RLRE Consulting Engineers

SRP Building

William Hulme's Grammar School, Manchester

Remediation Strategy

SRP Building, William Hulme's Grammar School

REMEDIATION STRATEGY

For

United Learning.

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Executive Summary

This presents a summary of the remedial requirements and should not be referred to in isolation.

Instruction	In December 2025 Rodgers Leask Ltd (RLL) was commissioned by United Learning to produce a Remediation Strategy for a proposed development at William Hulme Grammar School, Manchester. It is understood that the site is in use as a school and proposed development will consist of two new Multi-Use Games Areas (MUGAS) and a new Specially Resourced Provision (SRP) Building. The Remediation Strategy is required to specify both the remedial and validation works needed to facilitate the proposed development.
Site Setting	The site is located on Spring Bridge Road, Manchester, M16 8PR and is approximately centred on National Grid Reference 383695E, 394286N. The site is currently occupied by an existing MUGA, car park and playing fields. Historically the site appears to have been greenfield until the construction of the Grammar school in the 1890s. A specialist desk based UXO assessment identified a low risk from unexploded ordnance. Published geology indicates the site to be underlain by Glacial Till and the Wilmslow Sandstone Formation. The Wilmslow Sandstone is a Principal Aquifer however the site does not lie within a groundwater source protection zone and there are no viable surface water receptors within the site vicinty. Ground investigation undertaken by RLL in May 2025 has indicated the presence of made ground across the site overlying Glacial Till and the Wilmslow Sandstone. Perched groundwater was encountered within the Glacial Till. Exceedances of some PAH compounds and heavy metals when compared to Generic Assessment Criteria were recorded in samples of made ground and topsoil. Ground gas monitoring indicated elevated concentrations of Carbon Dioxide and a CS-2 gas regime was considered appropriate.

Remediation Strategy	In order to mitigate the risk to site end users, it is proposed to place 600mm of clean material over the made ground in all landscaped areas. The remediation strategy provides a methodology which should be followed to validate these remedial works. The strategy provides chemical standards for site-won and imported soils. The strategy also provides a methodology for the removal and validation of unexpected contaminated soils. Gas protection measures commensurate with a CS-2 gassing regime and a Type B building will be required in accordance with BS8485:2015+A1:2019 comprising a ventilated subfloor void and gas membrane installed and verified in accordance with CIRIA C735. Liaison with the statutory water providers is required to determine the specification of water main to be used.
Validation	Validation of all remedial works will be required and a protocol for carrying out validation works is provided. A completion report will be required to document the remedial works carried out, including verification of the installed gas protection membrane. It shall be necessary to submit the completion report to the regulatory authorities in order to discharge associated planning conditions. The responsibility for carrying our remediation, validation and completions works shall be defined during letting of the construction contract.

Contents

1.0	**Introduction**	**8**
1.1.	Instruction	8
1.2.	Objectives	8
1.3.	Reference Reports	8
1.4.	Scope	8
1.5.	Approvals	9
1.6.	Limitations and Confidentiality	9
2.0	**Background Information**	**10**
2.1.	Site Location and Description	10
2.2.	Site History	11
2.3.	UXO	11
2.4.	Regulatory Information	11
2.5.	Geology, Hydrology and Hydrogeology	12
2.6.	Ground Investigation	12
2.6.1.	Ground Conditions	12
2.6.2.	Groundwater	14
2.6.3.	Gas	14
2.6.4.	Contamination – Risk to Human Health from Soils	14
2.6.5.	Contamination – Risk to Controlled Waters	15
2.6.6.	Risk to Structures	15
3.0	**Conceptual Model**	**16**
3.1.	Potential Contaminant Linkages	16
4.0	**Site Preparation**	**18**
4.1.	Grubbing out of Existing MUGA	18
4.2.	General	18
5.0	**Proposed Remediation Works**	**20**
5.1.	Remediation Options Appraisal & Sustainability	20
5.2.	Assessment Criteria for Formation of Capping Layers	21
5.3.	Capping Layers within Landscaped Areas	21
5.4.	Water Mains	22
5.5.	Buried Concrete	22
5.6.	Risks to Construction Workers	22
5.7.	Gas Mitigation	22
5.8.	Hydrocarbon Vapour	23
6.0	**Verification of Capping Layers**	**24**

6.1. Validation Methodology 24
6.1.1. Placement and Testing of Clean Cover Materials 24
6.1.2. Site-won Material Testing Requirements 24
6.1.3. Imported Material Testing Requirements 25
6.2. Validation of Cover Layer Depth 27

7.0 Verification of Gas Membranes 28

8.0 Contingency Arrangements for Dealing with Unexpected Contamination 29

9.0 Regulatory requirements 31

9.1. Licensing and Permitting 31
9.2. Waste Management 31
9.3. 3rd Party Liability 31

10.0 Verification Reporting and timeframes 32

11.0 References 33

Tables

Table 1: Generic Assessment Criteria Residential End use without plant uptake

Appendices

Appendix A: Proposed Site Layout and Drainage Design Drawings

1.0 Introduction

1.1. Instruction

In December 2025, Rodgers Leask Ltd (RLL) was commissioned by United Learning Ltd. to produce a Remediation Strategy for a proposed development at William Hulme Grammar Schoolin Manchester, henceforth referred to as 'the Site'.

It is understood that the site is in use as a school and proposed development will consist of two new Multi-Use Games Areas (MUGAS) and a new Specially Resourced Provision (SRP) Building. A proposed development layout is included as **Appendix A**.

1.2. Objectives

The Remediation Strategy is required in order to discharge Condition 12A of planning permission 140594/FO/2024.

The objectives of this Remediation Strategy are to establish which remedial options provide the most suitable approach to remediation for each of the identified potential contaminant linkages.

The report has been prepared in accordance with the Land Contamination Risk Management (LCRM) guidance from the Environment Agency.

1.3. Reference Reports

The following existing information/reports have been reviewed as part of this assessment:

- RLL Phase 1 Geo-Environmental Desk Study – SRP, William Hulme's Grammar School 22639-RLL-24-XX-RP-O-0001.
- RLL Ground Investigation Report – SRP Building, William Hulme's Grammar School 22639-RL-25-XX-RP-O-0002_P02

This Remediation Strategy is based upon the findings and recommendations of the above reports.

1.4. Scope

In order to achieve the outlined objectives, the scope of the study encompassed:

- A review and summary of the pertinent findings of the reference reports.
- Recommendations for remedial and validation works.

1.5. Approvals

It is recommended that this strategy be submitted, in conjunction with the referenced supporting reports, to the appropriate regulatory bodies for approval prior to implementation.

1.6. Limitations and Confidentiality

All conclusions and recommendations made within this report are based upon and limited to the factual information. No responsibility can be taken by RL Ltd for information obtained by third parties and it has been assumed that all third-party information provided is true and correct.

No liability can be accepted for conditions not revealed within the exploratory holes or pits undertaken. The exploratory points cover only a small proportion of the total Site area. RL Ltd has where necessary undertaken extrapolation between locations and no responsibility can be taken for different conditions which may occur between locations.

RL Ltd has undertaken the work in accordance with our understanding of current best practice at the time of undertaking the report. Further assessment and revision of the report may be required should new information come to light or legislation/changes to best practice be introduced after the date of issue of the report.

RL Ltd has prepared the report for the sole use and reliance of the Client. The report may not be used or relied upon by any unauthorised third party without the explicit written agreement of RL Ltd.

The interpretive work undertaken within this report remains the intellectual property of RL Ltd and must not be divulged to any commercial third party without prior written agreement of RL Ltd.

2.0 Background Information

Information used to inform the following sections have been summarised from reports referenced in Section 1.3 above.

2.1. Site Location and Description

The site is located on Spring Bridge Road, Manchester, M16 8PR and is approximately centred on National Grid Reference: 383695E, 394286N.

The site has an irregular outline, covers an area of approximately 0.5 hectares (ha) and is relatively level. The site was accessed via Spring Bridge Road.

The site comprises three main areas:

- A roughly square area in the north, comprising two-thirds grass and one third gravel hardstanding. The grass area forms part of the existing school playing fields. The hardstanding area was utilised as a car park at the time of the site visit.
- A roughly square area in the central portion of the school covered by asphalt hardstanding associated with an existing MUGA (courts). Existing drainage was noted within the MUGA together with flood lighting. Telegraph poles were noted along the western edge of the MUGA.
- A rectangular area in the south, covered by grass, which forms part of the existing school playing fields.

The boundaries of the site comprise:

Northern Area

- Mature treeline and hedge line to the north.
- Greenfield to the east.
- Greenfield to the south.
- Car park comprising hardstanding to the west.

Central Area

- MUGA's to the north.
- Greenfield to the east.

- Existing resource provision building and cricket nets to the south.
- Service road and existing school buildings to the west.

Southern Area

- Cricket nets and greenfield to the north.
- Greenfield to the east.
- Greenfield to the south.
- Fencing and hardstanding to the west.

2.2. Site History

The Site was historically greenfield from earliest mapping, until the construction of the Grammar School where the land-use changed to playing fields in 1894. Whilst the historic OS maps do not indicate the addition of the MUGA's, they are known to be present in the central area, and a carpark / hardstanding area in the northern area.

2.3. UXO

Regional Unexploded Bomb Risk maps, obtained from Zetica, indicate the Site is in a moderate-risk area for unexploded ordnance (UXO). As such, a detailed UXO risk assessment was recommended and carried out by 1st Line Defence.

The Detailed UXO Risk Assessment indicated an overall low-risk from German and anti-aircraft ordnance and a low-risk for Allied unexploded ordnance. A recommendation was given for a UXO management plan to be put in place and for a site specific UXO awareness briefing to be undertaken for personnel conducting intrusive works.

2.4. Regulatory Information

The RLL Desk Study reports that there are no records of historical landfill within 500m of the site.

There are 3 No. records of unknown filled ground for ponds located 76m to 235m from the site.

The site does not lie within an area where radon protection measures are required.

2.5. Geology, Hydrology and Hydrogeology

Information pertaining to the underlying geological and hydrogeological conditions at the Site has been obtained via the RLL Desk Study.

The published geological information shows the Site to be underlain by:

- Glacial Till Formation – Diamicton (GTF)
- Wilmslow Sandstone Formation (WSF)

There is 1 No. fault indicated within the vicinity of the Site, orientated northwest to southeast. This crosses the southwestern corner of the site. However, this is considered unlikely to significantly impact the site and the proposed development.

