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Lawrenceville, Georgia 30045
www.CrystalStream.com

TECHNICAL AND OPERATING DOCUMENTATION

ESK

HIGH PERFORMANCE COALESCENCE SEPARATOR OF PETROLEUM DERIVATIVE SUBSTANCES

MANUFACTURER & SUPPLIER:

ECOL Ltd Sp. z o.o.
ul. Równa 2
80-067 Poland

THE DOCUMENTATION INCLUDES:

- ESK Separator – System Description
- Assembly Instructions
- Operating Instructions

GDAŃSK – April 2009

ESK SEPARATOR

ASSEMBLY INSTRUCTIONS

I. PREPARATION OF THE FOUNDATION TRENCH

Excavation preparation should be in accordance with standard precast installation requirement for your specific region. Contractor should consult with project engineer to determine any additional installation needs based on soil conditions.
Don't forget to provide access of vehicles and cranes to the assembly site when making the foundation trench for delivery and installation of the Separator.

II. ASSEMBLY

II.1. Assembly of the Separator Body

The body should be assembled with the use of a crane with a loading capacity and reach that allow safe assembling of the unit in the excavation, while considering the specific assembly conditions.

II.1.1. Assembly of the Precast Structure

Position the structure in the excavation along the axis of the sewage line and check elevation and correct orientation of the inlet/outlet (marked on the structure), and the vertical position of the structure as they are critical to correct operation.

All exterior joints should be sealed, grouted and wrapped with manufacturer recommended materials.

When assembling the body, it is recommended to fill the trench around the assembled and sealed body sections with gravel, per local installation requirements, up to the height that enables laying and sealing the next section continuing until reaching the elevation of the bottom of the pipe.

If there is no inlet and outlet opening prepared in the supplied body sections then make them with a drilling rig at appropriate elevation marked on the structure after assembling the structure.

Backfill of the structure should be in accordance with regional and ASTM standards for the specific structure type.

Assembly of the internal fittings and components should be in accordance with ESK Separator Drawings.

II.2. Connecting the Piping

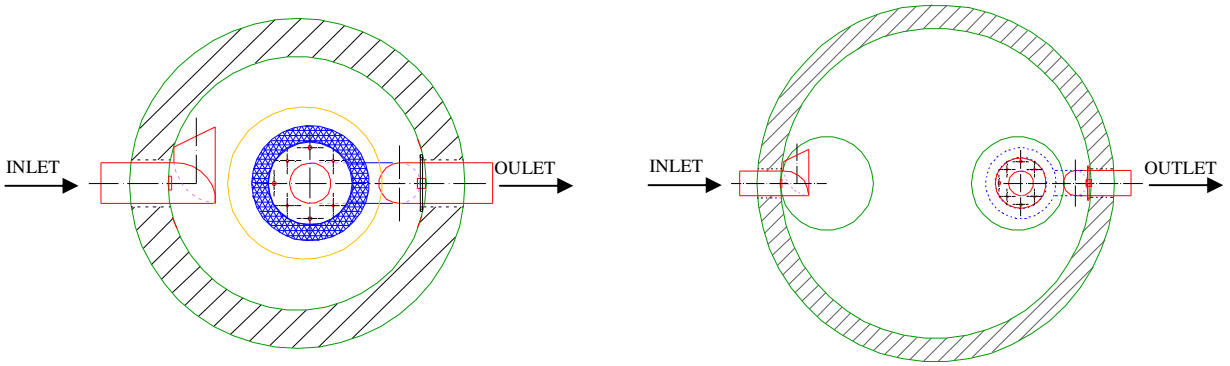
II.2.1. Connecting the Piping to the ESK Separator

Inlet/Outlet pipe stubs are provided, which are adapted to connect PVC smooth wall pipes. Connection of other pipe types is made by means of appropriate connectors. Please verify the need for a fernco coupler as required by project needs. This coupler is to be supplied by the contractor and is not included in the package price.

II.3. Assembly of the Superstructure Sections and Cover

The separator structure can be built up with concrete riser sections in order to fit the cover to finished grade. Tightness between the sections can be achieved by using rubber gaskets and/or waterproof mortar.

After assembling the superstructure sections and sealing them, put the last section of the separator structure on the mortar layer, in such a way that **the access cover is placed over the coalescence column** (this will allow pulling the coalescence element out during inspection and cleaning of the separator). If the cover has 2 inspection openings then the opening located farther from the cover edge should be placed directly over the coalescence column (refer to project drawings.)



When the structure is cast in one piece monolithically, then put the access cover directly on the mortar layer over the coalescing column.

III. FILLING THE TRENCH

Backfill of the excavation should be accomplished by compacting it in layers after completion of the installation. Be extremely careful when back filling the excavation in order to avoid destruction of piping connections to the unit and avoid uneven soil pressure on the tank walls.

VERY IMPORTANT!

After assembly, lift the float and fill the separator with clean water to overflow the inlet opening. You can slowly lower the float only after filling the separator up. Otherwise, the float can prematurely close and dam the wastewater.

ESK COALESCENCE SEPARATOR
OPERATING INSTRUCTIONS

The ESK coalescence separator is designed for high performance separation of petroleum derivative substances from stormwater runoff in water distribution systems and process water from car wash stations before introduction of the water to any receiver or even fuelling stations. The separator must operate together with a sediment separation tank, where any suspended sediment is trapped. The separator should be sized according to the local conditions and requirements.

