



PROPOSED DEVELOPMENT AT YSTALYFERA SCHOOL PHASE III, SWANSEA

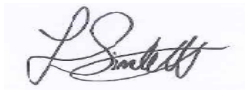
REMEDIATION STRATEGY REPORT

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CONTENTS

FOREWORD	3
1.0 INTRODUCTION	4
1.1 General	4
1.2 Aims & Objectives of Report	4
2.0 BACKGROUND	5
2.1 Overview of Proposed Scheme.....	5
2.2 Site Location and Description	5
2.3 Past Studies.....	6
3.0 REMEDIATION STRATEGY.....	10
3.1 Derivation of Remediation Strategy	10
3.2 Summary of Risks	10
3.3 Remediation Design.....	10
3.4 General Contaminated Land Risk	12
3.5 Unexpected Contamination – General Advice	13
3.6 Verification of Remediation Works.....	15
4.0 GENERAL CONSIDERATIONS FOR REMEDIATION WORKS.....	16
4.1 General	16
4.2 Health and Safety Requirements	16
4.3 Environmental Requirements.....	16
5.0 REFERENCES	17

APPENDICES

APPENDIX I – PROPOSED DEVELOPMENT PLANS	I
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FOREWORD

The following Report is based on information gained from previous studies undertaken in relation to the site, supplemented by information and data provided by the Main Contractor in support of this Remediation Strategy Report.

Quantum Geotechnic Ltd have provided the Main Contractor with Consultancy support during these works, relating to Phase III Intrusive Ground Investigation Interpretive Report. Where referenced, past studies in relation to the site should be read in conjunction with this Report.

1.0 INTRODUCTION

1.1 General

Upon the instructions of the Client, Andrew Scott Ltd, Quantum Geotechnic Limited (QGL) has been commissioned to undertake a Remediation Strategy Report in relation to the proposed development at Ysgol Gyfun Ystalyfera, Glanyrafon, Ystalyfera, Swansea, SA9 2JJ. The proposed development entails the demolition of the buildings in the north-west quadrant of the school, followed by the construction of a new assembly hall, kitchen and dining room.

As part of the Planning Conditions set out by the Local Planning Authority, this Report is produced to satisfy Planning Condition #8 which reads;

‘Prior to the commencement of work on site a remediation scheme to bring the site to a condition suitable for the intended use by removing any unacceptable risks to human health, buildings, other property and the natural and historical environment shall be prepared and submitted to and agreed in writing with the Local Planning Authority. The scheme shall include all works to be undertaken, proposed remediation objectives, remediation criteria and site management procedures. The measures proposed within the remediation scheme shall be implemented in accordance with an agreed programme of works.’

Reason:

‘To ensure that risks from land contamination to the future users of the land and neighbouring land are minimised, together with those to controlled waters, property and ecological systems, and to ensure that the development can be carried out safely without unacceptable risks to workers, neighbours and other offsite receptors.’

The following Report provides an overview of any past studies undertaken, and the methods or mechanism by which to either remove or reduce these risks to acceptable levels for the end-use receptors of the premises.

1.2 Aims & Objectives of Report

This Remediation Strategy updates the conceptual site model produced in the 2020 intrusive ground investigation and outlines the proposed remedial measures to be implemented as the basis for a Remediation Method Statement.

The Strategy should be read in conjunction with the documents listed and summarised in Section 2.3 of this Report.

2.0 BACKGROUND

2.1 Overview of Proposed Scheme

At time of writing, development proposals entail the demolition of the buildings in the north-west quadrant of the school, followed by the construction of a new assembly hall, kitchen and dining room. A development proposal plan is presented within Appendix I.

2.2 Site Location and Description

The area under investigation is a Welsh language comprehensive school in Ystalyfera in the upper Swansea Valley, on the River Tawe 13 miles north-east of Swansea City Centre.

The site has the River Tawe flowing North-South to the east and residential housing to the north and west. Residential housing is situated to the north and west of the site and while site works were undergoing the existing building was being dismantled.

The approximate National Grid Reference of the site is SN 77098 08839 with the postcode of SA9 2JJ. The area under investigation outlined for ease of reference in Figure 1 below;