Information presented in the RLL Desk Study indicates that the underlying Glacial Till Formation is defined as a Secondary (Undifferentiated) Aquifer. The underlying Wilmslow Sandstone Formation is defined as a Principal Aquifer.

Information presented in RLL Desk Study indicates that there are 2 No. active groundwater abstraction licences within 2,000m of the Site, the nearest is 1,505m north. The Site is not however located within a groundwater Source Protection Zone.

No surface water features are recorded within 250m of the site.

2.6. Ground Investigation

2.6.1. Ground Conditions

RLL carried out a ground investigation May 2025 comprising window sample boreholes and Dynamic Cone Penetration (DCP) tests, together with soil gas monitoring, laboratory testing of soils and groundwater and interpretative reporting. The ground conditions encountered during the RLL ground investigation is summarised below:

Strata Encountered	Mean depth to top of strata (m) [range, m]	Mean depth to base of strata (m) [range, m]	Mean thickness of strata (m) [range, m]
Stratum 1: TOPSOIL Encountered in WS02, WS08, WS09, WS10. Grass over dark brown loamy topsoil.	From ground level	0.30 [0.30]	0.30 [0.30]

Strata Encountered	Mean depth to top of strata (m) [range, m]	Mean depth to base of strata (m) [range, m]	Mean thickness of strata (m) [range, m]
Stratum 2: TARMAC Encountered in WS03, WS04, WS05, WS06 and WS07.	From ground level	0.10 [0.10]	0.10 [0.10]
Stratum 3: MADE GROUND – Gravel parking area in the north of site Encountered in WS01 only. Comprising Yellowish brown to reddish brown sandy limestone and brick gravel.	From ground level	0.30 [Only one location]	0.30 [Only one location]
Stratum 4. MADE GROUND – Gravel subbase below the tarmac areas Encountered in WS03, WS04, WS05, WS06 and WS07. Typically comprising yellowish grey very sandy fine to coarse angular limestone gravel.	0.10 [0.10]	0.54 [0.40-0.70]	0.44 [0.30-0.60]
Stratum 5. MADE GROUND – Historic Made Ground below current school developments Encountered in WS01, WS02, WS03, WS04, WS06, WS07, WS08, WS09 & WS10. Typically comprising dark brown clayey gravelly sands or sandy gravelly clays with ceramic and brick fragments occasionally with glass and clinker present. Rare slag present.	0.41 [0.30-0.70]	0.88 [0.55-1.40]	0.47 [0.10-1.10]
Stratum 6: GLACIAL TILL (GT) Encountered in WS01, WS03, WS04, WS05, WS06, WS07, WS08, WS09 & WS10. Typically comprising greyish brown sandy gravelly CLAY.	0.71 [0.50-1.00]	1.39 [0.80-2.65]	0.68 [0.25-2.00]
Stratum 7. WILMSLOW SANDSTONE FORMATION (WSF) Encountered in all WS locations. Typically comprising reddish brown SAND, occasionally silty.	1.39 [0.80-2.65]	*base not determined. [depth of maximum exploration 3.00]	*base not determined [maximum thickness explored 1.60]

No olfactory observations of hydrocarbons was noted during the investigation however, rare fragments of slag were observed in WS09 during drilling. Clinker was observed in made ground encountered in WS02, WS08, WS09 and WS10.

2.6.2. Groundwater

During the investigation, groundwater strikes were recorded at depths of between 0.4m bgl and 2.8m bgl. During subsequent monitoring, standing groundwater was encountered at depths of between 0.46m bgl and 1.95m bgl in 2 out of 3 monitoring standpipes and was considered to represent perched water within the Glacial Till deposits.

2.6.3. Gas

A ground gas risk assessment was undertaken by RLL as part of the 2025 ground investigation works based on a lines of evidence approach, taking into account potential sources of soil gas (predominantly made ground), total organic carbon (TOC), and spot monitoring on 4 No. occasions.

The calculated GSV from the gas monitoring results indicated a CS-1 classification. However, given that elevated CO_2 concentrations (>5%) were recorded throughout the monitoring period, a CS-2 classification was considered appropriate and in agreement with TOC concentrations recorded within the made ground, which was considered to be the source of the CO_2.

2.6.4. Contamination – Risk to Human Health from Soils

A risk assessment was carried out based on the source-pathway-receptor contaminant linkage. Chemical test results were compared against a residential end use without plant uptake scenario considered appropriate for the proposed development, using Category 4 Screening Levels (C4SL) as assessment criteria where available. For those contaminants where C4SL's are not published, Generic Assessment Criteria (GAC) for the relevant contaminants of concern included in this report have been derived in accordance with this CLEA guidance and spreadsheet Version 1.071.

Exceedances were identified in 4 No. of the samples tested; the following table provides a summary of the exceedances recorded:

Location	Sample Ref	Depth (m)	Strata	Contaminants Exceeding GAC
WS01	ES1	0.15 – 0.20	Stratum 3 (MG)	Dibenz(a,h)anthracene
	ES2	0.40 – 0.50	Stratum 5 (MG)	Lead, Benzo[b]fluoranthene, Benzo[a]pyrene, Dibenz(a,h)anthracene
WS02	ES1	0.15 – 0.20	Stratum 1 (Topsoil)	Benzo[a]anthracene, Chrysene, Benzo[b]fluoranthene, Benzo[a]pyrene, Dibenz(a,h)Anthracene

Location	Sample Ref	Depth (m)	Strata	Contaminants Exceeding GAC
WS09	ES1	0.15 – 0.20	Stratum 1 (Topsoil)	Benzo[b]fluoranthene, Benzo[a]pyrene, Dibenz(a,h)Anthracene

No asbestos was identified in 6 No. samples analysed.

The above exceedances were recorded within the locality of the proposed MUGA's and the SRP building. RLL considered that the proposed MUGA's hardstanding construction and the building floor slab would block the pathway to end users from all the identified strata containing chemical concentrations above preliminary assessment criteria (PAC). Depending on levels and construction thicknesses, the affected materials may require removal from site which would also break the pollutant linkage.

No mitigation measures were therefore proposed other than the assessment of any imported material for use in landscaped areas.

2.6.5. Contamination – Risk to Controlled Waters

The risk to controlled waters did not identify a significant potential risk to the critical receptor (Principal Aquifer). No remedial works are considered necessary with regard to controlled waters.

2.6.6. Risk to Structures

In accordance with the recommendations given within BRE SD1 and based on the pH and sulphate testing, a Design Sulphate (DS) class of DS-1 and Aggressive Chemical Environment for Concrete (ACEC) class of AC-1 was recommended.

3.0 Conceptual Model

The CSM below has been developed based on the commonly adopted source-pathway-receptor model as recommended within the Land Contamination Risk Management (LCRM) guidance from the Environment Agency[1].

The following potential contaminant linkages have been identified:

3.1. Potential Contaminant Linkages

3.1.1. Sources

The Site was previously occupied by agricultural fields with some development of the school from 1894 onwards. A variety of land uses have occurred in the environs of the site, however this has predominantly been limited to the development of the school.

Soil analysis as part of this ground investigation has identified elevated levels of Lead and PAH compounds based on a residential end use without plant uptake end use scenario.

No positive identification of asbestos has been detected in 6 No. samples analysed.

No olfactory evidence of hydrocarbons was noted within any of the made ground encountered.

No contaminant concentrations were detected above DWS screening values within groundwater tested beneath the site.

Potential contaminant sources are summarised in the table below:

Summary of Potential On Site Sources of Contamination		
Source	**Site Area**	**Key Contaminants**
Stratum 1 (Topsoil)	North and South MUGA areas	Benzo[a]anthracene, Chrysene, Benzo[b]fluoranthene, Benzo[a]pyrene, Dibenz(a,h)anthracene
Stratum 3 (MG)	North MUGA area	Dibenz(a,h)anthracene Carbon dioxide (Ground Gas)

[1] https://www.gov.uk/government/publications/land-contamination-risk-management-lcrm

Summary of Potential On Site Sources of Contamination		
Source	**Site Area**	**Key Contaminants**
Stratum 5 (MG)	North of site	Lead, Benzo[b]fluoranthene, Benzo[a]pyrene, Dibenz(a,h)anthracene Carbon dioxide (Ground Gas)

3.1.2. Pathways and Receptors

Human Health

There is potential for exposure of site end-users to contaminants in soils via the following pathways, based on a residential end-use without plant uptake (Environment Agency, SR3) considered appropriate to the proposed end use:

- Direct soil and dust ingestion via landscaped areas;
- Dermal contact with soil directly and indoor dust from any landscaped areas;
- Inhalation of dust.
- Inhalation of gasses.
- Ingestion of contaminated water via plastic pipes.

Contamination in soils and ground gas may also present a risk to construction workers. As such, appropriate risk assessments and safety measures (PPE / hygiene rules) will need to be implemented in order to provide adequate protection.

Structures

Ground gas mitigation measures will be required based on a Characteristic Situation 2 (CS-2). The proposed building has been classed as a 'Type B' building in accordance with BS8485:2015+A1:2019 based on the proposed development drawings.

In accordance with BS8485:2015+A1:2019, a classification of CS-2 and a building type of B, a point score of 3.5 would be required. The following mitigation measures are therefore considered to be appropriate:

- A minimum 2000-gauge gas resistant membrane continuous throughout the building footprint with joints and service penetrations taped and sealed, installed and verified in accordance with CIRIA C735. (2 points).
- A ventilated sub-floor void. (1.5 points).

4.0 Site Preparation

4.1. Grubbing out of Existing MUGA

Further testing of tarmacadam areas is recommended to determine whether the asphalt contains coal tars, and the contractor shall be responsible for undertaking such works.

Tarmacadam should be stockpiled separately and should not be mixed with other materials.

Stockpiled asphalt materials containing coal tars could potentially be re-used on Site without an EA environmental permit providing the material meets the requirements for re-use within the Specification for Highways Series 800 or 900 (depending on the re-use method). Further details are presented in the EA Regulatory Position Statement. The material would have to be re-bound to make it suitable for re-use.

Alternatively, the asphalt containing coal tars could be disposed of at a suitably licensed disposal facility and will likely be classified as hazardous waste for disposal. The material may however be accepted at a waste recycling facility for re-use in bound cold lay sub-surface layers within construction projects. This should be confirmed with appropriate waste recycling facilities.

4.2. General

The Contractor shall provide appropriate fencing, signage and maintain security at all times.

