CANNON
CONSULTING ENGINEERS
Highways. Transport & Infrastructure Planning

The Waterhouse

800 Group Construction Management Plan

CCE/V321/CMP

August 2017

Document Review Sheet

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Document Status

Rev	Date	Issue	Author	Checked

Contents

1 Executive Summary

1.1 Cannon Consulting Engineers Ltd has been commissioned by Leonard Lewis 'the client' to prepare a Construction Management Plan in liaison with 800 Group for the proposed refurbishment of The Waterhouse, Millfield Lane. The proposed development includes the erection of a single storey side extension, 2 storey front infill extension, and part single part two storey rear extension, including facade and roof alterations to main house and front wing; erection of a side extension to outbuilding in rear garden to be used as ancillary habitable accommodation; and landscaping works including external ramps.

1.2 The site is currently occupied by a 2 storey house and swimming pool. The house was rebuilt following a fire in the 1970's and extensively modified and extended in the 1990's. The site form part of the original estate of Fitzroy Farm which has been subdivided into the current plots during the post war period.

1.3 The only vehicle access along Millfield Lane. Pedestrians can access the site from Millfield Lane and via a narrow pedestrian access from the rear of the property onto Fitzroy Park.

Pre-application Community Engagement

1.4 As part of the scheme development, the client and their project team have carried out extensive pre-application community engagement in the months leading up to submission of the planning application. This Construction Management Plan (CMP) has been produced to:

- Respond to the sensitive nature of the location;
- The concerns raised by local residents and interested parties;
- Set out the methodology of access and construction management; and
- Ensure the character of Millfield lane is retained.

1.5 This CMP will build on the Camden Pro-forma for CMPs to provide a robust and responsible construction methodology.

1.6 In July 2017 following tender 800 Group were formally appointed as principal contractor and their programme is based on the initial requirements as presented in the CMP documentation submitted with the planning application for the site (ref:2017/3692/P)

1.7 Table 1.1 highlights responses to key issues raised by neighbouring residents which is detailed further within this report.

Issue	Response	Further Detail in Report
Volume/Weight/Type of vehicle	Careful consideration has been given to the size of vehicles and frequency	Section 3 – Vehicle type Section 6.2 - frequency
Proximity to Ladies Pond	Respecting the Ladies' Pond and their constitution	Section 4.6, 4.7, 5.4, 6.2, 6.32-6.34, 6.40-6.42
Maintaining Millfield Lane	Millfield lane will be monitored daily and repairs undertaken as required	Section 6.31
Hours of working	Traffic associated with works will only occur on weekdays between 8am and 6pm.	Section 6.17
Speed of vehicles and use of the lane	All movement to occur at walking speed with marshals	Section 6.29
Construction Working Group	A construction working group will be set up and chaired by 800 Group	Section 6.2-6.3
Private Land ownership	The entirety of Millfield Lane is private (although unregistered in part). This will be respected.	

Table 1.1 – Key issues addressed

1.8 This report comprises of the following:

- Section 2 details 800 Group experience and company information
- Section 3 details the vehicle fleet for the project
- Section 4 describes the characteristics of Millfield Lane
- Section 5 details Engagement with interested parties
- Section 6 details the construction methodology
- Section 7 is a summary for quick reference

2 800 Group – Company experience

2.1 This section of the report provides information in relation to 800 group who are the principal contractor and will be responsible for the delivery of the Construction Management Plan.

2.2 800 Group have over 30 years of experience within the construction industry and has worked on a number of projects within the Fitzroy Park area. The following is a summary of projects completed and on-going that demonstrate that 800 Group are suitably experienced in terms of the location and scale of project proposed to deliver the requirements of the CMP.

Local Experience

2.3 Table 2.1 provides a summary of experience that 800 Group have in relation to projects within the Fitzroy Park area and similar scale of projects.

Fitzroy Park Project Experience	
1 Fitzroy Park, N6	
Status	Completed 2012
Description	Installation of new windows and boiler plant and various small works including decorations. Ongoing small works and maintenance
3 Fitzroy Park, N6	
Status	Completed 2010
Description	Guest house to Victorian villa (No. 5), Mechanical & Electrical Installation, Structural Design, Bespoke Cabinetry and Joinery
The Summit, (No. 5) Fitzroy Park, N6	
Status	Completed 2010
Description	Refurbishment of Victorian villa with guest house attached (No 3.). Large rear garden room extension, Mechanical & Electrical Installation, Structural Design, Bespoke Cabinetry and Joinery
10 Fitzroy Park, N6	
Status	Completed December 2008
Description	Extensive refurbishment of Grade II Listed Building on private road in Highgate. Contemporary side extension with structural glazing. External tennis court and external swimming pool with infinity edge. Mechanical & Electrical Installation, Structural Glazing & Steelworks
Fitzroy Lodge, Fitzroy Park, N6	
Status	Completed/Ongoing
Description	Full Internal and external restoration and refurbishment. Construction of extension and conversion of garage to living

	accommodation. Ongoing small works and maintenance
Fitzroy Farm, Fitzroy Park, N6	
Status	Ongoing small works and maintenance

Table 2.1 – Project Experience in Fitzroy Park

2.4 All of the above projects have been carried out in accordance with the strict access/logistical limitations of Fitzroy Park and Millfield Lane and have involved liaison with the Fitzroy Park Residents Association and other community engagement to ensure compliance.

2.5 800 Group have also previously carried out another project with the same Design/client team namely, 1 Frognal Gardens NW3. Projects undertaken of a similar scale to the proposed refurbishment are shown in table 2.2.

Similar Project Experience	
Tregunter Road, SW10	
Status	Due for completion August 2017
Description	Partial demolition and reconstruction of residential house including double-depth basement excavation/formation including swimming pool installation.
1 Frognal Gardens, NW3	
Status	Completed May 2013
Description	Partial demolition and reconstruction of residential house including basement excavation/formation inclusive of swimming pool installation.
25 Bracknell Gardens, NW3	
Status	Completed February 2014
Description	Partial demolition and reconstruction of residential house including basement excavation/formation inclusive of swimming pool installation.

2.6 800 Group have been appointed based on their successful track record on similar projects and their understanding of the local context and are fully committed to delivering the CMP.

2.7 The 800 Group Project Manager will also operate as a liaison manager and will set up a communication forum along with regular meetings with interested parties to provide updates and general interaction with residents.

2.8 800 Group are providing 3 points of contact for this project as follows:

- Matt Elms – Project Manager
- Spencer Kean – Site Project Manager
- Caroline Somerset – Off-site 800 Group Liaison

Matt Elms

Spencer Kean

2.9 800 Group contact details will be circulated to relevant parties and will be clearly displayed on literature for the site.

3 Vehicle Fleet

3.1 800 Group operate their own fleet of vehicles and are located in Potters Bar where the fleet of vehicles will be managed from. The location of their depot allows for off-site consolidation and storage of materials. As a result the majority of the proposed fleet of vehicles will comprise Light Goods Vehicles (LGV) only.

3.2 A vehicle with a gross vehicle weight of not more than 3.5 tonnes is categorised as an LGV. These vehicles will be primarily petrol and LPG and this will limit the exposure of particulate matter to users of the lane and the local environment.

3.3 Due to the flexible nature of commercial vehicles this scale of vehicle can include pick-up trucks and panel vans. The largest vehicles requiring access to the site will be those utilised for waste collection.

3.4 The route for all vehicle traffic will be via the A1 which forms part of the North West Area Red Routes. Vehicles will depart the red route via the B519 North Hill and Highgate West Hill before accessing Merton Lane.

3.5 Swept path analysis of the proposed vehicle fleet has been undertaken and is demonstrated in Appendix A.

3.6 The largest form of vehicle anticipated to be used for these works will be a modified vehicle for refuse collection. The following images represent the vehicle that will be used for carriage of waste.

Image 3.1

Image 3.2

Image 3.3

3.7 The largest form of vehicle anticipated to be used for these works will be a modified vehicle for refuse collection. The following images represent the vehicle that will be used for carriage of waste

3.8 800 Group will resource deliveries to the site using its own fleet of vehicles which are primarily American vans. The following is taken from their office in Potters Bar and demonstrates the vehicles that will be administrated from their offsite facility.

Image 3.4

3.9 An example of a usual 800 group Chevrolet pickup which will be used in the course of activities for the development are shown using Millfield Lane over the following images:

Image 3.5

Access from highway onto private section of Millfield Lane

Note: All construction movements will use marshals

Image 3.6

800 Group pickup with access to the Waterhouse

Note: All construction movements will use marshals

4 Characteristics of Millfield Lane

4.1 Millfield Lane is a private road and falls within the ownership of adjacent land owners and is managed and maintained by City of London. The surface of the road has been created to provide the finished effect of an unmade track.

4.2 Millfield Lane varies in width and is primarily a pedestrian route although it does accommodate a small number vehicular traffic movements per day. A survey undertaken on 7th April 2011 identified in excess of 200 pedestrian movements between 8am and 8pm. However, this is not a suitable snapshot of the lane given that seasonal impacts can result in thousands of pedestrians benefitting from use of the lane.

4.3 17 vehicle trips were recorded on Millfield Lane during the same period with the type of vehicles recorded as cars, light goods vehicles and motorcycles. This can be roughly rounded to 8/9 two-way trips between the hours of 8am and 6pm.

4.4 Based on discussions and visual inspection this would appear to be a typical volume of vehicle traffic on Millfield Lane.

4.5 Millfield Lane is also used for cycling and dog walking and is an attractive leisure route as well as providing access to the Kenwood Ladies' Pond.

4.6 Millfield Lane provides access to the Kenwood Ladies' Pond which for the majority of the year opens at 7am. The duration of opening varies greatly throughout the year and the times are summarised in table 4.1.

Period From	Open	Vacate Water	Vacate Facility
26 March	7am	4.30pm	4.45pm
16 April	7am	6.30pm	6.45pm
7 May	7am	8.30pm	8.45pm
20 August	7am	7.30pm	7.45pm
29 August	7am	6.30pm	6.45pm
24 September	7am	4.30pm	4.45pm
29 October	7am	2.15pm	2.30pm
3 December	7.30am	2.45pm	3pm
28 January 2018	7am	2.15pm	2.30pm
25 March 2018	7am	4.30pm	4.45pm

Table 4.1 – Ladies Pond opening times

4.7 The Kenwood Ladies' Pond constitution is provided in Appendix B and has been considered as forming part of the character of Millfield Lane. 800 Group are committed to respecting the constitution of the Ladies' Pond in particular the following:

*'….**to promote the interests of the users of the Pond so that it may continue to provide** for women and girls, irrespective of race, disability, class or sexual orientation, **a quiet , peaceful place to swim and relax**' and;*

*'**to promote diversity of access to the Pond, positively encouraging its use by women in the locality irrespective of background**.'*

4.8 A topographical survey has been undertaken for the length of Millfield Lane and this data has been utilised in producing the swept path analysis associated with this CMP. For the access on Merton Road OS data was obtained and overlaid using geo-referencing.

4.9 The lane as constructed has been the subject of discussions and has also had a number of tests undertaken in recent years. California Bearing Ratio tests were instructed and the information supplied to Cannon Consulting Engineers. It is intended that the CBR outputs form part of any condition survey and that tests will be undertaken on completion of the works. A copy of the CBR results are contained in Appendix C.

5 Engagement with interested parties

5.1 As part of the pre-planning process a number of consultations were held presenting the proposed scheme and seeking further views from interested parties.

5.2 A summary of when these consultations occurred and with whom is provided in table 5.1.

Date	Consultation Activity
28 April 2017	**One to one meetings** to discuss emerging plans and consultation strategy with: • Bob Warnock (Superintendent of the Heath) – City of London • Jonathan Mears (Conservation and Trees Manager) – City of London
4 May 2017	**One to one meeting** with Karen Beare, Chair of Fitzroy Park Residents Association (FPRA)
18 May 2017	**Open House Event** at The Water House (4-7pm) • Invitation letters sent to all residents in local area (Millfield Lane, Fitzroy Park, Fitzroy Close and Millfield Place) • All local amenity groups, ward councillors and stakeholders invited
19 May 2017	**One to one meeting** with Owner of Fitzroy Farm
28 May 2017	**One to one meeting** with Owner of Wallace House
30 May 2017	**One to one meeting** with Owner of 51 Fitzroy Farm
12 June 2017	**One to one meeting** with Owner of 1 Millfield Place
15th June 2017	**Walking meeting down Millfield Lane** to discuss tree protection measures and construction methodology with: • Bob Warnock (Superintendent of the Heath) – City of London • Jonathan Mears (Conservation and Trees Manager) – City of London • David Humphries (Trees Management Officer) – City of London
17 June 2017	**One to one meeting** with Owner of 55 Fitzroy Park
17 June 2017	**Hampstead Heath Consultative Committee** visit to the Waterhouse • Facilitated by the City of London, and attended by 12-15 representatives of local amenity groups who are interested in development bordering the Heath
22 June 2017	**One to one meeting** with Owners of Apex Lodge to discuss tree protection measures and construction methodology.
22 June 2017	**Walking meeting down Millfield Lane** to discuss tree protection measures and construction methodology with: • Karen Beare, Chair of Fitzroy Park Residents Association (FPRA) • Mary Powell and Nicky Mayhew, Ladies Pond

Table 5.1 – Consultation activity

5.3 A record of the comments made on the meetings held on 15th June and 22nd June is provided in Appendix D. These discussions were used to inform 800 Group during the tender process of specific requirements to be addressed within their construction methodology.

5.4 A number of fundamental matters were agreed following a review of comments raised. These included but were not limited to:

- Vehicular traffic to be limited to walking speed and escorted by two marshals at all times;
- That the right of passage of vehicles associated with these works was limited to the boundary of the site, effectively removing the ability to turn on Millfield Lane. As a result all turning will occur on site. See image 5.1;
- Ongoing maintenance to the lane will be required;
- That land owners be duly notified prior to any activity; and
- Emergency Access to the Kenwood Ladies' Pond be respected at all times.

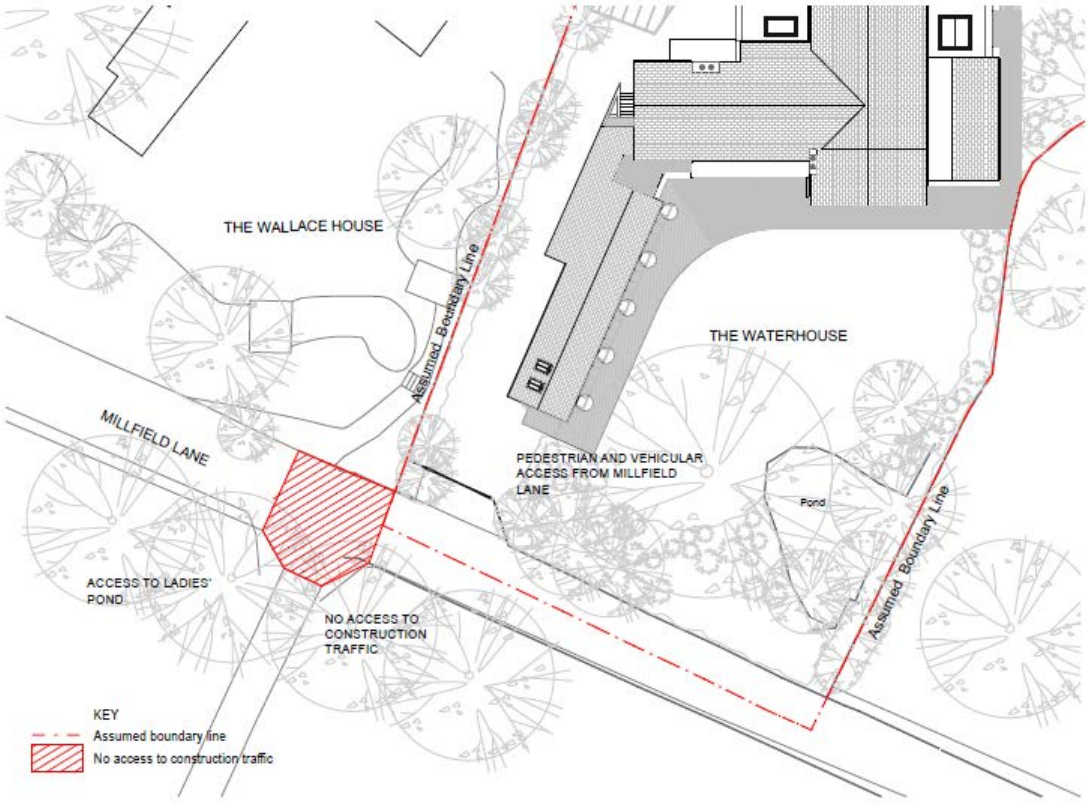


Image 5.1 - Extent of land available to access The Waterhouse

6 Construction Methodology

6.1 800 Group have appointed a named Project Manager – Matt Elms, who has intimate knowledge of working in Fitzroy Park from both a client and contractor perspective and who was involved in the Fitzroy Farm project including agreeing and managing the CMP. The site manager will be Spencer Kean.

6.2 Point of contact details will be provided directly to affected parties including but not limited to:

- Fitzroy Park Residents Association
- City of London
- Kenwood Ladies' Pond Association
- Residents
- London Borough of Camden

6.3 These parties will be invited to form part of a Construction Working Group for the duration of the project from pre-construction through to completion.

6.4 The working hours for the site will be Mon – Fri 8am to 6pm and 8am to 1pm on Saturdays. There will be no vehicle movements at weekends associated with the works unless prior written approval is obtained from the Construction Working Group and London Borough of Camden. This would only occur in exceptional circumstances.

6.5 An initial 62 week construction programme has been devised exclusive of FF&E works.

6.6 The key programme sequences and methodology are summarised as follows;

- **Site set up/Enabling – All areas**
  We show a 7 week period to set up the site, which importantly includes forming a vehicle turning facility at the top of the drive, erection of scaffolding, clearing away of foliage and carrying out the internal and external strip out/demolitions. This enabling work will then allow the main works to commence in week 7. Our proposal is to erect lightweight demountable cabins for office/welfare within the gardens.

  The external elements of demolition, i.e the removal of windows etc, will be carried out behind a fully sheeted and enclosed scaffolding to prevent any migration of dust or debris. The demolition elements will be carried out by hand using hand held small power tools where necessary. We envisage that all demolition materials will be removed from site by means of small open backed LGV vehicles and/or small skips as required.

- **Structural/Shell works to main house**
  We show two concurrent sequences during this 21 week period.
  The first sequence is the external groundworks and construction of the side, rear and first floor extensions to a weathertight shell
  The second sequence is the internal structural works including the formation of the lift shaft, new staircase, structural steelwork and new/lowered floor slabs. This window installation completes this sequence

  The ground works will be the main source of bulk materials removed from and transported to site. There is opportunity to use some of the arisings to infill the

existing Pool structure and thereby reduce the amount of soil to be removed. Where soil is removed, it will be by small skip or LGV.

The groundworks comprise mass concrete underpins to the existing side wall of the house, pad foundations and ground beams with ground bearing slabs to the new side and rear extensions and an reinforced concrete hydro pool structure. We plan to carry out the groundworks in a continuous 12 week sequence.

