Contractors Civil Installation Details

MATRIX CLF1-3
(6, 12&18 PERSON)
SEWAGE TREATMENT PLANTS.

Synergy Wastewater Treatment Products.
01278 671927

HEALTH AND SAFETY

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 C & L Fabrication 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 C & L Fabrication 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

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 plant will provide long and trouble free operation provided the simple 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 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.

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

SCOPE OF SUPPLY

The **MATRIX** system comprises the CLF unit itself and an enclosure containing an air blower unit and comes complete with 10m of airline.

CLF Unit

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

The CLF tank is manufactured in Polypropylene and is supplied in a standard black/blue colour. It is completely impervious to water and sewage and has been designed 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 uPVC 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.

An air diffuser is installed into the submerged filter bed(s) and is located underneath the filter bed(s) this is connected to the external air supply (blower) by uPVC pipework.
The recirculation pipework is a uPVC pipe running from the bottom of the humus and media tank to the top of the primary settlement tank. The pipework has a tapping at its top where tubing is inserted down the uPVC pipe which is connected to the blower. (NOTE! On all models a control jet in the air line ensures a correctly balanced air flow between the air lift recirculation pipe and the diffuser in the submerged filter zone. The control jet is an integral part of the air lift hose connector which is fitted to the bulkhead between the humus tank and the submerged filter bed)
The air lift system is used to recirculate effluent from the humus and media tanks to the primary settlement tank.

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.

NOTE :
C & L Fabrication Ltd operate a policy of continuous product and process development and reserve the right to change specifications without prior notification.

INSTALLATION INSTRUCTIONS

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 be subject to a Consent to Discharge approval or an Exemption Certificate for treatment plants up to 5.0m3/Day, CLF4, (from 6th April 2010), from the Environment Agency which 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. C & L Fabrication 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 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 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)

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 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 for the CLF 1,2 & 3 is 550mm, all other models have a 600mm standard inlet invert. If the invert of the inlet drain is deeper than this C & L Fabrication 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.**

MECHANICAL INSTALLATION (continued)

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

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 cable duct is laid from the 110mm connection on the neck of the treatment plant to the desired position of the Blower unit. This is for the airline only and is to ensure complete protection of the airline. There are NO electrical components within the treatment plant unless you have requested the option of a pumped discharge.

If the treatment plant is to be installed in a trafficked area specific guidance should be sought from C & L Fabrication Ltd

ELECTRICAL INSTALLATION (Blower Unit)

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.
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.

ELECTRICAL INSTALLATION (continued)

2. 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 CLF4 Blower & Housing