REMEDIATION METHOD STATEMENT

Northorpe Lane, Mirfield, West Yorkshire

Report: 26058-RMS

Date: July 2026

Client:
Chartford Homes Ltd
The Tannery
91 Kirkstall Road
Leeds
West Yorkshire
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REMEDIATION METHOD STATEMENT
Northrope Lane, Mirfield, West Yorkshire

DOCUMENT VERIFICATION

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REMEDIATION METHOD STATEMENT
Northrope Lane, Mirfield, West Yorkshire

1. EXECUTIVE SUMMARY

Proposed Development	• 44 low-rise residential houses with private gardens and soft landscaping. • New adoptable estate roads.
History	• Primarily open grassed fields alongside a residential property, with associated domestic gardens, outbuildings and fish ponds.
Environmental Assessment	• Elevated total arsenic in topsoil - bioaccessibility testing confirmed soils are okay for retention or reuse in proposed gardens or soft landscaping areas. • Soils not suitable for off-site transfer due to high total arsenic levels. • No ground gas protection measures deemed necessary by previous Geoenvironmental Appraisal report by Lithos Consulting.
Further Assessment	• Following demolition of existing buildings a localised ground investigation is recommended to ensure that the demolition works have not resulted in any residual contamination. • A series of trial pits are recommended, along with chemical testing of a suitable number of soil samples.
Verification	• On completion of the demolition works and validation of any imported soils needed, a Verification Report will be produced and sent to the Local Authority for their comment and approval.

2. INTRODUCTION

2.1. Project Scope and Objectives

On the instruction of Chartford Homes Ltd a Remediation Method Statement has been prepared by Abbeydale Geoscience for a proposed residential development off Northrope Lane in Mirfield, West Yorkshire. See Figure 1.

This report has been produced to outline what remediation measures might be required as part of the redevelopment of the site, to ensure that residents are not at risk from any shallow depth soils they could be exposed to in any gardens or soft landscaping areas.

2.2. Limitations

This Remediation Method Statement has been prepared by Abbeydale Geoscience for the sole use of our client, Chartford Homes, in support of the proposed residential development at Northorpe Lane, Mirfield. It should not be relied upon or transferred to any other parties without the express written authorisation of Abbeydale Geoscience and our client.

If any other unauthorised third party comes into possession of this report they rely on it at their own risk and the authors owe them no duty of care or skill.

