

NEW ISLINGTON PHASE 3 – PHASE 3C

DRAINAGE MANAGEMENT AND MAINTENANCE PLAN

1.0 INTRODUCTION

- 1.1 The site has been developed to provide residential accommodation, arranged in a single stepped terrace of thirteen modular houses and associated landscaping.

A post development site layout for New Islington Phase 3 is included in Appendix A.

2.0 DRAINAGE PROPOSALS

- 2.1 The agreed drainage strategy is outlined in the previously submitted Drainage Statement, ref: 284/05 – Drainage Statement – Revision E, dated July 2020.
- 2.2 The site is drained utilising new private foul and surface water drainage systems as shown on the proposed Drainage Layout drawing, ref: 284-05-2050 included in Appendix B.

3.0 SURFACE WATER DRAINAGE

- 3.1 As agreed with the Local Authority Flood Risk Management Team and United Utilities, surface water drainage from the site is managed sustainably via on site attenuation storage and subsequent discharge to the combined sewer network at controlled rates.

- 3.2 Details of the contractor designed proprietary attenuation tank are included in Appendix C.

The hydrobrake flow control manhole sits outside the Phase 3C site with Phase 3A.

4.0 MANAGEMENT AND MAINTENANCE

- 4.1 Management and maintenance of the new private surface water network will be required to secure the operation of the sustainable drainage scheme through its lifetime. The process is to be managed by the appointed property management company, details as noted below.

Residential Management Group
3 Chepstow Street
Manchester
M1 5FW

0345 003 0044

- 4.2 The management company will be responsible for inspection of manholes and catch pits upstream and downstream of the attenuation tank and for the appropriate removal of silt build up as required. It is anticipated that this work will be undertaken on a regular 3 monthly basis or as required following large storm events, in accordance with the manufacturers recommendations.

- 4.3 Where proprietary products have been used appropriate maintenance periods are outlined in trade literature included in appendices C and summarised below.

4.3.1 ATTENUATION TANK

Extract from manufacturer's O&M manual:



Hydro Water Management Solutions Maintenance Requirements

Regular inspection and maintenance is required to ensure the effective long term operation of below ground modular storage systems. The following table details the recommended maintenance requirements for modular systems.

Maintenance schedule	Required action	Frequency
Regular maintenance	Inspect and identify any areas that are not operating correctly. If required take remedial action.	Monthly for 3 months then annually
	Debris removal from catchment surface (where may cause risk to performance)	Monthly or as required
	Remove sediment from pre-treatment structures and/or manifold connections	Monthly or as required
Remedial actions	Repair/rehabilitation of inlets/outlets, overflows and vents	Annual inspection or as required
Monitoring	Inspect/check all inlets, outlets, vents and overflows to ensure that they are in good condition and operating as designed	Annually
	Survey inside of tank for sediment build up and remove if necessary	Annually and after large storms

The maintenance plan and schedule should be developed during the design phase. Specific maintenance requirements should be identified based on upstream drainage sedimentation controls and the schedule developed to suit these needs.

Maintenance details should be detailed in the project Health & safety file and a risk assessment should be undertaken and recorded.

Note,

It is generally recommended that the cells be flushed through with large volumes of water under low pressure.

Certain modular units will allow higher pressure jetting to remove larger objects or heavier deposits of sediment. These modules can be accessed via integral access chambers (where applicable) and surveyed/flushed in a linear fashion or alternately water can be flushed/jetted through via the inlet/outlet pipe connections.

Hydro Water Management Solutions Ltd

Randolph House 37-41 Longshut Lane West, Stockport, Cheshire, SK2 6RX

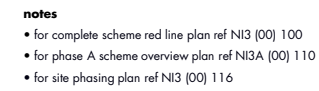
Tel: 01614 563476 Fax: 01614 565820 Email: sales@hydro-wms.co.uk

4.3.2 HYDROBRAKE FLOW CONTROL

The hydrobrake flow control manhole sits outside the Phase 3C site with Phase 3A.

Management and maintenance details are covered in the New Islington Phase 3A – Management and Maintenance Plan, dated April 2021.

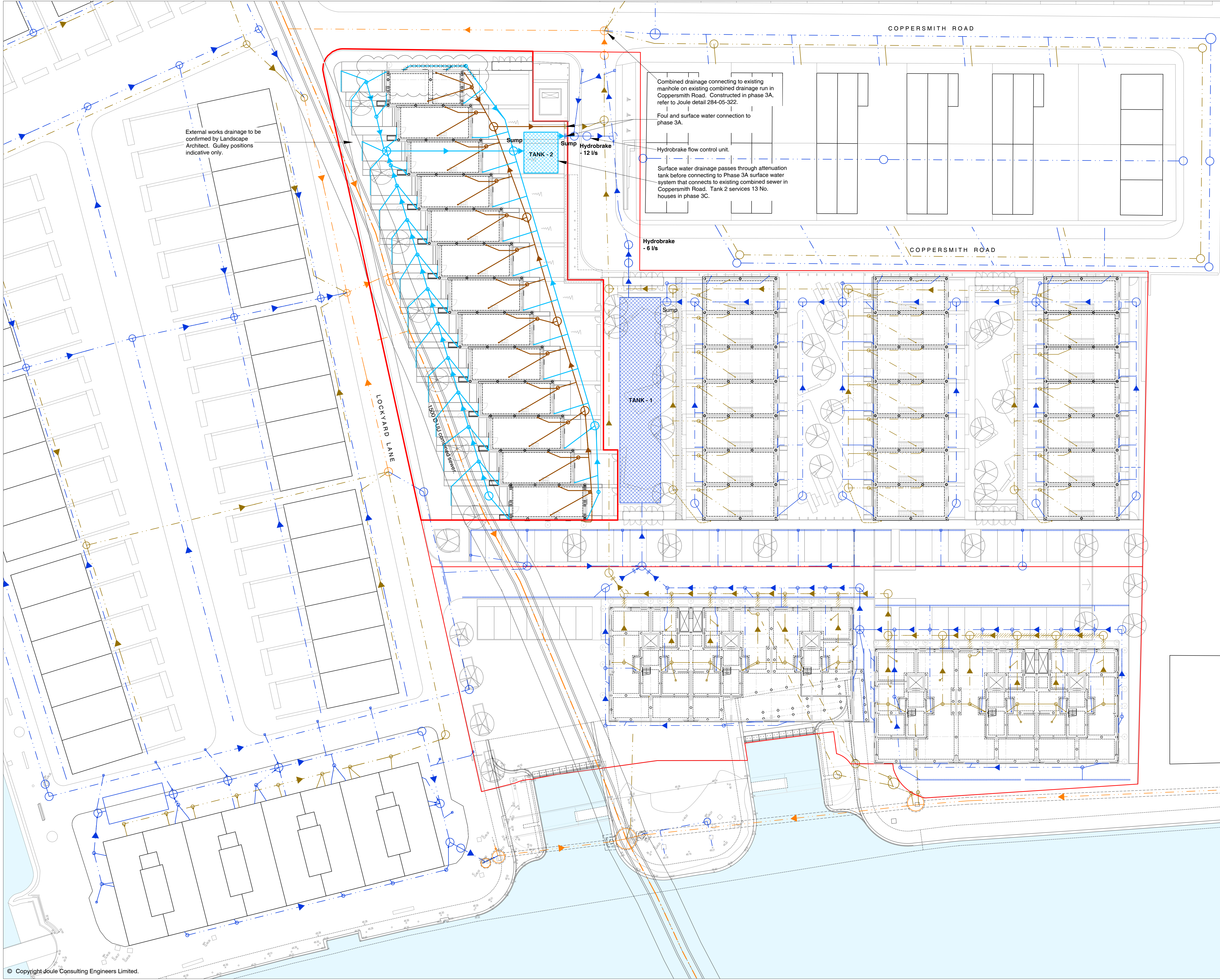
APPENDIX A – POST DEVELOPMENT SITE LAYOUT



site plan • scheme overview

do not scale from this drawing • all dimensions are to be set out and checked on site prior to starting construction • any discrepancy found between information given on this drawing and that given elsewhere or recorded on site shall be brought to the attention of the project architect immediately

APPENDIX B – PROPOSED DRAINAGE LAYOUT



Notes:

1. This drawing is to be read in conjunction with the site survey and all relevant Architects and Engineers drawings and the specification.
2. For general notes refer to drawing no. 284-05-3C-N01 & 3C-N02.
3. For setting out refer to Architects details.
4. For assumed site build ups over formation level, refer to drawing 284-02-29.

Key:

- Phase 3C Site Boundary.
- Phase 3 Site Boundary.

Drainage Key:

- Existing Drainage, (Surface Water).
- Existing Drainage, (Foul).
- Existing Drainage, (Combined).
- Proposed Drainage, (Surface Water).
- Proposed Drainage Attenuation Tank, (Surface Water).
- Proposed Drainage, (Foul).
- Proposed Drainage, (Combined).

