HALSTON

ENGINEERING REPORTS

(PROJECT 3)

HALSTON

Drawing Register				
Project Name	**Coolpowra GIS**			
Project No.	**SEP-0398**			
Stage	**Planning**			
Distribution	**Issue Number**	**1**	**2**	**3**
	Issue Date	22.03.2024	17.04.2024	07.06.2024
	Issued By:	SK	SK	SK
Galway County Council		E	E	E&1H
An Bord Pleanála		E	E	E&5H
Drawing	**Title**			
CPA-HAL-SS-XX-DR-PL-2000	Proposed Site Location	P01		P02
CPA-HAL-SS-XX-DR-PL-2010A	Proposed Site Layout	P01		P02
CPA-HAL-SS-XX-DR-PL-2010B	Proposed Site Layout	P01		P02
CPA-HAL-SS-XX-DR-PL-2010C	Proposed Site Layout			P02
CPA-HAL-SS-XX-DR-PL-2010D	Proposed Site Layout			P01
CPA-HAL-SS-XX-DR-PL-2020A	Proposed Surface Water and Foul Water Site Layout			P01
CPA-HAL-SS-XX-DR-PL-2020B	Proposed Surface Water and Foul Water Site Layout			P01
CPA-HAL-SS-XX-DR-PL-2020C	Proposed Surface Water and Foul Water Site Layout			P01
CPA-HAL-SS-XX-DR-PL-2020D	Proposed Surface Water and Foul Water Site Layout			P01
CPA-HAL-SS-XX-DR-PL-2030	Proposed Water Main Layout			P01
CPA-HAL-SS-XX-DR-PL-2100	GIS Building Details	P01	P02	P03
CPA-HAL-SS-XX-DR-PL-2110	GIS Compound Elevations			P01
CPA-HAL-SS-XX-DR-PL-2300	Fence and Light Details			P01
CPA-HAL-SS-XX-DR-PL-2400	Stream Crossing and Culvert Details			P01
CPA-HAL-SS-XX-DR-PL-2500	Road and Filter Drainage Details			P01
CPA-HAL-SS-XX-DR-PL-2600	Existing Dwellling and sheds for demolition			P01

Issue type:
H = Hardcopy
F = Fax
E = electronic

Project:	Date:		
COOLPOWRA	30/04/2024		
	Designed by:	Checked by:	Approved By:
FILTER DRAIN EXAMPLE	TG & JH	DML	DML
Report Details:	Company::		
Type: Stormwater Controls Storm Phase: Access Road	LALLY CHARTERED ENGINEERS Udaras Business Park Tourmakeady, Co. Mayo		

Infiltration Trench

Type : Infiltration Trench

Dimensions

Exceedance Elevation (m)	53.000
Depth (m)	1.000
Base Elevation (m)	52.000
Freeboard (mm)	0
Porosity (%)	30
Length (m)	5.000
Long. Slope (1:x)	500.00
Width (m)	0.750
Total Volume (m³)	1.187

Under Drain

Height Above Base (m)	0.150
Diameter (mm)	150
No. of Barrels	1
Release Height (m)	0.700
Friction Scheme	Manning's n
n	0.015

Inlets

Inlet (1)

Inlet Type	Point Inflow
Incoming Item(s)	Catchment Area
Bypass Destination	(None)
Capacity Type	No Restriction

Advanced

Base Infiltration Rate (m/hr)	0.16
Side Infiltration Rate (m/hr)	0.16
Safety Factor	1.0
Conductivity (m/hr)	50.0

Project:	Date:		
COOLPOWRA	30/04/2024		
	Designed by:	Checked by:	Approved By:
FILTER DRAIN EXAMPLE	TG & JH	DML	DML
Report Details:	Company::		
Type: Inflow Summary Storm Phase: Access Road	LALLY CHARTERED ENGINEERS Udaras Business Park Tourmakeady, Co. Mayo		

Inflow Label	Connected To	Flow (L/s)	Runoff Method	Area (ha)	Percentage Impervious (%)	Urban Creep (%)	Adjusted Percentage Impervious (%)	Area Analyzed (ha)
Catchment Area	Infiltration Trench		Time of Concentration	0.002	100	0	100	0.002
TOTAL		**0.0**		**0.002**				**0.002**

Project:	Date:		
COOLPOWRA	30/04/2024		
	Designed by:	Checked by:	Approved By:
FILTER DRAIN EXAMPLE	TG & JH	DML	DML
Report Title:	Company::		
Rainfall Analysis Criteria	LALLY CHARTERED ENGINEERS Udaras Business Park Tourmakeady, Co. Mayo		

Runoff Type	Dynamic
Output Interval (mins)	15
Time Step	Default
Urban Creep	Apply Global Value
Urban Creep Global Value (%)	0
Junction Flood Risk Margin (mm)	300
Perform No Discharge Analysis	☑
Rainfall Depth (mm)	1.0
Run Time (mins)	1440

Rainfall

Rain 1

Type: FSR

Region	Scotland and Ireland
M5-60 (mm)	14.5
Ratio R	0.300
Summer	☑
Winter	☑

Return Period

Return Period (years)	Increase Rainfall (%)
100.0	20.000

Storm Durations

Duration (mins)	Run Time (mins)
15	30
30	60
60	120
120	240
240	480
360	720
480	960
960	1920
1440	2880

Project:	Date:		
COOLPOWRA	30/04/2024		
	Designed by:	Checked by:	Approved By:
FILTER DRAIN EXAMPLE	TG & JH	DML	DML
Report Details:	Company::		
Type: Stormwater Controls Summary Storm Phase: Access Road	LALLY CHARTERED ENGINEERS Udaras Business Park Tourmakeady, Co. Mayo		

Rain 1: 100 years: Increase Rainfall (%): +20: Critical Storm Per Item: Rank By: Max. Avg. Depth

Stormwater Control	Storm Event	Max. US Elevation (m)	Max. DS Elevation (m)	Max. US Depth (m)	Max. DS Depth (m)	Max. Inflow (L/s)	Max. Resident Volume (m³)	Max. Flooded Volume (m³)	Total Lost Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Percentage Available (%)	Status
Infiltration Trench	Rain 1: 100 years: +20 %: 15 mins: Winter	52.175	52.082	0.165	0.082	0.2	0.140	0.000	0.269	0.0	0.000	88.245	OK

Project:	Date:		
COOLPOWRA	20/05/2024		
	Designed by:	Checked by:	Approved By:
	TG & JH	DML	DML
Report Details:	Company Address:		
Type: Junctions Storm Phase: GIS	LALLY CHARTERED ENGINEERS Udaras Business Park Tourmakeady, Co.Mayo		

Name	Junction Type	Easting (m)	Northing (m)	Cover Elevation (m)	Depth (m)	Invert Elevation (m)	Chamber Shape	Diameter (m)
MH201	Manhole	582166.007	709175.040	50.600	1.425	49.175	Circular	1.200
MH202	Manhole	582109.827	709161.828	49.750	1.715	48.035	Circular	1.200
MH203	Manhole	582069.530	709151.435	49.500	1.675	47.825	Circular	1.200
MH204	Manhole	582022.668	709139.401	49.250	1.670	47.580	Circular	1.200
MH205	Manhole	581993.859	709143.959	49.150	1.717	47.433	Circular	1.200
MH206	Simple Junction	581985.021	709176.481					
MH202.1	Manhole	582107.221	709181.736	49.550	1.415	48.135	Circular	1.200

Name	Access Required	Intersection Easting (m)	Intersection Northing (m)	Lock
MH201	☑	582166.007	709175.040	None
MH202	☑	582109.827	709161.828	None
MH203	☑	582069.530	709151.435	None
MH204	☑	582022.668	709139.401	None
MH205	☑	581993.859	709143.959	None
MH206				
MH202.1	☑	582107.221	709181.736	None

Inlets

Junction	Inlet Name	Incoming Item(s)	Bypass Destination	Capacity Type
MH201	Inlet	Catchment Area 6	(None)	No Restriction
MH202	Inlet	Catchment Area 5 P201.000 P202.100	(None)	No Restriction
MH203	Inlet	Catchment Area 4	(None)	No Restriction
	Inlet (1)	P201.001 Catchment Area 3	(None)	No Restriction
MH204	Inlet	Catchment Area 2 P201.002	(None)	No Restriction
MH205	Inlet	Catchment Area 1 P201.003	(None)	No Restriction
MH206	Inlet	P201.005	(None)	No Restriction
MH202.1	Inlet	Catchment Area	(None)	No Restriction

Outlets

Junction	Outlet Name	Outgoing Connection	Outlet Type
MH201	Outlet	P201.000	Free Discharge
MH202	Outlet	P201.001	Free Discharge
MH203	Outlet	P201.002	Free Discharge
MH204	Outlet	P201.003	Free Discharge
MH205	Outlet	P201.004	Free Discharge
MH202.1	Outlet	P202.100	Free Discharge

Project:	Date:		
COOLPOWRA	20/05/2024		
	Designed by:	Checked by:	Approved By:
	TG & JH	DML	DML
Report Details:	Company Address:		
Type: Stormwater Controls Storm Phase: GIS	LALLY CHARTERED ENGINEERS Udaras Business Park Tourmakeady, Co.Mayo		

Cellular Storage

Type : Cellular Storage

Dimensions

Exceedance Elevation (m)	48.805
Depth (m)	1.650
Base Elevation (m)	47.150
Number of Crates Long	22
Number of Crates Wide	8
Number of Crates High	5
Porosity (%)	95
Crate Length (m)	0.8
Crate Width (m)	0.8
Crate Height (m)	0.33
Total Volume (m³)	176.568

Inlets

Inlet

Inlet Type	Point Inflow
Incoming Item(s)	P201.004
Bypass Destination	(None)
Capacity Type	No Restriction

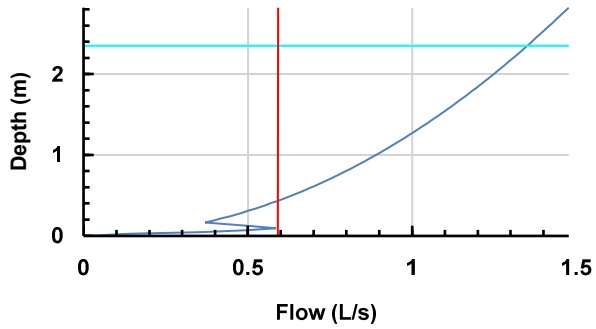
Outlets

Outlet

Outgoing Connection	P201.005
Outlet Type	Hydro-Brake®

Invert Elevation (m)	47.150
Design Depth (m)	2.350
Design Flow (L/s)	1.35
Objective	Minimize Upstream Storage Requirements
Application	Surface Water Only
Sump Available	☐

Unit Reference	CHE-0043-1350-2350-1350



Advanced

Side Infiltration Rate (m/hr)	0.0
Safety Factor	2.0

Project:	Date:		
COOLPOWRA	20/05/2024		
	Designed by:	Checked by:	Approved By:
	TG & JH	DML	DML
Report Details:	Company Address:		
Type: Connections Storm Phase: GIS	LALLY CHARTERED ENGINEERS Udaras Business Park Tourmakeady, Co.Mayo		

Name	Length (m)	Connection Type	Slope (1:x)	Manning's n	Colebrook-White Roughness (mm)	Diameter / Base Width (mm)	Upstream Cover Elevation (m)	Upstream Invert Elevation (m)
P201.000	57.713	Pipe	67.897		0.6	225	50.600	49.175
P201.001	41.616	Pipe	198.171		0.6	225	49.750	48.035
P201.002	48.382	Pipe	200.000		0.6	225	49.500	47.825
P201.003	29.168	Pipe	200.000		0.6	225	49.250	47.580
P201.004	13.172	Pipe	46.488		0.6	225	49.150	47.433
P201.005	18.443	No Delay						
P202.100	20.078	Pipe	200.000		0.6	225	49.550	48.135

Name	Downstream Cover Elevation (m)	Downstream Invert Elevation (m)	Part Family	Lock	Flow Restriction (L/s)
P201.000	49.750	48.325		None	
P201.001	49.500	47.825		None	
P201.002	49.250	47.583		None	
P201.003	49.150	47.434		None	
P201.004	48.805	47.150		None	
P201.005					
P202.100	49.750	48.035		None	

