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Arboricultural and Planning Integration Report: 99 Priory Road, London, NW6 3NL

2nd November 2009

Ref: GHA/DS/460:09

GHA trees arboricultural consultancy

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Arboricultural Report

Location: 99 Priory Road, London, NW6 3NL Ref: GHA/DS/460:09 Client: Mr. Geoff Gelbart Date: 2nd November 2009 Report Prepared by: Glen Harding Tech Cert (Arbor.A) Date of Inspection: Friday 23rd October 2009

Please note that abbreviations introduced in [Square brackets] *may be used throughout the report.*

Instructions

Issued by - Mr. Geoff Gelbart

TERMS OF REFERENCE – GHA Trees were instructed to survey the subject trees at 99 Priory Road, in order to assess their general condition and to provide a planning integration statement for the indicative proposed development that safeguards the long term well being of the retained trees and plans tree planting in a sustainable manner.

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Executive Summary

The proposal for the site is to widen the existing access to 99 Priory Road, as well as increasing the parking area within the site. The work will include the relocation of the existing brick piers. The proposed scheme does not require the removal of any trees or shrubs, and will therefore not significantly impact the local or wider landscape. The retained trees require protection in accordance with industry best practice and BS 5837: 2005 – Trees in relation to construction, in order to ensure their longevity.

Documents Supplied

Mr. Geoff Gelbart supplied the following documents:

- 1. Site location plan (Ref: (0923) 00 SLP 01)
- 2. Existing layout (Ref: (0923) 00 G/R 02)
- 3. Proposed layout (Ref: (0923) 20 G/R 03)
- 4. Existing street elevation (No ref)
- 5. Proposed street elevations (No ref)

Scope of Survey

- 1.1 The survey is concerned with the arboricultural aspects of the site only.
- 1.2 The planning status of the trees was not investigated in detail.
- 1.3 A qualified Arboriculturist undertook the report and site visit and the contents of this report are based on this. Whilst reference may be made to built structure or soils, these are only opinions and confirmation should be obtained from a qualified expert as required.
- 1.4 Trees in third party properties were surveyed from within the subject property, therefore a detailed assessment was not possible and some (if not all) measurements were estimated.
- 1.5 No discussions took place between the surveyor and any other party.
- 1.6 The trees were inspected on the basis of the Visual Tree Assessment method expounded by Mattheck and Breleor (The body language of tree, DoE booklet Research for Amenity Trees No. 4, 1994)
- 1.7 The survey was undertaken in accord with British Standard 5837: 2005 Trees in relation to construction Recommendations (BS5837).
- 1.8 Pruning works will be required to be in accord with British Standard 3998:1989 Tree work (BS3998).
- 1.9 Underground services near to trees will need to be installed in accord with the guidance given in BS5837 together with the National Joint Utilities Group Booklet 4: 2007 Guidelines for the planning, installation and maintenance of utility services in proximity to trees (NJUG4).
- 1.10 Where hard surfacing may be required in close proximity to trees, BS5837: 2005, and the principles of Arboricultural Practice Note 12: Through the Trees to Development (AAIS) 2007 (APN12) with regards to "no dig" surfacing will be employed.
- 1.11 Reference is made to the National House Building Council Standards, 2003, chapter 4.2: Building near trees (NHBC).

1.12 The client's attention is drawn to the responsibilities under the Wildlife and Countryside Act (1981).

Survey Method

- 2.1 The survey was conducted from ground level with the aid of binoculars.
- 2.2 No tissue samples were taken nor was any internal investigation of the subject trees undertaken.
- 2.3 No soil samples were taken.
- 2.4 The height of each subject tree was estimated using a clinometer.
- 2.5 The stem diameters (SD) were measured in centimetres at 1.5 metres above ground level for single stems, and just above the root flare for multistemmed trees. Where access was difficult the diameters were estimated.
- 2.6 The crown spreads were measured with an electronic distometer. Where the crown radius was notably different in any direction this has been noted on the Plan (appendix A), or in the tree table (Appendix B).
- 2.7 The Root Protection Area (RPA) for each tree is included in the tree table, both as an area, and as the radius of a circle.
- 2.8 All of the trees that were inspected during the site visit are detailed on the plan at Appendix A, and within the tree table at appendix B. Please note that the attached plan is for indicative purposes only, and that the trees are plotted at approximate positions. The trees are all categorised as follows, in accordance with table 1 of BS5837 - 2005:

Category A – Those of a high quality and value: in such a condition as to be able to make a substantial contribution (a minimum of 40 years is suggested).

