



Richard Jackson
Engineering Consultants

REMEDIATION METHOD STATEMENT

Starlings, Milton Road, Harwich, Essex

Tendring District Council

March 2021

Project no: 60275

Document Review Sheet: -

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Title: REMEDIATION METHOD STATEMENT
 Project: Starlings, Milton Road, Harwich, Essex
 Client: Tendring District Council
 Project No.: 60275

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1. Introduction

Richard Jackson Ltd received an instruction to prepare a remediation method statement (RMS) in connection with the proposed redevelopment of Starlings, Milton Road, Harwich, Essex.

The works were instructed by the Client Tendring District Council (TDC) and were carried out in accordance with our fee proposal, detailed in an email to Stephen Day, dated 21st January 2021.

This RMS relates to the proposed redevelopment of the site to provide an open-air car park. Proposed development plans are presented in Appendix A.

Phase one and two investigations have previously been undertaken at the site by Richard Jackson Ltd. (RJL), and are detailed in the following reports:

- Phase One Desk Study Report, ref. 60275 (November 2019);
- Ground Investigation Report, ref. 60275 (January 2020);
- Gas Monitoring Letter Report, ref. KB/60275 (30 April 2020);
- Asbestos Investigation Letter Report, ref. KO/60275/Asb GI (10 March 2021).

The above reports are reviewed briefly as part of this RMS.

1.1. RMS Objectives

This RMS provides a detailed strategy for the implementation of the required remedial measures for the proposed development. The specific objectives of the RMS are as follows:

- To summarise the site investigations and risk assessment work undertaken to date;
- To present the requirements of the remediation scheme to break the significant contaminant linkages which have been identified;
- To identify and designate the roles and responsibilities of various involved parties;
- To state how remediation should be recorded and verified.

2. Limitations of Use

This RMS sets out the measures which will be carried out to mitigate potentially significant risks as identified by the site investigation in relation to the proposed end-use of the site. It also provides a strategy for addressing risk arising from unexpected conditions which may be encountered during the redevelopment of the site.

This report does not provide a completion statement for the works, such verification will be provided at the appropriate time as a Validation Report.

3. Site Location and Description

The site was located to the northwest of Milton Road, Dovercourt, Harwich, Essex, CO12 3EQ. The approximate Ordnance Survey grid reference for the centre of the site was TM 257 316. A site location plan is presented as Figure 1 in Appendix A.

The site was irregular in shape with maximum approximate dimensions of 40m northwest to southeast by 60m northeast to southwest.

At the time of the most recent site visit (February 2021) the site comprised a vacant parcel of land which had been cleared of structures, although concrete floor slabs remained.

4. Review of Previous Investigation

As mentioned in Section 1, previous investigations have been undertaken at the site. These are summarised in the following section.

4.1. RJL - Phase One Desk Study Report, ref. 60275 (Nov 2019)

RJL prepared a phase one desk study report for the subject site and an adjacent two-storey car park, 'Milton Road Car Park'. The findings of the report, specific to the subject site, are summarised as follows.

The site was recorded to have been developed throughout the studied historical period (1870-2019), with various phases of redevelopment recorded including a garage from the 1950s. Off-site, mixed residential and industrial development was also recorded.

The Thames Group, an unproductive stratum, was recorded as the geology to exist beneath the site.

Made Ground, the site's former use as a garage and fly tipped asbestos containing materials were identified as potential on-site sources of contamination. Off-site, made ground, infilled brickfields, industrial development and a landfill were identified as potential sources of contamination.

A moderate/low risk from soil contamination was considered to be presented to the identified sensitive receptors together with a high risk considered to be presented from ground gases.

It was recommended that intrusive ground investigations were undertaken at the site to confirm the prevailing ground conditions, establish the presence and extent of made ground and to assess the contamination status of the site. The installation and subsequent monitoring of standpipes was also recommended to assess the potential gassing regime beneath the site. Given

the observed fly tipping, asbestos testing of recovered soil samples was also recommended.

4.2. RJL – Ground Investigation Report, ref. 60275 (Jan 2020)

The intrusive investigation on which this report was based comprised the following:

- The mechanical excavation of 6no. trial pits (TP01-TP06);
- The formation of 5no. small diameter windowless sampler (WLS) boreholes (WS01-WS05);
- The installation of 3no. semi-permanent monitoring standpipes in WLS boreholes.

An exploratory hole location plan is presented as Figure 2, Revision A and Appendix A.

In-situ testing, soil sampling and associated chemical analyses and geotechnical testing were also undertaken.

The encountered ground conditions comprised the following sequence:

- Made Ground – comprising a variable material including gravelly sand and sand to cobble sized fragments of brick, concrete, ash, cinder block - to a max. proven depth of 1.90m below ground level (bgl);
 - Localised black staining and a suspected hydrocarbon odour were recorded in TP03 from 1.40m bgl with associated suspected oil tank pipework from 1.70m bgl.
- Head Deposits – comprising a soft to firm clay with sandy pockets and gravel of flint - to a max. proven depth of 3.60m bgl;
 - Black mottling and an organic odour were recorded in WS03 from 0.40m bgl;
 - A strong suspected hydrocarbon odour was recorded in TP01 from 1.80m bgl;
- Thames Group – comprising a firm to stiff grey mottled brown clay, locally with mudstone fragments and ironstone nodules – the base unproven in this investigation at 5.00m bgl.
- Groundwater was encountered between 1.30m bgl and 2.70m bgl.

Geotechnical laboratory testing including water content determinations, Atterberg Limit tests, particle size distribution determinations and pH value

and sulphate content determinations were undertaken on recovered soils samples.

In addition to the geotechnical testing, 5no. soils samples were analysed from a broad suite of potential contaminants including asbestos, heavy metals, polycyclic aromatic hydrocarbons (PAH) and Total Petroleum Hydrocarbons (TPH). 4no. samples were analysed for the presence of Volatile Organic Compounds (VOC) and an additional 2no. samples were screened for TPH (criteria working group methodology).

The results of chemical analyses were compared to screening criteria for a commercial end use. Concentrations of contaminants were recorded to be below their threshold values.

Asbestos, comprising microscopic cement fragments of Chrysotile were encountered in a single sample recovered from the made ground between 0.40-0.50m bgl in WS05.