Project:	Date:		
COOLPOWRA	20/05/2024		
	Designed by:	Checked by:	Approved By:
	TG & JH	DML	DML
Report Details:	Company Address:		
Type: Manhole Schedule Storm Phase: GIS	LALLY CHARTERED ENGINEERS Udaras Business Park Tourmakeady, Co.Mayo		

Name	Cover Elevation (m) Invert Elevation (m)	Manhole Size (m)	Connection Details				Type
Coordinates (m)	Depth (m)		Incoming Connections	Connection Type	Connection Invert (m)	Connection Size (mm)	Junction Type
			Outgoing Connections				Cover
MH201	50.600 49.175	Diameter / Length: 1.200					Manhole - Access Required
E:582166.007 N:709175.040	1.425		{a} P201.000	Pipe	49.175	Diam/Width:225	Not Applicable
MH202	49.750 48.035	Diameter / Length: 1.200	{1} P201.000 {2} P202.100	Pipe Pipe	48.325 48.035	Diam/Width:225 Diam/Width:225	Manhole - Access Required
E:582109.827 N:709161.828	1.715		{a} P201.001	Pipe	48.035	Diam/Width:225	Not Applicable
MH203	49.500 47.825	Diameter / Length: 1.200	{1} P201.001	Pipe	47.825	Diam/Width:225	Manhole - Access Required
E:582069.530 N:709151.435	1.675		{a} P201.002	Pipe	47.825	Diam/Width:225	Not Applicable
MH204	49.250 47.580	Diameter / Length: 1.200	{1} P201.002	Pipe	47.583	Diam/Width:225	Manhole - Access Required
E:582022.668 N:709139.401	1.670		{a} P201.003	Pipe	47.580	Diam/Width:225	Not Applicable

Project:	Date:		
COOLPOWRA	20/05/2024		
	Designed by:	Checked by:	Approved By:
	TG & JH	DML	DML
Report Details:	Company Address:		
Type: Manhole Schedule Storm Phase: GIS	LALLY CHARTERED ENGINEERS Udaras Business Park Tourmakeady, Co.Mayo		

Name	Cover Elevation (m) Invert Elevation (m)	Manhole Size (m)	Connection Details				Type
Coordinates (m)	Depth (m)		Incoming Connections	Connection Type	Connection Invert (m)	Connection Size (mm)	Junction Type
			Outgoing Connections				Cover
MH205	49.150 47.433	Diameter / Length: 1.200	{1} P201.003	Pipe	47.434	Diam/Width:225	Manhole - Access Required
E:581993.859 N:709143.959	1.717		{a} P201.004	Pipe	47.433	Diam/Width:225	Not Applicable
MH206		Diameter / Length: 1.200	{1} P201.005	No Delay	Not Applicable	Not Applicable	Simple Junction
E:581985.021 N:709176.481							Not Applicable
MH202.1	49.550 48.135	Diameter / Length: 1.200					Manhole - Access Required
E:582107.221 N:709181.736	1.415		{a} P202.100	Pipe	48.135	Diam/Width:225	Not Applicable

Project:	Date:		
COOLPOWRA	20/05/2024		
	Designed by:	Checked by:	Approved By:
	TG & JH	DML	DML
Report Details:	Company Address:		
Type: Inflow Summary Storm Phase: GIS	LALLY CHARTERED ENGINEERS Udaras Business Park Tourmakeady, Co.Mayo		

Inflow Label	Connected To	Flow (L/s)	Runoff Method	Area (ha)	Percentage Impervious (%)	Urban Creep (%)	Adjusted Percentage Impervious (%)	Area Analyzed (ha)
Catchment Area	MH202.1		Time of Concentration	0.041	100	0	100	0.041
Catchment Area 1	MH205		Time of Concentration	0.045	100	0	100	0.045
Catchment Area 2	MH204		Time of Concentration	0.023	100	0	100	0.023
Catchment Area 3	MH203		Time of Concentration	0.157	100	0	100	0.157
Catchment Area 4	MH203		Time of Concentration	0.018	100	0	100	0.018
Catchment Area 5	MH202		Time of Concentration	0.023	100	0	100	0.023
Catchment Area 6	MH201		Time of Concentration	0.030	100	0	100	0.030
TOTAL		**0.0**		**0.336**				**0.336**

Project:	Date:		
COOLPOWRA	20/05/2024		
	Designed by:	Checked by:	Approved By:
	TG & JH	DML	DML
Report Details:	Company Address:		
Type: Outfall Details Storm Phase: GIS	LALLY CHARTERED ENGINEERS Udaras Business Park Tourmakeady, Co.Mayo		

Outfalls

Outfall	Outfall Type	Fixed Surcharged Elevation (m)	Elevation Curve
MH206	Free Discharge		

Project:	Date:		
COOLPOWRA	20/05/2024		
	Designed by:	Checked by:	Approved By:
	TG & JH	DML	DML
Report Title:	Company Address:		
Rainfall Analysis Criteria	LALLY CHARTERED ENGINEERS Udaras Business Park Tourmakeady, Co.Mayo		

Runoff Type	Dynamic
Output Interval (mins)	15
Time Step	Default
Urban Creep	Apply Global Value
Urban Creep Global Value (%)	0
Junction Flood Risk Margin (mm)	300
Perform No Discharge Analysis	☑
Rainfall Depth (mm)	1.0
Run Time (mins)	1440

Rainfall

Rain 1

Type: FSR

Region	Scotland and Ireland
M5-60 (mm)	14.5
Ratio R	0.300
Summer	☑
Winter	☑

Return Period

Return Period (years)	Increase Rainfall (%)
1.0	0.000
30.0	20.000
100.0	20.000

Storm Durations

Duration (mins)	Run Time (mins)
15	30
30	60
60	120
120	240
240	480
360	720
480	960
960	1920
1440	2880

Project: COOLPOWRA	Date: 20/05/2024		
	Designed by: TG & JH	Checked by: DML	Approved By: DML
Report Details: Type: Junctions Summary Storm Phase: GIS	Company Address: LALLY CHARTERED ENGINEERS Udaras Business Park Tourmakeady, Co.Mayo		

Rain 1: 1 years: Increase Rainfall (%): +0: Critical Storm Per Item: Rank By: Max. Depth

Junction	Storm Event	Cover Elevation (m)	Invert Elevation (m)	Max. Elevation (m)	Max. Depth (m)	Max. Inflow (L/s)	Max. Resident Volume (m³)	Max. Flooded Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Status
MH201	Rain 1: 1 years: +0 %: 30 mins: Winter	50.600	49.175	49.201	0.026	2.1	0.029	0.000	1.8	1.935	OK
MH202	Rain 1: 1 years: +0 %: 30 mins: Winter	49.750	48.035	48.092	0.057	6.0	0.065	0.000	5.4	5.977	OK
MH203	Rain 1: 1 years: +0 %: 30 mins: Winter	49.500	47.825	47.931	0.106	17.5	0.120	0.000	15.4	16.833	OK
MH204	Rain 1: 1 years: +0 %: 15 mins: Winter	49.250	47.580	47.687	0.107	12.8	0.121	0.000	16.3	13.655	OK
MH205	Rain 1: 1 years: +0 %: 1440 mins: Winter	49.150	47.433	47.622	0.189	2.5	0.213	0.000	2.5	86.113	OK
MH206	Rain 1: 1 years: +0 %: 15 mins: Summer				0.000	0.6			0.6	0.598	OK
MH202.1	Rain 1: 1 years: +0 %: 30 mins: Winter	49.550	48.135	48.176	0.041	2.8	0.046	0.000	2.7	2.605	OK

Project: COOLPOWRA	Date: 20/05/2024		
	Designed by: TG & JH	Checked by: DML	Approved By: DML
Report Details: Type: Junctions Summary Storm Phase: GIS	Company Address: LALLY CHARTERED ENGINEERS Udaras Business Park Tourmakeady, Co.Mayo		

Rain 1: 30 years: Increase Rainfall (%): +20: Critical Storm Per Item: Rank By: Max. Depth

Junction	Storm Event	Cover Elevation (m)	Invert Elevation (m)	Max. Elevation (m)	Max. Depth (m)	Max. Inflow (L/s)	Max. Resident Volume (m³)	Max. Flooded Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Status
MH201	Rain 1: 30 years: +20 %: 30 mins: Winter	50.600	49.175	49.218	0.043	5.6	0.049	0.000	5.0	5.163	OK
MH202	Rain 1: 30 years: +20 %: 1440 mins: Winter	49.750	48.035	48.379	0.344	1.6	0.389	0.000	1.6	55.044	Surcharged
MH203	Rain 1: 30 years: +20 %: 1440 mins: Winter	49.500	47.825	48.379	0.554	4.6	0.627	0.000	4.6	158.071	Surcharged
MH204	Rain 1: 30 years: +20 %: 1440 mins: Winter	49.250	47.580	48.379	0.799	5.0	0.903	0.000	4.8	170.116	Surcharged
MH205	Rain 1: 30 years: +20 %: 1440 mins: Winter	49.150	47.433	48.379	0.946	5.6	1.069	0.000	5.6	195.610	Surcharged
MH206	Rain 1: 30 years: +20 %: 15 mins: Summer				0.000	0.5			0.5	0.681	OK
MH202.1	Rain 1: 30 years: +20 %: 1440 mins: Winter	49.550	48.135	48.379	0.244	0.7	0.276	0.000	0.7	23.781	Surcharged

Project: COOLPOWRA	Date: 20/05/2024		
	Designed by: TG & JH	Checked by: DML	Approved By: DML
Report Details: Type: Junctions Summary Storm Phase: GIS	Company Address: LALLY CHARTERED ENGINEERS Udaras Business Park Tourmakeady, Co.Mayo		

Rain 1: 100 years: Increase Rainfall (%): +20: Critical Storm Per Item: Rank By: Max. Depth

Junction	Storm Event	Cover Elevation (m)	Invert Elevation (m)	Max. Elevation (m)	Max. Depth (m)	Max. Inflow (L/s)	Max. Resident Volume (m³)	Max. Flooded Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Status
MH201	Rain 1: 100 years: +20 %: 30 mins: Winter	50.600	49.175	49.224	0.049	7.3	0.056	0.000	6.5	6.638	OK
MH202	Rain 1: 100 years: +20 %: 15 mins: Winter	49.750	48.035	48.799	0.764	17.0	0.864	0.000	27.0	15.800	Surcharged
MH203	Rain 1: 100 years: +20 %: 1440 mins: Winter	49.500	47.825	48.739	0.914	5.8	1.034	0.000	5.5	195.389	Surcharged
MH204	Rain 1: 100 years: +20 %: 1440 mins: Winter	49.250	47.580	48.739	1.159	6.0	1.311	0.000	5.9	209.894	Surcharged
MH205	Rain 1: 100 years: +20 %: 1440 mins: Winter	49.150	47.433	48.739	1.306	6.9	1.477	0.000	6.8	241.746	Surcharged
MH206	Rain 1: 100 years: +20 %: 15 mins: Summer				0.000	0.6			0.6	0.760	OK
MH202.1	Rain 1: 100 years: +20 %: 15 mins: Winter	49.550	48.135	48.808	0.673	4.4	0.761	0.000	10.9	6.954	Surcharged

Project: COOLPOWRA	Date: 20/05/2024		
	Designed by: TG & JH	Checked by: DML	Approved By: DML
Report Details: Type: Stormwater Controls Summary Storm Phase: GIS	Company Address: LALLY CHARTERED ENGINEERS Udaras Business Park Tourmakeady, Co.Mayo		

Rain 1: 1 years: Increase Rainfall (%): +0: Critical Storm Per Item: Rank By: Max. Avg. Depth

Stormwater Control	Storm Event	Max. US Elevation (m)	Max. DS Elevation (m)	Max. US Depth (m)	Max. DS Depth (m)	Max. Inflow (L/s)	Max. Resident Volume (m³)	Max. Flooded Volume (m³)	Total Lost Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Percentage Available (%)	Status
Cellular Storage	Rain 1: 1 years: +0 %: 1440 mins: Winter	47.622	47.622	0.472	0.472	2.5	50.461	0.000	0.000	0.6	79.826	71.421	OK

Project: COOLPOWRA	Date: 20/05/2024		
	Designed by: TG & JH	Checked by: DML	Approved By: DML
Report Details: Type: Stormwater Controls Summary Storm Phase: GIS	Company Address: LALLY CHARTERED ENGINEERS Udaras Business Park Tourmakeady, Co.Mayo		

