Technical design note

Project name	HMP Prescoed		
Design note title	Sewage Treatment Plant - Management Plan		
Document reference	22259-HYD-066-XX-RP-C-0002-S4-01-D0200		
Author	Richard Baker		
Revision	P02		
Date	27 June 2023	Approved	✓

1. Introduction and Purpose of Report

The foul drainage system at HMP Prescoed is served by a packaged sewage treatment plant that collects foul drainage flows from the prison site, treats the water within two large Kingspan Environmental "BioDisc BN" treatment tanks to a strict water quality standard. The treated effluent is conveyed via an existing drainage pipe, to an existing discharge point at the local small watercourse (Dowlais Brook at ST 34872 98865) to the south of the prison site.

The 2x BioDisc BN treatment plant replaces a previous twin-tank treatment plant (2 x Titan BioTec), installed in 2008, which has reached operational capacity and needs to be fully replaced, to support planned and future potential expansions at the prison site.

The purpose of this report is to present the operation, management and maintenance requirements for the treatment plant, for use by the prison estate management (MoJ), the appointed maintenance company (Amey) and any subcontractors (Kingspan and others) used to run, clean and maintain the treatment plant.

Location of sewage treatment plant within the HMP Prescoed site.

2. Drainage System Overview

The HMP Prescoed site is served by separate gravity foul and surface water drainage systems. A schematic existing site drainage plan is included in the appendices of this report.

The surface water drainage system serves runoff from hardstanding and roof areas and discharges to the local watercourse to the south of the site.

The foul drainage system conveys foul water flows from all buildings, to the south of the site, into the blow ground balancing tank of the treatment plant, where the flow is split and treated within two large BioDisc BN treatment units.

The treatment plant operates automatically, but does require periodic inspection, servicing, & maintenance. A chemical dosing system needs refilling frequently. The units shall be repaired when required.

All of these activities shall be planned-ahead and strictly controlled and must be carried out to ensure the plant is operating as required and the treated effluent is within the limits set by the discharge permit.

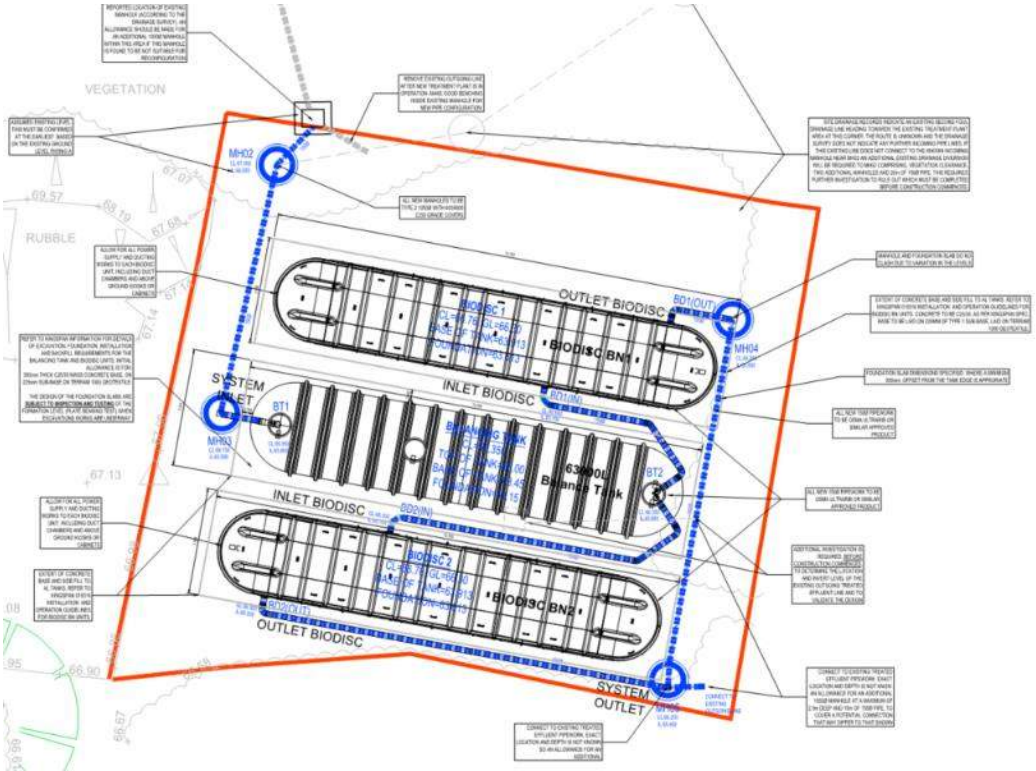
Regular water quality testing is required to check compliance against the discharge permit.

This is the similar to the level of operation and maintenance that the previous treatment plant system required.

3. Treatment Plant Overview

3.1 Specification

The treatment plant contains 2 no. Kingspan Environmental BioDisc BN units, fed by a single below ground balancing tank. A further stage of treatment occurs within each BioDisc plant through the "chemical dosing" of the treated effluent water, which requires a container of fluid that must be refilled weekly (or as required before is it emptied).



Extract from drawing "22259-HYD-066-XX-DR-C-1003 - STP Proposed Tank & Drainage Layout"

Details of the treatment plant system are contained within the appendices of this report:

- *Appendix A - Existing Site Drainage Schematic.jpg"*
- *Appendix B - BioDisc Operation Guidlines*
- *Appendix C1 - BioDisc Service Scope*
- *Appendix C2 - Method Statement for Servicing of Biodisc*
- *Appendix D1 - BioDisc Chemical Dosing Assembly*
- *Appendix D2 - Chemical Dosing Ferric Sulphate 40% v1*
- *Appendix E - BioDisc certificate*
- *Appendix F - KSE Drawing - DS1334 - 01 BN BioDisc Sales Drawing*
- *Appendix F - KSE Drawing - SK941 - Issue A*
- *Appendix F - KSE Drawing - SK1046 Issue A*
- *Appendix G - Hydrock Design Drawing 504560-4793-HYD-066-XX-DR-C-1003-S4-03-D0100*

3.2 Sizing and capacity

The 2 x BioDisc BN treatment plant is rated for a population equivalent (PE) of 500, with a maximum volume capacity per day of 90,000L. The British Water Flows and Loads 4 guidance has been used to determine the existing and predicted flows at HMP Prescoed, to determine the volume inflow per day from all foul drainage uses on the site.

The unit has been sized for the current development at the HMP Prescoed site, plus the proposed RDCP cell block expansion, which will generate a predicted flow of around 70,000L per day. There is provision within the treatment plant for future potential expansion at the site up to 20%.

The discharge permit that has been applied for in November 2022 (to be determine in summer 2023) is for a maximum of 72,000L per day. If additional discharged effluent volume was required in the future then it would need to be supported by a further update in the discharge permit.

There is no provision for allowing surface water into the foul water drainage system and the treatment plant. Ongoing efforts to prevent the discharge of surface water and roof water runoff into the foul water drainage should be made as part of general site operations, maintenance and improvements.

The discharge quality is only compliant with the discharge permit if the chemical dosing equipment container is replaced. The current proposal is based on 20L containers in each BioDisc, to be changed weekly (or as required), but the interval could be longer depending on usage. **This must happen when required, without fail.**

3.3 Layout

The treatment plant location and layout is shown on the following drawing which can be found in the appendices of this report

» *22259-HYD-066-XX-DR-C-0004 - STP External Works and Levels*

The discharge route from the treatment plant area to the watercourse outlet is to remain as per the original arrangement. The existing drainage outlet pipe and headwall at the Dowlais Brook is accessible via the path provided and is accessible for water quality sampling at that point.

The old hay bale "filter" that is below the outlet is not strictly necessary, as it is a remnant of the original treatment plant (long since removed), but does perform some further water quality benefits at that point and as such can be retained.

4. Permit

4.1 Application

An application was been made in November 2022 to Natural Resources Wales (ref. PAN-019639) for an update to the existing discharge permit (ref. AN0239101). The determination of this is due for completion in summer 2023.

4.2 Limits

The water quality limits that have been included in the permit application are as follows:

- BOD 20mg/l
- Suspended Solids 15mg/l
- Ammoniacal Nitrogen 10mg/l
- Phosphate 2mg/l (or lower)

There is a need to strictly control the phosphate content of the discharge due to the downstream River Usk catchment being designated as a Special Area of Conservation (SAC) and as such required enhanced reduction of nitrates/phosphates.

While the effectiveness of the treatment process and quality from the two BioDisc units is greater than that of the previous BioTec units, there is a need to actively reduce the phosphate "P" content of the treated effluent to a far lower level. This is achieved with a chemical dosing unit within each BioDisc unit, details of which are in Appendix D of this report.

5. Responsibilities

It is the responsibility of the estate managers and facilities management company to ensure the sewage treatment plant is:

- **Operated in strict accordance with the manufacturer's guidance and instructions** presented in this report, by competent and trained personnel.
- **Fully serviced and maintained** in accordance with the manufacturer's guidance and instructions presented in this report and any further information provided by the supplier and main contractor that installed the plant.
- **Repaired** whenever necessary
- **Inspected weekly**. Reports and findings to be logged formally.
- **Sampled monthly** at the treatment plant sampling chamber, discharge point and watercourse monthly. Results to be formally issued to the site operator and records kept.
- **De-sludged** at the required intervals, depending on usage. This will require tankering, as per the previous sewage treatment plant in place at the site. **All collected sludge must be removed from the site by a fully licenced waste carrier and carried to a licenced approved disposal facility.**
- **Fully replenished with the chemical dosing fluid** within both of the BioDisc units, before any of them are emptied.

Existing drainage system should be inspected and cleaned at appropriate intervals, to ensure it is operating correctly. Any identified defects, mis-connections, ground water infiltration and blockages should be rectified. This approach will ensure that the correct type and volume of water is reaching the sewage treatment plant.

6. Operation

6.1 Overview

Guidance on the start-up, operation and checks are given in **Appendix B - Sections 6,7 and 8.**

All points within that guidance must be strictly adhered to and incorporated into the overall formal maintenance plan for the works.

Any further guidance or training that may be required by the maintainer must be sought directly from the manufacturer to ensure all parties involved in the operation of the treatment plant are competent and knowledgeable to keep the plant in good working order and within the limits of discharge permit.

The key points in the guidance are summarised below:

7 Operation

7.1.1 The biological treatment process of your BioDisc is self-regulating and it requires no specialised operational knowledge, but it is important that you are aware of the following points.

7.1.2 Your BioDisc system uses colonies of live natural micro-organisms (biomass), to break down the pollutants in the sewage. Many chemicals used in households and commercial establishments can inhibit or kill these micro-organisms; particularly if used in excessive amounts.

7.1.3 Bear in mind that treatment plants serving small populations do not have the benefit of dilution that occurs at a large sewage works. A bottle of bleach tipped down the toilet in Birmingham would be virtually lost amongst the millions of gallons of sewage arriving at the city's treatment works; a bottle of bleach in a plant serving a hotel could be a lethal dose for the biomass.

7.1.4 If the biomass is damaged, it will usually recover over time. But in the meanwhile, one of the more obvious symptoms is an unpleasant smell, so it is in the users interest to avoid this.

8.3 Customer Checks

8.3.1 The following periodic checks should be carried out monthly. Your attention is specifically drawn to the Health and Safety section of this manual.

8.3.1.1 Visually check the general condition of the plant and listen for any unusual noises. Report any aspects of concern to your maintenance engineer.

8.3.1.2 Check the appearance of the Biomass. It should be light grey to grey at both first banks, gradually changing to brown in both second stages and dark brown at the drive end of each second stage. If the growth is excessively thick and the colour predominantly grey throughout, an overload condition is indicated.

8.3.1.3 Visually check that all fixings are secure.

8.3.1.4 Clear any debris from inlet and outlet pipes.

8.3.1.5 Check dosing buckets and transfer pipes for any build-up of debris. Clean, if required, using a stiff bristled brush.

8.3.1.6 Check the Loss of Rotation Warning Devices for correct operation (see section 8.2). If the alarm does not operate properly, contact your maintenance engineer.

6.2 Restrictions, Do's and Don'ts

Like all modern sewage treatment plants there are important restrictions and "do's and don't's" that apply to its usage. Refer to Appendix B - Sections 6,7 and 8 for full details from the manufacturer.

The key summarised points are as follows:

7.2 Do's and Don'ts

7.2.1 Washing machine and dishwasher detergents, washing up liquids:

These are generally all right to use in the normal concentrations and usage found in domestic housing applications. All commercial applications are individually assessed before installation for their laundry load. Please contact Kingspan for advice if any changes are contemplated e.g. addition of extra laundry facilities.

7.2.2 Floor cleaners, disinfectants and bleaches:

These are safe to use in accordance with the makers recommendations and in the minimum necessary concentration. Do not pour neat disinfectant or bleach down sinks or outside gullies. If these are smelly it usually indicates a build-up of decaying material or a plumbing problem and should be dealt with accordingly.

7.2.3 Nappy disinfectants and bottle sterilising fluids E.g. Milton:

When disposing of the used fluid, ensure that it is well diluted with water. The easiest way of doing this is usually to flush it away down the toilet.

7.2.4 Waste disposal units:

These do not inhibit the biomass, but, depending on use, they can present the treatment plant with considerable extra load. This can result in the treatment process becoming unbalanced, leading to problems. Much better to compost your vegetable peelings etc - it's cheaper and environmentally friendly.

7.2.5 Home beer and wine making.

This presents a similar problem to waste disposal units. The BioDisc must work as hard to treat one pint of beer tipped down the drain as it does to treat all the normal waste produced by one person in 24 hours. See also the notes above regarding sterilising fluids.

7.2.6 THE FOLLOWING MUST NOT BE DISCHARGED INTO THE DRAINS

- **Motor oil, grease, anti-freeze, brake fluid etc.**
- **Cooking oil and fat.**
- **Weed-killers, insecticides, fungicides and other gardening chemicals.**
- **Paint, thinners, white spirit, turpentine, creosote etc.**
- **Medicines.** Take unused medicines to a pharmacist for safe disposal.
- **Photographic developing fluids.**
- **Nappies, sanitary towels, rags, soft toys, tennis balls etc.**

This may seem obvious, but it is amazing what gets flushed down the loo from time to time. Although such items are not directly damaging to the biomass they can cause problems, not the least of which is simple blockage of the drains.

Even so-called disposable nappies and sanitary towels often do not degrade fully in the treatment plant and can lead to malfunction, so it is best to dispose of them by other means.

6.3 De-sludging

A critically important aspect of any sewage treatment plant operation is the removal of collected and settled sludge. Refer to Appendix B - Sections 6,7 and 8 for full details from the manufacturer.

The key summarised points are as follows:

9 Desludging and Maintenance

9.1.1 These are vital to the plant's ongoing operation and should be carried out in accordance with the guidelines in this manual.

9.1.2 Mechanical and electrical maintenance must be performed by properly trained engineers, with reference to the appropriate Maintenance Manual. Kingspan offer a range of maintenance packages, details on request.

9.1.3 Kingspan BioDiscs are designed and engineered for the minimum possible maintenance requirements, consistent with proper performance. Nevertheless, it is important that routine preventive electro/mechanical maintenance and de-sludging are carried out at the appropriate intervals by suitably qualified persons.

9.1.4 Kingspan offer various levels of contract maintenance of all BioDisc Systems through Kingspan Environmental Services who can be contacted on 0844 846 0500.

De-sludge volume advice is summarised below, which is for a fully utilised single BioDisc BN unit, of which there are **two** in use at HMP Prescoed.

9.3 Desludge Volumes

9.3.1 The minimum volumes shown here are those which can be anticipated under full loading at the de-sludge period indicated. If the system is not loaded to full capacity, the de-sludge period and volumes removed may be adjusted, but it is essential that a) sludge is not allowed to accumulate to the detriment of the process and b) all settled sludge and floating matter are removed at each de-sludge visit.

UNIT	De-sludge Period	BioDisc Primary Settlement Zone	BioDisc Final Settlement Zone
BN	Approx. 3 months	29,150 (6,412)	14,300 (3146)

Note: Volume is in litres (gallons below in brackets)

All collected sludge must be removed from the site by a fully licenced waste carrier and carried to a licenced approved disposal facility.

6.4 Chemical Dosing

The sewage treatment plant cannot meet the strict requirements of the discharge permit without a chemical dosing unit working in each BioDisc tank. This injects a ferric-sulphate based fluid into the treated effluent to reduce the phosphate content.

2.0 Process Description

The chemical dosing process is started when the sludge return pump is activated and operates for a predetermined time. Chemical is intermittently pumped into the dosing point. The chemical mixes with the dissolved phosphate and coagulates together to form settleable particles which settle in the final settlement zone.

