

Appendix 3- Soil Logs

		Project: Maes Y Capel	Trial Pit: TP01
Excavation date: 23.06.22	Logged by: AP	Client: Ellis Williams Architect	Project ID: 4937
Strata:			Sheet 1 of 1
Depth (m)		Description	Samples
From	To		
0	0.25	Dark brown sandy silt with grass/rootlets contains occasional piece of clay pipe, metal and plastic. TOPSOIL.	
0.25	1.1	Greyish brown very sandy slightly clayey gravelly silt. Gravel fine to coarse subangular of siltstone, sandstone and occasional piece of glass brick and metal.	Env: 0.4-0.45
1.1	1.2	Firm grey mottled orange slightly sandy gravelly CLAY. Gravel fine to coarse rounded to sub-rounded of siltstone. Becomes sandy at 1.5m. Becomes stiff at c. 2.1m (excavator advancement slows).	Env: 1.1m Geo: 1-1.15m (tub), 1.5m (tub), 2m (tub).
2.2	2.5	Dark grey stiff slightly gravelly CLAY. Gravel fine to coarse rounded to subrounded of siltstone. End 2.5m excavator could not reach further due to angle of trial hole on embankment.	Geo: 2.5m (tub)
Excavated by – 5 tonne tracked excavator Plan Dimensions of Pit – 0.7m x 1.8m Groundwater - Dry Stability – Stable, sides remained vertical when excavated, Contamination – No visual or olfactory evidence of contamination			

Trial Pit Photographs:





		Project: Maes Y Capel	Trial Pit: TP02
Excavation date: 23.06.22	Logged by: AP	Client: Ellis Williams Architect	Project ID: 4937
Strata:			Sheet 1 of 1
Depth (m)		Description	Samples
From	To		
0	0.3	Dark brown sandy silt with grass/rootlets contains occasional brick cobble and plastic TOPSOIL.	Env: 0-0.05m
0.3	0.6	Brown very gravelly sand. Gravel fine coarse angular to subangular of sandstone and occasional brick fragment. Occasional cobble of brick (REWORKED GROUND/MADE GROUND).	
0.6	0.8	Black slightly sandy organic SILT. Potentially relic topsoil.	
0.8	2	Stiff grey mottled orange slightly sandy gravelly CLAY. Gravel fine to coarse rounded to sub-rounded of siltstone. Hand shear vane average reading= 104kPa at 0.8m. End 2m. Could not advance further due to having to reach over metal fence.	Geotech: 1m (bulk), 1.5m (bulk), 2m (bulk)
Excavated by – 5 tonne tracked excavator Plan Dimensions of Pit – 0.7m x 1.8m Groundwater - Dry Stability – Stable, sides remained vertical when excavated, Contamination – No visual or olfactory evidence of contamination			

Trial Pit Photographs:





		Project: Maes Y Capel	Trial Pit: TP03
Excavation date: 23.06.22	Logged by: AP	Client: Ellis Williams Architect	Project ID: 4937
Strata:			Sheet 1 of 1
Depth (m)		Description	Samples
From	To		
0	0.2	Dark brown sandy silt with grass/rootlets contains occasional brick cobble and plastic TOPSOIL.	Env: 0.2-0.25m
0.2	0.4	Very gravelly slightly silty sand. Gravel fine to coarse angular to subangular of sandstone and occasion piece of brick and pottery. Occasional cobble of brick.	
0.4	0.6	Black slightly sandy organic SILT. Potentially relic topsoil.	
0.6	2.7	Firm grey mottled orange slightly sandy gravelly CLAY. Gravel fine to coarse rounded to sub-rounded of siltstone. Occasional subrounded cobble and boulder of sandstone. Excavator struggles at 2.2m interpreted as stiff to very stiff. Bucket scrapes at 2.6m very slow advancement. 2.7m end, excavator could not advance either due large boulder or bedrock.	Geotech: 0.7-0.75m (bulk), 1.5-1.66m (bulk), 2.2-2.3m (bulk).
Excavated by – 5 tonne tracked excavator Plan Dimensions of Pit – 0.8m x 2m Groundwater - Dry Stability – Stable, sides remained vertical when excavated, Contamination – No visual or olfactory evidence of contamination			

Trial Pit Photographs:





			Project: Maes Y Capel	Trial Pit: TP04
Excavation date: 23.06.22		Logged by: AP	Client: Ellis Williams Architect	Project ID: 4937
Strata:				Sheet 1 of 1
Depth (m)		Description		Samples
From	To			
0	0.4	Dark brown sandy silt with grass/rootlets contains roots, occasional brick cobble, plastic, and wood TOPSOIL.		
0.4	0.85	Black gravelly slightly silty sand. Gravel fine to coarse subrounded to angular of sandstone, glass milk bottle, plastic. ASH/MADE GROUND.		
0.85	1.5	Firm grey mottled orange slightly sandy gravelly CLAY. Gravel fine to coarse rounded to sub-rounded of siltstone. Occasional subrounded cobble and boulder of sandstone. Average hand shear vane reading=52kPa.		
1.5	3	Stiff dark grey mottled brown sandy gravelly CLAY with occasional cobbles. Gravel fine to coarse and subrounded of mudstone. Cobbles subrounded of mudstone. Excavator struggles to advance (interpreted as stiff). Cobbles become more frequent at c.2.5m Digging very slow at 2.7m End 3m.		
Excavated by – 5 tonne tracked excavator Plan Dimensions of Pit – 0.8m x 2.2m Groundwater - Dry Stability – Stable, sides remained vertical when excavated, Contamination – No visual or olfactory evidence of contamination				

Trial Pit Photographs:







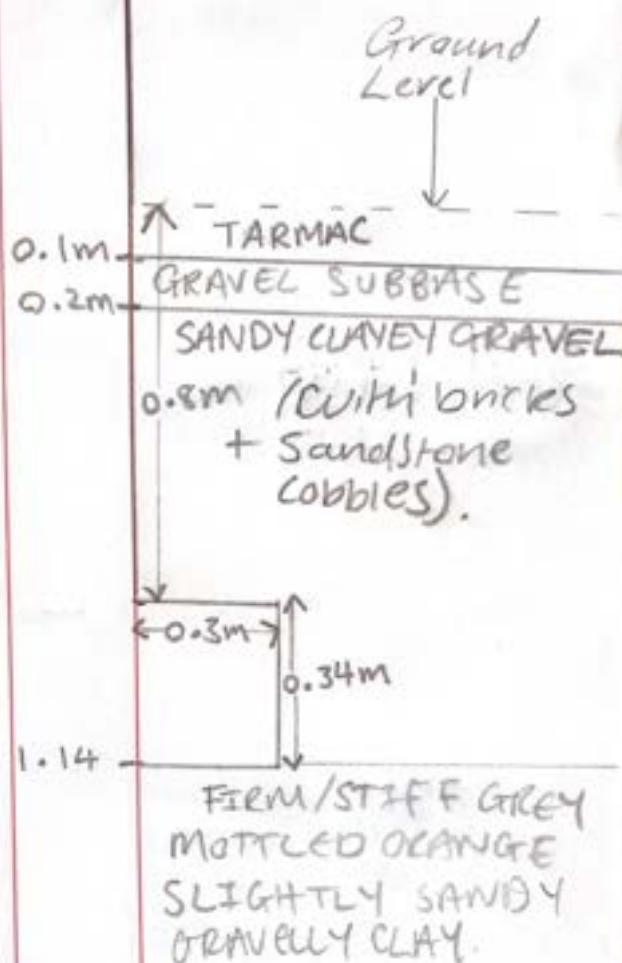


Trial Pit Photographs:





HDP1 MAES Y CAPEL





Project:

Maes Y Capel

Trial Pit:

HDP2

Trial Pit Photographs:





HDP 2 - MAES Y CAPEL.



Appendix 4- Chemical Laboratory Results



Environmental
Chemistry

Certificate of Analysis

Client: Caulmert Limited

Project: 22061863

Quote: BEC220625981 V1.1

Project Ref: 4937

Site: Maes Y Capel and Wisteria Court

Contact: Amy Pritchett

Address: Intec
Ffordd Y Parc
Parc Menai
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LL57 4FG

E-Mail: AmyPritchett@caulmert.com

Phone: 01248 663 738

No. Samples Received: 5

Date Received: 28/06/2022

Analysis Date: 07/07/2022

Date Issued: 07/07/2022

Report Type: Final Version 01

This report supercedes any versions previously issued by the laboratory

Account Manager
Anna Jasjulevica

Authorised by the Operations Manager
Becky Batham



Client: Caulmurt Limited
Project Name: 4937
Project No: 22061863
Date Issued: 07/07/2022

Samples Analysed

<u>Sample Reference</u>	<u>Text ID</u>	<u>Sample Date</u>	<u>Sample Type</u>
TP1MC-0-ES-0.40-0.45	22061863-001	23/06/2022 00:00:00	SOLID
TP1MC-0-ES-1.10	22061863-002	23/06/2022 00:00:00	SOLID
TP4MC-0-ES-0.40-0.60	22061863-003	24/06/2022 00:00:00	SOLID
TP1WC-0-ES-0.30-0.40	22061863-004	24/06/2022 00:00:00	SOLID
TP5WC-0-ES-0.55-0.60	22061863-005	24/06/2022 00:00:00	SOLID



Analysis Results

Client: Caulmert Limited
Project Name: Maes Y Capel and Wisteria Court
Project No: 22061863
Date Issued: 07/07/2022



