Robbie Gannon Site Services
VAT No: 4576567G

Specialising in Sewage Treatment Groundwork's
Percolation Areas, Polishing filters
Sales, Service and Maintenance.

Ardrahan Housing Development,

Rathlin Housing Estate,

Ardrahan,

Co Galway.

Percolation Polishing Filter Design Details

Final Report

Report for Galway County Council

June 6th 2022

Outline

The polishing filter we propose for this project is based on the information supplied, through detailed investigative work, carried out by Blue Rock Environmental (BREL), and contained in the Tier 2 Hydro-geological assessment carried out by them on this site. (see attached)

The details of the existing treatment plant on site was provided by the company that supplied and installed the system, EPS, Ballyhaunis, Co. Mayo. (see attached)

Existing system on site

The existing system on site consists of a waste water treatment Plant that is designed to cater for 100 PE and to comply with the terms of the existing discharge licence requirements. However, from the investigative work carried out by Blue rock Environmental, it is clear that there are problems with the plant, and the percolation area /polishing filter was not constructed to EPA standards. It is critically important that the plant is treating the effluent to a high standard prior to disposal to the percolation field as poor-quality effluent will shorten the life expectancy and operational capacity of the polishing filter.

In section 5.2.1 of the BREL report it defines the existing construction of the polishing filter. A key finding is that the percolation area construction is a layer of distribution gravel overlain on undisturbed stiff subsoil measuring 26m in length x 24m in width. The pipe distribution pipe network of the percolation area was not adequate to give even distribution over the entire polishing filter of 624m^2. The pump line from the plant to the polishing filter was broken and discharging into the French-drain surrounding the filter.

Proposal

1. Increase the total area of the polishing filter

The total hydraulic loading proposed for this site which will include the proposed additional houses and rainfall recharge is 15.5m^3per day. When divided by the polishing filter total area, this equates to 24.8ltrs per m^2 density of a loading rate. In my opinion, the desired loading rate is under 20ltrs per m^2 density. By increasing the footprint of the polishing filter to 850m^2 this would reduce the loading rate to 18.2ltr per m^2 density.

Polishing filter area	Current (624m^2)	Proposed (850m^2)
Total Hydraulic loading	15.5m^3	15.5m^3
Loading rate on polishing filter	24.8lts / m^2	18.2lts / m^2

Polishing filter construction

The existing filter is effectively a gravel distribution bed only and is not a soil or sand filter as originally understood. The filter was also not constructed in line with the EPA Code of Practice, 2009 as it would appear the filter was constructed circa 2007 and prior to the publication of the 2009 guidance. The existing filter will need to be removed completely. I would advise increasing the size of the filter to 850$m^2$to keep the loading rate under 20ltr per mtr^{2}density. The addition of enhanced filtration via puraflo modules would ensure a good quality effluent being discharged to the polishing filter, and greatly improve the life expectancy of the polishing filter.

Based on the findings of investigation work by Bluerock Environmental contained in the Tier 2 Hydro geological Assessment section 5.2.1 the subsoil's beneath the filter area described as very stiff slightly sandy gravelly silt with cobbles and limestone small boulders resulting in slow to poor permeability subsoil's .

As part of the construction of the polishing filter, improvement works will have to be carried out on this ground. We propose to excavate slit trenches on the base of the proposed polishing filter to a depth of 3m below base level of the polishing filter area, and back fill with optimum T20 sand gravel material this will improve the vertical mobility of water through the stiff subsoil's.

It is proposed to construct the new filter in the same location of the old one and increase the size from 624m^2 to 850m^2 Bunding on all sides will be required to prevent side leakage and lined with a waterproof liner. All existing material will have to be removed and can be used to landscape around the new filter as there are no signs of contamination in this material. Imported sand gravel will be used to build the filter to 1mtr high with an optimum T value of 20. A sample chamber can be installed at this level to facilitate monitoring of water quality. As can be seen from the cross section drawing sheet no RTE 1003 there is 150 to 200 mm clean washed 20mm distribution gravel beneath the pressure grid network

Distribution of effluent will be by means of a pressure grid and will be divided into 4 zones which will ensure even distribution of final effluent over the entire polishing filter. A further 100mm of 20mm stone will cap the pipe work and covered with a terram filter fabric and finally a 300 mm soil cap and landscaping to finish

2. Install a secondary filtration system

Install secondary filtration prior to disposal to a polishing filter; this can be by way of peat fibre modules, or coconut fibre modules, (see layout drawing no 4 in cad file attached).

(See attached specification sheets for Puraflo and coconut filters)

Option of Tertiary Treatment Prior to Polishing Filter

There are two options that can be used in this case, Puraflo peat fibre modules or Coconut Fibre modules. These systems operate where effluent from a properly functioning treatment plant is pumped through a pipe system in the module and let filtrate down through the fibre, collected at the base into a holding tank, and from there it is pumped through a zoned pressure grid in the polishing filter for final disposal to ground. (See attached specification sheets)

A proposed layout of the two systems are in the drawings sheet no RTE 1001 Puraflo mods and sheet no RTE 1002 coconut filter pods.

Either system will fit in the space between the Existing Treatment Plant and the proposed polishing filter. The collection tank can be located inside the treatment plant compound.

