Phase 3- Method Statement

Mendle Farm, Holme

Produced for Flynn Architecture c/o Mr J W Richardson

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Document history

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Revision	*Purpose*	*Originated*	*Checked*	*Date*
0.0	Document for issue	D Driver *Director*	R Lester *Geo-Env Engineer*	August 2020
1.0	Updating information	D Driver *Director*	R Lester *Geo-Env Engineer*	September 2020
2.0	Additional information regarding intended remediation	D Driver *Director*	R Lester *Geo-Env Engineer*	September 2020

Method Statement

Contents

1 Introduction

MR J W Richardson is to develop a parcel of land at Mendle Farm, Holme near Scunthorpe. The site is associated with Mendle Farm and includes open land and barns, hereinafter described as *the site*. The site has been the subject of a phase 1 desktop study, phase 2 geo-environmental / geotechnical investigation and a supplementary phase 2 geo-environmental investigation, the result of which identified some contamination requiring remediation. These works were undertaken by Michael D Joyce Associates and Humberside Materials Laboratory as referenced below.

- Phase 1 desktop study – Michael D Joyce LLP (report No. 3666)
- Phase 2 geo-environmental / geotechnical report – Michael D Joyce LLP (report No. 3666)
- Supplementary Phase 2 geo-environmental report – Humberside Materials Laboratory Ltd 1260/5063/P/P2 Revision 2.0 dated September 2020

Humberside Materials Laboratory Limited (HML) has produced this method statement for the remediation of the site. This document is intended to be a working document of the procedures employed by all parties concerned with the remediation of the site as a housing development. The success of the remediation is dependent on good operational procedures. It is essential that good communication links are maintained and that verification for the works is obtained. There is an obligation to keep the local authority informed of any problems or requests for variations to this method statement.

Reference has been and will be made to the Yorkshire and Lincolnshire Pollution Advisory Group – Verification requirements for cover systems as a reference document.

This method statement is produced solely for MR J W Richardson c/o Flynn Architecture and should only be copied in full. When transmitted electronically the definitive copy of the report is held by Humberside Materials Laboratory Ltd.

2 Site

2.1 Site description

The site is located off (to the north) Holme Lane, Holme, North Lincolnshire. The site is centred around grid reference 492564E, 407093N.

The site is roughly a square tract of land about 28m long and about 31m wide.

2.1.1 Site features

The site is predominantly covered by either existing farm out buildings or granular hardstanding with the west section currently open grass land. The sites known history is associated with farming from as early as 1886. The existing site structures may have been present from 1966 and potentially re-developed in the 1980's.

The existing buildings are multiple portal frame structures adjacent to one another with a combined measurement of about 12m by 20m in plan area.

There are some large trees along the eastern boundary of the site. To the north and south are farm buildings and to west is arable land.

2.1.2 Proposed development

It is proposed to develop the site with a low-rise agricultural workers residential dwelling with associated driveway and garden area.

2.2 Contamination

The original phase 2 report by Michael D Joyce LLP (report No. 3666) which included four window sample boreholes (WS1 to WS4) identified no elevated levels above current guideline values in relation to Metals and PAH and no asbestos was identified. Shallow made ground samples from WS2 and WS4 were analysed.

The phase 2 supplementary report (1260/5063/P/P2 – revision 2.0) dated September 2020 included an additional four number hand dug trial pits. Two number sample holes were through the existing structures concrete floor slabs and two number within the green area to the west of the existing structures. No metal contamination or asbestos was recorded within the additional sample locations. Slightly elevated PAH was recorded within the made ground sample from HP3 (0.05m to 0.3m). HP1, HP2 and HP4 did not reveal any elevated levels of PAH

The elevated PAH's could create an unacceptable risk of harm to human health in garden areas. The PAH's could be ingested, directly absorbed or inhaled (in dust) in garden

areas (or through produce grown in garden areas). Identified receptors include future site users, e.g. young children.

A location plan of all sample locations is included within appendix A.

The phase 1 report identified the site as being in an area with <1% of homes affected by radon. Accordingly, no radon protection will be required.

