

6655/RG/AJ

By Email Only

Ms Helen Griffiths
Development Planning Advisor
Natural Resources Wales
Rivers House
St Mellons Business Park
Fortran Road
St Mellons
Cardiff
CF3 0EY

1st March 2019

Dear Ms Griffiths

Statutory Pre Application Consultation Development, Bike Park Wales, Gethin Woodland Centre, Abercanaid, Merthyr Tydfil, CF48 1YZ
Your Reference: CAS-75500-Y9Y7

We are the appointed Consulting Civil and Structural Engineers working for Bike Park Wales with respect to the above development. The project Architects, The Urbanists have forwarded to us your letter dated 4th February 2019 addressed to them, we respond to foul drainage matters raised as follows:-

Requirement 1

We would advise that the Catering Unit referenced has not been developed, further the bike hire and associated washing facilities were constructed as part of the initial development in 2013. Further we advise that the office has one toilet facility and two number taps and has replaced a previous security cabin which was again constructed as part of the initial 2013 development, the security cabin having an identical single toilet and two tap facility. Therefore, the load to the existing packaged treatment plant and receiving watercourse (Nant Graig) has not been currently increased.

We have now amended the design such that the new toilet and shower block discharges to the proposed foul water treatment facility.

We attach calculations to demonstrate adequacy of existing packaged treatment plant.

Requirement 2

We confirm the breakdown of foul effluent proposed for discharge to the new foul water treatment facility as below:-

Cont'd../2

- 6 No Cabins/Lodges
- 2 No Camping Pods converted to Toilets
- 4 No Shepherd Huts
- 7 No Motorhomes

We advise that the 30 number camping/land pods do not have any water or drainage connection and will utilise the proposed shower and toilet block referenced in requirement 1, which also discharges to the new foul water treatment facility.

Considering that currently no local specific on site percolation testing has been undertaken, in accordance with Approved Document H, Part H1 of the Building Regulations (for use in Wales), we would propose one of the following options for the proposed foul water treatment facility. The options set out below are preferenced in accordance with the hierarchy as set out in Part H1:

- Option (C) (i) Either a septic tank or packaged treatment plant with a secondary form of treatment comprising a drainage field designed and constructed in accordance with BS 6297:2007 + A1:2008. This option is subject to the results of specific on site percolation testing. Preferred option subject to appropriate consents to be obtained from Natural Resources Wales.
- Option (C) (ii) Either a septic tank or packaged treatment plant with an outfall to a watercourse, effluent treated to 20 (BOD)/30 (Suspended Solids) 20 (NH3) quality. This option is to be approved and consented by Natural Resources Wales.
- Option (D) A cesspool with a capacity of 45 days foul effluent inflow. This option is to be approved and consented by Natural Resource Wales.

We attach our updated drawing reference 6655-BHP-22-XX-DR-S-(60) PO1 revision C, which has been updated in accordance with the above, together with supporting calculations.

Requirement 3

We confirm that the final design of the foul water treatment facility will include a provision to counter fluctuating loads.

Requirement 4

We thank you for drawing to our attention the requirement for a foul water provision for the area proposed for motorhomes. Following discussions with our Client we have included for this provision within our calculations.

Other Foul Drainage Matters

We confirm that our design team will engage with the NRW Permitting Team at the earliest opportunity, at a stage when the design is sufficiently developed in order to obtain both a new permit for the proposed foul water treatment facility and an appropriate variation to any existing permit with respect to the existing packaged treatment plant.

We note your comments with respect to our Drainage Strategy Report currently submitted in support of the pre-application consultation and advise that it will be revised to reflect the above and our revised drawing with respect to disposal of foul drainage effluent.

Should you require any further information or wish to discuss the above in more detail please do not hesitate to contact the writer.

Yours sincerely

A handwritten signature in black ink, appearing to be 'R Green', followed by a period.

R Green

for

BINGHAM HALL PARTNERSHIP LIMITED

PROJECT 6655

BIKE PARK WALES. DEVELOPMENT

Bingham Hall
PARTNERSHIP LTD

Sheet of
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Calculations by
WJ

Checked by
WJ

Date
FEBRUARY 2019

Calculations

Output

PROPOSED FOUL DRAINAGE REQUIREMENTS.

