

Our Ref: LC/1315/SRB

Date: 17th March 2025

Ms Anne McDonald
North Hertfordshire District Council
Planning Control and Conservation
Council Offices Gernon Road
Letchworth Garden City
Hertfordshire
SG6 3JF

Dear Anne,

**Re: Newsells Park Winery, Whiteley Hill, Barkway, Royston, Hertfordshire SG8 8DY
Planning Application: 23/01420/FP**

I am writing to you in connection with planning condition No 19 below:-

19. The development hereby permitted may not commence until a non-mains waste water drainage scheme has been submitted to and approved in writing by the local planning authority. The scheme shall be implemented as approved and completed prior to the development being brought into use.

Reason: To protect and prevent the pollution of controlled waters from potential pollutants associated with current and previous land uses in line with National Planning Policy Framework (NPPF), paragraphs 174, your local plan policy SP11 'Natural resources and sustainability' and relevant position statements within The Environment Agency's Approach to Groundwater Protection.

Further to the letter you received from the Environmental Agency dated 19th November 2024. Please find attached the specification for the wetlands cell lining together with details of the maintenance provisions for the foul drainage scheme.

I trust this is sufficient information to discharge planning condition No 19 but please do not hesitate to contact me if you have any further questions.

Yours sincerely,



Laura Cooper
Engineering Technician

Encl.

BUTEK Landline	Quotation Technical Data Sheet Landflex PVC 120AP Technical Data Sheet Landflex G3000 Proposals and Recommendations for the Supply and Installation of Liquid and Gas Proof Lining
Living Water	Technical Oversight and Maintenance Provision for the Ecological System for the Treatment and Evaporation of Winery Effluent and Sewage for Newsells Whitely Winery, Royston Hertfordshire Living Water drawing No. 23001 B 001(A1)
SPEL	Product Data Manual. Section 9 SPEL Separator Commissioning, Operation and Maintenance. Package Pumping Station O&M Manual
Biodigester	Clenviro Matric Sewage Treatment System Installation, Operation and Maintenance Manual

BUTEK Landline

Containment Solutions

E: [REDACTED]

Head Office: 01277 653281

Scottish Office: 01383 871209 [REDACTED]

QUOTATION

Tuesday, 23 April 2024

Our Ref: JM/LF/QUO999

Living Water Ecosystem Ltd
Carlingnose Studios
North Queensferry
Fife
KY11 1ER

E-mailed
[REDACTED]

No of Pages: 4 Pages

For the attention of David Shields

Dear David,

Re: Newsells Park Winery Reed Bed Cell Liners

Following your recent enquiry, we are pleased to present our recommendations and quotation for the above project. We would confirm that pipes entering the reed bed for sealing should be parallel, at 90 deg. to the bank and the pipe should be a minimum of 75mm from the base (area can be locally dished to suit site).

❖ Recommendations

We are pleased to recommend our specified 1.2mm Landflex 120AP geomembrane, with Black protective non-woven geotextile above and below the liner. These materials have been used extensively throughout the UK for similar projects and has recently been installed at Ancre Hill Winery Reed Beds Monmouth, Glengoyne Distillery, Classlochie Reed Beds Kinross, Lockerbie Canoe Pond (10,000m²), Hardgrave Farm Dumfries, Holytown Motherwell, Cumbernauld SWO for Scottish water, A7 detention ponds Auchinrivock, Chapel Level, Kirkcaldy (3 ponds), Eastern Expansion, Dunfermline (12 ponds), Easter Inch, Bathgate, Crompton Rd Glenrothes, and Great North Rd Kelty amongst others. We would be pleased to discuss detailing further as required and can confirm that our system has been used extensively throughout the UK.

Materials and Construction Details Proposed

- Liner system: prefabricated 1.2mm Landflex 120AP geomembrane.
- Protection system 3000CBR BLACK protective geotextile above and below the liner.
- Net area of lining for geomembrane and textile approx. 560m²

Quantities have been taken from emailed information and drawings of 15/04/24 from David Shields. ALL SIZES TO BE CONFIRMED AND AGREED BEFORE MANUFACTURE COMMENCES.

All work will be carried out in accordance with our ISO9001:2015 quality system and carry our standard 10-year guarantee. A copy of our ISO9001 Submittal Document is enclosed.

Samples and specifications of all materials recommended are available on request.



Directors: J R Young G Mitchell C S Ball L P Drumgold
Registered office: 11 Radford Crescent, Billericay, Essex CM12 0DW, England.
Registration No: GB 3141465



❖ Health and Safety and Accreditations

The Company complies in full to the Construction and Design Management Regulations (CDM).

All operational staff are CSCS card holders with selected staff confined space trained and NVQ Level 2 qualified.

Butek Landline have Safe Contractors Status and are full members of the British Safety Council, The British Geomembrane Association with Construction Line Gold Membership.

Risk Assessments and Method Statements will be provided upon award of contract.

❖ Quotation Supply and install

Description	Unit	Estimated Qty.	Estimated Total Price (ex. VAT)
❖ Cells 1, 2 and 3 lining - To supply and install up to 560m ² of 1.2mm Landflex 120AP geomembrane liner prefabricated into panels inclusive of delivery to Newsells Park Cambridgeshire, ❖ To supply and install up to 1120m ² of G3000 CBR BLACK protective geotextile above and below liner inclusive of in situ welding, overlaps and waste inclusive of delivery, ❖ To seal to up to 13 in No smooth pipes inclusive of securing clip.	Sum		£14,695.00
<i>Please note that we have assumed that all lining works will be completed in one mobilisation to site.</i>			
❖ To mobilise Butek Landline installation team for additional visits over and above the one allowed for above – if required	£1,500/ additional mobilisation	If required	Rate only

Additional charges may apply for demobilisations due to incomplete preparations prior to our arrival, delays/ standing time caused by others and damage to our works caused by others. Daywork charges are highlighted within our Submittal Document enclosed.

We will require the following attendances:

- 1) Mechanical handling with operator to unload delivery transport (Excavator with minimum SWL 1800kg with fork attachments), position materials adjacent to the excavation and then freely available for the deployment of the geomembrane for the duration of the contract, including loading collection transport at the end of the contract.
- 2) All civil engineering and earthworks, including dewatering, digging of anchor trench, backfilling and concrete structure preparation (where applicable) fully prepared to the contract specification.
- 3) The excavation must be dry and free of standing water in advance and maintained throughout the entire installation period.
- 4) Secure storage area to be provided to enable our materials to be delivered to site in advance.
- 5) Waste disposal facilities (non-hazardous) to be provided.
- 6) Safe and unrestricted access and egress to excavation to be provided.
- 7) Shared welfare provision for our site staff.



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❖ Quotation Terms

Quotation type:	Fixed Price - Lump sum
Additional mobilisations:	£1,500.00/ mobilisation over the one allowed for above.
Mobilisation period:	Currently 2-3 weeks from receipt of order. <i>N.B. The mobilisation period is valid at the time of quotation and is subject to change due to site programme and weather at time of order.</i>
Manufacture period for material:	14 - 21 working days from call off order.
Installation period:	Approx. 3 working days
Payment terms:	Credit Terms to be discussed and agreed upon receipt of order.
Validity:	Our quotation assumes that the work will be completed between 1 March and 31 October. If, however, the project is to be completed during winter months between 1 November and 28 February the price may increase to allow for reduced daylight hours and lost days due to weather.
Retentions:	Please note: We do not accept retentions. If a retention is required, then this must be added to our tender price.



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If we can be of any further assistance, please do not hesitate to contact us.

Best wishes.

Paul Graham

Technical Sales Manager



For Butyl Products Ltd.
T/A Butek-Landline

Enc: Submittal Document
Landflex 120AP data Sheet
Landflex G3000 data sheet

Accreditations



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Specialist Geomembranes

Technical Data Sheet

Landflex™ G3000



Puncture Resistant Geotextile

- Separation
- Filtration
- Protection
- Drainage



1137-CPD-61511

The information herein is based upon data obtained by the manufacturer and is considered accurate. However, no warranty is expressed or implied regarding the accuracy of this data. This information is furnished upon the condition that the person receiving it shall evaluate its suitability for the specific application.

Material Properties	Unit	Test Method	Typical values	Tolerance
Mechanical Properties				
Tensile strength MD	kN/m	EN ISO 10319	17.80	-2.30
Tensile strength CMD	kN/m		17.80	-2.30
Elongation MD	%	EN ISO 10319	50.00	±11.50
Elongation CMD	%		55.00	±12.70
Static puncture resistance (CBR)	kN	EN ISO 12236	3.10	-0.62
Dynamic perforation resistance - Cone drop	mm	EN ISO 13433	13.00	+3.30
Pyramid puncture	N	EN ISO 14574	275	-55.00
Protection efficiency	%	EN ISO 13719	1.50	-0.30
Hydraulic Properties				
Water permeability normal to the plane	m/s	EN ISO 11058	80 x 10 ⁻³	-24 x 10 ⁻³
Water flow normal to the plane (*)	l/m ² /s		80	-24.00
Water flow capacity in the plane @20 kPa	m ² /s	EN ISO 12958	7 x 10 ⁻⁶	-10% log g
Characteristic opening size (AOS)	µm	EN ISO 12956	70.00	±21.00
Physical Properties				
Thickness under 2 kPa (*)	mm	EN ISO 9863-1	2.20	±0.44
Weight (*)	g/m ²	EN ISO 9864	250	±25.00
Composition	100% Polypropylene non-woven geotextile			
Durability	Predicted to be durable for a minimum of 25 years in natural soil with 4<pH<9 and soil temperatures <25°C			



Suitable for use in the following applications:

- Roads (EN 13249:2000)
- Railways (EN 13250:2000)
- Foundations & retaining walls (EN 13251:2000)
- Drainage systems (EN 13252:2000)
- Erosion control systems (EN 13253:2000)
- Reservoirs & dams (EN 13254:2000)
- Canals (EN 13255:2000)
- Tunnels & underground structures (EN 13256:2000)
- Solid waste (EN 13257:2000)
- Liquid waste (EN 13265:2000)

Example use shown left:

Upper layer of protection for green roof projects, protecting the rubber membrane from soil / aggregates

(*) Not mandated characteristics for CE marking



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Essex, CM12 0DW, United Kingdom.

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Specialist Geomembranes

Technical Data Sheet

Landflex™ PVC120AP Unreinforced PVC (Grey)



Versatile, highly flexible and suitable for a number of applications including canal and stream lining due to its excellent resistance properties

The information herein is based upon data obtained by the manufacturer and is considered accurate. However, no warranty is expressed or implied regarding the accuracy of this data. This information is furnished upon the condition that the person receiving it shall evaluate its suitability for the specific application.

Material Properties	Unit	Test Method	Typical Values		
Thickness	mm	EN 1849	1.20 ±5%	1.50 ±5%	2.00 ±5%
Density	g/cm ³	EN ISO 1183	1.25 ±5%		
Tensile strength	N/mm ²	EN ISO 527	≥ 16		
Elongation at failure	%	EN ISO 527	L: ≥ 280 T: ≥ 280		
Puncture resistance: Height of fall without perforation	mm	DIN 16726	≥ 750	≥ 750	≥ 1100
Tear strength	N/mm	DIN 53363	≥ 80		
Resistance under water pressure	-	DIN 16726	Waterproof at 10 Bar / 72h		
Biaxial deformation	-	P 84-503	Without rupture		
Dimensional stability after accelerated ageing (6hrs / 80°C)	%	EN ISO 1107-2	≤ 2		
Behaviour after long term ageing (7 days / 80°C)	-	DIN 16726	-	-	-
General appearance	-		No blister		
Dimensional stability: L & T	%		≤ 2		
Variation of tensile strength: L & T	%		< ± 10		
Variation of elongation at failure: L & T	%		< ± 10		
Foldability at -20°C	-		No fissures		
Resistance to artificial weathering	Years	EN 12224 EN 13361	> 10		
Water permeability	m ³ /m ² /day	EN 14250	10 ⁻⁶		
Oxidation resistance (90 days / 85°C)	-	En 14575	Conform		
Cold folding resistance	-	EN 495-5	No cracks at -20°C		
Water absorption after 28 days	%	DIN 53495	≤ 1		
Root resistance	-	EN 14416	Resistant		



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Butek Landline

Containment Solutions

Spec.32 Rev. C

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Submittal Document

Proposals and Recommendations

for the

Supply and Installation

of

Liquid and Gas-Proof Lining Systems

in accordance with our ISO 9001

Quality Management System Certificate No. GB95/791

Materials covered:-

Plastic:	Polyethylene	HDPE LLDPE	Rubber:	Butyl
	Polypropylene	PP		EPDM
	Polyvinyl Chloride	PVC		
	Elvaloy			
	Polyurethane	PU		

Document No. 102 Rev. E
August 2022



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Installation Guidelines For Installing Flexible Geomembranes

General

To ensure that complete water or gas tightness is achieved, installation is carried out by our own personnel who have completed a minimum of 13 months in-house intensive training programme.

All matters relating to material specification and thicknesses are agreed prior to contract.

All construction details are agreed prior to commencement of work.

Requirements in Respect of the Installation Surfaces

All surfaces on which the lining is to be installed, must be prepared so that no damage to the lining is possible.

The surface shall be free of all rocks, sticks, stones, roots, sharp objects or debris of any kind. The surface should provide a firm unyielding foundation for the membrane with no sudden, sharp or abrupt change or break in gradient. No standing water or excess moisture shall be present. The surface must be constructed to allow the necessary compaction. 90% proctor with a surface tolerance of $\pm 25\text{mm}$ for plastic materials, 80% proctor and $\pm 50\text{mm}$ for rubber materials.

If, after inspection of the surface to be installed on to, it is deemed unsuitable, sand blinding or an approved geotextile may be required as a protection layer.

Water Table

The water table level should be established and, if higher than the base of the excavation, adequate drainage should be installed to prevent water pressure build up below the liner.

Transport and Storage of the Sheet

The liner is provided in rolls or panels weighing up to 1.5 tonnes. On site it should be stored on a flat area in the open.

Installation of Geomembranes

Before installation work begins, all surfaces to be lined have to be approved by Butek-Landline Site Supervisor.

The installation of the sheet is carried out in three steps:

- (a) Positioning and unfolding of the rolls or panels.
- (b) Welding of joints.
- (c) Connections to concrete structures, pipe penetrations, sumps, anchor trenches, etc.

The lining work is carried out in accordance with an agreed installation programme. On-site progress of the installation work, as well as the climatic and working conditions are recorded, and on completion a lay-out plan is prepared to record the location and sizes of each roll / panel of geomembrane.

Positioning of Geomembrane Rolls / Panels

Positioning of individual panels / sheets is undertaken by machinery and / or hand. Special care is necessary not to damage the surface to be lined. After unrolling the geomembrane, panel overlaps are adjusted so that a suitable lap is achieved for the welding process. The geomembrane is checked before, during and after welding for any damage.

Environmental Conditions Limiting Geomembrane Works

No welding can be carried out where temperatures are below 0°C or above 40°C or in wet / damp conditions that will affect the integrity of the welding process. Deployment of geomembranes during high winds can become dangerous. Installation procedures may be ceased if wind speeds exceed 20 mph.

Joining of Rolls / Panels

For plastics: Wide wedge with open air channel, extrusion welding and hot air.

For rubbers: The hot platten vulcanising system is employed.

All welds are 100% inspected / tested.

Testing of the Weld Joints

The non-destructive test of each weld is carried out by our operatives. The test procedures are as follows:

- (a) For wedge welding the joint is air-pressure tested.
- (b) For extrusion the joint is spark tested.
- (c) Vulcanised joints are air lance or vacuum box tested.

For destructive testing, a check of the welded joints mechanical properties is carried out by taking samples of a joint from installation in progress and checking the welds' bonding strengths in tensile and peel.

Constructional Details

We enclose illustrations of our standard fixing details. We will recommend designs for any special detail that a project may require and submit them for approval by the project designers prior to commencement on site.

Protective Cover

All materials, which are to be placed on top of the liner, will be inspected. If deemed unsuitable, a non-woven geotextile may be recommended as a protective layer.

Installation of cover materials should be carried out after acceptance of the inspected and tested liner. Any cover materials should be placed with a suitable machine (excavator bucket, front loader) always pushing out and running on at least 500mm thickness of the deposited material and not travelling directly on the lining.

The cover material shall be spread in a manner to ensure that the liner maintains good contact with the contours of the ground and no over-tensioning or bridging of the material occurs.

Should the cover placement operation cause damage to the liner, our engineers should be informed immediately. They will carry out any necessary repairs and advise on actions to prevent recurrence.

Contamination Protection Gas / Hydrocarbons (Gas membranes only)

Inspection and testing would be carried out as detailed above for all gas/hydrocarbon installations protection but, given the need for follow on trades to access all areas of the installed geomembrane, the contractor should maintain some form of quality control routine to ensure the geomembrane will not be damaged or compromised. Access is permitted for machinery following discussions on best practices.

In addition to the requirements detailed above for the 'install guidelines for geomembranes', gas/hydrocarbon projects would need to take into consideration the following:-

- (1) Geocomposites and components need to be correctly installed to ensure that gas venting design will work.
- (2) All gas venting, components materials and extraction equipment should be installed by competent persons and following design criteria's based on the acceptable configuration for the type of contaminant or concentrations. Components should be fit for purpose and connected and sealed to venting mats and or outlet set/boxes. Components should be installed by trained lining operatives although suitably trained bricklayers and ground workers may install, often prior to geomembrane works commencing but always following manufacturer's guidelines.
- (3) Gas venting layout plans should be consulted prior to installation. Alteration can be made due to a lift pit, internal wall, stairwell, door or window being in direct line of a particular venting run, specialist advice should be taken prior to altering this detail.

Positioning of Geocomposite (Gas membranes only)

Geocomposite can be installed into a 30mm recessed grip to provide a flush finish with the formation. It may also be installed directly on to the prepared surface following consideration for sufficient concrete cover. The composite can also be buried within the formation therefore eliminating detailed preparation and interphase at installation times.

Perimeter Sealing (Gas membranes only)

Perimeter sealing can be carried out by jointing to the DPC with welding or gas adhesive tapes or sealing to the external primed perimeter beam or provide an upstand. Sealing to internal walls, sumps, thickening, lift shafts may also be sealed in this way. All porous surfaces should be primed and gas tape applied within the specified timeframe. Penetration through the geomembrane should be sealed by either using welding techniques, gas resistant tapes and purpose built shrouds and this would include columns, wind posts, dock levellers and pop-up pipe details.

Gas tape sealing should be covered, i.e. loaded, within a reasonable timeframe to prevent ambient conditions affecting its short term performance.

Drawings

The client shall provide a large scale construction drawing for the project, so that Butek-Landline can indicate a proposed panel layout for all phases of the project.

Health and Safety - General Statement of Policy

Our Policy is to provide and maintain safe and healthy working conditions, equipment and systems of work for all our employees and to provide such information, training and supervision as they need for this purpose. We also accept our responsibility for the health and safety of other people who may be affected by our activities.

This general Statement of Policy is supported by 17 sections of detail in the full Health and Safety Policy which is available on request.

Risk Assessments and Method Statements

Site specific Risk Assessments and Method Statements are prepared for each contract.

Lining Construction Quality Assurance

General

Quality control of the installation can be divided into three areas:

- (1) Checking the material delivered to site for damage prior to use, checking the roll / panel identification number with factory QA and carrying out checks for the QA procedure.
- (2) Inspection and continuous control of all welding, including weld parameters and full testing of regular trial seams.
- (3) Testing of the completed weld seams by destructive and non-destructive methods.

The on-site welding of each material is carried out by special welding processes which are fully monitored and tested. This ensures consistent weld seam quality within a wide range of ambient conditions.

Daily progress, weather and machinery set-ups and test welds, materials tests, panel sizes faults and repairs are all recorded on our QA reporting sheets which forms part of our contractor quality assurance procedure. A full report is provided following completion of the contract works.

Inspection of Welding Seams

All weld seams are inspected to ensure a strong water-tight or gas-tight bond.

The principal inspection methods are continuous and non-destructive.

The company's site personnel conduct and record the following inspection of the welded joints.

- (a) **Visual Inspection of Welding Seam**
Visual inspection of the welding surfaces, the welding process and the completed weld is carried out to ensure consistency of weld.
- (b) **Destructive Mechanical Testing**
The procedure is carried out on samples of completed trial welds and the requirements of the contract QA procedure. Each sample is subjected to tensile testing. At least two specimens are tested, one in the direct tensile mode and one in the peel mode.
Once the test has been completed, the sample is viewed to establish where the break has occurred and the weld classified by referring to industry standard charts.
- (c) **Non-Destructive Air Pressure Testing - For Wedge Welded Joints**
The welds are tested for continuity by pneumatic pressurisation to the central void in the double weld. On completion of the weld, the channel is sealed at each end and attached to the air testing equipment. The air channel is charged to the correct pressure, is then allowed to stabilize and isolated from the air pressure source and monitored. A weld would have passed the test if the air pressure level had not altered by more than 10% of its initial stabilized value.
- (d) **Non-Destructive Spark Testing - For Extrusion Welded Joints**
A copper wire is encapsulated within the weld. A high voltage electric spark is applied above the welded section. The spark will normally spread evenly across the surface of the weld, but will concentrate into any areas where a satisfactory welded seam has not been achieved, shorting to earth on the copper wire.
- (e) **Vacuum Box Testing - For Vulcanised and Hot Air Joints**
This method is used in areas of complex welding detail or where other methods are not feasible and comprises treating the area of the liner to be tested with a soap solution and then using an open-based box producing a vacuum over the soaped area. Leaks are detected by the appearance of bubbles.
- (f) **Air Lance - For Vulcanised and Hot Air Joints**
This method involves forcing a high pressure jet of air along the weld edge and looking for signs of lifting or bubbling.

Work Measurement, Dayworks and Weather Constraints

Measuring of Work

As part of the company's QA procedures all materials are measured after cutting to shape prior to welding. These figures are checked regularly against the area covered and form the basis of the final measurement.

Contract Price - Measured Work

Unless stated otherwise, the contract price is based on the surface area of material laid including materials in anchor trenches but excluding weld overlaps.

Contract Price - Fixed Prices

The price is based on the areas shown on the drawings and agreed prior to contract. Small variations in area will not incur extra costs.

Weather

Lining cannot be positioned at times when wind speed exceeds 20 mph and lining cannot be welded in damp conditions (mist and rain) or when material temperature falls outside the range 0°C to 30°C. Therefore, work rate can be severely affected by inclement weather. Whilst our costs of weather caused delay are for our account, contract time extensions will be claimed.

Site Conditions

All civil engineering work including dewatering is the responsibility of others unless otherwise agreed in writing.

Should our works be delayed due to lack of suitable ground on which we can carry out installation works, the time lost due to these delays will be classed as standing time irrespective of weather conditions. The costs of such delay will be charged under our dayworks arrangements and extension of time claimed.

Repairs

Any repairs or rework incurred due to damage caused by others will be carried out by our operatives and charged under our dayworks arrangements. Any extra civil engineering work required shall be carried out by others at no charge to Butek-Landline.

Programme

We will programme the works in accordance with the original agreed schedule. Please advise us in writing of any programme changes. Whilst we will endeavour to meet any schedule changes, we will normally require 10 working days' notice of such changes.

Quality Assurance

It is a requirement of ISO 9001 that we receive full written instructions with the order a minimum of 2 weeks before any work is undertaken.

Working Week

Where possible we would wish to work 7 days per week on alternative weeks. This time is helpful in pulling back time lost to bad weather and reduces the time lost travelling to/from site and advantageous for the swift completion of the works.

Attendance

The unloading of materials delivered to site shall be carried out by others (USUALLY TELEHANDLER / FORK TRUCK OR EXCAVATOR SUITABLE FOR THE MAX. LOAD WEIGHT BEING DELIVERED) at no cost to Butek-Landline.

Free assistance may be required for machinery complete with operator, and/or labour to assist in unrolling materials for cutting and site deployment.

Dayworks

Any extra works required resulting from site instruction changes, repairs and standing time will be charged as dayworks unless previously agreed otherwise. Site instructions are recorded on our "Confirmation of Verbal Instruction Form" and shall be signed by the main contractor/client and our Site Foreman. (The form is produced in duplicate, one copy for site and one copy for our permanent records.) Contractors own forms can be used in conjunction with Butyl Products Ltd. / Butek-Landline own documentation.

Daywork Rates - Based on Civil Engineering Contractors Association Schedule of Dayworks

All daywork rates are inclusive of subsistence and overheads are charged as follows:

Team Manager/Supervisor £54.00 per man, per hour
Lead Technician £43.00 per man, per hour
Technician £28.00 per man, per hour
Specialist Welding Equipment £39.50 per man hour

Travel to and from site, plus standing time will be charged at the above rates. All other labour will be charged at £25.00 per man, per hour.

Daywork hours, materials and consumables used and description of work are recorded on our Dayworks Sheet. On completion of the dayworks this shall be signed by the main contractor/client. (The form is produced in duplicate, one copy for site and one copy for our permanent records). Contractors own forms can be used in conjunction with Butek-Landline own documentation

Completion Period

Geomembrane works are very dependent on weather and site conditions, including ground and civils preparation normally being carried out by others. Any contract period agreed will be based on full production days of work.

Completion Certificate

A Completion Certificate will be issued on the completion of the works. This should be signed by either the contractor or representative when they are satisfied that the works are complete and they are happy for us to leave site.

WARRANTY

All our work carries a warranty, the terms of which are agreed prior to contract. A Warranty Certificate is issued on completion of the work and is valid once full payment has been received. The standard warranty wording is as follows:-

Butyl Products Ltd, / Butek-Landline ("the company") warrants that the liner installed by the company under this warranty shall be free from defects, and to be able to withstand normal weathering for the warranty period if the liner is used for normal use in applications approved in writing.

The company shall not under this warranty be liable for any defect in installation resulting from acts of God, fire, force majeure, earthquake, flood, piercing hail, malicious damage, tornado, abuse by machinery, equipment or people, excessive pressure or stress from any source, improper site preparation, subgrade settlement, or any event beyond the reasonable control of Butyl Products Ltd. / Butek-Landline.

Any claim for any alleged breach of this warranty must be made in writing to the company within 30 days after the alleged defect is first noticed. Should the required notice not be given the defect and this warranty shall be deemed to have been waived by the purchaser and the purchaser shall have no right of recovery against the company.

The company's liability for breach of this warranty shall be limited to repairing or replacing the defective installation, using such workmanship as should result in providing the prorated performance remaining under this warranty.

Under no circumstances shall the company's liability under this warranty extend to, direct, indirect or consequential damages, arising from loss of production or other losses including, without prejudice to the generality of the foregoing losses due to a personal injury and product liability owing to the alleged breach of this warranty and no allowance will be made for the cost of labour expended by any person on repairing the liner for any remedial work due to be carried out by the company.

This workmanship warranty is non-transferable and non-assignable.

(Variations to this warranty shall only be valid if in writing and signed by a director of the company).

This warranty is given, so far as the law permits, in lieu of all other warranties either expressed or implied and, by accepting delivery of the liner, the purchaser waives all such other possible warranties except those specifically given. I hereby state that I have read and understand the above warranty and agree to such by signing hereunder.

Contractual Conditions

1. Interpretation

"The Company" is Butyl Products Ltd. / Butek-Landline.

"Goods" are the goods supplied by Butyl Products Ltd. / Butek-Landline.

2. Delay

If there is a delay or failure in delivery to site resulting from circumstances beyond the Company's reasonable control, performance shall be deemed suspended during such period.

3. Retention of Title

3.1 Notwithstanding delivery, the contractor will not own the goods until the Company has been paid in full for the goods and no other accounts between the parties are outstanding.

3.2 Until payment due under all contracts between the parties is made in full, then:-

- (a) The goods shall be stored separately and kept identifiable as those of the Company, and
- (b) The Company shall have the right to recover and resell the goods and may enter the contractor's premises for that purpose, and
- (c) The contractor shall keep the goods insured against all the risks for the full replacement value of the goods.

4. Payment

4.1 Payment is due thirty days from the end of the month in which the goods are invoiced, or on pre-agreed specific dates.

4.2 All amounts which are not paid by the due date shall bear interest without prior notice at the rate of 2% per month, which is deemed to accrue on a day to day basis from and including the due date for payment.

4.3 Furthermore, if the contractor fails to make payment on one or more invoices by the due date, then the contractor shall be required to make payment for all goods delivered and services supplied by the company and due date of payment shall then be the invoice date.

4.4 In relation to this clause 4, time shall be of the essence.

5. Guarantee

Unless and until payment is made in full as described above any guarantee given by the company to the contractor is void.

6. Liability

The Company shall not be liable for any consequential or indirect loss suffered by the contractor, whether this loss arises from breach of duty in contract or tort, including loss arising from the Company's negligence

7. Assignment

The contractor shall not without the written consent of the Company assign or transfer the contract or any part of it.

8. Bankruptcy, Liquidation and Security

8.1 The Company reserves the right to cancel the contract and payment shall become due immediately, regardless of any previous agreements to the contrary if the contractor, being a company:

- (a) has a petition presented for its winding-up or
- (b) passes a resolution for voluntary its winding-up or
- (c) enters into any voluntary arrangements with its creditors.

8.2 Any cancellation under this clause shall not prejudice any rights which the Company may have against the contractor or otherwise.