Rain 1: 30 years: Increase Rainfall (%): +20: Critical Storm Per Item: Rank By: Max. Avg. Depth

Stormwater Control	Storm Event	Max. US Elevation (m)	Max. DS Elevation (m)	Max. US Depth (m)	Max. DS Depth (m)	Max. Inflow (L/s)	Max. Resident Volume (m³)	Max. Flooded Volume (m³)	Total Lost Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Percentage Available (%)	Status
Cellular Storage	Rain 1: 30 years: +20 %: 1440 mins: Winter	48.378	48.378	1.228	1.228	5.6	131.455	0.000	0.000	1.0	131.698	25.550	OK

Project: COOLPOWRA	Date: 20/05/2024		
	Designed by: TG & JH	Checked by: DML	Approved By: DML
Report Details: Type: Stormwater Controls Summary Storm Phase: GIS	Company Address: LALLY CHARTERED ENGINEERS Udaras Business Park Tourmakeady, Co.Mayo		

Rain 1: 100 years: Increase Rainfall (%): +20: Critical Storm Per Item: Rank By: Max. Avg. Depth

Stormwater Control	Storm Event	Max. US Elevation (m)	Max. DS Elevation (m)	Max. US Depth (m)	Max. DS Depth (m)	Max. Inflow (L/s)	Max. Resident Volume (m^3)	Max. Flooded Volume (m^3)	Total Lost Volume (m^3)	Max. Outflow (L/s)	Total Discharge Volume (m^3)	Percentage Available (%)	Status
Cellular Storage	Rain 1: 100 years: +20 %: 1440 mins: Winter	48.739	48.739	1.589	1.589	6.8	169.998	0.000	0.000	1.1	149.755	3.721	OK

Project: COOLPOWRA	Date: 20/05/2024		
	Designed by: TG & JH	Checked by: DML	Approved By: DML
Report Details: Type: Connections Summary Storm Phase: GIS	Company Address: LALLY CHARTERED ENGINEERS Udaras Business Park Tourmakeady, Co.Mayo		

Rain 1: 1 years: Increase Rainfall (%): +0: Critical Storm Per Item: Rank By: Max. Flow

Connection	Storm Event	Connection Type	From	To	Upstream Cover Elevation (m)	Max. US Water Elevation (m)	Max. Flow Depth (m)	Discharge Volume (m^3)	Max. Velocity (m/s)	Flow / Capacity	Max. Flow (L/s)	Status
P201.000	Rain 1: 1 years: +0 %: 30 mins: Winter	Pipe	MH201	MH202	50.600	49.201	0.026	1.935	0.7	0.03	1.8	OK
P201.001	Rain 1: 1 years: +0 %: 30 mins: Winter	Pipe	MH202	MH203	49.750	48.092	0.082	5.977	0.4	0.15	5.4	OK
P201.002	Rain 1: 1 years: +0 %: 30 mins: Winter	Pipe	MH203	MH204	49.500	47.931	0.104	16.833	0.9	0.42	15.4	OK
P201.003	Rain 1: 1 years: +0 %: 15 mins: Winter	Pipe	MH204	MH205	49.250	47.687	0.106	13.655	0.9	0.45	16.3	OK
P201.004	Rain 1: 1 years: +0 %: 15 mins: Winter	Pipe	MH205	Cellular Storage	49.150	47.510	0.093	15.769	1.2	0.24	18.2	OK
P201.005	Rain 1: 1 years: +0 %: 1440 mins: Winter	No Delay	Cellular Storage	MH206		47.622	0.022	79.821	0.0		0.6	
P202.100	Rain 1: 1 years: +0 %: 30 mins: Winter	Pipe	MH202.1	MH202	49.550	48.176	0.049	2.605	0.4	0.07	2.7	OK

Project: COOLPOWRA	Date: 20/05/2024		
	Designed by: TG & JH	Checked by: DML	Approved By: DML
Report Details: Type: Connections Summary Storm Phase: GIS	Company Address: LALLY CHARTERED ENGINEERS Udaras Business Park Tourmakeady, Co.Mayo		

Rain 1: 30 years: Increase Rainfall (%): +20: Critical Storm Per Item: Rank By: Max. Flow

Connection	Storm Event	Connection Type	From	To	Upstream Cover Elevation (m)	Max. US Water Elevation (m)	Max. Flow Depth (m)	Discharge Volume (m^3)	Max. Velocity (m/s)	Flow / Capacity	Max. Flow (L/s)	Status
P201.000	Rain 1: 30 years: +20 %: 30 mins: Winter	Pipe	MH201	MH202	50.600	49.218	0.043	5.163	0.9	0.08	5.0	OK
P201.001	Rain 1: 30 years: +20 %: 15 mins: Winter	Pipe	MH202	MH203	49.750	48.344	0.225	11.816	0.7	0.72	26.5	Surcharged
P201.002	Rain 1: 30 years: +20 %: 15 mins: Winter	Pipe	MH203	MH204	49.500	48.237	0.225	33.068	1.1	1.18	43.1	Surcharged
P201.003	Rain 1: 30 years: +20 %: 15 mins: Winter	Pipe	MH204	MH205	49.250	47.893	0.225	36.441	1.2	1.27	46.6	Surcharged
P201.004	Rain 1: 30 years: +20 %: 15 mins: Winter	Pipe	MH205	Cellular Storage	49.150	47.576	0.225	41.870	1.3	0.67	51.0	OK
P201.005	Rain 1: 30 years: +20 %: 1440 mins: Winter	No Delay	Cellular Storage	MH206		48.378	0.027	131.690	0.0		1.0	
P202.100	Rain 1: 30 years: +20 %: 15 mins: Summer	Pipe	MH202.1	MH202	49.550	48.225	0.140	4.595	0.3	0.24	8.7	OK

Project: COOLPOWRA	Date: 20/05/2024		
	Designed by: TG & JH	Checked by: DML	Approved By: DML
Report Details: Type: Connections Summary Storm Phase: GIS	Company Address: LALLY CHARTERED ENGINEERS Udaras Business Park Tourmakeady, Co.Mayo		

Rain 1: 100 years: Increase Rainfall (%): +20: Critical Storm Per Item: Rank By: Max. Flow

Connection	Storm Event	Connection Type	From	To	Upstream Cover Elevation (m)	Max. US Water Elevation (m)	Max. Flow Depth (m)	Discharge Volume (m^3)	Max. Velocity (m/s)	Flow / Capacity	Max. Flow (L/s)	Status
P201.000	Rain 1: 100 years: +20 %: 30 mins: Winter	Pipe	MH201	MH202	50.600	49.224	0.049	6.638	1.0	0.1	6.5	OK
P201.001	Rain 1: 100 years: +20 %: 15 mins: Summer	Pipe	MH202	MH203	49.750	48.609	0.225	13.999	0.7	0.78	28.8	Surcharged
P201.002	Rain 1: 100 years: +20 %: 15 mins: Winter	Pipe	MH203	MH204	49.500	48.680	0.225	43.791	1.3	1.44	52.8	Surcharged
P201.003	Rain 1: 100 years: +20 %: 15 mins: Winter	Pipe	MH204	MH205	49.250	48.179	0.225	47.263	1.5	1.61	59.1	Surcharged
P201.004	Rain 1: 100 years: +20 %: 15 mins: Winter	Pipe	MH205	Cellular Storage	49.150	47.771	0.225	54.176	1.6	0.85	65.2	Surcharged
P201.005	Rain 1: 100 years: +20 %: 1440 mins: Winter	No Delay	Cellular Storage	MH206		48.739	0.029	149.745	0.0		1.1	
P202.100	Rain 1: 100 years: +20 %: 15 mins: Winter	Pipe	MH202.1	MH202	49.550	48.808	0.225	6.834	0.3	0.3	10.9	Surcharged

BRE Digest 365 Soil Infiltration Tests

For

Halston
on behalf of Coolpowra Flexgen Ltd

At

Coolpowra,
Co. Galway

Date of Issue: 22/05/2024

INTRODUCTION

This report is based on the findings of soil infiltration test examinations and provides calculations of soil infiltration rates as per BRE Digest 365, carried out by Lally Chartered Engineers.

The site assessment was undertaken on the 11th & 12th of April 2024.

3 no. Trial pits (T1, T2, T3) were dug by excavator and all indicated a well-drained subsoil profile. (See photographs).

The assessment and report have been undertaken in accordance with the following documents.

BRE Digest 365 CIRIA Guidance Documents,

Met Eireann rainfall return periods for Coolpowra, Co. Galway.

SITE SPECIFIC INFORMATION

Site Address: Coolpowra, Co. Galway

Project Management by Halston, on Behalf of Coolpowra Flexgen Ltd.

