



SJ Stephens Associates

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Arboricultural Impact Assessment

- Tree Survey
- Tree Protection Plan
- Arboricultural Method Statement

For:-

Refurbishment and extensions to the
Science Building and landscape
improvements

At:-

Highgate School
North Road
London
N6 4AY

On behalf of:-

Highgate School
North Road
London
N6 4AY

Prepared by:

Simon Stephens MA Oxon, Dip
Arb(RFS), MArborA, C Env. MICFor
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Survey Date: 30th May 2022
Report Date: 21st September 2023 revA
Project no: 380.8

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1 BACKGROUND

- 1.1** This Arboricultural Impact Assessment has been instructed by Highgate School to specify tree protection measures and assess the arboricultural impact of the proposed refurbishment and extension of the Science Building at the North Road site.
- 1.2** Trees were surveyed, with findings shown in the Tree Schedule in Appendix B and plotted on the Tree Protection Plan in Appendix A. This also shows tree protection measures, which are specified in the Arboricultural Method Statement in section 5 below. The arboricultural impact is assessed in section 6, which assumes that these measures are followed.
- 1.3** The tree survey was undertaken, and this report has been prepared, by Simon Stephens MA Oxon, Dip Arb (RFS), MArborA, C Env, MICFor a Registered Consultant with the Arboricultural Association, with over 20 years relevant experience.
- 1.4** This survey and report have been prepared in accordance with the recommendations of BS 5837:2012, Trees in relation to design, demolition and construction - Recommendations.
- 1.5** Documentation supplied:
 - Robert Myers Associates, Site Plan, drawing 814-01 (MP) 001 revP2
 - Robert Myers Associates, Hard Landscape Materials Plan, drawing 814-01 (DP) 001 revP2

2 SURVEY DETAILS AND SCOPE

- 2.1 The site survey included trees and shrubs, within and immediately adjacent to the red line boundary, with a stem diameter over 75mm at 1.5m height, as shown located on the Tree Protection Plan, included as Appendix A.
- 2.2 Tree inspection took place from ground level with the use of binoculars, sounding hammer and metal probe using the Visual Tree Assessment method (Mattheck & Breloer 1994). The presence and condition of bark and stem wounds, cavities, decay, fungal fruiting bodies and any structural defects that could increase the risk of structural failure were noted.
- 2.3 Tree diameters were measured using a girthing tape and tree heights were measured using a hypsometer. Where use of a tape was restricted by site factors, diameters were estimated, with the diameter recorded in the tree schedule as eg “est 300”.
- 2.4 At the time of the survey, the weather was fine with no restrictions to visibility. Broadleaf trees were in leaf. There were no limitations to access around the trees.
- 2.5 Tree details are shown on the Tree Protection Plan included as Appendix A. Tree locations have been taken from the topographical survey provided. Where not included on the topographical survey, they have been determined by measuring distances from features shown on the plan, using a laser measuring device. The following information was recorded for each tree, and is shown in the Tree Schedule included as Appendix B:
 - **Number:** an identity number for each tree, prefixed with a “T”, which cross references locations shown on the plan with the schedule in Appendix B. Where a number of trees are located close together and are similar in character and management requirements, they have been treated as a Group under a single number, prefixed with a “G”.
 - **Species:** common name.
 - **Tree height:** approximate height in metres.
 - **Stem diameter:** diameter in millimetres, taken at 1.5m above ground. Where there are a number of stems, stem diameters are recorded in the condition column.
 - **Branch spread:** approximate spread in metres to N,S,E and W of the trunk. The approximate branch spread is drawn on the plan.
 - **Canopy clearance:** approximate height of the canopy above ground. Where a significant, low lateral branch is present, its height and direction of growth is included in the Condition column.
 - **Age class:** Young, Semi-mature, Early mature, Mature, Over-mature, Veteran.
 - **Condition:** features that affect the safe useful life expectancy and amenity of the tree, including the presence of decay or any physical defect.
 - **Management Recommendations:** recommendations to ensure the health and safety of the tree, within the future development.
 - **Estimated Remaining Contribution:** <10 years, 5-15 years, 10-20 years, 15-30 years, 20-40 years, >40 years.

