CCG-C-20-11980

PHASE III REMEDIATION STRATEGY REPORT FOR LAND AT THE FORMER WHITEHOUSE CLUB MIDDLETON ROAD CRUMPSALL MANCHESTER M8 4JZ

NOVEMBER 2020

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DOCUMENT CONTROL FORM	
Client:	Branley Homes Limited via Grays Architecture Limited
Project Title:	Phase III Remediation Strategy Report for land at the former Whitehouse Club, Middleton Road, Crumpsall, Manchester M8 4JZ
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Signature	
For and behalf of CC GEOTECHNICAL LTD	
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REMEDIATION STRATEGY DOCUMENT	
Document No: CCG-C-20-11980	Site: Former Whitehouse Club, Middleton Road, Crumpsall, Manchester, M8 4JZ

Nature of Development:

Following the demolition of a former social club (Whitehouse) and associated site clearance works, it is proposed that the site be redeveloped for mixed commercial / residential land use by the construction of the following:

- Construction of a replacement social club building at the eastern end of the site
- Construction of a 60-space off-road car park immediately west of the new club house
- Construction of 2nr x 3storey apartment blocks with dedicated parking areas immediately west of the 60-space car park referred to above
- Construction of 50nr residential dwellings on the western half of the site, comprising 32nr x 2-storey and 18nr x 2.5-storey houses arranged in pairs of semi-detached and terraces of 3 and 4 units, each with off road parking bays and front and rear private gardens
- Construction of a road layout providing access to all areas of the proposed development

The existing and proposed site layouts, together with elevations of the proposed houses are shown on ***Grays Architects Limited*** architectural drawings contained herein.

The proposed development falls within the administrative jurisdiction of ***Manchester City Council***

PREVIOUS REPORT REFERENCE(S):	DATE:
Phase I Desk Study Report, prepared by ***Brian Clancy Higby Partnership***, under Report Reference No. 1701-6450	?
Phase II Geoenvironmental Report for land Whitehouse Club, Middleton Road, Crumpsall, Manchester, M8 4JZ, prepared by CC ***Geotechnical Limited***, under Report Reference No. CCG-C- 19-11308	January 2020

1. Soil Contamination Assessment / Garden Remediation

That above referenced reports dated April 2013 and February 2019 confirmed the presence of elevated concentrations of:

- Lead at 2nr sampling positions
- Mercury at 2nr sampling positions
- Arsenic at 1nr sampling positions

Exposure risks associated with these contaminants arise via dermal and ingestion pathways and as such remedial design features and specific site management activities will be required to mitigate these risks – see Detailed Remediation Strategy hereunder.

2. Gas Risk Assessment

A gas monitoring programme comprising 6nr rounds confirmed a gas screening value (GSV) of 0.0059l/hrs for CO_2. Using this GSV value, the risk to the proposed development was assessed in line with Situation B as defined in CIRIA C665, and on this basis the site complies with Characteristic Situation 1. Notwithstanding the above assessment, given that CO_2 concentrations are persistently above 5%, and in this circumstance CIRIA C665 recommends that the classification be advanced to CS2, for which protective measures are required

A CS2 classification requires the adoption of remedial measures with respect to ground gas. For Type A buildings as is proposed in the development, BS 8485:2015 requires a protective regime giving a score of 3.5 or greater. This score can be achieved through use of a precast suspended segmental subfloor such as beam and block (Score 0.0), incorporating a passively vented subfloor void (Score 2.5), and a proprietary gas resistant membrane, such as '*Visqueen Geoseal'* Gas Barrier', or similar (Score 2.0). In the light of the detection of asbestos in a soil sample, a 50mm layer of blinding concrete should be placed under the subfloor void space.

3. New Water Mains

The assessment of requirements for new water mains at this site was based on the criteria specified in Paper 10/WM/03/21 'Guidance for the selection of Water Supply Pipes to be used in Brownfield Sites' published by UK Water Industry Research (UKWIR) January 2011.

The preliminary findings indicate that the soil concentrations of pertinent contaminant species are below the threshold concentrations permitted under the UKWIR, indicating that normal alkathene mains may be deployed. Good practice requires that PE mains be laid in a remediated alignment comprising of clean granular fill extending to 600mm + pipe diameter and to 300mm below pipe underside.

Pipes should be laid in accordance with BS EN 12201-2 'Plastic piping systems for water supply, and for drainage and sewerage under pressure as stated in UKWIR guidance.

It should be noted that this recommendation is subject to the opinion of the water supplier, and in this instance the local water authority must be consulted to confirm that the proposals above accord with their interpretation of current guidance.

4. Unanticipated Contamination

Notwithstanding the recommendations discussed in the detailed remediation strategy presented hereunder, as with all developments, disturbance of the ground may uncover unanticipated features which may give rise to considerations of contamination insofar as the exposed conditions may have the potential to impact on receptors including *inter alia* humans, animals, controlled waters, or the fabric

of buildings. Any such encounters will require the contractor to halt work, isolate the risk area, and summon ***CCG*** to site to determine the nature of the exposure and to determine an appropriate course of action. Any such incidents will be fully documented in the site Validation Report.

Detailed Remediation Strategy		
Recommendation (see above)	**Governing Standard Operating Procedure**	**Site Specific Additions to Standard Operating Procedure**
1 & 4	**Standard Operating Procedures 2 & 6**	**<u>GARDEN REMEDIATION WORKS</u>** Lead, Mercury, Arsenic and several Polyaromatic Hydrocarbons (leachates) are shown to be present at concentrations that exceed its respective guideline criteria and hence a risk to human health is indicated. It is recommended that surface levels in proposed garden areas as delineated on the ***CCG*** Drawing '11980' Appendix A be reduced to 600mm below finished garden level and reconstructed by the placement of a 600mm composite clean imported subsoil / topsoil cover with a minimum thickness of 200mm of topsoil within the cover. However as indicated on the ***CCG*** Drawing '11980' Appendix A the area requiring action appears to be largely communal gardens, and hence exposure to contamination via plant uptake / ingestion is unlikely, and hence the required remediation on communal landscaped areas may be reduced to a cover of 450mm clean imported topsoil. Where made ground remaining in place, imported sub-soil / topsoil is to be placed on a suitable hi-vis geotextile fabric such as '*Terram 1000*', or similar. All imported soils for garden areas are to be non-recycled of greenfield source. The proposed frequency of sampling / analysis for imported materials is one sample per 50m^3 of material, with a minimum of 4nr samples being analysed per source material. Test suite and compliance thresholds for imported clean subsoil / topsoil are presented on the enclosed series of tables 'Cover System – Validation Analysis Test Suite and Threshold Assessment Criteria, Imported materials. Where possible imported soils should be sourced from a single supplier and be visually inspected prior to transportation to site to ensure soil is free from detritus and deleterious materials. It is proposed that all soil sampling for contamination (validation) analyses is to be undertaken at the development site, either from stockpiled soils or following deposition on to designated garden areas. **<u>VALIDATION</u>** The removal of surplus soils generated in new landscaped / cultivated areas will be documented by Waste Transfer Notes, to be retained by the Contractor and made available to ***CCG*** for inclusion in the Validation Report. Site reduction works within newly created landscaped areas are to be independently validated and photographed by ***CCG*** to ensure that the correct depth (600mm) has been achieved and to record the placement of geotextile barrier before reconstruction works commence. These records will be incorporated in the Validation Report. Test suite and compliance thresholds for imported clean sub-soil and topsoil are presented on the enclosed tabulation Summary of LQM GAC Thresholds and Proposed Acceptance Criteria for Imported Soils' in Appendix C. The suite of testing will comprise metals, non-metals, asbestos, BTEX compounds, speciated PAH's, and hydrocarbons to the TPHCWG methodology. Analysis of soils for demonstration of compliance will be undertaken at a frequency of 1 analysis per 100m^3 Results of analyses will be collated in a Validation Report. Dockets for imported subsoil / topsoil to be retained by the Contractor and provided to ***CCG*** for inclusion in the Validation Report. The Contractor will keep photographic records during site preparation works and provide these to ***CCG*** for inclusion in the Validation Report ***CCG*** will independently validate the specified thickness of topsoil cover by excavation of inspection pits/photography following completion of works. These records will be incorporated in the Validation Report.
2	**Standard Operating Procedure** 5	**<u>GAS PROTECTION MEASURES</u>** The requirements to protect against ground gas contamination are as follows: Provide CS2 protection for BS8485:2015 + A1 2019 Type B Building requiring a score of 3.5 in accordance with BS8485 – provided by:

- Passively vented subfloor void – Score 2.5
- Proprietary gas resistant membrane – Score 2
- The membrane must be installed under a regime of independent Validation Inspections

Detailed methodologies for monitoring implementation of these recommendations are given hereunder.