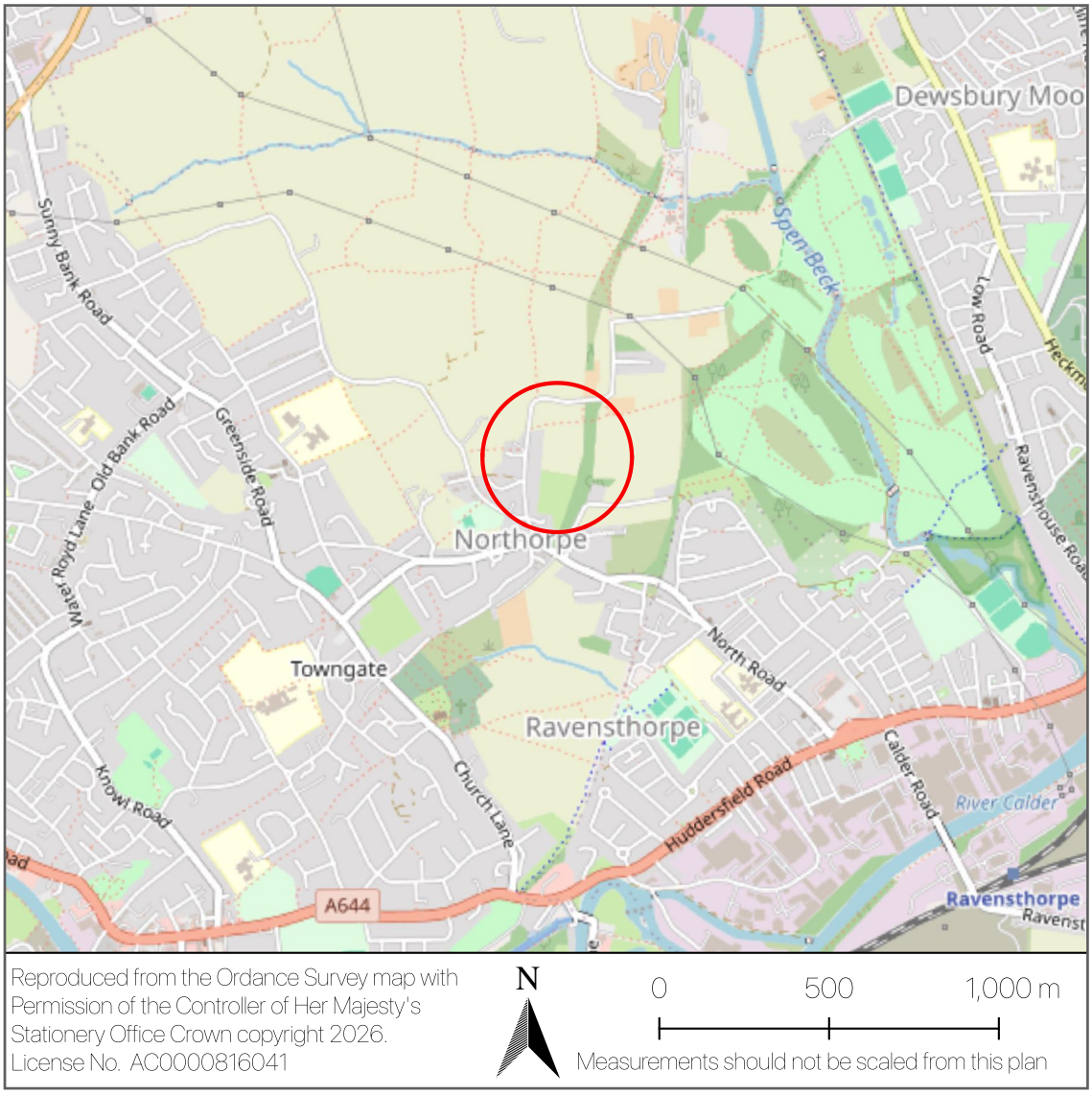


FIGURE 1 - LOCATION PLAN

The drafting of this remediation method statement relies extensively on third-party historical, environmental, and geological data, alongside the intrusive fieldwork and laboratory testing compiled in the Lithos Consulting Geoenvironmental Appraisal (Report No. 3433/2C), dated March 2022.

If there are changes to the nature, scale or layout of the proposed development then some modification to the comments and recommendations given may be required. The proposed site layout is shown on the site plan in Appendix A.

The conclusions, recommendations, and remediation measures detailed in this report are subject to the following inherent limitations and assumptions:

- **Variable Ground Conditions:** Intrusive ground investigations can only examine a small fraction of the total sub-surface area. Therefore, ground, chemical, and groundwater conditions are assumed to be naturally gradational

between exploratory positions. Localised anomalies or unrecorded Made Ground may exist that were not revealed during investigations.

- **Temporal Groundwater Dynamics:** Groundwater levels are highly susceptible to seasonal variations, tidal influences (where relevant), and recent meteorological events. Resting water levels recorded during initial monitoring cycles may not reflect absolute annual or long-term equilibrium conditions.
- **Post-Demolition Uncertainties:** A significant portion of this statement assumes a baseline ground risk model for areas that were structurally inaccessible at the time of the original investigation (i.e., underneath existing buildings, outbuildings, and active fishponds). These zones must be verified via supplementary intrusive investigation post-demolition to eliminate residual ground uncertainties.
- **Third-Party Data Reliance:** Abbeydale Geoscience has exercised reasonable professional skill and care in reviewing information provided by third parties. We have used the available information in good faith, however, the absolute authenticity, accuracy, and completeness of third party information or assessments cannot be independently guaranteed by us.
- **Regulatory Approval:** The recommendations outlined herein represent good engineering practice aimed at achieving regulatory compliance with Yorkshire and Lincolnshire Pollution Advisory Group (YALPAG) standards. However, this document is subject to formal review and written approval by the Local Planning Authority as part of the planning application process, and should also be passed to any other interested parties before commencement on site.

3. THE SITE

The development site occupies an area of approximately 1.4 hectares, located off Northorpe Lane, roughly 3km west of Dewsbury town centre. The site is centred around British National Grid Reference (NGR) E: 421480, N: 421070.

