



## **SITE SUITABILITY ASSESSMENT REPORT**

In Accordance with the Environmental Protection Agency Manual Code of Practice –  
Domestic Waste Water Treatment Systems (Population Equivalent  $\leq 10$ )

---

**MULTIDISCIPLINARY BUILDING CONSULTANCY**  
**BRINGING YOUR IDEAS AND INNOVATIONS TO LIFE SINCE 2009**

**01**

Point of  
Contact

**16+**

Service  
Offerings

**14**

Year In  
Business

**2800**

Projects  
Delivered



## PROJECT PARTICULARS:

<b>Project Description</b>	Wastewater Treatment and Disposal for a Domestic One-Off Dwelling – Site Suitability Assessment – Doire na bhFlann, Recess, County Galway.
<b>OMC Project #</b>	2401/2501
<b>Status</b>	Final Report

<b>Document Title</b>	Site Suitability Assessment for the location of On-Site Wastewater Treatment and Management at Doire na bhFlann, Recess, County Galway.
<b>Client</b>	Ann Conroy
<b>Date of Issue</b>	25 <sup>th</sup> March 2025
<b>Prepared for</b>	Ann Conroy
<b>Prepared by</b>	OMC
<b>Emailed from</b>	info@omcgroup.ie
<b>Office Origin</b>	Galway



## CONTENTS:

1.0	Site Location
2.0	Certification

## APPENDICES:

Appendix A	Site Characterisation Form - Environmental Protection Agency - Code Of Practice - Domestic Waste Water Treatment Systems (Population Equivalent $\leq 10$ )
Appendix B	Site & Test Excavation(s) Photographic Log
Appendix C	Geo Scientific Maps
Appendix D	Associated Design Calculations
Appendix E	Proposed Wastewater Treatment and Disposal System Site Specific Details

## REFERENCES:

Environmental Protection Agency – Code Of Practice – Domestic Waste Water Treatment Systems (Population Equivalent $\leq 10$ ).
Environmental Protection Agency – Wastewater Treatment Manuals Treatment Systems for Single Houses, published in the year 2000.
Groundwater Protection Schemes – Department of Environment and Local Government, Environmental Protection Agency, and Geological Survey of Ireland, 1999.
Groundwater Protection Responses for On-Site Wastewater Systems for Single Houses.
Geological Survey of Ireland Groundwater Viewer

## 1.0 SITE LOCATION

The site is located in the town land of Doire na bhFlann, approximately 14.5km east of Clifden Town in County Galway.

## Grid Reference

**L 79865 48752**

X (Easting) :	Y (Northing) :	X (ITM):	Y (ITM):
<b>079865</b>	<b>248752</b>	<b>479826</b>	<b>748775</b>
Latitude :	Longitude :	X (UTM):	Y (UTM):
<b>53.475287</b>	<b>-9.8103232</b>	<b>446218</b>	<b>5925450</b>



**Figure One**

Site Location – Satellite Image Google Maps



## 1.0 CERTIFICATION

OMC, confirm that a Site Suitability Assessment has been completed on this site, located as per section 2.0 Site Location, at the following address:

Doire na bhFlann, Recess, County Galway.

This assessment has been completed at the request of the applicant:

Ann Conroy

Although contracted by the client / client's agent, this report is prepared independently and is not subject to external influences.

The Site Suitability Assessment completed on this site has been carried out in strict accordance with the requirements of the Environmental Protection Agency "Environmental Protection Agency - CODE OF PRACTICE - Domestic Waste Water Treatment Systems (Population Equivalent  $\leq 10$ ).

All opinions, conclusions, and recommendations contained in this report are based on existing site conditions, knowledge acquired during the desk study, and on-site investigation works. We cannot take into account the impact of future variations in site conditions which may alter this site's current characteristics. These possible variations may occur as a result of a specific activity carried out on site, or on neighbouring lands.

Results obtained are specific to the area tested and more specifically to the percolation rate in the Surface / Subsurface test pits.

No comment or liability is made or accepted for variations in ground conditions or in percolation rates outside the test area.



It is the responsibility of the client / client's agent to ensure the test excavations, and more specifically the trial pit which is used to determine the water table and / or bedrock level is a true reflection of the water table and / or bedrock level on site; and more specifically in the proposed location on site to accommodate the wastewater treatment and disposal system and associated polishing filter and / or percolation area. No test excavation or pit should be tampered with in any way in an effort to distort the assessment of this site.

Variations in water table and / or bedrock level on site during times of construction and / or installation of the wastewater treatment and system and associated polishing filter bed; are not the responsibility of OMC. This report has been prepared in line with current best practice and with all reasonable skill, care and diligence in consideration of the limits imposed by the survey techniques used and the resources devoted to it in agreement with the client.

All variations in ground conditions or perceived percolation values encountered on site during construction should be reported immediately to the professional personnel responsible for the certification of construction and installation of the wastewater treatment and disposal system.

Please note, that the recommendations outlined in this site suitability assessment report are subject to the installation of the specified treatment procedure only. Any deviation from the specified wastewater treatment system, wastewater design or the proposed location on site; renders the conclusion and recommendations of this report null and void.

It is the responsibility of the client / client's agent to ensure the proposed wastewater treatment system and associated polishing filter can be accommodated on site, and that all required separation distances are achievable on site; should the proposed site layout plan deviate in any way from what was discussed and relayed during the site suitability assessment procedure.



## Appendix A

Site Characterisation Form -  
Environmental Protection Agency - Code Of Practice - Domestic Waste Water  
Treatment Systems (Population Equivalent  $\leq 10$ )

# SITE CHARACTERISATION FORM

## COMPLETING THE FORM

**Note:** This form requires the latest version of Adobe Acrobat Reader and on PC's Windows 7 or later. Windows XP produces errors in calculations

### Step 1:

Goto Menu Item **File, Save As** and save the file under a reference relating to the client or the planning application reference if available.

#### Clear Form

Use the **Clear Form** button to clear all information fields.

### Notes:

All calculations in this form are automatic.

Where possible information is presented in the form of drop down selection lists to eliminate potential errors.

Variable elements are recorded by tick boxes. In all cases only one tick box should be activated.

All time record fields must be entered in twenty four hour format as follows: HH:MM

All date formats are DD-MM-YYYY.

All other data fields are in text entry format.

This form can be printed out fully populated for submission with related documents and for your files. It can also be submitted by email.

**Section 3.2** In this section use an underline \_\_\_\_\_ across all six columns to indicate the depth at which changes in classification / characteristics occur.

**Section 3.4** Lists supporting documentation required.

**Section 4** Select the treatment systems suitable for this site and the discharge route.

**Section 5** Indicate the system type that it is proposed to install.

**Section 6** Provide details, as required, on the proposed treatment system.

# APPENDIX A: SITE CHARACTERISATION FORM

File Reference:

## 1.0 GENERAL DETAILS (From planning application)

Prefix:  First Name:  Surname:

Address:  Site Location and Townland:

Number of Bedrooms:  Maximum Number of Residents:

Comments on population equivalent

Proposed Water Supply:  
Mains  Private Well/Borehole   Group Well/Borehole

## 2.0 GENERAL DETAILS (From planning application)

Soil Type, (Specify Type):

Subsoil, (Specify Type):

Bedrock Type:

Aquifer Category: Regionally Important  Locally Important  Poor

Vulnerability: Extreme  High  Moderate  Low

Groundwater Body:  Status

Name of Public/Group Scheme Water Supply within 1 km:

Source Protection Area: ZOC  SI  SO  Groundwater Protection Response:

Presence of Significant Sites  
(Archaeological, Natural & Historical):

Past experience in the area:

Comments:

(Integrate the information above in order to comment on: the potential suitability of the site, potential targets at risk, and/or any potential site restrictions).

**Note:** Only information available at the desk study stage should be used in this section.

## 3.0 ON-SITE ASSESSMENT

### 3.1 Visual Assessment

Landscape Position:

Slope: Steep (>1:5)  Shallow (1:5-1:20)  Relatively Flat (<1:20)

Slope Comment

Surface Features within a minimum of 250m (Distance To Features Should Be Noted In Metres)

Houses:

Existing Land Use:

Vegetation Indicators:

Groundwater Flow Direction:

Ground Condition:

Site Boundaries:

## 3.0 ON-SITE ASSESSMENT

### 3.1 Visual Assessment (contd.)

Roads:

Outcrops (Bedrock And/Or Subsoil):

Surface Water Ponding:

Lakes:

Beaches/Shellfish Areas:

Wetlands:

Karst Features:

Watercourses/Streams:\*

\*Note and record water level

## 3.0 ON-SITE ASSESSMENT

### 3.1 Visual Assessment (contd.)

Drainage Ditches:\*

Springs:\*

Wells:\*

Comments:

(Integrate the information above in order to comment on: the potential suitability of the site, potential targets at risk, the suitability of the site to treat the wastewater and the location of the proposed system within the site).

\*Note and record water level

**3.2 Trial Hole** (should be a minimum of 2.1m deep (3m for regionally important aquifers))

To avoid any accidental damage, a trial hole assessment or percolation tests should not be undertaken in areas which are at or adjacent to significant sites, (e.g. NHAs, SACs, SPAs, and/or Archaeological etc.), without prior advice from National Parks and Wildlife Service or the Heritage Service.

Depth of trial hole (m):

Depth from ground surface to bedrock (m) (if present):

Depth from ground surface to water table (m) (if present):

Depth of water ingress:  Rock type (if present):

Date and time of excavation:   Date and time of examination:

Depth of Surface and Subsurface Percolation Tests	Soil/Subsoil Texture & Classification**	Plasticity and dilatancy***	Soil Structure	Density/ Compactness	Colour****	Preferential flowpaths
0.1 m	<input type="text"/>					
0.2 m	<input type="text"/>					
0.3 m	<input type="text"/>					
0.4 m	<input type="text"/>					
0.5 m	<input type="text"/>					
0.6 m	<input type="text"/>					
0.7 m	<input type="text"/>					
0.8 m	<input type="text"/>					
0.9 m	<input type="text"/>					
1.0 m	<input type="text"/>					
1.1 m	<input type="text"/>					
1.2 m	<input type="text"/>					
1.3 m	<input type="text"/>					
1.4 m	<input type="text"/>					
1.5 m	<input type="text"/>					
1.6 m	<input type="text"/>					
1.7 m	<input type="text"/>					
1.8 m	<input type="text"/>					
1.9 m	<input type="text"/>					
2.0 m	<input type="text"/>					
2.1 m	<input type="text"/>					
2.2 m	<input type="text"/>					
2.3 m	<input type="text"/>					
2.4 m	<input type="text"/>					
2.5 m	<input type="text"/>					
2.6 m	<input type="text"/>					
2.7 m	<input type="text"/>					
2.8 m	<input type="text"/>					
2.9 m	<input type="text"/>					
3.0 m	<input type="text"/>					
3.1 m	<input type="text"/>					
3.2 m	<input type="text"/>					
3.3 m	<input type="text"/>					
3.4 m	<input type="text"/>					
3.5 m	<input type="text"/>					

Likely Subsurface Percolation Value:

Likely Surface Percolation Value:

**Note:** \*Depth of percolation test holes should be indicated on log above. (\*Enter Surface or Subsurface at depths as appropriate).  
 \*\* See Appendix E for BS 5930 classification.  
 \*\*\* 3 samples to be tested for each horizon and results should be entered above for each horizon.  
 \*\*\*\* All signs of mottling should be recorded.

**3.2 Trial Hole (contd.)** Evaluation:

--

**3.3(a) Subsurface Percolation Test for Subsoil**

**Step 1: Test Hole Preparation**

**Percolation Test Hole**

	1	2	3
Depth from ground surface to top of hole (mm) (A)			
Depth from ground surface to base of hole (mm) (B)			
Depth of hole (mm) [B - A]			
Dimensions of hole [length x breadth (mm)]	x	x	x

**Step 2: Pre-Soaking Test Holes**

Pre-soak start	Date			
	Time			
2nd pre-soak start	Date			
	Time			

Each hole should be pre-soaked twice before the test is carried out.

**Step 3: Measuring  $T_{100}$**

Percolation Test Hole No.	1	2	3
Date of test			
Time filled to 400 mm			
Time water level at 300 mm			
Time (min.) to drop 100 mm ( $T_{100}$ )			
Average $T_{100}$			

If  $T_{100} > 480$  minutes then Subsurface Percolation value  $>120$  – site unsuitable for discharge to ground

If  $T_{100} \leq 210$  minutes then go to Step 4;

If  $T_{100} > 210$  minutes then go to Step 5;

**Step 4: Standard Method** (where  $T_{100} \leq 210$  minutes)

Percolation Test Hole	1			2			3		
Fill no.	Start Time (at 300 mm)	Finish Time (at 200 mm)	$\Delta t$ (min)	Start Time (at 300 mm)	Finish Time (at 200 mm)	$\Delta t$ (min)	Start Time (at 300 mm)	Finish Time (at 200 mm)	$\Delta t$ (min)
1									
2									
3									
Average $\Delta t$ Value									
	Average $\Delta t/4 =$ [Hole No.1] <input type="text"/> ( $t_1$ )			Average $\Delta t/4 =$ [Hole No.2] <input type="text"/> ( $t_2$ )			Average $\Delta t/4 =$ [Hole No.3] <input type="text"/> ( $t_3$ )		

Result of Test: Subsurface Percolation Value =  (min/25 mm)

Comments:

**Step 5: Modified Method** (where  $T_{100} > 210$  minutes)

Percolation Test Hole No.	1					
Fall of water in hole (mm)	Time Factor = $T_f$	Start Time hh:mm	Finish Time hh:mm	Time of fall (mins) = $T_m$	$K_{fs} = T_f / T_m$	T-Value = $4.45 / K_{fs}$
300 - 250	8.1					
250 - 200	9.7					
200 - 150	11.9					
150 - 100	14.1					
Average	T- Value	T- Value Hole 1 = ( $T_1$ )		<input type="text"/>		

Percolation Test Hole No.	2					
Fall of water in hole (mm)	Time Factor = $T_f$	Start Time hh:mm	Finish Time hh:mm	Time of fall (mins) = $T_m$	$K_{fs} = T_f / T_m$	T-Value = $4.45 / K_{fs}$
300 - 250	8.1					
250 - 200	9.7					
200 - 150	11.9					
150 - 100	14.1					
Average	T- Value	T- Value Hole 2 = ( $T_2$ )		<input type="text"/>		

Result of Test: Subsurface Percolation Value =

(min/25 mm)

Percolation Test Hole No.	3					
Fall of water in hole (mm)	Time Factor = $T_f$	Start Time hh:mm	Finish Time hh:mm	Time of fall (mins) = $T_m$	$K_{fs} = T_f / T_m$	T-Value = $4.45 / K_{fs}$
300 - 250	8.1					
250 - 200	9.7					
200 - 150	11.9					
150 - 100	14.1					
Average	T- Value	T- Value Hole 3 = ( $T_3$ )		<input type="text"/>		

Comments:

### 3.3(b) Surface Percolation Test for Soil

#### Step 1: Test Hole Preparation

Percolation Test Hole	1	2	3
Depth from ground surface to top of hole (mm)			
Depth from ground surface to base of hole (mm)			
Depth of hole (mm)			
Dimensions of hole [length x breadth (mm)]	x	x	x

#### Step 2: Pre-Soaking Test Holes

Pre-soak start	Date			
	Time			
2nd pre-soak start	Date			
	Time			

Each hole should be pre-soaked twice before the test is carried out.

#### Step 3: Measuring $T_{100}$

Percolation Test Hole No.	1	2	3
Date of test			
Time filled to 400 mm			
Time water level at 300 mm			
Time to drop 100 mm ( $T_{100}$ )			
Average $T_{100}$			

If  $T_{100} > 480$  minutes then Surface Percolation value  $>90$  – site unsuitable for discharge to ground

If  $T_{100} \leq 210$  minutes then go to Step 4;

If  $T_{100} > 210$  minutes then go to Step 5;

**Step 4: Standard Method** (where  $T_{100} \leq 210$  minutes)

Percolation Test Hole	1			2			3		
Fill no.	Start Time (at 300 mm)	Finish Time (at 200 mm)	$\Delta T$ (min)	Start Time (at 300 mm)	Finish Time (at 200 mm)	$\Delta T$ (min)	Start Time (at 300 mm)	Finish Time (at 200 mm)	$\Delta T$ (min)
1									
2									
3									
Average $\Delta T$ Value									
	Average $\Delta T/4 =$ [Hole No.1] <input type="text"/> ( $T_1$ )			Average $\Delta T/4 =$ [Hole No.2] <input type="text"/> ( $T_2$ )			Average $\Delta T/4 =$ [Hole No.3] <input type="text"/> ( $T_3$ )		

Result of Test: Surface Percolation Value =  (min/25 mm)

Comments:

**Step 5: Modified Method** (where  $T_{100} > 210$  minutes)

Percolation Test Hole No.	1					
Fall of water in hole (mm)	Time Factor = $T_f$	Start Time hh:mm	Finish Time hh:mm	Time of fall (mins) = $T_m$	$K_{fs} = T_f / T_m$	T-Value = $4.45 / K_{fs}$
300 - 250	8.1					
250 - 200	9.7					
200 - 150	11.9					
150 - 100	14.1					
Average	T-Value	T-Value Hole 1 = ( $T_1$ )		<input type="text"/>		

Percolation Test Hole No.	2					
Fall of water in hole (mm)	Time Factor = $T_f$	Start Time hh:mm	Finish Time hh:mm	Time of fall (mins) = $T_m$	$K_{fs} = T_f / T_m$	T-Value = $4.45 / K_{fs}$
300 - 250	8.1					
250 - 200	9.7					
200 - 150	11.9					
150 - 100	14.1					
Average	T-Value	T-Value Hole 2 = ( $T_2$ )		<input type="text"/>		

Result of Test: Surface Percolation Value =  (min/25 mm)

Percolation Test Hole No.	3					
Fall of water in hole (mm)	Time Factor = $T_f$	Start Time hh:mm	Finish Time hh:mm	Time of fall (mins) = $T_m$	$K_{fs} = T_f / T_m$	T-Value = $4.45 / K_{fs}$
300 - 250	8.1					
250 - 200	9.7					
200 - 150	11.9					
150 - 100	14.1					
Average	T-Value	T-Value Hole 3 = ( $T_3$ )		<input type="text"/>		

Comments:

**3.4 The following associated Maps, Drawings and Photographs should be appended to this site characterisation form.**

1.	Discovery Series 1:50,000 Map indicating overall drainage, groundwater flow direction and housing density in the area.	-----
2.	Supporting maps for vulnerability, aquifer classification, soil, subsoil, bedrock.	Included
3.	North point should always be included.	Included
4. (a)	Scaled sketch of site showing measurements to Trial Hole location and	Please refer to the Planning Maps Planning Drawings and Planning Documents
(b)	Percolation Test Hole locations,	
(c)	wells and	
(d)	direction of groundwater flow (if known),	
(e)	proposed house (incl. distances from boundaries)	
(f)	adjacent houses,	
(g)	watercourses,	
(h)	significant sites	
(i)	and other relevant features.	
5.	Site specific cross sectional drawing of the site and the proposed layout <sup>1</sup> should be submitted.	Included
6.	Photographs of the trial hole, test holes and site including landmarks (date and time referenced).	Included
7.	Pumped design must be designed by a suitably qualified person.	To be Supplied by the WWTS system supplier

<sup>1</sup> The calculated percolation area or polishing filter area should be set out accurately on the site layout drawing in accordance with the code of practice's requirements.

## 4.0 CONCLUSION of SITE CHARACTERISATION

Integrate the information from the desk study and on-site assessment (i.e. visual assessment, trial hole and percolation tests) above and conclude the type of system(s) that is (are) appropriate. This information is also used to choose the optimum final disposal route of the treated wastewater.

Slope of proposed infiltration / treatment area:

Are all minimum separation distances met?

Depth of unsaturated soil and/or subsoil beneath invert of gravel (or drip tubing in the case of drip dispersal system)

Percolation test result: Surface:

Sub-surface:

Not Suitable for Development

Suitable for Development

### Identify all suitable options

1. Septic tank system (septic tank and percolation area) **(Chapter 7)**
2. Secondary Treatment System **(Chapters 8 and 9)** and soil polishing filter **(Section 10.1)**
3. Tertiary Treatment System and Infiltration / treatment area **(Section 10.2)**

### Discharge Route <sup>1</sup>

## 5.0 SELECTED DWWTS

Propose to install:

and discharge to:

Invert level of the trench/bed gravel or drip tubing (m)

Site Specific Conditions (e.g. special works, site improvement works testing etc.)

<sup>1</sup> A discharge of sewage effluent to "waters" (definition includes any or any part of any river, stream, lake, canal, reservoir, aquifer, pond, watercourse or other inland waters, whether natural or artificial) will require a licence under the Water Pollution Acts 1977-90. Refer to Section 2.4.

## 6.0 TREATMENT SYSTEM DETAILS

### SYSTEM TYPE: Septic Tank Systems (Chapter 7)

Tank Capacity (m <sup>3</sup> )	<input type="text"/>	Percolation Area		Mounded Percolation Area	
		No. of Trenches	<input type="text"/>	No. of Trenches	<input type="text"/>
		Length of Trenches (m)	<input type="text"/>	Length of Trenches (m)	<input type="text"/>
		Invert Level (m)	<input type="text"/>	Invert Level (m)	<input type="text"/>

### SYSTEM TYPE: Secondary Treatment System (Chapters 8 and 9) and polishing filter (Section 10.1)

#### Secondary Treatment Systems receiving septic tank effluent (Chapter 8)

Media Type	Area (m <sup>2</sup> )*	Depth of Filter	Invert Level
Sand/Soil	<input type="text"/>	<input type="text"/>	<input type="text"/>
Soil	<input type="text"/>	<input type="text"/>	<input type="text"/>
Constructed Wetland	<input type="text"/>	<input type="text"/>	<input type="text"/>
Other	<input type="text"/>	<input type="text"/>	<input type="text"/>

#### Packaged Secondary Treatment Systems receiving raw wastewater (Chapter 9)

Type	<input type="text"/>
Capacity PE	<input type="text"/>
Sizing of Primary Compartment	<input type="text"/> m <sup>3</sup>

#### Polishing Filter\*: (Section 10.1)

Surface Area (m <sup>2</sup> )*	<input type="text"/>	Option 3 - Gravity Discharge Trench length (m)	<input type="text"/>
Option 1 - Direct Discharge Surface area (m <sup>2</sup> )	<input type="text"/>	Option 4 - Low Pressure Pipe Distribution Trench length (m)	<input type="text"/>
Option 2 - Pumped Discharge Surface area (m <sup>2</sup> )	<input type="text"/>	Option 5 - Drip Dispersal Surface area (m <sup>2</sup> )	<input type="text"/>

### SYSTEM TYPE: Tertiary Treatment System and infiltration / treatment area (Section 10.2)

Identify purpose of tertiary treatment	Provide performance information demonstrating system will provide required treatment levels	Provide design information
<input type="text"/>	<input type="text"/>	<input type="text"/>

#### DISCHARGE ROUTE:

Groundwater <input type="checkbox"/>	Hydraulic Loading Rate * (l/m <sup>2</sup> .d)	<input type="text"/>	Surface area (m <sup>2</sup> )	<input type="text"/>
Surface Water ** <input type="checkbox"/>	Discharge Rate (m <sup>3</sup> /hr)	<input type="text"/>		

\* Hydraulic loading rate is determined by the percolation rate of subsoil

\*\* Water Pollution Act discharge licence required

## 6.0 TREATMENT SYSTEM DETAILS

### QUALITY ASSURANCE:

---

Installation & Commissioning

On-going Maintenance

## 7.0 SITE ASSESSOR DETAILS

Company:

Prefix:  First Name:  Surname:

Address:

Qualifications/Experience:

Date of Report:

Phone:  E-mail

Indemnity Insurance Number:

Signature: \_\_\_\_\_

**Appendix B**

Photographic Evidence of Assessment  
Site & Test Excavation(s) Log



Photograph One

Northern Direction



**Photograph Two**

Southern Direction



**Photograph Three**

Eastern Direction



**Photograph Four**

Western Direction



**Photograph Five**  
Trial Pit

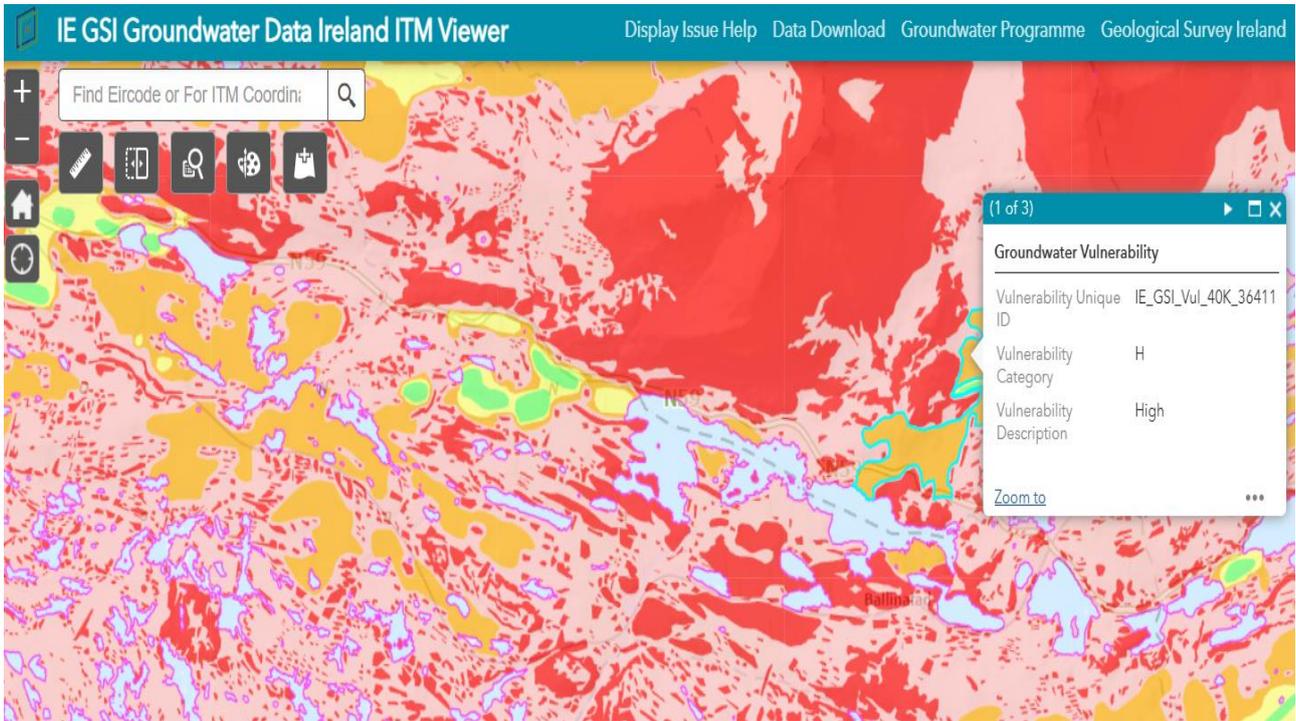


**Photograph Six, Seven, Eight**

Percolation Test Excavations

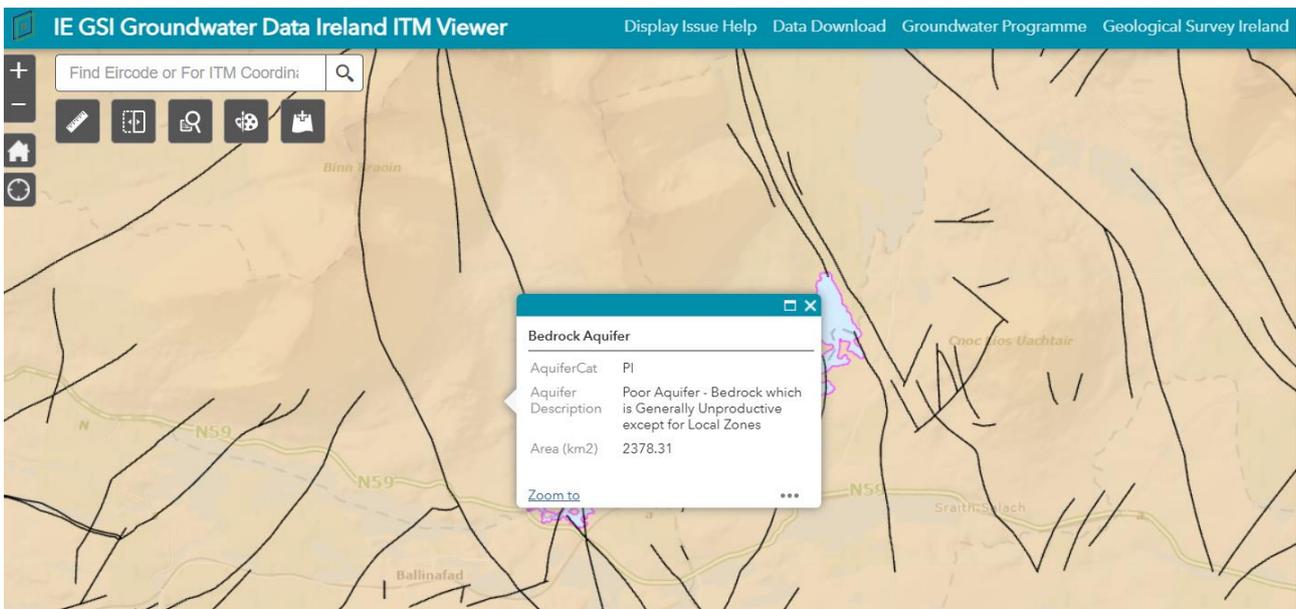


<b>Appendix C</b>
Geo Scientific Maps



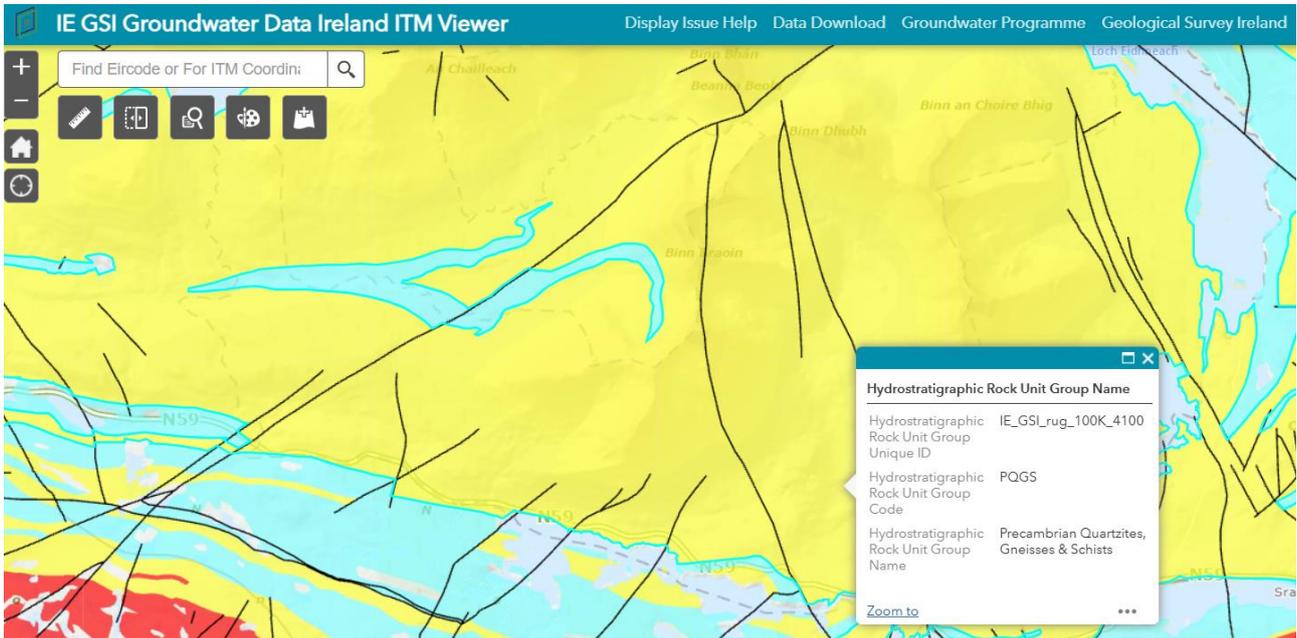
## Map One

Groundwater Vulnerability – Category: H  
Description: High



## Map Two

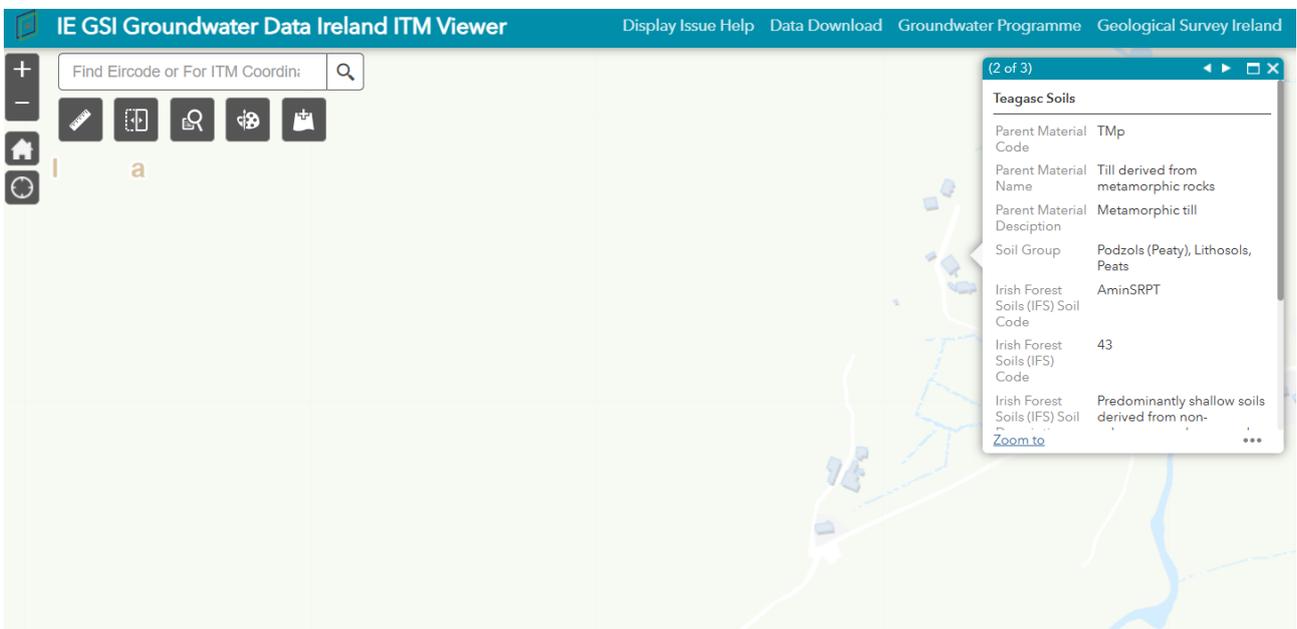
Bedrock Aquifer – Category: PI  
Description: Poor Aquifer – Bedrock which is generally unproductive except for local zones



## Map Three

Groundwater Rock Units – PQGS

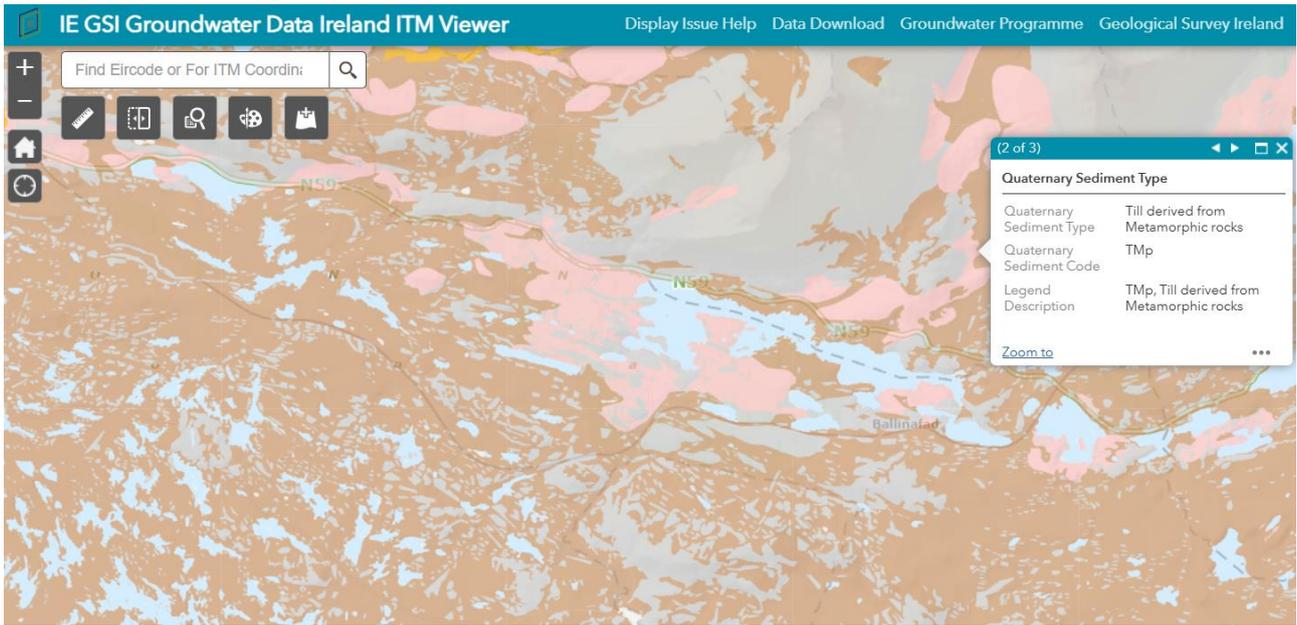
Description: Precambrian Quartzites, Gneisses & Schists



## Map Four

Teagasc Soils – Podzols (Peaty), Lithosols, Peats      IFS Soil Code: AminSRPT

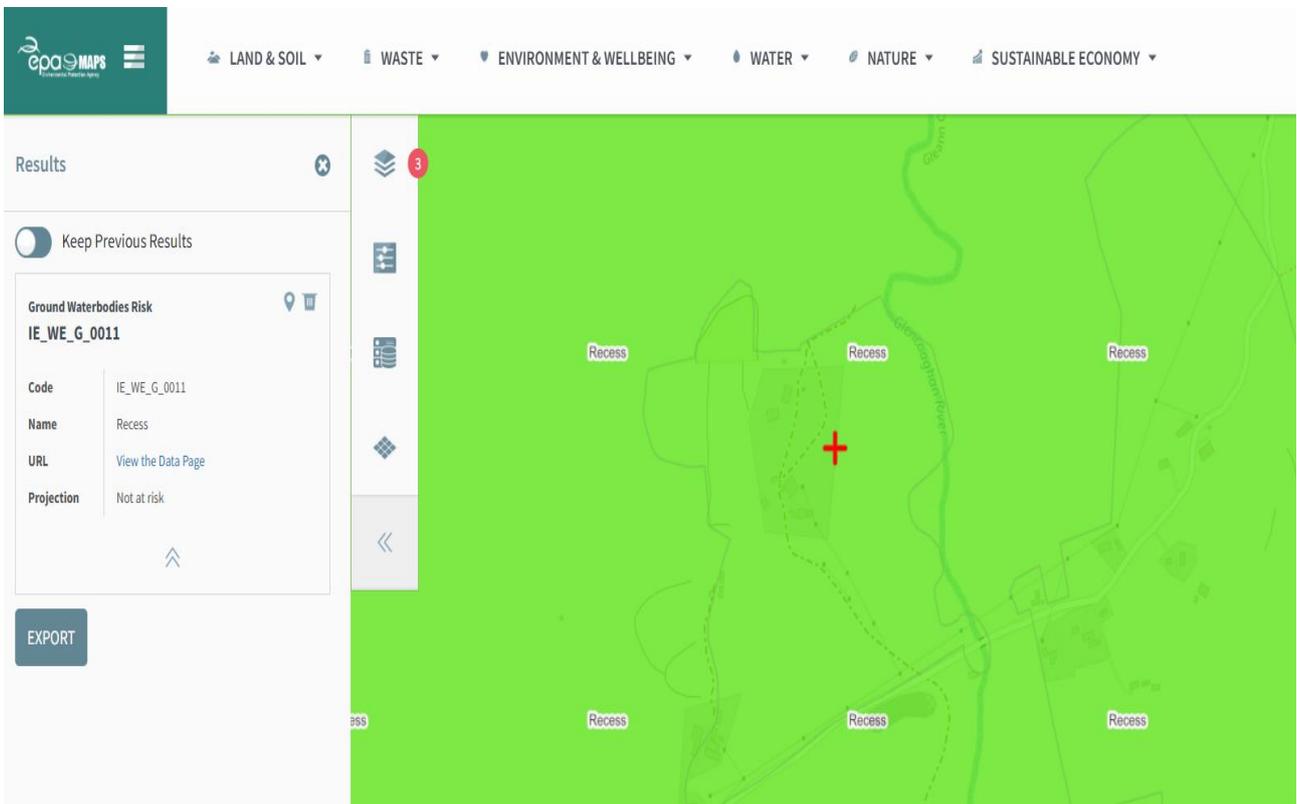
Parent Material Description: Till derived from metamorphic rocks



## Map Five

Sub Soils – Lithology: Till derived from metamorphic rocks

Quaternary Sediment: TMp



## Map Six

Ground Waterbodies Risk - IE\_WE\_G\_0011

Code:IE\_WE\_G\_0011 Name: Recess



<b>Appendix D</b>
Associated Design Calculations



**Hydraulic Loading Calculation:**

As per the Environmental Protection Agency CODE OF PRACTICE Wastewater Treatment and Disposal Systems Serving Single Houses (p.e. ≤ 10).

The hydraulic Loading rate per population equivalent per day for the proposed development, shall be 150 litres per person per day.