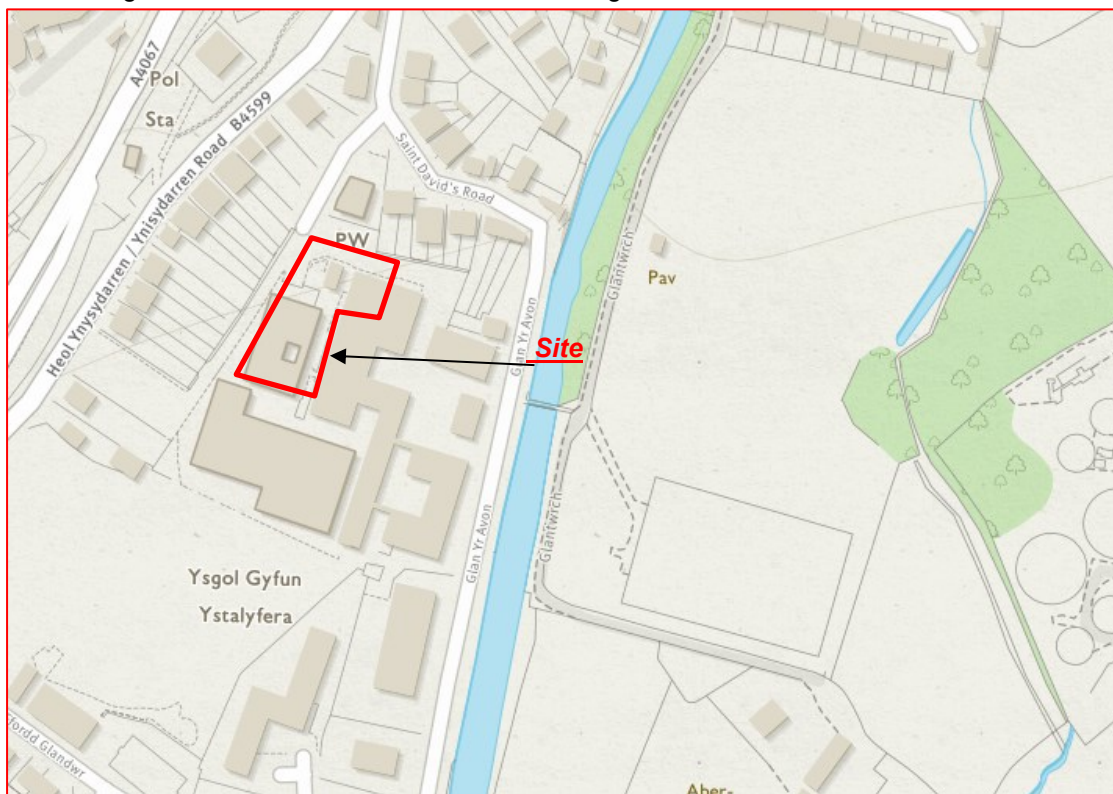


Figure 1: Site location indicating area under investigation. *Not to Scale* © Ordnance Survey

2.3 Past Studies

The entire school premises has been subject to eight previous studies as part of the ongoing process of contaminated land risk identification in order to derive a suitable Remediation Strategy. However it is items 7 and 8 listed below which pertain directly to this current Phase III development. This past studies are listed below;

1. Land Adjacent to Ystalyfera School, Geotechnical and Geo-Environmental Desk Study (JACOBS)
- Document Reference Number: B1844758/01/R1 (December 2013)
2. Ysgol Gyfun Ystalyfera, Nr Swansea Factual and Interpretative Report on Ground Investigation (ESG)
- Report Number: H4011-14/1 (September 2014)
3. Ysgol Gyfun Ystalyfera School, Phase II Preliminary Risk Assessment/ Desk Study
Report Number: G40035/PRA (Quantum Geotechnical Ltd – May 2017)
4. Ysgol Gyfun Ystalyfera School, Phase II Ground Investigation Interpretative Report
Report Number: G40035/IR (Quantum Geotechnical Ltd – May 2017)
5. Ysgol Gyfun Ystalyfera School, Phase II Remediation Strategy Report
Report Number: G40035/RS (Quantum Geotechnical Ltd – January 2018)
6. Ysgol Gyfun Ystalyfera School, Phase II Remediation Validation Assessment Report
Report Number: G40035/VR (Quantum Geotechnical Ltd – May 2018)
7. Ysgol Gyfun Ystalyfera School, Phase III Preliminary Risk Assessment/ Desk Study
Report Number: Q0229/PRA (Quantum Geotechnic Ltd – March 2020)
8. Ysgol Gyfun Ystalyfera School, Phase III Interpretative Report
Report Number: Q0229/IR (Quantum Geotechnic Ltd – October 2020)

Section 2.3.1 overpage provides a synopsis of this previous study highlighting the pertinent findings of the ground investigation and subsequent laboratory testing and risk assessments in relation to human health and the environment (controlled waters). This summary should be read in conjunction with QGL's Phase III reports to provide a comprehensive understanding and rationale behind the Remediation Strategy proposed within this Report;

2.3.1. Summary of Past Study Findings

A synopsis of the Phase II reports are provided below in Table 1.

Report Ref. #	Summary of Report & Findings
7.	From this Preliminary Risk Assessment for the proposed development of the Phase III area and the playing fields of Ysgol Gyfun Ystalyfera school, the following risks have been identified: Geotechnical Issues: • The Geological maps for the area indicate superficial deposits comprising Alluvium and Glacial Fluvial soils. Whilst no Made Ground is mapped there may well be a thin mantling, as identified locally within previous development areas. • The solid geology of the site is indicated to be Mudstones, Siltstones and Sandstones, with possible coal seams from the South Wales Coal Measures of Carboniferous age. • An unnamed fault line is mapped below the Phase III development site which suggests the potential for fractured and weakened bedrock below the site, which in turn can lead to variations in the erosion of the bedrock surface by rivers or glaciation (shown as variations in rock head levels). • The site lies in an area of former coal mining. The site-specific mining report indicates workings to be at depth (minimum of 60m) with any related movement having stopped by now. No mine entries have been recorded. The geological map review concurs with this and the risk from former shallow coal mining is considered low. • The site is highlighted as being in an area of either very low risk or negligible risk from shrink swell clays, collapsible deposits, landslides and running sands. Environmental Issues: The potential risk of pollutant linkages can be summarised as moderate to low across the site with the more pertinent risks listed below; • Possible Made Ground on-site as identified within the previous development sites which potentially contains contaminants at concentrations that may pose a risk to future site users. • Potential for groundwater contamination from off-site to impact the soils and groundwater beneath the site. • Potential for ground gas from off-site sources to on-site that may impact human health and/or buildings on site. Recommendations A number of potential geotechnical and environmental issues have been identified within this study hence the following is recommended;