Analysis	Method Code	MDL	Units	Accred.	Sample ID	001	002	003	004	005
					Customer ID	TP1MC-0-ES-0.40-0.45	TP1MC-0-ES-1.10	TP4MC-0-ES-0.40-0.60	TP1WC-0-ES-0.30-0.40	TP5WC-0-ES-0.55-0.60
					Sample Type	SOLID	SOLID	SOLID	SOLID	SOLID
					Sampling Date	23/06/2022	23/06/2022	24/06/2022	24/06/2022	24/06/2022
>C6-C7 Aliphatic HS_1D_AL	GROHSA/BTEXHSA	0.2	mg/kg [^]	UM		<0.238	<0.274	<0.238	<0.211	<0.213
>C7-C8 Aliphatic HS_1D_AL	GROHSA/BTEXHSA	0.2	mg/kg [^]	UM		<0.238	<0.274	<0.238	<0.211	<0.213
>C7-C8 Aromatic HS_1D_AR	GROHSA/BTEXHSA	0.01	mg/kg [^]	UM		<0.012	<0.014	<0.012	<0.011	<0.011
>C8-C10 Aliphatic HS_1D_AL	GROHSA/BTEXHSA	0.2	mg/kg [^]	UM		<0.238	<0.274	<0.238	<0.211	<0.213
>C8-C10 Aromatic HS_1D_AR	GROHSA/BTEXHSA	0.04	mg/kg [^]	UM		<0.048	<0.055	<0.048	<0.043	<0.043
C5-C6 Aliphatic HS_1D_AL	GROHSA/BTEXHSA	0.2	mg/kg [^]	UM		<0.238* _B	<0.274* _B	<0.238* _B	<0.211* _B	<0.213* _B
C5-C7 Aromatic HS_1D_AR	GROHSA/BTEXHSA	0.01	mg/kg [^]	UM		<0.012	<0.014	<0.012	<0.011	<0.011
Total GRO C5-C10 HS_1D_Total	GROHSA/BTEXHSA	0.2	mg/kg [^]	UM		<0.238	<0.274	<0.238	<0.211	<0.213
pH (2.5:1 extraction)	PHSOIL	1	pH units	UM		8.1	8.0	8.0	8.4	8.9
Chromium (VI) as Cr	KONENS	0.1	mg/kg [^]	N		<0.1	<0.1	<0.1	<0.1	<0.1
Phenol Index	SFAPI	0.5	mg/kg [^]	U		<0.6	<0.7	<0.6	<0.5	<0.5
Soil Organic Matter	WSLM59	0.04	% m/m [^]	U		10.3	0.79	15.0	3.51	2.62
Arsenic as As	ICPMSS	0.3	mg/kg [^]	UM		10.3	7.0	12.3	9.1	7.2
Cadmium as Cd	ICPMSS	0.2	mg/kg [^]	UM		9.0	0.5	7.5	0.4	0.4
Copper as Cu	ICPMSS	1.6	mg/kg [^]	UM		35.8	7.1	46.1	21.4	25.0
Lead as Pb	ICPMSS	0.7	mg/kg [^]	UM		719.3	115.2	1243	104.0	46.2
Mercury as Hg	ICPMSS	0.5	mg/kg [^]	UM		<0.5	<0.5	<0.5	<0.5	<0.5
Nickel as Ni	ICPMSS	2	mg/kg [^]	UM		23.7	7.3	19.4	21.6	21.9
Selenium as Se	ICPMSS	0.5	mg/kg [^]	UM		<0.5	<0.5	<0.5	<0.5	<0.5



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					Customer ID	TP1MC-0-ES-0.40-0.45	TP1MC-0-ES-1.10	TP4MC-0-ES-0.40-0.60	TP1WC-0-ES-0.30-0.40	TP5WC-0-ES-0.55-0.60
					Sample Type	SOLID	SOLID	SOLID	SOLID	SOLID
					Sampling Date	23/06/2022	23/06/2022	24/06/2022	24/06/2022	24/06/2022
Total Chromium as Cr	ICPMSS	1.2	mg/kg^	UM		20.0	11.6	15.2	17.6	18.8
Zinc as Zn	ICPMSS	16	mg/kg^	UM		1705	82.1	1317	113.8	103.0
Barium as Ba	ICPSOIL	0.5	mg/kg^	UM		166	74.3	148	93.6	92.1
Beryllium as Be	ICPSOIL	0.1	mg/kg^	U		0.84	0.24	1.08	0.58	0.49
Boron as B	ICPBOR	0.5	mg/kg^	UM		0.6	<0.5	0.8	<0.5	<0.5
Water Soluble Sulphate as SO4 by Mass	ICPWSS	20	mg/kg^	UM		43	<20	51	51	209
Benzene HS_1D_AR	BTEXHSA	10	µg/kg^	UM		<12	<14	<12	<11	<11
Ethylbenzene HS_1D_AR	BTEXHSA	10	µg/kg^	UM		<12	<14	<12	<11	<11
m/p-Xylene HS_1D_AR	BTEXHSA	20	µg/kg^	UM		<24	<27	<24	<21	<21
o-Xylene HS_1D_AR	BTEXHSA	10	µg/kg^	UM		<12	<14	<12	<11	<11
Toluene HS_1D_AR	BTEXHSA	10	µg/kg^	UM		<12	<14	<12	<11	<11
Acenaphthene	PAHMSUS	0.08	mg/kg^	UM		<0.10	<0.11	<0.10	<0.08	<0.09
Acenaphthylene	PAHMSUS	0.08	mg/kg^	U		0.28	<0.11	<0.10	<0.08	<0.09
Anthracene	PAHMSUS	0.08	mg/kg^	U		0.81	<0.11	0.14	<0.08	<0.09
Benzo[a]anthracene	PAHMSUS	0.08	mg/kg^	UM		3.18	<0.11	0.34	<0.08	<0.09
Benzo[a]pyrene	PAHMSUS	0.08	mg/kg^	UM		4.28	<0.11	0.40	0.13	0.09
Benzo[b]fluoranthene	PAHMSUS	0.08	mg/kg^	UM		5.10	<0.11	0.55	0.15	0.12
Benzo[g,h,i]perylene	PAHMSUS	0.08	mg/kg^	UM		2.82	<0.11	0.28	<0.08	<0.09
Benzo[k]fluoranthene	PAHMSUS	0.08	mg/kg^	UM		1.93	<0.11	0.22	0.10	<0.09



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Analysis	Method Code	MDL	Units	Accred.	Sample ID	001	002	003	004	005
					Customer ID	TP1MC-0-ES-0.40-0.45	TP1MC-0-ES-1.10	TP4MC-0-ES-0.40-0.60	TP1WC-0-ES-0.30-0.40	TP5WC-0-ES-0.55-0.60
					Sample Type	SOLID	SOLID	SOLID	SOLID	SOLID
					Sampling Date	23/06/2022	23/06/2022	24/06/2022	24/06/2022	24/06/2022
Chrysene	PAHMSUS	0.08	mg/kg^	UM		2.87	<0.11	0.43	0.14	0.09
Dibenzo[a,h]anthracene	PAHMSUS	0.08	mg/kg^	UM		0.57	<0.11	<0.10	<0.08	<0.09
Fluoranthene	PAHMSUS	0.08	mg/kg^	UM		5.43	<0.11	0.67	0.16	0.11
Fluorene	PAHMSUS	0.08	mg/kg^	UM		<0.10	<0.11	<0.10	<0.08	<0.09
Indeno[1,2,3-cd]pyrene	PAHMSUS	0.08	mg/kg^	UM		3.17	<0.11	0.26	<0.08	<0.09
Naphthalene	PAHMSUS	0.08	mg/kg^	UM		0.20	<0.11	0.12	<0.08	<0.09
Phenanthrene	PAHMSUS	0.08	mg/kg^	UM		1.60	<0.11	0.57	0.10	<0.09
Pyrene	PAHMSUS	0.08	mg/kg^	UM		5.53	<0.11	0.61	0.15	0.14
Total PAH 16	PAHMSUS	1.28	mg/kg^	U		38.0	<1.75	4.96	1.68	1.50
>C10-C12 (Aliphatic) EH_CU_1D_AL	TPHFIDUS (Aliphatic)	4	mg/kg^	U		<4.76	<5.47	<4.76	<4.23	<4.27
>C12-C16 (Aliphatic) EH_CU_1D_AL	TPHFIDUS (Aliphatic)	4	mg/kg^	U		5.16	<5.47	4.94	<4.23	10.1
>C16-C21 (Aliphatic) EH_CU_1D_AL	TPHFIDUS (Aliphatic)	4	mg/kg^	U		10.4	<5.47	5.50	<4.23	31.1
>C21-C35 (Aliphatic) EH_CU_1D_AL	TPHFIDUS (Aliphatic)	10	mg/kg^	U		64.7	<13.7	19.2	<10.6	406
Total TPH >C8-C40 (Aliphatic) EH_CU_1D_AL	TPHFIDUS (Aliphatic)	20	mg/kg^	U		93.6	<27.4	34.1	<21.1	538
>C10-C12 (Aromatic) EH_CU_1D_AR	TPHFIDUS (Aromatic)	4	mg/kg^	U		<4.76	<5.47	<4.76	<4.23	16.7
>C12-C16 (Aromatic) EH_CU_1D_AR	TPHFIDUS (Aromatic)	4	mg/kg^	U		<4.76	<5.47	7.21	<4.23	<4.27
>C16-C21 (Aromatic) EH_CU_1D_AR	TPHFIDUS (Aromatic)	4	mg/kg^	U		27.1	<5.47	18.8	<4.23	28.1
>C21-C35 (Aromatic) EH_CU_1D_AR	TPHFIDUS (Aromatic)	10	mg/kg^	U		249	14.0	72.9	16.3	563
Total TPH >C8-C40 (Aromatic) EH_CU_1D_AR	TPHFIDUS (Aromatic)	20	mg/kg^	U		303	<27.4	110	<21.1	677



Analysis Results

Client: Caulmert Limited
Project Name: Maes Y Capel and Wisteria Court
Project No: 22061863
Date Issued: 07/07/2022