Using a chemical increases the volume of sludge formed within the treatment unit when compared to a standard unit. The level of sludge produced also relates to loading and so an assessment of the sludge production should be made monthly bearing in mind that there is a need for increased emptying frequency when compared to the standard recommendations given in the manual.

Addition of the chemical is fundamental to the process and it is important to check the chemical usage and replace the drum. Should the chemical run out, there will be no phosphate removal.

The reduction of phosphate is required by the environmental regulator in order to protect the local environment. The addition of limiting nutrients such as phosphate can cause eutrophication in the receiving water.

Is it essential that this fluid is replenished in each tank before it runs out, which will require weekly inspection to check the levels.

It is likely that 20L containers for each BioDisc will need to be changed between 1 and 1.5 weeks depending on usage.

The ferric sulphate chemical is not supplied by the treatment plant manufacturer, but must be purchased separately, stored on the site and changed by the operator. Larger container sizes are available, which may reduce the replacement period, but may be more difficult to handle.

Details of the Chemical Dosing equipment is included in Appendix D

Chemical (Customer supply)

The recommended chemical is XL 60 obtainable from Kemira or Univar.
Other chemicals may be used but they must be checked for suitability. Please contact Kingspan

- **See enclosed chemical specification. Please ensure that you have the most up to date versions of the health and safety data sheets from the chemical supplier and observe all health and safety precautions.**
- The chemical container(s) should be placed inside the unit on the ledge adjacent to the chemical pump.
- Ensure that the chemical container is carefully located and secured into position.

Control panel

The control panel includes a micro-processor which is provided pre set to dose the estimated dose of chemical at the appropriate interval.

- The setting assumes that the influent Phosphate (P) is approx 8-12 mg/l and assumes that an outlet of 2 mg/l is required. These settings may be altered by the commissioning engineer if there are known different volumes or different incoming or effluent phosphate values.

7. Health & Safety

HEALTH AND SAFETY

These warnings are provided in the interest of safety. You must read them carefully before installing or using the equipment.

It is important that this document is retained with the equipment for future reference. Should the equipment be transferred to a new owner, always ensure that all relevant documents are supplied in order that the new owner can be acquainted with the functioning of the equipment and the relevant warnings.

Installation should only be carried out by a suitably experienced contractor, following the Guide-Lines supplied with the equipment.

We recommend the use of a dust mask and gloves when cutting GRP components.

Electrical work should be carried out by a qualified electrician.

Sewage and sewage effluent can carry micro-organisms harmful to human health. Any person carrying out maintenance on the equipment should wear suitable protective clothing, including gloves. Good hygiene practice should also be observed.

Covers must be kept locked.

Observe all hazard labels and take appropriate action to avoid exposure to the risks indicated.

The correct ongoing maintenance is essential for the proper operation of the equipment. Kingspan offer a range of maintenance contracts, details on request.

Should you wish to inspect the operation of the equipment, please observe all necessary precautions, including those listed below, which apply to maintenance procedures.

BioDisc units contain rotating machinery and associated drive chains or belts.

Ensure that you are familiar with the safe working areas and accesses.

Ensure that the working area is adequately lit.

The power supply to the equipment must be isolated at the control panel(s) before lifting the covers. Where a specific maintenance procedure requires the equipment to be running with the covers off, all care must be taken to avoid contact with moving parts and electrical components or conductors. Drive guards must be replaced and secured if removed during maintenance.

Once power has been isolated, the control panel must be kept locked shut to avoid accidental re-connection whilst work or inspection is being carried out.

Use only the designated access walkways. Do not walk on the cover or deep well safety mesh(es). Desludge port covers, where fitted, must be replaced if removed.

Take care to maintain correct posture, particularly when lifting. Use appropriate lifting equipment when necessary. Keep proper footing and balance at all times. Avoid any sharp edges.

Desludging should be carried out by a contractor holding the relevant permits to transport and dispose of sewage sludge. The contractor must refer to the desludge instructions in the Operating Manual, a copy of which is fastened under the covers.

Ensure that you have the appropriate COSH sheet and chemical handling information for the chemical selected for dosing. The chemicals used for control of phosphorus are dangerous and must be stored and handled safely. They are acidic and corrosive. See the Material Safety Data Sheet (MSDS) provided by the supplier for appropriate personal protective equipment.

Appendix A

Existing site drainage schematic

HM Young Offender Institution

Tanks

Shelter

Old Prescoed

Sewage Bed

Spring

Coed M

Appendix B

Kingspan BioDisc Operation Guidelines

018316
INSTALLATION & OPERATION GUIDELINES FOR SINGLE PIECE UNITS BIODISC® BN

Kingspan Water & Energy Service Contact Numbers:

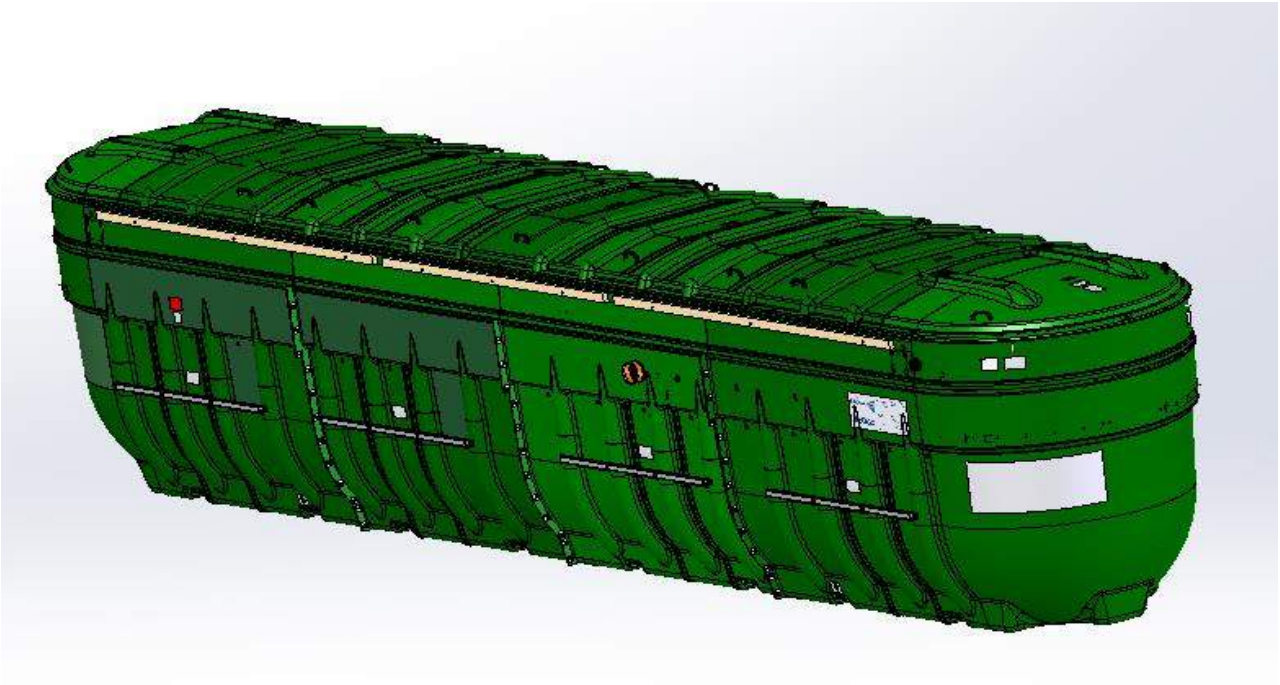
UK: 0333 240 6868

NI: 028 3836 4600

ROI: 0818 543 500

Enclosed Documents

DS1334	BN BioDisc General Assembly – Sales Drawing



Issue	Description	Date
02	ECN 1621 / ECN 1650	January 2023
01	Initial Issue – CC1392	August 2017

HEALTH AND SAFETY

These warnings are provided in the interest of safety. You must read them carefully before installing or using the equipment.

It is important that this document is retained with the equipment for future reference. Should the equipment be transferred to a new owner, always ensure that all relevant documents are supplied in order that the new owner can be acquainted with the functioning of the equipment and the relevant warnings.

Installation should only be carried out by a suitably experienced contractor, following the Guidelines supplied with the equipment.

We recommend the use of a dust mask and gloves when cutting GRP components.

Electrical work should be carried out by a qualified electrician.

Sewage and sewage effluent can carry micro-organisms harmful to human health. Any person carrying out maintenance on the equipment should wear suitable protective clothing, including gloves. Good hygiene practice should also be observed.

Covers must be kept locked.

Observe all hazard labels and take appropriate action to avoid exposure to the risks indicated.

The correct ongoing maintenance is essential for the proper operation of the equipment. Kingspan offer a range of maintenance contracts, details on request.

Should you wish to inspect the operation of the equipment, please observe all necessary precautions, including those listed below, which apply to maintenance procedures.

BioDisc units contain rotating machinery and associated transmission equipment.

Ensure that you are familiar with the safe working areas and accesses.

Ensure that the working area is adequately lit.

The power supply to the equipment must be isolated at the control panel(s) before lifting the covers. Where a specific maintenance procedure requires the equipment to be running with the covers off, all care must be taken to avoid contact with moving parts and electrical components or conductors. Drive guards must be replaced and secured if removed during maintenance.

Once power has been isolated, the control panel must be kept locked shut to avoid accidental re-connection whilst work or inspection is being carried out.

Use only the designated access walkways. Do not walk on the cover.

Take care to maintain correct posture, particularly when lifting. Use appropriate lifting equipment when necessary. Keep proper footing and balance at all times. Avoid any sharp edges.

Desludging should be carried out by a contractor holding the relevant permits to transport and dispose of sewage sludge. The contractor must refer to the desludge instructions in the operation section of this manual.

CONTENTS

1 Introduction

Thank you for choosing a Kingspan product. This manual will help you to keep it operating efficiently over a long service life. Please read this manual thoroughly, preferably before installation.

This manual should be referred to by:

a) The installer.

b) The electrician.

c) The maintenance engineer.

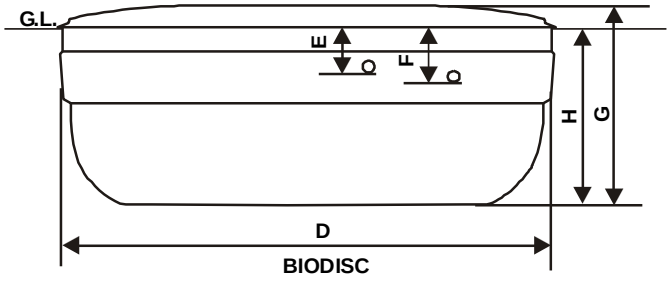
d) The desludge contractor.

e) The owner/user

These Guidelines represent Best Practice for the installation of these Kingspan BioDisc Units. Many years of specialist experience has led to the successful installation of thousands of BioDisc units. It must be noted, however, that these Guidelines are necessarily of a general nature. It is the responsibility of others to verify that they are appropriate for the specific ground conditions and in-service loads of each installation. Similarly, any information or advice given by employees or agents of Kingspan regarding the design of an installation must be verified by a qualified specialist (e.g. Civil engineering consultant).

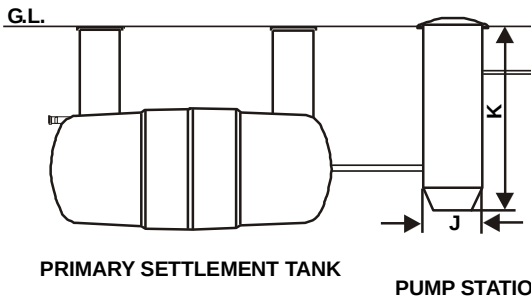
2 Technical Data

STANDARD - SINGLE PIECE SYSTEM

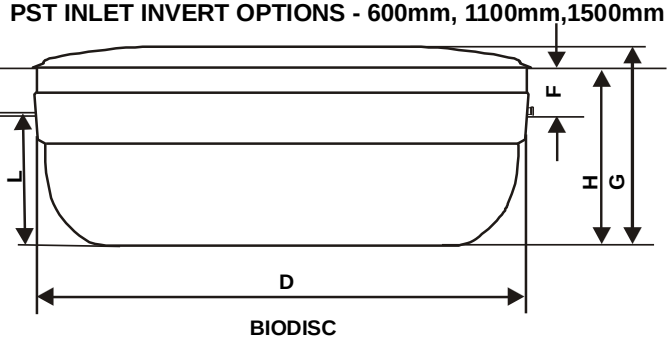


Note: Illustrations are schematic. Refer to General Arrangement Drawings for true pipework orientation.

OPTION - PUMP FED THREE PIECE SYSTEM



PST INLET INVERT OPTIONS - 600mm, 1100mm,1500mm



GL = Ground Level

2.1.1 The loadings given below are representative of typical domestic housing applications for a discharge consent of 20/30/20. The sizing of sewage treatment plants requires specialised knowledge and experience. Please consult Kingspan for an assessment of your application.

2.1.2

Unit	BN	
Maximum Daily BOD **(kg)**	18	
Maximum Daily Flow **(m^3)**	60	
Peak Flow Rate **(m^3)**	7.5	
BOD **(mg/l)**	20	
Suspended Solids **(mg/l)**	30	
Ammonium NH_4^+-N **(mg/l)**	20	
Primary Settlement Tank		
Please Refer To Klargester Sales For Applications Requiring A Primary Settlement Tank For Sizing And Dimensional Information.		
BioDisc	BN	
Inlet Invert Depth **E mm**	600	1000
Length **D mm**	13100	
Width **mm**	2582	
Depth Below Inlet Invert **L mm**	1790	
Outlet Invert Depth **F mm**	750	1150
Overall Height **G mm**	2850	3250
Height To rim cover **H mm**	2490	2890
Empty Weight **kg**	5500	5650
Standard Power Supply	400V 3 Phase	
Motor Rating 1 Phase **Watts**	2 x 370	
Full Load Current 3 Phase **Amps**	2 x 1.35	
Sludge Return Pump Rating **Watts**	480	
Pump Station		
Diameter **J mm**	900	
Flange Height **K mm**	2530	
Standard Power Supply	1ph	
Pump Rating **Watts**	480	

3 Handling & Storage

3.1.1 Care must be taken to ensure that the unit is not damaged during delivery and handling on site. If there is any damage it should be reported to the Warranty Team (0844 225 2785) within 48 hours of delivery.

3.1.2 The design requirements of Kingspan products will frequently mean that the centre of gravity of the unit is “offset”. Care must therefore be taken to ensure that the unit is stable when lifting. Rainwater may also collect inside units, particularly if they have been stored on site prior to installation, adding weight and increasing instability. Check units before lifting and pump out any excess water.

3.1.3 When lifting units, use webbing slings of a suitable specification. When lifting BioDisc units the slings must be passed through the indicated channels in the base of the unit.

3.1.4 A suitable spreader bar should be used to ensure that the unit is stable and that loads are evenly distributed during lifting. When lifting BioDisc units the spreader bar length should be equal to the width of the BioDisc to avoid compression damage to the covers or sides of the unit.

3.1.5 Do not use chains. Do not use the U-bolts or horizontal beams on the BioDisc case for lifting.

3.1.6 Lifting equipment should be selected by taking into account the unit weight, length and the distance of lift required on site.

3.1.7 Kingspan Environmental accepts no responsibility for the selection of lifting equipment.

3.1.8 Whenever Kingspan BioDiscs are stored or moved on site, ensure that the storage location is free of rock, debris and any sharp objects, which may damage the unit. The BioDisc must be placed on ground, which is flat and level to evenly support the base of the unit.

4 Site Planning

The following points should be considered before installation of the equipment:

4.1.1 The discharge must have the consent of the relevant Environmental Regulator.

4.1.2 The installation should have Planning and Building Control approval.

4.1.3 Due to rising groundwater conditions in GB and Ireland, we strongly recommend that a concrete backfill is used to install the product.

4.1.4 Ground conditions and water table level should be assessed. If the water table will be above the base of the unit at any time of the year, adequate concrete backfill must be provided to avoid flotation. In poorly draining ground, consideration should also be given to the likelihood of flotation due to surface water collecting in the backfill. It should be borne in mind that the inlet drain trench will act as a land drain, directing surface water to the backfill around the unit.

4.1.5 If discharge is to a soakaway, a porosity test should be carried out in accordance with BS 6297 to assist in assessing sub-soil drainage and designing the sub-surface irrigation system.

4.1.6 The use of Borehole soakaways with Kingspan sewage treatment products is only acceptable when the Environment Agency discharge license allows them. Borehole soakaways are not accepted under building regs or BS6297 so it is only under special circumstances that the EA will allow such a system. Maintenance of the borehole is essential to maintain permeability.

