Remediation Method Statement (Enabling Works Phase)

Former Brockhampton West Landfill, North of Harts Farm Way, Havant

Presented to: Clowes Developments (UK) Ltd

Issued: October 2022

Delta-Simons Project No: 19-2099.10 / 87080.544067.

Protecting people and planet

Report Details

Client	Clowes Developments (UK) Ltd
Report Title	Remediation Method Statement (Enabling Works Phase)
Site Address	Former Brockhampton West Landfill, North of Harts Farm Way, Havant, PO9 1HS
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Quality Assurance

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Executive Summary

Brief	Delta-Simons Environmental Consultants Limited ("Delta-Simons") was instructed by Exton Estates on behalf of Clowes Developments (UK) Ltd (the "Client") to undertake the preparation of a Remediation Method Statement (Enabling Works Phase) for the former Brockhampton West Landfill, North of Harts Farm Way, Havant, PO9 1HS (the "Site"). The Site has been granted outline planning permission (Ref. APP/21/00189) for re-development into commercial purposes (logistics warehousing).
Context & Purpose	This Report is intended to cover the Enabling Works Phase only which will comprise: Site Strip (topsoils/subsoils) and stockpiling for future reuse; Excavation in areas of required cut of the re-engineered cover syster materials and segregation into cohesive and granular material types; Excavation of landfilled wastes in the east of the Site; and Associated earthworks under a Material Management Plan (MMP) together with the creation of the two access points and the roadway linking the two in the South of the Site.
Site Setting	The Site is currently an undeveloped parcel of grassland that was previously part of a wider landfill Site with limited areas of hardstanding in the centre, previously used as a vehicle turning circle.
Ground Conditions	The typical ground conditions comprise topsoil overlying a variable thickness of re-engineered cover system, underlain by landfill waste, River Terrace Deposits and the Lewes Nodular Chalk Formation. Monitoring data suggests that the groundwater is tidally influenced and there are likely two groundwater bodies present beneath the Site, within the landfill waste and the Chalk. The data indicates groundwater flows generally south t Langstone Harbour and in the east of the Site in an easterly direction towards the Hermitage Stream.
Land Contamination Assessment	The following is a summary of land contamtion assessment from the previous Geoenvironmental Assessment Report and are not all relevent to the Enabling Works Phase: <u>Human Health</u> Asbestos was detected locally within the re-engineered cover system and landfill waste. The main exposure pathway is inhalation and therefore, the potential health risks to future site users from impacted soils can be mitigated via the presence of buildings and hardstanding, which will satisfactorily address direct c exposure pathways. Where areas of soft landscaping are pro contaminant linkage can be broken by the installation of a clean cover system (existing soils/imported soils subject to appropriate further testing). <u>Controlled Waters</u> Slightly elevated ammonium concentrations have been detected at low tide in the Hermitage Stream on both monitoring occasions, but at concentrations below the relevant Environmental Quality Standard. There is no evidence that the Site is having an unacceptable impact to the quality of the Hermitage Stream as it flo

	to the adjacent east of the Site based upon the monitoring/modelling obtained to date. Risks of contaminants migrating to the south through the further landfill materials to the Harbour and causing significant harm have b discounted. The proposed development is considered to result in overall betterment in terms of the risks posed to surface and groundwater receptors (and thus Langstone Harbour) due to the reduced infiltration rates (and consequentially lower leachate generation rates) from building footprints and increased hardstanding provision compared to the present situation. The degree of this betterment (via reduction in contaminant load on the stream) has also been modelled and demonstrated in the *Geo-Environmental Assessment* by Delta-Simons dated January 2022 (Ref: 19-2099.04). <u>Built Environment</u> Design Sulphate Class DS-3 and ACEC Class AC-3 for soils and groundwater, is considered the most appropriate type of concrete to be used at the Site in order to resist chemical attack from elevated sulphate present in the soils (assuming mobile groundwater in potentially pyritic soils). However, the groundwater data suggests that the concentrations of ammonium (predominantly the perched groundwater/leachate within the landfill waste and River Terrace Deposits) present 'highly aggressive' conditions with reg buried concrete and the guidance suggests that specialist advice sh sought in this instance. <u>Ground Gas</u> Monitoring of hazardous ground gases indicates elevated concentrations of both methane and carbon dioxide to be present on a Site-wide basis whilst gas flow rates are considered to be low. Based on the data obtained to date, there is considered to be a plausible risk from hazardous ground gases on the Si therefore, protection measures will be required as part of the development to adequately mitigate such risks to future Site users. It is considered prudent to adopt gas protection measures in line with Characterisation Situation (CS3) as a precautionary approach. This will be addressed at part Remediation Methos Statement for the Construction Phase. The management of impacts that are determinet to the amenity e,g, odours and noise are covered in the Construction Environmental Management Plan.
Remedial Options Appraisal	Various practicable techniques for providing betterment / risk reduction to the stream have been assessed in relation to time, cost, degree of bett environmental impact, sustainability and regulatory approval likelihood. The only viable remedial technique is considered to be via reducing rainwater infiltration into the waste mass. The reduced infiltration that will be achieved via the proposed development (provision of hard standing, buildings and formal surface water drainage network) is considered to represent the preferred remedial option

Remediation Works Overview (Enabling Works Phase)	The following should be undertaken on Site as part of the Enabling Phase Remediation Works: CCTV surveys of outfalls, particularly in the east of the Site and appropriate mitigation if considered a risk to the Hermitage Stream and where asset owned by the developer/landowner; Decommissioning of any previous boreholes installed into natural strata, in accordance current good practice. This should be documented and verified; As part of the cut and fill programme, material intended for reuse will need to be segregated, tested (if necessary) and stored appropriately in line with the requirements detailed in the Materials Management Plan; A watching brief should be employed during the earthworks, specifically in areas of Site level reduction. All observations during the watchir should be recorded in order to provide evidence to confirm no unanticipated / gross contamination is present within the cut material, beyond what i expected. Any identified granular areas during the cut should be covered in cohesive materials to reduce infiltration of rainwater into the landfill material; Excavation of up approximately 12,100m^3 of landfill waste for off-Site management in the east of the Site. This will be covered in cohesive materials when excavation has been completed to reduce risk of increased infiltration of rainwater in this area; Implementation of the to be produced/approved CEMP for the Construction Phase Works; A Verification Report (Enabling Works Phase) to be produ completion of the remedial works to confirm that the work was undertaken in accordance with the Remediation Strategy and this Report, legislation and planning conditions.
This is intended as a summary only. Further detail and the limitations of the assessment are provided within the main body of the Report.	

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1.0 Introduction

1.1 Appointment

Delta-Simons Limited ("Delta-Simons") was instructed by Exton Estates on behalf of Clowes Developments (UK) Ltd (the "Client") to undertake the preparation of a Remediation Method Statement (Enabling Works Phase) for the former Brockhampton West Landfill, North of Harts Farm Way, Havant, PO9 1HS (the "Site").

1.2 Previous Reports

For information on Site setting, and full details of intrusive investigations undertaken at the Site and the remediation options appraisal and verification strategy, this Report should be read in conjunction with Delta-Simons' previous reports as follows:

Preliminary Geo-Environmental Risk Assessment by Delta-Simons dated February 2021 (Ref: 19-2099.01);

Factual Site Investigation Report by Delta-Simons dated June 2021 (Ref: 19-2099.04);

Geo-Environmental Assessment by Delta-Simons dated January 2022 (Ref: 19-2099.04); and

Remediation Options Appraisal & Verification Strategy Report by Delta-Simons dated January 2022 (Ref. 19-2099.10).

1.3 Context & Purpose

The Site has been granted outline planning permission (Reference APP/21/00189) for the development of commercial warehousing (logistics).

The purpose of this document is to:

Present a summary of specific/detailed remediation methods for implementation of the *Remediation Options Appraisal & Verification Strategy* relating specifically to the Enabling Works Phase only;

Support the discharge of pre-commencement planning Condition 17 relating to the provision of a Remediation Method Statement prior to the commencement of any specific phase of development i.e. the Enabling Phase covered by this Report.

For the purposes of this Report the Enabling Works Phase comprises the following activities:

Site Strip (topsoils/subsoils) and stockpiling for future reuse;

Excavation in areas of required cut of the re-engineered cover system materials and segregation into cohesive and granular material types;

Excavation of landfill waste in the east of the Site for off-Site management; and

Associated earthworks together with the creation of the two access points and the roadway linking the two in the South of the Site.

1.4 Scope of Works

The scope of works undertaken for this method statement was to consider and set out in this document the additional requirements/detail not covered within the Remedial Strategy document relating to the Enabling Works Phase of the development only.

This report is not intended to supersede the *Remediation Options Appraisal & Verification Strategy Report* and has been produced to provide further detail on the following:

Landfill Waste Excavation Plan;

Environmental Watching Briefs;

Relict drainage surveys & proposed mitigation;

Wastewater management; and

Decommissioning of boreholes.