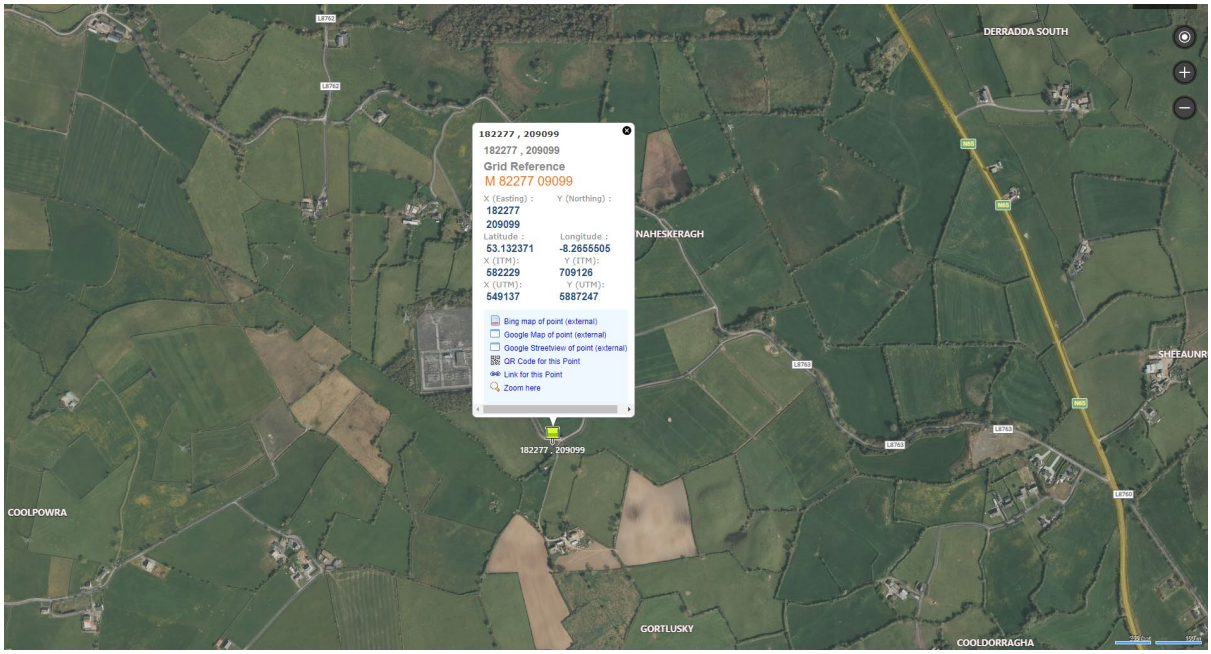


Fig 1. Site Location

Irish Grid Coordinates: Easting 182277, Northing 209099,

ITM Coordinates: Easting 582229, Northing 709126

GSI MAPS

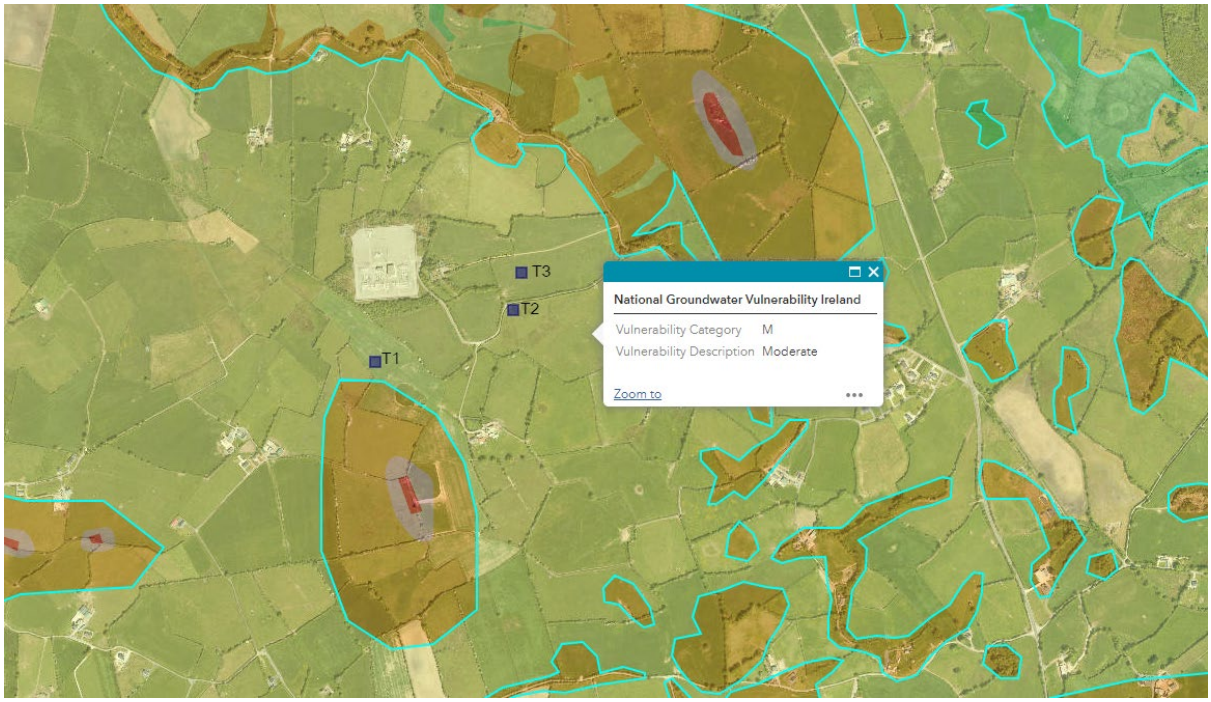


Fig 2. Groundwater Vulnerability – Moderate

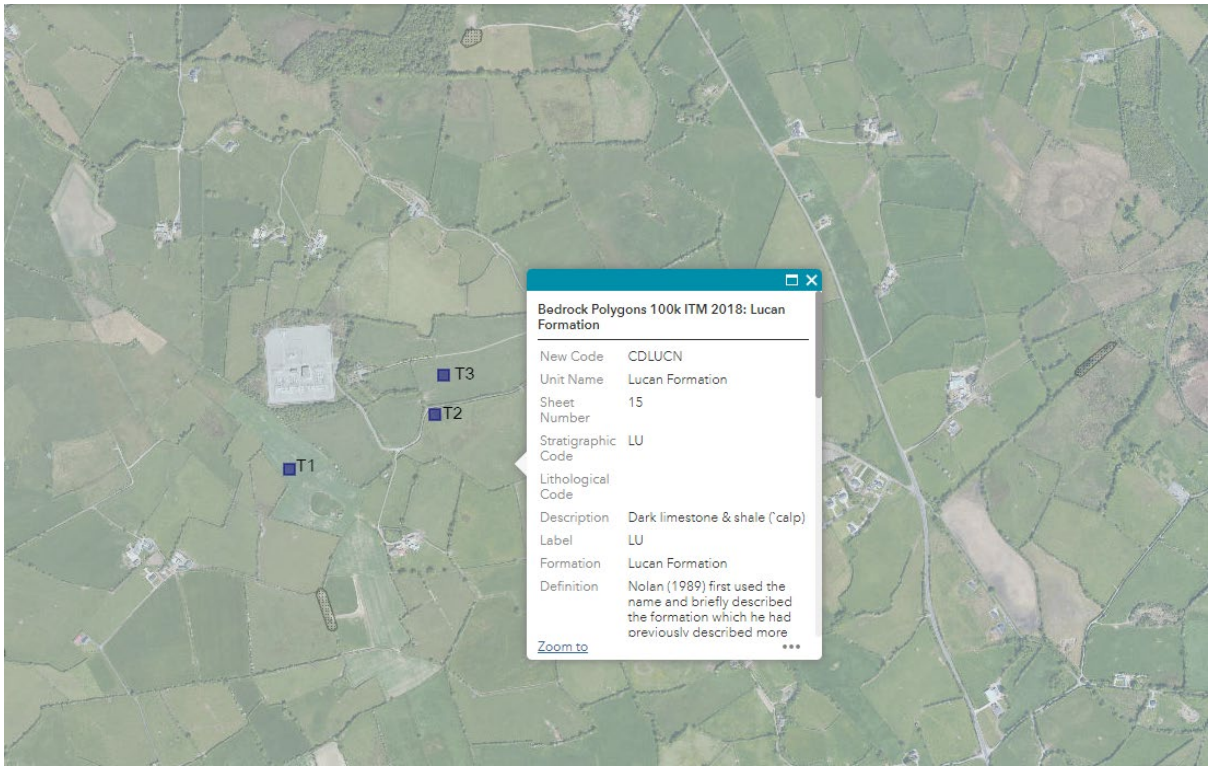


Fig 3. Bedrock – Lucan Formation

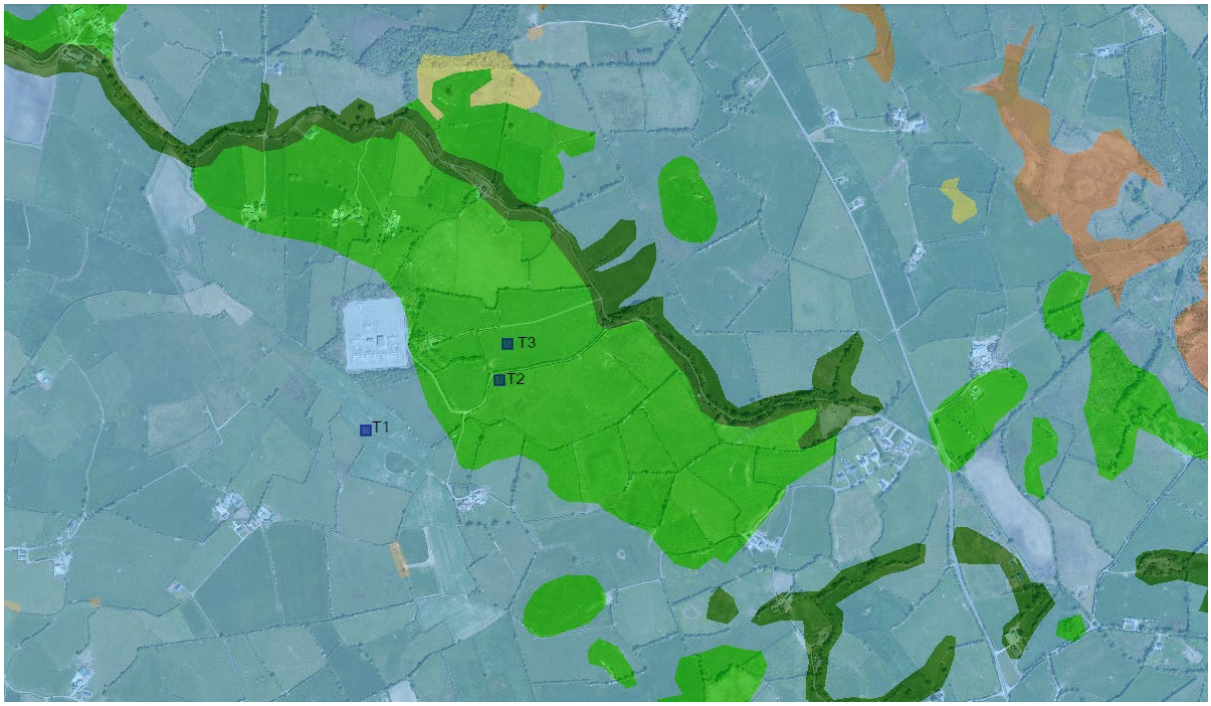


Fig 4. Subsoils – T1 - TLs, T2-T3 - GLs

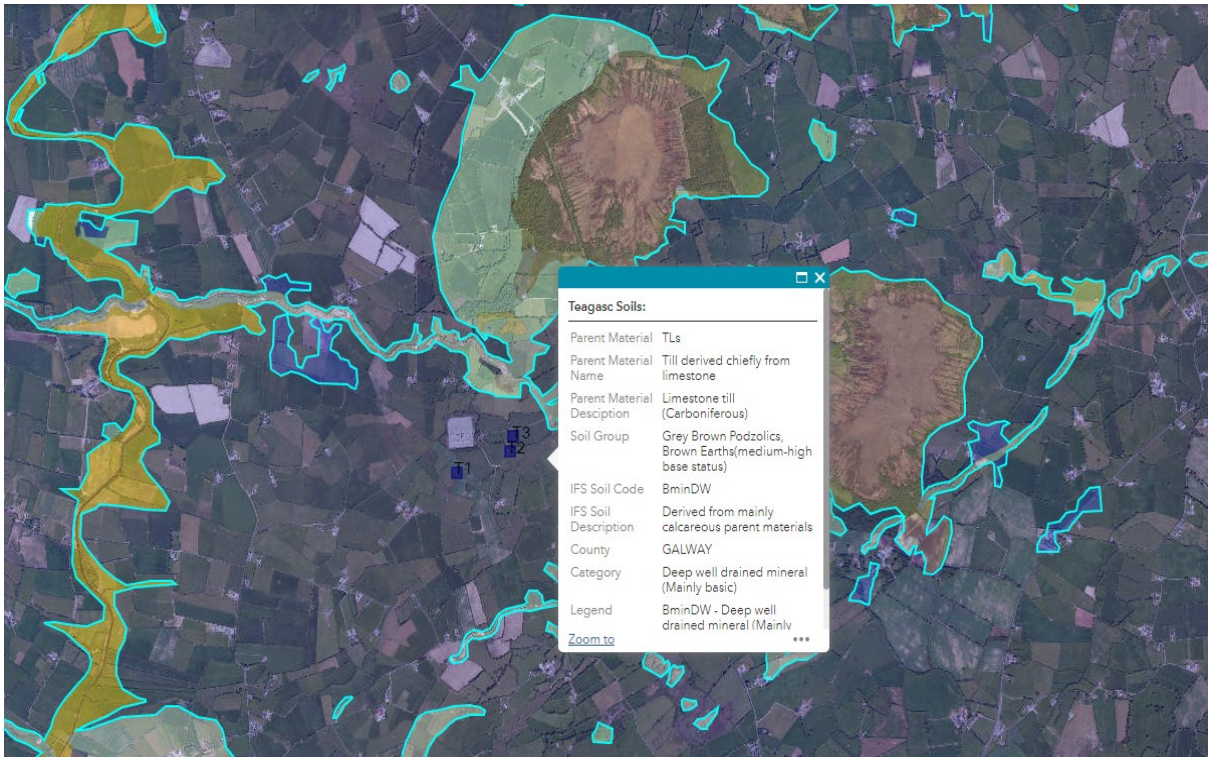


Fig 5. Teagasc Soils – BminDW – Deep well drained mineral

TRIAL PIT 1 (T1)

A trial pit measuring 1.70m long x 1.0m wide x 2.0m deep was dug by excavator. The soil/subsoil profile consisted of an uncompact crumb topsoil 0.3m deep over a brownish grey coloured uncompact gravel layer 1.70m deep.

The soil types observed in the trial hole are consistent with the GSI maps soils description.

Teagasc Soils - BminDW - Deep well drained mineral (Mainly basic).

Subsoils – TLs - Till derived from Limestones.

Bedrock Geology - Lucan Formation - Dark limestone & shale.

These can be moderately to well drained.

The effective depth of the soakaway test was 0.8m. The time for water to infiltrate from 75% to 25% of the effective depth was 60 minutes or 3600 sec.