The recorded concentrations of TPH and BTEX compounds in samples with suspected hydrocarbon odours were considered to pose a risk to controlled waters beneath the site. However, it was acknowledged that the encountered groundwater beneath the site was in discrete pockets and unlikely to be in hydraulic continuity with the wider groundwater environment due to the predominantly cohesive nature of the prevailing soils. Furthermore, the encountered groundwater was considered to be of low sensitivity and minimal resource value due to its hydrogeological setting. Remediation of these contaminants for the protection of end users or controlled waters was not considered to be necessary, however, barrier pipe may be required to protect water supply services should they be installed.

Asbestos was encountered in the made ground beneath the site and was also recorded as fly tipped material. The report recommended that the fly tipped materials be removed from the site by an appropriately qualified contractor. It was considered that the proposed hardstanding forming the development would be sufficient to mitigate the risk posed by the single location in which asbestos was disclosed in the soils.

4.3. RJL – Gas Monitoring Letter, ref. KB/60275 (30 April 2020)

Ground gas monitoring was undertaken at the site in accordance with the requirements of CIRIA document 665, 'Assessing risk posed by hazardous ground gases to buildings', comprising 6no. visits over a period of three months.

The monitoring results recorded the following:

- Max. CO₂ concentrations of 3.1% by volume (v/v);
- Max. (sustained) CH₄ concentration of 1.2% v/v;
- Min. O₂ concentrations of 10.2% v/v;
- Max. VOC concentrations of 0.0ppm;
- Peak flow rate 0.0l/hr.

The site was characterised as a Characteristic Situation 2 (CS-2) and ground gas mitigation measures including the following were recommended:

- The installation of a gas resistant membrane, the type dependent on the proposed building construction;
- All joints and penetrations to be sealed;
- The provision of underfloor venting.

In addition, due to the depleted oxygen concentrations recorded at the site, it was recommended that excavations were monitored for the presence of anoxic/explosive conditions prior to entry by operatives, to ensure safe working conditions be were maintained.

4.4. RJL – Asbestos Investigation Letter report, ref. KO/60275/Asb_GI (10 March 2021)

Following the visual identification of asbestos contamination, by a third party, during site clearance activities, RJL were instructed to undertake additional investigative works to assess the nature and extent of the asbestos contamination.

The report noted that RJL had previously identified 2no. bulk bags of asbestos containing materials (ACM) at the site during the phase one desk study report (November 2019), with these materials remaining on-site at the time of the ground investigation works (December 2020).

At the time of the asbestos investigation (February 2021), the previously identified bulk bags of ACM remained at the site. Additionally, asbestos containing materials including cement sheets and insulating board panels and fragments were visually identified in the southwest of the site. Figure 2, revision A, presented in Appendix A, indicates the approximate extent of the area in which asbestos was visually identified to be present.

The fieldworks on which this letter report was based comprised the mechanical excavation of 13no. trial pits (A01-A13) as shown on Figure 2, Revision A in Appendix A. The trial pits were excavated to a maximum depth of 0.60m bgl, with samples recovered from ground level and 0.50m bgl in each of the 13no. locations.

This investigation disclosed variable made ground, commonly comprised of blackish/greyish brown silty, gravelly sand with gravel of brick, concrete, flint, coal, glass, plastic, wood, ceramic tiles and lightweight block. Locally fragments of carpet, telephone cables, asphalt, concrete slabs and possible former foundations were also recorded.

Each of the 26no. recovered soil samples underwent asbestos screening, with asbestos quantifications subsequently undertaken on 4no. samples in which loose fibres of asbestos were disclosed. Table 1, provide a summary of the asbestos screening and quantifications undertaken on recovered soil samples.

Table 1: Summary of encountered asbestos

Location	Depth (m bgl)	Asbestos Type	Asbestos Matrix	Quantification (%)
A02	0.50	Chrysotile	Loose Fibres	<0.001
A03	0.00	Chrysotile	Cement	n/a
A03	0.50	Chrysotile	Loose Fibres	<0.001
A04	0.50	Chrysotile	Loose Fibres	<0.001
A06	0.00	Chrysotile & Amosite	Board	n/a
A08	0.00	Chrysotile & Amosite	Board & Loose Fibres	3.412
A08	0.50	Chrysotile, Crocidolite & Amosite	Board & Cement	n/a

**n/a Where Asbestos was identified as a bulk material only (e.g. cement) quantifications were not undertaken.*

Remediation was considered to be required to mitigate the risk posed by the encountered asbestos contamination to end users of the site.

5. Potential Contaminant Linkages

5.1. Summary of Identified Significant Potential Contaminant Linkages

On the basis of the above summarised previous investigations and risk assessments, together with the site's proposed end use, a number of unacceptable potential contaminant linkages have been identified, which will require remediation. These are summarised in Table 2.

Table 2: Summary of identified unacceptable potential pollutant linkages

Potential Source	Potential Pathway(s)	Potential Receptor(s)	Comments
Asbestos Containing Materials within the Made Ground	Inhalation of dust.	Commercial end users, construction workers & site neighbours.	Exposure to asbestos is considered to have the potential to cause significant harm to the identified receptors, should the site be occupied prior to remediation.
TPH & BTEX compounds in the soils	Direct Contact	Water Supply Services	Consideration should be given to the adoption of barrier pipe for new water supply services.

Potential Source	Potential Pathway(s)	Potential Receptor(s)	Comments
Carbon-dioxide & methane from made ground & off-site sources.	Migration into buildings and excavations and inhalation.	Commercial end users and construction workers.	Consideration should be given to the incorporation of protection measures into the new structure to prevent gas ingress and to the monitoring of excavations during site development.

5.2. Breaking the Contaminant Linkages

In order to break the contaminant linkages identified in Table 2, one or more elements of the potentially significant contaminant linkages should be removed by the remediation so that there is no longer a potential linkage. The contaminant linkages may be broken via one of the following remediation types:

- Removal of the potential receptors of contamination;
- Removal of the contaminant source;
- Removal/management of the contaminant pathways.

6. Remedial Strategy

Remedial measures are considered to be required to address the unacceptable potential pollutant linkage identified in Table 2. The following sections provide details on the required remediation and how it is to be implemented.

For the purposes of these works 'clean' means validated materials that are physically and chemically suitable for their intended end use.