Total Hydraulic loading	=	Population Equivalent	X	Hydraulic Loading Rate
(Litres/Day)		(P.E.)		(Litres/P.E./Day)

<b>600</b>	=	<b>4</b>	<b>X</b>	<b>150</b>
(Litres/Day)		(P.E.)		(Litres/P.E./Day)

=	<b>600 (Litres/Day)</b>
---	-------------------------

**Organic Loading Calculation:**

As per the Environmental Protection Agency CODE OF PRACTICE Wastewater Treatment and Disposal Systems Serving Single Houses (p.e. ≤ 10).

The Organic Loading rate per population equivalent per day for the proposed development, shall be 0.060kg of BOD5 per person per day

Total Organic loading	=	Population Equivalent	X	Organic Loading Rate
(Kg BOD <sub>5</sub> /Day)		(P.E.)		(Kg BOD <sub>5</sub> /P.E./Day)

0.24	=	4	X	0.06
(Kg BOD <sub>5</sub> /Day)		(P.E.)		(Kg BOD <sub>5</sub> /P.E./Day)

=	<b>0.24 (Kg BOD<sub>5</sub>/Day)</b>
---	--------------------------------------



**Proposed Stages of Wastewater Treatment and disposal:**

A three-stage wastewater treatment and disposal system, consisting of:

<b>Stage One –</b>
Primary and Secondary Treatment Advanced Mechanical Wastewater Treatment Unit.
<b>Stage Two –</b>
Tertiary Treatment Polishing Filter Bed.
<b>Stage Three –</b>
Tertiary Treatment Dispersal Pad.

The proposed wastewater treatment and disposal system is a comprehensive wastewater solution and satisfies in full what is required for compliance with the regulatory document that is currently in place.

<b>Stage One –</b>
Primary and Secondary Treatment Advanced Mechanical Wastewater Treatment Unit:

All wastewaters exiting the proposed dwelling shall be collected and transported via pipe network to the first stage of treatment. It is crucial that this pipe network be installed by an experience professional at correct falls and gradients, to ensure that all of the wastewater content flow to the septic tank unit. All domestic wastewater treatment systems should be properly installed by a competent person. You should obtain a certificate of installation upon completion. Incorrectly installed pipe work can lead to blockages in the future.

The wastewater will flow via gravity to stage one; and into an advanced mechanical wastewater treatment unit, the Tricel Novo System. Under EU regulations, all wastewater treatment plants must be tested in compliance with EN12566-3 CE certification, and the Tricel Novo has achieved this certification.



The Tricel Novo treatment system will provide high quality wastewater treatment, and ensure compliance with all environmental protection regulations. The Tricel Novo wastewater treatment system has three stages of treatment within the system.

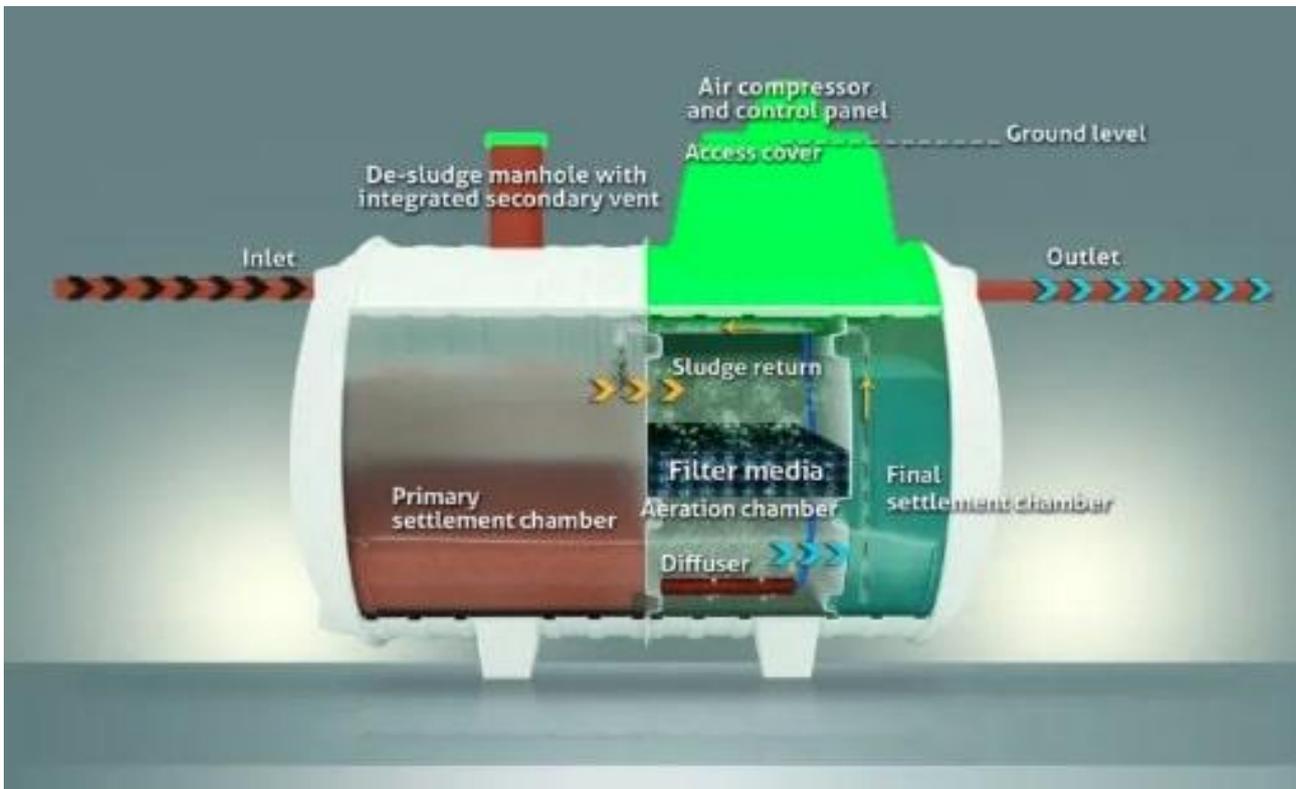
In the initial stage of wastewater treatment, anaerobic breakdown takes place in the primary settlement chamber. The wastewater is introduced and the solids drop to the bottom, becoming detached from the liquid.

The second stage of the wastewater treatment involves aerobic breakdown. This takes place in the aeration chamber, where masses of natural occurring bacteria inhabit specially designed filter media.

These bacteria are sustained with air, which is continuously supplied from a purpose-built pump in the unit's top section. As the liquid moves, slowly through the filter media, the bacteria feed on the waste and eliminate it from the liquid.

In the third stage of wastewater treatment, the wastewater flows from the aeration chamber into the final settlement chamber. Suspended sludge containing bacteria is carried with the liquid into the settlement chamber and settles to the bottom of the chamber. From there, a continuous sludge return system pumps it back to the primary settlement chamber.

The remaining treated liquid now meets the required standard to be safely passed out of the Tricel system, and onto the next stage of treatment.



**Figure Two & Three**  
Stage One – Secondary Treatment – Advanced Mechanical Wastewater Unit



<b>Stage Two –</b>
--------------------

Tertiary Treatment Package Plant:
-----------------------------------

The highly treated wastewater effluent will then be delivered via a pumped discharge to a package tertiary treatment plant, this will ensure further treatment and polishing to the effluent, and offer a safe and acceptable means of disposal on the proposed site.

The Tricel TERO tertiary wastewater system further purifies the treated effluent from a packaged wastewater treatment plant resulting in a reduced area and depth of discharge bed.

**Stage One:** TERO receives secondary treated effluent from a wastewater treatment plant. The TERO is designed to work seamlessly with the Tricel NOVO but can also be used with third-party products, providing that a pumped discharge with a dose limit is utilised.

**Stage Two:** The pre-treated effluent is dispersed using an easily serviceable distribution network which ensures the effluent is distributed evenly and uniformly onto natural filter media. The effluent filters through the media and is treated by a combination of biological, chemical and physical processes. The treated water is transported to the soil at the base of the tank.

The Tricel TERO tertiary wastewater system is designed to “EPA Wastewater Treatment and Disposal Systems Serving Single Houses (p.e. ≤ 10) 2021” standards.

The proposed dwelling is a 1-bedroom unit, which equates to a Population Equivalent of 4. The recorded Percolation value is 20.33.

Proposed for this particular site is a system that will provide tertiary treatment and a total of **1 Tero module** is required to ensure the loading rate of the coconut coir filter per day is not exceeded.

As mentioned, the system provides a dual function of polishing the effluent from a wastewater treatment system and disposing of the treated liquid into groundwater. It incorporates an enclosed filter, which can be installed under or over ground at varying heights to suit all site conditions.



Figure Four & Five

Stage Two - Tertiary Treatment Package Plant

## Stage Three –

Tertiary Treatment Disposal Pad:

The package tertiary treatment plant will require discharge to a tertiary infiltration area. Evenly discharging to a 300 mm deep gravel distribution area (pea gravel, 12–32 mm), sized according to Option 6 in Table 10.1.

Thus, based on a Percolation value of 20.33 min the required minimum area for the tertiary infiltration area is square meters.

$$7.5\text{m}^2 \times \text{PE.5} = 15\text{m}^2$$

Percolation values (PVs)	Pumped or underlying gravity discharge (Options 1 and 2)	Gravity discharge into 500 mm wide trenches (Option 3)	Low-pressure pipe distribution into 300 mm wide trenches (Option 4)	Drip dispersal system (Option 5)	Tertiary infiltration area (Option 6)
	Area required per person (m <sup>2</sup> )	Trench length required per person (m)	Trench length required per person (m)	Area required per person (m <sup>2</sup> )	Area required per person (m <sup>2</sup> )
3 ≤ PV ≤ 20	≥7.5	≥6	≥6	≥5	≥3.75
21 < PV ≤ 40	≥15	≥12	≥12	≥14	≥7.5
41 < PV ≤ 50	≥30	≥17	≥17	≥16	≥15
51 < PV ≤ 75	≥50	≥19	≥19	≥22	≥25
76 < PV ≤ 90	–	–	≥28	≥34	–
91 < PV ≤ 120	–	–	–	≥54	–



## Appendix E

Proposed Wastewater Treatment and  
Disposal System Site Specific Details

---

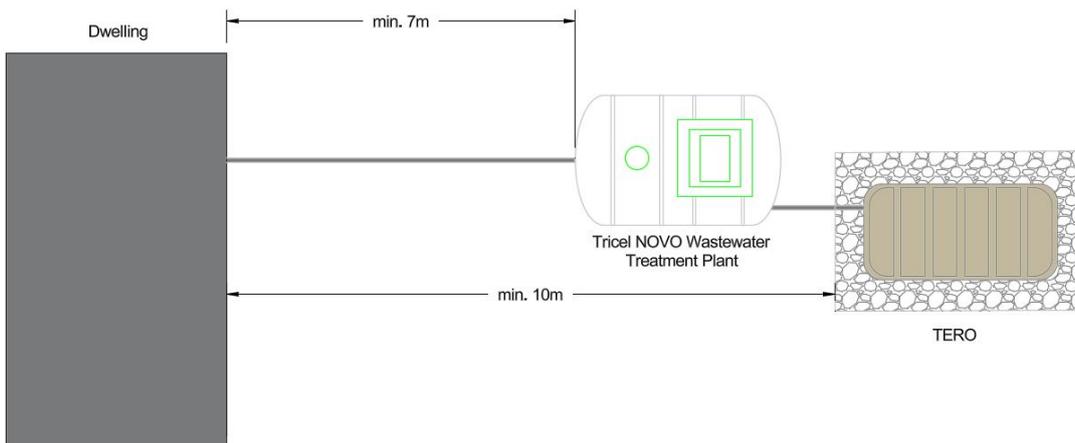
**Date** 26/03/2025  
**Report No:** TSA\_XX\_17219  
**Client Name** Ann Conroy  
**Site Location & Townland** Doire na bhFlann, , 0874446405  
Tel:

---

Thank you for choosing Tricel for your wastewater treatment requirements. This report contains the following information for your site and is based on a population of 4 and a subsurface/surface value of between 3-20.

Based on the information provided to us and using SR66 and the EPA Code of Practice: Wastewater Treatment and Disposal Systems Serving Single Houses (p.e.  $\leq 10$ ), the appropriate solution for treating wastewater on your site is a Tricel Novo Package Plant and Tricel Tero.

**Typical layout of a Tricel Novo Package Plant and Tricel Tero:**



**Note:**

In the above named site, a substitute wastewater treatment system may not be put in place of the following recommendation.

*This recommendation only applies to the above named site based on the information supplied to Tricel.*

*A Site Characterisation Form should accompany this report. Tricel cannot be responsible for misinformation due to misleading information being received by us from clients.*

---

## **Section 1: Information on the Novo Package Plant**

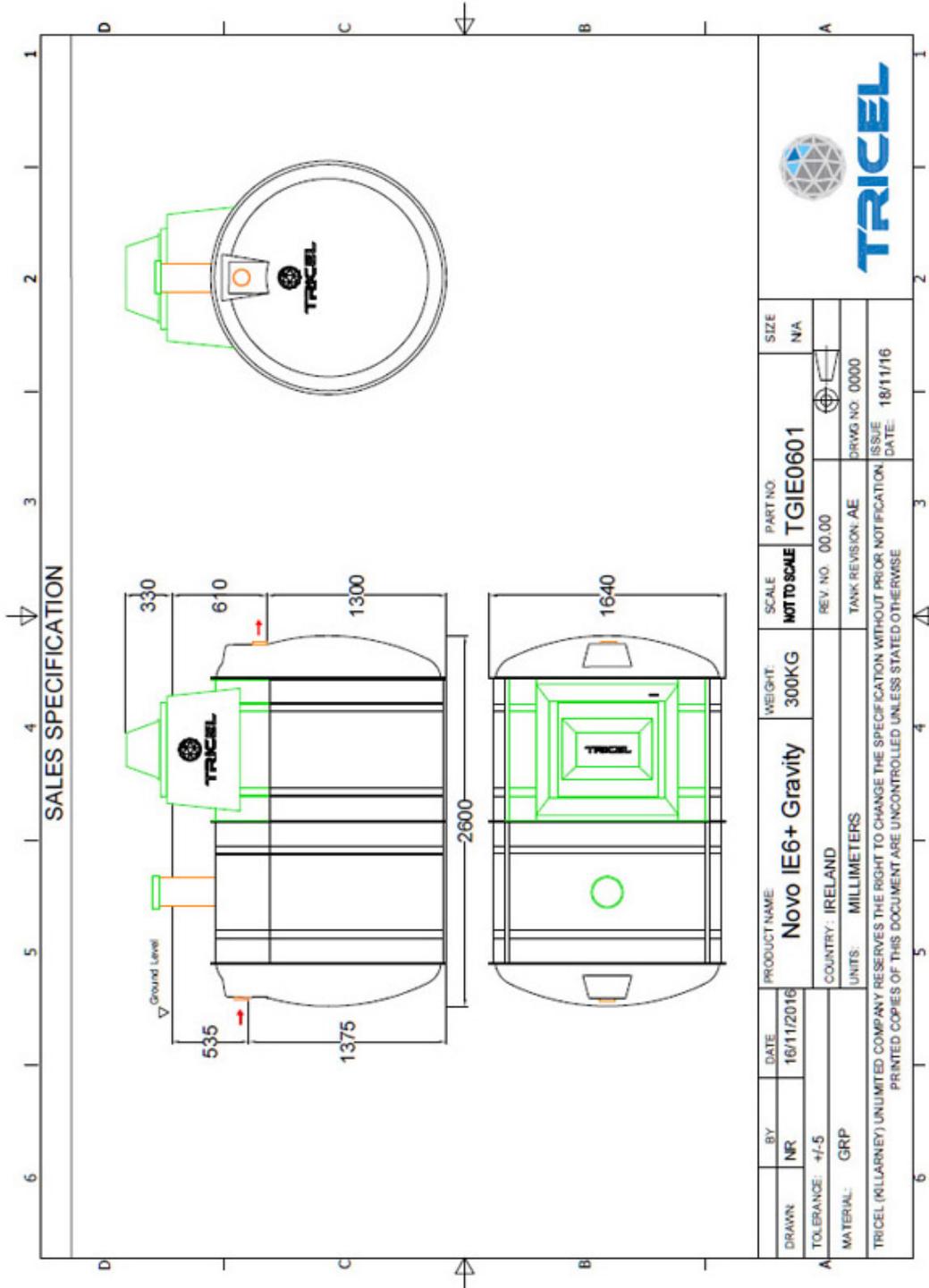
- Manufacturers report and sizing of the Tricel Novo Package Plant.
- Drawings of the Novo Package Plant.
- Pump selection and technical data
- Certification of the selected Novo Package Plant.
- Brochure on the Novo Package Plant.
- Optional Novo maintenance agreement.

For your site, we recommend a Novo IRL6+ wastewater treatment plant which is designed to treat a maximum of 900 litres of wastewater per day. The Tricel Novo range of wastewater treatment plants is fully in conformance with EN12566-3 and complies with SR66.

The Novo IRL6+ has a capacity of 4000 litres, of which 2400 are in the primary chamber, this ensures a long desludging interval.

This solution contains a BEST FOUR pump based on an the Length of Rising Main 90 metres and Difference in Height of Rising Main 2.5 metres. A 38mm compression is supplied for connection to a rising main of 38mm internal bore pipework. Details and pump specifications are contained in Section 1.

Section 1



Rev.G

**SUBMERSIBLE SUMP PUMPS**

**BEST 2-5**

**SPECIFICATIONS**

50 Hz

PUMP		
Liquid Handled	Type of liquid	Clean / dirty water
	Max temperature [°C]	35
	Max solids size [mm]	10 (suspended particles)
Maximum immersion [m]		10
Construction	Impeller	Open centrifugal type
	Shaft seal type	Double mechanical seal
	Bearing	Sealed ball bearing
Pipe Connection	Suction-Flange	Strainer
	Discharge-Flange [inch]	G 1½ UNI ISO 228
Material	Casing	AISI 304
	Impeller	AISI 304
	Casing cover	AISI 304
	Shaft seal	Pump side : Sic/Sic/NBR Motor side : Carbon/Ceramic/NBR
	Seal cover	AISI 304
	Shaft	AISI 303 (wet extension)
	Lubricating liquid	White mineral oil ESSO MARCOL 172 (180 cc)
Applicable standard of test	ISO 9906 - Annex A	

MOTOR		
Type	Submersible dry type	
	Single Phase	Three Phase
No. of Poles	2	
Rotation speed [min <sup>-1</sup> ]	≈2800	
Insulation Class	F	
Protection degree	IP 68	
Power rating	[kW]	0.55 ÷ 1.1
	[HP]	0.75 ÷ 1.5
Frequency [Hz]	50	
Voltage [V]	230 ±10%	400 ±10%
Capacitor	Built in	
Over load protection	Built in	
Float Switch	Optional	
Float Switch Cable	material	H07RN-F
	size	3G1
Casing material	AISI 304	
Base material/motor support	AISI 304	
Power cable	length [m]	10
	material	H07RN-F
	size	3G1 (Best 2) 3G1.5 (Best 3, 4)
Dimensions of cable entry	Cable Gland	

200



EBARA PUMPS EUROPE S.p.A.

Rev.G

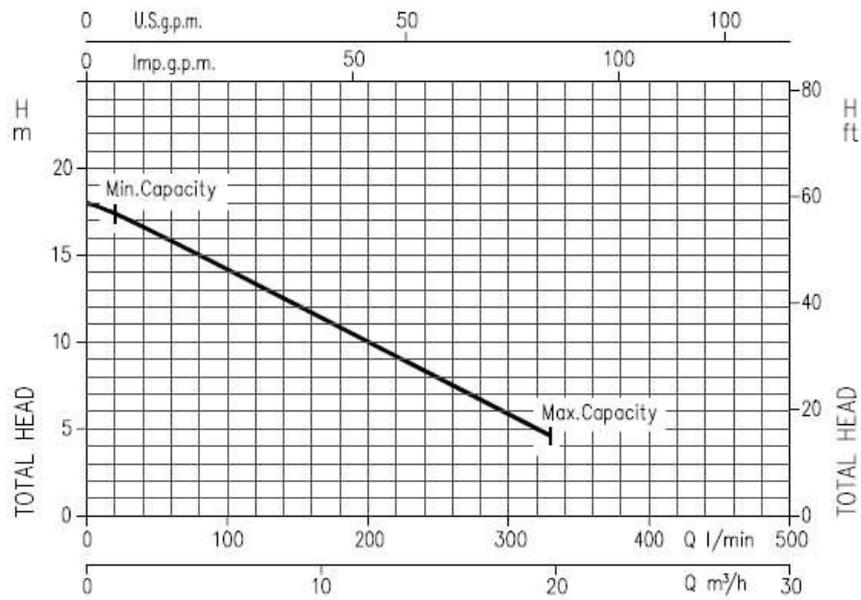
**SUBMERSIBLE SUMP PUMPS**

**BEST 2-5**

**PERFORMANCE CURVE**

50Hz

**PUMP CHARACTERISTIC PERFORMANCE**  
 BEST 4 (1.1 kW) SYNCHRONOUS SPEED : 3000 min<sup>-1</sup>



Temperature of water: 20°C  
 Impeller diameter = 125 mm  
 Applicable standard of test: ISO 9906 – Annex A

204



**EBARA** PUMPS EUROPE S.p.A.

Certificate in accordance with SR66 for EN12566-Part 3



## TREATMENT PERFORMANCE RESULTS

**Tricel (Killarney)**  
Ballyspillane Industrial Est., Killarney, Co. Kerry, Ireland

**EN 12566-3**  
Results corresponding to EN 12566-3 and S.R. 66  
PIA-SR66-1512-1062

**Novo**  
Submerged fixed film

---

Nominal organic daily load	0.26 kg/d	
Nominal hydraulic daily load	0.90 m <sup>3</sup> /d	
Material	Glass reinforced plastic	
Watertightness	Pass	
Structural behaviour (Calculation)	Pass (also wet conditions)	
Durability	Pass	
Treatment efficiency (nominal sequences)		
	Efficiency	Effluent
	COD	91.6 %
	BOD <sub>5</sub>	52 mg/l
	NH <sub>4</sub> -N	95.9 %
	SS	79.9 %
		8 mg/l
		16 mg/l
	95.3 %	
Number of desludging	Not more than once	
Electrical consumption	1.1 kWh/d	

---

Performance tested by:

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

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

  
Notified Body  
No.: 1739

  
Certified according to  
ISO 9001:2008

  
IAC-MRA

  
Deutsche  
Akkreditierungsstelle  
D-PL-17712-01-00

  
geprüft - testet - testet

Elmar Lancé      July 2016

NOVO BROCHURE

Homeowners: Individual domestic installation



► The lightweight nature of the system makes for easy on-site delivery.



► No need for big excavators and large holes that disrupt and disturb your garden.



► Very low visual impact from fully installed units.

Larger projects: Commercial installations up to 50PE



► These units are suitable for installation at housing estates, camping sites, hotels etc., and have low maintenance and running costs.



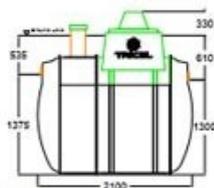
► Each WWTP unit is constructed of lightweight SMC and is easy to maneuver which simplifies the installation process.



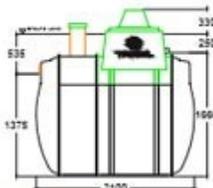
► Example of a fully installed 50PE Novo wastewater treatment unit in a 5-star hotel.

Technical characteristics/ Plant dimensions

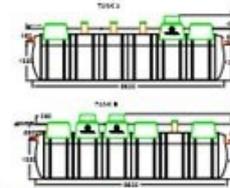
Nom Design Population	No. of people	Length			Horizontal inlet/outlet diameter	Weight empty	Inlet Invert to base	Outlet Invert to base	Inlet Invert to ground level	Air blower rating
		m	m	m						
IE6	1-6	2.1	1.64	2.24	110	270	1.375	1.3	0.535	60
IE6+ <sup>1</sup>	2-6	2.6	1.64	2.24	110	300	1.375	1.3	0.535	60
IE8	2-8	2.6	1.64	2.24	110	300	1.375	1.3	0.535	80
IE10	3-10	3.1	1.64	2.24	110	370	1.375	1.3	0.535	80
IE13	4-12	3.6	1.64	2.27	110	400	1.375	1.3	0.535	100
IE18	6-18	4.6	1.64	2.27	110	500	1.375	1.3	0.535	200
IE24	8-24	6.6	1.64	2.27	150	700	1.35	1.3	0.56	200
IE30	Tank A	10-30	2.6	1.64	1.99	300	1.35	1.3	0.46	
	Tank B		5.6	1.64	2.27	600	1.35	1.3	0.56	200 + 80
IE36	Tank A	12-36	3.6	1.64	1.99	400	1.35	1.3	0.46	
	Tank B		6.6	1.64	2.27	700	1.35	1.3	0.56	200 + 80
IE42	Tank A	14-42	5.6	1.64	2.27	600	1.35	1.3	0.46	
	Tank B		5.6	1.64	2.27	600	1.35	1.3	0.56	200 x 2
IE50	Tank A	16-50	6.6	1.64	2.27	700	1.35	1.3	0.46	
	Tank B		6.6	1.64	2.27	700	1.35	1.3	0.56	200 + 120 + 80



► **IE6 gravity outlet**  
Up to 6PE domestic gravity flow outlet.



► **IE6 pumped outlet**  
1-6 domestic pumped unit. Suitable for pumping to a raised discharge area (over).



► **Gravity IE50 outlet**  
Suitable for commercial installation, caters for up to 50 people.

Tricel Novo riser options for deep installation

Tricel offer 3 different manhole riser heights to suit different Invert/Inlet levels. Manhole risers allow for the positioning of the treatment plants at the depth which is optimum to each individual installation. Wastewater is gravity fed from the home to your treatment plant. The inlet pipe's position from the premises determines the excavation depth for the WWTP plant. Tricel offer a choice of manhole risers 250mm/500mm/750mm to help with installation where site conditions require a flexible solution.

**Tricel Novo: Wastewater Treatment System  
Service Agreement**

Establishing a regime of yearly inspections and maintenance is advised to ensure that your Tricel Novo continues to perform to the same high standards throughout its lifetime. The service agreement covers travel, the service and the labour cost of servicing only. Other labour costs are excluded, as are all replacement parts.

Tricel (Killarney) Unlimited Company, Ballyspillane Industrial Estate, Killarney, Co. Kerry, V93 X253, Ireland ("the Company") enter this Tricel Novo service agreement with the Customer named below:

Customer Details:			
Name:			
Address:		Address of Site: (If other)	
Telephone No.:			
Date of Tricel Novo Order:			
Work Order No.:			
Date of Delivery of Tricel Novo:			
Date of System Commissioning:			
Service Agreement Fee Paid:			
Date of Service Agreement Commencement:			
Unit Serial No.:			

**During routine servicing, the service technician will perform a series of checks and procedures:**

**Checks:**

- The air-diffuser is monitored to check for sufficient dispersion of air.
- The sludge return system is functioning correctly.
- The covers and locks are in place and in good condition.
- General appearance and condition of the treatment system is good.

**Procedures:**

- The blower is tested.
- The blower filter is replaced.
- The system alarm is tested.
- The pump and float-switch are tested (If applicable).
- The vents are cleared of any blockages.
- The sludge level in the primary chamber is measured.

**Notes:**

- Full inspection labour is covered (including any immediate minor system adjustment required). This service agreement does not cover the cost of any labour or materials that may arise as a result of this inspection.
- Components that require replacing will incur additional charges.
- All service agreements exclude de-sludging.

Tricel (Killarney) Unlimited Company trading as Tricel.

March 2017

---

## **Section 2: Information on Tertiary Treatment and Disposal route**

The proposed solution to use on site is a Tero module.

This system will provide tertiary treatment a total of 1 modules are required to ensure the loading rate of the coconut coir filter per day is not exceeded.

The tertiary treated liquids is disposed into the ground through a gravel distribution layer required underneath the Tero module. The gravel distribution layer must be 300mm thick and should be 15.00m<sup>2</sup> based on a population of 4 and a Subsurface/surface Value of 3-20.

The location and construction of the Tertiary infiltration area is the responsibility of the site engineer. A full site layout drawing should accompany this report.

The EPA CoP 2021 outlines the design, siting and construction requirements for tertiary polishing filters. The tables below outline some of the key factors to take into consideration when designing and locating a tertiary polishing filter.

Table 6.2: Minimum separation distances from the entire DWWTS

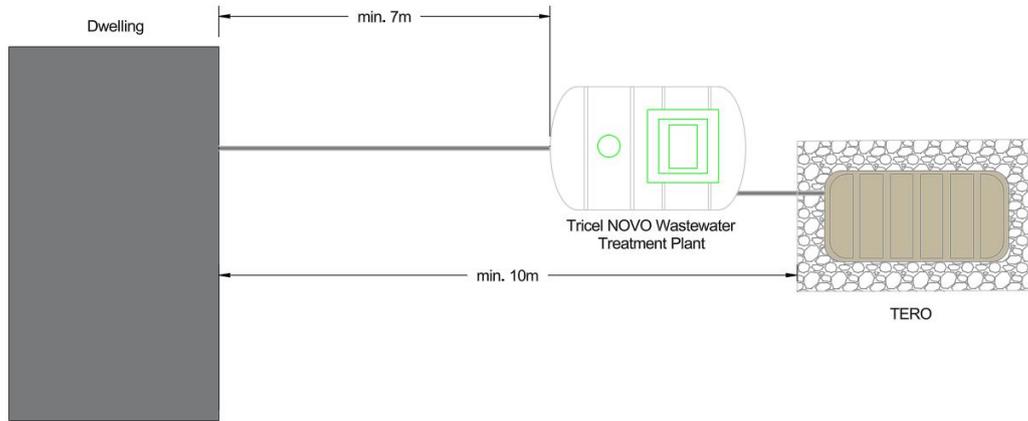
Features			DWWTS – periphery of tank/plant and infiltration/treatment area (m)
Public/group water supply abstraction points/wells			60
Down-gradient domestic well	3 ≤ PV ≤ 10 (usually SAND- or GRAVEL-dominated material)	Depth of soil/subsoil > 2.0 m between invert level and bedrock, and water table 1.2–2.0 m	60
		Depth of soil/subsoil 2.0–8.0 m between invert level and bedrock, and water table > 2.0 m	40
		Depth of soil/subsoil > 8.0 m between invert level and bedrock, and water table > 2.0 m	30
	10 < PV ≤ 30 (usually SILT- or SAND- or silty GRAVEL-dominated material)	Depth of soil/subsoil 1.2–8.0 m between invert level and bedrock	45
		Depth of soil/subsoil > 8.0 m between invert level and bedrock	30
	30 < PV ≤ 120 (usually SILT/CLAY- or CLAY-dominated material)	Depth of soil/subsoil 1.2–3.0 m between invert level and bedrock	40
Depth of soil/subsoil ≥ 3.0 m between invert level and bedrock		30	
Alongside domestic well			25
Up-gradient domestic well			15
Karst feature			15
Lake or foreshore			50
Watercourse/stream			10
Open drain or drainage ditch			10
Adjacent tank/plant and percolation area, polishing filter or infiltration area			10
On-site dwelling house			7 (tank/plant) 10 (free water surface constructed wetland) 10 (infiltration/treatment area)
Neighbouring dwelling house			7 (tank/plant) 25 (free water surface constructed wetland) 10 (infiltration/treatment area)
Surface water soakaway <sup>a</sup>			5
Road			4
Slope break/cuts			4
Trees <sup>b</sup>			3
Site boundary			3
Heritage features, NIHA/SAC/SPA <sup>c</sup>			See note
<p>PV, percolation value.</p> <p><sup>a</sup> The soakaway for surface water drainage should be located down-gradient of the infiltration/treatment area; it should also be ensured that this distance is maintained from neighbouring storm water disposal areas or soakaways.</p> <p><sup>b</sup> Tree roots may lead to PFPs developing. The canopy spread indicates potential root coverage.</p> <p><sup>c</sup> The distances required depend on the importance of the feature. Therefore, advice should be sought from the local authority and/or from the the Department of Housing, Local Government and Heritage, specifically the National Monuments Service and the National Parks and Wildlife Service.</p>			

Table 6.1 EPA CoP 2021: Minimum separation distances

---

Please see attached the accompanying documents in Section 2 for the Tricel Tero

- Separation Distances
- Tero Drawing
- Tero Technical Specification
- Technical information on the Tero



The Tricel Tero modules are filled with coconut coir. The wastewater is distributed over the top of the coir filter using a specially designed pipe network. Through a combination of biological, chemical and physical processes the coir treats the wastewater as it filters through. At the outlet of the Tero modules the tertiary treated wastewater is discharged into the in situ subsoil through a gravel distribution area.

**TERO BROCHURE**

### TERO module

The Tricel TERO tertiary wastewater system further purifies the treated effluent from a packaged wastewater treatment plant resulting in a reduced area and depth of discharge bed.

**Stage One:**

TERO receives secondary treated effluent from a wastewater treatment plant. The TERO is designed to work seamlessly with the Tricel NOVO but can also be used with third-party products, providing that a pumped discharge with a dose limit is utilised.

**Stage Two:**

The pre-treated effluent is dispersed using an easily serviceable distribution network which ensures the effluent is distributed evenly and uniformly onto natural filter media. The effluent filters through the media and is treated by a combination of biological, chemical and physical processes. The treated water is transported to the soil at the base of the tank.



**DIAGRAM INDEX**

1. Tricel NOVO wastewater treatment plant
2. TERO Module
3. Inlet Pipe
4. Distribution Pipework
5. Coconut Fibre
6. Outlets
7. Gravel Bed

**The environmental advantages of TERO**

- Improved E.coli treatment efficacy. Test results show less than 1000 cfu/100ml, reducing soil depth requirements to 600mm.
- TERO is an Environmentally friendly system that utilises natural, long-life renewable media. The remarkable filtration properties of coconut fibre requires no chemical additives in achieving exceptional results.
- The closed system design of TERO greatly reduces odour whilst ensuring high treatment efficiency of the wastewater.

**Advantages for you**

- Compact system - one module meets requirements for 6PE.
- The modular design of TERO makes it ideal for retrofit upgrades, extensions etc., and can be used with many existing treatment systems.
- The shallow profile of TERO makes it easy to incorporate into landscape design.
- Simple maintenance. No desludging required.
- No electrical components or power consumption used in the TERO system.

**Advantages for installation**

- Easy installation – Flat base for easy installation, one inlet connection from wastewater plant. Reduced discharge depth and area, thus reducing contractor expense and costs.
- Plug and play system – assembled module with single input connector.

The TERO system has undergone a rigorous performance testing regime to achieve the highest results required. The tables below show the sizes and the wastewater treatment capability of a TERO. If you have any specific requirements, please contact the Tricel sales team who will be able to assist you with your enquiry.

Tertiary Treatment Performance		TERO module dimensions	
ESSENTIAL CHARACTERISTICS	PERFORMANCE	Length	2,444mm
Nominal Organic Design Load	0.01 kg BOD/d	Height	1,078mm
Nominal Hydraulic Daily Design Load	0.90 l/d	Width	1,012mm
COD	54 mg/l	Weight (one TERO module)	515kg
BOD5	5 mg/l		
SS	4 mg/l		
NH4 <sup>+</sup>	0.2 mg/l		
Electrical Power Consumption	0.2 kWh/d		
Number of desludging	0		

\* determined at temperatures of ≥ 12°

**SEWAGE TREATMENT SIMPLIFIED**

**Sewage Treatment:** Combination of physical and biological processes which break down the organic and inorganic sewage content which cause pollution to receiving waters.

**Receiving Waters:** All groundwaters and watercourses such as streams and rivers.

**Population Equivalent (PE):** A measure of the number of people the treatment plant serves.

**Media:** Coconut fibre.

**Sludge:** The solids that settle to the bottom of the tank chambers.

**BOD:** Biological Oxygen Demand measured in milligrams per litre (mg/l) is a relative measure of how polluting the sewage is.

**SS:** Suspended Solids measured in milligrams per litre (mg/l) includes all suspended matter both organic and inorganic.

**E.Coli bacteria:** commonly used as an indicator microorganism for faecal pollution, and the sanitary quality of foods and water, measured in (cfu/100ml).

**Pathogenic Bacteria:** Pathogenic bacteria such as Streptococcus are bacteria which cause disease in humans and animals.

The Tero modules are a tertiary treatment filter. They can be located above or below ground depending on the existing bedrock or subsoil. According to the EPA Code 2021 the tertiary treated effluent can be discharge to ground through a gravel distribution area. As outlined below in table 10.1 the area required per person of this distribution bed is dependent on the Subsurface value of the receiving subsoil. It is compulsory that the percolation test is carried out at the infiltration level which is located at the base of the proposed distribution layer. This distribution bed should comprise of a 300mm layer of 12 -32mm gravel

**Table 10.1:** Infiltration/treatment area and trench length design for tertiary treatment, per PE

Percolation values (PVs)	Pumped or underlying gravity discharge (Options 1 and 2)	Gravity discharge into 500 mm wide trenches (Option 3)	Low-pressure pipe distribution into 300 mm wide trenches (Option 4)	Drip dispersal system (Option 5)	Tertiary infiltration area (Option 6)
	Area required per person (m <sup>2</sup> )	Trench length required per person (m)	Trench length required per person (m)	Area required per person (m <sup>2</sup> )	Area required per person (m <sup>2</sup> )
3 ≤ PV ≤ 20	≥7.5	≥6	≥6	≥5	≥3.75
21 < PV ≤ 40	≥15	≥12	≥12	≥14	≥7.5
41 < PV ≤ 50	≥30	≥17	≥17	≥16	≥15
51 < PV ≤ 75	≥50	≥19	≥19	≥22	≥25
76 < PV ≤ 90	–	–	≥28	≥34	–
91 < PV ≤ 120	–	–	–	≥54	–

**Table 10.1 from EPA CoP 2021 - Loading rates for infiltration/treatment area**

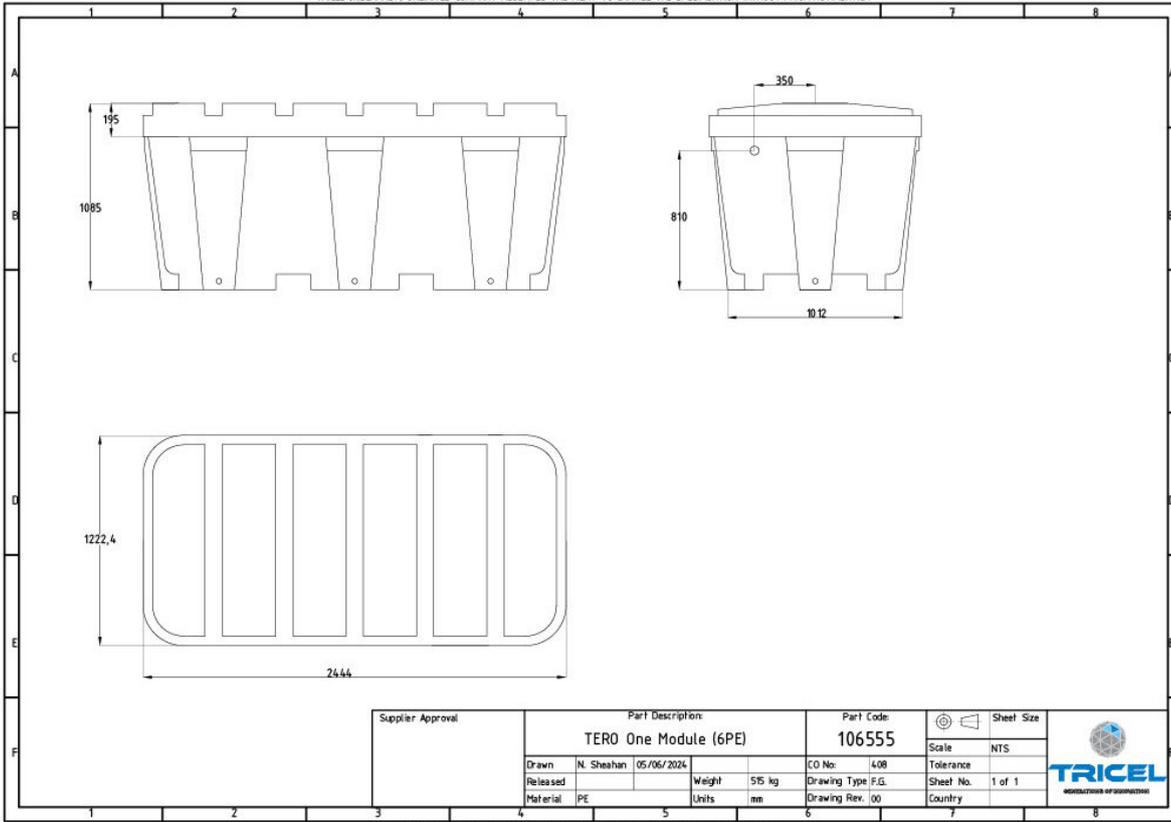
**Terms and conditions:**

*Tricel cannot accept responsibility for incorrect site details or calculations as these are based on user inputs which are outside of Tricel control.*

Full terms of website use are available at [www.tricelsiteassessor.ie/TermsOfWebsiteUse](http://www.tricelsiteassessor.ie/TermsOfWebsiteUse)

**\*\*\*Domestic WwTP catering for over 10 Population Equivalent that are discharging to TERO Tertiary Treatment modules may require a pump station\*\*\***

TRICEL (KILLARNEY) UNLIMITED COMPANY RESERVES THE RIGHT TO CHANGE THE SPECIFICATION WITHOUT PRIOR NOTIFICATION



PRINTED COPIES OF THIS DOCUMENT ARE UNCONTROLLED UNLESS STATED OTHERWISE

# IRELAND



## WASTEWATER TREATMENT

### Tricel® Novo

For Single Dwellings & Small Communities

*Innovative design for superior performance*



# CE

Certified to EN12566-3



# TRICEL

GENERATIONS OF INNOVATION

## What is the Tricel Novo

Tricel Novo wastewater treatment plants are reliable, easy to install and simple to maintain for all wastewater requirements. These highly functional plants can cater for ranges from 1 to 50 PE (population equivalents).