Category B – Those of a moderate quality and value: those in a condition as to be able to make a significant contribution (a minimum of 20 years is suggested).

Category C – Those of low quality and value: currently in adequate condition to remain until new planting could be established (a minimum of 10 years is suggested), or young trees with a stem diameter below 150mm. Colour =

Category R – Those in such a condition that any existing value would be lost within 10 years and which should, in the current context, be removed for reasons of sound arboricultural management.

All references to tree rating are made in accordance with British Standard 5837 'Trees in relation to construction – Recommendations' 2005, Table 1 (section 4.3.1).

<u>The Site</u>

- 3.1 The site is located on Priory Road, a residential through road located in the South Hampstead area of North West London.
- 3.2 A moderate tree cover is present on the site itself as well as adjacent sites, with semi-mature and mature trees of both native and exotic origin characterising the local area.
- 3.3 Access to the property is currently gained via a driveway to the front (North) of the site.

The Subject Trees

- 4.1 The details of the subject trees are set out in the Schedule at Appendix B.
- 4.2 The overall quality of the trees is good.
- 4.3 Of the two trees / groups of trees surveyed, one tree (T1) has been assessed as BS 5837 category B; with the remaining trees (G2) being assessed as BS 5837 category C.

The Proposal

- 5.1 The proposal for the site is to widen the existing access to 99 Priory Road, as well as increasing the parking area within the site.
- 5.2 The work will include the relocation of the existing brick piers.
- 5.3 The proposed location of the above structures can be seen on the attached plan.

Arboricultural Implication Assessment

TREE REMOVAL / RETENTION:

- 6.1 The proposed site layout and all of its associated structures allows for the healthy retention of all of the trees on the site itself, and within nearby adjacent sites; therefore the arboricultural landscape character of the site will be retained.
- 6.2 The assessed grading (as per BS5837 table 1) of each of the trees to be removed, as well as any relevant comments on their condition can be seen in the tree table at appendix B.

TREE PRUNING TO ACCOMODATE THE PROPOSAL OR ACCESS TO THE SITE

6.3 T1 will require some minor crown lifting to a height of 2.5m over the new driveway area. This work will not however affect the health of this tree, or detract from its visual amenity. It is of note that such work would have been required in the future regardless of the proposal, given the trees location over the driveway.

ASSESSMENT OF RETAINED TREES ROOT PROTECTION AREAS

- 6.4 Section 5.2.4 b) of BS 5837: 2005 states that the Root Protection Area (RPA) of each tree should be assessed by an arboriculturalist considering the likely morphology and disposition of the roots, when known to be influenced by past or existing site conditions.
- 6.5 The relocated brick pier nearest the house would be situated within a section of the assessed circular Root Protection Area (RPA) of T1. The construction process will need to show consideration to this issue (of working within the RPA) by ensuring all work in this area is undertaken by hand. The existing wall section will need to be removed carefully by hand, and then the new brick pier will need to be built reusing the footings which support the existing wall. If the existing piers footings are not deemed structurally sufficient, they should be removed by hand and increased in depth, and <u>not</u> width (tree roots grow predominantly in the top 500mm of soil).
- 6.6 Sections of the new driveway are in proximity to T1, and within the RPA of this tree. It is therefore essential that the design of this area is planned so as to cause minimal disruption to this tree. An "up and over" style construction will be necessary, to ensure that all existing ground levels are retained in their current form, as well as ensuring that satisfactory moisture and oxygen can be obtained from the underlying soil by any tree roots in this area. A design for this proposed access route must be drawn up by a structural engineer, in close co-ordination with the retained arboriculturalist. A preliminary method statement has been included at 8.5, and information of an appropriate product can be seen at appendix C.

GENERAL

6.7 The methodology set out within section 8 of this report, <u>must</u> be adopted and adhered too, in order to ensure the healthy retention of all of the retained trees.