CONSTRUCTION

08.07.22	Issued for Construction, IC's 3C-S04 Omitted 3C-S18 & 3C-F05 updated.	F	TP	SW
14.09.21	Issued for Construction, rear garden layout updated, IC's 3C-F05, 3C-F15, 3C-F17 and MH's 3C-F02, 3C-F03, 3C-F04 updated.	E	TP	SW
27.07.21	Issued for Construction, plots P01, P02 & P03 relocated as required by the Contractor, inspection chamber 3C-F05 relocated.	D	TP	SW
09.04.21	Issued for Construction, manholes in driveways centred, drainage layout under driveways updated, inspection chamber C3-S18 added.	C	TP	SW
19.03.21	Issued for Information RIBA Stage 4, driveway layout and drainage updated, manhole position updated in line with Open requirements.	B	TP	SW
25.02.21	Issued for Information RIBA Stage 4, beam setting out updated, tank size updated, existing drainage connection layout updated, joint omitted.	A	TP	SW
23.11.20	Issued for Information.	-	TP	SW

Issue:

Rev:

Revised:

Checked:

joule

Joule Consulting Engineers Ltd
T: 0161 832 3487
W: www.jouleconsultingengineers.co.uk
E: mail@jouleconsultingengineers.co.uk

Timber Wharf
40 Worsley Street
Castlefield
Manchester
M15 4LD

Project:
N13,
New Islington,
Manchester.

Title:
Proposed,
Drainage,
Phase 3C,
Overall Site.

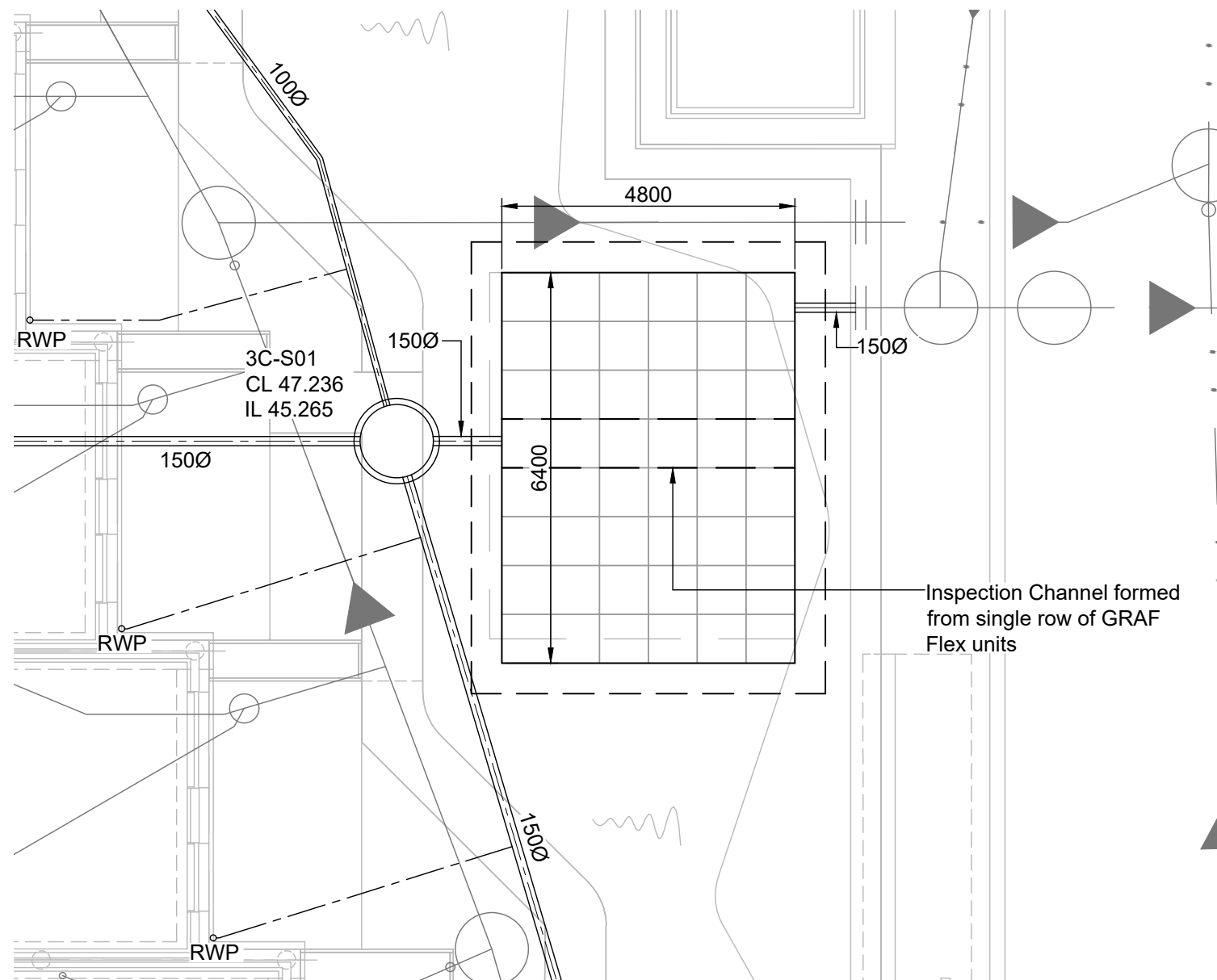
Job No:	284-05	Orig No:	2050	Rev:	F
Scale:	1:500 @ A3	Date:	02.20	Drawn:	TP

APPENDIX C – CONTRACTOR DESIGNED PROPRIETARY ATTENUATION TANK

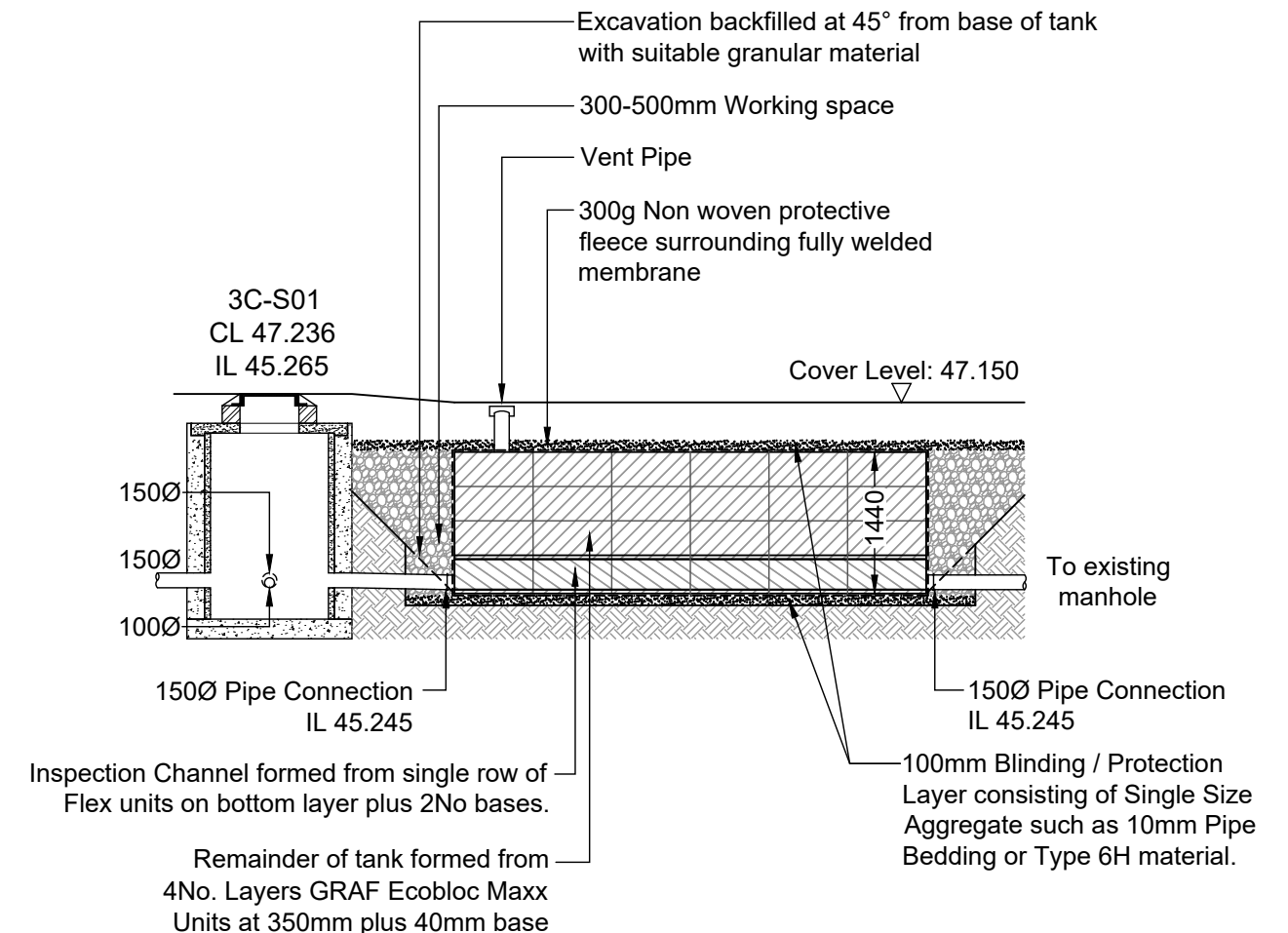
NOTES

6.4 x 4.8 x 1.44m deep
 Total Vol = 44.24m³
 Net Vol ≈ 42.467m³
 At 96% min Void Ratio
 186 GRAF Ecobloc Maxx units
 48 Maxx base units
 6 GRAF Ecobloc Flex units
 6 Flex base units

1. Proposed Hydro WMS layout.
2. All dimensions are in millimetres, all elevations in metres unless otherwise stated.
3. All temporary and enabling works by others.
4. All dimensions of fabricated items are nominal and may vary within manufacturing tolerances.