EQUIPMENT INSPECTIONS

Both the separator and sludge settling tank should be inspected for the quantity of the trapped petroleum derivative compounds and deposits. Results of each inspection should be noted in the **Separator Inspection Card**.

Recommended Extension and interval of inspections are shown in the Table below:

Inspection interval	Inspection Items	Possible results/notes	Recommended maintenance work
Monthly	Oil film thickness	oil film thickness exceeds 10 cm	oil to be removed by a licensed company
	inspection of sediment level in the settling tank	level of sediment above half the height of the storage level	sediment to be removed by a licensed company
Quarterly	inspection of coalescence material	contamination noted	cleaning of the material
	inspection of the float	contamination noted	cleaning of the float

Check thickness of the separated film of petroleum.

Check deposit content in the settling tank with a measuring rod or disc probe.

If any defects of the separator fittings are discovered during inspection, make notification so repairs may be made.

For replacement parts contact CrystalStream Technologies at 1-800-748-6945.

DISPOSAL OF THE TRAPPED PETROLEUM AND SUSPENDED MATTER

The disposal of the trapped impurities depends upon local requirements. It is recommended to clean the separator and settlement tank totally at least 2 times per year. The units should be cleaned each time you note shut down of the flow or collection of big amount of petroleum substances (see the Table above).

The separated petroleum compounds and sludge should be removed by a waste removal truck with a pump and flexible hose. The company that takes the contamination away should be appropriately licensed.

Each cleaning of the separator is to be noted in the Separator Inspection Card.

In order to clean the separator and settlement tank correctly, proceed as follows:

1. Pump away the separator and the settlement tank contents using a waste Vacuum Truck.
2. Clean the separator and settlement tank walls and bottoms.
3. Clean the coalescence element through intense washing with a water jets, **after having removed them from the separator**. Do it in such a way that water contaminated by washing the components is directed into the oiled waste treatment system.

Fill the separator with clean water after cleaning, until it overflows into the outlet opening. Lower the float slowly after filling the separator and then insert the coalescence element.

Correct operation of the separator, cleaning intervals and/or coalescence element replacement intervals depend upon proper maintenance and regular disposal of sediment collected in the settlement tank (i.e. less sediment goes into the separator and contaminate the coalescence element).

SEPARATOR INSPECTION CARD

A sample of a Separator Inspection Card is attached to these instructions. It should be completed after each inspection and cleaning of the unit. Send a copy of the Card to the following address or FAX after the first year of operation of the equipment:

Attn: ESK Report
CrystalStream Technologies
2090 Sugarloaf Parkway, Suite 135
Lawrenceville, Georgia 30045
Fax: 770-979-6954

In case of any ambiguity or doubts concerning operation of the ESK separators, please call us at 800-748-6945

Correct operation of the separator as described in this document include, but are not limited to, proper and timely inspections and disposal of contamination trapped in the separator and settlement tanks connected to it, should be noted on the Separator Control Card.

Notes:

- **In order to achieve guarantee, you have to meet the requirements specified in the Technical and Operating Documentation including obligatory inspections of the unit each month. The inspection, performed by authorized personnel, must be documented in the operation logbook.**
- **The user should also observe local and national regulatory requirements for conditions that are to be met when introducing waste to water or soil and where operation inspections of the treatment devices are required to be performed at least twice a year.**

Safety Instructions for Operation, Repair and Maintenance of Petroleum Derivative Substance Separators

When performing any servicing, repair and/or maintenance work, observe the safety regulations and in particular:

1. Repair and assembly work should be performed under supervision of a person with appropriate authorizations.
2. The workplace should be fenced or protected by safety barriers and be correctly marked and lit at nights; substitute lighting should be provided in case of power failure.
3. When work is performed on streets and roads, the workplaces should be protected against access of unauthorized persons and marked accordingly to the traffic regulations.
4. Personnel working on the road should wear safety jackets or clothing with elements attached permanently to it, made in safety color as required by local regulations.
5. Work inside the separators is to be performed following industry local and national safety requirements for confined space entry.
6. Personnel working in the separator should be protected against unexpected rise of waste level before beginning work.
7. Time of work in the separator should be agreed with the unit owner in order to stop waste drainage during work.
8. There should be permanent communication provided between those working in the separator and personnel outside.
9. Cover of a separator located in the street or pavement should only be opened after traffic has been directed from the work area.
10. Open the separator covers by means of hooks made of intrinsically safe material.
11. Open flames, sparks, or other heat sources should be clear of work area prior to opening of separator.
12. The separator should be ventilated before entering it.
13. Personnel working in the separators should wear personal protective equipment as required by local and national regulations.
14. The personnel watching at the manholes must not leave their post throughout the whole time when work is performed inside the separator.
15. All equipment, tools and materials should be removed from inside of the separator after finishing work and the workplace should be put in order and all life and health hazards for the workers and outsiders removed.
16. Personnel should be out of the separator during pump-out process.
17. The separator should only be cleaned according to the operating instructions provided by the unit manufacturer, i.e. CrystalStream Technologies.

SEPARATOR INSPECTION CARD

To be completed after each inspection and cleaning of the separator

ESK Coalescence Separator.....

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Separator Type

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Location (rainwater, car wash, etc.)

Location (address and facility)

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Owner Name and Address and Phone Number

Item	Date of inspection	Status of the equipment	Oil qty in the separator in	Sediment qty in the separator in	Sediment qty settlement tank in	Additional notes (e.g. notes on separator and/or settlement tank cleaning)	Inspector's signature
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