

APPENDICES

Appendix A Architectural Development Proposals

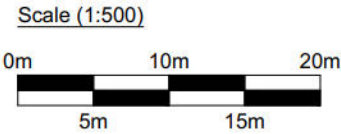
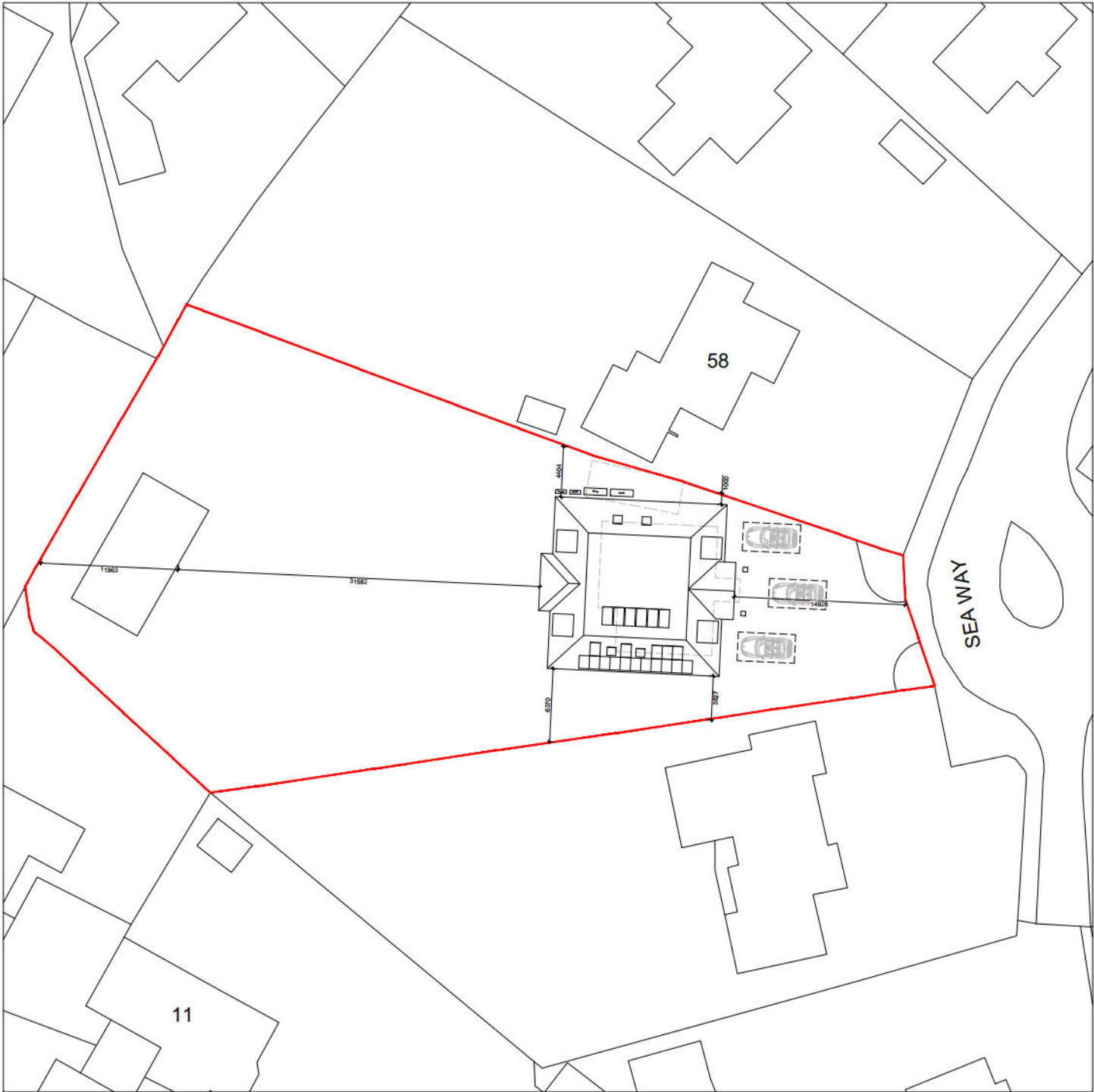
Notes

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This drawing is to be read in conjunction with the other drawing(s) and specification(s).

Do not scale from this drawing, except for Planning purposes.

All dimensions are to be checked on site.



B	Generally revised	23.01.26
A	Generally revised	28.05.24
Rev.	Description	Date

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Client

Mr Vlad

Project

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 Bognor Regis, West Sussex. PO22 7SA

Drawing Title

Block Plan

Date	Drawn	Scale
September 2021	DH	1:500 @ A3

Drawing No.	Rev.
2021/87/L02	B

☐ Feasibility
 ☒ Planning
 ☐ Building Regulations

Appendix B Topographic Survey



LEGEND

AV	Air Valve	ME	Manhole Electricity
BB	Belisha Beacon	MF	Manhole Foul
BI	Illum.Bollard	MH	Manhole General
BL	Bollard	MK	Marker Post
BM	Bench Mark	MRF	Metal Railing Fence
BP	Brick Pillar	MS	Manhole Surface Water
BPS	Block Paving Slabs	MW	Water Supply/Meter
BRK	Brick	NB	Notice Board
BS	Bus Stop/Shelter	OHC	Over Head Cable
BW	Brick Wall	P	Post
BRW	Brick Retaining Wall	PB	Post Box
CB	Telephone Box	PI	Pipe
CBF	Close Boarded Fence	RE	Rodding Eye
CC	CCTV Camera	RG	Road Gulley
Ce	Cats Eye	RN	Road Name Plate
CL	Cover Level	RP	Reflector Post
CLF	Chain Link Fence	PRF	Post & Rail Fence
CONC	Concrete	RS	Road Sign
CPS	Concrete Paving Slabs	PSW	Post & Wire Fence
CW	Concrete Wall	Sap	Sapling
CRW	Concrete Ret. Wall	SMP	Sheet Metal Piling
DK	Drop Kerb	SL	Soffit Level
EB	Electricity Box	Stu	Stump
EP	Electricity Pole	SP	Sign Post
FB	Flower Bed	SV	Stop Valve
FH	Fire Hydrant	SW	Stay Wire
FL	Flood Light	TH	Threshold Level
FS	Flag Staff	TL	Traffic Light
FP	Footpath	TP	Telegraph Pole
G	Gully	TPS	Tactile Paving
HW	Headwall	TSR	Tubular Steel Railings
IC	Inspection Cover	TV	Cable TV Point
IL	Invert Level	TC	Traffic Camera
IRF	Iron Railing Fence	TW	Top of wall
KW	Kerb Weir Inlet	VP	Vent
LB	Litter Bin	WL	Water level
LP	Lamp Post	WMF	Wire Mesh Fence
MB	Manhole Telecom	WO	Washout
MC	Manhole Cable	WPR	Wooden Post & Rail

NOTES

1. The Grid is OSGB 36 using OSTN15 & OSGB15 on the OS Active Network
2. All levels are related to OS Datum (Newlyn)

Rev	Date	Description	Checked
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geopoint.
Geospatial Engineering & Surveying

Client	George Vlad				
Project	60 Southing, Sea Way, PO22 7SA				
Title	Topographical Survey				
Drawing No.	Geo22-020_T				
Scale	1:200@ A1		Date	09/02/2022	
Drawn	DGK	Checked	AS	Approved	DGK
Geopoint Ltd. Unit 8 Jupiter House Calleva Park Aldermaston Reading					

Appendix C Albury S.I. Ltd Ground Investigation and BGS Records

REPORT ON A SITE INVESTIGATION

Site

**60 SEA WAY, MIDDLETON ON SEA,
BOGNOR REGIS, WEST SUSSEX PO22 7SA**

Client

GEORGE 4 BUILDING PROJECTS LTD

Report Ref

23/12617/GO

Issued

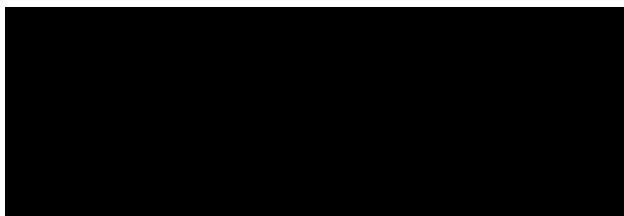
June 2023



ALBURY S.I. LTD

Geotechnical and Environmental Consultants

Miltons Yard, Petworth Road,
Witley, Surrey GU8 5LH



DOCUMENT CONTROL			
Report Title	Report on a Site Investigation		
Contract	Sea Way, Middleton on Sea		
Report Reference	23/12617/GO		
Client	George 4 Building Projects Ltd		
Prepared by	G C D Owens BSc MSc FGS MEnvSc Director		
Approved by	K J Clark BSc Hons Director		
Revision No.	Status	Date of Issue	Final Issue Check
0	Final	20/06/2023	

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This Report is prepared for the specific purpose stated and in relation to the development proposals or usage indicated to Albury S.I. Limited at the time of preparation. The recommendations should not be used for adjacent schemes and may not be appropriate for alternative proposals.

The recommendations made and opinions expressed in this Report are based on the strata conditions revealed by the fieldworks as indicated on the exploratory records, together with an assessment of the data from in situ and laboratory tests. No liability can be accepted for conditions which have not been revealed by the fieldworks, for example, between exploratory positions. While this Report may offer opinions on the possible configuration of strata, both between the excavations and below the maximum depth achieved by the investigation, these comments are for guidance only and no liability can be accepted for their accuracy. The data obtained relate to the conditions which are relevant at the time of the investigation.

The groundwater observations entered on exploratory records are those noted at the time of the investigation. The normal rate of progress does not usually permit the recording of any equilibrium water level for any one water strike. It should be noted that groundwater levels are prone to seasonal variation and to changes in local drainage conditions. The word 'none' indicates that groundwater was sealed off by the borehole casing or that no water was observed in the exploratory hole upon completion.

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REPORT REF: 23/12617/GO

CONTRACT: SEA WAY, MIDDLETON ON SEA

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- 1 Site Layout Plan

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- 1 Exploratory Records
 2 Laboratory Test Results
 3 Desiccation
 4 Waste

SYNOPSIS

This investigation has demonstrated that limited thickness of made ground and loam overlies cohesive soils typical of the Brickearth or River Terrace Deposits in this area of West Sussex. The observations made at the time of the investigation infer that the groundwater table lies above the anticipated basement excavation depth. Given the variability of the near surface soils and requirement to control groundwater inflows, it is suggested that attention be given to the use of a secant piled foundation solution. The results of the geochemical analysis have recorded an isolated exceedance of PAH compounds and some localised remedial measures are recommended.

1 INTRODUCTION

The Client proposes to construct a single storey annexe with a small wine cellar in the existing rear garden and replacement of the existing dwelling to incorporate a basement following the demolition of the existing structures at 60 Sea Way, Middleton on Sea ("the site"). Accordingly, a site investigation has been undertaken in order to ascertain the nature and engineering properties of the soils underlying the proposed development site and to obtain data which will assist in the formulation of a safe and economical foundation solution. In addition, a geo-environmental appraisal of the site has also been carried out. At the time of the works the site was occupied and the existing buildings were present.

The programme of this investigation comprised the construction of six boreholes using hand-held window sampling techniques. At three of the locations continuous dynamic probing (DPH) was completed using a lightweight rig. During this work samples were recovered for further examination and laboratory testing. In addition, several in situ hand shear vane tests were also performed. This report describes the work undertaken, presents the information obtained and discusses the ground conditions with respect to foundation design, construction, and potential contamination.

2 FIELDWORKS

2.1 Site Works

The boreholes and probes were constructed on 23rd May 2023 at locations as shown on the site plan, drawing no. 23/12617/1, which is presented as Figure 1. The exploratory positions were located in order to provide adequate site coverage.

At locations 1, 3 and 4 continuous dynamic probing was completed using a lightweight rig utilising DPH specification equipment. The results are presented in graphical format, as a penetration resistance-depth relationship, with the number of blows required to drive the probe 100mm.

The depths and descriptions of the strata encountered in the boreholes are given on the records which comprise Appendix 1 to this report. These records note the depths at which samples were taken, the results of in situ tests and the groundwater observations noted at the time of the fieldworks. Photographs which give a general impression of the site at the time of the fieldworks are included below.



3 GROUND CONDITIONS

3.1 Geology

Reference has been made to the published 1:10,000 scale British Geological Survey (BGS) mapping of the area, sheet no. SU90SE (1994). The site is indicated as being underlain by Brickearth of recent or Quaternary age. The current digital 1:50,000 mapping indicates that the Brickearth has since been reclassified as River Terrace Deposits. These superficial deposits are underlain at depth by the Tarrant Chalk Member, part of the White Chalk Subgroup of Cretaceous age.

3.2 Stratigraphy

Consideration of the borehole records indicates that disturbed or made ground in the form of brown to dark brown clayey loam, becoming silty clay with occasional roots was revealed from surface and proved to depths of 0.20m, 0.30m and 0.40m.

Brown friable slightly sandy (fine) silty to very silty clay with rare gravel was exposed beneath the made ground. These cohesive soils are typical of Brickearth and were proved to the concluding depths of boreholes 1, 2 and 6.

Variations to the above general conditions were noted within boreholes 3, 4 and 5. Pale brown becoming grey slightly gravelly to gravelly silty sand was encountered below 1.70m within borehole 4 and these granular soils were proved to the conclusion of this position at 4.10m. Further alternating granular horizons were noted between 1.30m to 1.90m and 2.90m to 3.80m within borehole 5. Light grey and orangish brown clayey silt was encountered below 2.20m at borehole 3, with gravelly silt (structureless chalk) noted from 2.80m to the concluding depth of 3.10m. Collectively, these soils are believed to be associated with River Terrace Deposits and the White Chalk Subgroup has not been proven in the boreholes.

3.3 Groundwater

During the construction of the exploratory positions groundwater strikes were encountered at between 1.70 and 2.90m depths. Short-term standing water levels upon completion of the boreholes of between 0.95 and 3.00m were recorded. The water level at borehole 5 was observed to have risen to 1.00m below ground level after 3 hours.

3.4 In Situ Testing

A sequence of dynamic probing (DPH) was performed adjacent to boreholes 1, 3 and 4. Initially blow counts ranging between 1 to 4 blows/100mm were recorded to depths of 2.90m and 3.30m within probes 1 and 3 increasing to 6 to 8 blows/100mm to depths of 5.00m and 5.40m. Similar magnitudes of blow counts were recorded to 5.80m within probe 4. Below these levels increasing resistances to penetration were recorded and this marked change is thought to indicate the boundary between the River Terrace Deposits and the underlying White Chalk Subgroup. The probing was concluded at depths of 8.90m, 9.00m and 10.00m.

Hand shear vane tests were performed using the Geonor Shear Vane test equipment. Shear strengths ranging between 110kPa and 220kPa have been recorded which is indicative of a stiff to very stiff in situ condition for a purely cohesive soil.

4 LABORATORY TESTING

A programme of laboratory testing has been undertaken and the results are presented as Appendix 2 to this report. The geotechnical soil testing was undertaken by Albury S.I. Ltd, whilst representative samples were submitted for geochemical testing at the UKAS accredited

laboratories operated by i2 Analytical Ltd. Each type of test is summarised below and the results obtained have been used to assist in the formulation of the discussion.

4.1 Water Content

The water contents of samples of the soils encountered at this site have been determined. Water contents within the range 16.2% to 26.0% have been recorded.

4.2 Index Properties

The liquid and plastic limits of samples of the clay soils have been determined. The results of this work indicate that the samples tested can generally be described as inorganic clays of low plasticity and of either low volume change potential or are of a non-shrinkable nature.

4.3 Particle Size Distribution

Samples of the granular soils encountered at this site have been subjected to sieve analysis in order to determine the soils' particle size distribution. In one instance this work was extended by sedimentation analysis. The results of this work are presented in the form of grading curves.

4.4 Chemical Testing – Soluble Sulphates & pH

Samples of the soils and groundwater encountered at this site have been subjected to chemical analyses in order to determine their soluble sulphate contents and pH values. Under the conditions of this work low concentrations of soluble sulphate have been recorded in association with near neutral pH values.

4.5 Geochemical Testing

Selected samples of the made ground have been submitted to the UKAS accredited laboratories operated by i2 Analytical Ltd. The testing comprises a suite of typical inorganic and organic priority contaminants including metals, PAH, TPH CWG and an asbestos screen. Based upon the initial round of test results additional samples from 0.10m and 0.30m were screened for speciated PAH compounds.

5 GEOTECHNICAL DISCUSSION

The Client proposes to construct a single storey annexe incorporating a wine cellar within the rear garden of the existing property and consideration is also being given to the replacement of the existing dwelling to incorporate a basement, following the demolition of the existing chalet bungalow.

It cannot be recommended that major structural foundations be located within any made ground revealed by this investigation. Soils of this origin are frequently present in a weak and variable condition such that unacceptable settlement could occur even under the action of light loading intensities. Therefore, it will be necessary to continue foundation excavations through these undesirable materials where they are of less than 1.00m in thickness to this minimum depth in order to avoid that zone of soil which is subject to normal seasonal moisture variation or frost action. The above precautions need not necessarily be applied to light ancillary structures, which will be formed structurally discrete from the main development and in which a greater degree of settlement can be tolerated.

5.1 Foundations – Garden Annexe

We understand that the garden annexe will be a single storey timber framed structure and will include a small wine cellar some 2.00m by 3.60m in plan area with a depth of the order of 2.00m . The proposed layout is shown in Figure 1. At the time of the preparation of this report the anticipated structural loads were not known.

It is known that a number of trees were present in the vicinity of the proposed structure. A discussion of the causes, effects and classification of desiccation in clay soils is included in Appendix 3 to this report. Consideration of the results of the laboratory testing indicates that moisture deficiency is not present within the near surface soils. The reduced water contents are thought to reflect the presence of gravel and variations in soils lithology, as opposed to tree root action. Nevertheless, the final foundation depth should be established using NHBC criteria, taking into account any existing, removed or proposed trees, on the basis that the soils are of low volume change potential.

Interpretation of the data derived from this investigation indicates that strip or spread foundations constructed at a minimum depth of 1.00m and using NHBC criteria, can be designed to accept a maximum increase in load of 100kPa. At this loading intensity a factor of safety of 3 against general shear failure will be operative. Moreover, settlements should remain within tolerable limits for the type of structure proposed.

5.2 Foundations – Main House

The proposal to incorporate a basement implies that excavation depths of the order of 3.00m are anticipated. This investigation has demonstrated that the groundwater table lies above the basement excavation level. The necessity to provide support to the basement excavation implies that a system of contiguous bored or secant piles could be incorporated, which would address issues associated with groundwater and will reduce potential ground movements. The design of piles outside the scope of this report as it is dependent upon the type of pile

employed its size and required bearing capacity. Once the loadings are known a specialist piling contractor can derive suitably economic designs. It is likely that a deep borehole will be required extended into the chalk at depth to provide sufficient parameters to enable economic designs.

5.3 Retaining Wall Parameters

The walls to the basement structures should be designed to resist any earth pressures generated by the surrounding ground and surcharge loads, for example adjacent foundations. The earth pressures can be calculated using the following soil parameters which are quoted in terms of effective stress and, therefore, reflect the long-term conditions.

Table 1 - Retaining Wall Design			
Soil Parameter	Effective Cohesion c' kPa	Effective Angle of Friction ϕ'	Soil Density kg/cum
Made Ground	0	15	1800
River Terrace Deposits	0	20	1900

5.4 Heave

The soils revealed are generally non-shrinkable at depths below the anticipated wine cellar and basement level and evidently contain clay minerals which are inactive. Hence, long-term heave or swelling due to the reduction in overburden loading is not anticipated.

5.5 Stability of Excavations

Excavations of less than 1m depth should not require temporary support to their sides. However, as foundation excavations are likely to be extended below this level, adequate temporary support or shoring should be provided in order to comply with current statutory safety regulations and to maintain the stability of the excavation sides.

With regards to the basement construction works, it is evident that support will have to be given to the surrounding ground. Due to the high groundwater table and proximity of the adjacent structures secant bored piles could be employed to form a cofferdam and minimise ground movements, as well as seal out any groundwater. The depth and type of foundations of adjacent structures are not known, however, it will be necessary to ensure their stability and integrity throughout the construction works.

5.6 Groundwater

It is evident that the groundwater table lies above the anticipated excavation depth of the basement and this will need to be catered for during siteworks. The necessity to install a cofferdam will achieve a seal and probably limit the groundwater flow. However, it will be necessary to ensure that control over groundwater is achieved in order to maintain a safe working environment. Moreover, continuous working will need to be achieved in respect of pile construction.

In view of the high groundwater table, the basement should be designed and constructed as a water tight element, capable of resisting the hydrostatic pressures which will be acting upon it.

It should be appreciated that the soils revealed are likely to be susceptible to rapid softening or deterioration in the prolonged presence of groundwater. Where necessary, a blinding layer of leanmix concrete should be applied to prevent this deterioration occurring.

5.7 Drainage

The near surface drainage characteristics of the underlying soils have not been considered as part of this investigation. It is believed that these would be a poor drainage medium and together with the depth of the groundwater table, is likely to preclude the use of traditional soakaways at this site.

5.8 Ground Floor Slabs

The basement and cellar slabs will be situated upon naturally occurring soils. However, the earlier comments regarding hydrostatic uplift may have implications for the floor slab design.

5.9 Buried Concrete

The information obtained from this investigation has been compared with the criteria proposed in BRE Special Digest 1, 2005 Edition, Concrete in Aggressive Ground. Using the information in Table C1 (natural ground) of this publication the Aggressive Chemical Environment for Concrete Classification (ACEC) is AC-1, which coincides with a Design Sulphate Class DS-1. The ACEC Class above can be used to determine the Design Chemical Class for concrete for general cast-in-situ use as required Part D of the Digest.

6 GROUND CONTAMINATION

6.1 Human Health

A generic assessment of the chronic or long-term risk to human health from soil contamination has been made using the available generic screening criteria. The screening values include the Category 4 Screening Levels [C4SLs] (DEFRA, 2014) and Suitable for Use Levels [S4ULs] (LQM/CIEH, 2014) derived using the CLEA software. It should be appreciated that these do not consider the short-term or acute risks, such as to construction workers or SI personnel.

The results obtained have been compared against the GAC for the proposed land-use category Residential (with home-grown produce) and 2.5% SOM.

A study of the data reveals elevated levels of PAH within borehole 3 at 0.10m. Specifically the level of benzo(a)pyrene of 19 mg/kg exceeds the S4UL GAC of 2.7 mg/kg. Samples at 0.30m depth and the remaining untested locations at 0.10m were tested for speciated PAH, with the results revealing that these levels markedly reduce and are below the GAC at the remaining locations.

It is evident that the shallow made ground at the area of borehole 3 is not suitable for the intended residential use and localised remedial measures are recommended in this area of the site. Based upon the results obtained it is anticipated that remedial measures could take the form of excavation and replacement with clean soils.

The unsuitable made ground at borehole 3 will need to be excavated to a depth of 0.30m and replaced with clean topsoil/subsoil. A formal Remediation Method Statement may be required to satisfy any LPA or building warranty provider conditions, with supplementary validation confirming that the measures have been implemented.

6.2 Vegetation

The metals boron, copper, nickel and zinc are phytotoxic at certain levels, with their availability being dependent upon soil pH. These levels may not pose a significant long-term health risk to humans, but could be detrimental to plant growth or function. The results obtained suggest that problems in this regard are not anticipated.

6.3 Preliminary Waste Assessment

It is likely that, if excavated soils cannot be re-used or retained on site, these surplus materials will require off-site disposal. It may be possible to divert the unwanted material to a soil

treatment hub where it can be recycled. Where material cannot be re-used or recycled then disposal at a licensed landfill site can be considered. It will then be necessary to classify the spoil as inert, non-hazardous or hazardous. A discussion of the current regime for the classification and treatment of waste soils is included in Appendix 4.

An initial assessment of the geochemical results obtained from this investigation has been carried out to provide a preliminary classification of the surplus materials. The HazWaste Online tool determines whether waste soil should be classified as being non-hazardous or hazardous. The output from the HazWaste assessment is located in Appendix 4. Asbestos was not detected in any of the samples screened. Based on the output waste soil arisings from this site have been tentatively identified as being non-hazardous waste. The underling natural soils are considered to be inert for disposal purposes.

This assessment is preliminary and based upon the information obtained from the investigation. Where made ground is excavated then these materials should be stockpiled and segregated. Further sampling, testing and characterisation to accurately classify waste soil arisings may be required.

It should be appreciated that it is the responsibility of the waste producer to sufficiently characterise their waste. Moreover, the agreement of the waste acceptor should be sought.