Post Development Pressure

FUTURE TREE AND STRUCTURE RELATIONSHIPS

- 7.1 The retained trees are at a satisfactory distance from the proposed new structures, and highly unlikely to give rise to any inconvenience.
- 7.2 There will be a slight overhang of the new driveway and wall, from the crown of T1. This tree will require crown lifting, a practice that will no doubt continue to

be undertaken by the site owner. Such pruning would mean that this overhang will not be an ongoing issue, as satisfactory clearances will always be retained.

- 7.3 The BS3998: 1989 Recommendations for Tree Work discusses and endorses various methods of pruning that can alleviate the minor inconveniences trees can cause, whilst retaining them in a healthy condition. Methods such as crown reductions (section 13.4) partial or whole, crown lifting (section 13.5) and crown thinning (section 13.6) can be used to both increase light to properties, as well as improve clearances from buildings. Trees in towns are often sited in close proximity to buildings; however residents concerns can be readily appeased with the implementation of regular, well-planned, sensitive pruning.
- 7.4 The recommendations for tree retention have been made with due consideration to BS 5837 : 2005 section 3.1.1

3.1.1

"Trees can occupy a substantial part of a new development and because of their potential size can have a major influence on the planning and use of the site. Existing trees of good quality and value can greatly enhance new development, such as by providing an immediate appearance of maturity. However trees can also be a constraint. Layouts sited poorly in relation to retained trees, or the retention of trees of an inappropriate size or species may be resented by future occupiers and no amount of legal protection will ensure their retention and survival. To avoid such problems and to ensure a harmonious relationship between trees and structures, careful planning and expert advice is needed on their juxtaposition".

7.5 Regular inspections of the retained trees by a suitably qualified Arboriculturalist and subsequent remedial works will ensure that the trees are maintained in a suitable manner, to exist in harmony with the new structures and its occupants for many years to come.

REMEDIATION / REPLACEMENT PLANTING AND SOFT / HARD LANDSCAPING

- 7.6 Any new trees that are planted should be selected to ensure they do not become a nuisance and that the level of routine maintenance is low.
- 7.7 The soil type may require the guidance of NHBC as far the building foundations are concerned. Clearly the planting schedule must be available to assist with foundation design, but any potential for subsidence damage in the future will be designed out.

<u>Tree Protection Measures and Preliminary Method Statement for Development</u> <u>Works</u>

8.1 TREE PRUNING / REMOVAL A list of all tree works that are required (including trees to be removed) is included in the tree table at Appendix B. Pruning / removal has only been specified for the following reasons:

- Where work is necessary to implement the proposed scheme.
- Where works are required for safety reasons.
- Where work is required to improve tree form, or improve the appearance of overgrown areas of the site.

Where any tree work is needed, this work will be in accordance with British Standard 3998: 1989 – Recommendations for tree work.

8.2 TREE PROTECTION BARRIERS

It is essential for the future health of the trees to be retained on site, that <u>all</u> development activity is undertaken outside the root protection zone of these trees, whenever this is practical. The position of the proposed protective fencing for the site is shown on the plan 'Appendix A' by a <u>pink</u> line. The position of the fence is to be marked out with biodegradable marker paint on site and agreed with appropriate representatives from the LPA and contractor. The fencing will be erected **prior** to any works in the vicinity of the trees and removed only when all development activity is complete. The protective fencing will be 1.2m high chestnut paling which must be secured in position with 45 degree angled supports.

The Fence must be marked with a clear sign reading:

"Construction Exclusion Zone – Keep Out".

8.3 REMOVAL OF THE EXISTING WALL SECTION

Prior to the new brick piers construction commencement, sections of the existing wall will need to be removed. This work must <u>all</u> be undertaken by hand when within the root protection areas of retained trees, with the supervision of the retained arboriculturalist and / or the site manager. The removed material must be stored outside of the RPA of all of the retained trees whilst this work commences. The existing footings must be left in situ, to avoid any root damage. If during the work, any roots from the retained trees are discovered in excess of 25mm, the retained arboriculturalist must be contacted immediately to assess the roots and arrange subsequent working methods that will cause <u>no</u> damage to the tree(s). The new brick piers must be constructed using the existing footings are not deemed structurally sufficient, they should be removed by hand and increased in depth, and <u>not</u> width. A membrane should be placed within the new deeper hole to avoid any leaching to the adjacent soil where roots may be.

