Ben's Yard, Frampton Cotterell

Remediation Strategy

Report for:

Prestige Developments (Bristol) Ltd

Reference:

P0637/CS-J-1363

T & P Regeneration Ltd
Unit 4, Brunel Lock Development
Smeaton Road
Bristol
BS1 6SE
Tel: 0117 927 7756

Document Revision

Client		Prestige Developments (Bristol) Ltd		Project Reference	P0637/CS-J-1363
Site Address		Ben's Yard, Frampton Cotterell			
Issue	**Date**	**Revision Details**	**Prepared by**	**Checked by**	**Approved by**
01	27/05/2022	Original Issue	John Flannery	Jon Adams	Mike Nicholas

CONTENTS

APPENDICES

1 INTRODUCTION

1.1 Background

Following instruction from Prestige Developments (Bristol) Ltd (the 'client'), this report presents a Remediation Strategy for a proposed residential development at Ben's Yard, Frampton Cotterell (the 'site').

1.2 Site Location and Description

The site is approximately centred on National Grid Reference 365679, 182001. The nearest postcode is BS36 2AU. A site location plan is included within Appendix A.

The site is an elongated rectangular parcel of land 215m in length and 57m in width occupying approximately 1.25 hectares (ha).

The site currently comprises two separate areas. The first area includes a residential dwelling and garden, located in the south-east of the site which is separated from the remainder of the site by a 3m tall fir tree hedge line. The second larger area is currently used for various commercial purposes including a dog groomers and car wash, aggregate and vehicle storage and a vehicle maintenance workshop.

The site is located on the outskirts of Frampton Cotterell with residential development to the south and east.

1.3 Proposed Development

Information presented to T&P Regeneration Ltd (T&P) indicates that the proposed development is intended to comprise the construction of 25N^{o} traditional single and two storey residential dwellings with associated areas of communal and private soft landscaping with hard landscaped access and parking and an area of allotment gardens in the west of the site.

A Proposed Development Plan is included within Appendix A.

1.4 Previous Reports

A previous report has been undertaken for the site as detailed in Table 1.1. Pertinent information is summarised in this report where appropriate. However, reference should be made to this report directly for further detail.

Table 1.1 Summary of Previous Reports

Date	Title	Reference	Author
May 2022	Desk Study and Ground Investigation Report	P0637 CS-J-1363	T&P Regeneration Ltd.

1.5 Objectives

The objective of this remediation strategy is to outline the risk mitigation measures required to address identified unacceptable risks presented to human health or the environment in the context of the site's proposed future end use as a residential development.

1.6 Report Limitations

The recommendations, interpretations and conclusions of this report are based solely on the site conditions observed and the ground conditions revealed during previous site investigation works undertaken by T&P and/or third parties. No responsibility can be accepted for the accuracy of third-party data. Due to the inherent variability of the ground conditions between exploratory hole positions these conditions can only be interpreted and are accurate only for the date of the investigation works.

2 BACKGROUND INFORMATION AND SITE SETTING

2.1 Information Sources

Reference has been made to previous reports and publicly available information from the Environment Agency, MAGIC and BGS websites, as relevant. Background and site setting information has been provided to provide context to the site, proposed development and remediation strategy.

2.2 Geology, Hydrology and Hydrogeology

Available geological records show the site to be underlain by Mangotsfield Member; part of the Pennant Sandstone Formation deposited in the Carboniferous Period. These deposits typically comprise sandstone with sparse coal seams.

The underlying Mangotsfield Member is classified as a Secondary A Aquifer. The site is not located in a Source Protection Zone. There are no records of licensed groundwater abstractions within 500m of the site.

The nearest surface water feature is an unnamed stream located adjacent to the north-west boundary.

There are no licensed surface water abstractions located within 500m of the site.

2.3 Site History

The site history is summarised from publicly available historical maps.

The site is shown on the earliest maps to be undeveloped and spread across two fields. By 1920, a large square building indicated to be a glasshouse/ greenhouse is shown to have been constructed across the central portion of the site. The map dated 1935 shows continued development of the site with a glasshouse which now covers the central and eastern portions of the site and an additional glasshouse constructed in the western site area. In addition to the development of the nursery, a building is shown to have been constructed in the east of the site which is considered to be the existing residential building.