- **Category grading:** tree classification taken from BS 5837:2012, Trees in relation to design, demolition and construction (see Appendix C for details), as follows:
 - Category U: Unsuitable for retention, trees with less than 10 years life expectancy, normally recommended for removal (Red)
 - Category A: high quality trees, able to make a substantial contribution for at least 40 years, normally retained unless there is an over-riding reason for removal and appropriate mitigation. (Green)
 - Category B: moderate quality trees, able to make a significant contribution for at least 20 years, normally retained. (Blue)
 - Category B/C: an intermediate category between categories B and C (not specifically described in BS5837). Trees, which should be retained wherever possible, providing retention does not unreasonably constrain the layout. (Blue)
 - Category C: low quality, in adequate condition to remain for at least 10 years, or young trees <150mm stem diameter. Trees which can be removed to allow the desired layout or new planting. (Grey)

For category A, B and C trees, a subcategory has been allocated, providing information on the reasons for selection of a specific category, as follows:

- Subcategory 1: mainly arboricultural values.
 - Subcategory 2: mainly landscape values.
 - Subcategory 3: mainly cultural values, including conservation.
- Trees have been classified irrespective of the possible proximity to future construction. The BS 5837 category is colour coded, as indicated above, on the plan included as Appendix A.
- **Protection Distance:** the protection distance in metres required to provide the Root Protection Area recommended in BS 5837, assuming a circular area centred on the tree.
- **Root Protection Area (RPA):** the area in m², as recommended in BS 5837, to provide sufficient rooting area to ensure tree survival and which, in most situations, should be fenced off to prevent root damage from construction activities.

3 SURVEY LIMITATIONS

- 3.1 No internal decay devices, or other invasive tools to assess tree condition, were used.
- 3.2 No soil excavation or root inspection was carried out.
- 3.3 This survey has not considered the effect that trees or vegetation may have on the structural integrity of future building through subsidence or heave.

- 3.4 The tree survey has been undertaken for planning purposes. Although any obvious structural defects have been noted, a Tree Hazard Assessment has not been carried out. Mature trees close to highly populated areas or public highways should normally be checked for safety annually, by a suitably qualified person.

4 LEGAL PROTECTION OF TREES

- 4.1 The Haringey Council website was viewed on 24-06-2022, showing that the site does contain Tree Preservation Orders. Although the details of the Tree Preservation Order were not seen, no tree work must be undertaken without approval from the council.
- 4.2 Once planning permission has been granted, provided the application clearly shows any trees to be removed or pruned, this overrides protection provided by Tree Preservation Orders or Conservation Areas, provided the work is necessary to implement the approved development. If not essential, a separate tree work application will need to be submitted for trees protected by a Tree Preservation Order.

5 ARBORICULTURAL METHOD STATEMENT

5.1 Site Overview

- 5.1.1 The proposal is for the refurbishment and extension of the science building. The proposed site plan is included as Appendix F and is shown on the Tree Protection Plan, which identifies the parts of the building to be extended.
- 5.1.2 As part of the proposals, the Science Quad, south of the science building will be re-landscaped. Detailed proposals have been prepared by Robert Myers Associates and are provided in a separate report. However, their materials plan for the quad is included as Appendix G, which shows the changes proposed.
- 5.1.3 There is an attractive River birch, *Betula nigra*, in the northern courtyard, shown in the photo in Appendix Ei) which will not be affected by the works. There are three mature purple plum, T4, T5 and T6, alongside Southwood Lane which will be retained.
- 5.1.4 The line of mature plane trees alongside North Road, shown in the photo in Appendix Eii), will not be affected.

5.2 Tree Work

- 5.2.1 No tree works are proposed.

5.3 Root Protection Areas

- 5.3.1 Root Protection Areas are shown for all trees in the tree schedule included as Appendix B. They are also shown for all retained trees, as circular areas centred on the trunk, on the Tree Protection Plan included as Appendix A. Where there are physical obstructions to root growth the Root Protection Area should be shown as an equivalent area that is more likely to reflect actual root growth. The Root Protection Area shows the area around a tree in which all construction activity must normally be excluded, unless appropriate protection measures are implemented.