Analysis	Method Code	MDL	Units	Accred.	Sample ID	001	002	003	004	005
					Customer ID	TP1MC-0-ES-0.40-0.45	TP1MC-0-ES-1.10	TP4MC-0-ES-0.40-0.60	TP1WC-0-ES-0.30-0.40	TP5WC-0-ES-0.55-0.60
					Sample Type	SOLID	SOLID	SOLID	SOLID	SOLID
					Sampling Date	23/06/2022	23/06/2022	24/06/2022	24/06/2022	24/06/2022
1,1,1,2-Tetrachloroethane	VOCHSAS	1	µg/kg^	UM		<6 D	<1	<6 D	<1	<1
1,1,1-Trichloroethane	VOCHSAS	1	µg/kg^	UM		<6 D	<1	<6 D	<1	<1
1,1,2,2-Tetrachloroethane	VOCHSAS	1	µg/kg^	N		<6 D	<1	<6 D	<1	<1
1,1,2-Trichloroethane	VOCHSAS	1	µg/kg^	UM		<6 D	<1	<6 D	<1	<1
1,1-Dichloroethane	VOCHSAS	1	µg/kg^	UM		<6 D	<1	<6 D	<1	<1
1,1-Dichloroethene	VOCHSAS	1	µg/kg^	U		<6 D	<1	<6 D	<1	<1
1,1-Dichloropropene	VOCHSAS	1	µg/kg^	UM		<6 D	<1	<6 D	<1	<1
1,2,3-Trichlorobenzene	VOCHSAS	3	µg/kg^	UM		<18 D	<4	<18 D	<3	<3
1,2,3-Trichloropropane	VOCHSAS	1	µg/kg^	UM		<6 D	<1	<6 D	<1	<1
1,2,4-Trichlorobenzene	VOCHSAS	3	µg/kg^	N		<18 D	<4	<18 D	<3	<3
1,2,4-Trimethylbenzene	VOCHSAS	1	µg/kg^	UM		<6 D	<1	<6 D	<1	<1
1,2-Dibromo-3-chloropropane	VOCHSAS	1	µg/kg^	U		<6 D	<1	<6 D	<1	<1
1,2-Dibromoethane	VOCHSAS	1	µg/kg^	UM		<6 D	<1	<6 D	<1	<1
1,2-Dichlorobenzene	VOCHSAS	1	µg/kg^	UM		<6 D	<1	<6 D	<1	<1
1,2-Dichloroethane	VOCHSAS	1	µg/kg^	UM		<6 D	<1	<6 D	<1	<1
1,2-Dichloropropane	VOCHSAS	1	µg/kg^	UM		<6 D	<1	<6 D	<1	<1
1,3,5-Trimethylbenzene	VOCHSAS	1	µg/kg^	UM		<6 D	<1	<6 D	<1	<1
1,3-Dichlorobenzene	VOCHSAS	1	µg/kg^	UM		<6 D	<1	<6 D	<1	<1
1,3-Dichloropropane	VOCHSAS	1	µg/kg^	UM		<6 D	<1	<6 D	<1	<1



Analysis Results

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Analysis	Method Code	MDL	Units	Accred.	Sample ID	001	002	003	004	005
					Customer ID	TP1MC-0-ES-0.40-0.45	TP1MC-0-ES-1.10	TP4MC-0-ES-0.40-0.60	TP1WC-0-ES-0.30-0.40	TP5WC-0-ES-0.55-0.60
					Sample Type	SOLID	SOLID	SOLID	SOLID	SOLID
					Sampling Date	23/06/2022	23/06/2022	24/06/2022	24/06/2022	24/06/2022
1,4-Dichlorobenzene	VOCHSAS	1	µg/kg^	UM		<6 _D	<1	<6 _D	<1	<1
2,2-Dichloropropane	VOCHSAS	2	µg/kg^	UM		<12 _D	<3	<12 _D	<2	<2
2-Chlorotoluene	VOCHSAS	1	µg/kg^	UM		<6 _D	<1	<6 _D	<1	<1
4-Chlorotoluene	VOCHSAS	1	µg/kg^	UM		<6 _D	<1	<6 _D	<1	<1
Benzene	VOCHSAS	1	µg/kg^	UM		<6 _D	<1	<6 _D	<1	<1
Bromobenzene	VOCHSAS	1	µg/kg^	UM		<6 _D	<1	<6 _D	<1	<1
Bromochloromethane	VOCHSAS	1	µg/kg^	UM		<6 _D	<1	<6 _D	<1	<1
Bromodichloromethane	VOCHSAS	1	µg/kg^	UM		<6 _D	<1	<6 _D	<1	<1
Bromoform	VOCHSAS	1	µg/kg^	UM		<6 _D	<1	<6 _D	<1	<1
Bromomethane	VOCHSAS	1	µg/kg^	UM		<6 _D	<1	<6 _D	<1	<1
Carbon Tetrachloride	VOCHSAS	1	µg/kg^	UM		<6 _D	<1	<6 _D	<1	<1
Chlorobenzene	VOCHSAS	1	µg/kg^	UM		<6 _D	<1	<6 _D	<1	<1
Chloroethane	VOCHSAS	2	µg/kg^	UM		<12 _D	<3	<12 _D	<2	<2
Chloroform	VOCHSAS	1	µg/kg^	UM		<6 _D	<1	<6 _D	<1	<1
Chloromethane	VOCHSAS	3	µg/kg^	U		<18* _{B,D}	<4* _B	<18* _{B,D}	<3* _B	<3* _B
cis 1,2-Dichloroethene	VOCHSAS	5	µg/kg^	UM		<30 _D	<6	<30 _D	<5	<5
cis 1,3-Dichloropropene	VOCHSAS	1	µg/kg^	UM		<6 _D	<1	<6 _D	<1	<1
Dibromochloromethane	VOCHSAS	1	µg/kg^	UM		<6 _D	<1	<6 _D	<1	<1
Dibromomethane	VOCHSAS	1	µg/kg^	UM		<6 _D	<1	<6 _D	<1	<1



Analysis Results

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					Customer ID	TP1MC-0-ES-0.40-0.45	TP1MC-0-ES-1.10	TP4MC-0-ES-0.40-0.60	TP1WC-0-ES-0.30-0.40	TP5WC-0-ES-0.55-0.60
					Sample Type	SOLID	SOLID	SOLID	SOLID	SOLID
					Sampling Date	23/06/2022	23/06/2022	24/06/2022	24/06/2022	24/06/2022
Dichlorodifluoromethane	VOCHSAS	1	µg/kg^	N		<6 D	<1	<6 D	<1	<1
Ethylbenzene	VOCHSAS	2	µg/kg^	UM		<12 D	<3	<12 D	4	3
Hexachlorobutadiene	VOCHSAS	2	µg/kg^	N		<12 D	<3	<12 D	<2	<2
iso-Propylbenzene	VOCHSAS	1	µg/kg^	UM		<6 D	<1	<6 D	<1	<1
m and p-Xylene	VOCHSAS	4	µg/kg^	UM		<24 D	<5	<24 D	<4	<4
MTBE	VOCHSAS	1	µg/kg^	UM		<6 D	<1	<6 D	<1	<1
Naphthalene	VOCHSAS	5	µg/kg^	UM		<30 D	<6	<30 D	<5	<5
n-Butylbenzene	VOCHSAS	1	µg/kg^	U		<6 D	<1	<6 D	<1	<1
o-Xylene	VOCHSAS	2	µg/kg^	UM		<12 D	<3	<12 D	<2	<2
p-Isopropyltoluene	VOCHSAS	1	µg/kg^	UM		<6 D	<1	<6 D	<1	<1
Propylbenzene	VOCHSAS	1	µg/kg^	UM		<6 D	<1	<6 D	<1	<1
sec-Butylbenzene	VOCHSAS	1	µg/kg^	UM		<6 D	<1	<6 D	<1	<1
Styrene	VOCHSAS	1	µg/kg^	UM		<6 D	<1	<6 D	<1	5
tert-Butylbenzene	VOCHSAS	1	µg/kg^	UM		<6 D	<1	<6 D	<1	<1
Tetrachloroethene	VOCHSAS	3	µg/kg^	UM		<18 D	<4	<18 D	<3	<3
Toluene	VOCHSAS	5	µg/kg^	UM		<30 D	<6	<30 D	<5	<5
trans 1,2-Dichloroethene	VOCHSAS	1	µg/kg^	UM		<6 D	<1	<6 D	<1	<1
trans 1,3-Dichloropropene	VOCHSAS	1	µg/kg^	UM		<6 D	<1	<6 D	<1	<1
Trichloroethene	VOCHSAS	1	µg/kg^	U		<6 D	<1	<6 D	<1	<1



Analysis Results

Client: Caulmert Limited
Project Name: Maes Y Capel and Wisteria Court
Project No: 22061863
Date Issued: 07/07/2022



Analysis	Method Code	MDL	Units	Accred.	Sample ID	001	002	003	004	005
					Customer ID	TP1MC-0-ES-0.40-0.45	TP1MC-0-ES-1.10	TP4MC-0-ES-0.40-0.60	TP1WC-0-ES-0.30-0.40	TP5WC-0-ES-0.55-0.60
					Sample Type	SOLID	SOLID	SOLID	SOLID	SOLID
					Sampling Date	23/06/2022	23/06/2022	24/06/2022	24/06/2022	24/06/2022
Trichlorofluoromethane	VOCHSAS	1	µg/kg ^A	UM		<6* _{B,D}	<1* _B	<6* _{B,D}	<1* _B	<1* _B
Vinyl Chloride	VOCHSAS	1	µg/kg ^A	UM		<6* _{B,D}	<1* _B	<6* _{B,D}	<1* _B	<1* _B
Total Moisture at 35°C	CLANDPREP	0.1	%	N		15.9	26.9	15.9	5.4	6.3
Description of Solid Material	CLANDPREP		-	N		SILT	CLAY	SILT	SILT	SILT
Asbestos Identification	SUB002		-	N		NAIIS	NAIIS	NAIIS	NAIIS	NAIIS

[illegible]



Client: Caulmurt Limited
 Project Name: Maes Y Capel and Wisteria Court
 Project No: 22061863
 Date Issued: 07/07/2022

Deviating Sample Report

Sample Reference	Text ID	Reported Name	Incorrect Container	Incorrect Label	Headspace	Incorrect/No Preservative	No Sampling Date	Holding Time
------------------	---------	---------------	---------------------	-----------------	-----------	---------------------------	------------------	--------------

