Soakaway 1
Surface water attenuation/Soakaway to be provided.
Crate Soakaway. 13m3 storage volume. size currently based infiltration rates of 1.46x10-4 taken on site 24th June 2025

Minimum 800mm cover depth
size currently based on 350mm deep crate units, 95% void ratio. Graf Eco Block or similar approved.

BOT 97.550
TOT 97.900
CL 98.70 min (800mm)

impermeable new site area = 700m2

10% urban creep allowed to SW calculations

Tank Size shown = 25.6m x 1.6m x 0.35m based on Graf 800mm x 800mm x350mm crates.

Soakaway 2
Surface water attenuation/Soakaway to be provided.
Crate Soakaway. 12m3 storage volume. size currently based infiltration rates of 1.46x10-4 taken on site 24th June 2025

Minimum 800mm cover depth
size currently based on 350mm deep crate units, 95% void ratio. Graf Eco Block or similar approved.

BOT 94.80
TOT 95.150
CL 96.95 min (800mm)

impermeable new site area = 650m2

10% urban creep allowed to SW calculations

Tank Size shown = 16m x 2.4m x 0.35m based on Graf 800mm x 800mm x350mm crates.

Soakaway 3
Surface water attenuation/Soakaway to be provided.
Crate Soakaway. 43m3 storage volume. size currently based infiltration rates of 1.46x10-4 taken on site 24th June 2025

Minimum 800mm cover depth
size currently based on 350mm deep crate units, 95% void ratio. Graf Eco Block or similar approved.

BOT 94.30
TOT 94.65
CL 95.500 min (800mm)

impermeable new site area = 700m2

10% urban creep allowed to SW calculations

Tank Size shown = 20m x 6.4m x 0.35m based on Graf 800mm x 800mm x350mm crates.

Foul Water package treatment units. 2No Marsh Nutra Lite NL45 units discharging to a GEM APS and then a MUVP2 filter
Full design and sizing by manufactures, multi tank configuration likely required.

EA/NRW discharge permit may be required
discharge to ground proposed

Proposed River outlet as agreed under Natural Resources Wales (NRW) environmental discharge permit.

application currently under review.
Treated foul discharge = 13.2m3 per day or 0.15L/s

Foul Water Treatment works
multi tank set up. Marsh design in general approved, design and specification strictly by manufacturer.

Key.

- Proposed foul sewer (Invert level shown)
- Proposed Combined water sewer
- Proposed surface water drain (roof water/ highway/treated external area flows only)
- Proposed foul sewer - Above ground level suspended at GF ceiling height - design by others
- Proposed rain water sewer - Above ground level suspended at GF ceiling height - design by others
- 600/460/225 "non -accessible" inspection chambers
- Minimum 1200Ø "accessible" manholes
- Proposed road gully and lateral Connection
- Proposed Rodding Eye point
- Proposed channel drainage system - hauraton fasserfix super or similar approved. 150mm wide.
- Existing drain - to remain
- Existing sewers to be diverted/made redundant
- Proposed surface water attenuation/soakaway unit
- Proposed surface water treatment/suds planter
- Proposed surface water flow control unit
- Foul Water package treatment unit. marsh Ensign or similar approved.

Note: All Treatment units noted are for indicative costing purposes only. Full detailed design specification to be obtained from the manufactures prior to any orders being placed.

- FFL 130.000 — Proposed Finished Floor Level
- x131.05m — Proposed site levels
- 1:35 — Proposed Gradients
- Embankment (@1:3 unless stated)
- 600mm high — Retaining wall/SOE detail
- 600mm high — Underbuild detail
- For retaining wall positions refer to landscaping proposals
- Exceedance Flow routes.

RWP and internal foul points positions are indicative only

Levels provided are indicative only to assist with completion of drainage design works. For precise level information refer to architects/landscaping information

Attenuation units designed for 100 year + 40% storm event situations. No above ground flooding

Discharge to watercourse is subject to NRW approval and discharge consent permits being in place.

General Notes

Do not scale this drawing. If in doubt, consult with the Engineer

1. This drawing is to be read in conjunction with all other relevant Engineers, Architects and Specialist design drawings and specifications.
2. All dimensions and levels are in metres unless noted otherwise.
3. This drawing is for information purposes and all information displayed is subject to detailed design.
4. Cover levels noted are indicative or best design levels, constructed levels should take into account as-built surfacing levels and gradients.
5. The Contractor shall be responsible for checking all tie-ins for line and level with existing foul and surface water systems before commencing any works.
6. The Engineer shall be notified immediately, in writing, should any errors or discrepancies be found prior to the commencement or continuation of any works. All work is to be carried out in accordance with current British Standards, Building Regulations and NHBC Standards.
7. All drainage work is to be strictly in accordance with the requirements of the Building Regulations 2010, Approved Document Part H, "Drainage and waste disposal".
8. It is the responsibility of the Contractor to execute the works at all times in strict accordance with the requirements of the Health and Safety at Work Act 1974, and the C.D.M. Regulations 2015. The Contractor will be deemed to have allowed for full compliance, including full liaison with the Principle Contractor, within his rates.
9. All existing land drains encountered on site during construction are to be re-connected.
10. Should any departure from the proposed slab or external levels be considered, agreement shall be sought from the Engineer immediately and prior to the commencement or continuation of any works. Proposals should take full account of all restrictions to the slab level.
11. Temporary protection to be provided to drainage work during construction as necessary.
12. Power supply to separator/treatment units, alarm, panel, vent etc to be provided by contractor in accordance with manufacturers recommendations.
13. Topographical survey shown is based upon Curvisoure survey drawing 24_083r01
14. Architects layout shown is based upon Trial Architecture Site Layout drawing no. 24014-BASE-SE site planThis layout may be subject to change and is intended for indicative purposes only.