9. Relaxation or Forbearance

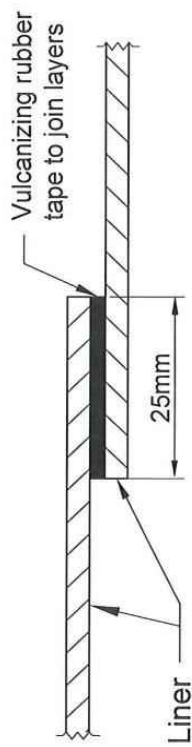
No relaxation, forbearance, delay or indulgence on the part of the Company in enforcing any terms herein shall constitute a waiver of the Company's rights, neither shall it prejudice, affect or restrict the same.

10. Jurisdiction

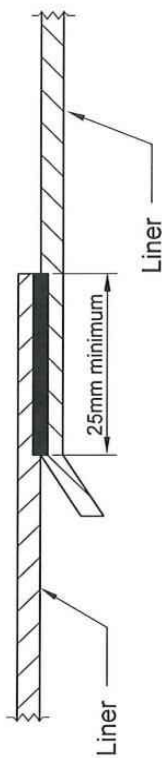
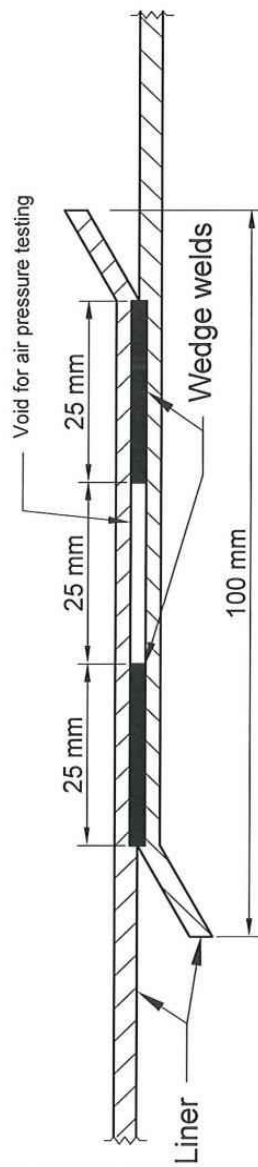
In case of any dispute the English or Scottish courts or duly appointed U.K. Arbitrator shall have jurisdiction.

11. Severance

If any provisions of this agreement are held by any court or other competent authority to be void or unenforceable in whole or in part, the other provisions of the agreement and the remainder of the affected provisions shall continue to be valid.

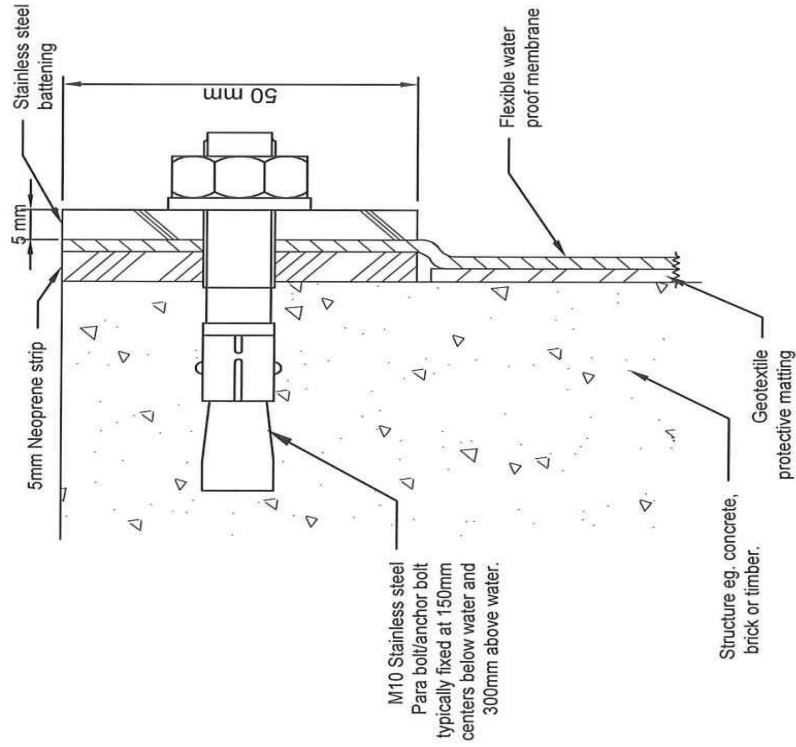


Vulcanized Joint



Hot Air Joint

				Document 101		Page 9 of 13	
		GENERAL NOTES:		Butyl Products Ltd 11 Radford Crescent Billericay Essex, CM12 0DW Tel. +44 1277 653281 Fax. +44 1277 657921			
		- Standard cross section				TITLE: Types of material weld	
		- All dimensions in millimeters unless otherwise stated				Scale: 1:1	
						Material Specification:	
ITEM	CODE NO.	Description		NO. RECD. PER UNIT		Drawn by AJ Date 15/2/10 Checked by E Date REV.	
						Drawing revision	
						AJ	
						Date	
						By	
						Date	

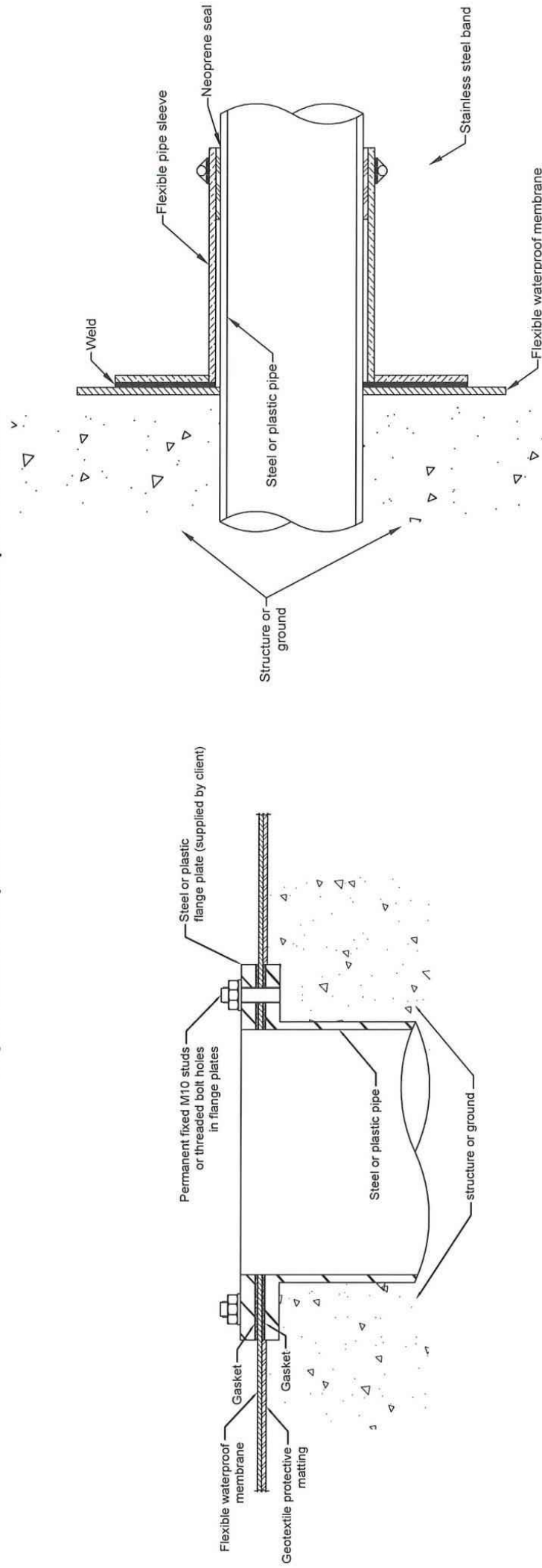


Stainless Steel Batten for fixing membrane

Polythene Batten for fixing membrane

Document 101										Page 10 of 13									
GENERAL NOTES:																			

Pipe sizes dependant on customer requirements.



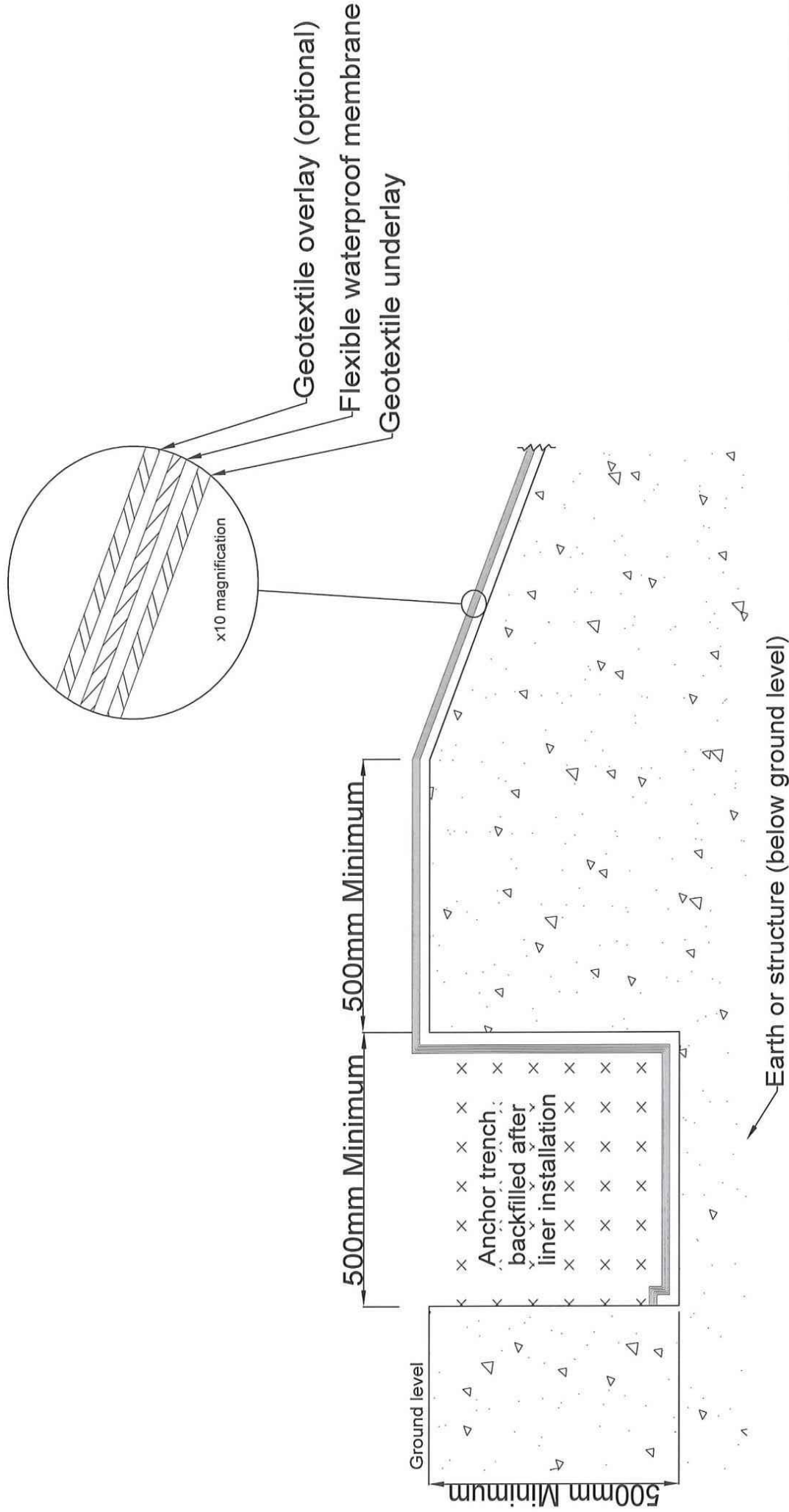
Membrane/Pipe connection with flange fitting

Number of studs dependant on diameter of flange.

Membrane/Pipe connection where pipe passes through membrane

Manufactured to various sizes dependant on customer requirements.

Document 101				Page 11 of 13			



				Document 101		Page 12 of 13								
				GENERAL NOTES:		Butyl Products Ltd 11 Radford Crescent Billericay Essex, CM12 0DW Tel. +44 1277 653281 Fax. +44 1277 657921		TITLE: Anchor trench located around periphery of excavation		Scale: 1:10	Drawn by AJ			
				- Standard cross section							Date	15/2/10		
				- All dimensions in millimeters unless otherwise stated				Material Specification:			Checked by		E	15/2/10
								Geotextile and waterproof membrane			Date		REV.	
ITEM	CODE NO.	Description	NO. REQD. PER UNIT					Description					By	Date



Butyl Products Ltd
11 Radford Crescent
Billericay
Essex, CM12 0DW
Tel. +44 1277 653281
Fax. +44 1277 657921



			Document 101	Page 13 of 13
			TITLE:	Drawn by AJ
			Polythene "U" channel anchor for fixing membrane to structure	Date 15/2/10
			Material Specification:	Checked by
			Polythene anchor and membrane	Date
				E
			Drawing revision	AJ 15/2/10
			Description	REV.
				By Date



Carlingnose Studios, North Queensferry, Fife KY11 1ER Scotland

Tel: +44 (0)1383 415215

Web: www.livingwater.org.uk

Direct email: [REDACTED]

**Technical Oversight and Maintenance Provision for the Ecological System for
the Treatment and Evapotranspiration of Winery Effluent and Sewage for
Newsells Whitely Winery, Royston Hertfordshire**

**The aim of the ecological treatment system (ETS) and utilising a natural
approach to drainage and landscaping at the Newsells Whitely Winery is to:**

- To attenuate and treat winery effluent and pre-treated sewage to excellent standards on a daily basis, using a carbon neutral / negative ecological treatment system.
- Evapotranspire winery effluent and pre-treated sewage in the ecological treatment system that includes a willow coppice so that no discharge to watercourse is required.
- Create wildlife habitats to maximise biodiversity.

Our diverse ecological systems are multifunctional providing substantial and diverse aquatic, wetland, shrub, tree and meadow habitats and wildlife corridors. We plant native wildflower and grass seed mixtures on the edge of our wetland and swale systems increasing biodiversity and food for insects and birds. If there are particular species or habitats required to support rare species, we can choose specific plants and design our ecological systems to meet the requirements.

Sizing and Operation Summary of the Ecological Treatment System:

The processing of 80 tonnes of fruit per annum at the Newsells Whitely Hill Winery will produce 280 m³ per annum of raw winery effluent (with reduced solids from management) that will be treated in the ecological treatment system. Winery effluent would discharge to an aerated storage tank which would be sized to hold 21 days of the peak winery production. The effluent in the storage tank would be dosed over 352 days (to the 2 Living Water Biofilter bays (46 m² / 88 m³) / (each 23 m² / 44 m³).

We have chosen to dose the peak loading over a period of 365 days. Any other effluent arising during the rest of the year would discharge via the aerated storage tank to the Biofilter which would discharge directly to the first of three wetland cells in series.

Sewage arising from the winery development will discharge to and be treated in a package treatment plant (designed by others).



Living Water Ecosystems Ltd
Directors: Jane and David Shields
VAT Registration Number: 502 5065 89
Registered in Scotland No 181843



The pre-treated sewage would discharge to the sump after the Biofilter which would then be pumped to the top of Wetland 1 which would also receive the winery effluent after being pre-treated in the Living Water Biofilter.

The three wetland cells (that receive the winery effluent which is pre-treated in the biofilter) would require a 300 m² area to treat the volume and loading of winery effluent plus sewage. The wetland would be divided into three, lined wetland cells in series. Each of the 3 wetland cells would have a 100 m² area.

From an ecological perspective it is better for the treated winery effluent and sewage to be discharged to trees rather than a watercourse. We achieve this by discharging the treated, high-quality water from the wetland cells into a 300 m² willow coppice which comprise the Living Water ecological treatment system. The wetland plants in combination with the willow trees provide year-round treatment and evapotranspiration of the winery and sewage daily discharge. The ETS provides benefits to wildlife and the environment while eliminating the need to discharge to watercourse.

Please refer to the attached layout drawing of the Ecological Treatment System:

Ecological Treatment System Layout Drawing 23001.001 Rev. B.

Please find set out below a suggested technical oversight, training and maintenance schedule and agreement for the ecological treatment system for the Newsells Whitely Hill Winery which can commence following the commissioning of the ETS.

Duration of Agreement

We recommend a contract duration of 3 years, from (date 2025 to date 2028), thereafter on a rolling annual basis, although the contract may be cancelled by notifying Living Water in writing at any time.

Summary

Each Quarter during the contract, Living Water would attend on site to provide an overall assessment of the health of the Ecological Treatment System (ETS) and its water quality and check that the ETS is operating optimally. We will identify and carry out the maintenance tasks on the ETS, as required. Training of Newsells Winery staff can take place on a maintenance visit. A summary of the maintenance schedule is set out overleaf.

In addition, Living Water would provide technical oversight, assessment of chemical analyses and prepare quarterly reports.

Technical Oversight

Living Water would check the biofilter, wetland cells and willow coppice and assess the results of any laboratory tests obtained from the treatment system input and outfall, as well as any solids residues.

We would offer our assessment regarding the operation, management and maintenance of the Ecological Treatment System, together with general support and advice and would liaise with the Environment Agency, as necessary.

If there was an accident in the winery or at the sewage treatment plant, we would be the first point of contact to troubleshoot and find solutions to prevent problems downstream in the ETS or on site.

We have designed in fail safe mechanisms within the ecological treatment system to prevent pollution in the case of such an upstream accident. The riser pipe at the outlet of each wetland cell can be raised so that the water / effluent being treated remains within the wetland cells and the water can be recirculated through the wetland cells until the effluent is treated to excellent standards before being discharged to the willow coppice for final evapotranspiration.

Maintenance

Each quarter, the maintenance work on the ETS will be carried out as required at the correct time of year as some maintenance and willow coppicing can only be carried out during the winter period.

The maintenance tasks which may need to be carried out will include weeding, removing litter, leaves, old growth, willow coppicing, strimming. Please refer to the attached table.

Sampling of the inlet and outlet of the ETS will be carried out if not already being done on a regular basis.

Analysis of the chemical analyses and graphing the results are included as part of the ongoing assessment, understanding of the ecological complexity and maintaining the optimal conditions and operation of the ETS.

Please note that the supplier of the sewage package treatment plant will provide a separate service and maintenance contract.

Likewise, the pump supplier will also provide a separate service contract for maintaining the pumps.

Living Water

Carlingnose Studios, North Queensferry, Fife KY11 1ER Scotland

Tel: +44 (0)1383 415215

Web: www.livingwater.org.uk.

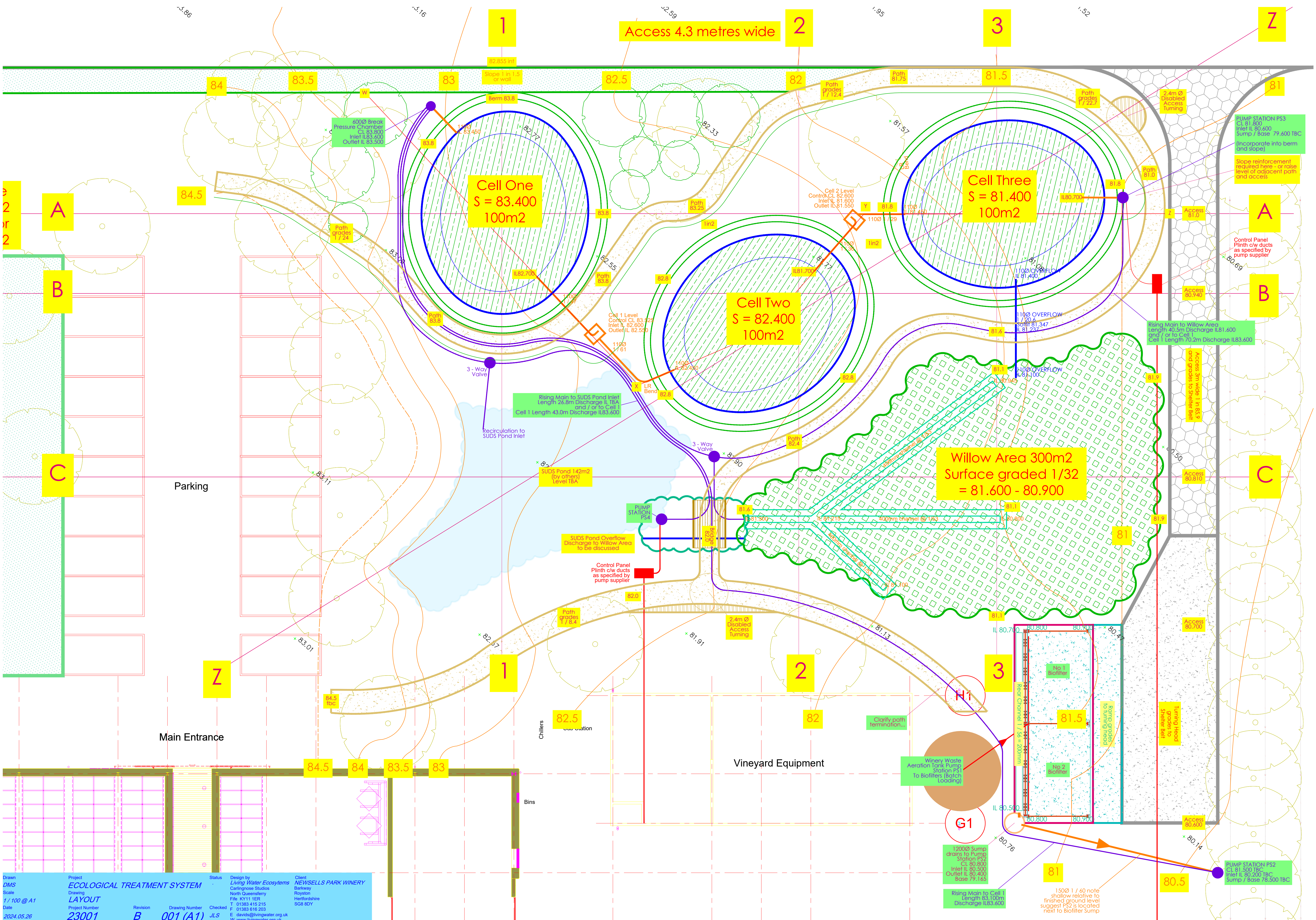
Direct email: janes@livingwater.org.uk

Maintenance Schedule for Ecological Treatment System Newsells Whitely Winery, Royston Hertfordshire

Month	Technical Oversight	Maintenance	Timing
January	Inspection: check water quality, plants, pipes, chambers. Assess plant and tree health and wetland beds. Training of operatives. Take samples. Assess chemical analyses. Report.	Willow coppicing. Manage old growth of wetland plants. Tidy, weed, and general inspection. Take Water Samples	1 x Quarterly visit during the period involving 1 to 2 days on site and follow up work in lab and office.
February			
March			
April	Inspection: check water quality, plants, pipes, chambers. Assess plant and tree health and wetland beds. Training of operatives. Take samples. Assess chemical analyses. Report.	Strim, weed, tidy, remove litter. General inspection. Take Water Samples	1 x Quarterly visit during the period involving 1 to 2 days on site and follow up work in lab and office.
May			
June			
July	Inspection: check water quality, plants, pipes, chambers. Assess plant and tree health and wetland beds. Training of operatives. Take samples. Assess chemical analyses. Report.	Strim, weed, tidy, remove litter. General inspection. Take Water Samples.	1 x Quarterly visit during the period involving 1 to 2 days on site and follow up work in lab and office.
August			
September			
October	Inspection: check water quality, plants, pipes, chambers. Assess plant and tree health and wetland beds. Training of operatives. Take samples. Assess chemical analyses. Report.	Strim, weed, tidy, remove litter. General inspection. Take Water Samples	1 x Quarterly visit during the period involving 1 to 2 days on site and follow up work in lab and office.
November			
December			

Living Water will analyse the results of any laboratory tests on samples taken from the ETS and offer our assessment regarding the management and operation of the ETS. Costs of laboratory chemical analyses are excluded. In addition to inspections, Living Water will provide general support and advice about the operation and maintenance of the Ecological Treatment System.

Technical Oversight and Maintenance Provision for the Ecological System for the Treatment of Winery Effluent and Sewage for Newsells Whitely Hill Winery, Royston Hertfordshire





Package Pumping Stations

O&M
Manual.



SPEL SPEL
Products

Lancaster Road
Shrewsbury, Shropshire, SY1 3NQ
T: +44 (0)1743 445200
E: info@spelproducts.co.uk

Scope

This document provides basic information for installation, operation and maintenance of the package pump stations. It is intended to provide general information on the supplied system and will not encompass any site specific circumstances.



Health and Safety

It is the customer's responsibility to ensure that anyone working on this equipment is using all necessary protective equipment and has received appropriate training. A warning notice should be visible at the top of each access shaft - "DANGER, HARMFUL FUMES" and "RESPIRATORS MUST BE WORN IN THIS TANK". Only 'Confined Space' qualified personnel should enter this tank.

PLEASE ALSO READ CAREFULLY THE FOLLOWING IMPORTANT HEALTH INFORMATION:

The following information is extracted from HSE publication ND (G) 84L/2-90/70L

Sewage gases are explosive and toxic. The equipment and the area immediately surrounding it should be subject to the following safety precautions:

- **NO SMOKING**
- *No naked flames or sparks*
- *Only qualified people may carry out maintenance/service work on the plant*
- *Nobody may enter the sump until the atmosphere is checked for safety by means of a suitable portable gas detector*
- *Nobody may enter the sump until the equipment is switched off/isolated electrically – and padlocked in the OFF position*
- *Temporary barriers and warning signs must be erected around all open access covers*

Leptospirosis – a risk that must not be ignored

Leptospirosis takes two forms in the UK: Weil's Disease, which is transmitted by contact with the urine of infected rats and Hardjo Leptospirosis, which is transmitted from cattle. As well as people whose jobs involve close contact with animals or carcasses e.g. Farmers, Vets, Meat Inspectors, Butchers, Abattoir workers etc., anyone who is in contact with sewage, river or canal water is at risk.

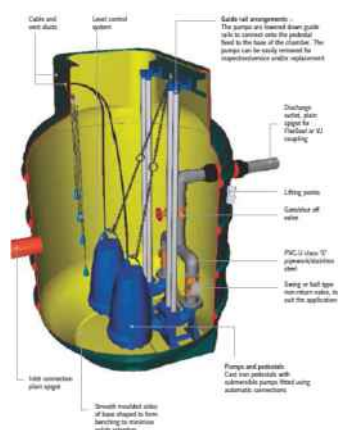
Infection can often be as a result of the bacteria entering the body via cuts or skin abrasions or through the mouth, throat or eyes after contact with an infected liquid. Symptoms of both forms are similar to influenza with a severe headache.

To prevent infection, use waterproof plasters on all cuts and skin abrasions and wear protective clothing. Wash thoroughly after handling any sewage or equipment in contact with sewage, and always do so before eating, drinking or smoking.

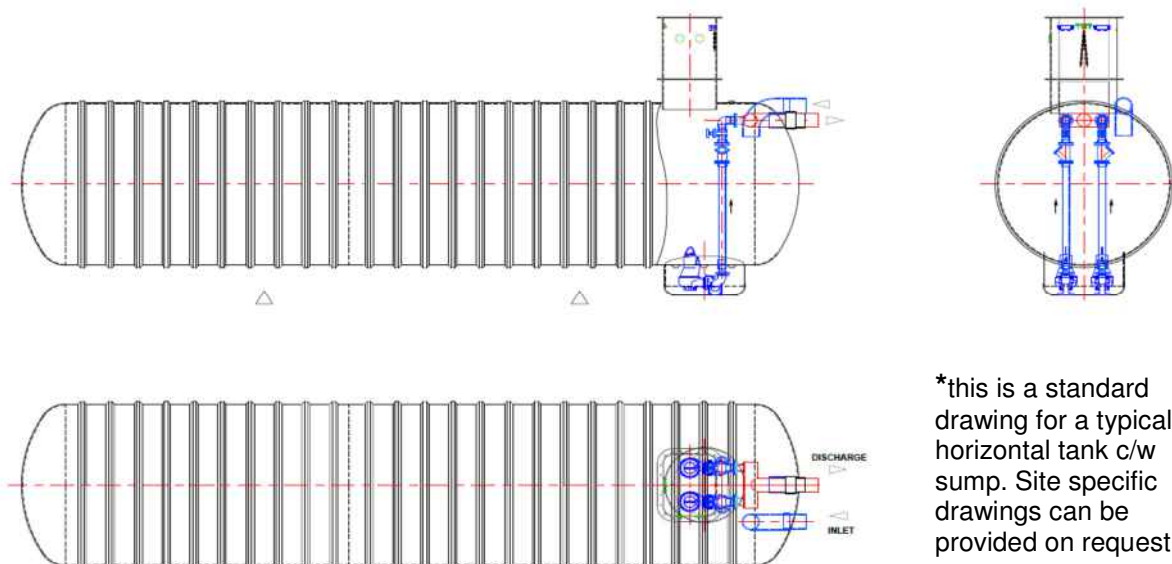
Report any illness to your doctor and inform him/her of your work (see medical information below). The effects of Leptospirosis can be much less severe if treated promptly.