Soil will be excavated by hand in some instances and also by means of small JCB type digger and excavator.
Where possible, we plan to mix concrete on site, however for the larger foundation constructions, we envisage using readymix type concrete vehicles
Following completion of the groundworks, the new extensions to the side and rear elevations will be constructed using traditional masonry cavity walls with timber roof structures and traditional roof coverings. Brick/block laying mortar will be mixed on site.

The new windows will be designed to ensure that they can be delivered to site in the appropriate and agreed sized vehicles.

- **Structural/Shell works to existing Pool house**
  This 10 week sequence of works is also partly concurrent with the Structural/Shell works to the main house above and ends with the window installation.

  There are new concrete pier foundations to the front of the existing Pool house and a small section of concrete retaining wall to be constructed to the rear elevation. These groundworks will be carried out over a 4.5 week period, simultaneously with the main house groundworks, using the same methodology.

- **Structural/Shell works to outbuilding**
  This 8 week sequence is concurrent with the latter stages of the main house Structural/Shell works and ends with the window installation.

  There is a small extension to the existing ground slab which is formed by means of 6no mini piles and a concrete ground beam and slab. The mini piles will be formed by use of a mini piling rig which will be transported to site on an LGV vehicle. We envisage the use of a silenced power pack to run the Mini piling rig to avoid any machine noise nuisance. These groundworks will be carried out over a 2.5 week period simultaneously with the main house/pool groundworks.

- **Fitout to main house and outbuilding**
  We show a 36 week sequence which commences with the Hydro-pool shell and fitout works following completion of the Pool shell.
  The fitout works to the main house commence on completion of the roof finishes to the rear extension.

  Where possible, the internal finishes will be prefabricated and prefinished to minimise both deliveries and the works on site.

- **External works**
  This 24 week sequence commences with the roof repair works to the main house, followed by works to chimneys and flues and external rendering. Other external works include elements of hard landscaping, i.e relevelling of areas, steps and paving adjacent to the house. The external decorations will be carried out during the summer when the weather should be favourable.
- **Landscaping**
  This is an indicative 8 week sequence subject to the final scope of works.
  This work will predominantly be the 'soft' landscaping involving planting and works to existing greenery.

- **Summary of durations/estimated labour levels**

  a. **Site set up/enabling**
  7 week duration. Estimated labour 8-16 operatives

  b. **Structural/shell works to main house**
  21 week duration. Estimated labour 15 - 25 operatives

  c. **Structural/shell works to existing pool house**
  Concurrent 10 week duration. Estimated labour 15 - 25 operatives

  d. **Structural shell works to outbuilding**
  Concurrent 8 week duration. Estimated labour 15 - 25 operatives

  e. **Fitout to main house and outbuilding**
  36 week duration. Estimated labour 20 – 35 operatives

  f. External works
  Concurrent 24 week duration. Estimated labour 20 – 35 operatives

  g. Landscaping
  Concurrent 8 week duration. Estimated labour 20 – 35 operatives

Site Access

6.7 Vehicle access to the site will be via Millfield Lane. There will be two full-time banks people / security to supervise all access into the property. There will be no parked vehicles on-site and vehicles will only remain on-site for the period of loading/unloading, as required.

6.8 The existing gates will be used for access with security information so that the site can be readily identified in the event of an emergency. The form of signing will be discussed as part of a Construction Working Group.

6.9 All vehicle turning will take place on-site and a turning area will be created at the end of the existing drive. The 800 group fleet can accommodate the majority of tools and materials required, whilst being of an appropriate scale to safely navigate Millfield Lane. Additional measures will be in place to respect the nature of Millfield Lane.

Site Set-up

6.10 Demountable cabins will be erected within the south elevation garden and will be used as office, welfare, meeting room and storage.

6.11 Wheel washing facilities will be provided on-site by means of a jetwash to prevent any transfer of mud/debris from the site onto Millfield Lane. Washing facilties will be laid out to prevent any run-off onto Millfield Lane.

6.12 On average there will be between 15 and 35 operatives on site with the maximum number of operatives attending site during the fit out phase.

6.13 Scaffolding will be set up in phases to suit the sequence of works and 'Monarflex' sheeted to provide containment of dust and for aesthetic purposes. Scaffolding will be alarmed and connected to a monitoring station.

6.14 All reasonable efforts to reduce the impact of noise, dust and other disruption throughout the project. 800 group have built their reputation on working respectfully and considerately on projects. As such they will maintain a dialogue with neighbours throughout the construction programme.

6.15 During the finishes stage an overnight security watchperson will remain on site.

Vehicle Movements

6.16 The overall strategy towards accessing the site from Millfield Lane is based on the following principles:

- 800 Group off-site consolidation and storage facility, allowing material deliveries to site in smaller 800 Group LGV vehicles and timed to suit any restrictions and/or avoid peak times, particularly in respect of the Ladies Pond.
- Materials and plant delivered to site by smaller 800 Group LGV vehicles that can turn within the site and have suitable ground clearance to enter without grounding.
- Smaller LGV vehicles will prevent congestion at the bottom of Millfield Lane and adjacent roads.
- Waste collections by small trucks rather than heavier skip lorries
- Full time Banksmen to marshal vehicle movements in and out of the site.

6.17 Use of Millfield Lane to vehicles associated with the development will be restricted to Monday – Friday, 8 am to 6pm only. Should there be a requirement to traffic the lane at other times then the principal contractor will contact the Construction Working Group and London Borough of Camden with more than 72 hours notice.

6.18 The site constraints require a smaller fleet of vehicles which are more in keeping with those vehicles that currently make use of Millfield Lane. This will reduce the wear on the lane and proximity to vegetation.

6.19 No cutting back of vegetation on private property will be required to accommodate the proposed vehicle fleet.

6.20 Vehicles will only travel in forwards gear on Millfield Lane. Along with the use of marshals vehicles will restrict speed to a walking pace and will use hazard lights at all times. In hours of darkness marshals will use torches and vehicles will use dipped headlights. Marshals will wear 800 Group hi-vis at all times for identification safety and identification purposes.

6.21 As such, whilst there may be times where 800 Group staff are actively using the lane and are waiting for a delivery vehicle to arrive they will be identifiable and acting professionally.

6.22 The estimated daily movements for the construction phase are as follows:

- Weeks 1-6: 6 vehicles per day
- Weeks 7-27: 9 vehicles per day

- Weeks 28-62: 9 vehicles per day

6.23 All deliveries will be consolidated off-site at the 800 Group depot in Potters Bar. This allows for the management of deliveries to ensure that the restricted working hours are respected. This also allows for the number of deliveries to be kept to a minimum and for timing of deliveries to be effectively managed.

6.24 Deliveries will be managed so that no vehicles are waiting on Millfield Lane at any time. This can be achieved by circulating any delivery on local roads without the need to suspend parking bays. As the vehicle fleet is petrol and LPG the strategy to circulate traffic will not have a detrimental impact on air quality.

6.25 800 Group will resource deliveries to the site using its own fleet of vehicles which are primarily American vans. An example of the Chevrolet pick-up using the lane is provided in Image 6.1 and 6.2.

Image 6.1

Image 6.2

6.26 As noted in Chapter 4 there were approximately 8/9 two-way vehicle trips on the lane recorded during the period 8am and 6pm.

6.27 The size and quantum of vehicles are in keeping with the existing use of the lane and as a result significant wear to Millefield Lane is not anticipated. However, daily inspections of the surface will be undertaken.

6.28 800 group are committed to a vehicle movement strategy which will be employed to ensure that vehicles are only located on Millfield Lane as follows:

'We will implement a delivery/collection protocol to avoid any vehicles waiting at the junction of Fitzroy Park and Millfield Lane. All delivery/collection vehicles will need to phone the Site Manager or Marshals in advance of entering either Merton Lane or the bottom of Millfield Lane/Highgate West Hill to check that there are no other delivery vehicles at the site and/or that the roadway is clear. If there is any reason why the planned deliveries cannot enter the section of roadway to the site, the drivers will be instructed to wait outside of the area until notified that the delivery/collection can take place.'

6.29 During the construction phase all vehicles entering or leaving the site will be marshalled with one marshall in front and one marshall behind the vehicle. Marshalls on Millfield Lane will communicate via 2-way radio. Vehicles will be limited to travel at walking pace, in the region of 3 miles per hour.

6.30 This approach will ensure the safety of all users of the lane including pedestrians, cyclists and escorted animals. Signage will encourage walkers to place pets on leads in the activity zone.

6.31 A strategy for any repairs to Millfield Lane will need to be agreed with City of London to ensure that users of the lane are not impacted. An initial condition survey of the lane surface will be undertaken with photographic records and held on record until construction is completed.

Emergency Access

6.32 Emergency access is required to the Ladies Pond from Millfield Lane. As noted there will be relatively few traffic movements associated with the development and these will be marshalled at all times.

6.33 In the event of an emergency at the Ladies Pond any vehicle on-site will be held until such time that the emergency has passed.

6.34 If a vehicle is on the lane when an emergency occurs the marshals will establish with users of the lane the need to remove the vehicle from Millfield Lane as quickly and reasonably as practicable.

Considerate Constructors & CLOCS

6.35 The site will be registered with the Considerate Constructors Scheme which incurs a fee based on the cost of construction. This will provide additional signage on-site for those who would prefer to contact a third party should they have a cause for concern.

6.36 The requirement for CLOCS is usually for vehicles greater than 3.5T and relates to larger delivery vehicles and road safety of pedestrians and cyclists.

6.37 Having reviewed the proposed vehicle fleet and giving consideration to the use of marshals for all vehicle movements it is considered that safety has been addressed. As the London Borough of Camden is a CLOCS champion the Project Manager will notify CLOCS of the proposed scheme for information purposes.

National Association of Women in Construction (NAWIC)

6.38 800 Group will make contact with the London and South East branch of NAWIC and encourage a discussion to promote opportunities for women in construction on this project.

6.39 800 Group have an excellent reputation but recognise the unique location and proximity to the Ladies' Pond carries additional challenges. A female contact person will be advertised at all times on site literature to provide an alternative contact from the lead project manager. The contact for 800 Group will be Caroline Somerset.

Travel Plan

6.40 Prior to attendance at site a briefing note will be circulated to all individuals attending site advising them on sustainable transport opportunities and that no vehicles will be able to access the site unless part of the delivery plan.

6.41 Further, all staff will be provided with information relating to the Kenwood Ladies' Pond and the expectation for professionalism when attending site.

6.42 Staff will be notified that they must be considerate of users of Millfield Lane at all times and they should not use Millfield Lane for any reason other than access and egress from the site. Any reports of behaviour below the standard expected will be dealt with formally by 800 Group.

7 Summary

7.1 The works proposed will allow for the refurbishment of 'The Waterhouse'. The scale of project allows for the appointment of a specialist contractor who has experience for the scale of project and the local area.

7.2 800 Group have an excellent reputation and have been appointed based on their experience and knowledge of the local area. They recognise the sensitive nature of the location and have appointed 3 staff members as contacts:

- Matt Elms – Project Manager
- Spencer Kean – Site Manager
- Caroline Somerset

7.3 800 Group will chair a Construction Working Group with immediate effect and the first discussions will occur during the planning consultation of this CMP.

7.4 Overall, inclusive of the usual movements by private vehicles and the Corporation of London, as well as 800 Group, it is anticipated that there will be no more than 20 two-way trips on the lane per day during the hours of construction, 8am to 6pm. Half of these trips will be associated with the proposed development.

7.5 The use of vehicles commonly associated with trafficking the lane has been encouraged to ensure no 'unusual' wear or detriment to Millfield Lane. As such any eroding to the surface of the lane during the construction cycle will have no impact greater than reducing the effective life of Millfield Lane by 1 calender year.

7.6 A visual condition survey will be carried out by 800 Group and City of London. Private landowners adjacent to Millfield Lane will be invited to attend. The documentation and a copy of the CBR previously undertaken will be shared with all affected parties.

7.7 800 Group and City of London will agree an on-going strategy for reparations to the lane during the construction phase.

7.8 No vehicle movements will be associated with the development at weekends unless written permission is obtained from London Borough of Camden, City of London and the Construction Working Group.

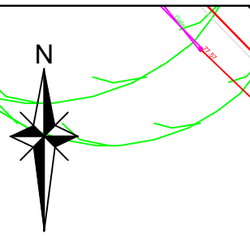
7.9 800 Group staff using Millfield Lane will be identifiable at all times by wearing branded 800 group Hi-vis jackets.

7.10 Vehicles will not 'wait' on or near the access to Millfield Lane and will only arrive when Marshals are in attendance. If marshalls are not in attendance deliveries will circulate on the local highway network away from the access.

7.11 In the event that any 'unusual' vehicle, not classed as an LGV or smaller is required for works associated with the development then written consent must be obtained from London Borough of Camden and City of London. The adjacent landowners and Construction Working Group must also be notified.

7.12 Upon completion of the project a further visual condition survey and new CBR tests must be undertaken and any final reparations agreed and completed by either 800 Group or an appointed contractor by City of London, as agreed.

Appendix A



7.5t Panel Van	
Overall Length	7.210m
Overall Width	2.192m
Overall Body Height	2.544m
Min Body Ground Clearance	0.316m
Track Width	1.865m
Lock to lock time	4.00s
Kerb to Kerb Turning Radius	7.400m

Apex

Lodge

REV	DESCRIPTION	CH	PA	DATE
.	.	.	.	.

PROJECT TITLE: The Waterhouse	CLIENT: UK & European					DATE: 03/08/2017	
DRAWING TITLE: Swept Path	DESIGNED: CM	DRAWN: CM	CHECKED: MK	PASSED: ??	SCALE @ A3: 1:200	ISSUE STATUS: CMP	DRAWING NUMBER: V321/002 / REV: .

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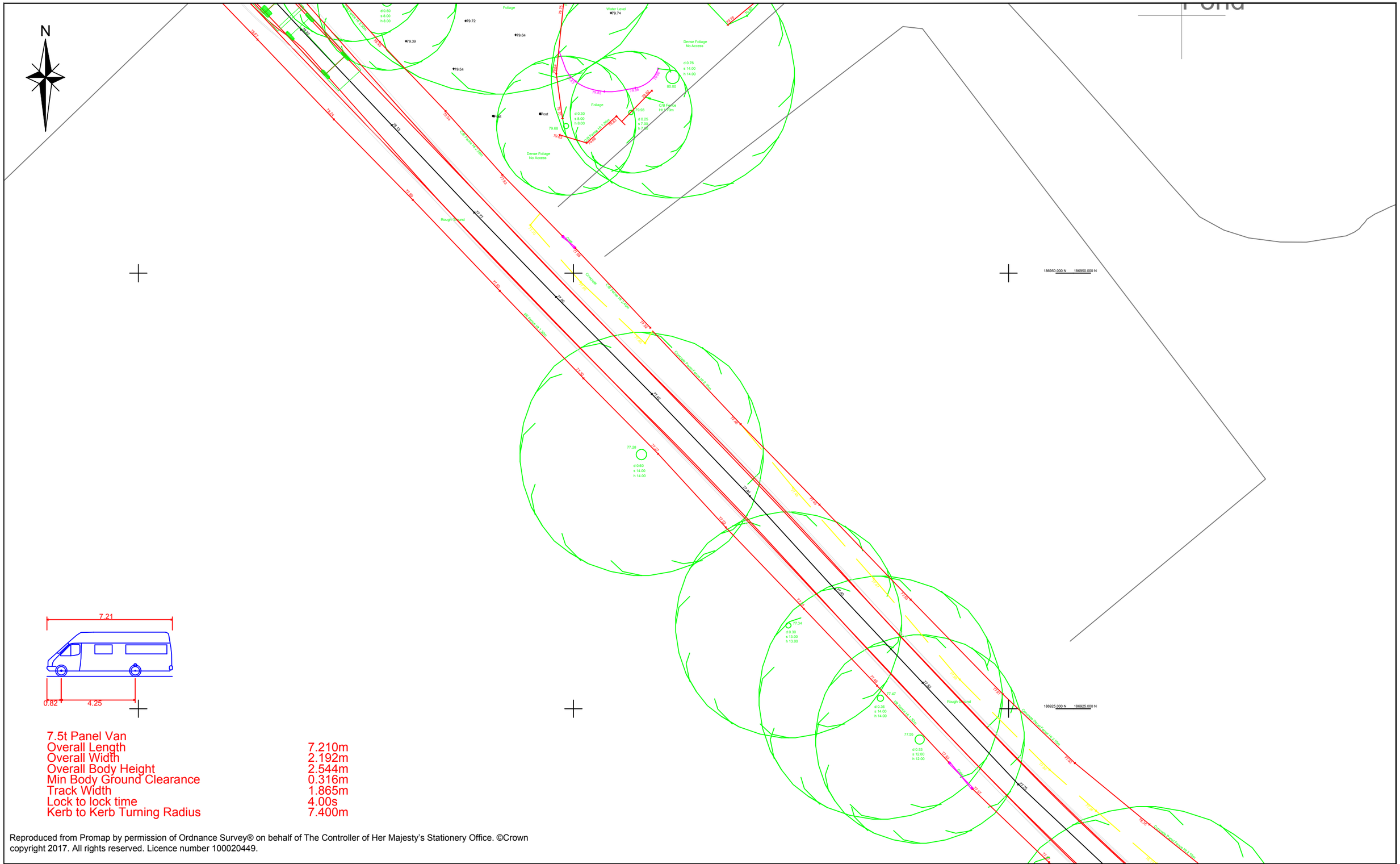

7.5t Panel Van	
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Overall Body Height	2.544m
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Track Width	1.865m
Lock to lock time	4.00s
Kerb to Kerb Turning Radius	7.400m

REV	DESCRIPTION	CH	PA	DATE
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PROJECT TITLE: The Waterhouse

CLIENT: UK & European

DATE: 03/08/2017

DRAWING TITLE: Swept Path

DESIGNED	DRAWN	CHECKED	PASSED	SCALE @ A3	ISSUE STATUS
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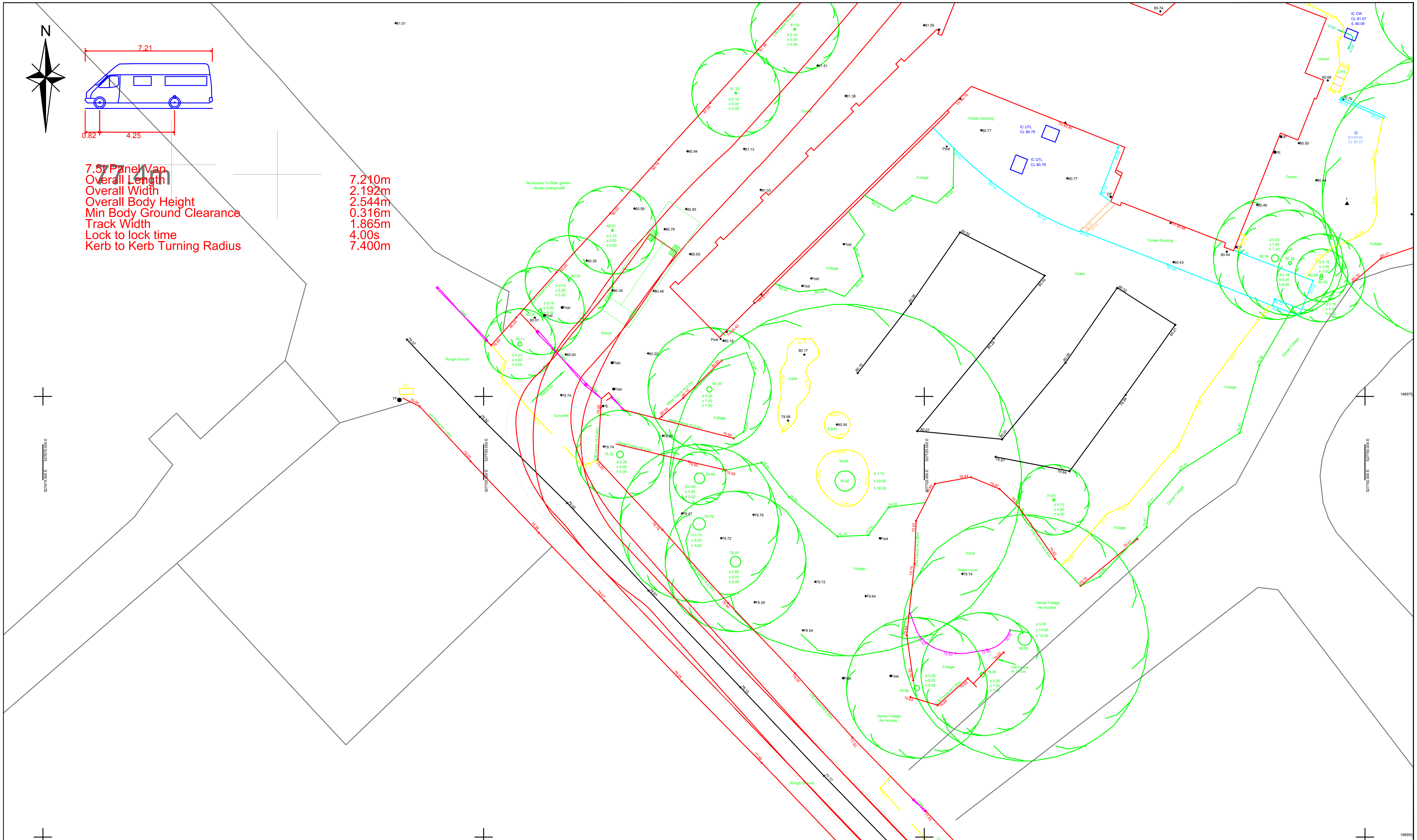
REV: .