Analysis Method

<u>Analysis</u>	<u>Analysis Type</u>	<u>Analysis Method</u>
BTEXHSA	ORGANIC	As Received
CLANDPREP	PHYS	As Received
GROHSA/BTEXHSA	ORGANIC	As Received
ICPBOR	METALS	Air Dried & Ground
ICPMSS	METALS	Air Dried & Ground
ICPSOIL	METALS	Air Dried & Ground
ICPWSS	METALS	Air Dried & Ground
KONENS	INORGANIC	Air Dried & Ground
PAHMSUS	ORGANIC	As Received
PHSOIL	INORGANIC	As Received
SFAPI	INORGANIC	As Received
SUB002	SUBCON	
TPHFIDUS (Aliphatic)	ORGANIC	As Received
TPHFIDUS (Aromatic)	ORGANIC	As Received
VOCHSAS	ORGANIC	As Received
WSLM59	INORGANIC	Air Dried & Ground



Client: Caulmert Limited
Project Name: Maes Y Capel and Wisteria Court
Project No: 22061863
Date Issued: 07/07/2022

Result Report Notes

Letters alongside results signify that the result has associated report notes.
The report notes are as follows:

<u>Letter</u>	<u>Note</u>
A	Due to the matrix of the sample the laboratory has had to deviate from our standard protocols to be able to process the sample and provide a result. Where applicable the accreditation has been removed and this should be taken into consideration when utilising the data.
B	The QC associated with this result has not wholly met the QMS requirements, the accreditation has therefore been removed. However, the Laboratory has confidence in the performance of the method as a whole and that the integrity of the data has not been significantly compromised.
C	Due to matrix interference the internal standard and/or surrogate has not met the QMS requirements. This should be taken into consideration when utilising the data.
D	A non-standard volume or mass has been used for this test which has resulted in a raised detection limit.
E	Due to recoveries beyond our calibration range and following the maximum size of dilution allowed, the result cannot be quantified and as such the result will appear as a greater than symbol (>) with the accreditation removed. This data should be used for indicative purposes only.
F	Based on the sample history, appearance and smell a dilution was applied prior to testing. Unfortunately, the result is either above (>) or below (<) our calibration range. Results above our calibration range have accreditation removed. The data should be used for indicative purposes only.
G	The day 5 oxygen reading was below the capability of the instrument to detect, and therefore the calculated BOD has been reported unaccredited for guidance purposes only.

HWOL Acronym Key

<u>Acronym</u>	<u>Description</u>
HS	Headspace Analysis
EH	Extractable Hydrocarbons - i.e everything extracted by the solvent(s)
CU	Clean up - e.g. by florisil, silica gel
1D	GC - Single coil gas chromatography
Total	Aliphatics & Aromatics
AL	Aliphatics only
AR	Aromatics only
+	Operator to indicate cumulative e.g. EH_CU+HS_1D_Total



Client: Caulmert Limited
Project Name: Maes Y Capel and Wisteria Court
Project No: 22061863
Date Issued: 07/07/2022

Additional Information

This report refers to samples as received, and SOCOTEC UK Ltd takes no responsibility for accuracy or competence of sampling by others.

Results within this report relate only to the samples tested.

In the accreditation column of analysis report the codes are as follows:

U = UKAS accredited analysis
M = MCERT accredited analysis
N = Unaccredited analysis

Any units marked with ^ signify results are reported on a dry weight basis of 35° c.

All Air Dried and Ground Samples (ADG) are oven dried at less than 35° c.

This report shall not be reproduced except in full and with approval from the laboratory.

Opinions and interpretations given are outside the scope of our UKAS accreditation.

Any samples marked with * are not covered by our scope of UKAS accreditation. If applicable, further report notes have been added.

Any solid samples where the Major Constituents are not one of the following (Sand, Silt, Clay, Made Ground) are not one of our accredited matrix types.

Any samples marked with ‡ have had MCERTS accreditation removed for this result

Any samples marked with a tick in the deviant table is deviant for the specific reason.

Any samples reported as IS, NA, ND mean the following:

IS = Insufficient Sample to complete analysis
NA = Sample is not amenable for the required analysis
ND = Results cannot be determined

Our deviating sample report does not include deviancy information for Subcontracted analysis. Please see the report from the Subcontracted lab for information regarding any deviancies for this analysis.

End of Certificate of Analysis

Human Health	Commercial (1%SOM)						
Chemical of Potential Concern	Generic Criterion (mg/kg)	Basis for Generic Criterion	No. Samples	Min. (mg/kg)	Max. (mg/kg)	No. Samples Equal to, or Greater Than, Generic Criterion	US95 (mg/kg)
Arsenic	79	C4SL	3	7	12.3	0	16.60
Beryllium	8600	LQM/CIEH + CLEA 1.06	3	0.24	1.08	0	1.81
Boron	45000	LQM/CIEH + CLEA 1.06	2	0.6	0.8	0	1.14
Cadmium	220	C4SL	3	0.5	9	0	17.09
Chromium (III)	660000	LQM/CIEH + CLEA 1.06	3	11.6	20	0	26.21
Chromium (VI)	23	C4SL	0	0	0	0	#DIV/0!
Copper	400000	LQM/CIEH + CLEA 1.06	3	7.1	46.1	0	80.54
Lead	200	C4SL	3	115.2	1243	2	2113.18
Mercury, inorganic	9900	SGV report + CLEA 1.06	0	0	0	0	#DIV/0!
Nickel	38000	SGV report + CLEA 1.06	3	7.3	23.7	0	38.21
Selenium	29000	SGV report + CLEA 1.06	0	0	0	0	#DIV/0!
Vanadium	13000	LQM/CIEH + CLEA 1.06	0	0	0	0	#DIV/0!
Zinc	1000000	LQM/CIEH + CLEA 1.06	3	82.1	1705	0	3168.01
Cyanide (free)	21000	Caulmert + CLEA 1.06	0	0	0	0	#DIV/0!
Phenol (total)	3000	SGV report + CLEA 1.06	0	0	0	0	#DIV/0!
Acenaphthene	39000	LQM/CIEH + CLEA 1.06	0	0	0	0	#DIV/0!
Acenaphthylene	39000	LQM/CIEH + CLEA 1.06	1	0.28	0.28	0	#DIV/0!
Anthracene	200000	LQM/CIEH + CLEA 1.06	2	0.14	0.81	0	1.94
Benz(a)anthracene	89	LQM/CIEH + CLEA 1.06	2	0.34	3.18	0	7.95
Benzo(a)pyrene	5	C4SL	2	0.4	4.28	0	10.80
Benzo(b)fluoranthene	92	LQM/CIEH + CLEA 1.06	2	0.55	5.1	0	12.74
Benzo(ghi)perylene	590	LQM/CIEH + CLEA 1.06	2	0.28	2.82	0	7.09
Benzo(k)fluoranthene	130	LQM/CIEH + CLEA 1.06	2	0.22	1.93	0	4.80
Chrysene	130	LQM/CIEH + CLEA 1.06	2	0.43	2.87	0	6.97
Dibenz(a,h)anthracene	12	LQM/CIEH + CLEA 1.06	1	0.57	0.57	0	#DIV/0!
Fluoranthene	8100	LQM/CIEH + CLEA 1.06	2	0.67	5.43	0	13.43
Fluorene	26000	LQM/CIEH + CLEA 1.06	0	0	0	0	#DIV/0!
Indeno(1,2,3,cd)pyrene	56	LQM/CIEH + CLEA 1.06	2	0.26	3.17	0	8.06
Naphthalene	13000	LQM/CIEH + CLEA 1.06	2	0.12	0.2	0	0.33
Phenanthrene	8100	LQM/CIEH + CLEA 1.06	2	0.57	1.6	0	3.33
Pyrene	20000	LQM/CIEH + CLEA 1.06	2	0.61	5.53	0	13.80
Plant Life							
Chemical of Potential Concern	Generic Criterion (mg/kg)	Basis for Generic Criterion	No. Samples	Min. (mg/kg)	Max. (mg/kg)	No. Samples Equal to, or Greater Than, Generic Criterion	US95 (mg/kg)
Arsenic	250	MAFF 1998	3	7	12.3	0	16.60
Boron	3	New Zealand timber 1997	2	0.6	0.8	0	1.14
Chromium (III)	400	MAFF 1998 (Cr(T))	3	11.6	20	0	26.21
Chromium (VI)	25	ICRCL 70/90 1990	0	0	0	0	#DIV/0!
Copper	135	BS3882 2007	3	7.1	46.1	0	80.54
Nickel	75	BS3882 2007	3	7.3	23.7	0	38.21
Zinc	300	BS3882 2007	3	82.1	1705	2	3168.01



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Email: contact@caulmert.com
Web: www.caulmert.com

APPENDIX 2

Drawing 4937-CAU-MYC-XX-DR-C-1601_S2.P03
Proposed Drainage Layout



ELEVATED LEVELS OF LEAD FOUND IN SOILS BY GROUND INVESTIGATION. USE SUITABLE PPE AND TAKE PARTICULAR CARE REGARDING HYGIENE



OTHER BURIED ASSETS ON SITE. GPR SURVEY LOCATED ELECTRIC CABLES, GAS, WATER AND TELECOMS NOT DETECTED. CAT SCAN BEFORE EXCAVATION AND EXCAVATE WITH CARE