The Tricel Novo submerged aeration plant is suitable for domestic and light commercial or communal applications and uses simple proven fixed bed technology. Each system comprises of 3 independent treatment zones, all fulfilling a different stage of the purification process.

## European Certification Requirements

All Tricel wastewater treatment plants have been tested to European certification EN 12566-3 and comply with the requirements of S.R. 66:2015. This certification tests all plants for strength, water tightness, durability and treatment efficiency.

By using a wastewater treatment plant which is CE certified clients can rest assured that it has complied with tests and inspections which guarantee a high level of security and efficiency.

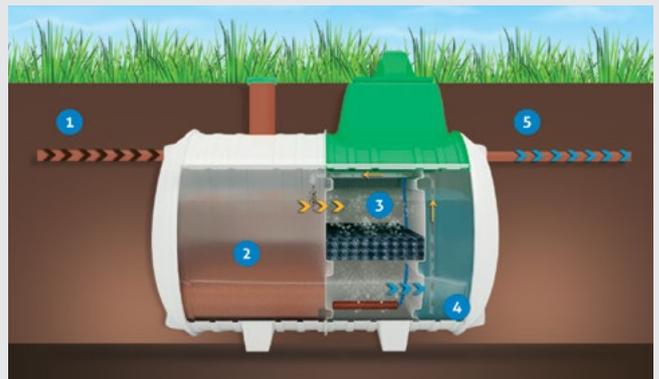
## How a Tricel Novo works

These plants use a simple, proven technology, consisting of 3 treatment zones. In each zone a different stage of the treatment occurs.

1. Wastewater from the dwelling, toilets, sinks, shower etc., enters the plant.
2. Effluent enters the primary settlement chamber. Settlement occurs when the heavier solids drop out of the wastewater and settle to the bottom of the tank to create sludge, and the lighter solids float to the top of the water to create a scum. The top layer acts as a seal and stops odours escaping. This chamber separates up to 70% of the solids present.
3. Next is the aeration chamber, where masses of naturally occurring bacteria inhabit specially designed plastic filter media. The bacteria feed on the waste removing it from the liquid. A continuous supply of air from a low pressure, high volume compressor in the top section of the unit sustains these bacteria. Wastewater passes through the filter media over and over, ensuring a very high treatment efficiency.
4. The liquid then proceeds to the final settlement chamber. Any remaining minute bacterial particles separate from the liquid within this chamber before discharge from the plant. This process slows the

liquid's velocity, allowing for any final trace impurities to settle to the bottom of the tank section. A sludge return system then returns these impurities back to the primary settlement chamber.

5. The remaining treated liquid now meets the required standard and is safely passed out of the Tricel Novo plant system. The treated effluent is now ready for discharge to a suitably designed discharge area as required by the relevant local authority.



*Tricel Novo Wastewater Treatment Plant has an overall efficiency of 95.9% BOD removal*

## Key features & benefits

- ▶ Compression moulded SMC tank. The compression moulding process is one of the most technologically developed processes available to manufacture structural composites. Components are manufactured under heat and high pressure and have unrivalled strength and durability over standard GRP tanks or Polyethylene tanks.
- ▶ SMC is unique in the wastewater treatment industry with Tricel SMC tanks operating in some of the harshest climatic conditions for over 50 years with no defects.
- ▶ Tricel's ceramic diffuser is unique in the domestic wastewater treatment plant market and will last twice

as long as all standard competitors rubber equivalents. This saves money in both call out fees and replacement parts.

- ▶ No concrete backfill for installation on most sites saving up to €400 over lower quality GRP or Polyethylene alternatives from competitors.
- ▶ No moving parts or pumps in the plant ensuring reliable operation and minimal maintenance and repair costs.
- ▶ Tricel Novo plants are designed with a shallow invert to reduce both installation and time costs.

Call us Today for a Free Quote

+ 353 (0) 64 6632421

sales@tricel.ie

## Homeowners: Individual domestic installation



▶ The lightweight nature of the system makes for easy on-site delivery.



▶ No need for big excavators and large holes that disrupt and disturb your garden.



▶ Very low visual impact from fully installed units.

## Larger projects: Commercial installations up to 50PE



▶ These plants are suitable for installation at housing estates, camping sites, hotels etc., and have low maintenance and running costs.



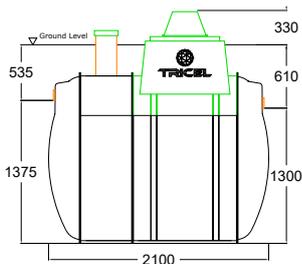
▶ Each WWTP unit is constructed of lightweight SMC and is easy to manoeuvre which simplifies the installation process.



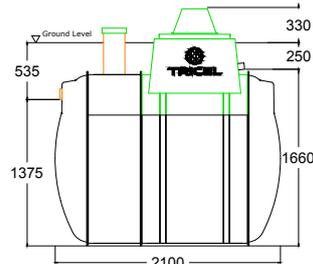
▶ Example of a fully installed 50PE Novo Wastewater Treatment Plant (WWTP) in a 5-star hotel.

## Technical characteristics/ Plant dimensions

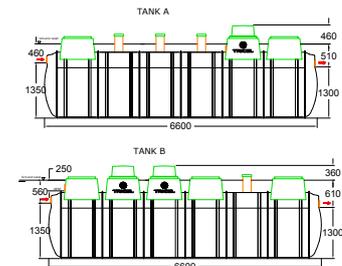
Novo Design Population	No. of people	Length	Width	Height	Nominal inlet/outlet diameter	Weight empty	Inlet invert to base	Outlet invert to base	Inlet invert to ground level	Air blower rating (Mean)	
										watts	
IE6	1-6	2.1	1.64	2.24	110	270	1.375	1.3	0.535	70	
IE6+*	2-6	2.6	1.64	2.24	110	300	1.375	1.3	0.535	70	
IE8	2-8	2.6	1.64	2.24	110	300	1.375	1.3	0.535	86	
IE10	3-10	3.1	1.64	2.24	110	370	1.375	1.3	0.535	86	
IE12	4-12	3.6	1.64	2.27	110	400	1.375	1.3	0.535	100	
IE18	6-18	4.6	1.64	2.27	110	500	1.375	1.3	0.535	215	
IE24	8-24	6.6	1.64	2.27	150	700	1.35	1.3	0.56	215	
IE30	Tank A	10-30	2.6	1.64	1.99	150	300	1.35	1.3	0.46	
	Tank B		5.6	1.64	2.27	150	600	1.35	1.3	0.56	215 + 86
IE36	Tank A	12-36	3.6	1.64	1.99	150	400	1.35	1.3	0.46	
	Tank B		6.6	1.64	2.27	150	700	1.35	1.3	0.56	215 + 86
IE42	Tank A	14-42	5.6	1.64	2.27	150	600	1.35	1.3	0.46	
	Tank B		5.6	1.64	2.27	150	600	1.35	1.3	0.56	215 x 2
IE50	Tank A	16-50	6.6	1.64	2.27	150	700	1.35	1.3	0.46	
	Tank B		6.6	1.64	2.27	150	700	1.35	1.3	0.56	215 + 130 + 86



▶ **IE6 gravity outlet**  
Up to 6PE domestic gravity flow outlet.



▶ **IE6 pumped outlet**  
1-6 domestic pumped unit. Suitable for pumping to a raised discharge area (over).



▶ **IE50 gravity outlet**  
Suitable for commercial installation, caters for up to 50 people.

## Tricel Novo riser options for deep installation

Tricel offer 3 different manhole riser heights to suit different invert/inlet levels. Manhole risers allow for the positioning of the treatment plants at the depth which is optimum to each individual installation. Wastewater is gravity fed from the home to your treatment plant. The inlet pipe's position determines the excavation depth for the WWT plant. Tricel offer a choice of manhole risers 250mm/500mm/750mm to help with installation where site conditions require a flexible solution.

## Tricel Group

Tricel is a world recognised global provider of **high-performance solutions**. Today, the company operates across multiple industries such as **Environmental, Construction, Water and Distribution**, including both composite materials and lubricants.

We occupy a unique position in the field of reinforced plastics, combining the technical expertise of **over 60 years in the press-moulding and composites industry**. Tricel is proud of being one of the largest manufacturers of wastewater treatment plants in Europe, and are regarded by regulators as the standard setters within the industry.

Tricel are experts in **Sheet Moulding Compound (SMC)** processes and produce the only wastewater treatment plant in Europe constructed from this material. This process gives the highest strength to thickness ratio of any tank on the market, and has no risk of corrosion over time.

Our company offers industry **leading innovative solutions** that our customers can trust, and with operations in **17 locations** across Europe we supply a comprehensive range of products to **over 50 countries worldwide**.



## Membership of European governing bodies on wastewater treatment



The Tricel Environmental Waste Water Treatment Plants are fully tested and accredited to **European standards for CE certification**. PIA (Prüfinstitut für Abwassertechnik GmbH) are the leading Test Institute in Europe for wastewater technology. Tricel Wastewater treatment plants meet with **EN12566-3** requirements which test both the quality of the components as well as the overall performance of the plant.



The **Irish Water Treatment Association (IWTA)** is the national association for the treatment, conservation, recycling and reuse of water and wastewater.



The **Irish Onsite Wastewater Association (IOWA)** formed in 2007 with the goal of improving the standard of professionalism in the on-site treatment of wastewater in Ireland.

## WARRANTY - IRELAND ONLY



- The warranty period for **mechanical parts** within the products is **12 months** from the date of purchase. This includes the compressor, control panel, ceramic diffuser and all internal components.
- The SMC structure of the tanks carry a **10 year warranty** from date of purchase.
- All products are **CE certified to EU safety**, health and environmental requirements.



All warranties are subject to correct installation and use of the product, including maintenance as per manufacturer guidelines

## Get a Quote

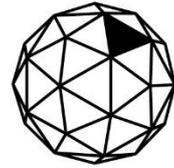
Contact us Today  
to get a free quote on  
**00 353 (0) 64 6632421**  
or email us at  
**sales@tricel.ie**

Tricel, Ballyspillane Industrial Estate, Killarney, Co Kerry, Ireland  
Tel: +353 (0) 64 6632421 | Email: sales@tricel.ie | www.tricel.ie

In accordance with Tricel's normal policy of product development these specifications are subject to change without notice.  
Tricel (Killarney) Unlimited Company trading as Tricel



**TRICEL**  
GENERATIONS OF INNOVATION



**TRICEL**  
GENERATIONS OF INNOVATION

# Tricel® Novo IE6-50

## Wastewater Treatment Plants

*Engineering a green future*



# Contents

1	Health & safety precautions.....	4
1.1	Electrical maintenance .....	4
1.2	Installation.....	4
2	Introduction: Tricel Novo .....	5
2.1	Treatment stages.....	5
3	Tricel Novo range .....	6
3.1	Dimensions .....	6
3.2	Tank drawings.....	7
3.3	Pumped outlet.....	11
3.3.1	Standard pump specification: .....	11
3.3.2	Outlet connection: .....	12
4	Transportation & lifting.....	12
4.1	Lifting tanks of 1-4 modules (max. 4.6m) .....	13
4.2	Lifting tanks of 5-6 modules (max. 6.6m) .....	14
5	Installation.....	15
5.1	Installation planning .....	15
5.2	Inspection on reception of tanks .....	15
5.3	Positioning and precautions .....	15
5.4	Types of installation.....	16
5.5	Installation procedure .....	17
5.5.1	Excavation (dry & wet sites).....	17
5.5.2	Installation – step by step guide .....	19
5.6	Gravel specification .....	20
5.7	Concrete specification .....	21
5.8	Topsoil requirements.....	21
5.9	Risers .....	21
5.10	Non-standard installations .....	22
5.10.1	Alternative to concrete backfill (for wet sites without risers only) .....	22
5.10.2	Sloping ground .....	23
5.10.3	Proximity to rolling & static loads.....	23
5.11	Electrical requirements .....	24
5.12	Additional accessories .....	24
5.12.1	Grease trap .....	24
5.12.2	Sampling chamber .....	24
6	Plant operation .....	25
6.1	Diffuser-manifold calibration (only applicable on plants IE18 and greater).....	25

6.2	Timed sludge-return system (only applicable on plants IE18 and greater) .....	26
7	Disposal of treated water.....	26
8	Maintenance .....	26
8.1	Regular maintenance.....	26
8.2	Annual maintenance.....	27
8.3	Annual service(availablefromyoursupplier).....	27
8.4	Production of sludge.....	27
8.5	Desludging (emptying the solid waste from the primary chamber) .....	27
9	Operating conditions.....	28
10	Troubleshooting .....	30
10.1	Plant operation.....	30
10.2	Odours .....	31
11	Certification .....	32
11.1	Declaration of performance .....	33
12	Terms & conditions.....	36

# 1 Health & safety precautions

Reading the full technical manual prior to installation is important. Retain this document for the lifetime of the product and in the event of a change of ownership of the site, be transferred to the new owner. As health and safety are of vital importance, the following aspects are critical:

- Ensure adherence to all the information contained in this manual at all times.
- Treated wastewater is not suitable for human consumption.
- It is vital that locks be fitted to the lid to prevent accidental access.
- Manholes are rated to 125kg and are for pedestrian use only.
- Never enter a tank, unless qualified to do so.
- Do not use naked flames in the vicinity of the tank due to the danger of combustion.
- The manhole covers shall never be left off an unattended tank. Always lock the manhole covers of the plant when work is complete.
- Sewage and sewage effluent can carry micro-organisms and gases harmful to human health. Only appropriately trained persons can carry out work on the plant. Suitable protective clothing; including gloves, goggles should be worn at all times. Always remove contaminated clothing and protective equipment after working with sewage treatment plants. Wash hands and face before eating, drinking or smoking.
- Lock all manholes for safety. Tanks are supplied with three locking points, as shown below. All locking points require locking with a suitable lock device to prevent unauthorised access. Locking devices do not come supplied.



## 1.1 Electrical maintenance

- All electrical work to be carried out by a qualified electrician using suitable materials for the application.
- Do not open the Tricel Novo air-blower housing without first isolating the mains power.
- Electrical work must be carried out strictly to the manufacturer's instructions and comply with the relevant national regulations for electrical installations.
- When working with machinery/electrical equipment, the proximity of water shall be noted. Electrical equipment shall not be wet when working with it.
- There is the potential danger of falling into the tank during desludging when manholes may be open – take all necessary safety precaution when desludging.

## 1.2 Installation

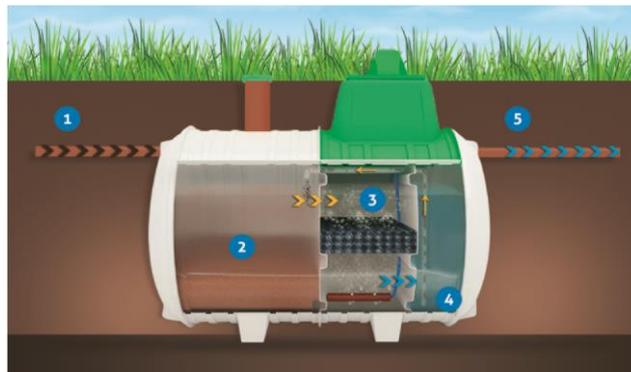
- Plan excavation work with due regard to health and safety requirements.
- Excavated material should either be shored or battened back to a "safe" angle.
- Use appropriate lifting equipment.
- Take care around grounds work machinery.
- Keep proper footing and balance at all time.
- **Treatment plants that require 500mm or 750mm risers need concrete installation. You cannot retrofit 500mm & 750mm risers to tanks with gravel installations.**

## 2 Introduction: Tricel Novo

Tricel Novo wastewater treatment plants are manufactured from sheet moulding compound (SMC) ensuring a durable and robust product. The Tricel Novo gets manufactured in modular components, and these modules are fabricated together to make various sized tanks.

SMC is a fiberglass-based compression moulded material used in applications that require high strength and durability. Lightweight and compact design facilitate ease of installation for domestic & light commercial applications up to 50PE.

### 2.1 Treatment stages



#### Stage 1

Wastewater from the dwelling, toilets, sinks, shower, etc., enters the plant.

#### Stage 2

Effluent enters the primary settlement chamber. Settlement occurs when the heavier solids drop out of the wastewater and settle to the bottom of the tank to create sludge, and the lighter solids float to the top of the water to form a scum. The top layer acts as a seal and stops odours from escaping. This chamber separates up to 70% of the solids present.

#### Stage 3

Next is the aeration chamber, where masses of naturally occurring bacteria inhabit specially designed plastic filter media. The bacteria feed on the waste removing it from the liquid. A continuous supply of air from low pressure, high volume compressor in the top section of the unit sustains these bacteria. Wastewater passes through the filter media repeatedly, ensuring a very high treatment efficiency.

#### Stage 4

The wastewater then proceeds to the final settlement chamber. Any remaining minute bacterial particles separate from the wastewater within this chamber before discharge from the plant. This process slows the liquid's velocity, allowing for any final trace impurities to settle to the bottom of the tank. A sludge return system then returns these impurities to the primary settlement chamber.

#### Stage 5

The remaining treated wastewater now meets the required standard and is safely passed out of the Tricel Novo plant. The treated effluent is now ready for discharge to a suitably designed discharge area as required by the relevant local authority.

## 3 Tricel Novo range

### 3.1 Dimensions

Tricel Novo wastewater treatment plants: certified to EN 12566-3.

Tricel Novo		IE6	IE6+	IE8	IE10	IE12	IE18	IE24
<b>Max. Population Equivalent</b>	<b>PE</b>	<b>6</b>	<b>6</b>	<b>8</b>	<b>10</b>	<b>12</b>	<b>18</b>	<b>24</b>
Design flow rate (max)	litres/day	900	900	1200	1500	1800	2700	3600
Primary chamber capacity	litres	1400	2400	1900	2550	2300	2550	2550
BOD Load (max)	kg/day	0.36	0.36	0.48	0.6	0.72	1.08	1.44
No. of persons		1-6	2-6	3-8	4-10	4-12	6-18	8-24
Nominal inlet/outlet diameter	mm	110	110	110	110	110	110	150
Overall length	m	2.1	2.6	2.6	3.1	3.6	4.6	6.6
Overall width	m	1.64	1.64	1.64	1.64	1.64	1.64	1.64
Overall height	m	2.24	2.24	2.24	2.24	2.27	2.27	2.27
Inlet invert to base	m	1.375	1.375	1.375	1.375	1.375	1.375	1.35
Outlet invert to base	m	1.3	1.3	1.3	1.3	1.3	1.3	1.3
Inlet invert to ground level	m	0.535	0.535	0.535	0.535	0.535	0.535	0.56
Outlet invert to ground level	m	0.61	0.61	0.61	0.61	0.61	0.61	0.61
Height above ground level	m	0.33	0.33	0.33	0.33	0.36	0.36	0.36
Weight empty**	kg	270	300	300	370	400	500	700
Air blower rating (mean)	watts	60	60	80	80	100	200	200
Desludging period (minimum)***	year	1-3	1.5-4	1-3	1-3	1-3	0.5-2	0.4-1
Thickness (minimum)	mm	5	5	5	5	5	5	5

Tricel Novo		IE30*		IE36*		IE42*		IE50*	
		Tank A	Tank B	Tank A	Tank B	Tank A	Tank B	Tank A	Tank B
<b>Max. Population Equivalent</b>	<b>PE</b>	<b>30</b>		<b>36</b>		<b>42</b>		<b>50</b>	
Design flow rate (max)	litres/day	4500		5400		6300		7500	
Primary chamber capacity	litres	3250		3850		4625		5550	
BOD load (max)	kg/day	1.8		2.16		2.52		3	
No. of persons		10-30		13-36		14-42		16-50	
Nominal inlet/outlet diameter	mm	150	150	150	150	150	150	150	150
Overall length	m	2.6	5.6	3.6	6.6	5.6	5.6	6.6	6.6
Overall width	m	1.64	1.64	1.64	1.64	1.64	1.64	1.64	1.64
Overall height	m	2.27	2.27	1.99	2.27	2.27	2.27	2.27	2.27
Inlet invert to base	m	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35
Outlet invert to base	m	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3
Inlet invert to ground level	m	0.46	0.56	0.46	0.56	0.46	0.56	0.46	0.56
Outlet Invert to ground level	m	0.51	0.61	0.51	0.61	0.51	0.61	0.51	0.61
Height above ground level	m	0.18	0.36	0.18	0.36	0.46	0.36	0.46	0.36
Weight empty**	kg	300	600	400	700	600	600	700	700
Air blower rating (mean)	watts	200 + 80		200 + 80		200 x 2		200 + 120 + 80	
Desludging period (minimum)***	year	0.4-1		0.4-1		0.4-1		0.4-1	
Thickness (minimum)	mm	5	5	5	5	5	5	5	5

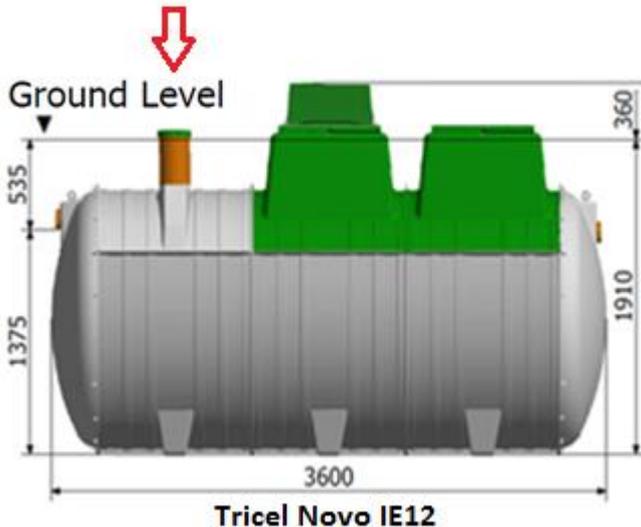
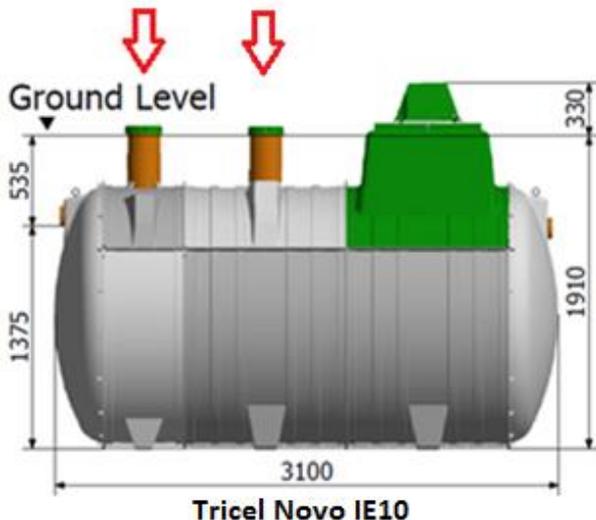
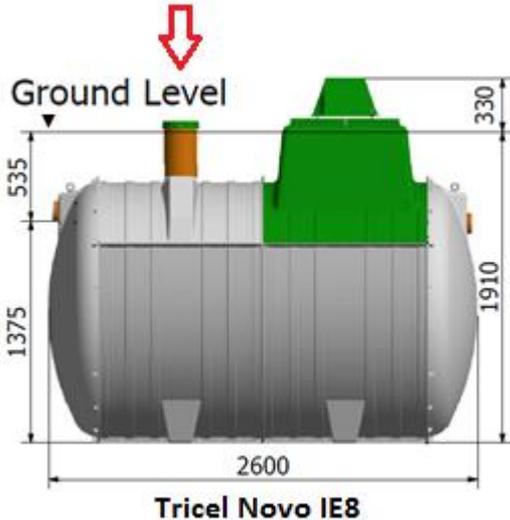
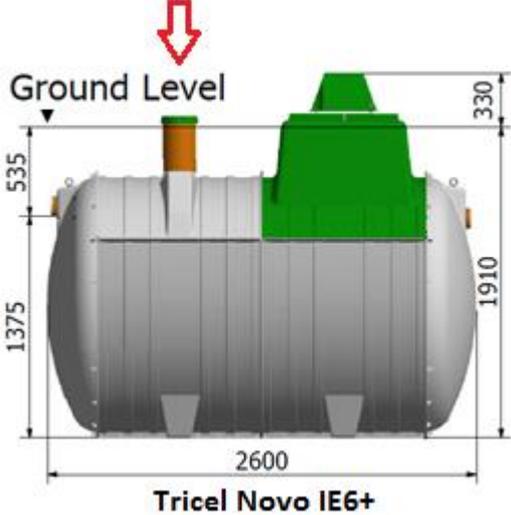
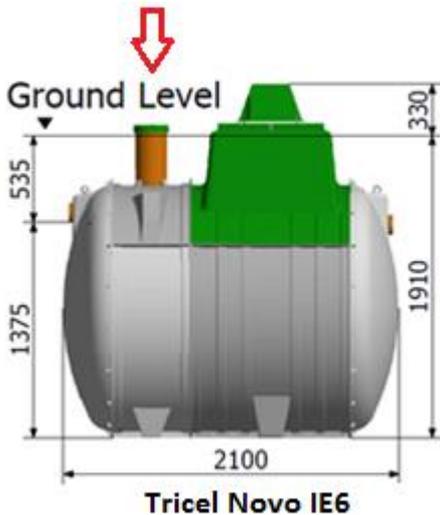
\*Tanks may require a stepped foundation, with "Tank B" lower than "Tank A" by 100mm approx.

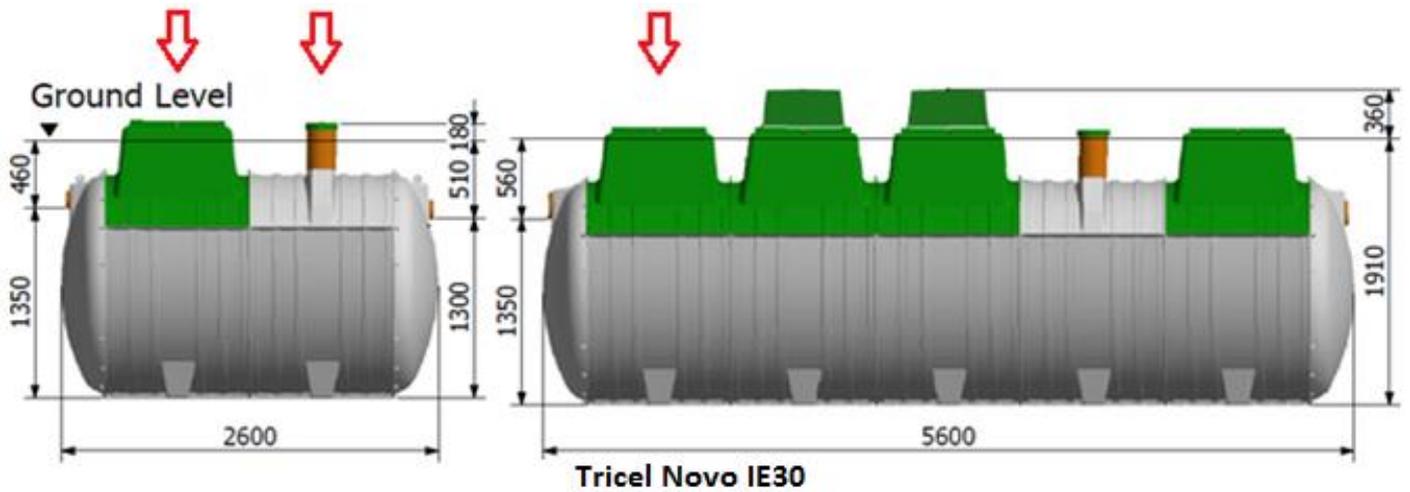
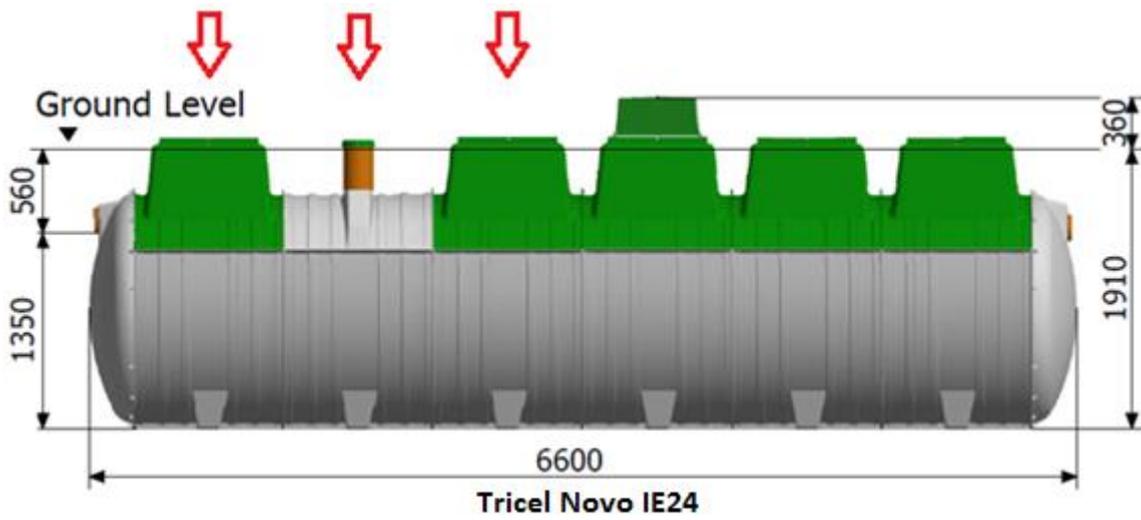
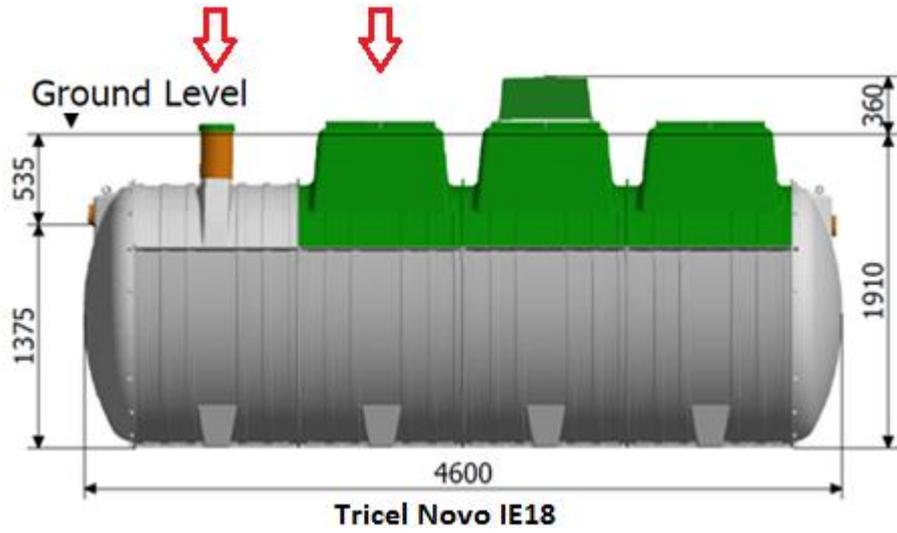
\*\*Allow 100kgs extra for lifting purposes.

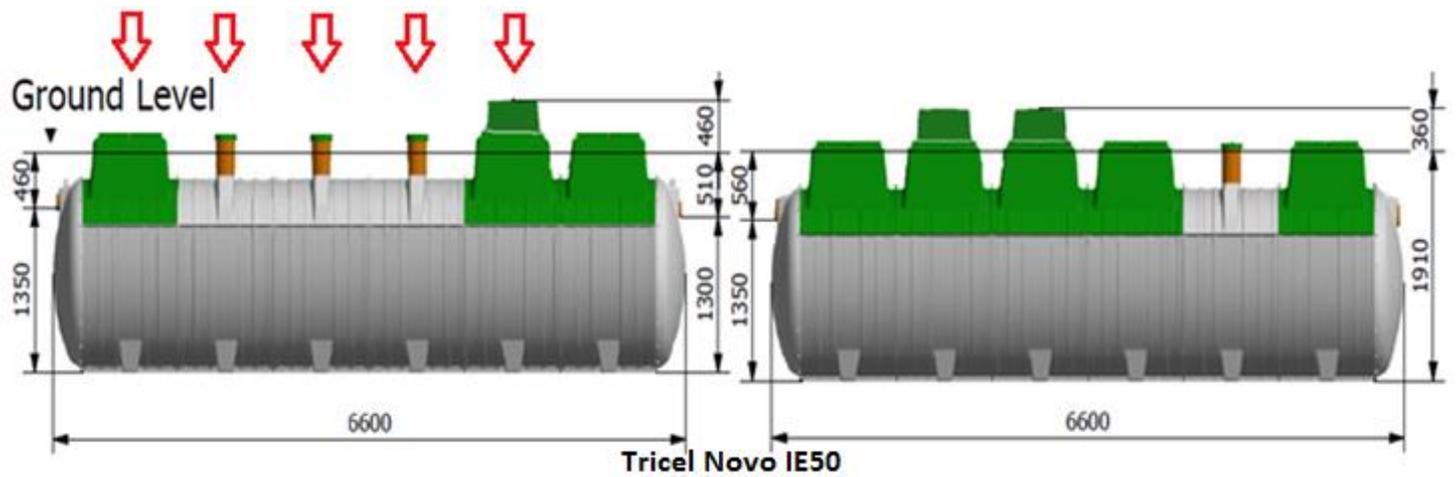
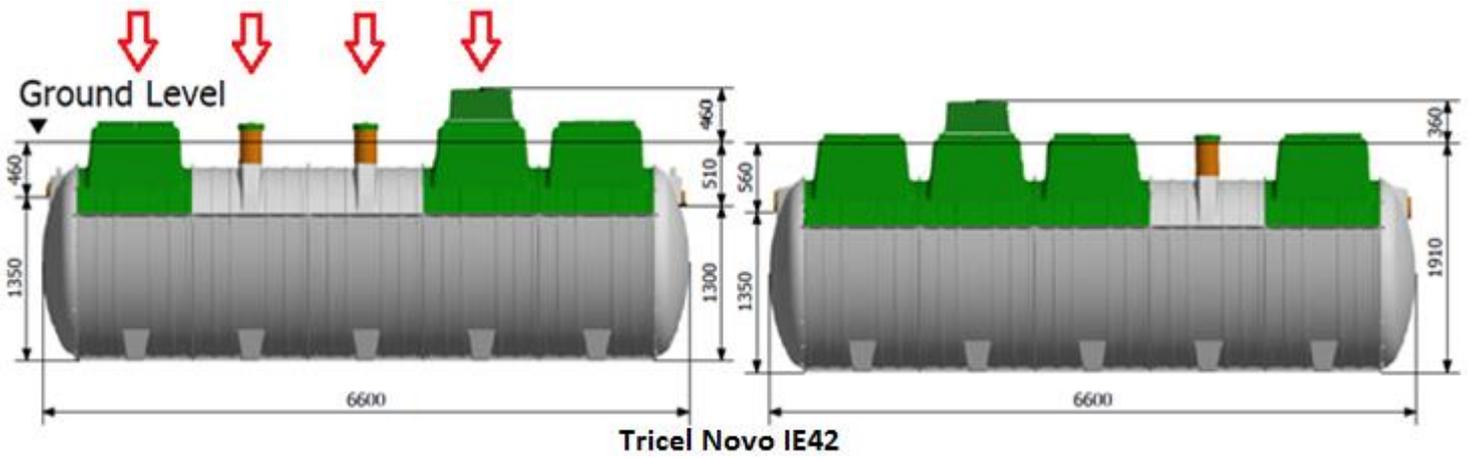
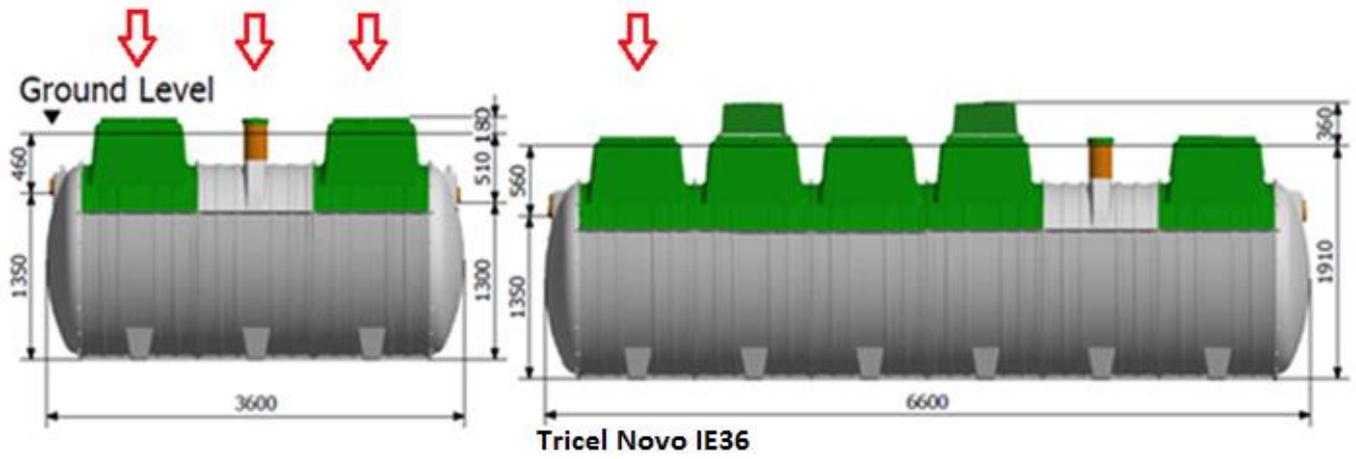
\*\*\* Depending on use.

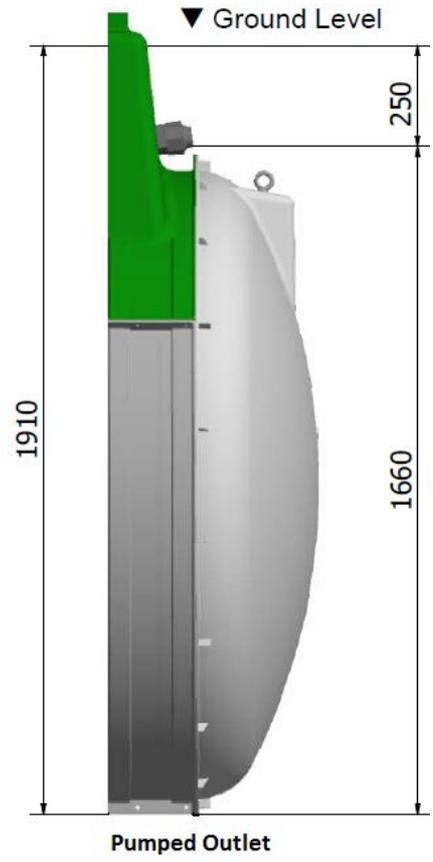
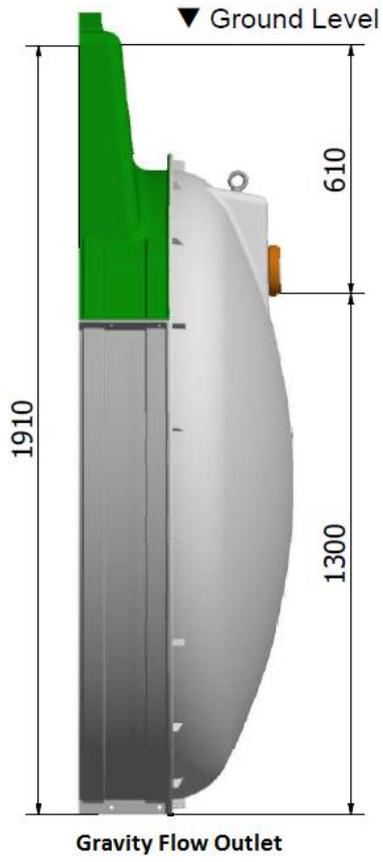
### 3.2 Tank drawings

↓ The arrow indicates an access point which must be opened to facilitate the desludging of the primary chamber.