4.1.7 The BioDisc system must be installed at a level, which will allow connection to the incoming drain and a free discharge at the system outlet. Effluent pumping station are available to lift the discharge to a higher level and/or pump to remote discharge points.

4.1.8 The unit should be installed so that the bottom lip of the cover is 65mm or more above local ground level. If the unit has to be recessed, measures must be taken to ensure that it cannot be flooded by surface water run-off.

4.1.9 There must be at least 1 metre of clear, level ground all around the unit to allow for routine servicing, plus adequate space to allow complete removal of the covers.

4.1.10 Adequate access must be provided for routine de-sludging and maintenance, including crane access. Vehicles should not be permitted within a distance equal to the depth of the unit, unless suitable structural protection is provided to the installation.

4.1.11 BioDisc covers are not suitable for walking on. Where necessary the BioDisc should be fenced off or otherwise protected. Maintenance access must be maintained as above.

4.1.12 The drainage system connected to the BioDisc must be adequately vented in accordance with the Building Regulations. The head of the drainage system should be connected to a stack pipe, open at high level, so as to draw foul air from the system and sited with consideration to prevailing wind direction. Tile vents & Air admittance valves should not be used as the sole drainage ventilation facility, but if this cannot be avoided, the BioDisc should be independently ventilated. All inspection points within the drain system should be sealed so as to enable ventilation at high level.

4.1.13 An adequate electrical supply must be provided, complying with current electrical regulations. The electrical details in section 2.1.1 will enable selection of suitable cable and current overload protection, taking into account the distance from the power source to the control panel and any other relevant factors. In most cases steel wire armoured (S.W.A) cable, minimum 2.5 mm^2 will be suitable, but this is a minimum recommendation and selection is the responsibility of the installing electrician. Although not obligatory for an installation of this type, RCD protection is suggested as an extra precaution.

4.1.14 Pump stations or any other associated equipment should have a separate power supply.

4.1.15 Proximity to a mains water hosepipe connection point is recommended, for maintenance purposes. Such a supply should be connected in accordance with water bylaws and regulations. **Never leave a hose connected and immersed in sewage.**

4.1.16 Installation should only be carried out by suitably qualified and experienced contractors in accordance with the Health and Safety at Work Act. Electrical work should be carried out by a qualified electrician, working to the latest edition of IEE.

5 Installation

5.1 General

5.1.1 When units are installed in unstable ground conditions where movement of the surrounding material and/or unit may occur, the connecting pipe work should be designed to minimise the risk of damage from differential movement of the unit(s) and/or surrounding material.

5.1.2 In situations where the excavation will not maintain a vertical wall, it will be necessary to support sidewalls of the excavation (E.g. with suitable trench sheets and bracing systems) to maintain a vertical wall from the bottom to the top of the excavation. DO NOT completely remove the shoring system until after the backfilling is complete, but before the concrete fully hardens.

5.1.3 In areas where the water table is above the bottom of the excavation and/or the excavation is liable to flood, the excavation should be de-watered, using suitable pumping equipment, until the installation is complete. In such conditions it may be advisable to line the excavation with polythene sheeting, to prevent cement being washed out of the concrete surround/base.

5.1.4 During installation care must be taken to ensure that the body of the unit is uniformly supported so that point loads through the unit are avoided.

5.1.5 Refer to the drawings attached for dimensions of units.

5.1.6 The Concrete Specification is not a site-specific installation design.

GENERAL CONCRETE SPECIFICATION IN ACCORDANCE WITH BS EN 206-1 (BS 8500-1)		
TYPE OF MIX		(DC) DESIGN
PERMITTED TYPE OF CEMENT		BS 12 (OPC): BS 12 (RHPC): BS 4027 (SRPC)
PERMITTED TYPE OF AGGREGATE ((coarse & fine)		BS 882
NOMINAL MAXIMUM SIZE OF AGGREGATE		20 mm
GRADES: C25 /30 C25 /30 C16 /20		REINFORCED & ABOVE GROUND WITH HOLDING DOWN BOLTS REINFORCED (EG. FOR HIGH WATER TABLE) UNREINFORCED (NORMAL CONDITIONS)
MINIMUM CEMENT CONTENT	C30 C20	270 - 280 Kg/M^3 220 - 230 Kg/M^3
SLUMP CLASS		S1 (25mm)
RATE OF SAMPLING		READY MIX CONCRETE SHOULD BE SUPPLIED COMPLETE WITH APPROPRIATE DELIVERY TICKET IN ACCORDANCE WITH BS EN 12350-1
NOTE: STANDARD MIXES SHOULD NOT BE USED WHERE SULPHATESOR OTHER AGGRESSIVE CHEMICALS EXIST IN GROUND WATER		

5.2 BioDisc Installation

5.2.1 Excavate a hole of sufficient length and width to accommodate the unit and a minimum of 200mm concrete surround and to a depth, which allows for the burial depth of the unit plus a minimum 300mm thick concrete base.

5.2.2 Construct a suitable concrete base slab, a minimum of 300mm thick, appropriate to site conditions. In wet or unstable ground conditions it may be necessary to lay a hard-core sub-base. Ensure that the slab is flat and level. Allow the slab to set sufficiently to support the installed load.

5.2.3 Ensure that the slab is free of any stones or other material, which could damage the unit. Lower the unit onto the slab using suitable webbing slings and lifting equipment.

5.2.4 Remove the package tied to the outside of the unit. This contains a copy of the Installation Guidelines and a cover key.

5.2.5 Remove the covers by undoing the locks and folding the end covers back over the inner covers before lifting them off. Then unlock and remove the centre covers.

5.2.6 Remove the Control Panel, from the walkway inside the unit.

5.2.7 Check that the inlet and outlet orientation is correct, and that the unit is level. It is essential that the unit is installed in a level plane to avoid undue stress on the bearings. The unit must be level to within ±5mm from side to side, measured at the walkway on either side of the rotor. If necessary, lift the unit off the base and apply further concrete as needed to level up.

Note: The top flange of the BioDisc should not be used for levelling as manufacturing tolerances may result in it not being parallel with the rotor shaft.

5.2.8 It is essential that the unit levels are checked regularly throughout the installation process. Should the unit become out of level, immediate remedial action is advised, to maintain the unit within the levels stated in section 5.2.7.

5.2.9 Pour no more than 1 metre depth of water into both primary (inlet) chambers and the final (outlet) chamber ensuring that there is never more than 250mm difference in water level between any of the sections.

5.2.10 Place concrete backfill to approximately 500mm depth around the unit ensuring good compaction to avoid voids. **Do not use vibrating pokers.**

5.2.11 Continue backfilling with concrete to just below the level of the inlet spigot. Keep the concrete at an even level all round the unit, compacting in layers. As backfilling progresses keep the ballast water level inside the unit 250-500mm above the concrete backfill level, but do not attempt to fill the unit with water above the outlet level.

5.2.12 Remove blanking cap from the cable duct at the outlet end of the unit.

5.2.13 Continue to backfill, with concrete or free flowing granular material, up to ground level. **Do not use sand.** The finished surface should be 65 mm minimum lower than the lip of the cover.

Important: Refer to Front Page regarding delayed electrical installation.

5.3 Control Panel – Installation

5.3.1 The control panel is supplied fixed to the pedestrian walkway at the outlet end of the unit, cut cable ties to remove.

5.3.2 The control panel is suitable for internal or external wall mounting, with volt-free contacts for an optional beacon or telemetry. Kiosks are available as an option on request.

5.3.3 It is important that the control panel is situated in an accessible location for servicing and maintenance.

5.3.4 The panel key is in the protective bag on the front of the panel.

5.4 Control Panel - Connection

5.4.1 It is necessary to supply (by others) SWA cable to connect the control panel with the internal junction box inside the unit.

5.4.2 The gearbox, loss of rotation alarm and sludge return pump are all pre-wired into the internal junction box within the unit.

5.4.3 The SWA cable connecting the control panel and internal junction box must be ducted through the 4” port at the outlet end of the unit.

5.4.4 Refer to the wiring diagram inside the panel for connection details.

5.5 Ancillary Equipment

5.5.1 Ancillary items should be installed in accordance with the Installation Guide supplied e.g.

- Primary Settlement Tank
- Sewage Pump Station
- Effluent Pump Station
- Sample Chamber
- Grease Trap

6 Start Up

6.1.1 Every care is taken to ensure that all mechanical components are correctly fitted, adjusted and lubricated prior to leaving the factory. However, subsequent handling during transportation and installation may result in the movement of components and a subsequent need to re-adjust prior to starting the unit. If, on inspection, you consider that any components require adjustment, please contact Kingspan.

6.1.2 Once the unit has been installed it should be left filled with water. Please switch on the motor, following the procedure below and leave the unit running, even if there is no sewage being fed into the plant. **If the unit has been installed with no operational power supply, then remove the motor/gearbox unit and store it in a dry or heated environment until such time as the unit is ready for permanent operation.** Kingspan or an experienced contractor should then replace the motor gearbox unit.

6.1.3 We recommend that Kingspan should commission the system: details on request.

6.1.4 Where circumstances dictate an immediate start-up the following basic procedures should be carried out.

6.1.5 Check that the Primary Settlement Tank (where applicable) and the BioDisc are full of water to their outlet levels.

6.1.6 Check that the power supply is connected to the control panel. Check that all electrical components and conductors are earthed.

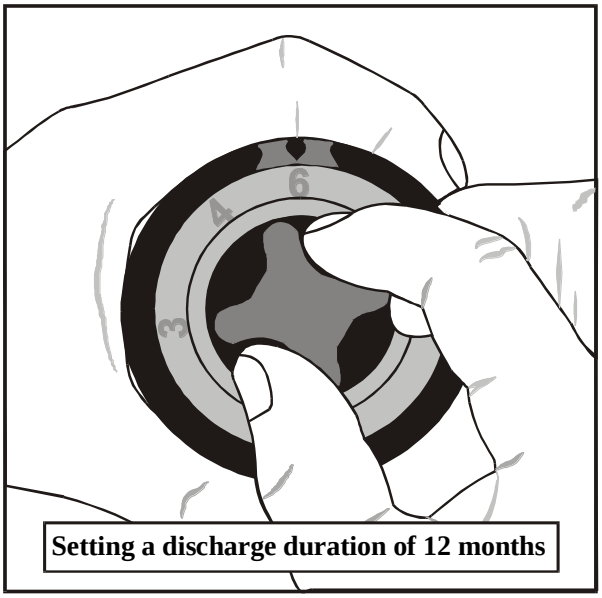
6.2 Automatic grease cartridges

6.2.1 The shaft roller bearings are fitted with pressurised grease cartridges. These should be activated before the unit is started.

6.2.2 Turn the control knob and it's linked dial until the figure 6 is against the arrow on the casing, as opposite (this will give a lubrication period of 12 months at the temperature in the BioDisc).

6.2.3 Depress the red button. This secures the setting and releases the control knob from dial.

6.2.4 Rotate the knob clockwise to activate the unit. **Note: Grease cartridges must be changed every 12 months.**



Setting a discharge duration of 12 months

6.3 Optional Pump Station

6.3.1 Check that the pumps have been installed and wired to the Pump Control Panel.

6.3.2 The pumps should be set to pump little and often in order to prevent excessive loading on the BioDisc.

6.3.3 Check the setting of the high-level float in the pump chamber. This must be set to operate the pumps so as not to exceed the balancing volume of the unit. To ensure this the float must operate below the level of the inlet of the unit. Ensure that the float(s) can operate freely without risk of entanglement. Check that the Pump Control Panel timer is set correctly, as shown on the wiring diagram.

6.4 BioDisc

6.4.1 Check that the BioDisc is in order, with no obvious damage or misalignment of parts. If any possible problems are discovered, contact Kingspan.

6.4.2 Check that all electrical components: Drive Motors, Sludge Return Pump and LOR Alarm sensors, are connected to the Control Panel.

6.4.3 Check that the Sludge Return Timer in the BioDisc Control Panel is set correctly, as indicated on the wiring diagram.

6.5 Switch-on

6.5.1 Open the BioDisc control panel, check that all circuit breakers are in the “on” position and switch on the main isolator switch. Close and lock the panel. Immediately upon switching on the sludge return pump should start and run for the set time.

6.5.2 Open the Pump Control Panel (where installed), check that all circuit breakers are in the “on” position and switch on the main isolator switch. Close and lock the panel. Immediately upon switching on the isolator, one of the pumps may start and run for the set time.

6.6 Process Initiation

6.6.1 During installation, the unit will have been filled with water to prevent flotation in the concrete surround. Allow sewage to enter the unit, this will gradually displace the clean water used during installation.

6.6.2 The colonisation by micro-organisms will commence naturally and a full operating biomass will establish itself on the discs in 4-8 weeks, depending on individual site circumstances.

7 Operation

7.1.1 The biological treatment process of your BioDisc is self-regulating and it requires no specialised operational knowledge, but it is important that you are aware of the following points.

7.1.2 Your BioDisc system uses colonies of live natural micro-organisms (biomass), to break down the pollutants in the sewage. Many chemicals used in households and commercial establishments can inhibit or kill these micro-organisms; particularly if used in excessive amounts.

7.1.3 Bear in mind that treatment plants serving small populations do not have the benefit of dilution that occurs at a large sewage works. A bottle of bleach tipped down the toilet in Birmingham would be virtually lost amongst the millions of gallons of sewage arriving at the city's treatment works; a bottle of bleach in a plant serving a hotel could be a lethal dose for the biomass.

7.1.4 If the biomass is damaged, it will usually recover over time. But in the meanwhile, one of the more obvious symptoms is an unpleasant smell, so it is in the users interest to avoid this.

7.1.5 Generally speaking, all common household cleaning fluids are acceptable, provided they are used in accordance with the makers instructions and stipulated concentrations. The following “Do’s and Don’ts” includes the most common household chemicals, but it is not an exhaustive list, and the golden rule is "If in doubt - leave it out."

7.1.6 Bear in mind too that it isn't only the toilet that is connected to the treatment plant; anything that goes down the sink, bath etc. also ends up there.

7.2 Do's and Don'ts

7.2.1 **Washing machine and dishwasher detergents, washing up liquids:**

These are generally all right to use in the normal concentrations and usage found in domestic housing applications. All commercial applications are individually assessed before installation for their laundry load. Please contact Kingspan for advice if any changes are contemplated e.g. addition of extra laundry facilities.

7.2.2 **Floor cleaners, disinfectants and bleaches:**

These are safe to use in accordance with the makers recommendations and in the minimum necessary concentration. Do not pour neat disinfectant or bleach down sinks or outside gullies. If these are smelly it usually indicates a build-up of decaying material or a plumbing problem and should be dealt with accordingly.

7.2.3 **Nappy disinfectants and bottle sterilising fluids E.g. Milton:**

When disposing of the used fluid, ensure that it is well diluted with water. The easiest way of doing this is usually to flush it away down the toilet.

7.2.4 **Waste disposal units:**

These do not inhibit the biomass, but, depending on use, they can present the treatment plant with considerable extra load. This can result in the treatment process becoming unbalanced, leading to problems. Much better to compost your vegetable peelings etc - it's cheaper and environmentally friendly.

7.2.5 **Home beer and wine making.**

This presents a similar problem to waste disposal units. The BioDisc must work as hard to treat one pint of beer tipped down the drain as it does to treat all the normal waste produced by one person in 24 hours. See also the notes above regarding sterilising fluids.

7.2.6 **THE FOLLOWING MUST NOT BE DISCHARGED INTO THE DRAINS**

- **Motor oil, grease, anti-freeze, brake fluid etc**.
- **Cooking oil and fat.**
- **Weed-killers, insecticides, fungicides and other gardening chemicals.**
- **Paint, thinners, white spirit, turpentine, creosote etc.**
- **Medicines.** Take unused medicines to a pharmacist for safe disposal.
- **Photographic developing fluids.**
- **Nappies, sanitary towels, rags, soft toys, tennis balls etc.**

This may seem obvious, but it is amazing what gets flushed down the loo from time to time. Although such items are not directly damaging to the biomass they can cause problems, not the least of which is simple blockage of the drains.

Even so-called disposable nappies and sanitary towels often do not degrade fully in the treatment plant and can lead to malfunction, so it is best to dispose of them by other means.

7.3 Automatic Restart

7.3.1 BioDiscs are designed to re-start automatically when power is resumed, but the re-start may not succeed in some circumstances, such as extended power cuts. This will cause the alarm to activate when power is re-established after power cuts, check that the rotor is turning correctly. In the event of any difficulties, contact Kingspan.