	• Sampling of soils to determine the underlying ground conditions and to obtain samples to determine the geo-environmental characterisation of the underlying shallow ground conditions. The geotechnical characteristics of the shallow soils can also be determined as part of the same exercise. • A human health assessment to determine whether any pollutant source exists and if any exceedances of recognised thresholds occur. • An assessment to determine the risk from pollution pathway linkages between sources and receptors on and off site. If any exceedances and viable pollution pathway linkages are found, the guidance and recommendations for remedial strategies to permit progression of the proposed development of the site should be given.
8.	The Ground Investigation Interpretative Report was based on intrusive investigation trial holes and boreholes located across the proposed development area of Phase III supplemented by data and information gained from the Phase I and II school development previous ground investigation due to proximity of both sites to each other (under the permission and agreement with Neath Port Talbot County Borough Council). A regime of contaminated land testing of soils and soil leachates was undertaken, the results of which were used in a human health risk assessment and environmental assessment to identify unacceptable risks. Only one sample marginally exceeded Aliphatic >EC8 – EC10 by 1mg/ kg located at 0.20m in TP01 (ES1) within the shallow Made Ground. The Made Ground was predominantly reworked natural gravels with occasional man-made inclusions of brick, glass and slag (demolition material). One slightly raised Arsenic level in SA02 in the Made Ground is considered an isolated occurrence. No Asbestos was detected either. The geo-environmental laboratory testing showed only marginal exceedances of raised contamination concentrations, therefore the risks posed to construction operatives from chemical contaminants within the shallow ground is considered negligible. The results for soil leachate testing, which are used to determine level of risk to the immediate environment, particularly any controlled waterways i.e. streams/ rivers/ groundwater, all recorded values well within the Environmental Quality Standards published assessment criteria by NRW/EA. The measurement of carbon dioxide at concentrations of up 7.3% (together with three other instances where the carbon dioxide values exceeded 5.0%) therefore indicates that it would be prudent to consider this site as Characteristic Situations 2 – same as the Phase I & Phase II

	scheme area. Should such an approach be adopted some kind of protection / remedial measures should be considered. Based on the Phase I Desk Study and the findings of the Phase II Investigation, no potential source-pathway-receptor (S-P-R) linkages have been identified and as such no risk to human health or controlled waters have been identified.
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Table 1: Synopsis of Previous Studies Undertaken on Phase III School Development Site

Based on the above, limited Remedial Measures were deemed necessary for the development in terms of the presence of contaminated land and contaminated land related issues.

3.0 REMEDIATION STRATEGY

3.1 Derivation of Remediation Strategy

The past studies have revealed that limited remediation is required in relation to contaminated land and contaminated land related issues. The revised Conceptual Model following the intrusive ground investigation and subsequent further testing based on the comparisons between the measured potential contaminant concentrations and the relevant assessment criteria concluded that the Made Ground present across the site may pose a health risk to future site users for both residential and commercial land use and should therefore be considered a potential contaminant source unless remedial or protective measures are undertaken.

3.2 Summary of Risks

The investigation and testing undertaken initially, as documented in the past studies listed in Table 1, subsequently revealed the following risks:

- i) Marginally raised TPH-CWG Aliphatic >EC08-EC10 in one locality (TP05 at 0.20mbgl)
- ii) Raised Arsenic in one locality (SA02 at 0.50mbgl)
- iii) Landgas

Therefore, remedial strategies must be adopted to manage items the aforementioned risks and these are set out within Section 3.3.

3.3 Remediation Design

3.3.1 Risk 1: Total Petroleum Hydrocarbons in Soils

One soil sample recorded raised Total Petroleum Hydrocarbons based contaminants, from the shallow lying Made Ground to a maximum depth of 0.20m, with TP05 recording raised value. The Made Ground was predominantly reworked natural gravels with occasional man-made inclusions of (demolition spoil) brick, glass, coal and slag. Table 2 summarises the elevated Total Petroleum Hydrocarbons test results recorded.

Analyte	Unit	SGV/ GAC Value	Site Result Value	Location of Raised Contaminant
TPH – Aromatic > EC08 – 10	(mg/kg)	27	28	Trial Pit – BH2 – 0.50mbgl

Table 2: Summary of elevated soil contaminants-hydrocarbons.

Risk 1 Remediation Measures:

Risk to be remediated through removing the top 0.60-0.80m (minimum) of Made Ground across the site area mainly i.e. demolition material. The Risk will be built out of the development through the construction

process.

3.3.2 Risk 2: Arsenic Analysis in Soils

One Arsenic sample recorded raised values in comparison. The Made Ground was predominantly reworked natural gravels with occasional man-made inclusions (demolition spoil) of brick, glass, coal and slag. Table 3 summarises the elevated chemical analysis test results recorded.

Analyte	Unit	SGV/ GAC Value	Site Result Value	Location of Raised Contaminant
Arsenic	mg/kg	50	103	Trial Pit – SA02 – 0.50mbgl

Table 3: Summary of elevated soil contaminants.

Risk 2 Remediation Measures:

Risk to be remediated through removing the top 1.00m (minimum) of Made Ground across the site area. The Risk will be built out of the development through the construction process.

3.3.3 Risk 3: Landgas

No ground gas monitoring installations could be installed during Quantum's 2020 intrusive investigation due to artesian water. However, a gas membrane akin to the previous phase of development should be implemented into the design of the Phase III development. The rationale for this recommendation is set out below.