By 1992, only the most western glasshouse is identified, with several smaller rectangular buildings replacing the larger glasshouse in the central and eastern site portions. By 2021, the glasshouse in the west of the site has been replaced with a larger rectangular building, with an additional two rectangular buildings shown to have been constructed in the eastern area of the site.

The area surrounding the site is shown to be broadly agricultural in use on the earliest maps. By 1964, significant residential development has occurred to the east of the site and a rectangular glass house has been constructed on the land to the south. The map dated 1992 shows further alterations/ development of the land to the south and identifies the buildings as stables. No further significant changes are noted.

2.4 Summary of Previous Findings

A summary of principal findings of previous ground investigation is provided below. Further detail can be obtained with reference to the original report.

2.4.1 Ground Conditions

Made ground was encountered across the site and broadly found to initially comprise a granular layer overlying a gravelly clay found to depths between 0.15m to 0.50m. The underlying cohesive made ground was found to a maximum depth of 1.10m within WS10.

Topsoil was only encountered in 2N° holes located within the residential garden, in general, the topsoil was found to comprise brown slightly sandy slightly gravelly clay with numerous man-made inclusions.

Beneath the made ground and topsoil, natural ground was found to initially comprise a firm and stiff gravelly clay or loose and medium dense gravelly sand. At depths between 0.70m to 1.80m, extremely weak sandstone was encountered which rapidly increased in strength and prevented further penetration. All of the boreholes are considered to have terminated upon competent sandstone bedrock.

2.4.2 Evidence of Contamination

With the exception of the made ground, no visible or olfactory evidence of significant contamination was encountered during the ground investigation.

2.4.3 Groundwater

Groundwater was generally not encountered in the majority of boreholes. However shallow groundwater was encountered within 3No.holes in the western site area close to the adjacent stream between depths of 0.90 and 1.0mbgl.

2.4.4 Human Health Risk Assessment

Soil laboratory analysis results were compared against generic standards[1] for a 'residential with homegrown produce' end use.

The review of the made ground dataset identified arsenic, beryllium and lead, together with PAH concentrations above the adopted screening criteria. Statistical assessment of the metal concentrations has determined that these are endemically elevated within the made ground and as such pose an unacceptable risk to future site users. Given the site wide endemic metal concentrations further assessment of the elevated PAH concentrations was considered inconsequential.

The GQRA also identified elevated lead and beryllium within the topsoil/ natural ground dataset. Due to the size of the dataset statistical analysis was not completed. Further assessment and delineation of lead and beryllium soil concentrations may therefore assist in reducing the level of remedial action required.

2.4.5 Controlled Waters Risk Assessment

No significant visual or olfactory evidence of gross contamination was observed and the encountered soil concentrations of mobile contaminants were considered to be below levels of concern. It was also noted that the majority of contaminant concentrations typically decreased significantly with depth, indicating a negligible leaching pathway.

As such, the risk to controlled waters was considered to be acceptably low owing to the low soil concentrations encountered within the made ground, and lack of an observed significant vertical leaching pathway.

2.4.6 Phytotoxic Risk Assessment

Concentrations of zinc, nickel and boron were found to exceed the phytotoxic screening criteria which may pose a risk to future planting. Furthermore, the physical composition of the made ground was noted to comprise granular hardstanding or gravelly clay with inclusions of brick,

[1] *The LQM/CIEH S4ULs for Human Health Risk Assessment. Nathanail, C.P. et al., 2015.*
SP1010. Development of Category 4 Screening Levels for Assessment of Land Affected by Contamination. CLAIRE. 2014.

plastic and glass. It was therefore considered physically unsuitable to remain at shallow depth in soft landscaping as it is unlikely to provide a sustainable growth medium.

2.4.7 Ground Gas Risk Assessment

In consideration of the site conceptual model, no off-site sources of ground gas have been identified. Furthermore, no significant organic or putrescible material was encountered during the ground investigation. Therefore, it was considered that the site has a low ground gas generating potential and that risks to future residents associated with ground gases are low. No ground gas protection measures are deemed necessary within future development.