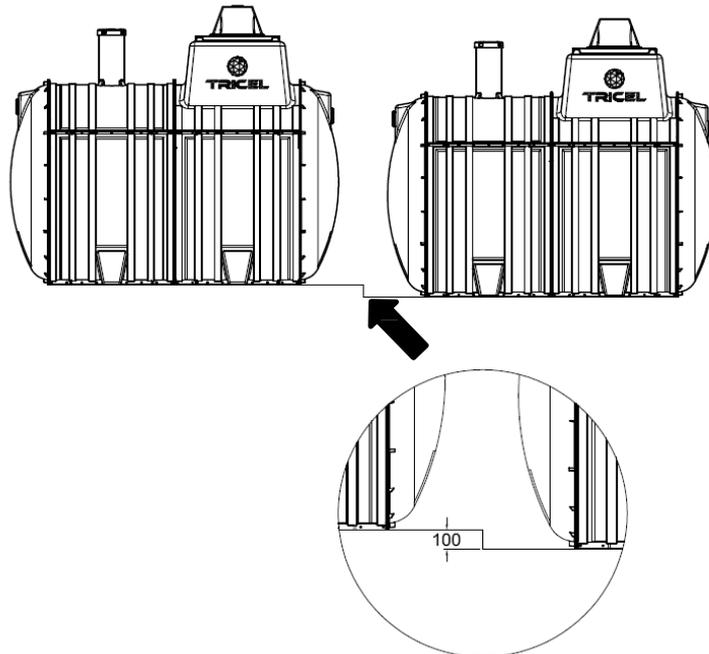








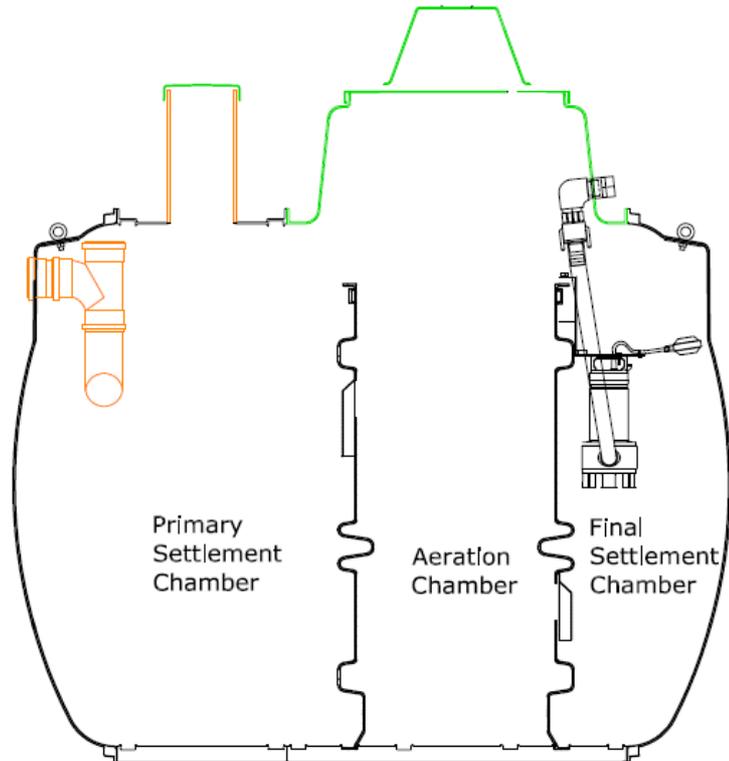
Two-tank Tricel Novo plants require a stepped installation:



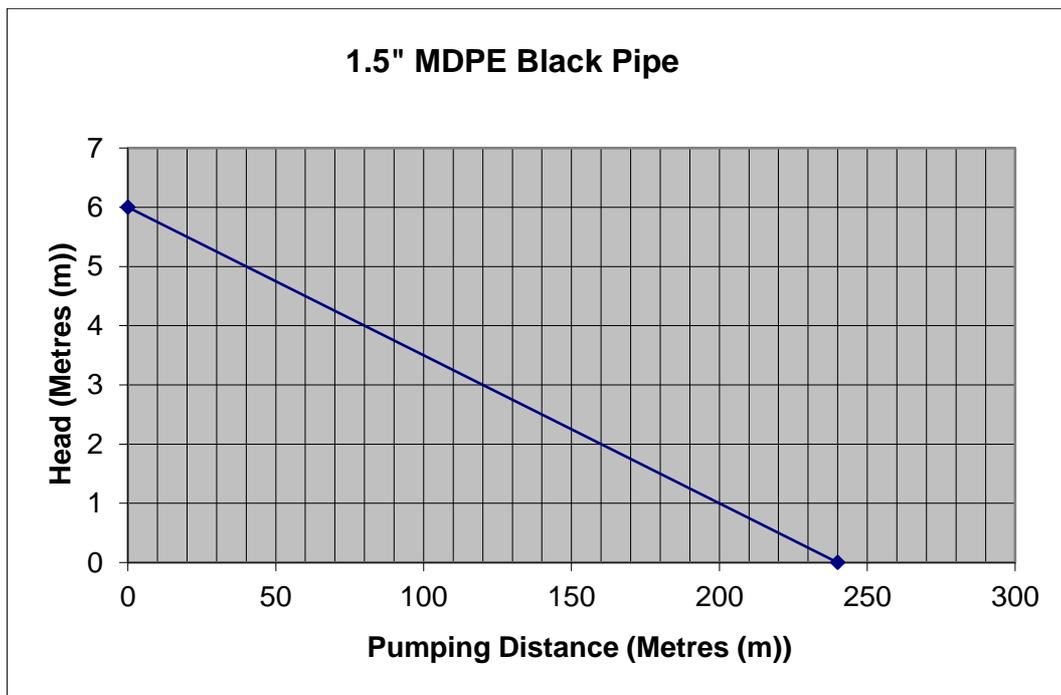
### 3.3 Pumped outlet

- All Tricel Novos are available with a pumped outlet option. The pump gets housed in the final settlement chamber of the plant.
- Outlined below is the standard pump specification. Other pump options are available to customer specifications if required; please contact your Tricel Novo supplier.

- Min discharge rate: 60 l/min
- Continuous duty with 35°C liquids & fully submerged.
- Dry motor (class F insulation)
- IP68 protection
- Single phase 220-240 V 50 Hz 2 poles
- 0.55 kW for single phase.



#### 3.3.1 Standard pump specification:



### 3.3.2 Outlet connection:

The Tricel Novo pumped outlet plant has a 1.5" end-connector compression fitting connected to the turret of the Tricel Novo. 1.5" MDPE black piping must be connected to this end-connector compression fitting to transfer the treated wastewater to the discharge point.

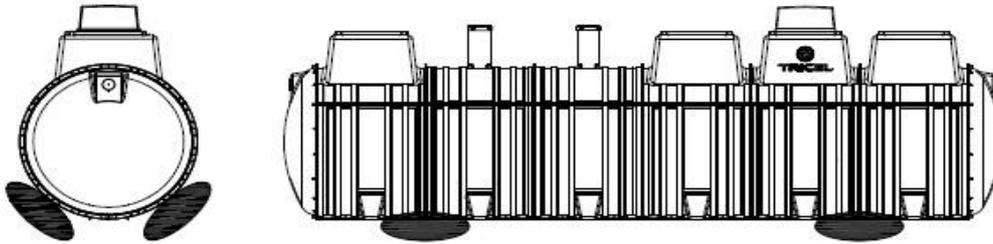


## 4 Transportation & lifting

- Tanks must be held down during transportation using nylon straps, do not use cables or chains to secure tanks. Do not over tighten straps that can result in deformation of the tank shell. Do not drop or roll tanks from the truck.
- Move tanks only by lifting and setting, do not drag or roll.



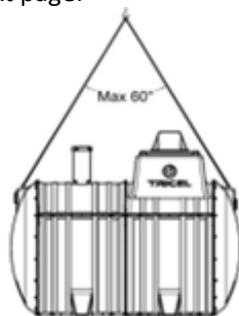
- Always set the tank(s) on flat, smooth ground clear of any debris, etc. Tanks may need to be tied down and chocked to avoid movement. Position the chocks in the locations shown below:



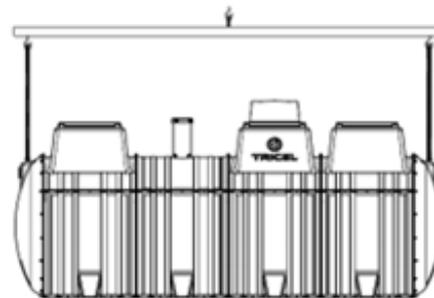
- A machine and webbing lifting straps are best to lift tanks – do not use chains or wire ropes in contact with the tank.
- Ensure tank is empty when lifting.
- Care is needed to control the lift to ensure the tank is not damaged.
- Ensure the slings are positioned at a joint on the tank, firmly secured and the load is evenly balanced.

#### 4.1 Lifting tanks of 1-4 modules (max. 4.6m)

- Tanks up to 4.6m in length should be lifted using the eyebolts on the tank.
- Tanks up to 4.6m in length can be lifted using only lifting straps, as shown in option one, next page. However, on sites where lifting height is restricted, a lifting bar should be used as shown in option two, next page:



Option 1

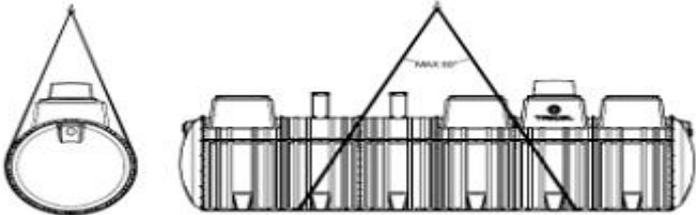


Option 2

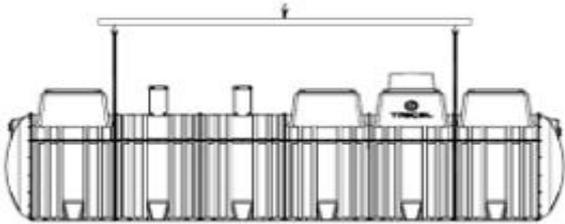
- To ensure the angle of the sling is not greater than 60°, as per option one above, the following sling lengths are required:

### 4.2 Lifting tanks of 5-6 modules (max. 6.6m)

- Tanks which consist of more than four modules (4.6m) in length should be lifted using the slings provided as shown in option three below. However, on sites where lifting height is restricted, a lifting bar should be used as shown in option four (see next page):



Option 3



Option 4

Length of tank	Minimum length of sling
2.1	2.1
2.6	2.6
3.1	3.1
3.6	3.6
4.6	4.6
5.6	5.6
6.6	6.6

# 5 Installation

## 5.1 Installation planning

**Important**

Prior to the installation of the Tricel wastewater treatment plant, it is essential to read these installation instructions carefully.

You must consider the following when planning the installation of a Tricel Novo plant:

- **Backfill Considerations:**

- Is this a dry or wet site, (the presence of a water table?)
- Which backfill material is appropriate for this site?
- What are the finished ground level and will risers be required?

**Note: Installations that require 500mm or 750mm risers also need concrete installations. 500mm & 750mm risers cannot get fitted to tanks with gravel installations.**

- **Site Considerations:**

- Is the site restricted regarding area or height?
- What is the topography of the site (is it sloping or flat?)
- What is the proposed depth of the installed tank to ensure the required slope upstream?
- Are static or rolling loads present on this site?

- Only suitably qualified personnel should install the Tricel Novo.
- Suitably sized equipment will be required to excavate the hole and to lift the Tricel Novo into place.

## 5.2 Inspection on reception of tanks

- Visually inspect tanks for damage and fractures to the shell or ribs, de-laminations, scratches, or abrasions deeper than 1.5mm, which may have occurred during transport, prior to installation. Notify the delivery driver and your supplier of any damage. Do not attempt to carry out any unauthorised repairs, as this will invalidate the warranty on the tank.
- Once installed, Tricel cannot accept any claims for damage to the tank.

## 5.3 Positioning and precautions

- Do not install the Tricel Novo in an area subject to flooding or excessive water runoff as no flood waters should enter the tank.
- The area around the Tricel Novo should be adequately drained, to permanently remove groundwater and surface water from the proximity of the tank.
- The Tricel Novo is not suitable to be used in waterlogged sites, where the groundwater may rise above the inlet invert pipe.
- When selecting the location of the Tricel Novo, ensure that it is always accessible for future maintenance.

## 5.4 Types of installation

All installations must be “fit for purpose” to suit the on-site conditions, which will vary from site to site. This assessment is the responsibility of the onsite contractor.

When installing a wastewater treatment plant, there are two possible installation methods:

1. **Gravel Installation**
2. **Concrete Installation**

Two factors require consideration when determining which installation to implement:

**1. Is the Tricel wastewater treatment plant being installed in a ‘dry site’ or a ‘wet site’?**

- A **‘dry site’** is a site in which the water table never rises higher than 300mm from the base of the tank.
- A **‘wet site’** is a site in which the water table may rise higher than 300mm from the base of the tank. We strongly advise the installation of a vertical water table inspection pipe. This pipe will facilitate convenient monitoring of the water table long after completion of the installation.

**Note:** In difficult soils (e.g., clay with a high t-value), a site could be potentially classified as wet if there is no drainage for surface water that enters the excavation and it rises higher than 300mm above the base of the unit. The installer must determine this when selecting the correct backfill.

**2. Is a riser required, and if yes, what height riser is necessary? (For more information on risers, please refer to the section 5.9 ‘Risers’).**

The following table specifies the required installation for on-site conditions:

<b>Factors that determine the required installation</b>		<b>Installation Required</b>
<b>Type of Site</b>	<b>Riser Required</b>	
Dry	None	<b>Gravel</b>
Dry	250mm	<b>Gravel</b>
Dry	500mm & 750mm	<b>Concrete</b>
Wet	None	<b>Concrete</b>
Wet	250mm, 500mm & 750mm	<b>Concrete</b>

**Important**

- Incorrectly installed tanks that are subject to movement, rotation or floatation may become damaged, for which Tricel cannot accept liability.
- During installation, tanks must not get subjected to buoyant forces.
- Contact a qualified engineer if there are difficulties on site due to adverse waterlogging.
- Ballasting the tank is important to avoid the tank from lifting when backfilling.

## 5.5 Installation procedure

### 5.5.1 Excavation (dry & wet sites)

<b>Important</b>
All excavation works must be done so under the strictest of supervision and in accordance with all associated construction guidelines.

#### 5.5.1.1 Excavation: length & width

Length and width of the excavation must exceed the dimensions of the Tricel wastewater treatment plant by a **minimum 500mm** to maintain a **minimum space of 250mm** all around the tank.

**Note:** In gravel installations, it is imperative that the gravel backfill is thoroughly compacted to ensure full support for the tank and that there will be no movement over time.

Tricel Novo		Tank Length (m)	Tank Width (m)	Min. Excavation Size (L x W) (m)
6		2.1	1.64	2.6 x 2.14
6+		2.6	1.64	3.1 x 2.14
8		2.6	1.64	3.1 x 2.14
10		3.1	1.64	3.6 x 2.14
12		3.6	1.64	4.1 x 2.14
18		4.6	1.64	5.1 x 2.14
24		6.6	1.64	7.1 x 2.14
30	Tank A	2.6	1.64	3.1 x 2.14
	Tank B	5.6	1.64	6.1 x 2.14
36	Tank A	3.6	1.64	4.1 x 2.14
	Tank B	6.6	1.64	7.1 x 2.14
42	Tank A	5.6	1.64	6.1 x 2.14
	Tank B	5.6	1.64	6.1 x 2.14
50	Tank A	6.6	1.64	7.1 x 2.14
	Tank B	6.6	1.64	7.1 x 2.14

**Note:** The size of the area for excavation applies to both dry and wet sites. However, unstable ground with excessive sand, peat swamps, etc. may require larger excavations. The hole should be maintained dry by pumping or whatever suitable means.

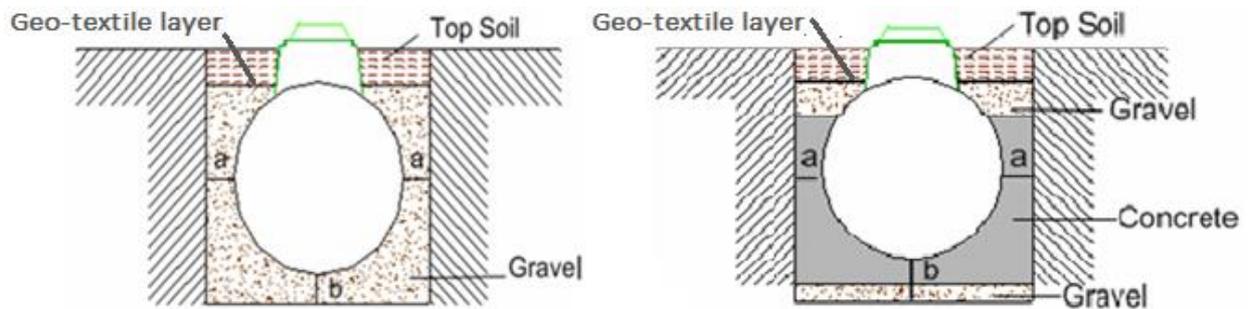
5.5.1.2 Excavation: depth

The outlet pipe determines the depth that the Tricel Novo must get installed from the source of the wastewater.

Please refer to section 5.9 'Risers' to determine the maximum invert level for the Tricel Novo. When a qualified individual is designing the connecting sewer system allowances for maximum inverts are necessary. The Tricel Novo is not suitable where a more in-depth installation is required.

Outlined below are the minimum distances (mm) that the excavation dimensions must exceed the tank dimensions for both concrete and gravel installations. Please refer to section 3.1, 'Dimensions' to view all tank dimensions.

Note: Ground instability, e.g., running sand may necessitate over-excavation and stabilisation with hard core or blinding concrete.



	Tank Width (mm)	"a" minimum (mm)	"b" minimum (mm)
Dry Site	1640	250	250
Wet Site	1640	250	300

### 5.5.2 Installation – step by step guide

Steps		Installation required	
		Gravel	Concrete
Installation of the tank base:	1	Remove any soft spots or large stones and boulders.	
	2	Construct the base of a 50mm layer of suitably compacted gravel.	Construct the base of a 50mm layer of suitably compacted gravel, covered with a 250mm layer of semi-dry concrete.
	3	Ensure that base is level and at the correct height to accommodate the incoming pipework.	
	4		It is important to maintain a completely dry excavation until the final pour of concrete becomes set. It may be necessary to line the excavation with a continuous layer of 1200-gauge polythene to maintain the integrity of the concrete.
Positioning of the tank onto the base:	5	Mechanically lift the plant carefully into the centre of the hole and place on the prepared plinth.	Mechanically lift the plant carefully into the centre of the hole before the concrete sets.
	6	The plant must sit level on the base.	
	7	Connect and seal the pipework to the tank.	
Backfilling around the tank:	8	Ballast the plant by filling each chamber with clean water to a depth of 300mm and recheck the pipework levels.	
	9	Commence backfilling with gravel in layers of 225mm evenly around the tank ensuring that there are no voids until gravel has reached 50mm over the cylindrical body of the tank. Compact each layer in succession. *	Commence backfilling in layers evenly around the tank, ensuring that there are no voids until it has reached the invert of the outlet pipe. Continue backfilling with gravel, until it has reached 50mm over the cylindrical body of the tank. *
			<i>* Continue filling the chambers with water while backfilling, ensure that the rising water level is no more than 300mm above the backfill level.</i>
	10	Mount and seal manhole risers (if used). Please refer to section 5.9 'Risers.'	
	11	Complete backfilling with topsoil up to the max ground level. Allow for subsequent settlement of topsoil.	

**Important**

A competent person should complete the plumbing to and from the plant in accordance with national regulations and best practices.

## 5.6 Gravel specification

### Primary backfill specification

- Primary backfill material should be free-flowing granular material.
- Compaction should be by lightweight rollers or vibratory plate. Compact gravel evenly to ensure proper support for the tank. Ensure the vibrating machine does not come in contact with the shell of the tank.
- Tanks must get installed with primary backfill only within the region immediately surrounding the tanks. This primary backfill must extend a minimum of 250mm outward from the tank, and directly beneath it.
- Backfill material shall not be frozen or contain lumps of frozen material at any time during installation.
- Use of other than specified backfill and bedding materials will void the tank warranty.

The following materials have approval as primary backfill:

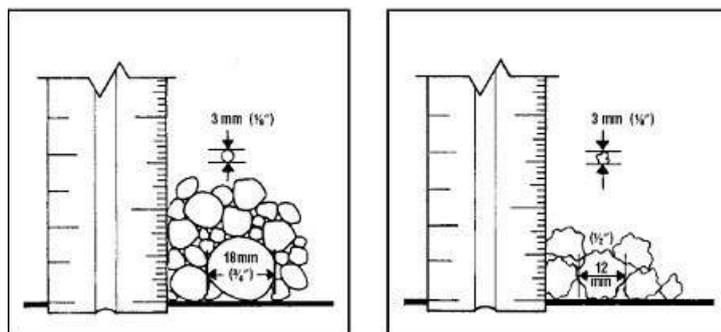
#### Rounded pea gravel

- Minimum particle size 3mm, maximum 18mm, compacted to a relative density of >70%.
- Gravel shall be clean and free flowing, free from large rocks, dirt, sand, roots, organic materials or debris.
- Upon screening analysis, the backfill material shall have no more than 5% by weight passing 2.36mm sieve.

Or

#### Crushed or processed stone

- Minimum particle size 3mm, maximum 12mm, compacted to a relative density of >40%
- Dry Gravel density must be at least 1500 kg/m<sup>3</sup>. The material should be washed or screened to remove fine particles.
- Upon screening analysis, the backfill material shall have no more than 5% by weight passing 2.36mm sieve.



Pea Gravel

Crushed Stone

## 5.7 Concrete specification

Semi-dry concrete 25n grade with a ratio of 4.5/1 parts aggregate to cement.

### **Important:**

- Standard concrete mixes should not get used where sulphates or similarly aggressive chemicals are present in the groundwater.
- **Lift height (rate of rise):** Determine the lift height (m), or rate of rise (m/h) for the specific concrete type used, to ensure that a design pressure (P max) of 15kN/m<sup>2</sup> on the tank does not get exceeded.
- **Vibration:** The tank design assumes minimal compaction of the surrounding concrete. Where necessary, this may be extended to include internal light vibration. Never use deep revibration which will substantially increase the pressure on the tank, possibly causing failure.
- **Impact of concrete on discharge:** Under no circumstances should concrete be discharged directly onto the tank.

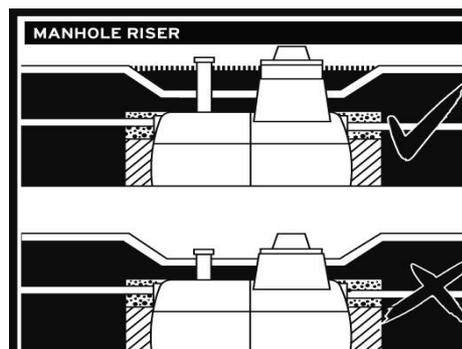
## 5.8 Topsoil requirements

Clean native topsoil shall not contain rocks larger than 36mm on largest dimension.

**Note:** The use of geotextile barrier fabrics surrounding the primary backfill material is considered good installation practice. This fabric must be chosen to allow the flow of water in and out of the excavation but to prevent the movement of fine soil particles into the primary backfill material.

## 5.9 Risers

If a Tricel Novo requires a deeper than standard installation to align with the wastewater outlet pipe from the dwelling, manhole risers are available to avoid the access hatch being positioned in a depression, as shown in the diagram below:



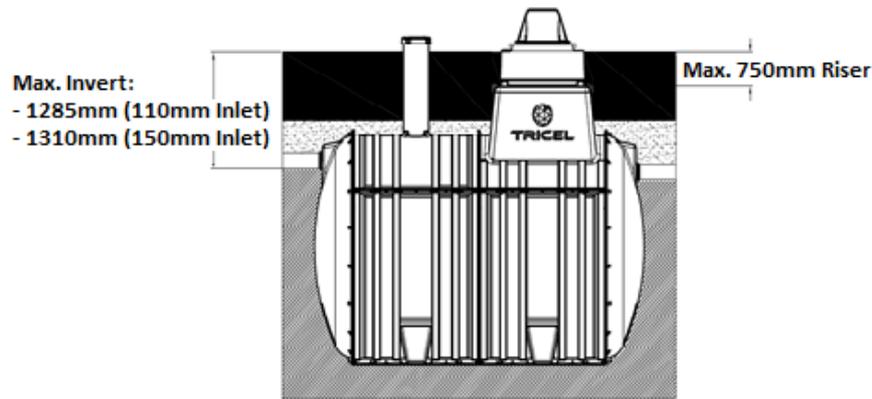
Risers are available in the following sizes:

- **250mm** (requires installation suitable for the site conditions)
- **500mm** (requires a concrete backfill) \*
- **750mm** (requires a concrete backfill) \*

**\* 500mm and 750mm risers cannot get retrofitted unless the correct installation is in place.**

- The Tricel Novo is suitable for a maximum manhole riser of 750mm which facilitates the following maximum inlet inverts:
  - 110mm Inlet: 1285mm
  - 150mm Inlet: 1310mm

- The Tricel Novo is not suitable where a deeper installation is required.



**Important:**

- Never place the access covers below ground level.
- Only use Tricel manhole covers.
- Do not allow groundwater or stormwater to enter the Tricel Novo.

## 5.10 Non-standard installations

### 5.10.1 Alternative to concrete backfill (for wet sites without risers only)

- The option of securing the Tricel Novo to a reinforced concrete slab or deadman anchor by way of straps may also be applied, as shown below:



- **Tricel accepts no responsibility for the design of the concrete slab/deadman anchor.** This solution should be designed by an on-site structural engineer to suit site conditions.
- The straps should get positioned as close to the bolted joints as possible.
- The reinforced concrete slab/deadman anchor must get installed after the level of the groundwater has been lowered, if necessary.
- Once the straps have secured the Tricel Novo, the backfilling with concrete or gravel can commence.

### 5.10.2 Sloping ground

When the slope of the ground is 5% or more, it is recommended to install a retaining wall to protect the tank from the lateral thrust. Concrete backfill may also in some cases be sufficient to protect the tank. A qualified structural engineer must determine if a retaining wall is required in the presence of a steep slope as shown in the picture below:



### 5.10.3 Proximity to rolling & static loads

Minimum separation distances from:

- Rolling Loads (e.g., vehicle traffic): four metres
- Static Loads (e.g., dwelling house, shed): seven metres

If the tank gets installed in an area where traffic or other superimposed loadings can be applied, consult a structural engineer for the design of a reinforced concrete slab to prevent the transmission of the load to the tank (or its concrete surround). If this slab is constructed immediately above the tank, it should get separated from the concrete surrounding it by a compressible material.

## 5.11 Electrical requirements

**Important:**

- Please ensure the electrical installation complies with all national regulations and requirements.
- Electrical installations must be carried out by a qualified and certified electrician.

The customers' minimum responsibility shall consist in the provision of:

- The power supply SWA cable must be suitably sized and comply with all national regulations and requirements. The sizing of the cable is the responsibility of a qualified electrician.  
**Note:** Typical domestic installations require a single run of 1.5mm<sup>2</sup> three core (two conductors plus earth conductor) steel wire armoured (SWA) cable from the customer's distribution cabinet to the tank unit socket box.
- Cable protection via 10-amp MCB protected by (RCD), rated 230V, 30mA.
- The cable armour must be bonded to the main earth correctly.
- Never disconnect the power to the air blower. It is imperative that it be running 24 hours a day, every day.
- In the event that a riser may need fitting at a later date, the qualified electrician must supply an additional one meter of the power supply SWA cable. This extra length of cable should be coiled and hung underneath the manhole cover as shown in the following image.



## 5.12 Additional accessories

### 5.12.1 Grease trap

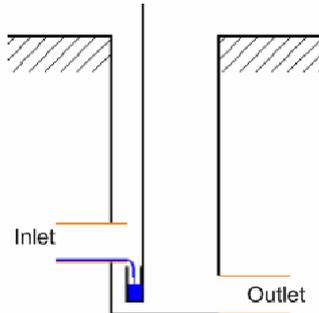
- Best practice indicates that a grease trap gets fitted before the Tricel Novo, particularly in applications where high quantities of grease/oil exist in the wastewater
- The grease trap must be monitored on a regular basis and emptied when required to ensure that it continues to operate correctly.

### 5.12.2 Sampling chamber

- Best practice indicates that a sampling chamber is fitted after every Tricel Novo to allow easy access for sampling purposes.
- Care should be taken to ensure that the sampling apparatus does not come into contact with the pipework or walls of the sampling chamber to avoid contamination of the sample.
- The inlet of the sampling chamber must be higher than the outlet to facilitate the sampling cup.

## 6 Plant operation

Once tank installation, plumbing and the electrical connection are complete, the Tricel Novo is now operational. The plant should be filled already with water during installation. If not, it should get filled before its first use. If



the plant is running correctly, you will hear a slight “hum” from the air blower, and there will be air bubbles coming up evenly from the bottom of the aeration chamber, rising to the surface.

Once the Tricel Novo plant is fully installed and operational, it is vital it gets commissioned by our service team or a Tricel Novo distributor to ensure it is working effectively. A commissioning certificate will then get issued to the customer.

The plant runs 24 hours a day, seven days a week all year round for optimum purification. In periods of low occupancy, the sludge return system re-circulates the liquid in the plant ensuring continuous performance. In periods of overload the sludge return plant passes the fluid back into the primary chamber, so it passes through the aeration chamber again guaranteeing continuous performance. It may take up to 13 weeks for the biomass to become fully established and to reach optimum purification. All plants come fitted with an alarm, which will alert to irregularities in the plant.

### 6.1 Diffuser-manifold calibration (only applicable on plants IE18 and greater)

Plants come supplied with the manifolds valves in the fully open position as shown in the following image.



The valves on the manifold may require adjusting, during installation and subsequent services, to distribute the air evenly among the diffusers. Tricel approved personnel should make any adjustment.

#### **Warning**

**Each valve must not be closed more than 50% as this will result in irreparable damage to the air-blower.**

## 6.2 Timed sludge-return system (only applicable on plants IE18 and greater)

The timed sludge-return system is set to operate for 15 mins followed by a rest period of 1hr 45mins.



## 7 Disposal of treated water

The treated wastewater from the Tricel Novo should get disposed of as per guidelines from the planning regulations issued by your local authority.

## 8 Maintenance

### **Warning**

Any maintenance carried out inside the tank represents a confined space. Therefore, the maintenance person must be suitably trained to work in confined spaces. Sewage and sewage effluent can carry micro-organisms and gases harmful to human health. Any person carrying out maintenance on the plant requires appropriate training. Suitable protection equipment including gloves, goggles, etc. should be worn at all times. Always remove contaminated clothing and protective equipment after completion of work. Wash hands and face prior to eating, drinking or smoking. Please refer to section 1 'Health & Safety Precautions.'

A certain amount of plant maintenance is required on an on-going basis to ensure that the plant is working correctly, this is the responsibility of the homeowner.

### 8.1 Regular maintenance

- The vent around the base of the blower housing guarantees a fresh supply of air to the air blower. All vents should be checked to make sure they are not blocked or obscured.
- The vent under the desludging cover allows gas to escape and stops the tank from becoming pressurized.
- Ensure the air blower is working by listening for a gentle hum when standing beside the plant.
- The inlet and outlet should be inspected and rodded to remove any blockages if necessary.

## 8.2 Annual maintenance

- The Tricel Novo will require a full service (available from your supplier) every year to guarantee the efficiency of the plant gets maintained. Service personnel must get accommodated with unobstructed access to the tank.

## 8.3 Annual service (available from your supplier)

During routine servicing, the service technician will perform a series of checks and procedures:

### Checks

- The air-diffuser is monitored to check for sufficient dispersion of air.
- The sludge return system is functioning correctly.
- The covers and locks are in place and good condition.
- General appearance and condition of the treatment plant are good.

### Procedures

- Test the blower.
- Replace the blower filter.
- Test the plant alarm.
- Tests the pump and float-switch (if applicable).
- Clear the vents of any blockages.
- The sludge level in the primary chamber is measured.
- The diffuser manifold is adjusted if required (if applicable).

## 8.4 Production of sludge

### **Important**

- The desludging of the Tricel Novo is the responsibility of the homeowner.
- There is the potential danger of falling into the tank during desludging when manholes may be open – take all necessary safety precautions when desludging.
- Do not allow machinery/traffic drive over the plant. Maintain a distance of at least four metres away from the covers on the Tricel Novo.
- The access cover should never be left off an unattended Tricel Novo.

When the sludge is occupying 50% of the volume of the primary chamber desludging is required, this is when the sludge is 700mm deep. For desludging periods, which depends on the occupancy of the dwelling, please refer to the table in section 3.1 'Dimensions.' Desludging gets done with a vacuum tanker (Tricel recommend the use of a licensed company).

## 8.5 Desludging (emptying the solid waste from the primary chamber)

- Remove the desludging access covers.
- Empty the Tricel Novo using the vacuum tanker. Ensure the solids get removed with the liquid.
- Care must be taken not to damage the Tricel Novo with the hose of the vacuum tanker.
- After emptying (de-sludging) the primary sludge chamber of any Tricel wastewater treatment tank, the primary chamber should be re-filled with water, until the water level flows into the aeration chamber (second chamber).
- Replace the desludging access cover securely.

## 9 Operating conditions

### Warning

Tricel shall not be liable for any damage or loss, including consequential loss, caused by the failure of any plumbing equipment or failure caused by the inclusion of prohibited material, in the plant.

The manufacturer's installation, operation and maintenance instructions outlined in this manual must be followed at all times to ensure the plant operates as designed. Any variations to these conditions could result in the unit not performing to its full potential, and the discharge may not meet the required standards. The property owner has a legal responsibility to ensure that the plant does not cause pollution, a health hazard or nuisance

- Desludging is a critical part of the successful operation of the Tricel Novo and is the responsibility of the customer.
- Only competent approved personnel should carry out desludging.
- Desludging must get carried out when required as specified, and the plant should be inspected regularly to check the depth of sludge in the primary chamber. If desludging is necessary, it should get carried out as soon as possible.
- An electrical connection to the plant must get maintained for it to function correctly. This connection ensures that the plant has a continuous air supply and where necessary the discharge pump will operate.
- The Tricel Novo is one part of the overall wastewater treatment system, which includes many components (plumbing, ventilation, plant and polishing filter. Each element has to function correctly for the whole system to work which is the responsibility of the homeowner.
- If the plant does not get installed correctly, flooding, overloading, electrical shock or floatation may occur. Tricel is not responsible for incorrectly installed plants.
- Soakaways, drains and the emptying of the primary chamber remains the responsibility of the client. The manufacturer does not cover damage to the installation due to the influx of surface water or the backing up of soak ways or drains.
- To ensure the continuance of the Tricel Novo's performance the user has to take certain precautions including the following:
  - Do not exceed the design loading of the plant.
  - High volume discharges such, as those from swimming pools and Jacuzzi's must never enter the plant.
  - Surface water must not enter the plant.
  - Do not allow large quantities of chemicals to enter the plant including but not limited to:
    - Watersoftener
    - Disinfectants
    - Strong acids and alkalis, or photographic chemicals
    - Oil or grease
    - Petrol or diesel
    - Pesticides
  - Do not allow any of the following to enter the Tricel Novo:
    - Large quantities of milk, alcohol or food
    - Large amounts of bleaches or cleaners

- Babywipes, cosmetic and cleaning wipes
- Sanitary towels
- Tampons
- Kitchen paper
- Nappies
- Medication
- Service personnel must be accommodated with unobstructed access to the plant.
- If others size the plant, Tricel will supply to these specifications. In this case, the responsibility lies with others in relation to the maximum flow/litres per day, the plant capacity and retention times. Similarly, if Tricel size the plant and a higher load is placed on the plant by the addition of extra houses, bedrooms, schools, crèches, etc. or by other means, Tricel is not responsible for the plant regarding overloading or quality of effluent as the retention times may be compromised.
- Should the plant be used intermittently or if extended periods of non-use are to be expected, it is recommended that a plant remains on and in operation. The contents of the plant should not be allowed to turn septic due to non-use.
- The tank is not suitable for vehicular traffic. Tricel also recommends fencing off the area to prevent livestock herds from accessing the plant. Where possible, avoid unnecessary human traffic around the plant.
- The Tricel Novo is only suitable for human faeces. No animal faeces must enter the plant.

## 10 Troubleshooting

Properly installed, operated and maintained plants will give many years of trouble-free service. All plants come fitted with an alarm, which will alert to irregularities in the plant. If a blower or pump stops working a buzzer will sound to indicate there is a problem with the plant. The buzzer can be muted until the problem gets fixed. Once fixed, the alarm will reset automatically and the mute switch must be turned off. All electrical work shall be carried out by a certified electrician.

### 10.1 Plant operation

Symptom	Possible causes	Solution
<b>Blower/pump won't start or run</b>	Fuse blown (if applicable).	Replace with a fuse of suitable size.
	Tripped breaker.	Reset breaker.
	Low line voltage and wet electrics.	An electrician should check the power supply to the plant.
	Defective blower/pump.	A qualified person must check the blower/pump.
	Thermal overload protection triggered by high ambient temperature.	Allow the blower time to cool. The blower will automatically restart when cooled sufficiently.
<b>Blower operates but delivers no air</b>	Low line voltage or wired incorrectly.	An electrician should check the power supply to the plant.
	Filter blocked.	Replace filter.
	Diaphragm damaged/torn (if applicable).	Replace damaged diaphragm.
	Defective blower malfunction.	A qualified person must check the air blower.
<b>Plant fills above the working water level</b>	Subsurface disposal plant clogged.	Contact installer to repair sub surface disposal plant/percolation area.
	Stormwater flooding.	Redirect stormwater drains. Stormwater must never enter the plant.
	Discharge hose/pipe blocked.	Find blockage and remove or replace the damaged hose/pipe.
<b>Pump operates but delivers no water</b>	Low line voltage or wired incorrectly.	An electrician should check the power supply to the plant.
	Something caught in impellers.	Clean out impellers or replace the pump. Ensure pump is disconnected from the mains before you attempt to unclog it.
	Delivery hose blocked.	Find blockage and remove or replace the damaged hose.
	Other.	A qualified person must check the pump.
<b>Blowers runs intermittently</b>	Thermal overload tripped.	Protect installation from the sun.
		Air supply vent blocked, clean if necessary.
		Filter blocked, replace if necessary.
		Discharge hose blocked or kinked, remove the obstruction.
	Electrical fault.	Get a qualified person to check that the alarm is installed correctly and the power supply to the plant is correct.
Diaphragm damaged/torn (if applicable).	Replace damaged diaphragm.	

<b>Pump runs intermittently</b>	Thermal overload tripped.	Check for clogged impeller ( <b>WARNING: Ensure the pump is plugged out before you attempt to unclog it.</b> )
		The pump has run dry so add water.
	Float from the pump stuck.	Ensure the float on the pump is set correctly and can move freely.
	Damaged float.	A qualified person must check the pump.
<b>The alarm is sounding, but the pump and blower are working</b>	Air return pipe to the alarm not returning an air signal.	Check that the air pipe is not damaged or bent. Ensure there is air blowing through this pipe. Check that the pipe is inserted to the alarm correctly.
	Electrical fault.	Get a qualified person to check that the alarm is installed correctly.
	The electrical panel is wet.	Get a qualified person to check that the alarm is installed correctly.

**Note:**

Before taking any corrective action, always positively identify the real source of the odour. Check if the smell is coming from another outside source such as a storm drain. All Tricel Novos vent gases back through soil pipe and out roof vents. Improperly installed roof vents can cause odour problems. Traps in drains prevent any odours from entering the home. To function, they must contain water and be sealed correctly.

## 10.2 Odours

Symptom	Possible causes	Solution
<b>Effluent odour directly outside the house or inside the house</b>	Pipe connections to toilets/drains not connected correctly.	Check that the traps/U-bends in the drains are fitted and the joints sealed.
	An air vent on pipework not fitted or fitted incorrectly.	Ensure all effluent pipes get vented correctly, vents are typically fitted to all pipes, and they should be higher than the eave of the roof.
	Pipework is damaged or blocked or fitted incorrectly.	Inspect pipework to ensure it is undamaged and clear of obstructions or sagging.
<b>Bad effluent odour directly over the tank</b>	Blocked pipework to or from the tank.	Check the level of liquid in the tank. Ensure the pipes are not blocked and are fitted correctly to the tank.
	Chemical kill of bacteria.	Ensure pumps are working correctly (If applicable). If the symptom persists for 48 hours or more, remove all liquid and replace with clean water.
	No air delivery - hydraulic/organic is overloading the tank vent.	Check blower is functioning properly
<b>Note:</b>	Smoke bombs/pellets, available from a plumber's merchants, can be used to trace the source the odour.	

## 11 Certification

The Tricel wastewater treatment plant has successfully passed the stringent European testing and approved to the new European standard EN 12566-3 Small wastewater treatment plants for up to 50 PT-Part 3: Packaged and/or site assembled domestic wastewater treatment plants. Tricel Wastewater treatment plants were placed through a rigorous 38-week test, by the certified laboratory PIA GmbH-Testing Institute for wastewater technology in Aachen, Germany [www.pia-gmbh.com](http://www.pia-gmbh.com).

The Tricel wastewater treatment plant passed all structural testing (crush test & durability test) carried out by PIA staff. Water tightness tests were performed by PIA at our headquarters on the range of tanks up to 50PE and successfully passed all of the required tests.

## 11.1 Declaration of performance



### - Declaration of Performance

DOP01CPRIRL03201414

**1. Classification of Product:**

Small wastewater treatment plant for up to 50PT – Packaged and/or Site Assembled Domestic Wastewater Treatment Plant as set out in EN12566 Part3

**2. Name of Product:**

Tricel Novo IE6 – IE50

**3. Product Characteristics**

<b>Material</b>	Glass Reinforced Plastic (GRP)
<b>Technology</b>	Submerged Aerated Filter combined with Activated Sludge
<b>Shape</b>	Horizontal Cylinder with domed ends. 620mm x 620mm and Ø200mm Access openings as required.

**4. Intended for Use:**

To treat domestic wastewater for up to 50 population equivalent.