4 Overview of remediation

The aim of the remediation works is to remove all made ground within proposed soft landscaped areas with validation of exposed natural sands by PAH analysis to mitigate any migration concerns.

Encountered ground conditions from previous site investigations have revealed made ground to circa 0.3m below existing ground levels onto natural sands, the encountered made ground included elevated levels of PAH and require removal within soft landscaped areas. Analysis of a sample below the made ground shows no concern regarding PAH contamination, further analysis for PAH from the natural sands after made ground removal will be undertaken to mitigate migration concerns. It is recommended that this is undertaken after structural works are completed to prevent cross contamination.

A geotextile membrane and a proven clean inert topsoil will be placed within the excavated areas.

Most of the area around the house will be permanent hardstanding. This area will include a thick layer of granular fill and will not require remediation.

Below ground concrete to be designed on DS1 category and an ACEC AC-1 classification as per BRE Special Digest. The validation of this will be undertaken by the building inspector.

Potable water supply pipes to the development will be approved barrier pipes if they are proposed to run through the existing granular layers. The validation of this shall be undertaken by the water authority prior to connection. Photographic evidence of placement of the barrier pipe may be included within a validation report if required.

5 Remediation

5.1 Key roles

The designated key roles for the proposed remediation works are shown below (in Table 1).

Table 1 Key roles

Role	Employer	Notes
Developer	MR J W Richardson	
Main contractor for remediation	TBC	
Independent consultant for remediation	Humberside Materials Laboratory Ltd	
Waste disposal site	To be confirmed	
Haulage to disposal site	To be confirmed	
Clean soil for garden areas	Imported soils source to be confirmed	

Final levels are anticipated to be circa current levels, subject to confirmation.

Hours of work on the site will be Monday to Saturday between the hours of 0800hrs and 1700hrs. The site will be fenced and secured when work is not being undertaken.

5.2 Order of work

1) Demolish existing farm buildings.

2) The made ground will provide a stable platform for the construction of the dwellings and so will remain in-situ until all or most of the structure of the properties are complete and the scaffold removed.

3) Removal of surplus ground for services and foundations etc. will be stockpiled on a suitable membrane and removed from site. Removed surplus ground should not be stockpiled on the existing grassed area to the west of the proposed building to prevent cross contamination.

4) Complete construction of residential property including all external hardstanding areas.

5) Undertake remediation to garden areas identified (orange outlined) within plan 3 in Appendix A.

5.1) Remove made ground within identified areas to exposed natural sands (circa 0.3m below ground level), remove from site to a licensed waste management facility (retain consignment notes as evidence).

5.2) Undertake PAH analysis on samples obtained from base of the excavation (natural sands). If no elevated levels are recorded compared to current GAC guidelines continue to point 5.3. If elevated levels are recorded dismiss points 5.3 to 5.4 and refer to point 5.5.

5.3) Placement of a geotextile membrane, this will cover the sides and base (retain purchase receipt as evidence).

5.4) Place a proven clean inert topsoil onto membrane within excavated areas to required finished level, finished levels assumed to be circa current levels so circa 0.3m in depth of topsoil would be required. (retain delivery tickets and suppliers test data as evidence).

5.5) If analysis from point 5.2 shows elevated levels of PAH work shall be halted at that point (5.2) and the phase 3 method statement revised to the satisfaction of the local authority. A cover system to a depth of 600mm may be proposed at that point.

The independent engineer shall be kept informed of the various stages during the remediation. This will allow strategic stages to be inspected as work progresses.

5.2.1 Construction to residential property

Construction of the dwelling can be completed before the main remediation is undertaken. Any surplus fill or soil from excavations should be stockpiled and disposed of at a later date or loaded directly into lorries for disposal. Stockpiled spoil should be placed within an area away from the existing grassland (proposed garden area to the west) to prevent any cross contamination. All external hardstanding works will be undertaken prior to remediation.