The proposed redevelopment scheme comprises the construction of 44 no. two-storey domestic dwellings. The scope of works includes associated private domestic gardens, areas of Public Open Space (POS), and a dedicated network of adoptable access roads, private driveways, and sub-surface sewers. Given the steep natural topography of the site (falling from east to west at gradients ranging between 1 in 7 and 1 in 13), significant structural earthworks and regrading are anticipated to establish stable development plateaux.

The proposed site layout is shown on Figure 2.



FIGURE 2 - PROPOSED LAYOUT PLAN

4. PREVIOUS INVESTIGATION

4.1. Historical Setting

Historically the site remained primarily as open grassed fields, alongside a residential property with associated domestic gardens, outbuildings, and fishponds.

4.2. Intrusive Ground Investigation

Exploratory investigations undertaken as part of the Lithos Geoenvironmental Appraisal consisted of trial pits and rotary openhole probeholes. Approximate locations of the exploratory holes are shown on Figure 3.

The ground profile across the accessible field areas typically comprised:

- **Topsoil / Made Ground Topsoil:** Encountered to an average depth of 0.3m. This material contains sporadic anthropogenic fragments (ceramic and plastic) within clay loams.

- **Natural Strata:** Cohesive Residual Soil (gravelly clays) extending to an average depth of 1.9m, underlain by completely weathered Lower Coal Measures bedrock (clayey gravels transitioning to mudstones, siltstones, and sandstones).

