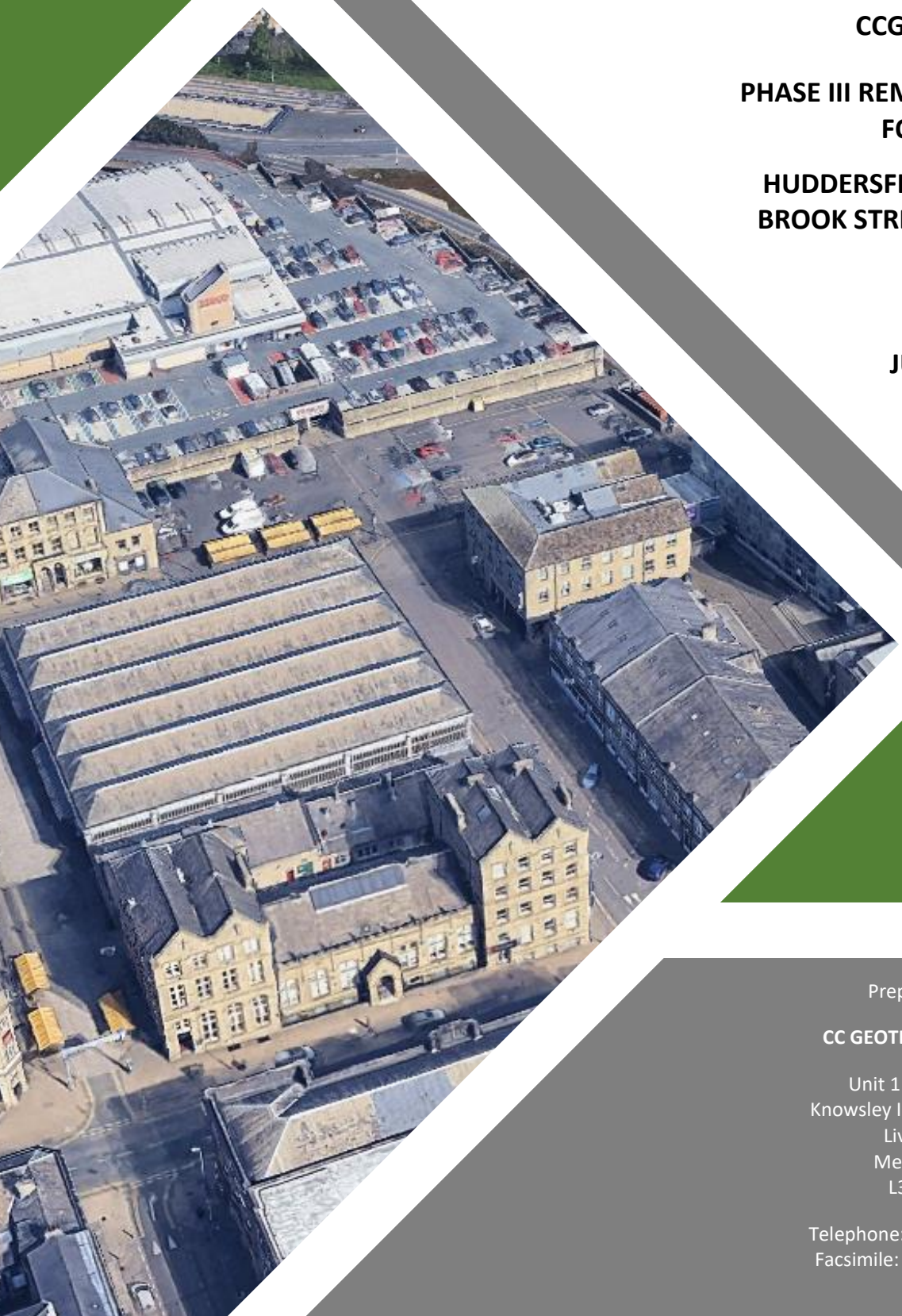

CCG-C-26-16291

PHASE III REMEDIATION STRATEGY FOR SITE AT

HUDDERSFIELD OPEN MARKET, BROOK STREET, HUDDERSFIELD, HD1 1DY

JUNE 2026

Prepared by:

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DOCUMENT CONTROL FORM	
Client:	**KIRKLEES COUNCIL**
Project Title:	PHASE III REMEDIATION STRATEGY FOR SITE AT HUDDERSFIELD OPEN MARKET, BROOK STREET, HUDDERSFIELD
Reference Number:	CCG-C-25-16291
Main Author:	Daniel O'Regan BSc (Hons) MIEnvSc PIEMA
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Reviewed by:	Chris Bolan MSc CEng MICE CEnv
Signature:	
Approved for Issue by:	Chris Bolan MSc CEng MICE CEnv
Signature	
	For and behalf of CC GEOTECHNICAL LTD
Date:	June 2026
Revision Number:	0
Comments:	
Status:	FINAL
Distribution:	**KIRKLEES COUNCIL** **TURNER & TOWNSEND PROJECT MANAGEMENT LIMITED**

REMEDIATION STRATEGY DOCUMENT	
Document No: CCG-C-26-16291	**Site:** Huddersfield Open Market, Brook Street, Huddersfield, HD1 1DY

INTRODUCTION:

CC GEOTECHNICAL LIMITED (***CCG***) was commissioned by ***KIRKLEES COUNCIL (THE CLIENT)*** to provide geoenvironmental consultancy services in connection with proposed redevelopment of Huddersfield Open Market, Brook Street, Huddersfield, HD1 1DY.

The existing Grade II Listed 1880's open market building is to be retained and refurbished by the installation of 4nr steel framed mezzanine structures, providing additional floor space accommodating community kitchens / bar, ancillary offices, and welfare facilities at ground floor level, with dining seating areas at first floor level. Small localised landscaped areas are also proposed. Layout plans of the proposed development are presented on ***GRIEG & STEPHENSON ARCHITECTS*** Drawings presented in Appendix A.

The proposed development falls within the administrative jurisdiction of ***KIRKLEES COUNCIL*** administered under planning application number 2025/92443.

It should be borne in mind that the data and opinions contained in this report should be read in conjunction with the Notes on Limitations, given in Appendix D.

ASSOCIATED REPORT REFERENCES:	DATE:
Phase I Desk Study Report (J3644/16/EDS) prepared by ***ROGERS GEOTECHNICAL SERVICES LTD***	October 2026
Phase II Ground Investigation Report (CCG-C-24-15006) prepared by ***CC GEOTECHNICAL LTD***	May 2025

1.0 Soil Contamination

The human health risk assessment contained in the above referenced Phase II Report identified Asbestos Containing Materials (ACM) and elevated levels of several PAH species within the made ground soils. On this basis a potential risk to receptors was identified, and hence some remedial actions / measures are recommended, as tabulated hereunder:

Table 1: Post Investigation Conceptual Model (Soils)