The Contractor shall be responsible for maintenance of service records, identification of services on Site, and maintenance of safe working areas.

The Contractor shall be responsible for the preparation of method statements and risk assessments for carrying out Site clearance and earthworks. The method statements shall address measures required to control emissions to land, air and water. Particular attention should be paid to the minimisation of noise and dust emissions given the inner-city location of the Site.

All manholes on Site shall be located by the contractor and the position and depth of all manholes and redundant drains recorded prior to removal. Any in-situ liquids shall be pumped out prior to removal of the drain and removed from the Site. All removal from Site shall be by a registered waste carrier and

be carried out in accordance with the Duty of Care Regulations 1991. Any drain runs shall be inspected by the Engineer. Should contamination be identified, the Engineer shall follow the procedure outlined within the 'Contingency Arrangements for Removal of Unidentified Contaminated Soil' as outlined below in Section 7.0.

All existing monitoring wells should be appropriately decommissioned prior to development.

Any upfilling / backfilling works required to achieve design levels are to be undertaken in accordance with an approved specification based upon the 'Specification for Highway Works' (Ref 1). Additional geotechnical testing may be required as part of these works. It should be ensured that no highly organic or putrescible materials are utilised within the earthworks operation, as these materials have the potential to create a new source of ground gas if placed at depth beneath proposed development areas.

5.0 Proposed Remediation Works

5.1. Remediation Options Appraisal & Sustainability

The following remediation options are considered to be suitable for the site in order to break the identified pollutant linkages:

- Construction of hardstanding
- Construction of a clean capping layer overlying made ground within limited areas of proposed landscaping (to include a minimum 100mm of topsoil).
- Excavation of impacted arisings and off-site removal to a licensed waste facility.

In accordance with LCRM guidance, a sustainable approach should be considered when selecting remediation options. The industry-led Sustainable Remediation Forum UK (SuRF-UK) has defined a range of Sustainable Management Practices (SMPs) that can be implemented at any stage of a land contamination management project to improve its environmental, social and/or economic performance. SMP's should be adopted during the remediation process and onward development works where possible to reduce cost, the use of natural resources and/or the negative impact on the community or the environment.

From a sustainability perspective, the retention and reuse of asphalt and made ground within the proposed development is considered the most sustainable remedial option for this material. However, the site is constrained by existing levels as shown by RLL Drawings 22639-RLL-24-XX-DR-C-2200 Rev P04 and 22639-RLL-25-XX-DR-C-2310 Rev P03 presented in **Appendix B**.

Off-site disposal of made ground arisings are likely to be required to accommodate construction thicknesses and drainage for both the SRP building and proposed MUGAs.

Contamination has been identified within samples of site-won topsoil analysed previously by RLL, and as such it is expected that there will be a requirement to import suitable clean topsoil to form a clean cover layer within landscaped areas. Site won natural subsoils are likely to be suitable for re-use as clean cover beneath topsoil subject to confirmatory testing.

5.2. Assessment Criteria for Formation of Capping Layers

Table 1 lists the criteria based on risk to human health for a residential end-use without plant uptake and shall be used to determine the suitability for the use of materials to form capping layers.

The criteria shall be used for both imported soils and for site won soils intended for re-use.

The above criteria can be used to assess individual samples in isolation or can be compared against the 95th percentile value where a range of samples have been taken (e.g. from a stockpile of excavated material).

In the interests of sustainability, soils shall be retained on Site wherever possible/geotechnically suitable.

Any soils which are visibly contaminated, or odorous, that may meet the respective criteria (e.g. for Total Petroleum Hydrocarbons), may be considered undesirable for re-use, despite not presenting an unacceptable risk. In such circumstances, the Environmental Engineer shall be consulted for advice on whether the material is suitable for re-use, or whether off-site disposal is required.

5.3. Capping Layers within Landscaped Areas

The proposed strategy for mitigating risk to end users from contaminants in the made ground is to place a minimum of 600mm of clean cover over made ground materials within landscaping, hence breaking the contaminant linkage. The clean cover layer should include a minimum of 100mm of topsoil at the surface.

Localised deepening of clean cover thickness may be required for proposed trees.

The soils used to form the clean cover and the depth of clean cover should be validated according to Section 6.0 below.

It is likely that all topsoil for use as capping will need to be imported. Site-won natural subsoil is likely to be suitable for re-use as clean cover beneath topsoil subject to confirmatory testing. Alternatively it may be required to import suitable clean subsoil.

5.4. Water Mains

Test results should be made available to the relevant water supply company to confirm suitable water pipes for the Site. ASL recommended the use of barrier piping appropriate to 'Brownfield' sites.

5.5. Buried Concrete

A Design Sulphate Class "DS-1" and an Aggressive Chemical Environment for Concrete (ACEC) site classification"AC-1" has been recommended when considering the specification of concrete to be used to resist sulphate attack.

5.6. Risks to Construction Workers

To mitigate short term risk to construction workers, it has been recommended that all development personnel wear the appropriate personal protective equipment and to adopt appropriate health and safety protocols where works with impacted soil are required. As a precautionary measure, these mitigation measures should include dust suppression techniques in the event of dry and windy conditions.

5.7. Gas Mitigation

A plan showing the proposed layout of the SRP Building is presented in RLL Drawing 22639-RLL-24-XX-DR-C-2200 Rev P04.

The following gas protection measures are required in order to meet the required points score (3.5) detailed in BS8485:2015+A1:2019 for a Type A structure:

- Clear void dispersal layer (Beam and Block Floor Slab) – minimum 150mm depth of void – 1.5-2 points.
- Gas resistant membrane meeting the criteria in Table 7 of BS8485 installed and verified in accordance with CIRIA C735 – 2 points.

A minimum 150mm sub-floor void shall be incorporated beneath the beam and block floor with a BS8485:2015+A1:2019 compliant polyethylene membrane continuous through the cavity walls installed above the beam and block floor. The membrane shall be fully taped and all service penetrations shall be sealed in accordance with the manufacturers recommendations using product specific self-adhesive membrane and top-hats. Telescopic vents shall provide a ventilation pathway from the outer brick course to the sub floor void. These

shall be installed at a minimum frequency as recommended in BS8485:2015+A1:2019.

Contractors and maintenance workers should undertake appropriate method statements and risk assessments relating to risk from ground gas. It is recommended that entry into excavations is prohibited due to the potential for depleted oxygen conditions.

5.8. Hydrocarbon Vapour

Should any unexpected visual or olfactory evidence of made ground, including hydrocarbon contamination be identified during construction, site strip or excavation of foundations, an Engineer should be contacted to supervise appropriate removal of the material in accordance with the methodology set out in Section 7.0. No hydrocarbon resistant membranes are considered to be required at this stage.

6.0 Verification of Capping Layers

6.1. Validation Methodology

The following method should be adopted for placement and validation of clean cover:

6.1.1. Placement and Testing of Clean Cover Materials

Prior to placement of clean cover, the chemical composition of the material will need to be assessed in order to confirm its suitability for use at the Site. Testing should be carried out by a suitably qualified Environmental Engineer.

Results shall meet the relevant human health Site acceptance criteria targets as presented in Table 1.

Additionally material should:

- Provide a suitable growing medium.
- Be free of unsuitable or deleterious material such as bricks, metal, timber and glass.
- Not odorous.
- Be free of Japanese Knotweed or other invasive plant or rhizomes.
- Show no visual of olfactory evidence of contamination.

6.1.2. Site-won Material Testing Requirements

Natural site-won subsoil is likely to be suitable for use as clean cover beneath topsoil subject to confirmatory testing. It is recommended that any material proposed for reuse is stockpiled and sampled at a minimum frequency of 1 No. sample per 250m^3 (minimum 3 samples). Testing should be undertaken for a suite of contaminants to include standard metals/metalloids, PAH (16 USEPA speciation), Asbestos, pH and soil organic matter (SOM) (or calculated from TOC).

Sampling will be in general accordance with BS 10175:2011+A2 2017. Handling, transport and storage of samples should conform to BS EN ISO 22475-1:2006, Clause 11.

The samples will be placed in the containers supplied by the laboratory appropriate to the tests to be undertaken. Trowels or other tools used to take samples will be cleaned between recovering samples.

Samples will be labelled appropriately and placed in cool boxes with ice packs and dispatched to the laboratory at the end of each day.

All samples will be dispatched to a UKAS and MCERTS accredited laboratory for appropriate analysis. Chain of custody papers shall be completed and retained. Results shall meet the relevant human health Site acceptance criteria targets as presented in Table 1.

Site won made ground and topsoil is considered unsuitable for reuse as clean cover.

6.1.3. Imported Material Testing Requirements

Wherever possible, chemical test certifications for proposed imported material should be obtained and supplied to the Engineer for assessment against the criteria in Table 1 prior importation. Details of the source site history should be obtained and provided to the Engineer. Any imported material should be provided with delivery tickets which should state the source site and volume of material imported, and copies of the tickets provided to the Engineer.

If inadequate of insufficient test certificates are available, further testing prior to importation/placement will be required. This is to avoid re-excavating unsuitable material and the possibility of cross-contamination. In exceptional circumstances material can be tested either within stockpiles once transported to Site or worst-case scenario post-placement, although this is not recommended.

Imported materials shall be tested at frequencies given in Table 2 of Manchester City Council Planning and Contaminated Land Technical Guidance (MCC CLTG) document (February 2021). Materials shall be tested as given in the table below in order to assess suitability:

Type of Material	Number of Samples (MCC CLTG Table 2)	Testing Schedule	Assessment Criteria
Virgin Quarried Materia	Minimum 3No. 1No. per 200m^3	Standard metals/metalloids (shall include as a minimum As, Cd, Cr, CrVI, Cu, Hg, Ni, Pb, Se, Zn)	Table 1, 3 Free of asbestos

Type of Material	Number of Samples (MCC CLTG Table 2)	Testing Schedule	Assessment Criteria
Crushed Hardcore, Stone, Brick	Minimum 3No. 1No. per 150m^3	Standard metals/metalloids (As above) PAH (16 USEPA speciation), Total TPH, Asbestos. Any additional analysis dependant on the history of the donor site.	
Greenfield/ Manufactured Soils	Minimum 3No. 1No. per 200m^3	Standard metals/metalloids (As above) PAH (16 USEPA speciation), Asbestos, pH and soil organic matter (SOM) (or calculated from TOC).	
Brownfield/ Screened Soils	Minimum 3No. 1No. per 150m^3	Standard metals/metalloids (As above) PAH (16 USEPA speciation) TPH (CWG banded), Asbestos, soil organic matter (SOM) (or calculated from TOC). Any additional analysis dependant on the history of the donor site.	