Both the *Remediation Options Appraisal & Verification Strategy Report* and this Report should be considered alongside each other in conjunction with the following:

Materials Management Plan (MMP) implemented under the CL:AIRE '*Definition of Waste: Development Industry Code of Practice*' initiative;

Construction Environmental Management Plan (CEMP); and

Foundation Works Risk Assessment.

1.5 Limitations

This document sets out the measures that will be carried out during the Enabling Works Phase to mitigate potentially significant risks as identified by the Site investigations in the context of the proposed end-use of the Site, it does not provide a verification or completion statement for the works. The standard limitations associated with this assessment are presented in Appendix A.

The Construction Phase Works are to be covered by a further Remediation Method Statement (Construction Phase) Report. For the purposes of completeness this will include:

Provision of ground gas protection measures in accordance with BS 8585:2015 CS3 with verification by a specialist contractor;

Provision of a clean cover system in soft landscaped areas of the Site where Made Ground (specifically landfill waste and re-engineered cover system materials) are present at the surface;

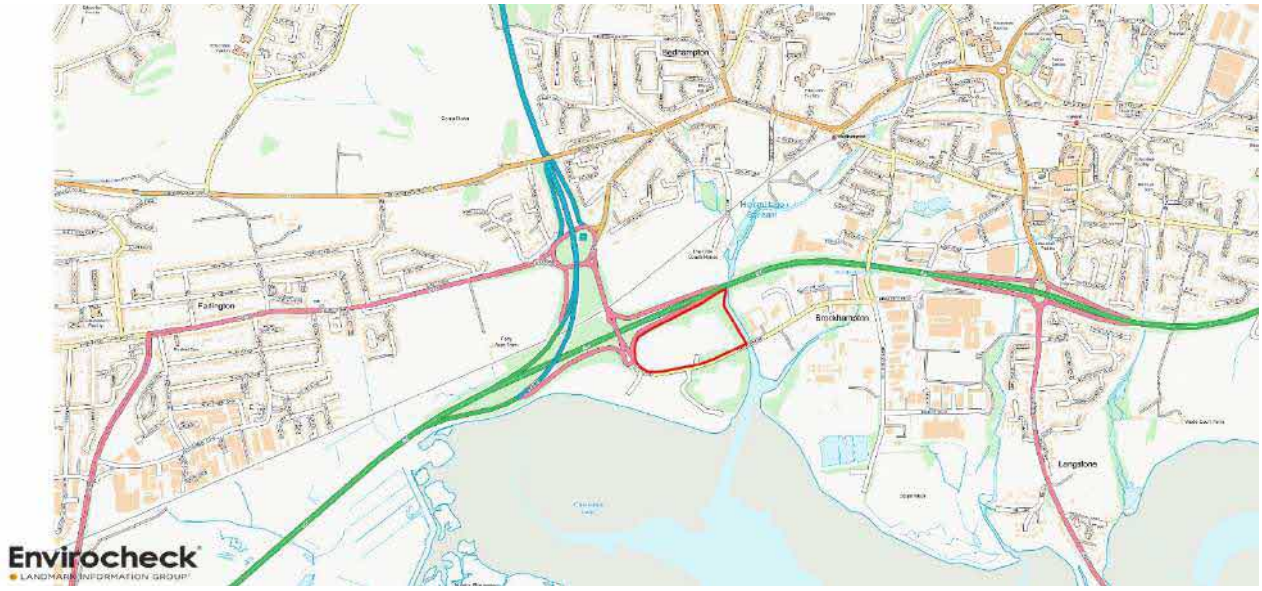
Verification of the clean cover system by an environmental consultant to confirm depth and chemical / physical suitability of the clean cover system; and

Installation of clean service corridors and upgraded water supply pipes;

A Verification Report (Construction Phase) is to be produced upon completion of the remedial works to confirm that the work (i.e. approved Remediation Strategy) was undertaken in accordance with the Remediation Strategy/Remediation Method Statement (Construction Phase), relevant legislation and planning conditions.

2.0 Site Context

2.1 Site Information

Site Overview			
 **Contains Data from, © 2022 Landmark Information Group Ltd**			
Co-ordinates	Centred approximately at National Grid Reference 470150, 105700.	**Elevation** (approx..)	~3.0 –14.0 m AOD
		Area	8.3 Ha
Site Address and Location	The Site is located to the south of the Havant Bypass (A27) towards the western outskirts of Havant, approximately 7.0 km north-east of Portsmouth. Google Maps Link		
Site Description	The Site is currently an undeveloped parcel of grassland that previously was part of a wider landfill Site with limited areas of hardstanding in the centre. The Site comprises a small access road branching from Harts Farm Way in the southern central area of the Site. The Site is occupied by trees and shrubs along the perimeter.		
Site History	Historically, the Site comprised tidal / estuarine mud flats until circa 1969, when the area was subjected to land reclamation via waste Authorised waste included concrete waste, construction and der wastes, household waste and incinerator residues. Landfilling ceased at the Site by circa 1987 and the Site was briefly used as playing fields (following a programme of landfill restoration), after which no further developments have taken place.		
Proposed Development Description	The proposed development for the Site is for new employment provide up to 29,000 sq m (gross internal area) for flexible use across use classes E (light industrial), B2 and B8 with ancillary offices, car parking, service yards, drainage works, landscaping and associated works to prepare the Site for development.		

	A proposed development plan is attached at the rear of the report as Drawing 1. The redevelopment of the Site will require earthworks to be und comprising a cut and fill operation. The earthworks will therefore need to be undertaken under a Materials Management Plan (MMP) in accordance with the CL:AIRE Code of Practice to facilitate the reuse of these materials.

2.2 Planning

Outline Planning Permission has been granted for the redevelopment of the Site for logistics warehousing (Havant Council). The Planning Decision Notice imposes a number of conditions on the proposed development. Conditions 11, 13, 17, 18 & 22 of the Permission relate to contamination/environmental risk and remediation, and are listed below:

Relevant Planning Conditions	Condition 11 - Piling/Foundations Risk Assessment Prior to development commencing, no piling or deep foundation columns shall be constructed on the site until a Method Statement which demonstrate groundwater will be protected, and how the efficacy of the protection measures will be verified, has been submitted to and approved in writing by the Local Planning Authority. Unless specifically excluded by agreement, the Statement shall include; a) details of piling methods, to ensure that the risks of co mobilisation are minimised and that the wider remedial o outlined within the Delta Simons Remediation Options Appraisal 19-2099.07 will not be prejudiced; b) details specification &/or design of materials, to ensure that the piles or deep foundation columns are not put at unacceptable risk by aggressive ground conditions; and, c) details of a water monitoring program, to be undertaken both during and after piling to demonstrate the efficacy of the methods in mini mobilisation of contaminants. **Condition 13 –Construction Environmental Management Plan (CEMP)** No development shall commence on site until a Construction Environmental Management Plan (CEMP) has been submitted to and approved in writing by the Local Planning Authority (in consultation with National Highways and the Highway Authority). The CEMP shall include but not be limited to: a) Details of transport logistics (including proposed routes on a plan accordance with section 6.1.2 of the Delta Simons Air Quality Assessment Report Reference 19-2099.03; b) Construction Traffic Management (to include the co-ordination c deliveries and plant and materials and the disposing of waste resulting from demolition and/or construction so as to avoid undue interference with the operation of the public highway, particularly during the Monday-Friday AM Peak (0800-0900) and PM Peak (1630-1800) periods); c) An estimate of the daily movement of the construction traffic, profiled for each construction phase, identifying the peak level of vehicle movements for each day; d) The hours of construction work and deliveries; e) Procedures for managing deliveries & collections at the site, including parking, (which shall include the long term facilities for contractor parking), loading materials handover and transport to secure storage areas, and the means of minimising the risk of release of fuel and other materials capable of causing harm to health or the environment;

f) The storage and dispensing of fuels, chemicals, oils and any hazard materials (including hazardous soils);
g) The proposed maintenance and aftercare of the site;
h) Measures to avoid impacts on the non-statutory designated sites an retained habitats;
i) Details of drainage arrangements during the construction phase identifying how surface water run-off will be dealt with so as not to increase the risk of flooding to downstream areas as a result of the construction programme;
j) Contact details of personnel responsible for the construction works;
k) Provisions for the segregation & storage of wastes destined for treatment, recycling or disposal, alongside details on how leachate generation from stockpiles will be minimised &/or appropriately managed so as to prevent cross contamination of materials or release of leachate to cor waters;
l) Measures to ensure safe pedestrian movement on the public highway & footpaths;
m) No bonfires to take place on the site, during any phase of the operation;
n) Control measures for dust and other air-borne pollutants, such as smoke and fume emission from the site during construction works. It s advise as to what measures are to be put in place for the control of any dust and other air-borne pollutants that might emanate from the development site. Furthermore, the methods of dust controls should a accordance with the guidance as laid down out in the BRE Report 456 – Control of Dust from Construction and Demolition activities. It should also be noted that besides the keeping of haul roads damp during dry weather conditions, any areas where tracked excavators, dozers and the like are working, are also kept damp at all times;
o) The means of preventing track out of mud & spoil on to the highway and preventing runoff from or excessive infiltration to the site from adversely impacting adjacent surface waters, including wheel washing facilities as appropriate;
p) Details of measures to be employed to control the emission of noise and vibration during the above phases to be provided. BS5228:2009=A1:2014 Code of practice for noise and vibration control on construction and open sites –part 1: Noise, and part 2: Vibration (BS1<2014v) provide guidance on the requirements and indicative noise and vibration levels and criteria;
q) Soft start vibro-piling shall only be used and all piling activities shall cease should the temperature fall below zero for a period of 3 consecutive days during January to February;
r) Details of the training of site operatives to follow the Construction Environmental Management Plan requirements;
s) The Asbestos Management Plan & Surface Water Quality Moni Programme, and other specific environmental controls mentio section 5.5 of Delta Simons Report 19-2099.07;
t) Measures for controlling the use of site lighting whether required for safe working or for security purposes to ensure no impact on neighbouring properties or the strategic highway;
u) Location of temporary site building and compounds.