8.4 ROOT PRUNING

Where any root pruning is required, this work will be in accordance with British Standard 3998 : 1989 – Recommendations for tree work. Any such root pruning should be undertaken by the retained arboriculturalist.

8.5 NO DIG SURFACING CONSTRUCTION METHOD IN ACCORDANCE ARBORICULTURAL PRACTICE NOTE 12 AND BS: 5837 The sections of the new driveway that are within the RPA's of the retained tree (T1) should be constructed as follows (see red hatching on appended plan for locations). The existing ground levels lend themselves to such a methodology, which will bring the new driveway to the same level as the existing section.

METHODOLOGY:

- Eradication of all existing ground vegetation must be undertaken using a translocated herbicide. Any product used for this purpose must be selected to ensure that it will not have an adverse affect on the health of the retained trees, and carried out by a suitably trained operative.
- Any major protrusions within the soil must be removed, such as large rocks or existing tree stumps. Any holes should be filled with sharp sand. **DO NOT GRADE OFF HIGH SPOTS.**
- Lay a geotextile membrane over the entire area to be protected.
- Construction of the edging of the area is to be implemented with the use of vertical steel pegs driven into the ground at intervals of 500mm with side supports firmly attached. CHECK FOR UNDERGROUND SERVICES PRIOR TO THE COMMENCEMENT OF SUCH WORK.
- The three dimensional cellular confinement system (e.g cellweb or similar) must be cut to size and placed within the pre-prepared area. This area must now be filled with a no-fines aggregate infill. This must then be compacted to avoid the possibility of future "rutting".
- Lay a final layer of the geotextile membrane on top of this surface.
- A porous material can now be placed on top to complete the construction.

N.B. An engineer will prepare the exact specification in agreement with the retained Arboriculturalist and Local Planning Authorities Arboricultural Officer.

More information on a suitable product for such driveways can be seen at appendix C.

8.6 DELIVERY AND STORAGE OF BUILDING MATERIALS Due to the limited on-site storage space, it may be necessary for bulk deliveries to be split into smaller deliveries. The use of a "just in time" delivery method can also be adopted to reduce the time materials are stored on site before use.

- 8.7 SITE HUTS, WELFARE FACILITIES AND STORAGE OF EQUIPMENT, MATERIALS AND CHEMICALS All site huts will be positioned outside of the retained trees RPA's.
- 8.8 MIXING OF CONCRETE

All mixing of cement / concrete <u>must</u> be undertaken outside of the RPA of all of the retained trees.

8.9 ON SITE SUPERVISION A detailed supervision programme will be devised by the developer and retained Arboriculturalist, ensuring that Arboricultural supervision is present at the appropriate periods during construction. It is therefore deemed necessary for the retained arboriculturalist to visit the site at the following critical points:

- Following tree pruning to ensure work is completed to the correct specification. Date and time yet to be agreed, however once confirmed, these dates will be sent to the Local Planning Authorities Arboricultural Officer.
- Erection of protective fencing to ensure it is constructed to the correct specification at the required proximity to ensure the healthy retention of the trees. Date and time yet to be agreed, however once confirmed, these dates will be sent to the Local Planning Authorities Arboricultural Officer.
- In addition to the above, random inspections of the site may also be undertaken during construction to ensure the Arboricultural responsibilities are being fulfilled by the developer. A full, written assessment of each visit will be sent the Local Panning Authority and copied to the developer at the expense of the applicant. Any issues relating to tree protection will subsequently be addressed immediately.

Once a commencement date has been confirmed for works on site, a representative from the applicant will contact the relevant officer from the local planning authority to arrange a pre-start site meeting. During this meeting, future requirements for site supervision will be agreed.

8.10 OTHER TREE PROTECTION PRECAUTIONS

- No fires lit on site within 20 metres of any tree to be retained.
- No fuels, oils or substances with will be damaging to the tree shall be spilled or poured on site.
- No storage of any materials within the root protections zone.

8.11 HARD / SOFT LANDSCAPING NEAR RETAINED TREES

All new pathways and hard landscaping areas within the Root Protection Areas (RPA's) of the retained trees should be designed using no-dig, up and over construction techniques, and be specified in close co-ordination with the retained Arboriculturalist. Porous materials should also be used when surfacing near the trees. No machinery will be used for this work, which <u>must</u> all be done by hand.