Sampling will be in general accordance with BS 10175:2011+A2 2017. Handling, transport and storage of samples should conform to BS EN ISO 22475-1:2006, Clause 11.

The samples will be placed in the containers supplied by the laboratory appropriate to the tests to be undertaken. Trowels or other tools used to take samples will be cleaned between recovering samples.

Samples will be labelled appropriately and placed in cool boxes with ice packs and dispatched to the laboratory at the end of each day.

All samples will be dispatched to a UKAS and MCERTS accredited laboratory for appropriate analysis. Chain of custody papers shall be completed and retained. Results shall meet the relevant human health Site acceptance criteria targets as presented in Table 1.

Topsoil should also meet the requirements of BS 3882:2015 – Specification for topsoil.

6.2. Validation of Cover Layer Depth

In accordance with YALPAG guidance, verification of depth shall be undertaken by:

- Depth testing in situ – small trial pit excavated to allow measurement of its depth by tape measure or measuring staff, or
- Topographical surveys – accurate survey of the base and final formation layer height to establish the depth of cover.

Frequency of verification of depth shall be 1 location per 100m^2 (minimum of 3 locations).

If inspection/survey prior to placement is preferred, photos of the reduced level should be taken with surveying staff to demonstrate the reduced level has been met.

If validation post placement is preferred, validation pits should be undertaken by an Engineer to confirm the correct depth and composition of material is present. Photographic records should be obtained to verify the required capping thickness for inclusion within the validation report.

The frequency or number of pits required may require agreement with the Local Authority.

Where demarcation, physical no-dig and capillary break layers are required they should be verified for their thickness and presence during the time of their installation. Details of the demarcation layer should be agreed with the Contaminated Land Officer prior to placement. This will include the design, type and strength of the geotextile separator or visual warning membrane.

7.0 Verification of Gas Membranes

Verification of the installation of the gas membranes shall be undertaken in general accordance with CIRIA Report C735, Table A3 (Situation B – low rise housing with ventilated voids):

Gas Regime	Installer Experience	Suggested levels of verification
CS-2	General builder/ groundworker (no relevant qualification) or Qualified and experienced installer (minimum one operative to hold qualification)	Verifier (consultant or qualified and experienced installer) to conduct thorough verification (visual) inspection of membrane. Consideration given to need for/scope of integrity testing if concerns identified by visual inspections.

The following process shall be adopted for verification of gas membranes:

- Contractor to provide verifier with details of qualifications and method statements in relation to the installation of gas membranes (where applicable).
- Contractor to install membrane in accordance with their method statement.
- Client/contractor to notify verifier of inspection date. Inspection to be undertaken prior to pouring concrete.
- Verifier to attend site to inspect membrane, take photographic evidence and issue written confirmation that the membrane was installed in accordance with the manufacturer's instruction.
- Validation Report to be submitted to the Local Authority documenting the works undertaken.

8.0 Contingency Arrangements for Dealing with Unexpected Contamination

In the event that undiscovered or unexpected contamination be encountered by the Contractor during construction works, a 'Hotspot Protocol' shall be implemented which shall comprise:

- The appointed Environmental Engineer shall be informed immediately.
- The Contaminated Land Officer/Environmental Health Officer at the Local Authority and the EA (if necessary) shall also be informed.
- Inspection of the suspected areas of contaminated soils shall be undertaken by the Engineer, with all suspected contaminated soils excavated and stockpiled separately on visqueen sheeting with appropriate bunding and suitably identified.
- Representative samples of affected soils shall be tested for the suspected contaminants of concern. Any potentially contaminated arisings proposed for re-use on Site will be re-tested at a minimum frequency of 1 test per ~100m^3 to confirm the soils meet the remedial targets (minimum of 3 samples). Any stockpiled arisings destined for off-site disposal will be sampled at a minimum rate of 1 sample per 1,000m^3 or a minimum of 3 samples (whichever is greater) to enable classification for disposal. Testing should be undertaken for a suite of contaminants to include heavy metals, PAH's, TPH's and asbestos.
- Results shall be assessed by the Engineer and advice provide on the suitability for re-use, or the requirement for treatment and/or off-site disposal.

Sampling will be in general accordance with BS 10175:2011+A2 2017. Handling, transport and storage of samples should conform to BS EN ISO 22475-1:2006, Clause 11.

The samples will be placed in the containers supplied by the laboratory appropriate to the tests to be undertaken. Trowels or other tools used to take samples will be cleaned between recovering samples.

Samples will be labelled appropriately and placed in cool boxes with ice packs and dispatched to the laboratory at the end of each day.

All samples will be dispatched to a UKAS and MCERTS accredited laboratory for analysis. The same laboratory shall be used for all validation testing and preferably be consistent with that used in the investigation phase. Chain of custody papers shall be completed and retained.

Results shall be compared against the assessment criteria provided in Table 1. Should samples fail to meet the relevant criteria within the upper 300mm, soils will be deemed unsuitable for re-use on Site without further assessment or remediation. Any unsuitable material may require disposal from the Site.

In the unlikely event that additional specialist remediation works will be required (e.g. removal of free product or bulk asbestos if encountered), in the first instance, the Environmental Engineer should be contacted for advice. Excavation works should be halted in the short term and the advice of a specialist remediation contractor may be required so that appropriate remediation techniques can be utilised.

Should soils require disposal from the Site, the soils chemical results shall be used to classify the material as non-hazardous or hazardous waste. Waste Acceptance Criteria (WAC) testing may be required before the waste is disposed of. Material sent to landfill must be hauled by a registered waste carrier in accordance with the Duty of Care Regulations 1991. The Contractor shall be responsible for keeping all records including waste transfer notes.

Validation testing of the sides and base of the resultant excavation shall be carried out by the Engineer. The minimum number of samples for each excavation will be five i.e. one from each side (if sides have been formed) and one from the base. As a minimum, one sample shall be taken for every 10m along the side per contaminated horizon and one sample per 100m^2 base area. The contaminated soils will be deemed to have been successfully removed once the validation samples meet the relevant criteria.

The extent and location of any contaminated soils removed shall be surveyed and recorded by the Contractor.

9.0 Regulatory requirements

9.1. Licensing and Permitting

It is the Contractors responsibility to ensure all permits and licenses are obtained prior to and for the duration of the works, and may include:

- Environment permit for waste treatment/importation of materials.
- Waste exemptions.
- Mobile plant licenses.
- HSE notification.
- Site waste management plan.
- CL:AIRE Materials Management Plan (MMP).

9.2. Waste Management

The contractor shall comply with appropriate waste management regulations, to include retention of all waste transfer documentation for a minimum of 6 years.

All demolition materials intended for re-use on site shall be crushed to 125mm down (typical 6F2 spec) and shall be free of unsuitable materials e.g. steel, timber, textile, plastics and asbestos. Any unsuitable or deleterious material shall be removed from site.

Any hazardous wastes generated on site intended for landfill must undergo pre-treatment to reduce the volume or hazardous nature of the waste. Treatment may include sorting or other physical, chemical or biological processes.

Materials intended for re-use, or those imported from other sites should be covered by a CLAIRE Definition of Waste Code of Practice Version 2 Material Management Plan (MMP).

9.3. 3rd Party Liability

The contractor shall adopt best practice and take all reasonable measures to prevent pollution or nuisance to local properties, watercourses and drainage systems.

10.0 Verification Reporting and timeframes

The remediation works described should be supervised by a suitably qualified Engineer in accordance with the requirements of this strategy.

Following the completion of remediation works, a validation report will be produced to document the works. This will include, but not be limited to, the following:

- Detail the verification testing for topsoil and subsoil placed in landscaped areas;
- Detail depth checks of clean cover placed within landscaped areas overlying made ground;
- Detail transfer tickets for any exported/ imported soils to/from Site;
- Detail survey plans and test results;
- Detail of licensing and / or certification;
- Document the specification of water mains used.
- Confirmation that the remediation objectives have been met.
- Details of gas membrane installation and verification.
- Photographic records.

Any remedial works undertaken by the Contractor shall be documented within a verification report and submitted to the Client's Engineer for approval and inclusion within the validation report.

The validation report will be provided to the relevant regulatory authorities, who will be requested to provide confirmation as to the suitability of the works against the agreed objectives.

Approval to this Remediation Strategy should be sought from the regulatory bodies.

11.0 References

The following documents shall be referred to in conjunction with this Specification.

1) HIGHWAYS AGENCY, Manual of Contract Documents for Highway Works, VOLUME 1: Specification for Highway Works. HMSO 1998. (Referred to as SHW within this Specification).

2) BS 10175: 2011+A2:2017 Investigation of potentially contaminated sites – Codes of Practice.

3) British Standard 1377:1990, Part 1-9, 'Methods of Test for Soils for Civil Engineering Purposes'.

4) British Standards Institution: BS 5930:2015+A1 2020 'Code of practice for ground investigations.' BSI 2015.

5) British Standards Institution: BS 8485:2015+A1:2019 'Code of practice for the design of protective measures for methane and carbon dioxide.' BSI 2015.

6) BRE Cover Systems for Land Regeneration 2004.

7) CIRIA C665 Assessing risks posed by hazardous ground gases to buildings, 2007.

8) BRE Report 414 – Protective Measures for Housing on Gas Contaminated Land (Johnson, 2001).

9) BS 8485:2015+A1:2019 Code of Practice for the Characterization and Remediation from Ground Gas in Affected Developments.

10) CL:AIRE / (2011), The Definition of Waste: Development Industry Code of Practice Version 2.

11) Nathanial et. al., (2009), The LQM/CIEH Generic Assessment Criteria for Human Health Risk Assessment (2nd edition), Land Quality Press, Nottingham.

12) Planting trees on contaminated soils: issues and guidance. Land Contamination & Reclamation, 8 (2), 2000.

