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ACORN HOUSE,
314 - 320 GRAY'S INN ROAD,
LONDON
WC1X 8DP

Remedial Action Plan

Client
MyCo Limited

Report No. 5657 RAP

20th March 2023

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314 - 320 GRAY'S INN ROAD,
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Remedial Action Plan

Synopsis

Following a combined Phase 1 Desk Study and intrusive investigtaion[1] undertaken by Soiltechnics; a remedial action plan has been commissioned for the mixed use development at Acorn House in Kings Cross on the instructions of MyCo Ltd.

The following strategy is based on the findings of the previous report. Appropriate recommendations with regard contamination and health and safety and completion of the development are included in this report.

1
Background information

The area under investigation comprises Acorn House a predominantly six storey with some two storey, building some 330m from Kings Cross Station. A basement car park to the building is provided

The site is located within a mixed use environment, or hospitality and residential.

Figure 1 at Appendix A illustrates the general layout of the site and its immediate environs as they stood at the time of the investigation.

1.1
Development proposals

It is proposed to construct a nine storey predominantly residential block with some office space at ground and lower ground floor (from retention of exiting basement) general layout of the lower ground floor and a smaller map of the whole development is shown on Figure 2 of Appendix A.

2
Environmental recommendations

The following summarizes the conclusions of the environmental assessment provided in the published reports.

2.1
Solid phase

Contaminant testing was undertaken on selected soil samples and the results compared with the limited number of CLEA[2] Soil Guideline Values (SGVs) that have been published to date. Where not available from that source, reference has also been made to the LQM/CIEH Suitable 4 Use Levels (S4ULs)[3] and the C4SL Levels[4] for lead.

Analysis for metals/metalloids revealed all the vast determinands to be below the triggers for residential land use apart from in BH02 at shallow depth which found an excess of lead.

The results for TPH & PAH analysis found very low levels that are below triggers or of little environmental interest.

Analysis for asbestos was carried out on selected samples. None of the samples recorded any fibres.

Soft landscaping is included in the development. Therefore, potential contaminant pathways (direct contact, ingestion and inhalation of contaminated dust) will exist in these areas. It is recommended that a capping layer be provided in soft landscaping areas to facilitate rooting depths and ensure potential contaminant pathways to future site users are severed. Capping layer thickness should be at least 300mm in soft landscaping areas placed onto a marker high visibility (orange or similar) geotextile membrane suitable for contaminated soils. This woven geomembrane is made from extruded polypropylene tapes and is most commonly used in ground contamination applications, providing a separation layer and warning marker in one solution.

2.2

Gas phase

The risk from gas contamination was deemed not to be of sufficient risk to cause harm to human end users of the site from the desk study and no monitoring was undertaken.

2.3

Site personnel

Some determinands were present at detectable concentrations and appropriate health and safety precautions, such as detailed in HS(G)66[5] and elsewhere, must be followed by the construction workforce and others who may come into contact with potentially contaminated soil. These should be agreed with the Health and Safety Executive and are likely to include, but not be restricted to, the following:-

- maintain good standards of personal hygiene.
- wear personal protective clothing that is changed and cleaned frequently to eliminate skin contact.
- prevent ingestion by using washing and changing facilities at all break times.
- not eating, drinking or smoking between break times.
- control the spread of dust and airborne mists to prevent inhalation.

3

Remediation action plan

3.1

Securing the site

Appropriate temporary fencing should be provided where necessary to prevent unauthorized persons entering the site, thus making the site satisfactorily secure.

3.2
Health and safety

It is emphasized that both the main contractor and any appointed sub contractors are under a statutory obligation to undertake thorough risk assessments in order to reasonably protect the Health & Safety of persons they employ.

Full details regarding the proposed working practices connected with the site works should be agreed in advance of the commencement of any works with the local Environmental Health Officer or Health and Safety department.

Reference should also be made to the Health and Safety Executive publication; "Protection of Workers and the General Public during the Development of Contaminated Land".

Any measures proposed in this report are suggested in order to provide a minimum level of Health & Safety provision and should not be regarded as exclusive. The inclusion of such suggested measures within the report does not absolve the main contractor or appointed sub contractor of their statutory obligations, and AP Geotechincs take no responsibility for any reliance made.