6.1. Preparatory Works

The following works are to be undertaken prior to remediation commencing at the site:

- Final site levels will be agreed;
- The positions of all services (above-ground and below-ground) shall be determined and clearly identified on site. This is to include the depth to below ground services;
- The phasing of the development / remediation will be agreed and indicated on a plan.

6.2. Health Safety and Environment

Reference should be made to CIRIA Report No.132 'A Guide for Safe Working on Contaminated Sites' (1996), and Health and Safety Guidance Document, 'Protection of Workers and the General Public during the Development of Contaminated Land' (1991).

6.2.1. Contractor & CDM Regulations

It is understood that the remediation works are to be undertaken by a groundworks contractor.

It is also envisaged that the works would be undertaken within the requirements of the Construction (Design and Management) Regulations 2015, which details specific duties for clients, designers and contractors to ensure that appropriate arrangements are put in place so that the work can be carried out without risk to the health and safety of any person. To that end any site operatives should be made aware of the possibility of encountering elevated concentrations of contaminants in the ground. Therefore, the precautions detailed within the RJL Ground Investigation report, reference 60275, dated January 2020 with respect to risks to construction workers should be incorporated into the groundworks contractor's method statements and risk assessments and adhered to during the works.

All site staff and visitors should maintain high levels of personal hygiene, utilize appropriate personal protective equipment (PPE), respiratory protective equipment (RPE) and pay attention to staff inductions and briefings.

The contractor is to ensure that all necessary welfare facilities are available for the staff and site visitors.

6.2.2. Control of Dust

It is recommended that measures to control the production of dust should be employed from a health and safety and nuisance perspective. All material excavated should ideally be loaded directly into waiting lorries, but should stockpiling be necessary, they should be placed on suitable impermeable plastic sheeting and covered to prevent the run-off or leaching of contamination and the generation of dust. Ideally stockpiles should be sited on areas of hardstanding. Measures should be taken to ensure that contaminated materials are not accidentally transferred off site, for example on vehicle tyres.

Specific reference should be made to the Control of Asbestos Regulations – CAR12 (2012) with respect to the control of dust to ensure that asbestos fibres are not released into the wider environment.

6.2.3. Control of Noise and Vibration

It is possible that the remediation process will create some unavoidable noise and vibration, all reasonable steps should be taken to minimise the noise and vibration.

The site is located within a residential area and specific consideration should be given the site neighbours during the remedial works.

6.3. Preliminary Tasks

6.3.1. Site Briefing

All site staff and site contractors will be briefed on the potential for soil contamination to be encountered prior to commencing works on site. In addition to the standard health and safety procedures, outlined above, this briefing will include the following information:

- A summary of the nature of contamination which may be encountered at the site. Soil contaminants previously recorded in the soils at the site include asbestos and hydrocarbons.
- Specific areas of the site in which contamination is considered likely to be encountered. Staff and contractors should be specifically aware of the potential for contamination to be encountered in the southwest of the site, where asbestos has been visually recorded.
- Responsibilities of individuals under the discovery strategy, which is discussed further below.

It will be the responsibility of the on-site manager to ensure written confirmation of staff briefing in accordance with the above, is retained and provided to the relevant person and authorities, if requested.

6.3.2. Unexpected Contamination

It is possible during the redevelopment of the site, that unexpected contamination may be encountered. A discovery strategy, has been devised, on the basis of current best practice, which will be adhered to in instances where unexpected contamination is encountered. The discovery strategy is presented in Appendix C.

6.4. Watching Brief - Generic

In order to monitor the ground conditions for soil impacts on a regular basis during the redevelopment of the site, we would recommend that the following works are undertaken as a watching brief:

- A photographic record of the key stages of the development, e.g. formation level excavations, reduced levels and the formation of areas of soft landscaping.

- Any observations of contamination, including visual (to be supported by photographic evidence), olfactory evidence, which are made during the course of the development by any member of site staff, contractor or site visitor.
- Where observations of contamination were 'unexpected' the methodologies detailed in the discovery strategy presented in Appendix C will be adhered to.

Written and signed statements will be obtained by the following parties on completion of the respective phases of work:

- Groundworks contractor(s) – on completion of groundworks, including the cut & fill exercise.
- Environmental consultant - completion of groundworks and landscaping works in the northwest.
- On-site manager – on completion of groundworks and landscaping works.

The written statements to be provided by the above specified persons are to include the following information:

- Site name and address.
- Name, company and role of the person signing the statement.
- Dates on which the works to which the statement refers were undertaken. Start and end dates must be specified.
- Confirmation of whether contamination was observed or not.

Where contamination was observed, the following additional information will be included in the signed, written statement:

- A description of the contamination observed, including reference to photographic evidence where appropriate.
- A plan indicating the locations where the contamination was observed.
- The details, including name and role of the person(s) notified of the observations.
- Details of the actions undertaken to mitigate the observed contamination.

In addition to the above information, the on-site manager will include confirmation that all site staff and contractors received appropriate briefing of the potential for contamination to be encountered at the site.

It will be the responsibility of the on-site manager to ensure that the watching brief is maintained.

6.5. Asbestos Impacted Soils

Bulk asbestos was visually identified and verified by laboratory analyses in the southwest of the site. The extent of the area impacted by asbestos is indicated in Figure 2 – revision A, in Appendix A.

The presence of asbestos poses a potential risk to construction workers at the site and reference should be made to Section 6.2.1 with respect to mitigating this risk.

There is also considered to be a risk from the identified asbestos to site neighbours, site visitors and the general public during the redevelopment of the site and reference should be made to Section 6.2.2 with respect to mitigating this risk.

Works undertaken at the site will need to be carried out in accordance with the Control of Asbestos Regulations – CAR12 (2012) in order that works are controlled as asbestos fibres are not released into the wider environment.

Ultimately the area impacted by asbestos will comprise hardstanding following completion of the development scheme and as such there is considered to be no pathway by which the asbestos contamination may reach end users of the site. To that end the potential pollutant linkage is considered to have been broken. Specific remediation is therefore not required as the development scheme will act as a structural barrier between the contaminant source (made ground) and the contaminant receptor (end users).

6.6. Areas of Proposed Soft Landscaping

The site is to be developed as an open-air car park & as such the majority of the site will be covered by hardstanding, as indicated on the proposed development plan presented in Appendix A. Limited areas of soft landscaping are proposed to the site's perimeters, notably adjacent to the northwestern boundary.