Test Hole Size	**Length**	**Width**	**Depth**	**Inlet Level**	**Depth Water Test**	
	m	**m**	**m**	**m**		
	1.7	1.2	2	1.2	0.8	
Depth to Water Table	n/a					
Infilltration Test No. 1	**Description**	**Depths**	**Staff Reading**			**Time Taken**
Details *Average Fill Details*	Trench Depth Inlet Depth 25% Water Drop 75% Water Drop	2 1.2 0.2 0.6	2 0.8 0.6 0.2			
	Average Time Taken to Drop 25% to 75% test hole =					60

Inputs		
Input Time Taken to drop from 75% to 25%	**60.00**	Minutes
Input depth to invert of outlet (m)	**1.20**	Meters
Input depth of soakway below outlet	**0.80**	Meters
Input Length Soakpit (m)	**1.70**	Meters
Input Width Soakpit (m)	**1.20**	Meters
Effective Depth = 0.5 soakaway (m)	**0.4**	Meters
Mean Surface Area of Soakway	**4.36**	m2
Surface Area subjected to infiltration	**4.94**	m2
Volume Outflowing between 75% and 25%	**2**	m3
Soil Infilltration m/s	**0.0001125** **1.125E-04**	**m/hr** **0.4048583**

PIC 1 - T1

PIC 2 - T1

PIC 3 - T1

TRIAL PIT 2 (T2)

A trial pit measuring 1.80m long x 0.9m wide x 1.6m deep was dug by excavator. The soil/subsoil profile consisted of firm dense topsoil 0.5m deep over a blueish grey coloured compact gravel layer 1.10m deep.

The soil types observed in the trial hole are consistent with the GSI maps soils description.

Teagasc Soils - BminDW - Deep well drained mineral (Mainly basic).

Subsoils – GLs - Gravel derived from Limestones.

Bedrock Geology - Lucan Formation - Dark limestone & shale.

These can be moderately to well drained.

The effective depth of the soakaway test was 0.85m. The time for water to infiltrate from 75% to 25% of the effective depth was 175 minutes or 10500 sec.

Test Hole Size	**Length**	**Width**	**Depth**	**Inlet Level**	**Depth Water Test**	
	m	**m**	**m**	**m**		
	1.8	0.9	1.6	0.75	0.85	
Depth to Water Table	n/a					
Infilltration Test No. 1	**Description**	**Depths**	**Staff Reading**			**Time Taken**
Details *Average Fill Details*	Trench Depth Inlet Depth 25% Water Drop 75% Water Drop	1.6 0.75 0.2125 0.6375	1.6 0.85 0.6375 0.2125			
	Average Time Taken to Drop 25% to 75% test hole =					175

Inputs		
Input Time Taken to drop from 75% to 25%	**175.00**	Minutes
Input depth to invert of outlet (m)	**0.75**	Meters
Input depth of soakway below outlet	**0.85**	Meters
Input Length Soakpit (m)	**1.80**	Meters
Input Width Soakpit (m)	**0.90**	Meters
Effective Depth = 0.5 soakaway (m)	**0.425**	Meters
Mean Surface Area of Soakway	**3.915**	m2
Surface Area subjected to infiltration	**4.32**	m2
Volume Outflowing between 75% and 25%	**2**	m3
Soil Infilltration m/s	**0.0000441** **4.409E-05**	**m/hr** **0.1587302**

Pic 4 – T2

Pic 5 – T2

Pic 6 – T2

TRIAL PIT 3 (T3)

A trial pit measuring 1.70m long x 1.2m wide x 1.4m deep was dug by excavator. The soil/subsoil profile consisted of compact topsoil 0.6m deep over a blueish grey coloured compact gravel layer 0.80m deep.

The soil types observed in the trial hole are consistent with the GSI maps soils description.

Teagasc Soils - BminDW - Deep well drained mineral (Mainly basic).

Subsoils – GLs - Gravel derived from Limestones.

Bedrock Geology - Lucan Formation - Dark limestone & shale.

These can be moderately to well drained.

The effective depth of the soakaway test was 0.80m. The time for water to infiltrate from 75% to 25% of the effective depth was 75 minutes or 4500 sec.

Test Hole Size	**Length**	**Width**	**Depth**	**Inlet Level**	**Depth Water Test**	
	m	**m**	**m**	**m**		
	1.7	1.2	1.4	0.6	0.8	
Depth to Water Table	n/a					
Infilltration Test No. 1	**Description**	**Depths**	**Staff Reading**			**Time Taken**
Details *Average Fill Details*	Trench Depth Inlet Depth 25% Water Drop 75% Water Drop	1.4 0.6 0.2 0.6	1.4 0.8 0.6 0.2			
	Average Time Taken to Drop 25% to 75% test hole =					75

Inputs		
Input Time Taken to drop from 75% to 25%	**75.00**	Minutes
Input depth to invert of outlet (m)	**0.60**	Meters
Input depth of soakway below outlet	**0.80**	Meters
Input Length Soakpit (m)	**1.70**	Meters
Input Width Soakpit (m)	**1.20**	Meters
Effective Depth = 0.5 soakaway (m)	**0.4**	Meters
Mean Surface Area of Soakway	**4.36**	m2
Surface Area subjected to infiltration	**4.94**	m2
Volume Outflowing between 75% and 25%	**2**	m3
Soil Infilltration m/s	**0.0000900** **8.997E-05**	**m/hr** **0.3238866**

Pic 7 – T3

Pic 8 – T3

Pic 9 – T3

Pic 10 – T3

APPENDIX

Met Eireann
Return Period Rainfall Depths for sliding Durations
Irish Grid: Easting: 182277, Northing: 209099,

DURATION	Interval 6months,	1year,	Years 2,	3,	4,	5,	10,	20,	30,	50,	75,	100,	150,	200,	250,	500,
5 mins	2.6,	3.5,	4.0,	4.7,	5.2,	5.5,	6.7,	7.9,	8.7,	9.9,	10.9,	11.6,	12.8,	13.7,	14.4,	N/A ,
10 mins	3.6,	4.9,	5.6,	6.5,	7.2,	7.7,	9.3,	11.0,	12.2,	13.8,	15.1,	16.2,	17.8,	19.1,	20.1,	N/A ,
15 mins	4.3,	5.8,	6.5,	7.7,	8.4,	9.0,	10.9,	13.0,	14.3,	16.2,	17.8,	19.1,	21.0,	22.4,	23.6,	N/A ,
30 mins	5.7,	7.5,	8.5,	9.9,	10.8,	11.5,	13.7,	16.1,	17.6,	19.7,	21.6,	23.0,	25.1,	26.7,	28.1,	N/A ,
1 hours	7.6,	9.9,	11.0,	12.6,	13.7,	14.5,	17.1,	19.9,	21.6,	24.0,	26.1,	27.7,	30.1,	31.9,	33.4,	N/A ,
2 hours	10.2,	12.9,	14.3,	16.2,	17.5,	18.4,	21.4,	24.6,	26.6,	29.3,	31.6,	33.4,	36.0,	38.0,	39.6,	N/A ,
3 hours	12.0,	15.1,	16.6,	18.7,	20.1,	21.2,	24.4,	27.9,	30.0,	32.9,	35.4,	37.2,	40.0,	42.1,	43.8,	N/A ,
4 hours	13.6,	16.9,	18.5,	20.8,	22.3,	23.4,	26.8,	30.4,	32.7,	35.7,	38.3,	40.2,	43.1,	45.3,	47.0,	N/A ,
6 hours	16.1,	19.7,	21.5,	24.0,	25.7,	26.9,	30.6,	34.5,	36.9,	40.1,	42.8,	44.9,	47.9,	50.2,	52.0,	N/A ,
9 hours	19.0,	23.1,	25.1,	27.8,	29.6,	30.9,	34.9,	39.0,	41.6,	45.0,	47.9,	50.1,	53.2,	55.6,	57.5,	N/A ,
12 hours	21.4,	25.8,	27.9,	30.8,	32.7,	34.1,	38.3,	42.7,	45.3,	48.9,	51.9,	54.1,	57.4,	59.8,	61.8,	N/A ,
18 hours	25.4,	30.2,	32.5,	35.7,	37.7,	39.2,	43.7,	48.3,	51.1,	54.9,	58.0,	60.3,	63.8,	66.3,	68.3,	N/A ,
24 hours	28.6,	33.8,	36.2,	39.6,	41.7,	43.2,	48.0,	52.8,	55.7,	59.6,	62.8,	65.2,	68.7,	71.3,	73.4,	80.2,
2 days	35.2,	41.3,	44.2,	48.2,	50.7,	52.5,	58.1,	63.8,	67.2,	71.7,	75.5,	78.3,	82.4,	85.4,	87.9,	95.8,
3 days	40.7,	47.7,	50.9,	55.5,	58.3,	60.4,	66.7,	73.1,	77.0,	82.1,	86.3,	89.5,	94.1,	97.5,	100.2,	109.1,
4 days	45.7,	53.4,	57.0,	62.0,	65.1,	67.4,	74.4,	81.4,	85.7,	91.3,	96.0,	99.5,	104.5,	108.2,	111.2,	121.0,
6 days	54.6,	63.7,	67.9,	73.8,	77.4,	80.1,	88.2,	96.4,	101.4,	108.0,	113.4,	117.4,	123.2,	127.6,	131.0,	142.3,
8 days	62.7,	73.0,	77.8,	84.4,	88.5,	91.6,	100.8,	110.0,	115.6,	123.0,	129.1,	133.6,	140.1,	145.0,	148.9,	161.5,
10 days	70.3,	81.7,	87.0,	94.4,	98.9,	102.3,	112.4,	122.6,	128.8,	136.9,	143.7,	148.6,	155.9,	161.2,	165.5,	179.4,
12 days	77.5,	89.9,	95.8,	103.8,	108.7,	112.4,	123.5,	134.6,	141.3,	150.1,	157.5,	162.9,	170.7,	176.5,	181.2,	196.3,
16 days	91.1,	105.5,	112.3,	121.5,	127.3,	131.5,	144.3,	157.1,	164.9,	175.0,	183.4,	189.6,	198.7,	205.4,	210.7,	228.1,
20 days	104.0,	120.2,	127.9,	138.3,	144.7,	149.5,	163.9,	178.3,	187.0,	198.4,	207.9,	214.8,	225.0,	232.4,	238.4,	257.9,
25 days	119.3,	137.8,	146.4,	158.2,	165.6,	171.0,	187.2,	203.5,	213.4,	226.3,	236.9,	244.8,	256.2,	264.6,	271.3,	293.3,

NOTES:
N/A Data not available
These values are derived from a Depth Duration Frequency (DDF) Model
For details refer to:
'Fitzgerald D. L. (2007), Estimates of Point Rainfall Frequencies, Technical Note No. 61, Met Eireann, Dublin',
Available for download at www.met.ie/climate/dataproducts/Estimation-of-Point-Rainfall-Frequencies_TN61.pdf

FOUL HOLDING TANKS

For buildings with low occupancy that require foul water management,

Foul water storage on site will be by means of 10,000Ltr underground cesspool tanks.

These cesspool tanks are simply holding tanks in which treatment does not take place.

Tanks shall be fitted with a 'high level' alarm for monitoring the tank for optimum usage and shall be emptied by a licensed waste carrier when full.

Each cesspool tank must be installed in a level condition and bedded on, and surrounded with, 225mm thickness of concrete.

The sizing of the tanks is calculated based on 5PE at 60Litres per day for a 31-day period.

5PE x 60l/day x 31 days = 9,300Litres.

A 10,000Ltr tank will provide an additional buffer of 700Litres/11.66 days usage.

Fig 1.Klargester 10,000Ltr

Example shown is a Klargester 10000Ltr underground cesspool tank.
Tank Weight: *680.000kg* - Dimensions: *L:3915mm* - Diameter: *2020mm*
Material: *GRP* - Invert *500mm*

NS GRP FORECOURT SEPARATORS - DECLARATION OF PERFORMANCE

kingspan-klargester-fs010-dop-en-oct2021-v1

1.Unique identification code of the product-type:

Separator Systems for Light Liquids, GRP Construction
FS010

2. Type, batch or serial number or any other element allowing identification of the construction product as required under Article 11(4) of the CPR:

Serial Number/Works Order Number printed on the Product Information Label & affixed to product

3. Intended use/es of the product, in accordance with the applicable harmonized technical specification, as foreseen by the manufacturer:

Collection & Separation of Light Liquids from Wastewater by means of gravity and/or coalescence & able to contain a spillage from a 7,600 litre road tanker compartment.