Please find attached

- Blue Rock Hydro-geological Assessment – Tier 2
- EPS Treatment Plant Information
- CAD file
- Design specification sheets.

_____

Yours Sincerely

Riverville, Craughwell, Co. Galway. H91YWV5 E-mail: robbiegannon2@gmail.com Mob: 087-2450739

EXISTING SECURITY FENCE AROUND TREATMENT PLANT

EXISTING TREATMENT UNITS

EXISTING PUMPING STATION

EXISTING INLET MANHOLE

EXISTING FOUL RISING MAIN TO BE REMOVED

OUTLINE OF EXISTING PERCOLATION AREA

LOCATION OF EXISTING ESB POLE

EXISTING BOUNDARY STONE WALL

EXISTING TREATMENT PLANT

EXISTING BOUNDARY STONE WALL

EXISTING FOUL FOUL SEWER FROM ESTATE TO TREATMENT PLANT

BOREHOLE LOCATION
COVER LEVEL : 29.700m

EXISTING GRAVEL ACCESS ROAD FROM ESTATE TO TREATMENT PLANT

BOREHOLE LOCATION
COVER LEVEL : 29.478m

MH 0003

MH 0002

N

General Notes

No.	Revision/Issue	Date
0	Draft Issue	02/22

Client

Galway County Council
Galway

Drawing Title

Rathlin Housing Estate,
Ardrahan
Site Survey

Drawn By

SkyScope
Ballabaun Loughrea

Status	Sheet
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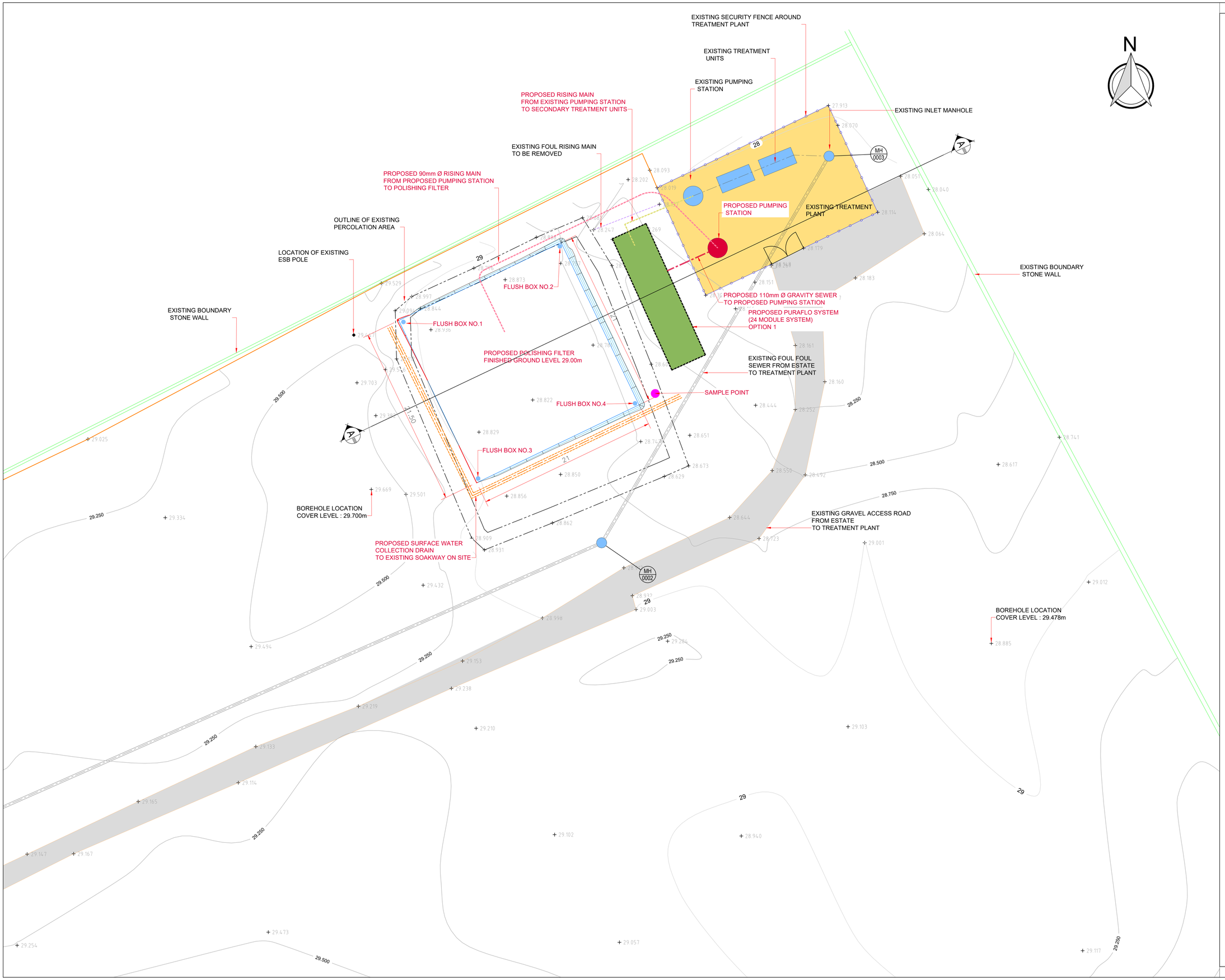
Scale: 1:200	