Remediation of the proposed soft landscaped areas at the site will be required for the protection of human health. Soft landscaping areas are indicated on the proposed development plan presented in Appendix A.

Remediation of these areas is to comprise a clean cover system with a minimum thickness of 300mm which is required to include a high visibility membrane and breaker layer due to the presence of asbestos at the site.

Depending on final site levels, remediation of soft landscaping areas will either be achieved via the addition of the 'cover system' to raise levels, or where levels are to be reduced, via the excavation of existing materials and replacement of 'cover system' materials.

Based upon the above requirements a suggested composition for the cover system within landscaped areas may be given as follows:

- 200mm Topsoil;
- 100mm Breaker Layer – comprising a coarse-grained material which may be distinguished from both the overlying and underlying soils;
- High visibility geotextile membrane as a marker layer.

The placed topsoil will comply with the specifications detailed in BS3882 – 2007, 'Specification for Topsoil and Requirements for Use'. The Topsoil will also comply with the screening values presented in Appendix B and should be sampled and tested prior to being used on site to confirm that it is suitable for its intended use.

6.7. Water Supply Pipes

Concentrations of TPH and BTEX compounds encountered at the site may necessitate the adoption of specialist barrier pipe. It is the responsibility of the on-site developer to liaise with the water supply company to confirm this requirement.

If barrier pipe is required by the water supply company, it will be the responsibility of the developed to ensure that pipe of the appropriate specification is used on-site. If barrier pipe is to be installed at the site, its installation will be subject to a watching brief under the methodology detailed in Section 6.4.

The water supply company should be provided with the chemical analyses results from the RJL Ground Investigation report in order that an appropriate grade of water supply pipe may be specified to prevent the contamination of the water supply at the site.

6.8. Waste Soils

The contractor undertaking the remediation works will at all times comply with all relevant legislation and best practice in relation to waste management.

Reference should be made to the EU Waste Framework Directive, Revised Directive 2008/98/EC and 'The definition of Waste: Development Industry Code of Practice (CoP) Version 2' published by CL:AIRE (2011) to establish whether soils generated from on-site works are classified as waste.

Some waste will likely be generated from excavation works associated with the cut and fill exercise proposed at the site. The groundworks contractor should classify the waste in accordance with the document entitled 'Guidance on the classification and assessment of waste (1st Edition 2015), Technical Guidance WM3', and the results of the analysis undertaken by Richard Jackson Limited to determine whether the soils are hazardous or not.

Waste removed from the site must be classified according to the analytical methods criteria recommended by the Landfill (England and Wales) (Amendment) Regulations 2004 and 2005. The regulations set new acceptance criteria for wastes to be disposed of at landfill sites with effect from 16 July 2005. It is recommended that the soil analyses undertaken by Richard Jackson Limited, along with any subsequent Waste Acceptance Criteria testing are forwarded to the receiving landfill to confirm the classification of the waste soils.

Full and detailed records should be kept of all waste soils removed from the site for future reference purposes.

6.9. Gas Mitigation Measures

On the basis of the ground gas monitoring regime undertaken at the site, the site has been classified as a Characteristic Situation 2 (CS-2) in accordance with the methodologies specified in CIRIA Report C665, 'Assessing risk posed by hazardous ground gases to buildings' (2007).

The following gas mitigation measures are required for inclusion in the new proposed public toilet building:

- All joints and penetrations are to be sealed;
- A 2000g gas resistant membrane will be installed;
- Underfloor venting will be required.

BS 8485:2015 should be consulted for guidance regarding design, installation and verification.

The manufacturers specification and installation methodologies required for the selected product to achieve warranty shall be adhered to.

7. Verification Plan

Verification of the remedial strategy will be required in order to demonstrate that the site specific objectives outlined in Section 1.1 have been met. This will comprise the following:

- Records of the watching brief undertaken at the site;
- Details of required additions to the remedial strategy if the watching brief identifies contamination to be present. This should include details of the encountered contamination together with the proposed remedial action and methodology for verifying the necessary remediation.
- All materials imported to the site will be certified as 'clean' (clean as defined in Sections 4 and 6.6). They will need to be sampled and tested by a UKAS accredited analytical laboratory. Delivery tickets and weighbridge tickets are to be retained.

- The placement of 'clean' cover (as defined in Section 6.6) to soft landscaped areas will be verified by an experienced and appropriately qualified third-party consultant. Verification will comprise visual inspection of the backfill materials, including plans showing sample locations, photographs and depth measurements, to confirm that sufficient material was been placed. Soil samples of each cover material will then be recovered in appropriate containers, stored in cool boxes and transported to the analytical laboratory under chain of custody.
- Details of the supplier and confirmation of the source(s) of materials used as the cover system will be provided.
- Sampling of the topsoil materials to be placed as a cover system will be undertaken at a rate of a minimum of 6no. samples per source/type of soil placed.
- All recovered samples will be analysed by an independent and appropriately qualified consultant and tested at a UKAS and MCerts accredited laboratory for the range of contaminants detailed in Appendix B.
- Cover system materials will be chemically compliant with the screening values for soils presented in Appendix B. For the purposes of remediation, the concentration of individual TPH fractions will not exceed 500mg/kg. Where the applicable screening value for human health is less than 500mg/kg, backfill materials will comply with the lower value.
- Confirmation that the required gas mitigation measures have been installed in accordance with the methods detailed in CIRIA Report C735, 'Good practice on the testing and verification of protection systems for buildings against hazardous ground gases' (2014). Confirmation that the installed gas mitigation measures have achieved warranty shall also be provided.
- Should barrier pipe be required at the site by the water supply company, certification confirming barrier pipe of an appropriate specification has been installed at the site will be provided.
- The information and evidence gathered as part of the above tasks will be provided to the Local Authority as soon as it is available.

8. Validation Report

A full validation report will be issued upon completion of the remediation works to demonstrate that the requirements of the remediation method statement have been met. This will be submitted to the Local Authority.