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LIST OF ABBREVIATIONS

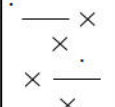
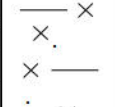
AOD	-	Above Ordnance Datum
ACM	-	Asbestos-containing Material
AST	-	Above-ground Storage Tank
BGS	-	British Geological Survey
BH	-	Borehole
BRE	-	Building Research Establishment
BSI	-	British Standards Institution
BS	-	British Standard
C4SL	-	Category Four Screening Level
CIRIA	-	Construction Industry Research and Information Association
CP	-	Cable Percussive
DPH	-	Dynamic Probing Heavy
DPSH	-	Dynamic Probing Super Heavy
EA	-	Environment Agency
GAC	-	Generic Assessment Criteria
LL	-	Liquid Limit
mAOD	-	Metres Above Ordnance Datum
mBGL	-	Metres Below Ground Level
mOD	-	Metres Ordnance Datum
OS	-	Ordnance Survey
PAH	-	Polycyclic Aromatic Hydrocarbons
PCB	-	Polychlorinated Biphenyl
PID	-	Photo Ionisation Detector
PL	-	Plastic Limit
PSD	-	Particle Size Distribution
SGV	-	Soil Guideline Value
SOM	-	Soil Organic Matter
SPT	-	Standard Penetration Test
SPZ	-	Source Protection Zone
SVOC	-	Semi-volatile Organic Compounds
TPH	-	Total Petroleum Hydrocarbon
UST	-	Underground Storage Tank
UXB	-	Unexploded Bombs
UXO	-	Unexploded Ordnance
VOC	-	Volatile Organic Compound

FIGURE 1

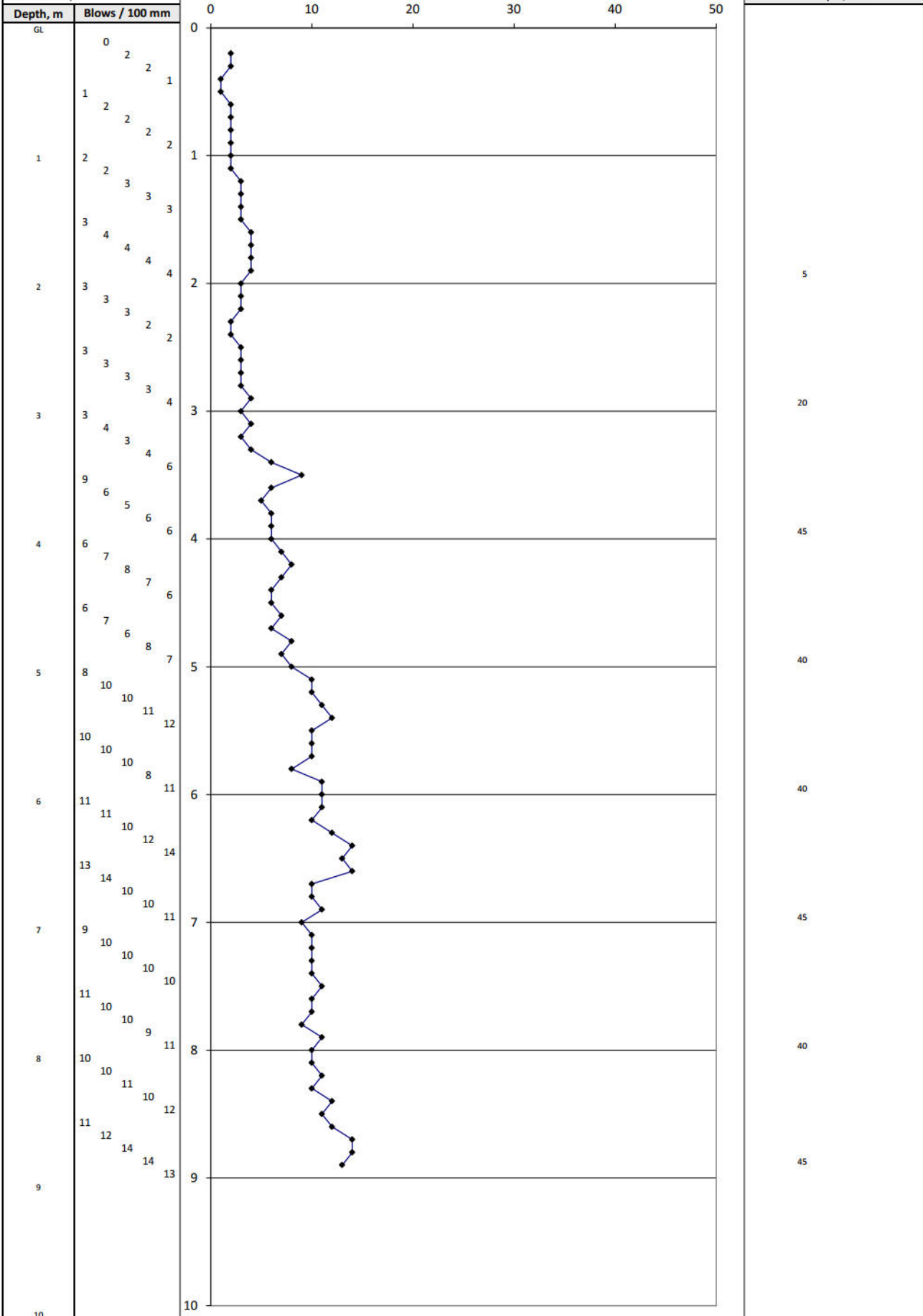
SITE LAYOUT PLAN

APPENDIX 1

EXPLORATORY RECORDS

 ALBURY S.I. LTD Miltons Yard, Petworth Road, Witley, Surrey GU8 5LH		BOREHOLE		1			
Contract		Sea Way, Middleton on Sea		Report Ref		23/12617/GO	
Client		George 4 Building Projects Ltd		Date		23/05/2023	
Site Address		60 Sea Way, Middleton on Sea, Bognor Regis West Sussex PO22 7SA		Ground Level			
Type of excavator		Window Sampler		Water level after completion, m		1.90	
Water strikes, m		Dimensions, m		Ease of excavation, m			
1 1.90		Diameter 0.06		Very easy		Difficult 1.90-3.10	
2				Moderate GL-1.90		Very hard	
Remarks DPH Dynamic probing carried out adjacent to position							
Samples or tests		Shear Strength kPa	Depth		Legend	Strata Description	
Type	Depth, m						
D	0.10	220	0.40			Disturbed or MADE GROUND (brown friable clayey LOAM becoming silty CLAY with occasional roots)	
D	0.30						
D	0.50					Very stiff brown friable slightly sandy (fine) very silty CLAY with rare flint gravel	
D	1.00	180	1.40				
D	1.50					Very stiff brown mottled grey sandy (fine) CLAY with rare flint gravel	
D	2.00					Greyish brown slightly gravelly very sandy CLAY/clayey SAND with occasional root hairs. Gravel is of flint and chalk	
D	2.50	180	2.70				
D	3.00					Grey/brown slightly gravelly very silty CLAY. Gravel is of flint and chalk fragments	
D	3.10					END OF BOREHOLE	

Sample Code: B - Large Disturbed D - Small Disturbed W - Water Sample R - Root Sample T - Tube Liner



Remarks

**ALBURY S.I. LTD**

Miltons Yard, Petworth Road, Witley, Surrey GU8 5LH

BOREHOLE**2****Contract**

Sea Way, Middleton on Sea

Report Ref

23/12617/GO

Client

George 4 Building Projects Ltd

Date

23/05/2023

Site Address60 Sea Way, Middleton on Sea, Bognor Regis
West Sussex PO22 7SA**Ground Level****Type of excavator**

Window Sampler

Water level after completion, m

2.10

Water strikes, m**Dimensions, m****Ease of excavation, m**

1 2.20

Diameter 0.06

Very easy

Difficult 2.20-2.75

2

Moderate GL-2.20, 2.75-3.10 Very hard

Remarks**Samples or tests****Shear
Strength
kPa****Depth****Legend****Strata Description****Type****Depth, m**

D

0.10

0.20

MADE GROUND (dark brown organic LOAM/silty CLAY with roots)

D

0.30

Brown silty CLAY with roots and rare flint gravel

D

0.50

0.80

Very stiff brown mottled slightly sandy very silty CLAY with rare flint gravel and occasional roots in the upper margins

D

1.00

180

D

1.50

220

1.90

Brown mottled grey slightly gravelly sandy (fine) CLAY. Gravel is of flint

D

2.50

2.75

Grey very silty CLAY with rare flint gravel

D

3.00

3.10

END OF BOREHOLE

W

(2.10)

**ALBURY S.I. LTD**

Miltons Yard, Petworth Road, Witley, Surrey GU8 5LH

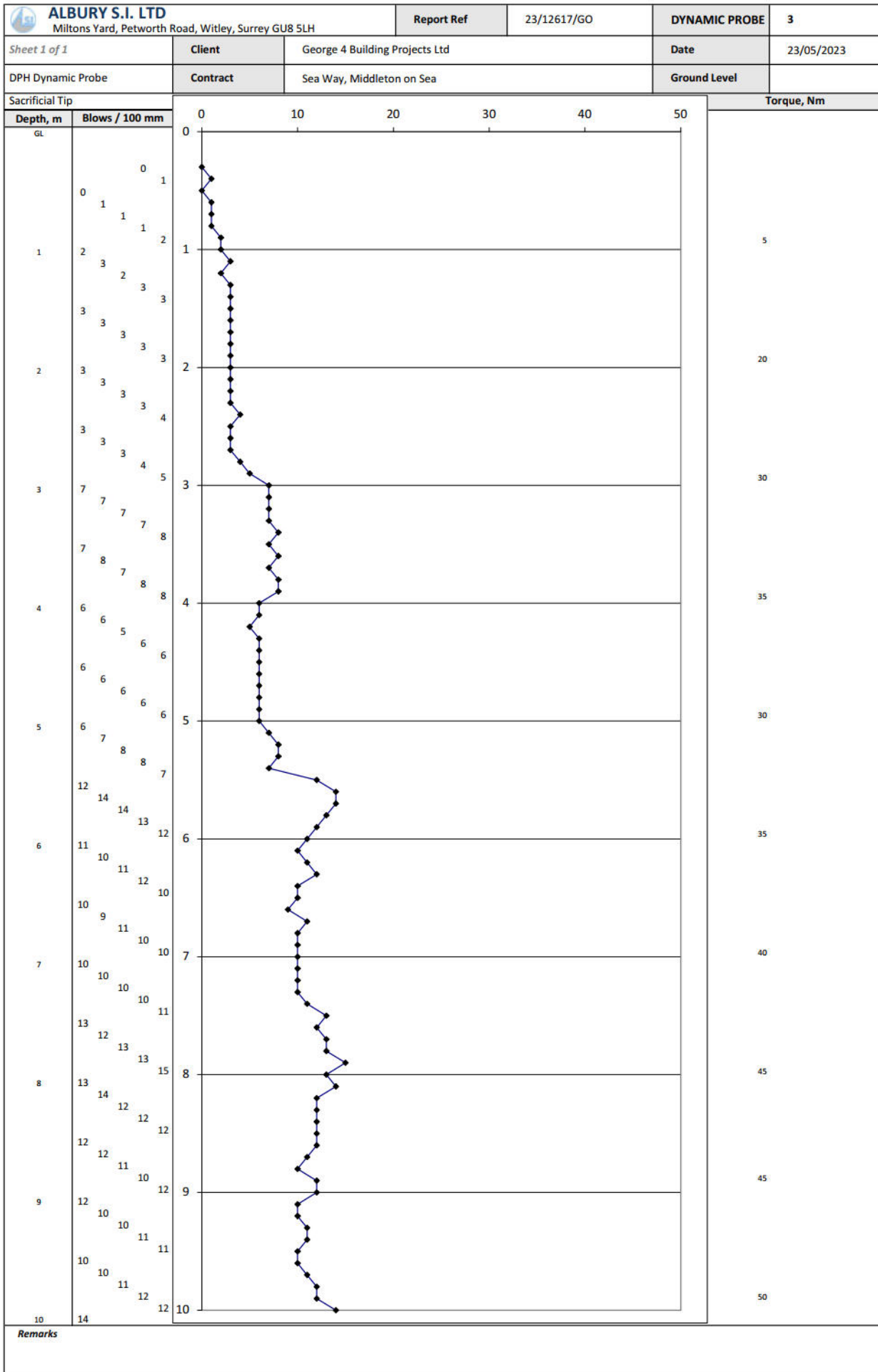
BOREHOLE**3**

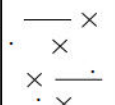
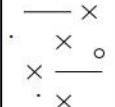
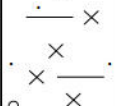
Contract	Sea Way, Middleton on Sea	Report Ref	23/12617/GO
Client	George 4 Building Projects Ltd	Date	23/05/2023
Site Address	60 Sea Way, Middleton on Sea, Bognor Regis West Sussex PO22 7SA	Ground Level	
Type of excavator	Window Sampler	Water level after completion, m	3.00*
Water strikes, m	Dimensions, m	Ease of excavation, m	
1 2.90	Diameter 0.06	Very easy	Difficult 2.80-3.10
2		Moderate GL-2.80	Very hard

Remarks * water at 1.95 in DP hole.
DPH Dynamic probing carried out adjacent to position

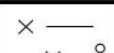
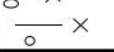
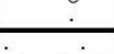
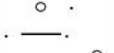
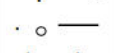
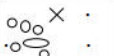
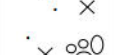
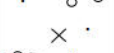
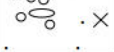
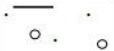
Samples or tests		Shear Strength kPa	Depth		Legend	Strata Description
Type	Depth, m					
D	0.10		0.40			MADE GROUND (dark brown (organic?) slightly gravelly silty/clayey SAND with roots. Gravel is of brick fragments.
D	0.30					
D	0.50					
		160	0.80			Brown friable very silty CLAY
D	1.00	200	1.30			Very stiff brown friable very silty CLAY with dark brown flecking
D	1.50	200	2.20			Very stiff brown mottled grey friable very silty/sandy (fine) CLAY with occasional roots and rare flint gravel
D	2.00	200	2.80			Light grey and orangish brown clayey SILT with occasional roots
D	2.50		3.10			Cream, white and orangish brown gravelly SILT (structureless chalk) with pockets of brown/grey very silty clay. Gravel is of flint
D	3.00					END OF BOREHOLE

Sample Code: B - Large Disturbed D - Small Disturbed W - Water Sample R - Root Sample T - Tube Liner



 ALBURY S.I. LTD Miltons Yard, Petworth Road, Witley, Surrey GU8 5LH		BOREHOLE		4			
Contract		Sea Way, Middleton on Sea		Report Ref		23/12617/GO	
Client		George 4 Building Projects Ltd		Date		23/05/2023	
Site Address		60 Sea Way, Middleton on Sea, Bognor Regis West Sussex PO22 7SA		Ground Level			
Type of excavator		Window Sampler		Water level after completion, m		1.05	
Water strikes, m		Dimensions, m		Ease of excavation, m			
1 1.70		Diameter 0.06		Very easy		Difficult 1.70-4.10	
2				Moderate GL-1.70		Very hard	
Remarks DPH Dynamic probing carried out adjacent to position							
Samples or tests		Shear Strength kPa	Depth		Legend	Strata Description	
Type	Depth, m						
D	0.10	160	0.40			Gravel over MADE GROUND (brown friable slightly gravelly sandy CLAY/clayey SAND with occasional roots. Gravel is of flint with occasional cobbles)	
D	0.30						
D	0.50						
D	1.00	180	1.70			Very stiff brown friable slightly sandy (fine) very silty CLAY with rare flint gravel	
D	1.50						
D	2.00						
D	2.50	290	2.90			Medium dense pale brown slightly gravelly silty SAND. Gravel is of flints and occasional chalk fragments	
D	3.00						
D	3.50						
D	4.00		4.10			Medium dense becoming loose grey gravelly silty SAND. Gravel is of flints and occasional chalk fragments	

Sample Code: B - Large Disturbed D - Small Disturbed W - Water Sample R - Root Sample T - Tube Liner

 ALBURY S.I. LTD Miltons Yard, Petworth Road, Witley, Surrey GU8 5LH		BOREHOLE		5					
Contract		Sea Way, Middleton on Sea		Report Ref		23/12617/GO			
Client		George 4 Building Projects Ltd		Date		23/05/2023			
Site Address		60 Sea Way, Middleton on Sea, Bognor Regis West Sussex PO22 7SA		Ground Level					
Type of excavator		Window Sampler		Water level after completion, m		1.52*			
Water strikes, m		Dimensions, m		Ease of excavation, m					
1 2.70		Diameter 0.06		Very easy		Difficult 1.30-3.00			
2				Moderate GL-1.30, 3.00-4.10		Very hard			
Remarks *water level had risen up to 1.0m below ground level after 3 hors.									
Samples or tests		Shear Strength kPa	Depth		Legend	Strata Description			
Type	Depth, m								
D	0.10	110	0.20			Grass over disturbed or MADE GROUND (brown sandy LOAM with rootlets)			
D	0.30								
D	0.50								
D	1.00	200	0.90			Stiff brown mottled grey slightly gravelly very silty CLAY with dark brown flecking. Gravel is of flint and calcareous nodules			
			1.30						
D	1.50		1.90			Grey and brown mottled slightly gravelly silty fine SAND. Gravel is of flint and chalk			
									
									
D	2.00		2.70			Very stiff pale grey mottled orange slightly gravelly very sandy (fine) CLAY. Gravel is of chalk			
									
D	2.50					2.90			Pale grey and orangish brown slightly gravelly very silty CLAY. Gravel is of flints and chalk fragments
D	2.75							3.80	
D	3.00								
D	3.25								
D	3.50					Grey slightly gravelly sandy CLAY with occasional pockets of fine sand. Gravel is of flint and chalk fragments			
									
D	4.00		4.10				END OF BOREHOLE		
W	(1.52)								

 ALBURY S.I. LTD Miltons Yard, Petworth Road, Witley, Surrey GU8 5LH		BOREHOLE		6			
Contract		Sea Way, Middleton on Sea		Report Ref		23/12617/GO	
Client		George 4 Building Projects Ltd		Date		23/05/2023	
Site Address		60 Sea Way, Middleton on Sea, Bognor Regis West Sussex PO22 7SA		Ground Level			
Type of excavator		Window Sampler		Water level after completion, m		0.95	
Water strikes, m		Dimensions, m		Ease of excavation, m			
1 1.80		Diameter 0.06		Very easy		Difficult 2.30-3.10	
2				Moderate GL-2.30		Very hard	
Remarks							
Samples or tests		Shear Strength kPa	Depth		Legend	Strata Description	
Type	Depth, m						
D	0.10		0.30			Grass over MADE GROUND (brown clayey LOAM with occasional roots, becoming sandy CLAY)	
D	0.30						

APPENDIX 2

LABORATORY TEST RESULTS

INDEX PROPERTIES AND WATER CONTENTS

BS 1377 : Part 2 : 1990

Report Ref	23/12617/GO	Contract	Sea Way, Middleton on Sea
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BH/TP No.	Sample		Water Content W %	Liquid Limit W _L %	Plastic Limit W _p %	Plasticity Index IP %	% Passing 425 Micron Sieve	Corrected Plasticity Index IP _c %	Soil Classification	Remarks
	Depth m	Description								
1	1.00	Brown friable slightly sandy (fine) very silty CLAY with rare gravel	16.9	29	19	10	98	10	CL	
	1.50	Brown mottled grey sandy (fine) CLAY with rare gravel	17.7							
	2.00	Greyish brown slightly gravelly very sandy CLAY/clayey SAND with rare gravel	16.2	23	16	7	96	7	CL	
	2.50	Greyish brown slightly gravelly very sandy CLAY/clayey SAND with rare gravel	21.4							
	3.00	Grey/brown slightly gravelly very silty CLAY	23.9							
2	0.50	Brown silty CLAY with roots and rare gravel	26.0							
	1.00	Brown mottled slightly sandy very silty CLAY with rare gravel	22.7							
	1.50	Brown mottled slightly sandy very silty CLAY with rare gravel	20.2	33	21	12	99	12	CL	
	2.00	Brown mottled grey slightly gravelly sandy (fine) CLAY	19.2							
	2.50	Brown mottled grey slightly gravelly sandy (fine) CLAY	18.2							
	3.00	Grey very silty CLAY with rare gravel	21.7	28	20	8	95	8	CL	
KEY: Soil Type: C - Clay M - Silt O - Organic NP - Non Plastic Plasticity: L - Low I - Intermediate H - High V - Very High E - Extremely High										



ALBURY S.I. LTD Miltons Yard, Petworth Road, Witley, Surrey GU8 5LH

Index Properties (April 2019)

INDEX PROPERTIES AND WATER CONTENTS

BS 1377 : Part 2 : 1990

Report Ref	23/12617/GO	Contract	Sea Way, Middleton on Sea	<i>Continuation Sheet</i> 1
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BH/TP No.	Sample		Water Content W %	Liquid Limit W _L %	Plastic Limit W _p %	Plasticity Index IP %	% Passing 425 Micron Sieve	Corrected Plasticity Index IP _c %	Soil Classification	Remarks
	Depth m	Description								
3	1.00	Brown friable very silty CLAY with dark brown flecking	24.3							
	1.50	Brown mottled grey friable very silty/sandy (fine) CLAY with rare gravel	20.7	35	22	13	99	13	CL/CI	
	2.00	Brown mottled grey friable very silty/sandy (fine) CLAY with rare gravel	19.7							
	2.50	Light grey and orangish brown clayey SILT	20.9	28	22	6	100	6	CL/ML	
	3.00	Cream, white and orangish brown gravelly SILT with pockets of very silty clay	16.2							
4	1.00	Brown friable slightly sandy (fine) very silty CLAY with rare gravel	19.8							
	1.50	Brown friable slightly sandy (fine) very silty CLAY with rare gravel	17.4	29	21	8	95	8	CL	
5	2.00	Pale grey mottled orange slightly gravelly very sandy (fine) CLAY	18.3							
	2.75	Pale grey and orangish brown slightly gravelly very silty CLAY	21.0	24	17	7	93	7	CL	
6	1.00	Brown slightly sandy (fine) very silty CLAY with rare gravel	21.5							
		(continued on next sheet)								
KEY: Soil Type: C - Clay M - Silt O - Organic NP - Non Plastic Plasticity: L - Low I - Intermediate H - High V - Very High E - Extremely High										



ALBURY S.I. LTD Miltons Yard, Petworth Road, Witley, Surrey GU8 5LH

INDEX PROPERTIES AND WATER CONTENTS

BS 1377 : Part 2 : 1990

Report Ref	23/12617/GO	Contract	Sea Way, Middleton on Sea	<i>Continuation Sheet</i>	2
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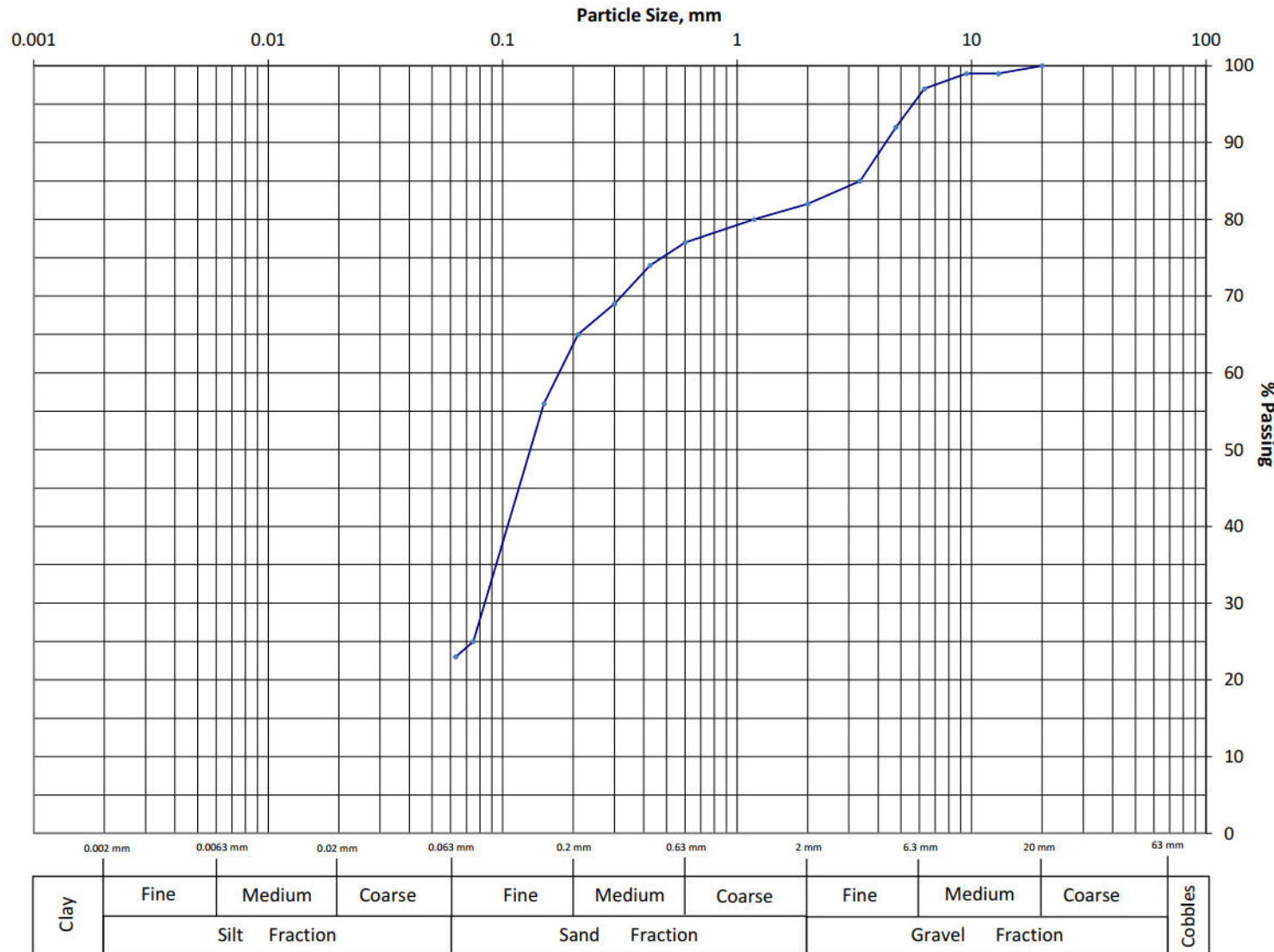
BH/TP No.	Sample		Water Content W %	Liquid Limit W _L %	Plastic Limit W _p %	Plasticity Index IP %	% Passing 425 Micron Sieve	Corrected Plasticity Index IP _c %	Soil Classification	Remarks
	Depth m	Description								
6	1.50	Brown slightly sandy (fine) very silty CLAY with rare gravel	21.5							
	2.00	Brown slightly gravelly sandy CLAY	16.9							
	2.50	Brown slightly gravelly very silty CLAY	18.5							
	3.00	Brown slightly gravelly clayey fine SAND	17.8	22	14	8	89	7	CL	
KEY: Soil Type: C - Clay M - Silt O - Organic NP - Non Plastic Plasticity: L - Low I - Intermediate H - High V - Very High E - Extremely High										