8 Running Checks

8.1.1 Check that the rotors are running smoothly in the correct direction of rotation (see section 8.1.2) and are not contacting any part of the fixed structure.

8.1.2 Check that the forward feed buckets are discharging correctly from both first to second stage Biozones.

8.2 Loss of Rotation Alarm

8.2.1 Check operation of the Loss of Rotation (LOR) Alarms as follows:

8.2.1.1 Open the Control Panel and switch off the drive motor circuit breakers. After a delay of 2-3 minutes the alarm should activate.

8.2.1.2 Push the “Beacon Off” button on the front of the Control Panel. The alarm beacon should stop flashing and the red indicator light on the panel front should remain illuminated.

8.2.1.3 Switch on the drive motor circuit breakers and close the Control Panel. The alarm should cease after approximately one minute.

8.2.1.4 Depress and release the “Beacon Off” button to reset it.

8.2.2 Malfunctioning of the LOR Alarm does not prevent operation of the BioDisc System, but it should be reported to your maintenance engineer for early rectification.

8.3 Customer Checks

8.3.1 The following periodic checks should be carried out monthly. Your attention is specifically drawn to the Health and Safety section of this manual.

8.3.1.1 Visually check the general condition of the plant and listen for any unusual noises. Report any aspects of concern to your maintenance engineer.

8.3.1.2 Check the appearance of the Biomass. It should be light grey to grey at both first banks, gradually changing to brown in both second stages and dark brown at the drive end of each second stage. If the growth is excessively thick and the colour predominantly grey throughout, an overload condition is indicated.

8.3.1.3 Visually check that all fixings are secure.

8.3.1.4 Clear any debris from inlet and outlet pipes.

8.3.1.5 Check dosing buckets and transfer pipes for any build-up of debris. Clean, if required, using a stiff bristled brush.

8.3.1.6 Check the Loss of Rotation Warning Devices for correct operation (see section 8.2). If the alarm does not operate properly, contact your maintenance engineer.

9 Desludging and Maintenance

9.1.1 These are vital to the plant's ongoing operation and should be carried out in accordance with the guidelines in this manual.

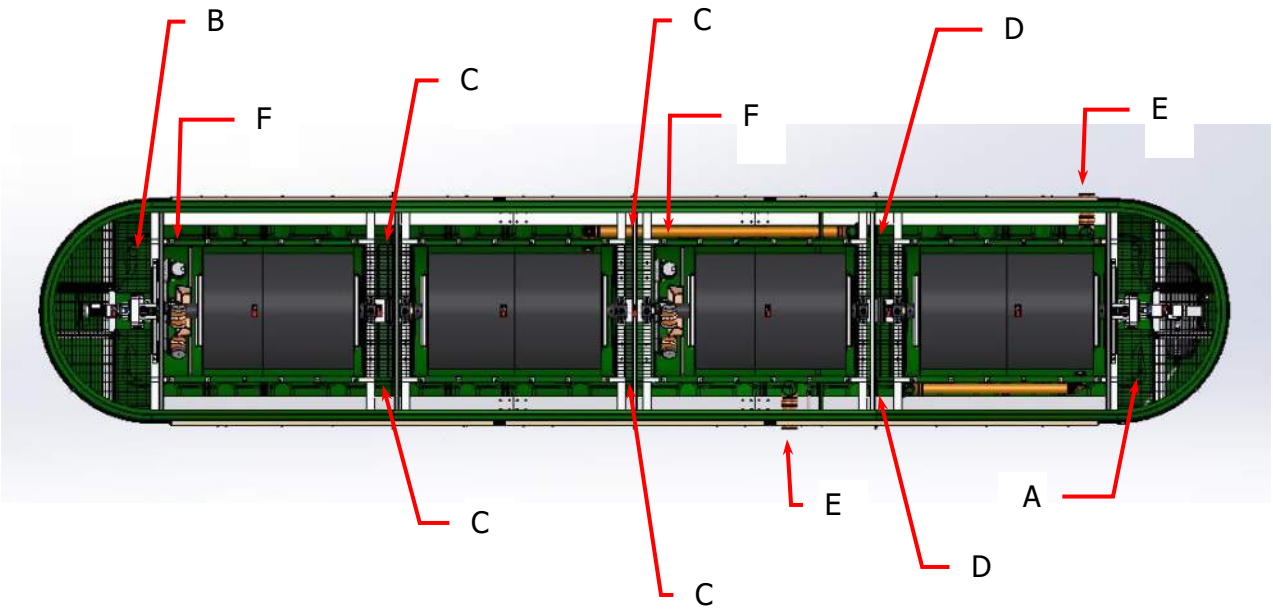
9.1.2 Mechanical and electrical maintenance must be performed by properly trained engineers, with reference to the appropriate Maintenance Manual. Kingspan offer a range of maintenance packages, details on request.

9.1.3 Kingspan BioDiscs are designed and engineered for the minimum possible maintenance requirements, consistent with proper performance. Nevertheless, it is important that routine preventive electro/mechanical maintenance and de-sludging are carried out at the appropriate intervals by suitably qualified persons.

9.1.4 Kingspan offer various levels of contract maintenance of all BioDisc Systems through Kingspan Environmental Services who can be contacted on 0844 846 0500.

9.2 Sludge Removal

9.2.1 Refer to the illustration below for recommended de-sludge positions. (Note: Illustration is typical; individual units may vary).



9.2.2 Isolate power to the BioDisc (and Pump Station if applicable) at the Control Panel(s).

9.2.3 Undo the BioDisc cover latches and fold back the hinged cover sections as required to gain access. Alternatively, the covers can be completely removed if wished. Hinged sections should be folded back before lifting off.

9.2.4 Remove any surface scum from the Final Settlement Tank [A]. The steel mesh may be removed for access if required. Lower the hose to the bottom of the tank and remove any settled sludge. Also, de-sludge at points [D] on either side of the rotors and along the length to prevent 'rat-holing'. The steel mesh over points [D] may be removed for access if required. Replace any removed steel mesh.

9.2.5 Remove surface scum from the BioDisc Primary Settlement Zone at point [B] and de-sludge at points [C] on either side of the rotors. De-sludge along the length of the rotors to prevent 'rat-holing'. The steel mesh over points [B] and [C] may be removed for access if required.

9.2.6 **Note:** While de-sludging ensure that there is never more than 250mm difference in water levels between points [A] and [C].

9.2.7 **DO NOT** attempt to remove any liquid from any Rotor Section.

9.2.8 **DO NOT** attempt to clean off the gelatinous growth on the rotors.

9.2.9 Ensure that the BioDisc inlet and outlet pipes [E] and the Forward Feed Buckets [F] are free of debris.

9.2.10 Ensure that all safety meshes are replaced, then close and lock the BioDisc covers.

9.2.11 Units with separate Primary Tank only - Remove the covers from Primary Settlement Tank. Remove any surface scum in the Primary Settlement Tank, then lower the hose into the bottom of the tank and completely remove settled sludge. It may be necessary to empty the tank completely to ensure full sludge removal. Ensure that the inlet and outlet pipes are clear of debris, and then replace the covers.

9.2.12 All units - Re-connect the power supply. Wait for two minutes. If the alarm on the control Panel does not activate, this indicates that the Rotor has successfully re-started. If the alarm activates, switch off the power at the Control Panel and immediately switch on again. If the alarm continues to activate, isolate the power supply and notify the plant owner so that the problem can be investigated.

9.3 Desludge Volumes

9.3.1 The minimum volumes shown here are those which can be anticipated under full loading at the de-sludge period indicated. If the system is not loaded to full capacity, the de-sludge period and volumes removed may be adjusted, but it is essential that a) sludge is not allowed to accumulate to the detriment of the process and b) all settled sludge and floating matter are removed at each de-sludge visit.

UNIT	De-sludge Period	BioDisc Primary Settlement Zone	BioDisc Final Settlement Zone
BN	Approx. 3 months	29,150 (6,412)	14,300 (3146)

Note: Volume is in litres (gallons below in brackets)

10 Warranty

Taken from 'Kingspan's Terms & Conditions of Sale'
The company will replace or, at its option, properly repair without charge any goods which are found to be defective and which cause failure in normal circumstances of use within a period of twelve months from the date of delivery.

This warranty is conditional upon:

(a) the Buyer notifying the Company of any claim within Seven days of the failure becoming discernible.
(b) the Company being allowed a reasonable opportunity to inspect the goods so as to confirm that they are defective.
(c) the goods not having been modified, mishandled or misused and being used strictly in accordance with any relevant instructions issued by the Company.

The Company's liability under this Clause is limited to the repair or replacement of the defective goods, and does not cover costs of transport, installation or associated site costs, if applicable.

The Company's liability to replace or repair the goods is in lieu of and excludes all other warranties and conditions, and in particular (but without limitation) the Company shall have no liability of any kind for consequential loss or damage.

For any further advice, please contact the Warranty department on 0844 225 2785.

A Warranty Form is included in this package, to register your unit for Warranty. Please complete ALL sections of the Form, and return it at your earliest convenience.

Also within this package is a Notice, describing the necessary maintenance of the plant in use. This should be fixed within the building.

Our service provider: Kingspan Water & Energy: 0333 240 6868

11 Notice

KINGSPAN BioDisc ®

The foul drainage from this property discharges into a package treatment works.

Maintenance is required, the frequency of which depends upon the model installed, its use and its application. Please consult your owner's pack.

* BN BioDisc requires routine maintenance and Desludging at 3 months intervals.

Maintenance and Desludging should be carried out by the owner in accordance with the Manufactures instructions.

THE OWNER OF THE PROPERTY IS LEGALLY RESPONSIBLE FOR ENSURING THAT THE SYSTEM DOES NOT CAUSE POLLUTION, A HEALTH HAZARD OR A NUISANCE.

We recommend that a separate log is kept of all maintenance and service visits, the log should detail the date and any action taken, e.g. Regular maintenance service, breakdown visit, desludge volume removed, parts replaced.

This notice should be fixed by the owner within the building alerting current and future owners to the maintenance requirement. (Building regulation H2 (1.57)

Please contact Kingspan Water & Energy Services on 0333 240 6868, to arrange a maintenance service or to request replacement operating instructions. It would be helpful if you provide your equipment serial number.

Appendix C

Kingspan Service Scope and Method Statement

SCOPE OF WORKS FOR PLANNED MAINTENANCE

ALL BIODISC PLANTS…….

- **Ensure the plant location is suitable to avoid flooding etc.**
- Remove cover and lay face down in a suitable location (on larger units ensure the cover hinges are in good condition)
- Ensure levels in primary and final zones are normal (below cut outs in primary and up to base of tee on the final)
- Advise if the system requires a desludge
- Check for signs of previous high level (water in bottom pulley guard, tide marks above working area.)
- Isolate power from motor/gearbox via local MCB or small plant control panel.
- Check all internal wiring and contactors for signs of wear.
- On larger plants check the function of all lamps and inverters.
- Remove belt and check for signs of wear,cracks, teeth missing.
- Larger plants remove top pulley guard and visually check the condition of the chain for tension and signs of damage
- Check the greaseomatic on the chain guard and replace if required (set to 8 months) check the condition of the chain brush
- Clean bottom pulley using wire brush, use grease on the locking element screws and wearing parts.
- Clean the bottom pulley guard of all debris and water
- Check front bearing for wear and ensure there isn't too much horizontal or vertical movement
- Check the greasomatics on all bearings fitted (larger units) and replace if required (set at 12 months)
- Refit belt (smaller units) and retension
- Remove gearbox terminal cover and check for signs of corrosion or terminal wear. (black or corroded)
- Remove capacitor box cover and check terminals for signs of corrosion.
- Remove IPS pump if fitted and clean the float and pump casing, ensure the bottom end is clear of any debris.

- Check the operation of the non-return valve.
- Remove desludge pump (larger units) clean and test as per IPS pumps(if possible)
- Clean Buckets and check the correct distribution across the centre baffle weir, adjust rear disc pack if required
- Clean the centre baffle weir using a soft brush to remove all scum and biomass build up
- Hose down discs if required due to excessive biomass build up (to reduce the weight) or poor biomass growth (discs white in colour)
- Clean and grease centre drive coupling if fitted(larger units) using a wire brush and ensure all securing bolts and shim plates are in tact. On new units check the condition of the drive rubber.
- Remove and clean the high level float and test the operation (if applicable)
- Check the operation of the high level beacon (if applicable)
- Clean and test the loss of rotation sensor (if applicable) by disconnecting the terminals at the panel. (ensure dip switch 10 has been activated) check the junction box within the plant to ensure it is dry and corrosion free.
- Check the condition and working of all cover locks, clean and grease where required.
- Replace all covers and ensure they are locked correctly.
- Remove all waste from site and around the plant. Where possible dispose in customers bin.

Date: April 2022

Method Statement for Servicing of Biodisc Domestic

Site/ Location	Various Sites UK & Ireland		
DIVISION/DEPARTMENT	Kingspan Water & Energy Ltd		
Written by	David Pender	Position	Technical and Compliance Manager

Subject:
Method statement to cover the onsite activities of Kingspan Water & Energy Service employees servicing of Biodisc plants.

Scope of Works

1

1.1 On-site Service of Biodisc
1.2 Location – Various Sites UK & Ireland
1.3 Start/ finish time – between working hours of 9:00-16:00 on each day of services.
1.4 1 engineer (or 2 if site dictates)

2 PPE, Tools and Regulatory Requirements (H&S)

2.1 P.P.E to be worn- Hard hat, safety glasses, Hi-Viz vest, , rubber gloves and appropriate mask (if task requires).
2.2 Tools – hand tools only
2.3 Reference manual handling and working in close proximity to open work areas.
2.4 Covid 19 prevention procedures to be adhered to at all times

Kingspan Water & Energy Ltd.
180 Gilford Road, Portadown, Co. Armagh
Northern Ireland BT63 5LF
kingspanwaterandenergy.com

GB: 0333 240 6868
NI: 028 3836 4600
ROI: 048 3836 4600
helpingyou@kingspan.com

Scope of Works cont.

3.1 Method of Work

3.2 Assess the general condition and quality of the installation.
3.3 Check sufficient access for maintenance/ emptying.
3.4 Check and test electrical isolation is working correctly.
3.5 Check all electrical connections in Control Panel/Isolator.
3.6 Check condition of all covers and locking devices.
3.7 Check levels between PST & FST (indication of split baffle) if applicable
3.8 Record Sludge levels in both PST and FST Chambers. if applicable
3.9 Check all bearings and record condition.
3.10 Bio Disc check and record volume of bearing greasomatics Cartridge and replace if required (-10%)
3.11 Check Drive condition and also volume of chain grease cartridge recorded and grease cartridge and replace chain grease cartridge if required (-10%).
3.12 BF and larger confirm grease "overspill" from the bearings and check for minimal play in the shaft coupling (where fitted)
3.13 Check condition of bottom pulley and locking mechanism and lubricate as mild steel parts will corrode and seize.
3.14 Confirm that the top pulley is secure and condition
3.15 Check Motor terminal box for wiring and ingress.
3.16 Remove Motor Fan Cowl and clean fan (If Applicable)
3.17 Check motor and gearbox for any signs of wear (gearbox noise or leaking oil)
3.18 Check the tension and alignment of the belt/chain (If Applicable)
3.19 Check the running current is in line with the manufacturer's specifications and that the direction of rotation is correct
3.20 Ensure that the bucket operation is correct and rectify if not (move PST discs forward)
3.21 Check action of re-circulation pumps, (if fitted) and integrity of pipework.
3.22 Confirm action of high-level float and beacon. (Where fitted)
3.23 Test the loss of rotation system by removing one of the input wires to the panel
3.24 If the system has an IPS then remove and clean the pump and check action of NRV
3.25 Set all overloads to the running current of the attached appliance.
3.26 Advise the client of any repairs that may be necessary and if unit needs emptying
3.27 Ensure that all the lids lock down and are secure.

4 Supervision

- Supervision of the service will be overseen by Kingspan Service Engineer unless outlined by site personal.

Kingspan Water & Energy Ltd.
180 Gilford Road, Portadown, Co. Armagh
Northern Ireland BT63 5LF

GB: 0333 240 6868
NI: 028 3836 4600
ROI: 048 3836 4600

kingspanwaterandenergy.com

helpingyou@kingspan.com

5 Training Requirements

- All Kingspan engineers/contractors have been fully trained on the product and meet the required standard of mechanical and electrical competency for the task
- All Engineers/Contractors hold a valid Confine Space certificate (If required) /Safe Pass and Manual handling training.