	A programme of and phasing of demolition (if any) and construction wor Demolition and construction work shall only take place in accordance with the approved method statement. **Condition 17 –Remediation Method Statement** Prior to the commencement of any specific phase of development approved by this planning permission (other than site clearance, forming the means of the approved access, erection of site hoarding, provision of site welfare units or any other date or stage in development as may be agreed in writing with the Local Planning Authority), a remediation method statement shall be submitted to and approved in writing by the Local Planning Authority. The Method Statement shall be based upon the Remediation Options Appraisal & Verification Strategy 19-2099.07 and shall provide details of proposed remedial & risk mitigation actions that could not be designed in detail at the outline stage. **Condition 18 - Contamination Watching Brief** The contamination 'watching brief' referred to at section 4.1 of the Delta Simons Report No. 19-2099.07 v2.3 shall be observed during all groundwork operations. If suspected contamination is encountered which is qualitatively out of keeping with ground conditions described within the Factual Geo-Environmental Investigation Report (19-2099.04); works in affected areas of the site shall cease until the Local Planning Authority has been notified of the discovery, and a scheme to deal with the risks associated with the suspected contamination ha submitted to and approved in writing by the Local Planning Authority. All investigation, assessments & other actions required shall be undertaken by competent persons, and the scheme shall be implemented as approved **Condition 22 - Environmental Verification Report** Prior to occupation of any relevant part of the approved development, a verification report which demonstrates both the satisfactory completion & efficacy of works set out in the approved remediation method statement shall be submitted to, and approved in writing, by the Local Planning Authority. The report shall include results of sampling and monitoring carried out in accordance with Delta Simons Report No. 19-2099.07 v2.3 (the approved Verification Strategy) & the Piling Method, to demonstrate that the site remediation criteria have been met.

2.3 Environmental Setting

Geology	A variable thickness of re-engineered cover system was recorded during investigation, underlain by landfill waste (maximum proven thickness 12.4 metres), River Terrace Deposits and the Lewes Nodular Chalk Formation. Limited alluvium was encountered in two locations in the west. The Site was divided into two landfill cells (east cell and west cell) based on the topography of the Site and the general composition of the waste. The known extents of these cells are indicative and are assumed to extend to the boundaries of the Site specifically the exiting road network and the stream to the east. The wider landfill (including other likely cells for disposal) is known to extend to the south and west. The landfill waste within the east cell appeared to consist of more 'household waste' items including containers, kitchen waste, glass bottles, newspapers and books. The waste within the west cell comprised less common household items and notably more 'industrial' items including large tyres, wood, metal and large-scale deposits of metal baby-powder containers.

	Ash was identified in the landfill waste within the west cell however, the ash content was notable greater and more widespread in the east. The west cell is also lower topographically, with regard to the east cell, which, along with the differences in waste types, supports the idea of two separate waste cells with differing dates of deposition.
Hydrogeology	The EA classify the bedrock (Chalk) as a Principal Aquifer and the supe geology (River Terrace Deposits) as a Secondary A Aquifer. Monitorir suggests that the groundwater is tidally influenced and there are li groundwater bodies present across the Site, within the landfill waste and the Chalk. There is limited and variable vertical separation of the two groundwater bodies, with evidence of direct connectivity. The data indicates groundwater flows south / south-east toward the Langstone Harbour and Hermitage Stream.
Hydrology	The nearest surface water feature is Hermitage Stream that flows along the eastern boundary of the Site and flows southwards into Storehouse Lake (Lan Harbour). This is a tidal watercourse with flow direction reversing during rising tides. Langstone Harbour is a site of significant ecological importa designations including a Ramsar Site, a Site of Special Scientific Interest (SSSI), a Special Area of Conservation (SAC) and a Special Protection Area (SPA).

3.0 Remediation Stakeholders

Parties Anticipated to be Involved	Company	Function / Interest / Likely Timing of Involvement
Client	Exton Estates on behalf of Clowes Developments (UK) Ltd	Landowner/developer
Principal Contractor	TBC	Delivery of Enabling Works / MMP / CEMP Implementation / Permits
Geoenvironmental Consultant	Delta-Simons	Production of MMP / Remedial Strate Remediation Method Statement / C Pollution Control Section / Asbestos Management Plan / Surface Water Quality Monitoring Programme / Advice during Earthworks on Contamination / Verification
Civil/Structural Engineer	Burrows Graham	Civils, drainage & flood risk assessment & design
Controlled Waters Regulator	Environment Agency	Regulator relating to Controlled Waters and Waste
Local Authority (Environmental Health)	Havant Council	Regulator relating to Human Health

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4.0 Landfill Waste Excavation Plan

The landfill in the east of the Site will be subject to the excavation of c. 12,100 m^3 of landfill waste material which is delineated in Drawings 2 & 3. The landfill waste arisings from this excavation activity will be appropriately managed off-Site.

The cut operation in this area should be undertaken within a short time period as possible to reduce the likelihood of undertaking these works during heavy rainfall event(s) which may allow a significant ingress of water into the exposed excavation. This could plausibly represent a short-term risk to the stream via increased leachate generation. The contractor should monitor the weather forecast on a routine basis whilst works are proceeding to assess the risk of such an event occurring and where appropriate re-arrange this activity for a drier period.

The activity is anticipated to take approximately three months which will be subject to the following activity by the earthwork's contractor:

1. Topsoils and underlying re-engineered cover system material to be stripped, segragted into granular and cohesive materials and stockpiled for re-use on Site as part of the fill earthworks under a Materials Management Plan;
2. Mechanical plant/machinery to excavate the delineated landfill waste material in sections with no proposed processing/treatment being undertaken on-Site;
3. Landfill waste material to be directly placed into tipper wagons either within the landfill waste excavation area or in an adjacent hard surfaced compound area specifically designed for this purpose;
4. Wagons should be sheeted up and pass through a wheel wash on egress from the Site; and
5. Post phased excavation of landfill waste material to desired levels, the excavation should be covered with a suitable thickness of Site-won cohesive material (minimum 200mm) to prevent ingress of rainwater into the exposed landfill material in this area. The cohesive layer should be designed such that it falls/drains to a collection point to prevent ponding above the landfill mass and allow for controlled and appropriately managed run off. The Earthworks Specification for the Site should allow for appropriate compaction and permeability requirements to demonstrate that the temporary capping is adequately impermeable. Based on the cohesive materials identified in the east of Site in the previous ground investigation, only Class 2A or 2B[1] materials should be used with suitable permeability testing (maximum permeability 1 $x10^{-7}$ m/s).

[1] Specification for Highways Work Series 600 (Earthworks) Table 6/1.