Proposed Plan
 (Scale 1:100)

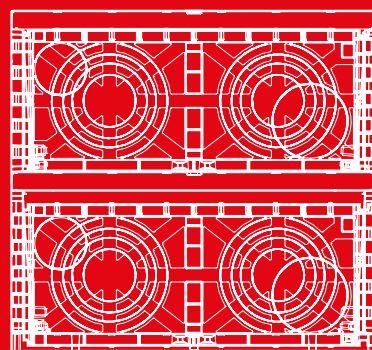
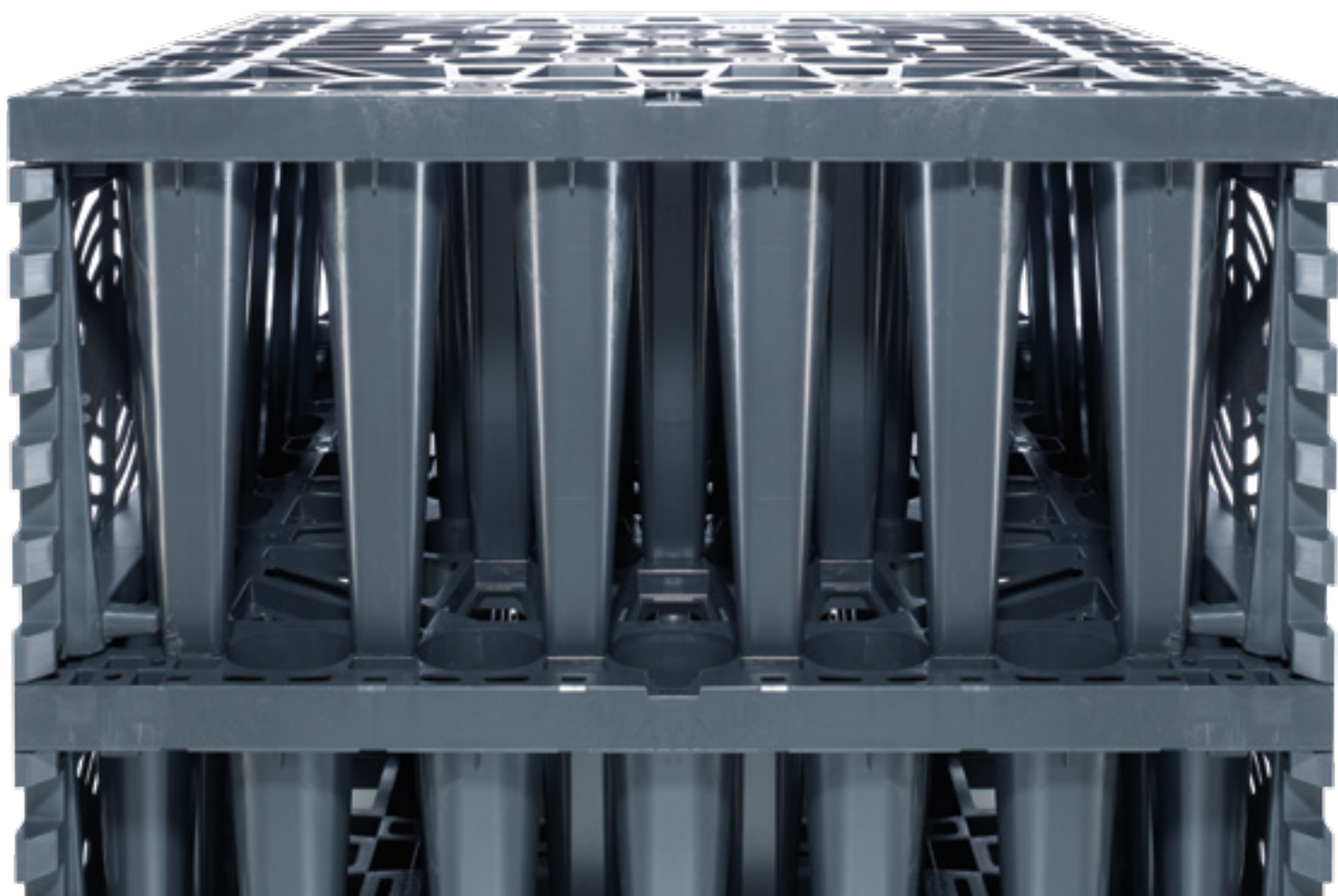


Proposed Section
 (Scale 1:75)



EcoBloc System

Stormwater management





Production site in Dachstein (France)



Production site in Teningen (Germany) near Freiburg

GRAF – Setting standards in quality

Otto Graf GmbH has been supplying high-quality plastic products to its customers for 50 years. In 1974, GRAF developed its first pioneering range of rainwater harvesting products. Today we are market leader in numerous countries for Rainwater Harvesting Systems.

High Quality Manufacturing

Graf continuously invests in the expansion of its headquarters in Teningen, near Freiburg (Breisgau). The facility has now an approximate area of 155,000 m² and is one of the most modern production facilities for plastic products in the world. Our choice of Germany for the new production site was easy. On the one hand, we feel an obligation to the site because of our history. On the other, we would like to offer our customers products of the highest quality.

Where quality comes first

To ensure consistent high product quality, you need optimised production processes and outstanding quality management. Every individual tank at the new production site in Teningen is checked for dimensional accuracy, wall thickness and weight. All production parameters, e.g. material composition, machine settings and the staff involved in the production process, are documented for each individual product.

Our goal: your satisfaction

More than 100,000 satisfied customers already benefit from the advantages of GRAF products.



Manufacturing certified according to ISO 9001



Manufacturing certified according to ISO 50001



Internationally proven: GRAF infiltration technology



Warehouse, Kent (UK)



Housing development, Singapur (SG)



Energy supplier, Warwick (UK)



Daycare centre, Lörrach (DE)



University of Agriculture, Prague (CZ)



Industrial building, Tumeltsham (AT)

EcoBloc

Stormwater management system

Various applications

- ✓ Rainwater infiltration
- ✓ Stormwater attenuation
- ✓ Rainwater harvesting

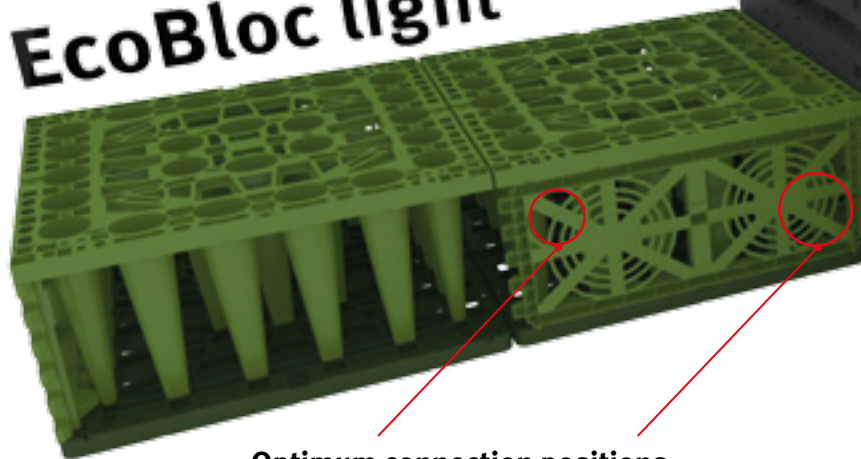


No tools required

Fully integrated shaft

The Vario 800 flex shaft system (page 12) can be directly installed in an EcoBloc infiltration or infiltration/attenuation system. The connection surfaces of the inspection channels in the Vario 800 flex shaft system are accurately matched to the EcoBloc system.

load ★ ★
logistics ★ ★ ★ ★ ★
EcoBloc light



Optimum connection positions

Optimum connection positions ensure full use of infiltration ditch volume.

High storage volume

GRAF infiltration modules have three times the storage volume of a standard gravel infiltration ditch. One module therefore takes the place of around 1300 kg (1,4 tons) of gravel or a 50 m (164') drainage pipe. Since you don't have to excavate so much soil and enjoy great value for money compared with a standard gravel infiltration ditch, the GRAF modules save you hard-earned cash!