**5. Name, Address and Contact Information of Manufacturer:**

Tricel (Killarney).  
Ballyspillane Ind. Est.  
Killarney,  
Co.Kerry.  
Tel: +353 (0) 64 6632421  
Web: [www.ie.tricel.eu](http://www.ie.tricel.eu)

**6. Plant of Assessment of Verification as set out by the CPR, Annex V:**

Plant 2+

**7. Name, Address and Notified Body Number of Notified Body who carried out Initial Type Testing**

Prüfinstitut für  
Abwassertechnik GmbH  
Hergenrather Weg 30  
D-52074 Aachen  
Germany  
NB 1739

**8. Declared Performance: Treatment Performance**

Essential Characteristic	Performance*	Harmonised Technical Specification
Nominal Organic Daily Load	0.36 kg/d	
Nominal Hydraulic Daily Load	0.90 m <sup>3</sup> /d	
COD	91.6%      52 mg/l	EN12566-3
BOD <sub>5</sub>	95.9%      11mg/l	
SS	95.3%      16 mg/l	
NH <sub>4</sub> **	79.9%      8mg/l	
Electrical Power Consumption	1.1 kWh/d	

\*Performance results obtained an average organic daily load of 0.26kg/d and a daily hydraulic load of 0.9m<sup>3</sup>/d

\*\*Determined at temperatures  $\geq 12^{\circ}$

**Material Performance**

Essential Characteristic	Method	Performance	Harmonised Technical Specification
Water Tightness	Vacuum Test	Pass	EN12566-3
Crushing Resistance	Pit Test	Pass (also wet conditions)	
Durability		Pass	
Reaction to Fire		Class E	

**9. The performance of the product identified in points two conforms with the declared performance in Point eight. This declaration of performance is issued under the sole responsibility of the manufacturer identified in point 4.**



Michael Stack  
Managing Director

27/03/2014



Tricel (Killarney)  
Ballyspillane Ind Est  
Killarney  
Co. Kerry  
Ireland

13

DOPO1CPRIRLO3201414

**EN 12566-3**

Packaged wastewater treatment plants for  
treatment of domestic wastewater

- Product: Tricel Novo IE6 – IE50 Range of Wastewater Treatment Plants
- Material: GRP

**Notified Body:** Prüfinstitut für Abwassertechnik GmbH  
Hergenrather Weg 30  
52074 Aachen

**Number.:** NB 1739

**Treatment capacity**

- Nominal organic daily load: (BOD<sub>5</sub>)
- Nominal Hydraulic daily flow (Q<sub>N</sub>)

As Set Out in  
Table CE  
for each Model

**Effectiveness of treatment:**

Treatment efficiency ratios (at tested organic daily load  
BOD<sub>5</sub> of 0,26 kg/d and daily hydraulic flow of 0.9m<sup>3</sup>/d)

COD: 91,6 %  
BOD<sub>5</sub>: 95,9 %  
SS: 95,3 %  
NH<sub>4</sub>-N: 79.9 %

**Water tightness: (Vacuum test)**

**Crushing resistance: (Pit test)**

Pass (also Wet conditions)

**Durability**

Pass

**Fire Resistance**

Class E

## 12 Terms & conditions

**Subject to our standard terms and conditions, which are available on request.**

In accordance with our standard policy of product development, this specification is subject to change without notice. (December 2017)

Notes

Notes

Notes

Tricel Identification Code	This Tricel is a	Nominal Organic Daily Load (BOD5) (Kg)	Nominal Hydraulic Daily Flow (Litres)
IE6		0.36	900
IE6+		0.36	900
IE8		0.48	1200
IE10		0.6	1500
IE12		0.72	1800
IE18		1.08	2700
IE24		1.44	3600
IE30		1.8	4500
IE36		2.16	5400
IE42		2.52	6300
IE50		3	7500



**TRICEL**  
GENERATIONS OF INNOVATION

Tricel (Killarney), Ballyspillane Ind. Est., Killarney, Co. Kerry, Ireland.  
Tel: +353 (0) 64 6632421 | Email: sales@ie.tricel.eu | [www.ie.tricel.eu](http://www.ie.tricel.eu)

In accordance with Tricel normal policy of product development these specifications are subject to change without notice.

# TREATMENT PERFORMANCE RESULTS

**Tricel (Killarney)**  
Ballyspillane Industrial Est., Killarney, Co. Kerry, Ireland

**EN 12566-3**  
Results corresponding to EN 12566-3 and S.R. 66

PIA-SR66-1512-1062

**Novo**  
Submerged fixed film

Nominal organic daily load	0.26 kg/d		
Nominal hydraulic daily load	0.90 m <sup>3</sup> /d		
Material	Glass reinforced plastic		
Watertightness	Pass		
Structural behaviour (Calculation)	Pass (also wet conditions)		
Durability	Pass		
Treatment efficiency (nominal sequences)		Efficiency	Effluent
		COD	52 mg/l
		BOD <sub>5</sub>	11 mg/l
		NH <sub>4</sub> -N	8 mg/l
		SS	16 mg/l
Number of desludging	Not more than once		
Electrical consumption	1.1 kWh/d		

Performance tested by:

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

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



Notified Body  
No.: 1739



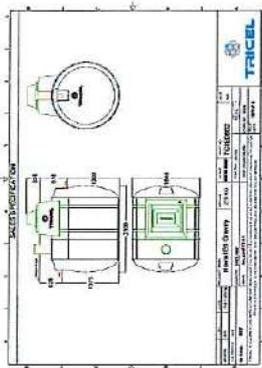
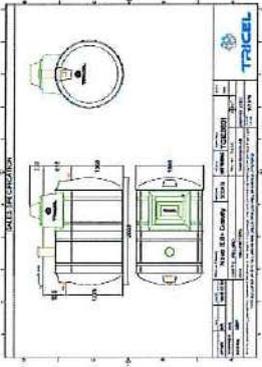
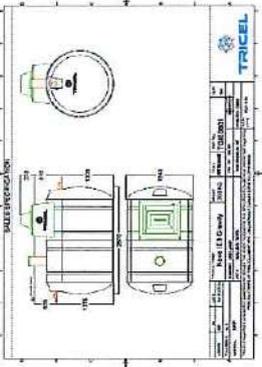
Certified according to  
ISO 9001:2008

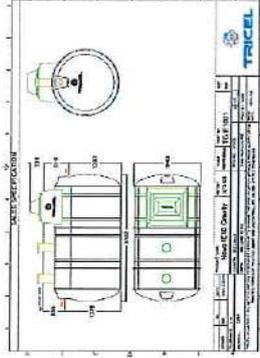
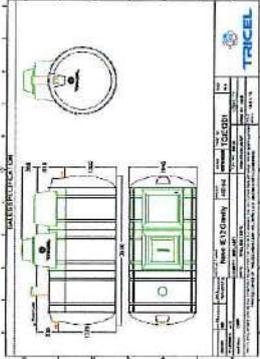
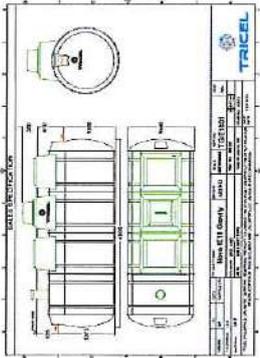


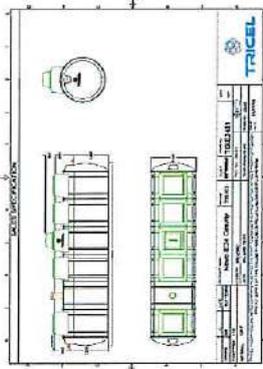
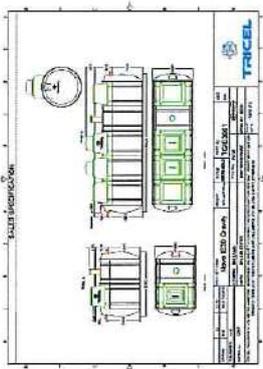
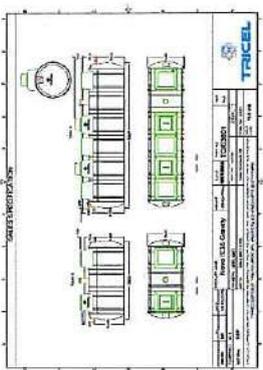
Elmar Lancé

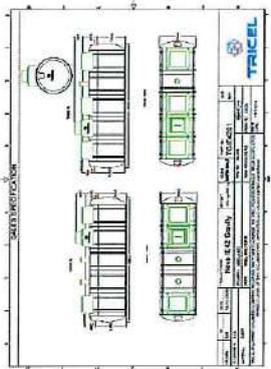
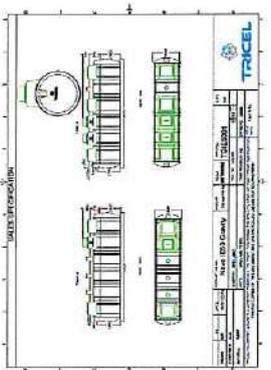
July 2016

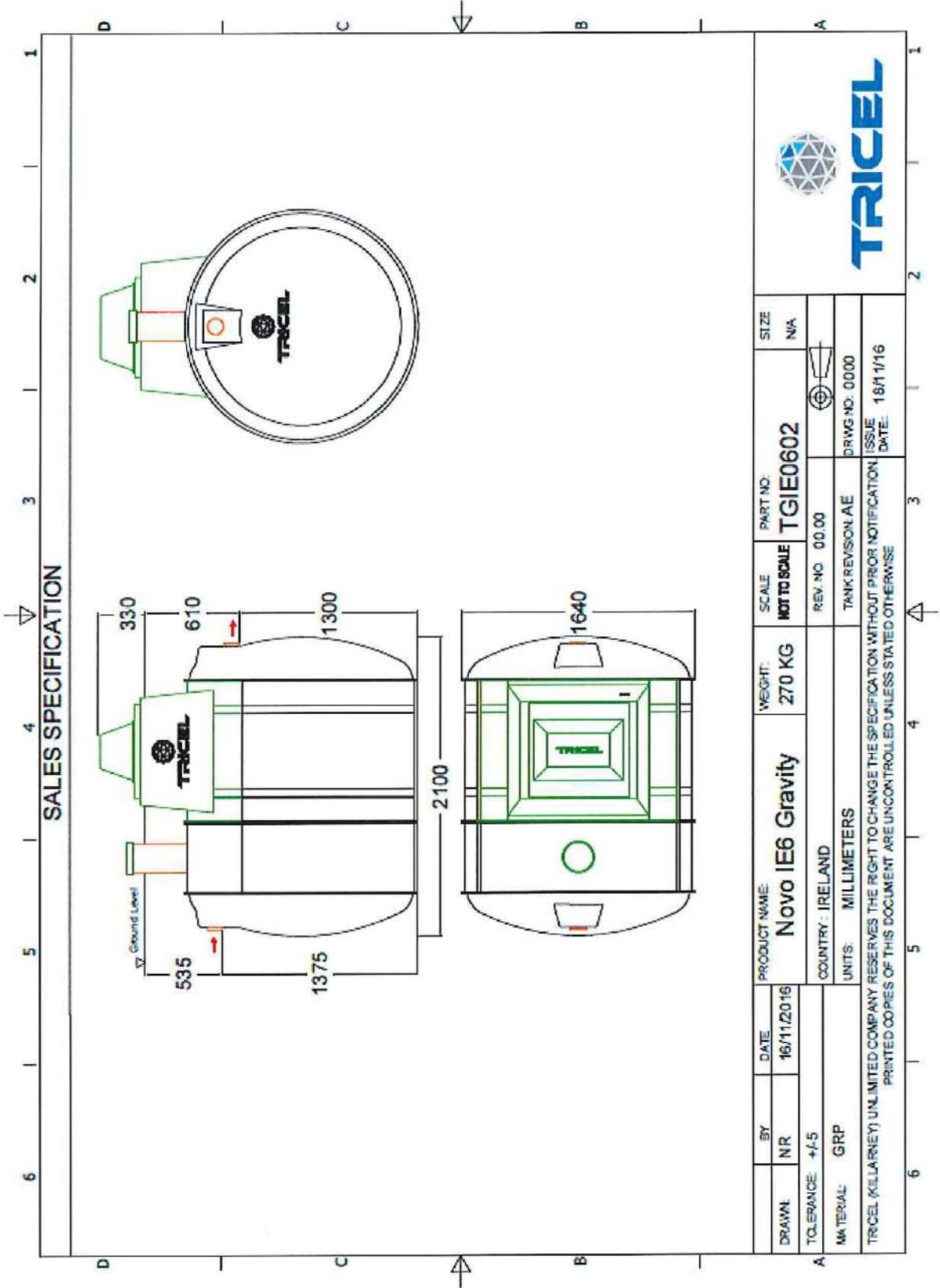
Novo range and its referring test reports:

Population equivalent (PE)	Drawing of model of the range	Watertightness (EN 12566-3 Annex A)	Treatment Efficiency (EN 12566-3 Annex B)	Structural Behaviour (EN 12566-3 Annex C)	Durability
Initial Type Test (ITT) 6		Pass PIA2009-WD-AT0909-1055 PIA2015-WD/NC-1404-1021.01 PIA2015-WD/NC-1406-1031.01	Pass PIA2010-103B18SB <sub>e</sub>	Pass For wet ground conditions also, 1.25 m installation depth from inlet invert	Pass PIA2015-DH-1504-1023.01
6		Pass PIA2009-WD-AT0909-1055 PIA2015-WD/NC-1404-1021.01 PIA2015-WD/NC-1406-1031.01	Pass Range conformity according to S.R. 66:2015	Pass For wet ground conditions also, 1.25 m installation depth from inlet invert	Pass PIA2015-DH-1504-1023.01
8		Pass PIA2009-WD-AT0909-1055 PIA2015-WD/NC-1404-1021.01 PIA2015-WD/NC-1406-1031.01	Pass Range conformity according to S.R. 66:2015	Pass For wet ground conditions also, 1.25 m installation depth from inlet invert	Pass PIA2015-DH-1504-1023.01

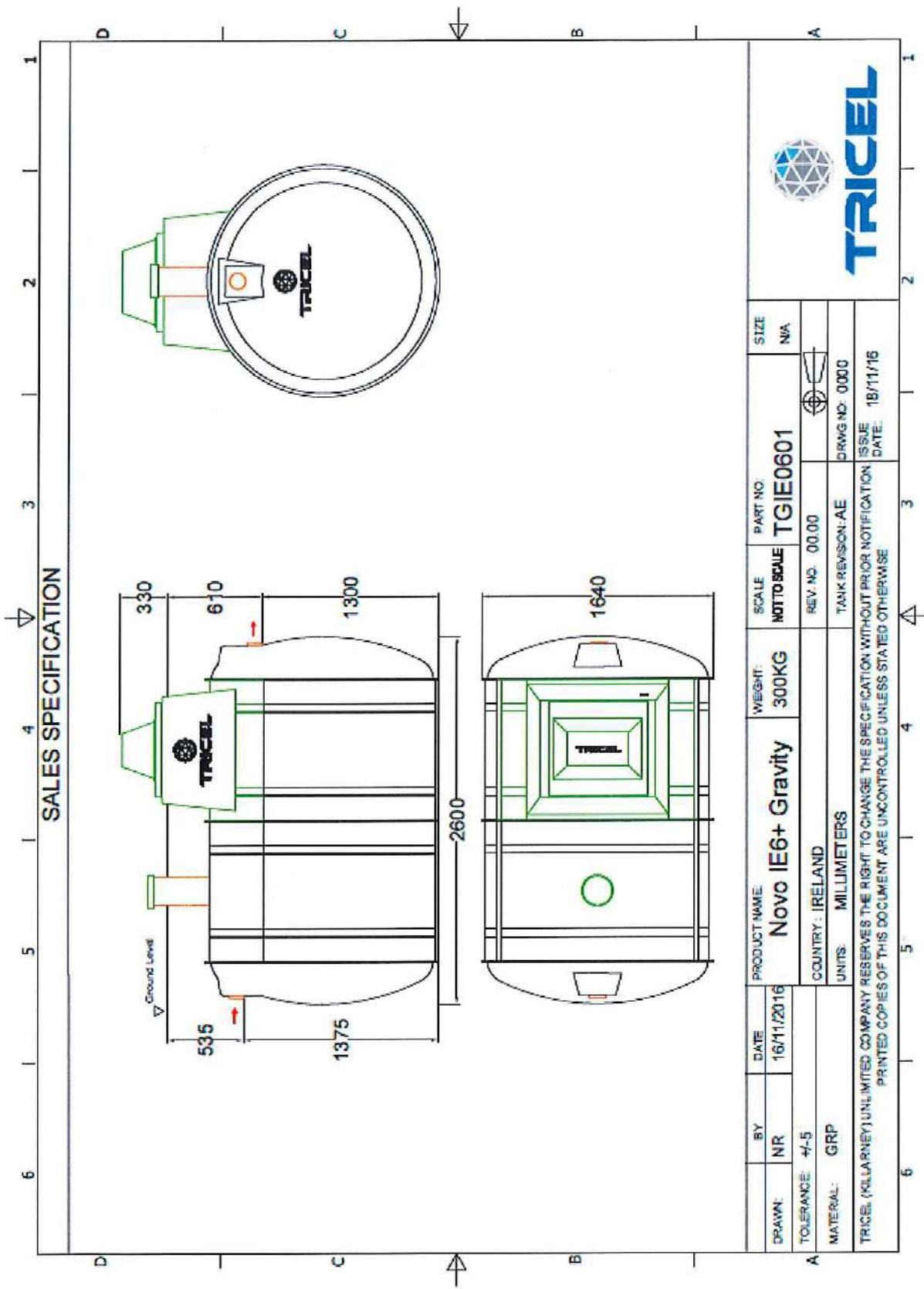
Population equivalent (PE)	Drawing of model of the range	Watertightness (EN 12566-3 Annex A)	Treatment Efficiency (EN 12566-3 Annex B)	Structural Behaviour (EN 12566-3 Annex C)	Durability
10		Pass  PIA2009-WD-AT0909-1055  PIA2015-WD/NC-1404-1021.01  PIA2015-WD/NC-1406-1031.01	Pass  Range conformity according to S.R. 66:2015	Pass  For wet ground conditions also, 1.25 m installation depth from inlet invert	Pass  PIA2015-DH-1504-1023.01
12		Pass  PIA2009-WD-AT0909-1055  PIA2015-WD/NC-1404-1021.01  PIA2015-WD/NC-1406-1031.01	Pass  Range conformity according to S.R. 66:2015	Pass  For wet ground conditions also, 1.25 m installation depth from inlet invert	Pass  PIA2015-DH-1504-1023.01
18		Pass  PIA2009-WD-AT0909-1055  PIA2015-WD/NC-1404-1021.01  PIA2015-WD/NC-1406-1031.01	Pass  Range conformity according to S.R. 66:2015	Pass  For wet ground conditions also, 1.25 m installation depth from inlet invert	Pass  PIA2015-DH-1504-1023.01

Population equivalent (PE)	Drawing of model of the range	Watertightness (EN 12566-3 Annex A)	Treatment Efficiency (EN 12566-3 Annex B)	Structural Behaviour (EN 12566-3 Annex C)	Durability
24		Pass  PIA2009-WD-AT0909-1055  PIA2015-WD/NC-1404-1021.01  PIA2015-WD/NC-1406-1031.01	Pass  Range conformity according to S.R. 66:2015	Pass  PIA2013-ST-PIT-1303-1018.01  For wet ground conditions also, 1.25 m installation depth from inlet invert	Pass  PIA2015-DH-1504-1023.01
30		Pass  PIA2009-WD-AT0909-1055  PIA2015-WD/NC-1404-1021.01  PIA2015-WD/NC-1406-1031.01	Pass  Range conformity according to S.R. 66:2015	Pass  For wet ground conditions also, 1.25 m installation depth from inlet invert	Pass  PIA2015-DH-1504-1023.01
36		Pass  PIA2009-WD-AT0909-1055  PIA2015-WD/NC-1404-1021.01  PIA2015-WD/NC-1406-1031.01	Pass  Range conformity according to S.R. 66:2015	Pass  For wet ground conditions also, 1.25 m installation depth from inlet invert	Pass  PIA2015-DH-1504-1023.01

Population equivalent (PE)	Drawing of model of the range	Watertightness (EN 12566-3 Annex A)	Treatment Efficiency (EN 12566-3 Annex B)	Structural Behaviour (EN 12566-3 Annex C)	Durability
42		Pass PIA2009-WD-AT0909-1055 PIA2015-WD/NC-1404-1021.01 PIA2015-WD/NC-1406-1031.01	Pass Range conformity according to S.R. 66:2015	Pass For wet ground conditions also, 1.25 m installation depth from inlet invert	Pass PIA2015-DH-1504-1023.01
50		Pass PIA2009-WD-AT0909-1055 PIA2015-WD/NC-1404-1021.01 PIA2015-WD/NC-1406-1031.01	Pass Range conformity according to S.R. 66:2015	Pass For wet ground conditions also, 1.25 m installation depth from inlet invert	Pass PIA2015-DH-1504-1023.01

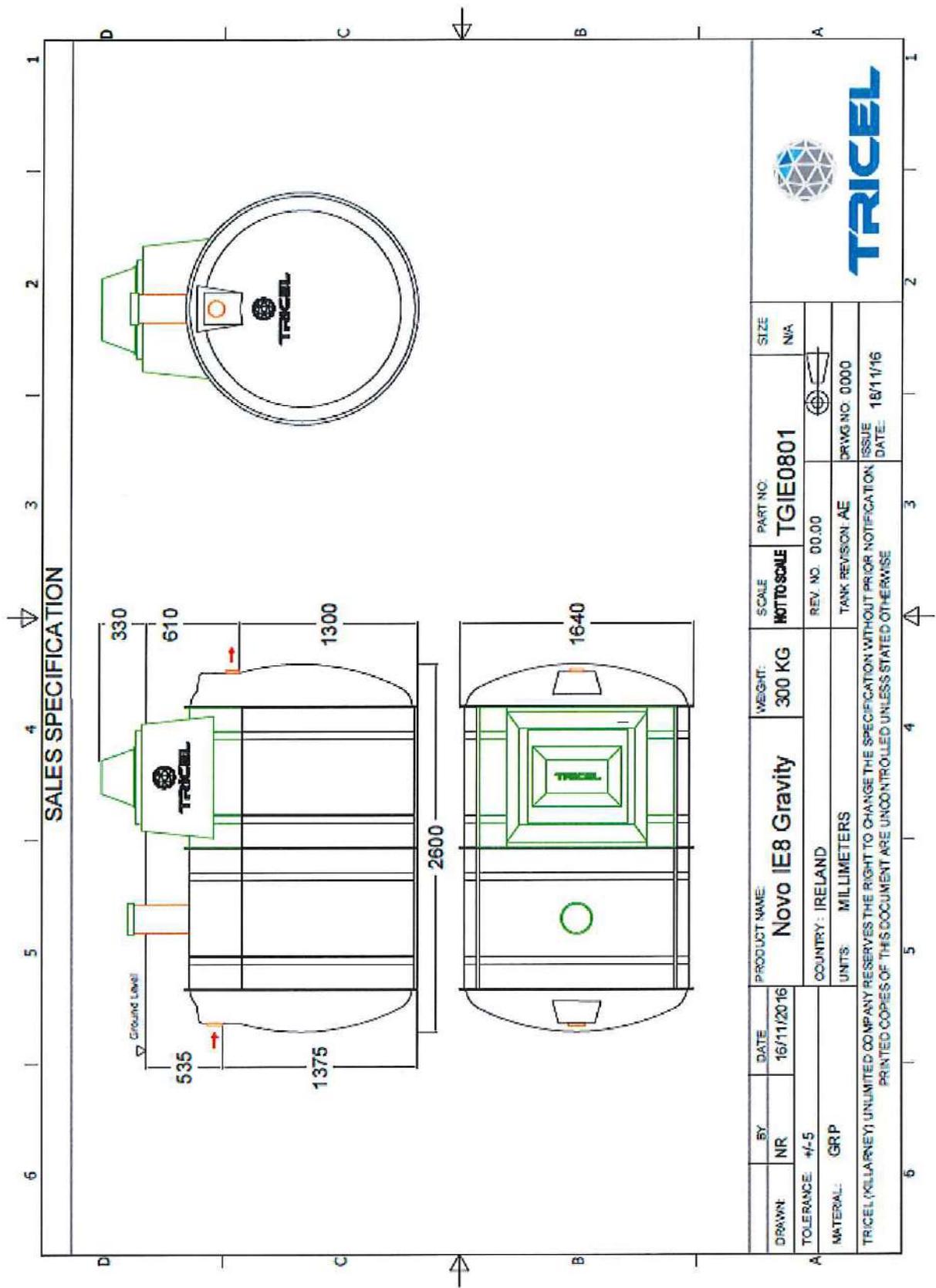


**SALES SPECIFICATION**



BY: NR		DATE: 16/11/2016		PRODUCT NAME: Novo IE6+ Gravity		WEIGHT: 300KG		SCALE: NOT TO SCALE		PART NO: TGIE0601		SIZE: N/A	
TOLERANCE: +/-5		COUNTRY: IRELAND		UNITS: MILLIMETERS		REV. NO: 00.00		TANK REVISION: AE		DRAWG NO: 0000		ISSUE DATE: 18/11/16	
TRICEL (KILLARNEY) UNLIMITED COMPANY RESERVES THE RIGHT TO CHANGE THE SPECIFICATION WITHOUT PRIOR NOTIFICATION. ISSUE DATE: 18/11/16 PRINTED COPIES OF THIS DOCUMENT ARE UNCONTROLLED UNLESS STATED OTHERWISE													

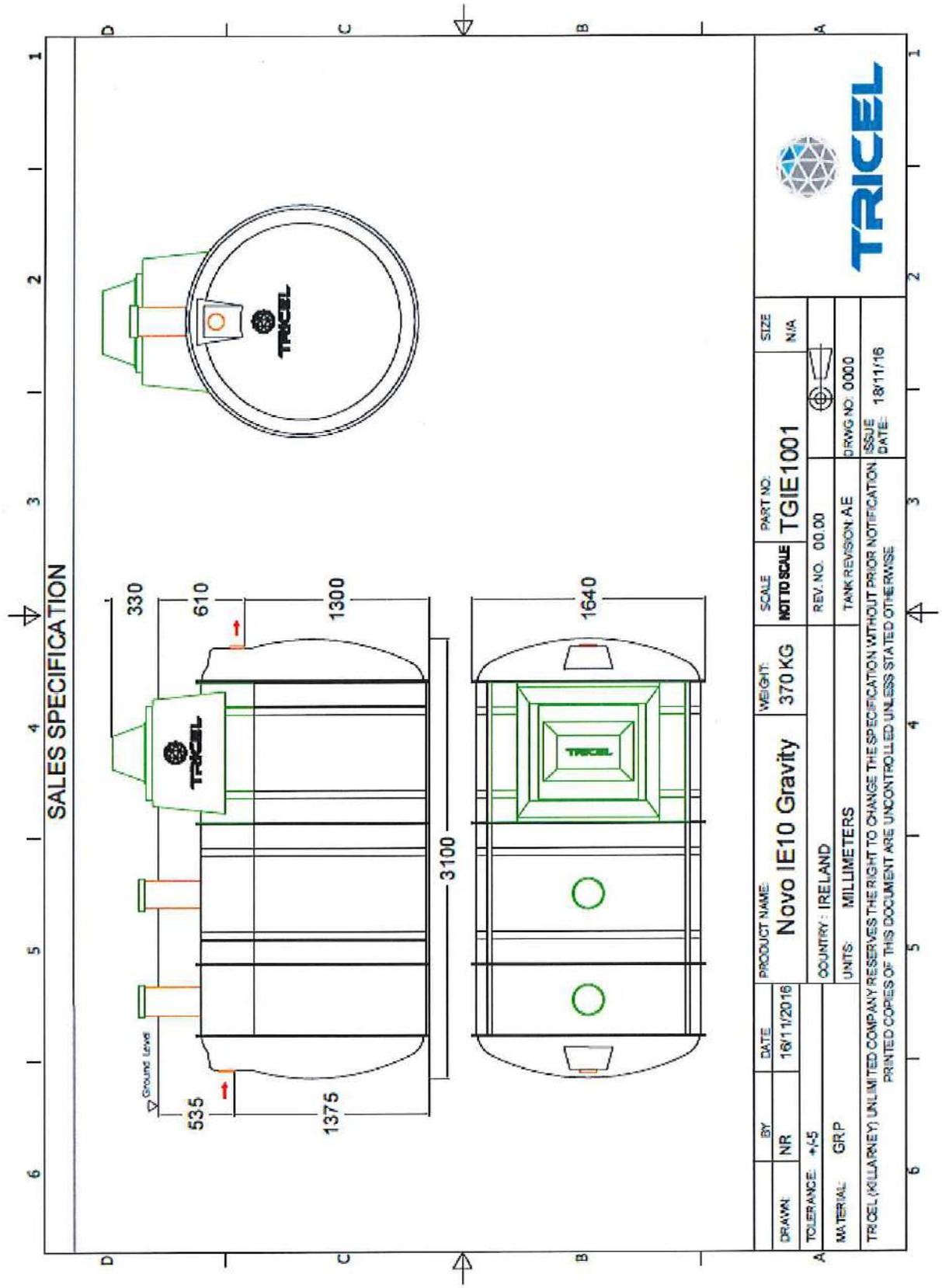


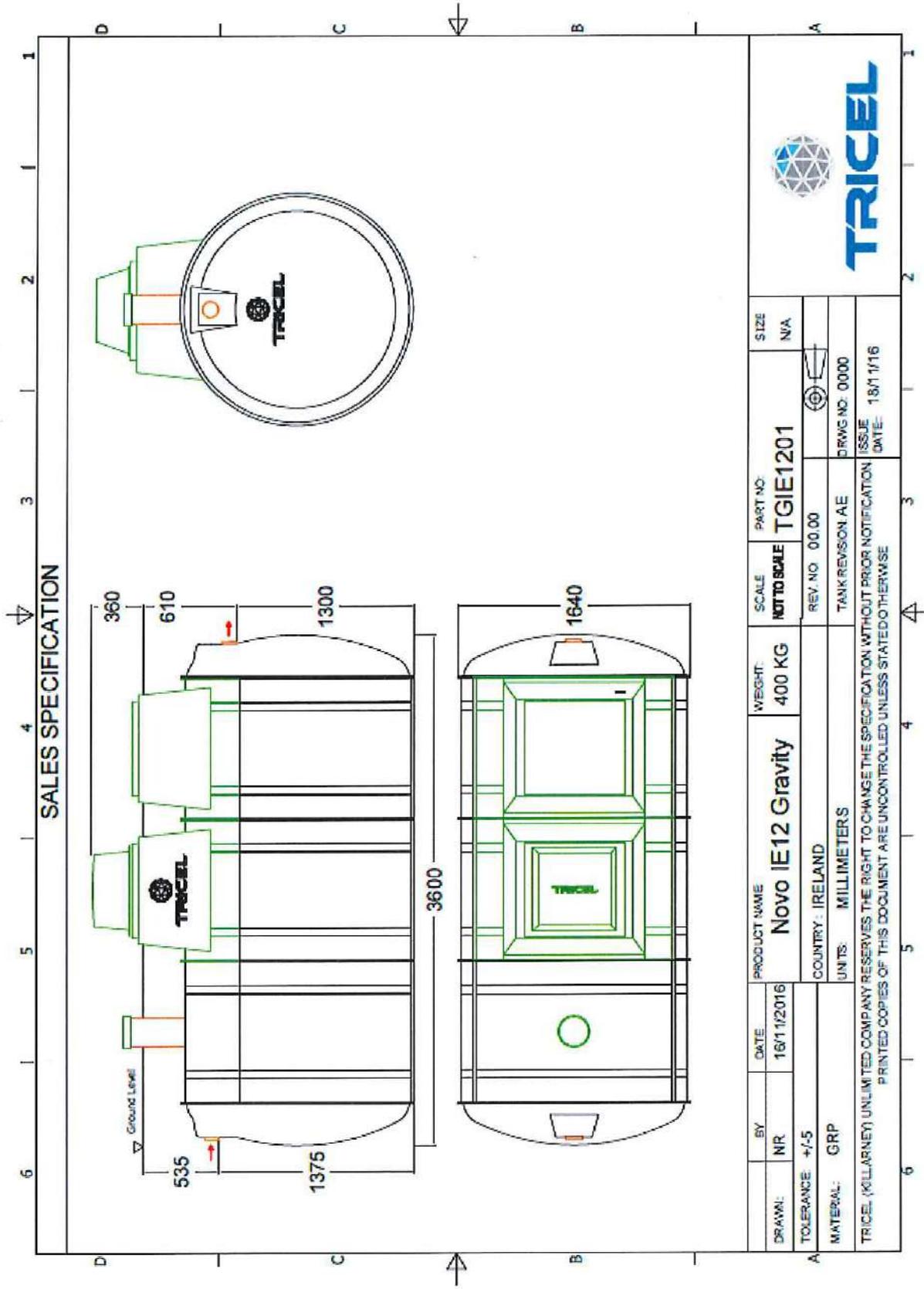


**SALES SPECIFICATION**

BY: NR		DATE: 16/11/2016	PRODUCT NAME: <b>Novo IE8 Gravity</b>	WEIGHT: <b>300 KG</b>	SCALE: <b>NOT TO SCALE</b>	PART NO: <b>TGIE0801</b>	SIZE: N/A
TOLERANCE: +/-5			COUNTRY: IRELAND		REV. NO. 00.00		
MATERIAL: GRP			UNITS: MILLIMETERS		TANK REVISION: AE		
TRICEL (KELLARNEY) UNLIMITED COMPANY RESERVES THE RIGHT TO CHANGE THE SPECIFICATION WITHOUT PRIOR NOTIFICATION. ISSUE DATE: 16/11/16 PRINTED COPIES OF THIS DOCUMENT ARE UNCONTROLLED UNLESS STATED OTHERWISE							

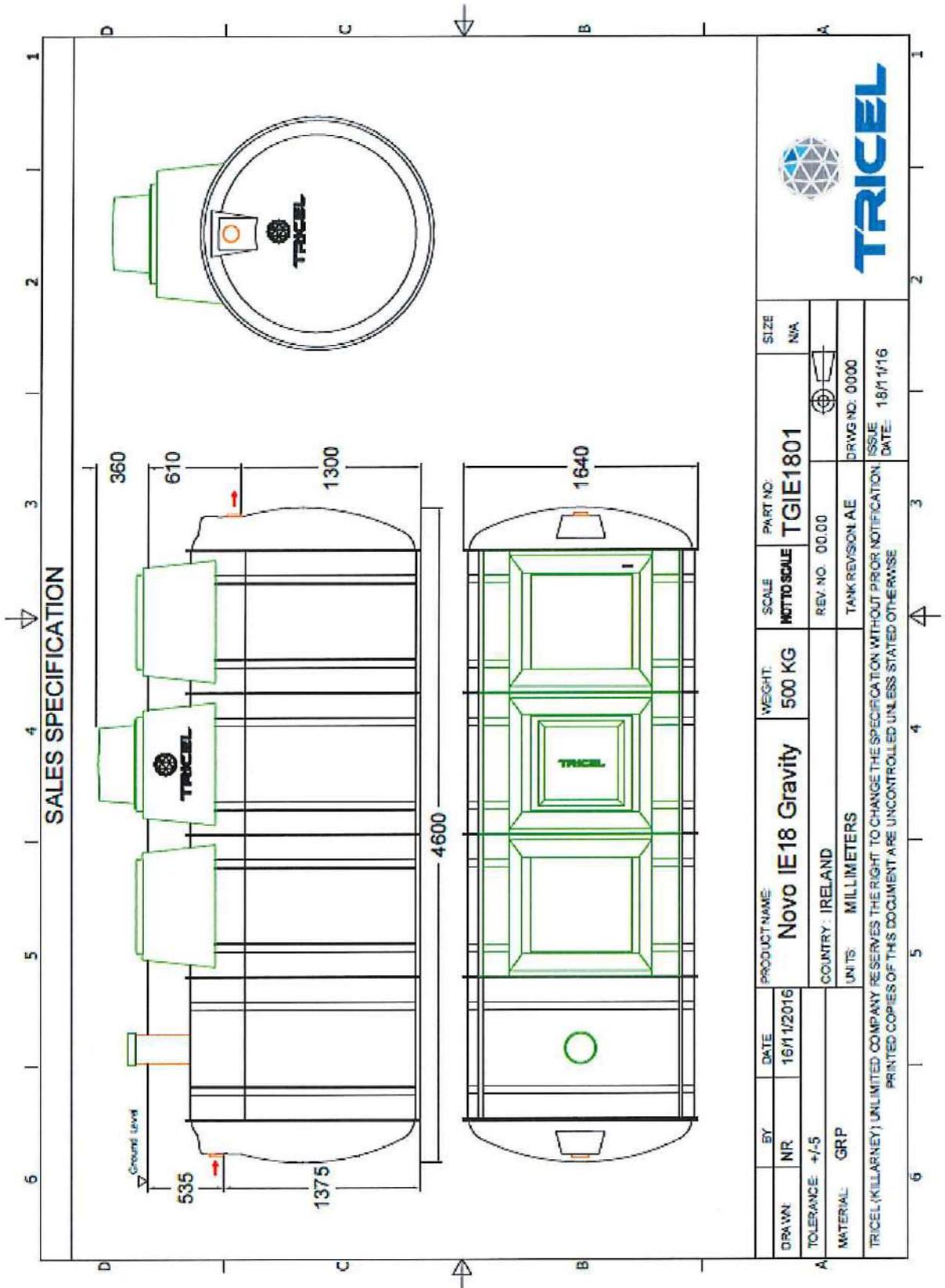






BY: NR		DATE: 16/1/2016		PRODUCT NAME: <b>Novo IE12 Gravity</b>		WEIGHT: <b>400 KG</b>		SCALE: <b>NOT TO SCALE</b>		PART NO: <b>TGIE1201</b>		SIZE: <b>N/A</b>	
TOLERANCE: +/-5				COUNTRY: <b>IRELAND</b>				REV. NO: <b>00.00</b>		TANK REVISON: <b>AE</b>		DRWS NO: <b>0000</b>	
MATERIAL: <b>GRP</b>				UNITS: <b>MILLIMETERS</b>								ISSUE DATE: <b>18/1/16</b>	
TRICEL (KILLARNEY) UNLIMITED COMPANY RESERVES THE RIGHT TO CHANGE THE SPECIFICATION WITHOUT PRIOR NOTIFICATION PRINTED COPIES OF THIS DOCUMENT ARE UNCONTROLLED UNLESS STATED OTHERWISE													

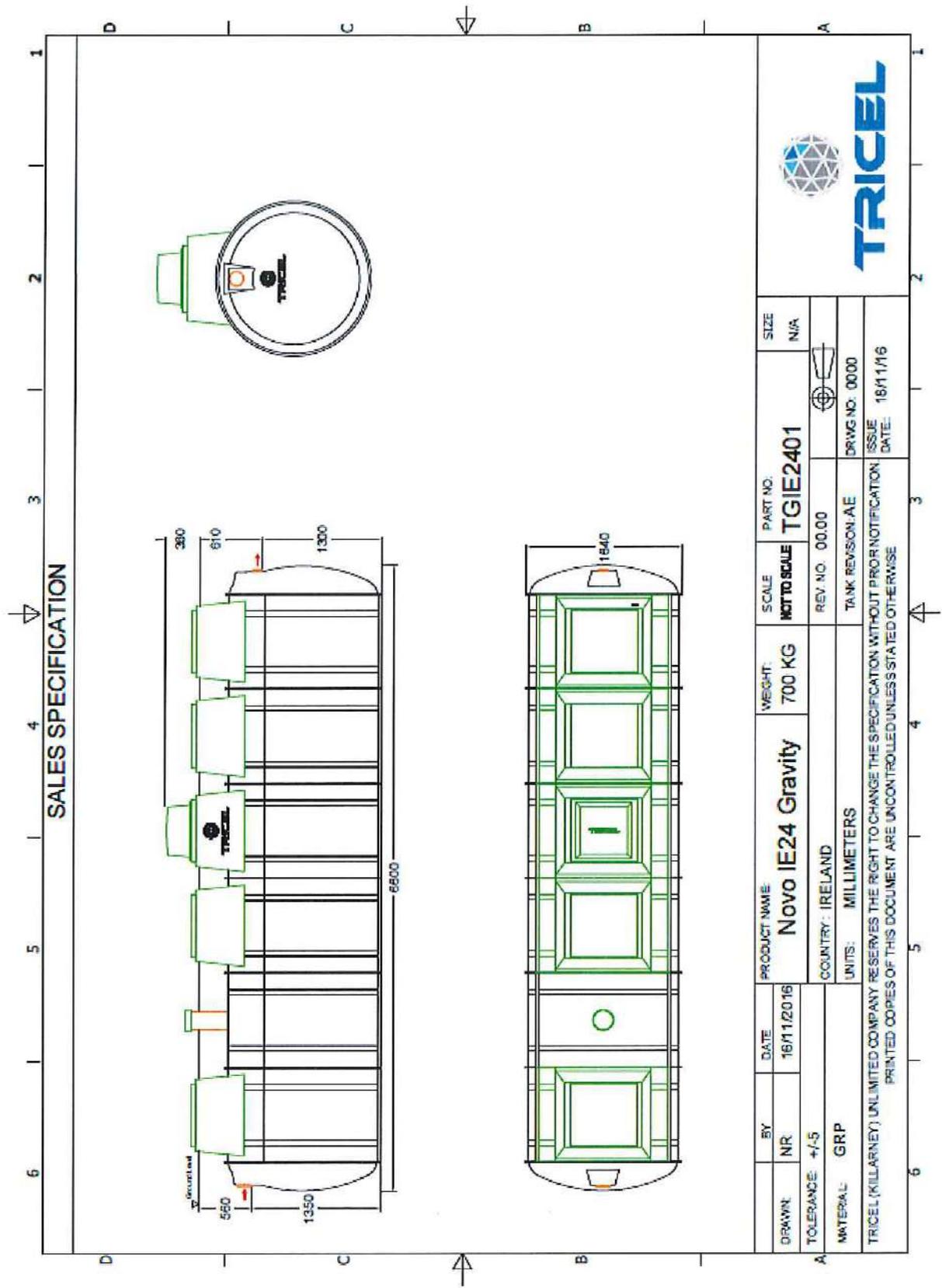




BY: NR		DATE: 15/11/2016		PRODUCT NAME: <b>Novo IE18 Gravity</b>		WEIGHT: <b>500 KG</b>		SCALE: <b>NOT TO SCALE</b>		PART NO: <b>TGIE1801</b>		SIZE: <b>N/A</b>	
TOLERANCE: +/-5				COUNTRY: IRELAND		UNITS: MILLIMETERS		REV. NO. 00.00		TANK REVISION: AE		DRAWG NO. 0000	
MATERIAL: GRP				UNLIMITED COMPANY RESERVES THE RIGHT TO CHANGE THE SPECIFICATION WITHOUT PRIOR NOTIFICATION		ISSUE DATE: 18/11/16		PRINTED COPIES OF THIS DOCUMENT ARE UNCONTROLLED UNLESS STATED OTHERWISE					