4. Manufacturer name, registered trade name or registered trade mark and contact address as required under Article 11(5):

Kingspan Water & Energy Ltd
College Rd North
Aston Clinton, Aylesbury, Buckinghamshire
HP22 5EW

5. Where applicable, name and contact address of the authorised representative whose mandate covers the tasks specified in Article 12(2):

N/A

6. System/s of assessment and verification of constancy of performance (AVCP) of the product as set out in CPR, Annex V:

4

7. In case of the declaration of performance concerning a construction product covered by a harmonised standard:

EN:858-1:2002

Notified body/ bodies:

Notified Body No: 1739 + PIA Prüfinstitut für Abwassertechnik GmbH

8. Declared performance/s:

Essential characteristics		Performance			Harmonised technical specification
Crushing Resistance (vertical load test)		Pass (also wet conditions)			EN:858-1:2002
Structural Behaviour		Pass			
Reaction to fire		Class E			
Water Tightness (water test)		Pass			
Material Durability		Creep Factor amaterial = 0,48 (average value)			
		Ageing Factor (β) = 0,46 (average value)			
Treatment Efficiency	Sample	Specified Maximum Light Liquid (mg/l)	Actual Light Liquid (mg/l)		
	1	≤10	<0.100	Pass	
	2	≤10	<0.130	Pass	
	3	≤10	<0.100	Pass	
	4	≤10	<0.100	Pass	
	5	≤10	<0.100	Pass	
	Average	≤5	<0.106	Pass	
Electrical Consumption		n/a			

9. The performance of the product identified in points 1 and 2 is in conformity with the declared performance in point 8. This declaration of performance is issued under the sole responsibility of the manufacturer identified in point 4.

Signed for and on behalf of the manufacturer by:

David Anderson – Water Business Unit Director

At Portadown on 22 September 2021

Water Management Solutions

Separators
Product Brochure

Fully compliant range of Separators for a variety of commercial and industrial applications

kingspan.me/water

Kingspan®

Fuel/Oil Separators for Commercial and Industrial Applications

Contact our expert local separators team for technical advice on your project requirements.

Email **Water-ME@kingspan.com** and a member of our team will be in touch.

Surface water drains typically discharge to a watercourse or indirectly into underground waters (groundwater) via a soakaway. Contamination of surface water by oil, chemicals or suspended solids can cause these discharges to have a serious impact on the receiving water.

UK environment regulators, the Environment Agency; the Scottish Environment Protection Agency (SEPA); and the Department of Environment (DOE); have all published guidance on surface water disposal, which includes dealing with pollution both at source and at the point of discharge from site (so-called 'end of pipe' treatment). These techniques are known as 'Sustainable Drainage Systems' (SuDS).

Where run-off is draining from relatively low risk areas such as car parks and non-operational areas, a source control approach - such as permeable surfaces or infiltration trenches - may offer a suitable means of treatment, removing the need for a separator.

Oil separators are installed on surface water drainage systems to protect receiving waters from pollution by oil, which may be present due to minor leaks from vehicles or from across the plant, or from more major events like accidental spillage.

Effluent from industrial processes and vehicle washing should normally be discharged to the foul sewer (subject to the approval of the sewerage undertaker) for further treatment at a municipal treatment works.

Separator Standards and Types
The UK has adopted a two-part European Standard (BS EN 858-1:2002 and BS EN 858-2:2003; Reference 5) for the design, use, selection, installation, operation and maintenance of prefabricated oil separators.New prefabricated separators should comply with the standard.

Separator Classes
The standard refers to two 'classes' of separator, based on performance under standard test conditions.

Class I
Designed to achieve a concentration of less than 5mg/l of oil under standard test conditions, a Class I separator should be used when the separator is required to remove very small oil droplets. Class 1 separators always discharge to a watercourse.

Class II
Designed to achieve a concentration of less than 100mg/l oil under standard test conditions, Class II separators are suitable for dealing with discharges where a lower quality requirement applies. Class II separators discharge effluent to a foul sewer.

Bypass separators
Bypass separators fully treat all flows generated by rainfall rates of up to 6.5mm/hr. This covers over 99% of all rainfall events. Flows above this rate are allowed to bypass the separator. These separators are used when it is considered an acceptable risk not to provide full treatment for high flows, for example where the risk of a large spillage and heavy rainfall occurring at the same time is small.

Full retention separators
Full retention separators treat the full flow that can be delivered by the drainage system, which is normally equivalent to the flow generated by a rainfall intensity of 65mm/hr.

On large sites, some short term flooding may be an acceptable means of limiting the flow rate and hence the size of full retention systems.

Forecourt separators
Forecourt separators are full retention separators specified to retain on site the maximum spillage likely to occur on a petrol filling station. They are required for both safety and environmental reasons and will treat spillages occurring during vehicle refuelling and road tanker delivery. The size of the separator is increased in order to retain the possible loss of the contents of one compartment of a road tanker, which may be up to 7,600 litres.

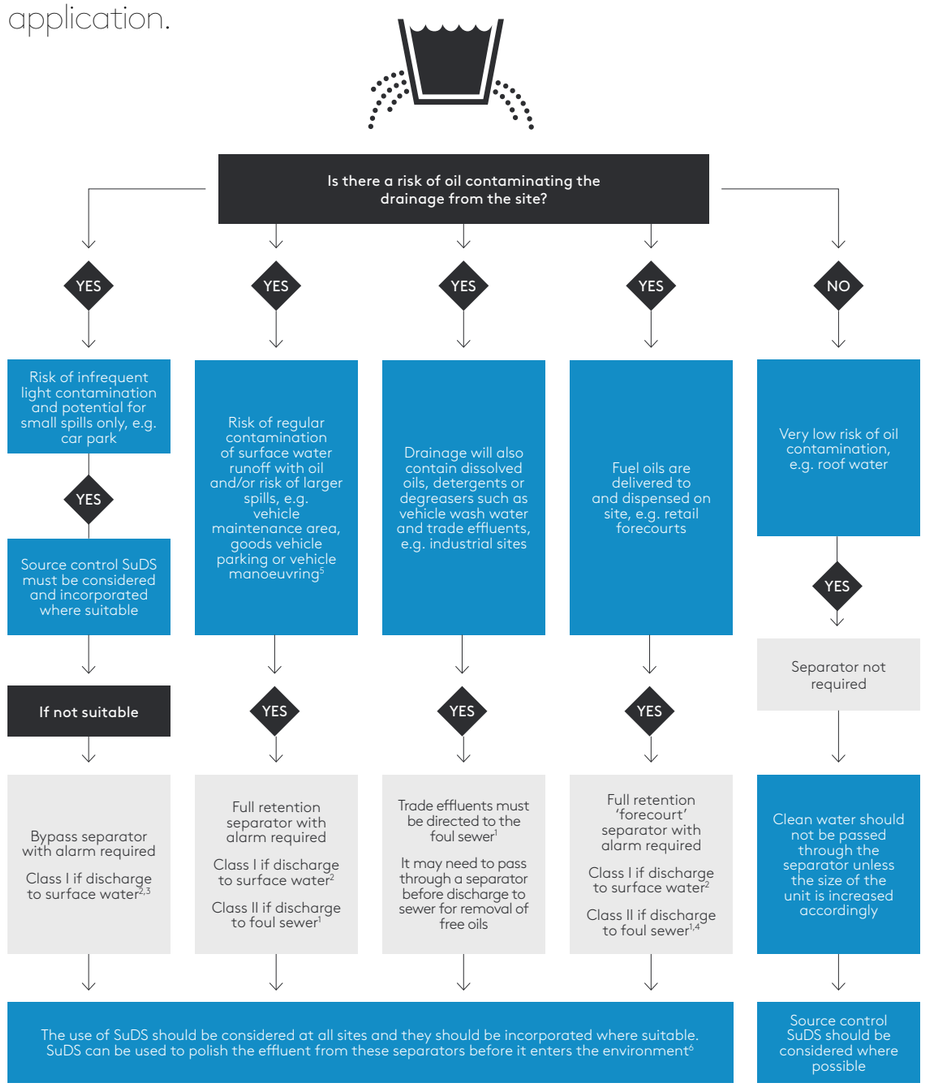
Selecting the right separator
The chart on the following page gives guidance to aid selection of the appropriate type of fuel/oil separator for use in surface water drainage systems which discharge into rivers and soakaways. For further detailed information, please consult your local Water/Environmental Agency.

Kingspan has a specialist team who provide technical assistance in selecting the appropriate separator for your application.

Choosing the Right Separator

Kingspan has a specialist team who provide expert technical assistance in selecting the appropriate separator for your application.

The chart below gives guidance to aid selection of the appropriate type of fuel/oil separator for use in surface water drainage systems which discharge into rivers and soakaways.



1 You must seek prior permission from your local sewer provider before you decide which separator to install and before you make any discharge.

2 You must seek prior permission from the relevant environmental body before you decide which separator to install.

3 In this case, if it is considered that there is a low risk of pollution a source control SuDS scheme may be appropriate.

4 In certain circumstances, the sewer provider may require a Class 1 separator for discharges to sewer to prevent explosive atmospheres from being generated.

5 Drainage from higher risk areas such as vehicle maintenance yards and goods vehicle parking areas should be connected to foul sewer in preference to surface water.

6 In certain circumstances, a separator may be one of the devices used in the SuDS scheme. Ask us for advice.

Bypass Separators

NSB RANGE

Kingspan NSB range achieved on average <1mg/l under EN 858-1 testing conditions

Performance
Kingspan was one of the first UK manufacturers to have separators tested to BS EN 858-1. In 2006, we introduced the NSB range of bypass separators. The NSB number denotes the maximum flow at which the separator treats liquids. The British Standards Institute (BSI) tested the required range of Kingspan bypass separators, and certified their performance in relation to their flow and process performance, assessing the effluent qualities to the requirements of BS EN 858-1. Kingspan bypass separator designs follow the parameters determined during the testing of the required range of bypass separators.

Each bypass separator design includes the necessary volume requirements for:
- Oil separation capacity
- Oil storage volume
- Silt storage capacity
- Coalescer (Class 1 units only).

The unit is designed to treat the first 10% of peak flow ('first flush principle'). The calculated drainage areas served by each separator are indicated according to the formula NSB = 0.0018A(m^2). Flows generated by higher rainfall rates will pass through part of the separator, bypassing the separation chamber.

Class I separators are designed to achieve a concentration of 5mg/litre of oil under standard test conditions.

Features
Light and easy to install.
- Inclusive of silt storage volume
- Fitted inlet/outlet connectors
- Vent points within necks
- Oil alarm system available (required by BS EN 858-1)
- Extension access shafts for deep inverts
- Maintenance from ground level
- GRP or rotomoulded construction (subject to model).

To specify a nominal size bypass separator, the following information is needed:

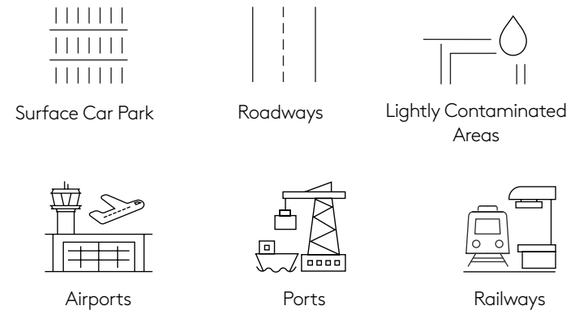
- The calculated flow rate for the drainage area served. Our designs are based on the assumptions that any interconnecting pipework fitted elsewhere on site does not impede flow into or out of the separator and that the flow is not pumped
- The drain invert inlet depth
- Pipework type, size and orientation.