Source	Pathway	Receptor	Remedial Recommendations
Asbestos Containing Materials (ACMs) in the form of Chrysotile (loose fibres) in soils recovered from 4nr borehole positions	Inhalation Pathway	Construction workers future end users Maintenance workers etc. General Public	The above human health risk assessment confirms the presence of asbestos containing material (ACM) and hence a risk to human health is indicated. All of the positive detects were recorded in the external car park area. None were recorded in samples from the existing market hall. The proposed works will involve removal / disturbance of soils in which positive asbestos detections were recorded in the form of Chrysotile (*loose fibres*). The disturbance of these soils may give rise to airborne releases of fibres posing an inhalation risk to market workers, the general public, and construction operatives. The potential for exposure to asbestos fibres is highest during the groundworks (construction workers & general public) and within future soft landscaped areas where receptors (maintenance staff and public) at the site are most likely to come in contact with the contaminated Made Ground soils. Hardstanding, including the building footprints, vehicular tarmac, pedestrian tarmac and concrete and block paving are considered sufficient to break the potential contaminant linkage, and therefore no specific remediation measures, above activities required for construction, are considered necessary where these are installed at the site. For all new soft landscaped areas, a clean cover layer is

			recommended. It is therefore recommended that verified clean capping, comprising a minimum total thickness of 600mm is incorporated over general soft landscaping areas. This is to be made up of a minimum 200mm imported topsoil and 400mm of sub-soil. Additionally, a high visibility warning geotextile or granular break layer (of minimum 100mm thickness) should be installed beneath the clean cover system. Where tree pits are to be planted, excavation of >600mm is likely to be required for a sufficient depth. Delivery of the project will require extensive disturbance of the made ground in site clearance, groundworks, foundation and service alignment construction, thereby increasing the risk of fibre releases. It is incumbent on the contractor to develop method statements designed to minimise risks to construction workers and the general public. Contractors may obtain guidance from CL:AIRE which has published the Joint Industry Working Group Asbestos in Soil and Construction & Demolition (C&D) Materials guidance titled "Control of Asbestos Regulations 2012: Interpretation for Managing and Working with Asbestos in Soil and Construction & Demolition materials: Industry Guidance (shortened name CAR-SOIL™)". This authoritative document has been prepared with the support of the Health and Safety Executive and presents the definitive explanation of how the legal requirements of the Control of Asbestos Regulations 2012 (CAR 2012 or the Regulations) have been interpreted to apply to work with asbestos contaminated soil and construction & demolition materials. Wagons carting spoil offsite must be sheeted and must pass through a wheel wash.
Elevated levels of soil contaminants including: Benzo(b)fluoranthene Benzo(a)pyrene Dibenzo(ah)anthracene	Oral / ingestion /dermal Pathways	Construction workers future end users Maintenance workers etc.	No remedial works will be required in areas of proposed permanent hardstanding – building / pavements - since the hard cover will break all plausible pathways. Required remedial works on soft landscaped areas are as described for asbestos risks discussed above
Contaminant concentrations above WRAS criteria for PE potable water supply	Ingestion of contaminated water	Future end users	New water mains must be specified as PE/AL/PE barrier (Protectaline) pipe construction. 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.

2.0 Site Preparation / Trafficking

The ground investigation has shown the site to be underlain by superficial deposits of made ground. It is these deposits which have been shown to contaminated with ACM and elevated levels of several PAH species. Full removal of these deposits is neither practicable nor environmentally beneficial. Where hard cover is removed and construction activity has

the potential to disturb the made ground soils then, for initial control of potentially harmful dust releases, appropriate suppression measures should be adopted. it is recommended that trafficking routes receive a cover of clean imported granular fill, such that general site activity and trafficking does not cause release of made ground dust. Foundation and service excavations through the cover into the made ground must be undertaken in a controlled manner to be developed by the contractor as described in Table 1 above.

3.0 Air Quality Monitoring

Disturbance of the ground during construction can cause the release of harmful fibres into the atmosphere. It is essential that these fibres are effectively suppressed to prevent exposure to receptors through the inhalation pathway. For the duration of the construction stage, where ground disturbance is likely, an air quality monitoring programme should be implemented to observe the exposure levels to airborne asbestos fibres. The programme will require a visiting independent qualified air monitoring specialist be commissioned to attend site at an agreed frequency, throughout the groundworks period. The air monitoring specialist will collect air samples to assist in determining the adequacy of engineering and environmental controls employed at the site.

Continuous air sampling will be implemented at suitable points around the site boundary.

The methodology of sampling and analysis of the air samples will be proposed in a protocol to be prepared by the appointed independent monitoring specialist.

4.0 Gas Contamination

Based on the gas monitoring data obtained, the risk to the proposed development was assessed in line with Situation A as defined in CIRIA C665, and on this basis the site complies with Characteristic Situation 1, and no gas protection measures are required.

5.0 Water Mains Supply

Assessment of the soil chemical data to specify the construction of new water mains at the development 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’ January 2011 published by UK Water Industry Research (UKWIR) and the supplementary guidance UUENG/RL/V2/July 2011 published by United Utilities Water (UUW).

Concentrations of the pertinent soil contaminants were found to be above the threshold values recommended under the guidance. On this basis, new water mains must be specified as PE/AL/PE barrier (Protectaline) pipe construction. Also, new watermains should be laid in a clean remediated alignment, with 300mm clean gravel surround (i.e 600mm wide trench, with mains set centrally).

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.

Notwithstanding the above preliminary assessment, the developer should contact the local water supplier (YW) to obtain concurrence with the recommendations given above. The supplier may require the developer to return a completed UUW Risk Assessment document.

Fill materials imported from offsite sources will require contamination assessment at a rate of 1 analysis per 100m^3.

6.0 Unanticipated Contamination

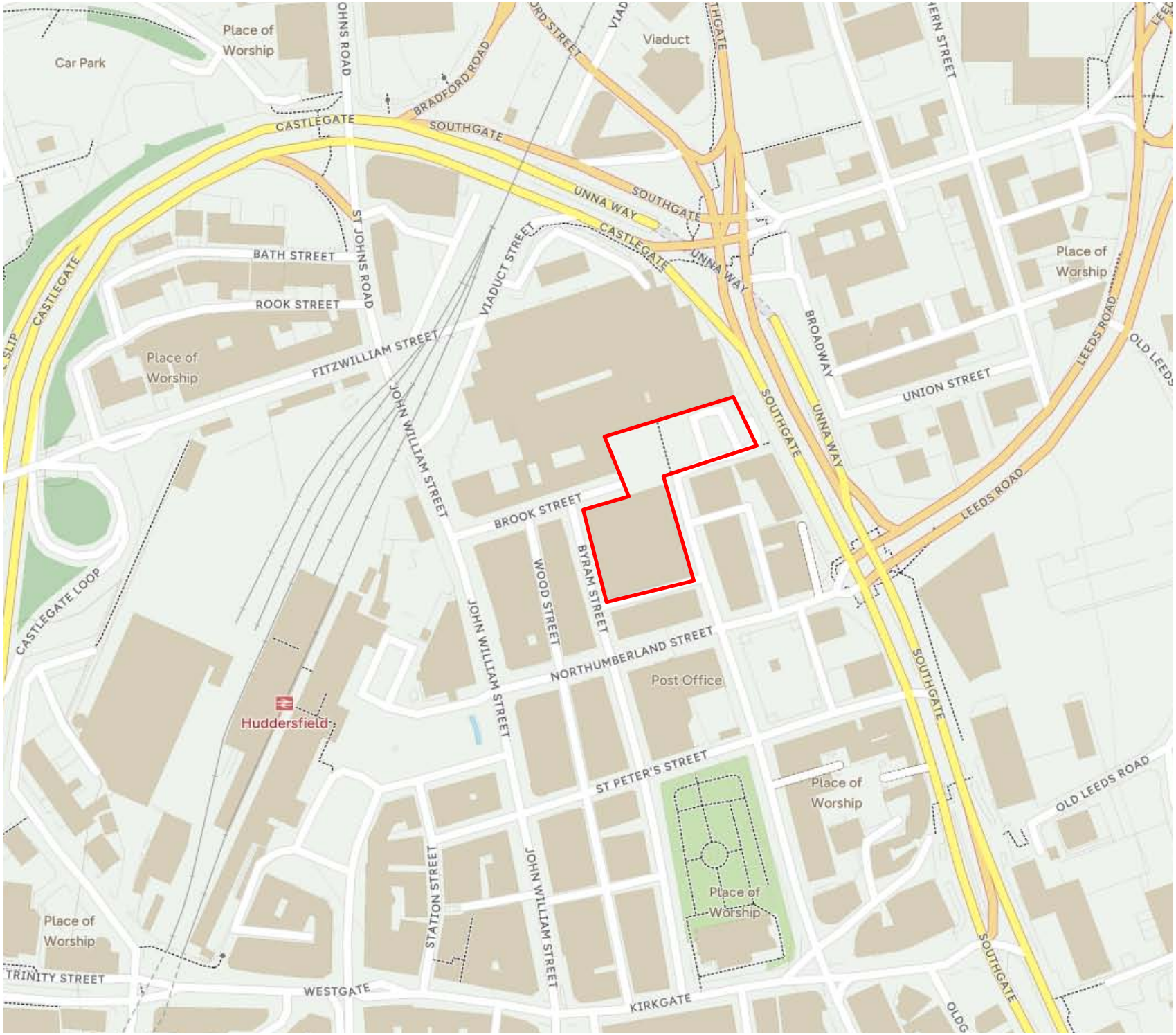
As with all urban developments, disturbance of the ground may uncover unanticipated features which may give rise to considerations of contamination insofar as the exposed conditions may have the potential to impact on receptors *inc* humans, animals, controlled waters, or the fabric of buildings. Any 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, 2 & 3	**Standard Operating Procedures 1, 2 & 3**	**LANDSCAPE AREA REMEDIATION WORKS** No remediation required under areas of hardstanding and building cover. If cultivated landscape areas are to be included within the development, the following measures should be carried out at these areas: • Reduction to 600mm below proposed finished level and restored to finished design levels by placement of 600mm composite subsoil / topsoil. All materials imported for landscaping will be subject to a regime of validation sampling and testing, and proof excavations will be undertaken to verify compliance with the stated thickness. • Test suite and compliance thresholds for imported clean subsoil / topsoil / granular fill 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. **Record keeping / Validation** • Removal of surplus soils generated during site level reduction works will be documented by Waste Transfer Notes, to be retained by the Contractor and made available to ***CCG*** for inclusion in the Validation Report. • Test suite and compliance thresholds for imported clean subsoil / 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 identification, 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, with a minimum of 4nr samples per source. • Soil chemical analyses are to be carried out at a UKAS/MCERTs laboratory. • 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 thickness of topsoil by inspection pits/photography following completion of works. These records will be incorporated in the Validation Report.