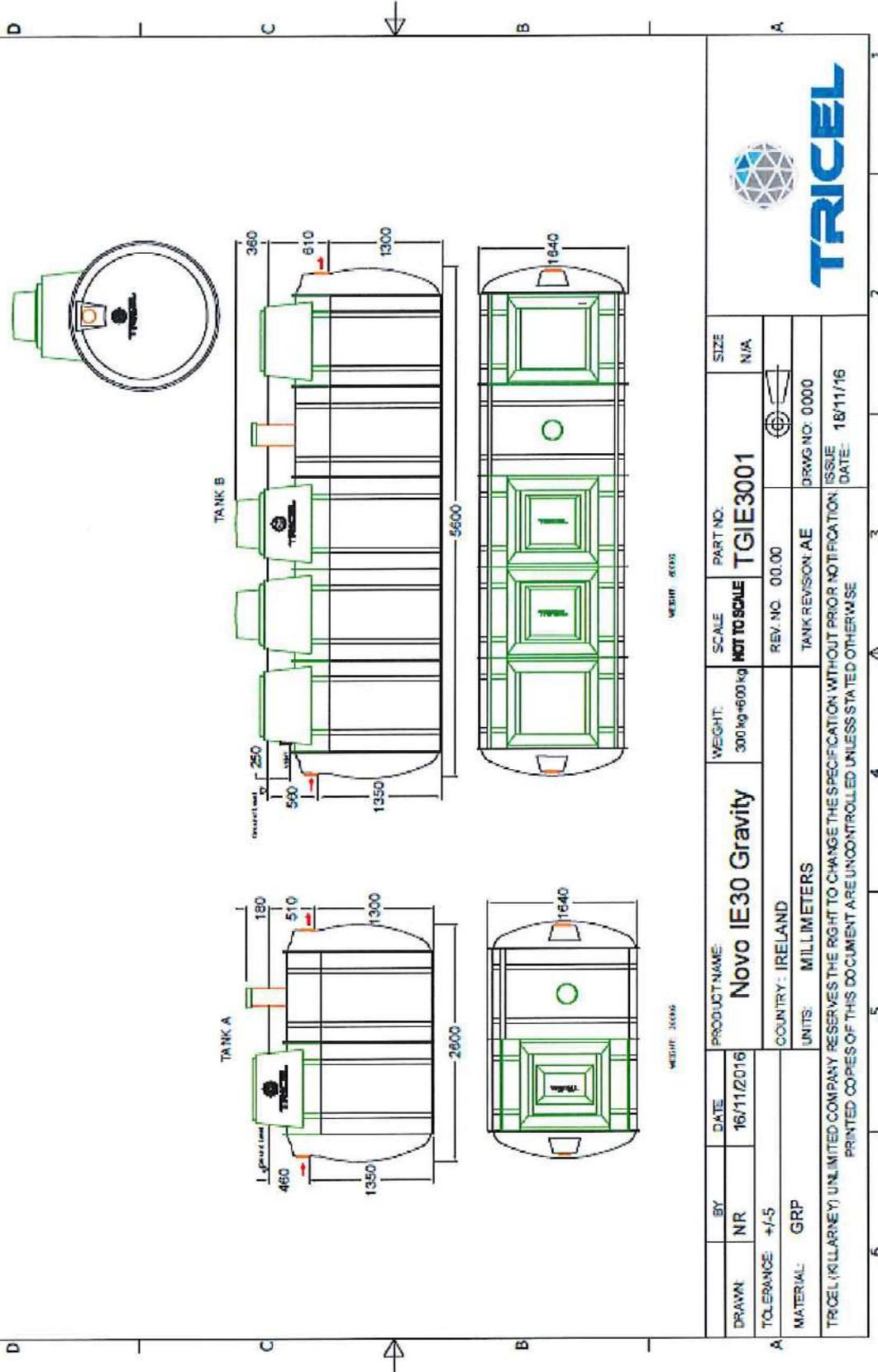
**SALES SPECIFICATION**



BY: NR		DATE: 16/11/2016		PRODUCT NAME: <b>Novo IE24 Gravity</b>		WEIGHT: <b>700 KG</b>		SCALE: <b>NOT TO SCALE</b>		PART NO: <b>TGIE2401</b>		SIZE: <b>N/A</b>	
TOLERANCE: +/-5		COUNTRY: IRELAND		UNITS: MILLIMETERS		REV. NO. 00.00		TANK REVISION: AE		DRWG NO: 0000		ISSUE DATE: 16/11/16	
MATERIAL: GRP		TRICEL (KILLARNEY) UNLIMITED COMPANY RESERVES THE RIGHT TO CHANGE THE SPECIFICATION WITHOUT PRIOR NOTIFICATION. PRINTED COPIES OF THIS DOCUMENT ARE UNCONTROLLED UNLESS STATED OTHERWISE											



SALES SPECIFICATION

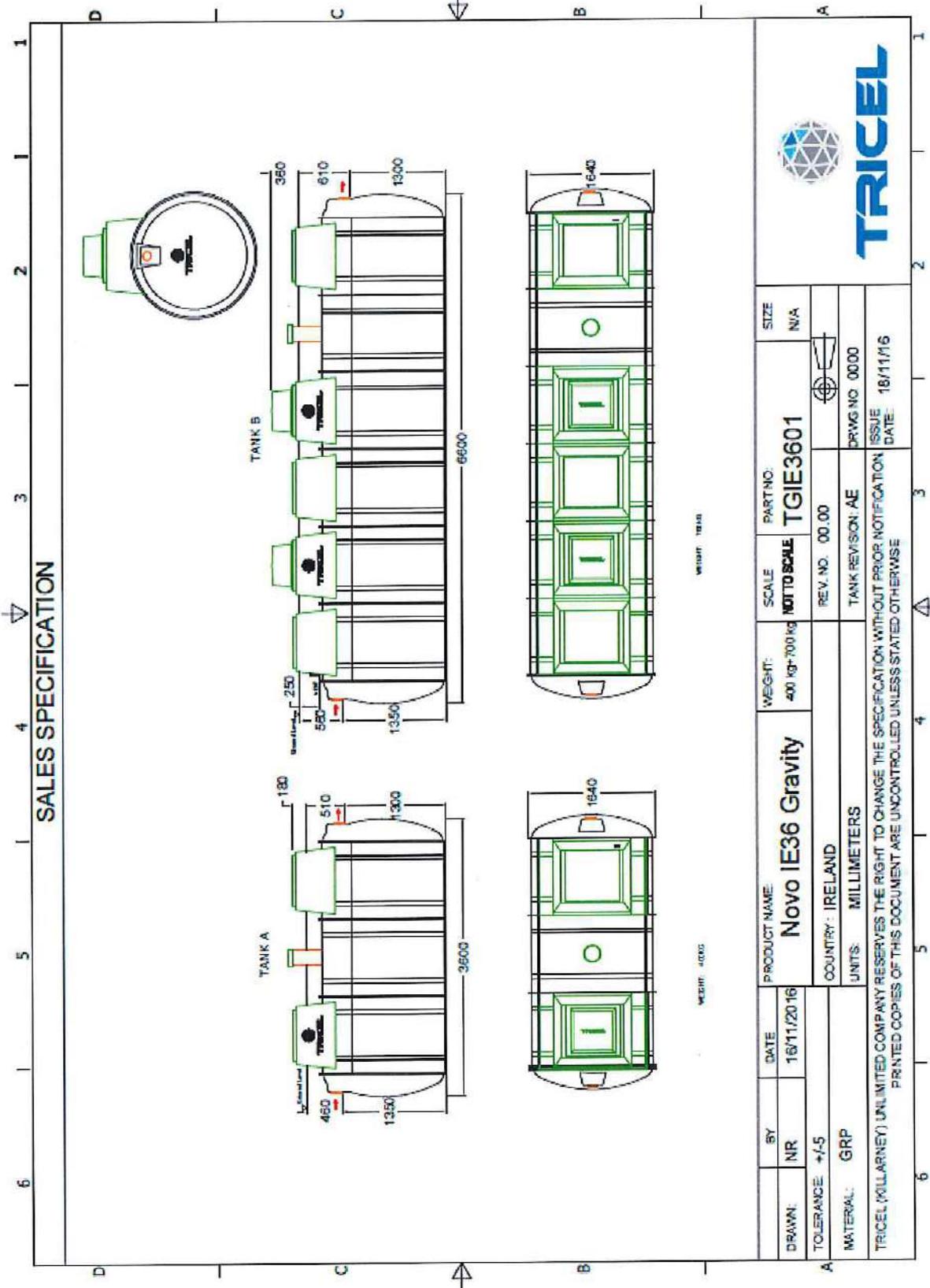


WEIGHT: 6000

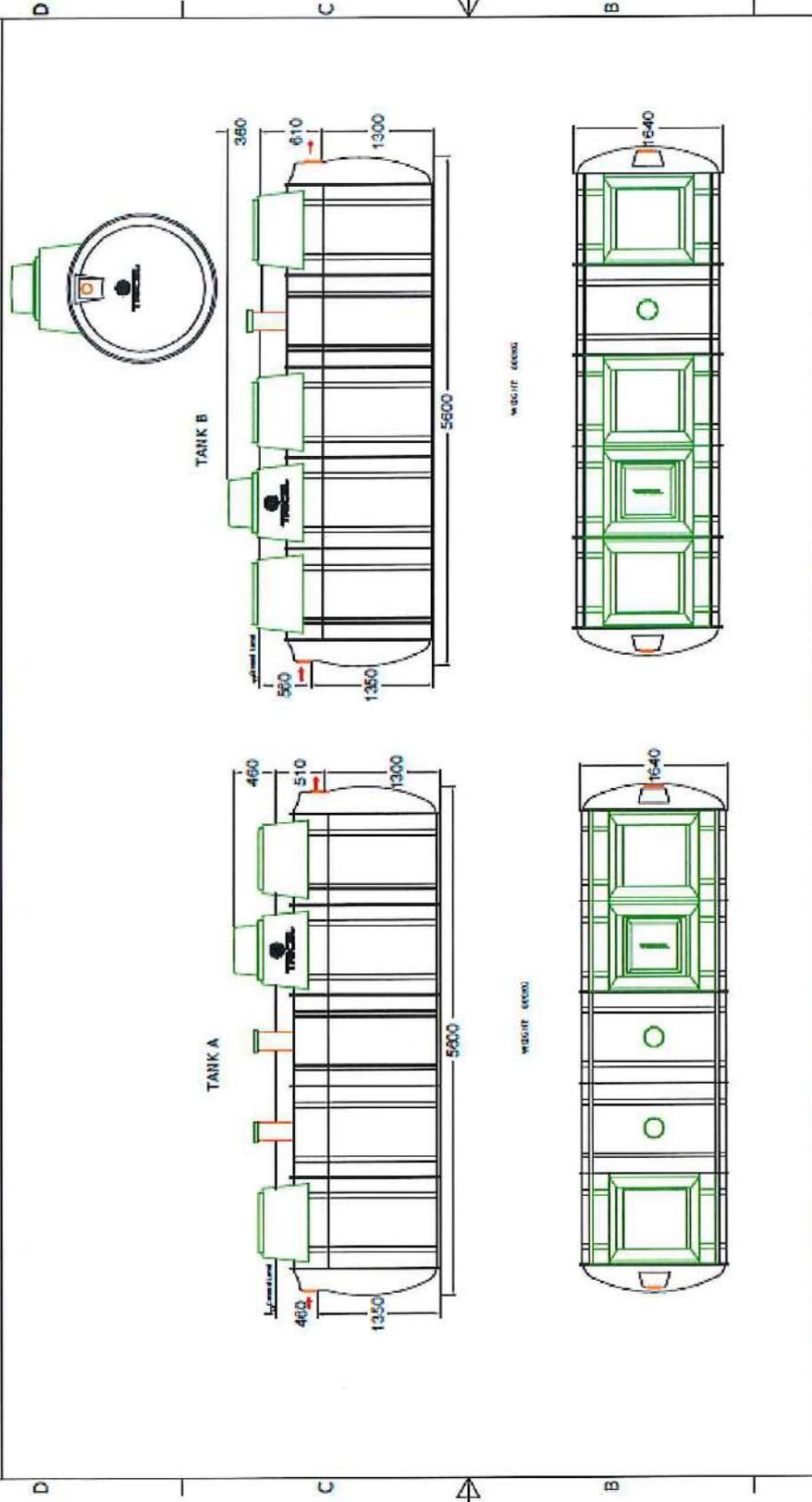
WEIGHT: 3000

BY: NR	DATE: 16/11/2016	PRODUCT NAME: Novo IE30 Gravity	WEIGHT: 300 kg ±600 kg	SCALE: NOT TO SCALE	PART NO: TGIE3001	SIZE: N/A
TOLERANCE: +/-5		COUNTRY: IRELAND	REV. NO: 00.00	TANK REVISION: AE	DRWG NO: 0000	
MATERIAL: GRP		UNITS: MILLIMETERS	TRICEL (WILLARNEY) UNLIMITED COMPANY RESERVES THE RIGHT TO CHANGE THE SPECIFICATION WITHOUT PRIOR NOTIFICATION. ISSUE DATE: 18/11/16			
PRINTED COPIES OF THIS DOCUMENT ARE UNCONTROLLED UNLESS STATED OTHERWISE						





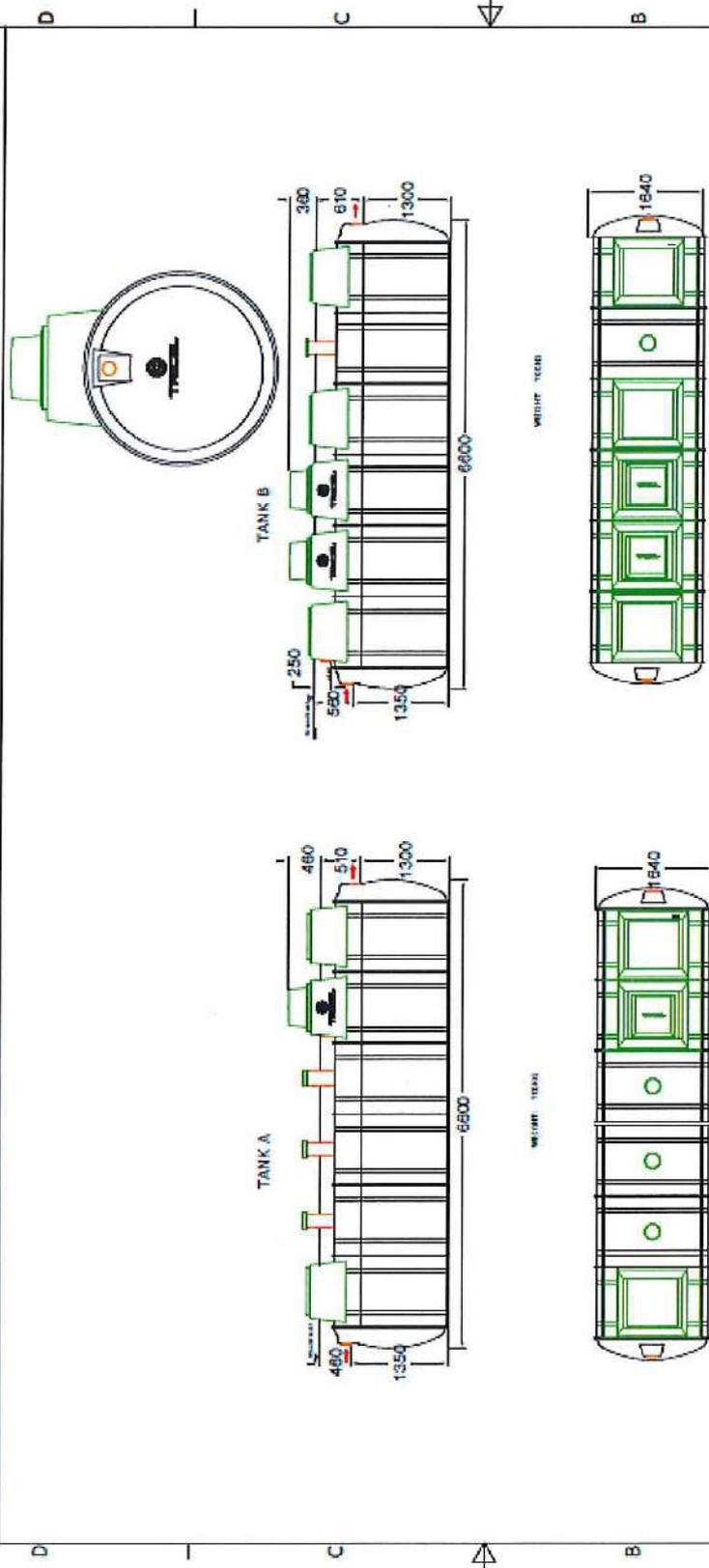
SALES SPECIFICATION



BY: NR	DATE: 16/11/2016	PRODUCT NAME: <b>Novo IE42 Gravity</b>	WEIGHT: 600 kg+800 kg	SCALE: <b>NOT TO SCALE</b>	PART NO: <b>TGIE4201</b>	SIZE: N/A
TOLERANCE: +/-5		COUNTRY: IRELAND		REV. NO. 00.00	DRWG NO: 0000	
MATERIAL: GRP		UNITS: MILLIMETERS		TANK REVISION: AE	ISSUE DATE: 18/11/16	
TRICEL (KILLARNEY) UNLIMITED COMPANY RESERVES THE RIGHT TO CHANGE THE SPECIFICATION WITHOUT PRIOR NOTIFICATION. PRINTED COPIES OF THIS DOCUMENT ARE UNCONTROLLED UNLESS STATED OTHERWISE						



SALES SPECIFICATION



DRAWN: NR	DATE: 18/11/2016	PRODUCT NAME: <b>Novo IE50 Gravity</b>	WEIGHT: 700 kg+700 kg	SCALE: <b>NOT TO SCALE</b>	PART NO: <b>TGIE5001</b>	SIZE: N/A
TOLERANCE: +/-5		COUNTRY: IRELAND	REV. NO. 00.00	TANK REVISION: AE	DRWG NO. 0000	
MATERIAL: GRP		UNITS: MILLIMETERS	TRICEL (KELLARNEY) UNLIMITED COMPANY RESERVES THE RIGHT TO CHANGE THE SPECIFICATION WITHOUT PRIOR NOTIFICATION. ISSUE DATE: 18/11/16 PRINTED COPIES OF THIS DOCUMENT ARE UNCONTROLLED UNLESS STATED OTHERWISE			



# TREATMENT PERFORMANCE RESULTS

**Tricel (Killarney)**  
Ballyspillane Industrial Est., Killarney, Co. Kerry, Ireland

**EN 12566-3**  
Results corresponding to EN 12566-3 and S.R. 66

PIA-SR66-1512-1062

**Novo**  
Submerged fixed film

Nominal organic daily load	0.26 kg/d		
Nominal hydraulic daily load	0.90 m <sup>3</sup> /d		
Material	Glass reinforced plastic		
Watertightness	Pass		
Structural behaviour (Calculation)	Pass (also wet conditions)		
Durability	Pass		
Treatment efficiency (nominal sequences)		Efficiency	Effluent
		COD	52 mg/l
		BOD <sub>5</sub>	11 mg/l
		NH <sub>4</sub> -N	8 mg/l
		SS	16 mg/l
Number of desludging	Not more than once		
Electrical consumption	1.1 kWh/d		

Performance tested by:

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

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



Notified Body  
No.: 1739



Certified according to  
ISO 9001:2008

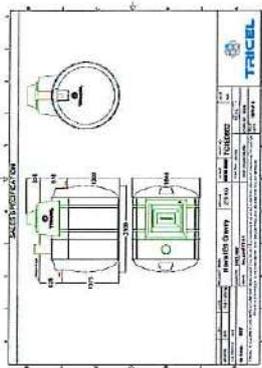
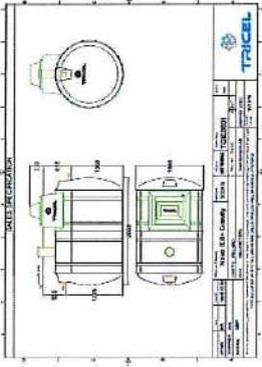
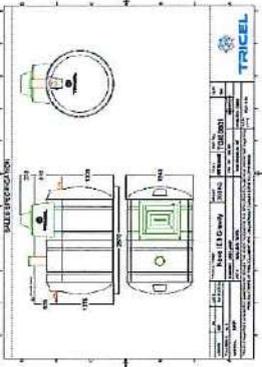


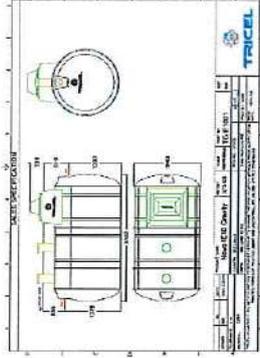
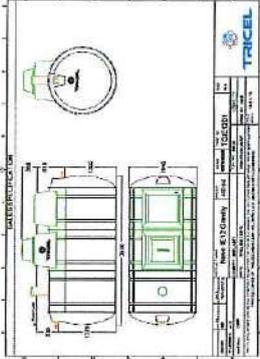
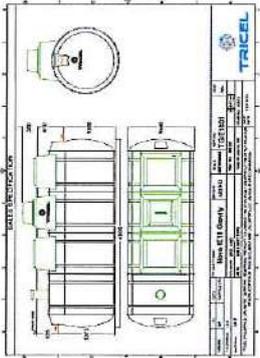
Prüfinstitut für Abwassertechnik GmbH  
*geprüft - tested - teste*

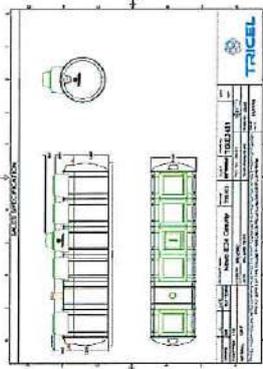
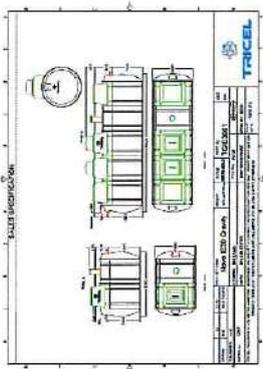
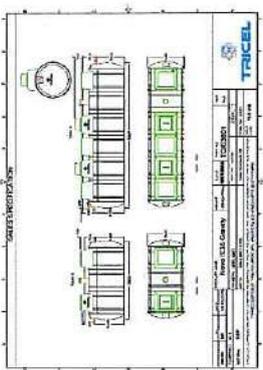
Elmar Lancé

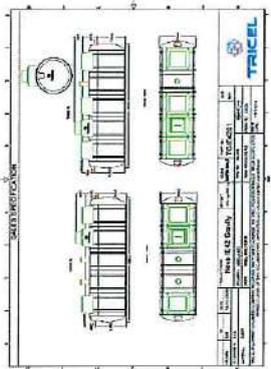
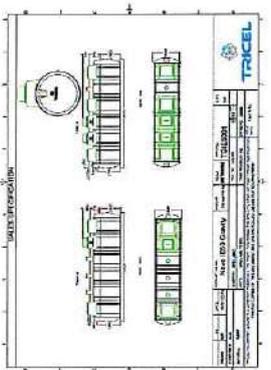
July 2016

Novo range and its referring test reports:

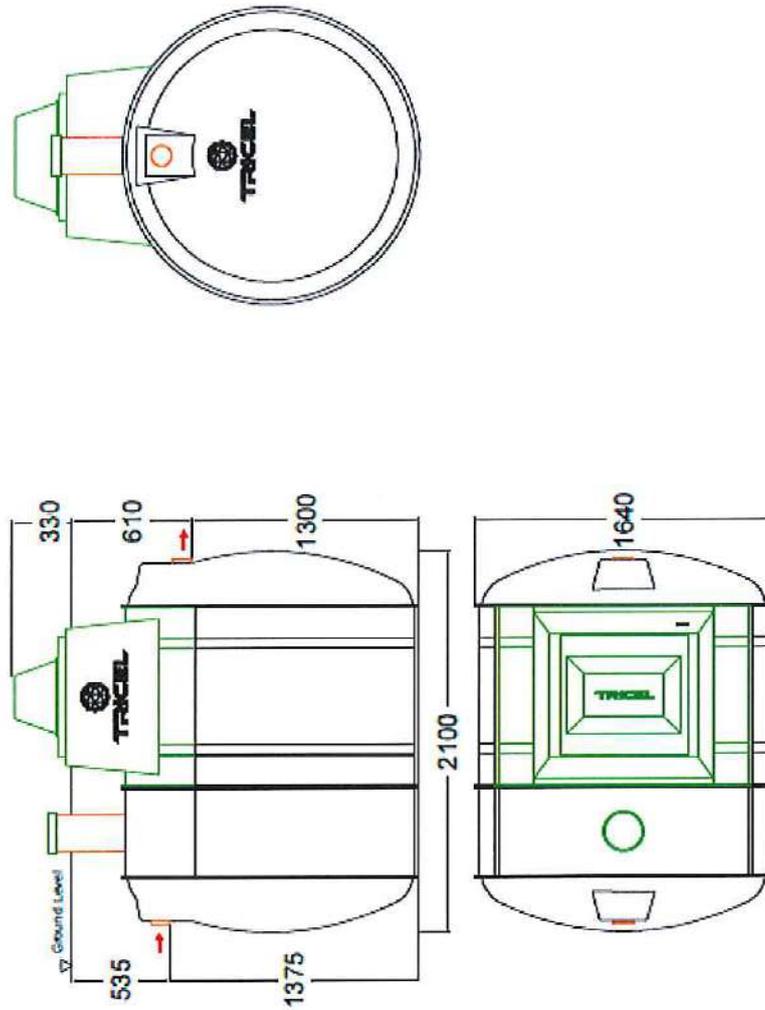
Population equivalent (PE)	Drawing of model of the range	Watertightness (EN 12566-3 Annex A)	Treatment Efficiency (EN 12566-3 Annex B)	Structural Behaviour (EN 12566-3 Annex C)	Durability
Initial Type Test (ITT) 6		Pass PIA2009-WD-AT0909-1055 PIA2015-WD/NC-1404-1021.01 PIA2015-WD/NC-1406-1031.01	Pass PIA2010-103B18SB <sub>e</sub>	Pass For wet ground conditions also, 1.25 m installation depth from inlet invert	Pass PIA2015-DH-1504-1023.01
6		Pass PIA2009-WD-AT0909-1055 PIA2015-WD/NC-1404-1021.01 PIA2015-WD/NC-1406-1031.01	Pass Range conformity according to S.R. 66:2015	Pass For wet ground conditions also, 1.25 m installation depth from inlet invert	Pass PIA2015-DH-1504-1023.01
8		Pass PIA2009-WD-AT0909-1055 PIA2015-WD/NC-1404-1021.01 PIA2015-WD/NC-1406-1031.01	Pass Range conformity according to S.R. 66:2015	Pass For wet ground conditions also, 1.25 m installation depth from inlet invert	Pass PIA2015-DH-1504-1023.01

Population equivalent (PE)	Drawing of model of the range	Watertightness (EN 12566-3 Annex A)	Treatment Efficiency (EN 12566-3 Annex B)	Structural Behaviour (EN 12566-3 Annex C)	Durability
10		Pass PIA2009-WD-AT0909-1055 PIA2015-WD/NC-1404-1021.01 PIA2015-WD/NC-1406-1031.01	Pass Range conformity according to S.R. 66:2015	Pass For wet ground conditions also, 1.25 m installation depth from inlet invert	Pass PIA2015-DH-1504-1023.01
12		Pass PIA2009-WD-AT0909-1055 PIA2015-WD/NC-1404-1021.01 PIA2015-WD/NC-1406-1031.01	Pass Range conformity according to S.R. 66:2015	Pass For wet ground conditions also, 1.25 m installation depth from inlet invert	Pass PIA2015-DH-1504-1023.01
18		Pass PIA2009-WD-AT0909-1055 PIA2015-WD/NC-1404-1021.01 PIA2015-WD/NC-1406-1031.01	Pass Range conformity according to S.R. 66:2015	Pass For wet ground conditions also, 1.25 m installation depth from inlet invert	Pass PIA2015-DH-1504-1023.01

Population equivalent (PE)	Drawing of model of the range	Watertightness (EN 12566-3 Annex A)	Treatment Efficiency (EN 12566-3 Annex B)	Structural Behaviour (EN 12566-3 Annex C)	Durability
24		<p>Pass</p> <p>PIA2009-WD-AT0909-1055</p> <p>PIA2015-WD/NC-1404-1021.01</p> <p>PIA2015-WD/NC-1406-1031.01</p>	<p>Pass</p> <p>Range conformity according to S.R. 66:2015</p>	<p>Pass</p> <p>PIA2013-ST-PIT-1303-1018.01</p> <p>For wet ground conditions also, 1.25 m installation depth from inlet invert</p>	<p>Pass</p> <p>PIA2015-DH-1504-1023.01</p>
30		<p>Pass</p> <p>PIA2009-WD-AT0909-1055</p> <p>PIA2015-WD/NC-1404-1021.01</p> <p>PIA2015-WD/NC-1406-1031.01</p>	<p>Pass</p> <p>Range conformity according to S.R. 66:2015</p>	<p>Pass</p> <p>For wet ground conditions also, 1.25 m installation depth from inlet invert</p>	<p>Pass</p> <p>PIA2015-DH-1504-1023.01</p>
36		<p>Pass</p> <p>PIA2009-WD-AT0909-1055</p> <p>PIA2015-WD/NC-1404-1021.01</p> <p>PIA2015-WD/NC-1406-1031.01</p>	<p>Pass</p> <p>Range conformity according to S.R. 66:2015</p>	<p>Pass</p> <p>For wet ground conditions also, 1.25 m installation depth from inlet invert</p>	<p>Pass</p> <p>PIA2015-DH-1504-1023.01</p>

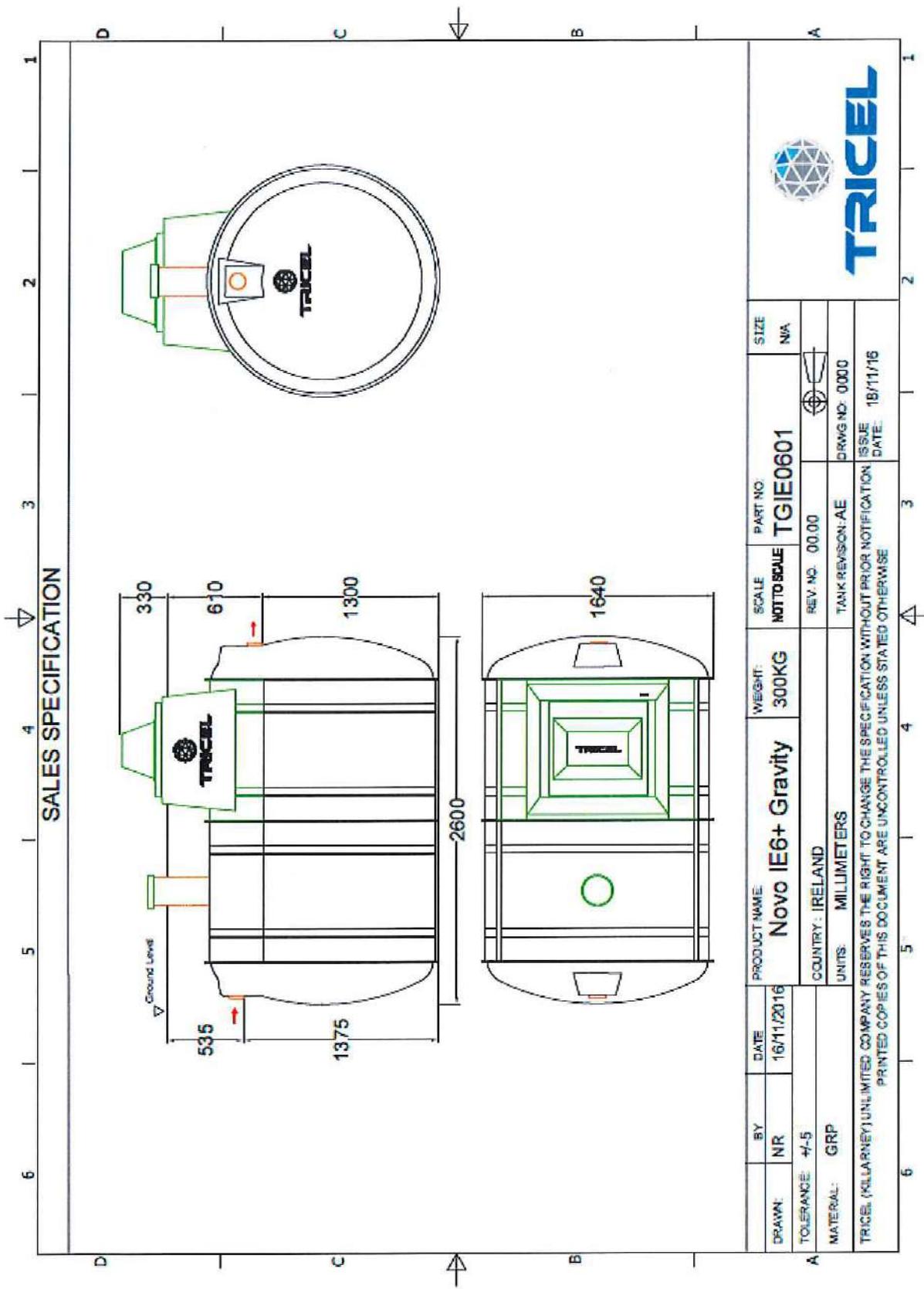
Population equivalent (PE)	Drawing of model of the range	Watertightness (EN 12566-3 Annex A)	Treatment Efficiency (EN 12566-3 Annex B)	Structural Behaviour (EN 12566-3 Annex C)	Durability
42		Pass PIA2009-WD-AT0909-1055 PIA2015-WD/NC-1404-1021.01 PIA2015-WD/NC-1406-1031.01	Pass Range conformity according to S.R. 66:2015	Pass For wet ground conditions also, 1.25 m installation depth from inlet invert	Pass PIA2015-DH-1504-1023.01
50		Pass PIA2009-WD-AT0909-1055 PIA2015-WD/NC-1404-1021.01 PIA2015-WD/NC-1406-1031.01	Pass Range conformity according to S.R. 66:2015	Pass For wet ground conditions also, 1.25 m installation depth from inlet invert	Pass PIA2015-DH-1504-1023.01

**SALES SPECIFICATION**



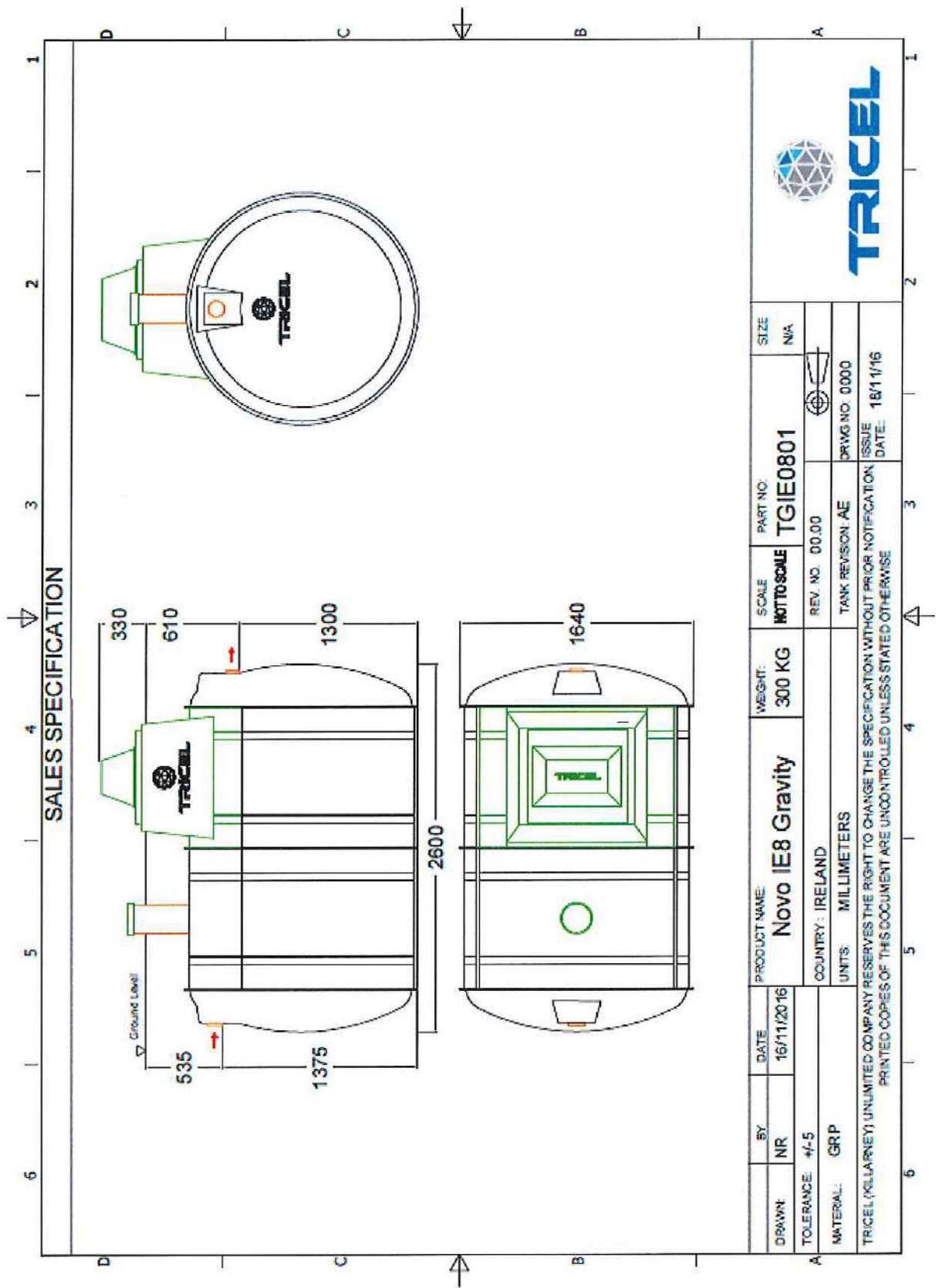
BY: NR		DATE: 16/11/2016	PRODUCT NAME: <b>Novo IE6 Gravity</b>		WEIGHT: 270 KG	SCALE: <b>NOT TO SCALE</b>	PART NO: <b>TGIE0602</b>	SIZE: N/A
TOLERANCE: +1-5			COUNTRY: IRELAND			REV. NO: 00.00		
MATERIAL: GRP			UNITS: MILLIMETERS			TANK REVISION: AE		DRWG NO: 0000
TRICEL (KILLARNEY) UNLIMITED COMPANY RESERVES THE RIGHT TO CHANGE THE SPECIFICATION WITHOUT PRIOR NOTIFICATION. PRINTED COPIES OF THIS DOCUMENT ARE UNCONTROLLED UNLESS STATED OTHERWISE.								
						ISSUE DATE: 18/11/16		