5.0 Environmental Watching Briefs/Monitoring

Based on the Construction Environmental Management Plan (CEMP) the following watching briefs/ monitoring requirement are required to be undertaken during the earthworks phase of construction works:

Asbestos Monitoring Plan –to be prepared separate to this Report;

Surface Water Quality Monitoring Plan - to be prepared separate to this Report;

A watching brief should be employed during the earthworks, specifically in areas of Site level reduction. All observations during the watching brief should be recorded in order to provide evidence to confirm no unanticipated / gross contamination is present within the cut material (this does not apply to the excavation of landfill waste due to the likely varied nature of potential unknown materisl/contaminants in this material which the contractor should be antipcating), beyond what is expected. This is to comply with planning conditions and also represents good Site practice;

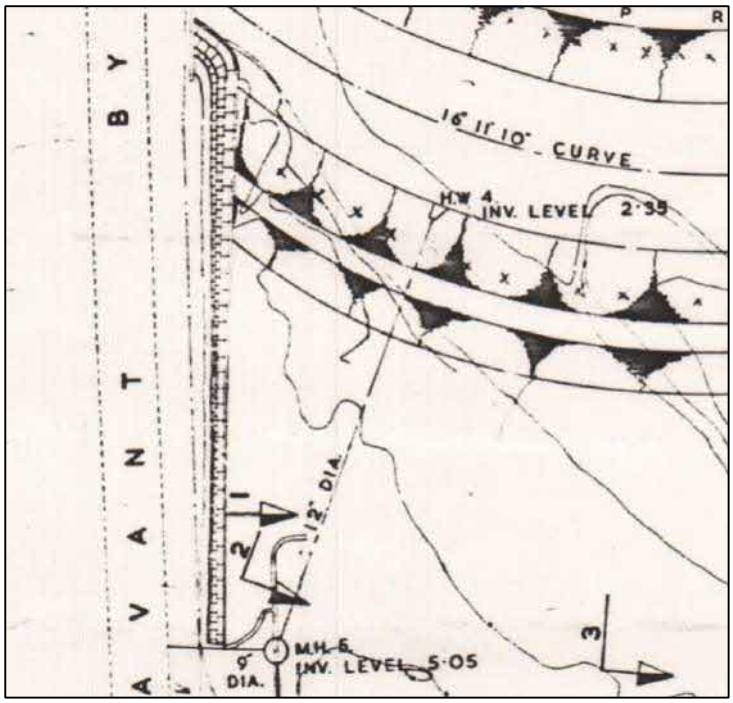
Under the MMP, a specific watching brief for any unexpected potentially contaminated materials during the earthworks programme will need to be maintained which is essentially the same as the above requirement. However, this will need to be included in the MMP Verification Report; and

A watching brief for exposed granular strata during any cut into the re-engineered cover system strata which should be covered with a suitable thickness of cohesive materials (minimum 200mm) prior to re-soiling of the development platform. Refer to Figure 3 –Granular Cover Materials Plan for areas where granular materials were encountered during the ground investigation.

The above will be managed/supervised by an appropriately experienced person(s) in conjunction with specialist input as required.

6.0 Relict Drainage Surveys

The presence, condition and location of existing surface water drainage is currently unknown, particularly within the east of the Site. An outfall (HW 4) into the Hermitage Stream has been observed north-east of the Site which “As Proposed” historical plans identify as surface water drainage from the A27.



This Outfall, and anticipated connection to the A27 based on existing manholes and orientation of the headwall, is not within the ownership of the Client/Developer and on this basis we do not propose to undertake any survey of this drainage feature.

There is a further outfall in the south-east of the Site (refer to plan below) which is thought to be connected to highways surface water drainage infrastructure on Harts Farm Way.

A CCTV survey should be undertaken to confirm the connection and integrity of the pipeline to assess its potential for presenting a preferential pathway for landfill leachates to enter the Hermitage Stream. Where damage to the pipeline is identified then this would require investigation to assess presence of landfill leachate and/or remedial treatment in consultation with the asset owner.

Land drains on-Site that are both connected to the outfall (which discharges directly into the watercourse) and emanate from within the landfill should be decommissioned/disconnected and alternative closed surface water systems sought as part of the development drainage design. This is to prevent any mobilised contamination directly entering the watercourse.

If further drainage exists within the red line boundary of the Site that may pose a risk of preferential pathways to the Hermitage Stream, this should also be dealt with in the same manner.

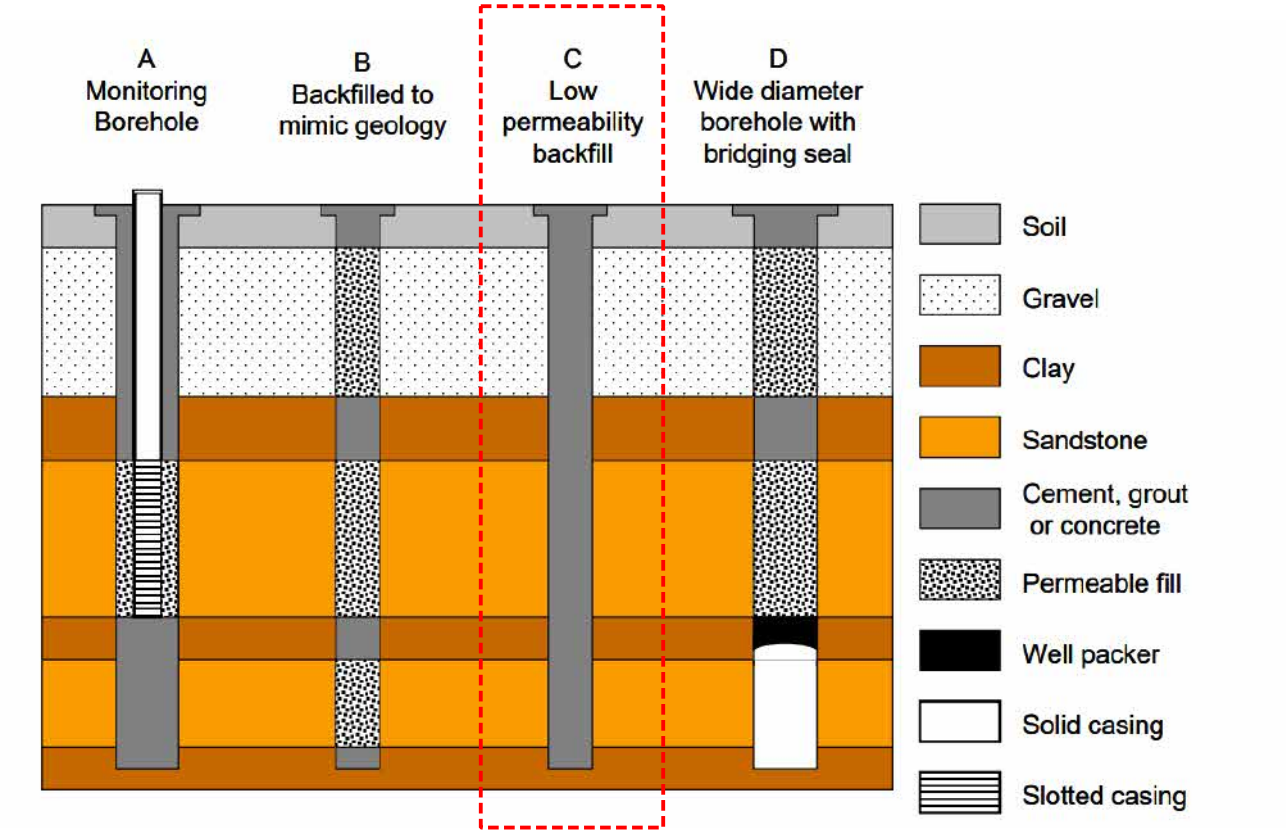
7.0 Decommissioning of Boreholes Specification

All boreholes were screened in a specific geological unit i.e., chalk, the River Terrace Deposits or within the landfill waste. Borehole screens did not cross geological units or span across the landfill waste into natural strata below. Furthermore, bentonite seals were installed at the base of the waste to protect the aquifer below notwithstanding the fact that the underlying chalk/River Terrace Deposits are in direct connectivity with the waste.

However, based on the above, the following objectives are still considered relevant in respect to decommissioning of the boreholes:

1. Remove the hazard of an open hole (safety issues) from removing headworks only during the enabling works phase;
2. Reduce the risk of the borehole acting as a conduit (preferential pathways) for (i) contamination to the Principal Aquifer within the chalk and subsequent baseflow to the Hermitage Stream and (ii) hazardousd ground gases migrating to surface receptors (i.e. enclosed spaces within future buildings);
3. Reduce the risk of mixing of contaminated and uncontaminated groundwater from different aquifers;
4. Reduce the risk of the flow of groundwater from one geological horizon to another;
5. Reduce the risk of the borehole acting as a structural soft spot.

Based on good practice/guidance[2] the following options are considered appropriate for decommissioning boreholes:



Whilst option B would suffice in terms of meeting Objectives 1 to 4 this could still present a structural risk to the proposed development due to a potential soft spots remaining (Objective 5). To reduce this residual risk as far as practicable option C is considered to be the preferred option.

The scope for decommissioning boreholes under option C is as follows:

[2] Good practice for decommissioning redundant boreholes and wells, Environment Agency, 2012

1. Locate borehole headworks (contractor to make note of ones that cannot be located)[3];
2. Remove headworks (raised/flush metal covers and any end caps/rubber bungs in the boreholes);
3. Dip boreholes to establish depth to base and depths to groundwater;
4. Pressure grout up the boreholes with a cement/bentonite slurry via a pump/hose of suitable length to surface level;
5. Boreholes in areas of cut should be reduced by a further 1m below the finished cut level, pipe removed and mass filled with a concrete plug to final cut level to further mitigate risk of creating preferential ground gas pathways.

The specific boreholes drilled and installed by both Delta-Simons (2021) and WYG (2017) are detailed in the following tables including their depths, water levels at the time of monitoring and BNG coordinates.