5	. Standard Operating Procedure 5	**<u>WATER MAIN PROTECTION MEASURES</u>** New water mains should be specified as Protecta-Line (PE/AL/PE) pipe construction. Good practice requires that water 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 – Polyethylene (PE) as stated in UKWIR guidance. Notwithstanding the above preliminary assessment, the contractor may wish to liaise with the relevant water supply company (United Utilities) to confirm these recommendations and any consequential requirements. **Record keeping / Validation** Validation records will be provided to ***CCG*** for incorporation into the Phase 4 Validation Report: • Records of the correct pipe purchases for reconciliation with plans and drawings to be provided by the Contractor for inclusion in the report appendices. • Photographs to be provided by the Contractor of mains installation showing clean backfill surround
The Standard Operating Procedures referred to above are attached in Appendix B.		

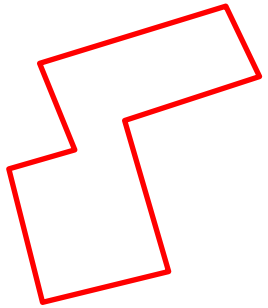
APPENDIX A

DRAWINGS



DO NOT SCALE

Notes: Study Site



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0151 545 2750

Client:
Kirklees BC

Project:
Clay Lane, Burtonwood

Title:
Aerial Photograph

Scale:	Issue:
NTS	01
Drawn by:	Date:
DG	March 25
Project No.	Drawing No.
CCG-C-24-15006	01

DO NOT SCALE

Notes: Study Site

CC GEOTECHNICAL LIMITED
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L33 7BA
0151 545 2750

Client:
Kirklees BC

Project:
Clay Lane, Burtonwood

Title:
Aerial Photograph

Scale:	Issue:
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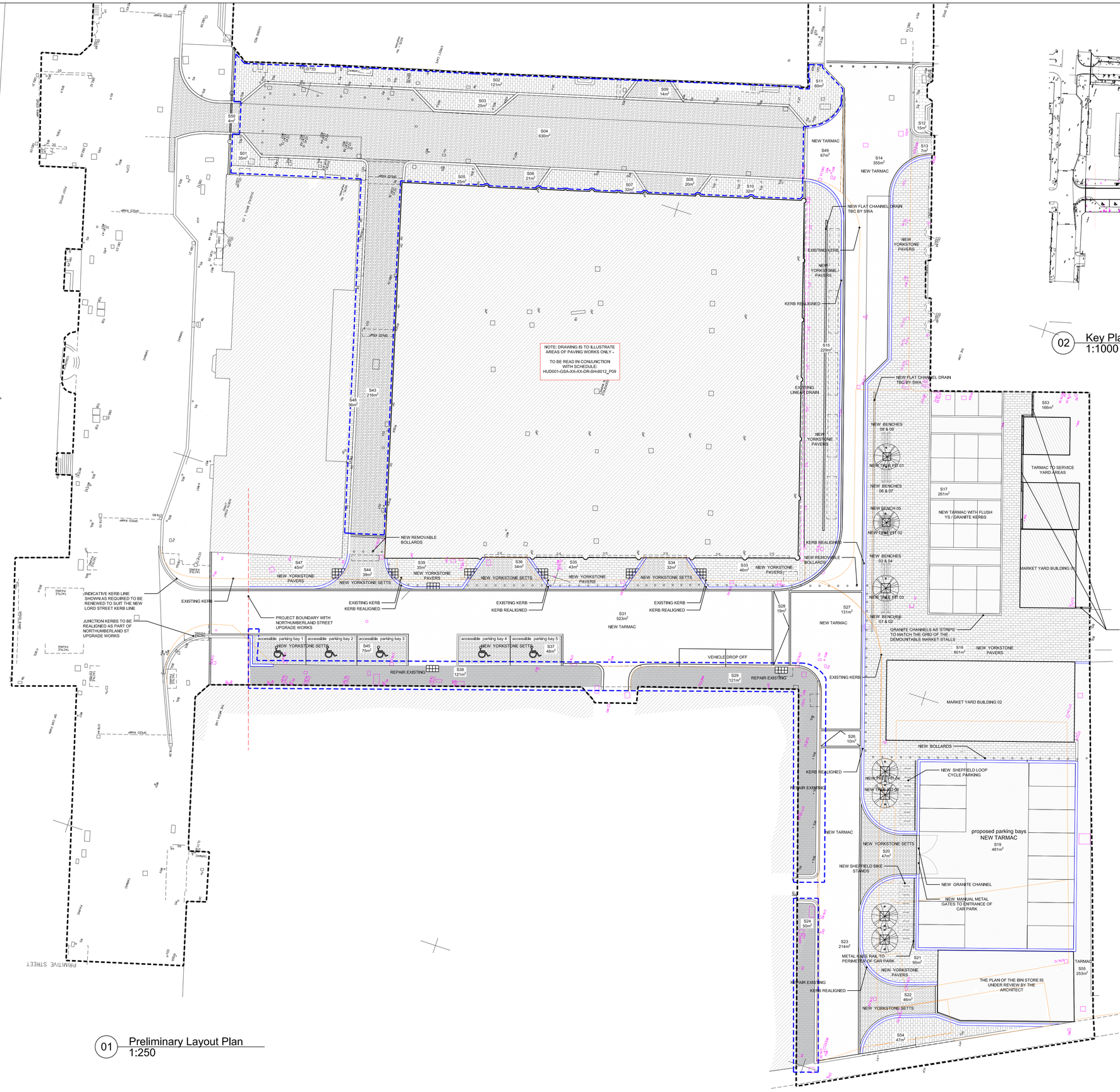
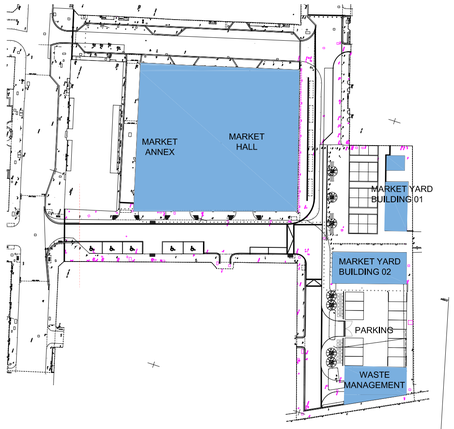
Drawn by:	Date:
DG	March 2025
Project No.	Drawing No.
CCG-C-24-15006	02