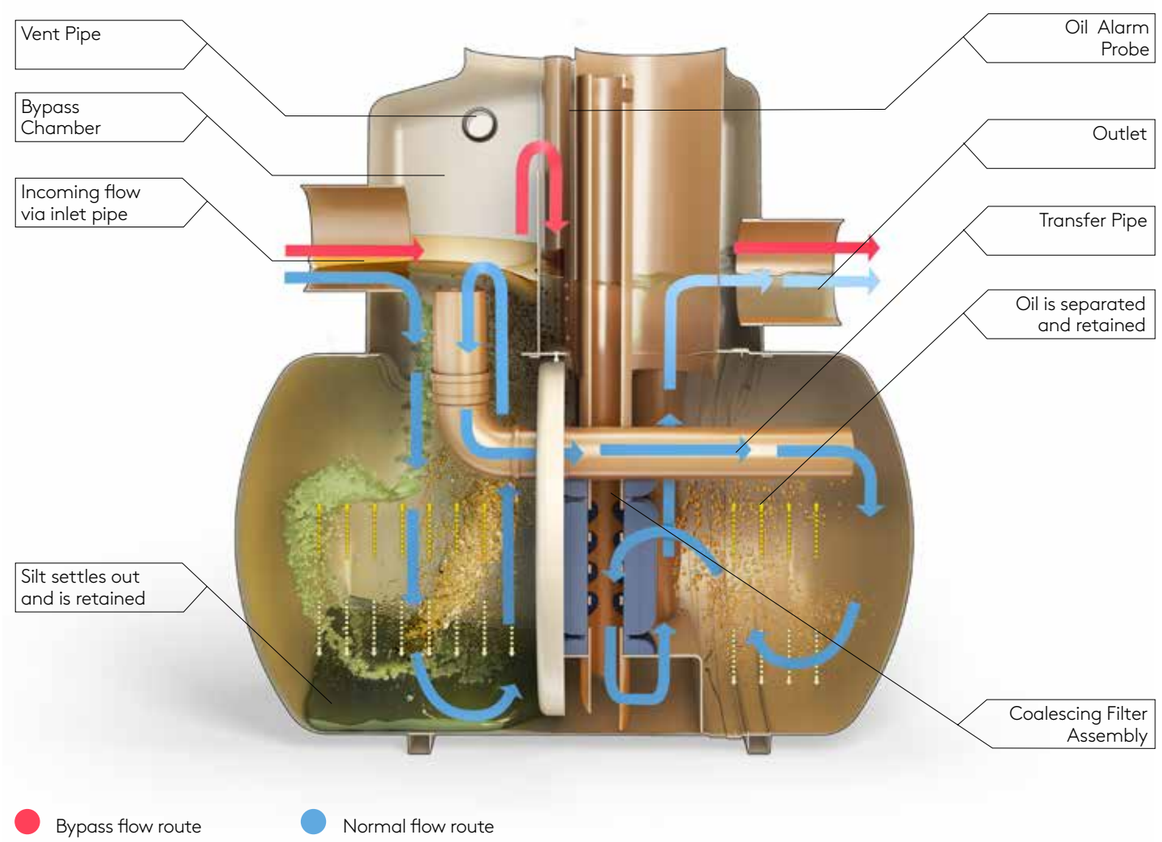
Technical Specifications

Model Reference	Flow (l/s)	Peak Flow Rate (l/s)	Drainage Area(M^2) Based on UK rainwater flow	Storage Capacity (Ltrs)		Length (mm)	Diameter (mm)	Access Shaft Diameter (mm)	Base Inlet Invert (mm)	Base to Outlet Invert (mm)	Standard Fall Across (mm)	Min Inlet Invert (mm)	Standard Pipework Diameter (mm)**
				Silt	Oil								
Polyethylene Chamber Construction													
NSBP003	3	30	1670	300	45	1700	1350	600	1420	1320	100	500	160
NSBP004	4.5	45	2500	450	60	1700	1350	600	1420	1320	100	500	160
NSBP006	6	60	3335	600	90	1700	1350	600	1420	1320	100	500	160
GRP Chamber Construction													
NSBE010	10	100	5560	1000	150	2069	1220	750	1450	1350	100	700	315
NSBE015	15	150	8335	1500	225	2947	1220	750	1450	1350	100	700	315
NSBE020	20	200	11111	2000	300	3893	1220	750	1450	1350	100	700	375
NSBE025	25	250	13890	2500	375	3575	1420	750	1680	1580	100	700	375
NSBE030	30	300	16670	3000	450	4265	1420	750	1680	1580	100	700	450
NSBE040	40	400	22222	4000	600	3230	1920	600	2185	2035	150	1000	500
NSBE050	50	500	27778	5000	750	3960	1920	600	2185	2035	150	1000	600
NSBE075	75	750	41667	7500	1125	5841	1920	600	2235	2035	200	950	675
NSBE100	100	1000	55556	10000	1500	7661	1920	600	2235	2035	200	950	750
NSBE125	125	1250	69444	12500	1875	9548	1920	600	2235	2035	200	950	750

** Systems to cater for larger flow rates are available on request. Email water-ME@kingspan.com for further information.*
** Some units have more than one access shaft – diameter of largest shown | ** Larger pipework available on request.*

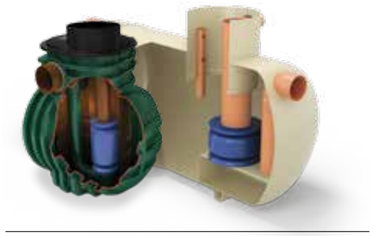
Applications
Kingspan's range of bypass separators are typically used for the following applications:





Full Retention Separators

NSF RANGE



Kingspan NSF range achieved on average <1mg/l under EN 858-1 testing conditions

Performance
Kingspan were the first UK manufacturer to have the required range (3-30 l sec) certified to BS EN 858-1 in the UK. The NSF number denotes the flow at which the separator operates. The British Standards Institute (BSI) have witnessed the performance tests of the required range of separators and have certified their performance, in relation to their flow and process performance to ensure that they meet the effluent quality requirements of BS EN 858-1. Larger separator designs have been determined using the formulas extrapolated from the test range.

Each full retention separator design includes the necessary volume requirements for:

- Oil separation capacity
- Oil storage volume
- Silt storage capacity
- Coalescer (Class I units only)
- Automatic closure device.

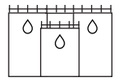
Kingspan full retention separators treat the whole of the specified flow.

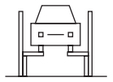
Features
- Light and easy to install
- 3-30 l/sec range independently tested and performance sampled, certified by the BSI
- Inclusive of silt storage volume
- Fitted inlet/outlet connectors
- Oil alarm system available
- Vent points within necks
- Extension access shafts for deep inverts
- Maintenance from ground level
- GRP or rotomoulded construction (subject to model)

To specify a nominal size full retention separator, the following information is needed:

- The calculated flow rate for the drainage area served. Our designs are based on the assumptions that any interconnecting pipework fitted elsewhere on site does not impede flow into or out of the separator and that the influent is not pumped
- The required discharge standard
- The drain invert inlet depth
- Pipework type, size and orientation.

Applications
Full retention separators are used in high risk spillage areas such as:


Fuel Distribution Depots


Vehicle Workshops


Scrap Yards


Airports

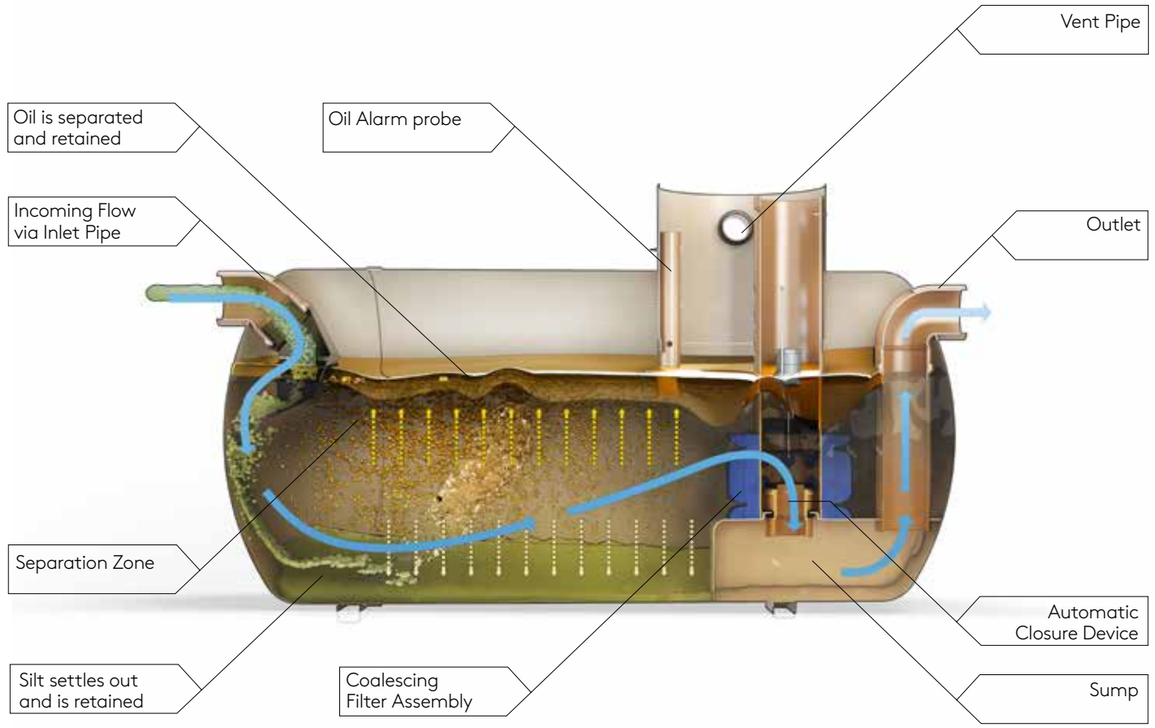

Ports


Railways

Technical Specifications

Model Reference	Flow (l/s)	Drainage Area (m2) PPG-3 (0.018)	Storage Capacity (Ltrs)		Length (mm)	Diameter (mm)	Manhole Cover Dimensions (mm)	Base Inlet Invert (mm)	Base to Outlet Invert (mm)	Min Inlet Invert (mm)	Standard Pipework Diameter (mm)
			Silt	Oil							
Polyethylene Chamber Construction											
NSFP003	3	170	300	30	1700	1350	600	1410	1335	550	160
NSFP006	6	335	600	60	1700	1350	600	1410	1335	550	160
GRP Chamber Construction											
NSFA010	10	555	1000	100	2610	1225	600	1050	1000	500	200
NSFA015	15	835	1500	150	3910	1225	600	1050	1000	1000	200
NSFA020	20	1115	2000	200	3200	2010	600	1810	1760	1000	315
NSFA030	30	1670	3000	300	3915	2010	600	1810	1760	1000	315
NSFA040	40	2225	4000	400	4640	2010	600	1810	1760	1000	315
NSFA050	50	2780	5000	500	5425	2010	600	1810	1760	1000	315
NSFA065	65	3160	6500	650	6850	2010	600	1810	1760	1000	315
NSFA080	80	4445	8000	800	5744	2820	600	2500	2450	1000	315
NSFA100	100	5560	10000	1000	6200	2820	600	2500	2450	1000	400
NSFA125	125	6945	12500	1250	7365	2820	600	2500	2450	1000	450
NSFA150	150	8335	15000	1500	8675	2820	600	2500	2450	1000	525
NSFA175	175	9725	17500	1750	9975	2820	600	2500	2450	1000	525
NSFA200	200	11110	20000	2000	11,280	2820	600	2500	2450	1000	600

** Systems to cater for larger flow rates are available on request. Email water-ME@kingspan.com for further information*
** Some units have more than one access shaft – diameter of largest shown.*



Forecourt Separators

Compliance
Operation ensures that the flow cannot exit the unit without first passing through the coalescer assembly.

In normal operation, the forecourt separator has sufficient capacity to provide storage for separated pollutants within the main chamber, but is also able to contain up to 7,600 litres of pollutant arising from the spillage of a fuel delivery tanker compartment on the petrol forecourt. The separator has been designed to ensure that oil cannot exit the separator in the event of a major spillage, therefore the separator should be emptied immediately.

Features
- Light and easy to install
- Inclusive of silt storage volume
- Fitted inlet/outlet connectors
- Vent points within necks
- Extension access shafts for deep inverts
- Maintenance from ground level
- Class I and Class II design
- Oil storage volume
- Coalescer (Class I unit only)
- Automatic closure device
- Oil alarm system available

Installation
The unit should be installed on a suitable concrete base slab and surrounded with concrete or pea gravel backfill.

If the separator is to be installed within a trafficked area, then a suitable cover slab must be designed to ensure that loads are not transmitted to the unit.

The separator should be installed and vented in accordance with local Health and Safety guidelines.

Technical Specifications

Separator Class	Backfill Type	Total Capacity (Ltrs)	Drainage Area (m^2)	Peak Flow Rate (L/s)	Length (mm)	Diameter (mm)	Access Shaft Diameter (mm)	Base Inlet Invert (mm)	Base to Outlet Invert (mm)	Standard Fall Across (mm)	Min Inlet Invert (mm)	Standard Pipework Diameter (mm)	Empty Weight (kg)
I/II	Concrete	10000	835	15	3915	2020	600	2180	2130	50	600	160	620
I/II	Concrete	10000	1115	20	3915	2020	600	2180	2130	50	600	200	620

Local and remote separator monitoring solutions

Kingspan offer both local oil level alarm systems and remote monitoring solutions, specifically designed to help you manage your separator system(s).