General Notes

No.	Revision/Issue	Date
0	Draft Issue	02/22

Client

Galway County Council
Galway

Drawing Title

Rathlin Housing Estate,
Ardrahan
Proposed Works - Option 1

Drawn By

SkyScope
Ballabaun Loughrea

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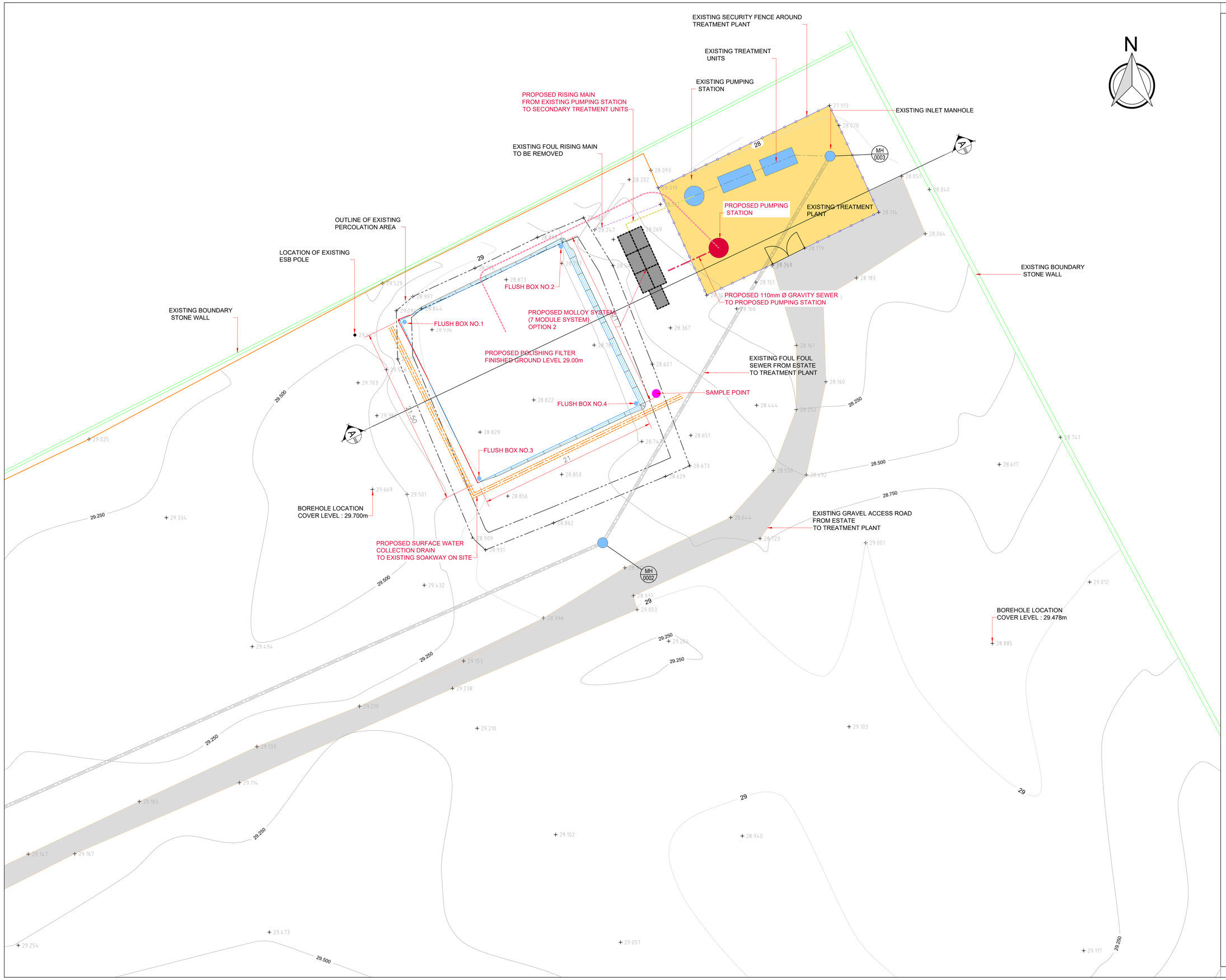