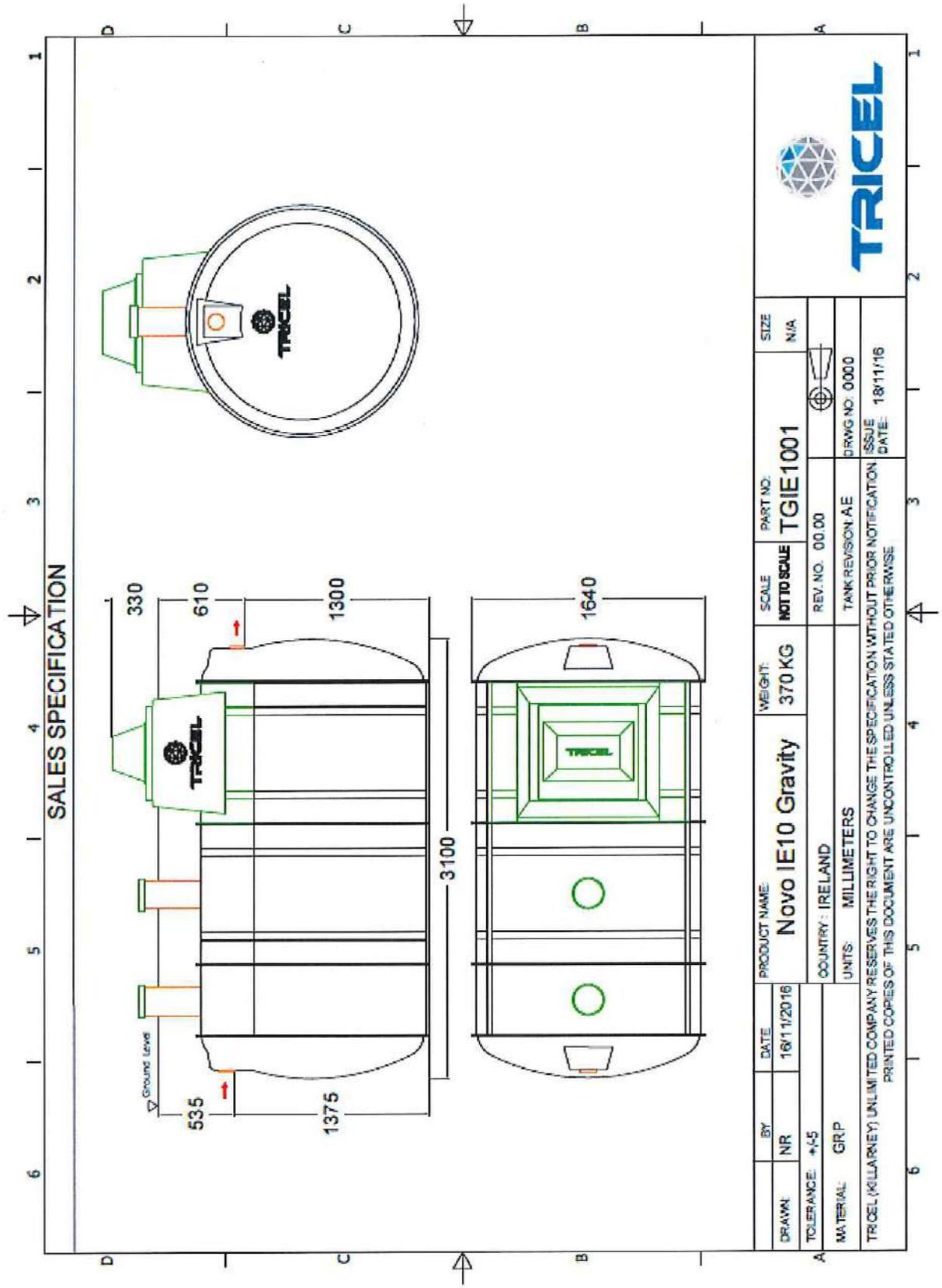


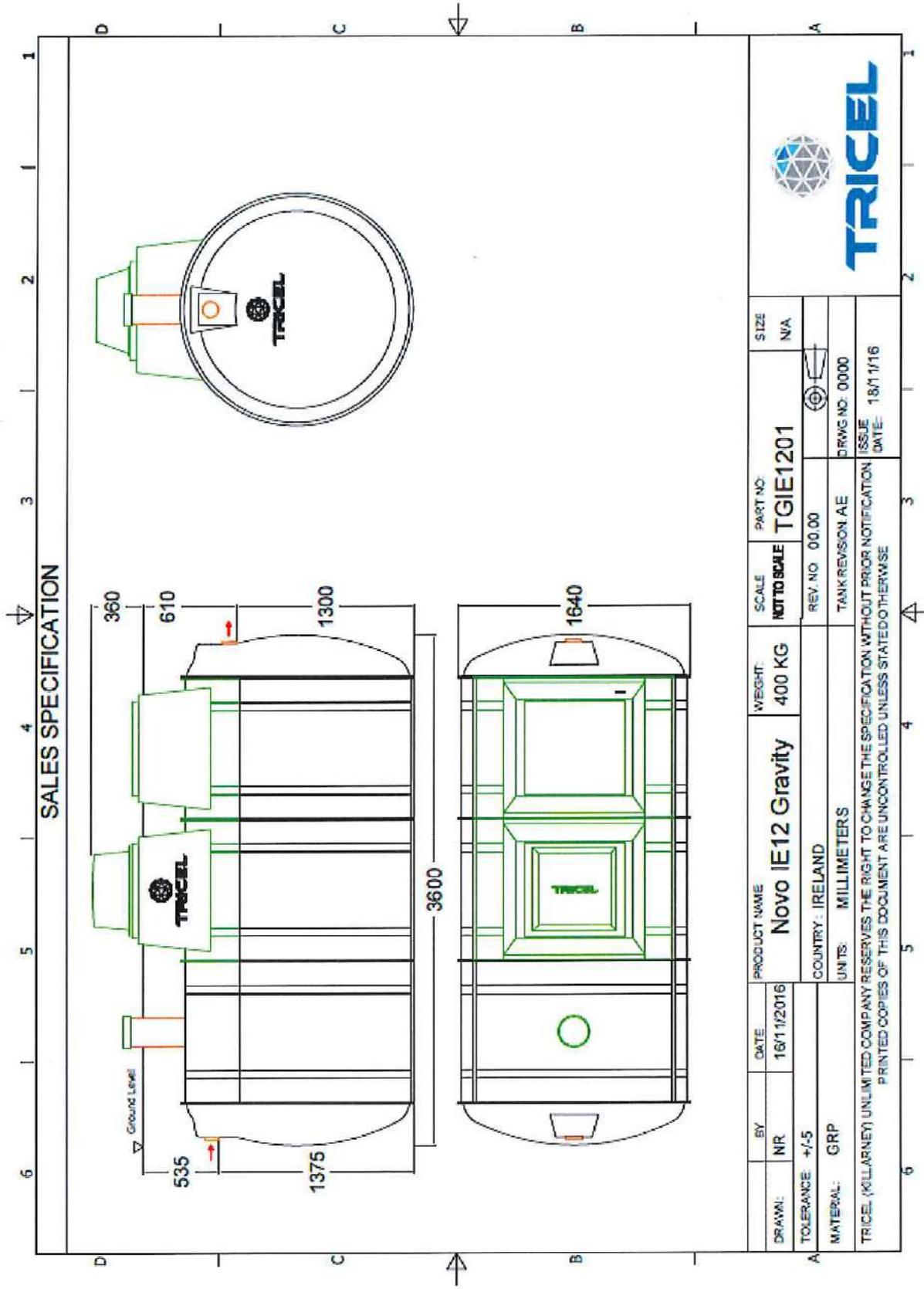


**SALES SPECIFICATION**

BY: NR		DATE: 16/11/2016		PRODUCT NAME: <b>Novo IE6+ Gravity</b>		WEIGHT: <b>300KG</b>		SCALE: <b>NOT TO SCALE</b>		PART NO: <b>TGIE0601</b>		SIZE: <b>N/A</b>	
TOLERANCE: +/-5		COUNTRY: IRELAND		UNITS: MILLIMETERS		REV. NO: 00.00		TANK REVISION: AE		DRAWG NO: 0000		ISSUE DATE: 18/11/16	
MATERIAL: GRP		<p>TRICEL (KILLARNEY) UNLIMITED COMPANY RESERVES THE RIGHT TO CHANGE THE SPECIFICATION WITHOUT PRIOR NOTIFICATION. ISSUE PRINTED COPIES OF THIS DOCUMENT ARE UNCONTROLLED UNLESS STATED OTHERWISE.</p>											

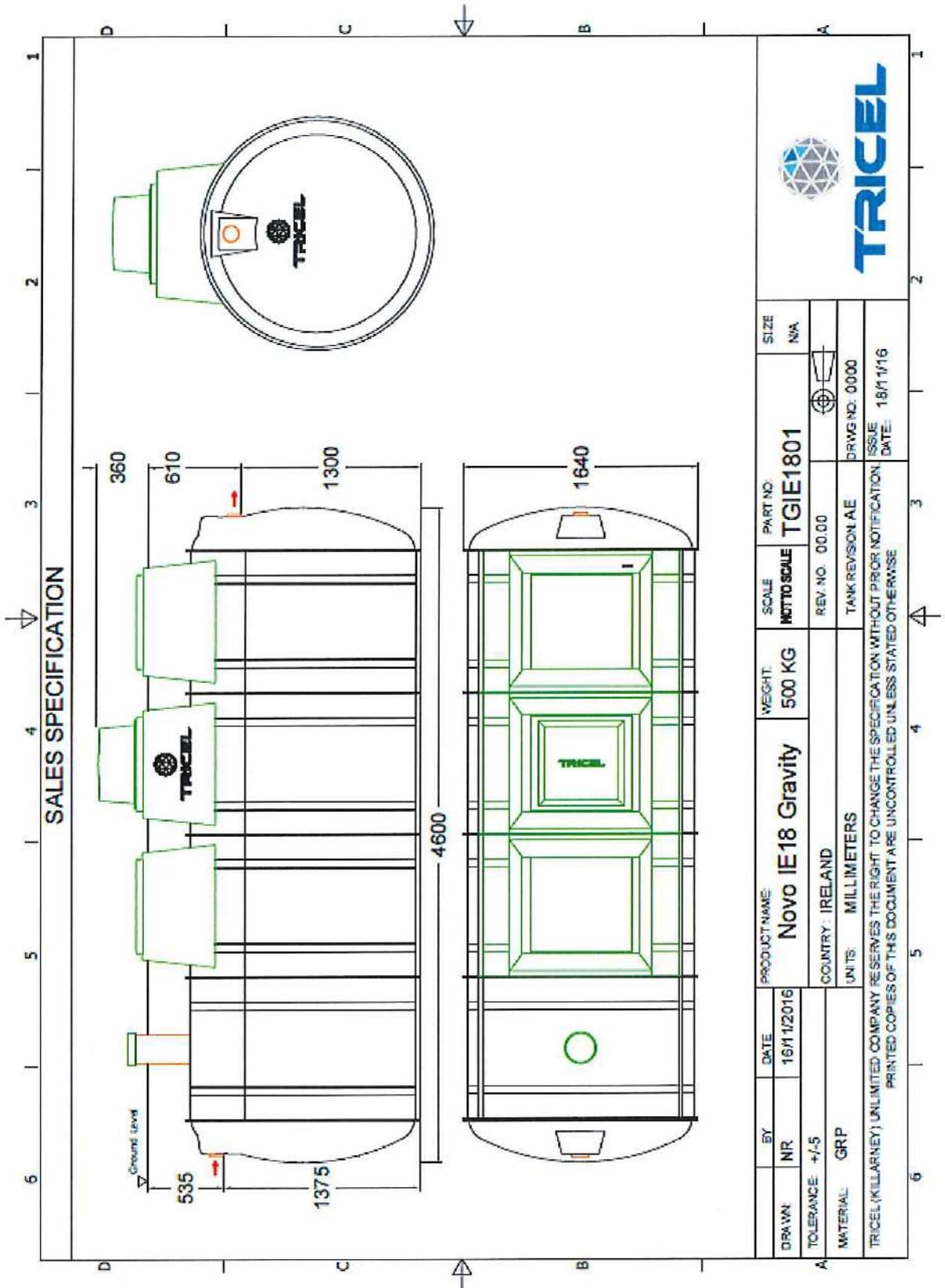






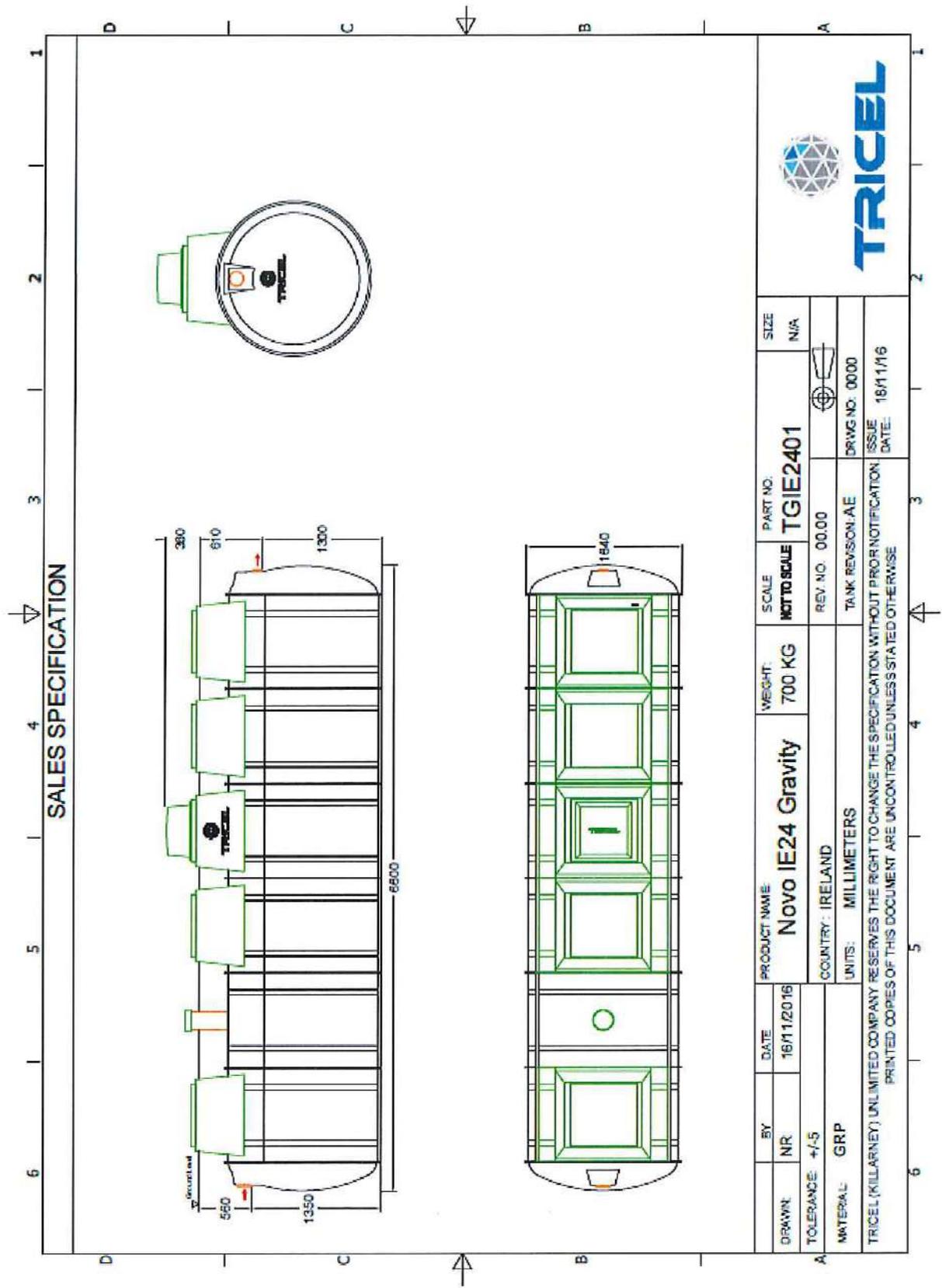
BY: NR		DATE: 16/1/2016		PRODUCT NAME: <b>Novo IE12 Gravity</b>		WEIGHT: <b>400 KG</b>		SCALE: <b>NOT TO SCALE</b>		PART NO: <b>TGIE1201</b>		SIZE: <b>N/A</b>	
TOLERANCE: +/-5				COUNTRY: IRELAND				REV. NO: 00.00		TANK REVISON: AE		DRWS NO: 0000	
MATERIAL: GRP				UNITS: MILLIMETERS								ISSUE DATE: 18/1/16	
TRICEL (KILLARNEY) UNLIMITED COMPANY RESERVES THE RIGHT TO CHANGE THE SPECIFICATION WITHOUT PRIOR NOTIFICATION PRINTED COPIES OF THIS DOCUMENT ARE UNCONTROLLED UNLESS STATED OTHERWISE													





BY: NR	DATE: 15/11/2016	PRODUCT NAME: <b>Novo IE18 Gravity</b>	WEIGHT: <b>500 KG</b>	SCALE: <b>NOT TO SCALE</b>	PART NO: <b>TGIE1801</b>	SIZE: <b>N/A</b>
TOLERANCE: +/-5		COUNTRY: IRELAND	REV. NO: 00.00	REV. NO: 00.00	DRWG NO: 0000	
MATERIAL: GRP		UNITS: MILLIMETERS	TANK REVISION AE			
TRICEL (KILLARNEY) UNLIMITED COMPANY RESERVES THE RIGHT TO CHANGE THE SPECIFICATION WITHOUT PRIOR NOTIFICATION. ISSUE DATE: 18/11/16						
PRINTED COPIES OF THIS DOCUMENT ARE UNCONTROLLED UNLESS STATED OTHERWISE						

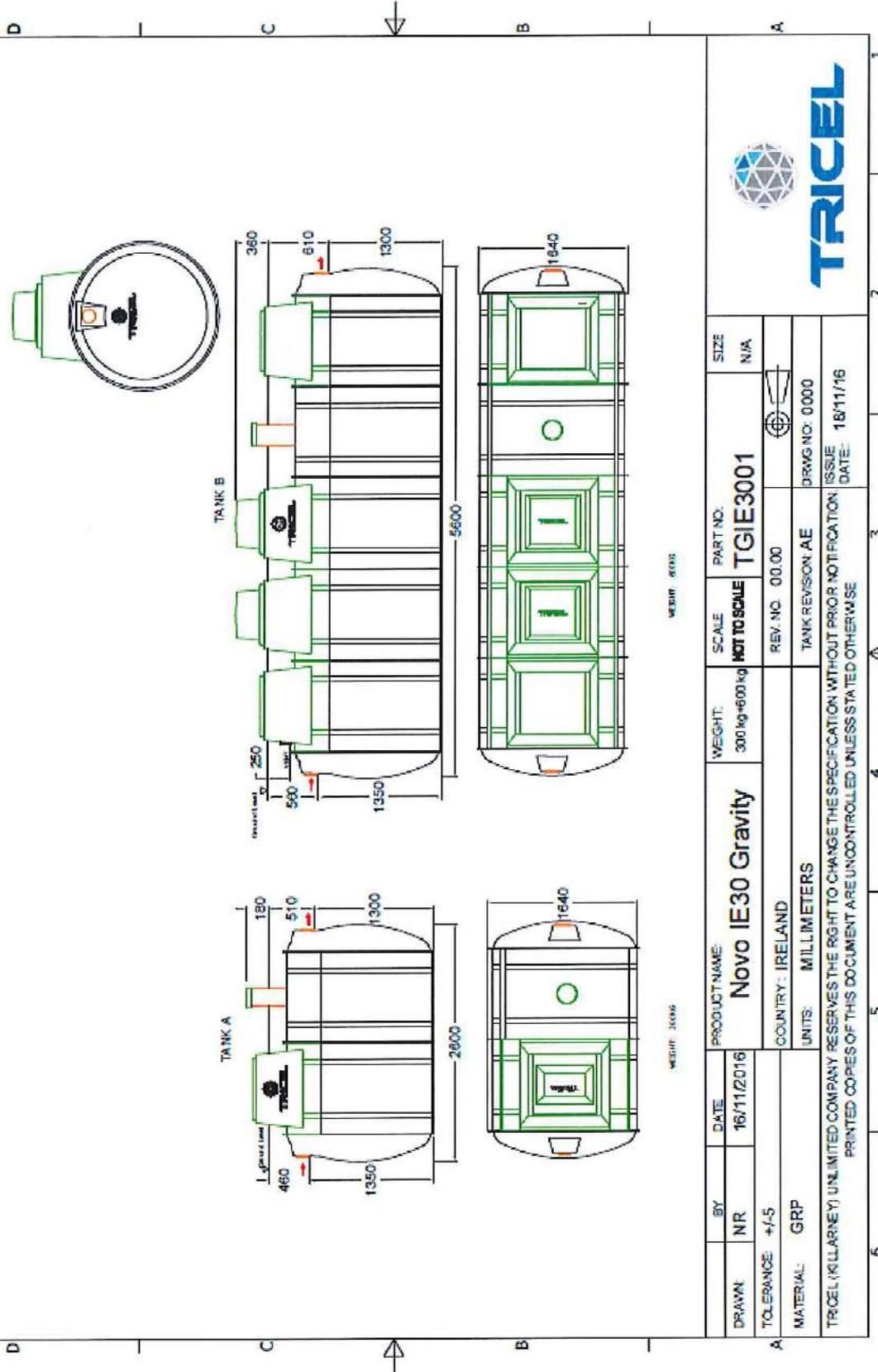
**SALES SPECIFICATION**



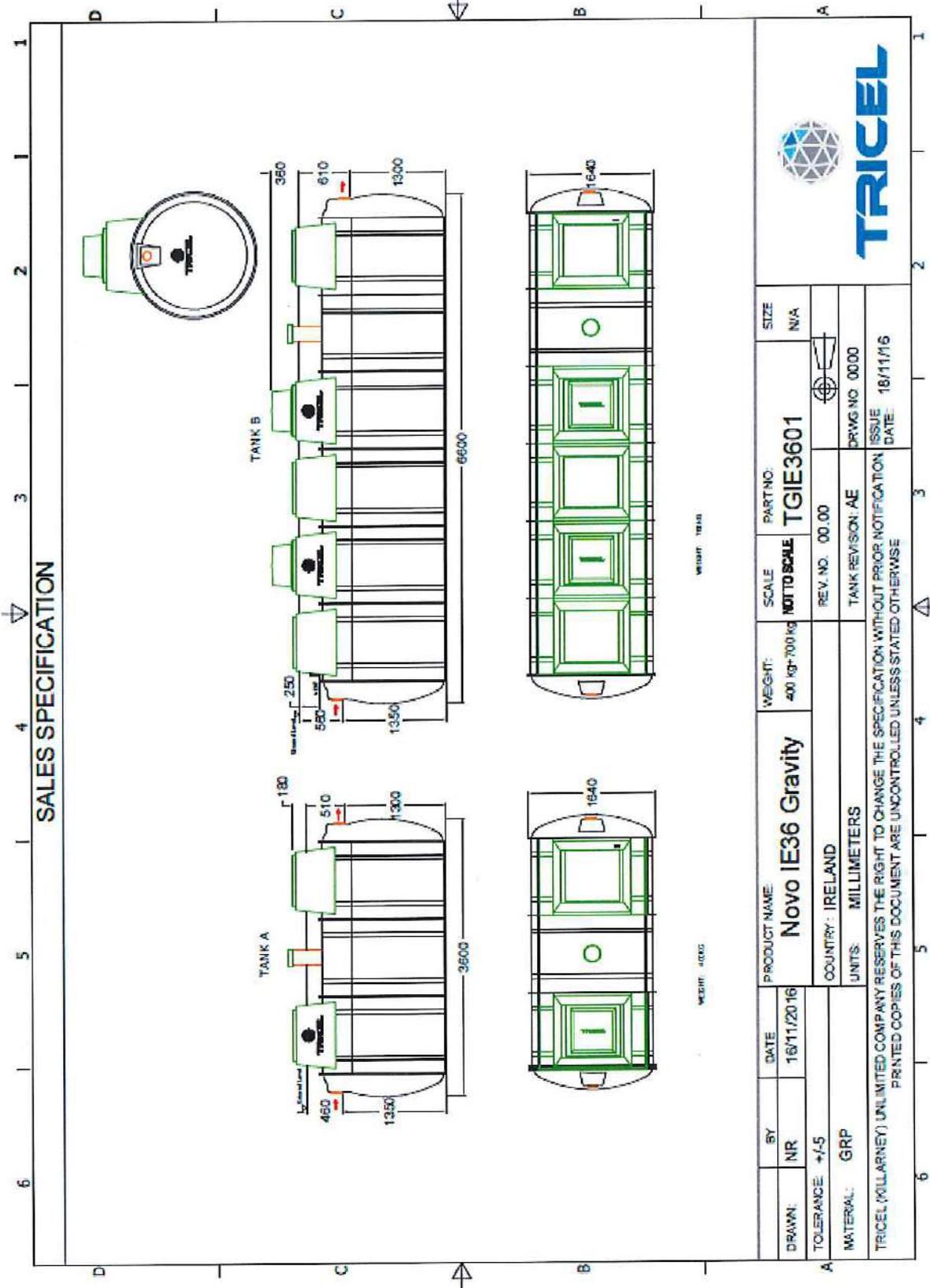
BY: NR		DATE: 16/11/2016		PRODUCT NAME: <b>Novo IE24 Gravity</b>		WEIGHT: <b>700 KG</b>		SCALE: <b>NOT TO SCALE</b>		PART NO: <b>TGIE2401</b>		SIZE: <b>N/A</b>	
TOLERANCE: +/-5		COUNTRY: IRELAND		UNITS: MILLIMETERS		REV. NO. 00.00		TANK REVISION: AE		DRWG NO: 0000		ISSUE DATE: 16/11/16	
MATERIAL: GRP		TRICEL (KILLARNEY) UNLIMITED COMPANY RESERVES THE RIGHT TO CHANGE THE SPECIFICATION WITHOUT PRIOR NOTIFICATION. PRINTED COPIES OF THIS DOCUMENT ARE UNCONTROLLED UNLESS STATED OTHERWISE											



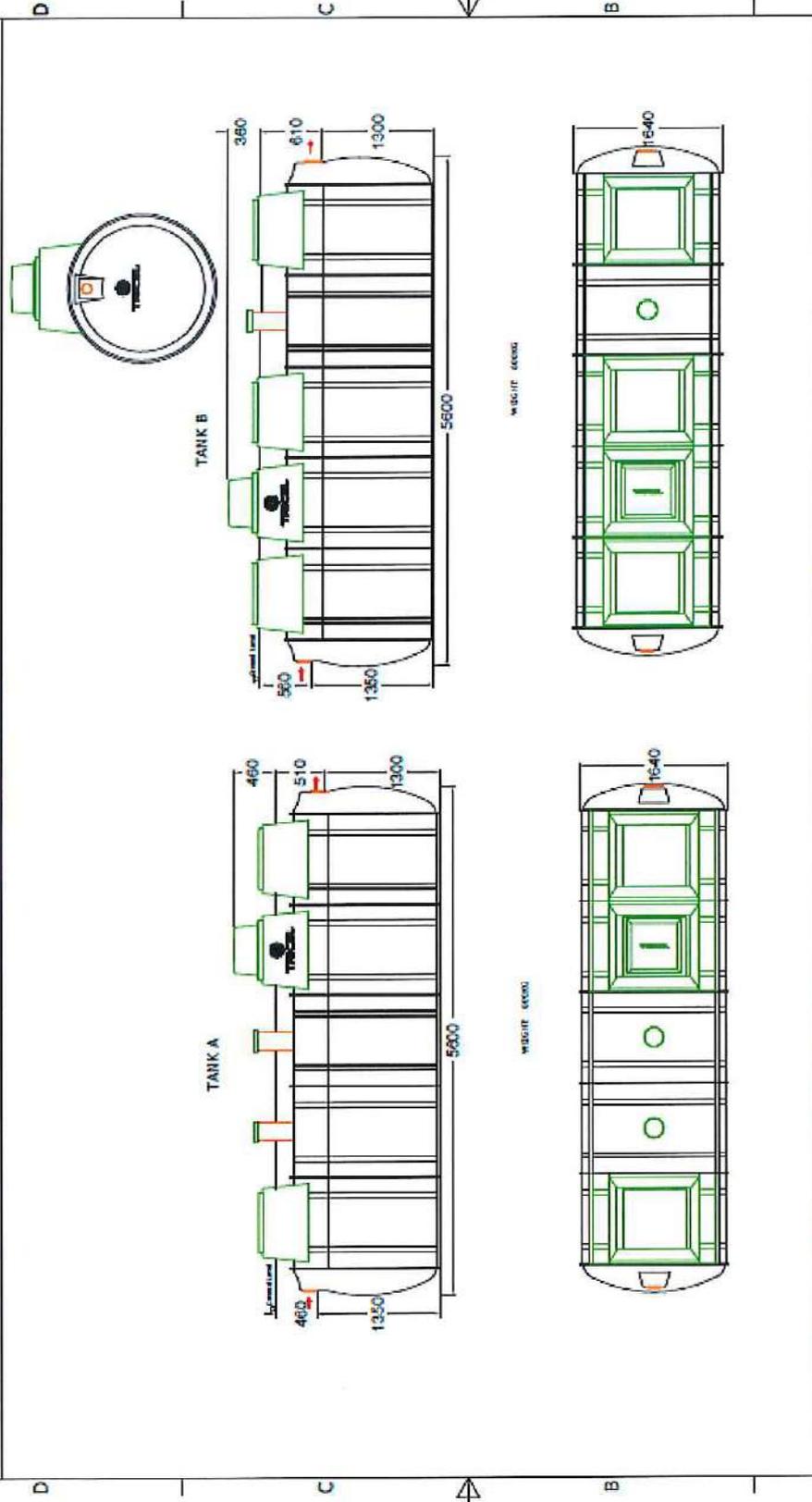
SALES SPECIFICATION



BY: NR	DATE: 16/11/2016	PRODUCT NAME: Novo IE30 Gravity	WEIGHT: 300 kg ±600 kg	SCALE: NOT TO SCALE	PART NO: TGIE3001	SIZE: N/A
TOLERANCE: +/-5		COUNTRY: IRELAND		REV. NO: 00.00		
MATERIAL: GRP		UNITS: MILLIMETERS		TANK REVISION: AE		
TRICEL (WILLARNEY) UNLIMITED COMPANY RESERVES THE RIGHT TO CHANGE THE SPECIFICATION WITHOUT PRIOR NOTIFICATION. ISSUE DATE: 18/11/16						
PRINTED COPIES OF THIS DOCUMENT ARE UNCONTROLLED UNLESS STATED OTHERWISE						



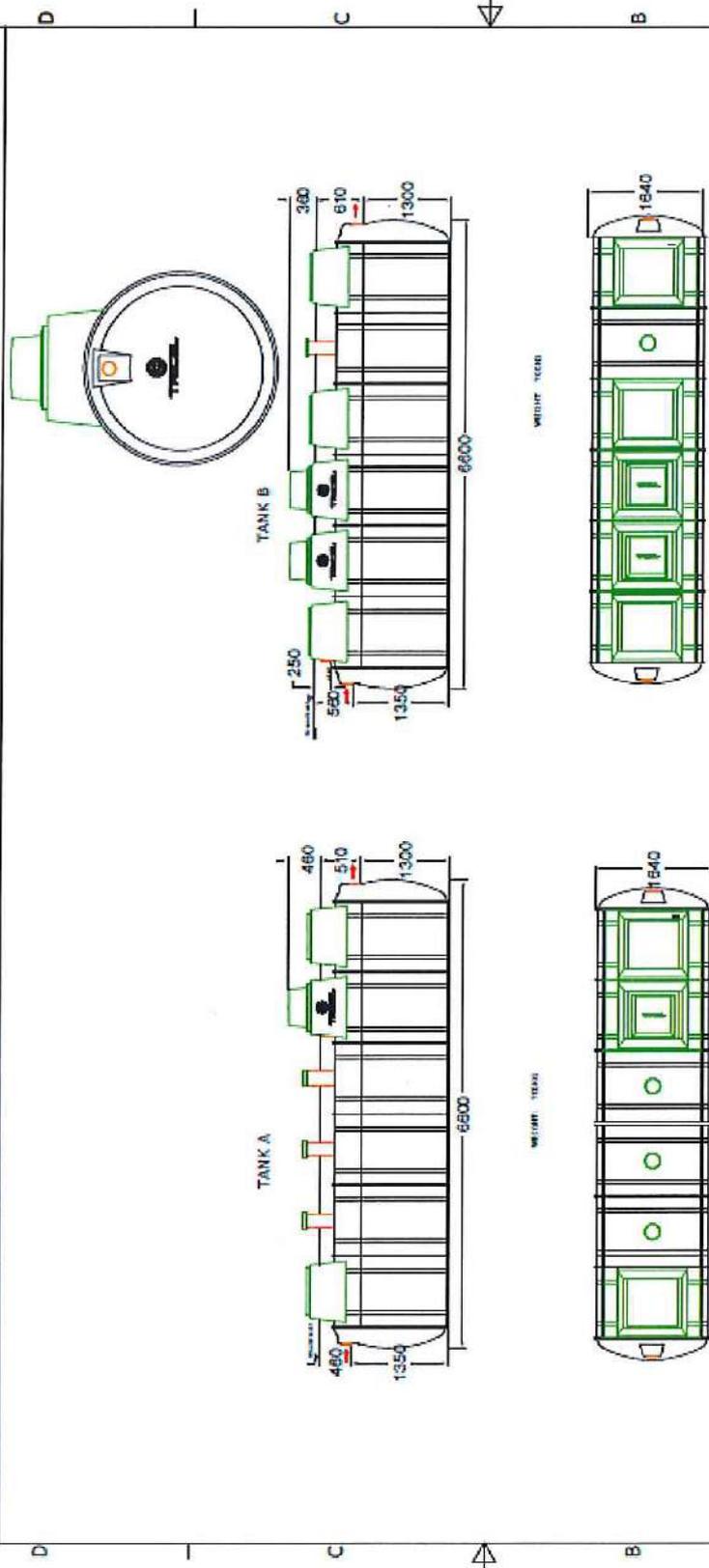
SALES SPECIFICATION



BY: NR	DATE: 16/11/2016	PRODUCT NAME: <b>Novo IE42 Gravity</b>	WEIGHT: 600 kg+800 kg	SCALE: <b>NOT TO SCALE</b>	PART NO: <b>TGIE4201</b>	SIZE: N/A
TOLERANCE: +/-5		COUNTRY: IRELAND		REV. NO. 00.00		
MATERIAL: GRP		UNITS: MILLIMETERS		TANK REVISION: AE	DRWG NO: 0000	
TRICEL (KILLARNEY) UNLIMITED COMPANY RESERVES THE RIGHT TO CHANGE THE SPECIFICATION WITHOUT PRIOR NOTIFICATION. ISSUE DATE: 18/11/16						
PRINTED COPIES OF THIS DOCUMENT ARE UNCONTROLLED UNLESS STATED OTHERWISE						



SALES SPECIFICATION



DRAWN: NR	DATE: 15/11/2016	PRODUCT NAME: <b>Novo IE50 Gravity</b>	WEIGHT: 700 kg+700 kg	SCALE: <b>NOT TO SCALE</b>	PART NO: <b>TGIE5001</b>	SIZE: N/A
TOLERANCE: +/-5		COUNTRY: IRELAND	REV. NO. 00.00	TANK REVISION: AE	DRWG NO. 0000	
MATERIAL: GRP		UNITS: MILLIMETERS	TRICEL (KELLARNEY) UNLIMITED COMPANY RESERVES THE RIGHT TO CHANGE THE SPECIFICATION WITHOUT PRIOR NOTIFICATION. ISSUE DATE: 18/11/16 PRINTED COPIES OF THIS DOCUMENT ARE UNCONTROLLED UNLESS STATED OTHERWISE			



# PACKAGED FILTER SYSTEM

For Tertiary Treatment

# IRELAND

## Tricel® TERO

Next generation of Tertiary Treatment  
Providing efficient E.coli treatment  
( $< 1000$  cfu / 100 ml).

For Single Dwellings & Small Communities.

*Innovative design for superior performance*



# TERO module

The Tricel TERO tertiary wastewater system further purifies the treated effluent from a packaged wastewater treatment plant resulting in a reduced area and depth of discharge bed.

## Stage One:

TERO receives secondary treated effluent from a wastewater treatment plant. The TERO is designed to work seamlessly with the Tricel NOVO but can also be used with third-party products, providing that a pumped discharge with a dose limit is utilised.

## Stage Two:

The pre-treated effluent is dispersed using an easily serviceable distribution network which ensures the effluent is distributed evenly and uniformly onto natural filter media. The effluent filters through the media and is treated by a combination of biological, chemical and physical processes. The treated water is transported to the soil at the base of the tank.



## The environmental advantages of TERO

- Improved E.coli treatment efficacy. Test results show less than 1000 cfu/100ml, reducing soil depth requirements to 600mm.
- TERO is an **Environmentally friendly** system that utilises natural, long-life renewable media. The remarkable filtration properties of coconut fibre requires no chemical additives in achieving exceptional results.
- The closed system design of TERO greatly reduces odour whilst ensuring high treatment efficiency of the wastewater.

## Advantages for you

- **Compact system** - one module meets requirements for 6PE.
- The **modular design** of TERO makes it ideal for retrofit upgrades, extensions etc., and can be used with many existing treatment systems.
- The shallow profile of TERO makes it easy to incorporate into landscape design.
- **Simple maintenance. No desludging required.**
- **No electrical components or power consumption** used in the TERO system.

## Advantages for installation

- **Easy installation** – Flat base for easy installation, one inlet connection from wastewater plant. Reduced discharge depth and area, thus reducing contractor expense and costs.
- **Plug and play system** – assembled module with single input connector.

## Simple installation, minimum maintenance

Easily installed by your contractor with full commissioning provided by qualified Technician. Annual maintenance recommended to extend life and performance of the system.

## Complementary products for the TERO residential system

- High Level Alarm(s)
- Sample Chambers
- Weatherproof GRP Enclosures & Kiosks

The TERO system has undergone a rigorous performance testing regime to achieve the highest results required. The tables below show the sizes and the wastewater treatment capability of a TERO. If you have any specific requirements, please contact the Tricel sales team who will be able to assist you with your enquiry.

Tertiary Treatment Performance	
ESSENTIAL CHARACTERISTICS	PERFORMANCE
Nominal Organic Design Load	0.01 kg BOD/d
Nominal Hydraulic Daily Design Load	0.90 m <sup>3</sup> /d
COD	54 mg/l
BOD <sub>5</sub>	5 mg/l
SS	4 mg/l
NH <sub>4</sub> <sup>*</sup>	0.2 mg/l
Electrical Power Consumption	0.2 kWh/d
Number of desludging	0

\* determined at temperatures of ≥ 12°

TERO module dimensions	
Length	2,444mm
Height	1,078mm
Width	1,012mm
Weight (one TERO module)	515kg

## SEWAGE TREATMENT SIMPLIFIED

**Sewage Treatment:** Combination of physical and biological processes which break down the organic and inorganic sewage content which cause pollution to receiving waters.

**Receiving Waters:** All groundwaters and watercourses such as streams and rivers.

**Population Equivalent (PE):** A measure of the number of people the treatment plant serves.

**Media:** Coconut fibre.

**Sludge:** The solids that settle to the bottom of the tank chambers.

**BOD:** Biological Oxygen Demand measured in milligrams per litre (mg/l) is a relative measure of how polluting the sewage is.

**SS:** Suspended Solids measured in milligrams per litre (mg/l) includes all suspended matter both organic and inorganic.

**E.Coli bacteria:** commonly used as an indicator microorganism for faecal pollution, and the sanitary quality of foods and water, measured in (cfu/100ml).

# Tricel Group

Tricel is a world recognised global provider of **high-performance solutions**. Today, the company operates across multiple industries such as **Environmental, Construction, Water and Distribution**, including both composite materials and lubricants.

We occupy a unique position in the field of reinforced plastics, combining the technical expertise of **over 50 years in the press-moulding and composites industry**. Tricel is proud of being one of the largest manufacturers of wastewater treatment plants in Europe, and are regarded by regulators as the standard setters within the industry.

Tricel are **experts in Sheet Moulding Compound (SMC)** processes and produce the only wastewater treatment plant in Europe constructed from this material. This process gives the highest strength to thickness ratio of any tank on the market, and has no risk of corrosion over time.

Our company offers industry **leading innovative solutions** that our customers can trust, and with operations in 17 locations across Europe we supply a comprehensive range of products to **over 50 countries worldwide**.



## Membership of European governing bodies on wastewater treatment



Tricel wastewater treatment plants are fully tested and accredited to **European standards for CE certification**.

PIA (Prüfinstitut für Abwassertechnik GmbH) are the leading Test Institute in Europe for wastewater technology.

Tricel wastewater treatment plants meet with **EN12566-7** requirements which test both the quality of the components as well as the overall performance of the plant.

The **Irish Water Treatment Association (IWTA)** is the national association for the treatment, conservation, recycling and reuse of water and wastewater.



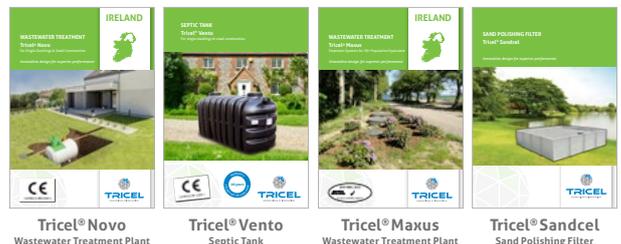
The **Irish Onsite Wastewater Association (IOWA)** formed in 2007 with the goal of improving the standard of professionalism in the on-site treatment of wastewater in Ireland.



### WARRANTY - IRELAND ONLY

- The warranty period for the Tricel TERO modules is 12 months from the date of purchase, including all internal components.
- The TERO is certified to EN12566-7 standards, and EU safety, health and environmental Requirements.

All warranties are subject to correct installation and use of the product, including maintenance as per manufacturer guidelines.



## Get a Quote

Contact us Today  
to get a free quote on  
**00 353 (0) 64 663 2421** or email us at  
**sales@tricel.ie**



# TRICEL

GENERATIONS OF INNOVATION

## Tricel Tero 1-50

# Installation & homeowner Manual

## Packaged Filter System

*Engineering a green future*



# Contents

Contents .....	2
1 Health & Safety precautions.....	4
1.1 General .....	4
1.2 Electrical/maintenance .....	5
1.3 Installation: .....	5
INSTALLATION MANUAL .....	6
2 Installation .....	6
2.1 Inspection on receipt of Tricel TERO modules .....	6
2.2 Positioning and precautions .....	6
2.3 Tricel TERO Systems: Single Zone .....	7
2.3.1 TERO module installation – step by step guide .....	7
2.4 Tricel TERO Systems: Multiple Zones .....	8
2.4.1 Indexing valve .....	8
2.4.2 Indexing valve – step by step installation procedure .....	8
HOMEOWNER MANUAL .....	10
3 Introduction: Tricel TERO.....	10
3.1 How a Tricel TERO Plant works: .....	11
3.2 Tricel TERO: Typical Layout .....	12
3.2.1 Plan view of Typical Tricel Tero Tertiary System .....	12
3.3 Tricel TERO Applications.....	12
3.3.1 Tertiary Treatment.....	12
4 Tricel TERO Range.....	14
4.1 System Specifications .....	14
4.1.1 TERO Module Treatment .....	14
4.2 System Components .....	14
4.2.1 Tricel TERO Module .....	14
4.2.2 Pipework .....	15
4.3 System Layout Drawings:.....	15
4.3.1 Tricel TERO 2 Module System .....	15
4.3.2 Tricel TERO 3 Module System .....	15
5 Transportation & Lifting .....	16
6 Installation .....	16
7 Disposal of Treated Water .....	16
8 Maintenance.....	17
8.1 Annual Service (Available from your supplier) .....	17

8.2	Regular Maintenance of Relating systems .....	18
8.2.1	Waste Water Treatment Plant.....	18
8.2.2	Pump Chamber (If applicable) .....	18
8.2.3	Control Panel .....	18
8.3	De-sludging.....	18
9	Operating Conditions.....	19
9.1	Conditions:.....	19
10	Troubleshooting .....	21
10.1	Plant Operation.....	21
10.2	Odours .....	22
11	Certification.....	23
11.1	Tricel TERO .....	23

# 1 Health & Safety precautions

This manual contains basic information on the installation, operation and maintenance of the Tricel TERO wastewater treatment system. For this reason, it is essential that these instructions are carefully read and understood before installation or commissioning by both the installation crew as well as those responsible for the operation and maintenance of the system.

This manual should be readily available at the location of the system. It is the responsibility of the homeowner to ensure that the wastewater treatment system is operated and maintained correctly and in a safe manner at all times. As safety and security are of vital importance, the following aspects are critical:

## 1.1 General

- Ensure that all the information contained in this manual is adhered to at all times.
- Treated wastewater is not suitable for human consumption. It is unhealthy for humans, pets, and wildlife to drink or come in contact with surface or ground water contaminated with sewage.
- It is important that the lid is tightly secured to prevent accidental access.
- Never enter a tank, unless qualified to do so.
- Naked flames shall not be used in the vicinity of the tank due to the danger of combustion.
- Sewage and sewage effluent can carry micro-organisms and gases harmful to human health.
- Any person carrying out work on the wastewater treatment system must be appropriately trained.
- Suitable protective clothing; including waterproof/abrasion-resistant gloves, overalls, safety footwear, eye, ear and respiratory protection, goggles (face visors are particularly effective against splashes) should be worn at all times. All protective clothing must be in good condition and be fit for its intended purpose.
- Always remove contaminated clothing and protective equipment after working with wastewater treatment plants. Wash hands and face prior to eating, drinking or smoking.
- Wastewater treatment plants contain very low levels of oxygen. Hydrogen sulphide, methane, carbon dioxide and other life-threatening gases are also present. Tanks have manholes covers to provide access to the tank only in times of cleaning and inspecting the tank from outside. The manhole covers must always be in place and secure.
- Keep vehicles and other heavy equipment away from the wastewater treatment plant and percolation area.
- Erect a safety barrier around open manholes to prevent anyone from accidentally falling down the manholes.
- Keep children away from the septic system when it is being worked on.
- Do not smoke near wastewater treatment plants. Combustible gases could be present and cause an explosion.
- Contact a plumber or other qualified person if you smell 'sewer gases'. They can identify the source and correct it immediately.
- The sewage treatment process uses many beneficial microorganisms, like bacteria, in the treatment process. However, the plant also contains harmful bacteria, viruses and disease-organisms. Liquid and solid contents of the septic system are capable of causing infectious diseases.

