



Remediation Strategy Bignor Street Park, Cheetham Hill

Prepared for Conlon Construction Ltd

27th July 2023

Phil Hill
Senior Geo-Environmental Engineer
phil.hill@clancy.co.uk

enquiries@clancy.co.uk
www.clancy.co.uk

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Clancy Consulting Ltd
Dunam Court
2 Dunham Road
Altrincham
Cheshire
WA14 4NX

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Conlon Construction Ltd
Charnley Fold Lane
Bamber Bridge
Preston
PR5 6BE

FAO John Hicks

Dear John

Remediation Strategy Report Bridge Street Park (Olive School), Cheetham Hill

Background

Clancy Consulting Ltd (CCL) has been instructed by Conlon Construction Ltd to prepare a Remediation Strategy for the redevelopment of the above site. The site covers an approximate area of 1.22 ha and is currently occupied by a public park comprising soft landscaped areas with a number of trees along the southern, eastern and western site boundaries. Hard surfaced play areas are present to the north with Brentfield Avenue beyond. Surrounding land uses are typical of a sub-urban area including housing estates, schools and public open space.

The proposal is for the redevelopment of the site with a new two storey primary school building with car parking and access in the central and northern area. A mini football field is proposed in the southern part of the site along with a multi-use games area (MUGA), habitat area and hard surfaced play areas in the west. The southern boundary of the site, adjacent to the mini football pitch is currently occupied by trees (with root protection zones) and is proposed to be planted with wildflowers.

The proposed development layout and landscape masterplan are shown on the drawings in Appendix I.

This Remediation Strategy follows previous phases of investigation works which have been undertaken by CCL, the findings of which are presented in the following documents:

- Phase 1 Desk Study report Bignor Street Park, Cheetham Hill: Clancy Consulting Ltd: reference 10/2204/001 dated December 2022.
- Phase 2 Site Investigation Report, Bignor Street Park, Cheetham Hill: Clancy Consulting report ref 10/2204/002 dated April 2023.

It is recommended that this current report be read in conjunction with those referenced above.

This document provides a summary of site investigation data presented in the above reports and outlines the remediation objectives necessary to protect environmental and human health receptors from potential contamination sources and ensure the site is suitable for the proposed development.

Site Setting

British Geological Survey mapping indicates the site to be underlain Glaciofluvial Sheet deposits comprising sand and gravel across the majority of the site with Devensian Till (Diamicton) in the southwestern corner of the site. Solid bedrock comprises sandstone of the Chester Formation.

The site is indicated to lie within a Coal Mining Reporting Area and on that basis a Consultants Coal Mining Report was obtained for the site. The report confirmed that the site does not lie within a Development High Risk Area, in addition, there are no recorded shallow mine workings or mine entries within 1km of the site.

The Glaciofluvial Sheet deposits underlying the majority of the site are classified by the EA as a Secondary A Aquifer, The Devensian Till deposits in the southwestern corner of the site are classified as Secondary Undifferentiated Aquifer.

The Chester Formation, indicated to be present beneath the superficial deposits, is classified by the EA as a Principal Aquifer. There is a small area in the northeastern corner of the site which is designated to be Secondary B Aquifer.

There are no active or recent landfill records within 500m of the site.

There are three historical landfill sites recorded within 500m of the site located between 350m southwest and 434m southeast of the site. One registered waste treatment site is present 323m to the southwest (licence lapsed/cancelled).

Summary of Site Investigation Findings

The site investigation comprised two cable percussion boreholes (BH1 and BH2) to depths of approximately 20.00m bgl, four window sampler boreholes (WS1 to WS4) to depths up to 5.45m bgl and ten machine excavated trial pits (TP1 to TP10) to depths of up to approximately 3.10m bgl.

Groundwater and ground gas monitoring wells were installed in boreholes BH1, BH2, WS1 and WS2 and SPTs were undertaken throughout the depth of each borehole. In addition, soakaway tests were carried out in three trial pits (TP1 to TP3) to assist with drainage design and four DCP tests (DCP1 to DCP4) were carried out in areas of proposed hardstanding to provide indicative CBR values. A copy of the exploratory hole location plan is attached.

Made Ground was recorded in all exploratory locations to depths between 1.00m and 1.90m bgl underlain by Glaciofluvial Sheet Deposits, comprising interbedded soft to stiff cohesive soils and very loose to medium dense granular deposits. This was in turn underlain by Devensian Till from circa 16.30m bgl comprising stiff and very stiff clay to a maximum proven depth of 20.45m bgl.

Concentrations of benzo(a)pyrene, benzo(b)fluoranthene, naphthalene and beryllium were recorded in samples of Made Ground collected from TP3, TP6 and TP10, in excess of their adopted AC. As such it is recommended that a 300mm thickness of clean capping layer, comprising at least 100mm thickness of topsoil, be placed in areas of soft landscaping to form a barrier between recorded contaminants of concern and future site users.