Overview of the Pump Station

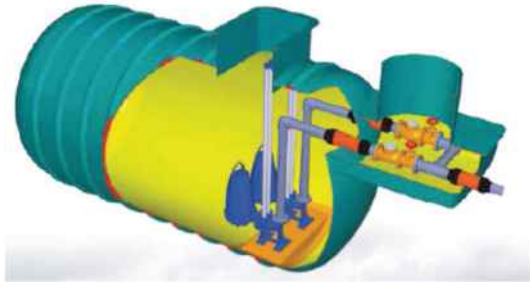
The SPEL Pump station is designed to automatically pump foul, waste, surface, storm water and trade effluent under certain conditions. When the level of fluid in the tank is above the start float switch level a pump will start to operate, it will continue to pump until the fluid level falls below the stop float switch level. On dual there is a further assist float switch that triggers the alternate pump to activate should the fluid reach this height. Also there is a high level float switch that triggers the high level alarm should fluid reach this level.



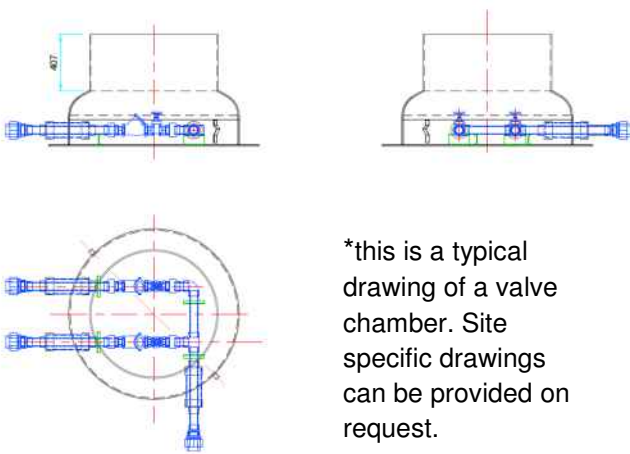
*this is a typical V-series Pumping Station c/w pump and float installation. Site specific drawings can be provided on request.



*this is a standard drawing for a typical horizontal tank c/w sump. Site specific drawings can be provided on request



*this is a horizontal Pumping Station c/w integrated valve chamber but can be supplied with fittings in wet well chamber. Site specific drawing can be provided on request.



*this is a typical drawing of a valve chamber. Site specific drawings can be provided on request.

Pump Control Operating Instructions

System activity is indicated by the pilot lights on the control panel. Pilot lights are typically included to indicate: system power, pump one running, pump two running, pump one tripped, pump two tripped, and high level alarm. When in alarm the system will also activate the flashing beacon.

Switches: Each pump has a switch that can be set at: HAND, OFF or AUTO.

Switch Settings: switches should normally be set to AUTO setting where float switch level activation will trigger the pump to operate as required. The OFF setting will stop the pump from functioning. The HAND setting will cause the pump work regardless of pumping media availability which will lead to pump damage if the pump runs dry.

Meters: Each pump has an ammeter and hours run meter on the control panel.

Notes: For additional information on pump operation please see supplementary pump information applicable to your system.

Installation

Typically a Vertical Pump Station chamber will arrive to site complete with guide rails, pedestals and pipework already installed. However a Horizontal pumping chamber with a separate extension shaft will be delivered without the guide rails already installed.

The tank should be correctly and carefully installed according to the SPEL installation instructions Ref. TSII for Horizontal Tanks, Section 12.8 in the SPEL Data manual for Vertical Tanks.

After the tank has been correctly installed, if necessary, the guide rails should be fitted to the pedestal and top brackets.

The contractor / commissioning engineer will then need to fit the auto coupling claw fitting to the pump and can then lower the pump down the guide rails, using the correct lifting chains and a suitable hoist until pump automatically latches onto the pedestal.

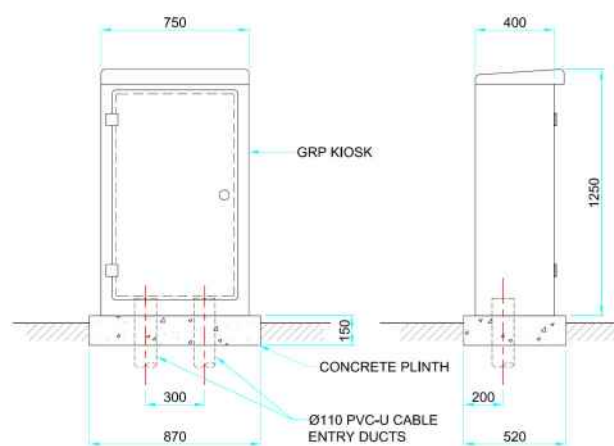
*it is not usually necessary for man entry into tank – all work is done from surface.

Float switches will then need to be lowered to correct design levels and fixed to assigned supporting brackets.

All cables (floats, pumps) can then be pulled through ducting to the control panel. If cables will not reach control panel then they need to be made off into suitable junction boxes, and extended via cable supplied by customer (unless specifically requested).

Once the floats and pumps have been wired into the control panel which is mounted by customer complete with the correct electric supply, the system can then be fully commissioned and tested.

A weatherproof kiosk is often provided for mounting the pump control panel externally. A suitable concrete plinth should be provided to suit.



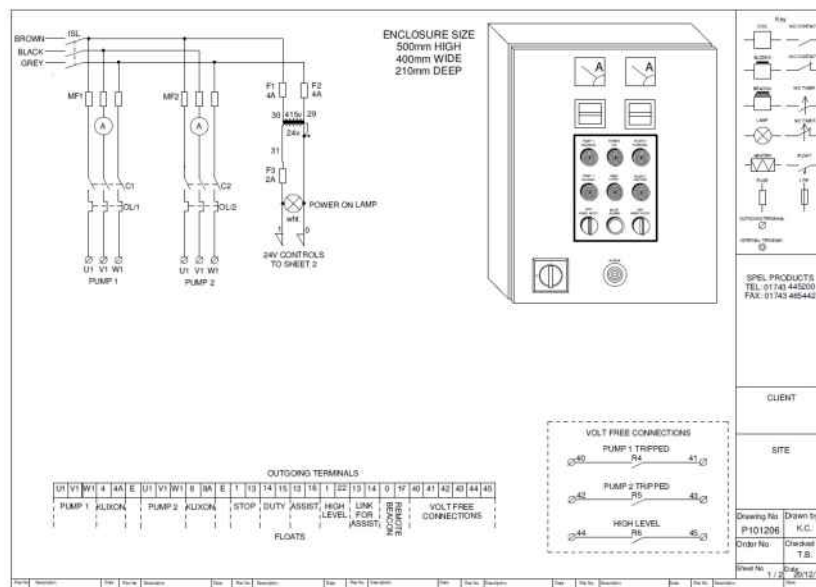
*this is a typical waterproof kiosk that would be used to house the pumps control panel for external location.

Standard Control Cabinets

The standard panel incorporates the following features:-

- Door interlocked mains isolator
- Motor fuse and motor thermal protection
- Alternate pump duty and
- Pump ammeters
- Pump hours run meters
- Pump klixon connections
- 24v AC control circuit
- Two, three or four float operation
- Duty stand by or assist operation
- Pump running indication x 2
- Pump tripped indication x 2
- Hand-Off-Auto selector switch x 2
- High level / pump tripped alarm comprising of lamp indication, audible buzzer, mute button, 24v connection for remote alarm
- Power on indication
- Engraved identification labels
- Volt free contacts for; Pump tripped x 2, High level alarm
- All out going terminals mounted on stand off brackets for easy on site connecting
- All control circuit wiring identified by colour coded ferrules
- All indicators long life LED lamps
- Manufactured in a mild steel enclosure with lockable hinged door, gland plate at bottom, galvanized mounting plate

*site specific extras can be provided on request.



*this is a standard 3 phase dual pump control panel. Site specific can be supplied on request.



BSEN 12566-3*
Certified Performance to 96.2% efficiency

MODELS

CLF1 (6pe) to CLF17 (300pe)

INSTALLATION, OPERATION AND **MAINTENANCE MANUAL**

***Applies to models CLF1 – CLF7 only**



INTRODUCTION

Congratulations on the purchase of your **MATRIX** Treatment System. It is designed and manufactured exclusively by **Clenviro Limited** in the UK, with quality, reliability and efficiency being prime objectives of our company.

We ask that you take time to fully read this manual to ensure that all the installation requirements are met and the operating principles are fully understood so that you can enjoy a trouble free system.

It is extremely important to read the health and safety information before working on the treatment plant.

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NOTE: If you require any further information regarding any aspect of our products, please contact our Customer Services Department 0800 32 888 52

PERFORMANCE RESULTS

Clenviro Ltd

Unit 1C, Queensway Business Park, Telford, Shropshire, TF1 7UL
England

EN 12566-3, Annex B

Results corresponding to the Irish National Annex for IS EN 12566-3

Small wastewater treatment system MATRIX CLF

Submerged fixed film process

Test report PIA2008-093B49

Nominal organic daily load*	0.34 kg/d		
Nominal hydraulic daily load	1.20 m³/d		
Material	polypropylene		
Watertightness (Annex A)	pass		
Structural behaviour (pit test)	pass (also wet conditions)		
Durability	pass		
Treatment efficiency (nominal sequences)		Efficiency	Effluent
	COD	91.4 %	56 mg/l
	BOD ₅	96.2 %	11 mg/l
	SS	95.5 %	16 mg/l
	NH ₄ -N**	83.3 %	5.9 mg/l
Electrical consumption	1.4 kWh/d		

*at a test influent of ≥ 300 mg/l BOD₅ (mean)

**determined for temperatures $\geq 12^{\circ}\text{C}$ in the bioreactor

Performance tested by:

PIA – Prüfinstitut für Abwassertechnik GmbH

(PIA GmbH)

Hergenrather Weg 30

52074 Aachen, Germany

This document replaces neither the declaration
of performance nor the CE marking.



Notified Body
No.: 1739



Certified according to
ISO 9001:2008



Deutsche
Akkreditierungsstelle
D-PL-17712-01-00



Elmar Lancé

January 2016

3.3.5 Results

Plant reference	MATRIX CLF 7					
Declared date of manufacture	08/07/09					
Maximum authorised depth of backfill	65 cm					
Condition of use	Not within the water table (dry ground conditions)			Within the water table (wet ground conditions following testing in dry ground conditions)		
Observed characteristic	Visual assessment	Volume	Deformation	Visual assessment	Volume	Deformation
Before test	/	$V_{1dry} =$ 20 970 litres	/	/	$V_{1wet} =$ 20 128 litres	/
After being buried for 24 hours	/	$V_{1dry} =$ 20 662 litres	- 1,5% (after 24 hours)	/	$V_{1wet} =$ 20 120 litres	- 0% (after 24 hours)
A the end of the test	No failure No deformation at connections	$V_{2dry} =$ 20 128 litres	$\Delta_{dry} =$ $V_{2dry} - V_{1dry} =$ - 534 litres i.e. - 2,6% of the initial volume (after 3 weeks)	No failure No deformation at connections No loss of watertightness	$V_{2wet} =$ 20 032 litres	$\Delta_{wet} =$ $V_{2wet} - V_{1wet} =$ - 88 litres i.e. - 0,4% of initial volume (after 3 weeks) $\Delta_{total} =$ $V_{2wet} - V_{1dry} =$ - 630 litres i.e. - 3,0% of initial volume (after 6 weeks)

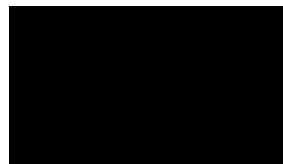
Table 1. Results of the structural behaviour test (Pit Test)

This test report only certifies the characteristics of the sample submitted for testing and makes no judgement about the characteristics of similar products. It does not, therefore, constitute product certification under article L 115-27 of the French consumer code and of the law of 3 June 1994. The specifications of the reference standard are given for information.

Test carried out by:



L. MORCET LAMARCHE



S. POUDEVIGNE



Certificate of Conformity & Guarantee

This certificate confirms that all MATRIX Sewage Treatment Systems are covered by a two year blower warranty and a minimum twenty five year tank warranty, commencing from the date of delivery.

All MATRIX Sewage Treatment Systems are designed and built to the requirements of BS6297 with treatment plants referenced CLF1 to CLF7 (6 – 50pe) additionally being fully certified and tested to BSEN12566-3, achieving a process efficiency rating of 96.2% which relates to a final effluent quality of 11mg/litre BOD : 16mg/litre Suspended Solids : 5.9mg/litre NH₄.

Unless otherwise stated all Matrix Sewage Treatment Systems are designed to produce a final effluent quality of 20mg/litre BOD : 30mg/litre Suspended Solids : 20mg/litre NH₄ subject only to the unit operating within the stated design parameters and being maintained in accordance with recommendations.

Every MATRIX sewage treatment plant is identifiable and fully traceable by a unique serial number located in the blower housing.

Manufactured within a certified ISO9001 Design & Build Quality Management System, extruded welds are spark tested to the requirement of operating procedure P50. Chamber is stress tested and checked prior to despatch.

Internal pipework is pressure tested.

This product is guaranteed as being free from any manufacturing defect.

All warranties are subject to the product having been installed in accordance with guidelines issued by the manufacturer and the equipment being used within the stated design parameters. Warranty cover is also subject to the equipment not having been misused or abused and that any routine maintenance required having been carried out in a timely fashion by authorised engineers. Any bought in component parts included in this product are subject to that manufacturer's warranty, deemed to be not less than 12 months, unless specifically identified separately.

Clenviro Limited reserve the right to limit any valid warranty claim to repair or replacement of the defective component only and do not accept any responsibility or liability for consequential costs or damage.

HEALTH AND SAFETY

Section 1

United Kingdom Health and Safety at Work Act 1974

Section 6a of this act requires manufacturers to advise their customers on the safety and the handling precautions to be observed when installing, operating, maintaining and servicing their products.

The user's attention is drawn to the following:

1. The appropriate sections of this manual must be read before working on the equipment.
2. Installation must only be carried out by suitably trained/qualified personnel.
3. Normal safety precautions must be taken and appropriate procedures observed to avoid accidents.

Refer to **Clenviro Ltd** or your local distributor for any technical advice or product information.

HEALTH

The following is extracted from a health warning card supplied to all **Clenviro Ltd** staff. It is the client's responsibility to ensure that all necessary protective clothing/equipment is available.

Leptospirosis Are you at risk?

What is Leptospirosis?

Two types of Leptospirosis affect people in the UK.

Weil's disease. This is a serious infection that is transmitted to humans by contact with soil, water or sewage which has been contaminated with urine from infected rats.

Hardjo type Leptospirosis which is transmitted from cattle to humans.

What are the symptoms?

Both diseases start with a flu like illness with a persistent and severe headache, muscle pains and vomiting. Jaundice appears about the fourth day of the illness.

How might I catch it?

The bacteria can enter your body through cuts and scratches and through the lining of the mouth and throat and eyes.

How can I prevent it?

After having worked in sewage or anything contaminated with sewage, wash your hands and forearms thoroughly with soap and water. If your clothes or boots are contaminated with sewage, wash thoroughly after handling them.

Take immediate action to wash thoroughly any cut, scratch or abrasion of the skin immediately. Apply antiseptic to the wound, cover with cotton wool or gauze, and protect with a waterproof plaster.

DO NOT handle food, drink or smoking materials without first washing your hands.

If you contract the symptoms described after coming into contact with sewage, report to your doctor immediately and advise him/her of the circumstances.

SAFETY

Sewage gases are potentially explosives and toxic. **DO NOT** enter any of the below ground compartments of the Sewage treatment plant.

Before carrying out any maintenance work, the equipment **MUST** be electrically isolated at the fuse box from which the blower power supply is derived.

Do not leave covers open for any longer than necessary. Temporary barriers and warning signs should be erected around any open covers or manways as appropriate.

PLANT DESCRIPTION & PROCESS

Section 2

The **MATRIX** range of treatment systems for residential population equivalents up to 300 persons are a "unitank" design comprising a primary settlement stage, a biological filtration zone and a final settlement zone, within a single structure.

THIS MANUAL REFERS SPECIFICALLY TO TREATMENT PLANT MODELS CLF1 (6pe) to CLF17 (300pe)

The treatment plant will provide long and trouble free operation provided the simple installation and maintenance procedures are adhered to.

Your attention is drawn to the Health and Safety section in this manual. It is imperative that you read these instructions carefully before attempting to carry out any work on the system.

The treatment plant has been designed to treat the volume and strength of sewage specified in the original quotation and as detailed in the technical data section of this manual. To ensure that the plant continues to operate efficiently, your attention is drawn to the following points:

- DO NOT** exceed the maximum design loading of the plant.
- DO NOT** allow surface water to enter the system.
- DO NOT** allow high volume discharges such as from swimming pools or jacuzzis to enter the system.
- DO NOT** allow large quantities of chemicals such as water softener regenerant, disinfectants, strong acids or alkalis, oil and grease, pesticides or photographic chemicals to enter the system.
- DO NOT** use chemical or biological emulsifiers in grease traps.
- DO NOT** allow fats, oil or grease from catering applications to enter the system.

If you have any doubt about a particular substance, please contact the Customer Service Department at **Clenviro Ltd** for further advice. 0800 32 888 52

SCOPE OF SUPPLY

Section 2

The **MATRIX** system comprises the CLF treatment unit itself and an enclosure containing an air blower unit with a mains power connection point and comes complete with 10m of airline and a failure alarm, as standard.

CLF Unit

This comprises a single tank containing all the components required for the sewage treatment process.

The CLF tank is manufactured in Elite Fabrication Grade Polypropylene and is supplied in a standard black colour. It is completely impervious to water and sewage and has been designed and independently tested to ensure a robust construction and a long service life. The tank is provided with a locking manhole cover, providing access to all parts of the unit.

The submerged filter beds comprise of plastic pieces of filter media, randomly packed into the tank. The media is made from UV stable polypropylene and provides a large surface area on which the bacteria, required for the purification process, can grow. The media is supported on an open mesh panel fixed above the base of the tank.

A fine bubble air diffuser is located underneath the filter bed(s) this is connected to the external air supply (blower) by uPVC pipework and a braided hose airline.

In most CLF units we incorporate recirculation systems which is a uPVC pipe running from the final settlement and media sections back to the primary settlement section.

The pipework has a tapping at its top where tubing is inserted down the uPVC pipe which is connected to the blower. On models which incorporate a media section continuous recycle (CLF5 to CLF17) a control tap in the 8mm air line inside the treatment plant ensures a correctly balanced air flow between the air lift recirculation pipe and the diffuser in the submerged filter zone. On models CLF3 to CLF17 there is a timed recirculation system from the final tank back to the primary settlement section. This is factory set, do not alter.

Blower

The blower is mounted along with its associated electrical controls inside a weatherproof enclosure.

The electrical controls comprise an isolator and a loss of air alarm connected to an external beacon which will provide a visual warning that the blower is not operational.

On models with a pumped discharge fitted there is also a high level/pump failure alarm and beacon. See pages 28-29-30.

NOTE :

Clenviro Ltd operate a policy of continuous product and process development and reserve the right to change specifications without prior notification.

INSTALLATION INSTRUCTIONS

Section 3

Please read the Health & Safety, section 1 of this manual before attempting to work on the system.

Note: The **CLF** tank should be stored with access covers in place to prevent accumulation of rainwater within the unit.

IMPORTANT

The siting of a treatment plant must be agreed with the Building Regulation department of the local authority prior to installation. Similarly, the discharge from a treatment plant will require a Discharge Permit from the Environment Agency if the volume of discharge is greater than 5.0m³/day direct to watercourse, or 2.0m³/day to soakaway. This must be obtained before installation. Consideration must also be given to the need for access for desludging the unit by tanker

MECHANICAL INSTALLATION

Note: Please refer to drawing CLFINSTAL, Drawings, section 8 of this manual.

The following instructions are offered for guidance only. It is for the customer/contractor to satisfy themselves that installation is in accordance with the prevailing ground conditions and regulatory requirements.

Clenviro Ltd can accept no responsibility for incorrect offloading or installation.

The contractor is responsible for offloading all items of equipment with due regard to the following:

DO NOT use chains or wire ropes.

DO NOT lift the tank if it contains any water.

DO NOT subject the tank to sharp impacts.

DO check that all items delivered correspond with the packing note.

The CLF unit is provided with lifting eyes or lifting slings on the outside of the tank. These are not intended for transportation of the units. The lifting hook should be connected to the tank lifting eyes by separate slings of equal length. **Ensure that the slinging angle does not exceed 60° at the hook in order to eliminate excessive compressive loads on the side of the unit.**

When working in a deep excavation, make sure that all necessary safety precautions are taken to ensure the stability of the excavation and provide safe working conditions for site personnel. The only time anyone needs to be working at the bottom of the excavation is when levelling the base and ensuring that the first backfill is correctly placed.

MECHANICAL INSTALLATION (continued)

Section 3

It is the responsibility of the installer to determine the thickness and strength of concrete required to suit the ground conditions, taking into account the buoyancy of the unit when being desludged, external forces exerted by the water table, backfill, traffic loading, etc.

The installation should be carried out in accordance with the requirements of the Construction and Building Regulations. An inspection chamber should be installed upstream of the Matrix CLF unit.

During the course of the installation, the following minimum equipment will be required:

Normal construction equipment and plant.

Concrete to C20P and semi dry to 30mm slump.

An adequate supply of water to fill the unit at the same rate as backfilling.

Dewatering equipment as necessary.

Set of lifting straps of correct length and adequate SWL.

Please Note : The foul drain to the treatment plant MUST have a traditional open soil/vent pipe at the head of the drain run. Air admittance valves, tile or ridge vents are NOT acceptable.

Excavate to the CLF tank dimensions allowing a minimum clearance of 150mm between the unit and the excavation sides. Excavate to the appropriate depth for the installation ie. depth of the unit plus 150mm minimum concrete thickness (actual thickness to suit ground conditions). NOTE : The standard inlet invert depth of all Matrix CLF units is 600mm (unless a deeper inlet invert has been requested at time of order). If the invert of the inlet drain is deeper than this **Clenviro Ltd** must be made aware at time of order so that the unit can be manufactured to suit.

Lay and level the concrete base for the tank to a minimum of 150mm thickness.

Lift the tank into position using slings, taking care not to damage any external flanges or pipework. Ensure correct orientation of the inlet and outlet pipework. Check that the tank is level in all directions. Commence backfilling with concrete in 500mm lifts, and at the same time, **fill each tank compartment with water starting with the media bay section**, ensuring that the progressive concrete and water levels are approximately equal (never exceed a difference of 200mm max). The concrete must be evenly distributed around the unit, ensuring spigot connections are not covered at this stage. **Never partly or wholly fill the tank with water before surrounding it in concrete.**

Note: Do not use vibrating pokers to compact the concrete.

MECHANICAL INSTALLATION (continued)

Section 3

Make all interconnecting pipework connections, ensuring a minimum pipe gradient of 1:70.

Continue placing the concrete in 500mm lifts, terminating at the shoulder of the unit. Allow an initial set of the concrete between lifts and wait at least 24 hours for the concrete to harden.

Ensure a duct (usually standard 110mm drain pipe) is laid from the 110mm 'Air Inlet Duct' connection on the neck of the treatment plant, to the desired position of the Blower unit. This is for the airline only (and discharge pump cables if fitted) and is to ensure complete protection of the airline. On models CLF1 to CLF4 a single 110mm airline duct connection is provided, directly facing the diffuser pipework connection inside the treatment plant, to allow the airline to be connected in a straight line.

The airline **MUST** be cut to length. **Do not** leave excess airline curled up in the treatment plant, this can be detrimental to efficient blower operation and will invalidate blower warranty.

On models CLF5 to CLF17 we provide a choice of airline duct connections (either side of the access upstand) to ensure the shortest and most direct connection of the airline from the blower to the diffuser connection. The airline duct connections are set back from the diffuser pipework connection to allow for a 'long radius' arc of the airline, which again **MUST** be cut to length.

Do not use short radius 90° bends on the airline duct. There are NO electrical components within the treatment plant unless you have requested the option of a pumped discharge. Ensure the blanking cap (supplied) is fitted to the unused airline duct connection.

On all Matrix treatment plants which have a pumped discharge, a pump failure alarm is supplied as standard. On the 6, 9 and 12 person systems this consists of a high level alarm float in the final chamber which must be connected to the alarm box provided.

The alarm float and pump float have been factory set, **DO NOT**, under any circumstances, alter the position or length of these float switches.

On all other Matrix models the pumped discharge consists of a full duty/standby twin pump set-up and the failure alarm is built into the auto changeover panel (with external beacon) supplied with the system.

If the treatment plant is to be installed in a trafficked area, guidance should be sought from Clenviro Ltd before the treatment plant is ordered as an alternative method of manufacture is required.

Standard Matrix Treatment Systems are NOT suitable for vehicular applications.

The blower housings for models CLF1 to CLF5 should be positioned on 'soft landscaping' not paving slabs or hardstanding areas.

All other units will require a properly constructed housing plinth.

ELECTRICAL INSTALLATION (Blower Unit)

Section 3

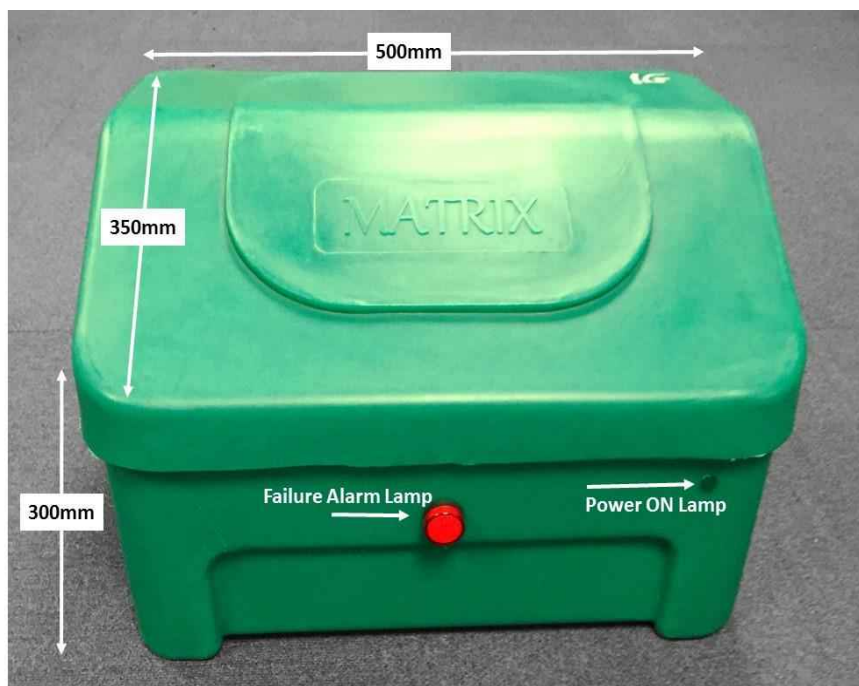
In order that you achieve a safe and cost effective installation, it is not possible to state a specific installation configuration that would suit all sites. The selection of current protection devices must remain the responsibility of the installer. It is imperative that electrical installation of this equipment is entrusted to a fully qualified electrician. The blower unit can be positioned wherever is most convenient bearing in mind the need to get a power supply to it and the airline from it to the treatment plant. If a pumped discharge has been requested on the treatment plant, the cable from the pump can be fed back up the airline duct to the blower unit within which is the electrical connection for the pump. Most pumps come complete with 10 meters of cable. The blower unit is supplied with 10 meters of airline as standard.

The airline duct MUST be sealed with expanding foam when installation is complete or the blower warranty will be invalidated.

When installing the electrical supply to the CLF blower unit, the following points should be considered:

The supply to the CLF unit should be by means of a dedicated circuit with isolation and protection devices consistent with the requirements for fixed equipment and in accordance with the latest regulations of the Institute of Electrical Engineers.

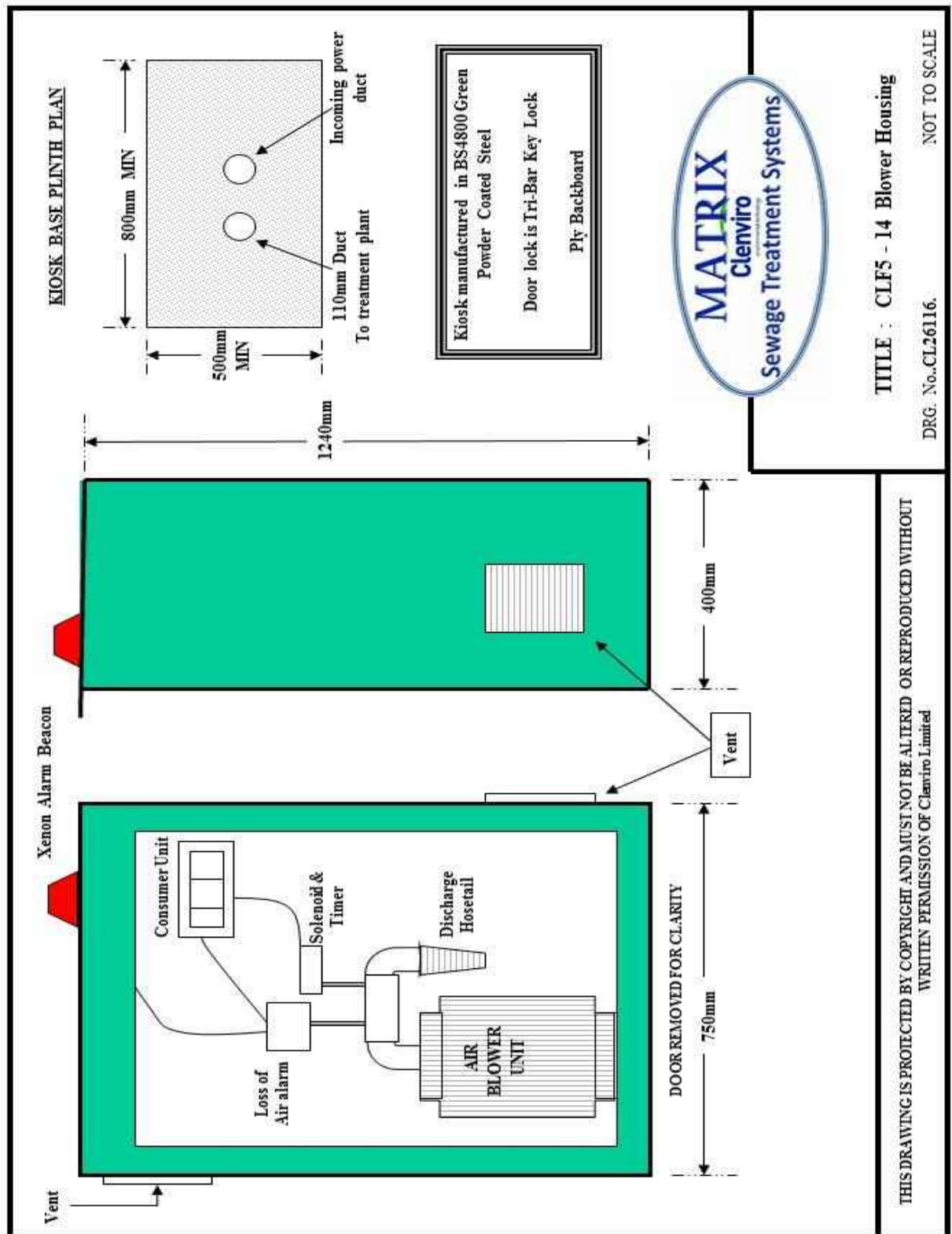
The supply to the CLF unit should be independent of all protection devices other than the supply authority's fuse and that provided specifically for the CLF power supply. In particular, earth leakage devices provided for normal domestic protection must **not** form part of the supply circuit to the CLF Unit.