Table 1: Generic Assessment Criteria Residential End use without Homegrown Produce for clean cover materials

Category	Contaminant	Criteria mg/kg			Source
Metals*	Arsenic	40			a
	Boron	11000			b
	Cadmium	149			a
	Chromium VI	6			b
	Chromium III	910			b
	Lead	310			a
	Elemental Mercury	1.2			b
	Inorganic Mercury	56			b
	Methyl Mercury	15			b
	Nickel	180			b
	Selenium	430			b
	Beryllium	1.7			b
	Copper	7100			b
	Vanadium	1200			b
	Zinc	40000			b
Inorganics	Asbestos	Free from fibres and any other ACM material			c
Soil Organic Matter Content (SOM) dependent		**SOM 1%**	**SOM 2.5%**	**SOM 6%**	
Cyanides	Free Cyanide				
	Total Cyanide				
Phenols	Phenol	750	1300	2300	b
Chlorophenols	Chlorophenols (except pentachlorophenol)	94	150	210	b
	Pentachlorophenol	27 (16.4)vap	29	31	b
Petroleum Hydrocarbons	Aliphatic EC 5-6	42	78	160	b
	Aliphatic EC>6-8	100	230	530	b
	Aliphatic EC>8-10	27	65	150	b
	Aliphatic EC>10-12	130 (48)vap	330 (118)vap	770 (283)vap	b
	Aliphatic EC>12-16	1100 (24)sol	2400 (59)sol	4400 (142)sol	b
	Aliphatic EC>16-35	65000 (8.48)sol	92000 (21)sol	110000	b
	Aliphatic EC>35-44	65000 (8.48)sol	92000 (21) sol	110000	b
	Aromatic EC 5-7 (Benzene)	370	690	1400	b
	Aromatic EC>7-8 (Toluene)	860	1800	3900	b
	Aromatic EC>8-10	47	110	270	b
	Aromatic EC>10-12	250	590	1200	b
	Aromatic EC>12-16	1800	2300 (419)sol	2500	b
	Aromatic EC>16-21	1900	1900	1900	b
	Aromatic EC>21-35	1900	1900	1900	b
	Aromatic EC>35-44	1900	1900	1900	b
	Aliphatic + Aromatic EC>44-70	1900	1900	1900	b
	Acenaphthene	3000 (57.0)sol	4700 (141)sol	6000 (336)sol	b

Category	Contaminant	Criteria mg/kg			Source
Polycyclic Aromatic Hydrocarbons	Acenaphthylene	2900 (86.1)sol	4600 (212)sol	6000 (506)sol	b
	Anthracene	31000 (1.17)vap	35000	37000	b
	Benz(a)anthracene	11	14	15	b
	Benzo(a)pyrene	3.2	3.2	3.2	b
	Benzo(b)fluoranthene	3.9	4.0	4.0	b
	Benzo(ghi)perylene	360	360	360	b
Polycyclic Aromatic Hydrocarbons	Benzo(k)fluoranthene	110	110	110	b
	Chrysene	30	31	32	b
	Dibenzo(a,h) anthracene	0.31	0.32	0.32	b
	Fluoranthene	1500	1600	1600	b
	Fluorene	2800 (30.9)sol	3800 (76.5)sol	4500 (183)sol	b
	Indeno(1,2,3cd)pyrene	45	46	46	b
	Naphthalene	2.3	5.6	13	b
	Phenanthrene	1300 (36.0)sol	1500	1500	b
	Pyrene	3700	3800	3800	b
Chloroalkanes & alkenes	1,2-Dichloroethane	0.0092	0.013	0.023	b
	1,1,1-trichloroethane	9.0	18	40	b
	1,1,2,2 Tetrachloroethanes (PCA)	3.9	8.0	17	b
	1,1,1,2 Tetrachloroethanes (PCA)	1.5	3.5	8.2	b
	Tetrachloroethene (PCE)	0.18	0.40	0.92	b
	Tetrachloromethane (Carbon Tetrachloride)	0.026	0.056	0.13	b
	Trichloroethene (TCE)	0.017	0.036	0.080	b
	Trichloromethane (chloroform)	1.2	2.1	4.2	b
	Vinyl Chloride (chloroethene)	0.00077	0.0010	0.0015	b
Explosives	2,4,6 Trinitrotoluene	65	66	66	b
	RDX	13000	13000	13000	b
	HMX	6700	6700	6700	b
Pesticides	Aldrin	7.3	7.4	7.5	b
	Dieldrin	7.0	7.3	7.4	b
	Atrazine	610	620	620	b
	Dichlorvos	6.4	6.5	6.6	b
	Endosulfan	160 (0.003)vap	280 (0.007)vap	410 (0.016)vap	b
	Hexachlorocyclohexanes (including Lindane)	6.9	9.2	11	b
Chlorobenzenes	Chlorobenzene	0.46	1.0	2.4	b
	1,2 Dichlorobenzenes	24	57	130	b
	1,3 Dichlorobenzenes	0.44	1.1	2.5	b
	1,4 Dichlorobenzenes	61	150	350	b
	1,2,3 Trichlorobenzenes	1.5	3.7	8.8	b
	1,2,4 Trichlorobenzenes	2.6	6.4	15	b
	1,3,5 Trichlorobenzenes	0.33	0.81	1.9	b
	1,2,3,4 Tetrachlorobenzenes	24	56	120	b
	1,2,3,5 Tetrachlorobenzenes	0.75	1.9	4.3	b

Category	Contaminant	Criteria mg/kg			Source
	1,2,4,5 Tetrachlorobenzenes	0.73	1.7	3.5	b
	Pentachlorobenzene	19	30	38	b
	Hexachlorobenzene	4.1 (0.20)vap	5.7 (0.50)vap	6.7 (1.2)vap	b
BTEX	o-xylene	88	210	480	b
	m-xylene	82	190	450	b
	p-xylene	79	180	430	b
	Toluene	880vap (869)	1900	3900	b
	Ethylbenzene	83	190	440	b
	Benzene	0.38	0.70	1.4	b
Other	Carbon Disulphide	0.14	0.29	0.62	b
	Hexachlorobutadiene	0.32	0.78	1.8	b

Source of Criteria

a Category 4 Screening Level (C4SL)

b LQM/CIEH Suitable 4 Use Level (S4UL)

c RL criteria

Notes

- Organic matter content does not affect assessment criteria for metals
- Arsenic S4UL is based on a comparison of oral and dermal soil exposure with oral Index Dose.
- Cadmium C4SL is based on lifetime exposure
- Beryllium S4UL is based on comparison of inhalation exposure with inhalation TDI
- Chromium VI S4UL are based on localised effects comparing inhalation exposure with inhalation ID only
- Values for total xylene should be compared with the most protective S4UL for xylene
- Methyl mercury is not a routine contaminant but a S4UL has been generated for sites where this may be present due to past industrial use. Unless methyl and elemental mercury is suspected to be present, a total mercury concentration can be compared with the GAC for inorganic mercury.
- ^{vap} S4UL presented exceeds the vapour saturation limit, which is presented in brackets.
- ^{sol} S4UL presented exceeds the solubility limit, which is presented in brackets.
- All assessment criteria assume no free phase contamination is present.

Appendix A: Construction Drawings

A0

JOINS ABOVE

Fire & Emergency Vehicle Tracking

MUGA forms part of emergency access strategy.

North MUGA

Carriageway tie-in - refer to RLL drawing - 22639-RLL-25-XX-DR-C-2330

Attenuation stone sub-base to provide surface water attenuation
Plan Area of 1420m^2
Type 3 Sub-base (30% voids ratio)
Min 350mm Depth
Formation Level - 31.160mAOD

Existing below ground attenuation tank

Unlikely that the existing tank will be suitable for vehicle loading. Vehicles in permanent and temporary case should be prevented from accessing the area.

South MUGA

Attenuation stone sub-base to provide surface water attenuation
Plan Area of 1,561m^2
Type 3 Sub-base (30% voids ratio)
Min 400mm Depth
Formation Level - 31.185mAOD

JOINS BELOW

GENERAL NOTES

1. DO NOT SCALE.
2. This drawing is to be read in conjunction with all other relevant drawings and details.
3. Should there be any conflict between the details indicated on this drawing and those on other drawings the Engineer should be informed PRIOR to construction on site.
4. Until technical approval has been obtained from the relevant Authority, it should be understood that all drawings issued are Preliminary and NOT for construction. Should the Contractor commence site works prior to such approval being provided it is entirely at their own risk.
5. Initial proposals are for illustrative purposes only and as such are subject to detailed site investigation including ground conditions, contaminants, drainage, design and planning / density negotiations.
6. All dimensions are in metres unless otherwise stated.
7. This drawing cover hard paved construction only, refer to Landscape Architects details for extents and specifications for landscaping and planting.
8. Site layout shown based on CoARC Site Plan drawing ref WHGS-COA-XX-00-D-A-0120 Rev P05, dated 30/06/25.
9. Topographical survey shown based on Cryfield Survey Ltd drawing ref 1157-13, dated Oct 2022.

KEY:

- Proposed External Level
- Proposed External Gradient
- Assumed Top of Kerb Level
- Existing External Levels from Topographical Survey
- Proposed Private Surface Water - Channel Drain
- Existing Below Ground Attenuation Tank - to remain
- Carriageway tie-in, refer to RLL drawing - 22639-RLL-25-XX-DR-C-2330

KERBING KEY:

- PCC Transitional dropper Kerb - HB2 to BN3 - 125mm to 0-6mm upstand
- PCC BN3 Kerb - 150(d)x125mm - 6mm upstand
- PCC Flat Top Edging Kerb - 150(d)x50mm - installed flush
- Existing HB2 Kerb - to remain

PAVING CONSTRUCTION SPECIFICATION:

North MUGA (Occasional Fire Tender Loading)

Surface course	25mm thick 6mm porous asphalt (Tarmac ULTIPLAY or equivalent) - Colour as specified by Architect
Binder course	60mm thick porous asphalt AC20 open bin 100/150 - to be laid in accordance with MHCW clause 803 & BS EN 13285
Base course	75mm thick porous asphalt AC32 open bin 100/150 - to be laid in accordance with MHCW clause 803 & BS EN 13285
Sub-base	minimum 350mm 4 < 20mm Open Graded Crushed Aggregate to BS.EN.12620 - to be laid in accordance with MHCW clause 803 & BS EN 13285
Geo-membrane	Min 2000 guage impermeable membrane wrapped around tanked system. Membrane to be fully welded / taped at all joints, min 300mm overlap.

South MUGA (Pedestrian Loading Only)

Surface course	25mm thick 6mm porous asphalt (Tarmac ULTIPLAY or equivalent) - Colour as specified by Architect
Base course	60mm thick porous asphalt AC20 open bin 100/150 - to be laid in accordance with MHCW clause 803 & BS EN 13285
Sub-base	minimum 400mm 4 < 20mm Open Graded Crushed Aggregate to BS.EN.12620 - to be laid in accordance with MHCW clause 803 & BS EN 13285
Geo-membrane	Min 2000 guage impermeable membrane wrapped around tanked system. Membrane to be fully welded / taped at all joints, min 300mm overlap.