DRAINAGE SPECIFICATION

- ALL PROPOSED LEVELS TO BE CHECKED AND CONFIRMED ON SITE BY THE CONTRACTOR PRIOR TO COMMENCEMENT OF WORKS. ANY DISCREPANCIES TO BE REPORTED TO THE ENGINEER IMMEDIATELY. ALL DOWNSTREAM LEVELS TO BE CHECKED AND CONFIRMED BY THE CONTRACTOR PRIOR TO CONSTRUCTION OF ANY UPSTREAM DRAINAGE.
- THE POSITION AND LEVELS OF ALL DRAINS ARE TO BE CONFIRMED ON SITE PRIOR TO THE COMMENCEMENT OF THE WORKS AND ANY DISCREPANCIES REPORTED IMMEDIATELY TO THE ENGINEER.
- ALL PRIVATE DRAINAGE WITHIN THE SITE IS TO COMPLY WITH THE REQUIREMENTS OF BS EN 752:2017 AND BUILDING REGULATIONS PART H.
- CONCRETE PROTECTION PIPEWORK IS TO BE PROVIDED AS FOLLOWS:
 - ALL PIPEWORK WITHIN PEDESTRIAN/ SOFT AREAS WITH LESS THAN 450mm COVER
 - ALL PIPEWORK SUBJECT TO VEHICULAR OVERRUN WITH LESS THAN 0.9m COVER, REINFORCED PROTECTIVE SLAB WHERE COVER IS LESS THAN 0.6m. ALSO REFER TO DETAIL WHERE IN CLOSE PROXIMITY TO FOUNDATIONS. ELSEWHERE PIPES TO HAVE CLASS 5 AND 2 SURROUND.
- ALL PIPEWORK WITHIN MANHOLES ARE TO BE LAID SOFFIT TO SOFFIT (UNLESS NOTED OTHERWISE). ALL CHAMBER INVERT LEVELS ARE FOR THE OUTGOING PIPE LEVELS. BACKDROP PIPEWORK SHALL BE CONNECTED AT SOFFIT TO SOFFIT WITH THE RODDING ACCESS LEVEL SPECIFIED.
- ANY GRADIENTS OF DRAINS ARE INDICATIVE ONLY AND THE CONTRACTOR SHALL INSTALL THE DRAINS TO THE SPECIFIED LEVELS SHOWN FOR EACH MANHOLE (UNLESS NOTED OTHERWISE).
- CO-ORDINATE SETTING OUT INFORMATION FOR MANHOLES IS TO THE INTERSECTION OF THE DRAINS AND NOT THE CENTRE OF THE MANHOLE.
- COVER LEVELS OF THE MANHOLES ARE PROVISIONAL AND SUBJECT TO ADJUSTMENT ON SITE TO SUIT THE FINISHED GROUND LEVELS.
- MANHOLE COVERS AND FRAMES ARE TO BE IN ACCORDANCE WITH BS EN 124 AND THE FOLLOWING:
 - HIGHWAY AREAS: CLASS D400, DOUBLE TRIANGULAR, 150mm DEEP DUCTILE IRON COVER AND FRAME WITH THREE POINT COVER SEATING, BADGED FW OR SW FOR FOUL OR SURFACE WATER DRAINAGE.
 - DRIVES AND OTHER LIGHT VEHICLE AREAS: CLASS B125.
 - PEDESTRIAN ONLY AREAS: CLASS A15, 100mm DEEP BADGED FW OR SW FOR FOUL OR SURFACE WATER DRAINAGE.
- HEAVY DUTY COVER SLABS ARE TO BE USED WITHIN VEHICULAR TRAFFICKED AREAS.
- GULLY GRATINGS AND STEEL CHANNEL COVERS ARE TO BE IN ACCORDANCE WITH BS EN 124 AS FOLLOWS:
 - AREAS SUBJECT TO GENERAL HIGHWAY VEHICLE OVERRUN CLASS D400 MINIMUM.
 - AREAS NOT SUBJECT TO REGULAR VEHICLE OVERRUN CLASS C250.
 - GULLY GRATES ADJACENT TO KERBS SHALL BE HINGED ON THE SIDE OF THE TRAFFIC DIRECTION (LEFT HAND SIDE).
- PLASTIC CHAMBERS AND RINGS SHALL COMPLY WITH BS-EN 13598-1 AND BS-EN 13598-2 OR HAVE EQUIVALENT INDEPENDENT APPROVAL.
- TESTING OF THE DRAINAGE SHALL BE CARRIED OUT IN ACCORDANCE WITH THE REQUIREMENTS OF THE BRITISH STANDARDS AND CURRENT BUILDING REGULATIONS. A SIGNED RECORD BY AN AUTHORISED PERSON OF THE TESTING SHALL BE KEPT AND MADE AVAILABLE TO THE ENGINEER IF REQUESTED.
- UPON COMPLETION OF THE WORKS, ALL THE DRAINS SHALL BE CLEANED BY JETTING, REMOVING ALL DEBRIS FROM THE SITE. NO DEBRIS SHALL BE PERMITTED TO ENTER THE OFF SITE PIPEWORK OR ENVIRONMENT.
- THE CONTRACTOR SHALL ALLOW FOR JETTING OF BOTH FOUL AND SURFACE WATER DRAINAGE SYSTEMS ON COMPLETION. AFTER CLEANING A COLOUR CCTV SURVEY OF ALL THE DRAINAGE SYSTEM AND PROVIDE THE ENGINEER WITH TWO COPIES OF THE CCTV ON DVD IN WINDOWS MEDIA FORMAT (MPEG) AND REPORTS.
- THE CONTRACTOR SHALL ALLOW FOR DEALING WITH GROUNDWATER IN ALL EXCAVATIONS AND OBTAIN ALL RELEVANT PERMITS FOR TEMPORARY DISPOSAL.
- PLASTIC PIPES FOR GRAVITY SEWERS, FOR 150-300mm DIAMETER ARE AS FOLLOWS:
 - MARLEY TWINWALL SYSTEM
 - UPONER ULTRARIB SYSTEM
 - OSMA ULTRARIB SYSTEM
 - POLYSEWER TWINWALL SYSTEM
 - POLYPIPES RIGISEWER (400-600MM & 750-900MM)
- THE INSTALLER OF UPVC PIPEWORK TO ADOPTABLE SEWERS MUST BE ACCREDITED WITH THE BRITISH PLASTICS FEDERATION (BPF), PLASTIC PIPES GROUP. A COPY OF THE ACCREDITATION CERTIFICATE TO BE ISSUED BEFORE ANY WORK ON SITE IS COMMENCED.
- ALL PIPES TO BE PLASTIC IN ACCORDANCE WITH SFA 7TH EDITION PART E AND NOTE 17 ABOVE.
- ALL SURFACE WATER DRAINS IN FILTER DRAINS AND BELOW POROUS SURFACES TO HAVE PERFORATED PIPES.
- ALL YARD GULLY & RAINWATER PIPE CONNECTIONS TO BE 100Ø UNLESS NOTED OTHERWISE.
- ALL ROAD GULLY CONNECTIONS TO BE 150Ø UNLESS NOTED OTHERWISE.
- ALL CONCRETE TO HAVE BES 6001 CERTIFICATION.

NOTES

- DO NOT SCALE FROM THIS DRAWING. WORK FROM FIGURED DIMENSIONS ONLY. ALL DIMENSIONS ARE IN METRES AND ALL LEVELS ARE IN METRES ABOVE ORDNANCE DATUM UNLESS NOTED OTHERWISE.
- THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL RELEVANT ISHTS, ENGINEERS AND SPECIALIST DRAWINGS AND SPECIFICATIONS.
- SEE DRAWING 4937-CAU-MYC-XX-DR-7600 FOR MANHOLE SCHEDULE.
- SEE DRAWING 4937-CAU-XX-DR-C-5600 TO 5602 FOR CONSTRUCTION DETAILS.

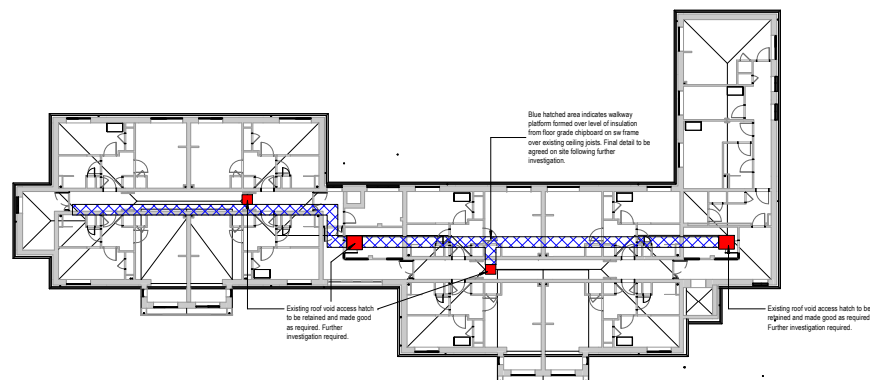
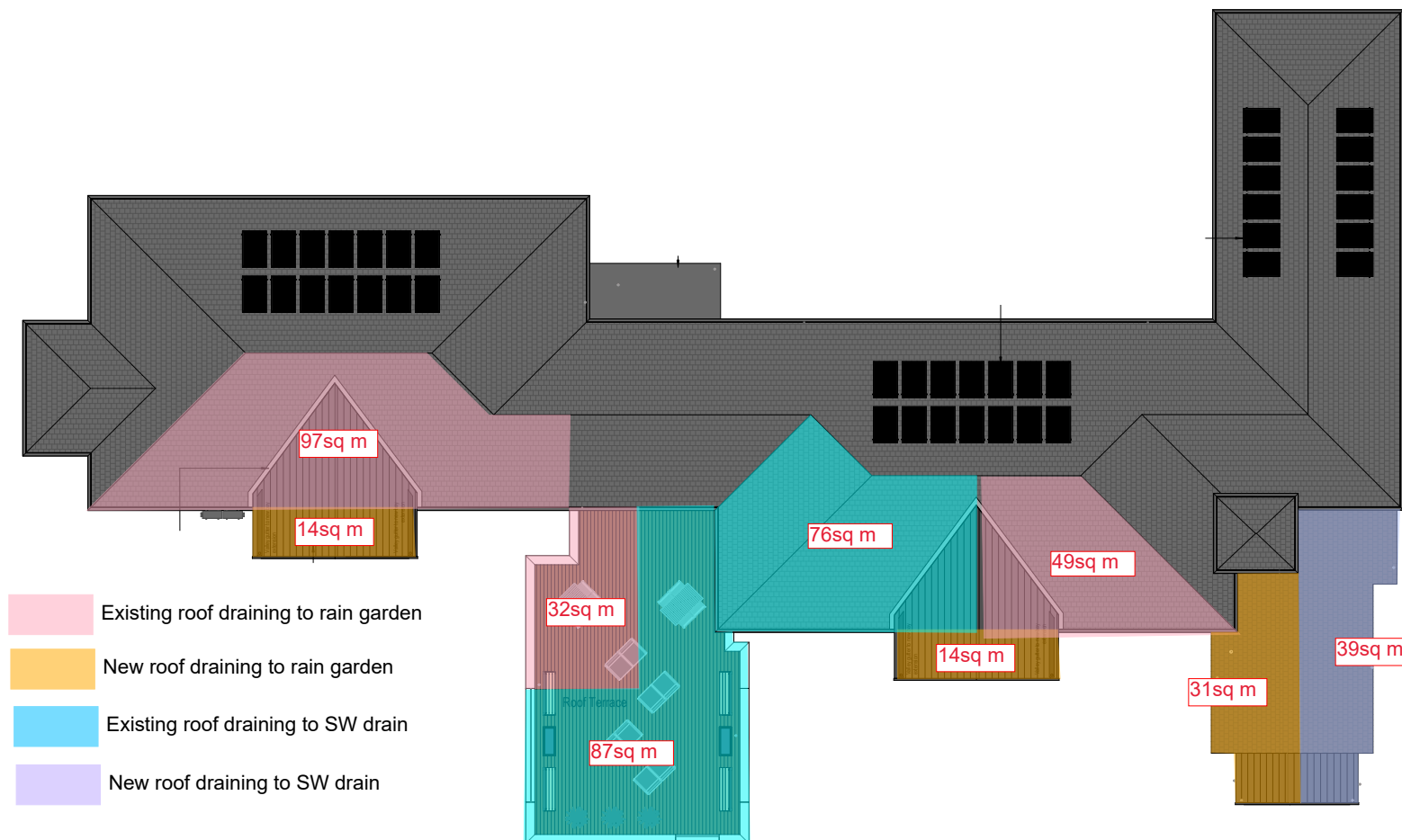
LEGEND