01 Preliminary Layout Plan
1:250



02 Key Plan
1:1000

0m 5m 10m 15m 20m 25m
SCALE 1:250 @ A1

N

KEY

- REPAIR LINE
- NEW KERB LINES
- EXISTING DEMOLISHED
- EXISTING FEATURES IMPACTED BY NEW PUBLIC REALM WORKS TO BE CO-ORDINATED WITH CIVIL ENGINEER AND MEP ENGINEER
- NEW TREE PIT AND SEMI MATURE TREE
- NEW TARMAC
- NEW YORKSTONE SETTS
- NEW YORKSTONE PAVERS
- REPAIRED CONCRETE PAVERS
- NEW CONCRETE PAVERS

REV	DATE	COMMENT	DRW | APRV
P06	30/01/25	Updated to latest design concept	CS | NM
P05	21/01/25	Updated to latest design concept	CS | NM
P04	17/12/24	Issued for stage 3 frozen set	CS | NM
P03	11/06/24	Finishes amended for Stage 2	NM | AP
P02	30/11/22	Layout Amended - Site sections added. Kerb line amended following stage 3 co-ordination. Removal of 2 parking bays, replaced with a loading bay. Car park & waste management re-designed. Outdoor market canopy columns & trader block amended. Surface finish areas re-calculated.	TMB | NM
P01	25/08/21	First Issue - for coordination	ZHA | NM

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email. info@gands.co.uk

CLIENT: KIRKLEES COUNCIL

PROJECT: HUDDERSFIELD MARKET

STATUS: INTERIM STAGE 3 FOR INFORMATION

DRAWING: Public Realm Proposed Plan with surface finish areas

SCALE	DRW | CHKD	RVW | APRV	DATE
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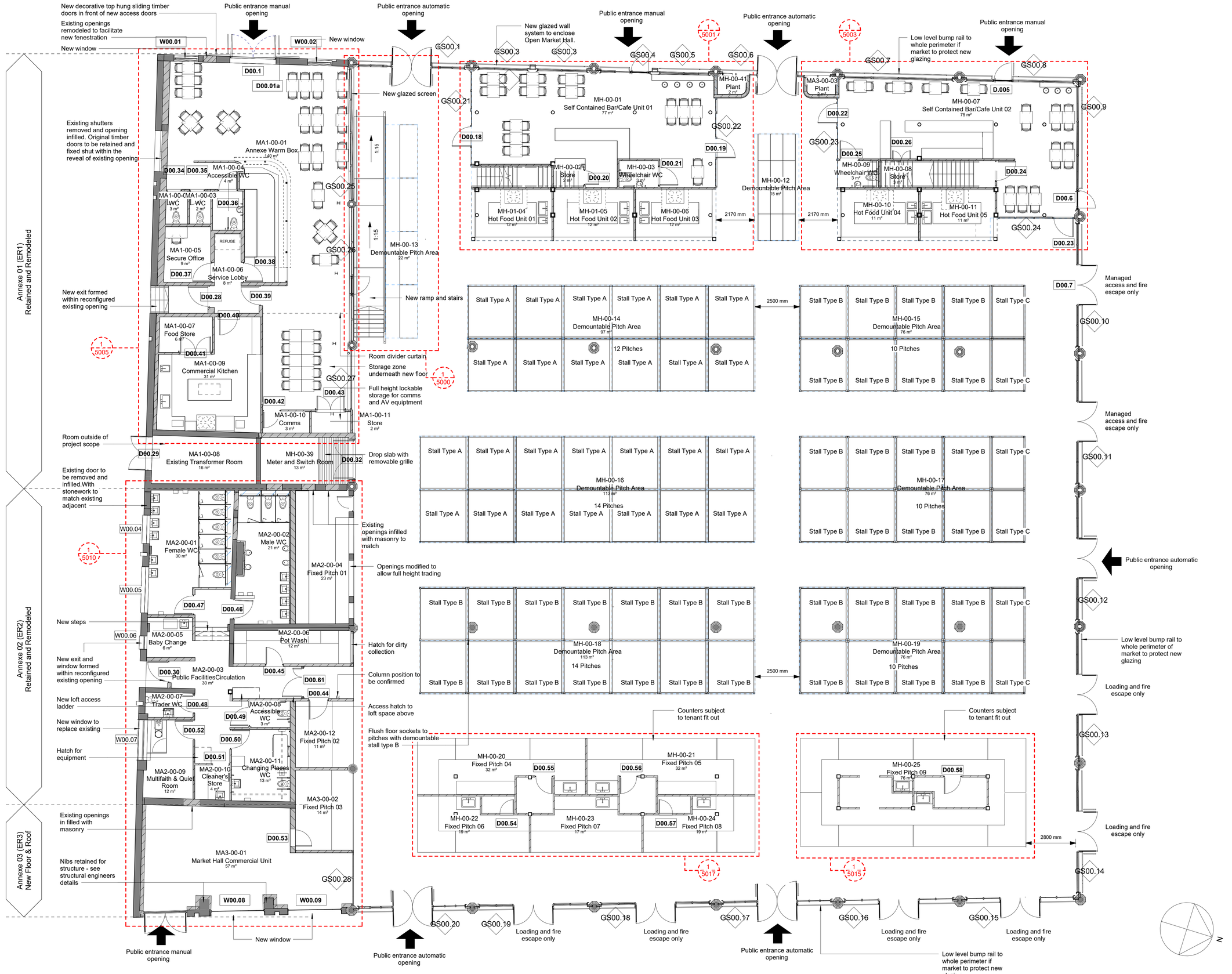
DRAWING NUMBER: HUD001-GSA-PR-00-DR-A-5110

REVISION: P06



1 Market Hall & Annexe - Level 00

1 : 100

Do not remove this panel from this drawing. Do not scale from this drawing. All dimensions and levels are to be checked on site. All discrepancies, errors and omissions must be reported immediately to Greig and Stephenson Ltd. The contractor is responsible for setting out, checking and confirming all site conditions prior to fabrication and construction. All building and fabrication works are to be carried out in accordance with the Local and National Building Codes, practices and standards. This drawing is copyright and must not be reproduced without the written consent of Greig and Stephenson Ltd. Greig and Stephenson Ltd. accept no responsibility for any loss or expenses arising from use of this drawing for any purpose other than those agreed in writing by Greig and Stephenson Ltd. This drawing is not to be used by any third party without the written consent of Greig and Stephenson Ltd.

Note:
No survey information is available within the former Market Cafe area within Annexe Zone ER2.

Layouts shows are based on assumed wall and opening positions, to be updated following verification from measured survey information.

Key
- New
- Existing

To be read in conjunction with other design information.

Refer to document HUD001-GSA-XX-XX-SP-A-0001 for outline specification.

Repair and Restoration works not identified on Proposed GA Plans.

For Repairs and Restoration works refer to Watts Condition Report ref:
Huddersfield Open Market Brook Street
Huddersfield
HD1 1RY
Version A Report Date 06 November 2023

Layouts and arrangements within spaces MH-00-01, MH-00-07 are indicative, subject to tenant fit out. Tenant ft out to be agreed prior to final fit out of hot food units and fixed stalls.