5.4 Tree Protection Fencing

- 5.4.1 Tree Protection Fencing must be erected where shown on the Tree Protection Plan, included as Appendix A. This will provide full protection of the Root Protection Areas of all retained trees within the site.
- 5.4.2 Tree Protection Fencing must be from weldmesh panels, at least 2m high, securely fixed, with wire or scaffold clamps, to a rigid framework. This framework must be constructed from scaffold tubes with vertical tubes, at a maximum interval of 3m and driven into the ground at least 0.6m. The structure must be well braced to resist impacts, constructed as per Figure 2 of BS5837:2012, which is reproduced in Appendix D. Alternatively, weldmesh panels can be supported on blocks, providing the blocks are pinned to the ground with road pins, or similar, and the panels are braced, as per Figure 3 of BS5837:2012, which is also reproduced in Appendix D.
- 5.4.3 Tree Protection Fencing must be maintained and retained for the duration of the works, or until such time as agreed in writing with the Local Planning Authority.
- 5.4.4 Once construction activity in the courtyard area to the north of the building has been completed, the Tree Protection Fencing can be removed.
- 5.4.5 Weatherproof notices must be fixed to the Tree Protection Fencing, and maintained, stating:-

**TREE PROTECTION AREA
KEEP OUT**

TREES ENCLOSED BY THIS FENCE ARE PROTECTED BY PLANNING CONDITIONS
AND A TREE PRESERVATION ORDER
CONTRAVENTION MAY LEAD TO CRIMINAL PROSECUTION
THE FOLLOWING MUST BE OBSERVED BY ALL PERSONS:

- The Protection Fence must not be moved
- No person or machine must enter the area
- No materials or spoil must be deposited
- No excavation must be permitted

ANY INCURSION INTO THE PROTECTED AREA MUST BE WITH THE WRITTEN
PERMISSION OF THE LOCAL PLANNING AUTHORITY

5.5 No-Dig Construction Area

- 5.5.1 The No-Dig area, shown hatched blue on the Tree Protection Plan included as Appendix A, must be constructed without excavation apart from the removal of shrubs/organic matter, which must be carried out by hand. Excavators, dumpers and other site traffic must not be allowed to track on the No-Dig area.
- 5.5.2 Engineering details must avoid localised compaction, using both a two dimensional geogrid, and a three dimensional cellular confinement system as integral components of the sub-base. A typical section is shown on the Tree Protection Plan included as Appendix A. As well as being fit for purpose, the design and methodology must protect tree roots, by ensuring the following:-
- topsoil/organic matter can be removed carefully by hand to a maximum of 75mm, but less if roots are found nearer the surface.
 - following leveling with soil or sand, a permeable, non-woven geotextile membrane, must be laid.
 - a suitable two dimensional geogrid, such the TriAx Geogrid supplied by Tensar International (www.tensar.co.uk), or the Biaxial Geogrid supplied by Geosynthetics Ltd (www.geosyn.co.uk), must be laid over the entire area and underneath the edging.
 - pressure treated timber edging boards, supported by driven stakes must be used.
 - a suitable cellular confinement system must then be laid to manufacturers instructions on top of the geogrid. Products that might be considered include Geoweb, supplied by Greenfix (www.greenfix.co.uk) or Cellweb, supplied by Geosynthetics Ltd (www.geosyn.co.uk). The depth of the system must be adequate to take pedestrian traffic, as per manufacturers guidance.
 - the cellular confinement system must be filled with clean (no fines), washed angular, 20/40mm, stone to provide load support, while allowing air and moisture to permeate to the root zone.
 - a further permeable, non-woven geotextile membrane, such as TreetexT300, or an alternative approved product which has similar oil trapping qualities, must be laid over the cellular confinement system.
 - a porous, surfacing material, free from contaminants, must then be laid. Either sand bedding and block paving, gravel or permeable tarmac would be suitable.
- 5.5.3 No-Dig construction will result in an increase in levels. This must be fully taken account of in all other aspects of the design.