Record keeping / Validation
Validation records will be provided to ***CCG*** for incorporation into the Phase IV Validation Report:

- Photographic records of floor construction shown subfloor void space (200mm min')
- Records of membrane purchases for reconciliation with total floor area to be provided by the Contractor for inclusion in the report appendices.
- Inspection of on-site membrane storage and handling provisions to demonstrate low risk of sustaining damage.
- Inspection visits (including photographic records) will be undertaken at appropriate intervals to monitor installation in accordance with the *pro-forma* contained herein. It is the responsibility of the Contractor to inform ***CCG*** of when construction is at the appropriate stage(s) for gas protection inspection visits.

The Standard Operating Procedures referred to above are attached in Appendix B.

APPENDIX A

DRAWINGS

APPENDIX B

STANDARD OPERATING PROCEDURES

APPENDIX C

SOIL CONTAMINANT ACCEPTANCE CRITERIA

APPENDIX A

DRAWINGS

Notes:

Site Boundary

CBR via DCP

CC GEOTECHNICAL LIMITED
UNIT 1 DELTIC WAY
KNOWSLEY INDUSTRIAL ESTATE
LIVERPOOL
L33 7BA
0151 545 2750

Client:
BRANLEY HOMES

Project:
The White House Club, Middleton Rd, Crumpsall, Manchester M8 4JZ

Title:
CBR via DCP Investigation Plan and Proposed Development Plan

Scale: NTS	**Issue:** 01
Drawn by: PR	**Date:** November 2020
Project Number: CCG-C-19-11980	**Drawing Number:** 01

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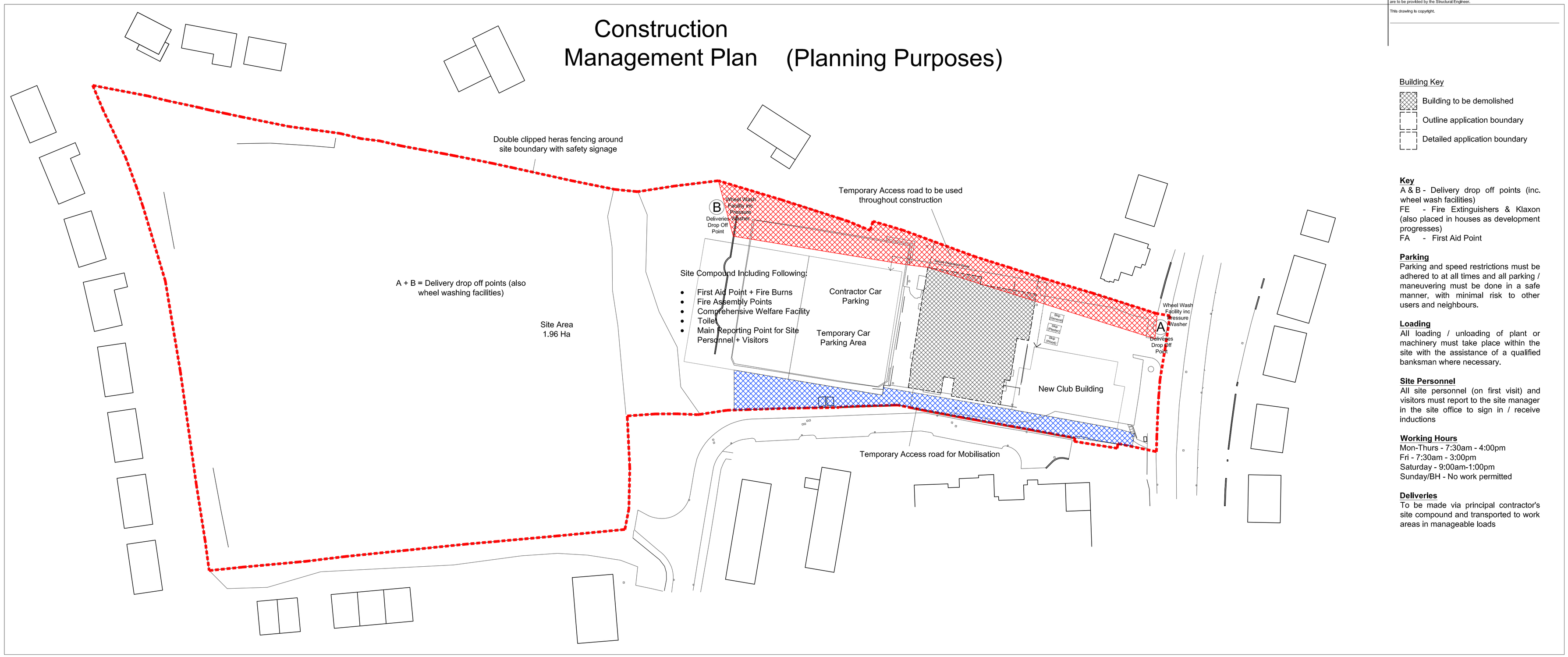
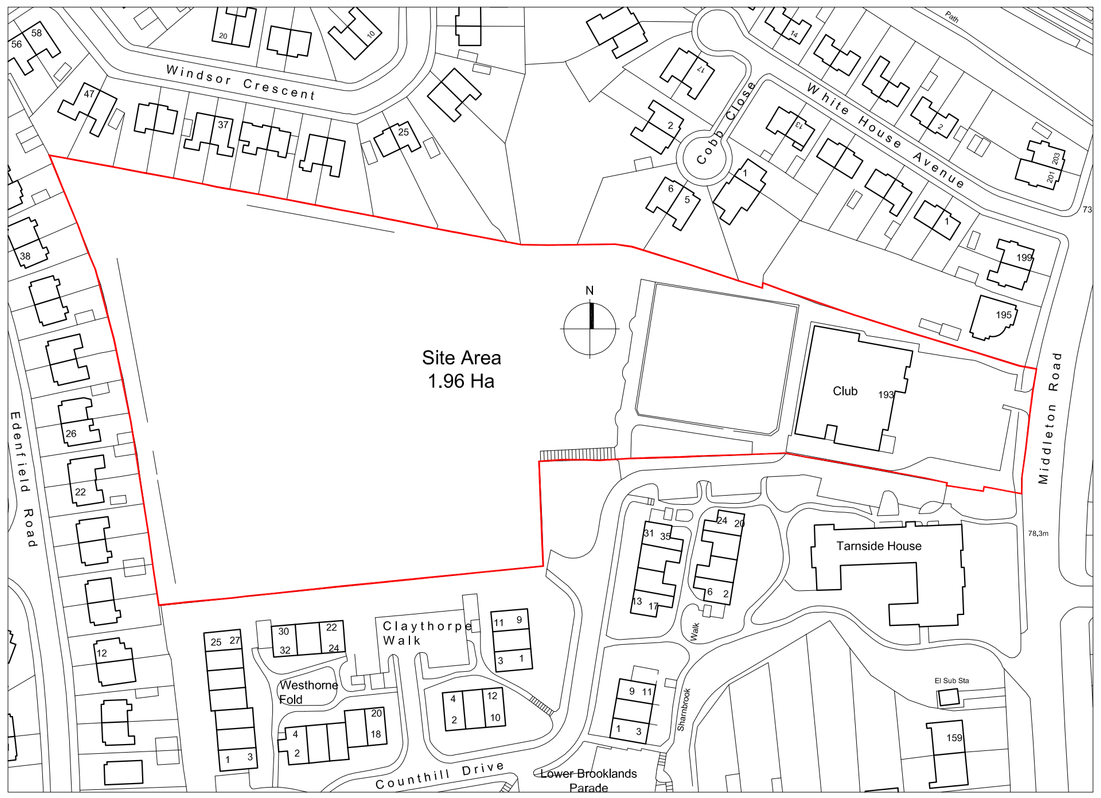
Construction Management Plan (Planning Purposes)



Existing Site Plan - 1:500



Existing Site Plan - 1:1250

All dimensions are to be checked on site, any discrepancies are to be reported to the Architect before work commences. Do not scale from this drawing.