REV	DATE	COMMENT	DRW | APRV
P12	10/12/24	Annexe ER 2 loft amended	CS NM
P11	04/12/24	Issued for Stage 3 frozen set	CS NM
P10	25/10/24	Issued for Coordination	CS NM
P09	03/10/24	Updated to latest design concept	CS NM
P08	14/06/24	Annexe retained openings amended. Column positions added. External glazing bays updated with protection barriers added.	CS NM
P07	29/05/24	Issued for comments & coordination	CS NM
P06	10/05/24	Issued for comments & coordination	CS NM
P05	30/11/22	Annexe layout updated, drainage and pop ups added	SS NM
P04	17/11/22	Internal layout amended as part of stage 3 plan development	SS NM
P03	14/06/22	Scale bar and Annexe Stairs amended	AA NM
P02	18/05/22	Market and Annexe amended to suit new stage 2 proposal & Dormer roof added	AA NM
P01	22/10/21	First issue - for coordination	AA NM

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email. info@gands.co.uk

CLIENT: KIRKLEES COUNCIL

PROJECT: HUDDERSFIELD MARKET

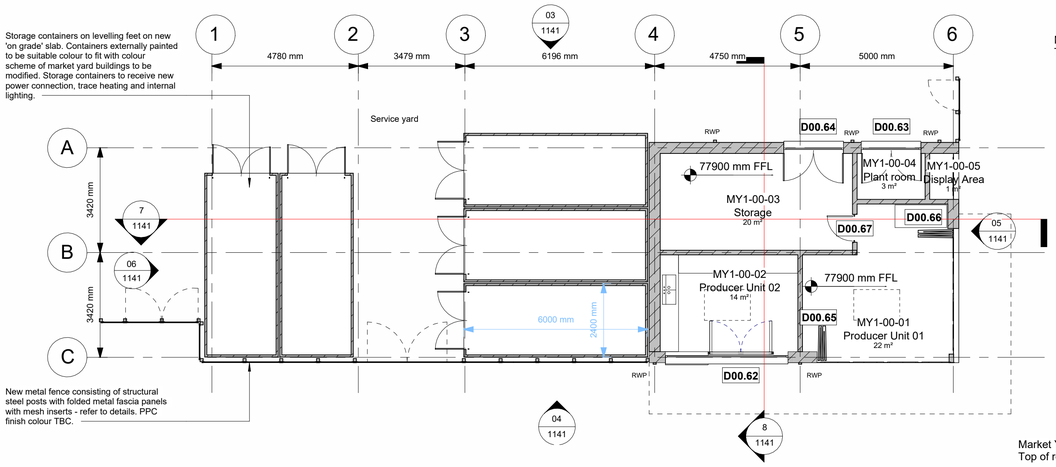
STATUS: S2 - For Information

DRAWING: **General Arrangement Market Hall and Annexe Level 00 as Proposed**

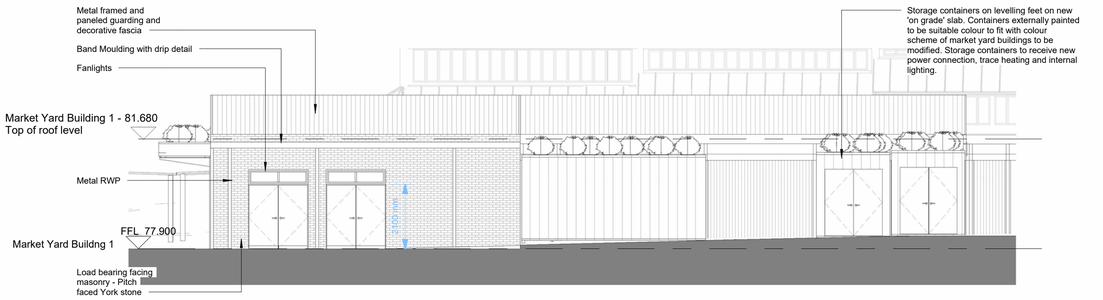
SCALE	DRW | CHKD	RVW | APRV	DATE
As indicated @ A1	CS NM	CS NM	17/04/24

DRAWING NUMBER: HUD001-GSA-ZZ-00-DR-A-1100

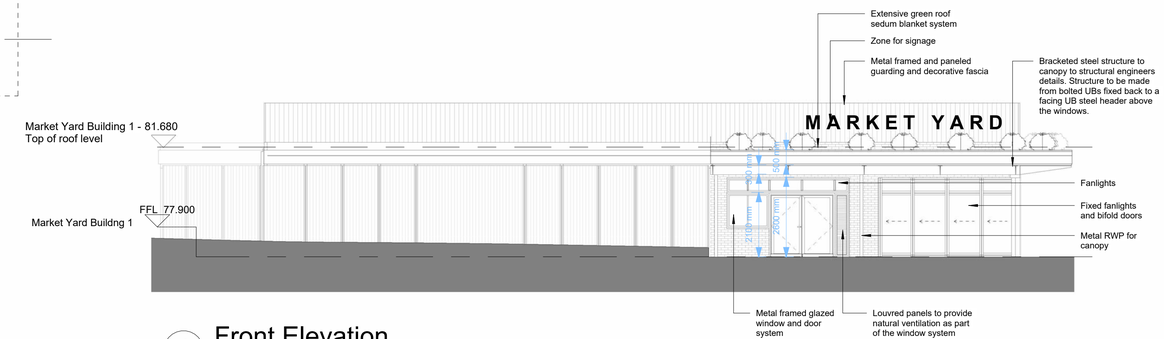
REVISION: P12



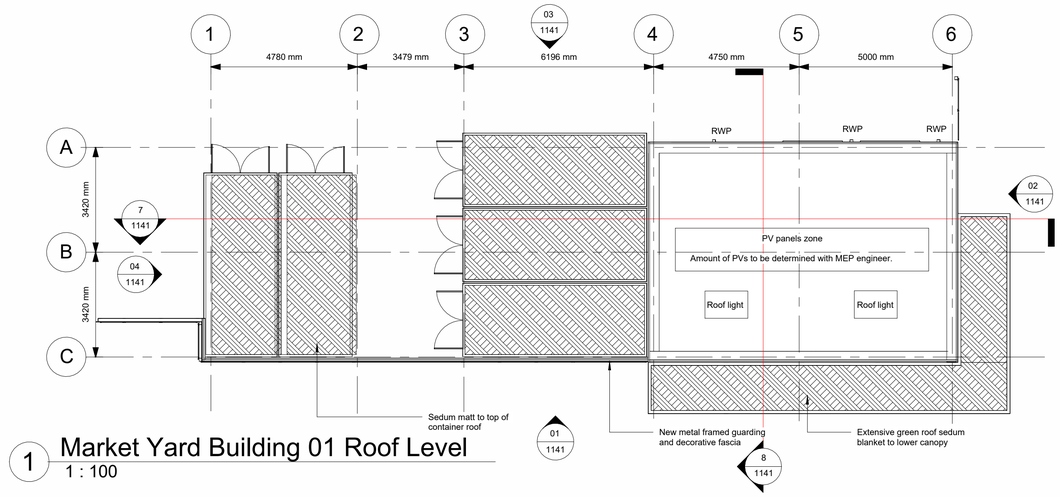
2 Market Yard Building 01 Level 00
1 : 100