ALBURY S.I. LTD Miltons Yard, Petworth Road, Witley, Surrey GU8 5LH

PARTICLE SIZE DISTRIBUTION TEST

BS 1377 : Part 2 : Clauses 9.2, 9.3 : 1990 Particle Size Distribution by Wet/Dry Sieving Method



BS Test Sieve Aperture Size (mm)	Percentage Passing
75	
63	
50	
37.5	
25	
20	100
13	99
9.5	99
6.3	97
4.75	92
3.35	85
2	82
1.18	80
0.6	77
0.425	74
0.3	69
0.21	65
0.15	56
0.075	25
0.063	23

Particle Proportions (%)	
Cobbles	0
Gravel	18
Sand	59
Silt & Clay	23

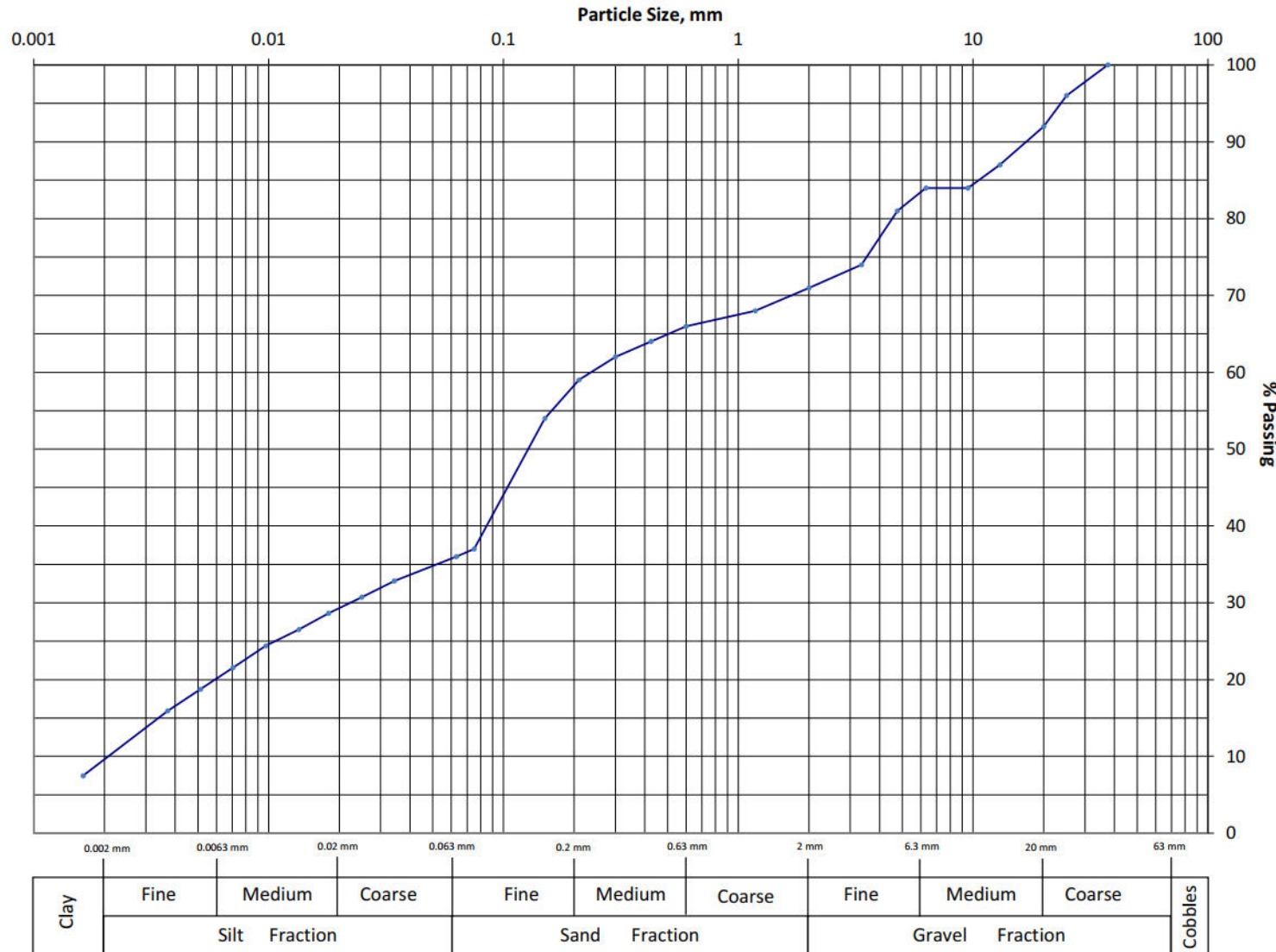
BH/TP No.	4	Depth, m	3.00	Report Ref	23/12617/GO
Visual Description	Grey gravelly silty SAND. Gravel is of flints and occasional chalk fragments			Contract	Sea Way, Middleton on Sea



ALBURY S.I. LTD Miltons Yard, Petworth Road, Witley, Surrey GU8 5LH

PARTICLE SIZE DISTRIBUTION TEST

BS 1377 : Part 2 : Clauses 9.2 and 9.5 : 1990 Particle Size Distribution by Wet Sieving & Sedimentation by Hydrometer Method



Sieve Aperture/ Particle Size (mm)	Percentage Passing
75	
63	
50	
37.5	100
25	96
20	92
13	87
9.5	84
6.3	84
4.75	81
3.35	74
2	71
1.18	68
0.6	66
0.425	64
0.3	62
0.21	59
0.15	54
0.075	37
0.063	36
0.034	33
0.025	31
0.018	29
0.013	27
0.010	24
0.0071	22
0.0051	19
0.0037	16
0.0016	7

Sample Proportions (%)	
Cobbles	0
Gravel	29
Sand	35
Silt & Clay	36

BH/TP No.	5	Depth, m	3.00	Report Ref	23/12617/GO
Visual Description	Pale grey gravelly very silty SAND. Gravel is of flint and chalk			Contract	Sea Way, Middleton on Sea



ALBURY S.I. LTD Miltons Yard, Petworth Road, Witley, Surrey GU8 5LH

SUMMARY OF CHEMICAL ANALYSES

Determination of Soluble Sulphate Contents of Soil and Groundwater, Organic Matter Content and pH Value

Report Ref	23/12617/GO	Contract	Sea Way, Middleton On Sea
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BH/TP No.	Sample			Concentration of Sulphates expressed as SO ₄		pH Value	Organic Content %
	Depth m	Soil Type	% passing 2mm sieve	2:1 Water:Soil Extract mg/l	Groundwater mg/l		
1	1.50	CLAY	100	<250		7.7	
2	0.50	CLAY	100	<250		6.7	
	(2.10)	WATER	-		<80	7.1	
3	2.00	CLAY	100	<250		7.9	
4	2.00	Slightly gravelly SAND	96	<250		8.1	
5	3.25	Gravelly SAND	81	<250		7.8	
	(1.50)	WATER	-		<80	7.0	
6	0.50	CLAY	100	<250		6.9	
	2.50	Slightly gravelly CLAY	94	<250		8.0	



ALBURY S.I. LTD Miltons Yard, Petworth Road, Witley, Surrey GU8 5LH

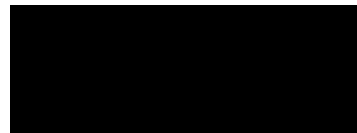
Chemical Analyses (Oct 2019)

**George Owens**

Albury SI Ltd
Miltons Yard
Petworth Road
Witley
Surrey
GU8 5LH

i2 Analytical Ltd.
7 Woodshots Meadow,
Croxley Green
Business Park,
Watford,
Herts,
WD18 8YS

e: george.owens@alburysl.co.uk



Analytical Report Number : 23-35541

Project / Site name:	Sea Way, Middleton on Sea	Samples received on:	24/05/2023
Your job number:	23 12617 GO	Samples instructed on/ Analysis started on:	24/05/2023
Your order number:	14857	Analysis completed by:	31/05/2023
Report Issue Number:	1	Report issued on:	01/06/2023
Samples Analysed:	3 soil samples		

Signed

Dominika Warjan
Reporting Specialist
For & on behalf of i2 Analytical Ltd.

Standard Geotechnical, Asbestos and Chemical Testing Laboratory located at: ul. Pionierów 39, 41-711 Ruda Śląska, Poland.

Accredited tests are defined within the report, opinions and interpretations expressed herein are outside the scope of accreditation.

Standard sample disposal times, unless otherwise agreed with the laboratory, are :

soils	- 4 weeks from reporting
leachates	- 2 weeks from reporting
waters	- 2 weeks from reporting
asbestos	- 6 months from reporting

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Any assessments of compliance with specifications are based on actual analytical results with no contribution from uncertainty of measurement.
Application of uncertainty of measurement would provide a range within which the true result lies.
An estimate of measurement uncertainty can be provided on request.

Analytical Report Number: 23-35541
Project / Site name: Sea Way, Middleton on Sea
Your Order No: 14857

Lab Sample Number				2690131	2690132	2690133
Sample Reference				1	3	5
Sample Number				None Supplied	None Supplied	None Supplied
Depth (m)				0.10	0.10	0.10
Date Sampled				23/05/2023	23/05/2023	23/05/2023
Time Taken				None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status			
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1
Moisture Content	%	0.01	NONE	16	16	18
Total mass of sample received	kg	0.001	NONE	1	1	1

Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	Not-detected	Not-detected
Asbestos Analyst ID	N/A	N/A	N/A	MLO	MLO	MLO

General Inorganics

pH - Automated	pH Units	N/A	MCERTS	5.9	7.9	6.2
Total Cyanide	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0
Total Sulphate as SO ₄	mg/kg	50	MCERTS	470	420	520
Water Soluble Sulphate as SO ₄ 16hr extraction (2:1)	mg/kg	2.5	MCERTS	34	35	18
Water Soluble SO ₄ 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.017	0.018	0.0092
Sulphide	mg/kg	1	NONE	< 1.0	< 1.0	< 1.0
Elemental Sulphur	mg/kg	5	NONE	< 5.0	< 5.0	< 5.0
Total Organic Carbon (TOC) - Automated	%	0.1	MCERTS	1.9	1.7	2.4

Total Phenols

Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0
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Speciated PAHs

Naphthalene	mg/kg	0.05	NONE	< 0.05	0.44	< 0.05
Acenaphthylene	mg/kg	0.05	NONE	< 0.05	0.44	< 0.05
Acenaphthene	mg/kg	0.05	NONE	< 0.05	1.9	< 0.05
Fluorene	mg/kg	0.05	NONE	< 0.05	1.3	< 0.05
Phenanthrene	mg/kg	0.05	NONE	0.18	28	0.09
Anthracene	mg/kg	0.05	NONE	< 0.05	6.9	< 0.05
Fluoranthene	mg/kg	0.05	NONE	0.34	47	0.31
Pyrene	mg/kg	0.05	NONE	0.33	43	0.3
Benzo(a)anthracene	mg/kg	0.05	NONE	0.16	17	0.16
Chrysene	mg/kg	0.05	NONE	0.16	16	0.18
Benzo(b)fluoranthene	mg/kg	0.05	NONE	0.2	18	0.23
Benzo(k)fluoranthene	mg/kg	0.05	NONE	0.08	8.2	0.1
Benzo(a)pyrene	mg/kg	0.05	NONE	0.15	19	0.19
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	NONE	0.11	10	0.14
Dibenz(a,h)anthracene	mg/kg	0.05	NONE	< 0.05	2.5	< 0.05
Benzo(ghi)perylene	mg/kg	0.05	NONE	0.13	12	0.16

Total PAH

Speciated Total EPA-16 PAHs	mg/kg	0.8	NONE	1.84	231	1.86
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Analytical Report Number: 23-35541

Project / Site name: Sea Way, Middleton on Sea

Your Order No: 14857

Lab Sample Number				2690131	2690132	2690133
Sample Reference				1	3	5
Sample Number				None Supplied	None Supplied	None Supplied
Depth (m)				0.10	0.10	0.10
Date Sampled				23/05/2023	23/05/2023	23/05/2023
Time Taken				None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status			

Heavy Metals / Metalloids

Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	8.5	12	9.1
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	0.75	0.78	0.84
Boron (water soluble)	mg/kg	0.2	MCERTS	0.6	0.7	1.3
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2
Chromium (hexavalent)	mg/kg	1.2	NONE	< 1.2	< 1.2	< 1.2
Chromium (III)	mg/kg	1	NONE	23	24	25
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	24	24	25
Copper (aqua regia extractable)	mg/kg	1	MCERTS	15	14	12
Lead (aqua regia extractable)	mg/kg	1	MCERTS	48	26	25
Manganese (aqua regia extractable)	mg/kg	1	MCERTS	410	370	300
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	16	19	16
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	34	33	36
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	47	52	50

Monoaromatics & Oxygenates

Benzene	µg/kg	5	NONE	< 5.0	< 5.0	< 5.0
Toluene# #	µg/kg	5	NONE	< 5.0	< 5.0	< 5.0
Ethylbenzene	µg/kg	5	NONE	< 5.0	< 5.0	< 5.0
p & m-xylene# #	µg/kg	5	NONE	< 5.0	< 5.0	< 5.0
o-xylene	µg/kg	5	NONE	< 5.0	< 5.0	< 5.0
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	5	NONE	< 5.0	< 5.0	< 5.0

Analytical Report Number: 23-35541
 Project / Site name: Sea Way, Middleton on Sea
 Your Order No: 14857

Lab Sample Number				2690131	2690132	2690133
Sample Reference				1	3	5
Sample Number				None Supplied	None Supplied	None Supplied
Depth (m)				0.10	0.10	0.10
Date Sampled				23/05/2023	23/05/2023	23/05/2023
Time Taken				None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status			

Petroleum Hydrocarbons

TPH C6 - C40 _{EH_CU+HS_CU_1D_TOTAL}	mg/kg	10	NONE	< 10	130	< 10
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TPH-CWG - Aliphatic >EC5 - EC6 _{HS_1D_AL}	mg/kg	0.001	NONE	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC6 - EC8 _{HS_1D_AL}	mg/kg	0.001	NONE	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC8 - EC10 _{HS_1D_AL}	mg/kg	0.001	NONE	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC10 - EC12 _{EH_CU_1D_AL}	mg/kg	1	NONE	< 1.0	< 1.0	< 1.0
TPH-CWG - Aliphatic >EC12 - EC16 _{EH_CU_1D_AL}	mg/kg	2	NONE	< 2.0	< 2.0	< 2.0
TPH-CWG - Aliphatic >EC16 - EC21 _{EH_CU_1D_AL}	mg/kg	8	NONE	< 8.0	< 8.0	< 8.0
TPH-CWG - Aliphatic >EC21 - EC35 _{EH_CU_1D_AL}	mg/kg	8	NONE	< 8.0	< 8.0	< 8.0
TPH-CWG - Aliphatic >EC21 - EC40 _{EH_CU_1D_AL}	mg/kg	10	NONE	< 10	< 10	< 10
TPH-CWG - Aliphatic > EC35 - EC44 _{EH_CU_1D_AL}	mg/kg	8.4	NONE	< 8.4	< 8.4	< 8.4
TPH-CWG - Aliphatic (EC5 - EC35) _{EH_CU+HS_1D_AL}	mg/kg	10	NONE	< 10	< 10	< 10
TPH-CWG - Aliphatic (EC5 - EC44) _{EH_CU+HS_1D_AL}	mg/kg	10	NONE	< 10	< 10	< 10

TPH-CWG - Aromatic >EC5 - EC7 _{HS_1D_AR}	mg/kg	0.001	NONE	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC7 - EC8 _{HS_1D_AR}	mg/kg	0.001	NONE	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC8 - EC10 _{HS_1D_AR}	mg/kg	0.001	NONE	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC10 - EC12 _{EH_CU_1D_AR}	mg/kg	1	NONE	< 1.0	< 1.0	< 1.0
TPH-CWG - Aromatic >EC12 - EC16 _{EH_CU_1D_AR}	mg/kg	2	NONE	< 2.0	8.8	< 2.0
TPH-CWG - Aromatic >EC16 - EC21 _{EH_CU_1D_AR}	mg/kg	10	NONE	< 10	55	< 10
TPH-CWG - Aromatic >EC21 - EC35 _{EH_CU_1D_AR}	mg/kg	10	NONE	< 10	60	< 10
TPH-CWG - Aromatic >EC21 - EC40 _{EH_CU_1D_AR}	mg/kg	10	NONE	< 10	62	< 10
TPH-CWG - Aromatic > EC35 - EC44 _{EH_CU_1D_AR}	mg/kg	8.4	NONE	< 8.4	< 8.4	< 8.4
TPH-CWG - Aromatic (EC5 - EC35) _{EH_CU+HS_1D_AR}	mg/kg	10	NONE	< 10	120	< 10
TPH-CWG - Aromatic (EC5 - EC44) _{EH_CU+HS_1D_AR}	mg/kg	10	NONE	< 10	130	< 10

U/S = Unsuitable Sample I/S = Insufficient Sample ND = Not detected

Analytical Report Number : 23-35541

Project / Site name: Sea Way, Middleton on Sea

* These descriptions are only intended to act as a cross check if sample identities are questioned. The major constituent of the sample is intended to act with respect to MCERTS validation. The laboratory is accredited for sand, clay and loam (MCERTS) soil types. Data for unaccredited types of solid should be interpreted with care.

Stone content of a sample is calculated as the % weight of the stones not passing a 10 mm sieve. Results are not corrected for stone content.

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
2690131	1	None Supplied	0.1	Brown clay and sand with gravel.
2690132	3	None Supplied	0.1	Brown clay and sand with gravel.
2690133	5	None Supplied	0.1	Brown clay and sand with vegetation.

Analytical Report Number : 23-35541

Project / Site name: Sea Way, Middleton on Sea

Water matrix abbreviations:

Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters (PrW) Final Sewage Effluent (FSE) Landfill Leachate (LL)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Sulphate, water soluble, in soil (16hr extraction)	Determination of water soluble sulphate by ICP-OES. Results reported directly (leachate equivalent) and corrected for extraction ratio (soil equivalent).	In house method.	L038-PL	D	MCERTS
Metals in soil by ICP-OES	Determination of metals in soil by aqua-regia digestion followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L038-PL	D	MCERTS
Asbestos identification in soil	Asbestos Identification with the use of polarised light microscopy in conjunction with dispersion staining techniques.	In house method based on HSG 248	A001-PL	D	ISO 17025
Boron, water soluble, in soil	Determination of water soluble boron in soil by hot water extract followed by ICP-OES.	In-house method based on Second Site Properties version 3	L038-PL	D	MCERTS
Elemental sulphur in soil	Determination of elemental sulphur in soil by extraction in acetonitrile followed by HPLC.	In-house method based on Secondsite Property Holdings Guidance for Assessing and Managing Potential	L021-PL	D	NONE
Moisture Content	Moisture content, determined gravimetrically. (30 oC)	In house method.	L019-UK/PL	W	NONE
Monohydric phenols in soil	Determination of phenols in soil by extraction with sodium hydroxide followed by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (skalar)	L080-PL	W	MCERTS
Speciated EPA-16 PAHs in soil	Determination of PAH compounds in soil by extraction in dichloromethane and hexane followed by GC-MS with the use of surrogate and internal standards.	In-house method based on USEPA 8270	L064-PL	D	NONE
pH in soil (automated)	Determination of pH in soil by addition of water followed by automated electrometric measurement.	In house method.	L099-PL	D	MCERTS
Sulphide in soil	Determination of sulphide in soil by acidification and heating to liberate hydrogen sulphide, trapped in an alkaline solution then assayed by ion selective electrode.	In-house method	L010-PL	D	NONE
Total sulphate (as SO ₄ in soil)	Determination of total sulphate in soil by extraction with 10% HCl followed by ICP-OES.	In house method.	L038-PL	D	MCERTS
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight.	In-house method based on British Standard Methods and MCERTS requirements.	L019-UK/PL	D	NONE
Total cyanide in soil	Determination of total cyanide by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (Skalar)	L080-PL	W	MCERTS
Total organic carbon (Automated) in soil	Determination of organic matter in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate.	In house method.	L009-PL	D	MCERTS
BTEX and MTBE in soil (Monoaromatics)	Determination of BTEX in soil by headspace GC-MS. Individual components MCERTS accredited	In-house method based on USEPA8260	L073B-PL	W	NONE
TPH Chromatogram in Soil	TPH Chromatogram in Soil.	In-house method	L064-PL	D	NONE

Analytical Report Number : 23-35541

Project / Site name: Sea Way, Middleton on Sea

Water matrix abbreviations:

Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters (PrW) Final Sewage Effluent (FSE) Landfill Leachate (LL)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Cr (III) in soil	In-house method by calculation from total Cr and Cr VI.	In-house method by calculation	L080-PL	W	NONE
TPHCWG (Soil)	Determination of hexane extractable hydrocarbons in soil by GC-MS/GC-FID.	In-house method with silica gel split/clean up.	L088/76-PL	W	NONE
TPH in (Soil)	Determination of TPH bands by HS-GC-MS/GC-FID	In-house method, TPH with carbon banding and silica gel split/cleanup.	L076-PL	D	NONE
Hexavalent chromium in soil (Lower Level)	Determination of hexavalent chromium in soil by extraction in water then by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry.	In-house method	L080-PL	W	NONE
D.O. for Gravimetric Quant if Screen/ID positive	Dependent option for Gravimetric Quant if Screen/ID positive scheduled.	In house asbestos methods A001 & A006.	A006-PL	D	NONE
Sulphate, water soluble, in soil	Determination of water soluble sulphate by ICP-OES. Results reported directly (leachate equivalent) and corrected for extraction ratio (soil equivalent).	In house method.	L038-PL	D	MCERTS

For method numbers ending in 'UK or A' analysis have been carried out in our laboratory in the United Kingdom (WATFORD).

For method numbers ending in 'F' analysis have been carried out in our laboratory in the United Kingdom (East Kilbride).

For method numbers ending in 'PL or B' analysis have been carried out in our laboratory in Poland.

Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30°C.

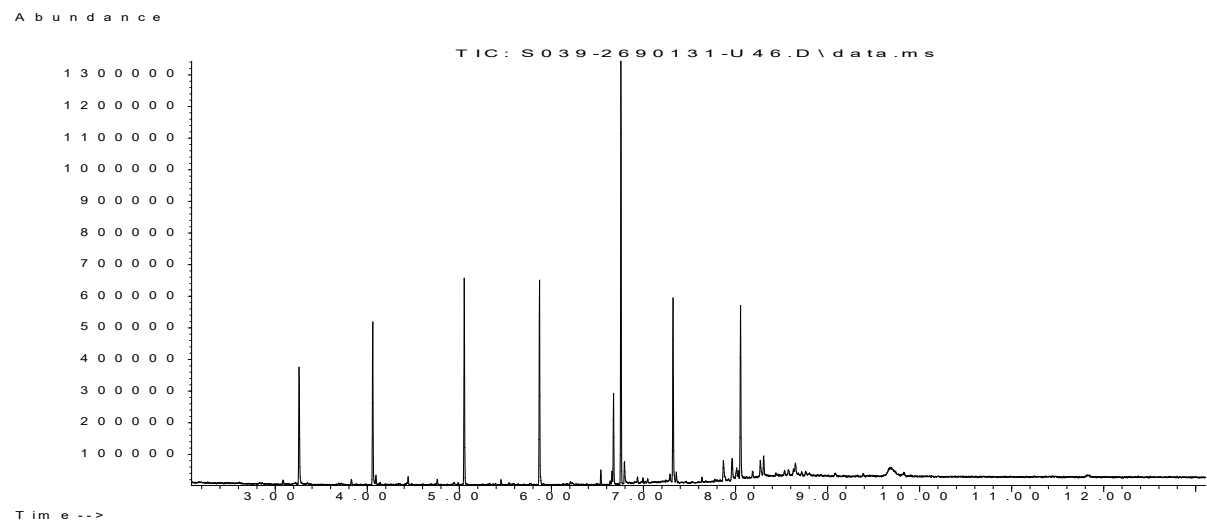
Unless otherwise indicated, site information, order number, project number, sampling date, time, sample reference and depth are provided by the client. The instructed on date indicates the date on which this information was provided to the laboratory.