5.6 Ground Protection Area

- 5.6.1 The Ground Protection Area, which is hatched cyan on the Tree Protection Plan, is to be replaced with new yorkstone paving.

- 5.6.2 If the existing sub-base has to be replaced, then No Dig Construction, (as per section 5.5 above) must be used for the build up. No excavation must be permitted beneath the base course in these areas.
- 5.6.3 If there is a delay between lifting the existing sub-base and laying the No-Dig sub-base, either the area must be fenced off with Tree Protection Fencing or ground protection panels must be laid. In this case, Trakmats, as supplied by either the Marwood Group, (www.marwoodgroup.co.uk) or Ground-Guards, (www.ground-guards.co.uk) or a similar approved product, must be used, laid on a compressible layer of sand or woodchips, laid onto a geotextile, with adjacent panels held together with connectors.

5.7 General measures

- 5.7.1 No construction activity whatsoever, including routing of underground services, storage of materials or on-site parking, must be allowed within Root Protection Areas, other than that specifically described above.
- 5.7.2 No mixing or storage of cement, concrete, oil, fuel, bitumen or other chemicals must be permitted within 10m of the trunk of any retained trees, nor in any position where the slope of the ground could lead to contamination of the Root Protection Area.
- 5.7.3 Fires must not be lit in a position where their flames could extend to within 10m of foliage, branches or trunk.
- 5.7.4 Landscape works carried out within Root Protection Areas must be undertaken with great care so as not to damage shallow roots. Tractor mounted rotovators or other heavy mechanical cultivation must not be used within the Root Protection Areas.
- 5.7.5 If any tree shown for retention is removed, uprooted or destroyed, another tree must be planted in the same location, at a size and species to be agreed in writing with the Local Planning Authority.
- 5.7.6 A copy of this report and the Tree Protection Plan must be kept on site and must be fully understood by the Site Agent.

5.8 Bat roosts

- 5.8.1 The current legislation makes it a criminal offence to disturb, damage or destroy any bat roost or hibernation area. Contractors must be reminded of their responsibilities and should contact the relevant authorities if any signs of bats are found.