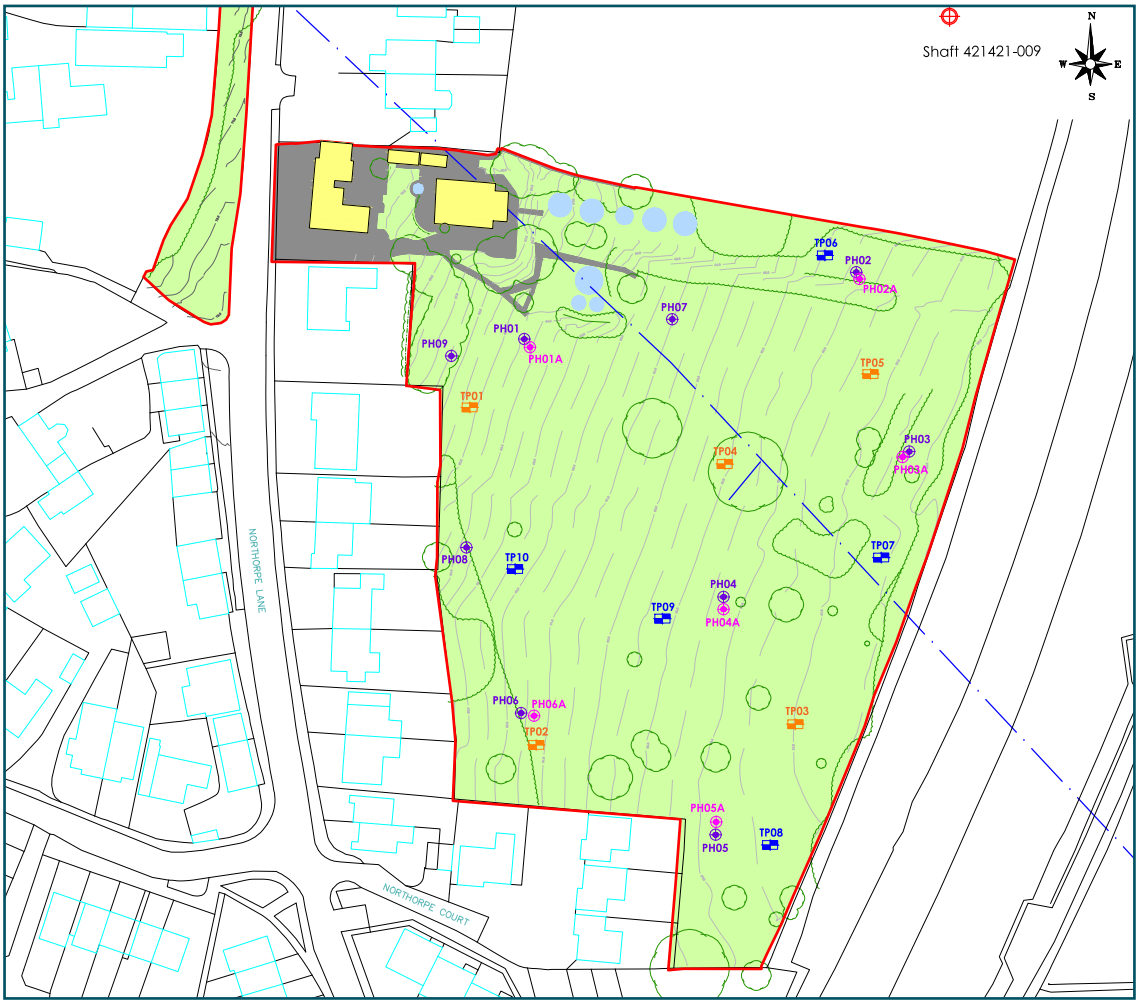


FIGURE 3 - LITHOS EXPLORATORY HOLE PLAN

4.3. Human Health Risk Assessment

Chemical screening of the site's topsoil identified total concentrations of arsenic exceeding the standard tier 1 soil screening value for residential with gardens end-use (37 mg/kg). However, additional site-specific Physiologically Based Extraction Testing (PBET) determined that the bio-accessible fraction of arsenic was less than 3%. Consequently, the existing topsoil was deemed to be chemically safe, and suitable for direct re-use within the on-site domestic gardens as part of the proposed redevelopment of the site.

It was explicitly noted, however, that the topsoil is not chemically suitable for unrestricted offsite transfer or deployment on external developer sites.

The primary residual risk potentially requiring remediation arises from inaccessible footprint underlying the existing house (No. 28 Northorpe Lane), its associated outbuildings, hardstanding yard areas, and fishponds/koi farming facilities.

It is expected that Made Ground (<1.0m deep) will be present beneath these structures, which may contain deleterious or undesirable materials (such as brick, concrete, tarmac, or clinker) structurally and chemically unsuitable for root-zone exposure. Furthermore, natural weathered coal outcrops (Wheatley Lime seam) are present at very shallow depths along the western margins.

Following demolition of the above features it would be recommended to carry out a localised ground investigation to confirm the depth and extent of any made ground, and the need for any associated remediation measures. This will also help to assess that the demolition works have not resulted in any residual contamination.

4.4. Ground Gas Risk Assessment

The response zones within the monitoring wells were often flooded. Bailing of wells was undertaken but the recharge rate was rapid. Where response zones initially remained clear following bailing, gas monitoring was completed. It was interpreted that shallow gas wells were being flooded by deeper confined groundwater breaching bentonite seals in adjacent probeholes advanced to identify mine workings.

No methane was recorded. Carbon dioxide concentrations in excess of 5% were deemed to be marginal and depleted oxygen was only recorded on one occasion. Carbon dioxide and oxygen concentrations were interpreted to be the result of microbial activity, taking place in both the shallow surface soils and to a lesser extent the groundwater, as opposed to hazardous gas migration.

Periods of elevated flow rates were deemed to be the result of groundwater movement, which can cause pressurisation of the monitoring well headspace and lead to artificial peak flow rates that often dissipate quickly.

The Lithos report concluded that no gas protection measures needed to be incorporated into the construction of new residential dwellings.

5. COVER SYSTEM FOR GARDENS & SOFT LANDSCAPING AREAS

Remediation would only be deemed necessary if any previously unidentified potential risks were highlighted during supplementary ground investigation and associated geoenvironmental assessment.

5.1. Post-Demolition Supplementary Intrusive Investigation

Prior to the commencement of main development works, the existing residential property, outbuildings, and fishponds/tanks must be fully demolished, and all concrete slabs/decking cleared.

Immediately following clearing, a supplementary trial pit investigation shall be undertaken within this specific previously inaccessible footprints. This is required to delineate the exact vertical and lateral extent of Made Ground, screen for possible human health risks, and confirm if any localised remediation measures need to be implemented in any gardens or soft landscaping where future receptors could come into contact with shallow depth soils.

Where the supplementary post-demolition investigation identifies heavy or visually poor Made Ground containing sharp or deleterious constituents, an underlying visual warning marker layer or barrier may be specified by the geoenvironmental engineer.