Delta-Simons Boreholes

Exploratory Hole	Response Zone				Water level during monitoring Max to Min Range				Stratum	Easting	Northing
	m bgl		m AOD		m bgl		m AOD.				
RO101 (S)	1.50	10.50	9.53	0.53	7.93	8.25	2.78	3.10	Landfill Waste	469964.58	105679.27
RO101 (D)	16.00	23.00	-4.97	-11.97	7.57	8.15	1.89	2.47	Chalk		
RO102 (S)	3.00	8.00	7.04	2.04	7.25	7.95	2.50	3.20	Landfill Waste	470113.74	105723.07
RO102 (D)	16.00	22.00	-5.96	-11.96	8.38	8.40	2.48	2.50	Chalk		
RO103 (S)	3.00	9.00	7.45	1.45	2.54	8.50	1.89	7.85	Landfill Waste	470052.79	105649.11
RO103 (D)	16.00	23.00	-5.55	-12.55	10.54	11.05	1.63	2.14	Chalk		
RO104 (S)	1.50	10.00	9.38	0.88	8.78	9.92	1.11	2.25	Landfill Waste	470167.04	105782.85
RO104 (D)	16.00	22.00	-5.12	-11.12	8.42	8.61	1.43	1.62	Chalk		
RO105 (S)	2.00	10.50	8.39	-0.11	8.72	9.69	0.76	1.73	Landfill Waste	470241.77	105779.04
RO105 (D)	16.00	21.00	-5.61	-10.61	9.32	9.63	1.25	1.56	Chalk		
RO106 (S)	2.00	13.50	10.68	-0.82	8.72	9.70	0.69	1.67	Landfill Waste	470226.12	105689
RO106 (D)	16.00	22.00	-3.32	-9.32	11.19	11.56	1.12	1.49	Chalk		
RO107	14.00	20.00	-3.26	-9.26	9.57	9.72	1.02	1.17	Chalk	469961.03	105591.99
RO108	12.00	20.00	-3.01	-11.01	7.43	7.94	1.06	1.57	Chalk	470153.78	105616.18
RO109	16.00	20.00	-6.21	-10.21	8.71	8.84	0.95	1.08	Chalk	470299.04	105683.47
DS101	9.50	10.50	-0.08	-1.08	8.36	8.84	0.58	1.06	RTD	470307.47	105691.79
DS102	10.50	12.50	0.35	-1.65	9.25	9.73	1.12	1.60	RTD	470267.03	105738.58
DS103	10.50	12.50	-0.58	-2.58	8.10	9.10	0.82	1.82	RTD	470241.67	105785.04

(S) = Monitoring standpipe installed within a shallower stratum as part of a dual install
(D) = Monitoring standpipe installed within a deeper stratum as part of a dual install
RTD = River Terrace Deposits

[3] Note: Use of a metal detector in conjunction with a GPS survey would be advisable

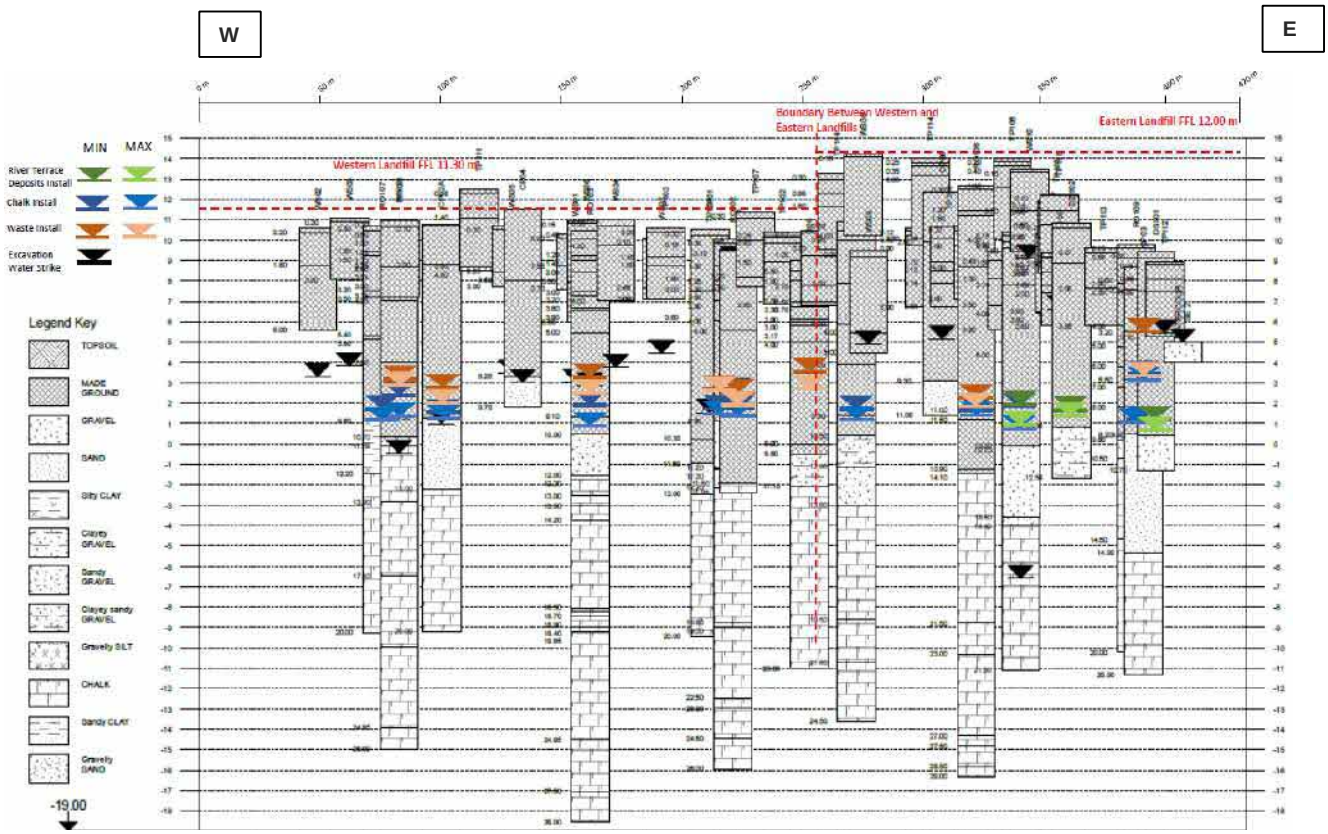
WYG Boreholes											
Exploratory Hole	Response Zone				Water level during monitoring Max to Min Range				Stratum	Easting	Northing
	m bgl		m AOD		m bgl		m AOD.				
CP01 (D)	14.0	35.0	-3.46	-24.46	8.56	9.29	1.25	1.98	Chalk	470104.27	105703.67
CP01 (S)	1.0	11.0	9.54	-0.46	7.67	8.02	2.52	2.87	Landfill Waste		
CP02A (D)	13.00	35.00	-2.21	-24.21	8.875	10.8	-0.01	1.915	Chalk	469988.76	105575.67
CP02A (S)	1.00	9.00	9.79	1.79	7.95	9.07	1.72	2.84	Landfill Waste		
CP03 (D)	14.00	35.00	-5.33	-26.33	6.6	8.69	-0.02	2.07	Chalk	470303.29	105661.52
CP03 (S)	1.00	10.00	7.67	-1.33	6.71	7.72	0.95	1.96	Landfill Waste		
CP04	1.0	9.0	10.52	2.52	7.01	8.52	3.0	4.51	Landfill Waste	470021.09	105669.83
CP05	1.00	10.00	8.56	-0.44	6.84	7.27	2.29	2.72	Landfill Waste	470122.58	105594.6
CP06	1.0	9.0	11.4	3.4	7.13	7.67	4.73	5.27	Landfill Waste	470206.36	105775.84
WS01	1.0	2.7	9.28	7.58	2.66	Dry	Dry	7.63	REC	470042.39	105723.24
WS02	1.0	5.0	9.57	5.57	Dry	Dry	Dry	Dry	REC	469928.28	105664.07
WS03	1.0	3.0	10.07	8.07	Dry	Dry	Dry	Dry	REC	469945.65	105602.32
WS04	1.0	4.0	10.01	7.01	Dry	Dry	Dry	Dry	REC	470062.25	105692.64
WS05	1.0	3.0	9.72	7.72	Dry	Dry	Dry	Dry	Landfill Waste	470020.69	105572.02
WS06	1.0	5.0	9.98	5.98	5.68	Dry	Dry	5.3	REC	470051.70	105635.00
WS07	1.0	3.0	9.12	7.12	Dry	Dry	Dry	Dry	REC	470086.62	105618.92
WS08	1.0	3.5	13.21	10.71	Dry	Dry	Dry	Dry	REC	470172.28	105741.85
WS09	1.0	4.0	8.46	5.46	4.57	Dry	Dry	4.89	Landfill Waste	470177.46	105681.74
WS10	1.0	4.0	12.45	9.45	4.32	Dry	Dry	9.13	Landfill Waste	470249.37	105705.34

(S) = Monitoring standpipe installed within a shallower stratum as part of a dual install
(D) = Monitoring standpipe installed within a deeper stratum as part of a dual install
REC = Re-engineered Cover System.