Asphalt Footway (Pedestrian & Occasional Maintenance Access Loading Only)

Surface course	30mm thick AC 6 Dense surf 160/220 rec. to BS EN 13108-1
Binder course	80mm thick AC 32 dense bin 100/150 rec. to BS EN 13108
Sub-base	200mm Type 1 material compacted in accordance with Specification for Highway Works. Assuming 3% CBR or greater is achieved on sub grade.

Asphalt Footway (Occasional Fire Tender Loading)

Surface course	40mm thick AC10 close surf 100/150 rec. to BS EN 13108
Binder course	60mm thick AC 20 dense bin 100/150 rec. to BS EN 13108
Base course	100mm thick AC 32 dense bin 100/150 rec. to PD 6691 Annex B
Sub-base	150mm Type 1 material compacted in accordance with Specification for Highway Works. Assuming 3% CBR or greater is achieved on sub grade.

Health & Safety Information Key

- Used to provide design specific safety information that may not be obvious to a competent contractor but may be useful.
- Used to restrict/prevent a possible action, e.g. stop construction traffic from entering an area
- Used to warn of significant design hazards, adding recommendations
- Used to encourage a positive action, e.g. use of robust protection for inspection chambers

Rev.	Date	Amendments	By	Chk
P03	24.10.25	Permavoid removed	EG	PJC
P02	13.05.25	Updated to revised site layout - CoARC drawing no. 0120 Rev P02, drop kerbs at new gateways, revised footway buildup, revised sub-base thickness for Northern MUGA pitch	EG	PJC
P01	23.04.25	FIRST ISSUE	EG	PJC

RLRE Consulting Engineers

Client
UNITED LEARNING

Project
SRP, WILLIAM HULME'S GRAMMAR SCHOOL MANCHESTER

Drawing Title
NORTH & SOUTH MUGA - EXTERNAL LEVELS & HARDWORKS PLAN

Status
INFORMATION

Scale	Drawn	Checked	Date
1:200 @ A0	EG	PJC	23.04.25

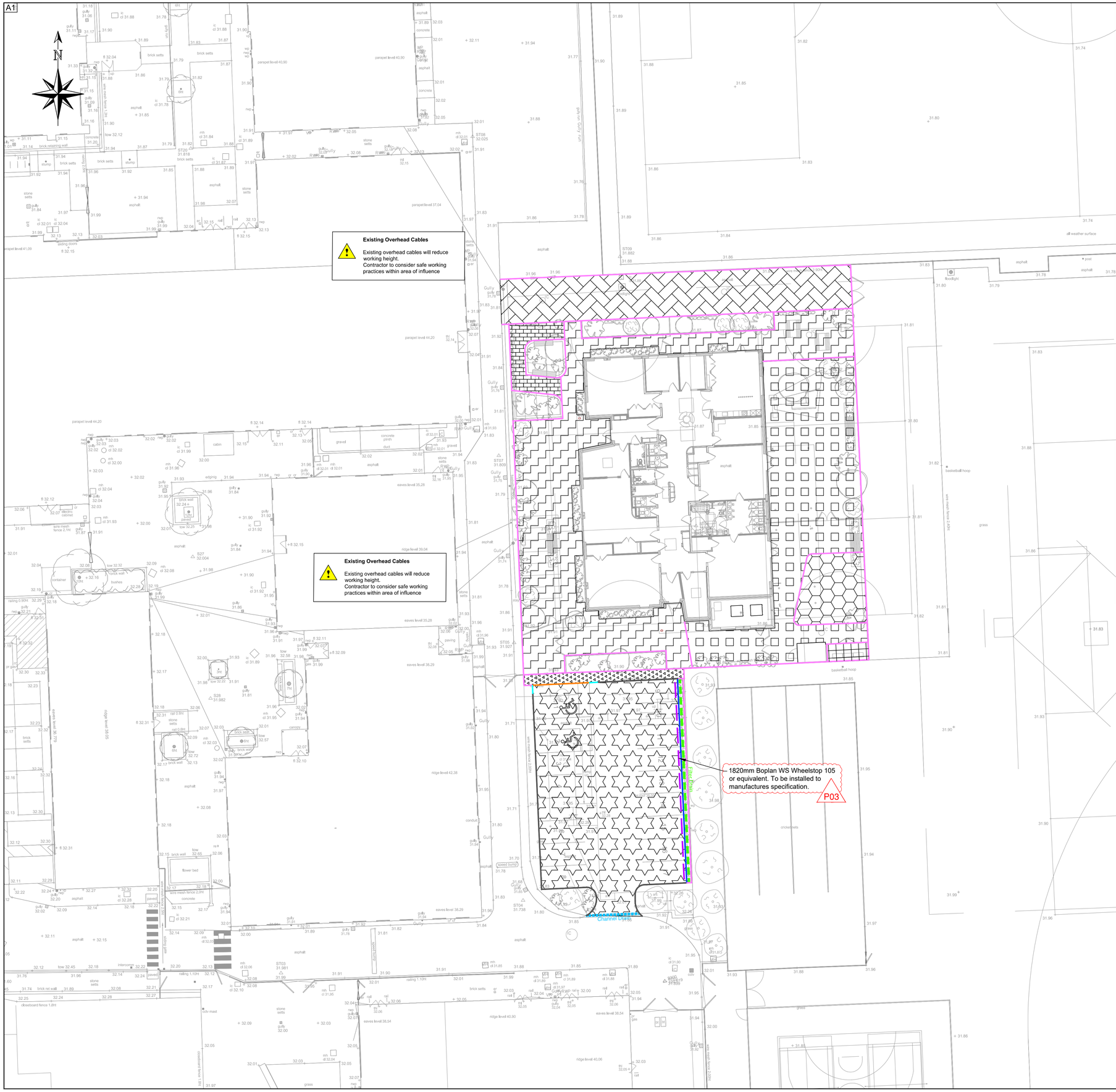
Drawing Number: 22639-RLL-25-XX-DR-C-2310
Revision: P03

BIM Drawing Reference

Scale Bar
1:200 0 4 8 12 16 20

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A1



GENERAL NOTES

1. DO NOT SCALE.
2. This drawing is to be read in conjunction with all other relevant drawings and details.
3. Should there be any conflict between the details indicated on this drawing and those on other drawings the Engineer should be informed PRIOR to construction on site.
4. Until technical approval has been obtained from the relevant Authority, it should be understood that all drawings issued are Preliminary and NOT for construction. Should the Contractor commence site works prior to such approval being provided it is entirely at their own risk.
5. Initial proposals are for illustrative purposes only and as such are subject to detailed site investigation including ground conditions, contaminants, drainage, design and planning / density negotiations.
6. All dimensions are in metres unless otherwise stated.
7. Site layout shown based on CoARC Site Plan drawing ref WHGS-COA-XX-00-D-A-0120 Rev P05, dated 30/06/25.
8. Topographical survey shown based on Cryfield Survey Ltd drawing ref 1157-13, dated Oct 2022.

KEY:

- Proposed Private Surface Water - Channel Drain
- Proposed Private Lined Filter Drain

KERBING KEY:

- PCC HB2 Kerb - 255(d) x 125mm - 125mm upstand
- PCC BN3 Kerb -150(d) x 125mm - 6mm upstand
- PCC Flat Top Edging Kerb - 150(d) x 50mm - Installed flush
- PCC Transition kerb - HB2 to BN - 125mm to 0-6mm upstand
- PCC Square Channel kerb - 150(d) x 125mm - Laid flush, smooth face up
- 1820mm Boplan WS Wheelstop 105 or equivalent. To be installed to manufactures specification.

P03

PAVING CONSTRUCTION SPECIFICATION:

Car Parking (Vehicular Loading up to 7.5 Tonnes)

Surface course	30mm thick AC 10 Close surf 100/150 rec. to PD 6691 Annex B
Binder course	60mm thick AC 20 dense bin 100/150 rec. to PD 6691 Annex B
Base course	75mm thick AC 32 dense bin 100/150 rec. to PD 6691 Annex B
Sub-base	200mm Type 1 material compacted in accordance with Specification for Highway Works. Assuming 3% CBR or greater is achieved on sub grade.

Asphalt Footway (Pedestrian Loading Only)

Surface course	30mm thick AC 6 Dense surf 160/220 rec. to BS EN 13108-1
Binder course	80mm thick AC 32 dense bin 100/150 rec. to BS EN 13108
Sub-base	200mm Type 1 material compacted in accordance with Specification for Highway Works. Assuming 3% CBR or greater is achieved on sub grade.

Permeable Slab Paved ASHP Compound

Surface course	50mm thick flag paviours to Landscape Architects specification
Laying course	25mm - 2-6.3 mm Clean aggregate to BS:12620
Geotextile	Permeable Terram T1000 Geotextile
Sub-base	Minimum 375mm of 4 < 20mm Open Graded Crushed Aggregate to BS.EN.12620. Assuming 3% CBR or greater is achieved on sub grade.
Geotextile	Min 2000 Gauge Impermeable membrane wrapped around tanked system. Membrane to be fully welded / taped at all joints, min 300mm overlap.

PAVING CONSTRUCTION SPECIFICATION:

Permeable Asphalt Footway (Occasional Fire Tender Loading & Maintenance Access Loading)

Surface course	40mm thick porous asphalt AC10 open surf 100/150 to BS EN 13108
Binder course	60mm thick porous asphalt AC20 open bin 100/150 - to be laid in accordance with MHCW clause 803 & BS EN 13285
Base course	100mm thick porous asphalt AC 32 open bin 100/150 to PD 6691 Annex B
Geotextile	Permeable Terram T1000 Geotextile
Sub-base	Minimum 300mm of 4 < 20mm Open Graded Crushed Aggregate to BS.EN.12620. Assuming 3% CBR or greater is achieved on sub grade.
Geotextile	Min 2000 Gauge Impermeable membrane wrapped around tanked system. Membrane to be fully welded / taped at all joints, min 300mm overlap.