6 Emergency Arrangements

- Engineers to be briefed on site emergency arrangements and provided with emergency numbers in the event of an accident.
- Kingspan Contact Details - 02838364600 (Office)
- Engineer Manager - Darren Doherty (+447826892628)
- David Pender – Technical and Compliance Manager 02838364600 (Office)
- Kingspan Service Director - (+447733314528)
- Accidents – All accidents and near misses to be reported to Senior Engineer and Manager.

7 Associated Risk Assessments

- Site specific risk assessment completed and to be reviewed by all operators.

I can confirm I have had an explanation of the method statement and all supporting documentation and understand the safe systems of work to be employed.

No attempt will be made to carry out any other works not detailed on this method statement.

Signature: …….

Print Name: …….

Date: …….

Review Date: 26th April 2022

Next Review Due: April 2025 or if an incident occurs before this date.

Kingspan Water & Energy Ltd.
180 Gilford Road, Portadown, Co. Armagh
Northern Ireland BT63 5LF

GB: 0333 240 6868
NI: 028 3836 4600
ROI: 048 3836 4600

kingspanwaterandenergy.com

helpingyou@kingspan.com

Appendix D

Kingspan Chemical Dosing Plant Information

010193

Guidelines for BA-BN BioDisc®
with Chemical Dosing

Contact Numbers:

UK
Kingspan Water & Energy Ltd.
College Road North Aston
Clinton | Aylesbury
Buckinghamshire | HP22 5EW

T: +44 (0) 1296 633 000
F: +44 (0) 1296 633 001
E: klargester@kingspan.com

www.kingspan.co.uk/klargester

Ireland
Kingspan Water & Energy Ltd.
Unit1a | Derryboy Road Carnbane
Business Park
Newry | BT35 6QH

T: NI: +44 (0)28 3026 6799
F: ROI: 0818 544 500
E: klargesterinfo@kingspan.com

www.kingspan.ie/klargester

Kingspan Water & Energy Ltd.
Service Office Details:
180 Gilford Road
Portadown | BT63 5LF

T: NI: +44 (0)28 3836 4600
F: ROI: 0818 543 500
E: helpingyou@kingspan.com

www.kingspanservice.ie

ENCLOSED DOCUMENTS	
1011027	DTP Control Panel Wiring Diagram

Issue	Description	Date
06	ECN 1637	08/12/2022

HEALTH AND SAFETY

These warnings are provided in the interest of safety. You must read them carefully before installing or using the equipment.

It is important that this document is retained with the equipment for future reference. Should the equipment be transferred to a new owner, always ensure that all relevant documents are supplied in order that the new owner can be acquainted with the functioning of the equipment and the relevant warnings.

Installation should only be carried out by a suitably experienced contractor, following the Guide-Lines supplied with the equipment.

We recommend the use of a dust mask and gloves when cutting GRP components.

Electrical work should be carried out by a qualified electrician.

Sewage and sewage effluent can carry micro-organisms harmful to human health. Any person carrying out maintenance on the equipment should wear suitable protective clothing, including gloves. Good hygiene practice should also be observed.

Covers must be kept locked.

Observe all hazard labels and take appropriate action to avoid exposure to the risks indicated.

The correct ongoing maintenance is essential for the proper operation of the equipment. Kingspan offer a range of maintenance contracts, details on request.

Should you wish to inspect the operation of the equipment, please observe all necessary precautions, including those listed below, which apply to maintenance procedures.

BioDisc units contain rotating machinery and associated drive chains or belts.

Ensure that you are familiar with the safe working areas and accesses.

Ensure that the working area is adequately lit.

The power supply to the equipment must be isolated at the control panel(s) before lifting the covers. Where a specific maintenance procedure requires the equipment to be running with the covers off, all care must be taken to avoid contact with moving parts and electrical components or conductors. Drive guards must be replaced and secured if removed during maintenance.

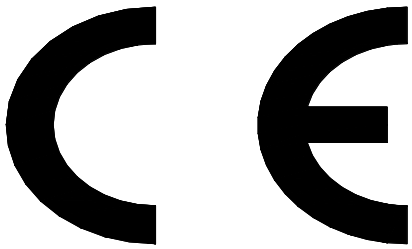
Once power has been isolated, the control panel must be kept locked shut to avoid accidental re-connection whilst work or inspection is being carried out.

Use only the designated access walkways. Do not walk on the cover or deep well safety mesh(es). Desludge port covers, where fitted, must be replaced if removed.

Take care to maintain correct posture, particularly when lifting. Use appropriate lifting equipment when necessary. Keep proper footing and balance at all times. Avoid any sharp edges.

Desludging should be carried out by a contractor holding the relevant permits to transport and dispose of sewage sludge. The contractor must refer to the desludge instructions in the Operating Manual, a copy of which is fastened under the covers.

Ensure that you have the appropriate COSH sheet and chemical handling information for the chemical selected for dosing. The chemicals used for control of phosphorus are dangerous and must be stored and handled safely. They are acidic and corrosive. See the Material Safety Data Sheet (MSDS) provided by the supplier for appropriate personal protective equipment.



Kingspan Water and Energy Ltd
College Road North
Aston Clinton
Aylesbury
HP22 5EW
United Kingdom

EN 12566-3+A2:2013	
Name of Product Type:	**BioDisc BA**
Material:	**GRP**
Treatment process:	**Rotating Biological Contactor (RBC) with chemical dosing equipment**
Testing authority:	**PIA GmbH, NB 1739**
Effectiveness of treatment:	
Treatment efficiency:	**COD: 95.9%**
(at tested organic daily load BOD_5 = 0.28 kg/d)	**BOD_5: 98.0%**
	N_{tot}: 63.9%
	NH_4-N: 84.8%
	P_{tot}: 95.4%
	SS: 95.6%
Nominal hydraulic flow (100%)	**0.9 m^3/d**
Number of desludging	**1**
Power consumption	**1.5 kWh/d**
Treatment capacity (nominal designation)	**6 PT**

CONTENTS **Page**

1.0 Chemical Dosing kit

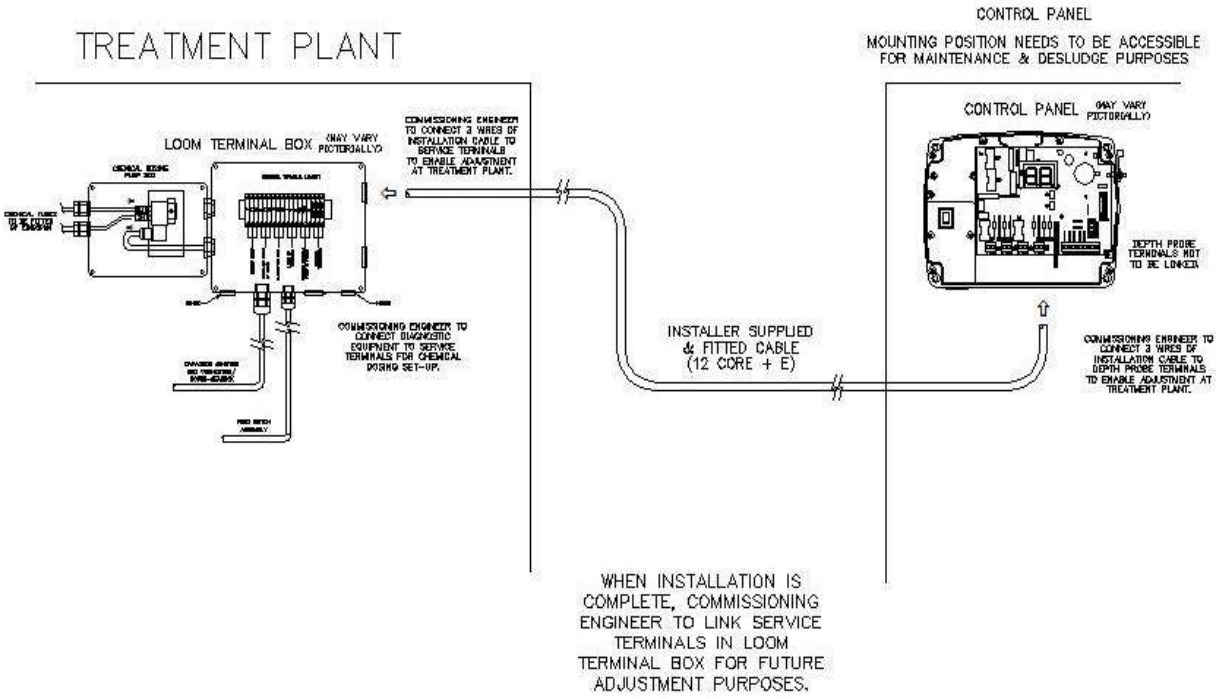
Please see the relevant BioDisc Installation and Operating manual, which indicates the flows permitted and expected daily volumes. These manuals should be followed however; **your unit has been modified to include chemical dosing equipment.**

In addition to the standard features described, your unit includes additional equipment and a special control panel.

Units are supplied with the additional equipment pre fitted. Your system and chemical dosing operations will be set up by the service engineer at installation due to variations of on-site conditions.

Wiring Loom

The wiring loom allows easy connection of the internal electrical components, i.e. chemical dosing pump, BioDisc motor, Loss of rotation sensor, sludge return pump (if included)



Chemical dosing pump

- The pump (shown below) is mounted on the wall of the tank within a chemical box or attached to the junction box. Its operation is controlled by the control panel.
- The duration of the dose and the interval of the dose can be altered using the control panel.
- Check that the chemical tubes are connected correctly to the pump inlet and outlet. (Labels are attached to the tubing externally and within the box, the white nipples are faintly embossed with in and out)
- Ensure that the pump and tube are primed with chemical and the line is bled of air.
- The discharge tube should be positioned /located at the pre drilled point at the end of the second biozone to allow the chemical to fall freely and to ensure that the chemical is delivered into the mixing zone. The discharge must be above the level of the stored chemical to prevent siphoning.

Gotec Pump

Flexible chemical Tubing

- Chemical inlet. Place the chemical draw pipe with weighted end into the chemical tank so that the chemical is drawn from above the base of the tank.
- Remove any excess tubing. The chemical tubes should be vertical and not be so long as to form unnecessary loops.

Chemical (Customer supply)

The recommended chemical is XL 60 obtainable from Kemira or Univar.
Other chemicals may be used but they must be checked for suitability. Please contact Kingspan

- **See enclosed chemical specification. Please ensure that you have the most up to date versions of the health and safety data sheets from the chemical supplier and observe all health and safety precautions.**
- The chemical container(s) should be placed inside the unit on the ledge adjacent to the chemical pump.
- Ensure that the chemical container is carefully located and secured into position.

Control panel

The control panel includes a micro-processor which is provided pre set to dose the estimated dose of chemical at the appropriate interval.

- The setting assumes that the influent Phosphate (P) is approx 8-12 mg/l and assumes that an outlet of 2 mg/l is required. These settings may be altered by the commissioning engineer if there are known different volumes or different incoming or effluent phosphate values.

- During commissioning, a check can be made of the sewage inlet P level and the pump setting adjusted if necessary. (Commissioning cost is additional)

See wiring diagram for connection details.

2.0 Process Description

The chemical dosing process is started when the sludge return pump is activated and operates for a predetermined time. Chemical is intermittently pumped into the dosing point. The chemical mixes with the dissolved phosphate and coagulates together to form settleable particles which settle in the final settlement zone.

Using a chemical increases the volume of sludge formed within the treatment unit when compared to a standard unit. The level of sludge produced also relates to loading and so an assessment of the sludge production should be made monthly bearing in mind that there is a need for increased emptying frequency when compared to the standard recommendations given in the manual.

Addition of the chemical is fundamental to the process and it is important to check the chemical usage and replace the drum. Should the chemical run out, there will be no phosphate removal.

The reduction of phosphate is required by the environmental regulator in order to protect the local environment. The addition of limiting nutrients such as phosphate can cause eutrophication in the receiving water.

3.0 Customer Information

A BA unit is normally supplied for use at 1 property with a maximum occupancy of 6 persons.
A BB, 2 properties with a maximum of 12 people.
A BC unit is normally supplied for use by multiple properties with a maximum occupancy of 18 persons. For applications of larger units consult Kingspan Sales.

Detergents and chemical products used within the properties should be selected with care so as to reduce the amount of added phosphates going into the treatment plant. It is possible to reduce the amount of phosphates entering the unit by up to 50%. The less phosphate entering the plant, the less chemical dose is required.

Each person / and visitor to the property contributes wastewater into the treatment plant and the volume treated by the unit will change on a daily and hourly basis. The volume treated is controlled by a flow device which transfers liquid over the baffle into a biozone.

Units which are over dosed with too much chemical tend to develop a creamy biomass, but this colour of biomass may also be the sign of excess fat or overloading, see trouble shooting notes in main manual.

The chemical dosing settings can be reviewed and, if necessary, adjusted at the next maintenance visit.

4.0 Chemical Consumption

The chemical dosing duration for units are set depending on their size.

The interval between the doses can be adjusted to suit the expected incoming phosphate load and the number of persons using the unit.

Low and average settings are given for each population load to assist the selection of the appropriate interval. These settings were calculated using averages obtained during performance testing, but higher use settings may be required to reflect high incoming phosphate levels or higher volume uses.

Initial Chemical dosing setting Single Control Panel for BA to BD.
BE and above require separate chemical dosing panel with timers.

	PE	Seconds	Minutes
		on	off
BA	6	3	25
BB	12	3	12
BC	18	4	12
BD	25	3	6
	PE	Seconds	Seconds
BE	35	7	593
BF	50	10	590
BG	70	13	587
BH	75	14	586
BJ	100	19	581
BK	125	23	577
BL	150	28	572
BM	225	5	7200
BN	300	5	7200

<u>No occupancy (i.e. periods > 3 days without residents)</u>

The BioDisc should be left on.
The recycle pump (if fitted) returns treated effluent so as to maintain the biomass on the discs.

If the period of absence is expected to be longer, then in order to save chemical and to protect the biomass, the chemical draw tube can be removed from the chemical drum. (it can be placed into a small container of water located on the biozone so that water is used in place of chemical.

On return, replace the draw tube in chemical drum and check that the chemical doses.

5.0 Installation of Chemical Dosing System for BA-BD Control Panel.

Upon installation, the multi-core cable between the control panel and the junction box in the unit, must link all relevant operating terminals. **Wiring Diagram 1011027**

Refer the DTP Control Panel Manual 1011026 for the setting up of Chemical Dosing Timetable.

Use the Guide in Section 4 to set the desired time on the Panel.

6.0 Maintenance

Excess solids are created by using the chemical. Units with chemical dosing systems will require desludging more often than standard units without the addition of chemical.

Regular replacement of the chemical containers is required, before the chemical runs out.
The chemical dosing lines should be checked each time the chemical container is replaced.
The dosing action should be checked when the container is replaced.

SAFETY DATA SHEET

FERRIC SULPHATE 40%

Compilation date: 08/09/2011

Revision date: 03/08/2016

Revision No: 3

Section 1: Identification of the substance/mixture and of the company/undertaking

1.1. Product identifier

Product name: FERRIC SULPHATE 40%

REACH registered number(s): 01-2119513202-59-XXXX

CAS number: 10028-22-5

EINECS number: 233-072-9

Synonyms: IRON (III) SULPHATE 40%

DIIRON TRIS(SULPHATE) 40%

1.2. Relevant identified uses of the substance or mixture and uses advised against

Use of substance / mixture: Water and effluent treatment.

1.3. Details of the supplier of the safety data sheet

Company name: Tan International Ltd

Tayview Industrial Estate

Perth

PH2 8DG

UK

Tel: +44 (0)1738 632 909

Fax: +44 (0)1738 632 901

Email: qa@taninternational.com

1.4. Emergency telephone number

Emergency tel: +44 (0)1270 502 891

Section 2: Hazards identification

2.1. Classification of the substance or mixture

Classification under CLP: Met. Corr. 1: H290; Acute Tox. 4: H302; Eye Dam. 1: H318; Skin Irrit. 2: H315

Most important adverse effects: May be corrosive to metals. Harmful if swallowed. Causes skin irritation. Causes serious eye damage.

2.2. Label elements

Label elements:

Hazard statements: * H290: May be corrosive to metals.

H302: Harmful if swallowed.

H315: Causes skin irritation.

H318: Causes serious eye damage.

Signal words: Danger

[cont...]

Hazard pictograms: GHS05: Corrosion

GHS07: Exclamation mark

Precautionary statements: P280: Wear protective gloves/protective clothing/eye protection/face protection.

P301+312: IF SWALLOWED: Call a POISON CENTER/doctor/ if you feel unwell.

P303+361+353: IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower.

P305+351+338: IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

P363: Wash contaminated clothing before reuse.