The decommissioning of these boreholes should be appropriately undertaken and recorded in line with this Report and the Environment Agency guidance[2] by the contractor responsible for these works for inclusion in the Verification Report (Enabling Works Phase) .

8.0 Wastewater Management

Significant groundwater and/or leachate is not anticipated to be encountered during the cut and excavation of landfill waste in the east based on the cut/fill drawing (Drawing 2) and monitored groundwater levels encountered during the investigation works (depicted below).



In the unlikely event of perched groundwater/leachate being encountered during the earthworks/infrastructure works, the waters should be pumped to an appropriate tank for either off-Site management or subject to testing, and potentially treatment, discharge to foul sewer under appropriate consent.

Details of this, including all duty of care paperwork, should be recorded in the Verification Report (Enabling Works Phase).

9.0 Verification Reporting & Regulatory Approvals

9.1 General

Following completion of works detailed in Sections 4.0 to 8.0 an Environmental Consultant shall prepare a Verification Report (Enabling Works Phase) for submission to the Local Authority to satisfy relevant planning conditions.

9.2 Verification - Enabling Phase

The Verification Report (Enabling Phase Works) shall be produced upon completion of the enabling works and should include as a minimum:

Summary of works undertaken (Site diaries, photographs etc);

Details relating to the excavation of landfill waste materials (photographs, volumes);

Details of waste disposal of any material from the Site including waste transfer documentation and details of the receiving treatment/landfill facility (to include solids and waste waters);

Details relating to the provision of a suitable thickness of cohesive materials (minimum 200mm) within the area of landfill waste excavation and any exposed granular strata during the Site cut;

Details of the CCTV surveys of the relict/highway's drainage that outfall into the Hermitage Stream;

Details of the borehole decommissioning including photographs, boreholes that were not able to be located, water levels and grout take;

Confirmation of the chemical results, and transfer notes detailing the place of origin of any imported fill including any stockpiles left for the subsequent cover system;

Compliance with the CEMP specifically relating to Pollution Control; and,

A record of any 'hotspots' found during enabling works phase e.g. during the Site cut (non landfill material) and the associated actions taken to appropriately delineate, remediate and manage these materials. This will include details of the chemical analysis of samples taken from these areas, verification that the entire hotspot has been removed as necessary, appropriate classification of the waste, waste transfer documentation, and details of the receiving disposal facility.

9.3 Regulatory Approvals and Planning Condition Discharge

It is intended that this report be submitted to Havant Council to support the discharge of contaminated land planning conditions (in conjunction with earlier technical reports).

Drawings

Drawing 1 –31383-PL-203B Site Layout Option 2

NOTES:

SUBJECT TO STATUTORY CONSENTS

SUBJECT TO SURVEY

BASED ON OS MAP REPRODUCED BY PERMISSION OF CONTROLLER OF HM STATIONARY OFFICE (c) CROWN COPYRIGHT

COPYRIGHT RESERVED

DO NOT USE ELECTRONIC VERSIONS OF THIS DRAWING TO DETERMINE DIMENSIONS UNLESS SPECIFICALLY AUTHORISED BY MICHAEL SPARKS ASSOCIATES

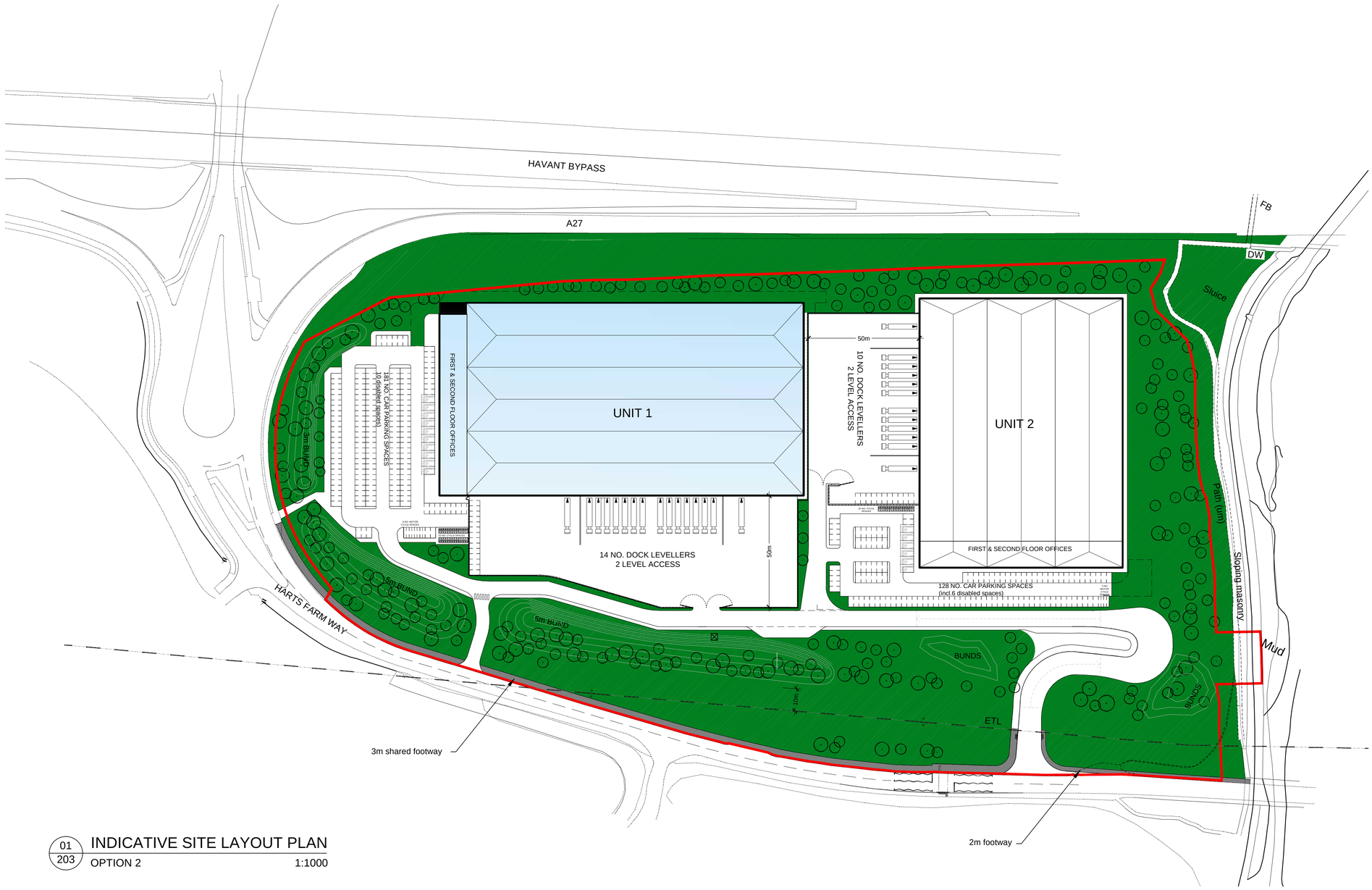
IF USING AN ELECTRONIC VERSION OF THIS DRAWING FIGURED DIMENSIONS TAKE PRECEDENCE AND NOTIFY MICHAEL SPARKS ASSOCIATES OF ANY DISCREPANCIES

N

0 25 50 100m

NOTE:

TREE PLANTING AND BUNDS ARE INDICATIVE. PLEASE REFER TO LANDSCAPE ARCHITECT'S DRAWINGS FOR DETAILS OF SOFT LANDSCAPING



01/203 INDICATIVE SITE LAYOUT PLAN

OPTION 2 1:1000

REV	DATE	NOTE	DRAW	CHCK
B	21/09/2022	Footways updated to Vectos details	AH	AC
A	28/07/2021	ACCESS ALTERED	PB	AC
-	09/02/2021	First Issue	AH	AC

MICHAEL SPARKS ASSOCIATES
CHARTERED ARCHITECTS
11 PLATO PLACE
ST DIONIS ROAD
LONDON SW6 4TU
TELEPHONE 020 7736 6162
www.msa-architects.co.uk

TITLE
HARTS FARM WAY, HAVANT

DRAWING
INDICATIVE SITE LAYOUT PLAN
OPTION 2

CLIENT
CLOWES DEVELOPMENTS (UK) LTD.

DATE	SCALE	DRAWN
FEBRUARY 2021	1:1000 @ A1	AH
	STATUS: PLANNING	CHECKED: AC

DRAWING NUMBER
31383 / PL / 203 B

Drawing 2 –21048-BGL-XX-X-DR-C-00304_P2-Enabling Works Earthwork Plan

THIS DRAWING IS THE COPYRIGHT OF BURROWS GRAHAM LIMITED.