Specification Notes

15. The following types of pipe may be used unless noted or agreed otherwise;
- Pipes up to 300mm diameter to be Structured Walled to BS EN 13476, Polypropylene to BS EN 1852 or PVC-U to BS EN 1401.
- Pipes 300mm diameter or over to be Concrete to BS 5911.
16. Both Clay and Concrete pipes shall be strength class 120 (100/150mm min crushing strength 28kN/m). Thermoplastic pipes shall have a minimum ring stiffness of SN4.
17. Pipes which run adjacent to buildings shall be installed in strict accordance with Part H, Clauses 2.23 to 2.25.
18. All pipes, chambers and fittings shall be installed, bedded and backfilled in accordance with the manufacturers instructions subject to the following minimum requirements;

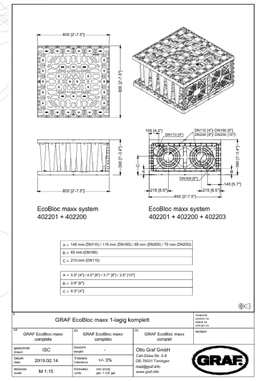
Pipe Location	Cover to crown	Clay/Concrete Pipe * Bedding	Plastic Pipe Bedding	Backfill
Roads (HGV)	>1.2m	Class S	Class S (S1or2)	Type 1Granular
	<1.2m	Class 'A' (Concrete)	Class 'A' (Concrete)	
Drives / car parking	>0.9m	Class S	Class S (S1or2)	Type 1 Granular
	<0.9m	Class 'A' (Concrete)	Class 'A' (Concrete)	
Hard and soft Landscaping	>0.6m	Class S	Class S (S1or2)	Suitable as dug material
	<0.6m	Class 'A' (Concrete)	Class 'A' (Concrete)	

19. The first flexible joint in pipes adjoining a manhole shall be a maximum length of 600mm from the inside face of the manhole, connecting to a rocker pipe. The length of the rocker pipe shall be as follows;

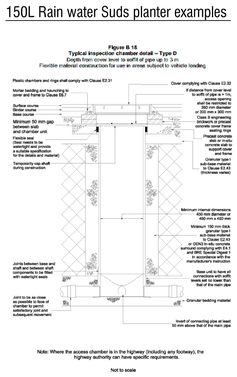
Pipe diameter	Length of Rocker pipe
150-600mm	600mm
675-750mm	1000mm
over 750mm	1250mm

20. All manholes and inspection chambers situated in areas subject to vehicular loading to have class D400 covers and frames to BS EN124 and those not subject to vehicular loading to have class minimum class B125 covers and frames.
21. Drainage frames must be tied to manhole risers by use of manufacturers ties (eg. Polypipe ref FRX300 fixing kit and FRX501 black ties.) The ground works contractor will be held fully responsible for any accidents due to incorrect fitting or failure to use the correct manufacturers fixing equipment.
22. All drains in the vicinity of existing or proposed trees to be constructed in accordance with the requirements of NHBC Practice Note 3.

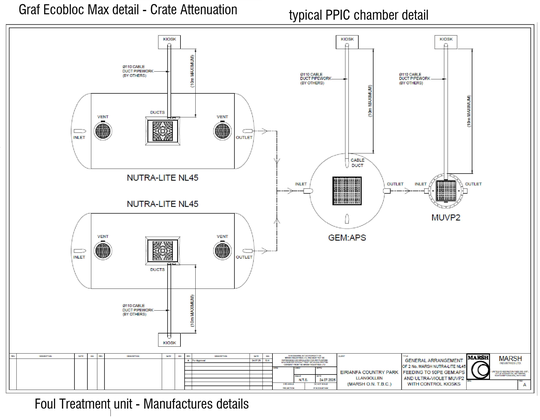
150L Rain water Suds planter examples



Graf Ecobloc Max detail - Crate Attenuation



typical PPIC chamber detail



Foul Treatment unit - Manufactures details

Rev.	Date	Amendments	By	Chk
P05	26.11.25	Foul Drainage revised to suit River Discharge. Suds Planter added	BD	
P04	31.010.25	Foul Drainage revised to suit River Discharge. Suds Planter added	BD	
P03	08.08.25	Foul Drainage revised to suit Marsh Ensign treatment works proposals	BD	
P02	05.06.25	Issued for Costing/approval - Foul to ground design	BD	
P01	09.07.24	Issued for Costing/approval	BD	

Project: Llangollen - Full Site

Drawing Title: BELOW GROUND DRAINAGE
Surface Water Soakaway option

Engineer: HOWARD WYNNE Consulting Engineers

Client:

Status: Planning - Costing-Approval

Scale	Drawn	Checked	Date
1:200	BD	JH	09.07.24

Drawing Number: 24137-HWC-00-xx-DR-C-2002 — Rev. P05

BIM Drawing Reference: N/A

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