5.2. Possible Remediation Options

If any remediation works were deemed necessary, they would need to be implemented prior to occupation of the dwellings.

The validation works would be undertaken in accordance with the requirements set out in Yorkshire And Lincolnshire Pollution Advisory Group (YALPAG) guidelines *"Verification Requirements for Cover Systems: Technical Guidance for Developers, Landowners and Consultants"* version 4.1, dated June 2021.

To ensure that residents are not exposed to any elevated contaminants in the existing shallow soils in the proposed gardens or new landscaping areas, two general remediation options would be considered:

A. Remove the source of potential contamination by excavating all of the made ground from beneath proposed garden and soft landscaping areas.

B. Install a cover system of clean imported soils over the existing soils in any garden or soft landscaping areas to break potential pathways with any future residents / site users.

The most appropriate option will depend on the depth of made ground in any areas requiring remediation measures to be implemented.

5.3. Reuse of Existing Soils

The Lithos Geoenvironmental Appraisal report confirmed that the existing topsoil across the fields can be reused across new gardens and soft landscaping areas as part of the proposed redevelopment of the site.

Provided that any excavated natural soils are not intermixed with the existing made ground they can be considered for reuse as subsoil in any amenity or soft landscaping areas.

All suitable existing topsoil across the field areas must be carefully stripped and placed into dedicated, sealed stockpiles to prevent mixing with subsoils or construction waste. Strict materials management protocols must be enforced: separate stockpiles must be maintained for clean topsoil, natural cohesive subsoil, broken-up demolition aggregates, and any impacted Made Ground arisings generated during foundation or infrastructure trenching.

6. SOIL VALIDATION

6.1. Overview

In all private gardens and soft landscaped areas where structural Made Ground or reworked material remains in-situ following development regrading, a clean cover system must be implemented to break any potential dermal contact, ingestion, or dust-inhalation pathways.

This should be excavated to a minimum 300mm depth to provide a suitable growing medium thickness, and the existing topsoil can be reused

At this stage we understand that any remediation works will likely to be undertaken by the appointed Main Contractor, including sourcing of any soils that need to be imported to the site, if required.

Validation testing of imported soils and preparation of a Verification Report on completion of the works shall be undertaken by an independent Consultant.

6.2. Imported Soils

If any topsoil or subsoil needs to be imported to the site from external sources to supplement any volume shortfalls, or form part of a clean cover system, must undergo rigorous chemical validation. All testing and verification must comply strictly with the Yorkshire and Lincolnshire Pollution Advisory Group (YALPAG) guidance standards for verification of soil cover depths.

No imported soil shall be spread on site until laboratory test certificates have been formally reviewed and approved by the independent geoenvironmental engineer. Soils must be sourced from clean, verified origins and must be accompanied by full source history documentation.

Before being considered for importation to site the prospective supplier shall provided chemical testing results from within the previous 3 months for the specific soils to be imported to site. The results should be given to the Validation Engineer to confirm that they cover a suitable scope of contaminants and do not have chemical level about the imported soil threshold levels tabulated in Appendix B.

In accordance with YALPAG requirements the following minimum sampling frequencies should be adhered to:

- **Greenfield or manufactured** - 1 sample per 250m^3 OR min. 3 samples.

- **Brownfield or recycled source** - 1 sample per 100m³ OR min. 6 samples.

Each load of imported soil should be visually inspected by the Main Contractor as it is being unloaded, for any obvious visual or olfactory signs of potential contamination. If any soils are suspected of being unsuitable they should either be rejected or quarantined separately until confirmatory testing can be undertaken on the soils.

Any stockpiles of imported soils should be placed away from any sources of potential cross-contamination and sealed to prevent any degradation from inclement weather and avoid the potential for dust emissions. Once confirmed to be chemically suitable the soils should be placed as soon as practical and protected against heavy trafficking or other activities that may result in subsequent contamination prior to final validation of cover thickness.

6.3. Geo-environmental Supervision

Based on the nature and relative simplicity of any remediation works it is likely that any supervision of the remediation works would be undertaken on a part time as-required basis. Although the actual number of validation visits required will be dependent on the phasing of the remediation works as development works progress, the likely minimum number of validation visits is summarised below.