8.12 LEVEL CHANGES

No level changes should occur within the root protection area of any of the retained trees.

8.13 DISMANTLING PROTECTIVE BARRIERS

Protective barriers must only be completely removed when all machinery, and equipment has left site. A minimum of seven days notice must be given to the local planning authority prior to dismantling works begin.

<u>Conclusion</u>

9.1 In conclusion, the principal arboricultural features within the site can be retained and adequately protected during development activities.

- 9.2 Subject to precautionary measures as detailed above, the proposal will not be injurious to trees to be retained.
- 9.3 There will be no appreciable post development pressure, and certainly none that would oblige the council to give consent to inappropriate tree works.

Recommendations

- 10.1 The site works should progress as follows to ensure the healthy retention of the trees.
 - a. Tree works, in accordance with BS3998
 - b. Installation of all tree protection measures.
 - c. Construction.
 - d. Soft landscaping.
- 10.2 Site supervision An individual e.g. the Site Agent, must be nominated to be responsible for all arboricultural matters on site. This person must:
 - a. Be present on the site the majority of the time.
 - b. Be aware of the arboricultural responsibilities.
 - c. Have the authority to stop any work that is, or has the potential to cause harm to any tree.
 - d. Be responsible for ensuring that <u>all</u> site personnel are aware of their responsibilities towards trees on site and the consequences of the failure to observe those responsibilities.
 - e. Make immediate contact with the local authority and / or retained arboriculturalist in the event of any related tree problems occurring whether actual or potential.
- 10.3 It is recommended, that to ensure a commitment from all parties to the healthy retention of the trees, that details are passed by the architect or agent to any contractors working on site, so that the practical aspects of the above precautions are included in there method statements, and financial provision made for these.

2nd November 2009 Signed:

affando-

Glen Harding For and on behalf of GHA Trees

01753643760 / 07884056025

Appendix A



Appendix B

Tree No.	Tree species	Height (m)	Multi-stem? (Enter MS)	Trunk / stem count dia. (mm)	Radius of RPA if circle	RPA -Root Protection Area sq.m.	Age Class	Branch spread	Height of Crown Clearance (m)	Comments / Recommendations for tree works	Estimated remaining contribution	Assessed BS 5837: 2005 Value category
T1	Yew	7		270	3.24	32.9792	MA	See plan	2	No observable defects noted at the time of inspection. Recommend: crown lift to 2.5m over new driveway area.	20-40	B1
G2	Lime	6		200	2.4	18.0956	MA	See plan	2	Trees previously topped @ 2.5m.	10-20	C2

KEY : Tree No: Tree number (T= individual tree, G= group of trees, W= woodland) Crown = the leaf bearing part of the tree Diameter: MS = Multi-stemmed Age class: Young (Y), Middle aged (MA), Mature (M), Over mature (OM), Veteran (V) Height (Ht): Measured in metres +/- 1m

Appendix C



Tree Root Protection System



CellWebTM Tree Root Protection System



The CellWeb™ TRP cellular confinement system protects tree roots from the damaging effects of compaction and desiccation, while creating a stable, load-bearing surface for vehicular traffic.

CellWeb[™] offers an alternative to the traditional methods of constructing roadways and building foundations that involve excavation, which can result in tree root severance and soil compaction from the passage of vehicles. Such damage can severely influence tree health, and in extreme cases leads to death. CellWeb[™] can be sensitively installed close to and under the canopies of trees without negative effects.

Trees are valuable landscape features and a vital environmental resource. Increasingly, contractors are being required to ensure the health and survival of trees during and beyond the construction period. Although this is enshrined in BS 5837: Trees in Relation to Construction: Recommendations (2005) and Tree Preservation Order legislation, it presents several issues when implementing construction projects near to trees:

- Root severance caused by excavation, leaving trees open to decay, less stable and with a diminished capacity to utilise soil water and nutrients.
- Destruction of soil structure and compaction due to the passage of heavy vehicles, restricting the flow of water and air to tree roots.
- Need for construction access, new roadways and hard surfaces that require engineering-standard load-bearing foundations that meet building regulations.
- Need for high-performance, cost-effective driveways and roadways in the vicinity of tree roots.



Potential loss of existing tree due to poor construction techniques.