General Notes

No.	Revision/Issue	Date
0	Draft Issue	02/22

Client

Galway County Council
Galway

Drawing Title

Rathlin Housing Estate,
Ardrahan
Proposed Works - Option 2

Drawn By

SkyScope
Ballabaun Loughrea

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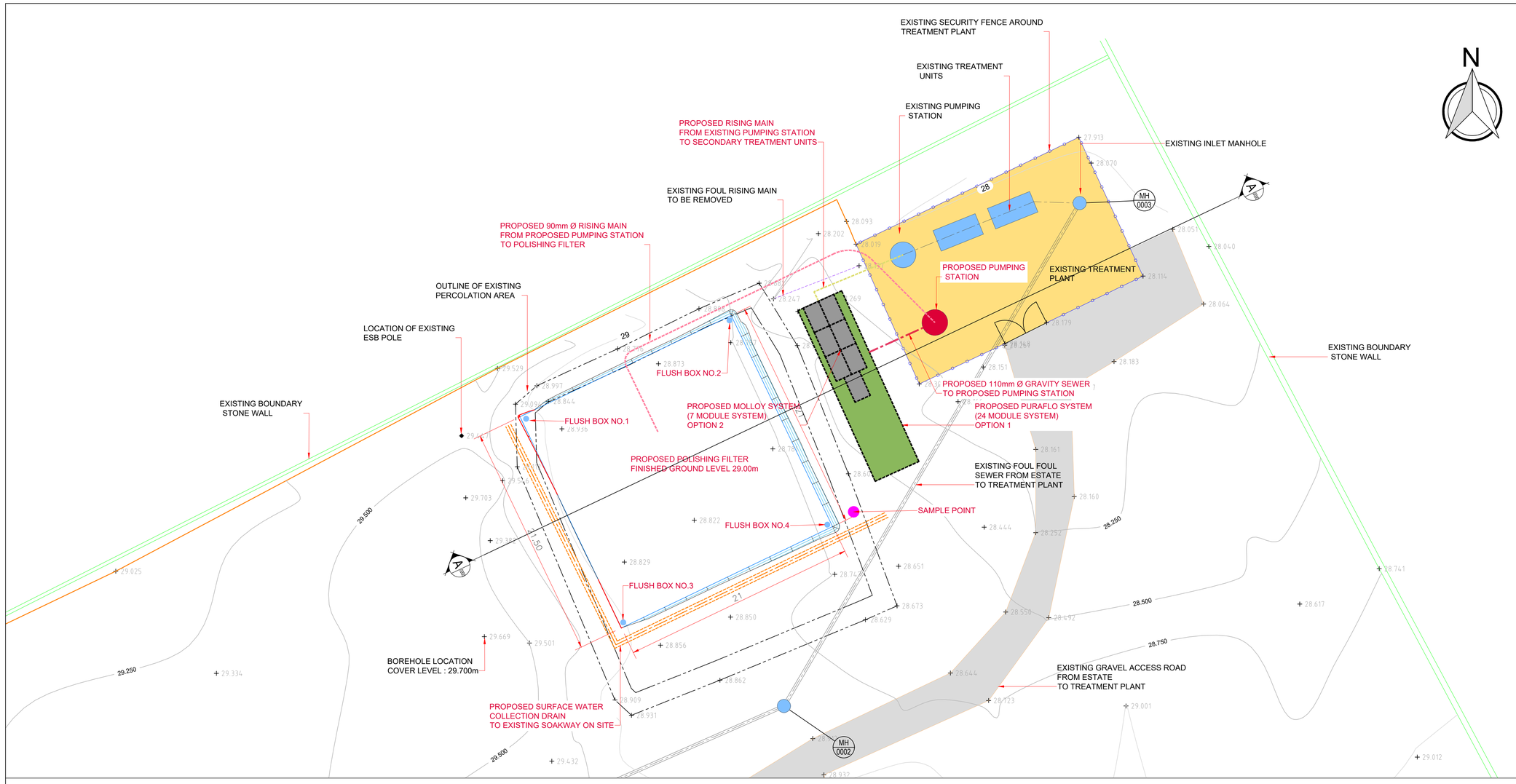
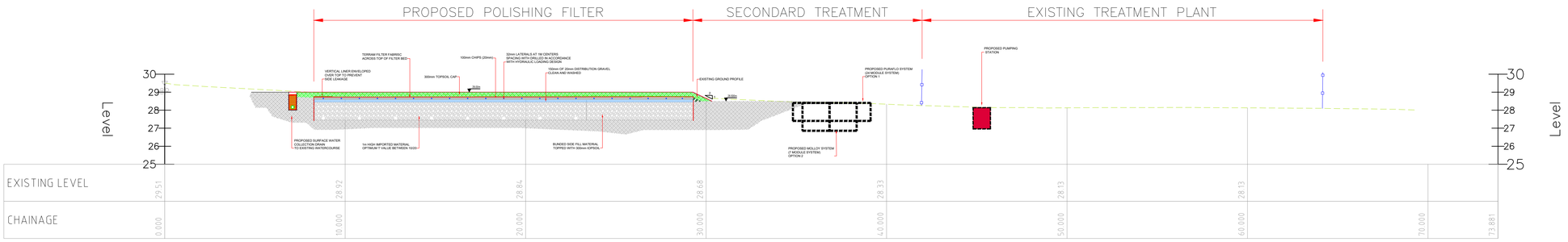