The 2014 ESG ground investigation involved the installation of 3No. ground gas monitoring wells/ standpipes which were subject to 6No. monitoring visits. The results were presented within Enclosure B of the ESG report. The results indicate carbon dioxide concentrations of up to 7.3% by volume and one record of methane, at a concentration of 0.5% by volume (no hydrogen sulphide was detected), together with oxygen concentrations as low as 9.6% by volume. A maximum gas flow rate of 0.1 l/h was recorded from the boreholes during the monitoring visits which were undertaken at atmospheric pressures ranging from 998 to 1014 mb.

The potential risks posed by any recorded presence of potentially harmful gases can be assessed on a semi-quantitative basis by reference to the guidance in documents CIRIA 665 and BS8485. The assessment comprises multiplying the maximum measured steady gas flow rate (expressed as litres per hour) by the maximum steady gas concentration (expressed as percentage-by-volume; divided by 100) to derive a Gas Screening Value (GSV).

The gas screening value is defined as a product of the gas concentration and gas flow, the worst case scenario being established from the highest of each. For a carbon dioxide value of 7.3%, and a gas flow value of 0.1 l/h, then the gas screening value would be 0.0073 l/hr. The maximum methane value was

0.5% and, again using a flow rate of 0.1 l/h, the gas screening value would be 0.0005 l/hr. Both of these results are within the range for Characteristic Situation 1 (after CIRIA R149), which is regarded as 'Very Low Risk'. However, as recommended in CIRIA C665, the adoption of Characteristic Situation 1 assumes that concentrations of methane are typically less than 1% by volume, and those of carbon dioxide typically less than 5% by volume. Should higher concentrations be present it is recommended that consideration be given to increasing the classification to Characteristic Situation 2.

The measurement of carbon dioxide at concentrations of up 7.3% (together with three other instances where the carbon dioxide values exceeded 5.0%) therefore indicates that it would be prudent to consider this site as Characteristic Situations 2 – same as the Phase I & Phase II scheme area. Should such an approach be adopted some kind of protection / remedial measures should be considered.

As per the earlier QGL PRA March 2020 report Radon protection measures are required.

3.4 General Contaminated Land Risk

3.4.1 Construction Workers

The geo-environmental laboratory testing showed only marginal exceedances of raised contamination concentrations, therefore the risks posed to construction operatives from chemical contaminants within the shallow ground is considered low.

Operatives working with, or likely to come into contact with made ground with the potential to harness raised concentrations of contaminants, should observe particular precautions concerning personal hygiene. They should be issued with the appropriate personal protective equipment and should be instructed in safe working methods.

Instructions should be issued in the recognition of potentially hazardous materials including oily and odorous soil and water and also any discoloured or fibrous substances for example. Operatives should be warned to avoid contact between hands and mouth before washing. The consumption of food must be confined to designated clean areas with suitable welfare including washing facilities should be provided. Further detail regarding working on potentially Asbestos contaminated soils/ sites is provided in Section 3.4.2.

3.4.2 Asbestos Mitigation Measures

Asbestos was not detected on site as part of the ground investigation albeit asbestos cannot be ruled out across the whole Phase III development. Therefore, there is a residual risk that elevated/ concentrated Asbestos may be encountered during the construction works.

- The Contractor is referred to the following guidance documents in relation to works impacted by asbestos:

- a. Control of Asbestos Regulations 2012 (SI 2012/2675)
 - b. Asbestos (Licensing) Regulations 1983 (SI 1983/1649), as amended in 1998 (SI 1998/3233)
 - c. Asbestos: Exposure Limits and Measurement of Airborne Dust Concentrations (EH10 and MDHS 39/4), 1996. Health and Safety Executive.
 - d. Asbestos: The survey guide (HSG 264), 2010. Health and Safety Executive
 - e. CIRIA C765: Asbestos in soil and made ground good practice site guide, 2017. CIRIA.
- The Contractor shall employ a watching brief by a suitably qualified person(s) to oversee higher risk activities (such as shallow excavations through Made Ground). Risks associated with excavating asbestos impacted soils will be included in the Contractors Risk Assessments and Method Statements.
 - If asbestos is identified a procedure for dealing with potentially suspect materials exposed requiring sampling and analysis will be produced.
 - The contractor will undertake specific precautions if materials containing asbestos are present or encountered during works, in order to comply with the Control of Asbestos Regulations 2012, and adhering to relevant guidance, including Asbestos: Exposure Limits and Measurement of Airborne Dust Concentrations (EH10 and MDHS 39/4) and Managing Asbestos in Workplace Buildings 1988.
 - Specialist measures may be required such as dampening down of excavations, adoption of specialist PPE and RPE, air monitoring, waste segregation and labelling and specialist waste disposal. Works may need to be undertaken by a specialist licenced asbestos contractor if significant quantities of fibrous materials are encountered.
 - The Contractor must ensure that the HSE is informed if the asbestos is classified as notifiable.
 - Transport of asbestos containing materials will be undertaken in accordance with Carriage of Dangerous Goods and Use of Transportable Pressure Equipment Regulations 2009 (SI 2009/1348). Disposal of asbestos containing materials to licensed waste sites in accordance with Hazardous Waste (England and Wales) Regulations 2005, as amended (SI 2005/894).
 - All records to be kept by the Contractor for verification purposes.