The CellWebTM system overcomes these issues and helps contractors to comply with tree health guidelines by creating a load-bearing base that is water-permeable, stable and durable.

With no need for excavation, the system is quick and easy to install, reducing construction time and saving costs and making it suitable for temporary and permanent solutions.



Glynebourne Wood.

Pedestrian path to recreational woodland built using a CellWeb^{IM} foundation which was covered with DuoBlock and then filled with woodchip to create a porous surface.

Product features



CellWeb[™] comprises an expandable cellular mattress that is then filled with a clean stone sub-base and above a Treetex T300 Geotextile.

The honeycomb-like structure is made of robust highdensity polyethylene (HDPE) that is simply stretched out and filled with clean angular material. Just like traditional roadways, the strength of the structure comes from the binding together of the infill, but with CellWebTM this is achieved without compaction and without reduction in permeability.

Perforated ceil walls allow the angular infill to bind with the contents of the adjacent cell, but with sufficient space for the movement of water and air to nearby tree roots. As the infill contains no fines and the geotextile layers prevent clogging from particles washing into the system, the structure remains permeable to water over time and protects the roots for the lifetime of the tree.

As well as being quick and easy to install, CellWeb^{IM} also dramatically cuts down the depth of sub-base required, in most cases by as much as 50%, further reducing costs. CellWeb^{IM} significantly reduces. surface rutting, increasing the long-term performance of the finished surface and ensuring that tree roots remain protected from vertical loads.

CellWeb can be used as a permanent solution or alternatively the system can be used in a temporary situation. In a temporary application the system can be used for the required period of time, then removed for use on another site or recycled, thereby adding to CellWeb's green credentials.

- No excavation Soil structure remains undisturbed; risk of root damage minimised.
- Porous infill Allows tree roots to conduct moisture and gas exchange.
- No compaction No need to compact the infill to achieve a load-bearing structure.
- Lateral stability Structure remains rigid to vertical loads.







Hydrological benefits

Water is a shrinking resource in the urban environment. As the extent of the built environment increases, more and more ground is being covered by impermeable hard surfaces that repel rainwater runoff, preventing it from reaching the roots of vegetation, and in particular trees. Rapid water runoff stretches the capacity of stormwater drains and frequently results in drainage management issues that are rarely resolved in favour of adjacent trees.

Using CellWeb[™] mitigates these issues by promoting both the vertical and the lateral movement of water, whether the system is installed above or below ground. The 'pores' that are created by the spaces between the infill stones and the cell perforations even allow water to flow to adjacent tree roots that are effectively 'trapped' under areas of impermeable hard standing. CellWeb[™] therefore helps to promote root growth and allows roots to continue to grow within areas of hard surfacing.













Design & installation

Final surfacing

The benefits of the CellWebTM system to trees can only be maintained if a suitably porous final surface is selected. An ideal surfacing is the DuoBlocks grass reinforcement and gravel retention system, a visually attractive surface that has the advantage of being fully porous. Alternatives include block paviors, porous asphalts and loose or bonded gravel.

Call the Geosynthetics sales team on 01455 617 139 for more advice on surfacing options and other products and systems.

Advice and product selection

Geosynthetics Limited has been supplying the CellWebTM system for many years and has acquired solid experience in its application. No two contracts are the same, and we understand the factors that need to be taken into account to specify the right CellWebTM product.

We provide a FREE consultation, design and advisory service to find the solution that is most cost-effective and beneficial for your site. Our service includes product selection, CAD drawings and full instructions to help you from project conception to completion.

Call our sales office on 01455 617 139 for specification details and project-specific design assistance.

CellWeb[™] in action: Access road for the Lake District National Parks Authority.



Site before construction pictured above.



Installation of the CellWeb™ system.



Four years later.

Technical specification

Product Specifications

Properties	Standard Cell
Material	Virgin HDPE
Wall thickness	1.25mm
Seam welding	Ultrasonic to 100% of seam length
Cell depth	75, 100, 150, 200 and 300mm
Width of expanded panel	2.56m
Length of expanded panel	8.1m
Cell diameter (expanded)	259 x 224mm

Certified Quality





Geosynthetics Ltd



Geosynthetics Limited

Fleming Road, Harrowbrook Industrial Estate Hinckley, Leicestershire LE10 3DU.

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