CLF1 to CLF5 Blower Housing

See Technical Data Section for electrical connections and alarm wiring.

CLF 6 – 15 BLOWER HOUSING



OPERATING SEQUENCE

Section 4

The **MATRIX** Sewage treatment plant is specifically designed to treat domestic sewage and other biodegradable waste in a simple and compact system comprising three basic stages, namely:

Primary settlement

Biological Filtration

Final settlement

The **MATRIX** system utilizes microorganisms growing on the surface of the filter media to breakdown the sewage. It is very important that toxic chemicals such as those listed in the Introduction (section 2) do not enter the system and poison the microorganisms.

Raw sewage flowing to the CLF unit is received in the primary settlement zone. Here, gross solids (primary sludge) settle to the bottom of the tank, where they remain until the tank is desludged as described in the Maintenance Schedule, section 6 of this manual. The settled sewage displaced from the primary zone then flows into the submerged filter zone, passing under a scum baffle.

Flow circulation in the submerged filter zone is generated by the hydraulic effect of the outlet air diffuser. This causes settled sewage entering the filter zone at high level to be drawn down through the media, aerating the sewage in the process. The flow circulation ensures that the influent sewage receives several passes through the filter bed at low flow.

In the filter zone, as the sewage passes over the filter media it is purified by micro-organisms growing on the surface of the media. Growth of these micro-organisms results in an excess which is shed as solid particles known as humus solids. Humus solids settling at the bottom of the filter zones are recirculated with the flow of incoming sewage and are deposited on the top of the primary settlement zone.

Sewage displaced from the submerged filter zone flows via a DIP pipe into the humus settlement zone. Liquid displaced from the humus zone has now been fully treated and is known as final effluent. It is suitable for discharge to a watercourse or soakaway as defined in the consent to discharge issued by the Environment Agency.

Humus solids from the final settlement tank are recirculated to the primary tank via the recirculation pipework. This helps reduce the sludge build up in the humus tank and prevents stagnation during very low inflow.

PLANT START UP / SHUTDOWN PROCEDURE

Section 5

PLANT START-UP

1. Fill the plant with clean water until there is a discharge from the outlet.
2. Connect the airline from the blower unit to the receiving hoesail inside the neck of the treatment plant and ensure the connections are airtight
3. Check the blower ventilation is unobstructed.
4. Turn on the main power supply to the blower unit.
5. Turn the isolator switch inside the blower housing to the on position. This will start the blower running.
6. It will take a minute or so for the pressure to build up in the system depending on the distance of the blower from the treatment plant.
7. Check that bubbles are breaking the surface in the filter media section of the treatment plant.
8. Where installed the flow regulator tap (green) on the airlft recycle is factory set to achieve an effluent return rate of not quite a constant flow. This may need adjustment due to temperature conditions or distance of blower from the treatment plant.
NOTE: It will take about a minute between adjustments for a change in flowrate. The desired setting is where the flow only just 'spitting' back. **Under no circumstances must this tap be fully open or the flow constant, as this will detrimentally affect the process performance of the treatment plant.**
9. If a discharge pump is fitted, check for operation.
10. Fit the manhole cover and lock if necessary.

The CLF Unit is now in an operational state. However, the treatment process relies on the growth of microorganisms on the filter media. The time taken for these naturally occurring organisms to develop is dependent on temperature and may take up to six weeks in winter. Until the biomass is fully developed, the treatment process will be incomplete. During this time do not allow any strong cleaning agents or bleaches to enter the system.

PLANT SHUTDOWN

Section 5

Temporary absence of flow to the plant will not be detrimental as the air lift will continue to recycle sewage within the system. However, if the flow of sewage to the plant will be interrupted for more than two months, the following procedure should be completed:

1. Desludge the primary and humus tank compartments in accordance with the instructions in the Maintenance, section 6 of this manual.
2. Refill the plant with clean water.
3. Fit the manhole cover and lock if necessary.
4. Stop the blower by turning the isolator switch to off.
5. Switch off the power supply to the blower enclosure.

MAINTENANCE

Section 6

OWNER RESPONSIBILITY

The owner of the sewage treatment plant is entirely responsible for the operation of the plant and for ensuring that the quality of the effluent does not breach the Environmental Permit Standards issued by the Environment Agency

Matrix Treatment Systems only require minimal maintenance but like anything, if it is going to fail it will only do so on a Sunday or Bank Holiday. Most of our maintenance recommendations are purely a visual inspection.

You are reminded that the existence of a service agreement does not transfer responsibility for general maintenance, which must be conducted in accordance with the accompanying instructions.

Soakaways, drains and the emptying of primary tanks remain the responsibility of the treatment plant owner.

If the plant appears not to be operating correctly, refer to the Fault Finding, section 7 of this manual or contact **Clenviro Ltd** for advice

MAINTENANCE SCHEDULE

WEEKLY

1. Check the operation of the blower. If the blower has failed for any reason other than a mains power failure the warning beacon will be flashing

MONTHLY

Carry out the weekly check plus:

1. Check the operation of the diffusers (bubbles rising in the Biological zone).
2. Check the recycle flow into the inlet zone if fitted.
Look at the liquor being returned, it should run clear by the end of its cycle.
4. Check the inlet and outlet stilling zones are clear of debris.(remove any obstructions)
5. Check the blower ventilation is un-obstructed
6. Check the biomass growth on the filter media. The biomass should be a light brown colour, not white or grey. The odour in the plant should be 'earthy'. There should not be a noticeable 'rotten eggs' smell.
7. Check the final effluent. If this is cloudy or contains many suspended particles, then the humus tank is likely to require desludging.

MAINTENANCE SCHEDULE (continued)

Section 6

6 MONTHLY / ANNUALLY

Carry out the weekly and monthly checks plus:

1. Check the primary settlement tank with a probe, the top floating crust blanket should not exceed 200mm thick, arrange desludge if required
2. Desludge the primary and final tank every 12 months* and desludge the biozone every 24 months*. This should be done by an experienced local waste disposal tankering company. * This applies to CLF units 1, 1A, 2, 3 & 4. Larger systems will require de-sludging more frequently depending on loading and type of application.
3. The tanker suction hose should be carefully lowered into the primary and final chambers ensuring all settled sludge is removed.
4. When desludging the biozone carefully lower the suction hose down the triangular section (rectangular in larger units) where the air diffuser pipework goes down making sure not to damage the pipework. Ensure the hose is down to the base of the tank so that all settled biomass sludge can be removed.
5. After desludging each compartment, it is essential that the unit is filled up with water. This can be done by using a hosepipe or by running several taps in the household(s).
6. Remove air filter from the blower unit (remove top cover to access filter), clean and replace.
7. It is the manufacturers recommendation that the diaphragms in the small blower units are replaced every 18-24 months.

See general layout drawings 'CLF1-17 Desludge' in the technical data section for desludge points

Repeat the Plant Start-up Procedure, section 5 of this manual.

1. THE BLOWER IS NOT RUNNING

	Cause	Remedy
1.1	Power cut.	If temporary do nothing. When the power is restored the system will restart automatically
1.2	Power supply RCD has tripped.	Switch off the power and reset the RCD, Switch on and the blower should restart automatically. If it doesn't, switch off the power supply and call an electrician, on 3 phase supply check correct rotation.
1.3	Blower runs Intermittently	Check air vents are clear and the airline is not kinked as overheating in the enclosure will cause the high temperature trip to switch off the power until cool.

2. AIR BUBBLES ARE NOT RISING FROM THE DIFFUSER

	Cause	Remedy
2.1	Blower is not running.	Refer to fault condition 1.
2.2	Blower running	Check all valves open, and all air lines are not broken or leaking.

3. THERE IS NO RECIRCULATION FLOW FROM THE HUMUS TANK COMPARTMENT

	Cause	Remedy
3.1	Blower fault.	Refer to fault conditions 1 & 2.
3.2	Recirculation pipework is blocked	Use a wooden pole to agitate any sludge which has settled around the bottom of the recirculation pipework in the humus tank. If there is a substantial level of sludge, then desludge the humus tank as described in the Maintenance Schedule, section 6 of this manual.
3.3	The air control jet is blocked	Remove and clean the jet. In cleaning the jet ensure the orifice is not enlarged.

TECHNICAL DATA

Section 8

Model No	CLF1 (6pe)	CLF1A (9pe)	CLF2 (12pe)	CLF3 (18pe)
Max Daily Flow	0.9m ³ /day	1.35m ³ /day	1.8m ³ /day	2.7m ³ /day
Total BOD Load	0.36kg/day	0.54kg/day	0.72kg/day	1.08kg/day
Population Equivalent	6	9	12	18
Overall Depth (std)	1956mm	1959mm	1959mm	1962mm
Diameter	1500mm	1700mm	1900mm	2200mm
Inlet Invert (Std)	600mm	600mm	600mm	600mm
Outlet Invert	650mm	650mm	650mm	650mm
Cover Size	900mm ²	900mm ²	900mm ²	2 x 900mm ²
Blower Rating	60w/240v	60w/240v	80w/240v	120w/240v
Discharge Pump rating (optional)	0.2kw/240v	0.2kw/240v	0.2kw/240v	0.2kw/240v
Desludge Frequency* (Based on full load)	180 days	180 days	180 days	180 days
Inlet Connection	110mm	110mm	110mm	110mm
Outlet Connection (Gravity)	110mm	110mm	110mm	110mm
Outlet Connection (pumped discharge)	50mmMDPE	50mmMDPE	50mmMDPE	50mm MDPE
Weight (empty)	200kgs	250kgs	300kgs	400kgs

*Desludge frequency assumes residential application with full daily design loading

Model No	CLF4 (25pe)	CLF5 (30pe)	CLF6 (40pe)	CLF7 (50pe)
Max Daily Flow	3.75m ³ /day	4.5m ³ /day	6.0m ³ /day	7.5m ³ /day
Total BOD Load	1.50kg/day	1.80kg/day	2.40kg/day	3.00kg/day
Population Equivalent	25	30	40	50
Overall Depth (std)	1912mm	1912mm	1912mm	1912mm
Width (inc ribs)	2500mm Diameter	1624mm	1624mm	2124mm
Length (inc. ribs)	N / A	4100mm	4500mm	5100mm
Inlet Invert (Std)	600mm	600mm	600mm	600mm
Outlet Invert	650mm	700mm	700mm	700mm
Blower Rating	120w/240v	200w/240v	0.37Kw/240v	0.70Kw/240v
Discharge Pump rating (optional)	0.2kw/240v	0.2kw/240v	0.2kw/240v	0.2kw/240v
Desludge Frequency* (Based on full load)	180 days	180 days	180 days	180days
Inlet Connection	160mm	160mm	160mm	160mm
Outlet Connection (Gravity)	160mm	160mm	160mm	160mm
Outlet Connection (pumped discharge)	50mm MDPE	50mm MDPE	50mm MDPE	50mm MDPE
Weight (empty)	750kgs	1200kgs	1400kgs	1700kgs

*Desludge frequency assumes residential application with full daily design loading.

Model No	CLF8 (60pe)	CLF9 (70pe)	CLF10 (80pe)	CLF11 (90pe)	CLF12 (100pe)
Max Daily Flow	9m ³	10.5m ³	12m ³	13.5m ³	15m ³
Total BOD load	3.60kg/day	4.20kg/day	4.80kg/day	5.40kg/day	6.00kg/day
Population Equivalent	60	70	80	90	100
Overall Depth (std)	1912mm	1912mm	1912mm	1912mm	1912mm
Width (inc. ribs)	2124mm	2124mm	2124mm	2124mm	2524mm
Length (inc ribs)	5600mm	6000mm	6600mm	7500mm	7500mm
Inlet Invert (Std)	600mm	600mm	600mm	600mm	600mm
Outlet Invert	700mm	700mm	700mm	700mm	700mm
Blower Rating	0.70kw	0.70kw	0.70kw	0.70kw	0.70kw
Desludge Frequency *	120 days	120 days	120 days	120 days	120 Days
Inlet Connection	160mm	160mm	160mm	160mm	160mm
Outlet Connection	160mm	160mm	160mm	160mm	160mm
Outlet (pumped)	50mm MDPE	50mm MDPE	50mm MDPE	50mm MDPE	63mm MDPE
Weight Empty	2000kg	2200kg	2400kg	2600kg	2900kg

*Desludge frequency assumes residential application with full daily design load

Model No	CLF13 (125pe)	CLF14 (150pe)	CLF15 (200pe)	CLF16 (250pe)	CLF17 (300pe)
Max Daily Flow	18.75m ³	22.5m ³	30m ³	37.5m ³	45m ³
Total BOD	7.50kg/day	9.00kg/day	12.00kg/day	15.00kg/day	18.00kg/day
Population Equivalent	125	150	200	250	300
Overall Depth	1912mm	1912mm	1912mm	2412mm	2612mm
Width (inc. ribs)	2524mm	2524mm	2524mm	2524mm	2524mm
Length (inc ribs)	9000mm	10500mm	12000mm	12000mm	12000mm
Inlet Invert (Std)	600mm	600mm	600mm	600mm	600mm
Outlet Invert	700mm	700mm	700mm	700mm	700mm
Blower Rating	0.75kw (240v)	1.1kw (240v)	1.1kw (240v)	1.5kw (415v)	2.2kw (415v)
Desludge Frequency*	120 days	120 days	120 days	120 days	90 Days
Inlet Dia	160mm	160mm	160mm	160mm	160mm
Outlet Dia	160mm	160mm	160mm	160mm	160mm
Outlet (pumped)	63mm MDPE	63mm MDPE	63mm MDPE	63mm MDPE	63mm MDPE
Weight Empty	3100kg	3300kg	3500kg	3700kg	3900kg

*Desludge frequency assumes residential application with full daily design load.

MATRIX PACKAGE SEWAGE TREATMENT PLANT

PROCESS DESCRIPTION

INFLUENT DESIGN PARAMETERS.

DWF (Dry Weather Flow)	=	As data sheet
Peak Design Flow	=	3 x DWF
Organic Load	=	As data sheet
Nature of Influent	=	CRUDE SEWAGE
PH Range	=	6 – 8
Standard Effluent Quality	=	20mg / L BOD : 30mg / L SS : 20mg/L NH ₄

ALL SURFACE WATER MUST BE EXCLUDED. – NO WASTE DISPOSAL UNITS IN USE
AN EFFECTIVE GREASE TRAP MUST BE INSTALLED ON ANY COMMERCIAL KITCHEN DRAINS eg.: HOTELS / RESTAURANTS

The “Matrix” treatment plant is of unitank design and incorporates Primary Settlement (PST) Biological Treatment (Biozone), and Final Settlement (FST) within the same structure, allowing delivery to site as a complete unit to provide for a simple and straightforward installation. No other tanks are required except for larger applications (over 300 p.e.) where a modular system is provided or where additional treatment may be required to achieve more stringent effluent quality standards or where effluent re-use is proposed.

The "Matrix" Treatment plant has been designed to optimize the aesthetic qualities of the final installation by ensuring that there is minimum visual impact. The "Matrix" process is designed in accordance with the requirements of BS 6297 and certified to BSEN 12566 – Pt3 achieving an average final effluent quality of 11mg/litre BOD : 16mg/litre SS : 6mg/litre NH₄.

PRIMARY SETTLEMENT TANK

The primary settlement tank is a two stage tank designed to maximize the removal of gross and suspended solids prior to transfer of the settled effluent to the biozone for treatment. The primary settlement tank also incorporates for a sludge storage volume (based on full load) depending on the desludge periods as identified for individual applications.

BIOZONE

The biological treatment phase utilizes BAF technology (biological aerated filter) which incorporates two proven principles of biological process in the form of a fixed film reactor for process stability and a suspended floc dispersed growth system for high transfer rates and operational control, to ensure a stable treatment process which is largely unaffected by shock loads.

The process incorporates a submerged, high rate, plastic media on which a fixed film of biomass is grown. This film takes nutrition from the incoming settled effluent and is provided with oxygen by means of a small blower unit which aerates the media through HDPE membrane diffusers to provide fine bubble aeration.

The action of the fine bubble aeration is carefully controlled to provide optimum oxygen transfer rates and to provide a scouring action to slough off excess biomass to keep the thickness of the fixed biological film at optimum levels, thereby preventing the production of anaerobic bacteria and ensuring maximum process efficiency.

The fact that the media remains submerged allows for an element of suspended floc dispersed growth which basically means that there will be biomass which is “unfixed” to the media but achieves treatment through suspended aeration.

The biozone incorporates a two stage process as standard that allows for constant mixing of incoming settled effluent to provide optimum treatment stability and to avoid any “short-circuiting.”

The use of a two stage biozone ensures a high degree of process efficiency to not only reduce B.O.D. levels to that required, but will also achieve reductions in ammoniacal nitrogen in excess of standard requirements.

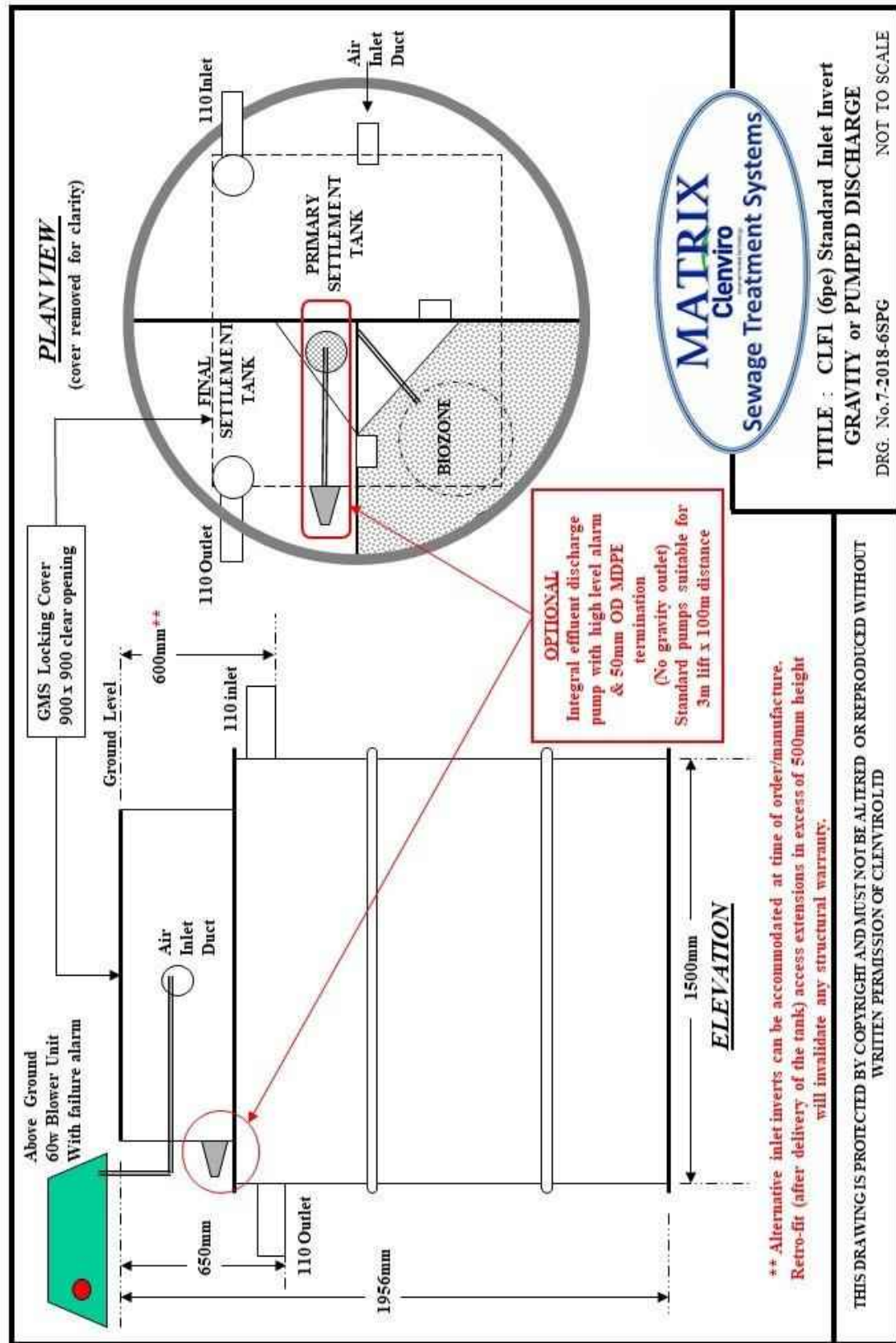
FINAL SETTLEMENT TANK

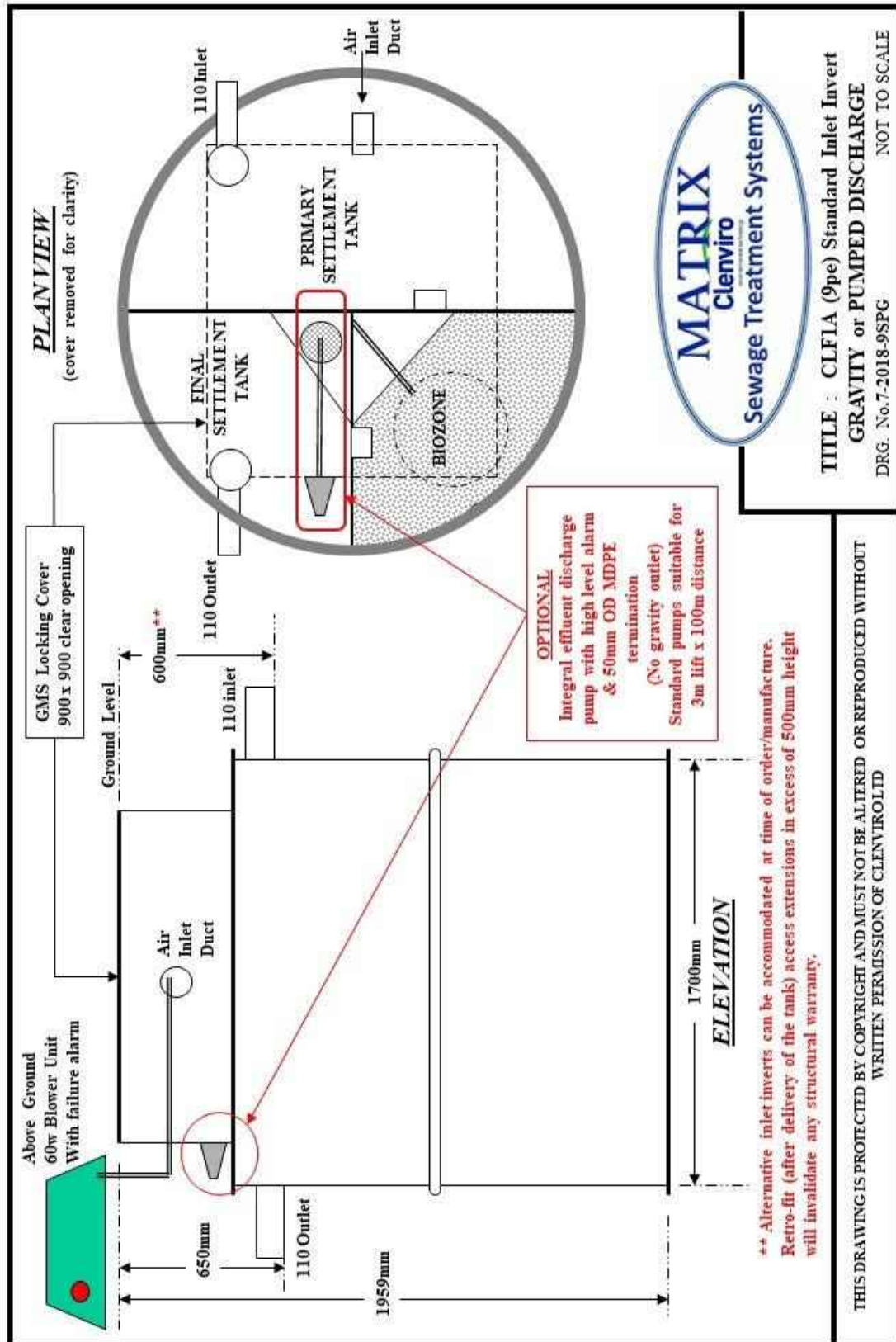
The final settlement tank is designed in accordance with the requirements of BS 6297 to ensure relevant surface areas and rise rates are achieved to provide maximum settlement of any suspended solids prior to discharge.

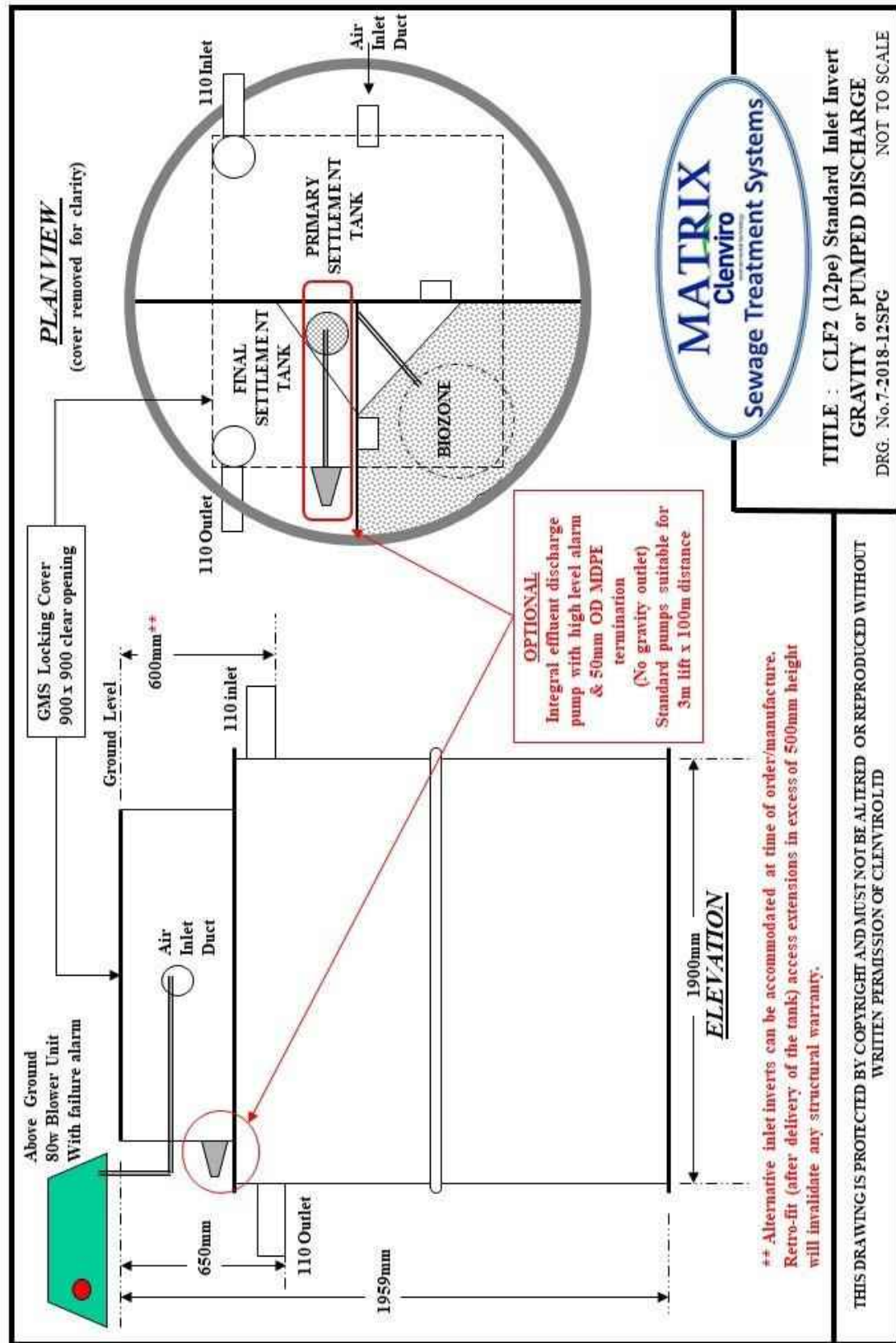
The “**Matrix**” system also incorporates continuous and automatically timed humus sludge return systems to return humus sludge from both the final settlement tank and each biozone, back to the primary settlement tank.