However, the site is in a radon risk area. Therefore, basic radon protection measures are considered necessary for any new development.

2.4.8 Potable Water Supply

Soil concentrations of benzo(a)pyrene (BaP) and mineral oil have been found to be elevated across the site within shallow made ground, As such, upgraded water supply pipework should be utilised if installed within the made ground.

Consultation with the statutory water provider is recommended.

3 REFINED CONCEPTUAL SITE MODEL

3.1 General

Following completion of previous ground investigation and risk assessment, a refined conceptual site model has been developed as detailed below. Further detail of the assessment undertaken is provided in previous reports as listed in Table 1.1.

3.2 Sources

With consideration of the assessment summarised in Section 2, the following Areas of Potential Concern (APC) have been identified which require risk mitigation:

- **APC 1:** Made ground associated with previous site development and current activities.
  - Elevated endemic concentrations of lead, arsenic and beryllium together with additional elevated PAH concentrations compared with human health screening levels.
  - Elevated concentrations of zinc, nickel and boron were found to exceed the phytotoxic screening.
  - The made ground across site is considered physically unsuitable to remain at shallow depth within soft landscaping.
  - Elevated BaP within made ground posing a risk to water supply pipework.
- **APC 2:** Elevated concentrations of beryllium compared with human health screening within natural ground.
- **APC 3:** Radon gas generation from natural underlying geology.

3.3 Risk evaluation

National guidance[2,3,4] has been considered in the development of the conceptual model for the site to inform an estimation of risk in relation to each plausible source-pathway-receptor (SPR) identified. Table 3.1 presents a summary of the (SPR) relationships identified as a moderate/low risk or higher which will require remedial action and/or management to mitigate unacceptable risks identified, further detail of which will be provided in later sections of this report.

[2] *Contaminated Land Risk Assessment. A Guide to Good Practice. CIRIA C552. 2001.*
[3] *Land contamination risk management - https://www.gov.uk/government/publications/land-contamination-risk-management-lcrm.*
[4] *Guidance for the Safe Development of Housing on Land Affected by Contamination. NHBC. 2008.*

Table 3.1 Source-Pathway-Receptor (SPR) Relationships Requiring Risk Mitigation

APC Nº	Source	Pathway (s)	Receptor	Consequence	Probability	Risk*	Comment
1	On-site Made ground associated with previous site development and current activities.	Oral ingestion	Future residents and maintenance workers	Medium	Low likelihood	**Moderate/Low**	Elevated concentrations of metals and PAHs.
		Vegetable uptake	Future residents	Medium	Low likelihood	**Moderate/Low**	
		Dermal contact	Future residents and maintenance workers	Medium	Low likelihood	**Moderate/Low**	
		Dust migration/inhalation	Future residents, maintenance workers and off-site residents/workers	Medium	Low likelihood	**Moderate/Low**	
		Uptake via root system	On-site flora	Medium	Low likelihood	**Moderate/Low**	
		Permeation into drinking water supplies	Future residents	Medium	Low likelihood	**Moderate/Low**	Elevated concentrations of BaP and mineral oil.
2	On site Elevated beryllium concentrations in natural ground	Dust migration/inhalation	Future residents, maintenance workers and off-site residents/workers	Medium	Low likelihood	**Moderate/Low**	Elevated concentrations of beryllium.
3	On-site Radon gas generation from natural underlying geology.	Gas inhalation	Future residents and maintenance workers	Medium	Likely	**Moderate**	Basic radon protection measures will be required throughout the development

Where multiple receptors exist the risk classification is based on most sensitive receptor for conservatism.

4 REMEDIATION STRATEGY

4.1 Remediation Objectives

The objective of the proposed remedial strategy is to render the site suitable for a proposed residential end-use. In addition, the remedial strategy will address statutory risks, such that the site would not be determined as Contaminated Land under Part 2A of the Environmental Protection Act 1995.