Information in Support of Analytical Results

List of HWOL Acronyms and Operators

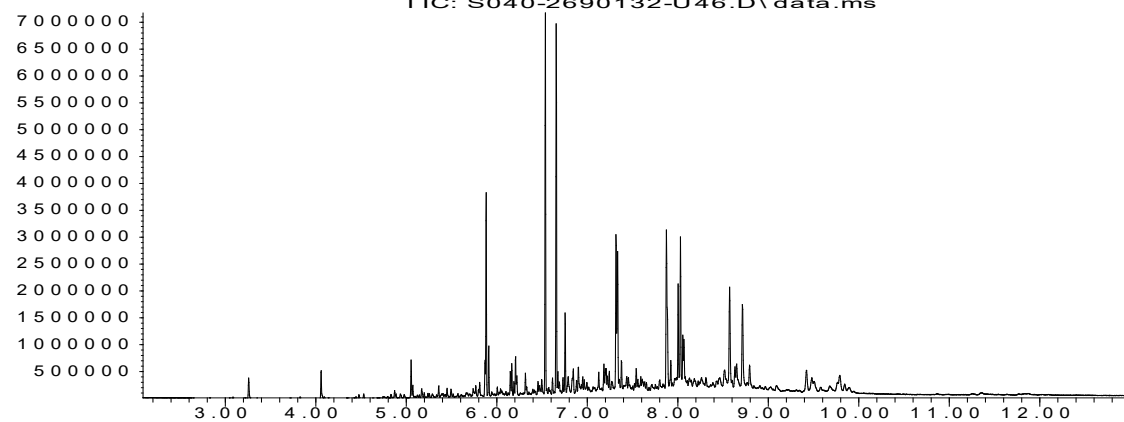
Acronym	Descriptions
HS	Headspace Analysis
MS	Mass spectrometry
FID	Flame Ionisation Detector
GC	Gas Chromatography
EH	Extractable Hydrocarbons (i.e. everything extracted by the solvent(s))
CU	Clean-up - e.g. by Florisil®, silica gel
1D	GC - Single coil/column gas chromatography
2D	GC-GC - Double coil/column gas chromatography
Total	Aliphatics & Aromatics
AL	Aliphatics
AR	Aromatics
#1	EH_2D_Total but with humics mathematically subtracted
#2	EH_2D_Total but with fatty acids mathematically subtracted
-	Operator - understore to separate acronyms (exception for +)
+	Operator to indicate cumulative e.g. EH+HS_Total or EH_CU+HS_Total

##Quality control parameter has a high recovery (outside of limit); however the associated result is below the reporting limit, other checks applied prior to reporting the data have been accepted. The result should be considered as being deviating and may be compromised.

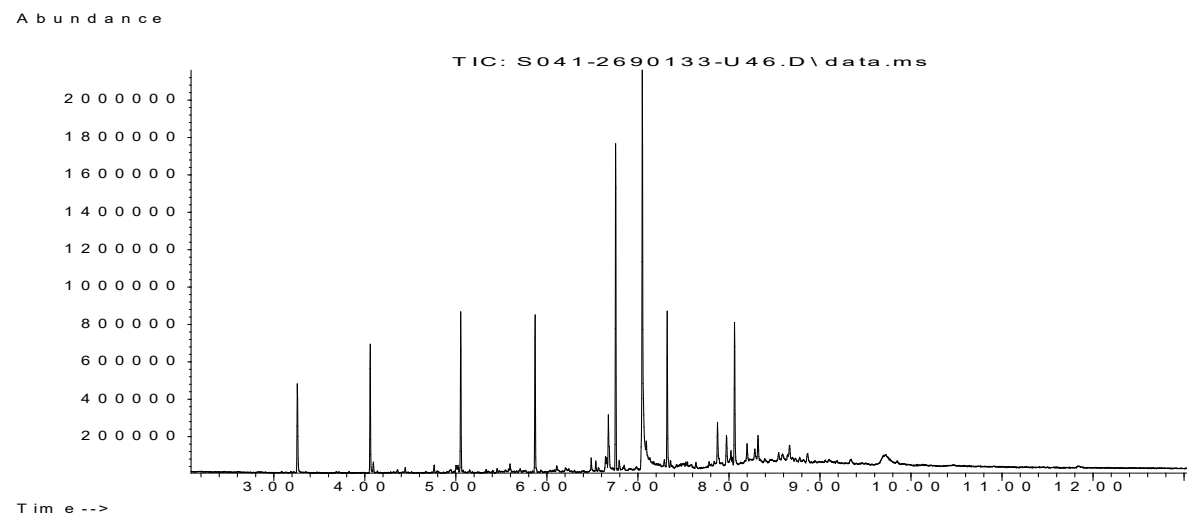


Abundance

TIC: S040-2690132-U46.D\data.ms



Time-->



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Analytical Report Number : 23-38166

Project / Site name:	Sea Way, Middleton on Sea	Samples received on:	08/06/2023
Your job number:	23 12617 GO	Samples instructed on/ Analysis started on:	08/06/2023
Your order number:	14857	Analysis completed by:	14/06/2023
Report Issue Number:	1	Report issued on:	15/06/2023
Samples Analysed:	4 soil samples		

Signed

Dominika Warjan
Reporting Specialist
For & on behalf of i2 Analytical Ltd.

Standard Geotechnical, Asbestos and Chemical Testing Laboratory located at: ul. Pionierów 39, 41-711 Ruda Śląska, Poland.

Accredited tests are defined within the report, opinions and interpretations expressed herein are outside the scope of accreditation.

Standard sample disposal times, unless otherwise agreed with the laboratory, are :

soils - 4 weeks from reporting
leachates - 2 weeks from reporting
waters - 2 weeks from reporting
asbestos - 6 months from reporting

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Any assessments of compliance with specifications are based on actual analytical results with no contribution from uncertainty of measurement.
Application of uncertainty of measurement would provide a range within which the true result lies.
An estimate of measurement uncertainty can be provided on request.

Analytical Report Number: 23-38166
 Project / Site name: Sea Way, Middleton on Sea
 Your Order No: 14857

Lab Sample Number				2706570	2706571	2706572	2706573
Sample Reference				1	2	4	6
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.30	0.10	0.10	0.10
Date Sampled				23/05/2023	23/05/2023	23/05/2023	23/05/2023
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status				
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1
Moisture Content	%	0.01	NONE	17	23	10	19
Total mass of sample received	kg	0.001	NONE	0.3	0.3	0.3	0.6

General Inorganics

Water Soluble SO ₄ 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.0083	0.042	0.073	0.0084
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Speciated PAHs

Naphthalene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05
Fluorene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05
Phenanthrene	mg/kg	0.05	MCERTS	< 0.05	0.05	0.05	0.07
Anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05
Fluoranthene	mg/kg	0.05	MCERTS	< 0.05	0.18	0.12	0.24
Pyrene	mg/kg	0.05	MCERTS	< 0.05	0.23	0.13	0.26
Benzo(a)anthracene	mg/kg	0.05	MCERTS	< 0.05	0.08	0.05	0.13
Chrysene	mg/kg	0.05	MCERTS	< 0.05	0.09	0.07	0.15
Benzo(b)fluoranthene	mg/kg	0.05	ISO 17025	< 0.05	0.12	0.07	0.22
Benzo(k)fluoranthene	mg/kg	0.05	ISO 17025	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(a)pyrene	mg/kg	0.05	MCERTS	< 0.05	0.09	0.06	0.14
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	< 0.05	0.06	< 0.05	0.09
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	< 0.05	0.07	< 0.05	0.11

Total PAH

Speciated Total EPA-16 PAHs	mg/kg	0.8	ISO 17025	< 0.80	0.97	< 0.80	1.41
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U/S = Unsuitable Sample I/S = Insufficient Sample ND = Not detected

Analytical Report Number : 23-38166

Project / Site name: Sea Way, Middleton on Sea

* These descriptions are only intended to act as a cross check if sample identities are questioned. The major constituent of the sample is intended to act with respect to MCERTS validation. The laboratory is accredited for sand, clay and loam (MCERTS) soil types. Data for unaccredited types of solid should be interpreted with care.

Stone content of a sample is calculated as the % weight of the stones not passing a 10 mm sieve. Results are not corrected for stone content.

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
2706570	1	None Supplied	0.3	Brown clay and loam with gravel and vegetation.
2706571	2	None Supplied	0.1	Brown loam and clay with gravel and vegetation.
2706572	4	None Supplied	0.1	Brown loam and clay with gravel.
2706573	6	None Supplied	0.1	Brown loam and clay with gravel and vegetation.

Analytical Report Number : 23-38166

Project / Site name: Sea Way, Middleton on Sea

Water matrix abbreviations:

Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters (PrW) Final Sewage Effluent (FSE) Landfill Leachate (LL)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Sulphate, water soluble, in soil (16hr extraction)	Determination of water soluble sulphate by ICP-OES. Results reported directly (leachate equivalent) and corrected for extraction ratio (soil equivalent).	In house method.	L038-PL	D	MCERTS
Moisture Content	Moisture content, determined gravimetrically. (30 oC)	In house method.	L019-UK/PL	W	NONE
Speciated EPA-16 PAHs in soil	Determination of PAH compounds in soil by extraction in dichloromethane and hexane followed by GC-MS with the use of surrogate and internal standards.	In-house method based on USEPA 8270	L064-PL	D	MCERTS
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight.	In-house method based on British Standard Methods and MCERTS requirements.	L019-UK/PL	D	NONE

For method numbers ending in 'UK or A' analysis have been carried out in our laboratory in the United Kingdom (WATFORD).

For method numbers ending in 'F' analysis have been carried out in our laboratory in the United Kingdom (East Kilbride).

For method numbers ending in 'PL or B' analysis have been carried out in our laboratory in Poland.

Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30oC.

Unless otherwise indicated, site information, order number, project number, sampling date, time, sample reference and depth are provided by the client. The instructed on date indicates the date on which this information was provided to the laboratory.

APPENDIX 3

DESICCATION

DESICCATION

Classification

The removal of moisture from a soil as a result of external influences with a constant stress regime, results in shrinkage or settlement of the soil. The magnitude of shrinkage is dependent upon the geological stress history of the soil, its clay content and the composition of the clay minerals. Under normal climatic conditions, there is a seasonal cyclic variation in soil moisture and, hence, volume change, which extends to depths of approximately 1m. When the soil moisture deficit attains a critical value, the shrinkage of the soil can become significant. In these circumstances, the soil can be regarded as being present in a desiccated state.

Causes

A common cause of desiccation consists of the reduction in soil moisture by tree root action. In the absence of a water table at shallow depth, root action of trees will reduce the soil moisture level in order to maintain growth. In general terms, the increase in rainfall which occurs during winter periods will allow for some replacement of the moisture content of the soil, particularly where isolated or immature trees are concerned.

However, when drought summer conditions or limited winter rainfall occurs, desiccated zones will develop within the zone of influence of tree roots. In woodland, desiccation develops as it is not possible for rainfall to overcome the soil moisture deficit. Other causes of desiccation, which have created problems to structures, include incorrectly installed and insulated heating pipes or ducts and industrial processes, ie furnaces or brick kilns.

Effects

The development of desiccation in clay soils will result in an increase in strength of the material. In addition, negative pore water pressure or soil suction will develop. Any foundation system located within soil which is subject to a reduction in soil moisture can experience structural distress, which results from the loss in volume or shrinkage of the ground. Also, if the source of the desiccation is removed, there will be heave of the soils as a result of an increase in equilibrium water content

It is evident, therefore, that foundation systems founded in soils which are actively experiencing an increase or decrease in soil moisture, will be subject to either heave or settlement, which can induce stresses within the structure. It should also be appreciated that a desiccated soil, which is experiencing an increase in equilibrium water content, will attempt to increase its volume in a horizontal as well as vertical plane. It is important, therefore, to ensure that horizontal movements do not apply differential stresses to structural elements, by incorporating collapsible membranes within remedial works.

Identification

A soil in a state of equilibrium is present in a semi-solid state. At the onset of desiccation, the condition of the soil moves towards the boundary between a solid and semi-solid state, this boundary being defined as the plastic limit of the soil. It follows, therefore, that when the natural water content of a soil lies close to, or falls below, the value of the plastic limit, the soil can be considered to be desiccated.

An alternative proposal was made by Driscoll (1983), who related the soil suction induced by desiccation to a function of the liquid limit of the soil. In general terms, desiccation is assumed to be present when the moisture content falls below a level of 40% liquid limit. The arbitrary factor of 0.4 relates to a soil suction value proposed by Croney (1977) and may vary with the composition and mineralogy of different soil types. This approach is only considered to be valid over a limited depth range as the overburden effect will result in a natural reduction in soil moisture and result in the development of negative pore pressures.

A further approach, which considers the shear strength of the clay, Pugh et al (1995), recognises the fact that a reduction in soil moisture will result in an increase in undrained shear strength as well as the development of negative pore pressures. Whilst this approach has a considerable amount of merit, care is required in establishing the value of the soil's in situ shear strength, particularly if it is not possible to obtain representative "undisturbed" samples from cable percussion boreholes. The proposal made in the Pugh paper that the simple pocket penetrometer will provide accurate consistent results should be treated with care, as the pocket penetrometer can take no account of the effects of disturbance and remoulding that are inevitable when completing a trial pit with a mechanical excavator. It is for this reason that this Company attempts to establish the shear strength of clay soils by using the Geonor Field Vane. With this test equipment the appropriate-sized vane is pushed into the side of the pit, through the thin disturbed zone which is caused by the teeth of the bucket during excavation. Furthermore, by use of the 'blank' probe, it is possible to take account of any skin friction which builds up on the shaft of the vane and thus provide a more accurate assessment of the shear strength of the soils.

Hence, a combination of the methods discussed above should be considered in order to confirm whether the development of soil moisture reduction to achieve a desiccated state has occurred within a particular site. The data for affected areas should, where possible, be compared with soils which lie outside the influence of tree root bulbs and may, therefore, be considered to be present in a stable and equilibrium state.

References

- | | |
|--|---|
| Croney D (1977) | The Design and Performance of Road Pavements
London HMSO pp 674 |
| Driscoll R (1983) | The Influence of Vegetation on the Swelling and Shrinking of Clay Soils in Britain
Geotechnique 33.4 pp 93-105 |
| Pugh RS, Parnell PG
and Parks RD (1995) | A rapid and reliable on site method of assessing desiccation in clay soils
Geotechnical Engineering 13 Jan 1995 pp 25—30 |

APPENDIX 4

WASTE

WASTE CLASSIFICATION

The European Waste Framework Directive is implemented in the UK by the 2002 Landfill Regulations, together with a number of other acts and regulations. A key part of this process is to establish the hazardous properties of potential waste. The classification and definition of hazardous waste is interpreted within the Environment Agency guidance WM3 and all wastes require classifying in accordance with the European Waste Catalogue [EWC]. The EWC is a detailed list of typical industry waste types and each has a 6 digit code. Typically the appropriate EWC codes for excavated soil being disposed off site are:

- 17 05 03* soil and stones containing dangerous substances, or
- 17 05 04 soil and stones other than those mentioned in 17 05 03

If excavated soils are to be discarded or exported from site then they would be considered controlled waste and require classification. However, if soils can be re-used on site then they are not considered to be controlled waste. A Desk Study, soil descriptions, laboratory chemical analysis and risk assessment can all contribute to basic waste characterisation. Depending upon the chemical composition or levels of contaminants in the waste (e.g. metals, TPH, asbestos), soil and stones can either be hazardous or non-hazardous. Waste Acceptance Criteria [WAC] test results are used to determine the suitability of the waste intended for disposal against the acceptance criteria for a particular class of landfill site. WAC tests are not used for the classification of waste soils and are only required for inert or hazardous excavated material which is destined for landfill.

Wastes containing asbestos with a concentration of >0.10% weight/weight (w/w) are generally considered to be hazardous. While waste with <0.10% w/w of asbestos are considered non-hazardous. Where free fibres or fibrous asbestos is present at concentrations of >0.001% then these are considered to pose a risk to human health and are deemed hazardous waste. These waste materials also require a suitably licensed company to handle them.

Waste Treatment

It is a requirement of the 2002 Landfill Regulations that all wastes must undergo some form of pre-treatment prior to disposal at an appropriately licensed landfill. Treatment is defined using a 'three-point test' and can include physical, chemical, biological or thermal processes, which must change the characteristics of the waste in order to:

- reduce its volume, or
- reduce its hazardous nature, or
- facilitate its handling, or
- enhance its recovery.

The exceptions to this are:

- inert waste for which treatment is not technically feasible.
- it is waste other than inert waste and treatment would not reduce its quantity or its hazards to human health or the environment.

The waste producer should either treat their own waste or ensure that the waste will be treated by a subsequent handler. The waste producer should record the type and amount of pre-treatment undertaken prior to disposal.

Examples of treatment include mechanical segregation or sorting, composting, soil treatment hubs and incineration. This can include physical sorting of waste soil types into separate stockpiles at the producer site, e.g. topsoil, made ground and natural clay, sand or gravels.

Waste Classification Report

HazWasteOnline™ classifies waste as either **hazardous** or **non-hazardous** based on its chemical composition, related legislation and the rules and data defined in the current UK or EU technical guidance (Appendix C) (note that HP 9 Infectious is not assessed). It is the responsibility of the classifier named below to:

- understand the origin of the waste
- select the correct List of Waste code(s)
- confirm that the list of determinands, results and sampling plan are fit for purpose
- select and justify the chosen metal species (Appendix B)
- correctly apply moisture correction and other available corrections
- add the meta data for their user-defined substances (Appendix A)
- check that the classification engine is suitable with respect to the national destination of the waste (Appendix C)



PD3ZX-SPPVC-EW4VV

To aid the reviewer, the laboratory results, assumptions and justifications managed by the classifier are highlighted in pale yellow.

Job name

23-35541_HWOL_Results

Description/Comments

Project

23/12617/GO

Site

Sea Way, Middleton

Classified by

Name:

George Owens

Date:

12 Jun 2023 14:32 GMT

Telephone:

Company:

Albury SI Ltd

Miltons Yard, Petworth Rd, Witley

Godalming

GU8 5LH

HazWasteOnline™ provides a two day, hazardous waste classification course that covers the use of the software and both basic and advanced waste classification techniques. Certification has to be renewed every 3 years.

HazWasteOnline™ Certification:

-

Course

Hazardous Waste Classification

Date

-

Purpose of classification

2 - Material Characterisation

Address of the waste

60 Sea Way, Middleton on Sea

Post Code PO22 7SA

SIC for the process giving rise to the waste

41202 Construction of domestic buildings

Description of industry/producer giving rise to the waste

Development of residential dwellings

Description of the specific process, sub-process and/or activity that created the waste

Waste soil arising from foundation excavations

Description of the waste

made ground and clay

Job summary

#	Sample name	Depth [m]	Classification Result	Hazard properties	Page
1	1--23052023-0.10		Non Hazardous		3
2	3--23052023-0.10		Non Hazardous		6
3	5--23052023-0.10		Non Hazardous		9

Related documents

#	Name	Description
1	23-35541_HWOL_Results.hwol	i2 Analytical .hwol file used to populate the Job
2	Example waste stream template for contaminated soils	waste stream template used to create this Job

Report

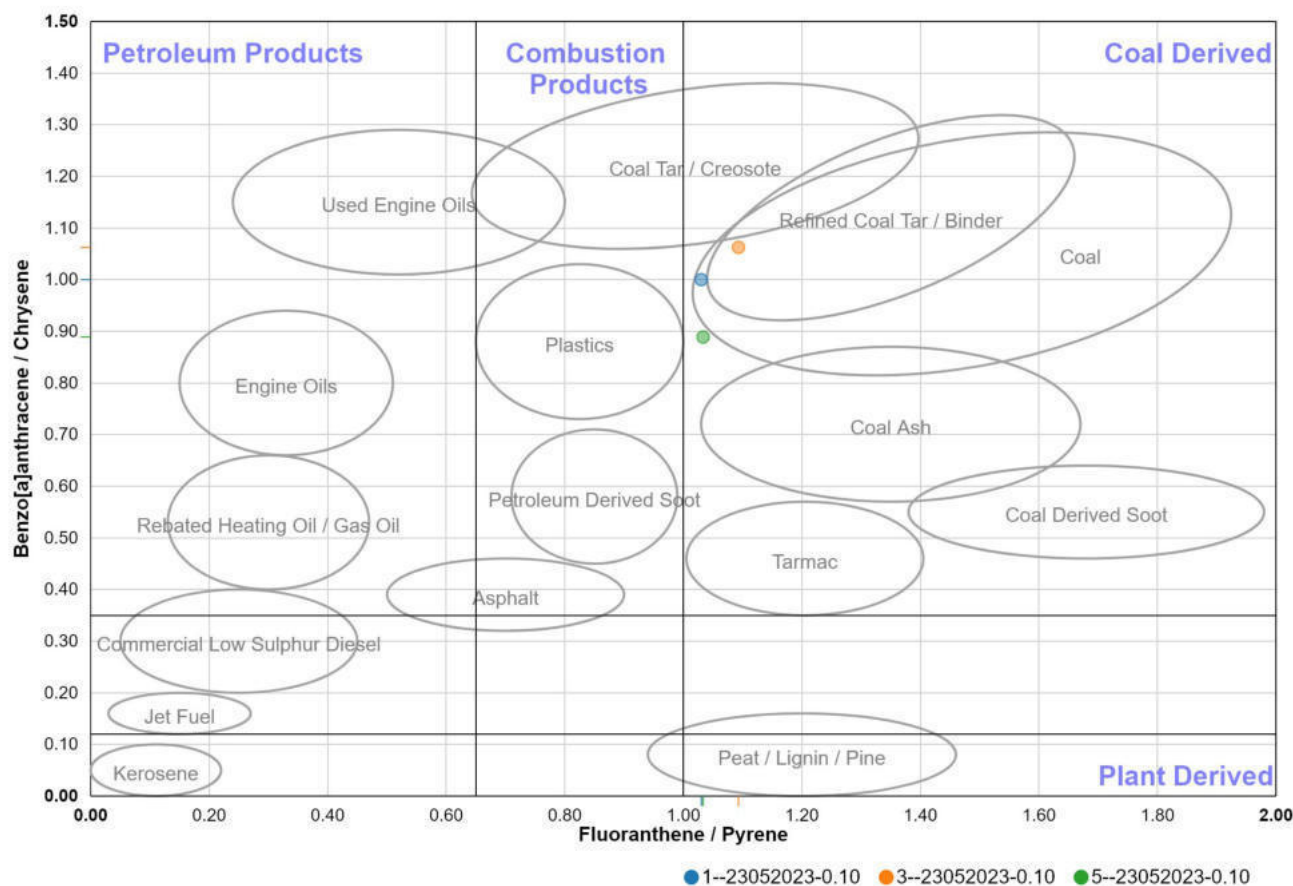
Created by: George Owens

Created date: 12 Jun 2023 14:32 GMT

Appendices

	Page
Appendix A: Classifier defined and non GB MCL determinands	12
Appendix B: Rationale for selection of metal species	13
Appendix C: Version	14

Double Ratio PAH Plot



Disclaimer

The domains, oval areas and the plotted points are **indicators only** and must be combined with other lines of evidence to form conclusions. Samples marked with an empty circle are not plotted as they fall outside of the graph's boundaries.

Credits

The domains and the horizontal and vertical lines are derived from Yunker et al. 2002 (Organic Geochemistry 33, 489-515). Most of the ellipses and their labels are with kind permission of Jones Environmental Forensics Limited (now Element Materials Technology).

