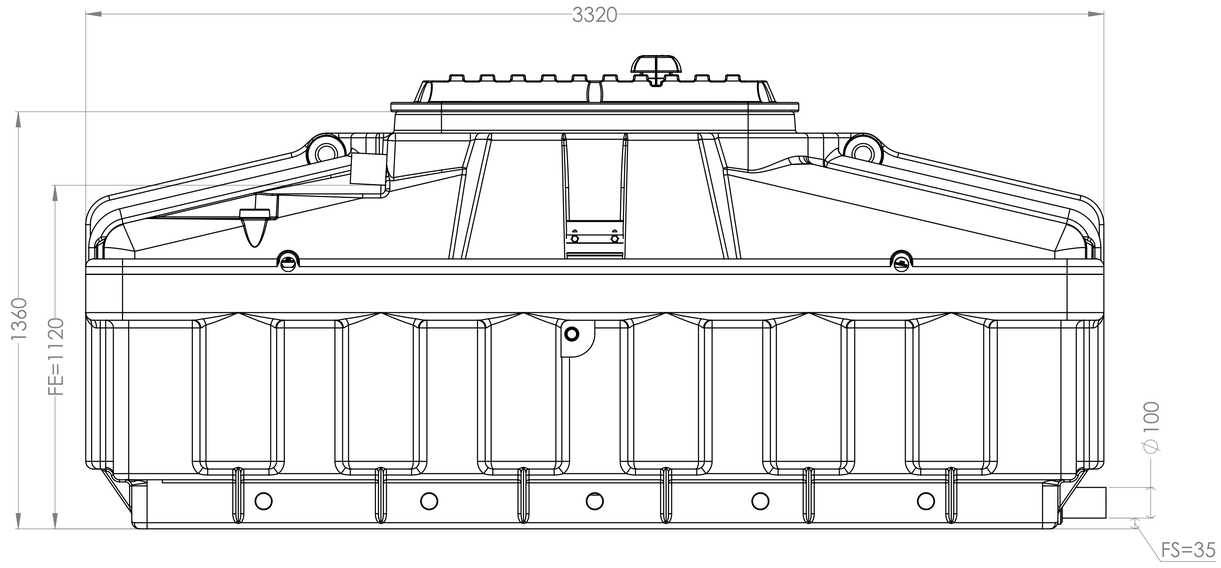
PREMIER TECH AQUA

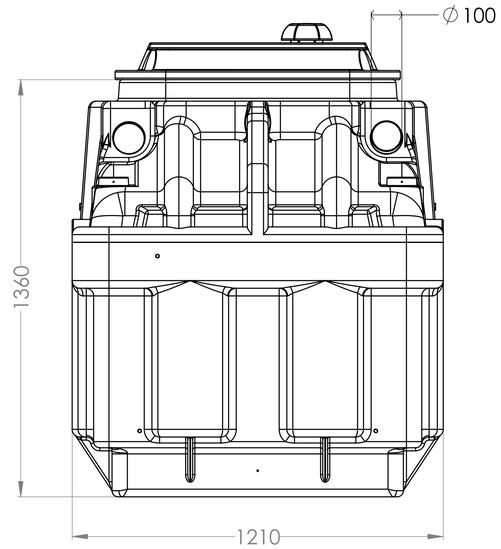
Quartertown Industrial Estate, Mallow, Co Cork, IRELAND
022 51411 | ptairl-sales@premiertech.com | **PREMIERTECHAQUA.IE**

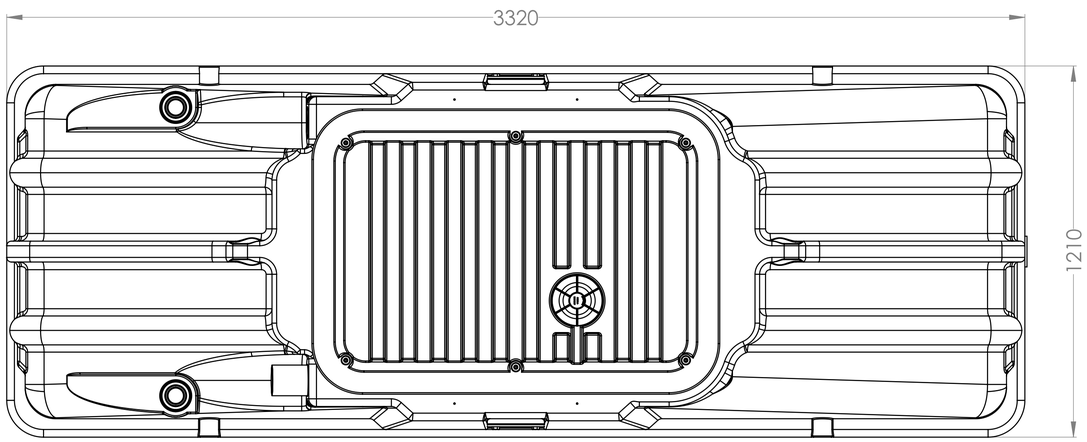
APPENDIX D

ECOFLO 6EH FILTER SPECIFICATION

Ecoflo Polyéthylène Filtre 6EH
(agrément ministériel 2012-026)