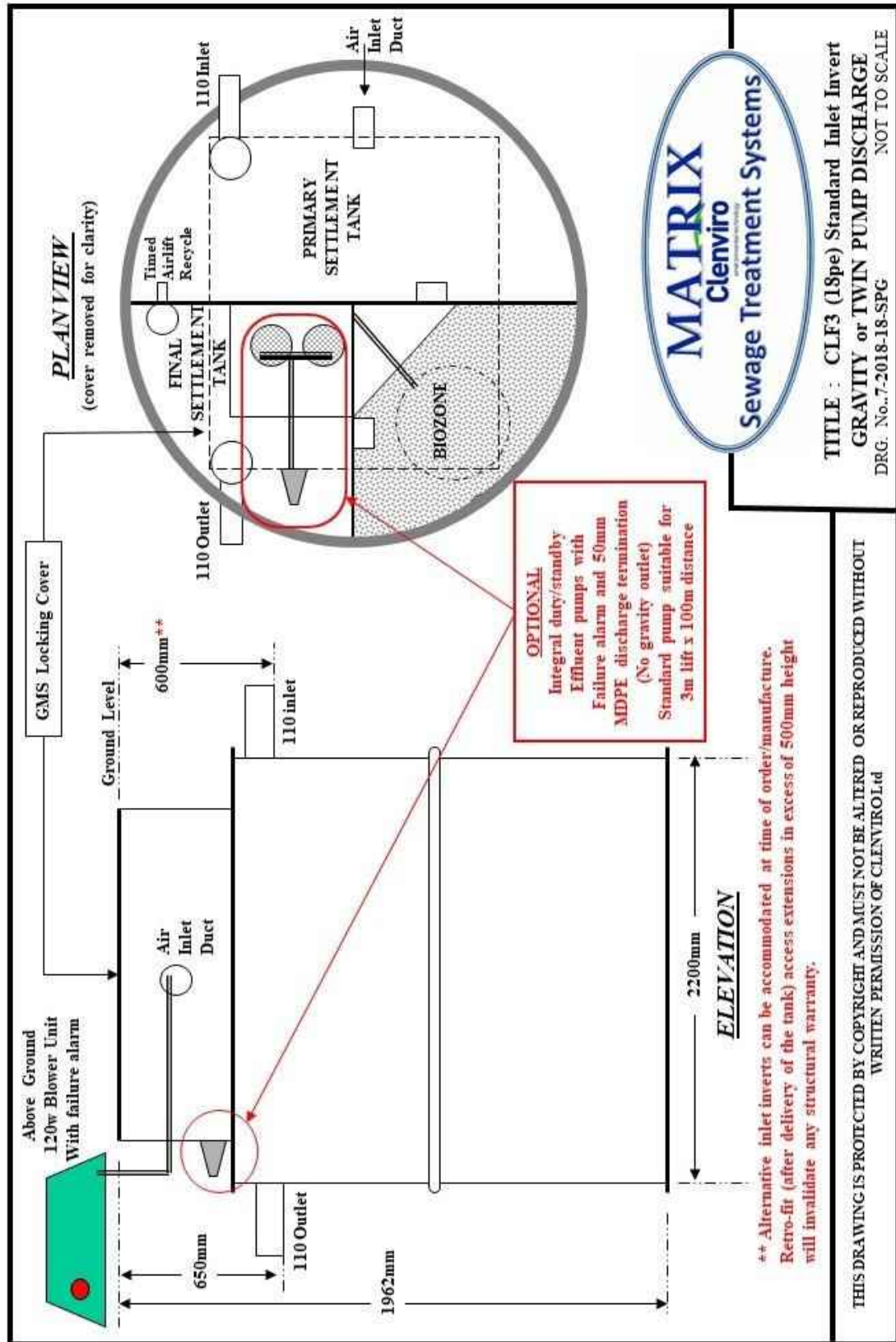
Additionally this system also provides for continuous recycling of treated effluent back to the P.S.T. to not only provide dilution of incoming settled effluent but to also ensure continuous flow during periods of low or no flow, thereby keeping the biomass in prime condition.

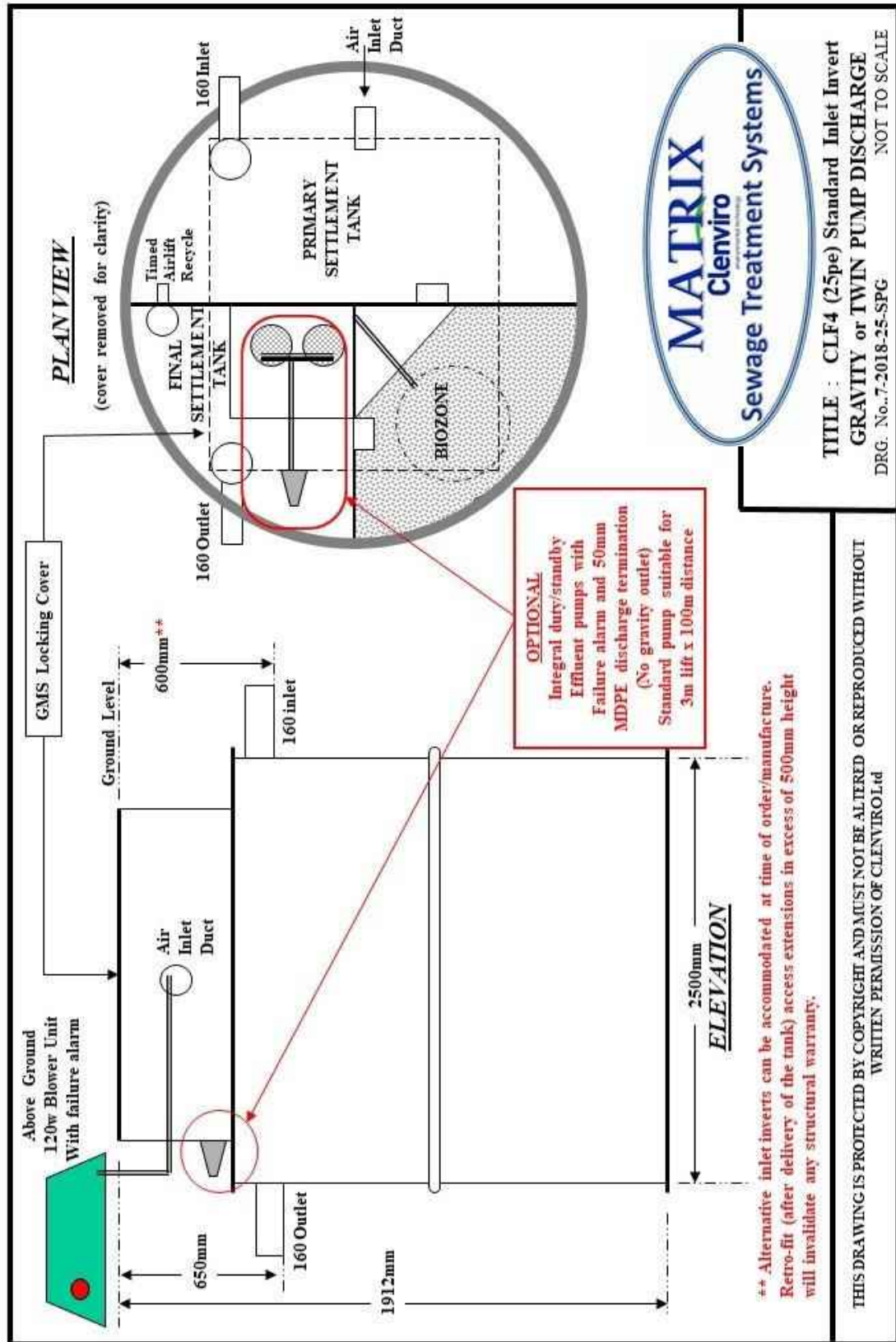
To maximize efficiency and to minimize maintenance requirements and potential problems, there are NO mechanical or moving parts contained within the treatment plant.













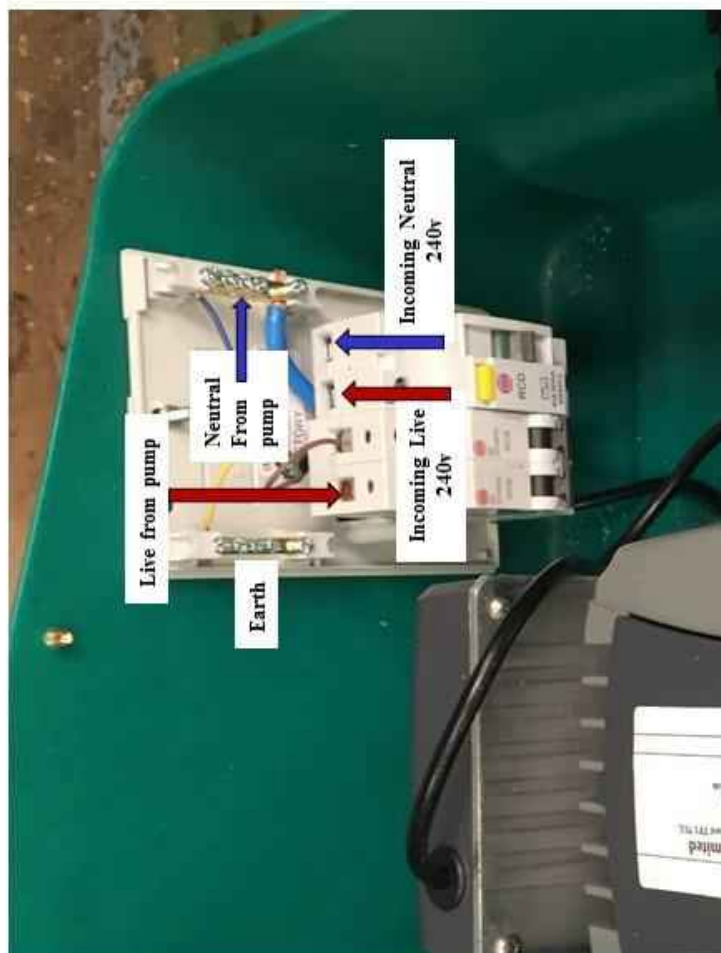
Note : Blower – Alarm & 'Power On' lamp are factory pre-wired.

MATRIX
Clenviro
Sewage Treatment Systems

TITLE : CLF1-CLF1A - CLF2- CLF3 - CLF4
Gravity Discharge Models
Electric Connection

DRG. No.26815-B NOT TO SCALE

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Note: Blower – Alarm & 'Power On' lamp are factory pre-wired

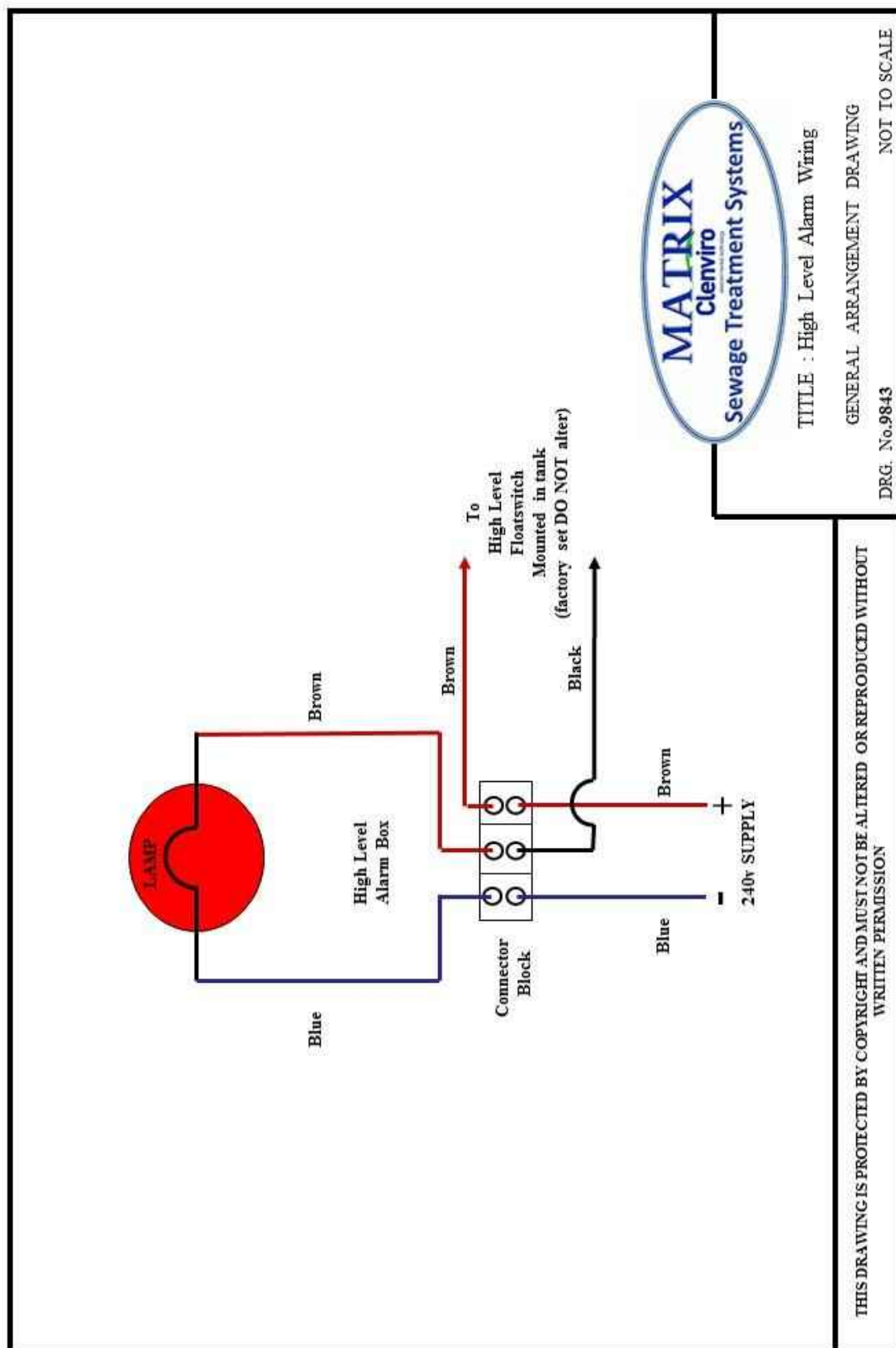
MATRIX
Clenviro
Sewage Treatment Systems

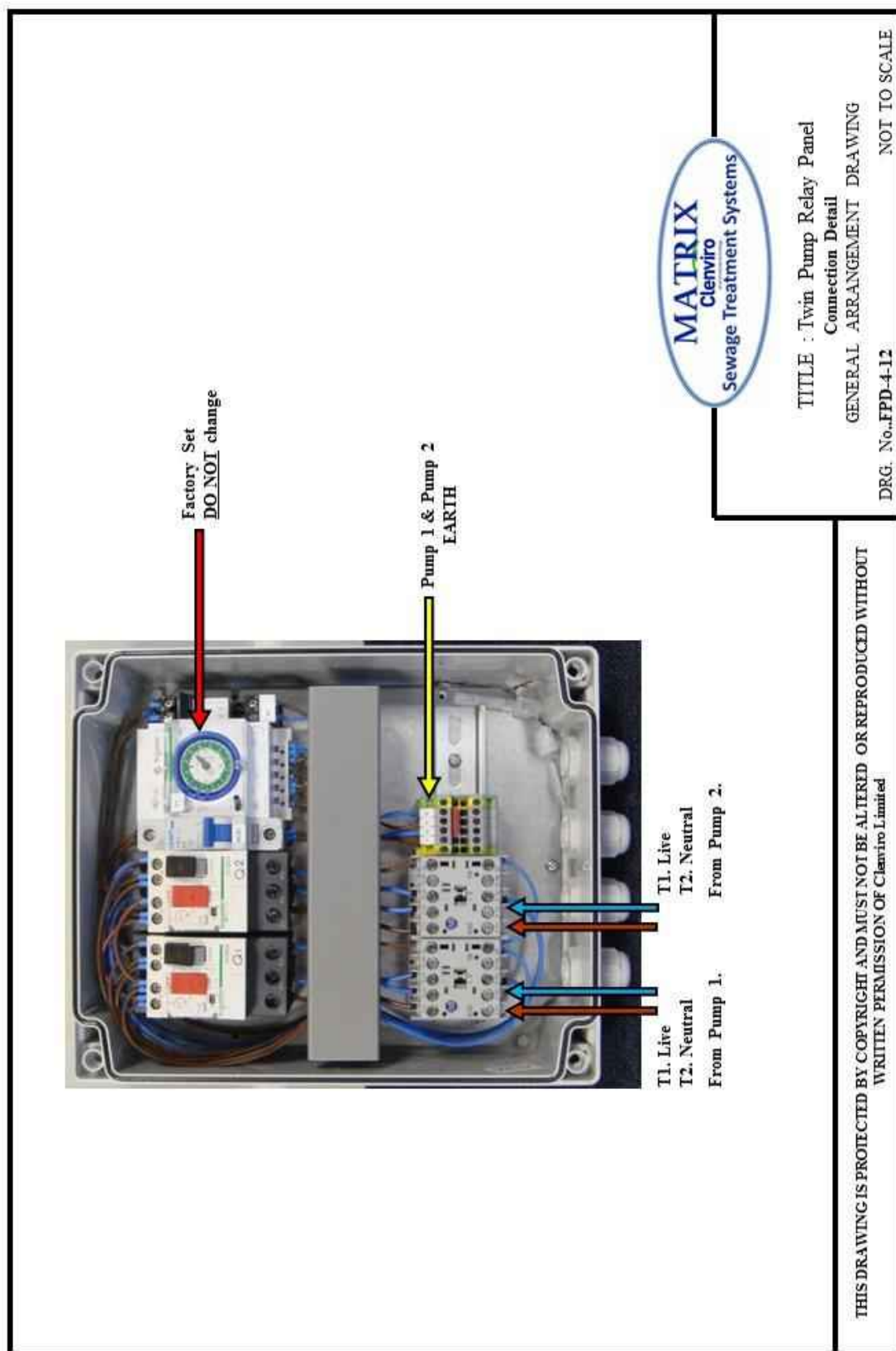
TITLE : CLF1-CLF1A - CLF2
Pumped Discharge Models
Electric Connection

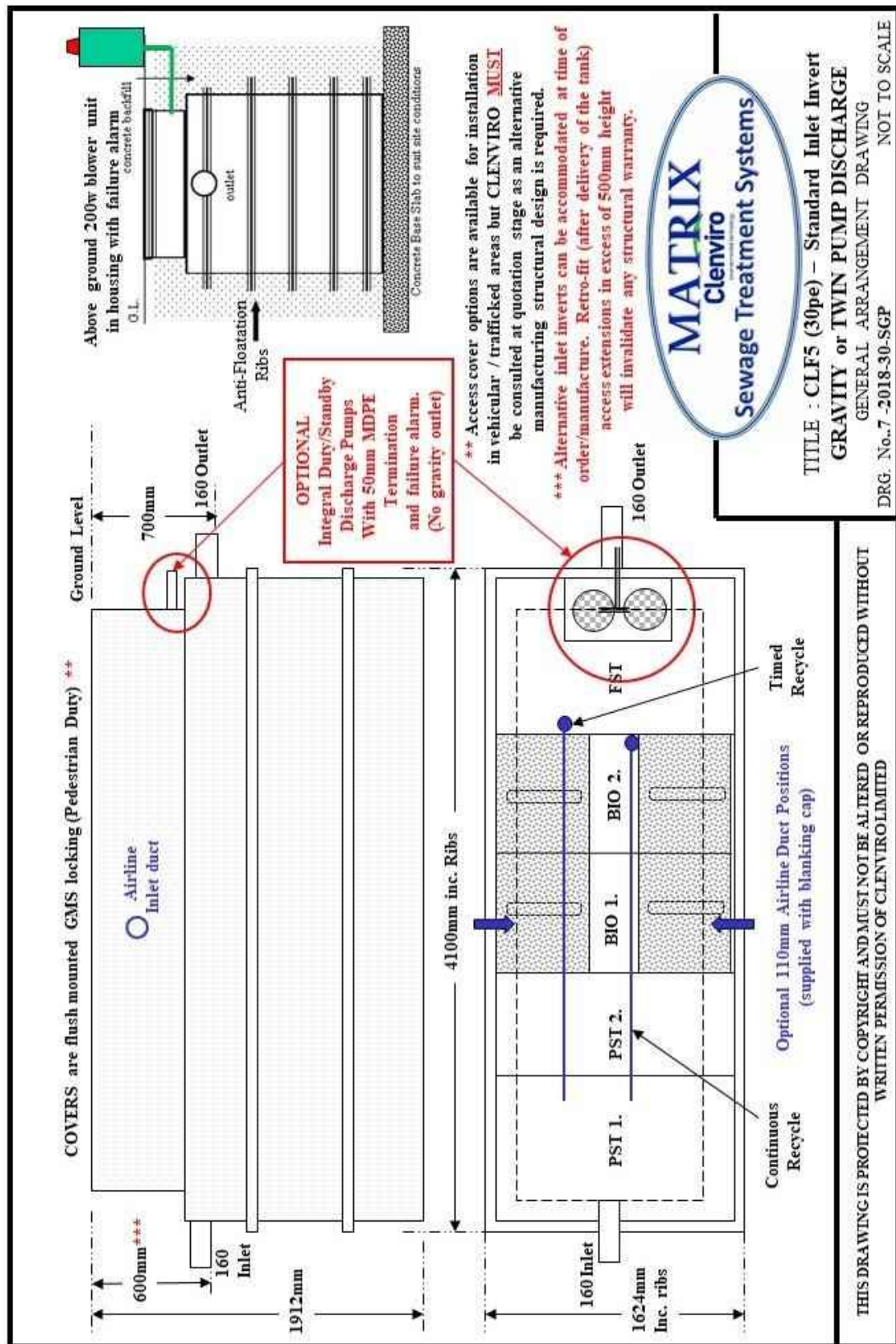
DRG. No.26815-A

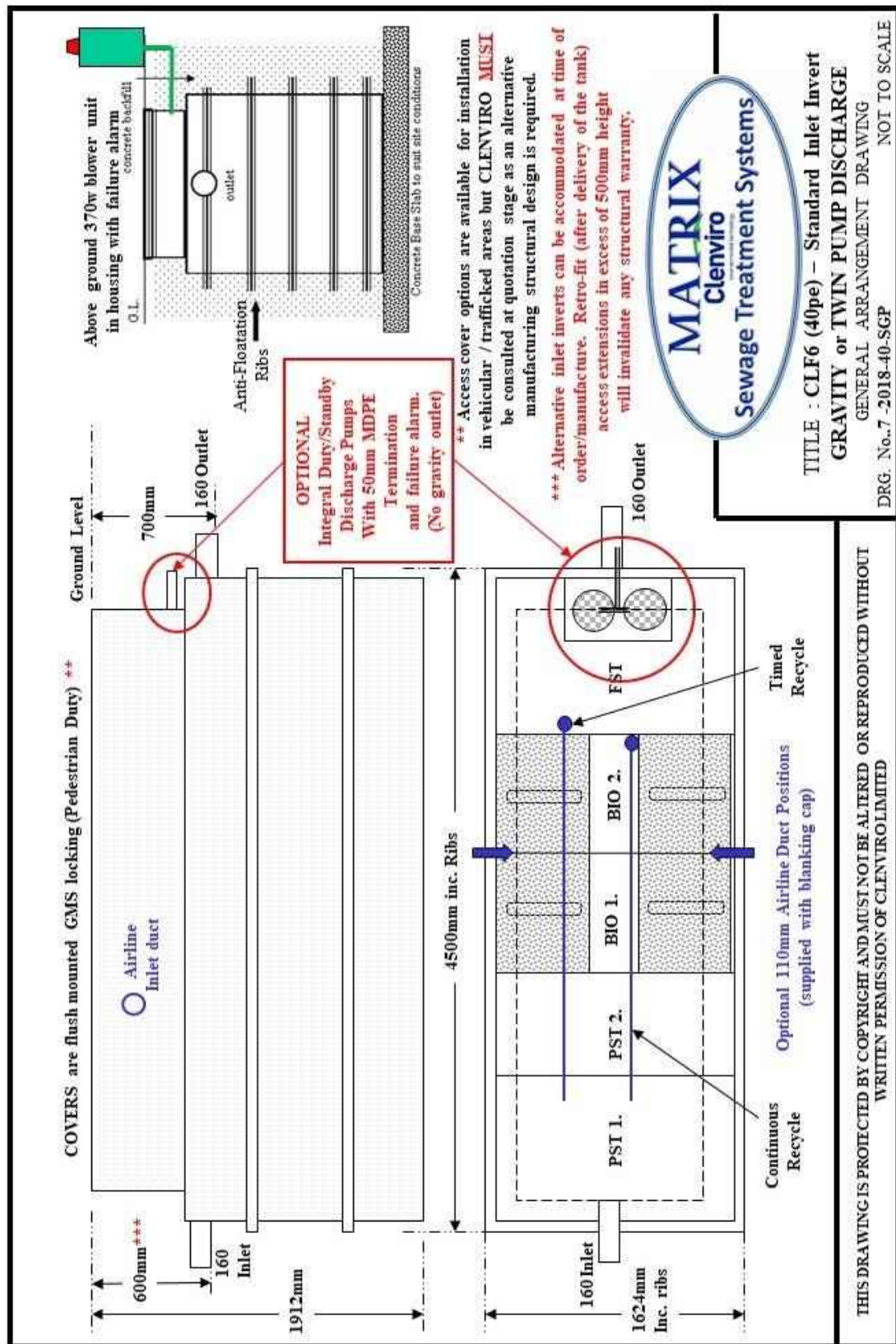
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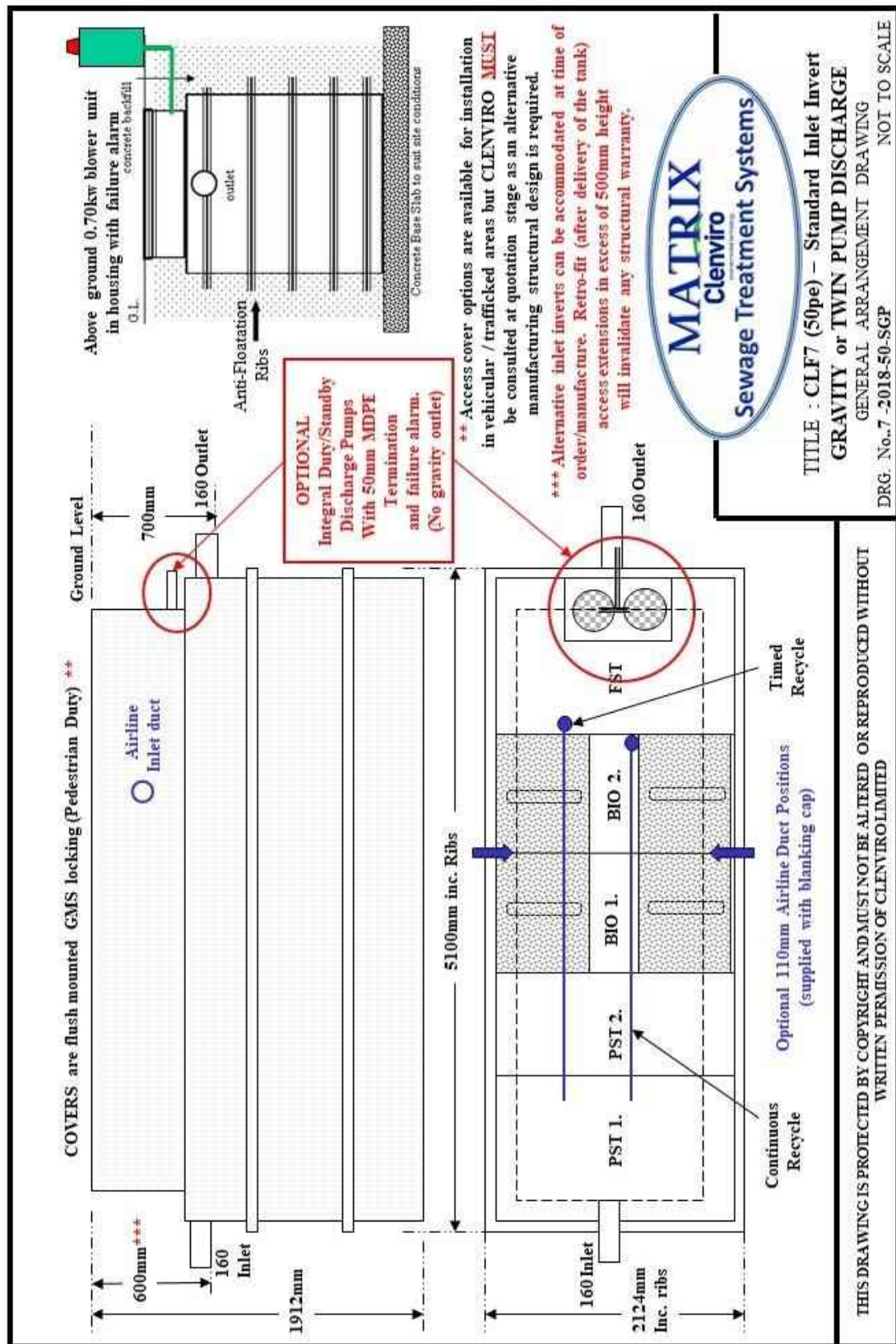