REV	DESCRIPTION	CH	PA	DATE
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PROJECT TITLE: The Waterhouse

CLIENT: UK & European

DATE: 03/08/2017

DRAWING TITLE: Swept Path

DESIGNED	DRAWN	CHECKED	PASSED	SCALE @ A3	ISSUE STATUS
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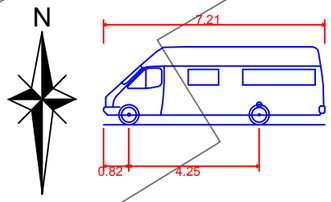

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Overall Length	7.210m
Overall Width	2.192m
Overall Body Height	2.544m
Min Body Ground Clearance	0.316m
Track Width	1.865m
Lock to lock time	4.00s
Kerb to Kerb Turning Radius	7.400m

REV	DESCRIPTION	CH	PA	DATE
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PROJECT TITLE: The Waterhouse	CLIENT: UK & European					DATE: 03/08/2017	
DRAWING TITLE: Swept Path	DESIGNED: CM	DRAWN: CM	CHECKED: MK	PASSED: ??	SCALE @ A3: 1:200	ISSUE STATUS: CMP	

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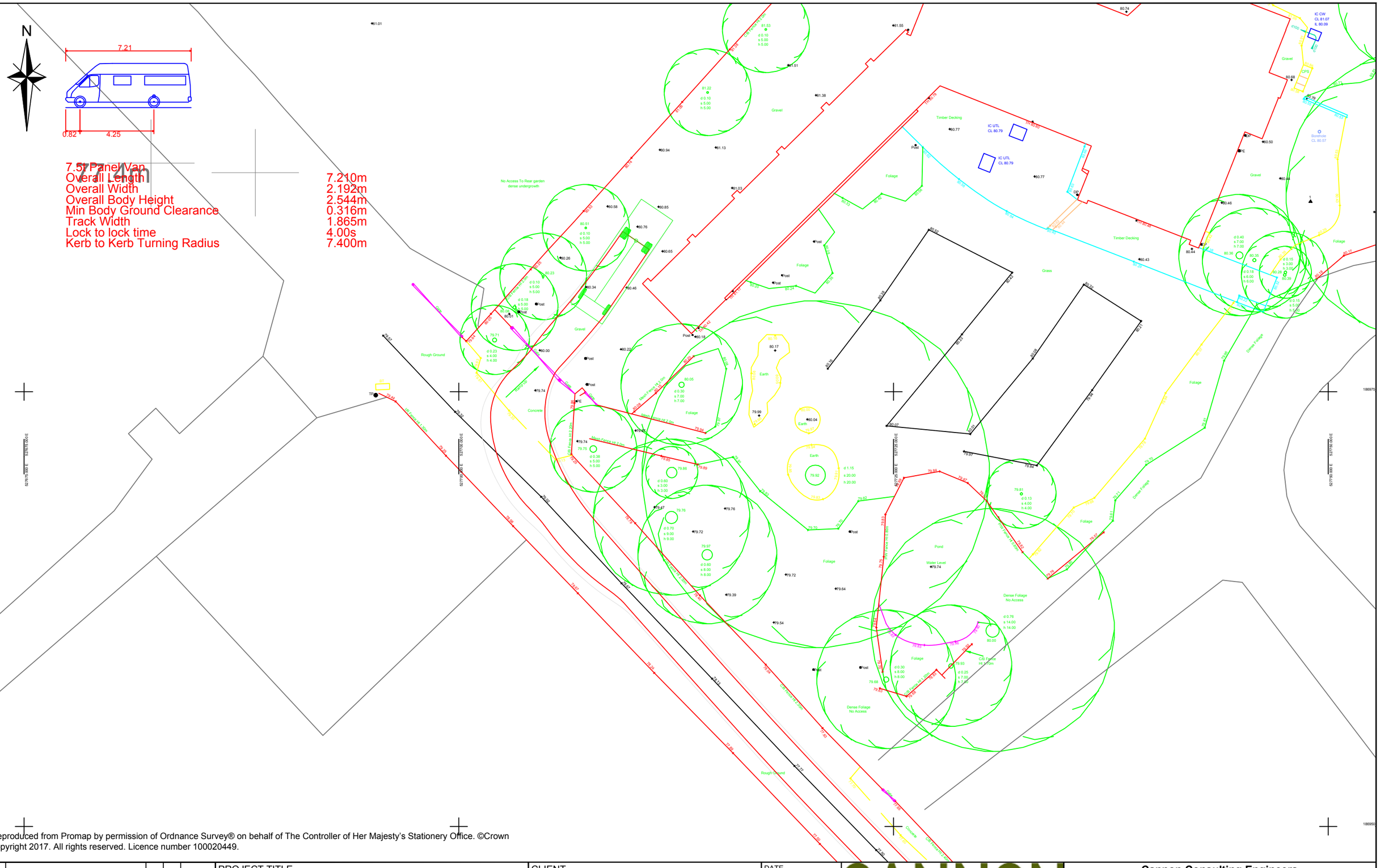
DRAWING NUMBER: V321/005 REV: .



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REV	DESCRIPTION	CH	PA	DATE
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PROJECT TITLE: The Waterhouse	CLIENT: UK & European					DATE: 03/08/2017	
DRAWING TITLE: Swept Path	DESIGNED: CM	DRAWN: CM	CHECKED: MK	PASSED: ??	SCALE @ A3: 1:200	ISSUE STATUS: CMP	DRAWING NUMBER: V321/006 / REV: .

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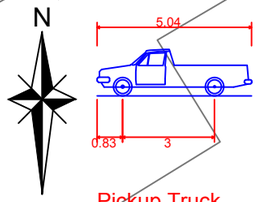

Pickup Truck	
Overall Length	5.040m
Overall Width	1.750m
Overall Body Height	1.515m
Min Body Ground Clearance	0.289m
Track Width	1.710m
Lock to lock time	4.00s
Kerb to Kerb Turning Radius	5.900m

REV	DESCRIPTION	CH	PA	DATE
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PROJECT TITLE: The Waterhouse	CLIENT: UK & European					DATE: 03/08/2017	
DRAWING TITLE: Swept Path	DESIGNED: CM	DRAWN: CM	CHECKED: MK	PASSED: ??	SCALE @ A3: 1:200	ISSUE STATUS: CMP	DRAWING NUMBER: V321/007 / REV: .

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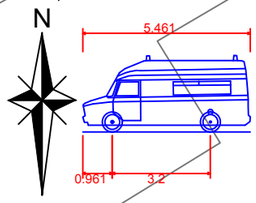

Ambulance	
Overall Length	5.461m
Overall Width	2.020m
Overall Body Height	2.498m
Min Body Ground Clearance	0.225m
Track Width	1.860m
Lock to lock time	4.00s
Kerb to Kerb Turning Radius	6.500m

REV	DESCRIPTION	CH	PA	DATE
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PROJECT TITLE: The Waterhouse	CLIENT: UK & European					DATE: 03/08/2017
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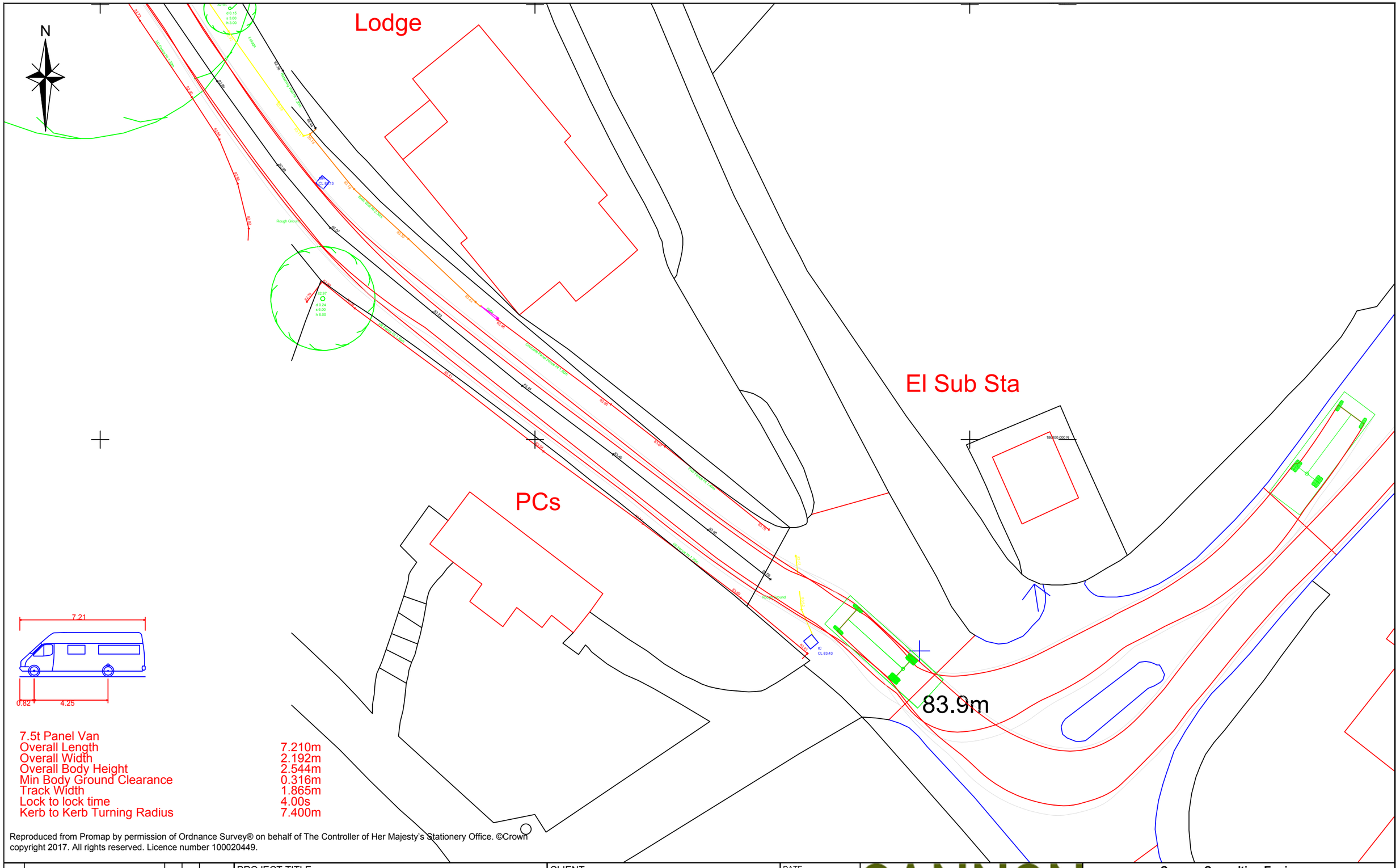
DRAWING NUMBER: V321/008 REV: .



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Lock to lock time	4.00s
Kerb to Kerb Turning Radius	7.400m

REV	DESCRIPTION	CH	PA	DATE
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PROJECT TITLE: The Waterhouse

CLIENT: UK & European

DATE: 03/08/2017

DRAWING TITLE: Swept Path

DESIGNED	DRAWN	CHECKED	PASSED	SCALE @ A3	ISSUE STATUS
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DRAWING NUMBER: V321/001

REV: .

Appendix B

Kenwood Ladies' Pond Association - Constitution

Title

1) The name shall be "Kenwood Ladies' Pond Association" referred to henceforth as "the Association".

Purposes

2) The purposes of the Association shall be:

   (a) to represent the views and interests of the users of the Pond to the authority responsible for Hampstead Heath;
   (b) to promote the interests of the users of the Pond so that it may continue to provide for women and girls, irrespective of race, disability, class or sexual orientation, a quiet , peaceful place to swim and relax;
   (c) to seek to co-operate with staff in the proper running and maintenance of the Pond; and
   (d) to promote diversity of access to the Pond, positively encouraging its use by women in the locality irrespective of background.

Membership

3) Membership shall be open to all users of the Pond. The Management Committee shall be empowered to refuse or withdraw membership to any woman acting against the interests of the Association. There shall be a right of appeal to an Appeals Sub-Committee whose members shall be nominated at the Annual General Meeting. This sub-committee shall consist of 3 members.

Subscription

4) Each member shall pay an annual subscription. The financial year shall run from 1 April to 31 March. The subscription shall be reviewed annually at the Annual General Meeting. Annual subscription is payable by 1 April each year. Those who have not paid by 31 May for the previous year will be deemed to have lapsed their membership.

Management of the Association

5) The affairs of the Association shall be co-ordinated by a Management Committee of not less than eight women who are regular users of the Pond, elected by the members of the Association at the Annual General Meeting. The Management Committee shall meet not less than 3 times per year. Any vacancies that occur during a year may be filled by co-option by the Management Committee. A quorum for meetings of the Management Committee shall be six. ("Regular users" shall include those who regularly swim winter and summer; those known to be regular summer swimmers; and others accepted as having a special interest in the Pond).

6) The Management Committee shall comprise of the following positions:

   (a) Chair;
   (b) Vice Chair;
   (c) Secretary;
   (d) Treasurer; and
   (e) At least 5 additional "general" members.

7) Nominations for all positions on the Management Committee shall be sought 28 days before the scheduled Annual General Meeting. A nomination form will be included in the winter newsletter posted to all members. In order to be nominated a member should have subscriptions paid up to date. She should be nominated by two other fully paid up members who have signed the nomination form which should then be returned before the date of the Annual General Meeting.

8) Nominations for the Membership Appeals Sub-Committee will be sought annually, from fully paid up members of the Association at the Annual General Meeting. The three positions on the sub-committee may be nominated and seconded by members present at the meeting and the positions will be filled on the basis of those nominated being available "as and when needed" in the event of an appeal.

9) In general specific named positions (Chair, Vice Chair, Secretary and Treasurer) will be held for no more than 5 consecutive years by one individual. However by agreement of two thirds of voting members at the Annual General Meeting this period may be extended.

Annual General Meeting

10) The Management Committee shall call an Annual General Meeting and shall submit a report of the Association's activities during that year. The Annual General Meeting shall not be held later than the end of March each year. At least 28 days' clear notice of the meeting shall be given to all members of the Association and this shall include the invitation for nominations to the Management Committee. The quorum shall be not less than 10% of total membership.

11) The business of the Annual General Meeting shall include election of a Chair, Vice Chair, Secretary and Treasurer (the Officers of the Association), who shall all by virtue of those offices be members of the Management Committee. This meeting will also formalise the election of at least 5 other Management Committee members duly nominated.

12) The Management Committee may call any other Extraordinary General Meeting which it considers necessary, where possible giving 14 days' clear notice to the members of the Association. Members may, on making written representation to the Management Committee, call for the convening of an Extraordinary General Meeting and shall give reasons for the holding of such a meeting. Where possible at least 14 days' clear notice of such a meeting shall be given to the members of the Association together with the agenda for such a meeting. At any Extraordinary General Meeting a quorum shall be not less than 10% of total membership.

Constitution

13) Amendments to the constitution shall be made only at an Annual General Meeting or at an Extraordinary General Meeting. Proposed amendments shall be sponsored by not less than six members and notice of the precise wording shall be given in writing to all members not less than 14 days before the meeting. Such amendments to the Constitution shall require a majority of not less than two thirds of the voting members present at that meeting.

Accounts

14) The Treasurer shall maintain a record of income and expenditure and shall submit at the Annual General Meeting a statement thereof. Any significant expenditure not authorised by the Committee shall be pre-authorised by the Treasurer and one other officer.

Appendix C

Soil Consultants (SC)

Geo Environmental (GE)

SC-CBR4 Company & test reference

2.4% Very low CBR value <2.5%

5% Low CBR value 2.5% - 10%

12% Moderate CBR value 10% - 20%

25% Good CBR value >20%

Variation between results between companies could be down to a number of factors however the main one is that SE's results are taken under the road construction whilst GE's are taken within the verge.