In the location of TP3 significantly elevated concentrations of naphthalene were recorded. Whilst it is possible the elevated concentrations are related to slag and clinker recorded in the sample analysed, given the sensitive nature of the proposed development and environmental setting (Secondary A and Principal Aquifers beneath the site) it is considered prudent for the contaminated Made Ground soils in the vicinity of TP3 to be locally excavated and disposed off site to ensure the protection of site end users and controlled waters receptors.

Based on the ground gas monitoring undertaken at the site (6 visits over a 3 month period), the ground gas regime corresponds to CIRIA CS1. On this basis, basic ground gas protection measures would not be required beneath new buildings.

No remedial measures are proposed on the area surrounding the mini football pitch in the south. Levels in this part of the site are to be maintained to avoid potential damage to the existing tree root systems. It is also envisaged that this area will have restricted access to end users of the site as it will form a low maintenance planting and wildflower meadow and as such we do not consider there to be a risk to human health from exposure to the underlying Made Ground soils in this part of the site.

Remediation Strategy

The following mitigation measures are recommended to break the pollutant linkages associated with the site, summarised above:

- In the area around TP3 the naphthalene impacted Made Ground soils are to be excavated and disposed off-site to a suitably licenced landfill. A PID meter should be used to assist in identifying potentially volatile contaminants during this process.
- It is recommended that a 300mm thickness of clean capping layer, comprising at least 100mm thickness of topsoil and 200mm of subsoil be placed in areas of soft landscaping readily accessible to pupils to form a barrier between recorded contaminants of concern and future site users.
- Chemical testing of soils imported for use within the clean soil cover layer.
- Validation of clean cover depth where required in soft landscaped areas.
- Provision of a Verification Report demonstrating the works above have been completed in a satisfactory manner.

Excavation of Contaminated Soils

In the sample taken from of TP3 (0.5m), elevated concentrations of PAH contamination (most notably naphthalene) have been identified which have the potential to impact upon the end users of the site and controlled waters. Given the majority of samples of this material analysed contained PAH compounds below the required GAC, CCL consider that the contamination is localised. It is therefore recommended that this area be excavated and removed from site.

The excavation of contaminated soils should be supervised by a qualified geo-environmental consultant. The consultant will identify visual evidence of contamination in soils and direct the excavation works.

It is anticipated that excavations will, as a minimum, extend to the base of the Made Ground materials. However, this will be confirmed by the supervising consultant on site. It may be necessary to deepen excavations locally to chase out visual and olfactory evidence of contamination. A PID meter will be utilised to assist in 'chasing out' any volatile materials for completeness.

Contaminated soils excavated should be stockpiled in a designated area prior to disposal. The stockpile will be placed on impermeable hard surfacing or plastic sheeting and bunded to prevent leaching of contamination into shallow soils. Alternatively, the contaminated soils could be loaded directly onto appropriately sheeted wagons for immediate disposal to landfill.

Materials exported to landfill should be hauled by a registered waste carrier in accordance with the requirements of the Duty of Care Regulations, 1991 and the Landfill Regulations (England and Wales) 2002. A transfer note should be completed, signed and retained by the parties involved. The transfer note should include the volume and nature of the waste material, details of the source, disposal site and the haulier.

Once contaminated soils have been excavated, the supervising consultant shall collect soil samples from the sidewalls and base of the resulting excavation. Samples will be analysed for the contaminants of concern i.e. speciated PAH compounds by a UKAS accredited analytical laboratory. The results will be compared against relevant soil screening values for the protection of controlled waters and human health. If results are recorded in excess of these limits, additional soils will be removed and the excavation extended. Sampling and testing of soil samples from the sidewalls and base of the excavation will be repeated until the contaminated soil is fully removed.

Following completion, the works to remove the identified contamination hotspot should be detailed in a Verification Report. This should include approximate volumes of contaminated soil removed, the name of the disposal facility used, copies of the validation test certificates and photographic evidence of the works being carried out. This will be required by the Local Authority to demonstrate that specified remediation works have been carried out successfully and to discharge planning conditions relating to the remediation of identified ground contamination.

The works summarised above would apply to the remediation of previously unidentified contaminated soils recorded across the proposed development area during the groundworks phase of the proposed development. Suspected contamination identified on site shall be brought to the attention of the supervising geo-environmental consultant.

Should significant unexpected contamination be encountered then a new or amended remediation strategy may be required. In such instances the LPA shall be notified and the new or amended remediation strategy should be agreed with them.

Clean Soil Cover

Given the nature of the Made Ground soils and presence of elevated soil contaminant concentrations some form of remediation is required. In the location of the mini football field, habitat area and general soft landscaping a 300mm layer of verified clean soil cover should be provided, including a minimum 100mm thickness of topsoil and 200mm subsoil in accordance with guidance set out in the NHBC Technical Standards 2022. The clean cover layer will form a barrier between recorded contaminants of concern and future site users, thus breaking the pollutant linkage.