Service life of over 50 years

A durable product design ensures sustainability. The GRAF EcoBloc system and the Vario 800 flex shaft system is designed for a service life of over 50 years.

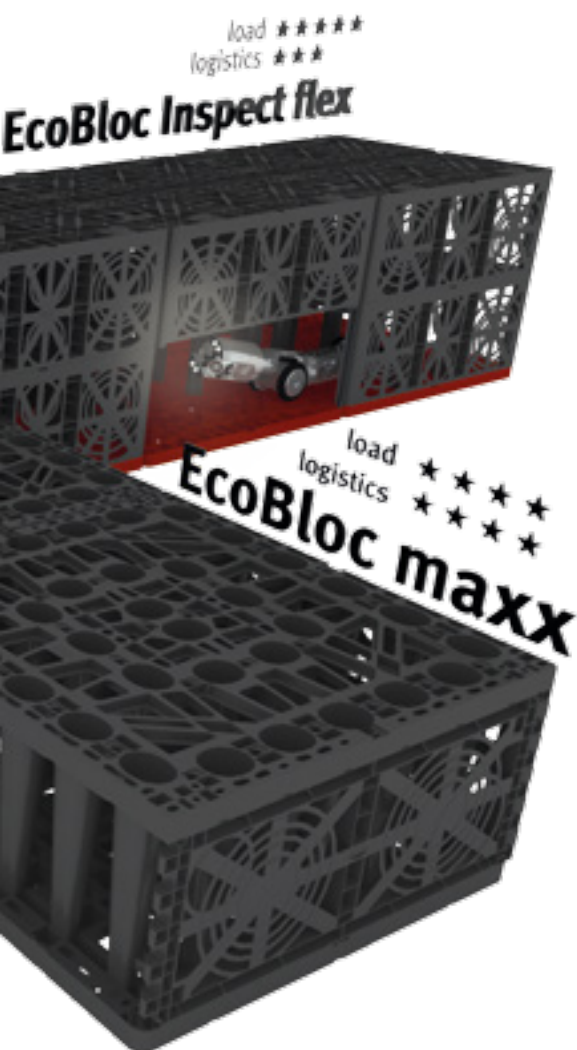
Easy to install

The modules are fitted simply, at speed and in various ways. They can be installed without heavy machinery – one EcoBloc Inspect flex module weighs just 8 kg (17.6 lbs), even only 7 kg (15.4 lbs) for one EcoBloc light



Lorry-bearing up to 60 tons

The GRAF EcoBloc Inspect flex has a heavy-duty lorry-bearing capacity of 60 tons with an 800 mm (2' 7.5") earth covering.



High pressure jetting possible

GRAF EcoBloc Inspect flex can easily resist high pressure jetting.



Easy to inspect

The standard inspection channel allows the entire infiltration/attenuation system to be monitored effectively. The EcoBloc Inspect flex allows access by commercially available inspection cameras. This has been confirmed by several independent testing authorities.



Up to 97% reservoir volume

The GRAF EcoBloc light has a gross volume of 225 litres (59.4 US gal.) and a reservoir volume of 219 litres (57.9 US gal.). With a reservoir volume in excess up to 97%, it is a market-leading product. The EcoBloc variants maxx and Inspect flex still offer a reservoir coefficient of 96% despite their high load-bearing capacity.

Installation depth of up to 5 metres (16' 4.8")

Even under very heavy loads, GRAF EcoBloc Inspect flex modules can be installed at a depth of up to 5 metres (16' 4.8"). This means that up to 14 layers are possible. Please consult GRAF when the installation depth is greater than 5 metres.

GRAF EcoBloc Configurator

Please ask your GRAF sales consultant for your login account information to the GRAF EcoBloc Configurator.



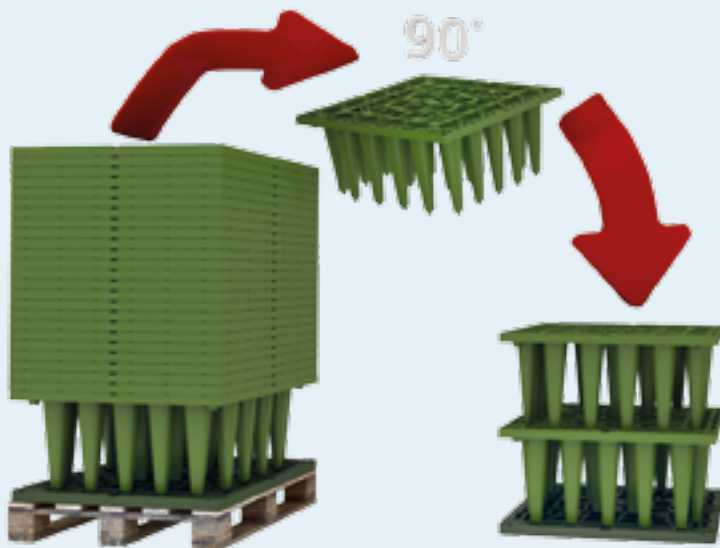
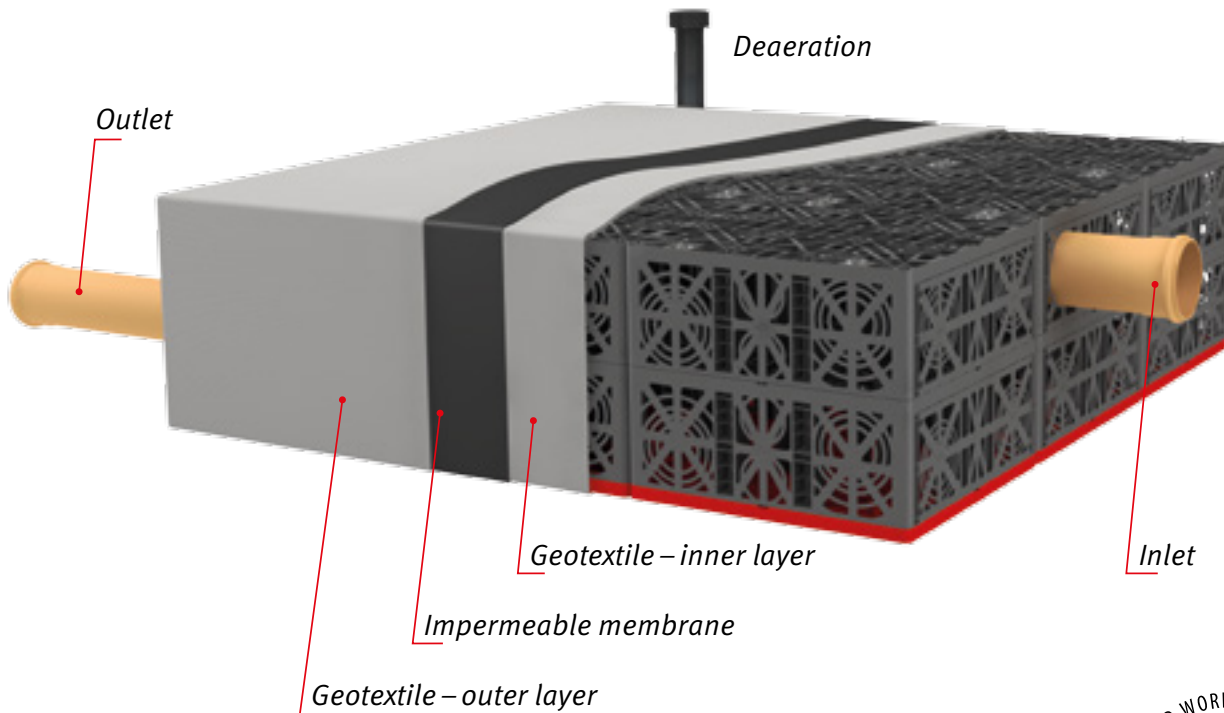
Application and logistics

Stormwater attenuation

The controlled discharge of rainwater is increasingly important during heavy rain. The GRAF EcoBloc modules can

be also surrounded by an impermeable membrane, which prevents water from escaping from the system unchecked.

Restricted outflow allows the water to be discharged into the sewage system in a controlled manner.



1. Stackable

To save space during transport, the EcoBloc maxx and EcoBloc light modules are stacked into each other. This minimizes transport costs, storage space in stock and CO₂ emissions.

2. Easy installation

The EcoBloc base plate forms the foundations of each EcoBloc system. Up to 14 EcoBloc modules can be fitted on one base plate.