During each site visit photographic records shall be taken by the Validation Engineer; relevant photographs would then be provided in the Verification Report produced on completion of the remediation and validation works.

7. VERIFICATION OF REMEDIATION WORKS

On completion of any remedial works a Verification Report will need to be compiled and submitted to the Local Authority, confirming that the agreed remedial works have been undertaken as proposed and that no residual risks are present to future residents / receptors.

All delivery notes for imported soils should be provided to the Validation Engineer for inclusion in the Verification Report, to confirm the total volume of soils brought to site and adherence to the minimum testing ratios outlined in this Remediation Method Statement report.

Once all gardens and soft landscaping areas have been completed the Validation Engineer shall attend site and hand excavate validation pits in such areas to confirm the depth of capping soils placed and take further samples should any additional validation chemical testing be deemed necessary. The validation pits shall be excavated down to positively identify the geotextile separator membrane installed at the base of the cover system, above the retained made ground soils.

Relevant photographic records should also be included in the Verification Report, as well as laboratory testing results undertaken on imported soils and any exploratory

logs for any validation pits undertaken, or excavations observed during any site visits by the Validation Engineer.

Any non-compliances with the agreed Remediation Method Statement shall be highlighted, along with any corrective measures undertaken to ensure that the resultant risks to future site users have been mitigated.

8. UNEXPECTED GROUND CONDITIONS

If any unexpected or unusual ground conditions are encountered during the course of the remedial works further geo-environmental advice should be sought, including further investigation and environmental assessment should be undertaken if deemed necessary.

9. WASTE DISPOSAL

Any waste arising from development of the site, such as excess soil or material deemed unsuitable for retention on site, should be disposed of in accordance with the Duty of Care Regulations. If any soils are being disposed directly to a landfill site Waste Acceptance Criteria (WAC) analysis may be required in addition to the basic environmental screen testing, to determine the most appropriate disposal facility for the waste, in accordance with the requirements of the current Landfill Directive.

APPENDIX A - PROPOSED LAYOUT DRAWING

0 5 10cm

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Notes | Sketch schemes may be based on plan information of unknown origin and is subject to verification and survey. Contractors must verify all dimensions on site before commencing any work or shop drawings. This drawing is not to be scaled. Use figured dimensions only. Ensure digital versions are plotted at 'Actual Size'. Building areas are liable to adjustment over the course of the design process due to ongoing construction detailing developments. Subject to statutory approvals and survey. The bar above is to check that the drawing has been printed to scale.

Proposed layby to highway engineer design

Existing house demolished to facilitate new access with 2.4x25m visibility splay

Retaining walls and embankments shown indicatively

Dual pumping station with 15m stand off to dwellings

Communal bin collection point

Potential access to woodland

NORTHORPE LANE

NORTHORPE COURT

27555

28774

28186

27721

24387

15365

14931

22639

14786

19425

Legend

- 1800mm timber gate
- Bin storage area
- Garden shed to provide secure, lockable cycle storage provided to plots without garage
- Pre-cast concrete paving
- Grass to front gardens and open space
- Existing trees retained

Notes

- All unhatched roads, private drives and driveways in tarmac
- Car parking provided at a minimum of 2 spaces per 2 and 3 bed dwelling and 3 spaces per 4 bed dwelling
- For landscape details please see Landscape Plan prepared by landscape architect