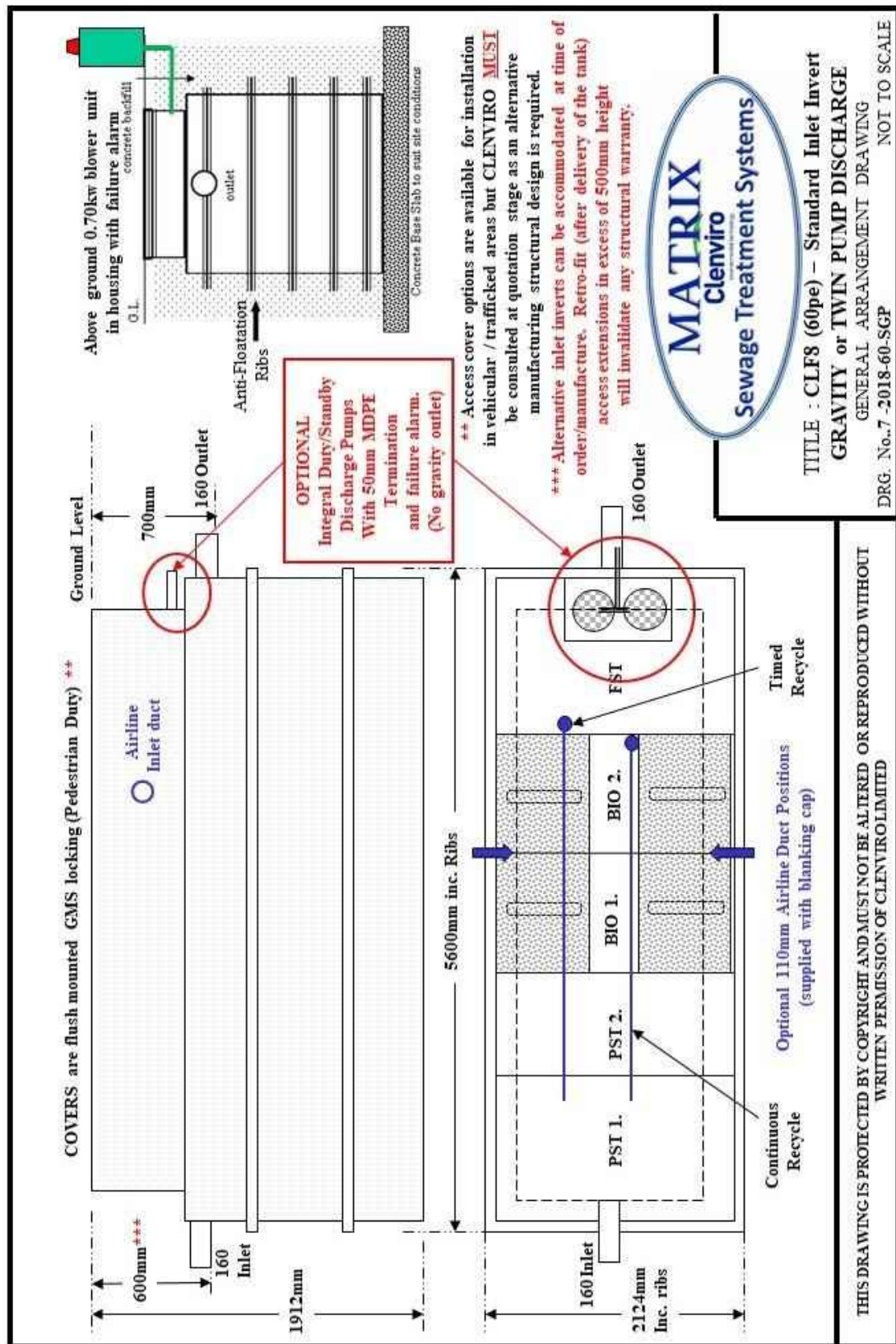


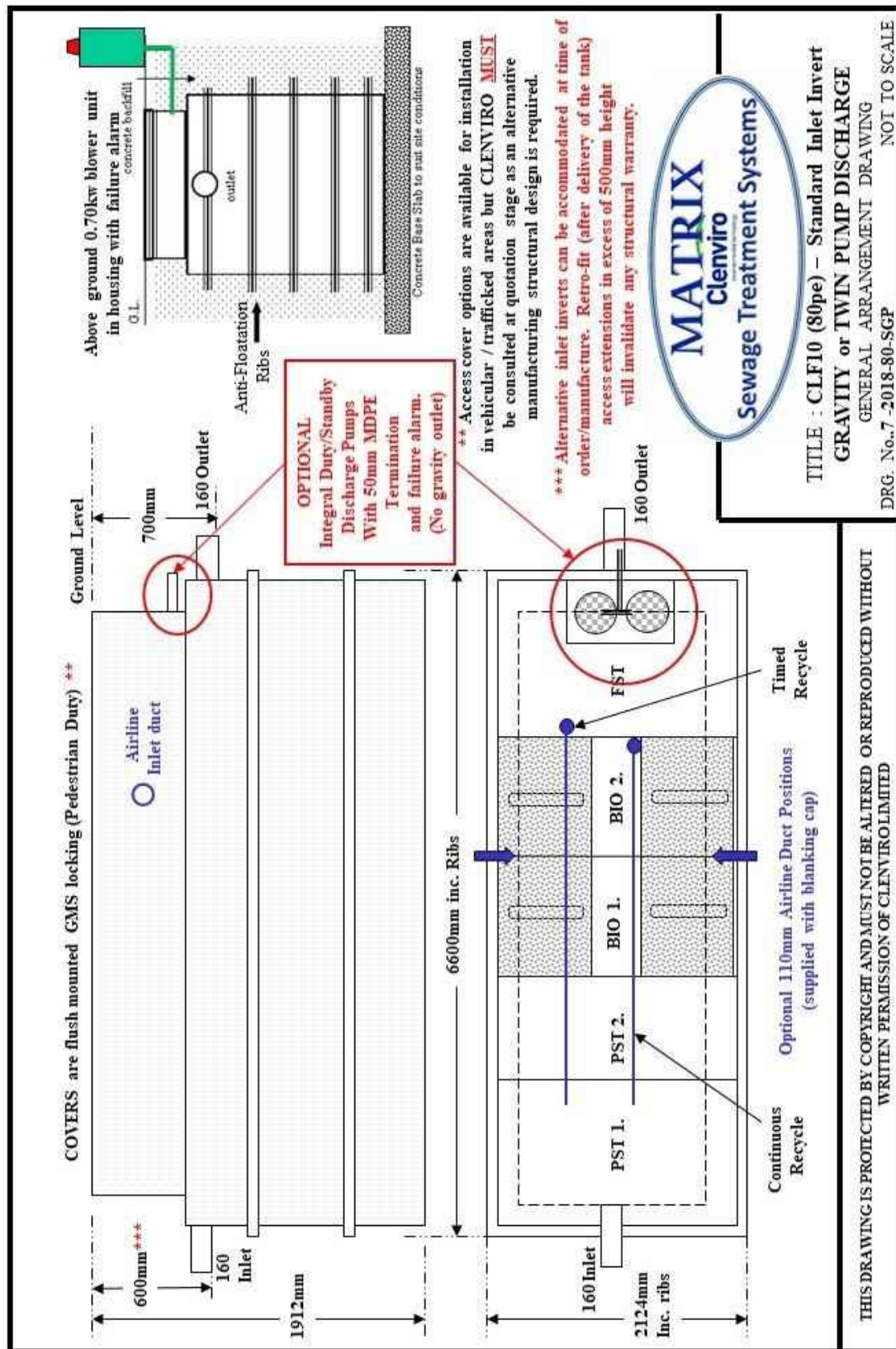


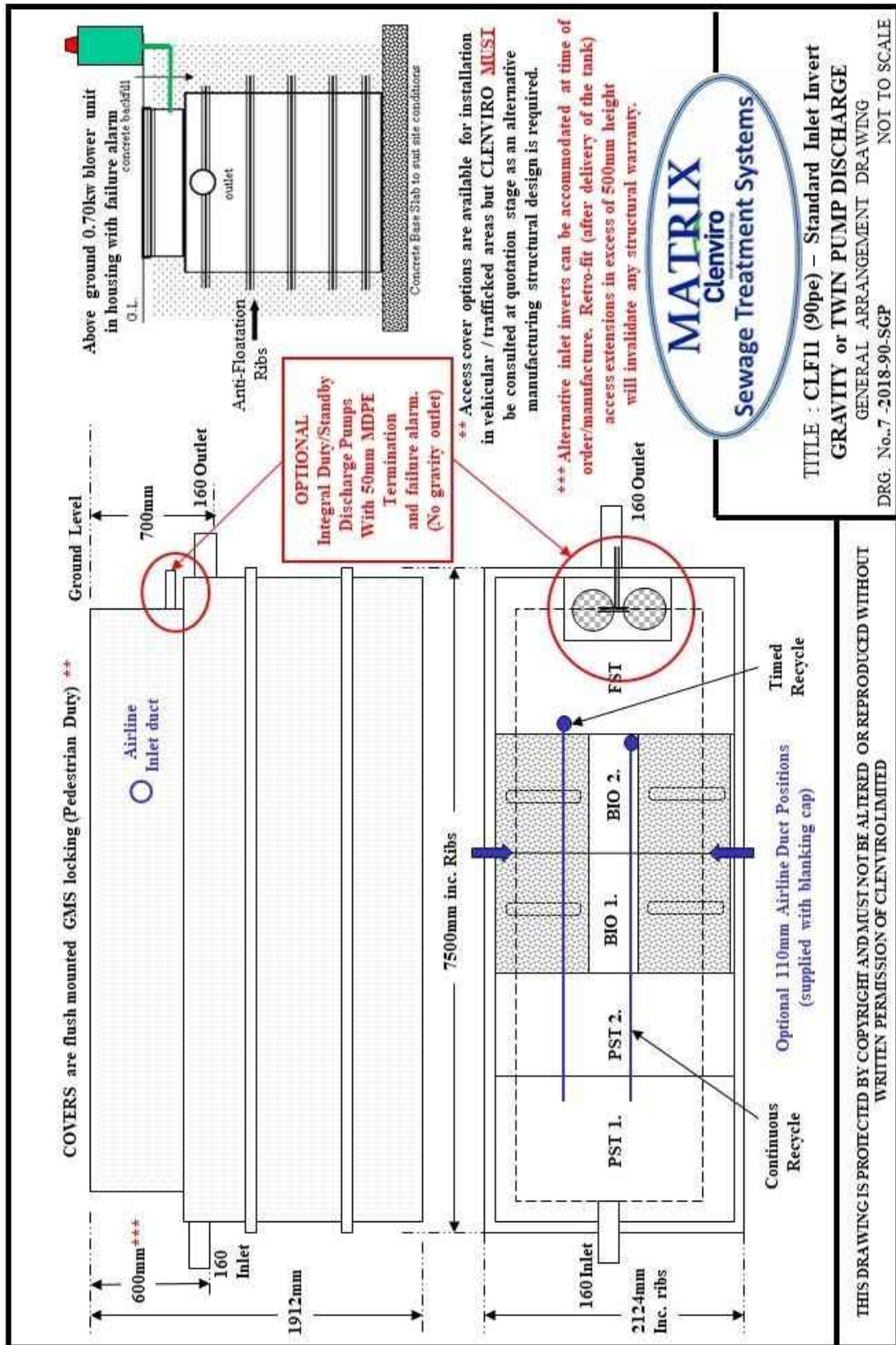


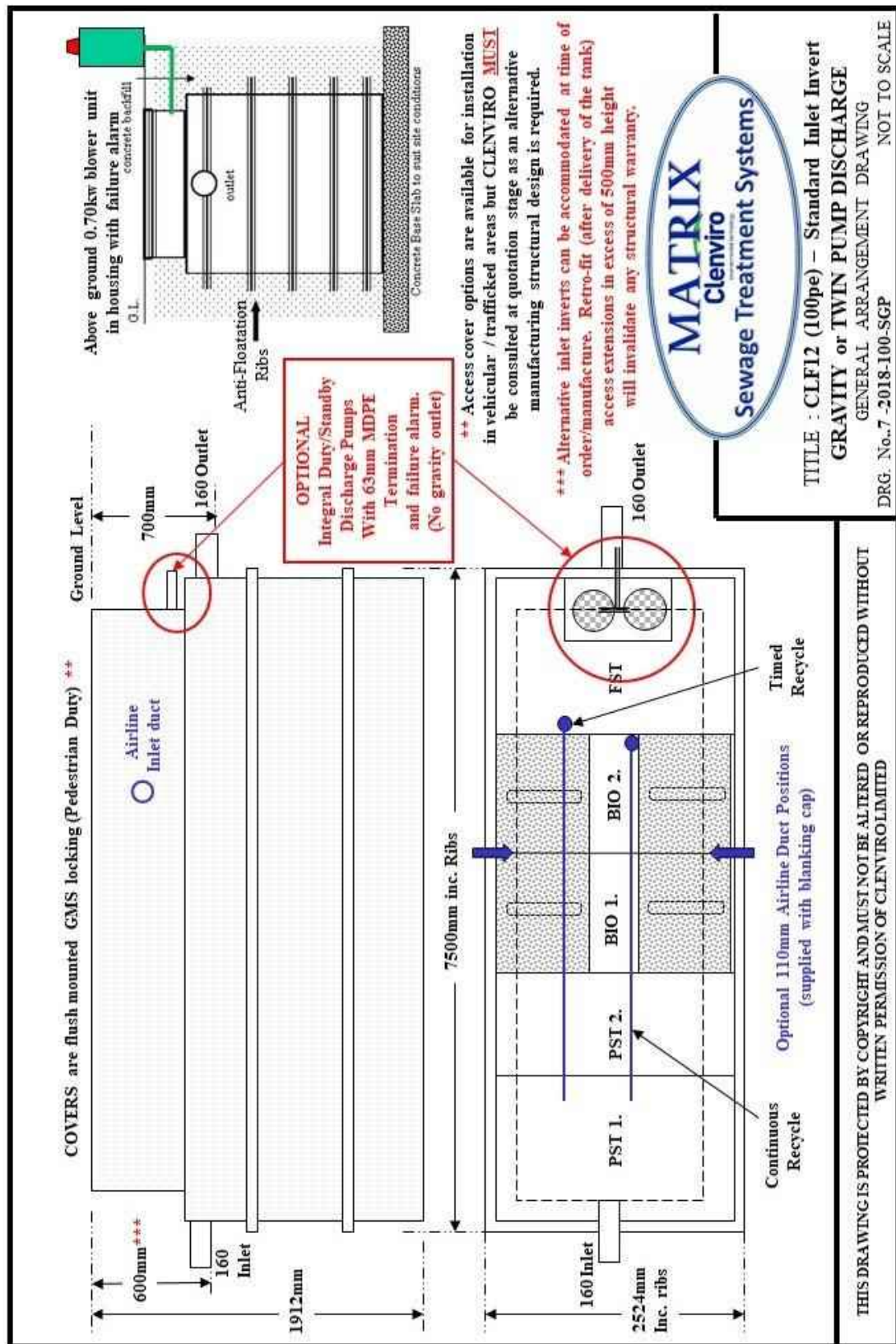
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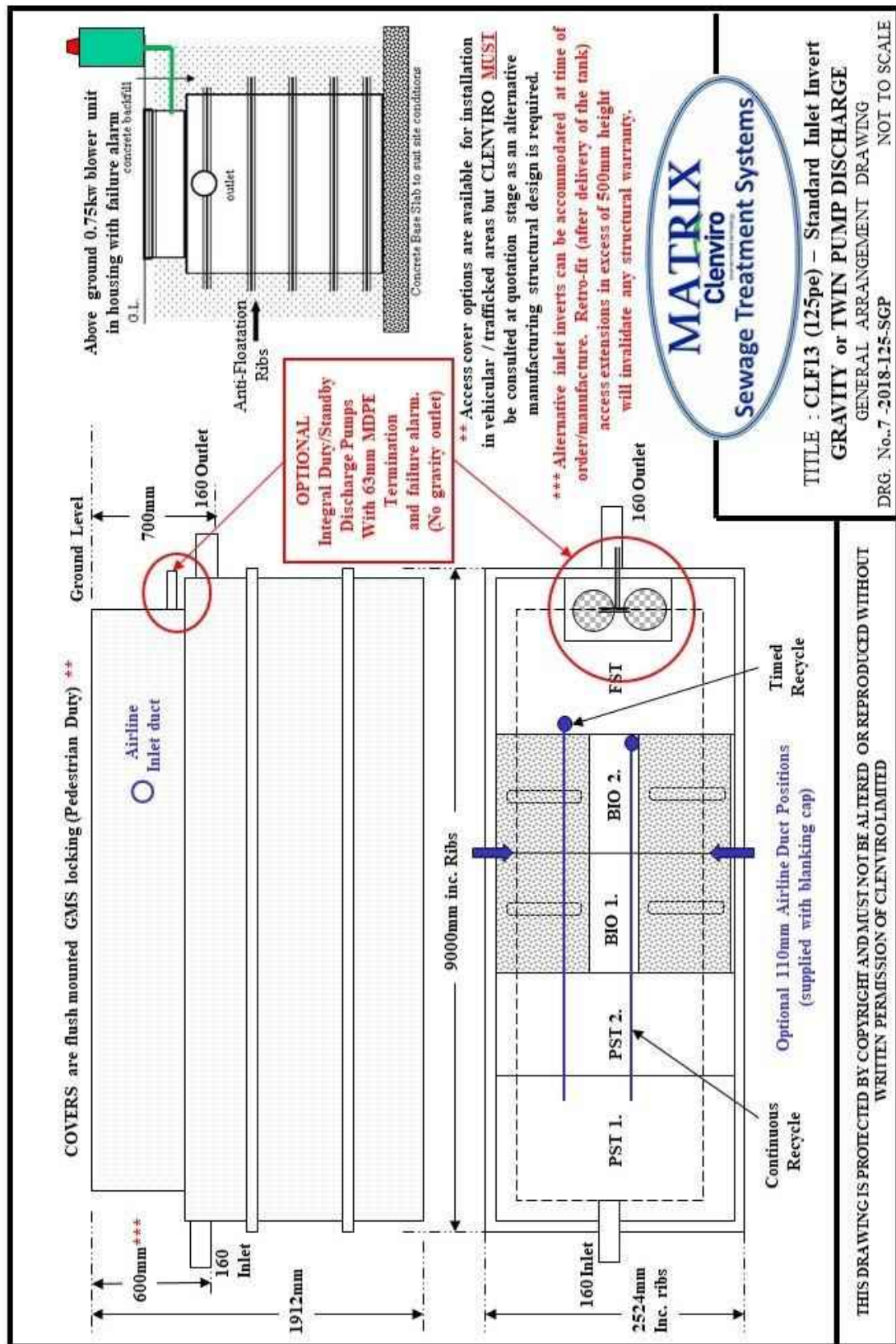