3.3
Prevention of pollution

Care should be taken in order to minimise the production of dust generated on the site, especially in dry climatic conditions.

All vehicles leaving the site should be clear of any potential contaminated debris other than that to be specifically removed. Vehicles transporting wastes for disposal should be appropriate for the required means in order to prevent release during transit.

Specific materials removed from site for subsequent disposal should be transported to a suitably approved and licensed facility. The contractor shall maintain a full documentary record in accordance with Duty of Care including copies of all Waste Transfer Notes for verification.

The programme of works and any subsequent modification should be maintained in such a manner as to avoid potential cross-contamination. A watching brief should be maintained and AP Geotechnics contacted in the event that evidence of any additional 'contamination' is encountered. The contractor should allow for any delays resulting from the presence of possible contamination and the necessary measures thereof.

AP Geotechnics should oversee the developments as necessary in order to help maintain an appropriate standard of working practice. It is the responsibility of all personnel on site to report any evidence of possible contamination to the suitably qualified and experienced Site Agent who will contact AP Geotechnics where there is any doubt about this contamination.

3.4
Remediation

Based on the previous investigations, it is considered that remediation of the site is not warranted where construction or hardstanding is present on site as all three aspects of the source-pathway-receptor relationship are not present in the completed development.

However a small area of soft landscaping is to be provided in the south east corner of the site as detailed in Figure 2. BH02 of the intrusive survey is located close to this area and it is recommended that remediation in the form of a 300mm thick "clean" soil cap should be provided. The thickness of the clean cap should be independently verified at 3 locations across the site. This information should be provided within the final validation and completion report to confirm compliance.

Any excavated material to be removed from site shall be disposed of in a suitably licensed landfill site with disposal records kept.

3.5
Water services

It is expected that due to the previous use of the site as detailed within the desk study and the results of the intrusive survey that the use of a "barrier" water pipe will be required. The use of this system has been confirmed by the client and will be provided.

3.6
Validation of imported/ site sourced materials - demolition materials & waste and remaining on-site soils

Imported / site sourced materials can generally be split into two categories imported or site sourced materials and imported soils validation of both types of materials will be required.

It should be noted that should material come from more than one source then the minimum following specified samples per source will be required.

3.6.1
Site sourced / imported demolition materials.

All material should be visually assessed to check for any contamination, including asbestos presence. Any suspected materials should be removed from site. For all material the following amount of validation testing is required as a minimum amount of samples per source should be 4 and samples should be analysed at a rate of 1 sample per 200m^3 of material, but allowing for

the above minimum. Assuming no other contamination is suspected all samples should be analysed for asbestos, CLEA metals, phenols, speciated PAH and TPH.

3.6.2
Imported soils

All imported soils should be certified clean by the supplying facility, with tests certificates supplied.

In addition on site sampling of the soils will be required, this should ideally be done when it has been placed, but as a minimum be undertaken on site. The following amount of validation testing is required. A minimum amount of samples per source should be 4 and samples should be analysed at a rate of 1 samples per 100m^3 of material, or one sample per garden are whichever is smaller, but allowing for the above minimum.

All samples should be analysed for asbestos, CLEA metals, phenols, speciated PAH and TPH.

All topsoil used on the site for landscaped or leisure areas will be subject to and pass the requirements of BS3882 (for topsoil) and BS8601 for subsoil. Tests will also need to be carried out in compliance with CLEA and BS10175:2011+A2:2017.

3.6.3
Sustainable use of soils

The Developers Code of Practice for the Sustainable Use of Soils on Construction Sites states "When stripping, stockpiling or placing soil, do so in the driest condition possible". Soil placement work should stop during adverse weather conditions, describing this as >10mm rain in 24hrs. Over compaction caused by working soils during wet conditions should be avoided.

Section 6.1 provides some advice on the damage and other issues associated with working soil in wet conditions, and relief of compaction measures that can be employed to ensure the soil remains or is made suitable for use as a growing media for grass, shrubs/plants and trees. Demolition and construction wastes are not soil and must not be relied upon as a substitute for soil and placed or mixed within soil cover layers or systems.

4
Discovery strategy and watching brief

During the course of the development it will be the responsibility of the on-site manager to ensure watching briefs are undertaken and documented.