5.9 Birds

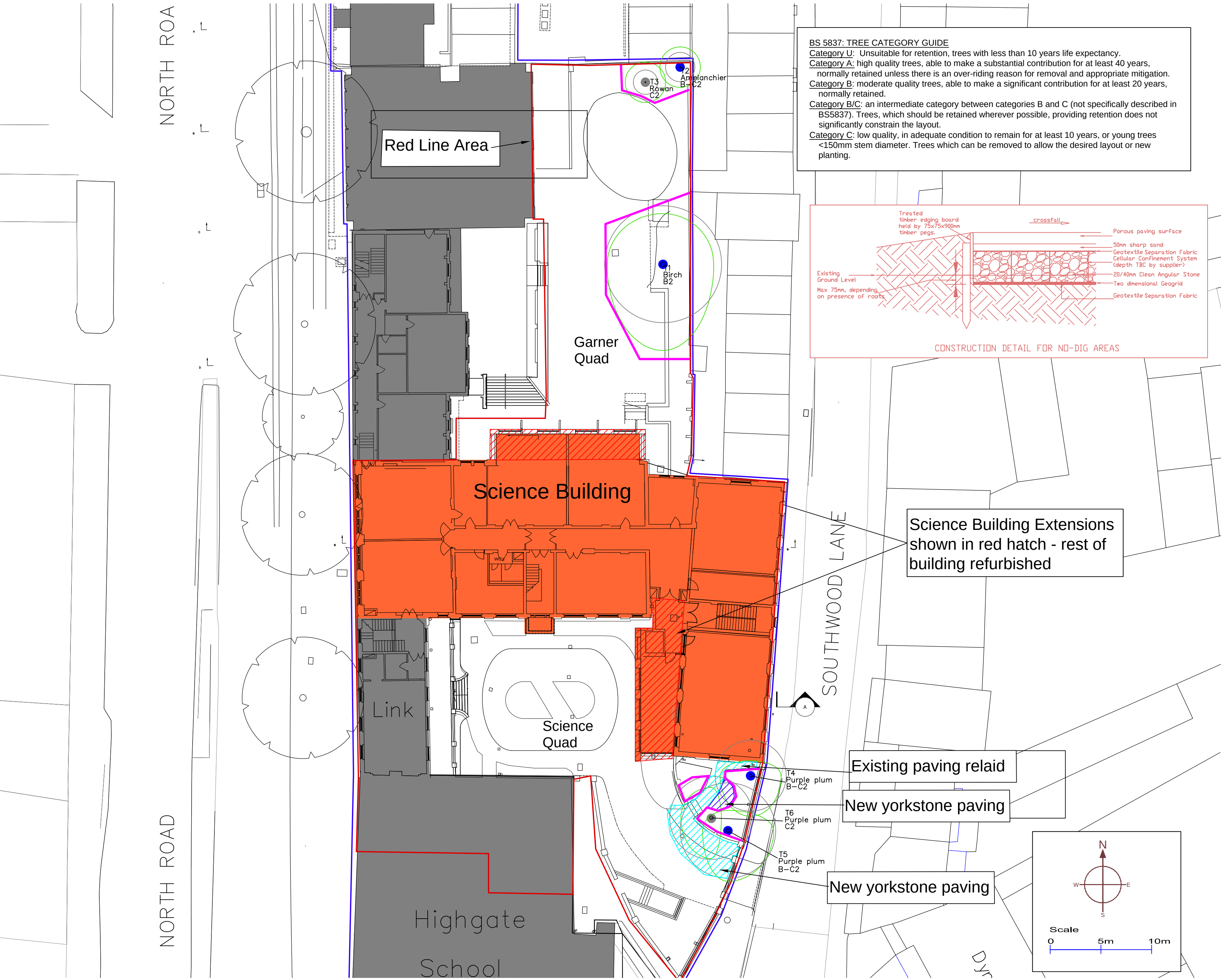
- 5.9.1 The current legislation makes it a criminal offence to disturb nesting birds. The nesting season is generally assumed to be from 1st March to 31st July, however this can vary depending on species and location. During these months a careful inspection must be made before work commences and works must be postponed if active nests are found.

6 ARBORICULTURAL IMPACT ASSESSMENT

- 6.1 No tree work is proposed, protection measures have been specified for retained trees and new tree planting is proposed.
- 6.2 Provided the recommendations in this report are followed, and the landscape proposals are implemented, the arboricultural impact of these proposals on existing tree cover is considered acceptable.

7 REFERENCES

- *BS5837:2012 Trees in relation to design, demolition and construction – Recommendations.*
- *BS3998:2010 Tree Work. Recommendations.*
- *BS8545:2014 Trees: from nursery to independence in the landscape. Recommendations.*
- *The use of Cellular Confinement systems near Trees: a guide to good practice Arboricultural Association Guidance Note 12.*
- *Common sense risk management of trees (FCMS024). Published by the National Tree Safety Group (www.ntsgroup.org.uk)*



APPENDIX A

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JOB TITLE SCIENCE BUILDING REFURBISHMENT HIGHGATE SCHOOL		
DRAWING TITLE TREE PROTECTION PLAN		
DRAWING NUMBER 380.8-01		REV A
REVISIONS		
SCALE 1:250 at A2	DATE SEP 23	DRAWN BY sjss