AA - LONGSECTION
SCALE: H 1:200,V 1:200. DATUM: 25.000



General Notes

No.	Revision/Issue	Date
0	Draft Issue	02/22

Client
Galway County Council
Galway

Drawing Title
Rathlin Housing Estate,
Ardrahan
Proposed Site Section A-A

Drawn By
SkyScope
Ballabaun Loughrea

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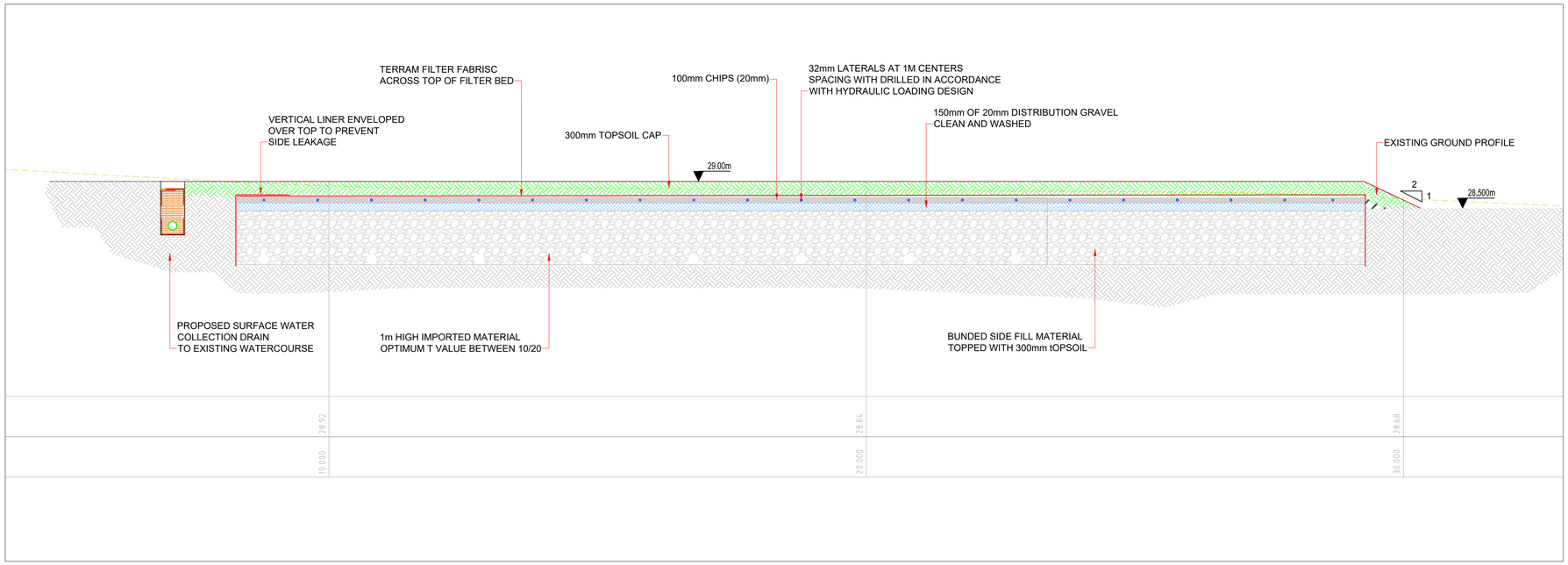

General Notes

No.	Revision/Issue	Date
0	Draft Issue	02/22

Client

Galway County Council
Galway

Drawing Title

Rathlin Housing Estate,
Ardrahan
Proposed Filter Details

Drawn By

SkyScope
Ballabaun Loughrea

Status	Sheet
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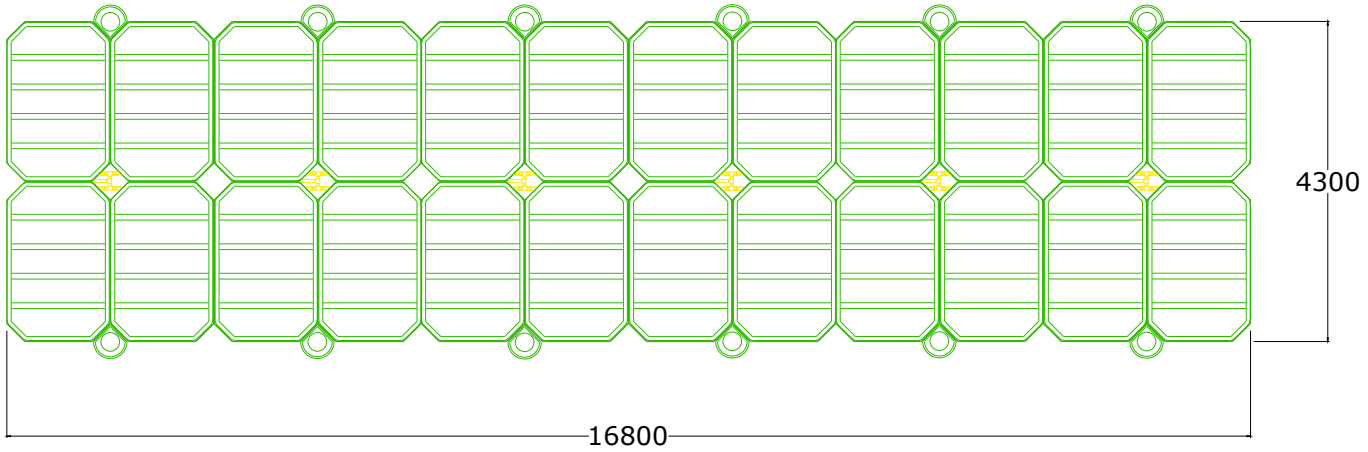
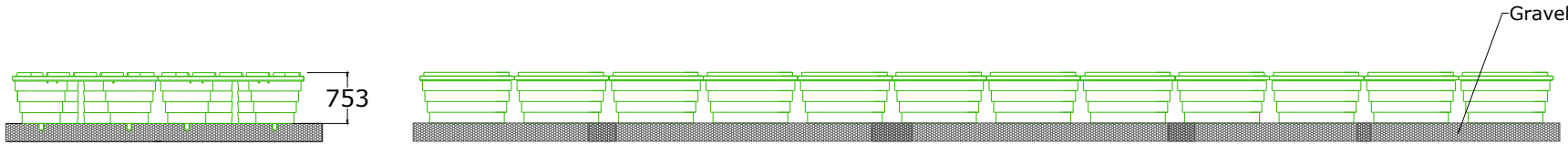
Puraflo System (24 Module)



The Puraflo modules are laid on a gravel bed.The gravel bed must be 300mm deep and sized in accordance with the EPA Code of Practice.