SE's would appear to be lower than those recorded by GE at 500mm to 700mm however they are broadly similar and follow a similar patteren along the road

Notes

Drawing Revisions

Rev:	Date:	Details

Client

CITY OF LONDON CORPORATION

Project

THE WATERHOUSE, MILLFIELD LANE, HIGHGATE

Title

CBR LOCATIONS & SUMMARY

MILESTONE TRANSPORT PLANNING
Heritage House, 7 Wey Court, Mary Road
Guildford, Surrey, GU1 4QU
Tel: 01483 397888
web: www.milestonetp.co.uk

Status:	Scale:
DRAFT	N.T.S. @ A3

Drawn:	Checked:	Date:
GPW	PJC	Jan 16

Drawing Number:	Revision:
16034 / 001	-

The Waterhouse, Millfield Lane, Highgate

Technical Note on CBR Test Results

Prepared on behalf of City of London Corporation

February 2016

Introduction

The purpose of this technical note is to provide a review of the recent CBR testing carried out on the area of Millfield Lane between the Fitzroy Park / Merton Lane junction and the Waterhouse by Soil Consultants on behalf of City of London Corporation. The CBR testing has been conducted to determine the load bearing capacity of Millfield Lane in relation to development proposals at The Waterhouse which would see Millfield Lane used as the primary vehicle and construction vehicle route to the site.

The proposals would see the demolition of the existing building and construction of a large single dwelling. The indicative construction timeframe would be in the order of 104 weeks and it is suggested by the applicants that there would be in the order of 898 construction vehicle (HGV) movements through the Lane during this period.

Millfield Lane comprises a narrow single lane two-way highway with no footways or street lighting. The Lane is bounded by private frontage to the northeast comprising boundary features and unmade, vegetated verge and an unmade, vegetated strip to the southwest making a boundary with Hampstead Heath which is in the ownership of the Heath / City of London.

The Lane varies in width through its length between the application site access and the junction with Fitzroy Park / Merton Lane (public highway) to the south east. The useable width of the Lane is between approximately 4m and 2.7m through its length to the application site with areas of vegetated verge.

Millfield Lane exhibits a range of surface conditions but generally comprises a worn, unbound surface with a run of concrete through much of the length under which runs drainage infrastructure with a number of utility chamber covers present along the Lane. There is evidence of wear, rutting and ponding on the Lane with the surface appearing susceptible to degradation in respect to environmental conditions.

In view of the proposed use of the Lane for construction vehicle movements, the City of London have commissioned a CBR Test (by Soil Consultants Ltd.) to determine the structure of the Lane and consider the likely implications of it use for the construction of the proposed development.

The Applicant has also included detail on CBR testing within their December 2015 Construction Management Plan, and this is also considered within this Technical Note.

CBR Testing Soil Consultants

Following the onsite testing undertaken to determine the nature of the subsoil on which Millfield Lane passes over, this Technical Note has been produced to provide some technical explanation of the results. It should be read in conjunction with the full CBR Test results provided by Soil Consultants following their site assessment carried out on 19th and 20th January 2016.

The testing primarily focused on the strength of the subsoil by undertaking a penetration test to determine the California Bearing Ratio (CBR). This ratio (recorded as a percentage) provides a way of determining the strength, and therefore suitability of road construction passing over it, of the subsoil.

Testing is normally undertaken at a depth which should exclude and manmade interference (such as road construction and/or ploughing) so as to ensure that any design undertaken using the results are not over or under engineered.

The range runs from 0% to 100% with results generally seen by engineers in the following bands:

- 0% to 2% Very poor ground conditions, with engineering solutions required to provide a suitable base to build the road construction upon.
- 2% to 5% Poor to reasonable ground conditions, engineering solutions can still be required and the requirements for this can be subject to the type road.
- 5% to 15% Reasonable ground conditions, engineering solutions are likely to be little more than the general road construction
- 15% to 20% Fairly good to exhalent ground conditions, general road construction is all that is required, mostly to protect against changes in moisture content or to provide for changes in surface profile of the subsoil.
- Over 20% Achieves the required CBR value for the surface of the sub base for roads with less than 2 msa (million standard axels) over the design life of the road
- Over 30% Achieves the required CBR value for the surface of the sub base for roads with more than 2 msa (million standard axels) over the design life of the road

As such any results returning a result of more than 5% (soft enough that a thumb nail can cause an indent but firm enough that it cannot be moulded) would be favourable as a starting point for road design.

Anything that can be moulded by hand (circa 4%, through to a gel like substance which can be squeezed between fingers, less than 1%) would generally require some form of engineering solution to spread the expected loadings over a greater area of the subsoil.

The results of the testing showed some reasonable areas to the south east end of the road with results above 6%. There is a weak spot with a result of 2.4% before another area of good results, before there is length of road which has weaker results of 3% to 4%.

Although there is some variation in the depth at which the tests were undertaken the weaker range near the north western end tended to be at a slightly shallower depth than the stronger values at the

south eastern end. This then limits the scope for the Lanes construction to be of sufficient depth to accommodate construction traffic loadings.

The depths are all taken below 450mm deep so as to avoid encountering road construction material.

As the Lanes surface would appear not to have a well maintained surface course it is considered that the road construction isn't likely to be particularly strong and where this is combined with weaker subsoil's, would be unlikely to cope well with heavy construction traffic loadings.

How well the Lane construction would cope would depend on how stressed the existing Lane construction is. If the Lane construction has a significant working life left then the proposed loading may not result in the Lane rutting or failing in another way during the time of construction; however it could significantly reduce the remaining working life of the Lane resulting in the Lane needing replacing maybe just a few years after the works have finished.

Depending on when the larger vehicles would be passing over the Lane could also have an impact on the strength of the Lane and how much damage is done. This is because wet subsoil tends to result in weaker CBR values than the same subsoil but with lower moisture content.

This is likely to be exhibited where the Lane is no longer impermeable and there is risk of fines being washed out of the Lane construction. This will result in less strength in the Lane construction (either through it not being held together or through voids being created).

It can be suggested that where CBR values are 3% or less that the Lane would require strengthening. Consideration should be given to the areas where the CBR results fall below 5% and preferably those areas which where the results fall below 7% in respect to some form of road construction improvement prior to works being undertaken to limit the extent of the damage caused to the Lane, this has been highlighted in section 6 of the applicants testing report by highlighting the need to consider tree root protection measures. With the Lane inspected after the works to see if further road construction mitigation would be required to ensure the suitability of the Lane going forwards.

There needs to be a balance between works which are required due to the Lane being at the end of the road's design life and works required to retain the integrity of the road with the proposed traffic loadings. However, it is considered likely that the level of construction traffic proposed would be highly likely to result in the degradation of the surface of the Lane and would lead to damage and compaction of the subsurface – potentially impacting on root zones.

Any mitigation work proposed for the Lane (including tree root protection measures), particularly in relation to potential compaction of the Lane / soil structure within root zones should be specified in detail and demonstrated to be sufficient and deliverable prior to the commencement of any development.

CBR Testing Applicant

Previous versions of the Construction Management Plan included commentary regarding two CBR tests which showed suitably strong ground conditions (30% or higher) However, there was limited supporting information with regard to these results. These tests were taken within the Lane construction (top of the sub base) and were taken to determine the suitability of the Lane construction whilst all other testing was taken outside of the Lane construction.

Subsequently the applicant have undertaken further tests over the length of the lane. These generally reflect the conclusions of the Soil Consultants CBR test results in that these showed the CBR results generally become weaker the further away from the Merton Lane / Fitzroy Park junction the closer they were to the site. See attached sketch map showing the approximate locations of the applicant's CBR tests and those undertaken by Soil Consultants along with comparable depth results to demonstrate this pattern.

The results taken by the applicant show that for testing locations DCP4 and DCP 5 are strong (29% or firmer to a depth of circa 600mm and 400mm respectively) as such the risk of damage to the Lane in these locations is reasonably low. As such along with considering resurfacing, we would recommend consideration be given to providing that some form of edging be considered to limit the risk of damage to the edge of the new surface. Any mitigation work would need to be demonstrated to be reflective the natural appearance of the Lane.

DCP3 shows areas of weaker (8% and 15%) material near the surface before the ground firms up before going through some reasonable to strong ground conditions before dropping away to about 4% to 7% at depth (circa 800mm). There is a fair chance that the surface of the Lane would deteriorate under heavy construction traffic loadings due to the weaker areas near the surface. Especially where vehicles are running near the edge of the Lane which is unsupported.

DCP2 follows a similar pattern although has firmer materials near the surface (14%, 34% & 39%) before reaching a hard spot (the report identifies this as a large stone rather than a strong layer of material) and then weakening off again at lower levels (13% and lower below 335mm down). DCP1 follows a similar paten with one high CBR value (56%, again related to a large stone) with the remaining values being mostly low (all bar one other are 7% or less).

As such, the Applicants CBR testing results would suggest the level of construction traffic is fairly likely to cause more damage to the Lane in these locations than at DCP3.

To limit the possibility of a number of changes in Lane surface level it should be suggested that any tree route protection areas be provided in such a way that they were provided so as to avoid short gaps (no gap of 15m or less) between each section and be provided to the full width of the Lane. This is so that the Lane remains a fairly consistent level throughout and doesn't appear to be formed of a series of patches.

Soil Consultants
Ground Investigation
Geotechnical Analysis
Contamination Assessment

Mr P Jackson-Cole
Milestone Transport Planning Ltd
Heritage House,
7 Wey Court,
Mary Road,
Guildford,
Surrey
GU1 4QU

February 2016
9919/MR

Dear Mr Paul Jackson-Cole,

Re: The Water House, Millfield Lane CBR Testing

Please find appended the factual data for the works carried out at Millfield Lane on the 19th and 20th January 2016. The factual data comprises window sample borehole logs, trial pit logs and also laboratory results carried out on the samples taken from site.

I trust this is satisfactory but if you have any queries please do not hesitate to contact us.

Yours sincerely,

Matthew Rust
Soil Consultants Limited

Enc
Factual Data

GENERAL INFORMATION, LIMITATIONS AND EXCEPTIONS

Unless otherwise stated, our Report should be construed as being a Ground Investigation Report [GIR] as defined in BS EN1997-2. Our Report is not intended to be and should not be viewed or treated as a Geotechnical Design Report [GDR] as defined in EN1997-2. Any 'design' recommendations which are provided are for guidance only and are intended to allow the designer to assess the results and implications of our investigation/testing and to permit preliminary design of relevant elements of the proposed scheme.

The methods of investigation used have been chosen taking into account the constraints of the site including but not limited to access and space limitations. Where it has not been possible to reasonably use an EC7 compliant investigation technique we have adopted a practical technique to obtain indicative soil parameters and any interpretation is based upon our engineering experience and relevant published information.

The Report is issued on the condition that Soil Consultants Ltd will under no circumstances be liable for any loss arising directly or indirectly from ground conditions between the exploratory points which differ from those identified during our investigation. In addition Soil Consultants Ltd will not be liable for any loss arising directly or indirectly from any opinion given on the possible configuration of strata both between the exploratory points and/or below the maximum depth of the investigation; such opinions, where given, are for guidance only and no liability can be accepted as to their accuracy. The results of any measurements taken may vary spatially or with time and further confirmatory measurements should be made after any significant delay in using this Report.

Comments made relating to ground-water or ground-gas are based upon observations made during our investigation unless otherwise stated. Ground-water and ground-gas conditions may vary with time from those reported due to factors such as seasonal effects, atmospheric effects and and/or tidal conditions. We recommend that if monitoring installations have been included as part of our investigation, continued monitoring should be carried out to maximise the information gained.

Specific geotechnical features/hazards such as [but not limited to] areas of root-related desiccation and dissolution features in chalk/soluble rock can exist in discrete localised areas - there can be no certainty that any or all of such features/hazards have been located, sampled or identified. Where a risk is identified the designer should provide appropriate contingencies to mitigate the risk through additional exploratory work and/or an engineered solution.

Where a specific risk of ground dissolution features has been identified in our Report [anything above a 'low' risk rating], reference should be made to the local building control to establish whether there are any specific local requirements for foundation design and appropriate allowances should be incorporated into the design. If such a risk assessment was not within the scope of our investigation and where it is deemed that the ground sequence may give rise to such a risk [for example near-surface chalk strata] it is recommended that an appropriate assessment should be undertaken prior to design of foundations.

Where spread foundations are used, we recommend that all excavations are inspected and approved by suitably experienced personnel; appropriate inspection records should be kept. This should also apply to any structures which are in direct contact with the soil where the soil could have a detrimental effect on performance or integrity of the structure.

Ground contamination often exists in small discrete areas - there can be no certainty that any or all such areas have been located, sampled or identified.

The findings and opinions conveyed in this Report may be based on information from a variety of sources such as previous desk studies, investigations or chemical analyses. Soil Consultants Limited cannot and does not provide any guarantee as to the authenticity, accuracy or reliability of such information from third parties; such information has not been independently verified unless stated in our Report.

Our Report is written in the context of an agreed scope of work between Soil Consultants Ltd and the Client and should not be used in any different context. In light of additional information becoming available, improved practices and changes in legislation, amendment or re-interpretation of the assessment or the Report in part or in whole may be necessary after its original publication.

Unless otherwise stated our investigation does not include an arboricultural survey, asbestos survey, ecological survey or flood risk assessment and these should be deemed to be outside the scope of our investigation.

[Rev_1_08_03_2013]

Foreword to: Window Sampler Boreholes

Window Sample Boreholes are constructed by driving in steel sample tubes in which long slots have been cut to enable the soil to be examined, tested or sampled. The tubes are either 1m or 2m in length. The borehole commences using a large diameter tube, 70mm or 80mm, with each succeeding tube reducing usually by 10mm in diameter to assist the extraction of the tube from the ground. Thus, it is theoretically possible to obtain a total continuous sample of the soil for examination or testing.

Window Sample boreholes are a means of rapid and economic sampling where access is not necessarily good or where impact of the investigation must be kept to a minimum.

The method is primarily suited to clay soils and can also achieve reasonable penetration into many granular soils. Soil recovery beneath the water table in granular soils can however be reduced.

The open slot in the sample tube allows hand shear vane and pocket penetrometer tests to be carried out. Samples can also be taken where necessary for laboratory testing, including moisture content, index property tests and contamination analyses.

Hand Shear Vane	:	The shear strength of cohesive soils are reported in kPa.
Pocket Penetrometer	:	The unconfined compression strengths values are reported in kg/cm^2.
SPT	:	The SPT tests results are reported as field test. Corrected SPT results are presented as an addendum sheet and soil descriptions incorporate the corrected values in accordance with BS EN ISO 22476-3, 2005, National Annex A

Site & Location	**The Water House, Millfield Lane, Highgate, London N6 6HT**	Trial Pit No	CBR1
Client	**Milestone Transport Planning Ltd**	Report No.	**9919/MR**

Depth (m)	**Strata Description**	**Samples / Tests**		
		Depth (m)	**Type**	**Results**
GL to 0.10m	MADE GROUND: compact crushed concrete fill.			
0.10m to 0.25m	MADE GROUND: dark grey mottled black ashy, slightly silty, sandy gravel. Gravel is fine to coarse, subangular flint, brick and tile.			
0.25m to 0.35m	MADE GROUND: pale grey mottled orange clayey, very sandy gravel. Gravel is fine to coarse, subrounded flint.	0.35m	D	
0.35m to 0.45m	Firm pale grey mottled orange slightly silty CLAY with rare to occasional pockets of silt.	0.45m	D	HV of 60 @ 0.45m PP of 2.3 @ 0.45m

Date of Excavation	19th January 2016	Groundwater	None recorded
Equipment	Hand dug trial pit	Logged by	MR
Stability	Stable	Checked by	SCW
Remarks			

Key: D = Disturbed B = Bulk V = Hand Shear Vane Test (kN/m²) P = Pocket Penetrometer (kg/cm²)

Soil Consultants

Site & Location	**The Water House, Millfield Lane, Highgate, London N6 6HT**	Trial Pit No	CBR2A
Client	**Milestone Transport Planning Ltd**	Report No.	**9919/MR**

Depth (m)	**Strata Description**	**Samples / Tests**		
		Depth (m)	**Type**	**Results**
GL to 0.15m	MADE GROUND: compact crushed concrete fill.			
0.15m to 0.40m	MADE GROUND: dark grey ashy, slightly silty, sandy gravel. Gravel is fine to coarse, subangular flint, brick and quartzite.			
0.40m to 0.45m	MADE GROUND: quartzite cobbles			
0.45m to 0.55m	Soft to firm orange brown mottled grey slightly silty CLAY with rare pockets of silt. …rare gravel between about0.45m and 0.50m.	0.55	D	HV of 48 @ 0.55m

Date of Excavation	19th January 2016	Groundwater	None recorded
Equipment	Hand dug trial pit	Logged by	MR
Stability	Stable	Checked by	SCW
Remarks			

Key: D = Disturbed B = Bulk V = Hand Shear Vane Test (kN/m²) P = Pocket Penetrometer (kg/cm²)

Soil Consultants

Site & Location	**The Water House, Millfield Lane, Highgate, London N6 6HT**	Trial Pit No	CBR3
Client	**Milestone Transport Planning Ltd**	Report No.	**9919/MR**

Depth (m)	Strata Description	Samples / Tests		
		Depth (m)	Type	Results
GL to 0.10m	MADE GROUND: concrete [partially desegregated].	0.15m	D	
0.10m to 0.25m	MADE GROUND: compact dark grey slightly silty, slightly sandy gravel. Gravel is fine to coarse, subangular concrete and brick.			
0.25m to 0.65m	MADE GROUND: dark grey mottled black ashy, very silty, very sandy gravel. Gravel is fine to medium, subangular brick, glass and slate. Occasional live roots.	0.65m	D	

Date of Excavation	19th January 2016	Groundwater	None recorded
Equipment	Hand dug trial pit	Logged by	MR
Stability	Stable	Checked by	SCW

Remarks
- WS1 carried out through the base of trial pit [CBR3].