The watching brief will consist of a record of:

observations of contamination made during the course of the development by any member of site staff, contractor or visitor; and

the key stages of the development and occurrences including contamination found during the course of the development, the formation levels of excavations, any reduced level dig/mass excavation, formation of landscaped or garden areas, etc. With supporting photographs.

4.1
Watching brief written statement

Upon completion of the development, a written and signed statement will be prepared by the following parties:

ground works contractor(s) - upon completion of foundations and ground works;

on-site manager - upon completion of groundworks and landscaping work; and

appointed environmental consultant - upon completion of groundworks and landscaping works.

The written statement will clearly state whether or not evidence of contamination was identified during the course of the development along with any remedial action that was taken.

4.2
Staff training

All site staff, contractors and visitors, will be briefed on the potential presence of land, groundwater or airborne contamination before commencing work on the site.

This will include the following information:

relevant health & safety considerations;

the type of land, water or airborne contamination present and potentially present at the site;

any particular areas of the site which are likely to be affected; and
staff responsibilities under the discovery strategy.

The on-site manager will provide written confirmation that site staff were briefed about contaminated land in line with these recommendations.

4.3

Construction workers risk assessments

A detailed health and safety risk assessment will be carried out, in accordance with current guidance, before works commence on-site and appropriate personal protective equipment will be worn by all construction workers.

4.4

Discovery Strategy

If unexpected contamination is found at any time then this will be reported to Environmental Health, Camden Council (CC) within seven days and the development will be halted at that part of the site.

The discovery strategy sets out the actions that will be taken if contamination is encountered during the course of a development. Examples of the types of observations that will be considered are detailed in Table 1 below, following which examples of the general actions that will be taken are set out in Table 2, and examples of any emergency actions are detailed in Table 3.

Table 1 Potentially significant observations (not exhaustive)

Evidence	Description
Visual	• Fuel or oil-like substances mixed in with or smeared on the soil or floating on perched, groundwater or surface waters. • Waste materials (refuse, barrels, industrial wastes, ash, tar, etc.) Buried at specific location across the site. • Marked variation in colour, e.g. red, orange, yellow, green, light or dark blue, etc. may indicate contamination from a variety of contaminants. • Soils including large amounts of ash and clinker where such contamination of soils wasn't expected. • Evidence of suspected asbestos.
Odours	• Fuel, oil and chemical-type odours. • Unusual odours such as sweet or fishy odours.
Well-being	• Lightheadedness and/or nausea when in excavations, at the working face of an excavation, when visual or olfactory evidence of contamination exists, etc. • Burning of nasal passages, throat, lungs or skin. • Blistering or reddening of ski due to contact with soil.

Table 2 General actions to be performed

Person observing contamination	To be reported to	Action to be taken
Site visitor	Must report observations to the site manager.	Stop work and where possible, make area safe and secure area before reporting to site manager.
Contractor	Must report observations to the site manager.	Stop work and where possible, make area safe and secure area before reporting to site manager.
On site manager	Must report observations to their direct manager, the appointed Environmental Consultant, the Planning Authority and Contaminated Land Officer at EBC.	Stop work and, where possible, make area safe and secure area before reporting to others.
Environmental Consultant	Must report observations to the site manager, the planning Authority and Contaminated Land Officer EBC.	Advise that work stops and where possible, make sure the area is made safe before reporting to others.

Table 3 Emergency actions to be performed

Occurrence	Description	Contact
Risk to the public	If at any point residents, the public or other may be at risk as a result of contamination found during the course of investigation, remediation or development works.	• Contact the emergency services if there is a risk to life. • Contaminated Land Officer at CC. • Health & Safety Executive.
Nuisance to residents/the public	If a nuisance has been or is likely to be caused to nearby residents, the public and others - for example, odours, dust, noise, vibration, etc.	• Environmental Health at CC.
Pollution of controlled waters	If any surface, culverted or groundwater has been polluted, e.g. slurry, contaminated soil/water or a chemical spillage entering a river or canal.	• Environmental Agency. • Planning Authority and Contaminated Land Officer at CC.
Pollution of adjoining land	If land outside the boundary of the development site is polluted from site activities, e.g. slurry, contaminated soil/water or a chemical spillage.	• The owner of the land. • Planning Authority and contaminated Land Officer at CC.