- EXISTING FOUL WATER PIPE
- EXISTING SURFACE WATER PIPE
- EXISTING COMBINED WATER PIPE
- EXISTING FOUL WATER CHAMBER
- EXISTING SURFACE WATER CHAMBER
- PROPOSED FOUL WATER PIPE
- PROPOSED SURFACE WATER PIPE
- PROPOSED FOUL WATER CHAMBER
- PROPOSED SURFACE WATER CHAMBER
- PROPOSED BUILDING EXTENSION
- PROPOSED ACO RAIN DRAIN B125 CHANNEL OR SIMILAR. COVER TO ARCHITECT DETAIL

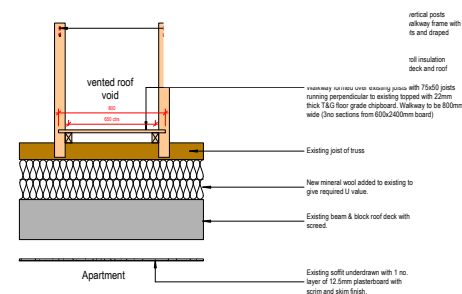
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P01		HAZARDS, NOTES ADDED		DA	DH	DH	24.11.22
P01		ISSUED FOR INFORMATION		LJ	DH	DH	25.10.22
REV	MODIFICATIONS		BY	RE	AP	DATE	
PURPOSE OF ISSUE				STATUS			
FOR INFORMATION				S2			
CLIENT: ELLIS WILLIAMS ARCHITECTS							
PROJECT: MAES Y CAPEL WREXHAM							
TITLE: PROPOSED DRAINAGE LAYOUT							
DESIGNED BY	DA	DRAWN BY	DA	REVIEWED BY	DH	AUTHORISED BY	DH
DATE	24.03.22	SCALE @ A2	1:200	JOB REF:	4937	REVISION	P03
DRAWING NUMBER 4937-CAU-MYC-XX-DR-C-1601							
Registered Office: Intec, Parc Menai, Bangor, Gwynedd, LL57 4FG Company Registered No: 06716319							
WWW.CAULMERT.COM							

APPENDIX 3

Roof Area Take Off

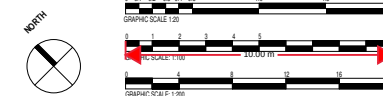


2 | Indicative Roof Void Access
 1:200



3 | Indicative Roof Walkway
 1:20

Information is indicative prior to further investigation.
 Final details to be agreed following on site investigation.



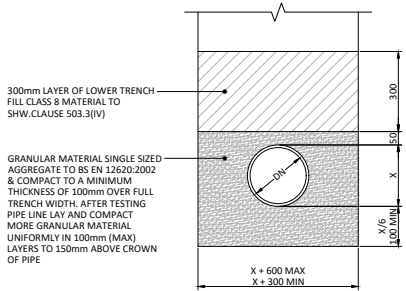
elliswilliams

Project Number: 2705
 Project Name: Maes y Capel
 Drawing Status: D1 Costing
 Drawing Name: Roof Plan As Proposed
 Date: 26.01.22
 Drawn By: JH
 Rev: P2
 Scale: As indicated

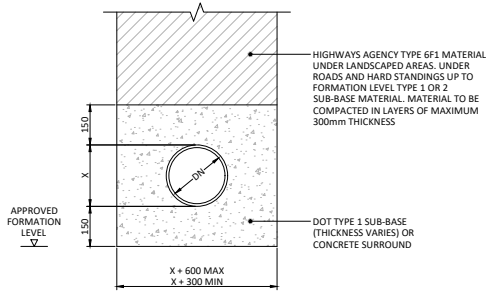
Wellfield Chester Road Preston Brook WA7 3BA
 T: 01928 752200 E: info@ewa.co.uk W: ewa.co.uk

APPENDIX 4

Drawing 4937-CAU-MYC-XX-DR-C-5603_S2.P03
Proposed Drainage Construction Details Sheet 4



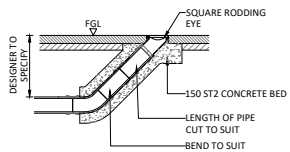
BEDDING CLASS 'S'
1:10



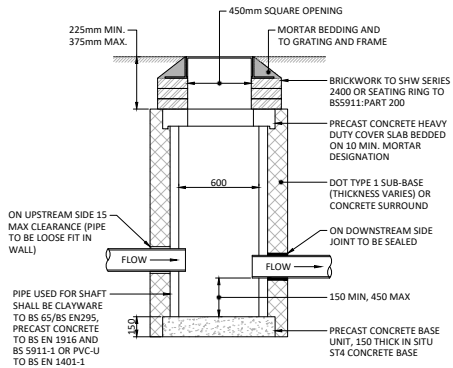
BEDDING CLASS 'Z'
1:10

TO ALL PIPE WITH COVER FROM FINISHED SURFACE TO CROWN
GREATER THAN 1200mm IN TRAFFICKED AREAS OR GREATER THAN
900mm COVER IN LANDSCAPED AREAS OR UNDER BUILDINGS.

TO ALL PIPES WITH COVER FROM FINISHED SURFACE TO CROWN
LESS THAN OR EQUAL TO 1200mm IN TRAFFICKED AREA OR LESS
THAN 900mm COVER IN LANDSCAPED AREAS OR UNDER BUILDINGS.

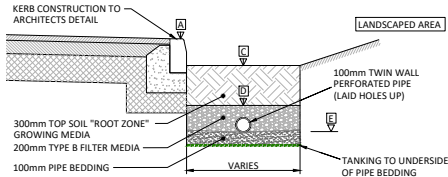


TYPICAL RODDING EYE DETAIL
SCALE 1:20

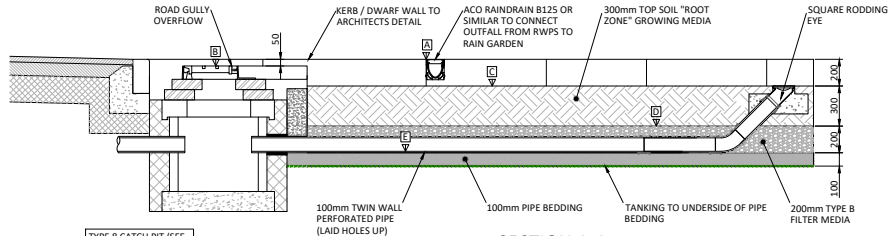


TYPE 8 - CATCHPIT CHAMBER
1:20

Feature	Raingarden 1 (West)		Raingarden 2 (East)	
	Level (mAOD)	Level (mAOD)	Level (mAOD)	Level (mAOD)
Top of kerb/retention wall	A	234.850	234.850	
Overflow gully level	B	234.800	234.800	
Topsoil surface level	C	234.650	234.650	
Top of type B filter media	D	234.550	234.550	
Invert level/ top of pipe bedding	E	234.350	234.350	
Underside of pipe bedding	F	234.250	234.250	

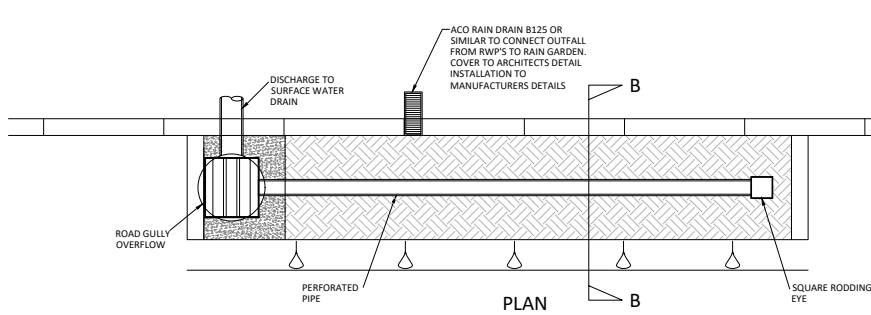


SECTION B-B
1:20



SECTION A-A
RAIN GARDEN DETAIL
1:20

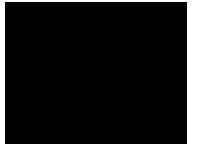
TYPE 8 CATCH PIT (SEE
DETAIL) FITTED WITH
GULLY GRATING TO
PROVIDE HIGH LEVEL
OVERFLOW



NOTES

- DO NOT SCALE FROM THIS DRAWING. WORK FROM FIGURED DIMENSIONS ONLY. ALL DIMENSIONS ARE IN METRES AND ALL LEVELS ARE IN METRES ABOVE ORDNANCE DATUM UNLESS NOTED OTHERWISE.
- THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL RELEVANT ARCHITECTS, ENGINEERS AND SPECIALIST DRAWINGS AND SPECIFICATIONS.