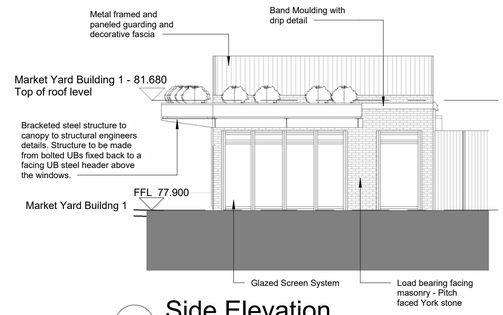
3 Rear Elevation
1 : 100



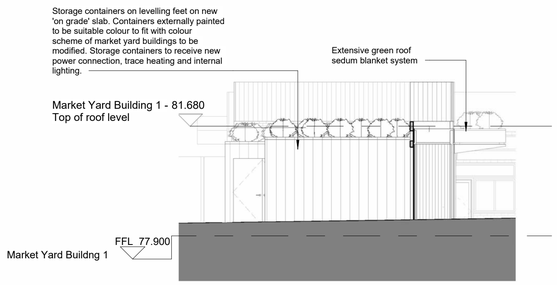
4 Front Elevation
1 : 100



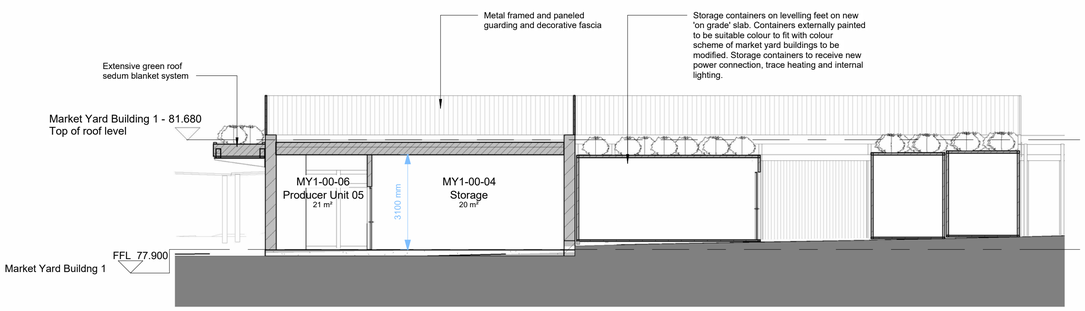
1 Market Yard Building 01 Roof Level
1 : 100



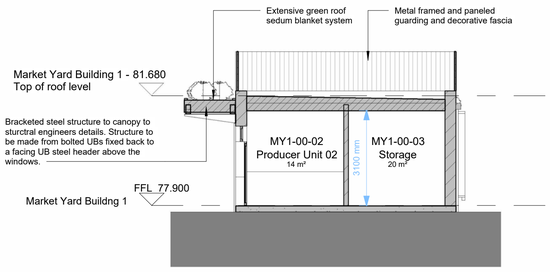
5 Side Elevation
1 : 100



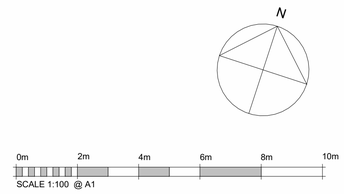
6 Side Elevation
1 : 100



7 Section AA as Propsoed
1 : 100



8 Section BB as Proposed
1 : 100



REV	DATE	COMMENT	DRW | APRV
P03	13/12/24	Issued for Stage 3 frozen set	CS NM
P02	14/06/24	Gridlines updated, RWPs added and elevation design updated	CS NM
P01	29/05/24	Issued for comments & coordination	CS NM

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CLIENT: KIRKLEES COUNCIL

PROJECT: HUDDERSFIELD MARKET

STATUS: S2 - For Information

DRAWING: **General Arrangement - Market Yard Building 01 Plans, Elevations and sections as Proposed**

SCALE	DRW | CHKD	RVW | APRV	DATE
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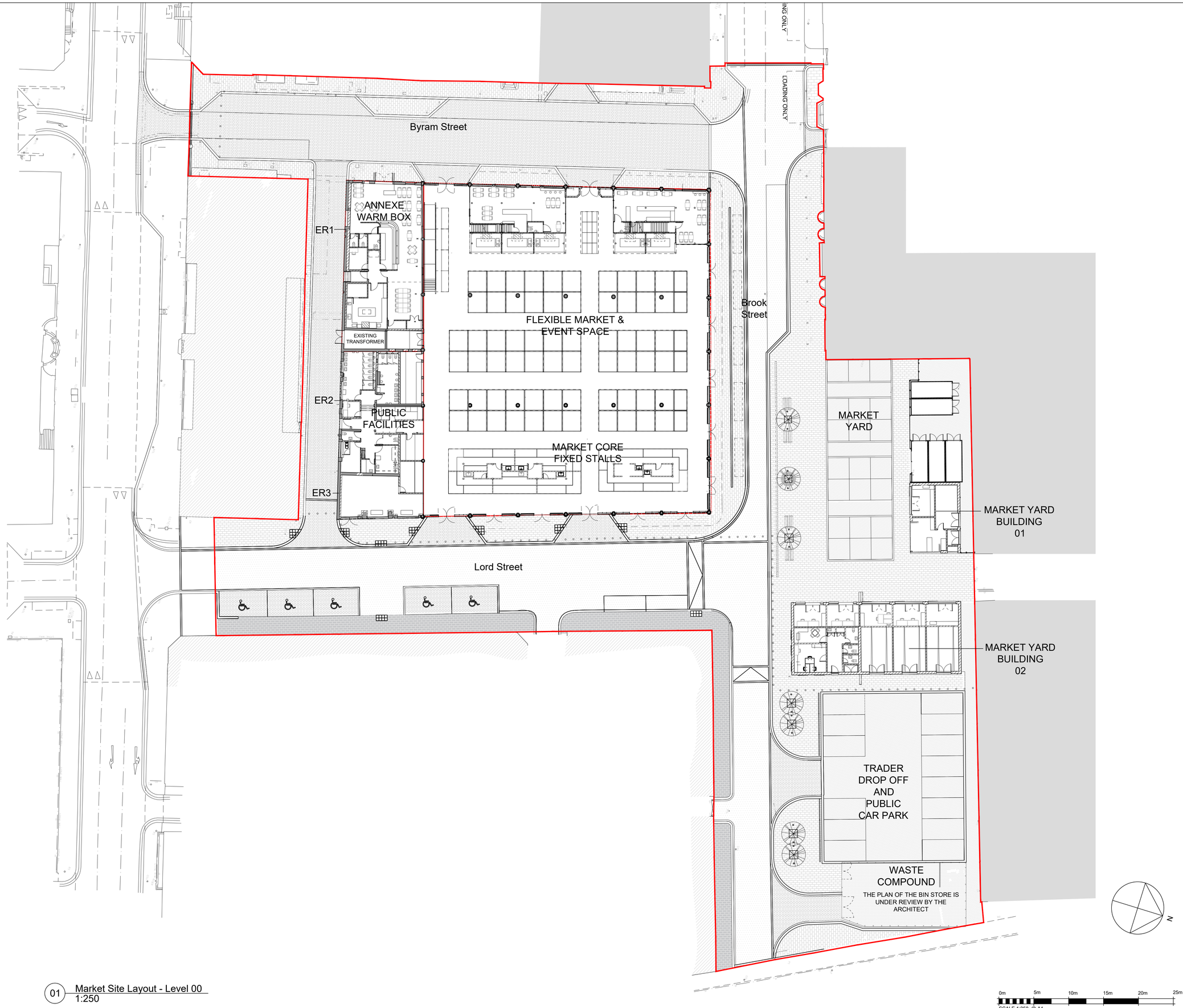
DRAWING NUMBER: HUD001-GSA-MY-XX-DR-A-1141

REVISION: P03



01 Market Site Layout - Level 00
1:250

Note:
Layout for co-ordination purposes

Survey Information Used for Drawings Includes:

Internal Topo Survey
S23897-T_Rev -- Issued October 2022 By Survey and Engineering Projects

Utilities Topo and GPR Survey
S20124-U_Rev -- Issued January 2020 By Survey and Engineering Projects

KEY

- NEW TARMAC
- NEW YORKSTONE SETTS
- NEW YORKSTONE PAVERS
- REPAIRED CONCRETE PAVERS

REV	DATE	COMMENT	DRW	APRV
07	31/01/25	Updated to latest design concept	CS	NM
06	17/01/25	Updated to latest design concept	CS	NM
05	27/09/24	Updated to latest design concept	CS	NM
04	14/06/24	Red line added	CS	NM
03	28/05/24	Issued for comments & coordination	CS	NM
02	02/06/24	Issued for comments & coordination	CS	NM
01	30/01/24	Issued for costing	NM	NM

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fax. 020 7403 5544
email. info@gands.co.uk