3. Ready

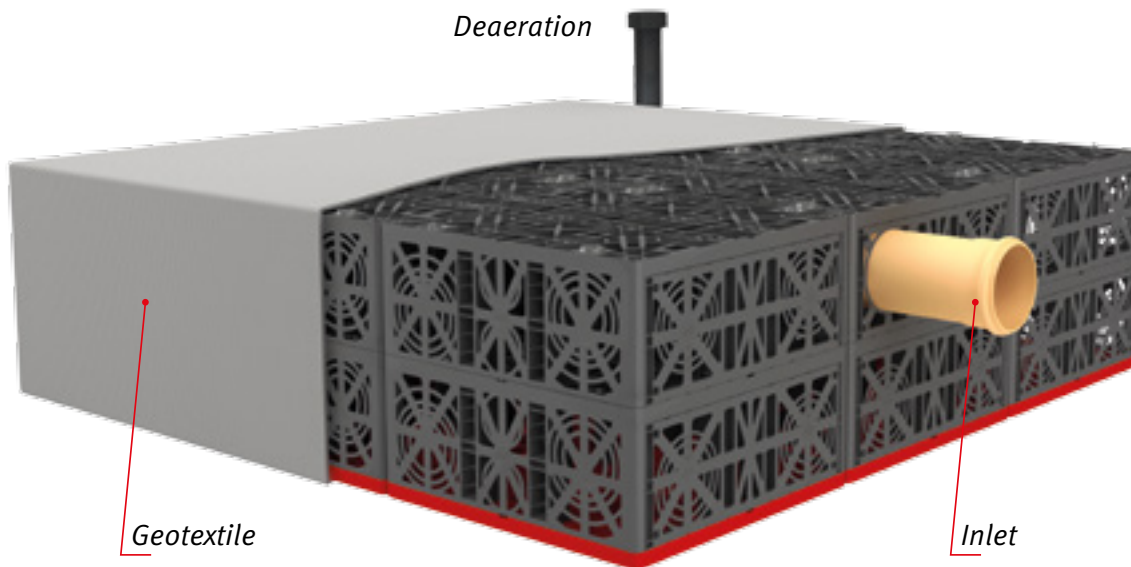
The side faces are sealed with EcoBloc end plates. The EcoBloc system can be adapted to match individual requirements.

Rainwater infiltration

Local infiltration of rainwater is gaining in importance. As we cover over more and more ground with concrete, we are interrupting the natural water

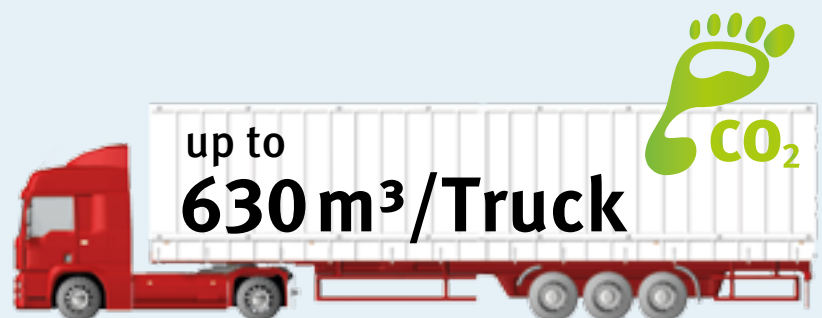
cycle. The GRAF EcoBloc modules combine environmental management of rainwater with the opportunity to protect against flooding. It stores rainwater

and gradually releases it back into groundwater reserves.



Eco-friendly product – green logistics

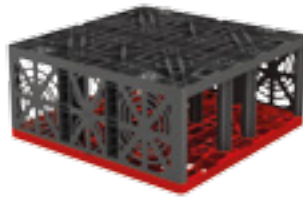
One lorry can transport up to 2800 EcoBloc light units. That corresponds to a volume of 630 m³ (22.250 ft³). This reduces carbon emissions during transport by 85 %!



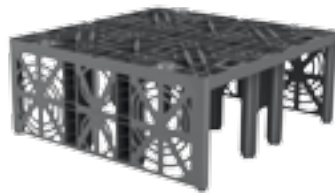
The system at a glance

EcoBloc Inspect flex

- Lorry-bearing 60 tons/HS-25
- 150 m³ (5.300 ft³)/Truck
- Inspectable
- High pressure jetting possible



Load ★★★★★
Logistics ★★★

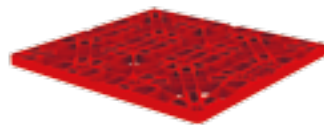


EcoBloc Inspect flex

DN 100 (4")/150 (6")/200 (8") connecting surfaces

Volume	Length	Width	Height	Weight	Colour	Order no.
205 l (54.2 US gal.)	800 mm (2' 7.5")	800 mm (2' 7.5")	320 mm (12.6")	8 kg (17.6 lbs)	grey	402005

Q Webcode G4107



EcoBloc Inspect flex base plate

Forms the foundation of the EcoBloc Inspect flex system

Volume	Length	Width	Height	Weight	Colour	Order no.
25 l (6.6 US gal.)	800 mm (2' 7.5")	800 mm (2' 7.5")	40 mm (1.6")	4 kg (8.8 lbs)	grey	402006

EcoBloc Inspect flex end plates

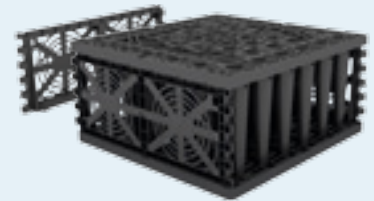
The front ends of an EcoBloc Inspect flex system are sealed by end plates with DN 100 (4")/150 (6")/200 (8") contact surfaces



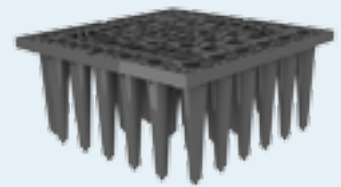
Item	Colour	Order no.
EcoBloc Inspect flex end plates (Set 2 units)	grey	402002

EcoBloc maxx

- Lorry-bearing 40 tons/HS-20
- 410 m³ (14.480 ft³)/Truck



Load ★★★★★
Logistics ★★★



EcoBloc maxx

Connecting surfaces on EcoBloc maxx end plates

Volume	Length	Width	Height	Weight	Colour	Order no.
225 l (59.4 US gal.)	800 mm (2' 7.5")	800 mm (2' 7.5")	350 mm (13.8")	9 kg (19.8 lbs)	grey	402200

Q Webcode G4108



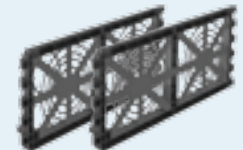
EcoBloc maxx base plate

Forms the foundation of the EcoBloc maxx system

Volume	Length	Width	Height	Weight	Colour	Order no.
25 l (6.6 US gal.)	800 mm (2' 7.5")	800 mm (2' 7.5")	40 mm (1.6")	4 kg (8.8 lbs)	grey	402201

EcoBloc maxx end plates

The outside surface of an EcoBloc maxx system is sealed by end plates with contact surfaces DN 100 (4")/150 (6")/200 (8")/250 (10")



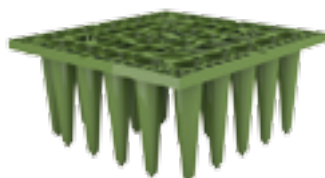
Item	Colour	Order no.
EcoBloc maxx end plates (Set 2 units)	grey	402203

EcoBloc light

- Lorry-bearing 12 tons
- 630 m³ (22.250 ft³)/Truck



Load ★★
Logistics ★★★★★

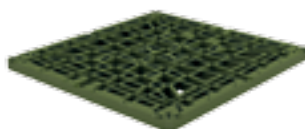


EcoBloc light

Connecting surfaces on EcoBloc light end plates

Volume	Length	Width	Height	Weight	Colour	Order no.
225 l (59.4 US gal.)	800 mm (2' 7.5")	800 mm (2' 7.5")	350 mm (13.8")	7 kg (15.4 lbs)	green	402300

[Webcode G4109](#)



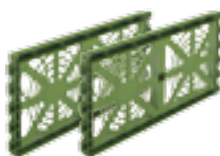
EcoBloc light base plate

Forms the foundation of the EcoBloc light system

Volume	Length	Width	Height	Weight	Colour	Order no.
25 l (6.6 US gal.)	800 mm (2' 7.5")	800 mm (2' 7.5")	40 mm (1.6")	4 kg (8.8 lbs)	green	402301

EcoBloc light end plates

The outside surface of an EcoBloc light system is sealed by end plates with contact surfaces DN 100 (4") / 150 (6") / 200 (8") / 250 (10")



Item	Colour	Order no.
EcoBloc light end plates (Set 2 units)	green	402303

EcoBloc System accessories

EcoBloc connectors

For horizontal connection



Order no. 402015	Set 10 units
Order no. 402018	Set 25 units
Order no. 402020	Set 50 units
Order no. 402025	Set 200 units

Deaeration end

DN 100 (4")



Order no. 369017

Adaptor plate



Order no. 402030	DN 300 (12")
Order no. 402031	DN 400 (16")
Order no. 402032	DN 500 (20")

GRAF-Tex geotextile

size of 2.50 x 2.50 m (8' 2.4" x 8' 2.4")