SPECIFICATION FOR TOPSOIL TO RAINGARDENS



THE PREFERRED MAKE UP OF THE TOPSOIL TO BE:

- FINE GRAVEL (2.0-6.0 MM) < 10%
- COARSE SAND (0.60-2.0 MM) 50% TO 60%
- MEDIUM SAND (0.2-0.6 MM) 35% TO 65%
- FINE SAND (0.063-0.2 MM) < 20%
- CLAY AND SILT (< 0.063 MM) < 5%

ORGANIC MATTER CONTENT

ORGANIC MATTER CONTENT SHOULD BE 3-5% (W/W).

PH

PH SHOULD BE 5.5-8.5 (1:2.5 SOIL/WATER EXTRACT)

ELECTRICAL CONDUCTIVITY (SALINITY)

ELECTRICAL CONDUCTIVITY (EC) SHOULD BE < 3300 µS/CM (1:2.5 SOIL/CASO4 EXTRACT)

MAJOR PLANT NUTRIENTS

TOTAL NITROGEN SHOULD BE 0.10-0.30%

EXTRACTABLE PHOSPHORUS SHOULD BE 16-100 MG/L

EXTRACTABLE POTASSIUM SHOULD BE 120-900 MG/L

(METHODS OF ANALYSIS IN ACCORDANCE WITH BS 3882:2015, UNLESS OTHERWISE STATED.)

HORTICULTURAL ASSESSMENT

SOILS AND TEST RESULTS SHOULD BE ASSESSED BY A HORTICULTURALIST TO ENSURE THAT THEY ARE CAPABLE OF SUPPORTING A HEALTHY VEGETATION COMMUNITY. THIS ASSESSMENT SHOULD TAKE INTO CONSIDERATION DELIVERY OF NUTRIENTS TO THE SYSTEM BY SURFACE WATER RUNOFF. ANY COMPONENT OR SOIL FOUND TO CONTAIN HIGH LEVELS OF SALT, CLAY OR SILT PARTICLES (EXCEEDING THE PARTICLE SIZE LIMITS SET ABOVE), OR ANY OTHER EXTREMES WHICH MAY BE CONSIDERED RETARDANT TO PLANT GROWTH SHOULD BE REJECTED.

PLANTING TO RAIN GARDEN TO ARCHITECTS SPECIFICATION

PD1	ISSUED FOR APPROVAL	DA	DH	DH	15.08.23					
REV	MODIFICATIONS	BY	RE	AP	DATE					
PURPOSE OF ISSUE					STATUS					
FOR APPROVAL					S4					
CLIENT:										
ELLIS WILLIAMS ARCHITECTS										
PROJECT:										
WREXHAM SHELTERED HOUSING MAES Y CAPEL										
TITLE:										
PROPOSED DRAINAGE CONSTRUCTION DETAILS SHEET 4										
DESIGNED BY	DH	DRAWN BY	DA	REVIEWED BY	DH					
DATE	01.08.23	SCALE @ A1	AS SHOWN	JOB REF:	4937					
DRAWING NUMBER	4937-CAU-MYC-XX-XX-DR-C-5603									
REVISION:										
P01										
REGISTERED OFFICE: 107 Fec, Pant Menai, Bangor, Gwynedd, LL57 4FG Company Registered No: 06716139										
www.caulmert.com										

APPENDIX 5

Suitable Plant Species

Your rain garden is designed to slow surface water run-off and improve water quality. However it is a garden feature and should work for you in terms of the overall design of your property. Like any garden, there is range of possible planting styles: your rain garden might have ornamental, low maintenance ground cover, designed to provide a habitat for wildlife or quirky, perhaps, with stone, gravels or even sculpture – the choice is yours. The English cottage, American prairie or ornamental grass styles are particularly well suited to rain gardens. In larger planters, you may be able to grow fruit and vegetables.

When choosing plants you may want to consider height, colour and flowering period. Taller plants tend to be situated at the centre of the garden and shorter ones around the edges, so that all can be seen and so that deeper-rooted plants can benefit from the deeper soil in the middle of the bed. By grouping plants of various size and texture you will be able to create an interesting looking garden even when few flowers are in bloom. If you wish to create habitat for wildlife, plant native species or plants that are known to attract insects like bees and butterflies and other wildlife. For further information on plants for pollinators see the Royal Horticultural Society's list, and for general advice on wildlife gardening see the Wild About Gardens website (see the Resources section).

It is recommended that your rain garden is planted with a wide range of species in order to create a densely vegetated, stable and thriving bed with dense and thick root systems which will thrive without frequent maintenance. A typical rain garden is planted with about 10 species planted in 2 to 3 clumps per square metre. By planting several species, you will be creating a rain garden that can still succeed even if one or two species do not thrive. A typical planting density is 6-10 plants per square metre, but you may wish to vary this, depending on the size and nature of the plants chosen.



Bugle, *Ajuga reptans* | Bob Gibbons

Plant the rain garden with nursery-grown stock. Good results have been achieved with one or two year old plugs or potted

plants, which have a strong root system. Before you plant, it is advisable to have a good idea of what goes where, by preparing a planting plan. Excavate a hole for each plant about twice the size of the root ball, place the plant in the hole and press the soil firmly around the roots. The stem should be at the same level relative to the ground as it was in the growing container. Once the garden is planted, you may consider spreading bark mulch across bare soil to suppress weed growth.



Yellow flag iris, *Iris pseudocorus* | Bob Gibbons

The perimeter berm can be seeded with a general purpose wildflower grassland mix, which can be left to grow, or mown as required, in order to match the adjacent garden. Unless it rains, plants should be watered during establishment. During hot weather, the soil loses about 3 litres per square metre per day by evaporation, so it is advisable to replace this if possible. Once established, the plants will not need to be watered unless the weather has been exceptionally dry. Plants can be planted anytime during the growing season, as long as they are watered. If watering is difficult, it may be advisable to plant in autumn.

A very wide range of plants can be planted in rain gardens, however you should avoid using plants that do not withstand occasional flooding - for example species which are usually associated with dry Mediterranean style gardens, like Lavender. Other plants to avoid include those susceptible to root rot including Azalea, Juniper and Chinese privet.

The frequency that the rain garden is inundated will depend on the size of the rain garden and the weather, so it is important to keep an eye on the rain garden, replace any failures and adjust the planting palette to suit the actual conditions. A selection of suggested plants is included in the table. There are many others that will be suitable which are not listed, so feel free to experiment and apply your own plant knowledge if you are a keen gardener. If you have success or notice problems with particular species, please let us know at: www.raingardens.info.



Planting Suggestions

Common name	Scientific name	Habit	Sunlight and Aspect	Origin
Gelder rose	<i>Viburnum opulus</i>	Perennial shrub	Any	Native. Flowers attract insects and berries are eaten by birds.
Dogwood	<i>Cornus sanguinea</i>	Perennial shrub	Any	Native. Leaves are larval food for vase bearer moth and berries eaten by birds. Often planted for attractive winter stems.
Culvers root	<i>Veronicastrum virginicum</i>	Herbaceous perennial	Full sun or partial shade	Non-native. Tall with long terminal blue flower spikes. On the RHS 'plants for pollinators' list.
Aster	<i>Aster spp.</i>	Herbaceous perennial	Full sun or partial shade	Non-native. Often late flowering. Clump forming. Several species on the RHS 'plants for pollinators' list.
Black eyed susan	<i>Rudbeckia hirta</i>	Herbaceous annual or biennial	Full sun or partial shade	Non-native. Spectacular yellow and black flowers. On RHS 'plants for pollinators' list.
Stinking hellebore	<i>Helleborus foetidus</i>	Herbaceous perennial	Full sun or partial shade	Native. Winter flowers.
Montbretia	<i>Crocusmia spp.</i>	Deciduous rhizomatous perennial	Partial shade	Naturalised. Red flowers. Thrives in most conditions.
Bugle	<i>Ajuga reptans</i>	Rhizomatous perennial	Partial shade	Native. Low growing and will form a mat.
Columbine	<i>Aquilegia spp.</i>	Herbaceous perennial	Full sun or partial shade	Non-native. Clump forming with tall flower spikes. On RHS 'plants for pollinators' list.
Inula	<i>Inula hookeri</i>	Herbaceous perennial	Partial shade	Tall clump forming with yellow flowers. On RHS 'plants for pollinators' list.
Hemp agrimony	<i>Eupatorium cannabinum</i>	Herbaceous perennial	Full sun or partial shade	Native. Sub-shrubs with pink flowers.
Bellflower	<i>Campanula glomerata</i>	Herbaceous perennial	Full sun or partial shade	Native. Clumps bearing violet-blue bell shaped flowers.
Sneezeweed	<i>Helenium sp.</i>	Herbaceous perennial	Full sun	Non-native. Clump forming with red flowers. On RHS 'plants for pollinators' list.
Lesser periwinkle	<i>Vinca minor</i>	Perennial sub-shrub	Any	Non-native. Ground cover with blue flowers.
Elephants ear	<i>Bergenia sp.</i>	Rhizomatous perennial	Full sun or partial shade	Non-native. Large leaves and pink flowers.
Plantain lilies	<i>Hosta spp.</i>	Herbaceous perennial	Part shade	Non-native. Attractive light coloured flowers.
Yellow flag	<i>Iris pseudocorus</i>	Rhizomatous perennial	Full sun or partial shade	Native. Likely to prefer wetter areas near inlet.
Siberian flag	<i>Iris sibirica</i>	Rhizomatous perennial	Full sun or partial shade	Non-native. Blue flowers. Prefers moist but well drained soil.
Garlic and onions	<i>Allium spp.</i>	Bulbous perennials	Full sun	Non-native. On RHS 'plants for pollinators' list.
Soft rush	<i>Juncus effusus</i>	Evergreen perennial	Full sun or partial shade	Native. Form tussocks – likely to prefer wetter areas.
Pendulous sedge	<i>Carex pendula</i>	Rhizomatous perennial	Full sun or partial shade	Native. Nodding flower spikes. Likely to prefer wetter areas near inlet.
Zebra grass	<i>Miscanthus sinensis</i>	Perennial, deciduous grass	Full sun	Non-native. Tussock forming ornamental grass with silky flowers.
Switch grass	<i>Panicum virgatum</i>	Deciduous perennial grass	Full sun	Non-native. Tussock forming ornamental grass.
Royal fern	<i>Osmunda regalis</i>	Deciduous fern	Any	Native. Large clump-forming plants.
Male fern	<i>Dryopteris filix-mas</i>	Deciduous or evergreen fern	Partial shade or full shade	Native. Large shuttlecock-like form.
Broad buckler fern	<i>Dryopteris dilatata</i>	Deciduous or evergreen fern	Partial shade or full shade	Native. Large shuttlecock-like form.