4.2 Remediation Strategy

Remedial recommendations are made in the context of the proposed development which will comprise the construction of 25N° residential houses. The residential houses will have private residential soft landscaped areas with an area of Public Open Space (POS) and allotment gardens also noted in the western site area.

In the absence of confirmed cut/fill estimates and information on proposed level changes within the development, remediation measures have been presented in the context of existing site levels. However, in the event that site levels are raised, this may in effect provide a suitable capping thickness and could achieve the remedial requirements set out below subject to the placement/import of chemically and physically suitable material. This approach is also likely to represent the most cost effective and environmentally sustainable means of achieving the remedial works, potentially in association with a supporting materials management plan to facilitate reuse of made ground on site (see section 4.4) if material movement and replacement on site are practically achievable.

4.3 Risk Mitigation

As summarised in Table 3.1, several SPR relationships have been identified which are considered to present an unacceptable risk to identified receptors, and which will require risk mitigation measures to be applied, as discussed further in subsequent sections. Reference should be made to the Remedial Strategy Plan included within Appendix A. In the event that significant changes to the development proposals are made, these recommendations should be reviewed and updated as necessary.

Remediation verification requirements are set out within Section 6.

4.3.1 Areas of Soft Landscaping – Front and Rear Gardens (All Plots)

- In all areas of proposed private soft landscaping as shown on the plan within Appendix A, a minimum 600mm capping layer of chemically and physically suitable topsoil/sub-soil should be provided. A high visibility geotextile marker should be provided at the base and sides of excavations as a marker layer.

4.3.2 Area of POSresi (west of site)

- In all areas of proposed POS soft landscaping as shown on the plan in Appendix A, a minimum 300mm capping layer of chemically and physically suitable topsoil/sub-soil should be provided. A high visibility geotextile marker should be provided at the base and sides of excavations as a marker layer where existing made ground soils are to remain in situ at the base of the capping excavations.

4.3.3 Area of Allotment Gardens (west of site)

- In all areas of proposed allotments as shown on the plan in Appendix A, a minimum 600mm capping layer of chemically and physically suitable topsoil/sub-soil should be provided. A high visibility geotextile marker should be provided at the base and sides of excavations as

a marker layer where existing made ground soils are to remain in situ at the base of the capping excavations.

4.3.4 Radon gas

- Basic radon protection measures will be required for all plots due to the presence of naturally occurring radon associated with the underlying geology. Radon protection measures will be required to be installed within all new buildings in line with the BRE guidance[5]. A designer should be sought to design the radon protection measures, which should then be verified by a suitable qualified contractor in line with CIRIA C735[6].

4.3.5 General Recommendations

- Where specialist planting is dictated by landscaping proposals, a deeper growth medium may be required, including up to 450mm in areas of proposed shrubs and up to 900mm for tree pits (which may also require specialist installation in line with BS 5837[7]). These details should be confirmed with the project landscaping adviser.
- Vigilance should be employed for any unforeseen ground conditions when excavating in previously inaccessible areas and when grubbing out, where specialist advice may be required.
- Upgraded water supply pipework shall be used within the development.
- The required thickness and quality of capping soils to support the necessary plant growth should be discussed and agreed separately with the project landscaping team as necessary.

4.4 Soil Re-Use Opportunities

As with all construction projects, it is preferable to maximise the reuse of soils on-site and minimise the amounts of off-site disposal. To achieve this whilst accomplishing the remedial objective, a number of potential re-use opportunities have been identified and which are described in later sections of this report which may be undertaken in line with the CL:AIRE Definition of Waste Code of Practice (DoW:CoP).

The made ground encountered across the majority of the site is not considered chemically or physically suitable for reuse within areas of soft landscaping. This material could be sorted/screened to remove the large fragments and subject to further soil testing, could be considered for re-use utilised as a construction mat or beneath areas of hard landscaping or at depth.

4.4.1 Topsoil

Chemical analysis has indicated that topsoil within the existing residential garden area located in the east of the site will not be suitable for retention/re-use within private garden areas or areas of allotments without additional chemical tests due to elevated lead concentrations.

However, based upon the available chemical data, the topsoil is suitable for reuse within the POS_{resi} area without further testing.