P501: Dispose of contents/container to an authorised waste contractor.

2.3. Other hazards

PBT: This product is not identified as a PBT/vPvB substance.

Section 3: Composition/information on ingredients

3.2. Mixtures

Hazardous ingredients:

FERRIC SULPHATE AQUEOUS SOLUTION - REACH registered number(s): 01-2119513202-59

EINECS	CAS	PBT / WEL	CLP Classification	Percent
233-072-9	10028-22-5	-	Met. Corr. 1: H290; Acute Tox. 4: H302; Skin Irrit. 2: H315; Eye Dam. 1: H318	35-75%

SULPHURIC ACID - REACH registered number(s): 01-2119458838-20-XXXX

231-639-5	7664-93-9	-	Skin Corr. 1A: H314	<1%

Section 4: First aid measures

4.1. Description of first aid measures

Skin contact: * Remove all contaminated clothes and footwear immediately unless stuck to skin. Drench the affected skin with running water for 10 minutes or longer if substance is still on skin. If irritation persists, seek medical advice/ attention. Launder contaminated clothing thoroughly before re-use.

Eye contact: Seek immediate medical attention. Rinse immediately with plenty of water. Remove any contact lenses and keep eye-lids wide apart. Continue rinsing for at least 10 minutes or until trained medical assistance arrives.

Ingestion: Seek immediate medical attention. Never give anything by mouth to an unconscious person. Do not induce vomiting. Wash out mouth with water. Give plenty of water to drink.

Inhalation: Move to fresh air in case of accidental inhalation of vapours. Rinse nose and mouth with water. Seek medical attention if any discomfort persists.

[cont...]

4.2. Most important symptoms and effects, both acute and delayed

Skin contact: * There may be irritation and redness at the site of contact.

Eye contact: There may be irritation and pain. Corneal burns may occur. May cause permanent damage.

Ingestion: * Corrosive burns may appear around the lips. May cause burns to the digestive system. Ingesting large quantities may cause damage to liver and kidneys. May prove fatal if ingested in large quantities.

Inhalation: There may be irritation to the respiratory system.

Delayed / immediate effects: * Immediate effects can be expected after short-term exposure. Prolonged and repeated exposure can cause sensitisation/dermatitis and/ or other skin damage. Not expected to cause cancer. Not expected to be a reproductive toxicant. Not expected to be a mutagenic toxicant.

4.3. Indication of any immediate medical attention and special treatment needed

Immediate / special treatment: Show this safety data sheet to the doctor in attendance. Eye bathing equipment should be available on the premises. A decontamination shower should be available on the premises.

Section 5: Fire-fighting measures

5.1. Extinguishing media

Extinguishing media: Suitable extinguishing media for the surrounding fire should be used. Use water spray to cool containers.

5.2. Special hazards arising from the substance or mixture

Exposure hazards: * Non-flammable. Corrosive. Reacts with many metals to form the flammable gas hydrogen. In combustion emits toxic fumes of sulphur oxides.

5.3. Advice for fire-fighters

Advice for fire-fighters: Wear self-contained breathing apparatus. Wear protective clothing to prevent contact with skin and eyes.

Section 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

Personal precautions: Refer to section 8 of SDS for personal protection details. Mark out the contaminated area with signs and prevent access to unauthorised personnel. Turn leaking containers leak-side up to prevent the escape of liquid. Provide adequate ventilation. Avoid contact with eyes and skin.

6.2. Environmental precautions

Environmental precautions: Do not discharge into drains or rivers. Contain the spillage using bunding. Spillages or uncontrolled discharges into watercourses must be immediately alerted to the appropriate environmental agency.

[cont...]

6.3. Methods and material for containment and cleaning up

Clean-up procedures: * If permitted, small volumes may be neutralised with soda ash solution and washed to sewer with copious amounts of water. OR - Absorb into dry earth or sand. Transfer to a closable, labelled salvage container for disposal by an appropriate method. For larger spills, use a suction pump to transfer the spilled material to a salvage container. Wash the spillage site with large amounts of water.

6.4. Reference to other sections

Reference to other sections: Refer to section 8 of SDS.

Section 7: Handling and storage

7.1. Precautions for safe handling

Handling requirements: * Ensure there is sufficient ventilation of the area. Avoid the formation or spread of mists in the air. Do not wear contact lens when handling this material. Avoid contact with eyes and skin. Use normal safe handling techniques.

7.2. Conditions for safe storage, including any incompatibilities

Storage conditions: Store in a cool, well ventilated area. Keep container tightly closed. Separate from incompatible material - see Section 10.

Suitable packaging: It is recommended that this product is only kept in its original packaging. Use non-metallic containers.

7.3. Specific end use(s)

Specific end use(s): Water and effluent treatment.

Section 8: Exposure controls/personal protection

8.1. Control parameters

Workplace exposure limits: **Respirable dust**

State	8 hour TWA	15 min. STEL	8 hour TWA	15 min. STEL
UK	1mg/m3	2mg/m3	-	-

Hazardous ingredients:

FERRIC SULPHATE AQUEOUS SOLUTION

Workplace exposure limits: **Respirable dust**

State	8 hour TWA	15 min. STEL	8 hour TWA	15 min. STEL
UK	1mg/m3	2mg/m3	-	-

[cont...]

SULPHURIC ACID...100%

UK	1 mg/m3	-	-	-

DNEL/PNEC Values

FERRIC SULPHATE 40%

Type	Exposure	Value	Population	Effect
DNEL	Dermal (long term)	2mg/kg/day	Workers	Systemic
DNEL	Inhalation (long term)	7.2mg/m3	Workers	Systemic
PNEC	Sewage Treatment Plant	500mg/l	-	-

8.2. Exposure controls

Engineering measures: Ensure there is sufficient ventilation of the area. Ensure eyewash stations and safety showers are provided in the storage and working areas.

Respiratory protection: Respiratory protective device is not required in normal working conditions but may be required in areas of poor ventilation. Gas/vapour filter, type E: sulphur dioxide and other acid gases (EN141).

Hand protection: * Gloves (acid resistant). The most suitable glove must be chosen in consultation with the gloves supplier, who can inform about the breakthrough time of the glove material. Recommended types include:- PVC gloves. Neoprene gloves.

Eye protection: Tightly fitting safety goggles. Face-shield. Ensure eye bath is to hand.

Skin protection: Acid-resistant protective clothing. Boots. Ensure safety shower is to hand.

Environmental: Storage should be placed inside a fully bunded area of sufficient size to contain the volume plus 10%.

Section 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

State: Liquid

Colour: Orange-brown

Odour: Not significant.

Oxidising: Non-oxidising (by EC criteria)

Solubility in water: Miscible in all proportions

Boiling point/range°C: 100 - 105

Flammability limits %: lower: Not applicable.

upper: Not applicable.

Flash point°C: Not applicable.

Autoflammability°C: Not applicable.

pH: <1

9.2. Other information

Other information: Decomposition Temperature 315C

Section 10: Stability and reactivity

[cont...]

10.1. Reactivity

Reactivity: Stable under recommended transport or storage conditions.

10.2. Chemical stability

Chemical stability: Stable under normal conditions.

10.3. Possibility of hazardous reactions

Hazardous reactions: Hazardous reactions will not occur under normal transport or storage conditions. Decomposition may occur on exposure to conditions or materials listed below. Reacts with many metals which may cause the flammable gas Hydrogen to be released.

10.4. Conditions to avoid

Conditions to avoid: Heat.

10.5. Incompatible materials

Materials to avoid: * Bases. Metals. Oxidising agents. Hypochlorites.

10.6. Hazardous decomposition products

Haz. decomp. products: In combustion emits toxic fumes of sulphur oxides.

Section 11: Toxicological information

11.1. Information on toxicological effects

*** Toxicity values:**

Route	Species	Test	Value	Units
ORAL	RAT	LD50	>500	mg/kg
DERMAL	RAT	LD50	>800	mg/kg

Hazardous ingredients:

SULPHURIC ACID...100%

ORL	RAT	LD50	2140	mg/kg

Relevant hazards for substance:

Hazard	Route	Basis
Acute toxicity (ac. tox. 4)	ING	Hazardous: calculated
Skin corrosion/irritation	DRM	Hazardous: calculated
Serious eye damage/irritation	OPT	Hazardous: calculated

Symptoms / routes of exposure

Skin contact: * There may be irritation and redness at the site of contact.

Eye contact: There may be irritation and pain. Corneal burns may occur. May cause permanent damage.

Ingestion: * Corrosive burns may appear around the lips. May cause burns to the digestive system.

[cont...]

Ingesting large quantities may cause damage to liver and kidneys. May prove fatal if ingested in large quantities.

Inhalation: There may be irritation to the respiratory system.

Delayed / immediate effects: * Immediate effects can be expected after short-term exposure. Prolonged and repeated exposure can cause sensitisation/dermatitis and/ or other skin damage. Not expected to cause cancer. Not expected to be a reproductive toxicant. Not expected to be a mutagenic toxicant.

Other information: Symptoms from inhaling combustion fumes may not be readily apparent. Keep under medical supervision for at least 24 hours.

Section 12: Ecological information

12.1. Toxicity

Ecotoxicity values:

Species	Test	Value	Units
RAINBOW TROUT (Oncorhynchus mykiss)	96H LC50	>100	mg/l
Daphnia magna	48H EC50	80	mg/l

12.2. Persistence and degradability

Persistence and degradability: The methods for determining biological degradability are not applicable to inorganic substances. This product is a flocculating agent. It should react with suspended material in an aquatic system and be neutralised.

12.3. Bioaccumulative potential

Bioaccumulative potential: * The methods for determining bioaccumulative potential are not applicable to inorganic substances.

12.4. Mobility in soil

Mobility: Soluble in water.

12.5. Results of PBT and vPvB assessment

PBT identification: This product is not identified as a PBT/vPvB substance.

12.6. Other adverse effects

Other adverse effects: * The low pH may have a temporary adverse effect on the aquatic environment. This product is not expected to have a long term adverse effect on the aquatic environment.

Section 13: Disposal considerations

13.1. Waste treatment methods

Disposal operations: Dispose of waste and residues in accordance with local and national requirements. Transfer to a suitable container and arrange for collection by specialised disposal company.

Disposal of packaging: Dispose of packaging in accordance with local and national requirements. Dispose of in a regulated landfill site or other method for hazardous or toxic wastes.

[cont...]

NB: The user's attention is drawn to the possible existence of regional or national regulations regarding disposal.

Section 14: Transport information

14.1. UN number

UN number: * UN1760

14.2. UN proper shipping name

Shipping name: CORROSIVE LIQUID, N.O.S. (Ferric Sulphate)

14.3. Transport hazard class(es)

Transport class: 8

14.4. Packing group

Packing group: III

14.5. Environmental hazards

Environmentally hazardous: No **Marine pollutant:** No

14.6. Special precautions for user

Special precautions: No special precautions.

Tunnel code: E

Transport category: 3

Section 15: Regulatory information

15.1. Safety, health and environmental regulations/legislation specific for the substance or mixture

Specific regulations: Not applicable.

15.2. Chemical Safety Assessment

Chemical safety assessment: A chemical safety assessment has been carried out for the substance or the mixture by the supplier.

Section 16: Other information

Other information

Other information: This safety data sheet is prepared in accordance with Commission Regulation (EU) No 453/2010.

* indicates text in the SDS which has changed since the last revision.

Phrases used in s.2 and s.3: H290: May be corrosive to metals.

H302: Harmful if swallowed.

H314: Causes severe skin burns and eye damage.

H315: Causes skin irritation.

H318: Causes serious eye damage.

Legal disclaimer: The above information is believed to be correct but does not purport to be all inclusive

[cont...]

and shall be used only as a guide. This company shall not be held liable for any damage resulting from handling or from contact with the above product.

Appendix E

Kingspan BioDisc Certificate

Certificate

353.02C02

Kingspan Water & Energy Ltd.
College Road North, Aston Clinton, Aylesbury, HP22 5EW, UK

EN 12566-3, Annex B
Small wastewater treatment systems for up to 50 PT

Small wastewater treatment system BioDisc +P
Rotating Biological Contactor (RBC) in a GRP tank with chemical dosing equipment

Test report PIA2019-353B47.02
This test certificate is a revised version of test certificate no. 353.02C01.

Nominal organic daily load (influent)	0.28 kg BOD_5/d		
Nominal hydraulic daily load	0.9 m^3/d		
Material	GRP		
Treatment efficiency		Efficiency	Effluent
(nominal sequences)	COD	95.9 %	31 mg/l
	BOD_5	98.0 %	6 mg/l
	N_{tot}*	71.1 %	17.9 mg/l
	NH_4-N*	92.1 %	3.0 mg/l
	P_{tot}	95.4 %	0.3 mg/l
	SS	95.6 %	15 mg/l
Electrical consumption	1.5 kWh/d		

**determined for temperatures ≥ 12 ° C in the bioreactor*

Performance tested by:

PIA – Prüfinstitut für Abwassertechnik GmbH
Hergenrather Weg 30
52074 Aachen
Germany

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

PIA - Sustainable Certification

geprüft - tested- testé

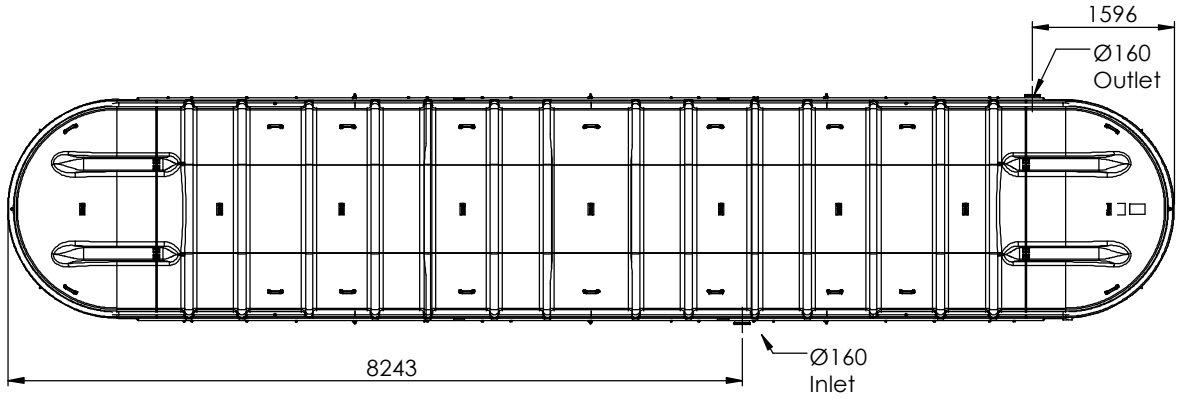
Notified Body No.: 1739

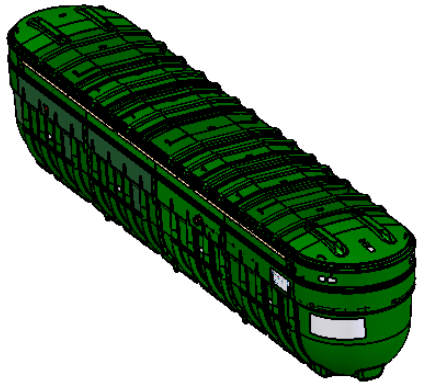
DAkkS Deutsche Akkreditierungsstelle D-PL-17712-01-00