PHILOSOPHY

IT IS PROPOSED TO DEVELOP THE EXISTING FACILITY AT BIKE PARK WALES TO INCLUDE A NEW SHOWER/TOILET BLOCK 30 LAND/CAMPING PODS, 6 LODGES, 4 SHEPHERDS HUTS AND A MOTOHOME AREA FOR 7 NUMBER VEHICLES.

THE EXISTING FACILITY IS SERVED BY A PACKAGED TREATMENT PLANT (PTP) WITH ITS OUTFLOW DISCHARGING TO THE NANT GRAIG WATERCOURSE WITH DISCHARGE EFFLUENT QUALITY OF 20 (BOD) / 30 (SUSPENDED SOLIDS) / 20 (NH3).

IT IS PROPOSED TO CONNECT THE NEW SHOWER/TOILET BLOCK TOGETHER WITH THE 6 LODGES, 4 SHEPHERDS AND MOTOHOME AREA TO A NEW FOUL WATER TREATMENT FACILITY. TWO NUMBER TOILET PODS SERVING THE HUT PROVISION WILL ALSO BE CONNECTED TO THIS FACILITY.

PARAMETERS.

BRITISH WATER FLOWS & LOADS 4.

ANTICIPATED USAGE CONFIRMED BY CLIENT AND PRESENTED ON HOLLOWAY PARTNERSHIP SPREADSHEET, COPY ATTACHED.

AS BUILT DATA SUPPLIED BY CLIENT (WATLING HOPE DATA DATED 12TH MARCH 2013).

ANUA TREATMENT PLANT TRADE LITERATURE

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BIKE PARK WALES DEVELOPMENT.

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FOUL WATER LOAD CALCULATIONS.21 NUMBER CAMPING PODS.TOILET USE :- OCCUPANCY 4 NUMBER.

USE/DAY 2 NUMBER.

TOTAL USES = $21 \times 4 \times 2 = 168$ USES

ASSUME SPLIT BETWEEN NEW

AMENITY BLOCK AND TOILET PODS
50% / 50%

AMENITY BLOCK 84 USES

TOILET PODS 84 USES.

SHOWER USE :- OCCUPANCY 4 NUMBER

USE/DAY 2 NUMBER

TOTAL USES = $21 \times 4 \times 2 = 168$ USES.

ALL TO NEW AMENITY BLOCK

AMENITY BLOCK 168 USES

9 NUMBER LAND PODSTOILET USE :- OCCUPANCY 4 NUMBER

USE/DAY 2 NUMBER.

TOTAL USES = $9 \times 4 \times 2 = 72$ USES.

ASSUME SPLIT BETWEEN NEW

AMENITY BLOCK AND TOILET PODS
50% / 50%

AMENITY BLOCK 36 USES

TOILET PODS 36 USES.

SHOWER USE :- OCCUPANCY 4 NUMBER

USE/DAY 2 NUMBER

TOTAL USES = $9 \times 4 \times 2 = 72$ USES

ALL TO NEW AMENITY BLOCK

4 NUMBER SHEPHERDS HUTSASSUME 150 LITRES PER DAY $\times 4 = 600$ l/d6 NUMBER CABINS (HOLIDAY CAMP CHALET).ASSUME 227 LITRES PER DAY $\times 6 = 1362$ l/d

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BIKE PARK WALES DEVELOPMENT.

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7 NUMBER MOTOR HOMES.

ASSUME 100 LITRES PER DAY $\times 7 = 700 \text{ l/d}$

EXISTING BUILDING.

TOILET USE : - 4 NUMBER TOILET FACILITIES
OCCUPANCY 1 NUMBER
USE/DAY 100 (TOTAL)
ALL TO EXISTING PTP.

SHOWER USE : - 4 NUMBER SHOWER FACILITIES
OCCUPANCY 1 NUMBER
USE/DAY 20 (TOTAL)
ALL TO EXISTING PTP.

NEW TOILET/SHOWER BLOCK (AMENITY)

TOILET USE : - 9 NUMBER TOILET FACILITIES.
OCCUPANCY 1 NUMBER
USE/DAY 100 (TOTAL)
ALL TO EXISTING PTP.

SHOWER USE : - 9 NUMBER SHOWER FACILITIES
OCCUPANCY 1 NUMBER
USE/DAY 50 (TOTAL)
ALL TO EXISTING PTP.