4.4.2 Natural Soils

Chemical analysis has indicated that natural soils will not be suitable for retention/re-use within private garden areas or areas of POS_{resi} without additional chemical tests due to elevated beryllium concentrations.

---

[5] *Radon – Guidance on protective measures for new buildings. BRE. BR211. (2015).*
[6] *Good Practice on the Testing and Verification of Protective Systems. CIRIA C735. (2014).*
[7] *Trees in relation to design, demolition and construction. Recommendations. BS 5837 2012.*

However, based upon the available chemical data, natural soils are suitable for retention and reuse within the allotment garden area without further testing.

4.4.3 Made Ground

Made ground may be suitable for re-use at depth as general fill beneath chemically and physically suitable capping soils or beneath areas of hardstanding. Subject to confirmation of geotechnical properties, it may be possible to re-use this material as engineering fill in line with the project earthworks strategy.

4.5 Residual Risk and Uncertainty

Subject to implementation of the risk mitigation measures described throughout Section 4.3, it is considered that no areas of uncertainty or residual risk will remain.

5 MANAGEMENT OF WORKS

5.1 Health and Safety

The works should be carried out in accordance with the Construction (Design & Management) Regulations 2015. These regulations place specific responsibilities on the Principal Contractor, Principal Designer and Employer. The Employer should appoint a Principal Designer and a Principal Contractor for the works.

The Principal Contractor shall develop appropriate methods of working to ensure the health and safety of workers, visitors and neighbours and also protect the environment, in accordance with management procedures outlined in their Construction Phase Plan.

Following completion of the remediation works, pertinent information shall be supplied to the Principal Designer for incorporation into the site Health and Safety File.

5.2 On-Site Material Management

In the event that on-site re-use of made ground is proposed, this may be undertaken in accordance with the CL: AIRE Development Industry Definition of Waste Code of Practice. In this case, a Materials Management Plan (MMP) shall be prepared to document the principles of re-use outlined within this Remediation Strategy prior to any excavation or stockpiling works commencing on site.

Alternatively, application of a U1 waste exemption may be an appropriate route to support re-use of smaller volumes of site won soils in construction projects. This allows re-use of suitable waste rather than virgin raw material providing site complies with standard rules as set out by the Environment Agency[8].

Re-use of aggregates from inert waste may also be undertaken in line with the WRAP Quality Protocol.

5.3 Waste Management Strategy

It is a requirement of the Landfill Regulations 2002 that all waste must be treated to reduce its quantity and/or its environmental impact before being disposed of to landfill. This process has been undertaken as part of this remediation design and is demonstrated by the following:

- Intrusive ground investigation has been undertaken at the site in order to identify areas where contamination deemed to present an unacceptable risk to identified receptors is present. Reference should be made to previous ground investigation reports for further details.
- The Principal Contractor is required to further reduce the volume of material for off-site disposal and/or treatment by the sorting of inert rubble, metal, etc. from all excavated and/or stockpiled soils where practically possible.

In line with the waste hierarchy, it is preferable to retain as much site won material as possible, in line with the reuse opportunities set out in Section 4.4.

Excavated soils requiring off-site disposal will be transported in road going lorries, in accordance with appropriate duty of care requirements[9]. The waste haulier will be a licensed waste carrier, with evidence of registrations obtained prior to consigning waste for off-site treatment and/or disposal. Appropriate controls will be put in place for handling/transportation of materials

[8] https://www.gov.uk/guidance/waste-exemptions-using-waste
[9] *Waste Duty of Care Code of Practice. Defra. 2016.*

including any which may contain asbestos. Laboratory results of the excavated material will be passed on to the haulier and the material will be transported and disposed of accordingly.

Demolition rubble or other recyclable aggregates, metals or other inert and recoverable materials may be segregated for re-use on-site or sent for off-site recycling to an appropriately licensed facility.

5.4 Waste Characterisation

A review of ground investigation data has been completed to support waste characterisation and pre-classification in the event that off-site disposal of soils is required, which is separate to human health or other environmental risk assessment completed to support the remediation strategy. Reference should be made to previous reports for detail on this assessment.