Classification of sample: 1--23052023-0.10

 **Non Hazardous Waste**
 Classified as **17 05 04**
 in the List of Waste

Sample details

Sample name:	LoW Code:	
1--23052023-0.10	Chapter:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Moisture content:	Entry:	17 05 04 (Soil and stones other than those mentioned in 17 05 03)
16% (wet weight correction)		

Hazard properties

None identified

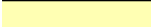
Determinands

Moisture content: 16% Wet Weight Moisture Correction applied (MC)

#	Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number									
1	arsenic { arsenic trioxide }				8.5	mg/kg	1.32	9.427	mg/kg	0.000943 %	✓	
	033-003-00-0	215-481-4	1327-53-3									
2	beryllium { beryllium oxide }				0.75	mg/kg	2.775	1.748	mg/kg	0.000175 %	✓	
	004-003-00-8	215-133-1	1304-56-9									
3	boron { diboron trioxide; boric oxide }				0.6	mg/kg	3.22	1.623	mg/kg	0.000162 %	✓	
	005-008-00-8	215-125-8	1303-86-2									
4	cadmium { cadmium oxide }				<0.2	mg/kg	1.142	<0.228	mg/kg	<0.0000228 %		<LOD
	048-002-00-0	215-146-2	1306-19-0									
5	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				23	mg/kg	1.462	33.616	mg/kg	0.00336 %		
		215-160-9	1308-38-9									
6	chromium in chromium(VI) compounds { chromium(VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }				<1.2	mg/kg	2.27	<2.724	mg/kg	<0.000272 %		<LOD
	024-017-00-8											
7	copper { dicopper oxide; copper (I) oxide }				15	mg/kg	1.126	14.186	mg/kg	0.00142 %	✓	
	029-002-00-X	215-270-7	1317-39-1									
8	lead { lead chromate }			1	48	mg/kg	1.56	62.892	mg/kg	0.00403 %	✓	
	082-004-00-2	231-846-0	7758-97-6									
9	manganese { manganese sulphate }				410	mg/kg	2.749	946.605	mg/kg	0.0947 %	✓	
	025-003-00-4	232-089-9	7785-87-7									
10	mercury { mercury dichloride }				<0.3	mg/kg	1.353	<0.406	mg/kg	<0.0000406 %		<LOD
	080-010-00-X	231-299-8	7487-94-7									
11	nickel { nickel chromate }				16	mg/kg	2.976	40.001	mg/kg	0.004 %	✓	
	028-035-00-7	238-766-5	14721-18-7									
12	selenium { nickel selenate }				<1	mg/kg	2.554	<2.554	mg/kg	<0.000255 %		<LOD
	028-031-00-5	239-125-2	15060-62-5									
13	zinc { zinc chromate }				47	mg/kg	2.774	109.523	mg/kg	0.011 %	✓	
	024-007-00-3	236-878-9	13530-65-9									
14	tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane				<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<LOD
	603-181-00-X	216-653-1	1634-04-4									
15	benzene				<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<LOD
	601-020-00-8	200-753-7	71-43-2									
16	toluene				<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<LOD
	601-021-00-3	203-625-9	108-88-3									

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number								
17	ethylbenzene 601-023-00-4	202-849-4	100-41-4		<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %			<LOD
18	xylene 601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]		<0.01 mg/kg		<0.01 mg/kg	<0.000001 %			<LOD
19	cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex } 006-007-00-5				<1 mg/kg	1.884	<1.884 mg/kg	<0.000188 %			<LOD
20	pH PH				5.9 pH		5.9 pH	5.9 pH			
21	naphthalene 601-052-00-2	202-049-5	91-20-3		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %			<LOD
22	acenaphthylene 205-917-1	208-96-8			<0.05 mg/kg		<0.05 mg/kg	<0.000005 %			<LOD
23	acenaphthene 201-469-6	83-32-9			<0.05 mg/kg		<0.05 mg/kg	<0.000005 %			<LOD
24	fluorene 201-695-5	86-73-7			<0.05 mg/kg		<0.05 mg/kg	<0.000005 %			<LOD
25	phenanthrene 201-581-5	85-01-8			0.18 mg/kg		0.151 mg/kg	0.0000151 %	✓		
26	anthracene 204-371-1	120-12-7			<0.05 mg/kg		<0.05 mg/kg	<0.000005 %			<LOD
27	fluoranthene 205-912-4	206-44-0			0.34 mg/kg		0.286 mg/kg	0.0000286 %	✓		
28	pyrene 204-927-3	129-00-0			0.33 mg/kg		0.277 mg/kg	0.0000277 %	✓		
29	benzo[a]anthracene 601-033-00-9	200-280-6	56-55-3		0.16 mg/kg		0.134 mg/kg	0.0000134 %	✓		
30	chrysene 601-048-00-0	205-923-4	218-01-9		0.16 mg/kg		0.134 mg/kg	0.0000134 %	✓		
31	benzo[b]fluoranthene 601-034-00-4	205-911-9	205-99-2		0.2 mg/kg		0.168 mg/kg	0.0000168 %	✓		
32	benzo[k]fluoranthene 601-036-00-5	205-916-6	207-08-9		0.08 mg/kg		0.0672 mg/kg	0.00000672 %	✓		
33	benzo[a]pyrene; benzo[def]chrysene 601-032-00-3	200-028-5	50-32-8		0.15 mg/kg		0.126 mg/kg	0.0000126 %	✓		
34	indeno[123-cd]pyrene 205-893-2	193-39-5			0.11 mg/kg		0.0924 mg/kg	0.00000924 %	✓		
35	dibenz[a,h]anthracene 601-041-00-2	200-181-8	53-70-3		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %			<LOD
36	benzo[ghi]perylene 205-883-8	191-24-2			0.13 mg/kg		0.109 mg/kg	0.0000109 %	✓		
37	vanadium { divanadium pentaoxide; vanadium pentoxide } 023-001-00-8	215-239-8	1314-62-1		34 mg/kg	1.785	50.985 mg/kg	0.0051 %	✓		
38	monohydric phenols P1186				<1 mg/kg		<1 mg/kg	<0.0001 %			<LOD
39	sulfur { sulfur } 016-094-00-1	231-722-6	7704-34-9		<5 mg/kg		<5 mg/kg	<0.0005 %			<LOD
Total:									0.126 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Determinand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
CLP: Note 1	Only the metal concentration has been used for classification

Classification of sample: 3--23052023-0.10

 **Non Hazardous Waste**
 Classified as **17 05 04**
 in the List of Waste

Sample details

Sample name:	LoW Code:
3--23052023-0.10	Chapter:
Moisture content:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
16%	Entry:
(wet weight correction)	17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

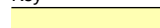
Determinands

Moisture content: 16% Wet Weight Moisture Correction applied (MC)

#	Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number									
1	arsenic { arsenic trioxide }				12	mg/kg	1.32	13.309	mg/kg	0.00133 %	✓	
	033-003-00-0	215-481-4	1327-53-3									
2	beryllium { beryllium oxide }				0.78	mg/kg	2.775	1.818	mg/kg	0.000182 %	✓	
	004-003-00-8	215-133-1	1304-56-9									
3	boron { diboron trioxide; boric oxide }				0.7	mg/kg	3.22	1.893	mg/kg	0.000189 %	✓	
	005-008-00-8	215-125-8	1303-86-2									
4	cadmium { cadmium oxide }				<0.2	mg/kg	1.142	<0.228	mg/kg	<0.0000228 %		<LOD
	048-002-00-0	215-146-2	1306-19-0									
5	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				24	mg/kg	1.462	35.077	mg/kg	0.00351 %		
		215-160-9	1308-38-9									
6	chromium in chromium(VI) compounds { chromium(VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }				<1.2	mg/kg	2.27	<2.724	mg/kg	<0.000272 %		<LOD
	024-017-00-8											
7	copper { dicopper oxide; copper (I) oxide }				14	mg/kg	1.126	13.24	mg/kg	0.00132 %	✓	
	029-002-00-X	215-270-7	1317-39-1									
8	lead { lead chromate }			1	26	mg/kg	1.56	34.066	mg/kg	0.00218 %	✓	
	082-004-00-2	231-846-0	7758-97-6									
9	manganese { manganese sulphate }				370	mg/kg	2.749	854.254	mg/kg	0.0854 %	✓	
	025-003-00-4	232-089-9	7785-87-7									
10	mercury { mercury dichloride }				<0.3	mg/kg	1.353	<0.406	mg/kg	<0.0000406 %		<LOD
	080-010-00-X	231-299-8	7487-94-7									
11	nickel { nickel chromate }				19	mg/kg	2.976	47.501	mg/kg	0.00475 %	✓	
	028-035-00-7	238-766-5	14721-18-7									
12	selenium { nickel selenate }				<1	mg/kg	2.554	<2.554	mg/kg	<0.000255 %		<LOD
	028-031-00-5	239-125-2	15060-62-5									
13	zinc { zinc chromate }				52	mg/kg	2.774	121.175	mg/kg	0.0121 %	✓	
	024-007-00-3	236-878-9	13530-65-9									
14	tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane				<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<LOD
	603-181-00-X	216-653-1	1634-04-4									
15	benzene				<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<LOD
	601-020-00-8	200-753-7	71-43-2									
16	toluene				<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<LOD
	601-021-00-3	203-625-9	108-88-3									

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number								
17	ethylbenzene 601-023-00-4	202-849-4	100-41-4		<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %			<LOD
18	xylene 601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]		<0.01 mg/kg		<0.01 mg/kg	<0.000001 %			<LOD
19	cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex } 006-007-00-5				<1 mg/kg	1.884	<1.884 mg/kg	<0.000188 %			<LOD
20	pH PH				7.9 pH		7.9 pH	7.9 pH			
21	naphthalene 601-052-00-2	202-049-5	91-20-3		0.44 mg/kg		0.37 mg/kg	0.000037 %		✓	
22	acenaphthylene 205-917-1	208-96-8			0.44 mg/kg		0.37 mg/kg	0.000037 %		✓	
23	acenaphthene 201-469-6	83-32-9			1.9 mg/kg		1.596 mg/kg	0.00016 %		✓	
24	fluorene 201-695-5	86-73-7			1.3 mg/kg		1.092 mg/kg	0.000109 %		✓	
25	phenanthrene 201-581-5	85-01-8			28 mg/kg		23.52 mg/kg	0.00235 %		✓	
26	anthracene 204-371-1	120-12-7			6.9 mg/kg		5.796 mg/kg	0.00058 %		✓	
27	fluoranthene 205-912-4	206-44-0			47 mg/kg		39.48 mg/kg	0.00395 %		✓	
28	pyrene 204-927-3	129-00-0			43 mg/kg		36.12 mg/kg	0.00361 %		✓	
29	benzo[a]anthracene 601-033-00-9	200-280-6	56-55-3		17 mg/kg		14.28 mg/kg	0.00143 %		✓	
30	chrysene 601-048-00-0	205-923-4	218-01-9		16 mg/kg		13.44 mg/kg	0.00134 %		✓	
31	benzo[b]fluoranthene 601-034-00-4	205-911-9	205-99-2		18 mg/kg		15.12 mg/kg	0.00151 %		✓	
32	benzo[k]fluoranthene 601-036-00-5	205-916-6	207-08-9		8.2 mg/kg		6.888 mg/kg	0.000689 %		✓	
33	benzo[a]pyrene; benzo[def]chrysene 601-032-00-3	200-028-5	50-32-8		19 mg/kg		15.96 mg/kg	0.0016 %		✓	
34	indeno[123-cd]pyrene 205-893-2	193-39-5			10 mg/kg		8.4 mg/kg	0.00084 %		✓	
35	dibenz[a,h]anthracene 601-041-00-2	200-181-8	53-70-3		2.5 mg/kg		2.1 mg/kg	0.00021 %		✓	
36	benzo[ghi]perylene 205-883-8	191-24-2			12 mg/kg		10.08 mg/kg	0.00101 %		✓	
37	vanadium { divanadium pentaoxide; vanadium pentoxide } 023-001-00-8	215-239-8	1314-62-1		33 mg/kg	1.785	49.485 mg/kg	0.00495 %		✓	
38	monohydric phenols P1186				<1 mg/kg		<1 mg/kg	<0.0001 %			<LOD
39	sulfur { sulfur } 016-094-00-1	231-722-6	7704-34-9		<5 mg/kg		<5 mg/kg	<0.0005 %			<LOD
Total:									0.137 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Determinand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
CLP: Note 1	Only the metal concentration has been used for classification

Classification of sample: 5--23052023-0.10

 **Non Hazardous Waste**
 Classified as **17 05 04**
 in the List of Waste

Sample details

Sample name:	LoW Code:	
5--23052023-0.10	Chapter:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Moisture content:	Entry:	17 05 04 (Soil and stones other than those mentioned in 17 05 03)
18% (wet weight correction)		

Hazard properties

None identified

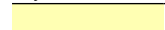
Determinands

Moisture content: 18% Wet Weight Moisture Correction applied (MC)

#	Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number									
1	arsenic { arsenic trioxide }				9.1	mg/kg	1.32	9.852	mg/kg	0.000985 %	✓	
	033-003-00-0	215-481-4	1327-53-3									
2	beryllium { beryllium oxide }				0.84	mg/kg	2.775	1.912	mg/kg	0.000191 %	✓	
	004-003-00-8	215-133-1	1304-56-9									
3	boron { diboron trioxide; boric oxide }				1.3	mg/kg	3.22	3.432	mg/kg	0.000343 %	✓	
	005-008-00-8	215-125-8	1303-86-2									
4	cadmium { cadmium oxide }				<0.2	mg/kg	1.142	<0.228	mg/kg	<0.0000228 %		<LOD
	048-002-00-0	215-146-2	1306-19-0									
5	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				25	mg/kg	1.462	36.539	mg/kg	0.00365 %		
		215-160-9	1308-38-9									
6	chromium in chromium(VI) compounds { chromium(VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }				<1.2	mg/kg	2.27	<2.724	mg/kg	<0.000272 %		<LOD
	024-017-00-8											
7	copper { dicopper oxide; copper (I) oxide }				12	mg/kg	1.126	11.079	mg/kg	0.00111 %	✓	
	029-002-00-X	215-270-7	1317-39-1									
8	lead { lead chromate }			1	25	mg/kg	1.56	31.976	mg/kg	0.00205 %	✓	
	082-004-00-2	231-846-0	7758-97-6									
9	manganese { manganese sulphate }				300	mg/kg	2.749	676.147	mg/kg	0.0676 %	✓	
	025-003-00-4	232-089-9	7785-87-7									
10	mercury { mercury dichloride }				<0.3	mg/kg	1.353	<0.406	mg/kg	<0.0000406 %		<LOD
	080-010-00-X	231-299-8	7487-94-7									
11	nickel { nickel chromate }				16	mg/kg	2.976	39.049	mg/kg	0.0039 %	✓	
	028-035-00-7	238-766-5	14721-18-7									
12	selenium { nickel selenate }				<1	mg/kg	2.554	<2.554	mg/kg	<0.000255 %		<LOD
	028-031-00-5	239-125-2	15060-62-5									
13	zinc { zinc chromate }				50	mg/kg	2.774	113.74	mg/kg	0.0114 %	✓	
	024-007-00-3	236-878-9	13530-65-9									
14	tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane				<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<LOD
	603-181-00-X	216-653-1	1634-04-4									
15	benzene				<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<LOD
	601-020-00-8	200-753-7	71-43-2									
16	toluene				<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<LOD
	601-021-00-3	203-625-9	108-88-3									

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number								
17	ethylbenzene 601-023-00-4	202-849-4	100-41-4		<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %			<LOD
18	xylene 601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]		<0.01 mg/kg		<0.01 mg/kg	<0.000001 %			<LOD
19	cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex } 006-007-00-5				<1 mg/kg	1.884	<1.884 mg/kg	<0.000188 %			<LOD
20	pH PH				6.2 pH		6.2 pH	6.2 pH			
21	naphthalene 601-052-00-2	202-049-5	91-20-3		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %			<LOD
22	acenaphthylene 205-917-1	208-96-8			<0.05 mg/kg		<0.05 mg/kg	<0.000005 %			<LOD
23	acenaphthene 201-469-6	83-32-9			<0.05 mg/kg		<0.05 mg/kg	<0.000005 %			<LOD
24	fluorene 201-695-5	86-73-7			<0.05 mg/kg		<0.05 mg/kg	<0.000005 %			<LOD
25	phenanthrene 201-581-5	85-01-8			0.09 mg/kg		0.0738 mg/kg	0.00000738 %	✓		
26	anthracene 204-371-1	120-12-7			<0.05 mg/kg		<0.05 mg/kg	<0.000005 %			<LOD
27	fluoranthene 205-912-4	206-44-0			0.31 mg/kg		0.254 mg/kg	0.0000254 %	✓		
28	pyrene 204-927-3	129-00-0			0.3 mg/kg		0.246 mg/kg	0.0000246 %	✓		
29	benzo[a]anthracene 601-033-00-9	200-280-6	56-55-3		0.16 mg/kg		0.131 mg/kg	0.0000131 %	✓		
30	chrysene 601-048-00-0	205-923-4	218-01-9		0.18 mg/kg		0.148 mg/kg	0.0000148 %	✓		
31	benzo[b]fluoranthene 601-034-00-4	205-911-9	205-99-2		0.23 mg/kg		0.189 mg/kg	0.0000189 %	✓		
32	benzo[k]fluoranthene 601-036-00-5	205-916-6	207-08-9		0.1 mg/kg		0.082 mg/kg	0.0000082 %	✓		
33	benzo[a]pyrene; benzo[def]chrysene 601-032-00-3	200-028-5	50-32-8		0.19 mg/kg		0.156 mg/kg	0.0000156 %	✓		
34	indeno[123-cd]pyrene 205-893-2	193-39-5			0.14 mg/kg		0.115 mg/kg	0.0000115 %	✓		
35	dibenz[a,h]anthracene 601-041-00-2	200-181-8	53-70-3		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %			<LOD
36	benzo[ghi]perylene 205-883-8	191-24-2			0.16 mg/kg		0.131 mg/kg	0.0000131 %	✓		
37	vanadium { divanadium pentaoxide; vanadium pentoxide } 023-001-00-8	215-239-8	1314-62-1		36 mg/kg	1.785	52.699 mg/kg	0.00527 %	✓		
38	monohydric phenols P1186				<1 mg/kg		<1 mg/kg	<0.0001 %			<LOD
39	sulfur { sulfur } 016-094-00-1	231-722-6	7704-34-9		<5 mg/kg		<5 mg/kg	<0.0005 %			<LOD
Total:									0.0981 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Determinand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
CLP: Note 1	Only the metal concentration has been used for classification

Appendix A: Classifier defined and non GB MCL determinands

■ chromium(III) oxide (worst case) (EC Number: 215-160-9, CAS Number: 1308-38-9)

Description/Comments: Data from C&L Inventory Database
Data source: <https://echa.europa.eu/information-on-chemicals/cl-inventory-database/-/discli/details/33806>
Data source date: 17 Jul 2015
Hazard Statements: Acute Tox. 4; H332, Acute Tox. 4; H302, Eye Irrit. 2; H319, STOT SE 3; H335, Skin Irrit. 2; H315, Resp. Sens. 1; H334, Skin Sens. 1; H317, Repr. 1B; H360FD, Aquatic Acute 1; H400, Aquatic Chronic 1; H410

■ ethylbenzene (EC Number: 202-849-4, CAS Number: 100-41-4)

GB MCL index number: 601-023-00-4
Description/Comments:
Additional Hazard Statement(s): Carc. 2; H351
Reason for additional Hazards Statement(s):
20 Nov 2021 - Carc. 2; H351 hazard statement sourced from: IARC Group 2B (77) 2000

■ salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex

GB MCL index number: 006-007-00-5
Description/Comments: Conversion factor based on a worst case compound: sodium cyanide
Additional Hazard Statement(s): EUH032 >= 0.2 %
Reason for additional Hazards Statement(s):
20 Nov 2021 - EUH032 >= 0.2 % hazard statement sourced from: WM3, Table C12.2

■ pH (CAS Number: PH)

Description/Comments: Appendix C4
Data source: WM3 1st Edition 2015
Data source date: 25 May 2015
Hazard Statements: None.

■ acenaphthylene (EC Number: 205-917-1, CAS Number: 208-96-8)

Description/Comments: Data from C&L Inventory Database
Data source: <http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>
Data source date: 17 Jul 2015
Hazard Statements: Acute Tox. 4; H302, Acute Tox. 1; H330, Acute Tox. 1; H310, Eye Irrit. 2; H319, STOT SE 3; H335, Skin Irrit. 2; H315

■ acenaphthene (EC Number: 201-469-6, CAS Number: 83-32-9)

Description/Comments: Data from C&L Inventory Database
Data source: <http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>
Data source date: 17 Jul 2015
Hazard Statements: Eye Irrit. 2; H319, STOT SE 3; H335, Skin Irrit. 2; H315, Aquatic Acute 1; H400, Aquatic Chronic 1; H410, Aquatic Chronic 2; H411

■ fluorene (EC Number: 201-695-5, CAS Number: 86-73-7)

Description/Comments: Data from C&L Inventory Database
Data source: <http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>
Data source date: 06 Aug 2015
Hazard Statements: Aquatic Acute 1; H400, Aquatic Chronic 1; H410

■ phenanthrene (EC Number: 201-581-5, CAS Number: 85-01-8)

Description/Comments: Data from C&L Inventory Database
Data source: <http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>
Data source date: 06 Aug 2015
Hazard Statements: Acute Tox. 4; H302, Eye Irrit. 2; H319, STOT SE 3; H335, Carc. 2; H351, Skin Sens. 1; H317, Aquatic Acute 1; H400, Aquatic Chronic 1; H410, Skin Irrit. 2; H315

■ anthracene (EC Number: 204-371-1, CAS Number: 120-12-7)

Description/Comments: Data from C&L Inventory Database
Data source: <http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>
Data source date: 17 Jul 2015
Hazard Statements: Eye Irrit. 2; H319, STOT SE 3; H335, Skin Irrit. 2; H315, Skin Sens. 1; H317, Aquatic Acute 1; H400, Aquatic Chronic 1; H410

■ fluoranthene (EC Number: 205-912-4, CAS Number: 206-44-0)

Description/Comments: Data from C&L Inventory Database
Data source: <http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>
Data source date: 21 Aug 2015
Hazard Statements: Acute Tox. 4; H302, Aquatic Acute 1; H400, Aquatic Chronic 1; H410

▪ **pyrene** (EC Number: 204-927-3, CAS Number: 129-00-0)

Description/Comments: Data from C&L Inventory Database; SDS Sigma Aldrich 2014

Data source: <http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>

Data source date: 21 Aug 2015

Hazard Statements: Skin Irrit. 2; H315, Eye Irrit. 2; H319, STOT SE 3; H335, Aquatic Acute 1; H400, Aquatic Chronic 1; H410

▪ **indeno[123-cd]pyrene** (EC Number: 205-893-2, CAS Number: 193-39-5)

Description/Comments: Data from C&L Inventory Database

Data source: <http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>

Data source date: 06 Aug 2015

Hazard Statements: Carc. 2; H351

▪ **benzo[ghi]perylene** (EC Number: 205-883-8, CAS Number: 191-24-2)

Description/Comments: Data from C&L Inventory Database; SDS Sigma Aldrich 28/02/2015

Data source: <http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>

Data source date: 23 Jul 2015

Hazard Statements: Aquatic Acute 1; H400, Aquatic Chronic 1; H410

▪ **divanadium pentaoxide; vanadium pentoxide** (EC Number: 215-239-8, CAS Number: 1314-62-1)

GB MCL index number: 023-001-00-8

Description/Comments: Hazard statements H301, H330, H350 added by HazWasteOnline due to ATP 18 (Regulation (EU) 2022/692) considers vanadium pentoxide to be Carc. 1B; H350. The GB MCL Agency has reached the same opinion [but is yet to formerly make this change to the MCL List]. Substance has therefore been self-classified.

Additional Hazard Statement(s): Carc. 1B; H350, Acute Tox. 3; H301, Acute Tox. 2; H330

Reason for additional Hazards Statement(s):

20 Sep 2022 - Carc. 1B; H350 hazard statement sourced from: ATP 18 (Regulation (EU) 2022/692) considers vanadium pentoxide to be Carc. 1B; H350. The GB MCL Agency has reached the same opinion [but is yet to formerly make this change to the MCL List]. Substance has therefore been self-classified.

28 Sep 2022 - Acute Tox. 3; H301 hazard statement sourced from: ATP 18 (Regulation (EU) 2022/692) considers vanadium pentoxide to be "Acute tox 3; H301". The GB MCL Agency has reached the same opinion [but is yet to formerly make this change to the MCL List]. Substance has therefore been self-classified.

28 Sep 2022 - Acute Tox. 2; H330 hazard statement sourced from: ATP 18 (Regulation (EU) 2022/692) considers vanadium pentoxide to be "Acute tox 2; H330". The GB MCL Agency has reached the same opinion [but is yet to formerly make this change to the MCL List]. Substance has therefore been self-classified.