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All structural components shown are indicative only. Details / calculations of structural members are to be provided by the Structural Engineer.

This drawing is copyright.

Building Key

- Building to be demolished
- Outline application boundary
- Detailed application boundary

Key
A & B - Delivery drop off points (inc. wheel wash facilities)
FE - Fire Extinguishers & Klaxon (also placed in houses as development progresses)
FA - First Aid Point

Parking
Parking and speed restrictions must be adhered to at all times and all parking / maneuvering must be done in a safe manner, with minimal risk to other users and neighbours.

Loading
All loading / unloading of plant or machinery must take place within the site with the assistance of a qualified banksman where necessary.

Site Personnel
All site personnel (on first visit) and visitors must report to the site manager in the site office to sign in / receive inductions

Working Hours
Mon-Thurs - 7:30am - 4:00pm
Fri - 7:30am - 3:00pm
Saturday - 9:00am-1:00pm
Sunday/BH - No work permitted

Deliveries
To be made via principal contractor's site compound and transported to work areas in manageable loads

Grays Architecture Limited

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e-mail: mail@graysarchitecture.co.uk

Northwood House (N1)
Greenwood Business Centre,
Manchester, M5 4QH

Client:
Dappa Homes Ltd

Project:
Whitehouse Club, Middleton, Crumpsall, M8 4JZ

Drawing Title:
Construction Management Plan

Scale: 1:500 / 1:1250 @ A1
Date: April 2019

Drawing No: 4050 / 006
Revision: -

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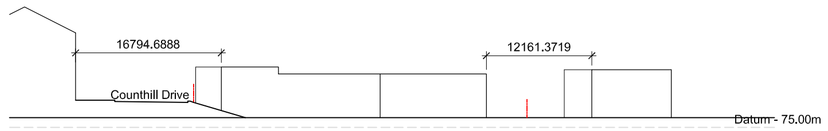
A	Proposed site plan updated	11/03/2019



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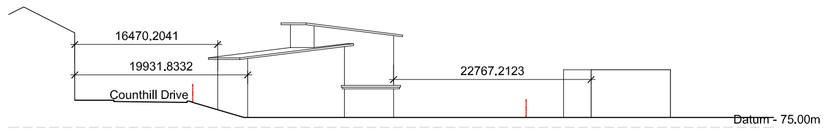
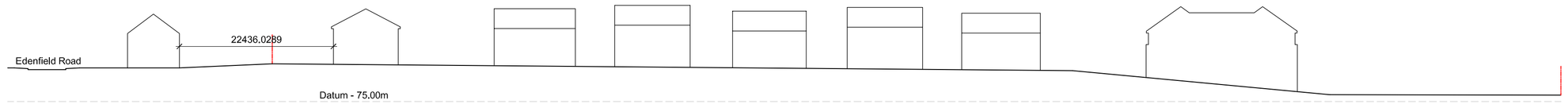


Proposed Section E - E



Proposed Section D - D

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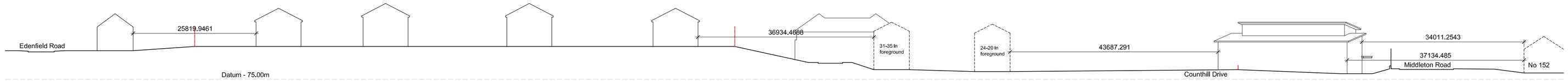
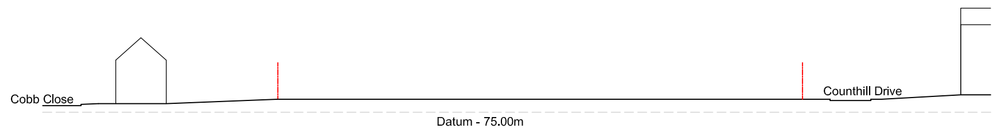


Proposed Section C - C

Existing Section C - C



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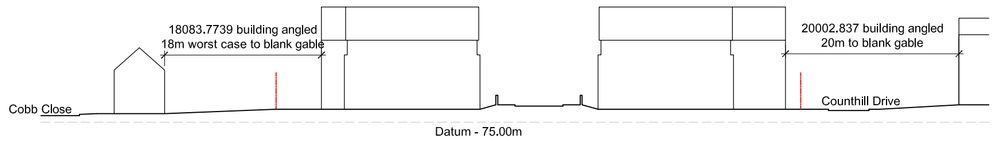
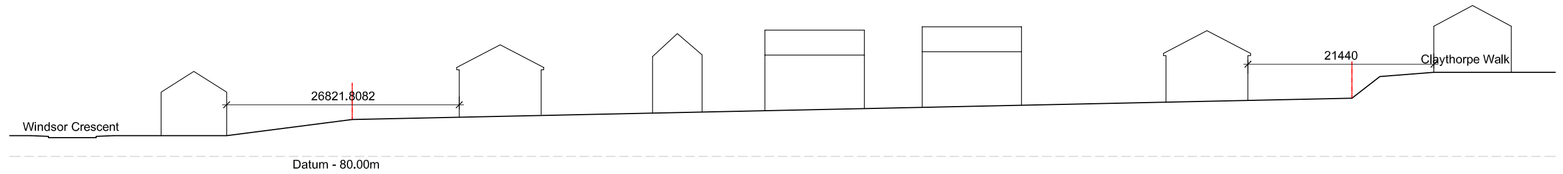