5.2.2 Removal from garden areas

All granular fill will be removed from garden areas down to existing natural strata (silty sands) to the satisfaction of the validating engineer. Trial pits and window sampler holes show the made ground to be approximately 0.30m to 0.32m in thickness. The area of existing grassland will not require remediation (outlined in green within the below plan).

Standard excavation plant shall be used to excavate the made ground and soils to the required level.

Soils for removal shall be either loaded direct into lorries and removed to a suitable landfill site or stockpiled on a protected area of the site to prevent the spread of contamination, i.e. the use of plastic sheeting under the stockpile. The stockpile will be loaded to lorries for removal to an approved suitable landfill site, again using standard construction plant.

If during dry weather, dust may become an issue for the neighbours and or work force, water will be added to suppress the dust when handling.

After the removal of the made ground within the garden areas five number samples from the base of the excavated area will be taken and analysed for PAH speciation to investigate contamination migration from the granular fill to the natural soils. No membrane shall be placed, and no topsoil shall be backfilled into the excavated area until results have been obtained showing no elevated levels of PAH.

If further testing cannot mitigate migration after the removal of the made ground within the garden areas all remediation works should be halted, and the phase 3 method statement revised to the satisfaction of the local authority.

A site plan below shows proposed areas for remediation (orange outlined) and proposed areas of existing grassland to be retained (green outlined).

Mendle Farm, Holme – proposed development plan

Area of existing grassland

Area of granular fill / hardstanding proposed to be gardens or soft lanscaping (remediation area)

Plan 3 March 2020

5.2.3 Barrier system

A typical barrier system compliant with the Yorkshire and Lincolnshire Pollution Advisory Group – Verification requirements for cover systems shall be used as a reference document. A cover system would include a granular capillary break layer and clean inert topsoil.

A geotextile membrane (Wrekin woven geotextile fastrack membrane or similar) will be placed within the excavated areas after the removal of made ground and confirmation of clean natural soil formation. The membrane will cover the sides and base, clean inert topsoil from a proven source can then be imported and placed within the excavated area to required finished levels.

5.2.4 Quantities

Gardens are estimated to be 330m^2. 250m^2 of existing grassland which does not require remediation and about 80m^2 of existing granular fill area which requires remediation. The phase 2 report shows an average depth of granular fill around 0.3m which would give a total of 24m^3 of made ground to be removed.

5.2.5 Unforeseen contamination

If during the works any unforeseen contamination is encountered, work will be halted, and the local authority shall be informed. The nature and extent of contamination shall be assessed. If required, remediation will be proposed and verified by the independent engineer to the satisfaction of the local authority. This will include further assessment of the natural soils below the made ground within garden areas for PAH analysis.

5.2.6 Stockpiles

Any materials stockpiled on site shall be done in a manner that no cross contamination between any materials can occur. This will include an underlying plastic membrane.

6 Validation

Validation shall be by the independent engineer, who shall visit the site on a regular basis. Fortnightly visits will be made during the construction period to validate no cross contamination of the existing grassland to the west of the proposed development has occurred. Remediation to the garden / soft landscaped areas that include granular made ground may take 1 to 2 days, the validation engineer will be present during this process with sampling of the underlying soils when satisfied all made ground has been removed from garden areas. Depending on satisfactory results from the underlying natural soils, the validation engineering will require a minimum further two visit, one to validate the correct installation of geotextile membrane and anther to validate the imported topsoil along with relevant sampling.

Testing will be undertaken as per the rates in table 2 and 3. Testing will be undertaken by a UKAS/MCERTS laboratory accredited for the type of testing being undertaken. The assessment criteria will be as defined in tables 4 to 8 and is based on domestic gardens with plant uptake included. Material failing the criteria will be removed from site. It is recommended that testing of the source material should initially be done on at least one sample prior to delivery to ensure suitability.