▪ **monohydric phenols** (CAS Number: P1186)

Description/Comments: Combined hazards statements from harmonised entries in CLP for phenol, cresols and xylenols (604-001-00-2, 604-004-00-9, 604-006-00-X)

Data source: CLP combined data

Data source date: 26 Mar 2019

Hazard Statements: Muta. 2; H341, Acute Tox. 3; H331, Acute Tox. 3; H311, Acute Tox. 3; H301, STOT RE 2; H373, Skin Corr. 1B; H314, Skin Corr. 1B; H314 >= 3 %, Skin Irrit. 2; H315 1 & conc. < 3 %, Eye Irrit. 2; H319 1 & conc. < 3 %, Aquatic Chronic 2; H411

Appendix B: Rationale for selection of metal species

arsenic {arsenic trioxide}

Reasonable case CLP species based on hazard statements/molecular weight and most common (stable) oxide of arsenic. Industrial sources include: smelting; main precursor to other arsenic compounds (edit as required)

beryllium {beryllium oxide}

Reasonable case CLP species based on hazard statements/molecular weight. Industrial sources include: most common (non alloy) form, used in ceramics (edit as required)

boron {diboron trioxide; boric oxide}

Reasonable case CLP species based on hazard statements/ molecular weight, physical form and low solubility. Industrial sources include: fluxing agent for glass/enamels; additive for fibre optics, borosilicate glass (edit as required)

cadmium {cadmium oxide}

Reasonable case CLP species based on hazard statements/molecular weight, very low solubility in water. Industrial sources include: electroplating baths, electrodes for storage batteries, catalysts, ceramic glazes, phosphors, pigments and nematocides. (edit as required) Worst case compounds in CLP: cadmium sulphate, chloride, fluoride & iodide not expected as either very soluble and/or compound's industrial usage not related to site history (edit as required)

chromium in chromium(III) compounds {chromium(III) oxide (worst case)}

Reasonable case species based on hazard statements/molecular weight. Industrial sources include: tanning, pigment in paint, inks and glass (edit as required)

chromium in chromium(VI) compounds {chromium (VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex}

Worst case species based on hazard statements/molecular weight (edit as required)

copper {dicopper oxide; copper (I) oxide}

Reasonable case CLP species based on hazard statements/molecular weight and insolubility in water. Industrial sources include: oxidised copper metal, brake pads, pigments, antifouling paints, fungicide. (edit as required) Worse case copper sulphate is very soluble and likely to have been leached away if ever present and/or not enough soluble sulphate detected. (edit as required)

lead {lead chromate}

Worst case CLP species based on hazard statements/molecular weight (edit as required)

manganese {manganese sulphate}

Worst case CLP species based on hazard statements/molecular weight (edit as required)

mercury {mercury dichloride}

Worst case CLP species based on hazard statements/molecular weight (edit as required)

nickel {nickel chromate}

Worst case CLP species based on hazard statements/molecular weight (edit as required)

selenium {nickel selenate}

Worst case CLP species based on hazard statements/molecular weight (edit as required)

zinc {zinc chromate}

Worst case CLP species based on hazard statements/molecular weight (edit as required)

cyanides {salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex}

Harmonised group entry used as most reasonable case as complex cyanides and those specified elsewhere in the annex are not likely to be present in this soil: [Note conversion factor based on a worst case compound: sodium cyanide] (edit as required)

vanadium {divanadium pentaoxide; vanadium pentoxide}

worst case

sulfur {sulfur}

worst case

Appendix C: Version

HazWasteOnline Classification Engine: **WM3 1st Edition v1.2.GB - Oct 2021**

HazWasteOnline Classification Engine Version: 2023.111.5569.10274 (22 Apr 2023)

HazWasteOnline Database: 2023.111.5569.10274 (22 Apr 2023)

This classification utilises the following guidance and legislation:

WM3 v1.2.GB - Waste Classification - 1st Edition v1.2.GB - Oct 2021

CLP Regulation - Regulation 1272/2008/EC of 16 December 2008

1st ATP - Regulation 790/2009/EC of 10 August 2009

2nd ATP - Regulation 286/2011/EC of 10 March 2011

3rd ATP - Regulation 618/2012/EU of 10 July 2012

4th ATP - Regulation 487/2013/EU of 8 May 2013

Correction to 1st ATP - Regulation 758/2013/EU of 7 August 2013

5th ATP - Regulation 944/2013/EU of 2 October 2013

6th ATP - Regulation 605/2014/EU of 5 June 2014

WFD Annex III replacement - Regulation 1357/2014/EU of 18 December 2014

Revised List of Waste 2014 - Decision 2014/955/EU of 18 December 2014

7th ATP - Regulation 2015/1221/EU of 24 July 2015

8th ATP - Regulation (EU) 2016/918 of 19 May 2016

9th ATP - Regulation (EU) 2016/1179 of 19 July 2016

10th ATP - Regulation (EU) 2017/776 of 4 May 2017

HP14 amendment - Regulation (EU) 2017/997 of 8 June 2017

13th ATP - Regulation (EU) 2018/1480 of 4 October 2018

14th ATP - Regulation (EU) 2020/217 of 4 October 2019

15th ATP - Regulation (EU) 2020/1182 of 19 May 2020

The Chemicals (Health and Safety) and Genetically Modified Organisms (Contained Use)(Amendment etc.) (EU Exit)

Regulations 2020 - UK: 2020 No. 1567 of 16th December 2020

The Waste and Environmental Permitting etc. (Legislative Functions and Amendment etc.) (EU Exit) Regulations 2020 - UK: 2020 No. 1540 of 16th December 2020

GB MCL List - version 1.1 of 09 June 2021

Appendix D Arun District Council Strategic Flood Risk Assessment (SFRA) & Lidsey Surface Water Management Plan (SWMP) Extracts

Arun District Council Level 1 Strategic Flood Risk Assessment

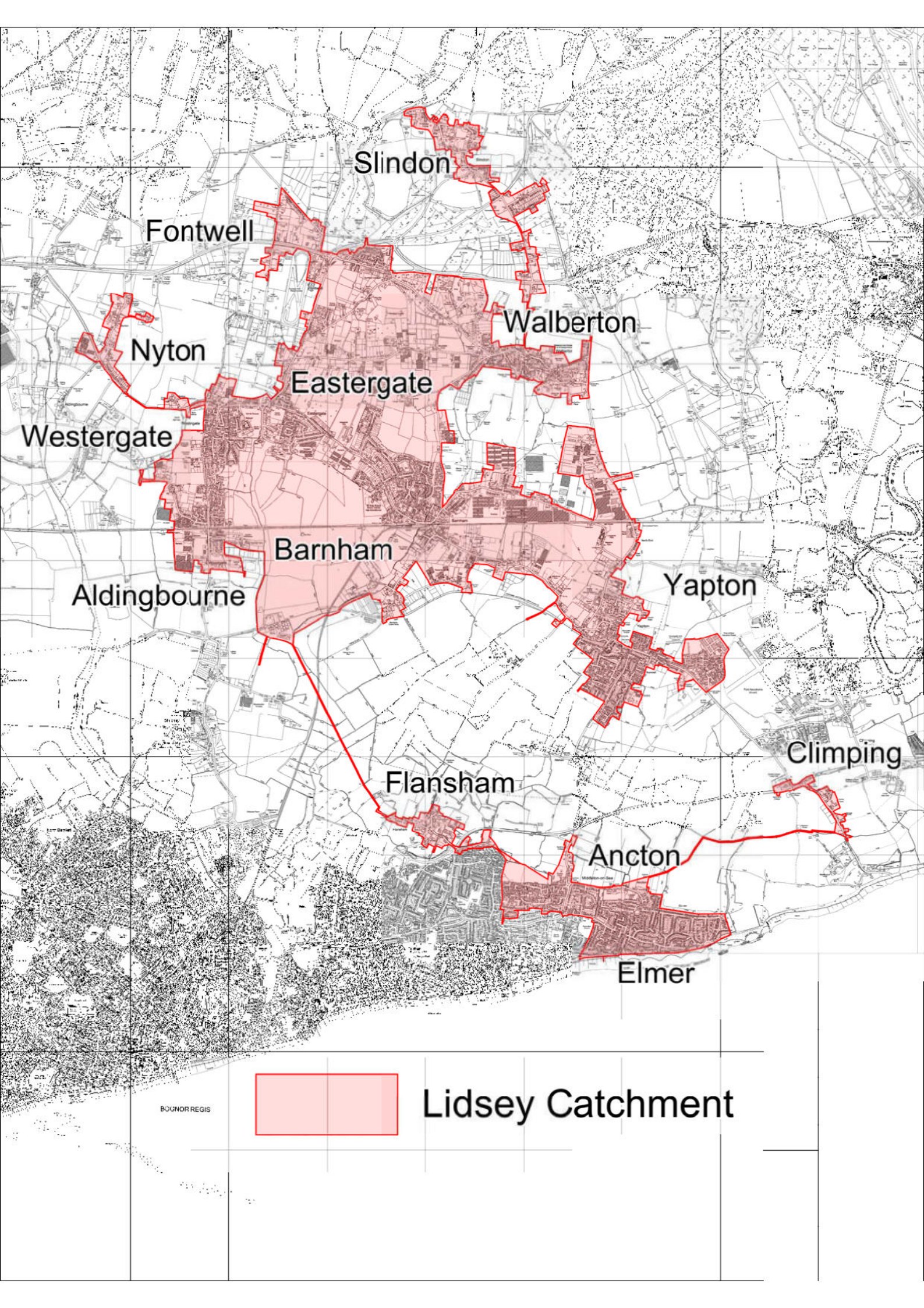
Final Report

March 2026

Prepared for:

Arun District Council

www.jbaconsulting.com



Slindon

Fontwell

Nyton

Walberton

Eastergate

Westergate

Barnham

Aldingbourne

Yapton

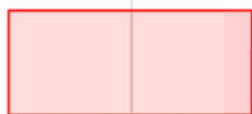
Flansham

Climping

Ancton

Elmer

BOGNOR REGIS



Lidsey Catchment

LFRZ_0015 - Sea Way, Middleton on Sea

Figure 7.31 - Flood Risk LFRZ_015 (1 in 100 year storm event)

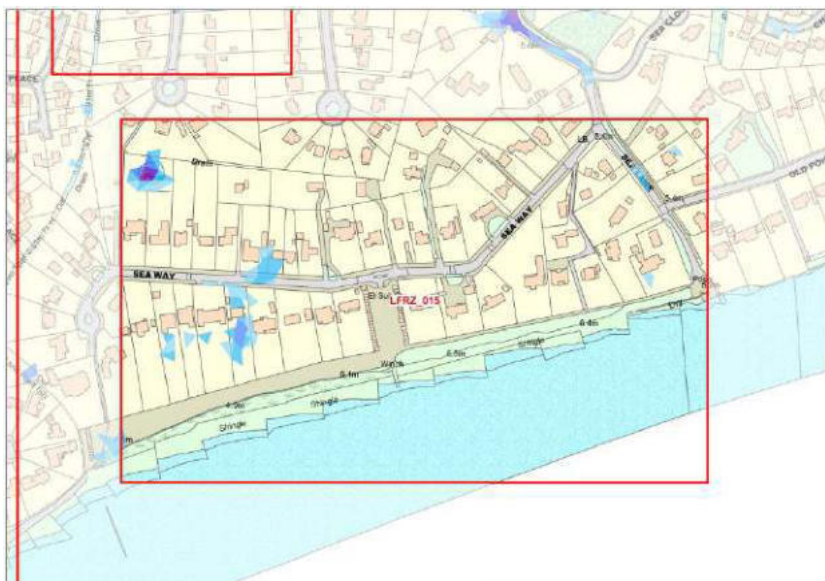


Figure 7.32 - Flood Hazard LFRZ_015 (1 in 100 year storm event)

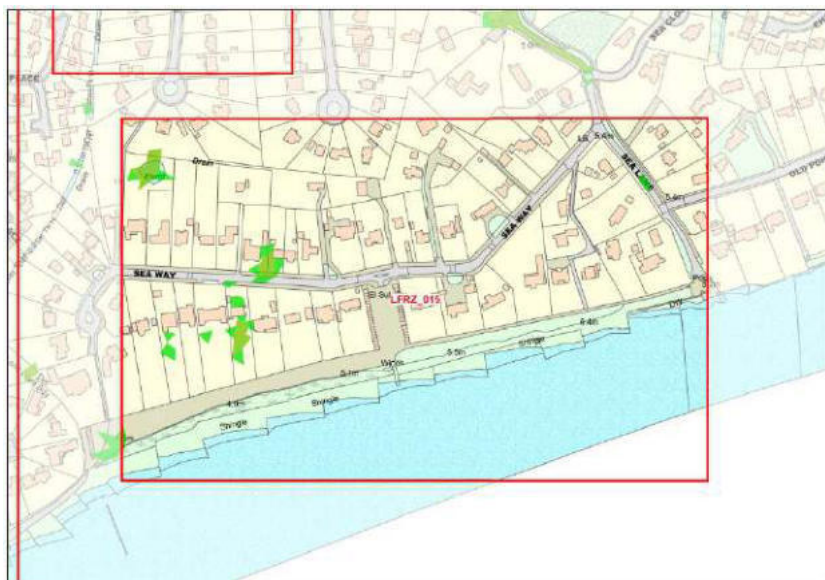


Table 7-30 - Predicted Residential and Commercial Property Flood Impact LFRZ_015

Rainfall Return Period	Predicted number of properties at risk of flooding	
	Residential	Commercial
1 in 30 Year	7	1
1 in 100 Year	7	1
1 in 100 Year + (Climate Change (2080's))	7	1

Table 7-31 - Summary of local flood risk within the LFRZ_015

Flood Risk Source			
Pluvial Flood Risk	Fluvial Flood Risk	Ground Water Flood Risk	Public Sewer Flood Risk
High	Low	Medium	High
Flood Mechanism			
Pluvial flooding in highway area of Sea Way and cartilage flooding of properties. Surface water not able to effectively drain away. Internal property flooding reported in 2012 due to pluvial flooding. Flooding from the public foul sewer is reported and restricted toilet for prolonged periods is experienced. High ground water is reported by residents this is likely to compromise the effectiveness of soakaway systems.			
Flood Risk Receptors			
Residential properties.			
Flood Hazard			
A 'low' flood hazard is predicted for 1% annual chance storm event (1 in 100 year return period).			
Validation			
SWS SIRM data reports local flooding in the LFRZ. SWMP Partners, residents and the Middleton Strategic Action Group have all reported the flooding in this area. Completed questionnaires have been provided confirming local flood risk and flood extents.			
General Notes			
A new storm system has been installed by the residents to reduce surface water flood risk. It was reported that this provided hydraulic benefit in the December 2012 storm event. As well as the surface water ponding in Sea Way the new storm gully is reported to drain flooding from foul manholes. Problems associated with the foul flooding are of main local concern.			

8.4. Source / Pathway / Receptor Options

As outlined in Section 8.3 options or interventions can be categorised under the three headings. The types of options available are detailed in Table 8.1.

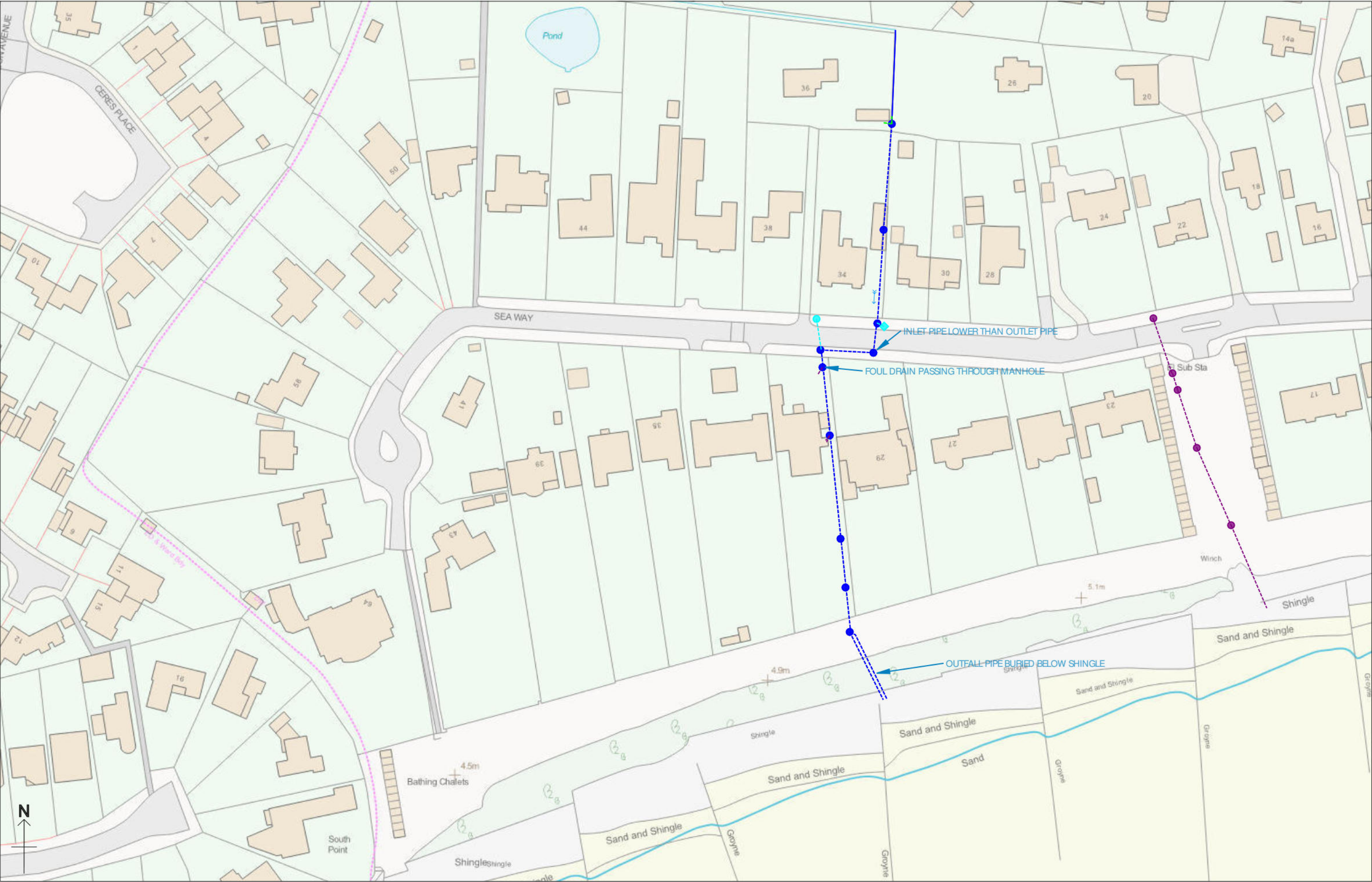
Table 8-1 - Source / Pathway / Receptor Options

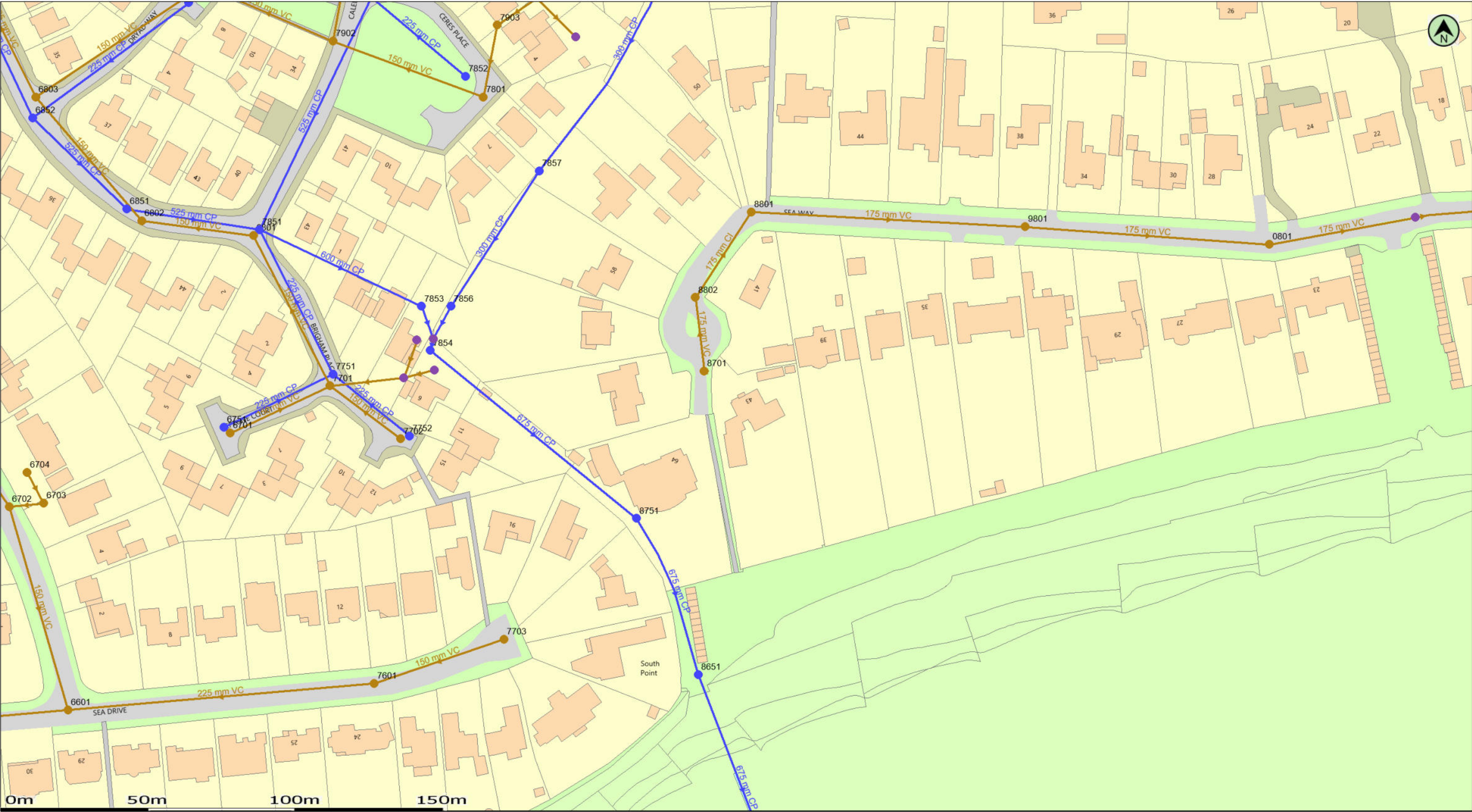
Option Ref.	Category	9. Option
1	Source	Green Roof
2	Source	Detention Basins (Attenuation / Retention)
3	Source	Permeable Paving
4	Source	Ponds and Wetlands
5	Source	Rainwater Harvesting
6	Source	Soakaways
7	Source	Swales
8	Source	Bioretention Basins
9	Source	Bioretention Street Planting
10	Source	Sealing of foul manhole covers and protecting open foul gullies
11	Source	Sealing Sewers (Reduce ground water / rainfall induced infiltration)
12	Pathway	Increasing Capacity in Drainage System (Storage, Upsize)
13	Pathway	Deculverting Watercourse(s)
14	Pathway	Improved maintenance regimes
15	Pathway	Increase Gully Assets
16	Pathway	Land management practices
17	Pathway	Managing overland flows (above ground storage)
18	Pathway	Managing overland flows (preferential flow paths during exceedance)
19	Pathway	Separation of foul and surface water
20	Receptor	Improve Weather Warning
21	Receptor	Improve resilience to flooding
22	Receptor	Social change, education and awareness
23	Receptor	Raising doorway / access threshold
24	Receptor	Planning policies to influence development (Development Control, SUDS Strategy, Blue Development Corridors, New Development).
25	Receptor	Temporary demountable flood defences
26	Strategy	Further Study / Investigations
27	Strategy	Survey, Advise & Monitoring
28	Strategy	Community Awareness

Examples of the Source Control options are shown in Figure 4.4. Figure 8.4 and Figure 8.5 show examples of Pathway and Receptor Options available to the drainage planners.

Appendix E Arun District Council Drainage Assets & Southern Water Public Sewer Records

Arun District Council Maps





(c) Crown copyright and database rights 2024 Ordnance Survey 100031673

Date: 23/04/24

Scale: 1:1250

Map Centre: 496863,99784

Data updated: 12/04/24

Our Ref: 1452305 - 1

Wastewater Plan A3

The positions of pipes shown on this plan are believed to be correct, but Southern Water Services Ltd accept no responsibility in the event of inaccuracy. The actual positions should be determined on site. This plan is produced by Southern Water Services Ltd (c) Crown copyright and database rights 2024 Ordnance Survey 100031673. This map is to be used for the purposes of viewing the location of Southern Water plant only. Any other uses of the map data or further copies is not permitted.

WARNING: BAC pipes are constructed of Bonded Asbestos Cement.

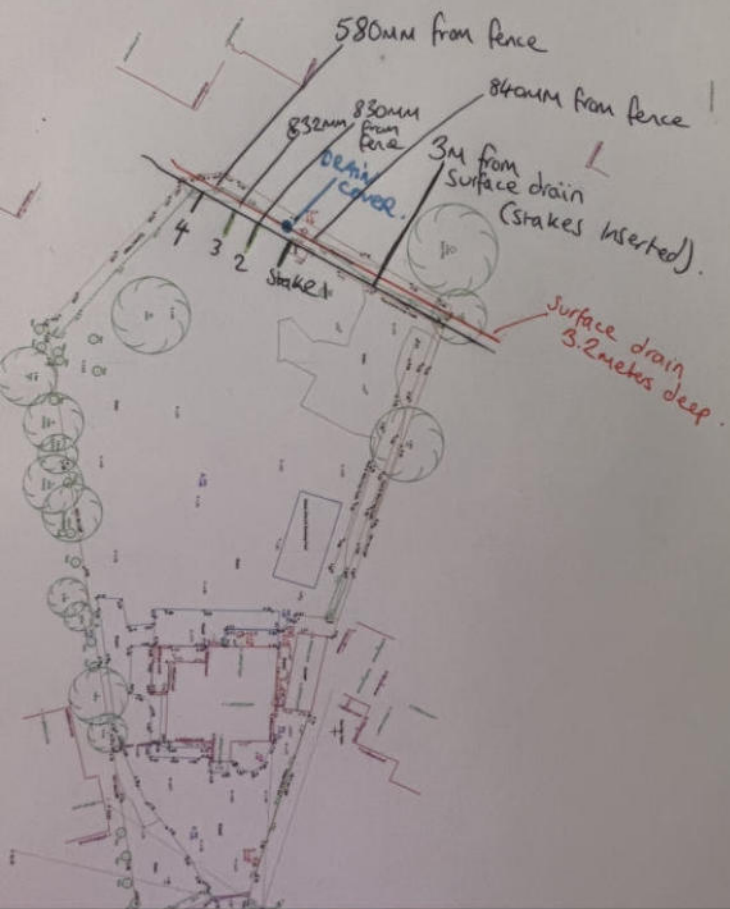
WARNING: Unknown (UNK) materials may include Bonded Asbestos Cement.

searches@bpcivils.co.uk

D2239 43 Sea Way



Appendix F Abacus Drainage Investigation



Darren attended 60 Sea Way, Middleton on Sea on Monday the 28th of November and carried out a trace and locate on the underground surface water drainage located to the rear of property. Upon lifting the cast iron access cover situated at the bottom of the garden in-between the hedges, we identified the outlet/downstream surface water drainage to be approximately 3200mm deep from ground level and the inlet surface water drainage to be approximately 2900mm from ground level. The material of these surface water pipes is made from Vitrified Clay and is 300mm in diameter.