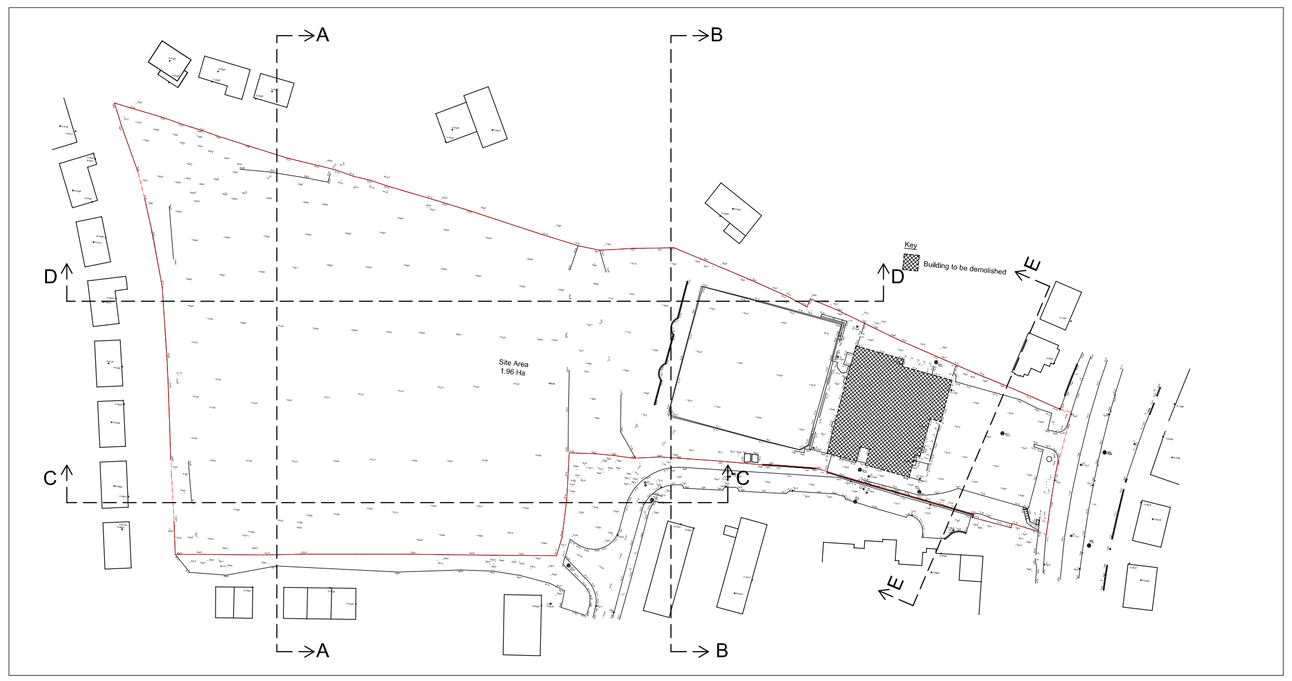
Proposed Section B - B



Proposed Section A - A

Existing Section A - A

Existing Key - 1:1250



Existing Key - 1:1250

Proposed Key - 1:1250

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Northwood House (N1)
Greenwood Business Centre,
Manchester, M5 4QH

Client:
Dappa Homes Ltd

Project:
Whitehouse Club, Middleton, Crumpsall, M8 4JZ

Drawing Title:
Existing & Proposed Site Sections

Scale: 1:500 / 1:1250 @ A1

Date: November 2018

Drawing No: 4050 / 005

Revision: A

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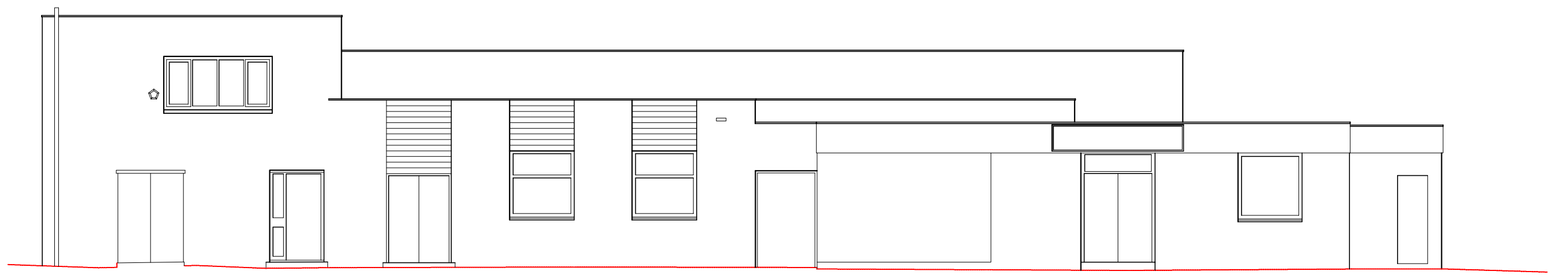
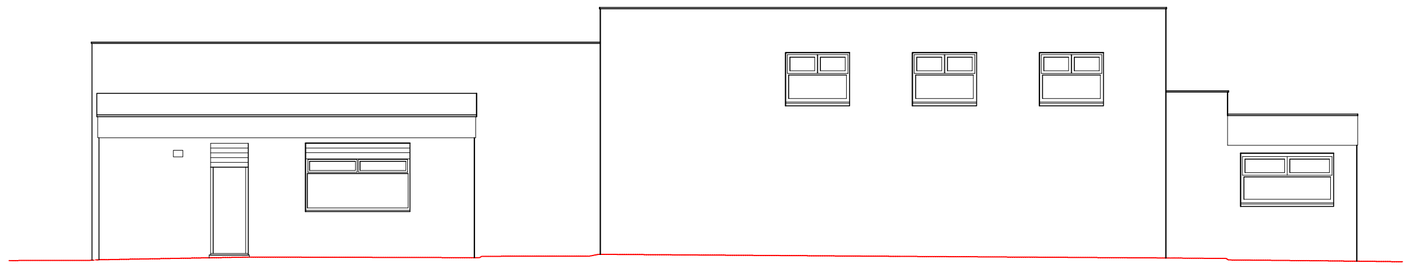
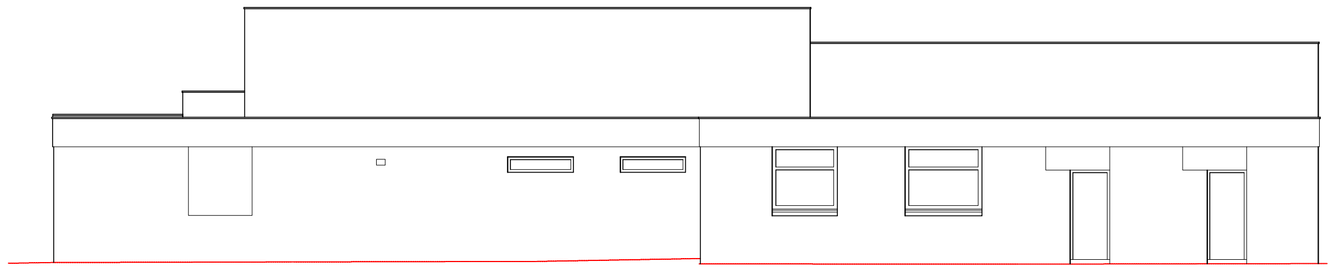


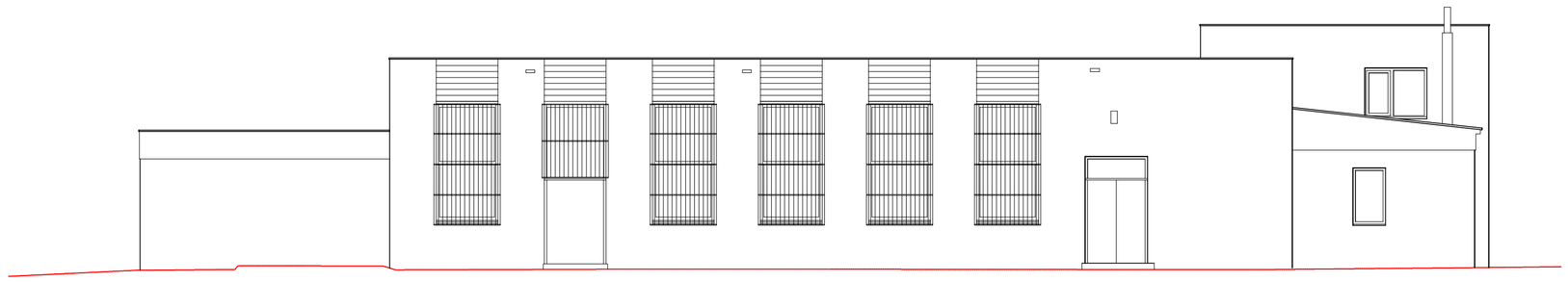
FRONT ELEVATION



SIDE ELEVATION



SIDE ELEVATION



REAR ELEVATION

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Client:

Dappa Homes Ltd

Project:

Whitehouse Club, Middleton, Crumpsall, M8 4JZ

Drawing Title:

Existing Social Club Elevations

Scale:	Date:
1:100 @ A1	January 2017

Drawing No:	Revision:
4050 / 010	-

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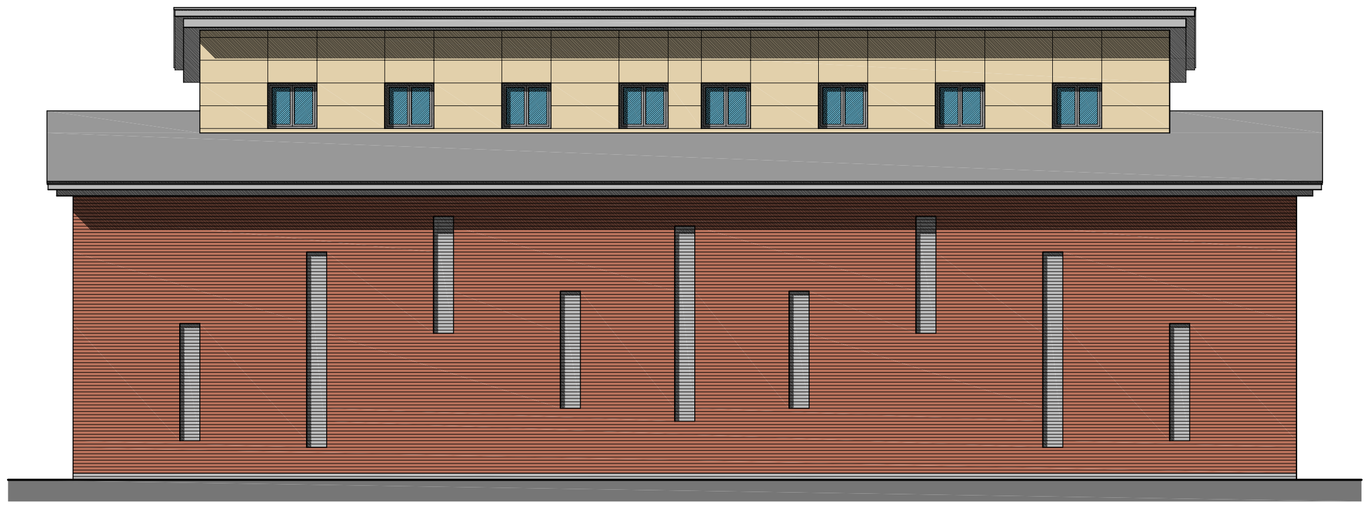
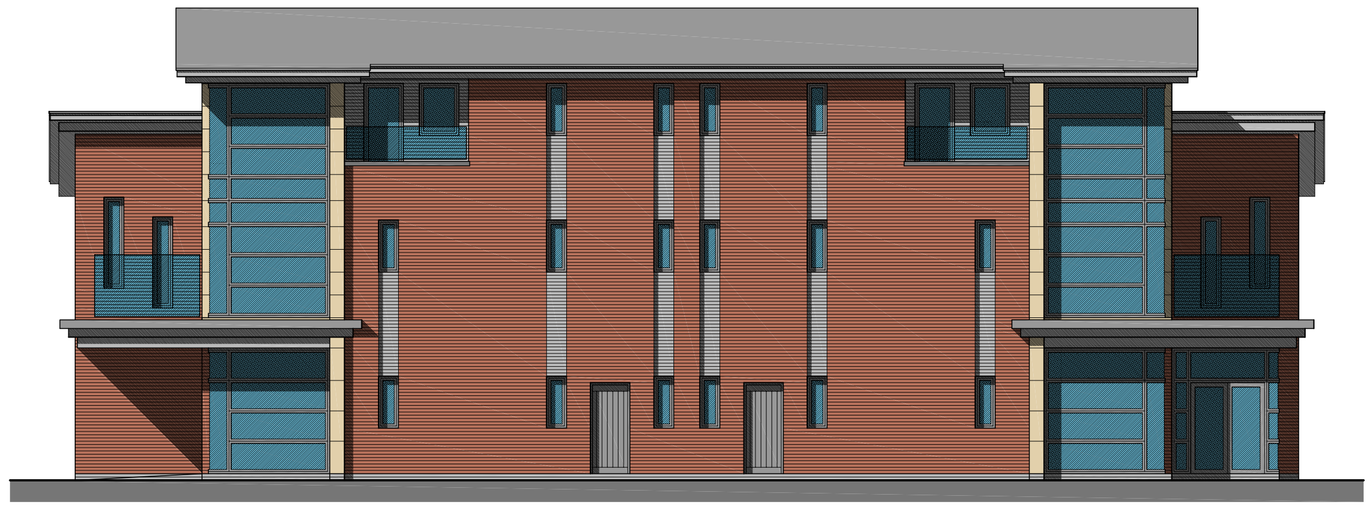
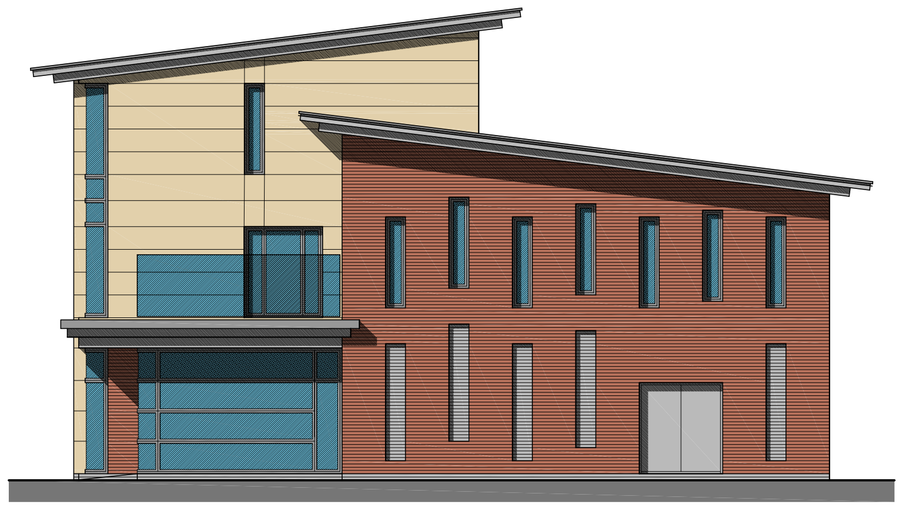
Middleton Road Elevation



Rear Elevation



Main Elevation



Car Park Elevation

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Northwood House (N1)
Greenwood Business Centre,
Manchester, M5 4QH

Client:

Dappa Homes Ltd

Project:

Whitehouse Club, Middleton, Crumpsall, M8 4JZ

Drawing Title:

Proposed Elevations - Club House

Scale:	Date:
1:100 @ A1	March 2015

Drawing No:	Revision:
4050 / 120	-

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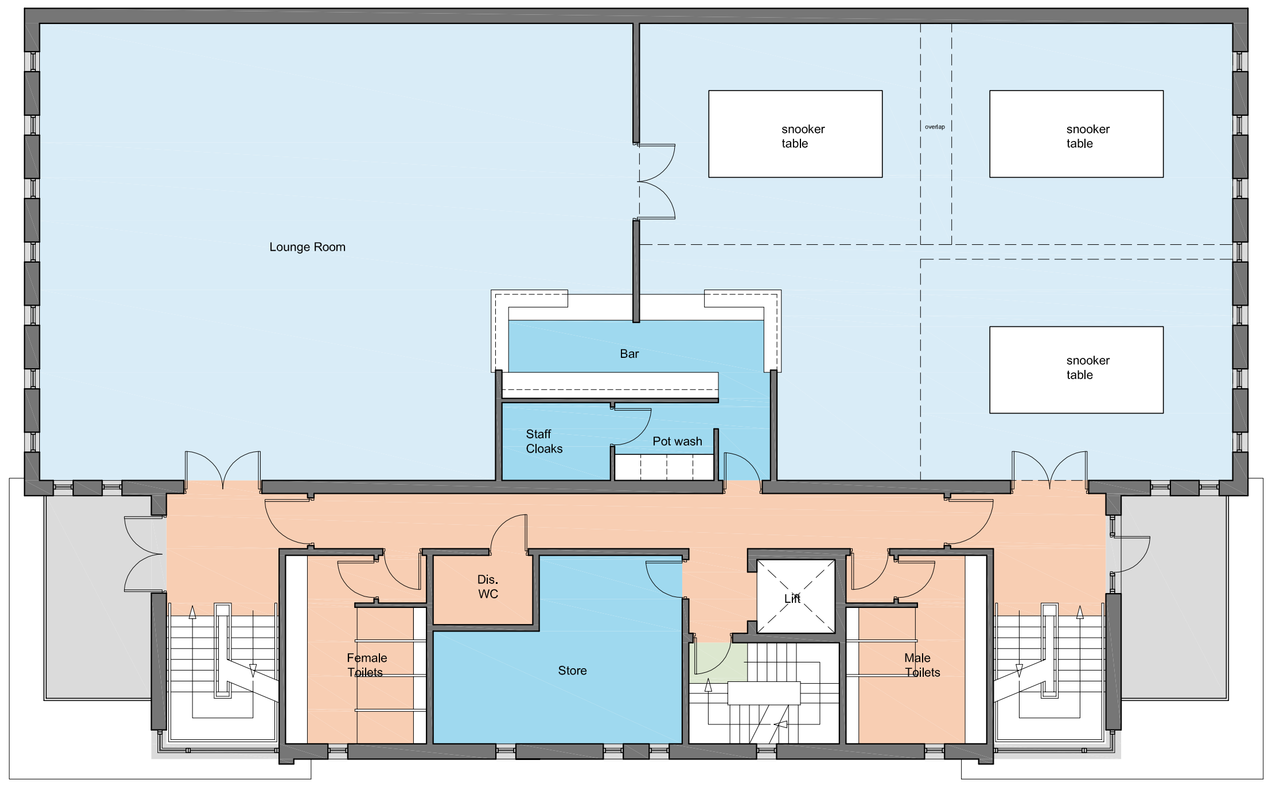
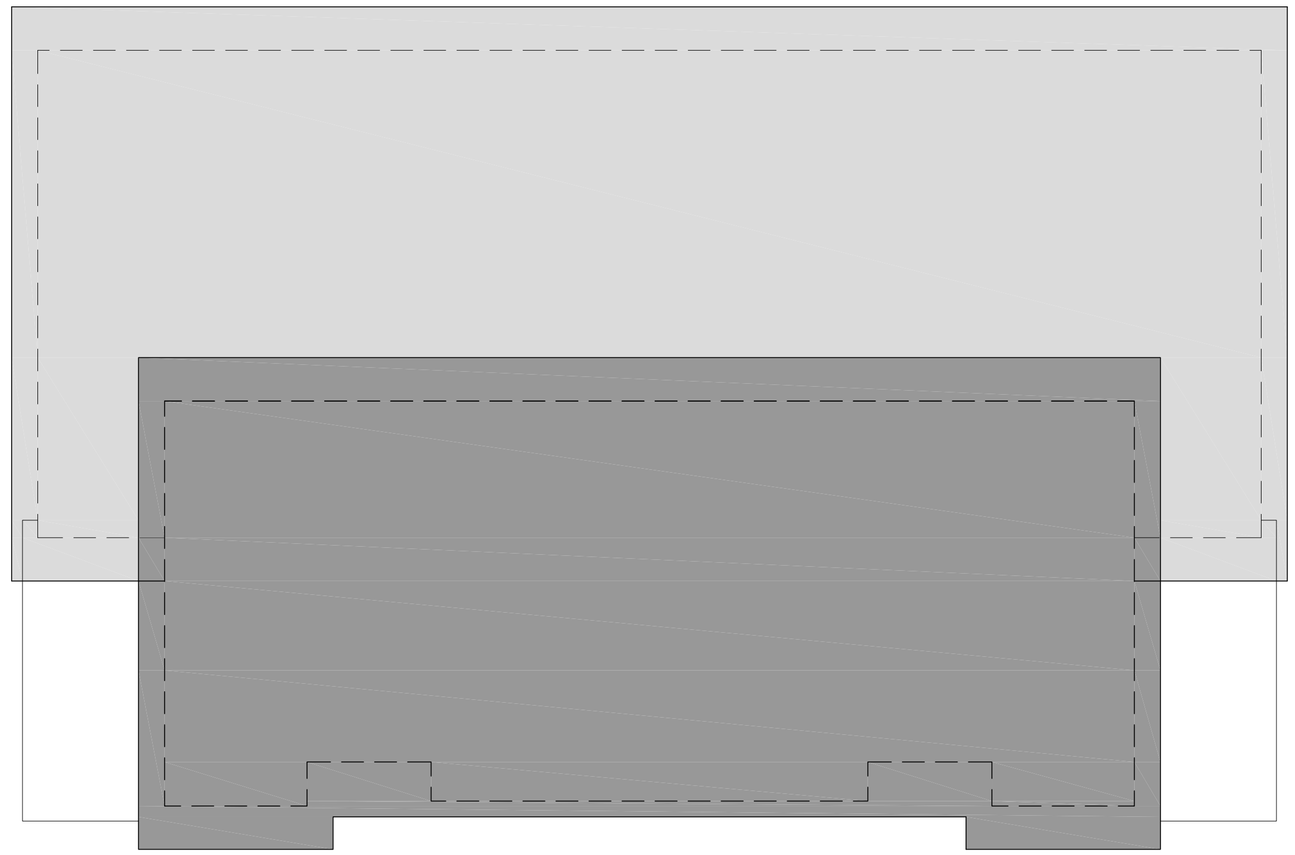
A	General Amendments	01/04/2015
B	General Amendments	29/04/2015
C	Additional Specification Included	08/12/2015
D	General Amendments	27/05/2016
E	General Amendments	05/07/2016
F	General Amendments	06/07/2016
G	Smoking areas omitted	07/07/2016
H	Issued for Planning	12/01/2017



First Floor Plan



Roof Plan

Ground Floor Plan

Second Floor Plan

Areas

Ground Floor Area	-	432 sqm
First Floor Area	-	435 sqm
Second Floor Area	-	179 sqm
Total	-	1,046 sqm (11,259 sqft)

Grays Architecture Limited

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Northwood House (N1)
Greenwood Business Centre,
Manchester, M5 4QH

Client:
Dappa Homes Ltd

Project:
Whitehouse Club, Middleton, Crumpsall, M8 4JZ

Drawing Title:
Proposed Plans and Section - Club House

Scale: 1:100 @ A1

Date: March 2015

Drawing No: 4050 / 110

Revision: H

APPENDIX B

STANDARD OPERATING PROCEDURES

1.0 PURPOSE

The purpose of this procedure is to identify the methodology, sequence of events, responsibilities, and reporting requirements required in connection with site remediation involving excavation of contaminated soils to a level where soils of acceptable contamination status remain in place

2.0 SCOPE

The methods described within this procedure are applicable to the mechanical/hand removal of site soils impacted by contamination.

3.0 RESPONSIBILITIES

CC GEOTECHNICAL (CCG) – Responsible for delineating the lateral extent and notional vertical extent of soil removal, and for on site monitoring of the excavation works. In some cases, the lateral extent will not require delineation by CCG as the whole site will fall under the same remediation regime.

Site Management - The site manager is to ensure that the instructed excavations are undertaken as detailed by *CCG*. It is the site manager`s responsibility to accurately transfer dimensions of all areas to be remediated from drawings to site markers.

Precautions should be taken to ensure that the foundations of adjacent structures are not undermined by excavation activities. Similarly, care should be taken to prevent the collapse of excavations.

Spoil to be disposed, is to be transported off-site as soon as practicable. Only licensed waste transfer operators are to be employed for spoil removal offsite. Where possible, excavated spoil is to be loaded directly on to a waiting wagon ready for transportation to the accepting landfill. Wagons must be sheeted.

Where stockpiling of waste spoil is to take place, preventative action should be undertaken to ensure mixing of contaminated and clean soils does not occur. Measures are to include placement of stockpile on an impermeable membrane.

The site manager is to ensure that any stockpiles of spoil are homogenous.

4.0 PROCEDURE

Soils identified for removal are to be excavated by mechanical / hand dug methods. Where the depth of contamination and hence depth of required excavation is known, this should be adhered to.

Where a specific impacted stratum is to be removed e.g. where the objective is to remove all made ground, excavations are likely to be undertaken to varying depths – following the profile of the underlying strata.