Key: D = Disturbed B = Bulk V = Hand Shear Vane Test (kN/m²) P = Pocket Penetrometer (kg/cm²)

Soil Consultants

Site & Location:	**The Water House, Millfield Lane, Highgate, London N6 6HT**	Borehole No:	**WS1**
Client:	**Milestone Transport Planning Ltd**	Coordinates:	Sheet 1 of 1
Engineer:		Ground Level:	Report No: 9919/MR

Progress & Observations	Samples & Tests Type	Samples & Tests Depth (m)	Field Test Results	Strata Depth (m)	Strata Level (m)	Legend	Strata Descriptions	Backfill / Installation
BH commenced: 19/01/2016	D	0.10					See CBR3 trial pit log for soil descriptions.	
BH diameter: Reducing with depth								
	D	0.65		0.65			MADE GROUND: dark grey mottled black ashy, slightly silty, sandy gravel. Gravel is fine to medium, subangular brick, glass and slate. Occasional live roots.	
	D	0.80		0.80				
	PP	0.80	1.0				MADE GROUND: soft / friable orange brown silty, gravelly clay. Gravel is fine to coarse, subangular to subrounded flint and brick.	
	HV	0.95	55					
	D	1.00		1.00				
	PP	1.00	1.8				MADE GROUND: orange brown slightly gravelly, silty sand with rare shell fragments. Gravel is fine to coarse, subangular brick.	
Inspection pit to 1.20m								
	D	1.40						
BH complete: 19/01/2016				1.80				
BH depth: 2.00m							Soft dark grey slightly silty CLAY. Slight organic odour.	
Water depth: 1.30m	D	1.90						
	HV	1.90	40					
				2.00			End of hole at 2.00m	

Key: U = Undisturbed B = Bulk D = Small disturbed W = Water ES = glass jar & plastic tub E = glass jar SPT/S = split spoon SPT/C = solid cone PP = Pocket Penetrometer [kg/cm²] HV = Hand Vane [kPa] PID = Photo Ionisation Detector [ppm - Isobutylene Equivalent, PhoCheck Tiger, 10.6eV lamp] * = full SPT penetration not achieved - see summary sheet

Borehole type: Window Sample

Remarks:

Borehole No: **WS1**

Soil Consultants

Site & Location	**The Water House, Millfield Lane, Highgate, London N6 6HT**	Trial Pit No	CBR4
Client	**Milestone Transport Planning Ltd**	Report No.	**9919/MR**

Depth (m)	Strata Description	Samples / Tests		
		Depth (m)	Type	Results
GL to 0.15m	MADE GROUND: compact crushed concrete fill.			
0.15m to 0.35m	MADE GROUND: grey lightly cemented gravel fill. Gravel is fine to coarse, subangular brick and concrete.	0.30m	D	
0.35m to 0.70m	MADE GROUND: dark grey mottled black ashy, very silty, very sandy gravel. Gravel is fine to medium, subangular brick, slate, clinker, tile and bone.	0.50m to 0.70m	D	

Date of Excavation	19th January 2016	Groundwater	None recorded
Equipment	Hand dug trial pit	Logged by	MR
Stability	Stable	Checked by	SCW
Remarks			

Key: D = Disturbed B = Bulk V = Hand Shear Vane Test (kN/m²) P = Pocket Penetrometer (kg/cm²)

Soil Consultants

Site & Location	**The Water House, Millfield Lane, Highgate, London N6 6HT**	Trial Pit No	CBR5
Client	**Milestone Transport Planning Ltd**	Report No.	**9919/MR**

Depth (m)	Strata Description	Samples / Tests		
		Depth (m)	Type	Results
GL to 0.10m	MADE GROUND: compact crushed concrete fill.	0.10m	D	
0.10m to 0.45m	MADE GROUND: dark grey mottled black silty, very sandy gravel. Gravel is fine to medium, subangular concrete, brick, glass and clinker.	0.30m	D	
0.45m to 0.60m	Orange brown mottled grey slightly clayey to clayey, silty GRAVEL. Gravel is fine to coarse, subangular to subrounded flint.	0.50m	D	

Date of Excavation	19th January 2016	Groundwater	None recorded
Equipment	Hand dug trial pit	Logged by	MR
Stability	Stable	Checked by	SCW
Remarks			

Key: D = Disturbed B = Bulk V = Hand Shear Vane Test (kN/m²) P = Pocket Penetrometer (kg/cm²)

Soil Consultants

Site & Location	**The Water House, Millfield Lane, Highgate, London N6 6HT**	Trial Pit No	CBR6
Client	**Milestone Transport Planning Ltd**	Report No.	**9919/MR**

Depth (m)	**Strata Description**	**Samples / Tests**		
		Depth (m)	**Type**	**Results**
GL to 0.10m	MADE GROUND: compact crushed concrete fill.	0.10m	D	
0.10m to 0.45m	MADE GROUND: dark grey mottled black ashy, silty, very sandy gravel. Gravel is fine to medium, subangular brick and clinker.	0.30m to 0.40m	D	
0.45m to 0.65m	Orange brown mottled grey slightly silty, gravelly CLAY. Gravel is fine to coarse, subangular flint.	0.50m	D	

Date of Excavation	19th January 2016	Groundwater	None recorded
Equipment	Hand dug trial pit	Logged by	MR
Stability	Stable	Checked by	SCW

Remarks
- WS2 carried out through the base of trial pit [CBR6].

Key: D = Disturbed B = Bulk V = Hand Shear Vane Test (kN/m²) P = Pocket Penetrometer (kg/cm²)

Soil Consultants

Site & Location:	**The Water House, Millfield Lane, Highgate, London N6 6HT**	Borehole No:	**WS2**
Client:	**Milestone Transport Planning Ltd**	Coordinates:	Sheet 1 of 1
Engineer:		Ground Level:	Report No: 9919/MR

Progress & Observations	Samples & Tests Type	Samples & Tests Depth (m)	Field Test Results	Strata Depth (m)	Strata Level (m)	Legend	Strata Descriptions	Backfill / Installation
BH commenced: 19/01/2016	D	0.10					See CBR6 trial pit log for soil descriptions.	
	D	0.30						
BH diameter: Reducing with depth	D	0.45						
	D	0.50						
	PP	0.60	2.0					
	D	0.65		0.65			Firm to stiff orange brown mottled grey slightly silty to silty CLAY with rare pockets of silt. Rare manganese staining. Occasional live roots.	
	HV	0.65	70					
	D	0.80						
	HV	0.80	75					
	PP	0.80	2.3					
	HV	1.00	62					
	PP	1.00	2.2					
Inspection pit to 1.20m								
	HV	1.20	65					
	PP	1.20	2.2					
	D	1.25						
	HV	1.40	82					
	PP	1.40	3.1					
	D	1.50					....becoming stiff below about 1.50m	
	HV	1.60	80					
	PP	1.60	3.0					
	D	1.75						
BH Complete: 19/01/2016	HV	1.80	85				....roots observed to about 1.80m	
BH depth: 2.00m	PP	1.80	3.1					
Water: None observed								
	D	2.00		2.00			End of hole at 2.00m	
	HV	2.00	90					
	PP	2.00	3.2					

1 2 3 4

Key: U = Undisturbed B = Bulk D = Small disturbed W = Water ES = glass jar & plastic tub E = glass jar SPT/S = split spoon SPT/C = solid cone PP = Pocket Penetrometer [kg/cm²] HV = Hand Vane [kPa] PID = Photo Ionisation Detector [ppm - Isobutylene Equivalent, PhoCheck Tiger, 10.6eV lamp] * = full SPT penetration not achieved - see summary sheet

Borehole type: Window Sample

Remarks:

Borehole No: **WS2**

Soil Consultants

Site & Location	**The Water House, Millfield Lane, Highgate, London N6 6HT**	Trial Pit No	CBR7
Client	**Milestone Transport Planning Ltd**	Report No.	**9919/MR**

Depth (m)	Strata Description	Samples / Tests		
		Depth (m)	Type	Results
GL to 0.15m	MADE GROUND: compact crushed concrete fill.	0.10m	D	
0.15m to 0.50m	MADE GROUND: dark grey mottled brown/black ashy, sandy gravel. Gravel is fine to coarse, subangular to rounded flint, brick and clinker. ...becoming grey mottled brown below about 0.40m	0.30m 0.40m	D D	
0.50m to 0.65m	Orange brown clayey, sandy GRAVEL. Gravel is fine to coarse, subangular to rounded flint.	0.60m	D	

Date of Excavation	20th January 2016	Groundwater	None recorded
Equipment	Hand dug trial pit	Logged by	MR
Stability	Stable	Checked by	SCW

Remarks
- WS3 carried out through the base of trial pit [CBR7]

Key: D = Disturbed B = Bulk V = Hand Shear Vane Test (kN/m²) P = Pocket Penetrometer (kg/cm²)

Soil Consultants

Site & Location:	**The Water House, Millfield Lane, Highgate, London N6 6HT**	Borehole No:	**WS3**
Client:	**Milestone Transport Planning Ltd**	Coordinates:	Sheet 1 of 1
Engineer:		Ground Level:	Report No: 9919/MR

Progress & Observations	Samples & Tests Type	Samples & Tests Depth (m)	Field Test Results	Strata Depth (m)	Strata Level (m)	Legend	Strata Descriptions	Backfill / Installation
BH commenced: 20/01/2016	D	0.10					See CBR7 trial pit log for soil descriptions.	
	D	0.30						
BH diameter: Reducing with depth	D	0.45						
	D	0.60		0.65				
	HV	0.70	74				Stiff orange brown mottled grey slightly silty to silty CLAY with rare pockets of silt.	
	PP	0.70	2.9					
	D	0.75		0.80				
	HV	0.80	60				Firm to stiff orange brown silty CLAY with rare to occasional pockets of silt. Occasional live roots.	
	PP	0.80	2.1					
	D	1.00						
	HV	1.00	60					
Inspection pit to 1.20m	PP	1.00	2.1				*....becoming stiff to very stiff slightly sandy, silty CLAY below about 1.20m*	
	HV	1.20	62				*....partially desiccated below 1.20m*	
	PP	1.20	2.1					
	D	1.25						
	HV	1.40	88					
	PP	1.40	6.0					
	D	1.50						
	HV	1.60	92				*....sand lenses between about 1.60m to 1.90m*	
	PP	1.60	6.0					
	D	1.75						
BH Complete: 20/01/2016	HV	1.80	92					
BH depth: 2.00m	PP	1.80	5.6					
Water: None observed							*....roots observed to about 2.00m*	
	D	2.00		2.00			End of hole at 2.00m	
	HV	2.00	120					
	PP	2.00	6.0					

1

2

3

4

Key: U = Undisturbed B = Bulk D = Small disturbed W = Water ES = glass jar & plastic tub E = glass jar SPT/S = split spoon SPT/C = solid cone PP = Pocket Penetrometer [kg/cm²] HV = Hand Vane [kPa] PID = Photo Ionisation Detector [ppm - Isobutylene Equivalent, PhoCheck Tiger, 10.6eV lamp] * = full SPT penetration not achieved - see summary sheet

Borehole type: Window Sample

Remarks:

Borehole No: **WS3**

Soil Consultants

Site & Location	**The Water House, Millfield Lane, Highgate, London N6 6HT**	Trial Pit No	CBR8
Client	**Milestone Transport Planning Ltd**	Report No.	**9919/MR**

Depth (m)	Strata Description	Samples / Tests		
		Depth (m)	Type	Results
GL to 0.20m	MADE GROUND: compact crushed concrete fill.	0.10m	D	
0.20m to 0.30m	MADE GROUND: dark grey mottled brown/black ashy, silty gravel. Gravel is fine to medium, subangular, brick tile and cement.	0.25m	D	
0.30m to 0.50m	MADE GROUND: dark brown clayey, very silty, very gravelly sand. Gravel is fine to medium, subangular brick and slate. Rare live roots.	0.40m	D	
0.50m to 0.70m	Orange brown clayey, sandy GRAVEL. Gravel is fine to coarse, subangular to subrounded flint. Rare live roots.	0.60m	D	

Date of Excavation	20th January 2016	Groundwater	Non recorded
Equipment	Hand dug trial pit	Logged by	MR
Stability	Stable	Checked by	SCW
Remarks			

Key: D = Disturbed B = Bulk V = Hand Shear Vane Test (kN/m²) P = Pocket Penetrometer (kg/cm²)

Soil Consultants

Site & Location	**The Water House, Millfield Lane, Highgate, London N6 6HT**	Trial Pit No	CBR9
Client	**Milestone Transport Planning Ltd**	Report No.	**9919/MR**

Depth (m)	**Strata Description**	**Samples / Tests**		
		Depth (m)	**Type**	**Results**
GL to 0.20m	MADE GROUND: compact crushed concrete fill.+	0.10m		
0.20m to 0.40m	MADE GROUND: dark grey mottled black ashy, very silty, sand and gravel. Gravel is fine to coarse, subangular brick, tile, concrete and clinker.	0.30m		
0.40m to 0.55m	MADE GROUND: grey brown slightly clayey, slightly sandy, silty gravel. Gravel is fine to coarse, subangular flint, brick and tile. Rare to occasional live roots.	0.50m		
0.55m to 0.60m	Firm grey brown slightly gravelly, silty to very silty CLAY. Gravel is fine to coarse, subrounded flint.	0.60m		

Date of Excavation	20th January 2016	Groundwater	None recorded
Equipment	Hand dug trial pit	Logged by	MR
Stability	Stable	Checked by	SCW
Remarks			

Key: D = Disturbed B = Bulk V = Hand Shear Vane Test (kN/m²) P = Pocket Penetrometer (kg/cm²)

Soil Consultants

Site Location	**The Water House, Millfield Lane, Highgate, London N6 6HT**	Report No:	**9919/MR**

IN SITU CALIFORNIA BEARING RATIO TEST RESULTS

Sample Location	Depth [m]	Sample Description	Moisture Content [%]	CBR [%] 2.5mm Penetration	CBR [%] 5.0mm Penetration	CBR Value [%]
CBR1	0.45	Firm pale grey mottled orange slightly silty to silty CLAY with rare to occasional pockets of silt.	25.8	3.9	3.2	3.9
CBR2A	0.55	Soft to firm orange brown mottled grey slightly silty CLAY with rare partings of silt.	36.9	3.1	2.4	3.1
CBR3	0.65	MADE GROUND: dark grey mottled black ashy, slightly silty, sandy gravel. Gravel is fine to medium, subangular brick, glass, slate and tile. Occasional live roots.	35.5	3.4	3.6	3.6
CBR4	0.70	MADE GROUND: dark grey mottled black ashy, silty, sandy gravel. Gravel is fine to medium, subangular brick, clinker, slate, bone and tile.	44.2	7.0	6.6	7.0
CBR5	0.60	Orange brown mottled grey slightly clayey, silty GRAVEL. Gravel is fine to coarse, subangular flint.	10.0	7.1	7.2	7.2
CBR6	0.65	Firm to stiff orange brown mottled grey slightly silty to silty CLAY with rare pockets of silt. Rare black flecks possibly manganese staining. Rare roots.	30.4	2.5	2.1	2.5
CBR7	0.65	Orange brown mottled grey slightly clayey, silty GRAVEL. Gravel is fine to coarse, subangular to subrounded flint.	7.6	10.0	12.0	12.0
CBR8	0.70	Orange brown mottled grey clayey, silty GRAVEL. Gravel is fine to coarse, subangular to subrounded flint. Rare live roots.	10.9	6.4	6.0	6.4
CBR9	0.60	Grey brown slightly gravelly, silty to very silty CLAY. Gravel is fine to coarse, subrounded flint.	19.0	11.0	10.0	11.0

Tests carried out to the following standards:

- Laboratory California Bearing Ratio — BS 1377:Part 4 [1990] Clause 7
- In-situ California Bearing Ratio — BS 1377:Part 9 [1990] Clause 4.3

Sample examined by MR (Engineer)

Results checked by (Engineer) Certificate date : 22 January 2016

Soil Consultants

Site & Location: **The Water House, Millfield Lane, Highgate, London N6 6HT**

Report No: **9919/MR**

SUMMARY OF CLASSIFICATION TEST RESULTS

BH ID	Depth (m)	Type	w (%)	wL (%)	wP (%)	Pass 425 (%)	IP (%)	Mod IP (%)	IL (%)	LOI (%)	Description
CBR1	0.30	D	19								MADE GROUND: pale grey mottled orange clayey, very sandy gravel.
CBR1	0.45	D	26	50	30	95	20		-0.21		Pale grey mottled orange slightly silty CLAY.
CBR2A	0.55	D	37								Orange brown mottled grey slightly silty CLAY.
CBR4	0.50	D	44								MADE GROUND: dark grey mottled black ashy, very silty, very sandy gravel.
CBR5	0.55	D	10								Orange brown mottled grey slightly clayey to clayey, silty GRAVEL.
CBR6	0.50	D	24	53	21	26*	32	8	0.11		Orange brown mottled grey slightly silty, gravelly CLAY.
CBR7	0.60	D	8								Orange brown clayey, sandy GRAVEL.
CBR8	0.40	D	17								MADE GROUND: dark brown clayey, very silty, very gravelly sand.
CBR8	0.60	D	11								Orange brown clayey, sandy GRAVEL.
CBR9	0.50	D	16								MADE GROUND: grey brown slightly clayey, slightly sandy, silty gravel.
CBR9	0.60	D	19	36	23	92**	13	12	-0.35		Grey brown slightly gravelly, silty to very silty CLAY.
WS1	0.65	D	36								MADE GROUND: dark grey mottled black ashy, slightly silty, sandy gravel.
WS1	0.80	D	41								MADE GROUND: orange brown silty, gravelly clay.
WS1	1.00	D	21								MADE GROUND: orange brown slightly gravelly, silty sand.
WS1	1.40	D	21								MADE GROUND: orange brown slightly gravelly, silty sand.
WS1	1.90	D	32	60	27	>95	33		0.15		Dark grey slightly silty CLAY.
WS2	0.65	D	30	74	26	95	48		0.10		Orange brown mottled grey slightly silty to silty CLAY.
WS2	0.80	D	33	74	31	95	43		0.05		Orange brown mottled grey slightly silty to silty CLAY.
WS2	1.25	D	30								Orange brown mottled grey slightly silty to silty CLAY.
WS2	1.50	D	29								Orange brown mottled grey slightly silty to silty CLAY.

Testing in accordance with BS EN ISO 17892 unless specified otherwise

Date: 28 Jan 16

Modified Plasticity Index calculated in accordance with NHBC Standards Chapter 4.2 (reported if %passing 425mm <95%)

Percent passing 425μm: by estimation, by hand* or by sieving**

Soil Consultants

Site & Location: **The Water House, Millfield Lane, Highgate, London N6 6HT**

Report No: **9919/MR**

SUMMARY OF CLASSIFICATION TEST RESULTS

BH ID	Depth (m)	Type	w (%)	wL (%)	wP (%)	Pass 425 (%)	IP (%)	Mod IP (%)	IL (%)	LOI (%)	Description
WS2	1.75	D	30								Orange brown mottled grey slightly silty to silty CLAY.
WS2	2.00	D	30								Orange brown mottled grey slightly silty to silty CLAY.
WS3	0.75	D	26								Orange brown mottled grey slightly silty to silty CLAY.
WS3	1.00	D	27	51	23	95	28		0.14		Orange brown silty CLAY.
WS3	1.25	D	18	53	19	95	34		-0.03		Orange brown silty CLAY.
WS3	1.50	D	19								Orange brown silty CLAY.
WS3	1.75	D	20								Orange brown silty CLAY.
WS3	2.00	D	21	59	30	95	29		-0.30		Orange brown silty CLAY.