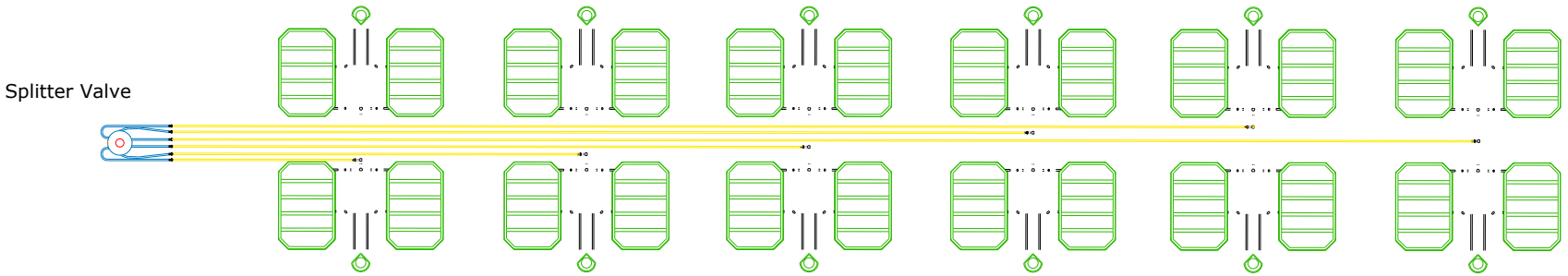
NOTE : Each module has an expected weight of 700 kg.
This weight can vary depending on moisture content.

DRAWN BY	DRAWING DATE (DD/MM/YY)	EFFECTIVE D ATE: (DD/MM/YY)	PRODUCT NAME:	PRODUCT NUMBER:	ACC NUMBER:
B Sheehan	26/08/2017	26/08/2017	Puraflo Tertiary (24 Module) Sales Drawing	221367	N/A

TOLERANCE: N/A	UNITS:mm	SCALE: NOT TO SCALE	DRAWING TYPE: F. G	
MATERIAL: Various	DRWG NO: N/A	TANK REVISION:000	REV. NO. 000	PAGE SIZE:A4
JOB NUMBER: N/A	WEIGHT (KG): 16800	PROJECT NO:243	ECO NO:	COUNTRY: Ireland

TRICEL

Puraflo System
(24 Module)



NOTE : Each module has an expected weight of 700 kg.
This weight can vary depending on moisture content.

DRAWN BY	DRAWING DATE (DD/MM/YY)	EFFECTIVE D ATE: (DD/MM/YY)	PRODUCT NAME:	PRODUCT NUMBER:	ACC NUMBER:
B Sheehan	26/08/2017	26/08/2017	Puraflo Tertiary (24 Module) Exploded	221367	N/A

TOLERANCE: N/A	UNITS:mm	SCALE: NOT TO SCALE	DRAWING TYPE: F. G	
MATERIAL: Various	DRWG NO: N/A	TANK REVISION:000	REV. NO. 000	PAGE SIZE:A4
JOB NUMBER:N/A	WEIGHT (KG): 16800	PROJECT NO: 243	ECO NO:	COUNTRY: Ireland

TRICEL

Certificate

398.01C01

Molloy Environmental Systems
Clara Road, Tullamore, Co. Offaly, Ireland

EN 12566-7, Annex A
Small wastewater treatment systems for up to 50 PT

Small wastewater treatment system Chieftain Coco filter
Tertiary treatment

Test report PIA2021-T7-398S16

Evaluation of the nominal sequences of the 16-week testing

Organic daily load (influent)	0.02 kg BOD_5/d		
Hydraulic daily load	1.2 m^3/d		
Material	Polyethylene		
Treatment efficiency		Efficiency	Effluent
	COD	61.9 %	31 mg/l
	BOD_5	78.4 %	4 mg/l
	NH_4-N	87.9 %	2.5 mg/l
	SS	90.4 %	5 mg/l

Evaluation of the complete 16-week testing

Electrical consumption	0 kWh/d
Number of desludging	0
pH	6.8 – 7.3

Tested by:

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

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

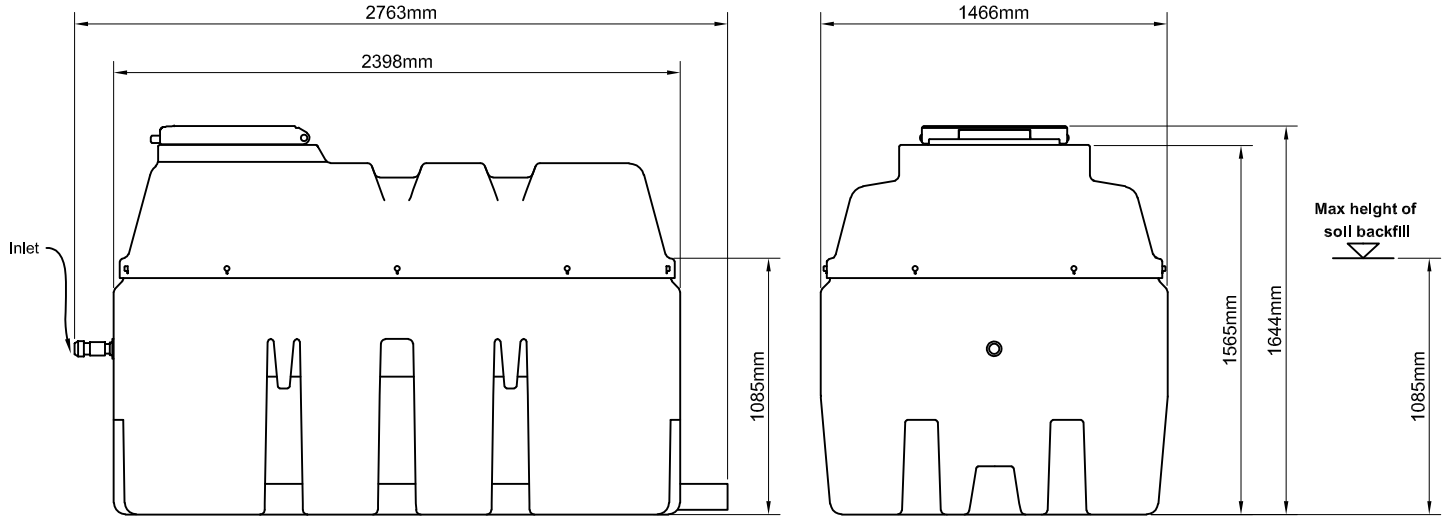
PIA - Sustainable Certification

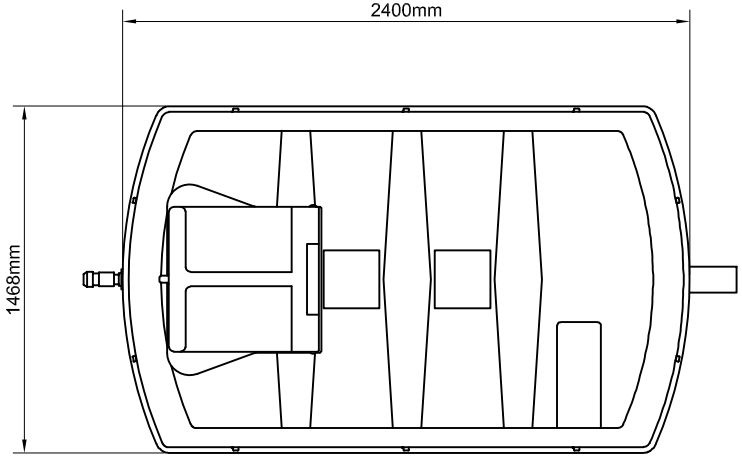
geprüft - tested- testé

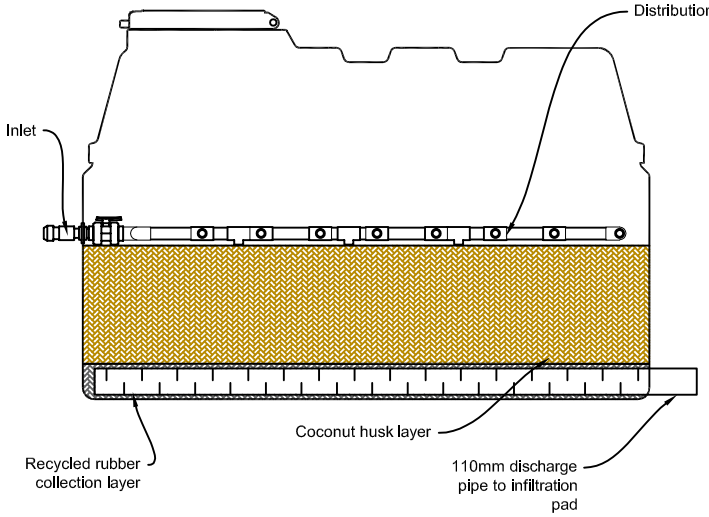
Notified Body
No.: 1739

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

Martina Wermter May 2021







Notes:

- Observe all safety regulations in regard to excavation and lifting requirements. Never leave opening uncovered or unattended at any time
- Specify any specific requirements prior to ordering. All civil works by customer
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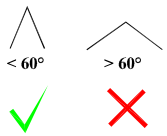
- The construction of all soil polishing filters should comply with the applicable soil characterisation and site suitability reports as well as the EPA CoP