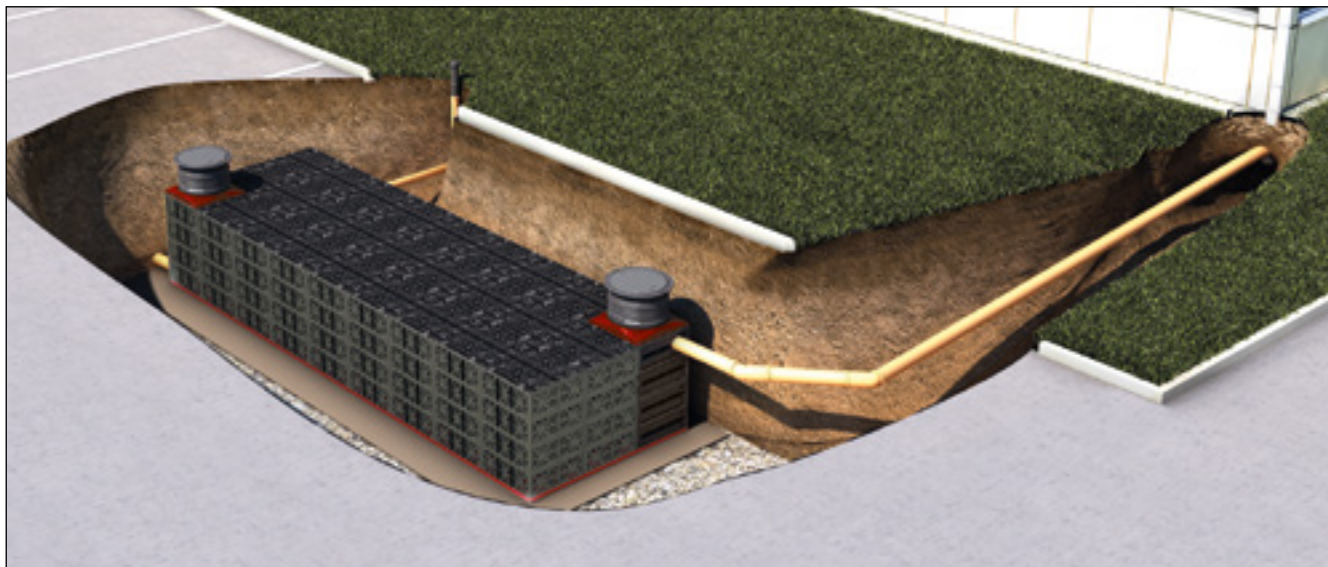


Order no. 231006

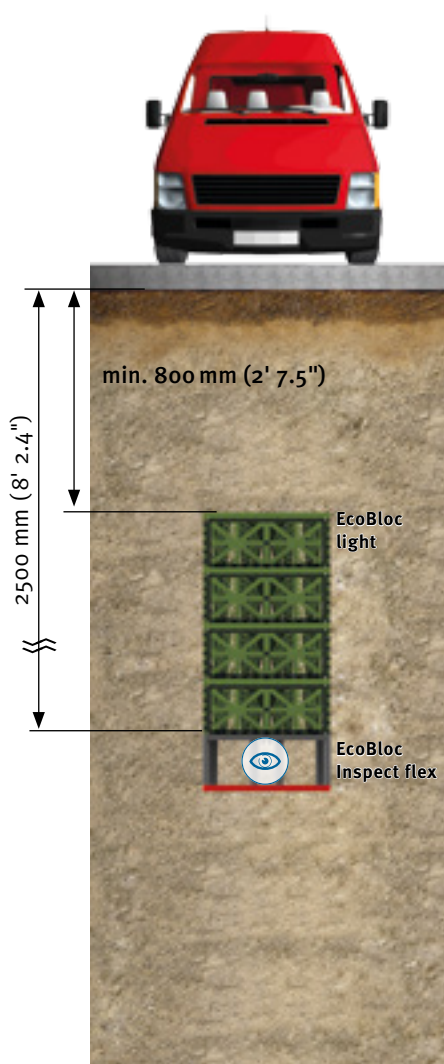
Sold by the metre, roll width 5 m (16' 4.8")