Testing in accordance with BS EN ISO 17892 unless specified otherwise

Date: 28 Jan 16

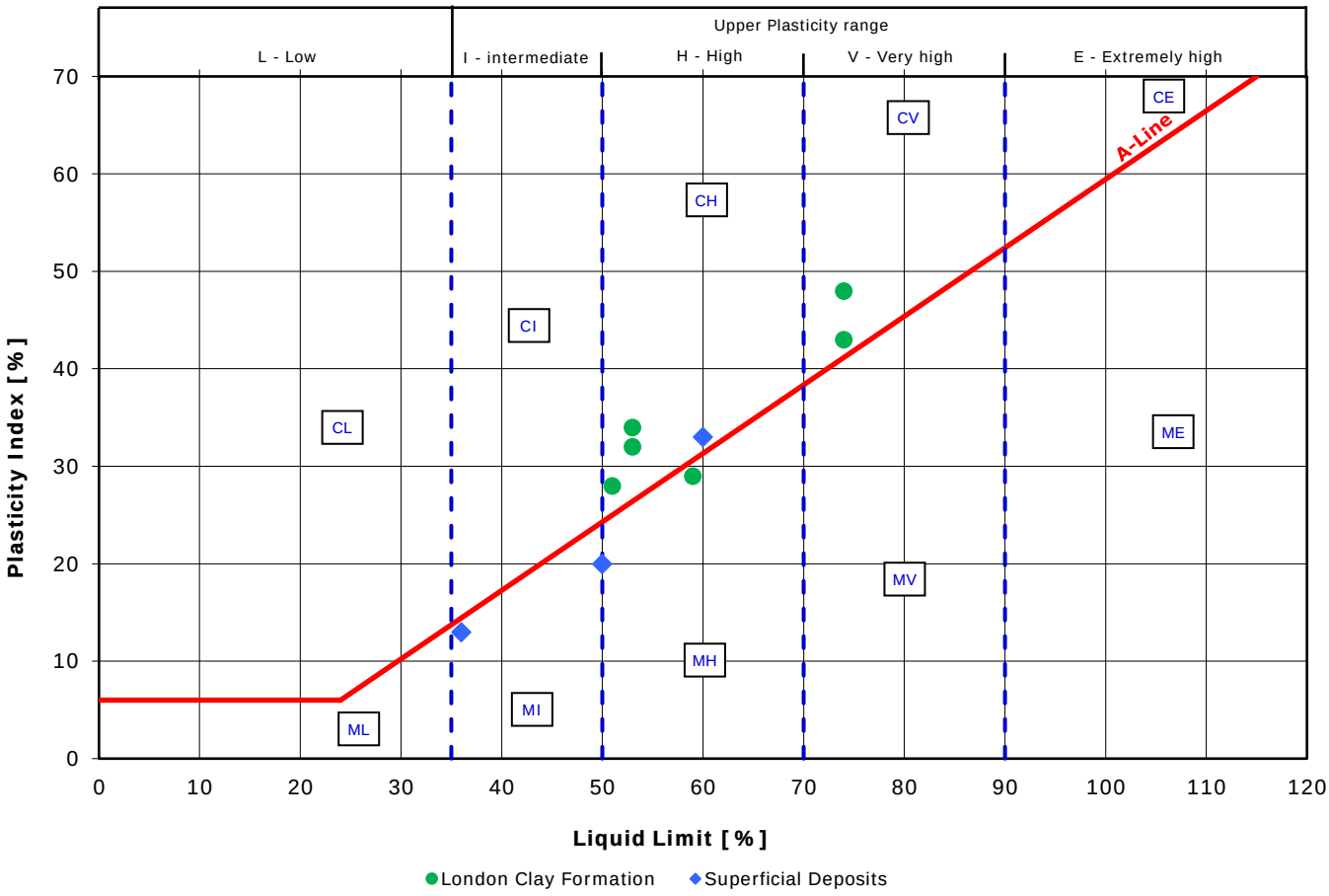
Modified Plasticity Index calculated in accordance with NHBC Standards Chapter 4.2 (reported if %passing 425mm <95%)

Percent passing 425μm: by estimation, by hand* or by sieving**

Soil Consultants

Site & Location	**The Water House, Millfield Lane, Highgate, London N6 6HT**	Report No:	**9919/MR**

Plasticity Chart



M - SILT [plots below the A-Line]

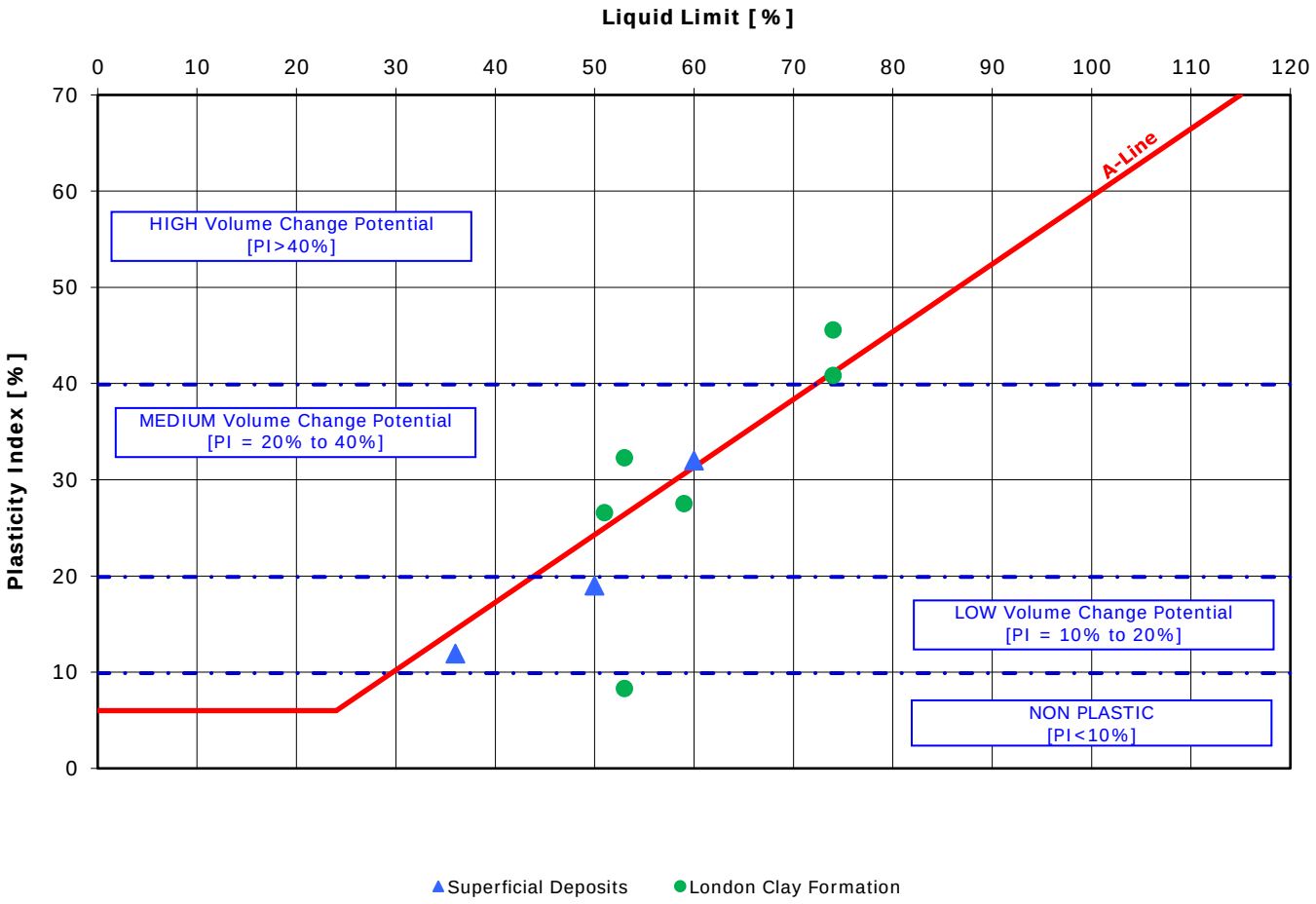
C - CLAY [plots above the A-Line]

Classification in accordance with BS5930:1999+A2:2010 "Code of practice for site investigations"

Soil Consultants

Site & Location	The Water House, Millfield Lane, Highgate, London N6 6HT	Report No:	9919/MR

Plasticity Chart



Modified Plasticity Index, I'p:

$$I'p = \frac{Ip \times (\%\ \text{passing 425mm})}{100\%}$$

[where Ip = Plasticity Index]

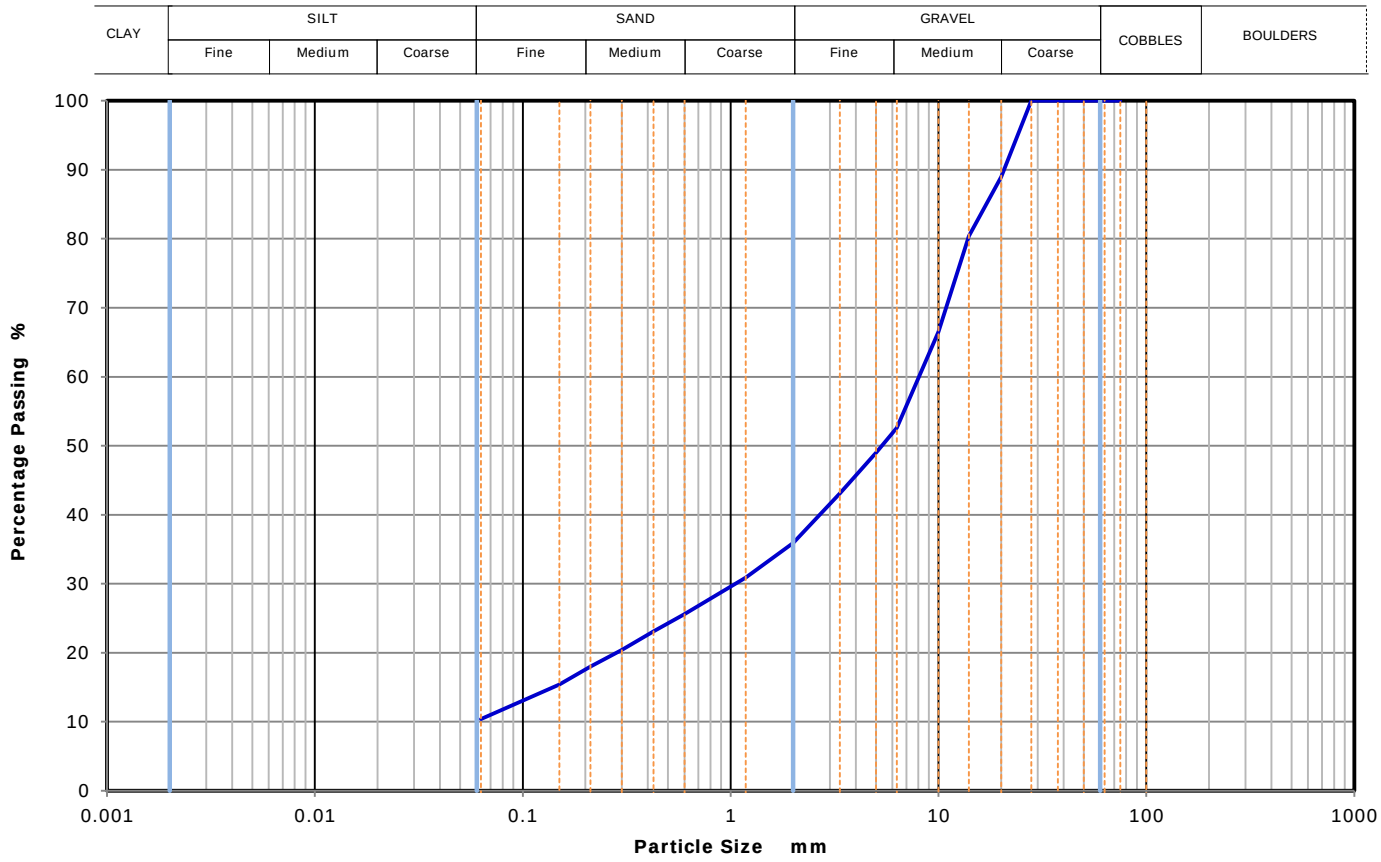
Classification in accordance with NHBC Standards, Part 4 'Foundations', Chapter 4.2 'Building near trees'

Soil Consultants

Site	**The Water House,**	Report No:	**9919/MR**
Location	**Millfield Lane, Highgate, London N6 6HT**		

PARTICLE SIZE DISTRIBUTION

Hole ID: **CBR1** Depth [m]: **0.30**	Description: **MADE GROUND: pale grey mottled orange clayey, very sandy gravel.**



Sieving	
Size [mm]	% passing
75	100
63	100
50	100
37.5	100
28	100
20	89
14	80.4
10	66.5
6.3	52.6
5	49
3.35	43.1
2	35.9
1.18	30.9
0.6	25.6
0.425	23.1
0.3	20.4
0.212	18
0.15	15.4
0.063	10.4

Sample proportions	%
Cobbles	0
Gravel	64
Sand	26
Fines <0.063mm	10

Grading analysis		
D60	mm	8.1
D30	mm	1.1
D10	mm	
Uniformity Coefficient		
Curvature Coefficient		

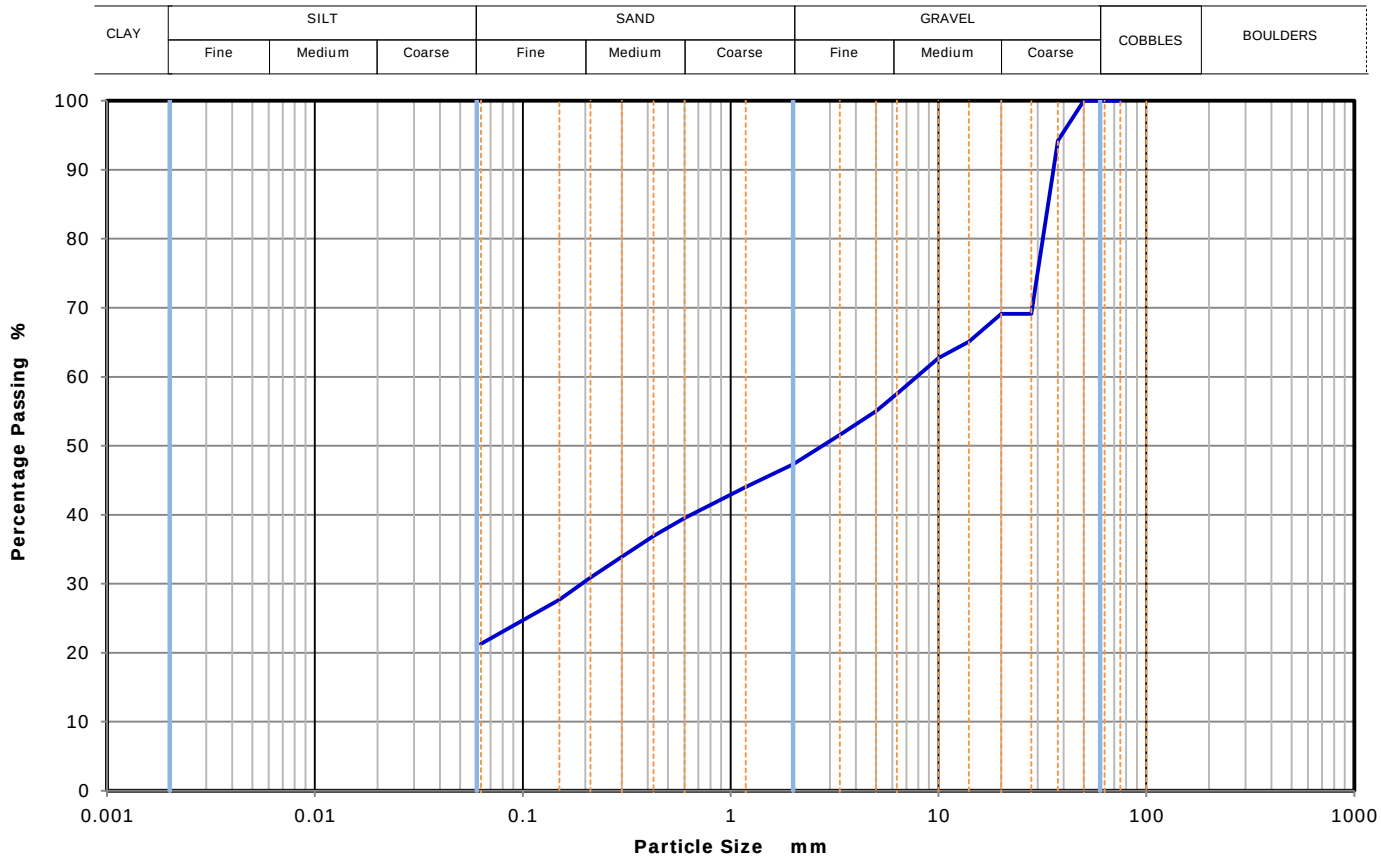
Test method and date	
Testing in accordance with BS EN ISO 17892:	
Wet sieving method	
Reporting date:	29 Jan 16

Soil Consultants

Site	The Water House,	Report No:	9919/MR
Location	Millfield Lane, Highgate, London N6 6HT		

PARTICLE SIZE DISTRIBUTION

Hole ID: CBR3 Depth [m]: 0.65	Description:	MADE GROUND: dark grey mottled black very silty, very sandy gravel.



Sieving	
Size [mm]	% passing
75	100
63	100
50	100
37.5	94.2
28	69.1
20	69.1
14	65.1
10	62.7
6.3	57.5
5	55
3.35	51.6
2	47.3
1.18	44
0.6	39.5
0.425	36.9
0.3	33.9
0.212	30.9
0.15	27.7
0.063	21.3

Sample proportions	%
Cobbles	0
Gravel	53
Sand	26
Fines <0.063mm	21

Grading analysis		
D60	mm	7.9
D30	mm	0.2
D10	mm	
Uniformity Coefficient		
Curvature Coefficient		

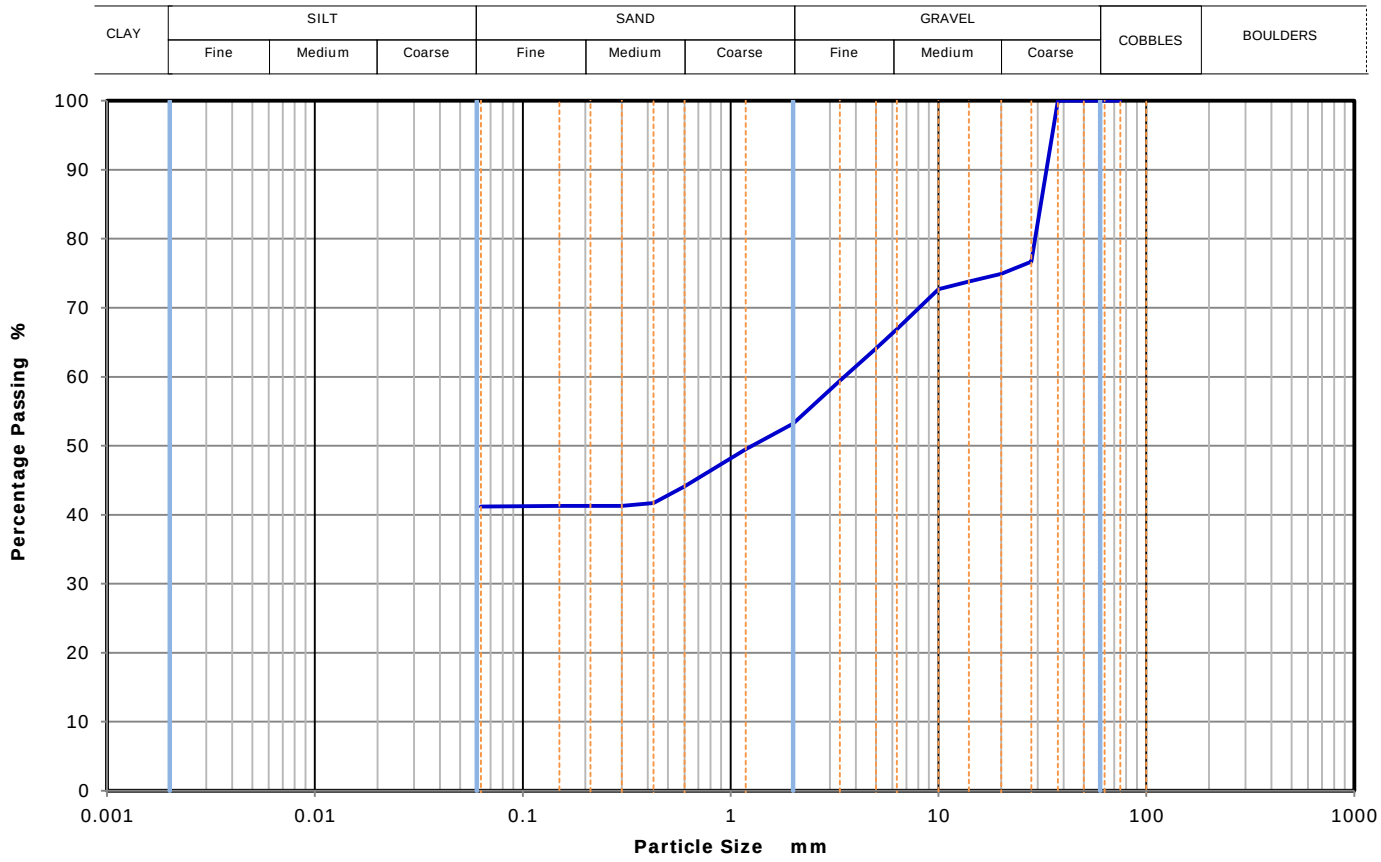
Test method and date	
Testing in accordance with BS EN ISO 17892:	
Wet sieving method	
Reporting date:	29 Jan 16

Soil Consultants

Site	The Water House,	Report No:	9919/MR
Location	Millfield Lane, Highgate, London N6 6HT		

PARTICLE SIZE DISTRIBUTION

Hole ID: CBR3 Depth [m]: 0.80	Description: MADE GROUND: orange brown silty, gravelly clay.