CLIENT: KIRKLEES COUNCIL

PROJECT: HUDDERSFIELD MARKET

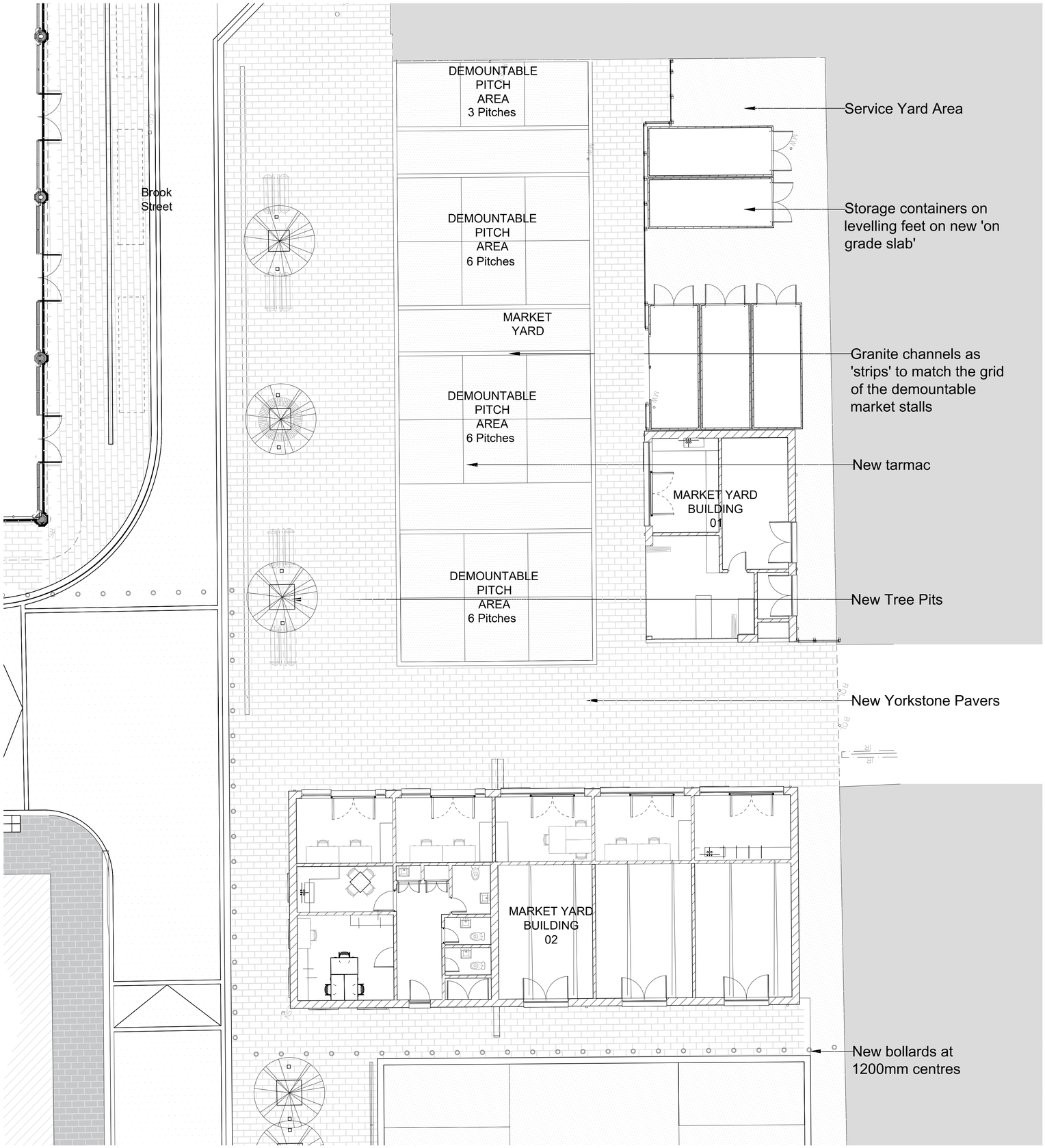
STATUS: For Information

DRAWING: **Market Site Layout Level 00 as Proposed**

SCALE	DRW | CHKD	RVW | APRV	DATE
1 : 250 @ A1	CS CS	NM NM	28.05.2024

DRAWING NUMBER: HUD001-GSA-ZZ-00-DR-A-1001

REVISION: P07



01 Market Yard Site Layout - Level 00
1:100

0m 5m 10m 15m 20m 25m
SCALE 1:250 @ A1

Note:
Layout for co-ordination purposes

Survey Information Used for Drawings Includes:

Internal Topo Survey
S23897-T_Rev -- Issued October 2022 By Survey and Engineering Projects

Utilities Topo and GPR Survey
S20124-U_Rev -- Issued January 2020 By Survey and Engineering Projects

KEY

- NEW TARMAC
- NEW YORKSTONE SETTS
- NEW YORKSTONE PAVERS
- REPAIRED CONCRETE PAVERS

REV	DATE	COMMENT	DRW	APRV
04	31/01/25	Updated to latest design concept	CS	NM
03	17/01/25	Updated to latest design concept	CS	NM
02	17/12/24	Issued for stage 3 frozen set	CS	NM
01	14/06/24	Issued for costing	CS	NM

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CLIENT: KIRKLEES COUNCIL

PROJECT: HUDDERSFIELD MARKET

STATUS: For Costing

DRAWING: **Market Yard Site Layout Level 00 as Proposed**

N

SCALE	DRW | CHKD	RVW | APRV	DATE
1 : 100 @ A1	CS CS	NM NM	28.05.2024

DRAWING NUMBER: HUD001-GSA-ZZ-00-DR-A-1002
REVISION: P04

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)

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 specified water mains.

2.0 SCOPE

The methods described within this procedure are applicable to the installation of water mains.

3.0 RESPONSIBILITIES

Contractor – The contractor is responsible for the installation of the water mains in accordance with the general recommendations provided in the site investigation reports. The contractor is responsible for the submission of the specification and detailed design of water mains to United Utilities, and for obtaining their approval to the proposals.

The contractor is responsible for ensuring that the approved specification and design of the water mains is communicated to ***CC GEOTECHNICAL LTD.***

The contractor is responsible for the installation of the water mains in accordance with the approved specification and design.

CC GEOTECHNICAL LTD - Responsible for the inspection and verification that water mains are installed in accordance with the approved specification and design.

4.0 PROCEDURES

The installation of water mains is to be undertaken in accordance with the approved specification and design. Mains installation will be undertaken by experienced and competent personnel. Only quarried virgin material will be acceptable for the formation of the remediated alignment around mains.

The installation works will be monitored for compliance in the following areas:

- Receipt of mains materials compliant with the specification stated within the Remediation Statement (eg. PE/Al/PE)
- Receipt of granular fill with appropriate source documentation
- Correct storage of mains / granular materials to ensure no cross contamination with onsite soils
- Certification of quarried granular fill (delivery notes etc.)
- Classification of quarried granular fill (eg. Limestone etc)
- Trench excavation to agreed depth/width
- Placement of geotextile where required
- Installation of mains
- Backfill with clean soils where required

5.0 REPORTING DELIVERABLES

The following will be reported in the Validation Report:

1. Manufacturers certificates
2. Photographic records of trench excavation/dimensions
3. Photographic records of geotextile placement where required
4. Photographic records of mains installation works
5. Photographic records of placement of mains surround with quarried granular fill