3.5 Unexpected Contamination – General Advice

On any previously developed site there is the potential to encounter areas or types of contamination including asbestos not identified through previous site investigations. Underground structures may also be encountered e.g. storage tanks, that may contain unknown fluids which may require specialist treatment or disposal. If unforeseen contamination in the form of suspicious odour, colour or staining is encountered during excavations, works in that area should be halted immediately.

In the case that unexpected contamination is identified then further risk assessments to receptors will be carried out as necessary and reported to the employer, the local authority (NPTCBC) and Natural Resource Wales (NRW). Should unacceptable risks be identified, the contractor shall submit to and agree a revised remediation method statement with the local authority, in consultation with NRW.

The discovery and management of potentially impacted soils should be dealt with on a case-by-case basis in order to address the specific nature of the ground conditions uncovered. A general approach to the discovery strategy is provided below. Visual and olfactory inspection shall be used to identify potentially impacted soils. Following agreement on a plan of action it is likely that a conventional delineation exercise will be used to segregate impacted soil from the surrounding material.

The following general sequence should be adopted for managing suspicious ground conditions:

1. Suspicious ground conditions are identified by groundworker(s) and the affected works are halted;
2. Contractor assesses the requirement for any additional health and safety or environmental management control measures;
3. Control measures, if required, are implemented;
4. Contractor notifies the Contractor's Land Quality Specialist;
5. Contractor's suitably qualified person records the extent of 'contamination' and nature of stratigraphy;
6. Findings are discussed with the Contractor's Land Quality Specialist and a way forward is ascertained e.g. sampling and testing requirements, special measures required during excavation etc.;
7. Contractor's Land Quality Specialist suitably qualified person collects samples and schedules the agreed laboratory analysis;
8. Details of samples collected and tests scheduled are recorded;
9. Contractor's Land Quality Specialist notifies Local Planning Authority and provides a copy of the records;
10. Contractor provides the test results to the Contractor's Land Quality Specialist for review;
11. Remedial action, if necessary, and programming of the works are agreed with the Local Planning Authority;
12. Contractor is informed of the remedial action required;
13. Contractor prepares a Method Statement that details how the agreed remedial action will be carried out;
14. Method Statement is agreed by Contractor's Land Quality Specialist;
15. Works proceed and Contractor's Land Quality Specialist provides a copy of the Method Statement to the Local Planning Authority.
16. Evidence of work carried out is collated for inclusion in the Close Out Report.

The following sequence outlines the approach to be adopted for a conventional delineation exercise:

1. Strip the overlying soil that does not appear to be impacted ('clean') and stockpile separately.
2. Collect 1no. sample from the stockpile. Schedule for analyses to be advised by the Contractor's Land Quality Specialist.
3. Collect 1no. sample from the impacted soil horizon per 25m² (or part thereof). Schedule for

analyses to be advised by the Contractor's Land Quality Specialist.

4. Continue the delineation exercise, appropriately separating the impacted soil from the 'clean' soil.
5. Upon exposing 'clean' soil at the extents of the excavation, halt the delineation.
6. From each side of the excavation collect 1no. sample within 1m above the impacted horizon, 1no. sample at the depth of the impacted horizon, and 1no. sample within 1m below depth of impacted horizon. Schedule for analyses to be advised by the Contractor's Land Quality Specialist
7. Across the base of the excavation collect 1no. sample per 25m² (or part thereof). Schedule for analyses advised by the Contractor's Land Quality Specialist.
8. All results and evidence of the work carried out should be collated for inclusion in the Verification Report.

3.6 Verification of Remediation Works

All remediation works completed at the site will be documented within a Verification Report. The Verification Report should detail the remediation works carried out; including any variation from the Andrew Scott approved remediation method statement, and also validation evidence to prove that remediation works had been successfully completed. Typical validation evidence to be included in the report should include photos, chemical analysis, logs, as-built drawings, delivery notes and import/ export soil audit trail.

Verification on this development will principally comprise evidence that the areas where raised contaminants were recorded are excavated/ removed during the foundation phase of the build. Therefore, removing any potential linkages between a source, pathway and receptor.

Any additional contamination identified and remediation works carried out will be recorded in the Verification Report. The Verification Report will be required by Andrew Scott in order to discharge planning conditions.

4.0 GENERAL CONSIDERATIONS FOR REMEDIATION WORKS

4.1 General

The Remediation Works shall constitute the development itself whereby the risks realised will be built out during the proposed development i.e excavation and removal of any Made Ground, however the following points should also be considered during any works.

4.2 Health and Safety Requirements

Any Remediation Method Statement should consider health and safety for workers at the site, and suitable arrangements made to comply with contemporary health and safety legislation. All works will be carried out by suitably qualified and experienced staff including supervision by an Environmental Engineer / Site Manager.

4.3 Environmental Requirements

4.3.1 Soil Management

The Contractor should operate a soil audit during the works. Any waste materials generated during the works will be classified as waste and recovered/disposed at suitably licensed/declared sites. All waste classified as hazardous, leaving the site will be transported with Hazardous Waste Consignment Notes. All non-hazardous and inert waste will be transported with suitable waste transfer notes. All waste will be removed by a licensed waste carrier.

4.3.2 Pollution Control

The Contractor should consider and detail in their Remediation Method Statement the control measures for potential environmental pollution during the remediation works, including cross-contamination of soil, mud and silt, noise, dust, etc.

4.3.3 Environmental Management System

The Contractor should have an Environmental Management System in accordance with BS EN ISO14001 accreditation. The procedures and records contained should therein ensure all works are carried out in a manner that minimises impact on the environment and generates adequate and accurate records to demonstrate remediation works have been carried out to the required standard and in accordance with all applicable legislation.