Sieving	
Size [mm]	% passing
75	100
63	100
50	100
37.5	100
28	76.7
20	74.9
14	73.8
10	72.7
6.3	66.9
5	64.1
3.35	59.4
2	53.2
1.18	49.5
0.6	44.1
0.425	41.7
0.3	41.3
0.212	41.3
0.15	41.3
0.063	41.2

Sample proportions	%
Cobbles	0
Gravel	47
Sand	12
Fines <0.063mm	41

Grading analysis		
D60	mm	3.5
D30	mm	
D10	mm	
Uniformity Coefficient		
Curvature Coefficient		

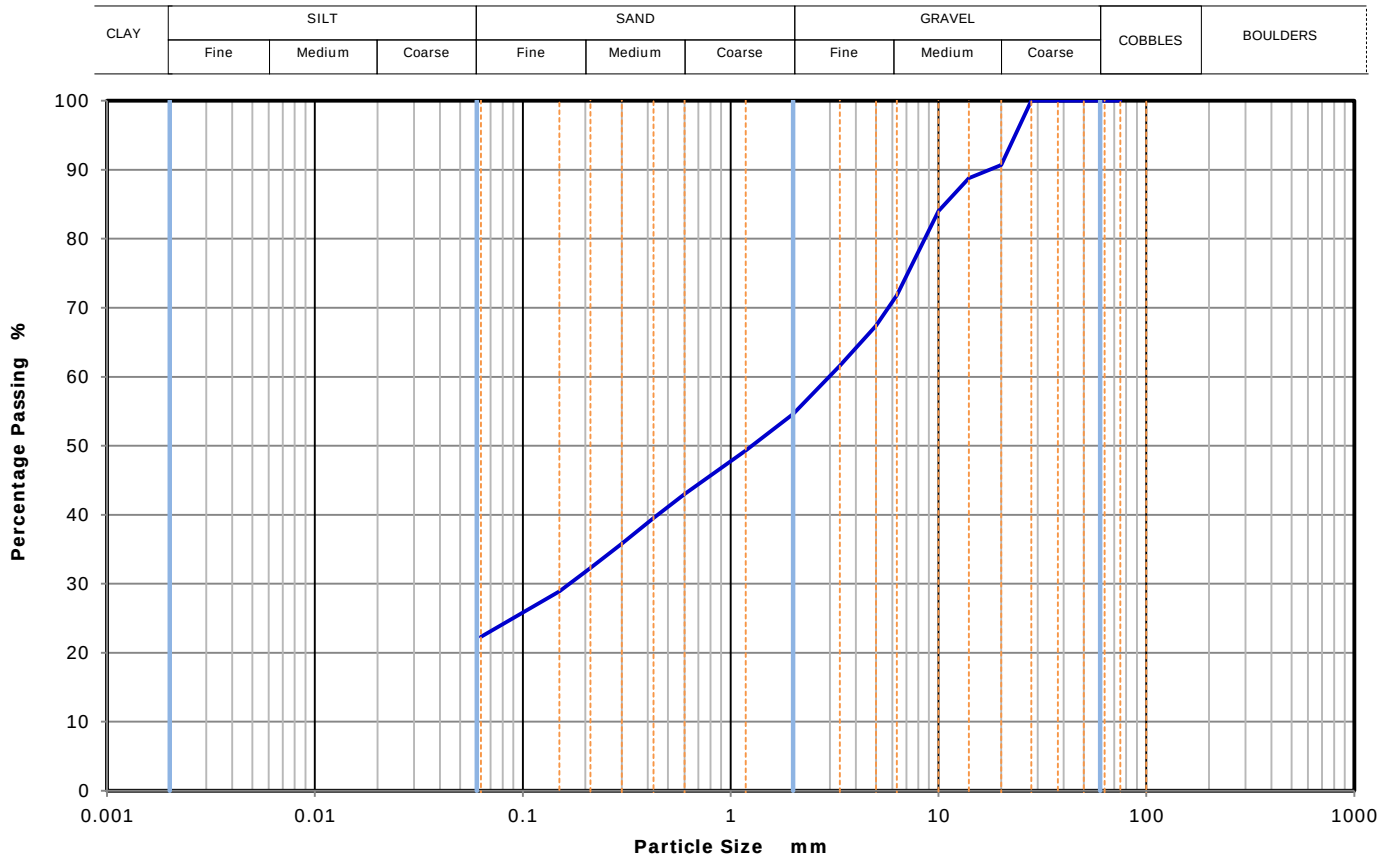
Test method and date	
Testing in accordance with BS EN ISO 17892:	
Wet sieving method	
Reporting date:	29 Jan 16

Soil Consultants

Site	**The Water House,**	Report No:	**9919/MR**
Location	**Millfield Lane, Highgate, London N6 6HT**		

PARTICLE SIZE DISTRIBUTION

Hole ID: **CBR4** Depth [m]: **0.50**	Description: **MADE GROUND: dark grey mottled black very silty, very sandy gravel.**



Sieving	
Size [mm]	% passing
75	100
63	100
50	100
37.5	100
28	100
20	90.7
14	88.8
10	84
6.3	71.8
5	67.4
3.35	61.6
2	54.6
1.18	49.3
0.6	43
0.425	39.5
0.3	35.8
0.212	32.3
0.15	28.9
0.063	22.3

Sample proportions	%
Cobbles	0
Gravel	45
Sand	32
Fines <0.063mm	22

Grading analysis		
D60	mm	3.0
D30	mm	0.2
D10	mm	
Uniformity Coefficient		
Curvature Coefficient		

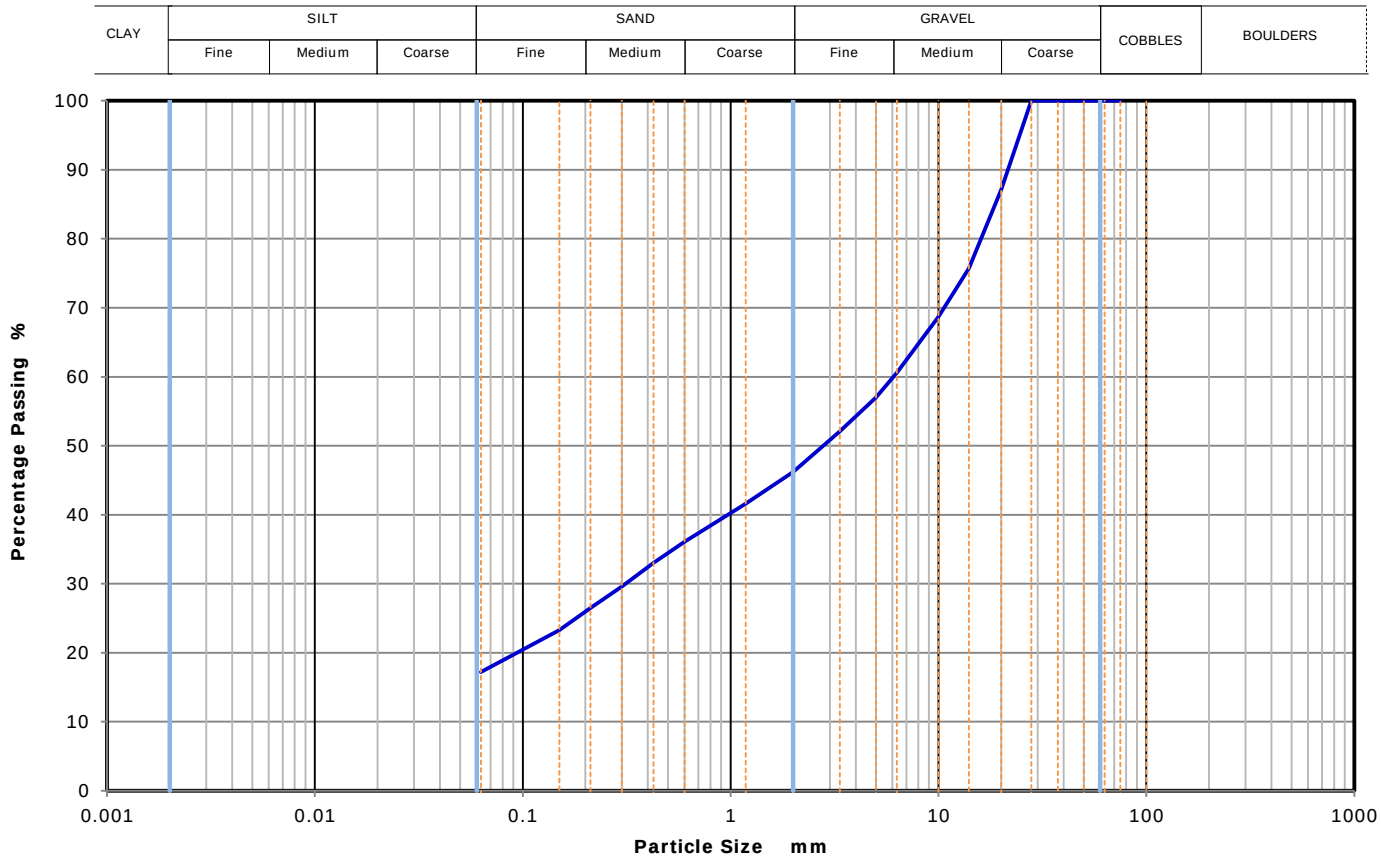
Test method and date	
Testing in accordance with BS EN ISO 17892:	
Wet sieving method	
Reporting date:	29 Jan 16

Soil Consultants

Site	**The Water House,**	Report No:	**9919/MR**
Location	**Millfield Lane, Highgate, London N6 6HT**		

PARTICLE SIZE DISTRIBUTION

Hole ID: **CBR5** Depth [m]: **0.30**	Description: **MADE GROUND: dark grey mottled black silty, very sandy gravel.**



Sieving	
Size [mm]	% passing
75	100
63	100
50	100
37.5	100
28	100
20	87.1
14	75.7
10	68.7
6.3	60.6
5	57
3.35	52.1
2	46.2
1.18	41.6
0.6	36.1
0.425	33
0.3	29.6
0.212	26.5
0.15	23.3
0.063	17.2

Sample proportions	%
Cobbles	0
Gravel	54
Sand	29
Fines <0.063mm	17

Grading analysis		
D60	mm	6.1
D30	mm	0.3
D10	mm	
Uniformity Coefficient		
Curvature Coefficient		

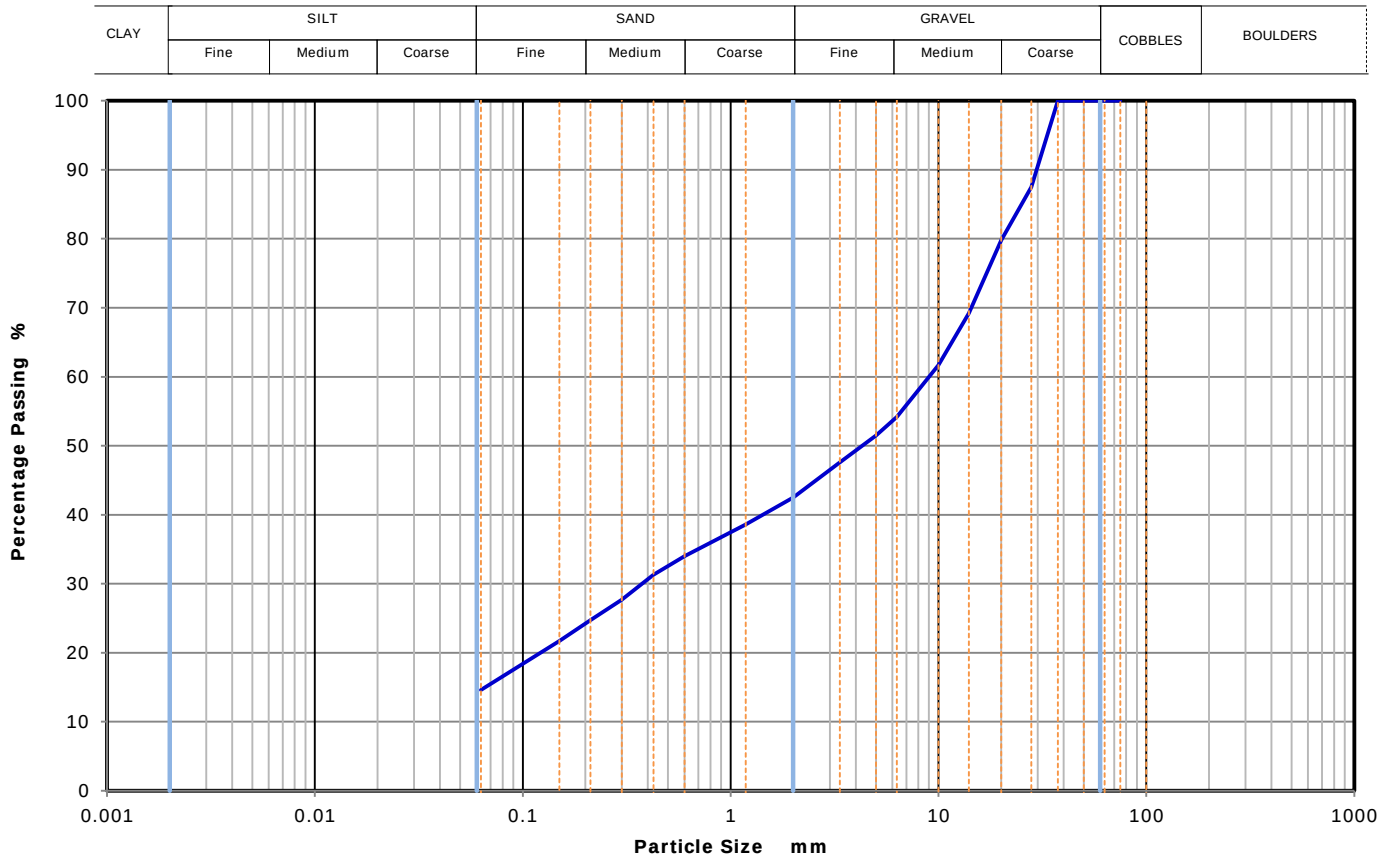
Test method and date	
Testing in accordance with BS EN ISO 17892:	
Wet sieving method	
Reporting date:	29 Jan 16

Soil Consultants

Site	The Water House,	Report No:	9919/MR
Location	Millfield Lane, Highgate, London N6 6HT		

PARTICLE SIZE DISTRIBUTION

Hole ID: CBR6 Depth [m]: 0.30	Description:	MADE GROUND: dark grey mottled blacksilty, very sandy gravel.