Tree/ Group No.	Species	Height (m)	Stem Diam. at 1.5m (mm)	Branch Spread (m)				Canopy Clearance (m)	Age Class	Observations	Management Recommendations	Estimated Remaining Contribution (years)	BS 5837 Category Grading	Protect- ion Distance (m)	Root Protect. Area (m2)
				N	S	E	W								
T1	River birch, <i>Betula nigra</i>	10.5	480	5	8.5	5	5.5	1.7	Mature	Previously reduced, leaving a wide spreading tree with a flat top. Occasional minor dead branches, but showing good overall vigour. Peeling bark- a feature of the species. Major lateral limb at 2.3m to south. Minor bulging of paving suggests underlying root activity.		20-40	B2	5.8	104
T2	Amelanchier	3.5	120	2	2	2	2	1.6	Early mature	Six stems- average 50mm. Attractive small growing tree.		20-40	B-C2	1.4	7
T3	Rowan	4	100	2	2	2	2	1.8	Semi-mature	Reasonable vigour.		>40	C2	1.2	5
T4	Purple plum	7	290	1.5	4	3	3	1.7	Mature	Previously reduced. Growing against building, with main stem leaning to south. Good vigour.		15-30	B-C2	3.5	38
T5	Purple plum	7	390	2	5	4.5	2.5	1.9	Mature	Leaning to south. Twin stems from 1.5m, growing around each other. Good vigour. Attractive tree.		15-30	B-C2	4.7	69
T6	Purple plum	6	340	3	4	1	3	1.7	Mature	Previously topped at 1.9m, but with healthy regrowth. Contributing to group.		10-20	C2	4.1	52

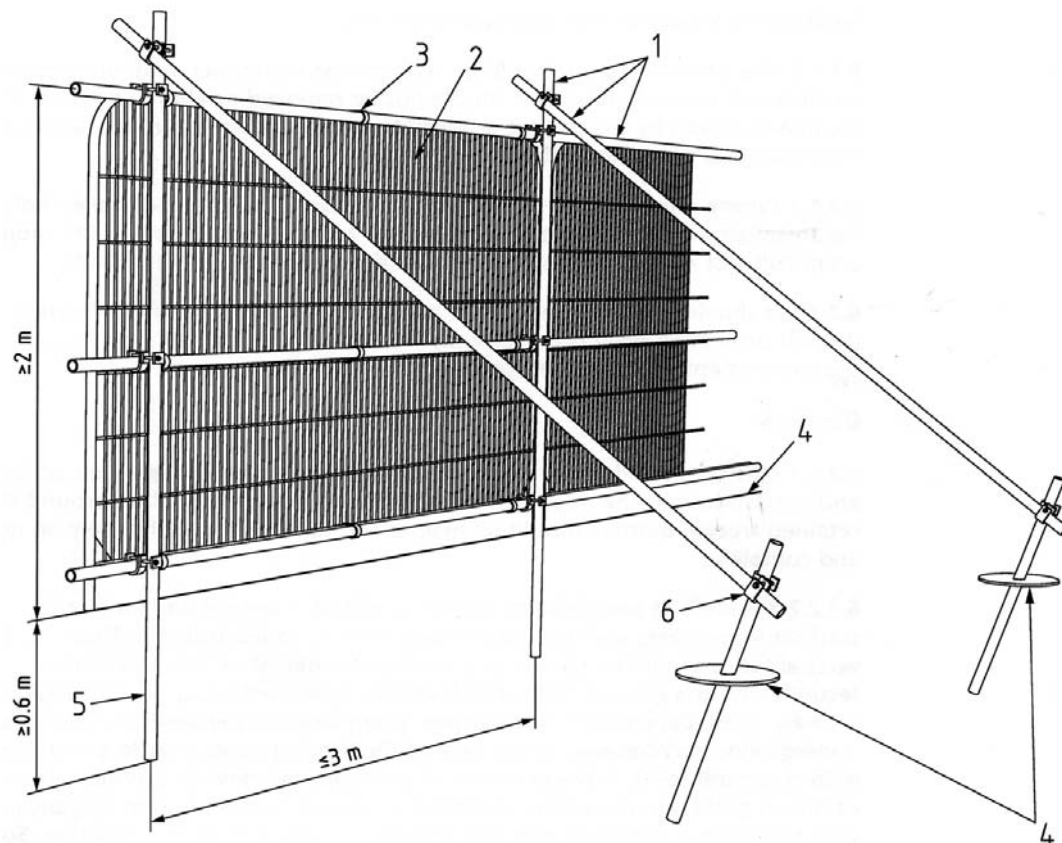
BS 5837:2012, Table 1 Cascade chart for tree quality assessment