We then used our Minicam Solo Pro CCTV unit to enter the underground surface drainage to enable us to carry out our trace and locate using our Vivax scanner.

As we went along tracing the drainage downstream, we line marked every 1meter which showed the surface water continuing to run underneath the hedges maintaining a depth of 3200mm. We also carried out this practice upstream of the surface water drainage heading up towards the rear shed. Again, maintaining a depth of 2900mm and running underneath the hedges. Once we found the correct direction of the surface drainage all 1meter points were marked with red line paint. We then inserted multiple wooden stakes exactly 3000mm away from the markings.

The first marking behind the shed, shows the surface drainage sits 840mm from the rear fence, panel. As the surface drain makes its way along the rear hedges and exiting to the corner of the garden at a distance of 580mm from the last fence panel, still at a depth of approximately 3200mm.

Appendix G Wallingford Greenfield Run-off Calculations

Calculated by: Stuart Burnett

Site name: 60 Sea Way

Site location: Middleton-on-Sea

Site Details

Latitude: 50.78992° N

Longitude: 0.62753° W

Reference: 1602830785

Date: Aug 01 2024 14:06

This is an estimation of the greenfield runoff rates that are used to meet normal best practice criteria in line with Environment Agency guidance "Rainfall runoff management for developments", SC030219 (2013) , the SuDS Manual C753 (Ciria, 2015) and the non-statutory standards for SuDS (Defra, 2015). This information on greenfield runoff rates may be the basis for setting consents for the drainage of surface water runoff from sites.

Runoff estimation approach

IH124

Site characteristics

Total site area (ha): 0.2043

Methodology

Q_{BAR} estimation method: Calculate from SPR and SAAR

SPR estimation method: Calculate from SOIL type

Notes

(1) Is $Q_{BAR} < 2.0$ l/s/ha?

When Q_{BAR} is < 2.0 l/s/ha then limiting discharge rates are set at 2.0 l/s/ha.

Soil characteristics

	Default	Edited
SOIL type:	3	3
HOST class:	N/A	N/A
SPR/SPRHOST:	0.37	0.37

(2) Are flow rates < 5.0 l/s?

Where flow rates are less than 5.0 l/s consent for discharge is usually set at 5.0 l/s if blockage from vegetation and other materials is possible. Lower consent flow rates may be set where the blockage risk is addressed by using appropriate drainage elements.

Hydrological characteristics

	Default	Edited
SAAR (mm):	700	700
Hydrological region:	7	7
Growth curve factor 1 year:	0.85	0.85
Growth curve factor 30 years:	2.3	2.3
Growth curve factor 100 years:	3.19	3.19
Growth curve factor 200 years:	3.74	3.74

(3) Is $SPR/SPRHOST \leq 0.3$?

Where groundwater levels are low enough the use of soakaways to avoid discharge offsite would normally be preferred for disposal of surface water runoff.

Greenfield runoff rates	Default	Edited
-------------------------	---------	--------

Q_{BAR} (l/s):	0.59	0.59
1 in 1 year (l/s):	0.5	0.5
1 in 30 years (l/s):	1.35	1.35
1 in 100 year (l/s):	1.87	1.87
1 in 200 years (l/s):	2.2	2.2

This report was produced using the greenfield runoff tool developed by HR Wallingford and available at www.uksuds.com. The use of this tool is subject to the UK SuDS terms and conditions and licence agreement , which can both be found at www.uksuds.com/terms-and-conditions.htm. The outputs from this tool are estimates of greenfield runoff rates. The use of these results is the responsibility of the users of this tool. No liability will be accepted by HR Wallingford, the Environment Agency, CEH, Hydrosolutions or any other organisation for the use of this data in the design or operational characteristics of any drainage scheme.

Appendix H Environment Agency Flood Risk Assessment Data

Flood risk assessment data



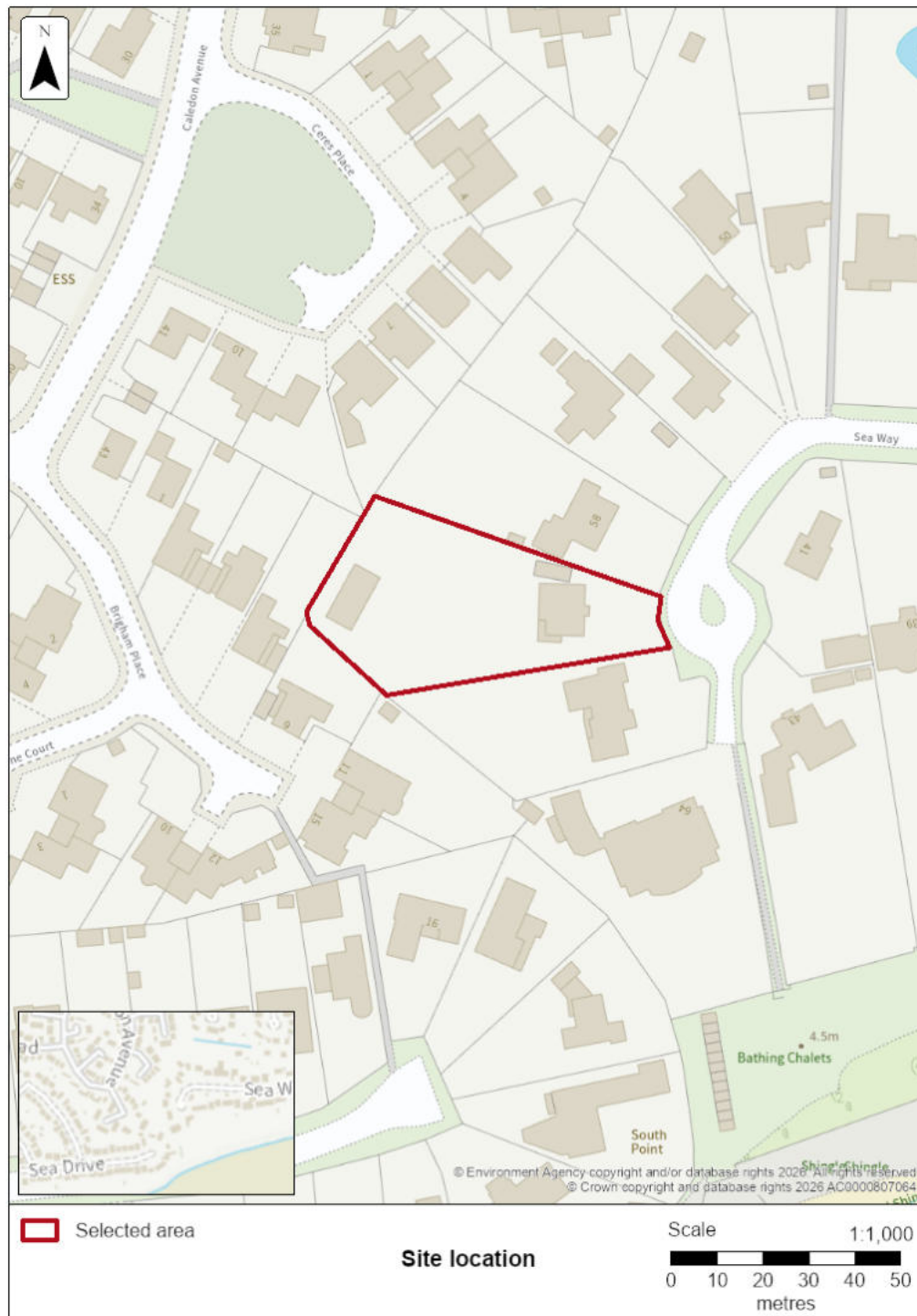
Location of site: 60 Sea Way, Middleton-on-Sea, Bognor Regis, PO22 7SA

Document created on: 13 April 2026

This information was previously known as a product 4.

Customer reference number: EIR2026/15870

Map showing the location that flood risk assessment data has been requested for.



How to use this information

You can use this information as part of a flood risk assessment for a planning application. To do this, you should include it in the appendix of your flood risk assessment.

We recommend that you work with a flood risk consultant to get your flood risk assessment.

Included in this document

In this document you'll find:

- how to find information about surface water and other sources of flooding
- information on the models used
- definitions for the terminology used throughout
- flood map for planning (rivers and the sea)
- modelled data
- climate change modelled data
- information about strategic flood risk assessments
- information about this data
- information about flood risk activity permits
- help and advice

Information that's unavailable

This document **does not** contain:

- past floods
- flood defences and attributes

We do not have past flooding data for this location.

Please note that:

- flooding may have occurred that we do not have records for
- flooding can come from a range of different sources
- we can only supply flood risk data relating to flooding from rivers or the sea

You can contact your Lead Local Flood Authority or Internal Drainage Board to see if they have other relevant local flood information. Please note that some areas do not have an Internal Drainage Board.

We aren't able to display flood defence locations and attributes as there are no formal flood defences in the area of interest.

Surface water and other sources of flooding

When using the surface water map on the [check your long term flood risk service](#) the following considerations apply:

- surface water extents are suitable for use in planning
- surface water climate change scenarios may help to inform risk assessments, but the available data fall short of what is required to assess planned development
- surface water depth information should not be used for planning purposes

To find out about other factors that might affect the flood risk of this location, you should also check:

- [reservoir flood risk](#)
- groundwater flood risk - you could use the [British Geological Survey groundwater flooding data](#), [groundwater: current status and flood risk](#) and the guide on [mining and groundwater constraints for development](#) - further information may be available from the lead local flood authority (LLFA)
- your local planning authority's SFRA, which includes future flood risk

Your Lead Local Flood Authority is West Sussex County.

For information about sewer flooding, contact the relevant water company for the area.

About the models used

Model name: Emsworth to Littlehampton Model - Arun to East Head (2016)

Scenario(s): Defended tidal, Undefined tidal

Date: 9 April 2016

This model contains the most relevant data for your area of interest.

Terminology used

Annual exceedance probability (AEP)

This refers to the probability of a flood event occurring in any year. The probability is expressed as a percentage. For example, a large flood which is calculated to have a 1% chance of occurring in any one year, is described as 1% AEP.

Metres above ordnance datum (mAOD)

All flood levels are given in metres above ordnance datum which is defined as the mean sea level at Newlyn, Cornwall.

Flood map for planning (rivers and the sea)

Your selected location is in flood zone 1.

Flood zone 3 shows the area at risk of flooding for an undefended flood event with a:

- 0.5% or greater probability of occurring in any year for flooding from the sea
- 1% or greater probability of occurring in any year for fluvial (river) flooding

Flood zone 2 shows the area at risk of flooding for an undefended flood event with:

- between a 0.1% and 0.5% probability of occurring in any year for flooding from the sea
- between a 0.1% and 1% probability of occurring in any year for fluvial (river) flooding

It's important to remember that the flood zones on this map:

- refer to the land at risk of flooding and do not refer to individual properties
- refer to the probability of river and sea flooding, ignoring the presence of defences
- do not take into account potential impacts of climate change



Flood map for planning

Location (easting/northing)
496794/99811

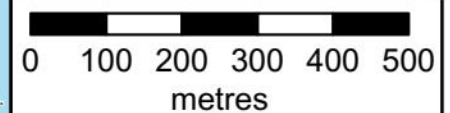
Scale

1:10,000

Created

13 Apr 2026

-  Selected area
-  Flood Zone 3
-  Flood Zone 2



Modelled data

This section provides details of different scenarios we have modelled and includes the following (where available):

- outline maps showing the area at risk from flooding in different modelled scenarios
- map(s) showing the approximate water levels for the return period with the largest flood extent for a scenario and table(s) of sample points providing details of the flood risk for different return periods

Climate change

The climate change data included in the models may not include the latest [flood risk assessment climate change allowances](#). Where the new allowances are not available you will need to consider this data and factor in the new allowances to demonstrate the development will be safe from flooding.

The Environment Agency will incorporate the new allowances into future modelling studies. For now, it's your responsibility to demonstrate that new developments will be safe in flood risk terms for their lifetime.

Modelled scenarios

The following scenarios are included:

- Defended modelled tidal: risk of flooding from the sea where there are flood defences
- Defences removed modelled tidal: risk of flooding from the sea where flood defences have been removed

Modelled Flood Outlines (Defended Tidal). Centred PO22 7SA. Created 13/04/2026.

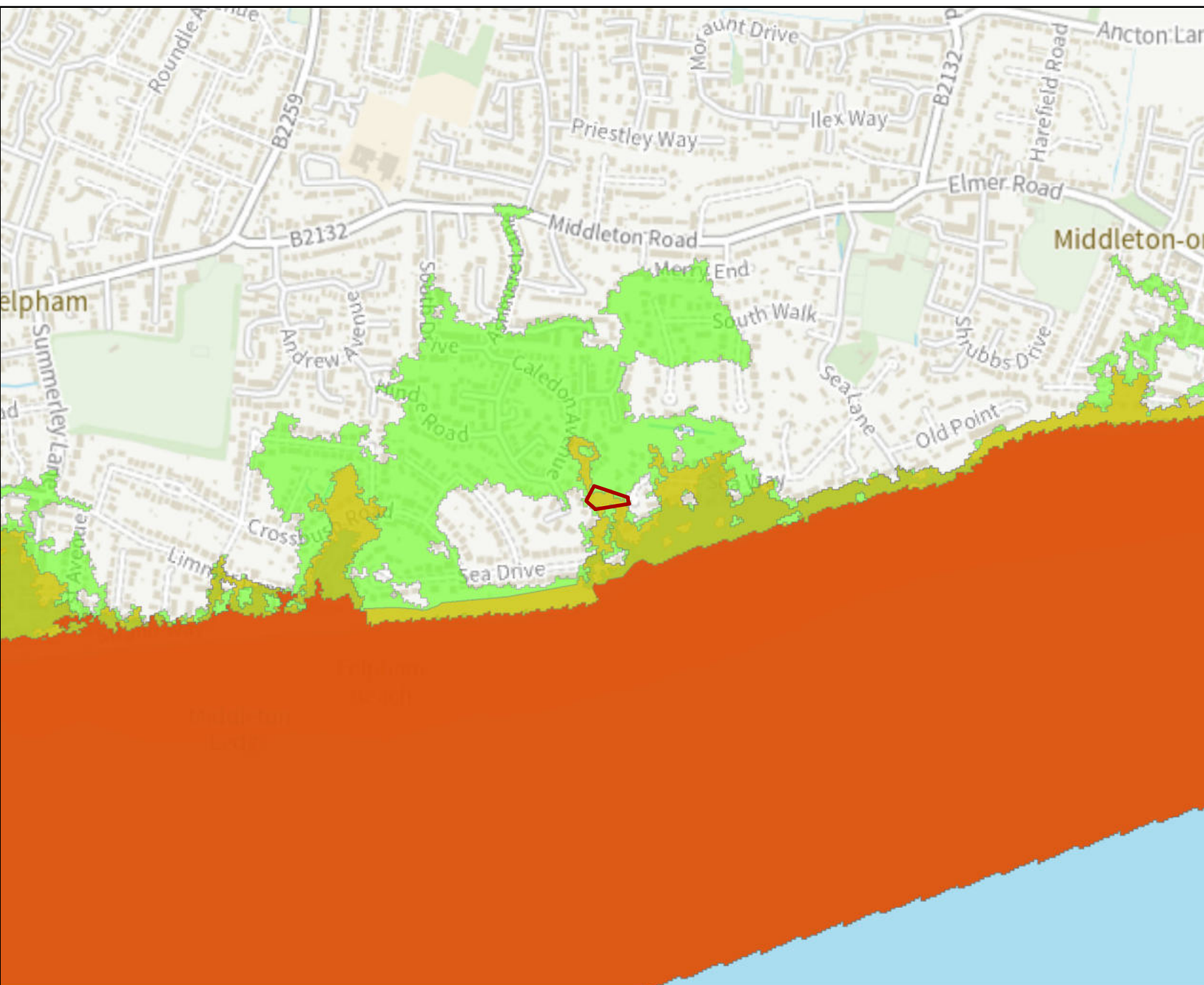
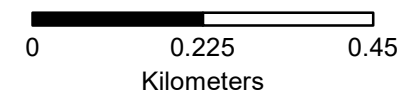


Legend

- Site Boundary
- 0.5% AEP (Defended Tidal)
- 0.5% AEP (2070) NPPF (Defended Tidal)
- 0.5% AEP (2115) NPPF (Defended Tidal)
- 0.1% AEP (Defended Tidal)

Annual Exceedance Probability (AEP) The probability of a flood of a particular magnitude, or greater occurring in any given year.

Scale: 1:10,000



Modelled Flood Outlines (Un defended Tidal). Centred PO22 7SA. Created 13/04/2026.

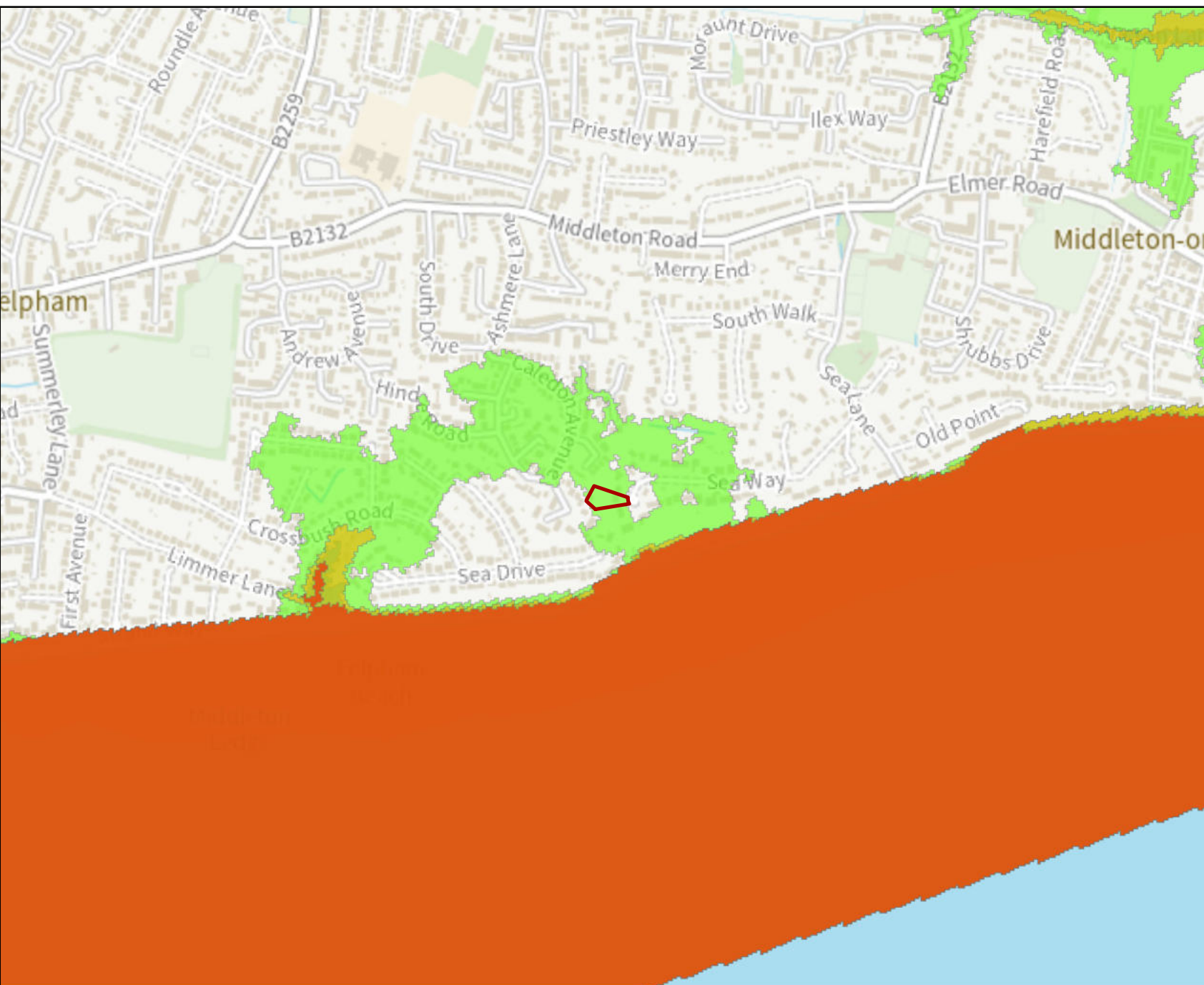
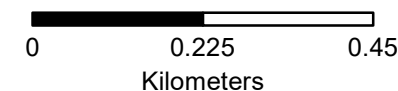


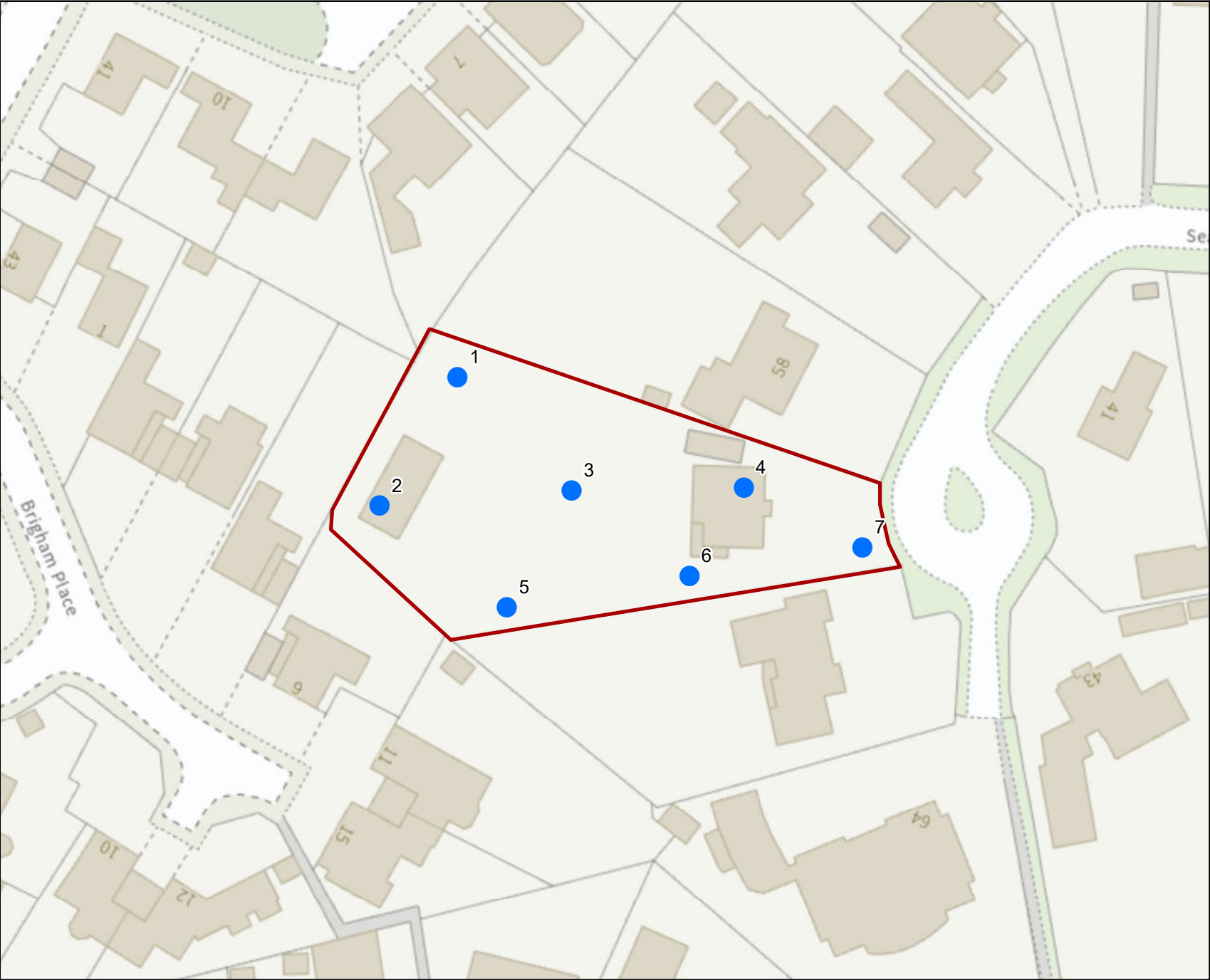
Legend

- Site Boundary
- 0.5% AEP (Un defended Tidal)
- 0.5% AEP (2070) NPPF (Un defended Tidal)
- 0.5% AEP (2115) NPPF (Un defended Tidal)
- 0.1% AEP (Un defended Tidal)

Annual Exceedance Probability (AEP) The probability of a flood of a particular magnitude, or greater occurring in any given year.