The areas requiring clean soil cover are shown on the Landscape Masterplan drawing in Appendix. In particular this relates to areas of landscaping annotated as Amenity Turf, Sports Turf and Ornamental Shrub Planting. As previously mentioned, areas of wildflower seeding and tree protection zones are excluded given these areas will remain largely inaccessible and to avoid potential damage to the protected tree root systems.

It will be necessary to carry out chemical testing on any material proposed for use within the clean cover layer to demonstrate it is suitable for use. The testing is recommended to be carried out at source prior to importation but can be done following placement (though there is a risk that if the material fails, it will need to be removed and replaced).

Topsoil / subsoil testing should be carried out by a qualified geo-environmental consultant, at a frequency of one sample per 50m³ for imported topsoil and one sample per 250m³ for subsoil (imported or site won).

Samples would require chemical testing for pH, metals / metalloids, speciated PAHs and screening for the presence of asbestos as a minimum. If the imported soils are from a Brownfield / recycled source, chemical testing should also include speciated TPH analyses.

Topsoil provided in the top 100mm of the clean cover (minimum) should be compliant with the specification provided within NHBC Technical Standards (2022)

The test results will then be compared against the relevant Soil Screening Values (SSVs) for a residential without plant uptake end use scenario, deemed appropriate to the proposed development due to the proposals to include a primary school. A list of the SSVs is appended to this report.

The thickness of the clean cover provided should be confirmed by the geo-environmental consultant by excavating a hand dug pit to the base of the clean cover. Within areas of soft landscaping, two pits should be dug to confirm thickness for each separate area or one per 100m² of each landscaped area, whichever is the greater. Scaled photographs should be taken of each pit, demonstrating the thickness and quality of clean cover provided.

Following completion of the works, the evidence summarised above (including chemical laboratory certificates and scaled photographs demonstrating thickness of cover provided) should be detailed in a Verification Report. This will be required by the Local Authority to demonstrate that specified remediation works have been carried out successfully.

Verification Report

Following remedial works a verification report should be produced which documents that all remedial measures have been completed. The verification report should include, as a minimum, the following:

- Approximate volumes of contaminated soils removed;
- The name of any disposal facility used for removal of contaminated soils;
- Copies of the chemical test certificates from samples taken following removal of contaminated soils;
- Photographic evidence of the contaminated soil works being carried out;
- Chemical test certificates for soils imported for clean cover in garden and soft landscaped areas;
- Scaled photographs demonstrating thickness of clean cover within garden and soft landscaped areas;
- Chemical test certificated for any imported stone aggregates or virgin quarried materials.

We trust the above and attached are satisfactory. However, should you require further information, please contact the undersigned.

Yours sincerely,



Philip Hill
Senior Geo-Environmental Engineer
For and on behalf of Clancy Consulting Ltd

Enc Exploratory Hole Location Plan (CCL)
 Proposed Site Layout Plan
 Landscape Masterplan
 Soil Screening Values



- Key
-  Cable Percussion Borehole
 -  Window Sampler Borehole
 -  TRL Dynamic Cone Penetrometer Test (CBR)
 -  Machine Excavated Trial Pit
 -  Machine Excavated Trial Pit + Soakaway Location

A	JAN 2023	Original Drawing	SP	CHK.	APP.
Rev	Date	Description	By	Check	App.

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Client	Conlon Contruction Ltd		
Project	Olive Primary School. Manchester		
Office	Manchester		
Discipline	GeoEnvironmental		
Title	Exploratory Hole Location Plan		
Drawn	SP	Date	Nov 2022
Checked		Scale @ A3	NTS
Approved		Status	LIVE



Job number	Drawing number	Revision
10/2204	002	A



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■ Drawing not to be scaled

■ Report Errors and Omissions to the Architect.

■ Check all dimensions on site

■ Drawing to be read in conjunction with the Health and Safety Plan and all relevant Risk Assessments

1:50
1:100

1m
1m

2
3

4
5
6

N

Q

00 Proposed Site Plan - Roof

1 : 500

BOWKER SADLER ARCHITECTURE

Hatherlow House | Hatherlow | Romiley | Stockport | SK6 3DY
0161 406 7333 | office@bowker-sadler.co.uk | www.bowker-sadler.co.uk

Project
Olive Primary School,
Manchester

Client
Conlon Construction Limited

Drawing
Proposed Site Plan - Roof

Scale 1 : 500	Sheet Size @ A1	Drawn SW	Checked AC	Date 8.12.22
Project No. FS0766	Originator -BSA-	Zone XX	Level -XX-	Form D -
Status	Discipline A -	Number 1004	Revision C	