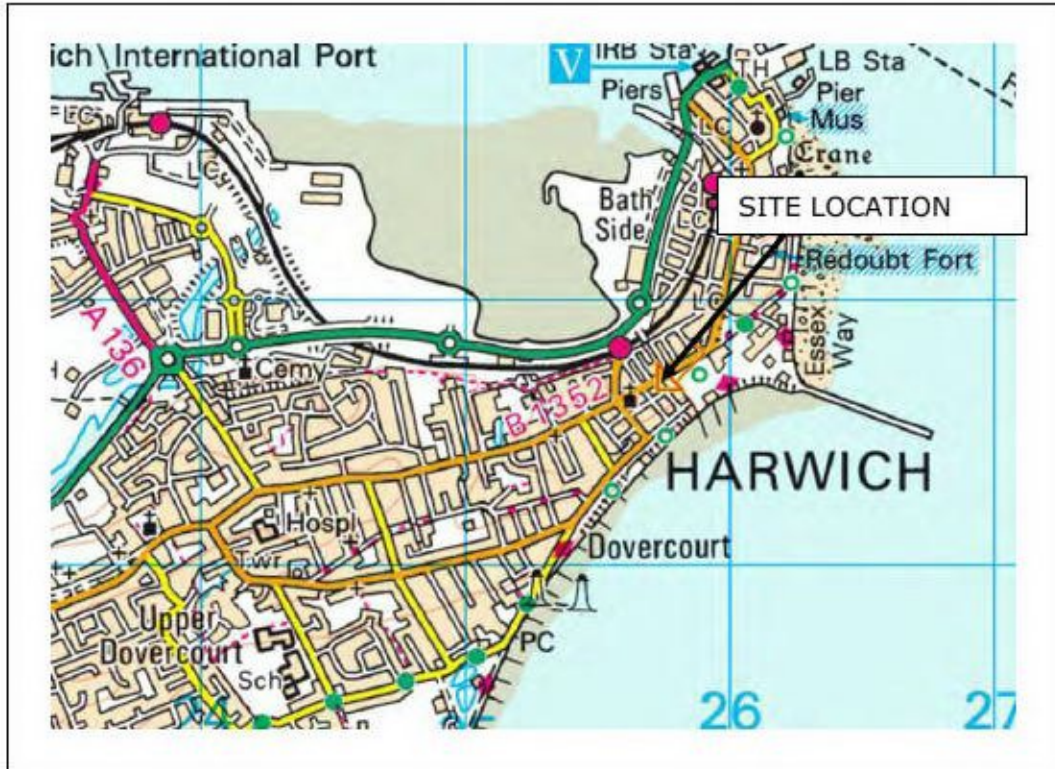
The following items should be included in the validation report:

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- Written confirmation from the on-site manager that staff briefing and training as specified in Section 6.1 was undertaken.
 - Written accounts of the watching brief undertaken at the site, which as a minimum will include all key stages of the development. Where appropriate, the watching brief will include details of any unexpected contamination encountered together with details of the proposed mitigation strategy.
 - Photographic evidence of the thickness and detail of the 'clean' cover placed to soft landscaped areas.
 - Details on the source and analytical laboratory data of the materials (topsoil) making up the 'clean' cover system to soft landscaped areas.
 - Presentation of consignment notes for soils disposed off-site indicating which treatment centre or landfill they were sent to.
 - Written confirmation of the appropriate installation of required gas mitigation measures, to include confirmation that warranties were achieved following verification of installation.
-

Appendix A

Figure & Drawings



REPRODUCED FROM ORDNANCE SURVEY MAP WITH THE PERMISSION OF THE CONTROLLER OF HER MAJESTY'S STATIONARY OFFICE, © CROWN COPYRIGHT RICHARD JACKSON LTD – ACC No. 100002572

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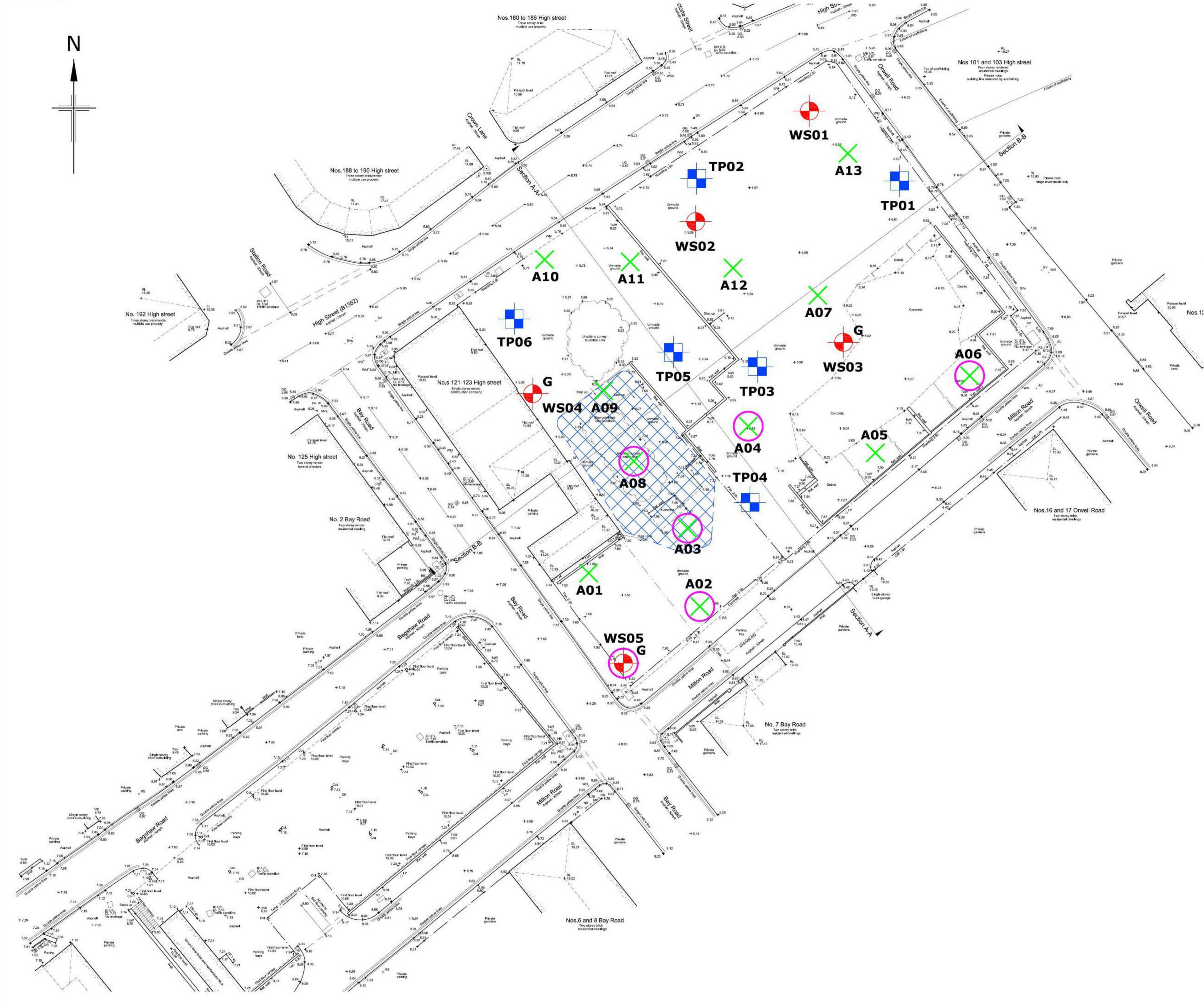
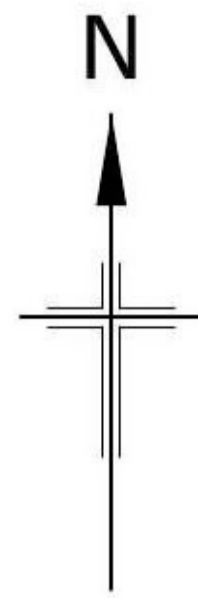
Starlings & Milton Road, Harwich,
Essex, CO12 3EQ