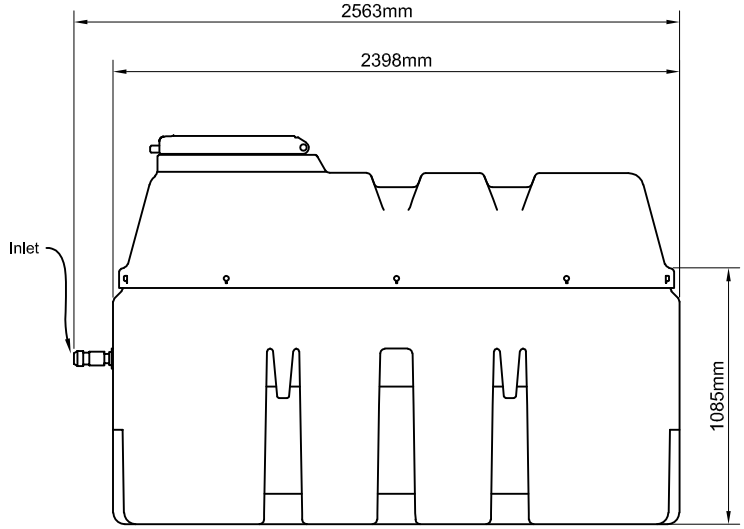
Tank lifting limitations:
Max chain angle < 60°

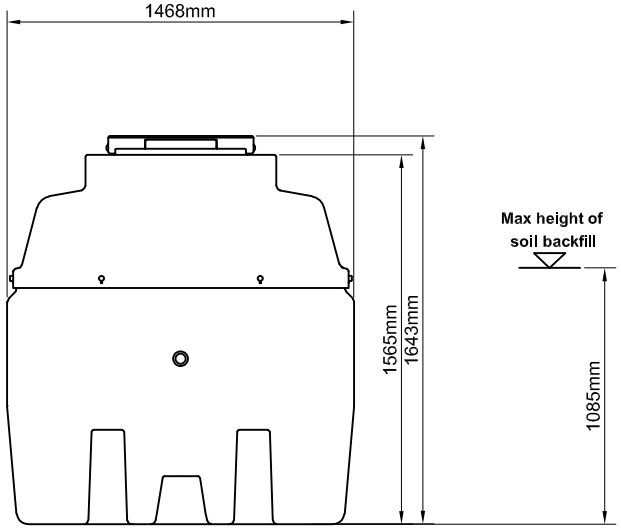


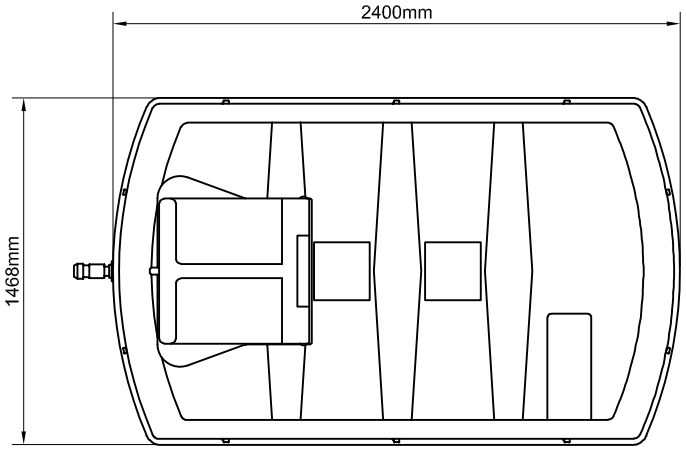
Damage caused by incorrect lifting is the responsibility of others

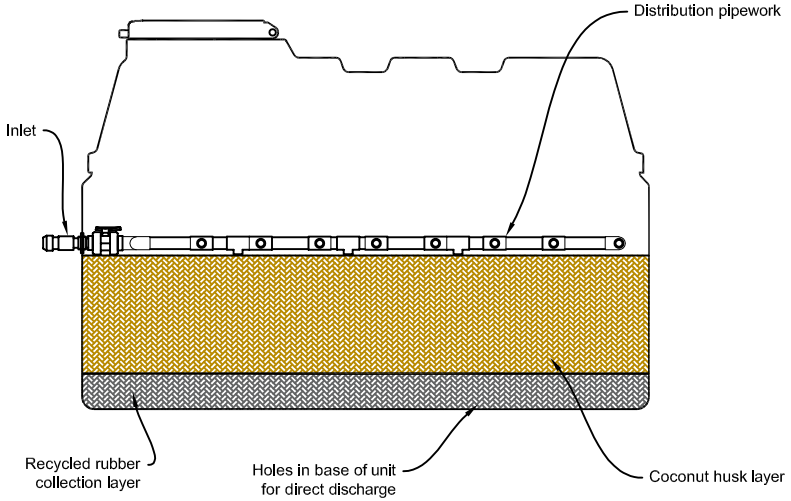
MOLLOY
ENVIRONMENTAL SYSTEMS
Clara Rd., Tullamore, Co. Offaly
T: 057 9326000 E: info@molloyprecast.com
F: 057 9326060 W: www.molloyprecast.com

Title: 15PE Chleftain Coconut filter with 110mm outlet
PE: 15PE
Drg. no.: Coco_15PE_01_211119
Date: 21/11/2019
Drawn by: SF









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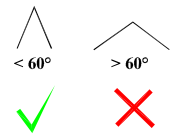

Damage caused by incorrect lifting is the responsibility of others

MOLLOY
ENVIRONMENTAL SYSTEMS
Clara Rd., Tullamore, Co. Offaly
T: 057 9326000 E: info@molloyprecast.com
F: 057 9326060 W: www.molloyprecast.com

Title: 15PE Chieftain Coconut filter with direct discharge

PE: 8PE

Drg. no.: Coco_15PE_02_211119

Date: 21/11/2019

Drawn by: SF