## 1.2 Electrical/maintenance

- Never use electrical lights, appliances or power tools in or close to water or wet ground near the wastewater treatment plant or percolation area. This can result in electrical shock or explosion.
- When working with machinery/electrical equipment, proximity of water shall be noted. Electrical equipment shall not be wet when working with it.
- There is potential danger when de-sludging and therefore this shall never be done alone.
- A wastewater treatment system that fails to fully treat sewage due to poor maintenance or overloading may allow excess nutrients (phosphorus and nitrogen) to reach nearby lakes and streams, promoting algae and plant growth. Algal blooms and abundant weeds may make lakes unpleasant for swimming, boating, and other water-based activities. This plant growth can also affect water quality for fish and wildlife habitat. As plants die and settle to the bottom, they are broken down by bacteria that use up oxygen that fish need to survive.
- It is the responsibility of the owner to ensure that the wastewater treatment plant is operated and maintained correctly at all times.
- It is advised that the owner enters into a yearly Service Agreement to ensure the correct operation of their wastewater treatment plant.

## 1.3 Installation:

- Excavation work should be planned with due regard to health and safety requirements.
- Excavated material should either be shored or battered back to a “safe” angle.
- Use appropriate lifting equipment.
- Care should be taken around grounds work machinery.
- Keep proper footing and balance at all time.

# INSTALLATION MANUAL

**NOTE:** This section of the Tricel TERO Manual is for the installer. For Home Owner information on the Tricel TERO, go to page 11.

## 2 Installation

Important

*Prior to the installation of the Tricel TERO system, it is important to carefully read these installation instructions.*

### 2.1 Inspection on receipt of Tricel TERO modules

- Tricel TERO modules should be visually inspected for damage which may have occurred during transport prior to installation. Any damage should be notified to the delivery driver and/or to your supplier. Do not attempt to carry out any unauthorised repairs, as this will invalidate the warranty on the modules.
- Once the modules have been installed, we cannot accept any claims for damage.

### 2.2 Positioning and precautions

- Only suitably qualified personnel should perform the installation of the Tricel TERO system.
- The groundwater level on the site must never rise above the base of the Tricel TERO modules.
- Suitably sized equipment will be required to excavate the hole and to lift the Tricel TERO system into place (minimum: 6-ton machine).
- The Tricel TERO system should not be installed in an area subject to flooding or excessive water runoff as no flood waters should enter the tank.
- When selecting the location of the Tricel TERO system, ensure that it is always accessible for future maintenance.
- The Tricel TERO system, if installed in the ground, should be installed at a depth greater than 800mm. The System Lid needs to be full accessible at all times for future maintenance.
- The location for each element of the system must be known and marked out prior to installation.
- The gravel base discharge area must be installed before the Tricel TERO system is installed. **Tricel is not responsible for the design and installation of the discharge area.**

## 2.3 Tricel TERO Systems: Single Zone

### 2.3.1 TERO module installation – step by step guide

Step	Description	
Site Preparation	1	The location for each element of the system must be known and marked out.
	2	Prepare excavation as per manufacturer's guidelines.
	3	As required, install a Waste Water Treatment Plant as per the manufacturer's guidelines.
	4	<p><b>Note:</b> A pump is required with the use of the TERO Tertiary treatment module.</p> <p>If WWTP does not contain a pump, install a separate pump chamber in accordance with manufacturer's guidelines.</p>
TERO Module Installation	5	<p>Level the ground and prepare a bed of 12-32mm pea gravel for the base for the installation of the TERO module, taking note of the water table and site conditions.</p> <p><b>NOTE: The TERO module must always be installed above the water table, and the lid must <u>NOT</u> be covered. Dig and back fill the base with gravel, as required to ensure the module complies with these requirements.</b></p> <p>The size of the area covered by the gravel base is determined by the Percolation Values (PVs) obtained from the following table:  <b>Table 10.1: EPA Codes of Practice</b></p>
	6	A trench, for the rising main, must be dug from the pump chamber/water treatment plant to the TERO module inlet assembly. Width and depth of the trench is to be determined based on installation depth and location of the TERO module. The rising main must be surrounded by 150mm of gravel all around. Backfill the rest of the trench with existing soil.
	7	Using the floor design of the tank as a guide, install two lifting ropes around the module, ensuring they sit flat . Lift the TERO module and position centrally on the gravel base.
	8	<p>Using the Philmac connection on the inlet assembly, connect the inlet pipework to the WwTP/pump chamber as required.</p> <p><b>NOTE: The inlet assembly should be connected to the WwTP/pump chamber in single zone systems. An indexing valve is required in multi-zone systems.</b></p>
	9	<p>Once the TERO module has been connected to the Wastewater Treatment system, backfilling around the module can be completed.</p> <p><b>NOTE: Maximum backfill height of 800mm permitted.</b></p> <p><b>NOTE: The Tricel TERO module must not be covered with soil.</b></p>

## 2.4 Tricel TERO Systems: Multiple Zones

- Tricel TERO systems with Four or more modules will consist of multiple zones. Each zone will consist of two or three modules.
- Wastewater is pumped to each zone intermittently via an indexing valve, which is positioned between the pump chamber and the TERO modules.

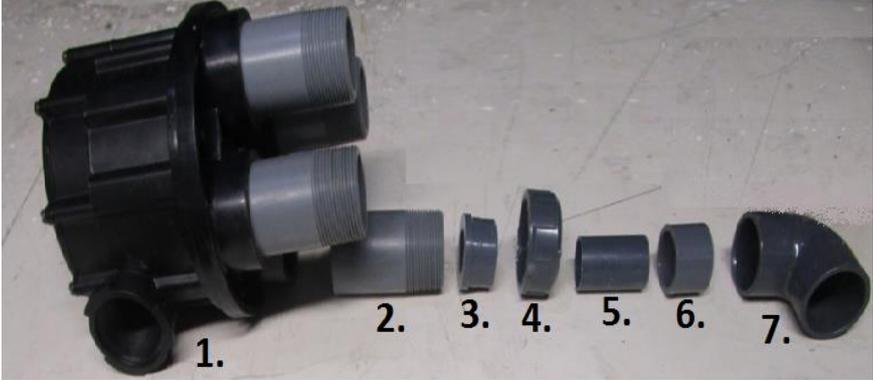
### 2.4.1 Indexing valve

- The indexing valve supplied to effectively pump each zone in the Tricel TERO system is a 4-outlet indexing valve: Used in systems of 2 - 4 zones.

Important

*For drawings of Multiple Zone Tricel TERO systems, please visit <http://ie.tricel.eu/downloads/>*

### 2.4.2 Indexing valve – step by step installation procedure

Step	Description	
1	Apply PTFE tape to threads of Philmac fitting and thread into inlet of indexing valve.	
2	<p>Assemble each of the active outlets required as shown below:</p> <ol style="list-style-type: none"> <li>1. Indexing valve</li> <li>2. Threaded pipe (supplied with valve)</li> <li>3. Union nut</li> <li>4. Union end</li> <li>5. 50mm length of 32mm pipe</li> <li>6. 40-32mm reducing bush</li> <li>7. 40mm elbow</li> </ol> <p><b>Note: The elbow (object 7. above) can be orientated to suit the installation.</b></p>	

3	<p>Push hose tails into the flexible outlet pipework and secure with hose clips.</p>	
4	<p>Using a 50mm hole saw, drill the inlet hole and the required number of outlet holes. The inlet hole/outlet holes can be positioned at alternative locations around the bottom of the distribution box to suit the site conditions.</p>	
5	<p>Place the indexing valve into the distribution box, connect the outlet pipes (to TERO modules) and inlet pipe (from the pump chamber) to the indexing valve.</p>	
6	<p>Secure distribution box riser in place using six 25mm pan screws.</p>	
7	<p>Position the indexing valve as close to the TERO modules as site conditions allow.</p>	

# HOMEOWNER MANUAL

**NOTE:** This section of the Tricel TERO Manual is for the Home Owner. For Installer information on the Tricel TERO, go to page 5.

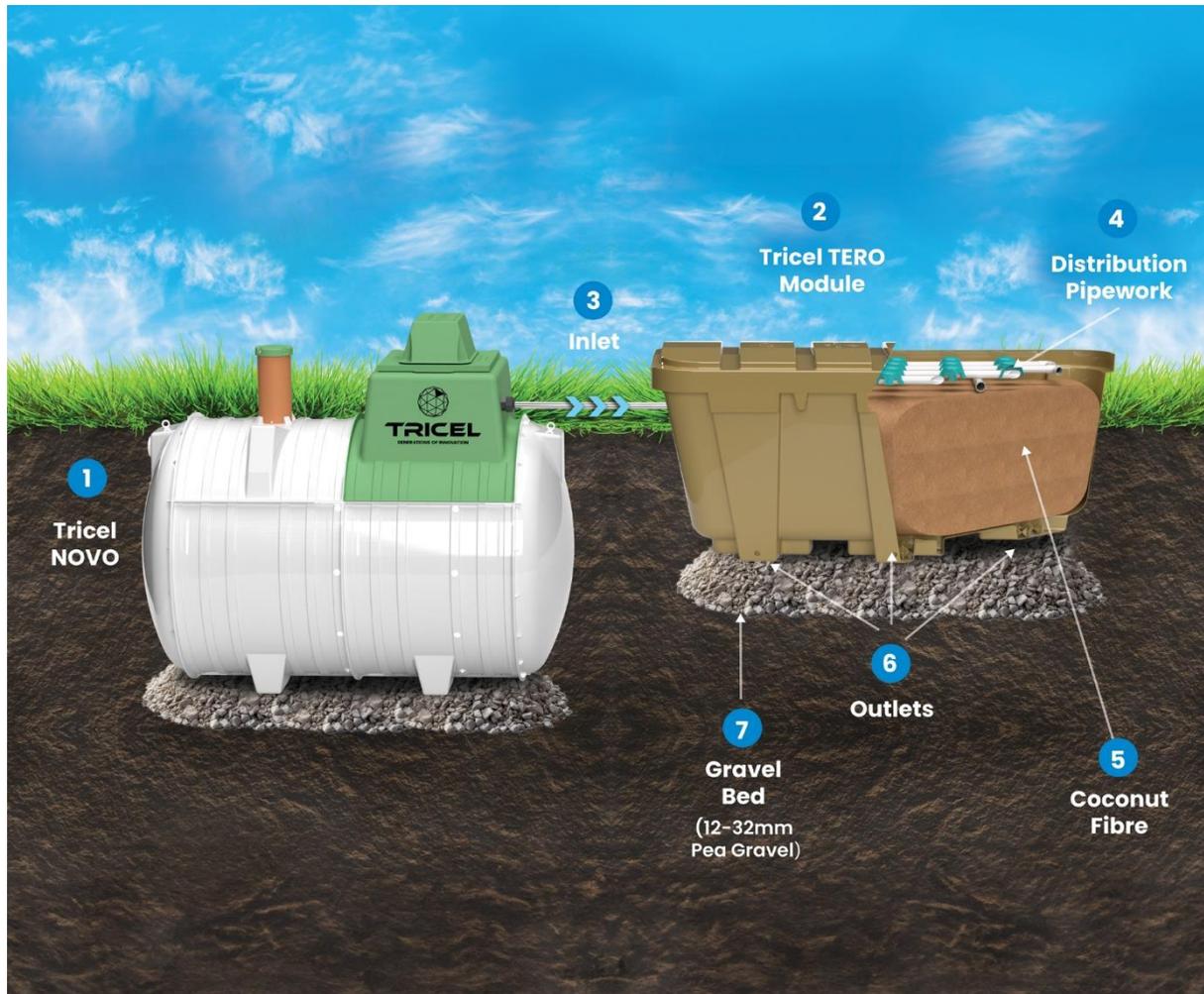
## 3 Introduction: Tricel TERO

Tricel TERO is a modular wastewater tertiary treatment system which can cater for large or small populations. It is a flexible system which can treat effluent from one-off domestic houses, to small communities and light commercial applications through the implementation of additional TERO modules.

The Tricel TERO system uses Coconut fibre to break down the effluent making this type of treatment system popular, using little to no energy. The Tricel TERO system works in conjunction with your wastewater treatment plant. The wastewater is distributed evenly over the top of the Coconut fibre, using a specially designed pipe network, to ensure optimum performance. Through a combination of biological, chemical and physical processes the Coconut fibre treats the wastewater as it filters through. The Tricel TERO is designed such that maintenance requirements are minimised while at the same time effectively treating effluent.

The Tricel TERO is a tertiary treatment as part of a complete Wastewater Treatment system.

### 3.1 How a Tricel TERO Plant works:



Typical Tricel TERO System

**Stage 1**

Liquid effluent is pumped, by a submersible pump, intermittently on-demand to the TERO module.

**Stage 2**

Effluent is distributed evenly onto the Coconut fibre via a distribution grid at the top of each TERO module.

**Stage 3**

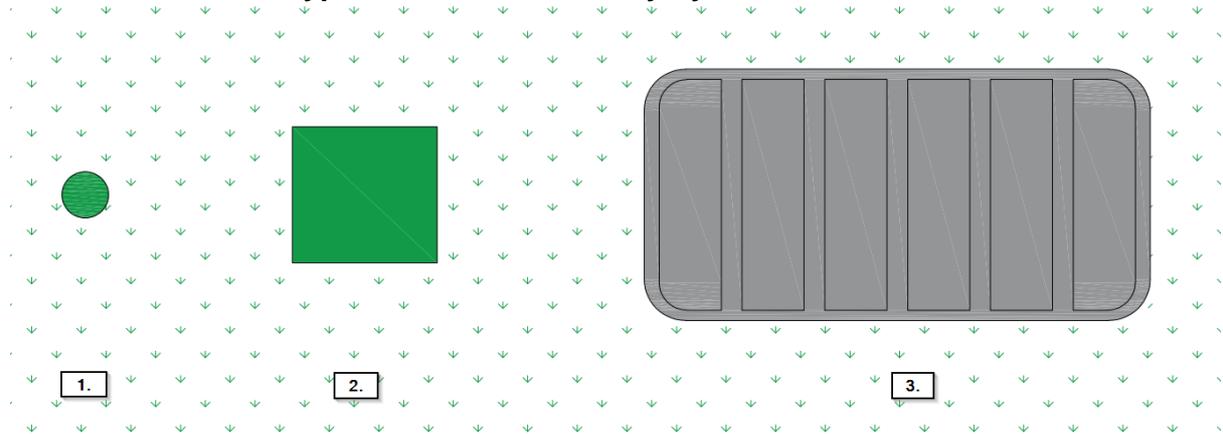
Liquid effluent undergoes treatment as it filters through the Coconut fibre in the TERO modules.

**Stage 5**

Treated wastewater flows from the outlet and is discharged to a percolation area/polishing filter.

## 3.2 Tricel TERO: Typical Layout

### 3.2.1 Plan view of Typical Tricel Tero Tertiary System



1. Desludge Cover – Access to primary chamber for desludging
2. Manhole Cover – Outlet from waste water treatment plant\*
3. Tricel TERO Module – Number of modules depend on loadings

\*Some Wastewater Treatment systems may only have one manhole cover.

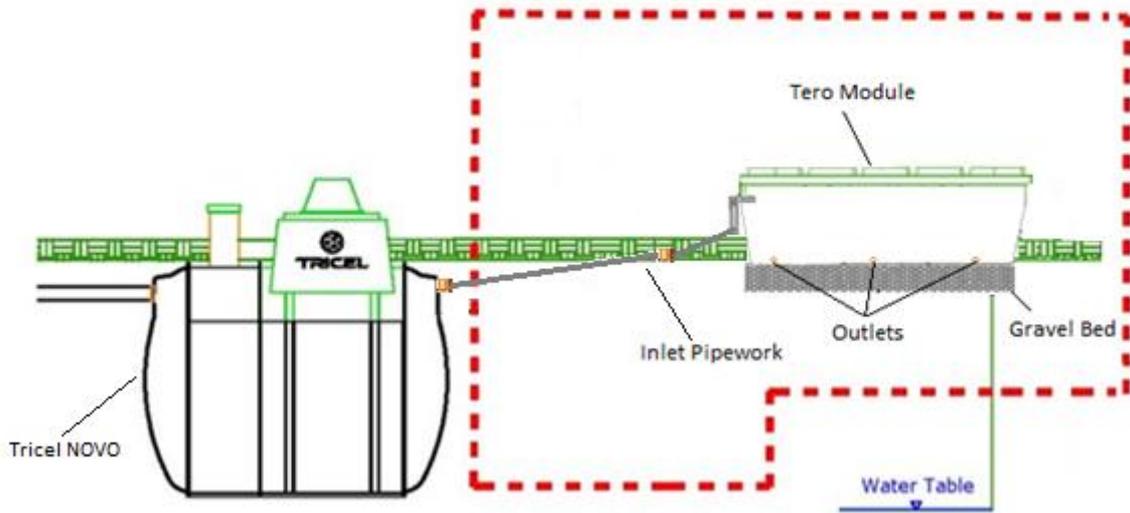
## 3.3 Tricel TERO Applications

Tricel TERO modules are used as tertiary treatment applications within the Wastewater Treatment system.

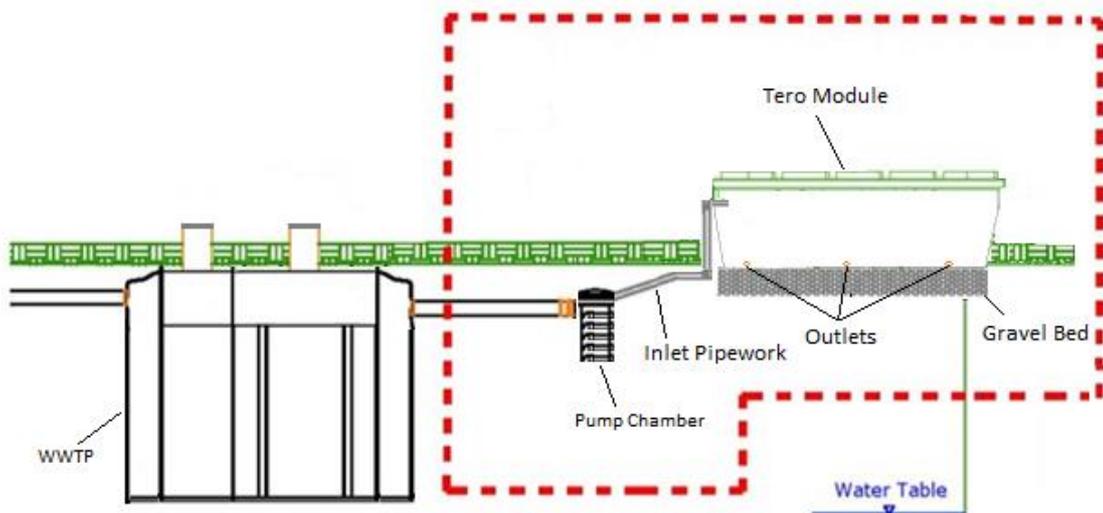
### 3.3.1 Tertiary Treatment

- Environmentally sensitive sites or sites that are restricted in terms of space, often require a higher level of treatment. This is achieved by passing the secondary treated wastewater through the Tricel TERO modules, within which the wastewater is treated to a higher treatment level this is known as tertiary treatment. Tertiary treatment will achieve very high-level pathogen and nutrient reduction.

### Tricel Tero Tertiary Treatment System (Complete Tricel Treatment System)



### Tricel Tero Tertiary Treatment System (Third Party WWTP and Pump Chamber)



## 4 Tricel TERO Range

### 4.1 System Specifications

Tricel TERO is a flexible system for treating wastewater. Tricel TERO systems are implemented in zones and each zone contains multiple modules, as outlined in the table below. In systems comprising of multiple zones, the wastewater is pumped to each zone sequentially ensuring equal dispersion and optimum treatment.

#### 4.1.1 TERO Module Treatment

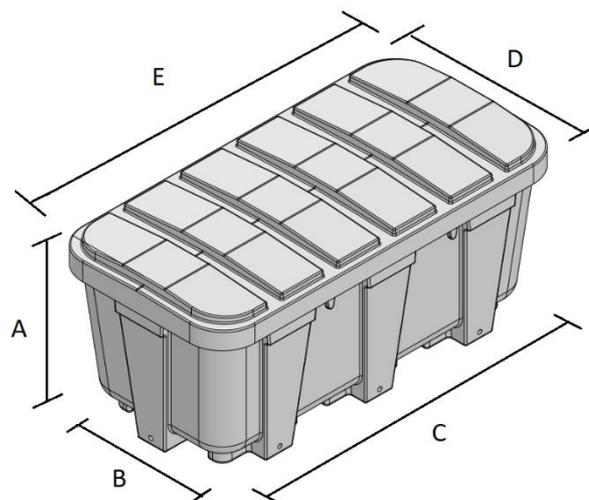
Tricel TERO Modules		1	2	3	4	5	6	7	8	9
Max. Population Equivalent	PE	6	12	18	24	30	36	42	48	54
No. of Zones		1	1	1	2	2	2	3	4	3
Design Flow Rate (max)	L/day	900	1800	2700	3600	4500	5400	6300	7200	8100
BOD Load (max)	Kg/day	0.135	0.27	0.405	0.54	0.675	0.81	0.945	1.08	1.215
Overall Length	m	2.44	2.44	2.44	4.88	4.88	4.88	4.88	4.88	4.88
Overall Width	m	1.22	2.44	3.66	2.44	3.66	3.66	4.88	4.88	6.1
Overall Height	m	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07
Weight *	Kg	515	1,031	1,546	2,062	2,577	3,093	3,608	4,124	4,639

\*Weight may vary due to moisture content in Coconut Fibre

### 4.2 System Components

#### 4.2.1 Tricel TERO Module

Dimension	Unit	Value
A	mm	1078
B	mm	1012
C	mm	2232
D	mm	1224
E	mm	2444
Height of Coconut fibre in Module	mm	780
Vol. of Coconut fibre in Module	M <sup>3</sup>	1.75



#### Warning

*It is imperative that the treatment system is not overloaded hydraulically or organically. The number of modules that are required to treat the wastewater has been designed in accordance with the EPA CoP. If the owner feels that the modules are being overloaded, please contact Tricel, as it is possible to add modules to accommodate any extra loadings.*

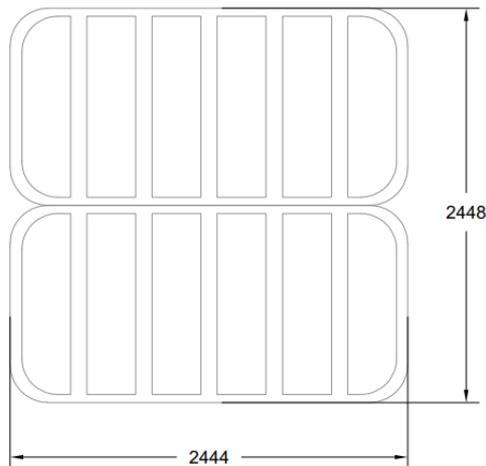
#### 4.2.2 Pipework

The pipework supplied with the Tricel TERO modules used for the dispersion of wastewater on top of the Coconut fibre inside the TERO modules, is in accordance with BS 3505: 1986\*

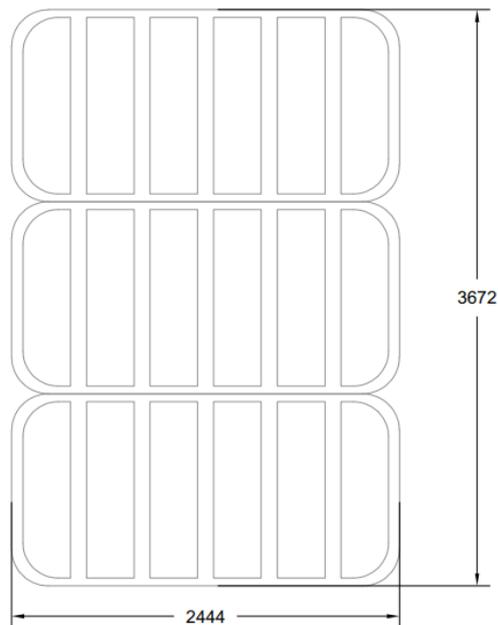
\*Specification for unplasticized polyvinyl chloride (PVC-U) pressure pipes for cold potable water.

### 4.3 System Layout Drawings:

#### 4.3.1 Tricel TERO 2 Module System



#### 4.3.2 Tricel TERO 3 Module System



**Important**

*If you require drawings for larger Tricel TERO systems, please visit <http://ie.tricel.eu/downloads/>*

## 5 Transportation & Lifting

- Tanks must be held down during transportation using nylon straps, do not use cables or chains to secure the modules.
- Do not over tighten straps that can result in deformation of the module shell.
- Do not drop or roll modules from the truck.
- Move modules only by lifting and setting, do not drag or roll.
- Always set the module(s) on flat, smooth ground clear of debris etc.
- Modules are best lifted by a machine and webbing lifting straps – do not use chains or wire ropes in contact with the modules.
- Care is needed to control the lift to ensure the modules are not damaged.
- Always lift modules using the design of the floor as a guide for securing straps.

## 6 Installation

### IMPORTANT

The installation of a Tricel TERO system must only be carried out by a Tricel authorised distributor or a Tricel service technician.

## 7 Disposal of Treated Water

The treated wastewater from the Tricel TERO system should be disposed of as per guidelines from the planning regulations issued by your local authority.

## 8 Maintenance

Warning

*When working on the Tricel TERO system during routine maintenance & servicing, please follow all national health and safety regulations. Sewage and sewage effluent can carry micro-organisms and gases harmful to human health. Any person carrying out maintenance on the system must be appropriately trained. Suitable protection equipment including gloves, goggles etc., should be worn at all times. Always remove contaminated clothing and protective equipment after completion of work. Wash hands and face prior to eating, drinking or smoking.*

The Tricel TERO system is designed with the best of quality and performance in mind to meet your specific wastewater treatment requirements and to provide years of trouble-free use. However, a certain amount of system maintenance is required on an on-going basis to ensure that the system is working correctly.

**This is the responsibility of the homeowner.**

Failure to maintain your system could also result in reduced effectiveness and increased maintenance and/or replacement costs in the long-term.

### 8.1 Annual Service (Available from your supplier)

- The Tricel TERO system will require a full service (available from your supplier) once a year to guarantee the efficiency of the system is maintained. Service personnel must be accommodated with clear access to the system.
- During routine servicing, the following items are checked if applicable:

Checks	Procedures
<b>The general condition of the pump chamber supplying the TERO module is good.</b>	The vents in the pump chamber are cleared.
<b>The distribution pipe network inside the module is inspected.</b>	The perforation holes are cleared of any blockages. Shield caps are in place.
<b>Condition of Coconut Fibre is inspected</b>	Correct level of media present. Saturation level checked.
<b>The system is inspected for any obvious non-wastewater infiltration into any compartment.</b>	
<b>General appearance and condition of the treatment system and the surrounding ground area is good.</b>	

## 8.2 Regular Maintenance of Relating systems

### 8.2.1 Waste Water Treatment Plant

- The waste water treatment plant should be inspected a minimum of once a year and de-sludged when required. The sludge level should never be more than 50% of the depth of the liquid.
- The vent around the base of the blower housing guarantees a fresh supply of air to the air blower. All vents should be checked to make sure they are not blocked or obscured.
- The vent under the de-sludging cover allows gas to escape and stops the tank from becoming pressurised.
- Ensure the air blower is working by listening for a gentle hum when standing beside the plant.
- The inlet and outlet should be inspected and rodded to remove any blockages if necessary.
- Ensure that no storm or surface water enters the system.
- The wastewater treatment plant should be serviced once a year or as per the manufacturer's instructions.

### 8.2.2 Pump Chamber (If applicable)

The pump chamber should be inspected annually and the following checks and procedures should be followed:

- Remove the manhole cover and de-sludge tank if necessary.
- Turn up the high-level alarm float switch and check that the alarm light flashes in the control panel.
- Clean the high-level alarm float switch if necessary.
- Ensure that the high-level alarm float switch is positioned correctly to ensure correct operation.
- Check the position of the pump to ensure that the control float has free movement within the pump chamber.

### 8.2.3 Control Panel

Depending on the Waste water treatment plant used with the Tricel TERO, it is possible that there will be a control panel contained within the WWTP. Regular maintenance of the control panel is recommended. Refer to manufacturer's guide for servicing requirements and procedures. Respond to alarm conditions promptly.

## 8.3 De-sludging

To ensure that the Tricel TERO system performs effectively, the waste water treatment plant must receive regularly maintenance.

- The de-sludging must be performed by qualified personnel. De-sludging is done with a vacuum tanker (we recommend the use of a licensed company).
- Please remove all floating and settled sludge from the primary chamber of the wastewater treatment plant during de-sludging.

## 9 Operating Conditions

### Warning

***Before installing/operating the Tricel TERO system, please read this manual in its entirety, paying special attention to the section entitled 'Health and Safety Precautions'. Normal health and safety precautions should be adhered to at all times, as well as the appropriate procedures to avoid the occurrence of accidents.***

The manufacturer's installation, operation and maintenance instructions outlined in this manual must be followed at all times to ensure the system operates as designed. Any variations to these guidelines could result in the unit not performing to its full potential and the discharge may not meet the required standards. The property owner has a legal responsibility to ensure that the system does not cause pollution, a health hazard or nuisance.

### 9.1 Conditions:

- De-sludging is a critical part of the successful operation of the Tricel TERO system and is the responsibility of the customer. Only competent and approved personnel should carry out de-sludging. De-sludging must be carried out when required as specified, and the system should be inspected regularly to check the depth of sludge in the primary chamber. If de-sludging is required it should be done as soon as possible.
- The Tricel TERO system is one part of the overall wastewater treatment system, which includes many components (plumbing, ventilation, plant and polishing filter). Each component has to function correctly for the overall system to work which is the responsibility of the homeowner.
- If the plant is not installed correctly, flooding, overloading, electrical shock or floatation may occur. We are not responsible for incorrectly installed plants.
- Soakaways, drains and the emptying of primary chamber remains the responsibility of the client. Damage to the installation due to the influx of surface water or the backing up of soak ways or drains is not covered by the manufacturer.

To ensure the continuance of the Tricel TERO system's performance the user has to take certain precautions including the following:

- The design loading of the system should not be exceeded
- High volume discharges, such as those from swimming pools and Jacuzzis must never enter the system.
- Surface water must not enter the system.
- Do not allow large quantities of chemicals to enter the system, including but not limited to:
  - Detergent
  - Water softener
  - Disinfectants
  - Strong acids and alkalis, or photographic chemicals
  - Oil or Grease
  - Petrol or Diesel
  - Pesticides
- Acceptable in normal conditions and usage. Excess amounts of biological detergent can affect the biomass development. If you have to use an unusual amount, it may be a good idea to spread it over a few days.
- In applications that produce large volumes of grease (e.g. commercial kitchens) it is advised that a suitably sized grease trap is installed and maintained effectively to ensure the correct operation of the

Tricel TERO system. Fats or grease present in the system will greatly reduce the operating efficiency of the system and will greatly reduce the life expectancy of the Coconut fibre.

- Generally speaking, all common household cleaning fluids are acceptable, provided they are used in accordance with the maker's instructions and stipulated concentrations.
- Do not allow any of the following to enter the Tricel Tero system:
  - Large quantities of milk, alcohol or food
  - Large quantities of bleaches or cleaners
  - Baby wipes, cosmetic and cleaning wipes
  - Sanitary towels
  - Tampons
  - Kitchen paper
  - Nappies
  - Medication
- Service personnel must be accommodated with clear access to the system.
- If others size the system, we will supply to these specifications. In this case, the responsibility lies with others in relation to the maximum flow/litres per day, the system capacity and retention times. Similarly, if we size the system and a greater load is placed on the system by the addition of extra houses, bedrooms, schools, crèche's etc., or by other means, we are not responsible for the system in terms of overloading or quality of effluent as the retention times may be compromised.
- The modules are not suitable for vehicular traffic. We also recommend fencing off the area to prevent livestock herds from accessing the system.
- There must be no load placed on the lids of the TERO module and the lid must not be covered.
- There must be no vegetation planted in the ground adjacent to the TERO module.
- In the event that a non-Tricel approved installer is installing the system, please ensure that the installer has the required skills and knowledge to ensure that the system is installed correctly.

# 10 Troubleshooting

## 10.1 Plant Operation

Symptom	Possible causes	Solution
<b>Pump operates but delivers no water to TERO</b>	Low Line voltage or wired incorrectly	An electrician should check the power to the plant.
	Something caught in impellers	Clean out impellers or replace pump.  <b>WARNING: Ensure pump is disconnected from the main before you attempt to unclog it.</b>
	Delivery hose blocked	Find blockage and remove or replace damaged hose.
	Other pump malfunction	Pump must be checked by a qualified person.
<b>Module becomes flooded</b>	Discharge outlets blocked	Find blockage and remove or replace damaged hose/pipe.
	Storm water flooding	Redirect storm water drains. Storm water must never enter the plant.
	Float from the pump is stuck	Ensure the float on the pump is set correctly and can move freely.
	Pump not working	Check pump is functioning properly as above.

## 10.2 Odours

When the Tricel Tero system is correctly installed and operated there should be no strong odour in the area adjacent to the system. The presence of a strong odour would indicate that the plant is not working effectively.

**NOTE:** Before taking any corrective action, always positively identify the real source of the odour. Check if the odour is coming from another outside source such as a storm drain. All wastewater treatment plants vent gases back through soil pipe and out roof vents. Improperly installed roof vents can cause odour problems. Traps in drains prevent odours from entering the home. To function they must contain water and be sealed correctly.

Odour Locations	Cause	Solution
<b>Strong effluent odour directly outside the house or inside the house</b>	Pipe connections to toilets/drains not connected correctly	Check that the traps/U - bends in the drains are fitted and the joints sealed.
	Air vent on pipe work not installed correctly.	Ensure all effluent pipes are vented correctly. Vents are normally fitted to all pipes.
	Pipe work is damaged, blocked or not installed correctly	Inspect pipe work to ensure it is undamaged and clear of obstructions or sagging.
	Septic tank effluent filter blocked (located at septic tank outlet).	Clean filter with hose.
<b>Strong effluent odour directly over the system</b>	Pipe work to or from the septic tank is blocked.	Check the level of wastewater in the tank. Ensure the pipes are not blocked and are installed correctly to the tank.
	Chemical kill of bacteria.	Empty the tanks and fill with fresh water
	No oxygen entering the tank.	Clear any blockages in the vents
	Too much grease entering the plant.	Install/empty grease trap.
	Coconut fibre level/quantity inside the modules are low.	Arrange a replacement of the Coconut fibre.

In accordance with our normal policy of product development, this specification is subject to change without notice.

# 11 Certification

## 11.1 Tricel TERO

Tricel TERO Modules tested to EN12566 Part 7, can be used in conjunction with a Wastewater Treatment Plant tested to EN12566-3 with 98.5% hydraulic efficiency.



### Certificate

Nr. 438.01C04

#### Coconut Fibre Tero System

Tertiary treatment unit

**TRICEL (Killarney) Unlimited Company**  
Ballyspillane Ind. Est., Killarney, Co. Kerry, Ireland

**EN 12566-7:2013, Annex A**

Small wastewater treatment systems for up to 50 PT – Part 7:  
Prefabricated tertiary treatment units

Only valid in combination with test report PIA2023-T7-438S23.  
This certificate replaces certificate no. 438.01C03.



#### Evaluation according to EN 12566-7, Annex A

Organic daily load (influent) 0.01 kg BOD<sub>5</sub>/d  
Hydraulic daily load 0.90 m<sup>3</sup>/d

Tank material PE

Treatment efficiency	Efficiency	Effluent
COD	- 67.6 %	54 mg/l
BOD <sub>5</sub>	37.8 %	5 mg/l
TN <sub>b</sub> *	18.2 %	24.0 mg/l
NH <sub>4</sub> -N*	95.7 %	0.2 mg/l
SS	64.4 %	4 mg/l

Electrical consumption (Nominal) 0.2 kWh/d  
Number of desludging (complete test) 0  
Number of maintenance operations during the test (without start-up phase) 0

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

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.  
The results relate only to the tested object.

PIA – Sustainable Certification

geprüft – tested – teste

January 2024, Dipl.-Ing. Gabriel Schatzki  
Head of department "Wastewater Treatment"



Notified Body  
No.: 1739



Certified according to  
ISO 9001:2015



# Attestation

Nr. 438.01A01

## Coconut Fibre Tero System

Tertiary treatment unit

**TRICEL (Killarney) Unlimited Company**  
Ballyspillane Ind. Est., Killarney, Co. Kerry, Ireland



Over a test period of 6 weeks (4 weeks nominal load, 2 weeks 50 % of nominal load), flow-proportional 24-hour composite samples were taken weekly (influent and effluent). The Tero was fed from a pump shaft which was connected to a small wastewater treatment plant (gravity flow mode). Dosing to the module took place in 20 litre portions and a flow of approx. 1 litre/s. Microbiological samples (E. coli) were taken as grab samples.

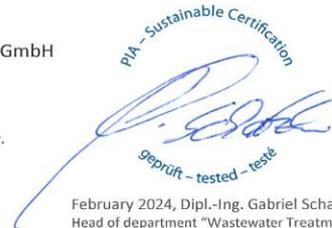
### Performance details

Organic daily load (influent, nominal)	0.06 kg BOD <sub>5</sub> /d			
Hydraulic daily load (nominal)	0.9 m <sup>3</sup> /d			
Treatment efficiency (nominal)		Efficiency (nominal / underload)	Effluent (nominal / underload)	
		COD	-39.0 % / -133.8 %	73 mg/l / 78 mg/l
		BOD <sub>5</sub>	59.9 % / 39.3 %	6 mg/l / 5 mg/l
		TN <sub>b</sub> *	18.2 % / -	25.8 mg/l / -
		NH <sub>4</sub> -N*	95.5 % / -	0.2 mg/l / -
		SS	78.4 % / 73.6 %	4 mg/l / 3mg/l
		E.Coli	99.3 % / 97.5 %	643 / 591 CFU/100 ml
Electrical consumption (nominal)	0.15 kWh/d			
Number of desludging (complete test – 6 weeks)	0			
Number of maintenance operations during the test	0			

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

Tested by:  
PIA – Prüfinstitut für Abwassertechnik GmbH  
Hergenrather Weg 30  
52074 Aachen, Germany

This document is for information purposes only.  
The results relate only to the tested object.



February 2024, Dipl.-Ing. Gabriel Schatzki  
Head of department "Wastewater Treatment"



Notified Body  
No.: 1739



Certified according to  
ISO 9001:2015

<b>Tero Module System</b>	<b>This Unit is a (mark "X")</b>
<b>One Module</b>	
<b>Two Module</b>	
<b>Three Module</b>	
<b>Four Module</b>	
<b>Five Module</b>	
<b>Six Module</b>	
<b>Seven Module</b>	
<b>Eight Module</b>	
<b>Nine Module</b>	



**TRICEL**

GENERATIONS OF INNOVATION

Tricel (**Killarney**) Unlimited Company Trading as Tricel  
 Ballyspillane Ind. Est. Killarney, Co. Kerry, Ireland  
**Tel:** +353 (0)64 663 2421 | **Email:** sales@tricel.ie | www.tricel.ie

In accordance with Tricel's normal policy of product development these specifications are subject to change without notice.



# Attestation

Nr. 438.01A01

## Coconut Fibre Tero System

Tertiary treatment unit

**TRICEL (Killarney) Unlimited Company**

Ballyspillane Ind. Est., Killarney, Co. Kerry, Ireland

Over a test period of 6 weeks (4 weeks nominal load, 2 weeks 50 % of nominal load), flow-proportional 24-hour composite samples were taken weekly (influent and effluent). The Tero was fed from a pump shaft which was connected to a small wastewater treatment plant (gravity flow mode). Dosing to the module took place in 20 litre portions and a flow of approx. 1 litre/s. Microbiological samples (E. coli) were taken as grab samples.



### Performance details

Organic daily load (influent, nominal) 0.06 kg BOD<sub>5</sub>/d

Hydraulic daily load (nominal) 0.9 m<sup>3</sup>/d

Treatment efficiency (nominal)	Efficiency (nominal / underload)	Effluent (nominal / underload)
COD	-39.0 % / -133.8 %	73 mg/l / 78 mg/l
BOD <sub>5</sub>	59.9 % / 39.3 %	6 mg/l / 5 mg/l
TN <sub>b</sub> *	18.2 % / -	25.8 mg/l / -
NH <sub>4</sub> -N*	95.5 % / -	0.2 mg/l / -
SS	78.4 % / 73.6 %	4 mg/l / 3mg/l
E.Coli	99.3 % / 97.5 %	643 / 591 CFU/100 ml

Electrical consumption (nominal) 0.15 kWh/d

Number of desludging (complete test – 6 weeks) 0

Number of maintenance operations during the test 0

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

Tested by:

PIA – Prüfinstitut für Abwassertechnik GmbH

Hergenrather Weg 30

52074 Aachen, Germany

This document is for information purposes only.  
The results relate only to the tested object.

PIA – Sustainable Certification

geprüft – tested – testé

February 2024, Dipl.-Ing. Gabriel Schatzki  
Head of department “Wastewater Treatment”



Notified Body  
No.: 1739



Certified according to  
ISO 9001:2015