Scale: 1:10,000







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Legend

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Site Nodes

□

Site Boundary

Annual Exceedance Probability (AEP) The probability of a flood of a particular magnitude, or greater occurring in any given year.

Scale: 1:750

00.0150.03

Kilometers



Product 4 Flood Risk Data Requested by [REDACTED]

Site: 60 Sea Way, Middleton-on-Sea, Bognor Regis, PO22 7SA

Table 1: Water Levels: Tidal Undefended

Node Ref	NGR		Modelled Flood Levels in Metres AOD			
	Eastings	Northings	Undefended Annual Exceedance Probability			
			0.5%	0.5% (2070)*	0.5% (2115)*	0.1%
1	496778	99829	-	-	4.82	-
2	496767	99811	-	-	4.83	-
3	496794	99813	-	-	4.84	-
4	496817	99813	-	-	4.83	-
5	496785	99797	-	-	4.87	-
6	496810	99801	-	-	4.84	-
7	496834	99805	-	-	4.85	-

Table 2: Water Levels: Tidal Defended

Node Ref	NGR		Modelled Flood Levels in Metres AOD			
	Eastings	Northings	Defended Annual Exceedance Probability			
			0.5%	0.5% (2070)*	0.5% (2115)*	0.1%
1	496778	99829	-	-	4.95	-
2	496767	99811	-	4.64	4.95	-
3	496794	99813	-	4.64	4.95	-
4	496817	99813	-	-	4.95	-
5	496785	99797	-	4.66	4.95	-
6	496810	99801	-	4.65	4.95	-
7	496834	99805	-	-	4.95	-

Table 3: Water Depths: Tidal Undefended

Node Ref	NGR		Modelled Flood Depths in Metres			
			Undefended Annual Exceedance Probability			
	Eastings	Northings	0.5%	0.5% (2070)*	0.5% (2115)*	0.1%
1	496778	99829	-	-	0.03	-
2	496767	99811	-	-	0.37	-
3	496794	99813	-	-	0.26	-
4	496817	99813	-	-	0.12	-
5	496785	99797	-	-	0.18	-
6	496810	99801	-	-	0.29	-
7	496834	99805	-	-	0.07	-

Table 4: Water Depths: Tidal Defended

Node Ref	NGR		Modelled Flood Depths in Metres			
			Defended Annual Exceedance Probability			
	Eastings	Northings	0.5%	0.5% (2070)*	0.5% (2115)*	0.1%
1	496778	99829	-	-	0.05	-
2	496767	99811	-	0.19	0.49	-
3	496794	99813	-	0.08	0.37	-
4	496817	99813	-	-	0.24	-
5	496785	99797	-	0.01	0.29	-
6	496810	99801	-	0.10	0.40	-
7	496834	99805	-	-	0.16	-

All levels taken from: River Arun to East Head Coastal Modelling (2016), by JBA Consulting.

Produced on: 13/04/2026

*** The flood risk data provided is based on existing EA hydraulic models with an allowance for climate change. Please note the climate change allowances provided are not up to date. These were updated on 27 July 2021.**

You should refer to ['Flood risk assessments: climate change allowances'](#) for the most up to date allowances. You will need to undertake further assessment of future flood risk using different allowances to ensure your assessment of future flood risk is based on best available evidence.

There is no additional information or health warnings for these levels/depths or the model from which they have been produced.

Strategic flood risk assessments

We recommend that you check the relevant local authority's strategic flood risk assessment (SFRA) as part of your work to prepare a site specific flood risk assessment.

This should give you information about:

- the potential impacts of climate change in this catchment
- areas defined as functional floodplain
- flooding from other sources, such as surface water, ground water and reservoirs

Your Lead Local Flood Authority is West Sussex County.

About this data

This data has been generated by strategic scale flood models and is not intended for use at the individual property scale. If you're intending to use this data as part of a flood risk assessment, please include an appropriate modelling tolerance as part of your assessment. The Environment Agency regularly updates its modelling. We recommend that you check the data provided is the most recent, before submitting your flood risk assessment.

Flood risk activity permits

Under the Environmental Permitting (England and Wales) Regulations 2016 some developments may require an environmental permit for flood risk activities from the Environment Agency. This includes any permanent or temporary works that are in, over, under, or nearby a designated main river or flood defence structure.

[Find out more about flood risk activity permits](#)

Help and advice

Contact the Solent and South Downs Environment Agency team at ssdenquiries@environment-agency.gov.uk for:

- [more information about getting a product 5, 6, 7 or 8](#)
- general help and advice about the site you're requesting data for

Appendix I Causeway Flow Hydraulic Calculations

	Bright Plan Civils	File: D2295 SW Drainage Rev. A.pfd	Page 1
	Unit 2 West Barn	Network: SW Drainage	D2295 60 Sea Way
	Norton Lane	Stuart Burnett	Middleton-on-Sea
	Chichester PO20 3AF	15/08/2024	Rev. A

Design Settings			
Rainfall Methodology	FEH-22	Minimum Velocity (m/s)	1.00
Return Period (years)	2	Connection Type	Level Soffits
Additional Flow (%)	0	Minimum Backdrop Height (m)	0.500
CV	1.000	Preferred Cover Depth (m)	1.200
Time of Entry (mins)	5.00	Include Intermediate Ground	✓
Maximum Time of Concentration (mins)	30.00	Enforce best practice design rules	✓
Maximum Rainfall (mm/hr)	50.0		

Circular Link Type			
Shape	Circular	Auto Increment (mm)	75
Barrels	1	Follow Ground	x

Available Diameters (mm)			
100	150		

Nodes							
Name	Area (ha)	T of E (mins)	Cover Level (m)	Diameter (mm)	Easting (m)	Northing (m)	Depth (m)
6		5.00	4.700	450	496823.773	99801.458	0.750
5	0.006	5.00	4.650	450	496803.296	99802.419	0.850
7	0.006	5.00	4.750	450	496814.105	99819.930	0.750
4	0.012	5.00	4.700	450	496804.139	99820.399	1.050
3			4.625	450	496793.139	99820.915	1.075
10	0.023	5.00	4.700		496819.731	99800.647	0.580
9			4.625	450	496802.250	99801.467	0.625
8			4.700	450	496803.192	99821.540	0.850
2			4.650	450	496792.191	99822.056	1.150
1			4.725	1500	496773.896	99824.209	2.725
Ex. MH			4.530	1200	496765.864	99819.527	2.920

Links												
Name	US Node	DS Node	Length (m)	ks (mm) / n	US IL (m)	DS IL (m)	Fall (m)	Slope (1:X)	Dia (mm)	Link Type	T of C (mins)	Rain (mm/hr)
1.000	6	5	20.500	0.600	3.950	3.800	0.150	136.7	150	Circular	5.40	50.0
1.001	5	4	18.000	0.600	3.800	3.650	0.150	120.0	150	Circular	5.73	50.0
2.000	7	4	9.977	0.600	4.000	3.650	0.350	28.5	150	Circular	5.09	50.0
1.002	4	3	11.012	0.600	3.650	3.550	0.100	110.1	150	Circular	5.92	50.0
1.003	3	2	1.483	0.600	3.550	3.500	0.050	29.7	150	Circular	5.93	50.0
3.000	10	9	17.500	0.600	4.120	4.000	0.120	145.8	150	Circular	5.35	50.0
3.001	9	8	20.095	0.600	4.000	3.850	0.150	134.0	150	Circular	5.74	50.0

Name	Vel (m/s)	Cap (l/s)	Flow (l/s)	US Depth (m)	DS Depth (m)	Σ Area (ha)	Σ Add Inflow (l/s)
1.000	0.858	15.2	0.0	0.600	0.700	0.000	0.0
1.001	0.916	16.2	1.1	0.700	0.900	0.006	0.0
2.000	1.893	33.4	1.1	0.600	0.900	0.006	0.0
1.002	0.957	16.9	4.3	0.900	0.925	0.024	0.0
1.003	1.855	32.8	4.3	0.925	1.000	0.024	0.0
3.000	0.830	14.7	4.2	0.430	0.475	0.023	0.0
3.001	0.866	15.3	4.2	0.475	0.700	0.023	0.0

Flow+ v10.7 Copyright © 1988-2024 Causeway Technologies Ltd



Links

Name	US Node	DS Node	Length (m)	ks (mm) / n	US IL (m)	DS IL (m)	Fall (m)	Slope (1:X)	Dia (mm)	Link Type	T of C (mins)	Rain (mm/hr)
3.002	8	2	11.013	0.600	3.850	3.500	0.350	31.5	150	Circular	5.84	50.0
1.004	2	1	18.421	0.600	3.500	2.000	1.500	12.3	150	Circular	6.04	50.0
1.005	1	Ex. MH	9.297	0.600	2.000	1.610	0.390	23.8	150	Circular	6.11	50.0

Name	Vel (m/s)	Cap (l/s)	Flow (l/s)	US Depth (m)	DS Depth (m)	Σ Area (ha)	Σ Add Inflow (l/s)
3.002	1.801	31.8	4.2	0.700	1.000	0.023	0.0
1.004	2.890	51.1	8.5	1.000	2.575	0.047	0.0
1.005	2.071	36.6	8.5	2.575	2.770	0.047	0.0

Pipeline Schedule

Link	Length (m)	Slope (1:X)	Dia (mm)	Link Type	US CL (m)	US IL (m)	US Depth (m)	DS CL (m)	DS IL (m)	DS Depth (m)
1.000	20.500	136.7	150	Circular	4.700	3.950	0.600	4.650	3.800	0.700
1.001	18.000	120.0	150	Circular	4.650	3.800	0.700	4.700	3.650	0.900
2.000	9.977	28.5	150	Circular	4.750	4.000	0.600	4.700	3.650	0.900
1.002	11.012	110.1	150	Circular	4.700	3.650	0.900	4.625	3.550	0.925
1.003	1.483	29.7	150	Circular	4.625	3.550	0.925	4.650	3.500	1.000
3.000	17.500	145.8	150	Circular	4.700	4.120	0.430	4.625	4.000	0.475
3.001	20.095	134.0	150	Circular	4.625	4.000	0.475	4.700	3.850	0.700
3.002	11.013	31.5	150	Circular	4.700	3.850	0.700	4.650	3.500	1.000
1.004	18.421	12.3	150	Circular	4.650	3.500	1.000	4.725	2.000	2.575
1.005	9.297	23.8	150	Circular	4.725	2.000	2.575	4.530	1.610	2.770

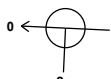
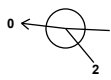
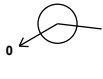
Link	US Node	Dia (mm)	Node Type	MH Type	DS Node	Dia (mm)	Node Type	MH Type
1.000	6	450	Manhole	Adoptable	5	450	Manhole	Adoptable
1.001	5	450	Manhole	Adoptable	4	450	Manhole	Adoptable
2.000	7	450	Manhole	Adoptable	4	450	Manhole	Adoptable
1.002	4	450	Manhole	Adoptable	3	450	Manhole	Adoptable
1.003	3	450	Manhole	Adoptable	2	450	Manhole	Adoptable
3.000	10		Junction		9	450	Manhole	Adoptable
3.001	9	450	Manhole	Adoptable	8	450	Manhole	Adoptable
3.002	8	450	Manhole	Adoptable	2	450	Manhole	Adoptable
1.004	2	450	Manhole	Adoptable	1	1500	Manhole	Adoptable
1.005	1	1500	Manhole	Adoptable	Ex. MH	1200	Manhole	Adoptable

Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)	
6	496823.773	99801.458	4.700	0.750	450					
						0	1.000	3.950	150	
5	496803.296	99802.419	4.650	0.850	450		1	1.000	3.800	150
						0	1.001	3.800	150	



Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)	
7	496814.105	99819.930	4.750	0.750	450		0	2.000	4.000	150
4	496804.139	99820.399	4.700	1.050	450		1	2.000	3.650	150
						2	1.001	3.650	150	
						0	1.002	3.650	150	
3	496793.139	99820.915	4.625	1.075	450		1	1.002	3.550	150
						0	1.003	3.550	150	
10	496819.731	99800.647	4.700	0.580			0	3.000	4.120	150
9	496802.250	99801.467	4.625	0.625	450		1	3.000	4.000	150
						0	3.001	4.000	150	
8	496803.192	99821.540	4.700	0.850	450		1	3.001	3.850	150
						0	3.002	3.850	150	
2	496792.191	99822.056	4.650	1.150	450		1	3.002	3.500	150
						2	1.003	3.500	150	
						0	1.004	3.500	150	
1	496773.896	99824.209	4.725	2.725	1500		1	1.004	2.000	150
						0	1.005	2.000	150	
Ex. MH	496765.864	99819.527	4.530	2.920	1200		1	1.005	1.610	150

Simulation Settings

Rainfall Methodology	FEH-22	Analysis Speed	Normal	Additional Storage (m³/ha)	0.0
Summer CV	1.000	Skip Steady State	x	Check Discharge Rate(s)	x
Winter CV	1.000	Drain Down Time (mins)	1440	Check Discharge Volume	x

Storm Durations

15	60	180	360	600	960	2160	4320	7200	10080
30	120	240	480	720	1440	2880	5760	8640	

Return Period (years)	Climate Change (CC %)	Additional Area (A %)	Additional Flow (Q %)
2	0	0	0
10	0	0	0
30	0	0	0
30	40	10	0
100	0	0	0
100	45	10	0

Node 10 Carpark Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Invert Level (m)	4.120	Slope (1:X)	90.0
Side Inf Coefficient (m/hr)	0.00000	Time to half empty (mins)	0	Depth (m)	0.450
Safety Factor	1.0	Width (m)	15.000	Inf Depth (m)	
Porosity	0.32	Length (m)	15.398		



Results for 2 year Critical Storm Duration. Lowest mass balance: 100.00%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	6	1	3.950	0.000	0.0	0.0000	0.0000	OK
15 minute summer	5	11	3.826	0.026	1.1	0.0042	0.0000	OK
15 minute summer	7	11	4.019	0.019	1.1	0.0030	0.0000	OK
15 minute summer	4	11	3.704	0.054	4.4	0.0086	0.0000	OK
15 minute summer	3	11	3.594	0.044	4.3	0.0070	0.0000	OK
15 minute summer	10	12	4.170	0.050	4.3	0.5361	0.0000	OK
15 minute summer	9	12	4.051	0.051	3.4	0.0081	0.0000	OK
15 minute summer	8	13	3.883	0.033	3.4	0.0053	0.0000	OK
15 minute summer	2	12	3.539	0.039	7.4	0.0061	0.0000	OK
15 minute summer	1	12	2.048	0.048	7.4	0.0852	0.0000	OK
15 minute summer	Ex. MH	12	1.656	0.046	7.4	0.0000	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute summer	6	1.000	5	0.0	0.000	0.000	0.0213	
15 minute summer	5	1.001	4	1.1	0.287	0.068	0.0706	
15 minute summer	7	2.000	4	1.1	0.345	0.033	0.0350	
15 minute summer	4	1.002	3	4.3	0.860	0.256	0.0554	
15 minute summer	3	1.003	2	4.3	1.135	0.132	0.0058	
15 minute summer	10	3.000	9	3.4	0.661	0.233	0.0904	
15 minute summer	9	3.001	8	3.4	0.838	0.219	0.0814	
15 minute summer	8	3.002	2	3.4	1.099	0.106	0.0352	
15 minute summer	2	1.004	1	7.4	1.752	0.145	0.0780	
15 minute summer	1	1.005	Ex. MH	7.4	1.569	0.202	0.0438	3.8



Results for 10 year Critical Storm Duration. Lowest mass balance: 100.00%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	6	1	3.950	0.000	0.0	0.0000	0.0000	OK
15 minute summer	5	11	3.837	0.037	2.2	0.0058	0.0000	OK
15 minute summer	7	10	4.026	0.026	2.2	0.0041	0.0000	OK
15 minute summer	4	10	3.730	0.080	8.6	0.0127	0.0000	OK
15 minute summer	3	11	3.616	0.066	8.5	0.0105	0.0000	OK
15 minute summer	10	12	4.190	0.070	8.3	1.0761	0.0000	OK
15 minute summer	9	12	4.072	0.072	6.4	0.0114	0.0000	OK
15 minute summer	8	13	3.896	0.046	6.3	0.0074	0.0000	OK
15 minute summer	2	12	3.554	0.054	14.1	0.0085	0.0000	OK
15 minute summer	1	12	2.070	0.070	14.0	0.1233	0.0000	OK
15 minute summer	Ex. MH	12	1.675	0.065	14.1	0.0000	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute summer	6	1.000	5	0.0	0.000	0.000	0.0342	
15 minute summer	5	1.001	4	2.1	0.339	0.132	0.1154	
15 minute summer	7	2.000	4	2.2	0.400	0.065	0.0575	
15 minute summer	4	1.002	3	8.5	1.001	0.501	0.0932	
15 minute summer	3	1.003	2	8.5	1.325	0.259	0.0097	
15 minute summer	10	3.000	9	6.4	0.781	0.437	0.1435	
15 minute summer	9	3.001	8	6.3	0.993	0.412	0.1291	
15 minute summer	8	3.002	2	6.3	1.312	0.199	0.0560	
15 minute summer	2	1.004	1	14.0	2.064	0.275	0.1262	
15 minute summer	1	1.005	Ex. MH	14.1	1.847	0.386	0.0711	7.4



Results for 30 year Critical Storm Duration. Lowest mass balance: 100.00%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	6	1	3.950	0.000	0.0	0.0000	0.0000	OK
15 minute summer	5	11	3.842	0.042	2.8	0.0066	0.0000	OK
15 minute summer	7	10	4.029	0.029	2.8	0.0047	0.0000	OK
15 minute summer	4	10	3.744	0.094	11.2	0.0150	0.0000	OK
15 minute summer	3	11	3.628	0.078	11.0	0.0124	0.0000	OK
15 minute summer	10	12	4.202	0.082	10.9	1.4441	0.0000	OK
15 minute summer	9	12	4.082	0.082	8.2	0.0131	0.0000	OK
15 minute summer	8	13	3.903	0.053	8.1	0.0084	0.0000	OK
15 minute summer	2	11	3.562	0.062	18.2	0.0098	0.0000	OK
15 minute summer	1	12	2.082	0.082	18.1	0.1445	0.0000	OK
15 minute summer	Ex. MH	12	1.685	0.075	18.2	0.0000	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute summer	6	1.000	5	0.0	0.000	0.000	0.0408	
15 minute summer	5	1.001	4	2.7	0.354	0.169	0.1405	
15 minute summer	7	2.000	4	2.8	0.418	0.083	0.0701	
15 minute summer	4	1.002	3	11.0	1.059	0.650	0.1145	
15 minute summer	3	1.003	2	11.0	1.407	0.337	0.0119	
15 minute summer	10	3.000	9	8.2	0.829	0.557	0.1723	
15 minute summer	9	3.001	8	8.1	1.054	0.528	0.1552	
15 minute summer	8	3.002	2	8.1	1.409	0.254	0.0673	
15 minute summer	2	1.004	1	18.1	2.187	0.354	0.1531	
15 minute summer	1	1.005	Ex. MH	18.2	1.957	0.497	0.0864	9.6



Results for 30 year +40% CC +10% A Critical Storm Duration. Lowest mass balance: 100.00%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	6	1	3.950	0.000	0.0	0.0000	0.0000	OK
15 minute summer	5	10	3.853	0.053	4.4	0.0084	0.0000	OK
15 minute summer	7	10	4.037	0.037	4.4	0.0058	0.0000	OK
15 minute summer	4	11	3.783	0.133	17.4	0.0212	0.0000	OK
15 minute summer	3	11	3.654	0.104	17.0	0.0165	0.0000	OK
15 minute summer	10	12	4.225	0.105	16.7	2.3688	0.0000	OK
15 minute summer	9	13	4.104	0.104	11.7	0.0166	0.0000	OK
15 minute summer	8	13	3.916	0.066	11.7	0.0104	0.0000	OK
15 minute summer	2	11	3.578	0.078	27.4	0.0124	0.0000	OK
15 minute summer	1	12	2.110	0.110	27.3	0.1942	0.0000	OK
15 minute summer	Ex. MH	12	1.707	0.097	27.4	0.0000	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute summer	6	1.000	5	0.0	0.000	0.000	0.0565	
15 minute summer	5	1.001	4	4.3	0.377	0.266	0.1979	
15 minute summer	7	2.000	4	4.4	0.452	0.131	0.0987	
15 minute summer	4	1.002	3	17.0	1.143	1.008	0.1626	
15 minute summer	3	1.003	2	17.1	1.554	0.521	0.0165	
15 minute summer	10	3.000	9	11.7	0.901	0.801	0.2283	
15 minute summer	9	3.001	8	11.7	1.144	0.767	0.2056	
15 minute summer	8	3.002	2	11.7	1.570	0.368	0.0900	
15 minute summer	2	1.004	1	27.3	2.364	0.535	0.2122	
15 minute summer	1	1.005	Ex. MH	27.4	2.116	0.748	0.1201	14.7



Results for 100 year Critical Storm Duration. Lowest mass balance: 100.00%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	6	1	3.950	0.000	0.0	0.0000	0.0000	OK
15 minute summer	5	10	3.847	0.047	3.5	0.0074	0.0000	OK
15 minute summer	7	10	4.033	0.033	3.5	0.0052	0.0000	OK
15 minute summer	4	10	3.760	0.110	14.0	0.0175	0.0000	OK
15 minute summer	3	11	3.640	0.090	13.8	0.0143	0.0000	OK
15 minute summer	10	12	4.213	0.093	13.6	1.8574	0.0000	OK
15 minute summer	9	13	4.093	0.093	9.9	0.0147	0.0000	OK
15 minute summer	8	13	3.909	0.059	9.9	0.0094	0.0000	OK
15 minute summer	2	11	3.570	0.070	22.5	0.0111	0.0000	OK
15 minute summer	1	12	2.095	0.095	22.4	0.1673	0.0000	OK
15 minute summer	Ex. MH	12	1.695	0.085	22.6	0.0000	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute summer	6	1.000	5	0.0	0.000	0.000	0.0480	
15 minute summer	5	1.001	4	3.4	0.368	0.212	0.1672	
15 minute summer	7	2.000	4	3.5	0.436	0.104	0.0834	
15 minute summer	4	1.002	3	13.8	1.107	0.816	0.1371	
15 minute summer	3	1.003	2	13.8	1.483	0.422	0.0141	
15 minute summer	10	3.000	9	9.9	0.868	0.676	0.1998	
15 minute summer	9	3.001	8	9.9	1.103	0.644	0.1800	
15 minute summer	8	3.002	2	9.8	1.488	0.309	0.0785	
15 minute summer	2	1.004	1	22.4	2.286	0.439	0.1814	
15 minute summer	1	1.005	Ex. MH	22.6	2.046	0.616	0.1024	12.0



Results for 100 year +45% CC +10% A Critical Storm Duration. Lowest mass balance: 100.00%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	6	1	3.950	0.000	0.0	0.0000	0.0000	OK
15 minute summer	5	11	3.885	0.085	5.7	0.0135	0.0000	OK
15 minute summer	7	10	4.042	0.042	5.7	0.0066	0.0000	OK
15 minute summer	4	11	3.872	0.222	21.3	0.0353	0.0000	SURCHARGED
15 minute summer	3	11	3.672	0.122	21.2	0.0193	0.0000	OK
15 minute summer	10	12	4.243	0.123	21.7	3.2586	0.0000	OK
15 minute summer	9	13	4.120	0.120	14.1	0.0191	0.0000	OK
15 minute summer	8	14	3.923	0.073	14.1	0.0116	0.0000	OK
15 minute summer	2	12	3.590	0.090	34.2	0.0143	0.0000	OK
15 minute summer	1	13	2.159	0.159	34.3	0.2812	0.0000	SURCHARGED
15 minute summer	Ex. MH	12	1.724	0.114	33.8	0.0000	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute summer	6	1.000	5	0.0	0.000	0.000	0.1049	
15 minute summer	5	1.001	4	6.0	0.398	0.371	0.2506	
15 minute summer	7	2.000	4	5.7	0.467	0.169	0.1078	
15 minute summer	4	1.002	3	21.2	1.221	1.251	0.1811	
15 minute summer	3	1.003	2	21.1	1.621	0.643	0.0194	
15 minute summer	10	3.000	9	14.1	0.928	0.961	0.2668	
15 minute summer	9	3.001	8	14.1	1.182	0.924	0.2371	
15 minute summer	8	3.002	2	14.1	1.666	0.443	0.1059	
15 minute summer	2	1.004	1	34.3	2.422	0.671	0.2622	
15 minute summer	1	1.005	Ex. MH	33.8	2.137	0.924	0.1477	19.1