In summary, this waste assessment indicated that the majority of soils are likely to be classified as non-hazardous waste with the exception of soils in WS06 (0.10-0.20), WS12 (0.10-0.20) and WS15 (0.10-0.20) which were classified as hazardous.

5.5 Unexpected Contamination

A watching brief should be maintained during the demolition of existing structures on-site.

If during the subsequent construction works additional suspected contaminated soils (e.g. visible/odorous hydrocarbon impacted soils) or structures/infrastructure with the potential to contain contamination are subsequently revealed, it will be necessary to contact a suitably qualified environmental consultant who will be able to attend site and advise upon the most appropriate course of action.

5.6 Control Measures and Monitoring

An environmental risk assessment shall be undertaken by the Principal Contractor which shall establish appropriate environmental control measures and monitoring protocols required during the works, which should be documented within a site-specific Environmental Management Plan. The Principal Contractor shall implement appropriate dust and noise control measures as appropriate and shall ensure that competent staff are on-site to implement the controls when necessary. Where/if movement of asbestos impacted soils/material is required, appropriate controls shall be implemented e.g. damping down and monitoring undertaken as required.

In addition to the above, construction and groundworkers should be made aware of the potential risks associated with made ground soils and when working with soils which may be potentially impacted by asbestos, should allow for appropriate precautionary working practices, personal protective measures and air monitoring in line with Control of Asbestos Regulations: 2012 – 'CAR:2012', as necessary.

6 VERIFICATION

6.1 Capping Soils in Soft Landscaping Areas

6.1.1 Imported Soils

Where imported soils are required within the development as capping soils, they shall comply with the soil criteria in Appendix B for a 'residential with homegrown produce', 'POSresi' or 'allotment' end use, as appropriate. All imported soils shall be free of asbestos (<0.001%w/w). Furthermore, it is recommended that the suitability of topsoil in accordance with BS3882[10] is considered, in consultation with a specialist landscaping consultant.

Details of the proposed source of material shall be supplied. It is recommended that soils are tested at source prior to movement and importation to confirm suitability.

Additionally, representative soil samples should be collected of imported soils for chemical analysis once received at site at a minimum frequency of 1 per 100m^3, where used within private gardens, reducing to 1 per 250m^3 within POS or allotments. A minimum number of samples shall be collected, as detailed in Table 6.1. The frequency of testing may need to be increased to 1 per 50m^3 if the origin of the topsoil is a brownfield site or an undefined source.

Table 6.1 Imported Capping Sampling Frequency

Number of Plots Per Capping Material	Minimum Number of Samples Per Capping Material
1 to 5 plots	3
6 to 10 plots	5
11 to 20 plots	5
21 to 30 plots	7
Over 30 plots	10

All samples shall be submitted to a laboratory with UKAS and MCERTS accredited methods (as appropriate).

Testing shall comprise the following, as a minimum:

- Metals.
- Speciated Polycyclic Aromatic Hydrocarbons (PAHs).
- pH.
- Phenols.
- Total organic carbon.
- Asbestos screening.

Additionally, where the origin of the material is a brownfield site or an undefined source, testing shall include banded petroleum and diesel range hydrocarbons within the carbon range C6-C35.

6.1.2 Site Won Soils

Existing ground information has determined that on-site natural soils are only suitable for re-use within allotments but may be reused without additional chemical analysis in this scenario.

[10] *Specification for Topsoil - 2015*

Alternatively, further site-specific risk assessment may address the risk posed by beryllium, to allow Site Specific Assessment Criteria (SSAC) to be derived through a Detailed Quantitative Risk Assessment (DQRA).

Based on previous experience in similar circumstances, it is anticipated that the output of the DQRA could be utilised to support derivation of a SSAC which would demonstrate that the natural soils do not pose an unacceptable risk with respect to human health. Furthermore, it is considered likely that this assessment would provide justification for natural soils to remain within soft landscaped areas including private gardens thus negating the need for off-site disposal or relocation of soils with elevated concentrations to less sensitive areas of the development. However, this is not guaranteed and should be reviewed upon completion of additional assessment.