SmartServ Remote Monitoring Solution
Kingspan's intelligent fuel/oil separator monitoring system ('SmartServ') is a cost effective solution designed to offer greater control over your separator system. SmartServ is also fully compliant with British European Standard EN 858-1.

Benefits
- Helps avoid costly overflows
- Saves money
- Greater control over assets

Oil Level Alarm System
British European Standard EN 858-1 requires that all separators are to be fitted with an oil level alarm system and that it should be installed and calibrated by a suitably qualified technician so that it will respond to an alarm condition when the separator requires emptying.

Benefits
- Easily fitted to existing tanks
- Excellent operational range
- Visual and audible alarm

Washdown and Silt Units

Performance
Vehicle wash down facilities must not be allowed to discharge directly into surface water. Instead, their discharge must be directed to a foul connection leading to a municipal treatment works as it is likely to contain emulsifiers, soaps and detergents, which can dissolve and disperse the oils.

Features
- Light and easy to install
- Inclusive of silt storage volume
- Fitted inlet/outlet connectors
- Vent points within necks
- Extension access shafts for deep inverts

Applications


Car Wash


Tool Hire Depots

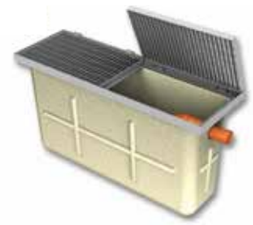

Truck Cleansing


Construction compounds cleansing points

Technical Specifications

Model Ref	Total Capacity (Ltrs)	Max.rec. Silt (Ltrs)	Max. Flow Rate (L/s)	Length (mm)	Diameter (mm)	Access Shaft Diameter (mm)	Base Inlet Invert (mm)	Base To Outlet Invert (mm)	Standard Fall Across (mm)	Min Inlet Invert (mm)	Standard Pipework Diameter (mm)	Approx. Empty (Kg)
W1/010	1000	500	3	1123	1225	460	1150	1100	50	500	160	60
W1/020	2000	1000	5	2074	1225	460	1150	1100	50	500	160	120
W1/030	3000	1500	8	2952	1225	460	1150	1100	50	500	160	150
W1/040	4000	2000	11	3898	1225	460	1150	1100	50	500	160	180
W1/060	6000	3000	16	4530	1440	600	1360	1310	50	500	160	320
W1/080	8000	4000	22	3200	2020	600	2005	1955	50	500	160	585
W1/100	10000	5000	27	3915	2020	600	2005	1955	50	500	160	680
W1/120	12000	6000	33	4640	2020	600	2005	1955	50	500	160	770
W1/150	15000	7500	41	5435	2075	600	1940	1890	50	500	160	965
W1/190	19000	9500	52	6865	2075	600	1940	1890	50	500	160	1200

Car Wash Silt Trap



Features
- FACTA Class B covers
- Light and easy to install
- Maintenance from ground level

Technical Specifications

Model Ref	Total Capacity (Ltrs)	Max.rec. Silt (Ltrs)	Max. Flow Rate (L/s)	Length (mm)	Diameter (mm)	Access Shaft Diameter (mm)	Base Inlet Invert (mm)	Base To Outlet Invert (mm)	Standard Fall Across (mm)	Min Inlet Invert (mm)	Standard Pipework Diameter (mm)	Approx. Empty (Kg)
W1/080	8000	4000	22	3200	2020	600	2005	1955	50	500	160	585
W1/100	10000	5000	27	3915	2020	600	2005	1955	50	500	160	680
W1/120	12000	6000	33	4640	2020	600	2005	1955	50	500	160	770
W1/150	15000	7500	41	5435	2075	600	1940	1890	50	500	160	965
W1/190	19000	9500	52	6865	2075	600	1940	1890	50	500	160	1200

Middle Eastern Installations

Kingspan operate in over 85 countries worldwide, with currently over 5 million water management system installations. Take a look at a selection of our case studies below.

Experience

OVER 60 YEARS

QA

Hamad International Airport
Qatar
Fuel/Oil Separators

EAU

Jumeirah Lake Towers
Dubai
Fuel/Oil Separators

EAU

Four Seasons Hotel
Abu Dhabi
Fuel/Oil Separators and Grease Separators

OM

Sohar Labour Camp
Oman
Forecourt Separators and Sewage Treatment Plants

KW

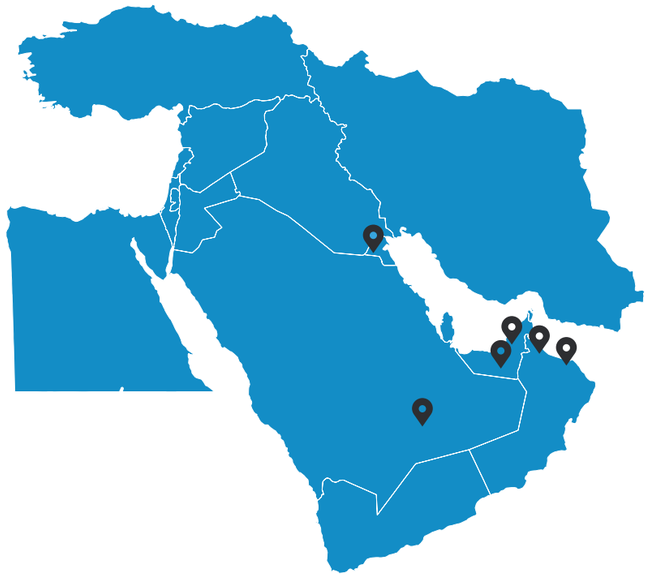
AZ-Zour Desalination Plant
Kuwait City
Fuel/Oil Separators and Package Pumping Stations

OM

Muscat Airport
Oman
Fuel/Oil Separators

SA

Haramain 'Western Railway' High Speed Rail Project
Saudi Arabia
Fuel/Oil Separators



Other Water Management Solutions from Kingspan

Expert Advice Available

Kingspan offer a full range of commercial, domestic and industrial wastewater treatment solutions. To find out more information on any of our products featured, email water-ME@kingspan.com or visit our website at kingspan.me/water

Domestic Sewage Treatment Plants

Commercial Sewage Treatment Plants

Domestic and Commercial Pumping Stations

Rainwater Harvesting Systems

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Hydro International

Stormbloc® Optimum Range

Attenuate or infiltrate surface water effectively even in challenging urban environments

Product Summary

The Stormbloc® Optimum range comprises two resilient geocellular storage systems that provide underground storage and infiltration of surface water runoff; **Stormbloc® Extra** and **Stormbloc®**, plus an inspection chamber, the **Stormbloc® Inspect**.

The system helps meet Sustainable Drainage System (SuDS) objectives by returning stormwater back to the natural water cycle at or near its source, without taking up valuable space for amenity or development above ground.

The lightweight materials, combined with robust design make them easy to transport, quick to install and extremely durable. With an optimum-strength option for high-traffic areas and a lighter option for landscape and low-traffic areas, the Stormbloc® Optimum range provides a space-saving solution for many applications.

Applications

- New and retrofit Sustainable Drainage (SuDS) schemes.
- Infiltration / soakaway schemes.
- Attenuation schemes.
- Highways and infrastructure projects.
- To increase swale / pond capacity.
- Car parks and Park & Ride schemes.
- Housing Developments.
- Schools and Public / Civil schemes.
- Aquifer re-charge.
- Storage for rainwater harvesting and re-use

Benefits

Maximise storage

The Stormbloc® Optimum range can store 960 litres of stormwater below ground in 1 cubic metre of volume, more than 60% more stormwater storage in the same volume when compared to conventional gravel infiltration trenches.

Save space on site

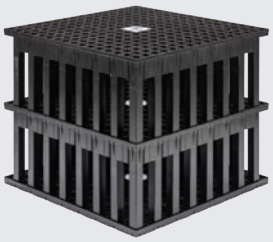
Both Stormbloc® Extra and Stormbloc® stack into compact nests for transport and storage, saving up to 75% of valuable space. The nested units save time and cost during installation, enabling more storage volume to be lifted into excavations at any one time.

Lightweight with two strength options

For more flexible designs choose between the high-strength Stormbloc® Extra for deep or high-loaded installations and Stormbloc® for shallower installations with lighter loads such as landscaped or low-traffic areas.

Stormbloc® Optimum range

Stormbloc®



A lighter, cost-effective option suitable for landscaped or low-traffic areas. Access for inspection and maintenance can be included where required using Stormbloc® Inspect chambers and Stormbloc® Extra blocks.

Stormbloc® Extra

A high-strength option ideal for installation beneath high-traffic areas such as roads, car parks and warehouse yards. Access for inspection and maintenance is via Stormbloc® Inspect chambers and the channels in the blocks allow access for CCTV and cleaning to ensure that the storage volume of the system isn't reduced by the build up of silts.

Stormbloc® Inspect

The Stormbloc® Inspect offers an unrivalled level of accessibility to any Stormbloc® Extra or Stormbloc® installation. This modular access chamber, sited within the tank, has identical dimensions to a Stormbloc® Extra module and so can be easily incorporated into the layout of the infiltration or storage system.

Find out about the Stormbloc® Optimum range can help you design cost-effective, space-saving surface water control systems:

→ **https://hydro-int.com/en/stormbloc-optimum**

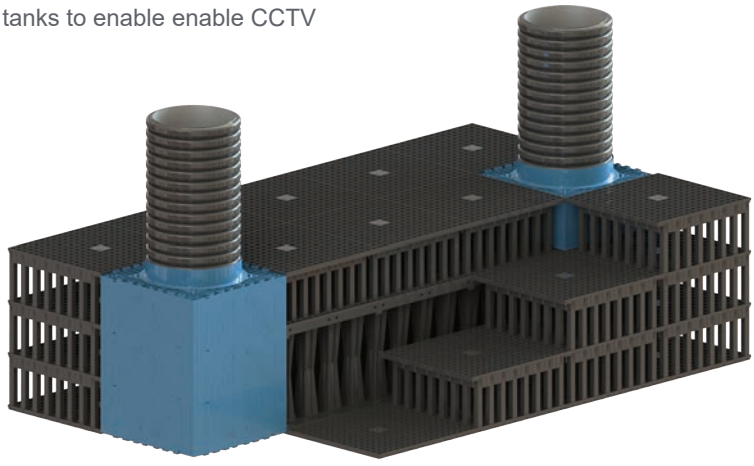
Technical information

	Stormbloc®		Stormbloc® Extra		
Application suitability	Lighter loaded areas, such as landscaped or low traffic areas (cars ≤ 2.5t)		Heavy loaded area and High-traffic areas such as car parks, roads and warehouse yards.		
Maximum installation depth	3 m		4 m		
Cover depth	Landscaped area, no traffic	Light traffic loading ≤ 2.5 t	Landscaped area, no traffic	Light traffic loading ≤ 2.5 t	Roads & HGV loading yards with traffic loading ≤44 t
	0.5 m - 1.5 m	0.8 m - 1.5 m	≥0.4 m	≥0.6 m	≥0.8 m
Material	Polypropylene (up to 100% recycled material)		Polypropylene		
	Half block		Full block		Half block
Length / Width / Height	800 / 800 / 330 mm (Note: for the bottom layer add 30 mm for the base plate)		800 / 800 / 660 mm		800 / 800 / 360 mm
Nominal block volume	0.230 m^3		0.422 m^3		0.230 m^3
Nominal storage capacity per unit	0.220 m^3		0.405 m^3		0.221 m^3
Constructed weight	10 kg (1 element and 1 baseplate)		18.6 kg		13.7 kg
Porosity	96%		96 %		96%
Vertical ultimate compressive strength	313 kN/m^2		420 kN/m^2		420 kN/m^2
Horizontal ultimate compressive strength	93 kN/m^2		165 kN/m^2		225 kN/m^2

Inspection and maintenance

To ensure that the storage volume of the systems aren't compromised by the build up of silts, Stormbloc® Inspect chambers can be added to Stormbloc® Extra tanks to enable enable CCTV inspection, maintenance and cleaning.

Access for inspection and maintenance of Stormbloc® tanks can be provided by adding Stormbloc® Inspect chambers and constructing a row of Stormbloc® Extra blocks through the tank.



Smart Maintenance

A Hydro-Logic® Smart Maintenance package can be added to either Stormbloc® Extra or Stormbloc® tanks to provide near real-time level information and send automated alerts when the tank requires maintenance.

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