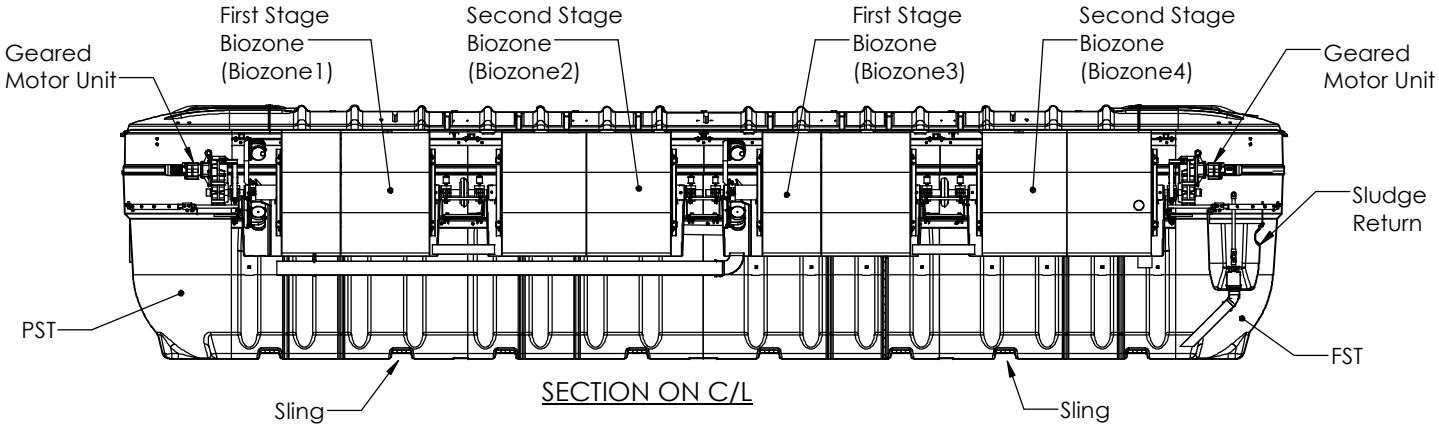
Martina Wermter December 2020

Appendix F

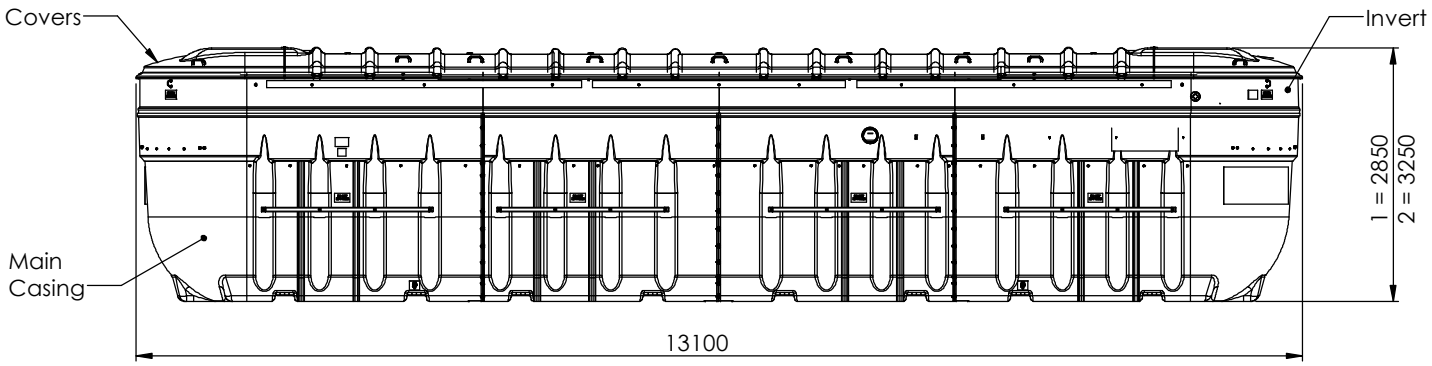
Kingspan BioDisc Drawings



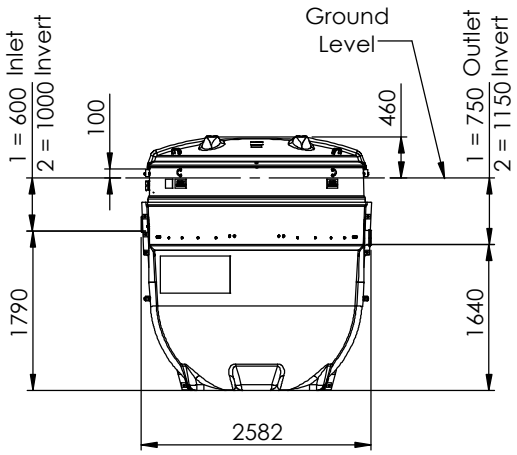




SECTION ON C/L



Notes:-
1. Inlet And Outlet Pipework To Be 6" PVCu
2. Unit Must Be Slung In Positions Shown.



Please Check with Kingspan Environmental For The Latest Issue Of This Drawing				
Issue	Date	Drawn by	Approved by	Description
01	21.08.17	T.Kelly		CC1392 - Initial Issue

Material : Various	Tolerance (unless stated) :
Finish :	Thickness : n/a
Weight : 5750 kg	Surface Area : m²
Modelled By : T.Kelly	

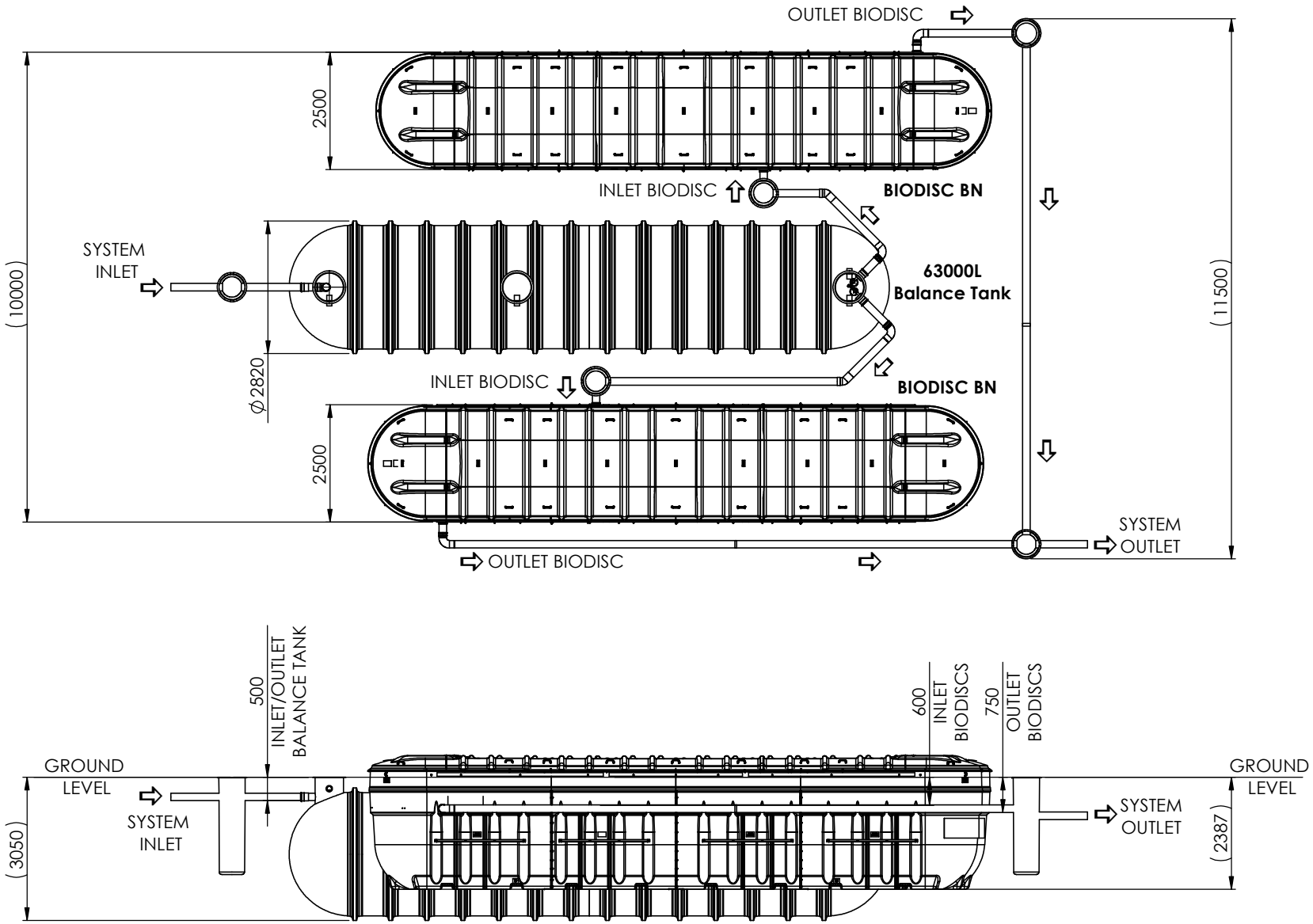
Drawing : DS1334 Page 1 of 1

BN BioDisc General Assembly - Sales Drawing

All Dimensions In mm | Scale: Do Not Scale | Third Angle Projection

R:\Engineering Projects\957A BioDisc BN\Two End Motor Gearboxes\DS1334

Kingspan Environmental



Please Check with Kingspan Environmental For The Latest Issue Of This Drawing				
Issue	Date	Drawn by	Approved by	Description
A	23.07.20	T.Kelly		Initial Issue - Sales Request

Material :	Tolerance (unless stated) :
Finish :	Thickness :
Weight :	Surface Area : m²
Modelled By :	

Drawing : SK941

Layout 2x Biodisc BN with 63000L Balance Tank

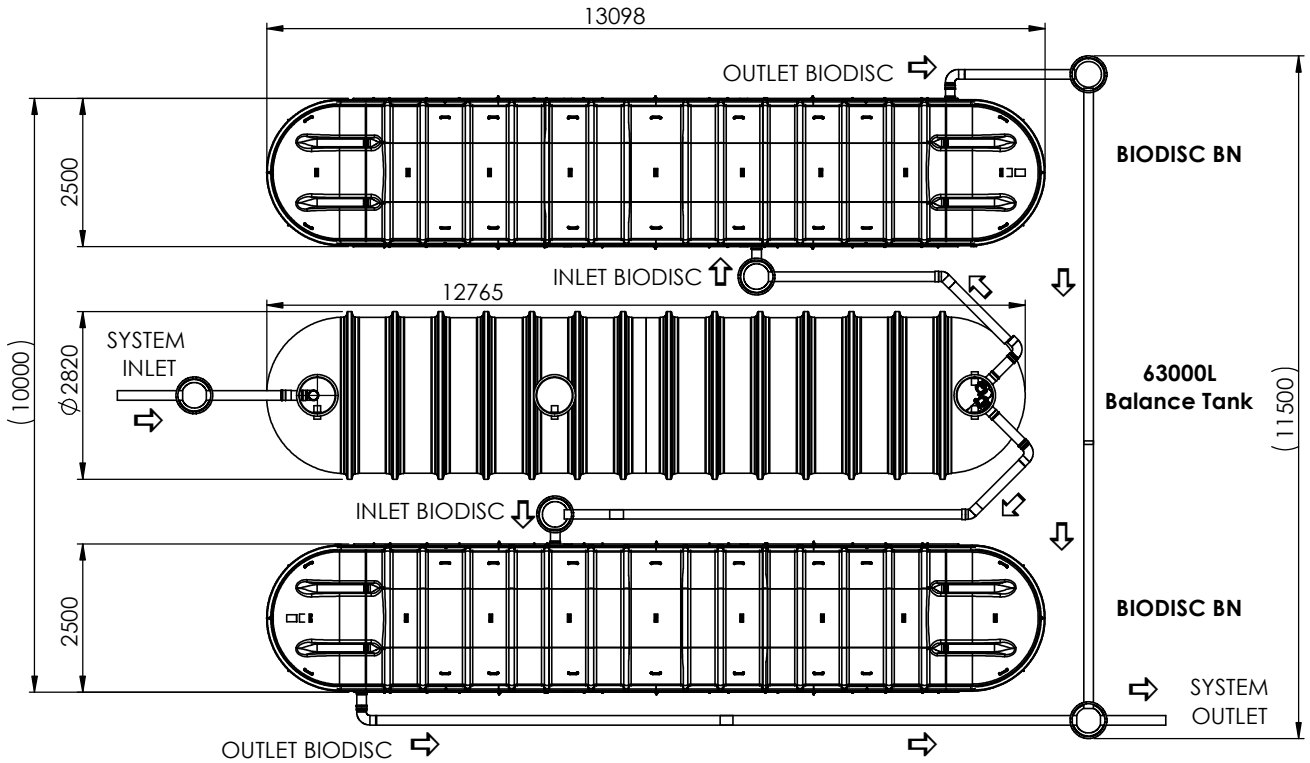
All Dimensions In mm

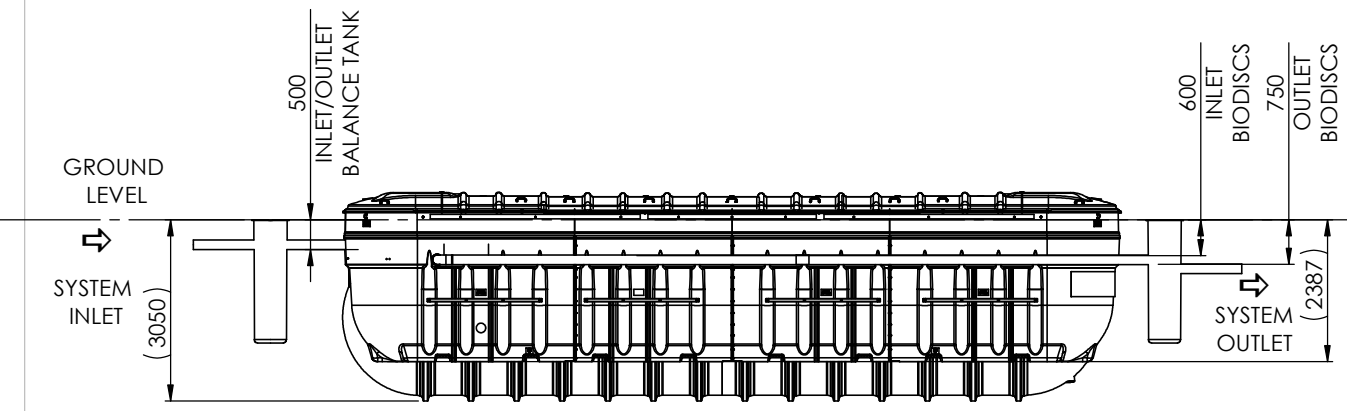
Scale: Do Not Scale

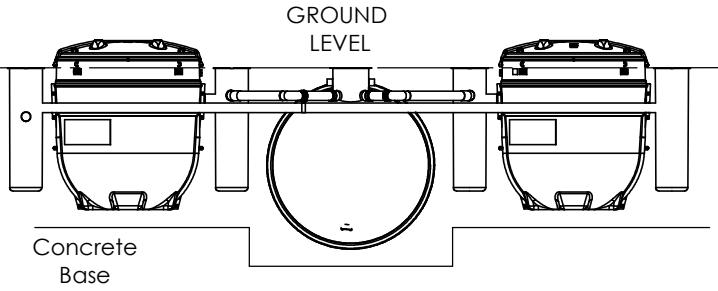
Third Angle Projection

Z:\Drawing Data\06 - Sketches\SK900-SK949\SK941\SK941

Kingspan Environmental







Please check with Kingspan Water & Energy for the latest Issue of the drawing				
Issue	Date	Drawn By	Approved By	Description
A	16/12/2022	Viaasan K		Intial Issue - Sketch Request

All Dimensions In mm

Scale: Do Not Scale

Third Angle Projection

A:\Wastewater\Engineering\Drawing Data\06 - Sketches\SK1000-SK1049\SK1046\SK1046

LN Number :	Tolerance (unless stated) :
Finish :	Thickness :
Weight :	Surface Area : m²
Modelled By :	Material :

Drawing : SK1046

Layout 2x Biodisc BN with 63000L Balance Tank

Kingspan

Appendix G

Hydrock Design Drawings

OS NORTH

GENERAL CONCRETE SPECIFICATION IN ACCORDANCE WITH BS EN 206-1 (BS 8500-1)		
TYPE OF MIX		(DC) DESIGN
PERMITTED TYPE OF CEMENT		BS 12 (OPC): BS 12 (RHPC): BS 4027 (SRPC)
PERMITTED TYPE OF AGGREGATE ((coarse & fine)		BS 882
NOMINAL MAXIMUM SIZE OF AGGREGATE		20 mm
GRADES:	C25 /30	REINFORCED & ABOVE GROUND WITH HOLDING DOWN BOLTS
	C25 /30	REINFORCED (EG. FOR HIGH WATER TABLE)
	C16 /20	UNREINFORCED (NORMAL CONDITIONS)
MINIMUM CEMENT CONTENT	C30	270 - 280 Kg/M³
	C20	220 - 230 Kg/M³
SLUMP CLASS		S1 (25mm)
RATE OF SAMPLING		READY MIX CONCRETE SHOULD BE SUPPLIED COMPLETE WITH APPROPRIATE DELIVERY TICKET IN ACCORDANCE WITH BS EN 12350-1
NOTE: STANDARD MIXES SHOULD NOT BE USED WHERE SULPHATESOR OTHER AGGRESSIVE CHEMICALS EXIST IN GROUND WATER		

REPORTED LOCATION OF EXISTING MANHOLE (ACCORDING TO THE DRAINAGE SURVEY). AN ALLOWANCE SHOULD BE MADE FOR AN ADDITIONAL 1050Ø MANHOLE WITHIN THIS AREA IF THIS MANHOLE IS FOUND TO BE NOT SUITABLE FOR RECONFIGURATION

REMOVE EXISTING OUTGOING LINE AFTER NEW TREATMENT PLANT IS IN OPERATION. MAKE GOOD BENCHING INSIDE EXISTING MANHOLE FOR NEW PIPE CONFIGURATION.