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BIKE PARK WALES DEVELOPMENT

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PROPOSED FOUL WATER TREATMENT PLANT LOAD

21 CAMPING PODS	168 TOILET USES	1
	SAY 126 @ 10 l/USE	1 260
	42 @ 5 l/USE	210
	168 SHOWER USES	
	@ 40 l/USE	6 720
9 LAND PODS	72 TOILET USES	
	SAY 54 @ 10 l/USE	540
	18 @ 5 l/USE	90
	72 SHOWER USES	
	@ 40 l/USE	2 880
4 NUMBER SHEPHERDS HUTS	@ 150 l/d	600
6 NUMBER CABINS	@ 227 l/d	1 362
NEW SHOWER BLOCK	100 TOILET USES	
	SAY 75 @ 10 l/USE	750
	25 @ 5 l/USE	125
7 NUMBER MOTOR HOMES	@ 100 l/d	700
		<u>15 237 l/d</u>

PROPOSED FOUL WATER TREATMENT FACILITY
TOTAL LOAD $\approx 16 \text{ m}^3$ SAY.

CESSPOOL CAPACITY AT 45 DAYS INFLOW
= $15.237 \times 45 = 685.7 \text{ m}^3$

PROPOSE
TREATMENT
FACILITY LOAD
 16 m^3

CESSPOOL
CAPACITY
 685.7 m^3
(IF REQUIRED)

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BIKE PARK WALES DEVELOPMENT.

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EXISTING FOUL WATER PACKAGED TREATMENT PLANT LOAD.

FROM AS BUILT INFORMATION.

PLANT DESIGNED FOR CAFETERIA & TOILET FACILITIES AS FOLLOWS.

CAFETERIA MAX 200 CUSTOMERS/DAY

13 STAFF

TOILETS 130 VISITORS / DAY.

LOAD CALCULATION

CAFETERIA	200 x 15	=	3000
STAFF	13 x 180	=	2340
TOILETS	98 x 10	=	980
	32 x 5	=	160
			<u>6480 l/d.</u>

MAKING REFERENCE TO THE CLIENT/HOLLOWAY PARTNERSHIP SPREADSHEET.

100 TOILET USES

SAY	75 @ 10 l/USE	750
	25 @ 5 l/USE	125

50 SHOWER USES @ 40 l/USE	<u>2000</u>
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<u>2875 l/day</u>

EXISTING FOUL WATER TREATMENT FACILITY
TOTAL LOAD = 9355 l/d OR 9.5 m³PROPOSED
TOTAL
LOAD
9.5 m³/DAYNOTE

THERE MAY EXIST AN ELEMENT OF DUPLICATION OF TOILET USAGE (ACCOUNTED IN BOTH THE AS BUILT & HOLLOWAY SPREADSHEET).

ANUA
2080 CG
PLANT AS
BUILTFROM AS BUILT INFORMATION ANUA 2080 CG PACKAGE SEWAGE TREATMENT PLANT EXISTS WITH A MANUFACTURERS CONFIRMED CAPACITY OF 16 m³/DAY MAXIMUM FLOW.EXISTING
PLANT
CAPACITY 16

Shower water use calculations

	Number of	Showers each	Total showers	Peak flow (l/min)	Occ	Sh/day	Total sh/day	litres/day
Existing	1	4	4	36	1	20	20	900
Amenity	1	9	9	81	1	50	50	2250
Cabins	6	2	12	108	6	2	72	3240
Shepherds	4	1	4	36	2	2	16	720
Camping pods	21	0	0	0	4	2	168	7560
Land pods	9	0	0	0	4	2	72	3240
				261				17910

Shower flow rate 9 litres/min

Shower duration 5 minutes

Toilet water use calculations

	Number of	Toilets each	Total toilets	Instant flush vol (litres)	Occ	Use/day	Total/day	litres/day
Existing	1	4	4	24	1	100	100	600
Amenity	1	9	9	54	1	100	100	600
Cabins	6	2	12	72	6	2	72	432
Shepherds	4	1	4	24	2	2	16	96
Camping pods	21	0	0	0	4	2	168	1008
Land pods	9	0	0	0	4	2	72	432
				174				3168

Flush volume 6 litres

Bike wash water use calculations

	Number of	Washers each	Total washers	Peak flow (l/min)	Occ	Wash/dy	Tot wash/dy	litres/day
Existing	1	4	4	60	1	100	100	4500
Proposed	1	4	4	60	1	100	100	4500
				120				9000

Washer flow rate 15 litres/min

Wash duration 3 minutes

Peak flow (l/min)	555	Total water use per day (litres)	30078
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Revisions

07/11/2018 R1

Bike wash flow rate changed



1 Goldicote Business Park
Stratford upon Avon
Warwickshire
CV37 7NB

Tel 01789 740 757
Fax 01789 741 829
Web www.watlinghope.co.uk

Client: S J Roberts Construction Ltd
Site: Mountain Bike Centre, Merthyr Tydfil
Equipment: Sewage Treatment Plant
Ref: REFQ.04170
Date: 12th March 2013

DESIGN REQUIREMENT

Cafeteria and toilet facilities for mountain bike centre.