Table 2 - sample frequency imported materials

Material	Sources	Sample rates	Test criteria	Notes
Granular fill capillary break	Natural source (quarried material)	1 per source	Metals	
	Recycled	1per source	Metals asbestos	
Soil	Green field	1 per 250m2 minimum of 3 per source	Metals Polyaromatic hydrocarbons Asbestos	
	Brownfield and recycled	1 per 100m2 minimum of 6 per source	Metals Polyaromatic hydrocarbons Asbestos Petroleum hydrocarbons	

Table 3 - Sampling of material remaining on site				
Material	Depth	Sample rates	Test criteria	Notes
Remaining soils	Immediately below excavation	5 number	Polyaromatic hydrocarbons	To mitigate the requirement of a barrier system

Table 4 - Generic assessment criteria metals and metalloids			
Contaminant	mg/kg	Contaminant	mg/kg
Arsenic	37	Selenium	250
Boron	290	Copper	2400
Cadmium	11	Nickel	150
Chromium III Chromium IV	910 6	Zinc	3700
Lead	200	Vanadium	410
Mercury element Inorganic Methyl	1.2 40 11		

Table 5 - Generic assessment criteria Polyaromatic hydrocarbons			
Contaminant	mg/kg 1% SOM	mg/kg 2.5% SOM	mg/kg 6% SOM
Acenaphthene	210	510	1100
Acenaphthylene	170	420	920
Anthracene	2400	5400	11000
benzo a anthracene	7.2	11	13
benzo pyrene	2.2	2.7	3
benzo b fluoranthene	2.6	3.3	3.7
benzo k fluoranthene	77	93	100
benzo perylene	320	340	350
chrysene	15	22	27
dibenzo anthracene	0.24	0.28	0.3
fluoranthene	280	560	890
fluorene	170	400	860
indeno pryene	27	36	41
Naphthalene	2.3	5.6	13
phenanthrene	95	220	440
pyrene	620	1200	2000
BaP as Surrogate marker	0.79	0.98	1.1

Table 6 - Generic assessment criteria TPH aliphatic			
Contaminant	mg/kg 1% SOM	mg/kg 2.5% SOM	mg/kg 6% SOM
C5-6	42	78	160
C6-8	100	230	530
C8-10	27	65	150
C10-12	130(48)	330 (118)	760 (283)
C12-16	1100(24)	2400 (59)	4300 (142)
C16-35	65000(8.5)	92000 (21)	110000
Values in brackets are limits for vapour or saturation			

Table 7 - Generic assessment criteria TPH aromatic			
Contaminant	mg/kg 1% SOM	mg/kg 2.5% SOM	mg/kg 6% SOM
C5-7	70	140	300
C7-8	130	290	660
C8-10	34	83	190
C10-12	74	180	380
C12-16	140	330	660
C16-21	260	540	930
C21-35	1100	1500	1700
Benzene	0.087	0.17	0.37
toluene	130	290	660
ethylbenzene	47	110	260

Table 8 - Generic assessment criteria others		
Contaminant	mg/kg	Notes
Asbestos		No detection noted

Waste acceptance criteria testing (i.e. WAC testing) for the shallow made ground and natural soil may be required for disposal purposes.

Copies of waste transfer notes and the destination will be required for all materials removed from site.

Copies of delivery notes will be required for imported soils.

Photographs of various strategic stages of removed granular fill and imported soil will be taken during anticipated site visits noted above, plus a register of the depths recorded. Diary and notes from site visits.

On the completion of the remediation, a report shall be produced that will depict the remediation undertaken.

Radon protection is not required within new dwellings.