6.1.3 Visual Inspections

Visual inspection should be undertaken to confirm placement of appropriate thickness of capping soils and presence of geotextile membrane is in line with requirements of Section 4.3. Inspections should be undertaken at a minimum frequency of 1 per 3 plots.

In addition, inspections shall be undertaken at 2N° and 3N° locations within communal soft landscaping and allotment area respectively. Anticipated communal soft landscaping and allotment inspection locations are shown on the plan in Appendix A.

6.2 Ground Gas Protection (Radon)

It is recommended that a Gas Protection Verification Plan should be prepared in line with CIRIA C735[11] which sets out the requirements for gathering information to demonstrate that radon gas protection measures meet the remediation objectives.

This report would typically include clear assignment of responsibilities for verification, details of the type and frequency of inspection/testing required aligned with the construction programme and records which must be kept. As part of this process, the responsible party for the Verification Plan should review the design to confirm the suitability of the proposed products, particularly with regard to their durability within the construction process. It is important to ensure that the proposed verification activities are appropriate and proportionate to the level of risk.

On completion of these works a Verification Report should be prepared to demonstrate the successful installation of the radon gas protective measures in accordance with the Verification Plan. These details can form part of a broader remedial completion report where verification of other on-site remedial mitigation measures is applicable.

6.3 Record Keeping

Records of operations relating to the remediation works will be maintained on-site by the Principal Contractor and provided to the client for inclusion within the Remediation Completion Report. These records shall include the following, where relevant/appropriate:

- Photographic records during construction works showing extents of excavation, placement of geotextile membranes and imported material for capping layers, where appropriate;
- Photos from inspection pits confirming required thickness of capping soils;
- Environmental monitoring undertaken (if required);
- Volumes of waste materials disposed off-site including tickets/waste consignment notes;
- Volumes of imported fill;

[11] *Good Practice on the Testing and Verification of Protective Systems. CIRIA C735. (2014).*

- Validation sample locations;
- Chemical validation test results including supplier certificates for imported fill;
- Details of variations and/or contingency arrangements as a result of design variation; and,
- Inspection records for gas protection measures including photos, integrity test data, defects and remedial measures undertaken (as appropriate) with reference to the requirements of the Gas Protection Verification Plan.

In addition, where reuse of materials is undertaken in line with an MMP the following shall be recorded:

- Wagon movements on- and off-site;
- On- and off-site soil movement records; and,
- Volumes and placement locations/depths of soil reuse.

6.4 Remediation Completion Report

A Remediation Completion Report will be prepared that will include a summary of the works undertaken to demonstrate that the remediation objectives have been met. Supporting information will be provided as summarised in Section 6.3, the report will also serve to demonstrate compliance with the principles of material re-use outlined within the supporting MMP and will be submitted to CL: AIRE as a final record, if required.

The Remediation Completion Report shall be issued to the regulators upon completion of the works.

Appendix A – Drawings

Site Boundary

Base Map
Company: Bing maps - Autodesk Licence
DWG Title: -
DWG Number: -
Date: -

RC	JF	Updated Client Details	26/05/22	A
Drawn	Checked	Amendment	Date	Rev.