- Cafeteria max 200 customers/day
- 13 Staff
- Toilets 130 visitors/day

Final effluent quality: 20 mg/l BOD, 30 mg/l susp.solids, 20 mg/l ammoniacal nitrogen.

PROPOSAL

Anua 2080CG submerged aerated filter with integral primary settlement and final humus tanks, all approx 2.6m dia x 7.2m long complete with 3 x blowers and controls in separate grp enclosure, power requirement 240v 1-phase, approx 0.65 kw.

Proposals registered with Environment Agency as exempt.

QUOTATION

Supply only Anua 2080CG package sewage treatment plant to meet above requirement including delivery to site (offloading by client) for the sum of £12,180.00 + vat

DELIVERY Approx 3 weeks from receipt of order.

COMMISSIONING

Commissioning free of charge subject to completion of installation prior to engineer's visit, connection of 240v electricity supply to kiosk, and all being completed within one working day.

TERMS 10% to be paid with order, balance within 30 days of delivery of equipment to site.

MJP/REFQ/04170

Platinum

Wastewater Treatment for the Commercial Market



Technology That Serves Customers and the Environment

Anua means 'to renew'. It describes our renewed contract with nature and our renewed focus on the development of innovative environmental solutions. We continue to develop and produce the sustainable technologies that our customers demand. Anua is part of Bord na Móna, a highly successful organisation and Ireland's leading resources company for over 75 years, which has a unique heritage and understanding of the natural environment. Bord na Móna has used its expert insights into natural processes, allied to its excellent in-house research facilities, to develop sustainable solutions across a wide range of environmental challenges – wastewater treatment, odour abatement, land reclamation, power generation, resource recovery and renewable energy. This is both Anua's history and our mission for the future. Our customers range from homeowners to major commercial, municipal and utility clients, united in seeking cost-effective solutions based on environmentally sound principles. Anua exists to serve both our customers and the natural environment. Across a broad range of sectors in countries around the world, our customers trust us to deliver the best sustainable solutions, backed by superior customer service. That is why we work with our clients throughout every project to achieve the best possible result, one that will build both our reputations. Anua enjoys the benefit of the support of a highly respected parent company with over 20 years experience in developing sustainable clean air and clean water solutions. As part of this wider organisation, we adhere to their world-class standards and values for both the technology we provide and the service we give our customers.

Complete Solutions

We don't just sell technologies. With our extensive laboratories and Innovation Centres located in Europe and the USA, we understand new challenges, pioneer research and create new processes. We work with you to create the systems you require, ensure correct installation and offer the full services of our nationwide network of support agents and technicians. From pre-planning to installation, service and maintenance, as well as the offer of monitoring and laboratory services, Anua stands by its technology and its customers.

Customised for Customers

Customers need a partner – and products – they can trust. Like nature itself, Anua must be adaptable and responsive to change. That means developing the solutions that best suit each individual project.

For Anua staff, understanding their customers' world is their business. That depth of understanding is matched by the depth of our customer support and focus. We work with clients to design solutions that are technically superior and cost-effective. We're with you every step of the way.



The Environmental Advantages of Platinum

Protection of groundwaters
Low power usage
No chemical additives
No noise pollution
Designed for minimal visual impact

The Platinum Advantages for You

Simple minimal maintenance
No moving internal parts
Ease of installation
Complete underground installation
Lockable covers
Low energy consumption
Low sludge production
Automatic sludge / effluent recycle system
Highly effective certified performance – BS EN 12566-3 up to 50 PE
Proven reliability

The Platinum Commercial System at Work

For developments involving a number of buildings, the Anua Platinum Commercial System offers everything that you need. It's highly effective, low maintenance and with proven reliability. Just as importantly, as the demand for sustainability grows, the processes it uses are 100% natural, utilising no chemical additives. Naturally occurring micro-organisms present in the sewage remove the biological (organic) content and nutrients which cause water pollution. Our system provides the conditions for these micro-organisms (biofilm) to grow providing highly efficient treatment to achieve high standard final effluent quality.