Accommodation Schedule

House Type			Area (sq.m)	NDSS requirement (sq.m)	Quantity	Total Areas (sq.m)
Affordable Units (Denoted with *)						
MAI 3	**Whitebeam 1**	1 bed 2 person maisonette A	59.4	1B2P = 50	4	237.6
		2 bed 3 person maisonette B	70.1	2B3P = 61	4	280.4
ASP	**Aspen**	3 bed semi detached/terraced 2.5 st	94.0	3B4P = 90	1	94.0
				TOTAL OVERALL	**9**	**518.0 sq.m**
Open Market Units						
BLA	**Blackthorn**	3 bed detached	90.4	3B4P = 90	2	180.8
ASP	**Aspen**	3 bed semi detached/terraced 2.5 st	94.0	3B4P = 90	11	1,034.0
MAY	**May**	3 bed detached	103.5	3B5P = 93	1	103.5
BEE	**Beeches**	3 bed semi detached int. garage split level	110.4	3B4P = 90	10	1,104.0
GUE	**Guelder**	4 bed detached	113.6	4B5P = 97	1	113.6
MUL	**Mulberry**	4 bed detached integral garage	115.8	4B7P = 115	3	347.4
HAZ+	**Hazel +**	4 bed detached integral garage 2.5 st	125.4	4B8P = 124	2	250.8
WIL	**Willow**	4 bed detached	128.6	4B8P = 124	1	128.6
WIL ALT	**Willow Alt**	4 bed detached	128.6	4B8P = 124	2	257.2
BIR	**Birch**	4 bed detached integral garage	131.7	4B8P = 124	1	131.7
SES	**Sesille**	3 bed detached integral garage split level	133.2	3B6P = 108	1	133.2
				TOTAL OPEN MARKET	**35**	**3,784.8 sq.m**
				TOTAL OVERALL	**44**	**4,302.8 sq.m**
				Total Site Area	13,678 sq.m	

Rev	Date	Description	Drawn	Checked
FF	19.01.23	Plots 17-20 bins and cycle storage amended	CR	
EE	16.01.23	Plots 17-20 parking, bins and cycle storage amended	CR	
DD	13.12.22	Whitebeam parking provision increased	CR	
CC	01.12.22	Mix changed	CR	
BB	22.11.22	Road changed between plot 25-28	CR	
AA	18.11.22	Block paving reduced	CR	
Z	27.06.22	Hatching corrected	CR	
Y	08.06.22	Plot 19 substituted	CR	
X	09.05.22	Baildon's omitted, house types substituted	CR	
W	22.03.22	Detail added	CR	
V	21.03.22	Street trees amended	CR	

Project: Northorpe Lane, Mirfield

Drawing: Proposed Site Layout

Client: Newett Homes

BIM Suitability Description: SUITABLE FOR INFORMATION — BIM Suitability Code: S2

Status: Planning
Date: 17.03.21
Drawn: CR
Checked: GE
Scale (A2): 1:500

2 Riverside Way, Whitehall Waterfront, LEEDS, LS1 4EH, t 0113 819 8041
320 City Road, Angel, LONDON, EC1V 2NZ, t 0203 883 8602
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edward architecture

Project 0899 - Originator EA - Discipline A - Drawing No P002 - Rev FF

APPENDIX B - IMPORTED SOILS THRESHOLD VALUES

Abbeydale Geoscience

IMPORTED SOIL CHEMICAL THRESHOLD VALUES

	Analyte	Threshold Value (mg/kg): Residential with homegrown produce
Metals & inorganics	Arsenic	37
	Beryllium	1.7
	Cadmium	11
	Chromium III	910
	Chromium VI	6
	Copper	2,400
	Cyanide	50
	Lead	210
	Mercury	40
	Nickel	180
	Selenium	250
	Vanadium	410
	Zinc	3,700
	Phenols	280
	Asbestos fibres	NONE
Organics	Napthalene	2.3
	Acenapthylene	170
	Acenapthene	210
	Flourene	170
	Phenanthrene	95
	Anthracene	2,400
	Flouranthene	280
	Pyrene	620
	Benzo(a)anthracene	7.2
	Chrysene	15
	Benzo(b)flouranthene	2.6
	Benzo(k)flouranthene	77
	Benzo(a)pyrene	2.2
	Indeno(1-2-3-c-d)pyrene	27
	Dibenzo(a,h)anthracene	0.24
	Benzo(g,h,i)perylene	320

	Analyte	Threshold Value (mg/kg): Residential with homegrown produce
Total Petroleum Hydrocarbons	Aliphatic C5 - C6	42
	Aliphatic C6 - C8	100
	Aliphatic C8 - C10	27
	Aliphatic C10 - C12	130
	Aliphatic C12 - C16	1,100
	Aliphatic C16 - C35	65,000
	Aliphatic C35 - C44	65,000
	Aromatic C5 - C7	70
	Aromatic C7 - C8	130
	Aromatic C8 - C10	34
	Aromatic C10 - C12	74
	Aromatic C12 - C16	140
	Aromatic C16 - C21	260
	Aromatic C21 - C35	1,100
	Aromatic C35 - C44	1,100