Client: Prestige Developments (Bristol) Ltd

Project: Bens Yard, Frampton Cotterell

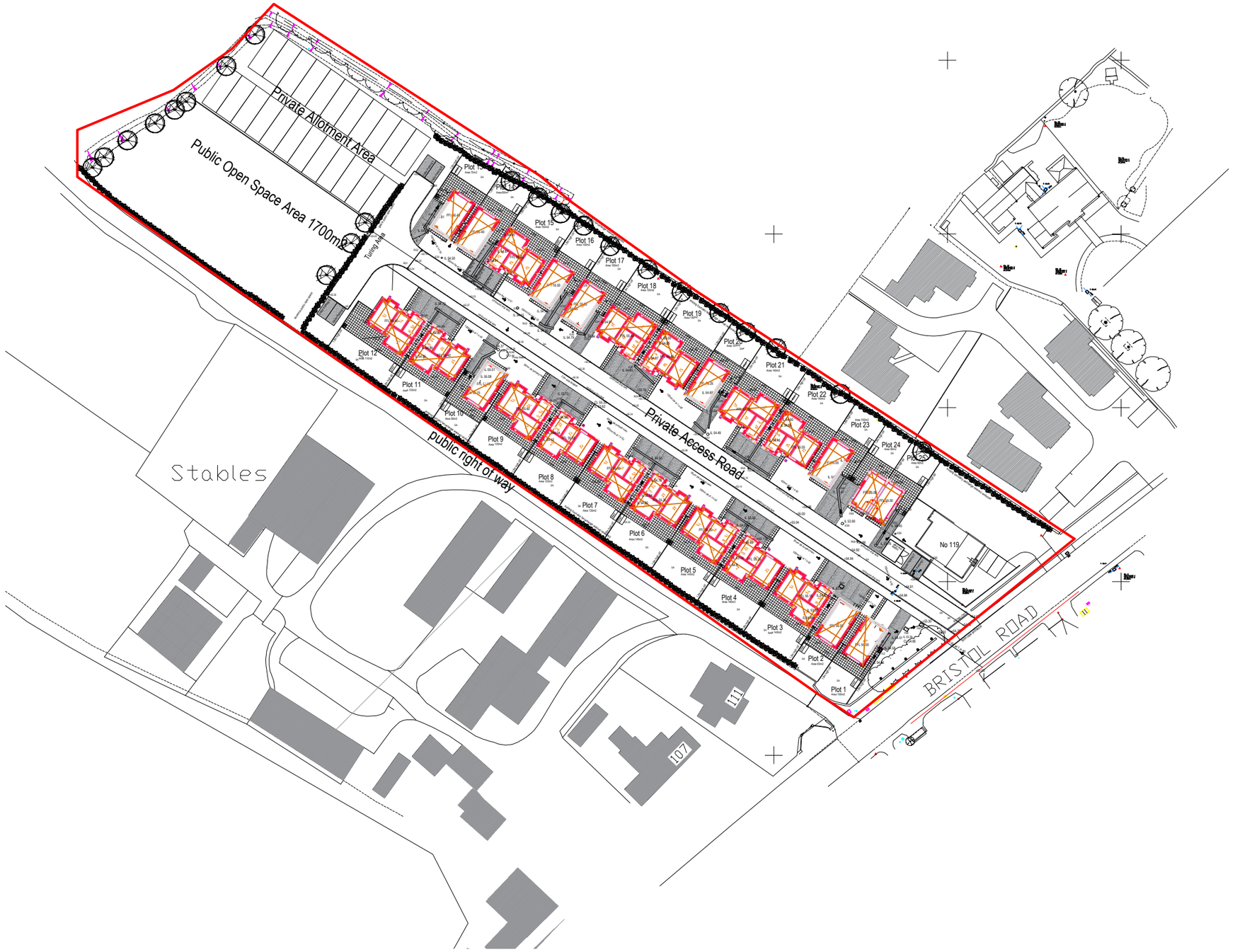
Title: Site Location Plan

T&P Regen
Unit 4 Brunel Lock Development, Smeaton Road, Bristol, BS1 6SE
Tel: 0117 927 7756
Email:Info@TP-regen.co.uk

Scale	Date	Drawn by	Check by	Rev.	Drawing No.
1:5000@A4	29/03/22	RC	JO	A	P0637-01-001

0 100 200 m

Site Boundary



Base Map
Company: David Cahill Design Consultants Ltd
DWG Title: Proposed Site Plan: Drainage
DWG Number: 3188/206
Date: Dec 2021

-	-	-	-	-
Drawn	Checked	Amendment	Date	Rev.

Client: Prestige Developments (Bristol) Ltd

Project: Bens Yard, Frampton Cotterell

Title: Proposed Development Plan

Scale	Date	Drawn by	Check by	Rev.	Drawing No.
1:1000@A3	26/05/22	RC	JF	-	P0637-01-007

T&P Regen
Unit 4 Brunel Lock Development, Smeaton Road, Bristol, BS1 6SE
Tel: 0117 927 7756
Email:Info@TP-regen.co.uk

0 20 40 m