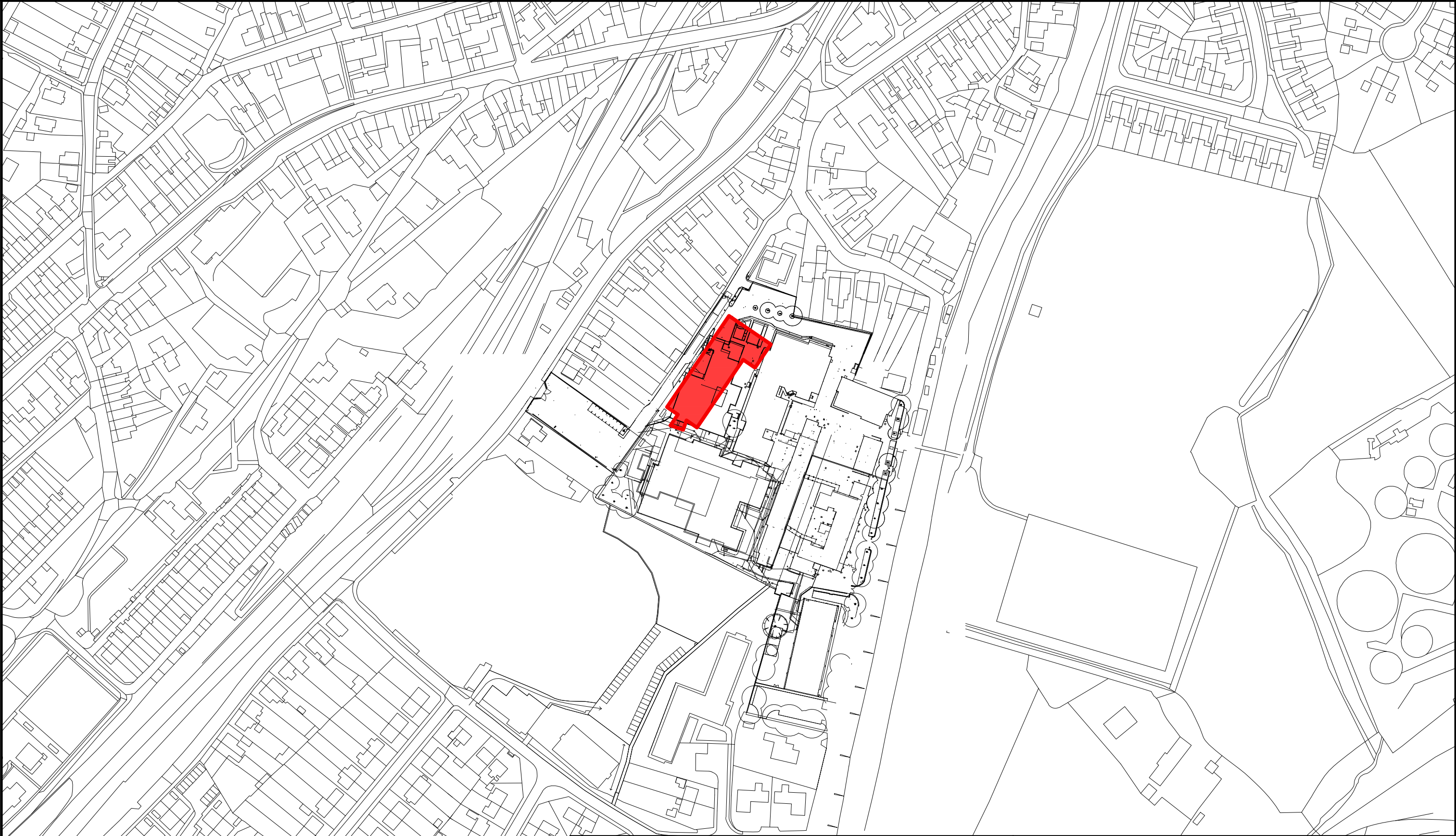
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Past Studies:

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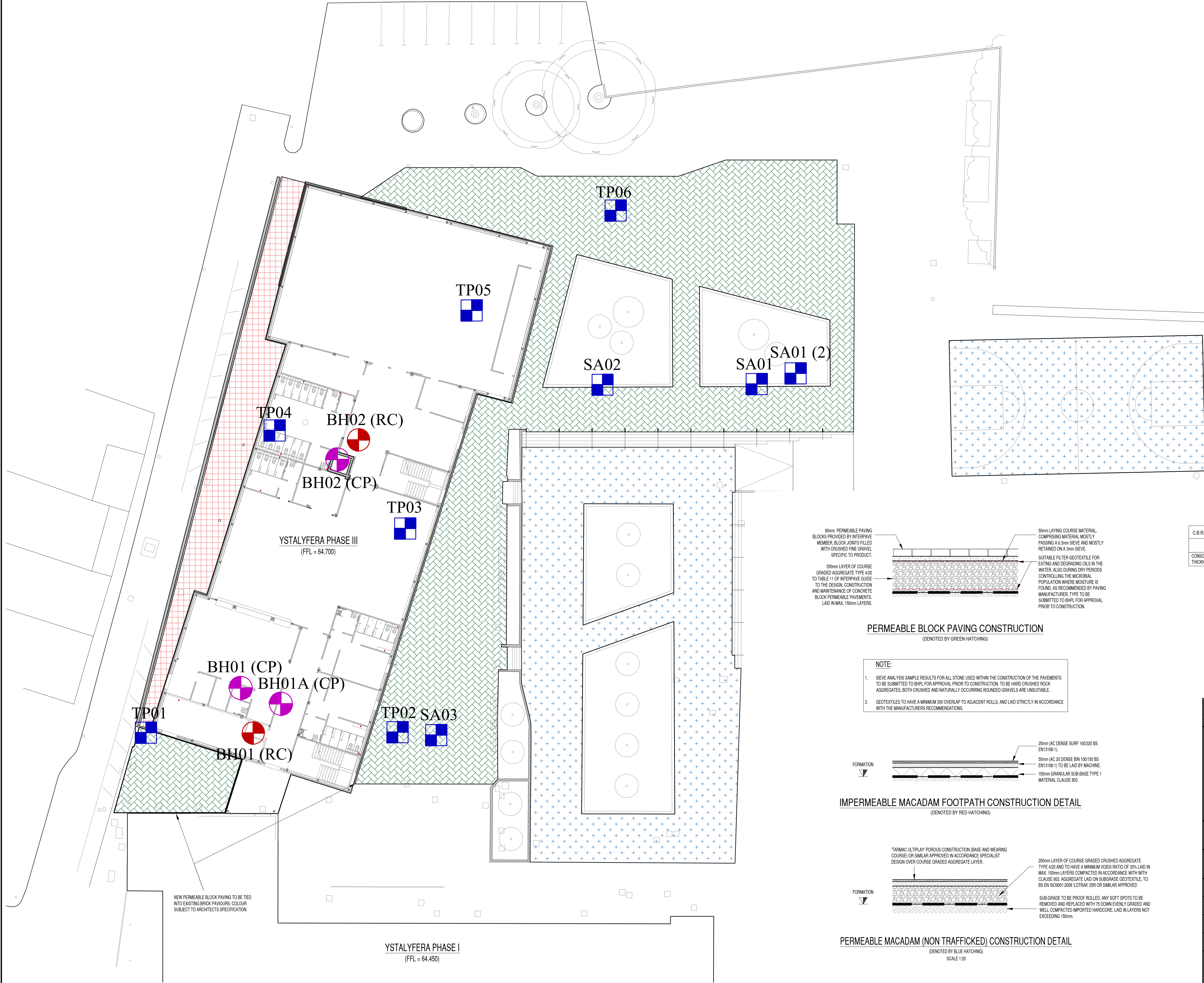
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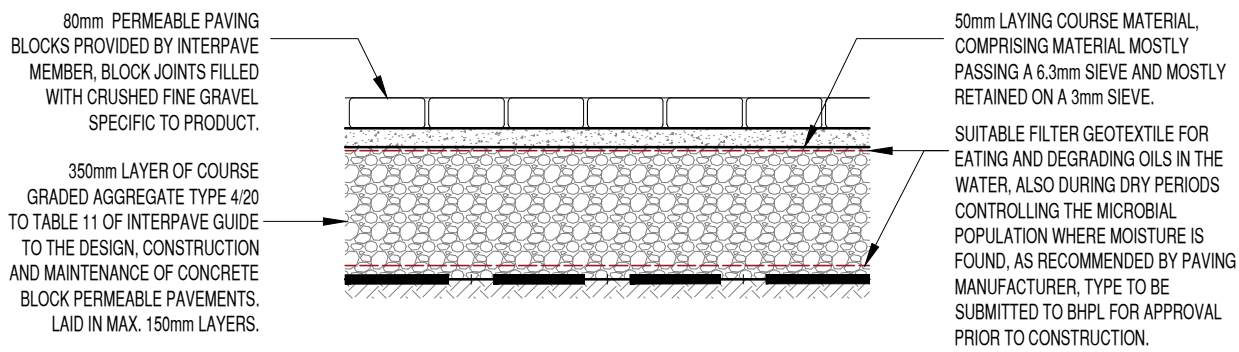


				Bingham Hall PARTNERSHIP LTD		Project Title YSTALYFERA SCHOOL, PHASE 3			
				Consulting Civil & Structural Engineers 5 Ty-Nant Court Morganstown Cardiff CF15 8LW Telephone (029) 2048 8588		Drawing Title PROPOSED BUILDING LOCATION			
Scale		Drawn DB	Drawing Size A3	Date MAR 20	Checked DTH				
Project No.		Originator	Volume	Level	Type	Role	Number	Drawing Status	Rev
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Rev	By	Date	Revision						

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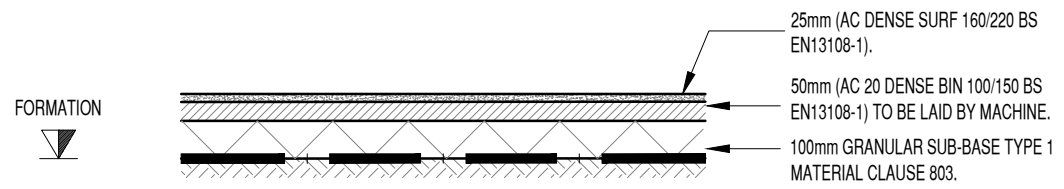