Category and definition	Criteria (including subcategories where appropriate)			Identification on plan
Trees unsuitable for retention (see Note)				
Category U Those in such a condition that they cannot realistically be retained as living trees in the context of the current land use for longer than 10 years	- Trees that have a serious, irremediable, structural defect, such that their early loss is expected due to collapse, including those that will become unviable after removal of other category U trees (e.g. where, for whatever reason, the loss of companion shelter cannot be mitigated by pruning) - Trees that are dead or are showing signs of significant, immediate, and irreversible overall decline - Trees infected with pathogens of significance to the health and/or safety of other trees nearby, or very low quality trees suppressing adjacent trees of better quality <i>NOTE Category U trees can have existing or potential conservation value which it might be desirable to preserve; see 4.5.7.</i>			See Table 2
	1 Mainly arboricultural qualities	2 Mainly landscape qualities	3 Mainly cultural values, including conservation	
Trees to be considered for retention				
Category A Trees of high quality with an estimated remaining life expectancy of at least 40 years	Trees that are particularly good examples of their species, especially if rare or unusual; or those that are essential components of groups or formal or semi-formal arboricultural features (e.g. the dominant and/or principal trees within an avenue)	Trees, groups or woodlands of particular visual importance as arboricultural and/or landscape features	Trees, groups or woodlands of significant conservation, historical, commemorative or other value (e.g. veteran trees or wood-pasture)	See Table 2
Category B Trees of moderate quality with an estimated remaining life expectancy of at least 20 years	Trees that might be included in category A, but are downgraded because of impaired condition (e.g. presence of significant though remediable defects, including unsympathetic past management and storm damage), such that they are unlikely to be suitable for retention for beyond 40 years; or trees lacking the special quality necessary to merit the category A designation	Trees present in numbers, usually growing as groups or woodlands, such that they attract a higher collective rating than they might as individuals; or trees occurring as collectives but situated so as to make little visual contribution to the wider locality	Trees with material conservation or other cultural value	See Table 2
Category C Trees of low quality with an estimated remaining life expectancy of at least 10 years, or young trees with a stem diameter below 150 mm	Unremarkable trees of very limited merit or such impaired condition that they do not qualify in higher categories	Trees present in groups or woodlands, but without this conferring on them significantly greater collective landscape value; and/or trees offering low or only temporary/transient landscape benefits	Trees with no material conservation or other cultural value	See Table 2

Figure 2

Key

- 1 Standard scaffold poles
- 2 Heavy gauge 2 m galvanised tube and welded mesh infill panels
- 3 Panels secured to uprights and cross-members with wire ties
- 4 Ground level
- 5 Uprights driven into the ground until secure (minimum depth 0.6 m)
- 6 Standard scaffold clamps