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

APPENDIX C

SOIL CONTAMINANT ACCEPTANCE CRITERIA

SOIL ASSESSMENT CRITERIA FOR COMMERCIAL LAND USE

Contaminant	Assessment Criteria for Commercial at 1% SOM (mg/kg)	Assessment Criteria for Commercial at 2.5% SOM (mg/kg)	Assessment Criteria for Commercial at 6% SOM (mg/kg)
Metals			
Arsenic	640	640	640
Boron	240000	240000	240000
Cadmium	190	190	190
Chromium III	8600	8600	8600
Chromium VI	33	33	33
Copper	68000	68000	68000
*Lead	2300	2300	2300
Mercury	58	58	58
Nickel	980	980	980
Selenium	12000	12000	12000
Vanadium	9000	9000	9000
Zinc	730000	730000	730000
Non-Metals			
Phenol	440	690	1300
Polyaromatic Hydrocarbons (PAH)			
Acenaphthene	84000	97000	100000
Acenaphthylene	83000	97000	10000
Anthracene	520000	540000	540000
Benz[a[anthracene	170	170	180
Benzo[a]pyrene	35	35	36
Benzo[b]fluoranthene	44	44	45
Benzo[ghi]perylene	3900	4000	4000
Benzo[k]fluoranthene	1200	1200	1200
Chrysene	350	350	350
Dibenz[ah]anthracene	3.5	3.6	3.6
Fluoranthene	23000	23000	23000
Fluorene	63000	68000	71000
Indeno[123-cd]pyrene	500	510	510
Naphthalene	190	460	1100
Phenanthrene	22000	22000	22000
Pyrene	54000	54000	54000
Coal Tar [Bap as surrogate marker)	15	15	15
Petroleum Hydrocarbons			
Aliphatic EC 5-6	3200	5900	12000
Aliphatic EC >6-8	7800	17000	40000
Aliphatic EC>8-10	2000	4800	11000
Aliphatic EC>10-12	9700	23000	47000
Aliphatic EC>12-16	59000	82000	90000
Aliphatic EC>16-35	1600000	1700000	1800000
Aliphatic EC>35-44	1600000	1700000	1800000
Aromatic EC5-7 (Benzene)	26000	46000	86000
Aromatic EC>7-8 (Toluene)	56000	110000	180000
Aromatic EC>8-10	3500	8100	17000
Aromatic EC>10-12	16000	28000	34000
Aromatic EC>12-16	36000	37000	38000
Aromatic EC>16-21	28000	28000	28000
Aromatic EC>21-35	28000	28000	28000
Aromatic EC>35-44	28000	28000	28000
Aliphatic – Aromatic EC>44-70	28000	28000	28000
Other			
Asbestos Containing Materials (ACM)	No Detection	No Detection	No Detection

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 "Commercial" land use 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.

APPENDIX D

NOTES ON LIMITATIONS

`Notes on Limitations
For
Geoenvironmental and Geotechnical Consultancy Services

General

This document has been prepared by CC GEOTECHNICAL LTD within the terms of the contract, scope of work, and resources agreed in writing with the client. The limitations of liability of CC GEOTECHNICAL LTD for the contents of this document have been agreed with the Client, as set out in the terms and conditions of offer and related contract documentation.

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The findings and opinions provided in this document are made in good faith and are subject to the limitations imposed by employing site assessment methods and techniques, appropriate to the time of investigation and within the limitations and constraints defined in this document.

The findings and opinions are relevant to the dates when the assessment was undertaken, but should not necessarily be relied upon to represent conditions at a substantially later date. In particular, seasonal groundwater levels, with the effects of precipitation, may affect the conditions found during the investigation. The report should be read in conjunction with the further Notes on Limitations included in Appendix A.

Where opinions expressed in this report are based on current available guidance and legislation, no liability can be accepted by CC GEOTECHNICAL LTD for the effects of any future changes to such guidelines and legislation. Additional information, improved practices, new guidance, changes in legislation, or amendments to design proposals, may necessitate this report having to be reviewed in whole or in part after that date. Opinions and interpretations are not accredited by UKAS.

Factual data contained in this report may have been obtained from enquiries with reputable third parties, the results of which are relied on unless indicated to be inaccurate by contradictory information.

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CC GEOTECHNICAL LTD accepts no responsibility or liability for:

1. the consequences of this document being used for any purpose or project other than for which it was commissioned

and/or

2. the consequences of use of this document by any party with whom an agreement has not been executed.

Phase I Environmental Audits / Desk Studies

The work undertaken to provide the basis of a Phase 1 Desk Study report comprises a study of available documented information from a variety of sources (including the client), together with (where appropriate) a brief walk over inspection of the site and meetings and discussions with relevant authorities and other interested parties. The opinions given in a Desk Study report have been dictated by finite data on which they are based and are relevant only to the purpose for which the report was commissioned. The information reviewed should not be considered exhaustive and has been accepted in good faith as providing true and representative data pertaining to site conditions. Should additional information become available which may affect the opinions expressed in the report, CC GEOTECHNICAL LTD reserves the right to review such information and to modify the opinions accordingly.

It should be noted that any risks identified in this report are perceived risks based on the information reviewed; actual risks can only be assessed following a physical investigation of the site.

Factual Ground Investigations

The investigation of the site has been carried out in accordance with the scope and specification instructed by the Client. No interpretations of the data generated by the investigation have been provided or implied. The exploratory holes undertaken in this commission, investigate only a small volume of the ground in relation to the size of the site, and can only provide a general indication of site conditions. Conditions may exist on the site which have not been detected by the works undertaken. Furthermore, the number of sampling points and the methods of sampling and testing do not preclude the existence of localised “hotspots” or more widespread contamination where concentrations may be significantly higher than those actually encountered.

Interpretative Phase II Environmental Audits

The investigation of the site has been carried out with the intention of providing sufficient information concerning the type and degree of contamination, and ground and groundwater conditions to allow a reasonable risk assessment to be made. The objectives of the investigation have been limited to establishing the risks associated to potential human targets, building materials, the environment (including adjacent land), and surface and groundwater.

The amount of exploratory work and chemical testing undertaken may have been restricted by factors including inter alia the Clients budget, the available timescale, access to all parts of the site, the existence of buried services etc., and where this is the case, a more comprehensive investigation may be required if the site is to be redeveloped, since a number of important engineering and environmental issues may need further assessment.

For those reasons, if costs have been included in relation to site remediation these must be considered as tentative only and must, in any event, be confirmed by a qualified quantity surveyor.

It must be borne in mind, that the exploratory holes undertaken, investigate only a small volume of the ground in relation to the size of the site, and can only provide a general indication of site conditions. The opinions provided and recommendations given in this report are based on the ground conditions apparent at the site of each of the exploratory holes. There may be ground conditions present on the site which have not been disclosed by this investigation, and which have therefore not been taken into account in this report. The number of sampling points and the methods of sampling and testing do not preclude the existence of localised “hotspots” or more widespread contamination where concentrations may be significantly higher than those actually encountered. The findings of the investigation are valid for the time of investigation and the passage of time may result in changes to the contamination status of the site, and a reassessment of the site may be required where significant time has elapsed.

Geoenvironmental Ground Investigations

The investigation of the site has been carried out within the constraints of Client budget, available timeframe, access to all parts of the site, the existence of buried services and a more comprehensive investigation may be required to provide sufficient information regarding the type and degree of contamination, geotechnical characteristics, and ground and groundwater conditions, to formulate a reasonable assessment of the environmental risks together with engineering and development implications.

If costs have been included in relation to the site remediation, these must be confirmed by a qualified quantity surveyor.

The exploratory holes undertaken, investigate only a small volume of the ground in relation to the size of the site, and can only provide a general indication of the site conditions. The opinions provided and recommendations given in this report are based on the ground conditions apparent at the site of each of the exploratory holes. There may be ground conditions present on the site which have not been disclosed by this investigation, and which have therefore not been taken into account in this report. The findings of the investigation are valid for the time of investigation and the passage of time may result in changes to the contamination status of the site, and a reassessment of the site may be required where significant time has elapsed.

The comments made on groundwater conditions are based on observations made at the time that site work was carried out. It should be noted that groundwater levels will vary owing to seasonal, tidal, weather, or other effects.

The risk assessment and opinions provided, inter alia, take into consideration currently available guidance relating to acceptable contamination concentrations and no liability can be accepted for the retrospective effects of any future changes or amendments to these values.