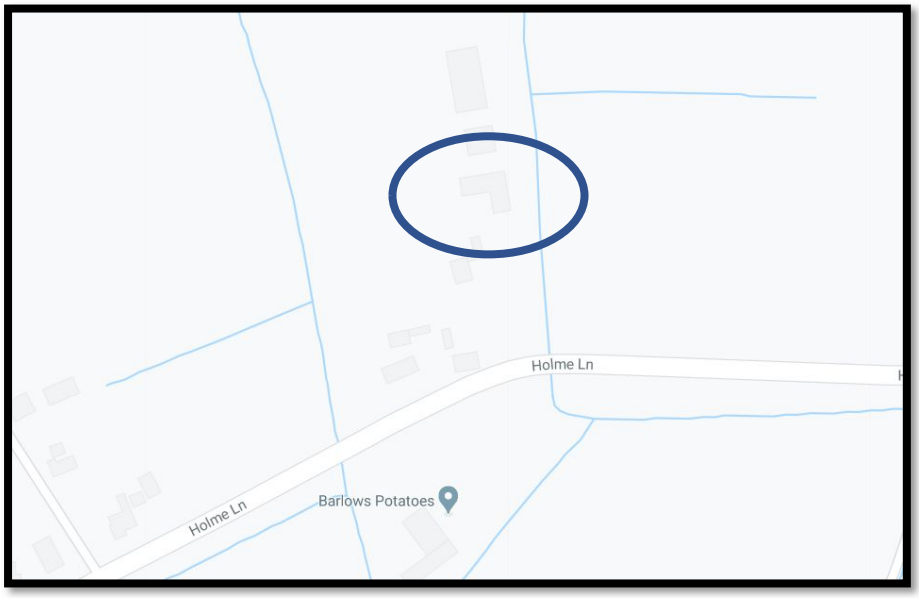
Below ground concrete to be designed to DS-1 AC1 BRE special digest classification 1. The validation of this will be undertaken by the building inspector.

Potable water supply pipes to the development will be approved barrier pipes if they are to run through the existing granular layers. The validation of this shall be undertaken by the water authority prior to connection. Photographic evidence of placement of the barrier pipe may be included within a validation report if required.