SITE LOCATION PLAN

FIGURE 1

SCALE: N.T.S.

JOB NO: 60275



KEY

- : WINDOWLESS SAMPLER BOREHOLE
- : TRIAL PIT
- G** : MONITORING WELL INSTALLED
- : ASBESTOS SAMPLING LOCATION (A01 - A13)
- : APPROXIMATE EXTENT OF AREA WITH VISUALLY IDENTIFIED SUSPECTED ASBESTOS CONTAINING MATERIALS (ACM)
- : LOCATIONS WHERE ASBESTOS WAS ENCOUNTERED IN THE SOILS

REV	DATE	DESCRIPTION	DRAWN	CHKD
A	FEB 21	ASBESTOS SAMPLING LOCATIONS ADDED	FM	KD

REVISIONS

This drawing is to be read in conjunction with all other Engineer's drawings and all other project information. Any discrepancy between the Engineer's drawings and other project information is to be reported to the Engineer immediately.



Project
**STARLINGS
 MILTON ROAD
 HARWICH**

Title
**EXPLORATORY HOLE LOCATION
 PLAN**

Client
TENDRING DISTRICT COUNCIL

Scale 1:200 @ A1	Drawn J.BAKER	Date DEC 2019
Job Manager R.LAYCOCK	Checked K.O'REILLY	Approved K.O'REILLY

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 The Windhouse, Bonds Mill, Stonehouse, Gloucestershire GL10 3RF

Drawing No. 60275/G/FIG02	Revision A
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<input checked="" type="checkbox"/> INFORMATION	<input type="checkbox"/> APPROVAL	<input type="checkbox"/> COSTING
<input type="checkbox"/> TENDER	<input type="checkbox"/> CONSTRUCTION	<input type="checkbox"/> AS CONSTRUCTED

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 Do not scale from this drawing. All contractors must visit the site and be responsible for taking and checking Dimensions.

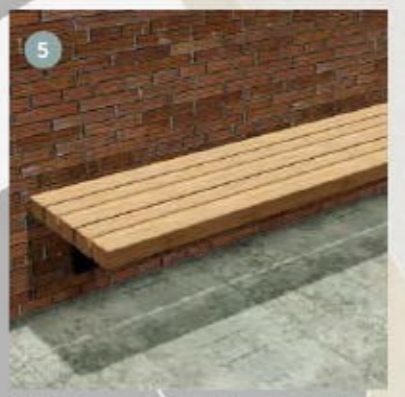
- Key**
- Application boundary
 - A Area with raised planting and benches
 - B Public toilets
 - C Electric supply
 - D
 - E Widened entrance & kerbs adjusted
 - F One way road
 - G Steps to car park
 - H Climbing vegetation along retaining walls
 - I Pocket green space
 - J Cycle storage



1 Marshall drivesett Tegula Traditional block paving



4 Retaining wall - Ibstock Class B red 65mm perforated engineering brick



5 Wall mounted timber bench



2 Tarmac



3 Gravel/Shingle (min 10mm) trench to boundary with existing



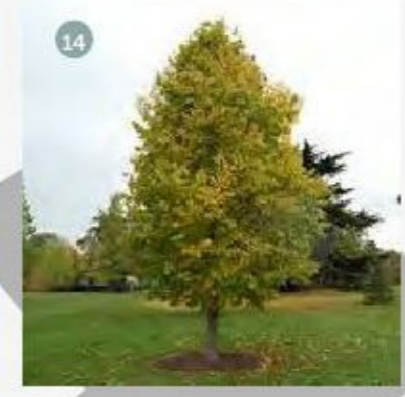
10 Light Post (SwanNeck Bracket, 936 Merrion, VeeLite)



11 Derby Compact Litter bin BX45G 2550-CMP



15 Ornamental pear - (Pyrus Caleryana Chanticleer)



14 Corner tree - Turkish Hazel



13 Planting along retaining wall



12 Railing to retaining wall (polyester powder coated matt black)



6 Feature tree - Freeman Maple (Acer Freemanii)



7 Low Planting along walls and



8 Timber Bench



9 Narrow columnar oak (Quercus robur fastigiata)



10 Ticket board



11 Ticket machine



Rev	Date	Description	Drawn	Check
04.03.21		First issue	CR	NB

Client: Tendrig District Council

Boyer

Project: Starlings Block, Land South of High Street, Dovercourt

Drawing Title: Illustrative Masterplan

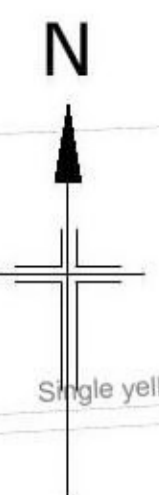
Drawing No: 171 Job Ref: 21.2005

Scale @A2: 1:250 Revision: -

Scale Bar: 0m 5m 10m

Reproduced from the Ordnance Survey map with the permission of Ordnance Survey on behalf of AN 100087226
 Boyer Planning Ltd, Coochome House, New Mile Rise, Widdingham, Barking, RG45 3JZ

DO NOT SCALE



NOTES:

- THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL RELATED RICHARD JACKSON LTD ARCHITECTS & SUB-CONTRACTORS DRAWINGS AND RELEVANT REPORTS. IN THE CASE OF DISCREPANCIES BETWEEN DRAWINGS REFER TO RJD FOR CLARIFICATION.
- TOPOGRAPHICAL SURVEY UNDERTAKEN BY SURVEY SOLUTIONS, NAMELY DRAWING NUMBER 25563e-01 DATED NOVEMBER 2018.
- BASED UPON LAYOUT INFORMATION PROVIDED BY TENDRING DISTRICT COUNCIL AS PART OF THE TENDER PACKAGE AND ONGOING DISCUSSIONS.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR LOCATING AND PROTECTING ALL EXISTING SERVICES AFFECTED BY THE WORKS.
- LEVEL INFORMATION AS SHOWN IS THE REGRADE STRATEGY AND DOES NOT REFLECT FINAL DETAILED DESIGN LEVELS. THE KEY SHOULD BE REFERRED TO.
- THE STRATEGY HAS BEEN PREPARED TO MAKE AN ASSESSMENT OF THE REQUIREMENT FOR RETAINING FEATURES AND BOUNDARY TREATMENTS AS PART OF TENDRING DC SITE APPRAISAL. IT HAS BEEN PREPARED TO BE IN ACCORDANCE WITH CURRENT GUIDELINES AND ACCOMMODATE REASONABLE AND PRACTICAL GRADIENTS ACROSS SITE.
* FURTHER DETAILS OF THE LEVEL STRATEGY CAN BE FOUND IN RICHARD JACKSONS ENGINEERING ASSESSMENT REPORT.
- THE CUT AND FILL HAS BEEN BASED UPON A REDUCED FORMATION LEVEL OF THE CAR PARKING AREA, 500mm REDUCED FROM PROPOSED FINISHED LEVEL TO ACCOMMODATE CONSTRUCTION BUILD UP. THICK THICKNESS SHOULD BE QUALIFIED THROUGH THE DETAILED DESIGN PROCESS.
- THE COLOUR BANDING IS BASED UPON THE SITE FORMATION LEVELS VS EXISTING TOPOGRAPHICAL LEVELS.
- THE GRID OF LEVELS IS BASED UPON PROPOSED FINISHED STRATEGY LEVELS AND EXISTING SITE LEVELS.
- IT SHOULD BE NOTED THAT THE EXISTING LEVELS ARE BASED UPON WHAT WAS RECORDED ON SITE AND DO NOT ALLOW FOR THE CLEARANCE OF DEBRIS OR PILED MATERIAL WHICH MAY NEED TO BE DISPOSED OF PRIOR TO THE WORKS. FOR COMPLETENESS AND A MORE ACCURATE REPRESENTATION OF THE CUT AND FILL A FURTHER ASSESSMENT SHOULD BE UNDERTAKEN FOLLOWING SITE CLEARANCE.
- THIS ASSESSMENT MAKES NO ALLOWANCE FOR THE DIFFERENT DESIGNATIONS OF MATERIALS TO BE EXPORTED OR IMPORTED AND SHOULD BE USED AS A VOLUMETRIC GUIDE ONLY.
- THE LEVELS SHOWN ON THIS DRAWING SHOULD NOT BE USED TO FORM ANY CONSTRUCTION.
- LEVEL STRATEGY SUBJECT TO CHANGE THROUGH DETAILED DESIGN PHASE TO ACCOMMODATE SITE CONSTRAINTS AND PRESENT FEATURES, THIS ASSESSMENT IS THEREFORE ONLY VALID UPON THE DATE OF ISSUE/ WHILE THE BASIS OF INFORMATION IS CURRENT.

CUT Depth Bands

- Band 10 -1.80 - -1.80
- Band 9 -1.40 - -1.60
- Band 8 -1.20 - -1.40
- Band 7 -1.00 - -1.20
- Band 6 -0.80 - -1.00
- Band 5 -0.60 - -0.80
- Band 4 -0.40 - -0.60
- Band 3 -0.20 - -0.40
- Band 2 -0.00 - -0.20

FILL Depth Bands

- Band 1 0.00 - 0.20
- Band 2 0.20 - 0.40
- Band 3 0.40 - 0.60
- Band 4 0.60 - 0.80
- Band 5 0.80 - 1.00
- Band 6 1.00 - 1.20
- Band 7 1.20 - 1.40
- Band 8 1.40 - 1.60
- Band 9 1.60 - 1.80
- Band 10 1.80 -

INDICATES 'ZERO' CUT/FILL

EXISTING TO FORMATION LEVEL

Prismoidal Volume Calculations

Summary of Total Volumes of Cut/Fill:

PGM1 (Existing) model: EXISTING TOPOGRAPHICAL SURVEY
PGM2 (Proposed) model: PROPOSED CAR PARK FORMATION (500mm REDUCED)

relative to PGM1 surface	Cut (m3)	Fill (m3)
Total Gross:	343.9	499.7
Nett:		155.9

REV	DATE	DESCRIPTION	DRAWN	CHKD
REVISIONS				

This drawing is to be read in conjunction with all other Engineer's drawings and all other project information. Any discrepancy between the Engineer's drawings and other project information is to be reported to the Engineer immediately.



Project
**PROPOSED CAR PARK
ORWELL ROAD**

Title
**LEVEL STRATEGY AND
CUT & FILL
OPTION 3**

Client
TENDRING DISTRICT COUNCIL

Scale	Drawn	Date
1:100 @ A1	MCB	04/03/2020
Job Manager	Checked	Approved
RPL	JJT	RPL



Drawing No.	Revision
60275/C/06	-

Drawing Status	APPROVAL	COSTING
<input checked="" type="checkbox"/> INFORMATION	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/> TENDER	<input type="checkbox"/> CONSTRUCTION	<input type="checkbox"/> AS CONSTRUCTED

Appendix B

Tier One Screening Values

Reference Criteria for Soils

In 2014 Land Quality Management Ltd (LQM) and the Chartered Institute of Environmental Health (CIEH) published 'Suitable 4 Use Levels' (S4ULs) for human health risk assessment. The S4ULs have been derived in accordance with UK legislation, national and Environment Agency policy using a modified version of the Contaminated Land Exposure Assessment (CLEA) software. The S4ULs are based on minimal or tolerable risk as described in SR2 (Environment Agency, 2009a).