SAFETY, HEALTH AND ENVIRONMENTAL INFORMATION

IN ADDITION TO THE HAZARDS/RISKS NORMALLY ASSOCIATED WITH THE TYPES OF WORK DETAILED ON THIS DRAWING, NOTE THE FOLLOWING

CONSTRUCTION

MAINTENANCE

DEMOLITION

IT IS ASSUMED THAT ALL WORKS WILL BE CARRIED OUT BY A COMPETENT CONTRACTOR WORKING, WHERE APPROPRIATE, TO AN APPROVED METHOD STATEMENT

GENERAL NOTES:

1. THIS DRAWING SHALL BE READ IN CONJUNCTION WITH ALL THE RELEVANT ARCHITECTS, ENGINEERS' AND SERVICE ENGINEERS DRAWINGS & SPECIFICATIONS.

SCOPE OF ENABLING WORKS:

1. UNDERTAKE 300mm SITE STRIP IN 150MM LAYERS TO EXTENT SHOWN AND STOCKPILE INITIAL (TOPSOIL) AND SECONDARY (SUBSOIL) 150MM STRIP INTO SEPERATE STOCKPILES AND FOR REUSE AS TEMPORARY COVER AND FUTURE SITE BUNDS. THIS INCLUDES GRUBBING UP AND CRUSHING EXISTING TARMAC SERVICE AREA AND STOCKPILING.
2. UNDERTAKE CUT AND FILL OPERATIONS IN LINE WITH BGL SPECIFICATION, EXCAVATING AND DISPOSING OF BLACK BAG WASTE IN LINE WITH THE AGREED MMP
3. ONCE REQUIRED FORMATION HAS BEEN ACHIEVED PROVIDE THE FOLLOWING:

- TO EXPOSED BLACK BAG AREAS OUTSIDE NEW ACCESS ROAD REINSTATE WITH 200MM CAPPING USING SITE ARISING APPROX AREA = 5000m², APPROX VOLUME = 1000m³
- OVER MAIN ACCESS AS ANNOTATED PROVIDE MINIMUM 200mm 6F2 STONE PROTECTION CAPPING ON TERRAM 2000 STONE SAVER GEOTEXTILE. - APPROX AREA = 4000m², APPROX VOLUME = 800m³
- TO REMAINING SITE THAT HAS BEEN STRIPPED REPLACE 150mm ORIGINAL COVER OVER THE SITE TO PROVIDE A PROTECTION SURFACE. APPROX AREA = 26,000m², APPROX VOLUME = 3,900m³ ANY REMAINING STOCKPILE TO LOCATED CENTRALLY ON THE SITE IN A LOCATION TO BE AGREED SO FACILITATE FUTURE DEVELOPMENT WORKS
- PROVIDE LAND DRAINAGE AS INDICATED

4. FOLLOWING COMPLETION OF THE WORKS ALLOW TO UNDERTAKE A FULL TOPO SURVEY TO CONFIRM REQUIRED FINISH LEVELS HAVE BEEN ACHIEVED
5. REFERENCE SHOULD BE MADE TO LATEST ECOLOGY AND AIA REPORTS IN RELATION TO PROTECTION WORKS REQUIRED.
6. CONTRACTOR TO VERIFY THE PRESENCE OF LIVE SERVICES AROUND THE SITE, PARTICULARLY AROUND THE SITE PERIMETER. THIS INCLUDES POSSIBLE SOUTHERN WATER SW DRAINAGE IN NW CORNER OF THE SITE AND ALSO EXISTING OVERHEAD CABLE LOCATED ALONG THE SOUTHERN BOUNDARY

KEY:

- SITE BOUNDARY
- EXTENT OF WORKS AND SITE STRIP (AREA = 58,200m²)

EXISTING ROUTE OF SW DRAINAGE PIPE - TO BE LOCATED AND ACCURATELY RECORDED

FUTURE SSL 12.000m FORMATION SET -800mm (ASSUMING GRID REINFORCED 500mm STONE PILE MAT AND 300mm SUSPENDED SLAB CONSTRUCTION)

FFL11.200m

FINAL FORMATION LEVEL 11.200m
FINAL PLATEAU LEVEL 11.350m

FUTURE SSL 12.000m FORMATION FORMED AT -1000MM TO REMOVE BLACK BAG THEN CAPPED WITH 200MM ORIGINAL SITE ARISING RESULTING IN FINAL FORMATION BEING -800MM. ASSUMING GRID REINFORCED 500mm STONE PILE MAT AND 300mm SUSPENDED SLAB CONSTRUCTION)

FFL11.000m

INITIAL FORMATION LEVEL 11.000m
FINAL FORMATION LEVEL 11.200m
FINAL PLATEAU LEVEL 11.350m

BLACK BAG AREA TO BE REMOVED = 5,000M²

BLACK BAG AREA TO BE REMOVED = 4,500M²

BLACK BAG AREA TO BE REMOVED = 735M²

Future screening Bunds volume 22,000m3

1 in 3 Slope

1 in 2 Slope

TO MITIGATE RISK OF SURFACE WATER RUNOFF ONTO THE NEW ACCESS AND HIGHWAY, ALLOWANCE TO BE MADE TO CONSTRUCT A 600 WIDE X 1000 DEEP LANDRAIN WITH 150MM DIA PERFORATED PIPE SURROUNDED IN GEOTEXTILE POSITIONED AT THE END OF THE ADOPTED HIGHWAY WITH 150mm DIAMETER OUTFALL PIPE TEMPORARILY DISCHARGING INTO THE EXISTING CULVERT HIGHWAY DITCH.
TO PREVENT INFILTRATION INTO THE UNDERLYING GROUND THE LAND DRAINAGE CHANNEL WILL BE LINED AND SEALED WITH AN IMPERMEABLE MEMBRANE.

278 HIGHWAY ENTRANCE DETAILS INCLUDING DRAINAGE CULVERT DIVERSION/PROTECTION WORKS AND NEW OFFSITE FOOTWAY AND CROSSING TO VECTOS DESIGN AND DETAILS. FINAL REVISED S278 HIGHWAY BOUNDARY LINE TO NEW ENTRANCE TO BE AGREED WITH HANTS CC HIGHWAYS

20M EASEMENT TO OVERHEAD POWER LINES

EXISTING NEWT FENCE TO BE PROTECTED DURING THE WORKS

EXTSING ACCESS POINT TO BE RETAINED TO FACILITATE THE WORKS ON SITE. TO BE STOPPED TO VECTOS DESIGN AND DETAILS. FINAL REVISED S278 HIGHWAY BOUNDARY LINE TO NEW ENTRANCE TO BE AGREED WITH HANTS CC HIGHWAYS

REV	DATE	BY	REVISION	CHK'D
P2	20.10.22	SN	Notes amended	RM
P1	14.10.22	SN	Preliminary Issue	RM

Burrows Graham
North Office:
5 Ambassador Place, Stockport Road, Altrincham WA15 8DB
Tel: +44 (0)161 804 8046
South Office:
Buckland House, Dower Mews, High Street, Berkhamsted HP4 2BL
Tel: +44 (0)161 804 8046