In addition to the previously noted, the following should also be noted:

should gross contamination be encountered during groundworks, then the advice of an environmental consultant will be sought;

any soil arising from areas where visual or olfactory evidence of contamination has been observed will be handled as potentially hazardous waste and temporarily stockpiled appropriately;

stockpiled soils may undergo validation testing to determine whether they can be used elsewhere on the site at or close to the ground; and

the Contaminated Land Officer at CC will be contacted to agree any further remedial works that become necessary during the course of the development.

4

Verification report

Following the completion of any remedial action and the development of the site, a post -remediation verification report will be produced and submitted to the planning authority, this report will be produced by a suitably qualified and experienced geoenvironmental engineer.

The report will detail fully any actions undertaken, including any report from the discovery strategy and watching brief. In addition the report will provide independent validation via confirmatory trial holes.

All work and validation works undertaken will be supported by photographic evidence, along with any other documented items such as waste transfer noted, asbestos removal reports, soil invoices etc.

All imported soil will undergo confirmatory analysis in order to satisfy their suitability for use. Laboratory certificated results will be included within the report.

Finally the report will include the aforementioned declaration from the site manager, groundworks contractor and appointed environmental consultant stating that wither no suspected additional contamination was detected, or, that all additional detected contamination has been addressed appropriately.

Adrian Smith
AP GEOTECHNICS LTD.
20th March 2023

References

[1] Report No. STS5053
Ground Investigation Report
Acorn House, 314 - 320 Gray's Inn Road, Kings Cross WC1X 8DP
Soiltechnics., July 2020

[2] The Contaminated Land Exposure Assessment Model
Department for Environment, Food and Rural Affairs
The Environment Agency
R & D Publications SGV 1 *et al*., March 2002

[3] The LQM/CIEH S4ULs for Human Health Risk Assessment
Nathanail, C.P., McCaffrey, C. *et al*
Land Quality Management Ltd., 2015

[4] Category 4 Screening Levels for assessment of land affected by contamination
Department for Environment Food and rural affairs., 2012

[5] Protection of workers and the general public during the development of contaminated land
HS(G)66
Health and Safety Executive, 1991

APPENDIX

A Figures

APPENDIX A

FIGURES

Acorn House,
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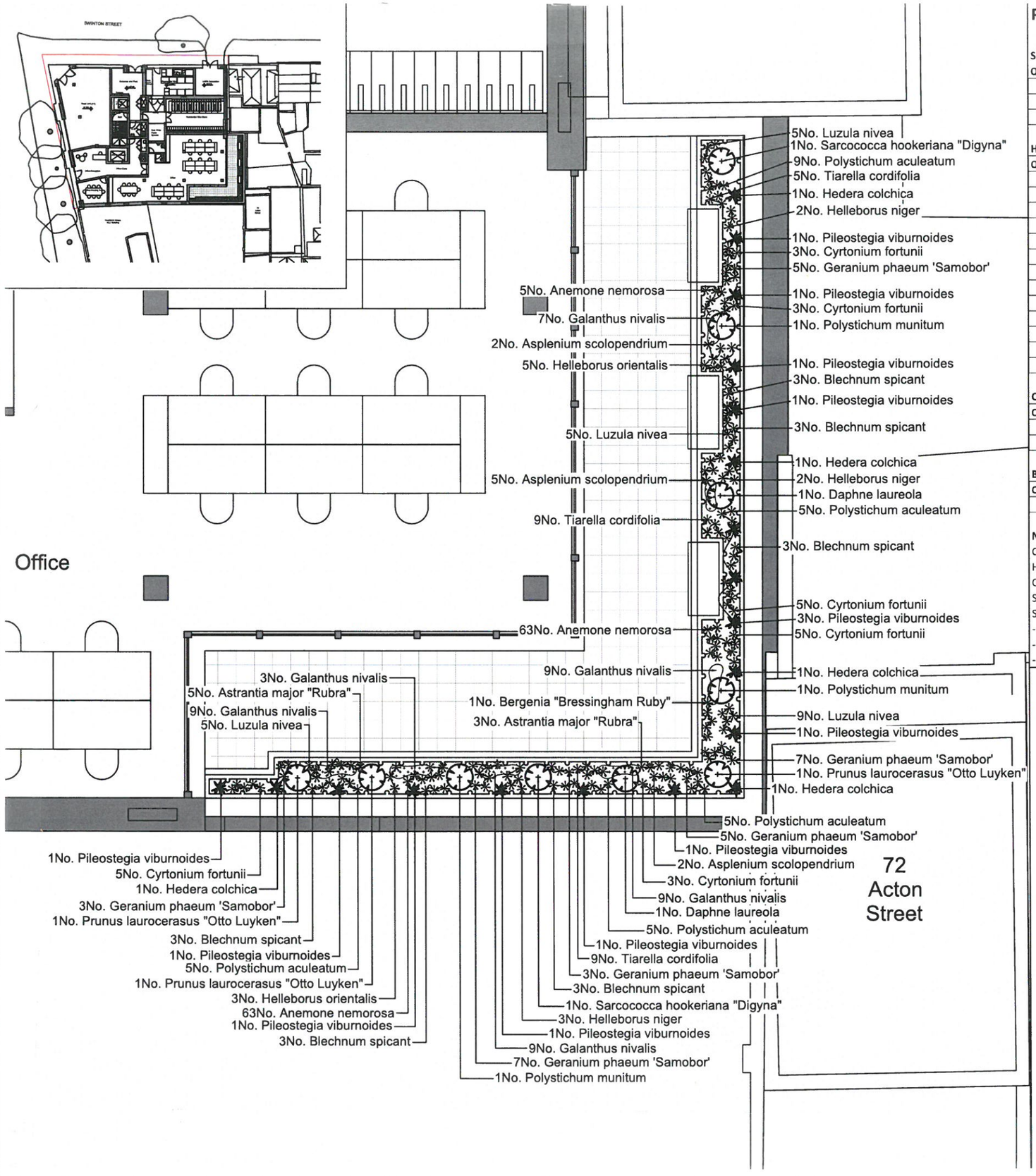
Existing Site Layout