Permeable Asphalt Footway (Pedestrian Loading Only)

Surface course	30mm thick 6mm porous asphalt - Colour as specified by Landscape Architect.
Binder course	60mm thick porous asphalt AC20 open bin 100/150 - to be laid in accordance with MHCW clause 803 & BS EN 13285
Geotextile	Permeable Terram T1000 Geotextile
Sub-base	Minimum 300mm of 4 < 20mm Open Graded Crushed Aggregate to BS.EN.12620. Assuming 3% CBR or greater is achieved on sub grade.
Geotextile	Min 2000 Gauge Impermeable membrane wrapped around tanked system. Membrane to be fully welded / taped at all joints, min 300mm overlap.

Wet Pour Play Surface (Pedestrian Loading Only)

Surface course	Wet Pour Surfacing specified by others - Colour as specified by Landscape Architect.
Base course	60mm thick porous asphalt AC20 open bin 100/150
Geotextile	Permeable Terram T1000 Geotextile
Sub-base	Minimum 300mm of 4 < 20mm Open Graded Crushed Aggregate to BS.EN.12620. Assuming 3% CBR or greater is achieved on sub grade.
Geotextile	Min 2000 Gauge Impermeable membrane wrapped around tanked system. Membrane to be fully welded / taped at all joints, min 300mm overlap.

Permeable Block Paved Footways (Pedestrian Loading Only)

Surface course	80mm thick concrete paviours to Landscape Architects specification
Laying course	25mm - 2-6.3 mm Clean aggregate to BS:12620
Geotextile	Permeable Terram T1000 Geotextile
Sub-base	Minimum 300mm of 4 < 20mm Open Graded Crushed Aggregate to BS.EN.12620. Assuming 3% CBR or greater is achieved on sub grade.
Geotextile	Min 2000 Gauge Impermeable membrane wrapped around tanked system. Membrane to be fully welded / taped at all joints, min 300mm overlap.

Resin Bound Gravel Play Surface (Pedestrian Loading Only)

Surface course	Resin Bound Gravel or similar to be specified by Landscape Architect
Binder course	60mm thick porous asphalt AC20 open bin 100/150 - to be laid in accordance with MHCW clause 803 & BS EN 13285
Geotextile	Permeable Terram T1000 Geotextile
Sub-base	Minimum 300mm of 4 < 20mm Open Graded Crushed Aggregate to BS.EN.12620. Assuming 3% CBR or greater is achieved on sub grade.
Geotextile	Min 2000 Gauge Impermeable membrane wrapped around tanked system. Membrane to be fully welded / taped at all joints, min 300mm overlap.

Health and safety symbols refer to reference numbers indicated on Designers Risk Assessment number: 22639-RLL-25-XX-HS-C-0001

Health & Safety Information Key

- Used to provide design specific safety information that may not be obvious to a competent contractor but may be useful
- Used to restrict/prevent a possible action, e.g. stop construction traffic from entering an area
- Used to warn of significant design hazards, adding recommendations
- Used to encourage a positive action, e.g. use of robust protection for inspection chambers

DETAILS OF SURFACE PAVING IS TO BE CONFIRMED BY LANDSCAPE ARCHITECT ONCE APPOINTED AS SUCH, SHOWN DETAILS ARE SUBJECT TO CHANGE

Rev	Date	Amendments	By	Chk
P03	18.08.25	Updated wheelstop specification	EG	PJC
P02	09.07.25	Updated to latest CoARC site layout - 0120 Rev P05, paving updated around new raised planters, revised ASHP compound & filter drain behind car parking, wheel stops added	EG	PJC
P01	06.06.25	FIRST ISSUE	EG	PJC

RLRE Consulting Engineers

Client

UNITED LEARNING

Project

SRP, WILLIAM HULME'S GRAMMAR SCHOOL MANCHESTER

Drawing Title

SRP BUILDING EXTERNAL HARDWORKS PLAN

Status

INFORMATION

Scale	Drawn	Checked	Date
1:200 @ A1	EG	PJC	06.06.25

Drawing Number: 22639-RLL-25-XX-DR-C-2220

Revision: P03

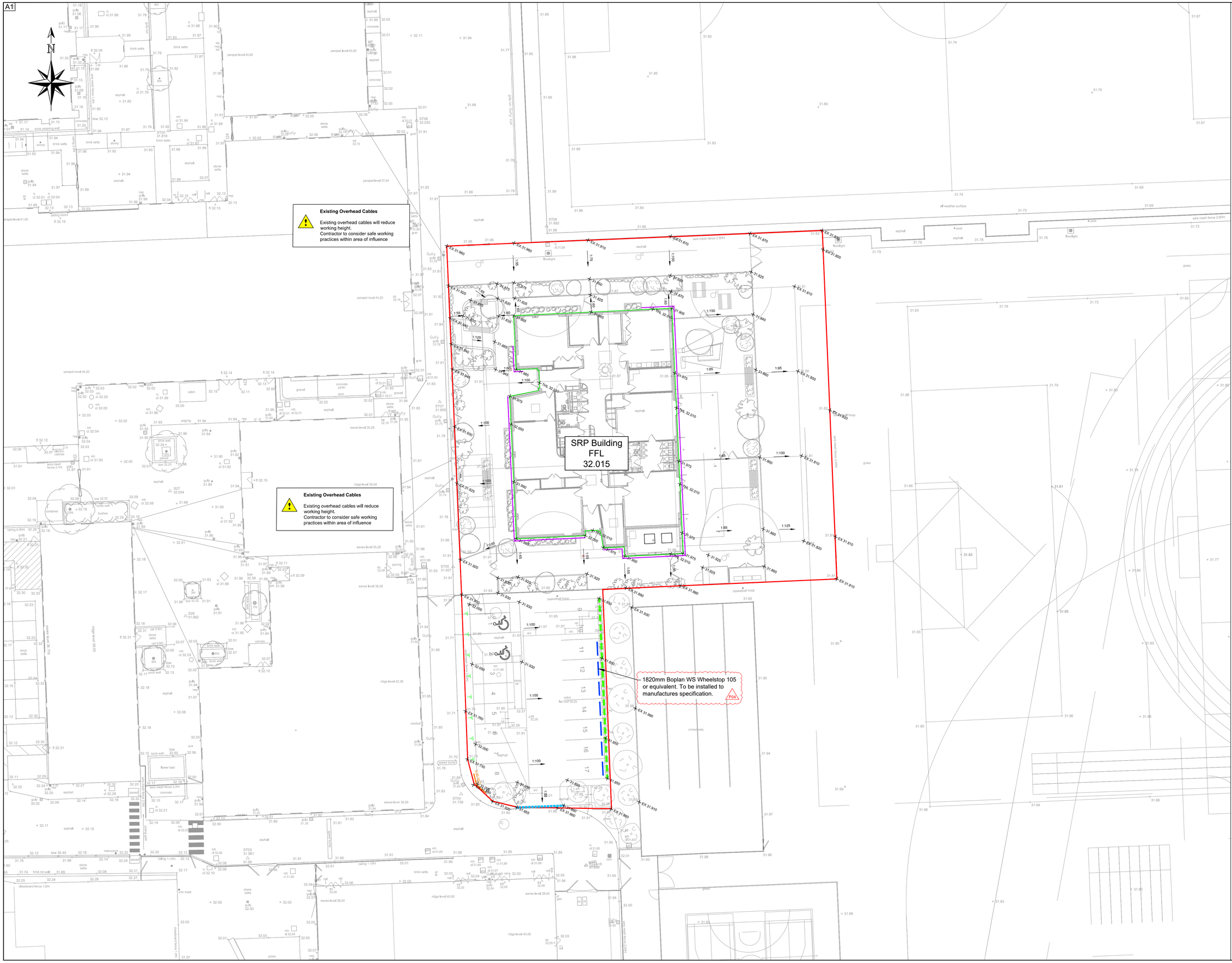
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A1



GENERAL NOTES

1. DO NOT SCALE.
2. This drawing is to be read in conjunction with all other relevant drawings and details.
3. Should there be any conflict between the details indicated on this drawing and those on other drawings the Engineer should be informed PRIOR to construction on site.
4. Until technical approval has been obtained from the relevant Authority, it should be understood that all drawings issued are Preliminary and NOT for construction. Should the Contractor commence site works prior to such approval being provided it is entirely at their own risk.
5. Initial proposals are for illustrative purposes only and as such are subject to detailed site investigation including ground conditions, contaminants, drainage, design and planning / density negotiations.
6. All dimensions are in metres unless otherwise stated.
7. Site layout shown based on CoARC Site Plan drawing ref WHGS-COA-XX-00-D-A-0120 Rev P05, dated 30/06/25.
8. Topographical survey shown based on Cryfield Survey Ltd drawing ref 1157-13, dated Oct 2022.

KEY:

- SRP Development Site Boundary
- SRP Building
- +THL XX.XXX — Proposed Threshold Levels - 5mm less than FFL
- +XX.XXX — Proposed External Levels
- 1:XX — Proposed External Gradient
- +EX.XX.XXX — Existing External Levels from Topographical Survey
- Tadpole indicating batter of max 1:3 gradient
- X.XX RET — Proposed Retaining Wall
- Proposed Lined Filter Drain
- Proposed Channel Drain
- 1820mm Boplan WS Wheelstop 105 or equivalent. To be installed to manufactures specification. P04
- High Ground Level DPC Detail - Refer to CoARC drawing ref WHGS-COA-SK017 Rev P01

Health and safety symbols refer to reference numbers indicated on Designers Risk Assessment number: 22639-RLL-25-XX-HS-C-0001

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Rev	Date	Amendments	By	Chk
P04	18.08.25	Wheel stop specification added	EG	PJC
P03	09.07.25	Updated to latest CoARC site layout - 0120 Rev P05, levels updated around external planters & play ground, Wheel stops added	EG	PJC
P02	06.06.25	Revised external ground levels around SRP building	EG	PJC
P01	02.04.25	FIRST ISSUE	EG	PJC