NOTES:
Les cotes bénéficient d'une tolérance de +/- 3%

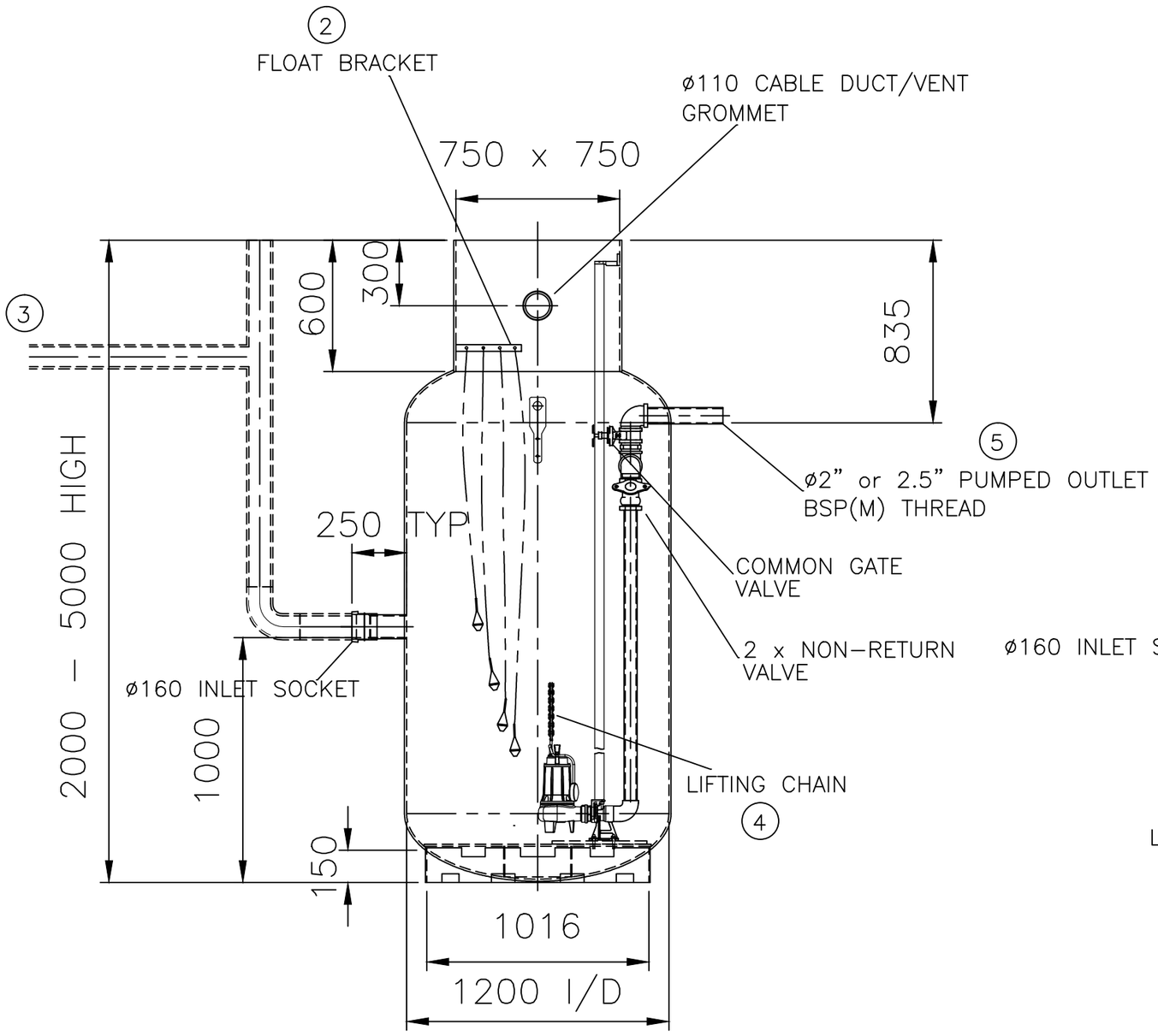
NOTES:

-Dimensionnement, mise en œuvre, utilisation et exploitation doivent être réalisés conformément à la réglementation en vigueur et aux instructions du fabricant

	Indice	Modifications	Date
maya design		PREMIER TECH AQUA	ECOFLO
		Ecoflo Polyéthylène Filtre 6EH	Matière:
			Poids: Kg
Feuille: 1/1	24/04/2014	Ce document est la propriété de PTAP et ne peut etre divulgué sans notre autorisation	Surface:

APPENDIX E

CONDOR PUMP CHAMBER SPECIFICATION

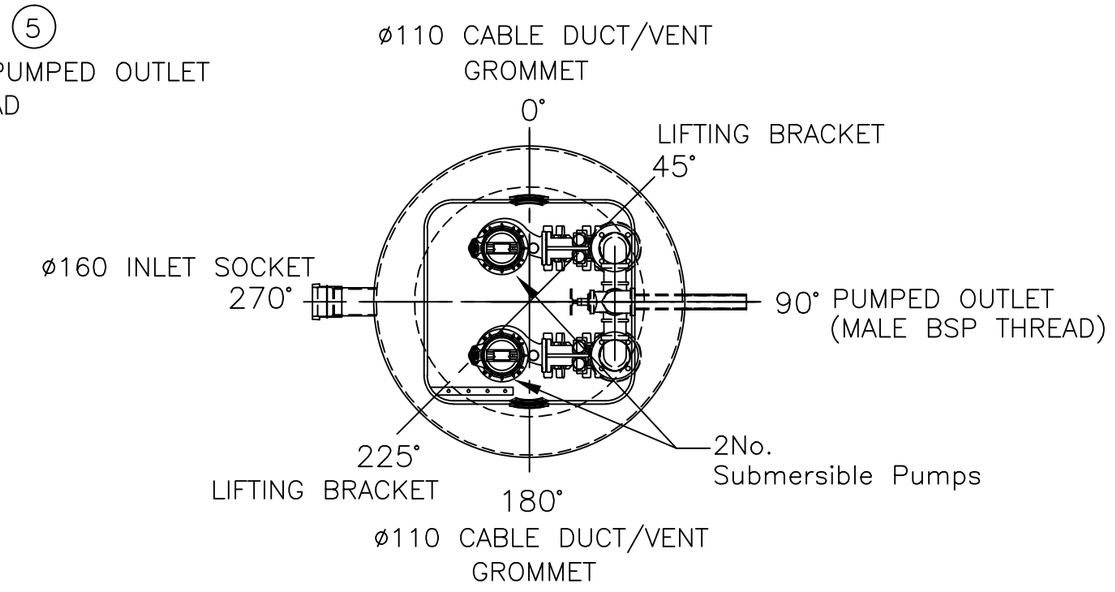


NOTES.

1. ALL UNITS TO BE SURROUNDED IN CONCRETE (SEE GUIDE UTG 9502)
2. 4 x FLOAT SWITCHES (TYPICAL SETTING SHOWN, TO BE SET DURING COMMISSIONING, SWITCHES TIED AT HIGH LEVEL FOR TRANSPORT)
3. VARIABLE INLET (EXTERNAL PIPEWORK AND VENT COVER BY OTHERS)
4. 2 x LIFTING CHAINS (HUNG FROM TOP GUIDE RAIL BRACKET)
5. TERMINATING IN MALE THREADED OUTLET ø1.2 TANK (2" OR 2.5" DEPENDING ON PUMP SELECTION)

STANDARD LOOSE ITEMS (SUPPLIED WITH TANK)
2 x SUBMERSIBLE PUMPS
1 x CONTROL PANEL
1 x PEDESTRIAN MANHOLE COVER AND FRAME (D400 OPTION AVAILABLE)

OTHER OPTIONAL ITEMS ARE AVAILABLE



PLAN VIEW SHOWING
TRUE PIPEWORK ORIENTATIONS

SITE SPECIFIC LAYOUTS/ORIENTATION
AVAILABLE AT AN ADDITIONAL COST

REV.	DATE	BY	CHKD.	APPD.	DESCRIPTION
–	–	–	–	–	–
A	04.03.14	MH	–	–	ISSUED FOR INFORMATION

S W E N
FOR INTERNAL USE ONLY

1ST ANGLE PROJECTION

GENERAL TOLERANCES (unless noted otherwise)				
GRP FABRICATED MACHINED	LINEAR	± 5mm ± 2mm ± 0.5mm	ANGLE	±0.5° ±0.2° ±0.1°

A3

DO NOT SCALE
IF IN DOUBT ASK
ALL DIMENSIONS IN MM

IMPORTANT INVERT LEVEL NOTE (RIBBED TANKS ONLY!):
The inlet and outlet Invert Level(IL) shown on this drawing is to internals of the shell unless otherwise stated.
For Invert level to the outside of the shell ribs, see the conversion below:
ø1.5m,1.8m,2.5m IL+50mm ('X')
ø3.0m,4.0m IL+75mm ('X')

INNER TANK SHELL
DETAIL 'Y'

TANKS SUPPLIED WITH LOOSE SHAFTS DO NOT COME SUPPLIED WITH A FIXING KIT.
THIS IS THE RESPONSIBILITY OF THE SITE CONTRACTOR.

CONDER AQUA SOLUTIONS
A PREMIER TECH AND EPS JOINT COMPANY

TITLE: G.A. FOR 1.2dia STANDARD PUMP CHAMBER (SALES)

DRAWN BY	CHKD.	APPD.	SCALE	DRAWING No.	PAGES
MH	–	–	NTS	1.2 Dia	1
DATE 04.03.14	DATE –	DATE –			