Stage One: Primary Settlement - Physical Treatment

1. The wastewater flows into the first primary chamber section where initial settlement occurs.
2. The gross solids and inorganic material settle to form a sludge layer at bottom of the tank. This sludge is stored in the first phase primary section and requires removal on a periodical basis.
3. The settled liquid effluent passes through the effluent filter system for treatment in the aeration zone.

Stage Two: Submerged Aerated Filtration - Biological Treatment

4. The aeration stage can be provided as a single or dual stage system* with both sections utilising plastic media. The lightweight durable filter media in the aeration zone provides a large surface area to aid development of the naturally occurring micro-organisms (biofilm) which reduce the levels of BOD and NH₄ when in contact with the wastewater.

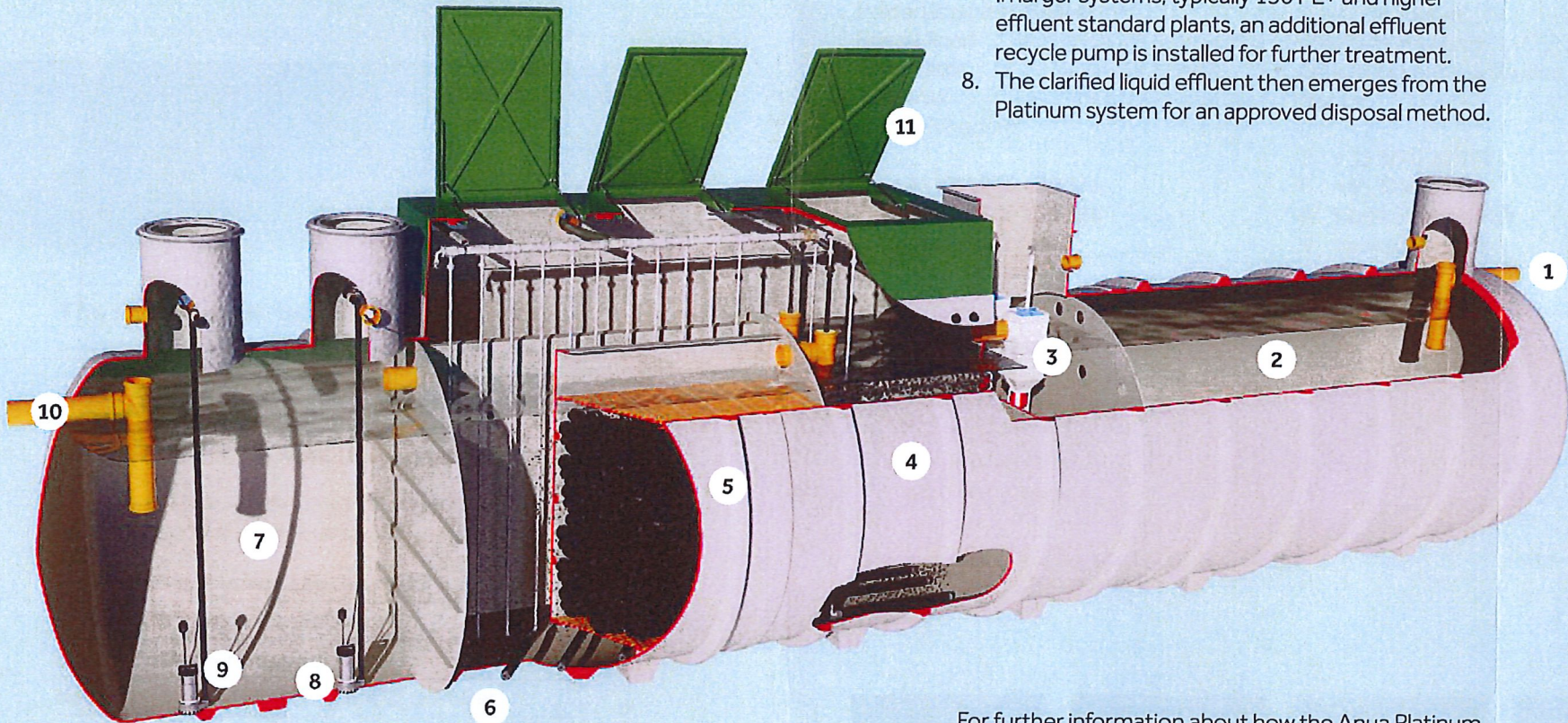
* Typically for plants over 150 PE and / or with a higher discharge standard requirement, the aeration section is provided in two stages, while plants under 150 PE have a single stage aeration system.