- NOTES**
- ALL CLAUSE REFERENCES ARE FROM D.O.T. PUBLICATION SPECIFICATION FOR HIGHWAY WORKS.
 - ALL FORMATIONS SHALL BE PROOF ROLLED ANY SOFT SPOTS REMOVED AND REPLACED WITH CLASS 8F2 TABLE 61 MATERIAL COMPACTION SHALL BE IN ACCORDANCE WITH CLAUSE 612. THE MINIMUM CBR OF AREAS OF FILL MATERIAL SHALL BE 15% ALL FILL MATERIAL MUST BE APPROVED BY THE HIGHWAY AUTHORITY PRIOR TO USE. (S.H.W.).
 - IF ROADBASE IS LAID AND IS NOT COVERED IMMEDIATELY WITH THE BASECOURSE THEN THE ROADBASE SHOULD BE SPRAYED WITH A SEALING COAT OF BITUMINOUS SPRAY TO CLAUSE 920.
 - FORMATION LEVELS TO ALL EXTERNAL CONSTRUCTION MAKE UPS TO BE PROOF ROLLED TO REFUSAL. ANY SOFT SPOTS TO BE REMOVED AND REPLACED WITH 8F2. MAKE-UP LEVELS TO UNDERSIDE OF SUB-BASE FOLLOWING PROOF ROLLING IF NECESSARY. MINIMUM CLASS OF CAPPING TO BE 8F2.

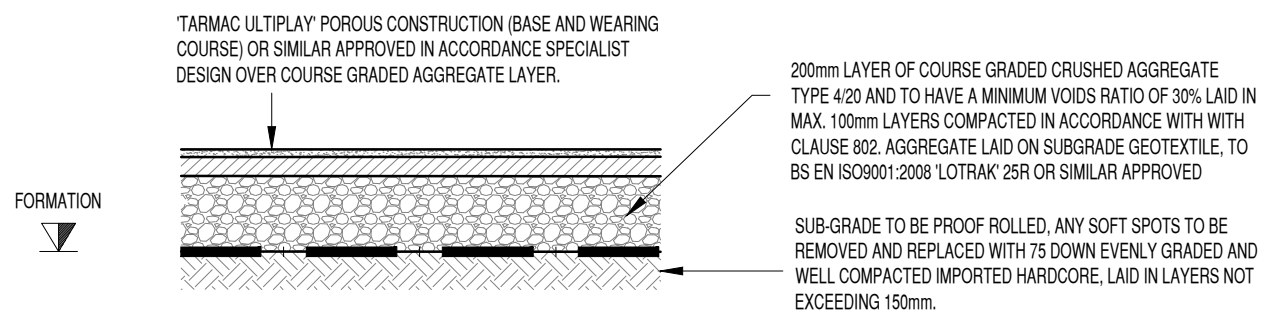


PERMEABLE BLOCK PAVING CONSTRUCTION
(DENOTED BY GREEN HATCHING)

- NOTE:**
- SIEVE ANALYSIS SAMPLE RESULTS FOR ALL STONE USED WITHIN THE CONSTRUCTION OF THE PAVEMENTS TO BE SUBMITTED TO BPHL FOR APPROVAL PRIOR TO CONSTRUCTION. TO BE HARD CRUSHED ROCK AGGREGATES. BOTH CRUSHED AND NATURALLY OCCURRING ROUNDED GRAVELS ARE UNSUITABLE.
 - GEOTEXTILES TO HAVE A MINIMUM 300 OVERLAP TO ADJACENT ROLLS. AND LAID STRICTLY IN ACCORDANCE WITH THE MANUFACTURERS RECOMMENDATIONS.



IMPERMEABLE MACADAM FOOTPATH CONSTRUCTION DETAIL
(DENOTED BY RED HATCHING)



PERMEABLE MACADAM (NON TRAFFICKED) CONSTRUCTION DETAIL
(DENOTED BY BLUE HATCHING)
SCALE 1:20

C.B.R. VALUE	BELOW 2%		2%-5%		5%-15%	
	SUB-BASE+	CAPPING LAYER	SUB-BASE+	CAPPING LAYER	SUB-BASE	ABOVE 15%
CONSOLIDATED THICKNESS	150	600	150	350	275	SUB-BASE
					275	

CAPPING LAYER MATERIAL SHALL BE A MINIMUM OF CLASS 8F1 OR 8F2 MATERIAL AS SPECIFIED IN TABLE 610 OF THE SPECIFICATION FOR HIGHWAY WORKS. THE SUB BASE & CAPPING LAYER SHALL EXTEND UNDER THE KERB.
ALL CLAUSES ARE FROM 'DOT' SPECIFICATION FOR HIGHWAY WORKS' (S.H.W.).
CBR TEST RESULTS TO BE SUPPLIED TO ENGINEER PRIOR TO ANY ROAD CONSTRUCTION.

TABLE INDICATING ROAD CONSTRUCTION DEPTHS IN RELATION TO C.B.R. VALUES.

P03	RC	20/06/20	REVISED SITE PLAN
P02	RC	23/06/20	RETAINING WALLS TO WEST BOUNDARY ADDED
P01	RC	16/06/20	ISSUED FOR INFORMATION
Rev	By	Date	Revision

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Project Title
YSTALYFERA PHASE III WORKS

Drawing Title
EXTERNAL FINISHES LAYOUT & DETAILS

Drawing Status
INFORMATION

Architect
LAWRAY ARCHITECTS

Client
ANDREW SCOTT LTD.

Scale
1:200

Drawn
RC

Drawing Size
A1

Date
JUNE 2020

Checked
DTH

Project No. - Originator - Volume - Level - Type - Role - Number
6685 - BHP - XX - 00 - DR - C - (60)001

Rev
P03