Examples of above-ground stabilising systems

Figure 3a

Stabiliser strut with base plate secured with ground pins

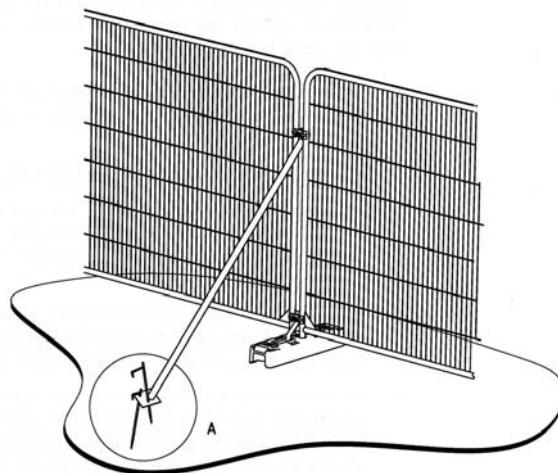
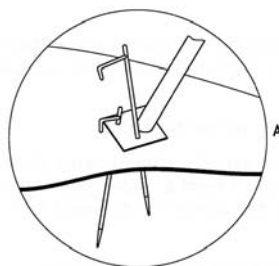
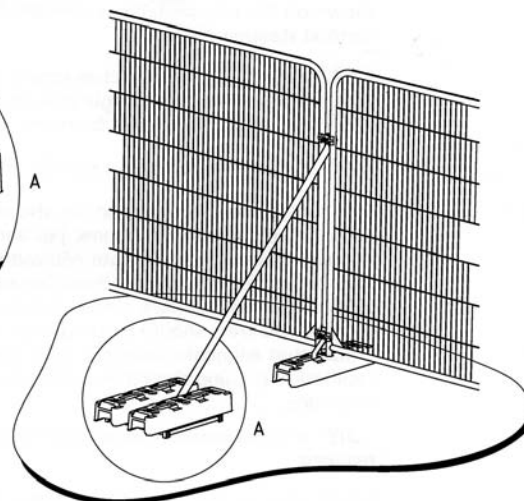
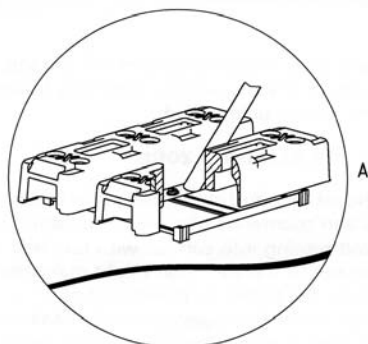


Figure 3b

Stabiliser strut mounted on block tray







Appendix F

NOTES

TO BE READ IN COLOUR

DO NOT SCALE FROM THIS DRAWING

Contractors, sub-contractors and suppliers are to verify any critical dimensions on site prior to commencing work, fabrication or construction of any elements.

Any discrepancies or errors must be brought to the attention of Robert Myers Associates.

All structural elements are shown indicatively. For all elements of structure, refer to structural engineers' and specialist sub-contractor/fabricators' design, detail and specification.

The drawings are to be read in conjunction with all relevant landscape architect, consultant and specialist drawings.

KEY

— Boundary Line

PURPOSE OF ISSUE

Rev:	Date:	Drawing Status:
P1	01.07.22	For Planning
P2	11.05.23	For Planning

REVISIONS

Rev:	Date:	Description:
P2	11.05.23	Amended to retain plan trees

Highgate School Science Project

Client: Highgate School

Drawing: Wider context plan

Project No: 814_01

Drawing No: 814_01 (MP) 001

Scale: 1:500 @ A3 Rev: P2

Date: July 2022 Drawn: EL

Checked: JF PM Checked: RM

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DO NOT SCALE FROM THIS DRAWING
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Appendix G

NOTES

TO BE READ IN COLOUR

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P1	01.07.22	For Planning
P2	11.05.23	For Planning

REVISIONS

Rev:	Date:	Description:
P2	11.05.23	Amended to retain plum trees

Highgate School Science Project

Client: Highgate School

Drawing: Science Quad - Hard landscape materials

Project No: 814_01

Drawing No: 814_01 (DP) 001

Scale: 1:200 @ A3

Rev: P2

Date: July 2022

Drawn: EL

Checked: JF

PM Checked: RM

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DO NOT SCALE FROM THIS DRAWING
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LEGEND

- Existing Yorkstone paving to be lifted, cleaned and re-laid, subbase for pedestrian loadings.
- New textured Yorkstone trapezoid paving slabs, colour buff, subbase for vehicular loadings.
- New textured Yorkstone paving setts, colour buff, subbase for vehicular loadings.
- New cropped granite setts, colour buff, subbase for vehicular loadings.
- New textured solid Yorkstone steps including visibility strip on tread and tactile paving at top& bottom of the steps in contrasting colour.
- New granite kerb, colour mid grey, installed flush in relation to adjacent paving levels.
- New granite bull-nosed kerb, colour mid grey, installed with 75mm upstand.
- New granite splayed kerb, colour mid grey, installed with 75mm upstand.

P-1 Science Quad - Hard landscape materials
Scale 1:200 @ A3