Scale: unknown

Figure 1



Plant Schedule

Shrubs

QTY	UNIT	PLANT NAME	STOCK	SIZE
2	No.	Daphne laureola	C 20L	80-100cm
3	No.	Prunus laurocerasus "Otto Luyken"	C 20L	80-100cm
2	No.	Sarcococca hookeriana "Digyna"	C 20L	80-100cm

Herbaceous plants

QTY	UNIT	PLANT NAME	STOCK	SPACING
131	No.	Anemone nemorosa	C 2L	as per drawing
9	No.	Asplenium scolopendrium	C 2L	as per drawing
8	No.	Astrantia major "Rubra"	C 2L	as per drawing
1	No.	Bergenia "Bressingham Ruby"	C 1L	as per drawing
18	No.	Blechnum spicant	C 3L	as per drawing
24	No.	Cyrtonium fortunii	C 2L	as per drawing
30	No.	Geranium phaeum 'Samobor'	C 2L	as per drawing
7	No.	Helleborus niger	C 2L	as per drawing
8	No.	Helleborus orientalis	C 2L	as per drawing
24	No.	Luzula nivea	C 2L	as per drawing
29	No.	Polystichum aculeatum	C 2L	as per drawing
3	No.	Polystichum munitum	C 10L	as per drawing
23	No.	Tiarella cordifolia	C 2L	as per drawing

Climbers

QTY	UNIT	PLANT NAME	STOCK	HEIGHT
5	No.	Hedera colchica	C 5L	200-250cm
14	No.	Pileostegia viburnoides	C 5L	100-125cm

Bulbs/WildFlowers

QTY	UNIT	PLANT NAME	GRADE	SPACING
46	No.	Galanthus nivalis	5-6cm	as per drawing

Notes and Abbreviations

C = Container (or pot) grown, followed by size of the container (or pot).
HABIT = Juvenile habit or plant shape as supplied by the nursery.
QTY = Quantity
SIZE = Height or Spread of juvenile plant.
STOCK = Root condition/protection method eg Bare root.
- Refer to specification for further information.
- All plants to be completely hardened off
- Substitutions to be agreed with Landscape Architect.

Acorn House,
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Proposed Ground Floor Layout

Scale: as shown

North

LEGEND

- Planting bed
- Specimen shrub (20L pot)
- Proposed climbers supported by high tensile wire fixed to wall
- Proposed shrubs / herbaceous planting
- Proposed bulb planting

0 1 2m

Figure 2