RLRE Consulting Engineers

Client

UNITED LEARNING

Project

SRP, WILLIAM HULME'S GRAMMAR SCHOOL MANCHESTER

Drawing Title

SRP BUILDING
LEVEL STRATEGY

Status

INFORMATION

Scale	Drawn	Checked	Date
1:200 @ A1	EG	PJC	02.04.25

Drawing Number: 22639-RLL-24-XX-DR-C-2200 — Revision: P04

BIM Drawing Reference

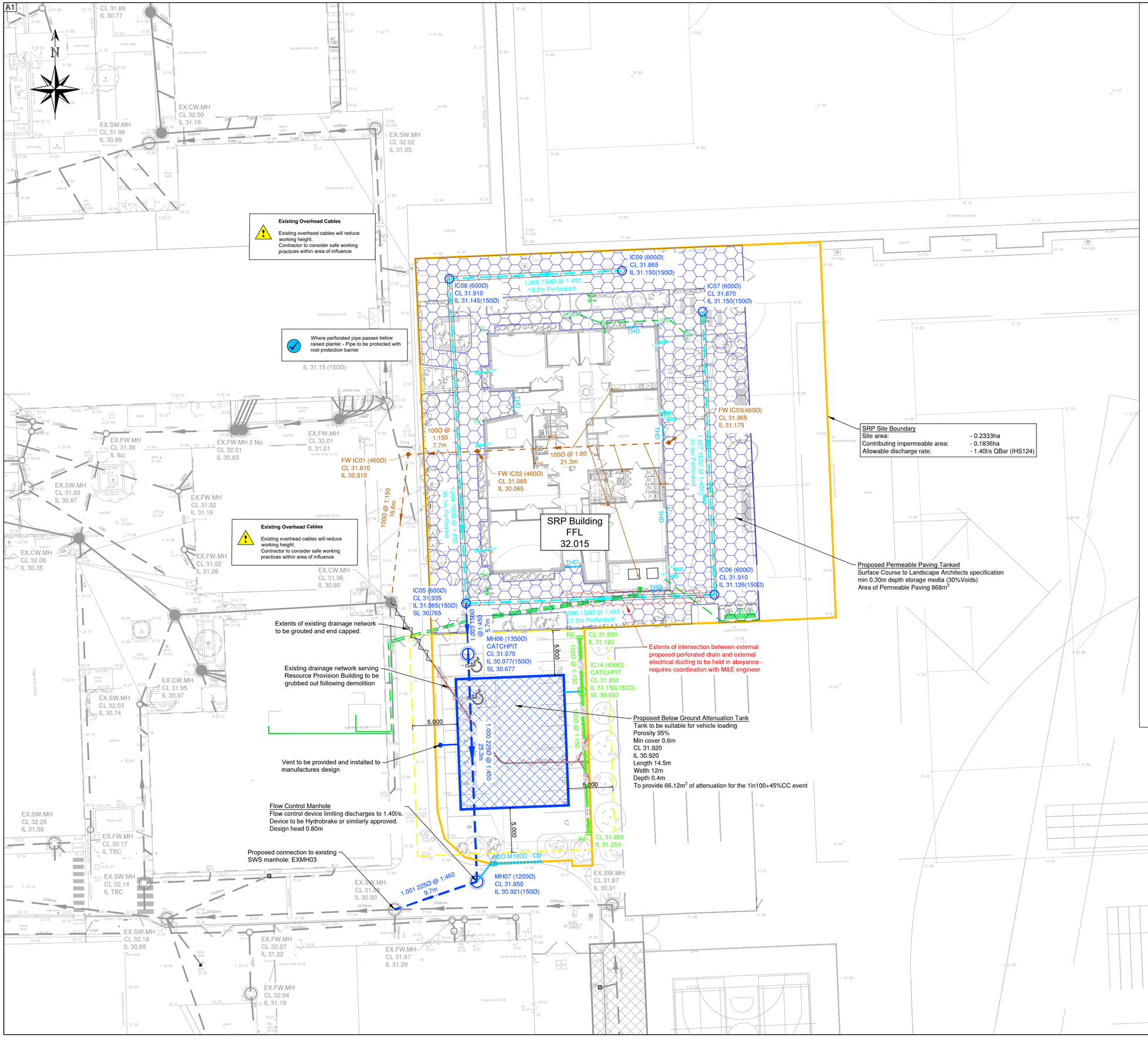
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A1



GENERAL NOTES

1. DO NOT SCALE.
2. This drawing is to be read in conjunction with all other relevant drawings and details.
3. Should there be any conflict between the details indicated on this drawing and those on other drawings the Engineer should be informed PRIOR to construction on site.
4. Until technical approval has been obtained from the relevant Authority, it should be understood that all drawings issued are Preliminary and NOT for construction. Should the Contractor commence site works prior to such approval being provided it is entirely at their own risk.
5. Sketch proposals are for illustrative purposes only and as such are subject to detailed site investigation including ground conditions, contaminants, drainage, design and planning / density negotiations.
6. All dimensions are in metres unless otherwise stated.
7. The Rodgers Leask Designer's Risk Assessment(s) for this project must be reviewed PRIOR to the commencement of any works on site.
8. Site layout shown based on CoARC Site Plan drawing ref WHGS-COA-XX-00-D-A-0120 Rev P05, dated 30/06/25.
9. Topographical survey shown based on Cryfield Survey Ltd drawing ref 1157-13, dated October 2022.

KEY:

- SRP Building & Parking Drainage Area
- Proposed Surface Water Drainage
- THD — Proposed Threshold Drain to architects detail
- Channel Drain — Proposed Channel Drain [17]
- RWP — Rain Water Pipe to discharge to a Bottle Gully and Permavoid Rainwater Diffuser Unit
- Proposed Perforated Pipe wrapped in geotextile
- Proposed Lined Filter Drain
- Proposed Foul Water Drainage
- G — Internal foul water gully - trapped and roddable
- Existing Surface Water Drainage
- Existing Foul Water Drainage
- Existing Combined Public UU Sewer
- Existing Drainage Infrastructure to be Grubbed Out
- Existing Drainage Infrastructure to be Abandoned, Grouted and End Capped
- Proposed Permeable Paving with min 300mm deep subbase with 30% voids ratio. Tanked
- 5m offset from attenuation tank to act as a maintenance easement
- Proposed Below Ground Attenuation Tank
- Existing Below Ground Attenuation Tank
- External Electrical Services - Refer to RWA drawing ref W2252-RWA-00-XX-DR-E-9001 Rev T1 for details

SPECIFICATION NOTES

1. The following types of pipe may be used unless noted or agreed otherwise;
   - Pipes up to 600mm diameter to be Structured Walled to BS EN 13476, Polypropylene to BS EN 1852 or PVC-U to BS EN 1401.
   - Pipes over 600mm diameter to be Concrete to BS 5911.
2. Both Clay and Concrete pipes shall be strength class 120 (100/150mm min crushing strength 28kN/m). Thermoplastic pipes shall have a minimum ring stiffness of SN4.
3. Pipes which run adjacent to buildings shall be installed in strict accordance with Part H, Clauses 2.23 to 2.25, Diagrams 7 and 8 are of particular relevance and shall be complied with.
4. All pipes, chambers and fittings shall be installed, bedded and backfilled in accordance with the manufacturer's instructions subject to the following minimum requirements;

Pipe Location	Cover to Crown*	Clay / Concrete Pipe Bedding	Plastic Pipe Bedding	Backfill
Roadways / Car Parking	> 0.9m < 0.9m	Class S Class 'Z' (Concrete)	Class S (S1 or S2) Class 'Z' (Concrete)	Type 1 Granular
Hard & Soft Landscaping	> 0.6m < 0.6m	Class S Class 'Z' (Concrete)	Class S (S1 or S2) Class 'Z' (Concrete)	Suitable as dug material

*The above depths are based on a private drainage network. Adoptable drainage should be installed in accordance with the requirements of the relevant statutory sewerage undertaker.

5. All pipes beneath structures to have concrete bed and surround. Where cover is less than 300mm the concrete is to be cast integrally with the floor slab.
6. The first flexible joint in pipes adjoining a manhole shall be a maximum length of 600mm from the inside face of the manhole, connecting to a rocker pipe. The length of the rocker pipe shall be as follows;

Pipe Diameter	Length of Rocker Pipe
Ø150 - Ø600mm	600mm
Ø675 - Ø750mm	1,000mm
over Ø750mm	1,250mm

7. Pipes Penetrating Walls:
   An opening is to be formed through walls to give pipes at least 50mm clearance all round. Brickwork over shall be supported by a lintel. Opening to be masked each side with rigid sheet material.Pipes embedded in walls shall have joints formed within 150mm of either wall face. Adjacent rocker pipes of max 600mm length with flexible joints shall continue the pipework.
8. All manholes and inspection chambers situated in areas subject to vehicular loading to have class D400 covers and frames to BS EN124.. Those not subject to vehicular loading to have class B125 covers and frames.
9. Drainage frames must be tied to manhole risers by use of manufacturer's ties (eg. Polypipe ref FRK500 fixing kit and FRK501 black ties.) The ground works contractor will be held fully responsible for any accidents due to incorrect fitting or failure to use the correct manufacturer's fixing equipment.
10. All drains in the vicinity of existing or proposed trees to be constructed in accordance with the requirements of NHBC Practice Note 3.
11. All drainage MH covers and frames to be orientated so that they are square and perpendicular to the block paving patterns where applicable. MH cover locations also to avoid building door opening locations where possible.
12. All surface water connections to be Ø150mm and foul connections to be Ø100mm unless noted otherwise.
13. All foul laterals to be min 1:80 gradient; surface water laterals to be min 1:100.
14. Foul pipes are to be wrapped in a suitable impermeable geotextile where they pass over surface water pipes in order to prevent any cross contamination.
15. All pipelines shall be tested both before and after backfilling, using either air test or water test, in accordance with BS EN 1610.
16. Where reinstatement of existing tarmac surfaces is required this should be completed to Specification for the Reinstatement of Openings in Highways Fourth edition
17. All channel drains to use propriety end caps, sump outfall units and grating hold down bolts.

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Health and safety symbols refer to reference numbers indicated on Designers Risk Assessment number: 22639-RLL-25-XX-HS-C-0001

Rev	Date	Amendments	By	Chk
P04	28.11.25	5m maintenance easement shown around attenuation tank	PJC	FL
P03	18.08.25	Updated to include gully in plant room, channel drain specification added	EG	PJC
P02	09.07.25	Updated to latest CoARC site layout - 0120 Rev P05, new raised planters added, Canopy RWP added, M&E external electrical services shown	EG	PJC
P01	06.06.25	FIRST ISSUE	EG	PJC

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Client
UNITED LEARNING

Project
SRP, WILLIAM HULME'S GRAMMAR SCHOOL MANCHESTER

Drawing Title
SRP BUILDING DRAINAGE STATEGY

Status
INFORMATION

Scale	Drawn	Checked	Date
1:200 @ A1	EG	PJC	06.06.25

Drawing Number: 22639-RLL-25-XX-DR-C-2210 Revision: P04

BIM Drawing Reference

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