VEGETATION

ASSUMED EXISTING LEVEL. THIS MUST BE CONFIRMED AT THE EARLIEST BASED ON THE EXISTING GROUND LEVEL RIISING A

MH02
CL:67.000
IL:66.000
1500

ALL NEW MANHOLES TO BE TYPE 2 1050Ø WITH 600X600 C250 GRADE COVERS

SITE DRAINAGE RECORDS INDICATE AN EXISTING SECOND FOUL DRAINAGE LINE HEADING TOWARDS THE EXISTING TREATMENT PLANT AREA AT THIS CORNER. THE ROUTE IS UNKNOWN AND THE DRAINAGE SURVEY DOES NOT INDICATE ANY FURTHER INCOMING PIPE LINES. IF THIS EXISTING LINE DOES NOT CONNECT TO THE KNOWN INCOMING MANHOLE NEAR MH02 AN ADDITIONAL EXISTING DRAINAGE DIVERSION WILL BE REQUIRED TO MH02 COMPRISING, VEGETATION CLEARANCE, TWO ADDITIONAL MANHOLES AND 20m OF 150Ø PIPE. THIS REQUIRES FURTHER INVESTIGATION TO RULE OUT WHICH MUST BE COMPLETED BEFORE CONSTRUCTION COMMENCES.

RUBBLE

ALLOW FOR ALL POWER SUPPLY AND DUCTING WORKS TO EACH BIODISC UNIT, INCLUDING DUCT CHAMBERS AND ABOVE GROUND KIOSKS OR CABINETS

MANHOLE AND FOUNDATION SLAB DO NO CLASH DUE TO VARIATION IN THE LEVELS

EXTENT OF CONCRETE BASE AND SIDE FILL TO AL TANKS. REFER TO KINGSPAN 018316 INSTALLATION AND OPERATION GUIDELINES FOR BIODISC BN UNITS. CONCRETE TO BE C25/30, AS PER KINGSPAN SPEC. BASE TO BE LAID ON 225MM OF TYPE 1 SUB-BASE, LAID ON TERRAM 1000 GEOTEXTILE.

REFER TO KINGSPAN INFORMATION FOR DETAILS OF EXCAVATION, FOUNDATION, INSTALLATION AND BACKFILL REQUIREMENTS FOR THE BALANCING TANK AND BIODISC UNITS. INITIAL ALLOWANCE IS FOR:
300mm THICK C25/30 MASS CONCRETE BASE, ON 225mm SUB-BASE ON TERRAM 1000 GEOTEXTILE.

THE DESIGN OF THE FOUNDATION SLABS ARE **SUBJECT TO INSPECTION AND TESTING** OF THE FORMATION LEVEL (PLATE BEARING TEST) WHEN EXCAVATIONS WORKS ARE UNDERWAY.

BIODISC 1
CL=66.76 GL=66.30
BASE OF TANK=63.913
FOUNDATION=63.613

OUTLET BIODISC

BD1(OUT)
IL:65.550
1500

MH04
CL:66.300
IL:65.550

FOUNDATION SLAB DIMENSIONS SPECIFIED, WHERE A MINIMUM 300mm OFFSET FROM THE TANK EDGE IS APPRORIATE

SYSTEM INLET

BT1
CL:66.350
IL:65.850

MH03
CL:66.750
IL:65.900

INLET BIODISC

BD1(IN)
GL:66.600
IL:65.700
1500

ALL NEW 150Ø PIPEWORK TO BE OSMA ULTRARIB OR SIMILAR APPROVED PRODUCT

BALANCING TANK
CL=68.350
TOP OF TANK=68.00
BASE OF TANK=63.45
FOUNDATION=63.15

63000L Balance Tank

BT2
CL:66.350
IL:65.850

ALL NEW 150Ø PIPEWORK TO BE OSMA ULTRARIB OR SIMILAR APPROVED PRODUCT

ALLOW FOR ALL POWER SUPPLY AND DUCTING WORKS TO EACH BIODISC UNIT, INCLUDING DUCT CHAMBERS AND ABOVE GROUND KIOSKS OR CABINETS

INLET BIODISC

GL:66.300
IL:65.700

BD2(IN)
1500

ADDITIONAL INVESTIGATION IS REQUIRED, BEFORE CONSTRUCTION COMMENCES, TO DETERMINE THE LOCATION AND INVERT LEVEL OF THE EXISTING OUTGOING TREATED EFFLUENT LINE AND TO VALIDATE THE DESIGN

EXTENT OF CONCRETE BASE AND SIDE FILL TO AL TANKS. REFER TO KINGSPAN 018316 INSTALLATION AND OPERATION GUIDELINES FOR BIODISC BN UNITS.

BIODISC 2
CL=66.76 GL=66.30
BASE OF TANK=63.913
FOUNDATION=63.613

BD2(OUT)
GL:66.300
IL:65.550

OUTLET BIODISC

SYSTEM OUTLET

MH05
CL:66.200
IL:65.400

CONNECT TO EXISTING OUTGOING LINE

CONNECT TO EXISTING TREATED EFFLUENT PIPEWORK. EXACT LOCATION AND DEPTH IS NOT KNOWN. AN ALLOWANCE FOR AN ADDITIONAL 1050Ø MANHOLE AT A MAXIMUM OF 2.0m DEEP AND 10m OF 150Ø PIPE, TO COVER A POTENTIAL CONNECTION THAT MAY DIFFER TO THAT SHOWN

CONNECT TO EXISTING TREATED EFFLUENT PIPEWORK. EXACT LOCATION AND DEPTH IS NOT KNOWN SO AN ALLOWANCE FOR AN ADDITIONAL

PRIVATE DRAINAGE NOTES:

1. DRAWING TO BE READ IN CONJUNCTION WITH ALL OTHER RELEVANT PROJECT DRAWINGS
2. DOUBLE SEALED AND LOCKABLE COVERS TO BE SUPPLIED WHERE SPECIFIED ON MANHOLE SCHEDULE.
3. ALL PRIVATE DRAINAGE TO COMPLY WITH CURRENT BUILDING REGULATIONS, BS EN-752 DRAIN AND SEWER SYSTEMS OUTSIDE BUILDINGS AND OTHER RELEVANT BRITISH STANDARDS AND CODES OF PRACTICES.
4. ALL SEWERS TO BE LAID SOFFIT TO SOFFIT UNLESS OTHERWISE SHOWN.
5. IT IS THE CONTRACTORS RESPONSIBILITY TO LOCATE EXISTING SERVICES ON SITE ACCURATELY.
6. THE CONTRACTOR IS TO VERIFY THE LINE, LEVEL AND DIAMETER OF EXISTING SEWERS BEFORE COMMENCING DRAINAGE WORKS.
7. ALL LEVELS ARE TO OS DATUM UNLESS OTHERWISE STATED.
8. COMPLIANCE WITH HEALTH & SAFETY MATTERS ON ANY TRENCH/MANHOLE IS OBLIGATORY AND A PERMIT TO ENTER A CONFINED SPACE IS REQUIRED WHEN CONNECTING SITE DRAINAGE TO THE EXISTING PUBLIC SEWERAGE SYSTEM. A PERMIT TO ENTER A CONFINED SPACE WILL BE OBTAINED FROM THE SEWERAGE UNDERTAKER PRIOR TO THE WORKS COMMENCING ON ANY PUBLIC SEWERAGE SYSTEM.
9. WHERE SEWERS ARE TO BE CONSTRUCTED INSIDE THE RESTRICT TREE ZONE A SUITABLE TRESS PROTECTION BARRIER IS TO BE INSTALLED TO THE LANDSCAPE ARCHITECTS SPECIFICATION.
10. ALL SVP, SS AND RWP POSITIONS SHOWN ARE APPROXIMATE ONLY. FOR SETTING OUT OF SVP'S, SS AND RWP'S REFER TO ARCHITECTS DETAILED CONSTRUCTION DRAWINGS AND/OR M&E ABOVE GROUND DRAINAGE DESIGN. ANY DISCREPANCIES TO BE REPORTED TO THE ENGINEER PRIOR TO CONSTRUCTION.
11. ALL PRIVATE SWS DRAINS TO BE Ø150mm PLASTIC PIPEWORK LAID AT A MINIMUM FALL OF 1 in 100.
12. ALL LINEAR DRAIN OUTLETS TO BE Ø100mm AT MINIMUM FALL OF 1 in 100 TO MAXIMUM FALL OF 1 in 10.
13. ALL PRIVATE FWS DRAINS TO BE Ø100mm PLASTIC PIPEWORK LAID AT A MINIMUM SLOPE OF 1 in 40 UPSTREAM OF FIRST W.C. CONNECTION ON A RUN. AFTER CONNECTION OF 1st W.C. TO BE LAID AT MINIMUM SLOPE OF 1 in 80.
14. PIPEWORK TO HAVE BED AND SURROUND AS FOLLOWS:
    - UNDERNEATH PRIVATE DRIVEWAYS, PARKING AREAS WITH RESTRICTIONS TO PREVENT ACCESS BY VEHICLES IN EXCESS OF 7.5T AND PATHWAYS ADJACENT TO VEHICLE ACCESS TO BE;
      - COVER TO TOP OF PIPE > 0.9m - TYPE S or TYPE T (PLASTIC)
      - COVER TO TOP OF PIPE < 0.9m - TYPE Z (CONCRETE SURROUND)
    - UNDERNEATH DOMESTIC GARDENS AND PATHWAYS WITH NO POSSIBILITY OF VEHICLE ACCESS TO BE;
      - COVER TO TOP OF PIPE > 0.35m - TYPE S or TYPE T (PLASTIC)
      - COVER TO TOP OF PIPE < 0.35m - TYPE Z (CONCRETE SURROUND)
15. ALL DRAINAGE OUTFALLS AND CONNECTIONS TO EXISTING FEATURES/SYSTEMS SHALL BE CHECKED & SURVEYED AND THE RESULTS PASSED TO THE OVERSEEING AUTHORITY / CLIENT IN ADVANCE OF THE START OF DRAINAGE WORKS.

Rev	Date	Description	By	Ckd	App
03	27/02/23	Concrete Base Slab inspection and testing note added	RB	RB	RB
02	12/12/22	Concrete Base Slab and Side Fill Indicated	HV	RB	RB
01	30/11/22	First Issue	HV	HV	RB

Property Directorate
102 Petty France
London
SW1H 9AJ

Project Address	Coed-y-Paen, Monmouthshire, NP4 0TB
Security Classification	Official
Drawing Number	504560-4793-HYD-066-XX-DR-C-1003-S4-03-D0100
Project Name if applicable	HMP PRESCOED RCDP
Dwg Title	Sewage Treatment Plant HMP Prescoed Proposed Tank and Drainage Layout
E-PIMS	504560
BPRN No. if applicable	4793
Rev Ref	03
Drawn By:	HV
DATE:	30/11/2022
SCALE	1:50 @A1

Appendix H

Contact Details

HM PRISON Prescoed Date of Plan: 18/04/2022

RISK OWNER: The Governor HMP Usk & Prescoed

Amey RISK MANAGER: Site Manager Mr Chris Silcox

EXTERNAL EMERGENCY CONTACT DETAILS			
Natural Resources Wales 03000653000	Environment incident Hotline number: 0800 80 70 60 (24hr Emergency Hotline)		Environmental Health Monmouthshire County Council: 01633 644100
Fire Authority: 01443 232000	Non Urgent Police Number 101	Police: Pontypool 01633 838111 Police: Cwmbran 01633 838111 Police: Usk 01291 672017 or 01633 838111	Emergency Services: 999 or 112
Water Provider: Welsh Water, Clean water: 0800 0520130 Sewerage: 0800 0853968	Doctor: 01291 672633	*Water Management Contractor Clearwater Limited 01454 612000*	Gas supplier: Calor Gas 0345 7444999
Local Authority: Monmouthshire County Council 01633 644644	Electricity supplier: EDF 0845 300 9126, Power failure; Western Power Distribution 0800 052 0400	Waste management contractor :Biffa Skips/smiths	Amey Environnemental Manager :Seaton Price 07841 166660

Local Fire Safety Advisor: Dave Burton	*Trained Sewage Plant operators* *Kingspan* *0333 240 6868*	*Capita – Gas Safe Registered Gas fitters* *0207 7991525*	*Certificated water operatives* *WCS* *01454 299310*
Trained Oil Management / spillage operatives *Staff awaiting training*	*Location of spill kits for Oil & hazardous liquids* *Kept adjacent to the oil tanks*	Specialist contaminated compounds disposal agents Wales Environmental Ltd 01834 860777	*CFC refrigeration gases:* *The Jordan Group* *Refrigeration House* *Quebec Street* *Oldham* *OL9 6QL.* 0800 716523

SITE DRAINAGE PLAN Available in works office contingency file: Include the most up-to-date maps and plans, with foul and surface water drainage appropriately marked (red for foul, blue for surface water). The plan will also clearly identify storage areas and location of PPE (personal protective equipment, spillage kits and related tools, plant, shut off valves etc.

Appendix I

HMP Prescoed - Extracts from "POLLUTION INCIDENT RESPONSE PLAN (PIRP) – POLICY 2022/2023"

Establishment Governors are responsible for ensuring that their establishments operations do not pollute the environment and must have sufficient contingency plans are in place to prevent such pollution, should an accidental spillage / leakage occur.

The aim of this Policy is to commit Amey – to assist Governors by the provision of an effective Pollution Incident Response Plan (PIRP) within HMP Usk and HMP Prescoed

Aims and objectives

- To identify all potential sources of pollution under our control.
- To have in place routine procedures and controls that will effectively prevent pollution under normal circumstances.
- To identify risk of pollution where normal circumstances may not apply.
- To ensure staff dealing with any pollution incident are trained and understand their responsibilities in regard to prevention, containment, reporting, clean up and disposal of contaminated waste.
- To ensure staff contact Natural Resources Wales and those affected as soon as reasonably possible.
- To ensure that adequate equipment and PPE is available near to risk areas to contain the situation until specialist help can arrive.
- To carry out periodic exercises to test procedures and equipment.
- To review this policy annually or when legislation changes.

Strategies

- To identify all potential sources of pollution under our control.
  - Amey will survey all potentially polluting substances whether solid, liquid or gas under its control and identify where such substances are stored and in what quantities. The results of the survey will be detailed in the site-specific section of this policy.
- To have in place routine procedures and controls that will effectively prevent pollution under normal circumstances.
  - Amey will survey all potentially polluting substances whether solid, liquid or gas under its control and identify where such substances are stored and in what quantities. Storage and transport of all such substances will be individually risk assessed and where deficiencies are found any perceived defects will be remedied. The approved correct method of storage and transport will be detailed in the site-specific section of this policy.

- To identify risk of pollution where normal circumstances may not apply.
  - Amey will survey all potentially polluting substances whether solid, liquid or gas under its control and identify, by use of risk assessment, potential hazards and incidents that may apply, during storage, transport and use. The potential risks will be detailed in the site-specific section of this policy.
- To ensure staff dealing with any pollution incident are trained and understand their responsibilities in regard to prevention, containment, reporting, clean up and disposal of contaminated waste.
  - Amey will use the risk assessments which identify the potential hazards and incidents that may apply, during storage, transport and use of potentially polluting substances and create site-specific Pollution Incident Response Plans for each potential incident. These plans will be communicated to all Wales Prisons (emg) staff who may be required to deal with any potentially polluting incident and where appropriate specialist training will be provided.
- To ensure staff contact the correct authorities and those affected as soon as reasonably possible.
  - Amey will provide site-specific contact details as part of this policy for any agencies that will need to be contacted for advice or incident control.
- To ensure that adequate equipment and PPE is available near to risk areas to contain the situation until specialist help can arrive.
  - Amey will use the risk assessments which identify the potential hazards and incidents that may apply, during storage, transport and use of potentially polluting substances and create site-specific areas where the correct PPE and containment equipment will be stored readily available (subject to security conditions) for use as near as possible to each potential source.
- To carry out periodic exercises to test procedures and equipment.
  - Amey will carry out at least one contingency exercise every 6 months in each establishment, to test the effectiveness of the PIRP, the competence of staff and the effectiveness of the equipment provided.
- To review this policy annually or when legislation changes.
  - Amey will review this Policy at least every 12 months and will make such changes as may be necessary to comply with changes in legislation or should an incident or exercise identify weaknesses in the plan.