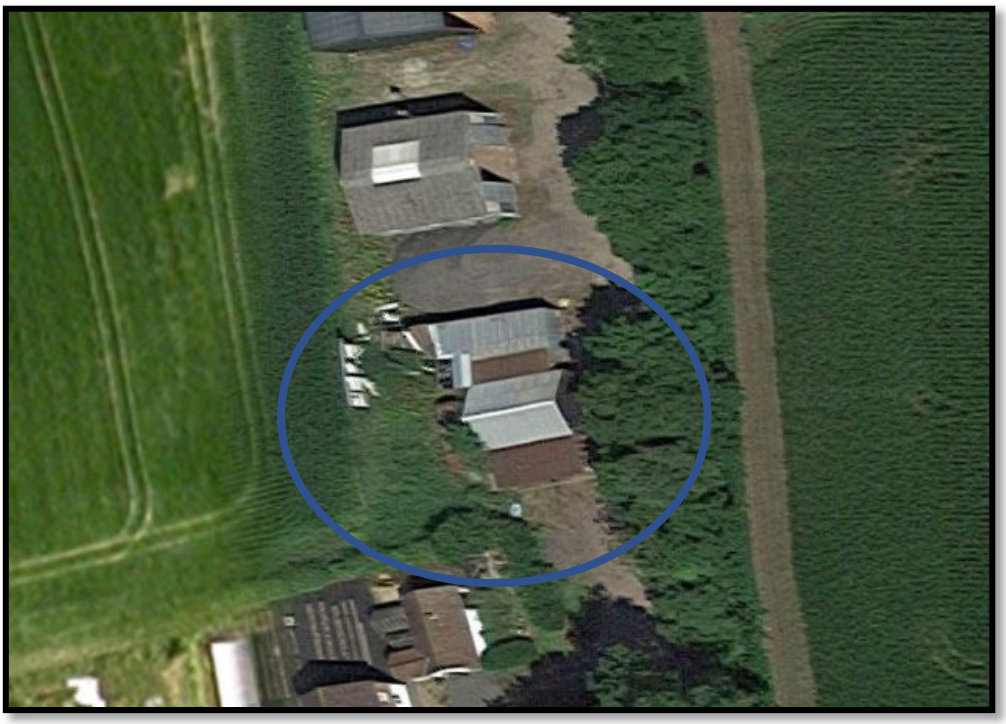
-- End of Report –

Appendix A

Plans

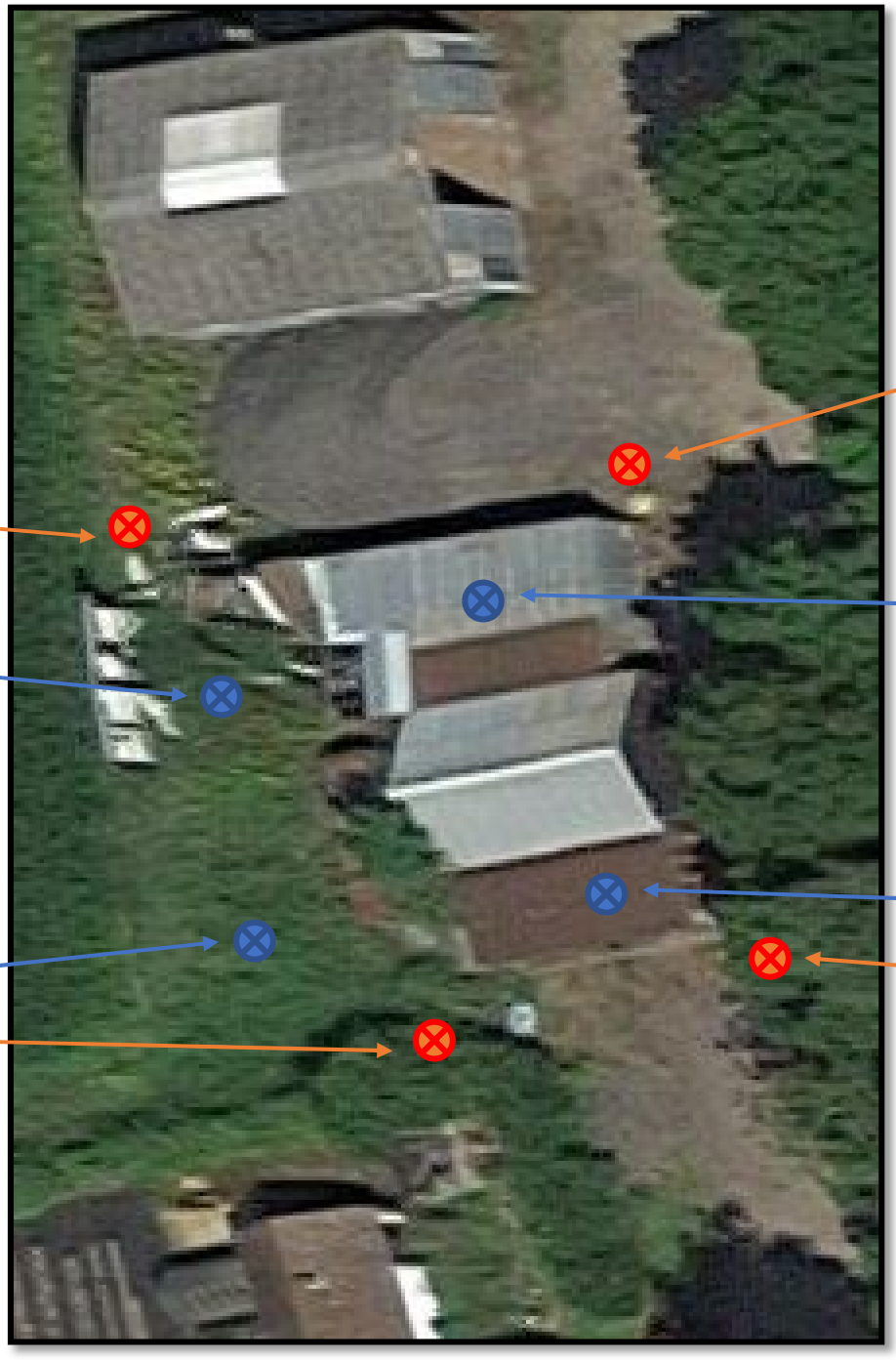


Site location



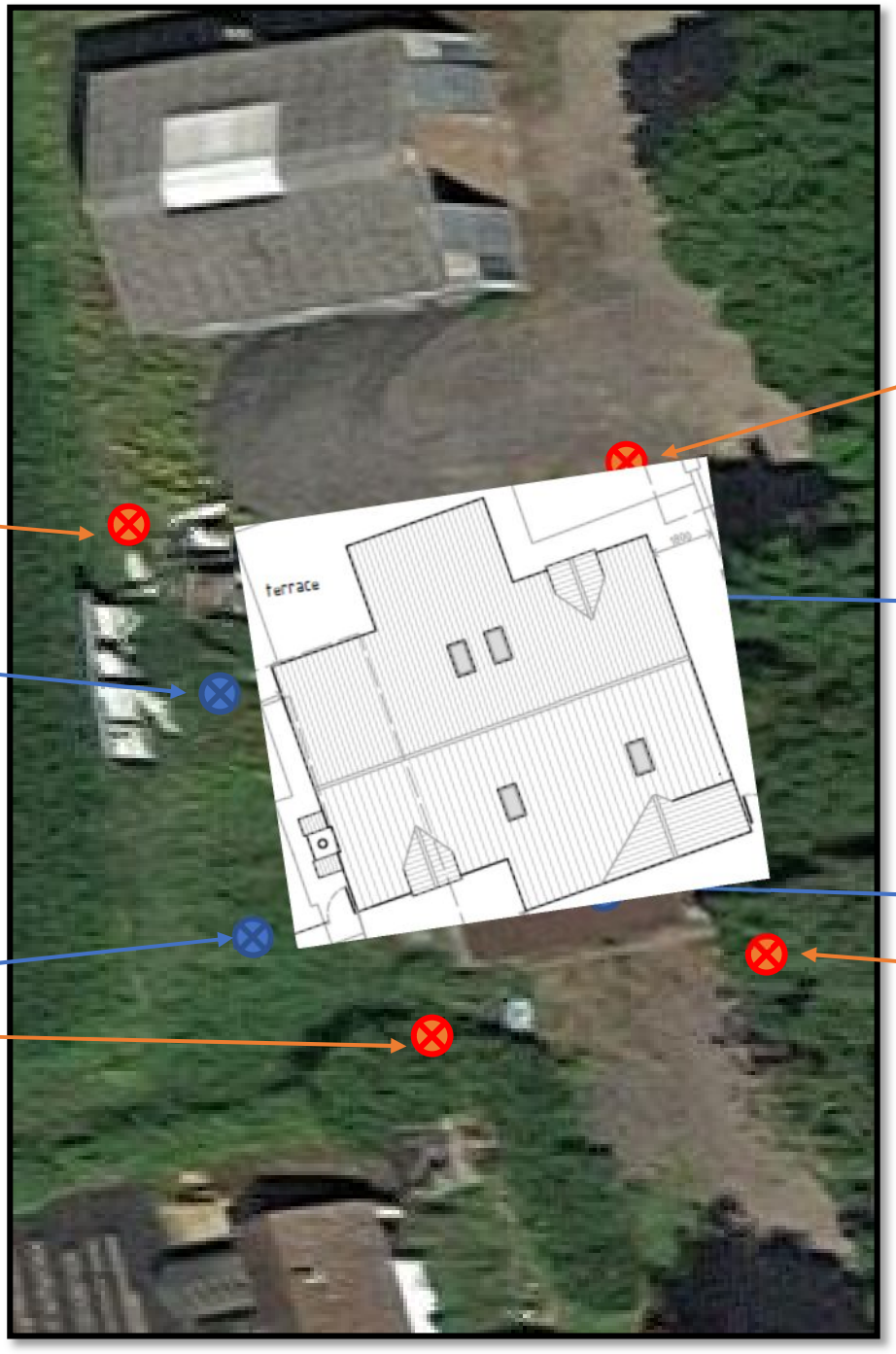
Aerial view

Mendle Farm, Holme – WS/HP location plan



Plan 1 March 2020

Mendle Farm, Holme – Estimated location



Plan 2 March 2020

Mendle Farm, Holme – proposed development plan

Area of existing grassland

Area of granular fill / hardstanding proposed to be gardens or soft lanscaping (remediation area)

Plan 3 March 2020