When a dual stage system is provided, the first phase utilises a moving bed biological process combined with a packed media second stage for enhanced treatment of the effluent. In a single stage system, the packed media provides the submerged aerated filter.

5. In conjunction with the media, oxygen is pumped into the liquid effluent by a highly efficient air blower via a diffuser grid. Located at base level in the tank, the diffusers provide fine bubble air diffusion for greater oxygen transfer efficiency, hence ensuring optimum treatment. The air system also ensures that mature outer biofilm layers are removed from the media.

Stage Three: Final Settlement - Physical Treatment

6. As the micro-organisms are regenerated, the oldest layer of the biofilm is removed from the media and passes with the effluent into the final chamber. Here settlement of this layer and any remaining solids occurs, reducing the levels of the SS (Suspended Solids) in the final effluent to the required standards.
7. When these solids settle as secondary sludge, they are returned via the sludge return system to the primary settlement chamber for storage. This application also allows enhanced treatment of the effluent as it is recycled through the system. In larger systems, typically 150 PE+ and higher effluent standard plants, an additional effluent recycle pump is installed for further treatment.
8. The clarified liquid effluent then emerges from the Platinum system for an approved disposal method.



For further information about how the Anua Platinum Commercial System works, go to www.anua.co.uk or www.anuaenv.ie

Diagram Index

- 1 Plant Inlet
- 2 Primary Settlement Zone
- 3 Primary Filter
- 4 Aeration Stage 1
- 5 Aeration Stage 2
- 6 Air Diffuser Network
- 7 Secondary Settlement Zone
- 8 Sludge Recycle
- 9 Effluent Recycle
- 10 Plant Outlet
- 11 Hinged Lockable Lids

Detailed Design Approach

Our dedicated technical design team provides individual attention to each project to build the optimum solution around your project's needs. Utilising our extensive experience in wastewater treatment design, we work with you and focus on:

Application Type – School, hotel, offices, new or existing build, specific design needs.

Flows & Loads – Calculation of potential hydraulic flows and organic loads in accordance with EPA or British Water Code of Practice Flows & Loads.

Treatment Levels – Level of treatment required and disposal methods.

Installation – Civil, Mechanical & Electrical installation requirements for your solution.

Efficiencies & Savings – selection of system designs to provide optimum life cycle costs.

Regulation / Legislation – How your project will fit with these requirements.

The Correct Solution for You

Anua's chambers are manufactured at our dedicated facility from GRP (Glass Reinforced Plastic) to the highest standard in accordance with BS EN 4994. We have developed rigorous control procedures at all stages of manufacture to ensure that your product is built to the highest possible standards in accordance with quality procedures of ISO 9001:2000 Quality Assurance system and the ISO 14001 Environmental system.

Our flexible manufacturing process allows us to tailor the solution to best fit your project requirements with units built to suit deep or shallow inverts, above ground installations, high strength influent applications and higher rate effluent quality. Utilising our process design experience, bespoke systems can be produced to achieve final effluent levels of 10:10:5 mg/l BOD:SS:NH₄ with denitrification and P removal options also available.

The Platinum Commercial System is designed in accordance with BS 6297 and Building Regulations Part H2. The systems up to 50 population equivalent are certified to the highest standards required by the new European standard for treatment plants to BS EN 12566 – Part 3. The Typical Specification table is a guide in selecting the best treatment solution for your needs. If you have any specific requirements, the Anua sales team will assist and guide you along from enquiry stage through to after-sales service.