There may be incidences where general oversite validation testing or localised validation testing is required at the base of remedial excavations. Such circumstances will be proposed in the Remediation Strategy, which will propose a frequency of testing and validation criteria against which the results will be assessed.

Where the results of testing indicate that the soils at the base of excavations fail the criteria, then further excavation and disposal of impacted soils will be undertaken.

Once the desired depth of excavation/site strip has been achieved photographic records of the nature of the reduced subgrade level will be obtained. Where agreed remedial action is that soils are to be removed to a specified depth, photographic records supported by survey levels will be collated.

5.0 REPORTING DELIVERABLES

The following will be reported in the Validation Report:

1. Drawing showing lateral extent of excavation
2. Drawing showing post excavation depths of dig
3. Photographs of reduced dig including levelling staff
4. Analyses for base of remediation excavations at a rate of 1 per 100m^2
5. Transfer notes for all loads of spoil carted offsite

6.0 SITE SPECIFIC REQUIREMENTS

Site specific requirements over and above the provision of this SOP must be proposed and agreed in the Remediation Strategy

1.0 PURPOSE

The purpose of this procedure is to identify the methodology, sequence of events, responsibilities, and reporting requirements required in connection with site remediation involving placement of clean imported soils to specified finished levels and/or thickness

2.0 SCOPE

The methods described within this procedure are applicable to the mechanical/manual placement of clean imported soils.

3.0 RESPONSIBILITIES

CC GEOTECHNICAL – Responsible for delineating the lateral extent and vertical extent of soil placement, the relative thickness of subsoil and topsoil (where appropriate), and for on site monitoring of the placement works. Responsible for sampling the soils at the frequency agreed with the Local Authority, procuring laboratory analyses, and reporting on the conformance of the soils in relation to the agreed criteria.

SITE MANAGEMENT - The site manager is to ensure that the instructed placements are undertaken as delineated by *CC GEOTECHNICAL* in terms of lateral and vertical dimensional control. It is the site managers responsibility to accurately transfer dimensions of all areas to be remediated from drawings to site markers.

Soil to be imported to site, is to be transported in sheeted wagons.

Where temporary stockpiling of imported soil is to take place, preventative action should be undertaken to ensure mixing of underlying ground and imported soils does not occur. Measures are to include placement of stockpile on an impermeable membrane.

4.0 PROCEDURE

Soils are to be spread in layers by mechanical / manual methods.

Where soils are placed under cultivated areas then they must be of suitable physical properties to promote root establishment and healthy plant growth

The imported soils may be sampled in stockpiles on the development site at a frequency proposed in the Remediation Strategy and approved by the Local Authority.

The imported soils will be sampled insitu at a frequency proposed in the Remediation Strategy and approved by the Local Authority.

Where a geotextile separation layer is to be placed beneath the remediated area, then it shall be to a specification proposed in the Remediation Strategy and approved by the Local Authority

Where a sample fails to meet the threshold criteria, then the specific plot at which the sample was taken will be excavated and the soil replaced. Other individual plots represented by the sample will be sampled and the sample analysed, to conform whether each individual plot fails the criteria, and if so the soil on the affected plots will be replaced.

Once the desired depth of subsoil placement has been achieved, the works will be halted and photographic records made of the remaining depth to finished level.

Once the desired finished placement level of topsoil has been achieved, photographic records will be made of the finished remediation.

Photographs records are to include as a minimum the following:

1. Spatial panoramic and individual stills of both the development and the areas of soft landscaping
2. Photographs taken of and within excavations showing all layering of soils with clearly shown depths of the strata. The excavations will additionally be photographed to show their spatial position within the site.
3. All photographs are to be taken in good light, with all aspects to be shown on the photograph clear and unobscured by shadow.
4. All photographs are to remain untouched as original exposures. No modification using photographic editing software is to be undertaken whatsoever.
5. Photograph locations are to be noted, and a plan demonstrating this constructed.
6. All photographs are to be fully and adequately described.
7. Once completed photographs of the landscaping are to be taken demonstrating extent of bare ground, planting volume and quality of workmanship.

5.0 REPORTING DELIVERABLES

The following will be reported in the Validation Report:

1. Drawing showing lateral extent of placement
2. Drawing showing total thickness of cover and division of subsoil / topsoil thickness
3. Photographs of subsoil completion including location / date / levelling staff
4. Photographs of completed restoration to top of topsoil including location / date / levelling staff
5. Analyses of subsoil and topsoil
6. Details of the source origin of cover materials
7. Delivery dockets for each consignment

6.0 SITE SPECIFIC REQUIREMENTS

Site specific requirements over and above the provision of this SOP must be proposed and agreed in the Remediation Strategy

1.0 PURPOSE

The purpose of this procedure is to identify the equipment, sequence of events, and appropriate methods necessary to obtain soil samples during validation sampling activities.

2.0 SCOPE

The methods described within this procedure are applicable while collecting soil samples at the base of excavations and from stockpiled materials.

3.0 RESPONSIBILITIES

Site Manager - The site manager is to ensure that site soils are accessible to the environmental project manager for the purpose of extracting samples. Where soils are identified as contaminated, preventative action should be undertaken to ensure mixing of contaminated and clean soils does not occur.

The site manager is to ensure that all stockpiles are homogenous.

CC GEOTECHNICAL appointed Project Manager – The environmental project manager is responsible for the design and implementation of the sampling strategy.

4.0 PROCEDURES

Samples to be taken from the base of excavations are to be taken from within the top 0.1m of exposed ground.

Samples to be taken from stockpiled materials are to be sampled from varying positions throughout the stockpile, penetrating it as far as practical. Sample positions to be identified by photographic means where possible.

Samples may be extracted by hand using a stainless steel trowel or spade. Such tools shall be decontaminated by means of rinsing with clean water prior to obtaining each and every sample.

Samples shall be immediately deposited to suitable tubs/jars, labelled, packaged in cool boxes and accompanied by a chain-of-custody record ready for transportation to the laboratory.

The positions/frequency at which samples are extracted will be as detailed in the remediation statement, any variation from this is to be accurately documented and the relevant local authority is to be notified.

5.0 EQUIPMENT

Disposable gloves, stainless steel spade, stainless steel hand trowel, sample containers, cool boxes, labels, logbook.

1.0 PURPOSE

The purpose of this procedure is to identify the methodology, sequence of events, responsibilities, and reporting requirements required in connection with the installation of gas protection measures in buildings.

2.0 SCOPE

The requirements described within this procedure are applicable to the installation of gas/hydrocarbon vapour resistant membranes.

3.0 RESPONSIBILITIES

Contractor – The contractor is responsible for the design of the gas protection measures, in accordance with the general recommendations provided in the site investigation reports and approved in principle by the Local Authority. The contractor is responsible for the submission of the specification and detailed design of gas protection measures to the Local Authority and obtaining approval to these submissions.

The contractor is responsible for ensuring that the approved specification and design of the gas protection measures is communicated to ***CC GEOTECHNICAL (CCG).***

The contractor is responsible for the installation of the gas protection measures in accordance with the approved specification and design. The site manager is to ensure where required, that the gas/vapour resistant membrane be installed in line with the manufacturers instructions.

CCG or Independent Inspector - Responsible for the inspection and verification that gas protection measures are installed in accordance with the approved specification and design.

4.0 PROCEDURES

The installation of the gas/vapour resistant membrane is to be undertaken in accordance with the specific manufacturers methodology. The installation of membranes must be undertaken by experienced and competent personnel.