Planning



NOTES:

1. Drawing scaled & issued for planning purposes only.
2. All setting out, levels & dimensions to be checked on site by the Contractor (s) prior to the relevant orders being placed & installation of materials, any discrepancies are to be brought to the attention of the client & contract administrator.
3. This drawing is to be read in conjunction with all others relating to the project & all information derived accordingly, any amendments to be reported to the client & contract administrator.
4. Work shown on this drawing to be carried out in accordance with current British Standards & Codes of Practice.
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KEY

- Existing tree or vegetation to be retained & protected in line with Arboriculturalist proposals
- Existing tree or vegetation to be removed in line with Arboriculturalist proposals
- Native Tree Species
- Fruit Tree
- Native hedge mix
- Tarmac/ rubber crumb surfacing
- Bark mulch surfacing
- Hoggins/ sealed surface
- Block paving
- Non permeable Tarmac - Pedestrian
- 4000mm high cricket netting & cage
- 1000-1300mm high pedestrian door barrier
- 1000-1200mm high pedestrian guard rail
- Hand rail
- Flag on edge retaining wall
- Amenity Turf
- Sports Turf
- Ornamental shrub planting
- Wildflower mix 1
- Wildflower mix 2
- Permeable Tarmac - Pedestrian
- Non permeable Tarmac - Vehicular
- MUGA Permeable Sports pitch surfacing
- Permeable Sports pitch surfacing - Cricket
- Artificial grass surfacing
- 2400mm high welded mesh security fence
- 2100mm high welded mesh security fence
- Security fence 1800mm high welded mesh security fence
- Metal railings 1200mm high bow top railings
- Timber fence 1800mm high timber close boarded fence
- Sports perimeter fence 1500mm high welded mesh fence

LANDSCAPE IMAGE EXAMPLES



Security & sports fencing



Bow top fencing



Block paving



Rubber crumb path



Outdoor teaching zone



Native tree planting



Native hedge mix



Low maintenance ornamental planting & wildflower meadow



Raised vegetable beds



Willow tunnel

Rev	Description	Initial	Date
E	Amended to latest site plan	KAS	May23
D	Parking updated, bins & benches added	KAS	Mar23
C	Amended to latest site plan	KAS	Mar23
B	Updated to site plan & detailed planting props	KAS	Jan23
A	Amended to latest site plan	KAS	Nov22

saville LANDSCAPE DESIGN
Hatherlow House Romiley Stockport Cheshire SK6 3DY
T : 0161 406 7333 E : info@savillelandscape.co.uk
M : 07502 289193 W : www.savillelandscape.co.uk

CLIENT Conlon Construction Ltd	PROJECT TITLE Olive Primary School, Manchester
DRAWING TITLE Landscape Masterplan	STATUS PLANNING
SCALE 1:250	SHEET SIZE A1
DRAWN KAS	CHECKED -
DATE May23	REV. E
PROJECT NO. 406	DRAWING NO. 01

SITE SCREENING VALUES (SSVs)

RESIDENTIAL END USE WITHOUT PLANT UPTAKE 1% SOM

CONTAMINANT	SSVs
Arsenic	40
Beryllium	1.7
Boron	11000
Cadmium	85
Chromium III	910
Chromium VI	6
Copper	7100
Lead	310
Mercury Elemental	1.2
Mercury Inorganic	56
Methylmercury	15
Nickel	180
Selenium	430
Vanadium	1200
Zinc	40000
Benzene	0.38
Toluene	880
Ethylbenzene	83
o-xylene	88
m-xylene	82
p-xylene	79
Aliphatic EC 5-6	42
Aliphatic EC >6-8	100
Aliphatic EC >8-10	27
Aliphatic EC >10-12	130
Aliphatic EC >12-16	1100
Aliphatic EC >16-35	65000
Aliphatic EC >35-44	65000
Aromatic EC 5-7 (benzene)	370
Aromatic EC >7-8 (toluene)	860
Aromatic EC >8-10	47
Aromatic EC >10-12	250
Aromatic EC >12-16	1800
Aromatic EC >16-21	1900
Aromatic EC >21-35	1900
Aromatic EC >35-44	1900
Acenaphthene	3000
Acenaphthylene	2900
Anthracene	31000
Benzo[a]anthracene	11
Benzo[a]pyrene	3.2
Benzo[b]fluoranthene	3.9
Benzo[ghi]perylene	360
Benzo[k]fluoranthene	110
Chrysene	30
Dibenz[ah]anthracene	0.31
Fluoranthene	1500
Fluorene	2800
Indeno[123-cd]pyrene	45
Napthalene	2.3
Phenanthrene	1300
Pyrene	3700

**All SSVs are based on The LQM/CIEH S4ULs for Human Health Risk Assessment 2015) & (CL:AIRE Category 4 Screening Levels 2014)*