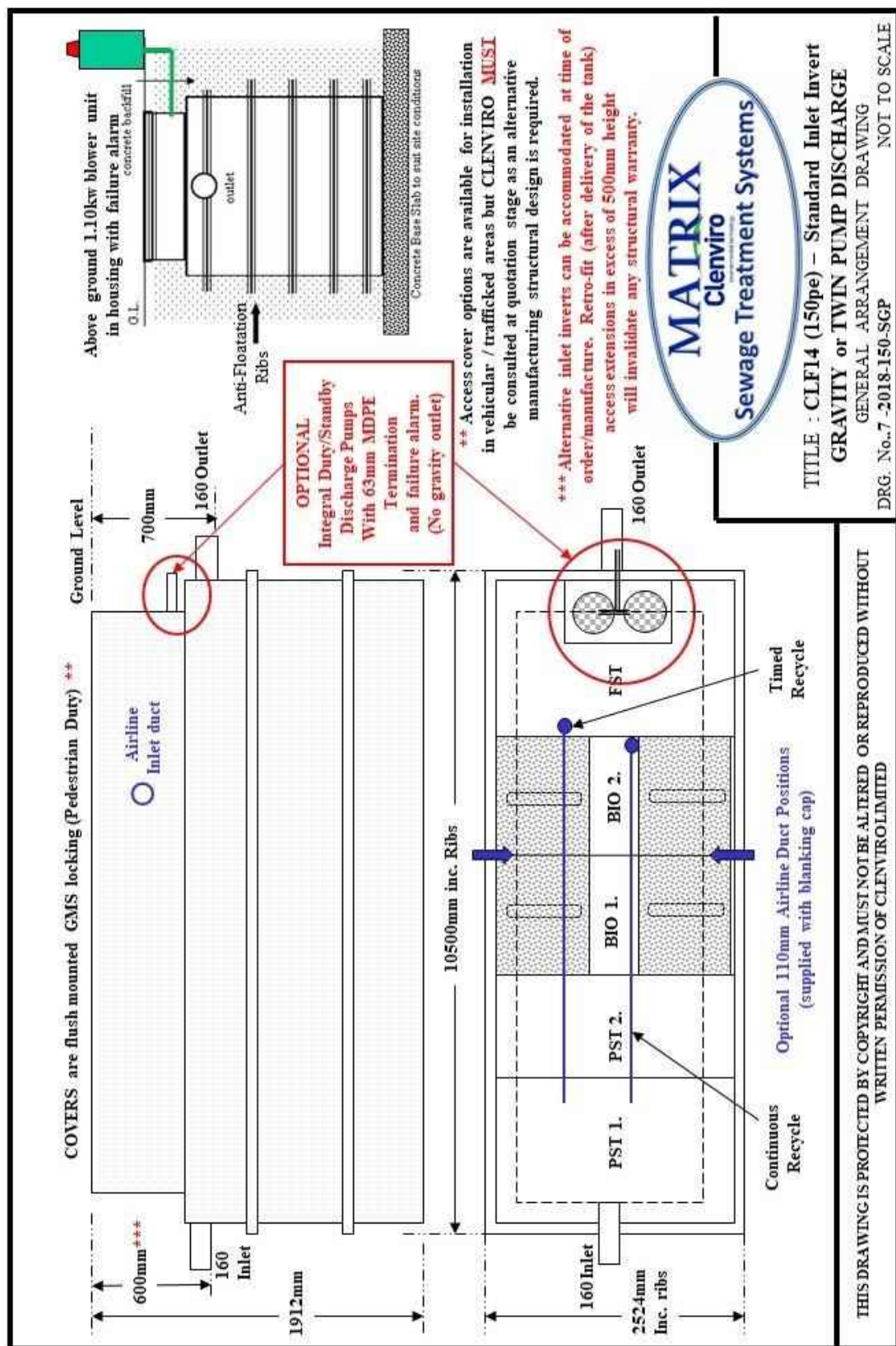


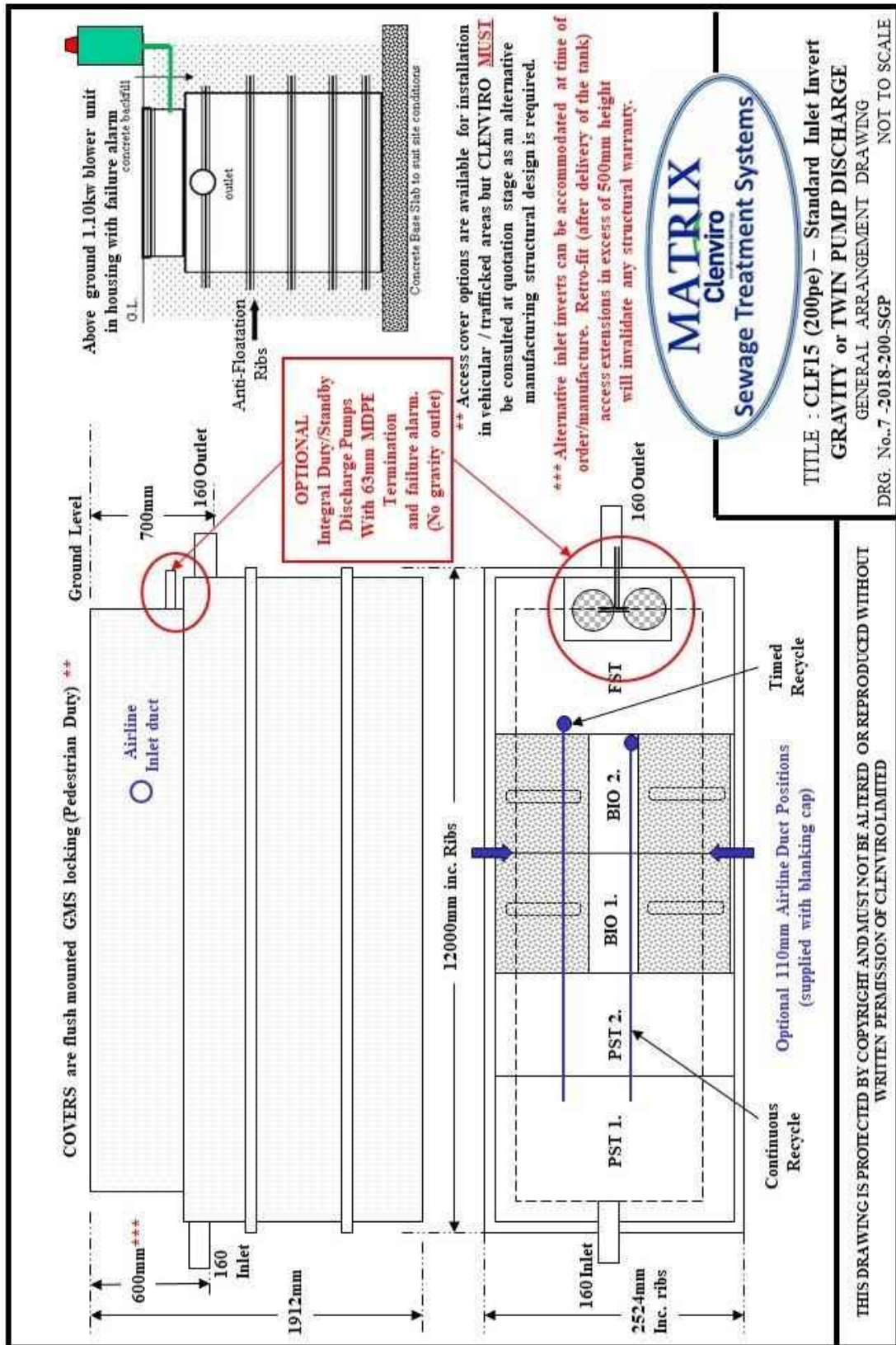


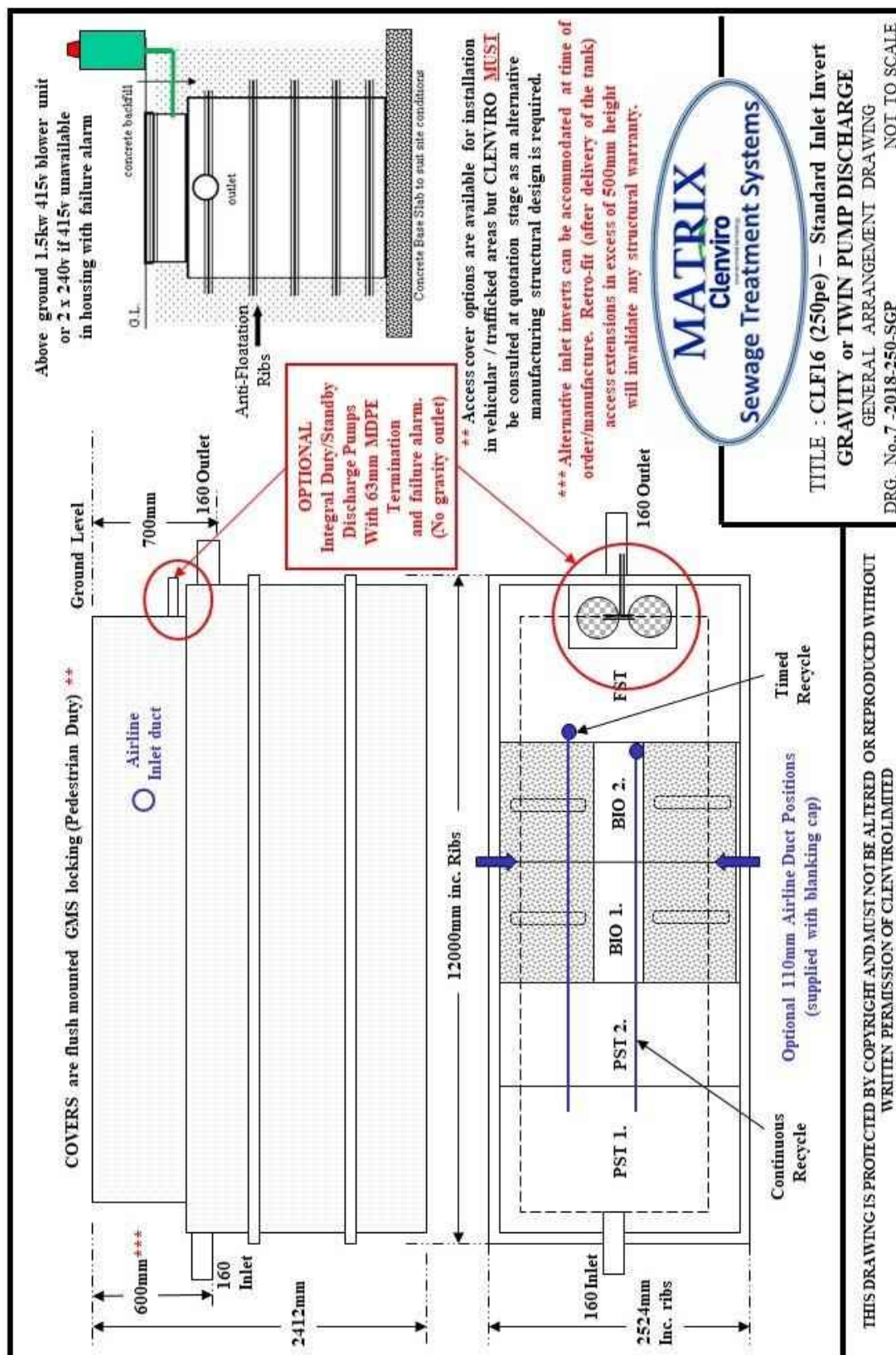


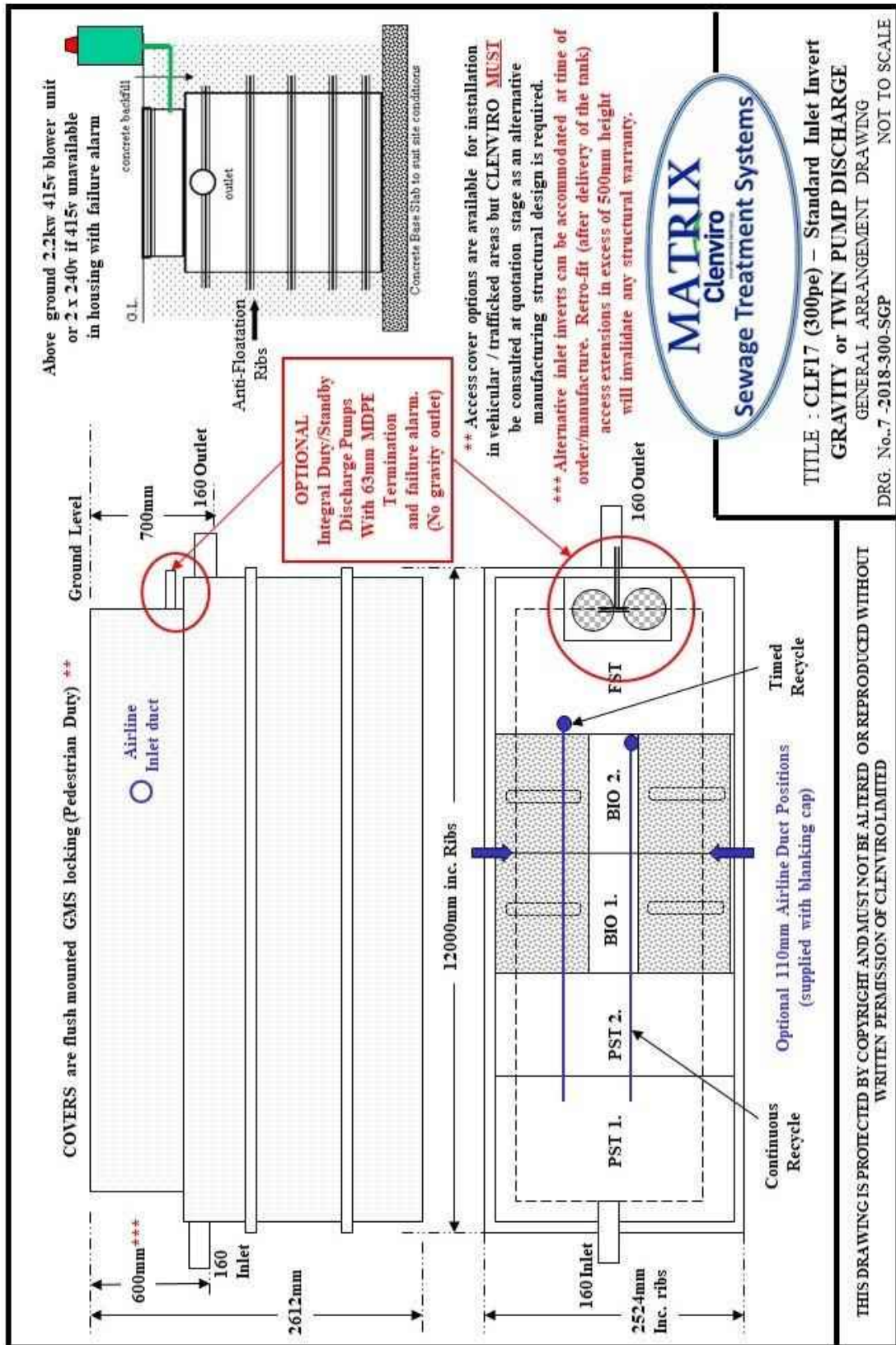


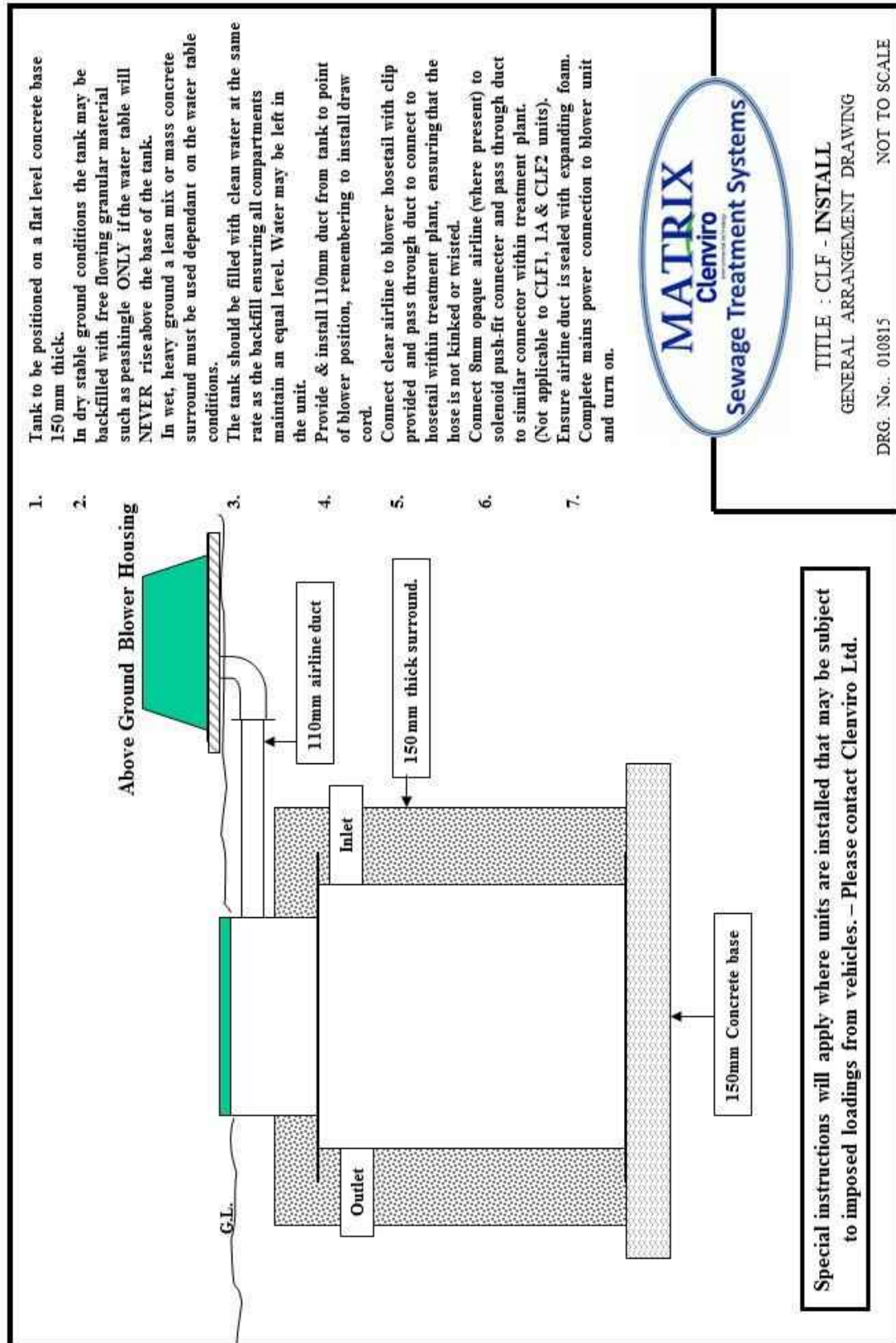




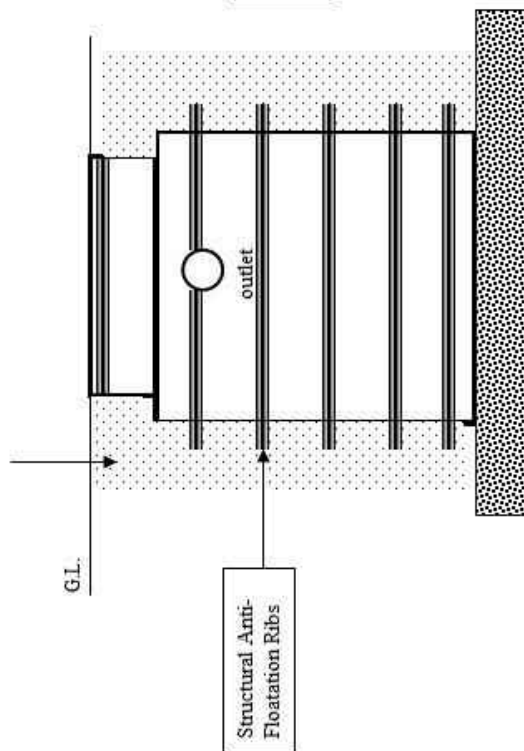








Concrete backfill to a minimum thickness of 150mm around tank.



Excavate hole to allow for 150mm bedding and surround.
(see relevant drawing for tank dimensions)

Position tank on a flat level concrete base to suit tank size and prevailing ground conditions ensuring it is level in all planes

When backfilling tank ensure all internal chambers are filled with water to keep pace with the level of backfill.

Never let the level difference between the backfill and the water in the unit exceed 200mm.

In high water table conditions or trafficked areas please contact Clenviro Ltd for specific advice

NOTE : Standard inlet invert is 600mm - shaft extensions can be provided for deeper inlet depths.

Inlet and outlet orientations can be changed to suit site requirements

Integral sample and effluent pumping arrangements available on request

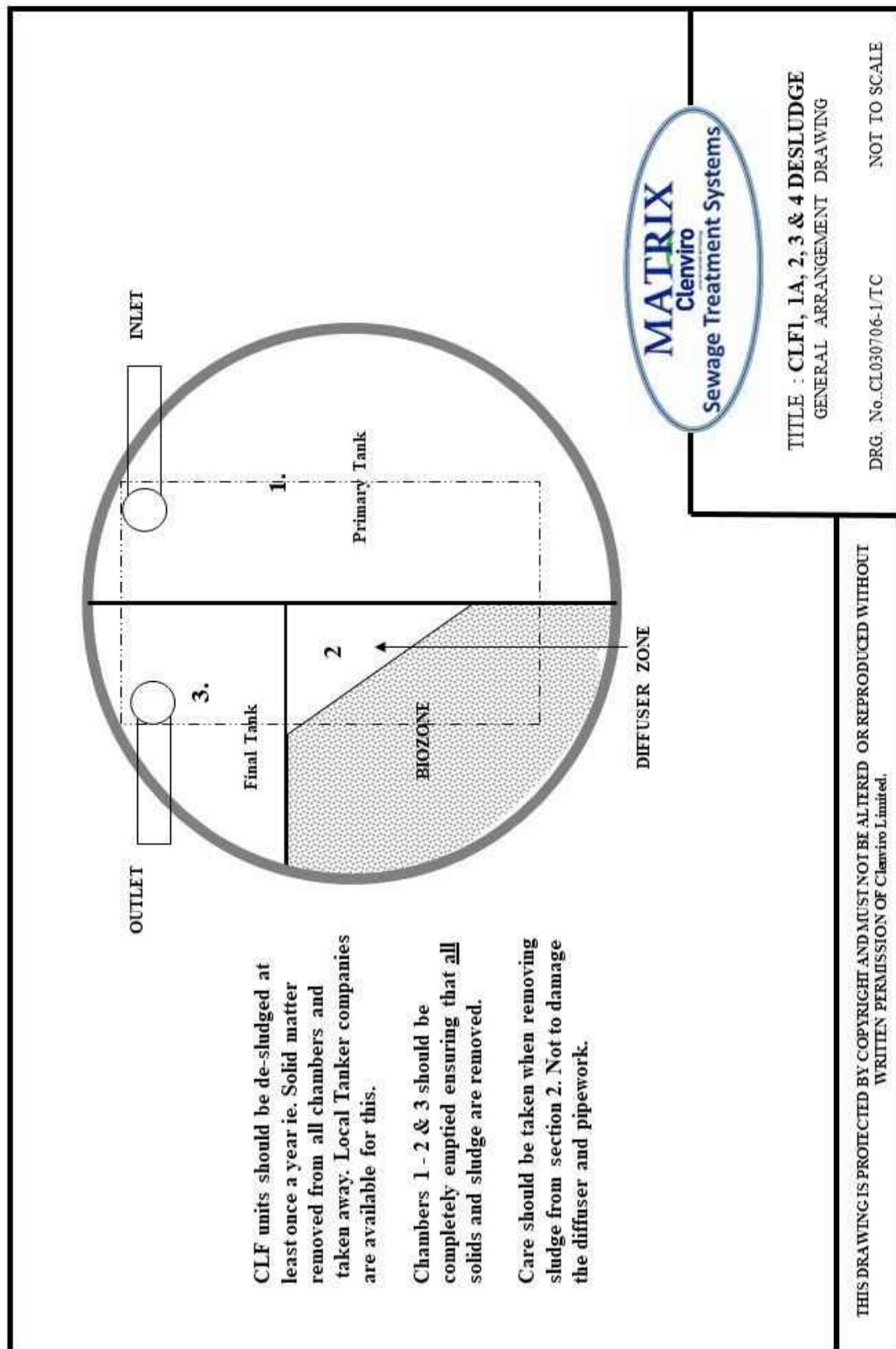
Concrete base to suit site conditions
Min thickness 150mm

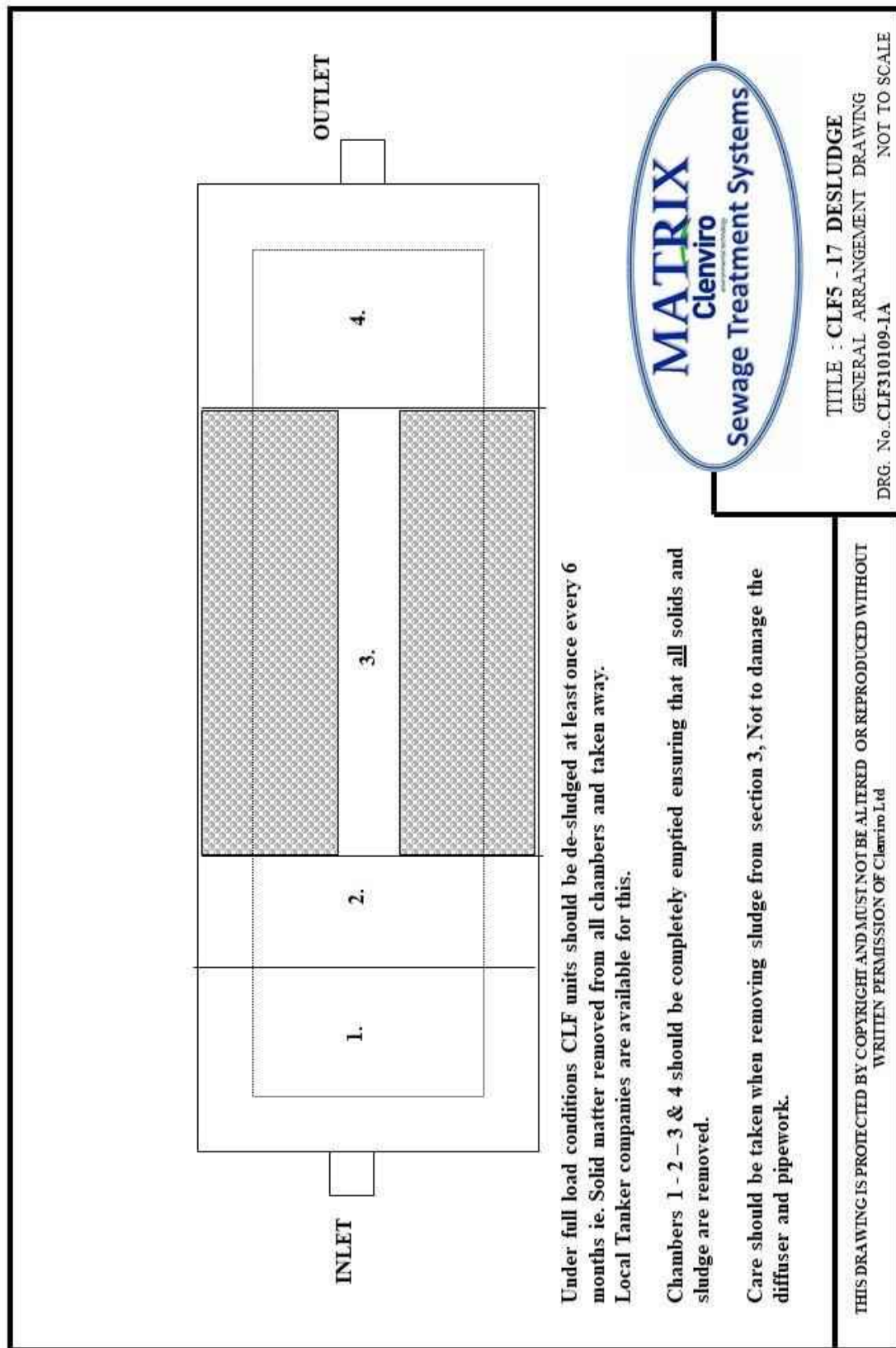


This drawing should be read in conjunction with the Operation & Maintenance manual.

Sewage Treatment Plant Installation
GENERAL ARRANGEMENT DRAWING

DRG. No.STPINSTALL NOT TO SCALE





CE	
Clenviro Limited Unit 1C Queensway Business Park Telford Shropshire TF1 7UL 09	
EN 12566 - 3	
Matric CLF Sewage Treatment Plant	
Hydraulic Daily Load	1.2 – 10m ³ /day
Material of Construction	Polypropylene
Watertightness (Water Test)	Pass
Crushing Resistance (dry ground)	Pass
Crushing Resistance (wet ground)	Pass
Treatment Efficiency	COD : 91.4% BOD : 96.2% SS : 95.5% NH-4N : 83.3%
Electrical Consumption	1.4Kwh/d

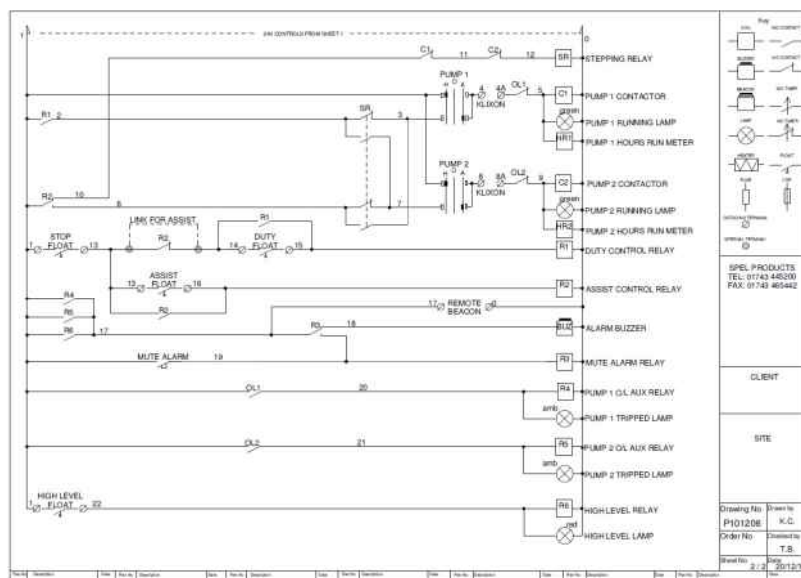
Clenviro Limited
Unit 1C Queensway Business Park
Telford
Shropshire
TF1 7UL

Tel : +44 (0) 1952 676666 Fax : +44 (0) 1952 677760

Freephone : 0800 32 888 52

Email : info@clenviro.co.uk

Website : www.clenviro.co.uk



*this is a standard control circuit for a 3 phase dual pump system. Site specific can be supplied on request.

Maintenance

The SPEL package pump station has been designed for minimum maintenance. The tank itself is made from glass reinforced plastic and will not normally require corrosion protection or inspection. The pumps and system should be inspected and serviced annually by a qualified pump engineer to ensure that it functions as expected, no damage has occurred and that it is free from silt and debris.

Notes: For additional information on pump maintenance please see supplementary pump information, applicable to your supplied system.

Further Information

For further information please contact the technical sales team.

Information contained in this data sheet is approximate and for general guidance only. In accordance with the company's policy of constant improvement and development SPEL Products reserves the right to change the specification without prior notice.

Section 9
**SPEL Separator commissioning,
operation and maintenance**



SPEL Stormceptor® class 1 and 2
by-pass separators.

SPEL full retention class 2 separators.

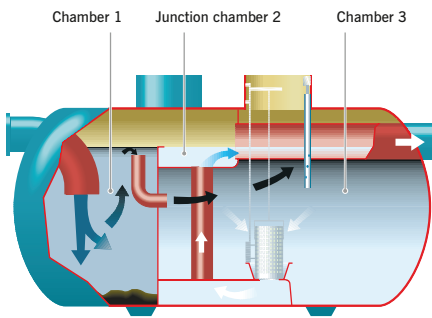
SPEL Puraceptor® class 1 full
retention separators (single and two
chamber models).

SPEL

The SPEL Stormceptor® by-pass separator is a well proven high quality factory made unit, designed and tested in accordance with the European Standard BS EN 858-1 and meets the requirements of the Environment Agency's Pollution Prevention Guidelines PPG3 and the Construction Products Regulations.

SPEL Stormceptors are designed for long term performance and with SPEL high volume coalescer units, low maintenance.

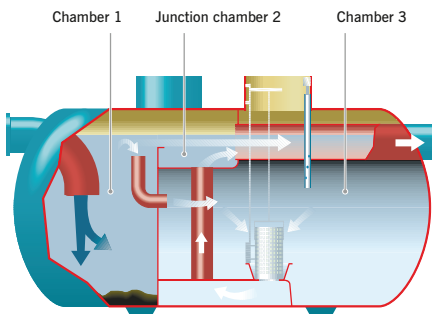
SPEL Stormceptor by-pass separators are manufactured in class 1 and class 2 models and with or without silt capacity in accordance with BS EN 858-1. The range of models is listed in section 6 or on the SPEL Stormceptor selection chart – available on request.



Flow according to nominal size (NSB)

The polluted surface water first enters the primary chamber where silt settles out and is retained. The fuel, oil and other pollutants lighter than water, rise to the surface and are efficiently skimmed off and transferred to the separation chamber.

All flows within the nominal size pass through the separation chamber, where the quiescent conditions allow the pollutants to separate out efficiently. Water from the cleanest zone in the separation chamber flows through a coalescer unit, to remove smaller globules of oil, up to the junction chamber and thence to the outlet.



Storm flows above NSB

During a storm the level in the primary chamber rises and the storm water passes over the weir into the junction chamber and to the outlet.

The design keeps the turbulence within the separation chamber to a minimum which avoids disturbing the contaminants retained.

Maintenance requirements

The SPEL automatic alarm/monitoring system will automatically warn you when the SPEL Stormceptor requires emptying of light liquids, however, silt will accumulate and require removing at intervals depending on the site conditions.

We recommend the SPEL Stormceptor is checked at 3, 6 or 12 monthly intervals to determine the depth of silt in the primary chamber.

Where a SPEL automatic alarm/monitoring system is not fitted, the SPEL Stormceptor should be checked at 3, 6, 12 monthly intervals, depending upon site conditions, to determine the depth of retained pollutants. When the depth of light liquids retained has reached the predetermined design level in accordance with the European Standard BS EN 858-1, or if excessive silt has accumulated, it should be emptied.

When emptying ensure both chambers (primary – chamber 1 and separation – chamber 3) are emptied equally to prevent unequal pressure on the internal partition.

Chamber 1

The inlet connects directly into chamber 1 – the primary chamber where silt etc. is deposited and light liquids are skimmed off to be transferred to the main separation chamber, chamber 3.

Maintenance requires the removal of accumulated silt etc., checking the skim pipe is not blocked and removing floating debris.

Chamber 2

This is the junction chamber where the clean water passing out of the main separation chamber and the storm flow over the weir from the primary chamber meet and pass to the outlet. This chamber is an approved sampling point if samples are required for analysis. As it is mainly clean water passing through the chamber, maintenance is confined to checking the weir plate is free of debris.

Chamber 3

The main separation chamber is where the light liquids are retained and in the case of class 1 Stormceptors, where the coalescer units are incorporated.

If coalescer units are incorporated, these should be removed and cleaned in accordance with the requirements set out in Data Sheet Ref. 9.4 steps 1 to 5.

Retained light liquids should be removed from the top and any sediment from the bottom. Small Stormceptor by-pass separators generally need to be completely emptied.

SPEL automatic alarm/monitoring system

If a SPEL automatic alarm/monitoring system is fitted this will automatically signal when the Stormceptor requires light liquids to be removed. If this system is fitted see ref. 10.1 and 10.2.

When emptying take care not to damage or shift the probe protection tube situated in the access shaft of chamber 3.

9.2 SPEL Stormceptor® by-pass separators

Maintenance

SPEL Stormceptor class 1 by-pass separators 400, 500 & 600 series

A wide range of SPEL Stormceptor class 1 by-pass separators is available incorporating coalescer unit/s for the larger catchment areas.

When emptying ensure both chambers (primary – chamber 1 and separation – chamber 3) are emptied equally to prevent unequal pressure on the internal partition.

Manhole access 1

This is the access to the primary chamber for removal of silt, the inspection of the skim pipe and clearing of any floating debris.

Manhole access 2

These provide access to the junction chamber which is suitable as a sampling point for the final discharge.

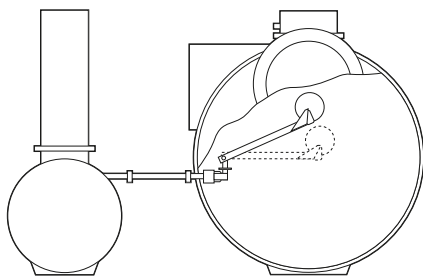
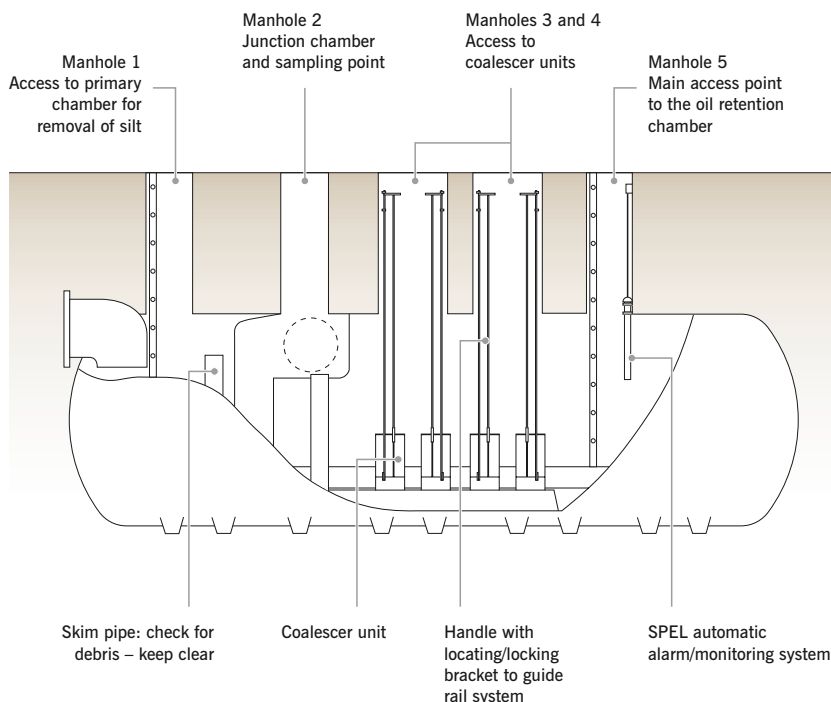
Manhole access 3 & 4 (larger models)

These provide access for the inspection, removal and reinsertion of the coalescer units.

Manhole access 5

Where manhole access is required for maintenance personnel to enter the separator, a minimum 750mm dia. manhole access shaft is provided and where required, a GRP ladder and stainless steel fittings.