Order no. 231002

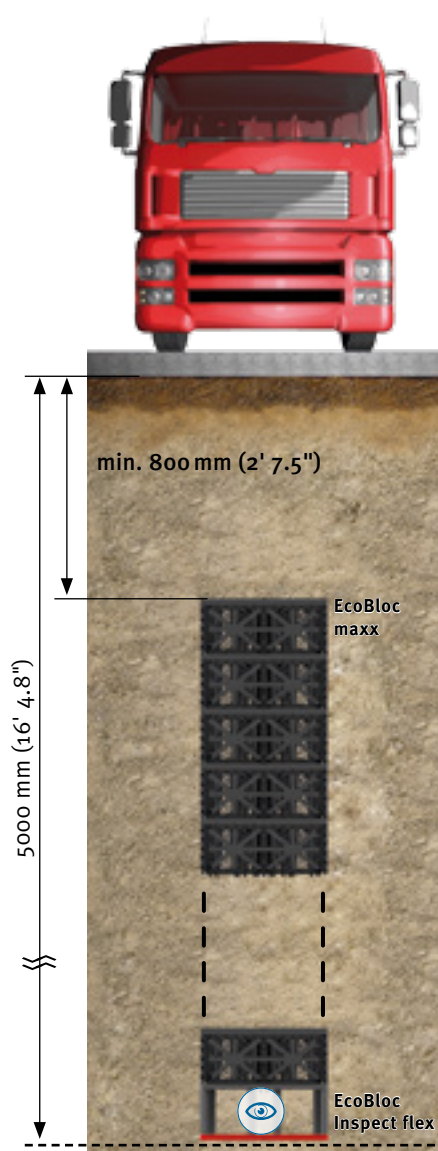
Applications and loads



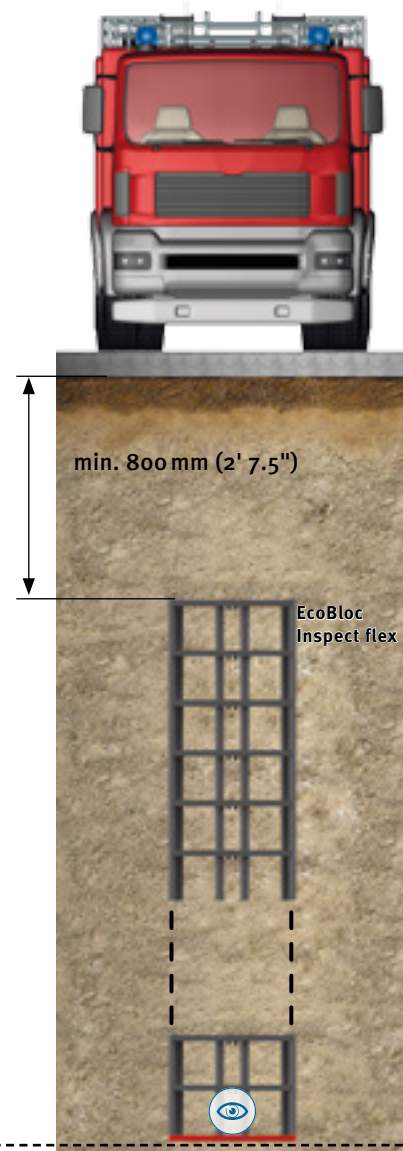
12 tons

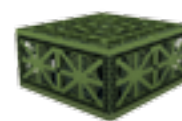


40 tons / HS-20



60 tons / HS-25





Infiltration module		EcoBloc Inspect flex	EcoBloc maxx	EcoBloc light
Gross volume		205 l (54.2 US gal.)	225 l (59.4 US gal.)	225 l (59.4 US gal.)
Net volume		195 l (51.5 US gal.)	217 l (57.3 US gal.)	219 l (57.9 US gal.)
Storage coefficient		96 %	96 %	97 %
Inspectable 		•	•	•
High pressure jetting possible		•	•	•
Load				
Load	Short-term	max. 100 kN/m ²	max. 100 kN/m ²	max. 75 kN/m ²
	Long-term	max. 59 kN/m ²	max. 59 kN/m ²	max. 35 kN/m ²
Without traffic load	min. earth covering	250 mm (9.8")	250 mm / 500 mm ¹⁾ (9.8") / (1' 7.7") ¹⁾	250 mm / o.r. ²⁾ (9.8") / o.r. ²⁾
	max. earth covering	2750 mm (9')	2750 mm / 2000 mm ¹⁾ (9') / (6' 6.7") ¹⁾	1500 mm / o.r. ²⁾ (4' 11") / o.r. ²⁾
	max. installation depth	5000 mm (16' 4.8")	5000 mm (16' 4.8")	2500 mm (8' 2.4")
	max. number of layers	14	14	6
Vehicle	min. earth covering	250 mm (9.8")	250 mm / 500 mm ¹⁾ (9.8") / (1' 7.7") ¹⁾	500 mm / o.r. ²⁾ (1' 7.7") / o.r. ²⁾
	max. earth covering	2750 mm (9')	2750 mm / 2000 mm ¹⁾ (9') / (6' 6.7") ¹⁾	1250 mm / o.r. ²⁾ (4' 1.2") / o.r. ²⁾
	max. installation depth	5000 mm (16' 4.8")	5000 mm (16' 4.8")	2250 mm (7' 4.6")
	max. number of layers	14	14	4
Lorry 12	min. earth covering	500 mm (1' 7.7")	500 mm / 800 mm ¹⁾ (1' 7.7") / (2' 7.5") ¹⁾	800 mm / o.r. ²⁾ (2' 7.5") / o.r. ²⁾
	max. earth covering	2750 mm (9')	2750 mm / 2000 mm ¹⁾ (9') / (6' 6.7") ¹⁾	1000 mm / o.r. ²⁾ (3' 3.3") / o.r. ²⁾
	max. installation depth	5000 mm (16' 4.8")	5000 mm (16' 4.8")	2250 mm (7' 4.6")
	max. number of layers	13	13	4
Lorry 30	min. earth covering	500 mm (1' 7.7")	500 mm / 800 mm ¹⁾ (1' 7.7") / (2' 7.5") ¹⁾	800 mm / o.r. ²⁾ (2' 7.5") / o.r. ²⁾
	max. earth covering	2500 mm (8' 2.4")	2500 mm / 1750 mm ¹⁾ (8' 2.4") / (5' 8.9") ¹⁾	1750 mm / o.r. ²⁾ (5' 8.9") / o.r. ²⁾
	max. installation depth	5000 mm (16' 4.8")	5000 mm (16' 4.8")	2500 mm (8' 2.4")
	max. number of layers	13	13	13
Lorry 40/HS-20	min. earth covering	500 mm (1' 7.7")	800 mm (2' 7.5") ¹⁾	800 mm (2' 7.5") ¹⁾
	max. earth covering	2250 mm (7' 4.5")	2250 mm / 1500 mm ¹⁾ (7' 4.5") / (4' 11") ¹⁾	1500 mm / o.r. ²⁾ (4' 11") / o.r. ²⁾
	max. installation depth	5000 mm (16' 4.8")	5000 mm (16' 4.8")	5000 mm (16' 4.8")
	max. number of layers	13	11	11
Lorry 60/HS-25	min. earth covering	800 mm (2' 7.5")	800 mm (2' 7.5")	800 mm (2' 7.5")
	max. earth covering	2250 mm (7' 4.5")	2250 mm (7' 4.5")	2250 mm (7' 4.5")
	max. installation depth	5000 mm (16' 4.8")	5000 mm (16' 4.8")	5000 mm (16' 4.8")
	max. number of layers	13	13	13
Connections				
DN 100 (4")		•	•	•
DN 150 (6")		•	•	•
DN 200 (8")		•	•	•
DN 250 (10")		–	•	•
DN 300 (12")		• 3), 4)	• 3), 4)	• 3), 4)
DN 400 (16")		• 3), 4)	• 3), 4)	• 3), 4)
DN 500 (20")		• 4)	• 4)	• 4)
Measurements				
Length		800 mm (2' 7.5")	800 mm (2' 7.5")	800 mm (2' 7.5")
Width		800 mm (2' 7.5")	800 mm (2' 7.5")	800 mm (2' 7.5")
Height		320 mm (12.6")	350 mm (13.8")	350 mm (13.8")
Weight		8 kg (17.6 lbs)	9 kg (19.8 lbs)	7 kg (15.4 lbs)

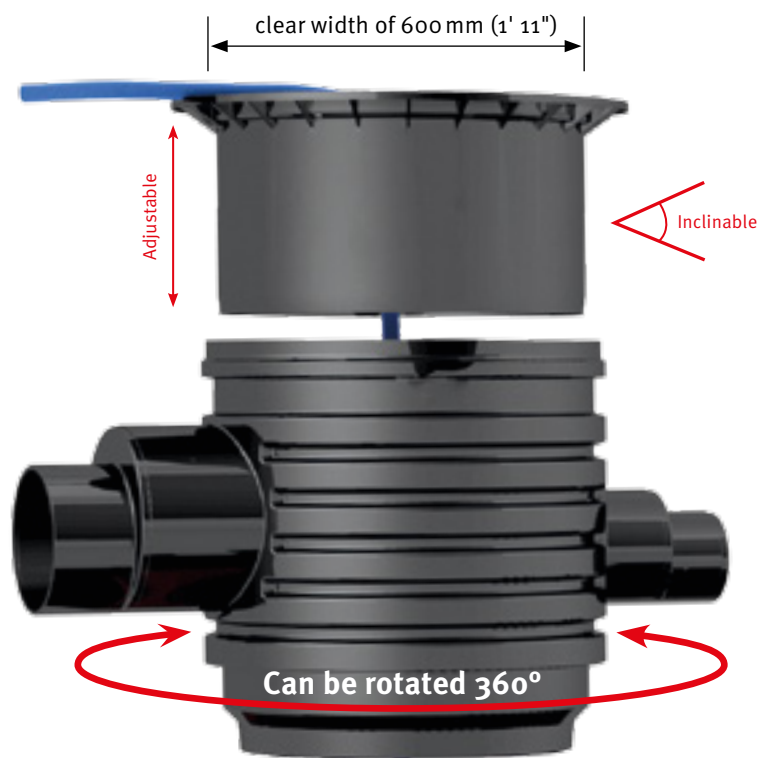
¹⁾ When combined with EcoBloc Inspect flex

²⁾ Values on request when combined with EcoBloc Inspect flex

³⁾ Optionally available with Vario shaft (page 12)

⁴⁾ Optionally available with adaptor plates (page 9)

Vario 800 flex shaft system



Flexible use

The GRAF Vario 800 shaft provides easy access to all EcoBloc modules. It can be used in many different ways:

- ✓ As an inspection shaft
- ✓ As an inlet shaft
- ✓ As a filter shaft
- ✓ As a flow control shaft

Easy to inspect

The Vario 800 shaft allows easy access to the EcoBloc system by commercially available inspection cameras. This has been confirmed by several independent testing authorities.

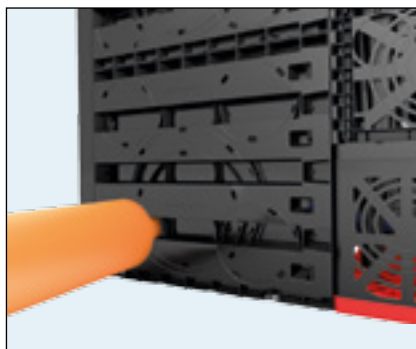


No tools required



Lorry-bearing up to 60 tons

The GRAF Vario 800 shaft has a heavy-duty lorry-bearing capacity of 60 tons with an 800 mm (2' 7.5") earth covering. The fibreglass reinforced material gives the shaft extra strength.



Connection surfaces up to DN 400 (16")

The Vario 800 comes with DN 200 (8"), DN 300 (12") and DN 400 (16") connection surfaces. The optional, freely rotating inlet module can be connected to pipes of sizes DN 150 (6"), DN 200 (8"), DN 250 (10") and DN 300 (12").



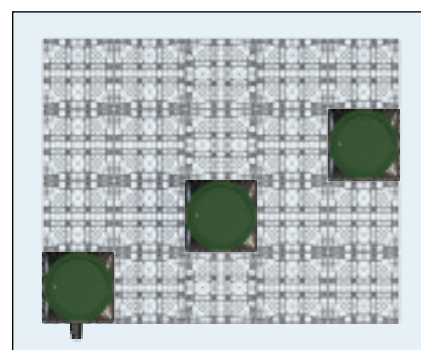
Wide access

The Vario 800 is terminated at the top by GRAF telescopic dome shafts. With a clear width of 600 mm, it gives easy access to the shaft. The base of the shaft itself is 800 x 800 mm (2' 7.5") x (2' 7.5") in size, providing sufficient space for all possible applications.



No additional excavation

The Vario 800 flex shaft system can be directly installed in an EcoBloc infiltration or detention system. The connection surfaces of the inspection channels in the Vario 800 flex shaft system are accurately matched to the EcoBloc system.



Can be positioned in any location

The dimensions of the Vario 800 shaft enable free positioning within the EcoBloc system. The corner position enables the connection of large pipe diameters of up to DN 400 (16") on the two side panels. The central position offers ideal access to the inspection camera from all directions. Using the optional inlet module, a connection of up to DN 300 (12") can be made with a freely defined angle.