Typical Specification*

Model Reference	Population Equivalent (PE)	Maximum Design Flow (m ³ /day)	Maximum Organic Load (kg BOD /day)	Diameter (metres)	Length (metres)	Total Height (metres)	Standard Dia Inlet/Outlet (mm)	Depth Below Inlet Invert (metres)	Depth Below Outlet Invert (metres)
2015	15	3	0.9	1.8	3.5	2.7	110	1.7	1.65
2020	20	4	1.2	1.8	4.2	2.7	110	1.7	1.65
2025	25	5	1.5	1.8	5	2.7	110	1.7	1.65
2030	30	6	1.8	1.8	5.9	2.7	160	1.7	1.65
2040	40	8	2.4	2.6	4.2	3.22	160	2.22	2.145
2050	50	10	3	2.6	5	3.22	160	2.22	2.145
2060	60	12	3.6	2.6	6	3.22	160	2.22	2.145
2070	70	14	4.2	2.6	6.6	3.22	160	2.22	2.145
2080	80	16	4.8	2.6	7.2	3.22	160	2.22	2.145
2100	100	20	6	2.6	8.2	3.22	160	2.22	2.145
2125	125	25	7.5	2.6	10.4	3.22	160	2.22	2.145
2150	150	30	9	2.6	11.2	3.22	160	2.22	2.1
2175	175	35	10.5	2.6	13.1	3.22	160	2.22	2.1

All standard inlet inverts at 1000mm below ground level. Inverts can be adjusted to suit site requirements. Standard Inlet/Outlet as shown. Pipework can be amended to client's requirements. *Details correct at time of going to press.



Meeting the Highest Standards

Anua is committed to meeting and surpassing the highest quality standards required for each of its products. That's why you will always see national and/or international standards, accreditations for all Anua products.

Free
pre-planning
and site
reports

Free
no obligation
quotations

Nationwide
maintenance
call-out service

Expert customer
support

The Anua Guarantee

Every Platinum Commercial System comes with a 12-month parts and labour warranty, but Anua's commitment to you goes far beyond this.

We have a national network of approved agents and installers, who will provide you with:

Free Pre-Planning and Site Reports

Free No Obligation Quotations

Expert Customer Support

Nationwide Maintenance Call-out Service

For further information, go to www.anua.co.uk or www.anuaenv.ie

Complementary Products for the Platinum Commercial System

- Plant Alarm Systems
- Telemetry
- Sample Chambers
- Weatherproof GRP Enclosures & Kiosks
- Deep Invert / Above Ground Applications
- Forward Feed or Final Effluent Pump Stations
- Nutrient removal – P Removal / Denitrification
- Tertiary treatment for enhanced treatment levels
- Tertiary treatment for enhanced treatment levels

Simple Installation, Minimum Maintenance

While an Anua Platinum Commercial System is made up of a number of separate components, we understand the pressures to minimise installation costs while maintaining quality. Therefore we design and manufacture the system with ease of installation and maintenance in mind. Our in-house manufacturing and fitting capabilities ensure that all tank pipe inverts / positions meet with your exact requirements for a quick, simple installation. Anua's systems do not have any internal moving parts which means no requirement to enter the tank, reducing Health and Safety risks.

Ireland

Anua
Main Street
Newbridge
Co. Kildare
Ireland

T 1850 381136
F +353 (0) 45 432 312
e env.info@anua.ie
w www.anuaenv.ie

UK

Anua
Polden Business Centre
Bristol Road
Bridgwater
TA6 4AW
United Kingdom

T +44 (0) 1278 439 325
F +44 (0) 1278 439 324
e info@anua.co.uk
w www.anua.co.uk

Italy

Air Clean SRL
Via Trento 37
20017 Rho (Milano)
Italy

T +39 (0)2 9311 989
F +39 (0)2 93504303
e airclean@tin.it
w www.aircleansrl.it

France

L'eau Pure
Z.A.C. de Toupes
39570 Montmorot
BP 90817 Lons-Le Saunier
France

T +33 384247979
F +33 384473200
e siege@eaupure.fr
w www.eaupure.fr

Spain

Air Clean SRL
Calle Est 14
43820 Calafell (Tarragona)
Espana

T +34 66 39 52707
e lbuzzi@aircleansrl.es
w www.aircleansrl.es

USA

Anua
PO Box 77457
Greensboro
NC 27417
USA

T 001 336 547 9338
F 001 336 547 8559
e info@anua-us.com
w www.anua-us.com

Renew



Wastewater
Treatment

Recover



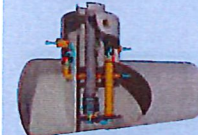
Rainwater
Harvesting

Re-direct



Pumps

Recycle



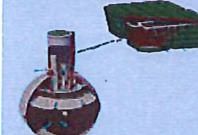
SUDS

Rarefy



Odour
Abatement

Retain



Holding
Tanks

In keeping with company policy of continuing research and development and in order to offer our clients the most advanced products, Anua reserves the right to alter specifications and drawings without prior notice.



Paper made from trees matured in sustainable, well managed forests and is certified to FSC standards