The SPEL automatic alarm/monitoring system probe is generally situated at the base of this access shaft. If system fitted see ref. 10.1 and 10.2.



SPEL Econoskim light liquid skimming/separate containment system

For optimum performance and efficient low cost maintenance for the larger SPEL Separators serving large and/or heavily polluted catchment areas. If a SPEL Econoskim system is fitted refer to the SPEL Data Manual, section 11.

SPEL full retention class 2 separators

These are generally single chamber units with a single, or in the case of large separators two access shafts, to enable periodic removal of pollutants and silt. An automatic closure device (ACD) is fitted and should be checked that it is operating correctly. See ACD ref. 9.5.

SPEL Puraceptor class 1 separators

The SPEL Puraceptor class 1 separator is available in single chamber or two chamber models.

Single chamber models (Figure 1)

These incorporate a coalescer unit and an automatic closure device type 'R'. For maintenance see ref. 9.5.

Two chamber models (Figure 2)

The maintenance procedure for the SPEL Puraceptor class 1 two chamber models is detailed on sheet ref. 9.4.

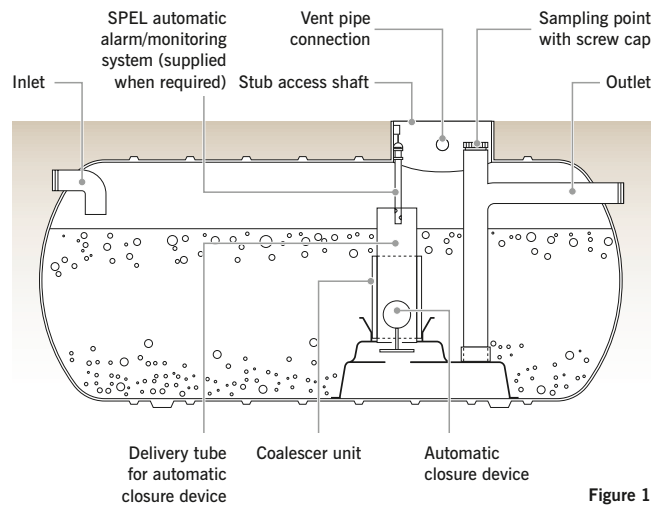


Figure 1

Maintenance requirements

The SPEL automatic alarm/monitoring system will automatically warn you when the SPEL Separator requires emptying of light liquids. See ref. 10.1 and 10.2. However, silt will accumulate and require removing at intervals depending on the site conditions.

We recommend the SPEL Separator is checked at 3, 6 or 12 monthly intervals to determine the depth of silt in the primary chamber.

Separators must be provided with a robust device to provide visual and audible warning (if necessary to a remotely located supervisory point) when the level of oil reaches 90 per cent of the oil storage volume (V) under static liquid level conditions. This automatic warning device indicates that the separator is in need of immediate emptying for it to continue to work effectively.

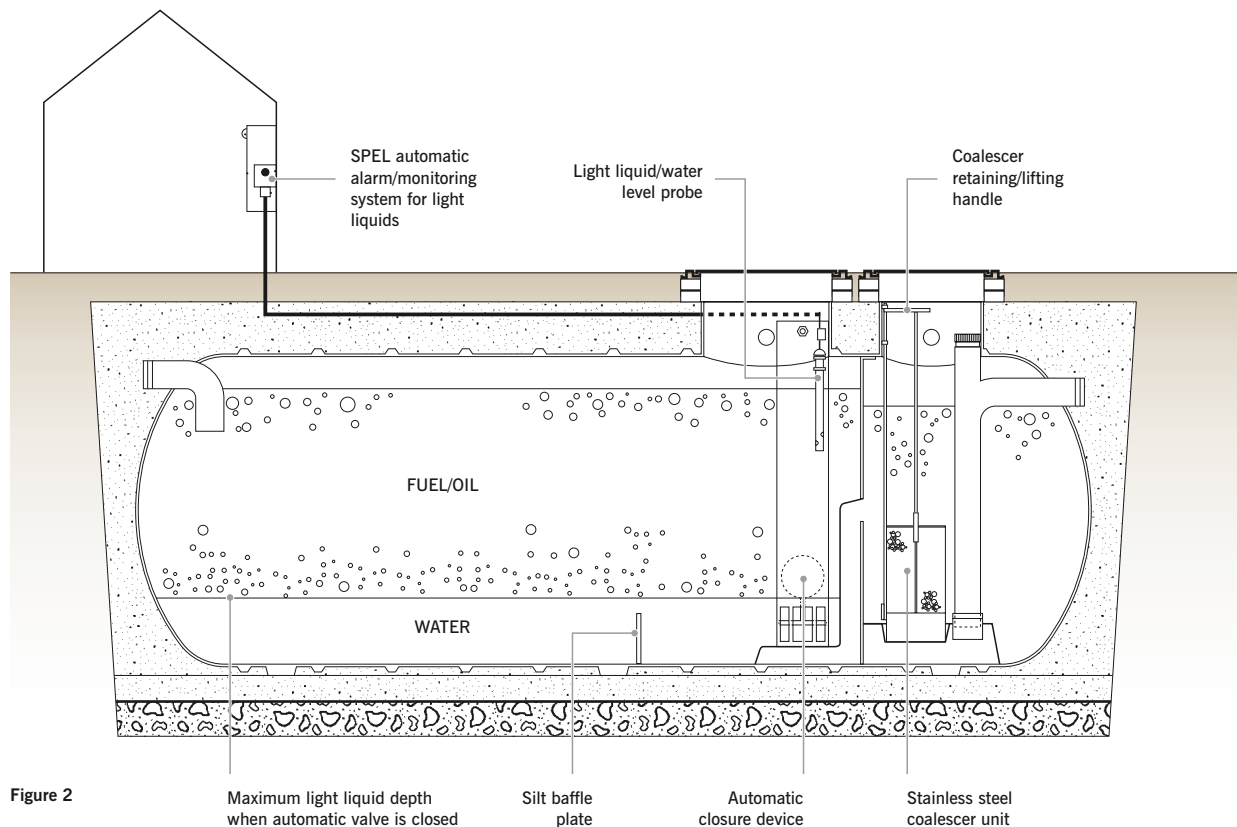


Figure 2

9.4 SPEL Puraceptor® class 1 separators FP2C and all two chamber models

Maintenance

Maintenance procedure

The SPEL automatic alarm/monitoring system will automatically warn you when the Puraceptor requires emptying. See ref. 10.1 and 10.2. Where a SPEL automatic alarm/monitoring system is not fitted, SPEL Puraceptors should be checked at three-, six- or twelve-monthly intervals depending on site conditions, to determine the depth of retained pollutants and silt in both chambers and the correct operating of the ACD (automatic closure device). When the depth of the oil/fuel retained has reached the pre-determined design level, in accordance with BS EN 858-1, it should be emptied.

Important Note: When emptying, ensure both chambers are emptied equally starting with the oil retention chamber and then the coalescer chamber and back again until empty.

Step 1: Sucking out oil/fuel and silt

Suck off the retained oil from both chambers of the Puraceptor and then the silt deposited on the bottom, leaving sufficient water to ensure the ACD remains floating.

Step 2: Coalescer unit

Use the lifting handle or unclip the retaining clip for the wire rope and lift the coalescer unit out of the tank and place ahead of the Puraceptor.

Step 3: Cleaning foam insert

Remove foam insert and wash with normal water pressure ensuring the dirty water runs into the Puraceptor.

Step 4: Sucking out complete contents (if necessary)

If the quantity of pollutants exceeds recommended levels, the complete contents of the Puraceptor may need to be removed. After sucking out completely, remove the ACD in the ACD retaining tube by first removing the retaining cap (this is to safeguard against the removal of the float by unauthorised persons). Then, by means of a pole with a hook, lift out the ACD using the lifting eye on the float. Check the seating at the base of the retaining tube is free of debris/silt that could prevent the ACD closing off in an emergency.

Step 5: Re-insert coalescer unit and ACD

Re-insert the foam insert into the stainless steel coalescer unit and re-insert the coalescer unit into the Puraceptor. Re-clip the wire rope or location pin as provided with the SPEL lifting/locating/locking system (see ref: 9.7).

Partially fill the Puraceptor with clean water to ensure the ACD when re-inserted remains floating. Check the ACD is not damaged and the closure plate is clean. Re-insert the ACD.

Finally check the ACD is floating and the retaining cap has been replaced to safeguard against its removal by unauthorised persons, unless depth of tank precludes doing so from ground level.

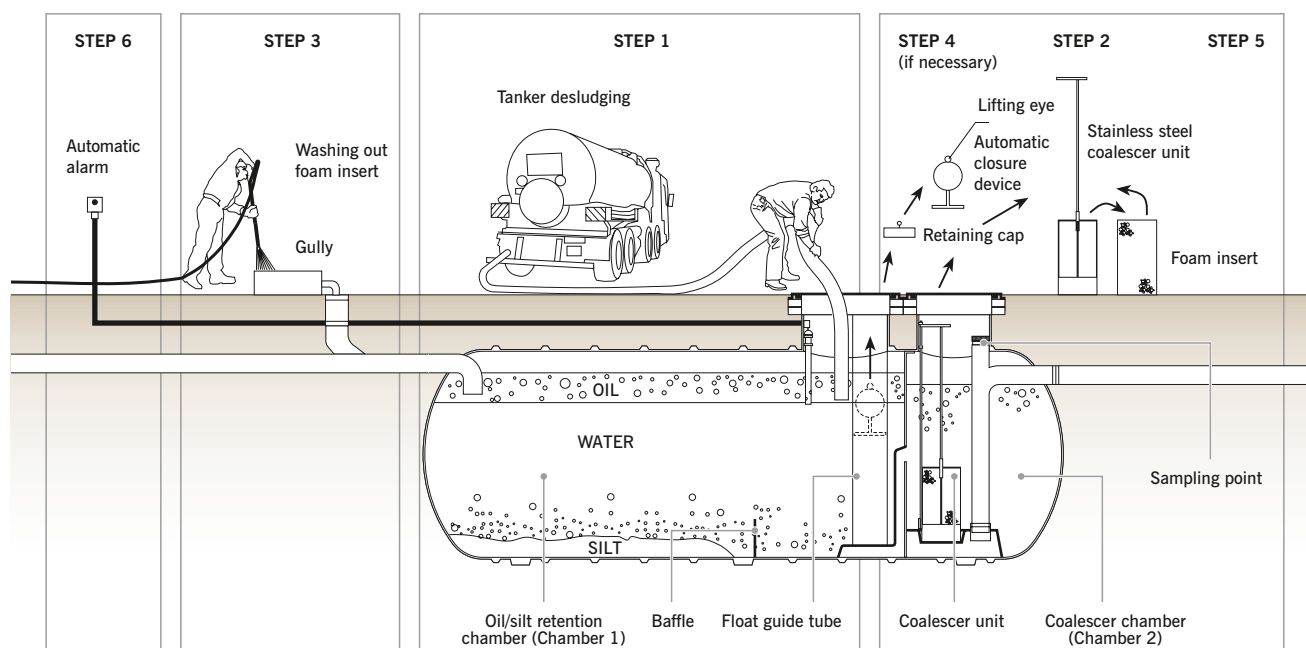
ACD closes off in emergency due to oil spill

If the ACD closes off, the oil/fuel spill needs to be removed by a suction tanker. With a single chamber model, the complete contents will need to be removed in order to release the ACD. With the two chamber models, insert the suction hose into the first chamber (oil/silt retention chamber) and then the head in the second chamber will normally provide a back pressure and automatically release the ACD.

Precaution: never try to pull the ACD off its seating by force.

Step 6: SPEL automatic alarm /monitoring system

The SPEL automatic alarm/monitoring system probe should be lifted out of the probe protection tube, wiped clean and re-inserted. The system should now be reset according to instructions. See ref. 10.1 and 10.2.



SPEL Puraceptor separator – two chamber model

The purpose of the automatic closure device (ACD) is to close the separator off automatically when the maximum storage capacity of light liquid is attained.

The ACD is to ensure that in the event of a major spillage, pollutants do not pass into the drainage system; it should not be regarded as a substitute for an automatic alarm/monitoring system.

Prior to installation

Prior to installation the ACD retaining tube should be covered with polythene to prevent ingress of concrete etc., which would fall onto the ACD and upset its calibration.

Operation and maintenance

If the tank should fill with light liquid the ACD, which is calibrated for a specific gravity of 0.85, will automatically fall and close off the SPEL Puraceptor.

Normally routine maintenance would include removing light liquid intercepted within the Puraceptor. If a SPEL automatic alarm/monitoring system is incorporated, it will automatically indicate when the Puraceptor should be emptied. Only in an emergency will the Puraceptor fill to its maximum and operate the ACD.

In such an event the Puraceptor should be completely sucked out and the ACD lifted out (see Maintenance Procedure – Ref: 9.4).

SPEL Puraceptor class 1 separators two chamber models and full retention class 2 separators

Commissioning

After the tank has been installed, leave the water in.

1. Remove the ACD from the packing box, taking care not to cause damage.
2. Remove the retaining cap from the top of the retaining tube in the separator.
3. Insert the ACD into the retaining tube using the lifting eye provided, ensuring it floats correctly with the float just visible above the water level.
4. Replace the retaining cap. This is to safeguard against the removal of the float by unauthorised persons or rising above the tube under abnormal conditions.

Note: If the tank's invert depth exceeds 1m it is advisable to remove the retaining cap prior to installation and only replace after inserting the ACD, if it is possible to do so from ground level.

SPEL Puraceptor class 1 separators single chamber models

Models P004/1C to P050/1CSC.

Commissioning

After the tank has been installed, leave the water in.

1. Remove the ACD from the packing box, taking care not to cause damage.
2. Remove the retaining cap from the top of the retaining tube in the separator.
3. Insert the ACD into the retaining tube using the lifting eye provided. Allow it to sink to the bottom. The stainless steel retaining plate should seat on the base flange and the ACD attain its operating position as shown in the open position.
4. Replace the retaining cap. This is to safeguard against the removal of the float by unauthorised persons or rising above the tube under abnormal conditions.

Note: If the tank's invert depth exceeds 1m it is advisable to remove the retaining cap prior to installation and only replace after inserting the ACD, if it is possible to do so from ground level.

Larger Models

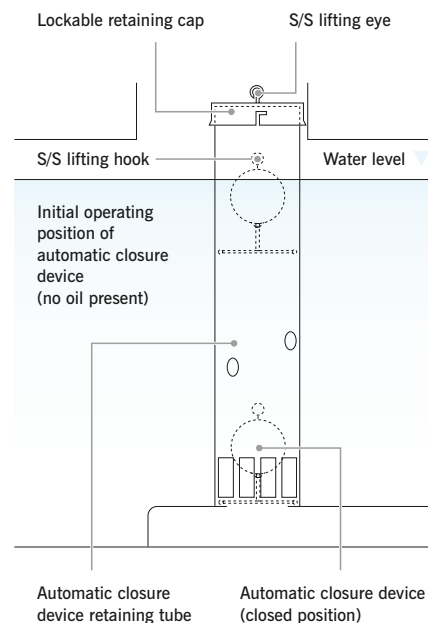
Where the ACD is already positioned in the unit, proceed as follows:

1. Before putting any water in the tank, lift rope attached to ACD up to the next knot and hang it from the rope hook. This is now in the 'operating position'.
2. As soon as the water level in the tank is above the ACD, the rope must be removed altogether and the rope hook must be unbolted. Do not leave the rope hook attached to the shaft. Ensure the ACD automatically remains in the 'operating position'.
3. Tape up or fill the hole(s) in the shaft where the rope hook was attached to prevent any backfill seeping into the shaft.

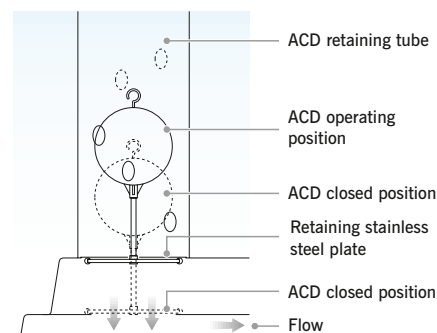
Maintenance

Dependent upon site conditions it is advisable to remove the ACD periodically taking care not to raise it too quickly and damage the plastic/copper float. Clean from debris/silt to prevent premature closing. Check the seating in the base unit is free of debris/silt that could prevent proper closing in an emergency.

Automatic closure device Type F (Floating)
SPEL Puraceptor class 1 separators (two chamber)
& full retention class 2 separators.



Automatic closure device Type R (Retained)
SPEL Puraceptor class 1 separator (single chamber).



9.6 SPEL coalescer units – with handles

The SPEL Puraceptor class 1 separator and SPEL Stormceptor class 1 by-pass separators incorporate coalescer units. The coalescer units provide a coalescence process for the separation of smaller globules of light liquid pollutants before final discharge to the surface water drain.

Prior to Installation

1. Remove any strapping/ropes which have been used to hold the coalescer units from shifting in transit.
2. The access shaft(s) above the coalescer units should be covered with polythene to prevent ingress of concrete, dust, debris etc. which could clog the foam inserts.
3. On completion of the installation, check that the coalescer unit is inserted securely into the base socket.

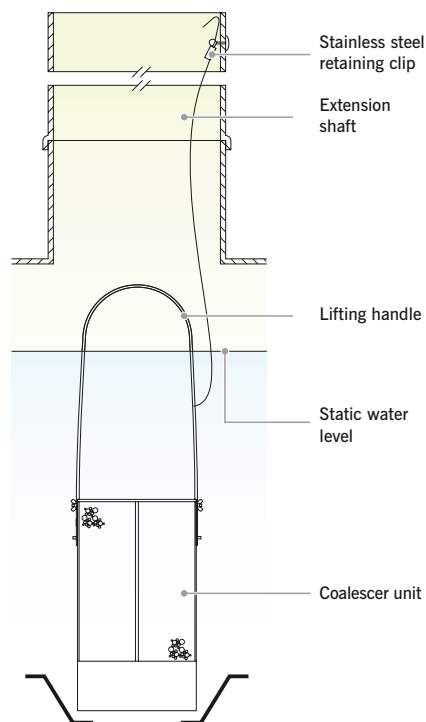


Figure 1
Stainless steel wire rope lifting device to facilitate lifting coalescer unit for maintenance. For 200/300 series separators with deep inverts.

Where wire ropes are fitted in place of the lifting, locating and locking system

Fig 1. The stainless steel wire rope lifting devices will be situated on top of the coalescer units and will have to be taken up out of the access shaft(s) above. A small slit in the polythene will allow you to pass the handles out.

Installation

During installation, it is important that the foam inserts are not clogged with dust, debris or drops of wet concrete. To safeguard against this, we recommend covering the access shaft with a sheet of polythene, if not already covered.

Commissioning

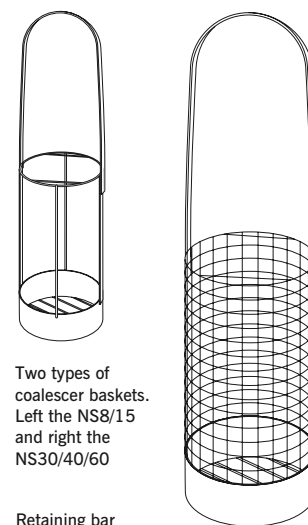
On completion of installation, check the foam insert is fitted inside the stainless steel coalescer unit (Fig 2) and the coalescer unit is inserted securely into the base socket.

Maintenance

1. Lift handle and coalescer unit out of the tank and place ahead of the Puraceptor.
2. Remove foam insert and wash with normal water pressure ensuring the dirty water runs into the Puraceptor.
3. Re-insert the foam insert into the stainless steel coalescer unit (Fig 2) and re-insert the coalescer unit into the Puraceptor.

Lifting chains

On heavily polluted sites silt and contaminants may build up in the coalescer unit foam inserts and add significantly to its weight. It is recommended that in this situation the larger coalescer units, NS40 and NS60, are fitted with SPEL lifting chain sets (Fig 3) to suit the tank invert depth at ground level for safe lifting with the SPEL tripod and hoist (see 9.8).



Two types of coalescer baskets. Left the NS8/15 and right the NS30/40/60

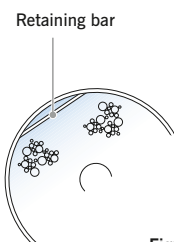


Figure 2
Ensure the foam insert is fitted inside the stainless steel coalescer unit and secured under the retaining bar.

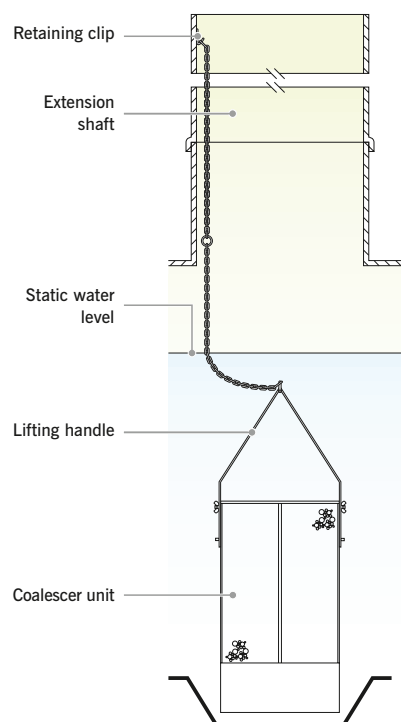
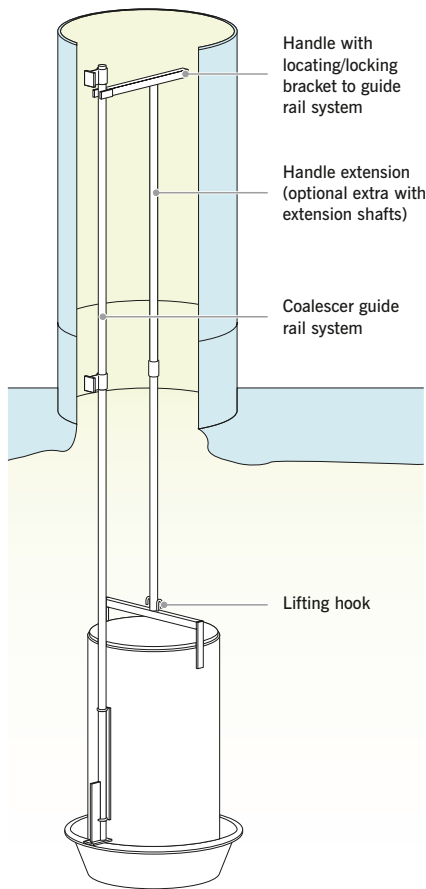


Figure 3
Coalescer unit with lifting chains.



SPEL coalescer unit guide rail system/lifting, locating and locking system.

SPEL coalescer unit guide rail system

This facilitates easy insertion and removal of coalescer units. The system is robust, manufactured throughout in stainless steel and the action positive, leaving no doubt the coalescer unit is located properly.

Brackets fixed to the top and bottom of the coalescer unit simply engage the stainless steel guide rail fixed to the top of the stub access shaft. The coalescer is then lowered in the normal way, being guided at the correct angle into the conical base unit which finally locates the coalescer unit into its final position.

Extension guide rails can be incorporated into SPEL extension shafts to suit (preferably when ordered with the separator).

SPEL coalescer unit lifting/locating/locking system for positive location and security locking

SPEL coalescer units lowered into the separator with the SPEL guide rail system are easily guided into the base unit's conical moulding to automatically seat correctly.

However, when the separator is full of water, debris or sludge accumulated over a period could prevent the coalescer unit from re-seating correctly after servicing.

The coalescer unit lifting/locating/locking system ensures the coalescer unit is seated correctly and can be locked into position to prevent tampering.

The system is particularly suitable in SPEL Separator + Econoskim systems where the total contents of the separator are not emptied on servicing.

The system comprises a robust stainless steel lifting and lowering handle that locates on the guide rail system. When the coalescer unit is correctly located in the conical seating in the separator the handle will align with guide rail top bracket i.e. the handles slotted holes with the top bracket clip locking groove, see diagram. When aligned the stainless steel clip can be located through the slots and lock into position on the top bracket.

The stainless steel lifting handle can be extended to suit deep tank inverters and provide easy access for lifting manually or with the SPEL tripod and hoist utilising the lifting hook.



9.8 SPEL tripod and hoist

For maintenance of coalescer units and pumps



SPEL tripod and hoist

Where surface water run-off has a high silt content the coalescer units can become filled, making them heavy to lift out. In order to facilitate easy withdrawal of coalescer units the SPEL tripod & hoist is recommended.

A stainless steel lifting hook is included for automatically engaging the coalescer unit, even under water. This enables coalescer units to be lifted out safely from ground level.

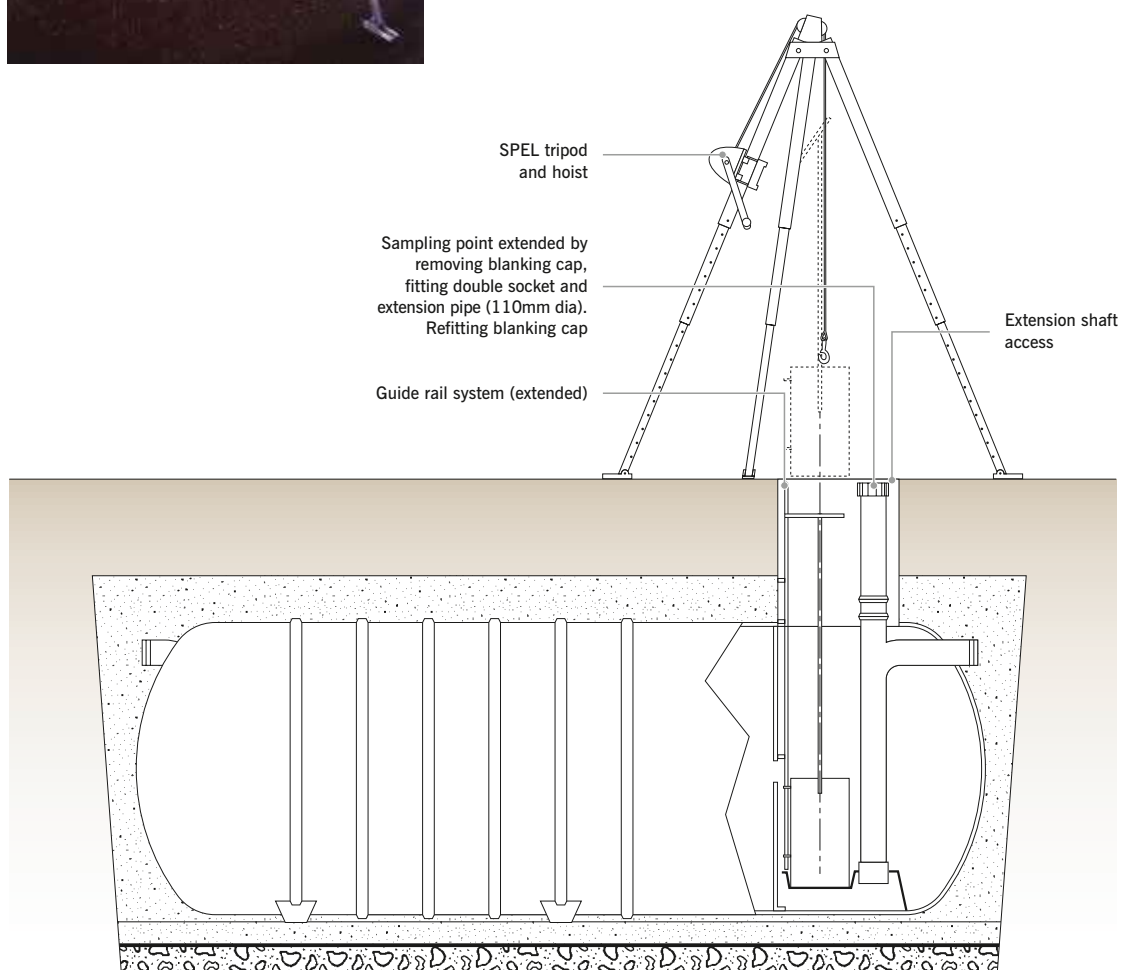
Note: The SPEL tripod and hoist can be used for servicing pumps incorporated in SPEL package pumping stations.

Health & safety

The HSE state that all equipment used for the health and safety of people at work should be periodically examined and tested in line with the manufacturer's recommendations. Safe working load is 200kg.

Service & maintenance

For service and maintenance contact SPEL on +44 (0)1743 445200.



For maintenance of coalescer units

SPEL tripod and hoist used in conjunction with the SPEL coalescer unit lifting/locating/locking system



Step 1&2 – Snap the 'lifting hook' onto the SPEL lifting/locating/locking system handle shaft.



Step 3 – Lower the 'lifting hook' down the shaft to the bottom bracket.



Step 4 – Swivel the hoist chain until the 'lifting hook' is at 90° to the bottom bracket, allowing it to pass the lifting hooks welded each side of the bottom bracket.



Step 5 – Once passed the lifting hooks, swivel the 'lifting hook' through 90° to allow it to saddle the bottom bracket and position itself under the lifting hooks.



Step 6 – Raise the lifting chain to engage the 'lifting hook' with the lifting hooks on the bottom bracket.



Step 7 – Raise the coalescer unit.



Step 8 – As the coalescer unit rises, steer the lifting handle past the tripod head and hoist to allow continued lifting of the coalescer unit.



Step 9 – Once the coalescer unit is above ground level, swing it to one side of the manhole for maintenance.