Vario 800 flex shaft system



Vario 800 flex, type 1

shaft body for one or more layer of EcoBloc system

Volume	Length	Width	Height	Weight	Colour	Order no.
230 l (60.7 US gal.)	800 mm (2' 7.5")	800 mm (2' 7.5")	355 mm (1' 2")	16 kg (35.3 lbs)	grey	450050

[Webcode G9303](#)



Vario 800 flex, type 2

shaft body for two or more layer of EcoBloc system

Volume	Length	Width	Height	Weight	Colour	Order no.
420 l (113.5 US gal.)	800 mm (2' 7.5")	800 mm (2' 7.5")	660 mm (2' 2")	27 kg (59.5 lbs)	grey	450051



Vario 800 flex, base/cover set

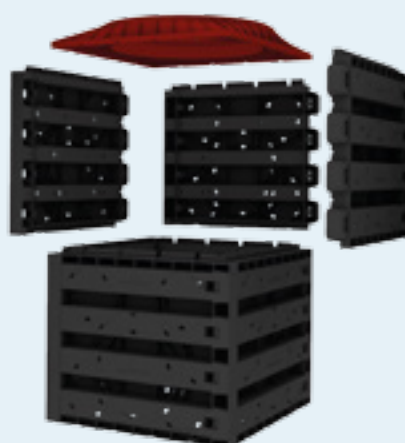
base- and cover for Vario 800 flex shaft

Item	Colour	Order no.
set consisting out of Vario base- and cover plate	grey	450052



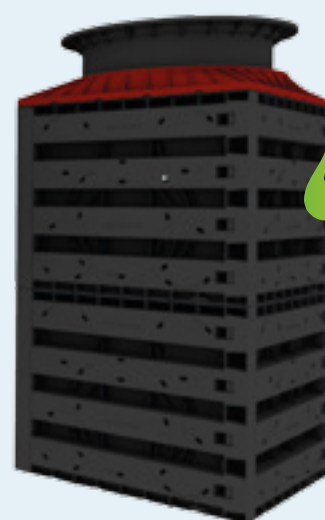
1. Stackable

To save space during transport and storage, the parts of the Vario 800 are stacked into each other. This minimizes transport costs and CO₂ emissions.



2. Easy installation

Groups of four wall elements are connected in a few simple steps and without tools to form a single height unit of the Vario 800. The height can be easily adjusted to the EcoBloc tank depth. A shaft cover and base plate complete the element.



3. Ready

GRAF accessory components can now be added to the Vario 800 shaft as required.



Shaft components

Infiltration filter strainer DN 600 (24")

Made entirely from stainless steel, mesh width 0.75 mm (0.03")

Order no. 340523



Infiltration inlet module DN 600 (24")

Incl. profile seal for telescopic dome shaft; DN 150 (6")/ DN 200 (8")/ DN 250 (10")/ DN 300 (12") connections

Order no. 330360



Infiltration connecting piece 1000 DN 600 (24")

With DN 200 (8") contact surface, incl. profile seal, length 1000 mm (3' 3.3"), 750 mm (2' 5.5"), 500 mm (1' 7.7")

Order no. 371015



Infiltration connecting piece 1000 DN 600 (24")

With DN 200 (8") pipe connections, incl. profile seal, length 1000 mm (3' 3.3"), 750 mm (2' 5.5"), 500 mm (1' 7.7")

Order no. 371016



Retention accessories

Choke drain DN 100 (4")

Incl. emergency overflow and DN 100 (4") connector seal; flow rate of 1.0 l (0.26 US gal.)/sec. up to 6.5 l (1.72 US gal.)/sec.

Order no. 330547



Choke drain DN 150 (6")

Incl. emergency overflow and DN 150 (6") connector seal; flow rate of 2.0 l (0.53 US gal.)/sec. up to 16 l (4.22 US gal.)/sec.

Order no. 330598



Tank Covers

Mini telescopic dome shaft

Suitable for pedestrian loading, height adjustable from 140 – 340 mm (5.5" – 13.4")

Order no. 371010



Maxi telescopic dome shaft

Suitable for pedestrian loading, height adjustable from 140 – 440 mm (5.5" – 17.3")

Order no. 371011



Cast iron telescopic dome shaft

Suitable for vehicle loading, height adjustable from 140 – 440 mm (5.5" – 17.3")

Order no. 371020



Telescopic dome shaft lorry

Suitable for lorry-bearing loading, height adjustable from 140 – 440 mm (5.5" – 17.3")

Order no. 371021



Cover and compensating ring to be provided on site



RAINWATER HARVESTING



INFILTRATION



WASTEWATER TREATMENT SOLUTIONS



MULTIPURPOSE CONTAINERS



Your expert specialist dealer:

Rainwater harvesting solutions

For more information about our rainwater harvesting solutions, ask for our catalogue.

Prices:

A price list with our export conditions is available on request.

Warranty clause:

The warranty mentioned in this brochure only refers to the tank in question and not to the accessories. Within the warranty period we grant free replacement of the material. Further benefits are excluded. Pre-condition for warranty benefits are proper handling, assembly and installation according to the mounting guidelines.

N.B. Protect tanks from frost when installed above ground! In case of groundwater installation, please contact us for further information prior to purchase!

For all dimensions and abstracts provided in this brochure, we reserve a tolerance of $\pm 3\%$. Depending on the connection type, the useful volume of the underground tanks may be up to 10% below the tank capacity.

Subject to technical modifications and errors. Design details, methods and standards of individual products may change as a result of technical advancements and environmental regulations.

For all our offers and conclusions of contract, only our General Terms and Conditions of Business dated 01/10/2012 shall apply, which we will send to you on request.

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Hydro WMS Ltd - 1.0mm LLDPE Geomembrane Specification

Properties	Test Method	Nominal Values
Thickness (mm)	ASTM D 5199	1.0
Multi-axial strain (%)	ASTM D 5617	70
Low temperature brittleness (°C)	ASTM D 746, cond B	> -77
Oxidative induction time (minutes)	ASTM D 3895 (200°C, Pure O ₂ 1Atm)	100
Dimensional stability (each direction) %	ASTM D 1204 (100°C 1 hour)	±2
Melt flow Index g/10 minutes	ASTM D 1238	≤1.2
Water Permeability	m ³ /m ² .day	<1.1 ⁻⁶
Stress Crack Resistance	h	>300
		Minimum Values
Thickness (mm)	ASTM D 5199	0.91
Density g.cm ⁻³	ASTM D 792/1505A	0.92
Tensile Strength at break (N/mm)	UN-EN ISO 527 Type V	31 (26)
Elongation at break	G.L. (50mm)	800 (≥750)
Tear resistance (N)	ASTM D 1004	≤100
Puncture resistance (KN)	SM D 4833	2.5
Carbon Black content (%)	ASTM D 1603	2.0 – 2.5

Values Shown are medium – Values in brackets () with 95% confidence level

**pH - Resistant to all naturally occurring soil acids and alkalis

***Chemical/biological resistance - Resistance to all substances found to naturally occur in soils and rainwater. Detailed information would need to be provided to geomembrane manufacturer in instances of contaminated land.

Hydro WMS Ltd - 300gsm Protection Geotextile Specification

Needle punched, thermally bonded non-woven Polypropylene geotextile

	Test Method	Typical Value
Mechanical Properties		
Tensile strength MD	EN ISO 10319	24 kN/m
Tensile strength CD		24 kN/m
Elongation MD	EN ISO 10319	65%
Elongation CD		75.0%
Static puncture Resistance - CBR	EN ISO 12236	3.7 kN
Dynamic perforation resistance cone drop	EN ISO 13433	15.0 mm
Protection efficiency	EN ISO 14574	300 KPA – 2.17 600 KPA – 3.98 1200 KPA – 6.89
Hydraulic Properties		
Water permeability normal to the plane	EN ISO 11058	34 x10 ⁻³ m/s
Water flow normal to the plane	EN ISO 11058	34 l/m ² .s
Water flow capacity in the plane 20kPa	EN ISO 12958	8 x 10 ⁻⁶ m ² /s
Characteristic opening size (AO3)	EN ISO 12956	50.0µm
Physical Properties		
Thickness under 2 kPa	EN ISO 9853-1	1.25 mm
Weight	EN ISO 9864	300 g/m ²
Composition	100% Polypropylene non-woven geotextile	

Hydro Water Management Solutions Maintenance Requirements

Regular inspection and maintenance is required to ensure the effective long term operation of below ground modular storage systems. The following table details the recommended maintenance requirements for modular systems.

Maintenance schedule	Required action	Frequency
Regular maintenance	Inspect and identify any areas that are not operating correctly. If required take remedial action.	Monthly for 3 months then annually
	Debris removal from catchment surface (where may cause risk to performance)	Monthly or as required
	Remove sediment from pre-treatment structures and/or manifold connections	Monthly or as required
Remedial actions	Repair/rehabilitation of inlets/outlets, overflows and vents	Annual inspection or as required
Monitoring	Inspect/check all inlets, outlets, vents and overflows to ensure that they are in good condition and operating as designed	Annually
	Survey inside of tank for sediment build up and remove if necessary	Annually and after large storms

The maintenance plan and schedule should be developed during the design phase. Specific maintenance requirements should be identified based on upstream drainage sedimentation controls and the schedule developed to suit these needs.

Maintenance details should be detailed in the project Health & safety file and a risk assessment should be undertaken and recorded.

Note,

It is generally recommended that the cells be flushed through with large volumes of water under low pressure.

Certain modular units will allow higher pressure jetting to remove larger objects or heavier deposits of sediment. These modules can be accessed via integral access chambers (where applicable) and surveyed/flushed in a linear fashion or alternately water can be flushed/jetted through via the inlet/outlet pipe connections.

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APPENDIX D – CONTRACTORS PHOTOGRAPHS