APPENDIX 6

Water Quality Summary

CALCULATION SHEET

Client: Wrexham CBC	Site: Maes Y Capel	Project: Drainage Strategy	
Made by: David High	Date: 18/08/2023	Checked by:	Date: Sheet no.: 1

Water Quality Summary

Water quality assessed using Simple Index Approach as described in Section 26.7.1 of the SuDS Manual.

Land Use Type	Residential roofing	Individual driveway
Pollution Hazard Level	Very low	Low
Pollution Hazard Indices		
TSS	0.20	0.50
Metals	0.20	0.40
Hydrocarbons	0.05	0.40
SuDS components proposed		
Component 1	Bio-retention	Pervious pavement
Component 2	None	None
Component 3	None	None
SuDS Pollution Mitigation Indices		
TSS	0.8	0.7
Metals	0.8	0.6
Hydrocarbons	0.8	0.7
Groundwater Protection Type	Bio-retention	Bio-retention
GW protection Pollution Mitigation Indices		
TSS	0.8	0.8
Metals	0.8	0.8
Hydrocarbons	0.8	0.8
Combined Pollution Mitigation Indices		
TSS	>0.95	>0.95
Metals	>0.95	>0.95
Hydrocarbons	>0.95	>0.95
Acceptability of Pollution Mitigation		
TSS	Sufficient	Sufficient
Metals	Sufficient	Sufficient
Hydrocarbons	Sufficient	Sufficient

Notes:

Roofing to bioretention system, where system is not designed as an infiltration component.

Bioretention component underlain by 30mm min depth of soils with good contamination attenuation potential

No category in SIA for footways, individual driveways used as worst case

Paving is pervious pavement, where system is not designed as an infiltration component.

APPENDIX 7

SuDS Maintenance Schedule

MODIFICATION WORKS, MAES Y CAPEL, COEDPOETH

SURFACE WATER DRAINAGE MAINTENANCE PLAN

1.0 Introduction

This document sets out the principles for the long-term management and maintenance of the surface water Sustainable Drainage Systems (SuDS) to be constructed as part of the proposed modifications to the southern elevation of Maes y Capel care home, Coedpoeth by Wrexham CBC. The extent of the site covered by this maintenance plan is shown in figure 1 below.



Figure 1. Site Location

The development will increase the building footprint by approximately 98m², through the provision of two new bay windows and the addition of a new entrance/ reception area. The site will remain in the ownership of Wrexham CBC who are responsible for all maintenance of the site.

The purpose of this document is to set out the basis of the development's SuDS Maintenance Plan and to ensure that Wrexham CBC (described as the Management Company in this document) is entrusted with a robust inspection and maintenance programme, ensuring the optimum operation of the surface water drainage network is continually maintained for the lifetime of the development, and to prevent the increased risk of flooding both on and offsite in accordance with the National Planning Policy Framework (NPPF).

The activities listed in this document are generic to the relative SuDS types and represent the minimum maintenance and inspection requirements. Additional tasks or varied maintenance frequency may be instructed by the maintenance Management Company as required. Specific maintenance needs of the SuDS elements should be monitored and maintenance schedules adjusted to suit requirements.

All those responsible for maintenance should follow relevant Health and Safety legislation (Health and Safety at Work Regulations, 1999) for all activities listed within this report including lone working, if relevant) and risk assessments should always be undertaken.

Any contractor employed by the Management Company shall carry out periodic maintenance of all such SuDS in accordance with the schedules listed in this report. Inspection checks shall be carried out by a qualified and competent person, at the minimum intervals listed within the schedules and the appropriate work carried out.

This drainage maintenance plan will be incorporated within the Operation and Maintenance (O&M) manual for the development and be accessible to those who undertake maintenance. This document should be read in conjunction with the drainage system drawing 4315-CAU-NBTYC-XX-DR-C-1600 Proposed Drainage Layout.

2.0 Overview of Maintenance

All drainage systems, whether piped systems or SuDS systems, require regular maintenance. The maintenance of the SuDS system should be included alongside other regular maintenance tasks. The table below gives an overview of typical maintenance tasks and the frequency with which they need to be undertaken.

Activity	Indicative frequency	Typical tasks
Routine/regular maintenance	Monthly to annually (for normal care of SuDS)	Litter picking Inspection of inlets, outlets and control structures Routine landscape maintenance of planted areas (including raingardens)
Occasional maintenance	Annually up to 25 years (dependent on the design)	Silt control around components Vegetation management around components Silt removal from catchpits, and cellular storage
Remedial maintenance	As required (tasks to repair problems due to damage or vandalism)	Inlet/outlet repair Erosion repairs Reinstatement of edgings Reinstatement following pollution Removal of silt build up

The required maintenance for each of the elements that make up the SuDS system is scheduled in the tables below. The following guidance is based on CIRIA C753 – The SuDS Manual.

3.0 Attenuation Storage Systems

Maintenance Schedule	Required Action	Typical Frequency
Regular Maintenance	Inspect and identify any areas that are not operating correctly. If required, take remedial action	Monthly for 3 months, then annually
	Remove debris from catchment surface (where it may cause risks to performance)	Monthly
	For systems where rainfall infiltrates into the stone attenuation cell from above, check surface for blockage by sediment, or other matter; remove sediment and or replace surface infiltration medium as necessary.	Annually
	Remove sediment from pre-treatment structures and/ or internal forebays	Annually, or as required
Remedial Maintenance	Repair/rehabilitation of inlets, outlet, overflows and vents	As required
Monitoring	Inspect/check all inlets, outlets, vents and overflows to ensure that they are in good condition and operating as designed	Annually and after large storms
	Survey inside of tank for sediment build up and remove if necessary	Every 5 years or as required

5.0 Silt Traps

These features are catchpits within inspection chambers and gully traps at the foot of rainwater pipes around the building and road gullies (including raingarden overflows).

Maintenance Schedule	Required Action	Typical Frequency
Routine Maintenance	Inspection	Monthly
	Litter / debris removal	Monthly or as required
Occasional Maintenance	Sediment removal – silt stores should be emptied.	6 monthly
Remedial Maintenance	Repair (as a result of damage or vandalism)	As required

6.0 Rain Gardens

As rain gardens are planted features they require more attention during the establishment period (years 1 and 2) than during the remainder of their life; heavier maintenance is required at 10 to 15 year intervals to de-silt and re-plant them as necessary.

Maintenance Schedule (During establishment period, years 1 & 2)	
Required Action	Typical Frequency
Watering	Weekly during dry period
Weeding	3- monthly
Litter picking	3- monthly
Pruning/ trimming	3- monthly
Check/ clean inlets/ outlets	3- monthly
Mulching	Annually (or as required)

Maintenance Schedule (Following establishment period, year 3 onwards)	
Required Action	Typical Frequency
Weeding	6- monthly
Litter picking	6- monthly
Pruning/ trimming	6- monthly
Check/ clean inlets/ outlets	6- monthly
Re-planting	Annually (or as required)

Maintenance Schedule (every 10 – 15 years)	
Required Action	Typical Frequency
Remove silt	10 – 15 years
Re-planting	6- monthly

7.0 Flood Routes

Flood routes (exceedance routes) allow water volumes that exceed the capacity of the SuDS system to pass through or round the site without causing damage to property. These routes must be clear of obstructions at all times.

Maintenance Schedule	Required Action	Typical Frequency
Routine Maintenance	Inspection	Monthly
	Litter / debris removal	Monthly or as required
Occasional Maintenance	Check route is not blocked by new fences, walls, stored materials, soil or other rubbish. Remove as necessary	Monthly
Remedial Maintenance	Repair (as a result of damage or vandalism)	As required

8.0 Sustainable Drainage (SuDS) features checklist

SuDS techniques include landscape features and control structures to manage runoff as it flows to the site outfall. The following lists the features which may be found throughout the development:

- Porous Pavements and Filter drains clean, store and convey water to another feature or allow it to soak into the ground. They are stone filled blankets or trenches, sometimes with a perforated pipe in the bottom. These may be enlarged to treat dirty water, as treatment trenches, or increase soakage into the ground, as infiltration features.
- Inlets and outlets structures are often conveyance pipes protected with mesh guards. They must be free from obstruction at all times to allow free flow through the SuDS.
- SuDS flow control structures are usually vortex controls, small orifices in control chamber, slots or V notches in weirs. They are usually near the surface so are accessible and easy to maintain. They may be in baskets, in small chambers or in the open.
- Inspection chambers, catchpit chambers and rodding eyes are used on bends or where pipes come together. They allow cleaning of the system if necessary.
- Flood routes (exceedance routes) allow water volumes exceeding the capacity of the system to escape from the site without causing damage to property. This route must be clear of obstructions at all times.

9.0 Spillage – Emergency Action

Most spillages are of compounds that do not pose a serious risk to the environment if they enter the drainage in a slow and controlled manner with time available for natural breakdown in a treatment system. Therefore small spillages of oil, milk or other known organic substances should be removed where possible using soak mats as recommended by the Natural Resource Wales with residual spillage allowed to bio-remediate in the drainage system.

In the event of a serious spillage, either by volume or of unknown or toxic compounds, then isolate the spillage with soil, turf or fabric and block outlet pipes from chamber(s) downstream of the spillage with a bung(s). (A bung for blocking pipes may be made by wrapping soil or turf in a plastic sheet or close woven fabric.)

Contact Natural Resources Wales immediately.

10.0 Updates (Installation Construction)

11.0 Revisions (Post Installation)

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