CLIENT
Clowes Development Ltd and Exton Estates

PROJECT
FORMER LANDFILL SITE
HARTS FARM WAY, HAVANT

DRAWING TITLE
ENABLING WORKS UNIT 2
SCOPE OF WORKS & FORMATION LEVELS PLAN

OUR PROJECT NUMBER	DRAWING STATUS	OFFICE
21048	PRELIMINARY	SOUTH

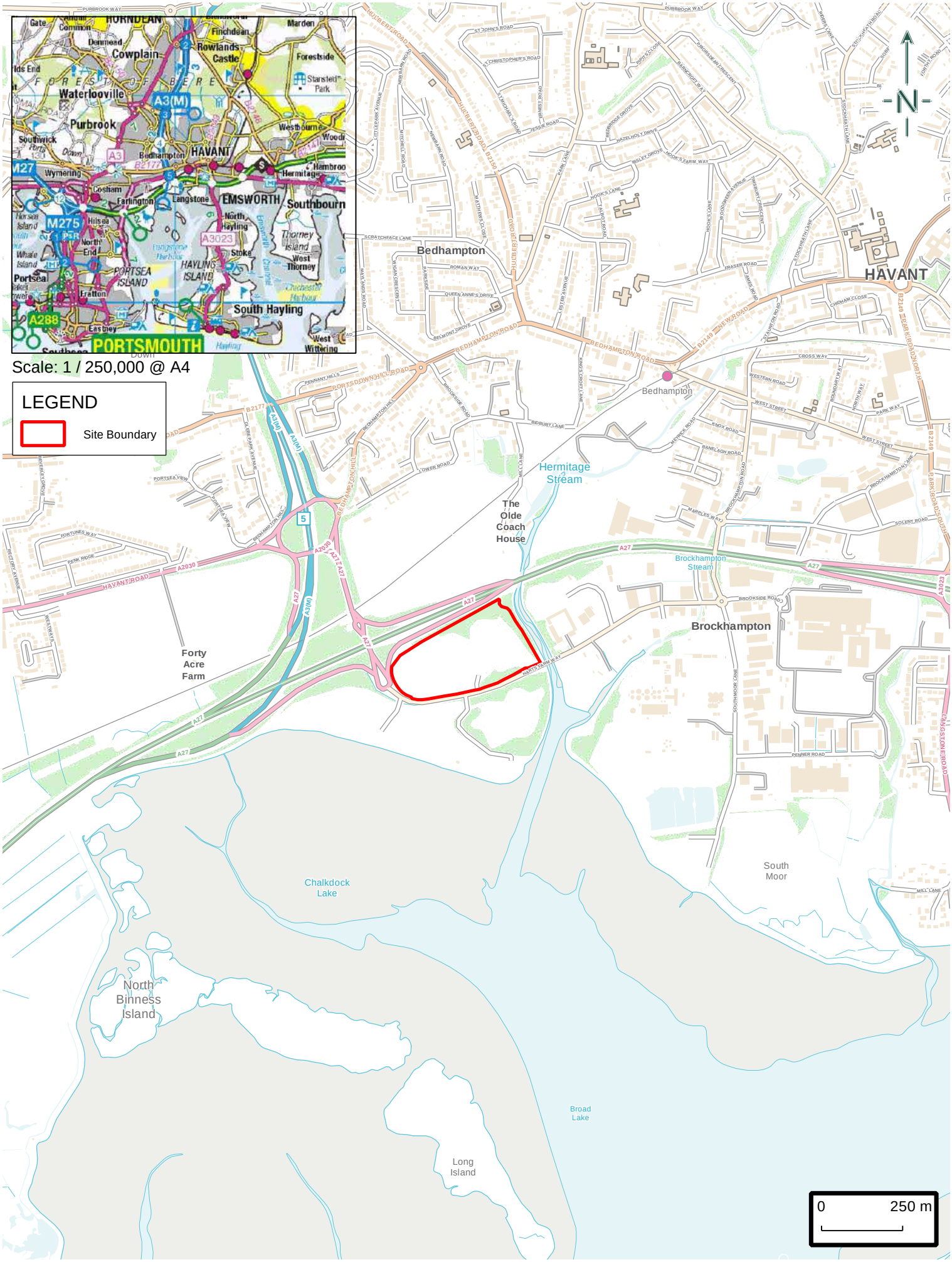
SCALE @ A0	DATE	DRAWN BY	CHECKED BY
1/500	14/10/2022	SN	RM

DRAWING No: 21048-BGL-XX-XX-DR-C-00303
REV: P2

Drawing 3 –21048-BGL-XX-X-DR-C-00302-P2-Enabling Works Black Bags Removal

Figures

Figure 1 –Site Location Map



Service Layer Credits: Contains OS data @ Crown Copyright and Database Right 2019

DeltaSimons
Protecting people and planet

TITLE:
Site Location Map
Havant, Brockhampton

DRAWN BY:	SCALE (@A4):	PROJECT NO:
LB	1:14,548	19-2099.10
CHECKED BY:	REVISION:	FIGURE NO:
LB	-	1
DATE:		
12 October 2022		

Figure 2 –Borehole & Trial Pit Location Plan

Bing

DeltaSimons

TITLE:

Brockhampton West Landfill
Borehole & Trial Pit Locations (Delta Simons & WYG)

DRAWN BY: DJ	SCALE (@A4): 1:1,750
CHECKED BY: DJ	REVISION: -
DATE: 12 October 2022	

PROJECT NO: 19-2099.10

FIGURE NO: **Fig 2**

Figure 3 –Granular Cover Materials Plan

Bing. LIDAR Data (C) Environment Agency

DeltaSimons
Protecting people and planet

TITLE:

Granular Re-Engineered Cover System Material Location Plan
Brockhampton West, Havant

DRAWN BY:	SCALE:	PROJECT NO.:
LB	NTS	19-2099.10
CHECKED BY:	REVISION:	FIGURE NO.:
DJ	01	3
DATE:		
12th October 2022		

Appendices

Appendix A –Limitations

Limitations

This Report was prepared by Delta-Simons Ltd (Delta-Simons) for the sole and exclusive use of the Client and for the specific purpose for which Delta-Simons was instructed. Nothing contained in this Report shall be construed to give any rights or benefits to anyone other than the Client and Delta-Simons, and all duties and responsibilities undertaken are for the sole and exclusive benefit of the Client and not for the benefit of any other party. Delta-Simons does not intend, without its written consent through a formal letter of reliance or warranty, for this Report to be disseminated to any party other than the named Client or to be used or relied upon by any party other than the named Client. Use of the Report by any other party is unauthorised and such use is at the sole risk of the user. Any party using or relying upon this Report, other than the Client, agrees by virtue of its use to indemnify and hold harmless Delta-Simons from and against all claims, losses and damages (of whatsoever nature and howsoever or whensoever arising), arising out of or resulting from the performance of the work by Delta-Simons. Unless explicitly agreed otherwise, in writing, this Report has been prepared under Delta-Simons' Standard Terms and Conditions as included within our proposal to the Client.

The recommendations contained within this Report represent Delta-Simons professional opinions, based upon the information detailed within the Report, exercising the reasonable skill and care to be expected of a professional consultant holding itself out as having the competence, experience and resources necessary for the purpose of carrying out similar work in scope and character to the services performed. The Report needs to be considered in the light of the proposal and associated limitations of scope. The Report needs to be read and considered in full and isolated sections cannot be used without full reference to other elements of the report and any previous works referenced within the Report.

Where Delta-Simons has obtained, reviewed and evaluated information in preparing this Report from the Client and others and Delta-Simons conclusions, opinions and recommendations has been reasonably determined using this information, Delta-Simons does not warrant the accuracy of the third-party information provided to it and cannot be responsible for any opinions which Delta-Simons has expressed, or conclusions which it has reached in reliance upon information which is subsequently proven to be inaccurate.

Site surveys document the conditions encountered at the time of survey only and conditions may change due to natural processes or human intervention. As such, surveys represent an assessment at a specific point in time and Delta-Simons cannot be responsible for adverse conditions which arise or become apparent after the time of the survey or for conditions which sit outside the scope for which the survey or Report was commissioned.

Where intrusive investigations have been completed, information, comments and opinions given in this report are based on the ground conditions encountered during the site work period and on the results of laboratory and field tests performed during the investigation. Ground conditions are inherently variable such that no investigation can be exhaustive to the extent that all adverse conditions are revealed. Conditions may therefore be present beneath the site that were not apparent in the data reviewed or obtained as part of this assessment. It should be noted that groundwater levels vary due to seasonal and other effects and may at times differ to those measured during the investigation. Delta-Simons does not warrant or guarantee that the Site is free of hazardous or potentially hazardous materials or conditions. Where risk assessment is undertaken, this is based upon the standards, guidance and common practice at the time of the assessment and Delta-Simons cannot be responsible for conditions which become apparent following changes in guidance or practice or advancements in scientific knowledge which change the position in relation to assessment of risk.

No aspect of this Report constitutes a design. Where this information is used in design, the designer should verify the information has been used appropriately.

Where budgets are prepared and presented within the Report, these are for information only to indicate the likely magnitude of a cost and do not represent an invitation to treat for the works. All budgets and programmes presented should be reviewed and verified by appropriately qualified and experienced independent Project Managers and Cost Consultants.

Appendix B -'Hotspot' Protocol

Protocol for Addressing Previously Unidentified 'Hotspots' of Contamination

As with any Brownfield development, there is a possibility that an unknown area of soil contamination may be encountered during excavation works. Should an area of contamination be identified by visual or olfactory means the following procedure will be followed:

Immediately stop all works in the area where contamination is suspected;

Immediately inform the Site Agent who should then contact the Environmental Consultant;

The Environmental Consultant will provide a verbal response outlining immediate actions with regard to Site Health and Safety and to limit the potential for contaminants to migrate;

The Environmental Consultant will judge each occurrence on merit and should it be deemed necessary. The Environmental Consultant will attend Site to oversee the removal of the 'hotspot' and collect validation samples;

Any excavated material should be isolated from all other material at the Site, on plastic sheeting and covered with plastic sheeting until the material can be tested for contamination and an appropriate disposal route can be identified;

Any 'hotspot' stockpiles and excavations should be fenced off, have appropriate signage and their locations recorded on a Site drawing;

Should any excavated material be required to be disposed of at an off-Site location, the material will be isolated from all other material at the Site prior to disposal at a suitably licensed facility. All documentation associated with the movement and disposal of any such material will be supplied to The Environmental Consultant, including waste transfer documentation;

Subject to appropriate Site Health & Safety controls (typically comprising fencing off the excavation) the excavation will remain open until the validation has been completed. Alternatively, for Site Health & Safety reasons, it may be necessary to backfill the excavation with Site derived material. In this case, the location of the excavation will be accurately recorded and the excavation reopened if required, based on the validation results; and

The Regulatory Authorities shall be informed by the Environmental Consultant of any remedial activities required and associated validation testing results. Representatives of these organisations may also wish to visit the Site.