5.0 REPORTING DELIVERABLES

The following will be reported in the Validation Report:

- Manufacturers certificates
- Independent inspectors statement of storage suitability
- Independent inspectors statement of subgrade inspection
- Independent inspectors statement of roll out damage inspection
- Independent inspectors photographic records of installation (identifying date & plot/block)
- Independent inspectors completion of Gas Protection Validation Record (see pro-forma)

Gas Protection Validation Record

One record sheet to be completed for each plot inspected by a SUITABLY QUALIFIED independent consultant/engineer

job number		design source/ref:		specification source/ref:		other documents attached	✓ / ×
site name / location		building use:	*residential*	*commercial*	*other (describe)*		
plot number/s		building description:	no. of storeys =		*detached*	*semi-detached*	*terrace* / *apartment block*
compiled by:		gas protection type:	*active / passive*		foundation type:	*suspended floor / raft / other*	

Ventilated sub-floor (if present)	inspection date/time:		inspected by:		photographed:	✓ / ×

	✓ / ×	**Notes/recommendations (see guide below)**
void former type		1.
height of void space		2.
gravel type		3.
pipe size and spacing		4.
external wall airbricks		5.
internal sleeper walls		6.
external vent trenches / ducts		7.

Gas barrier	inspection date/time:		inspected by:		photographed:	✓ / ×

	✓ / ×	**Notes/recommendations**
membrane type		8.
extent of coverage		9.
underside of membrane		10.
slab/membrane condition		11.
laps and joints		12.

Gas Protection Validation Record

damp-proof course	☐	13.
service entries and seals	☐	14.
cavity Inspection	☐	15.

Guide notes:

1	void former type	proprietary type - manufacturer and specification, in accordance with design?, installed properly without damage?
2	height of void space	height of proprietary former or constructed ventilation space below suspended floor - note any debris on void / obstructions to air flow, note formation surface soil type (e.g. crushed concrete/brick), any evidence of flooding
3	gravel type	gravel type, if used (limestone / granite etc.) and any specification (e.g. 6F2), typical particle dimensions (mm), apparent fines content (low/high), compaction (loose/dense), waterlogging / contamination by clay, organic matter, other debris. Take photographs of stockpile close up shot of stone with tape measure. Alternatively check details on delivery tickets for stone. Take photographs of adjacent plots if at this stage of construction. Check depth of stone conforms to at least 300mm if visible.
4	pipe size and spacing	diameter in mm; material type (e.g. PVC); slotted or perforated; positioning and spacing / separation and jointing as on design drawing - if not sketch arrangement - do pipes connect with external (telescopic / swan-neck) vents? Take photographs of vents on external walls for each plot. (May be possible to photograph other plots on site which are at stage of installing vents. Will be useful for these plots later on).
5	external wall airbricks	check numbers, size and positions as design drawing (if not shown, make sketch; check for blockage, e.g. by mortar, or soil / pavings etc.
6	internal sleeper walls	check for ventilation holes - e.g. honeycombe brickwork or pipe crossings - note size, spacing and location - in accordance with design?
7	external vent trenches / ducts	check whether located and constructed in accordance with design drawings; if open-topped gravel, note gravel type and presence of fines / contamination; if pipe or other vents - check positions and construction for functionality and absence of blockages - vents may be built over
8	membrane type	note manufacturer and product specification, including batch / roll numbers if present - in accordance with specification? Check stock storage arrangements - protected from dirt and damage?
9	extent of coverage	if membrane is incomplete, further inspection will be required - note areas completed / incomplete - is membrane fully visible or have internal walls been constructed over membrane / screed placed?
10	underside of membrane	Where necessary , for example, when using a granular blanket as a ventilation layer, check the underside of the membrane has adequate protection e.g. minimum 50mm no fines concrete blinding layer or appropriate geo-textile (see also below)

Gas Protection Validation Record

11	slab/membrane condition	record presence of debris / rough surfaces, in particular sharp projections, below or above membrane; record locations of all punctures or repairs, note arrangements to protect membrane surface from traffic / tools and equipment / materials, and temporary weighting down of membrane, e.g. use of boards - record evidence of footprints / tracks on membrane surface, creases or water/wind damage. Take photographs of each plot inspected.
12	laps and joints	check the all joints are lapped and sealed in accordance with manufacturer's requirements / specification, particularly where creases/folds are present (usually minimum 150mm laps with double-sided tape between sheets, and single-sided tape on top surface; note size of sheets and frequency of edge seals). Take photographs of jointing for each plot.
13	damp-proof course	record DPC manufacturer and product code - usually integrated with the membrane; measure the DPC projection from external wall in mm; check laps and seals between membrane and DPC - note any potential stress points and tension between the two; check for damage to DPC
14	service entries and seals	note number, position and diameter of service entries - check top hat seal arrangements in accordance with design / specification (laps and seals between top hat and floor membrane, pipe upstand is usually a minimum 150mm) check , with jubilee clips to secure top hat seal to pipe - note presence of clips and tightness of connections. Take photographs for all plots inspected.
15	cavity Inspection	check gas membrane or gas resistant dpc is taken across cavity. Check for rips across cavity. Check for jointing detail of gas resistant dpc or membrane across cavity to main membrane. Take photographs for all plots inspected.

This plot has PASSED / FAILED* inspection.

(Any proposed remedial works will be noted in the 'Remarks' column on this form).

An addition inspection visit IS / IS NOT* required for this plot.

Qualified Engineer: …… Signed:……
(Print Name)

* Delete as appropriate

APPENDIX C

SOIL CONTAMINANT ACCEPTANCE CRITERIA

SOIL ASSESSMENT CRITERIA FOR RESIDENTIAL LAND USE (WITH HOME GROWN PRODUCE)

Contaminant	Assessment Criteria for Residential at 1% SOM (mg/kg)	Assessment Criteria for Residential at 2.5% SOM (mg/kg)	Assessment Criteria for Residential at 6% SOM (mg/kg)
Metals			
Arsenic	37	37	37
Boron	290	290	290
Cadmium	11	11	11
Chromium III	910	910	910
Chromium VI	6	6	6
Copper	240	240	240
*Lead	200	200	200
Mercury	1.2	1.2	1.2
Nickel	180	180	180
Selenium	250	250	250
Vanadium	410	410	410
Zinc	3700	3700	3700
Non-Metals			
Phenol	280	550	1100
Polyaromatic Hydrocarbons (PAH)			
Acenaphthene	210	510	1100
Acenaphthylene	170	420	920
Anthracene	2400	5400	11000
Benz[a[anthracene	7.2	11	13
Benzo[a]pyrene	2.2	2.7	3.0
Benzo[b]fluoranthene	2.6	3.3	3.7
Benzo[ghi]perylene	320	340	350
Benzo[k]fluoranthene	77	93	100
Chrysene	15	22	27
Dibenz[ah]anthracene	0.24	0.28	0.3
Fluoranthene	280	560	890
Fluorene	170	400	860
Indeno[123-cd]pyrene	27	36	41
Naphthalene	2.3	5.6	13
Phenanthrene	95	220	440
Pyrene	620	1200	2000
Coal Tar [Bap as surrogate marker)	0.79	0.98	1.1
Petroleum Hydrocarbons			
Aliphatic EC 5-6	42	78	160
Aliphatic EC >6-8	100	230	530
Aliphatic EC>8-10	27	65	150
Aliphatic EC>10-12	130	330	760
Aliphatic EC>12-16	1100	2400	4300
Aliphatic EC>16-35	65000	92000	110000
Aliphatic EC>35-44	65000	92000	110000
Aromatic EC5-7 (Benzene)	70	140	300
Aromatic EC>7-8 (Toluene)	130	290	660
Aromatic EC>8-10	34	83	190
Aromatic EC>10-12	74	180	380
Aromatic EC>12-16	140	330	660
Aromatic EC>16-21	260	540	930
Aromatic EC>21-35	1100	1500	1700
Aromatic EC>35-44	1100	1500	1700
Aliphatic – Aromatic EC>44-70	1600	1800	1900

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The above is based on criteria contained in publication LQM/CIEH S4UL`s for Human Health Risk Assessment (2015) (***CCG*** Licence No. S4UL3233), applicable to the "Residential" land use (**with** home grown produce) scenario for soil organic matter (SOM) content of 1% - 6%.

*This document does not provide criteria for Lead, for which the results were compared to the C4SL published by DEFRA SP1010 Development of Category 4 Screening Levels.