The S4ULs are intended to replace the 2nd edition of the LQM/CIEH Generic Assessment Criteria (GAC).

The S4ULs have also been used to replace the Environment Agency Soil Guideline Values (SGVs), which were defined in 2009 alongside updates to the CLEA methodology and software.

The parameters detailed in the LQM/CIEH S4ULs publication have been adapted using the CLEA software to reflect site specific conditions, including the Soil Organic Matter (SOM).

A global SOM of 1% has been adopted for organic chemicals for the purposes of the initial assessment. A SOM of 6% has been adopted for inorganic chemical as detailed in 'The LQM / CIEH S4ULS for human health assessment', (2015).

In the absence of a comprehensive toxicology and physical parameter data no S4UL has been derived for lead. In March 2014 DEFRA published Category 4 Screening Levels (C4SLs) for six contaminants including lead. The C4SLs are based on a unique toxicological benchmark, 'Low Level of Toxicological Concern' rather than the 'minimal or tolerable level of risk' which forms the basis for the S4ULs.

It is understood the site is to be developed for commercial purposes, however, for the purposes of assessing materials to be imported to the site, the more conservative S4ULs for residential land use with homegrown produce have been adopted as these generally represent the most conservative screening values and should be used to assess the suitability of 'clean' backfill. Furthermore, the screening value concentrations of each of the TPH fractions has been limited to 500mg/kg unless the screening value for the protection of human health is less than 500mg/kg.

The screening values which are to be applied for backfill materials at the site are detailed in the below table.

Tier One Screening Values for Human Health

Contaminant	Source of Screening Value	Screening Value (mg/kg)
Arsenic	S4UL ¹	37
Cadmium	S4UL ¹	11
Chromium	S4UL ¹	910
Copper	S4UL ¹	2,400
Nickel	S4UL ¹	180
Lead	C4SL ³	200
Selenium	S4UL ¹	250
Mercury	S4UL ¹	40
Zinc	S4UL ¹	3,700
Benzo(a)pyrene	S4UL ²	2.2
Dibenz(a,h)anthracene	S4UL ²	0.24
Naphthalene	S4UL ²	2.3
TPH Aromatic C ₅ -C ₇	S4UL ²	70
TPH Aromatic C ₇ -C ₈	S4UL ²	130
TPH Aromatic C ₈ -C ₁₀	S4UL ²	34
TPH Aromatic C ₁₀ -C ₁₂	S4UL ²	74
TPH Aromatic C ₁₂ -C ₁₆	S4UL ²	140
TPH Aromatic C ₁₆ -C ₂₁	S4UL ²	260
TPH Aromatic C ₂₁ -C ₃₅	S4UL ²	500*
TPH Aromatic C ₃₅ -C ₄₄	S4UL ²	500*
TPH Aliphatic C ₅ -C ₆	S4UL ²	42
TPH Aliphatic C ₆ -C ₈	S4UL ²	100
TPH Aliphatic C ₈ -C ₁₀	S4UL ²	27
TPH Aliphatic C ₁₀ -C ₁₂	S4UL ²	130
TPH Aliphatic C ₁₂ -C ₁₆	S4UL ²	500*
TPH Aliphatic C ₁₆ -C ₃₅	S4UL ²	500*
TPH Aliphatic C ₃₅ -C ₄₄	S4UL ²	500*
Sulphide	Assumed	250

¹Limit value adopted based upon Suitable 4 Use Level for non-organic contaminants, residential land use with homegrown produce and a soil organic matter (SOM) of 6%

² Limit value adopted based upon Suitable 4 Use Level for organic contaminants, residential land use with homegrown produce and a global SOM of 1%

³ Limit value adopted based upon DEFRA Category 4 Screening Level for residential land use with homegrown produce.

*These values have been limited to 500mg/kg as discussed above.

Title: REMEDIATION METHOD STATEMENT
 Project: Starlings, Milton Road, Harwich, Essex
 Client: Tendring District Council
 Project No.: 60275

Appendix C

Discovery Strategy

Title: REMEDIATION METHOD STATEMENT
Project: Starlings, Milton Road, Harwich, Essex
Client: Tendring District Council
Project No.: 60275

Discovery Strategy

Should an area of unexpected contamination be identified or suspected by visual, olfactory or wellbeing means during the redevelopment of the site, the discovery strategy presented below should be implemented.

The following table outlines the responsibilities of persons in different roles when unexpected contamination is encountered:

Person Observing Contamination	To be reported to:	Action to be taken:
Site Visitor	<ul style="list-style-type: none"> Site Manager 	None further by site visitor
Contractor	<ul style="list-style-type: none"> Site Manager 	Where possible works are to cease. The area should be made safe and secure prior to reporting to the site manager.
Site Manager	<ul style="list-style-type: none"> Direct Manger (if applicable) Appointed Environmental Consultant Tendring District Council Planning authority TDC Environmental Health Officer (EHO) 	Where possible works are to cease. The area should be made safe and secure prior to reporting to the required persons.
Environmental Consultant	<ul style="list-style-type: none"> Site Manager TDC Planning Authority TDC EHO 	Advise persons working on the site that works are to cease and that the area is made safe and secure before reporting to required persons.

In accordance with the above responsibilities, the appointed Environmental Consultant will be informed, by the site-manager, of the instances of suspected contamination encountered during the redevelopment of the site. The Environmental Consultant should attend site to inspect the area of suspected contamination and develop a remedial strategy for the encountered contamination.

Unexpected contamination encountered during the redevelopment of the site should be isolated from other materials on site whilst a remedial strategy is prepared. The remedial strategy should include details on how to deal with the encountered contamination including how contaminated material should be disposed of.

The remedial strategy for the encountered contamination should be presented as an operational amendment to this RMS and submitted to TDC EHO for consideration and approval. The required mitigation measures should be implemented.

It is possible that during the redevelopment of the site, contamination may be encountered which is considered to pose a risk or nuisance to site neighbours or the general public. In this instance the TDC planning authority, pollution control team and the Health and Safety Executive should be informed. Where the encountered contamination is considered to pose a potential risk to life, the emergency services should be contacted immediately. If conditions encountered on-site during the development are considered to pose a potential risk of pollution to adjoining land, the owner of the adjoining land will be informed as will the TDC planning team and EHO.