Sieving	
Size [mm]	% passing
75	100
63	100
50	100
37.5	100
28	87.5
20	79.8
14	69.2
10	61.7
6.3	54.2
5	51.5
3.35	47.6
2	42.5
1.18	38.6
0.6	34
0.425	31.3
0.3	27.7
0.212	24.7
0.15	21.7
0.063	14.6

Sample proportions	%
Cobbles	0
Gravel	58
Sand	28
Fines <0.063mm	15

Grading analysis		
D60	mm	9.0
D30	mm	0.4
D10	mm	
Uniformity Coefficient		
Curvature Coefficient		

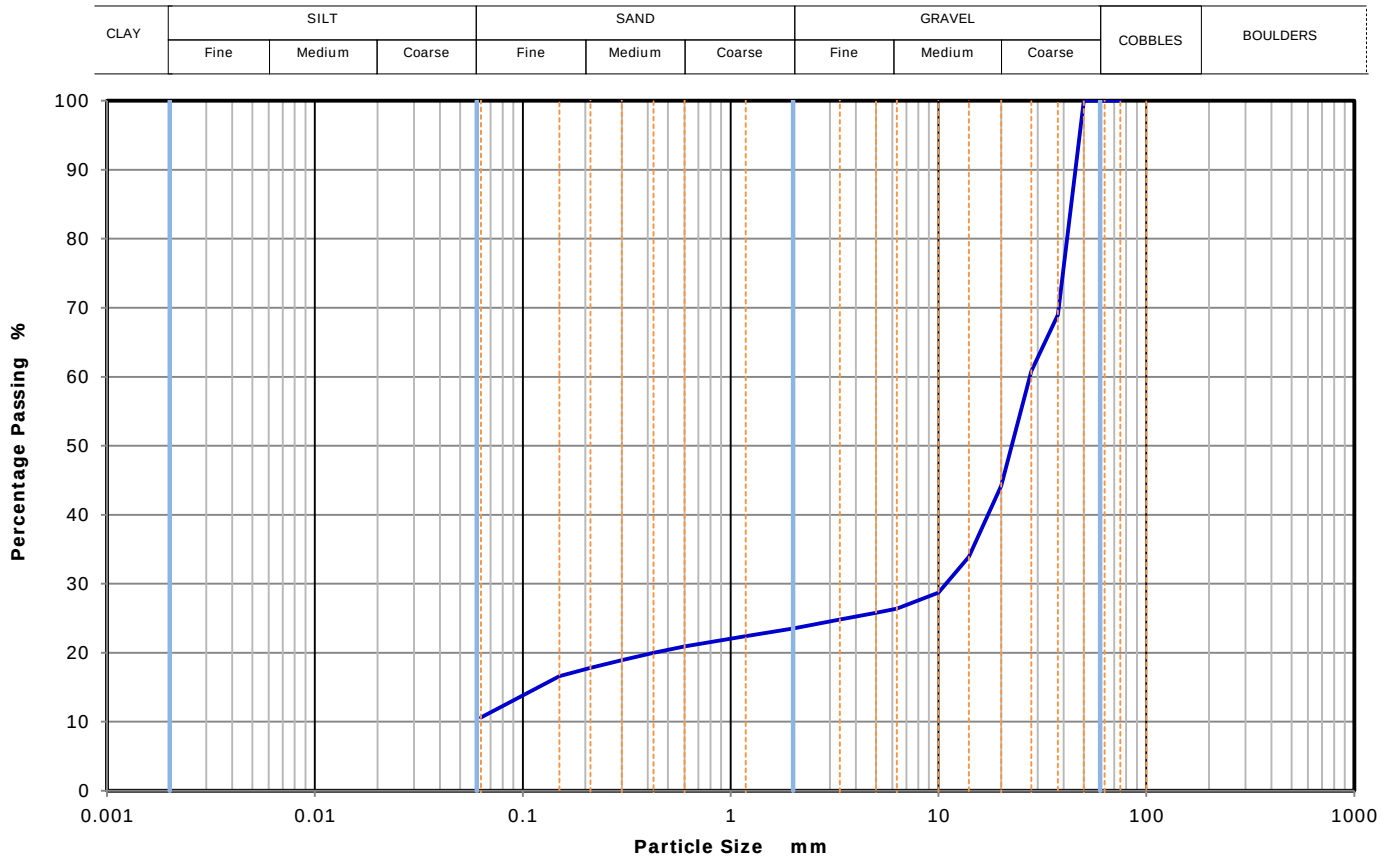
Test method and date	
Testing in accordance with BS EN ISO 17892:	
Wet sieving method	
Reporting date:	29 Jan 16

Soil Consultants

Site	**The Water House,**	Report	**9919/MR**
Location	**Millfield Lane, Highgate, London N6 6HT**	No:	

PARTICLE SIZE DISTRIBUTION

Hole ID: **CBR7** Depth [m]: **0.60**	Description: **Orange brown clayey, sandy GRAVEL.**



Sieving	
Size [mm]	% passing
75	100
63	100
50	100
37.5	69
28	60.8
20	44.2
14	33.9
10	28.7
6.3	26.4
5	25.8
3.35	24.8
2	23.5
1.18	22.4
0.6	20.9
0.425	20
0.3	18.9
0.212	17.8
0.15	16.6
0.063	10.6

Sample proportions	%
Cobbles	0
Gravel	77
Sand	13
Fines <0.063mm	11

Grading analysis		
D60	mm	27.5
D30	mm	10.9
D10	mm	
Uniformity Coefficient		
Curvature Coefficient		

Test method and date	
Testing in accordance with BS EN ISO 17892:	
Wet sieving method	
Reporting date:	29 Jan 16

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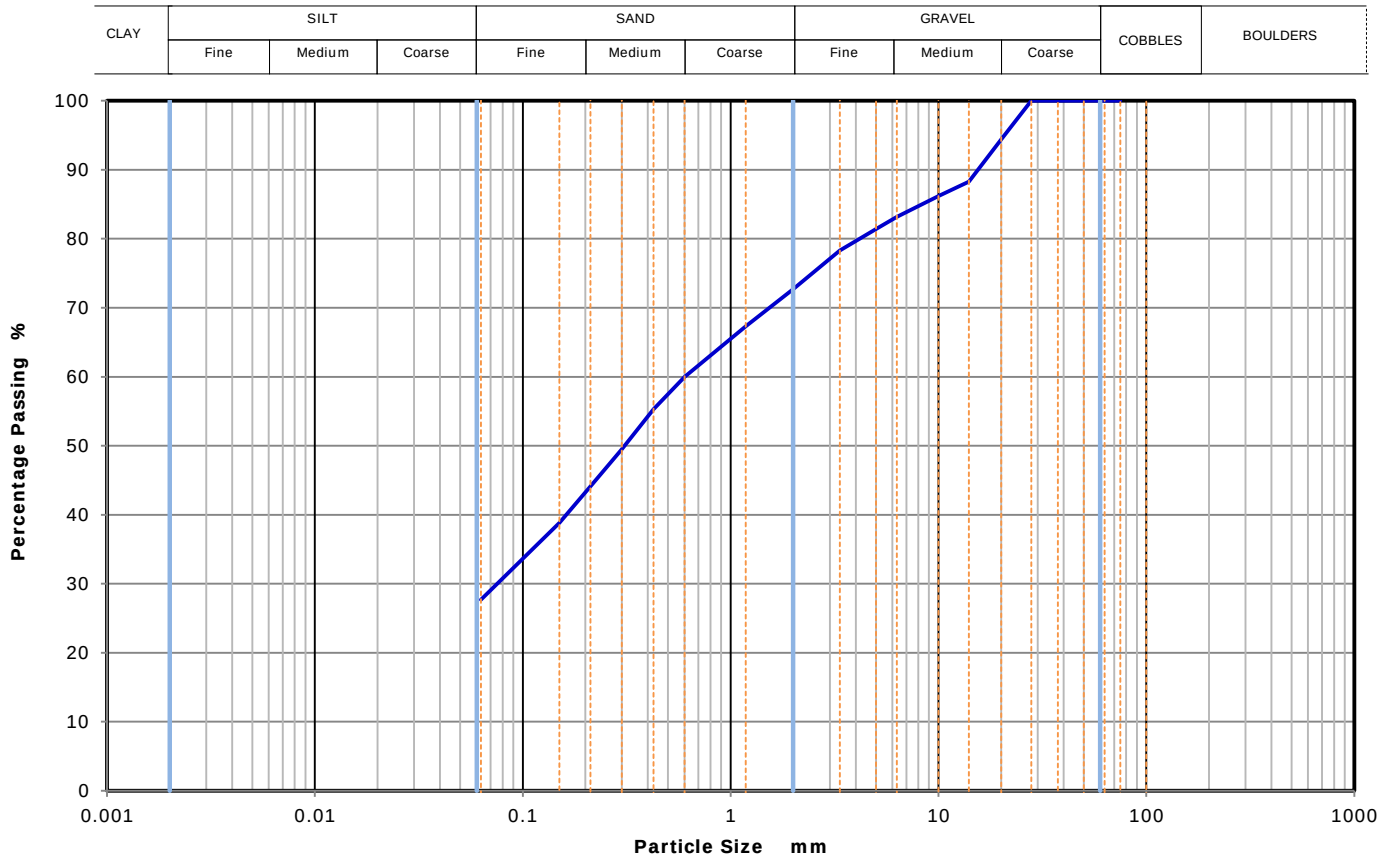
Site	**The Water House,**	Report No:	**9919/MR**
Location	**Millfield Lane, Highgate, London N6 6HT**		

PARTICLE SIZE DISTRIBUTION

Hole ID: **CBR8** Depth [m]: **0.40**	Description: **MADE GROUND: dark brown clayey, very silty, very gravelly sand.**



Sieving	
Size [mm]	% passing
75	100
63	100
50	100
37.5	100
28	100
20	94.4
14	88.3
10	86.2
6.3	83.2
5	81.4
3.35	78.3
2	72.7
1.18	67.3
0.6	60
0.425	55.3
0.3	49.5
0.212	44.1
0.15	38.8
0.063	27.7

Sample proportions	%
Cobbles	0
Gravel	27
Sand	45
Fines <0.063mm	28

Grading analysis		
D60	mm	0.6
D30	mm	0.1
D10	mm	
Uniformity Coefficient		
Curvature Coefficient		

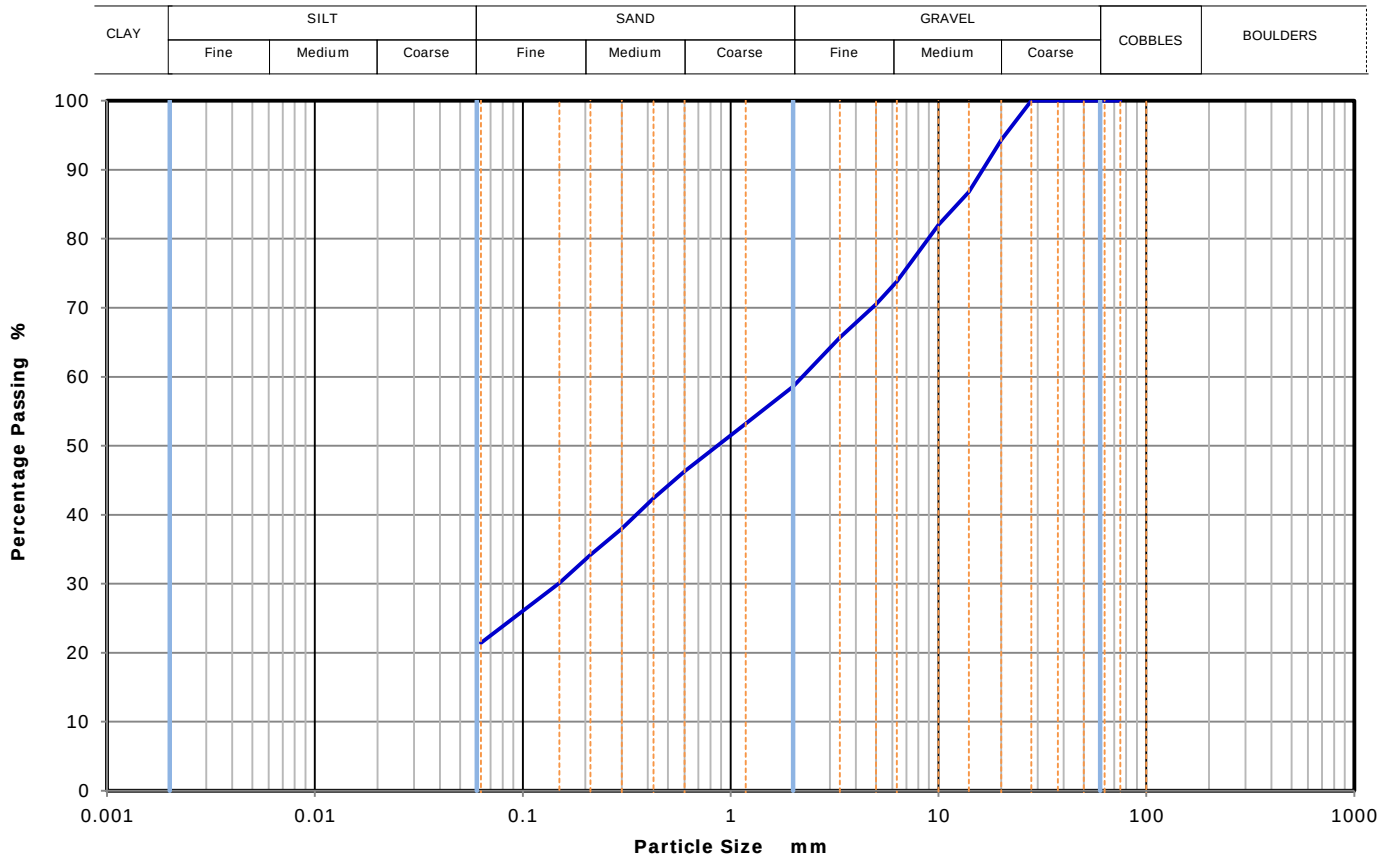
Test method and date	
Testing in accordance with BS EN ISO 17892:	
Wet sieving method	
Reporting date:	29 Jan 16

Soil Consultants

Site	The Water House,	Report No:	9919/MR
Location	Millfield Lane, Highgate, London N6 6HT		

PARTICLE SIZE DISTRIBUTION

Hole ID: CBR9 Depth [m]: 0.30	Description:	MADE GROUND: dark grey mottled black very silty, sand and gravel.



Sieving	
Size [mm]	% passing
75	100
63	100
50	100
37.5	100
28	100
20	94.3
14	86.8
10	82
6.3	73.8
5	70.5
3.35	65.7
2	58.6
1.18	53.2
0.6	46.3
0.425	42.4
0.3	38
0.212	34.2
0.15	30.1
0.063	21.4

Sample proportions	%
Cobbles	0
Gravel	41
Sand	37
Fines <0.063mm	21

Grading analysis		
D60	mm	2.2
D30	mm	0.1
D10	mm	
Uniformity Coefficient		
Curvature Coefficient		

Test method and date	
Testing in accordance with BS EN ISO 17892:	
Wet sieving method	
Reporting date:	29 Jan 16

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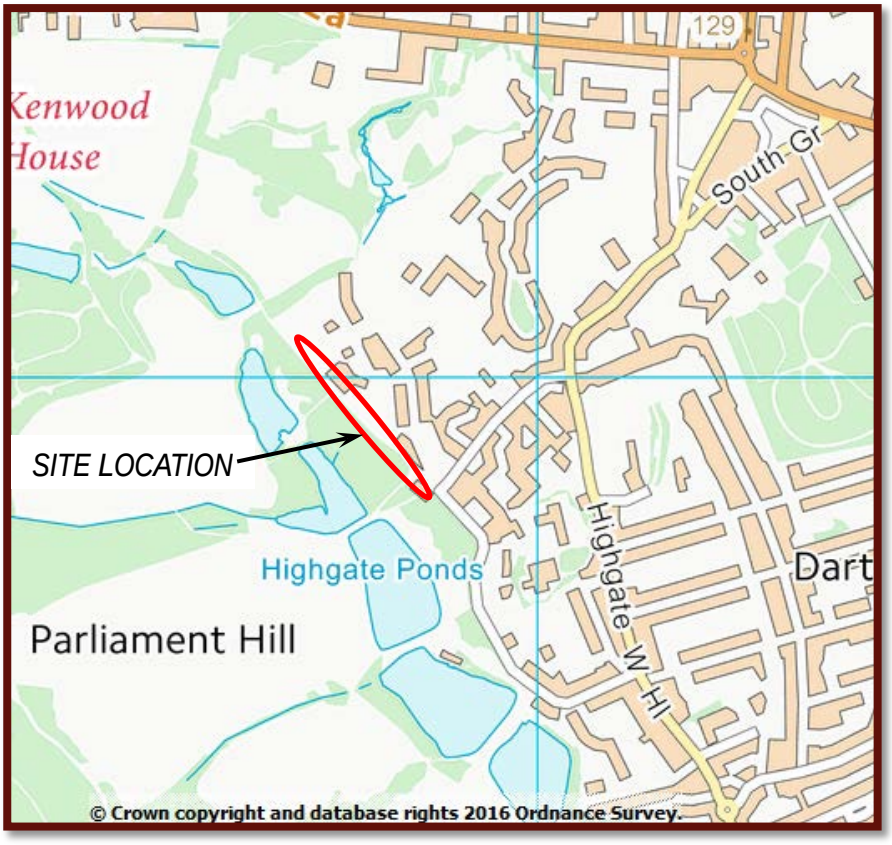
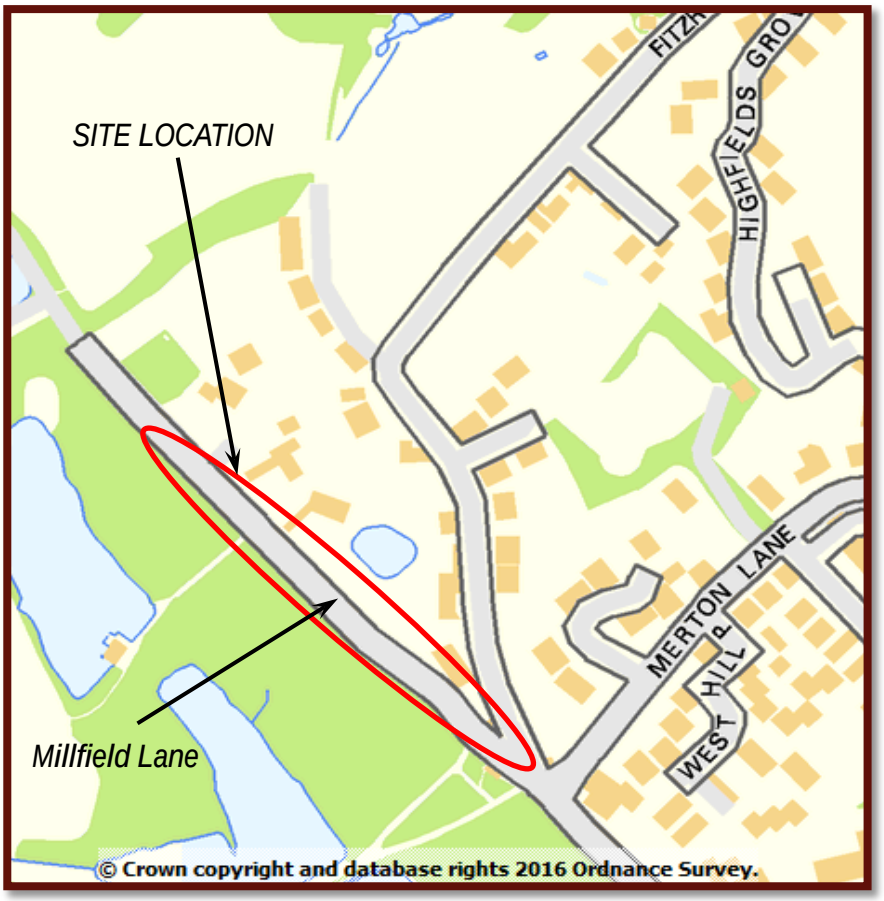
Site & Location	The Water House, Millfield Lane, Highgate, London N6 6HT	Report No: 9919/MR

Location Plan





Approx NGR of site 527690E 187000N

Site Location

The Water House,
Millfield Lane, Highgate, London N6 6HT

Report No:

9919/MR

Site Location Map

Approx NGR of site 527690E 187000N.
Approximate CBR locations plotted as GPS referencing wasn't applicable due to the dense vegetation.

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Appendix D

TECHNICAL NOTE

CANNON CONSULTING ENGINEERS
Highways, Transport & Infrastructure Planning

Project:	*The Waterhouse*
CCE Ref:	V321 The Waterhouse
Title:	Record of Meetings
Prepared by:	*CCE*
Approved by:	CM
Date:	June 2017

The following comments were made by consulted parties.

City of London (CoL) – 15th June

Owner of Apex Lodge, Fitzroy Park Residents Association, Ladies Pond – 22nd June

Key points raised by CoL

Right of access is to the boundary of the property, so vehicles can proceed no further than the property boundary.

The finish on the lane has been designed to deliberately make the look and feel informal and this is part of the character of the lane.

The running water across the lane was noted and this is from the pond in the adjacent property, seeking to discuss about mitigation with landowner but cannot be a piped solution.

Maintenance will be needed to protect fence and planting for the Waterhouse.

No dig solutions that spread the load of vehicles on the lane would be welcomed. Above ground interventions.

CoL would want to see a permanent solution come forward for protection of the tree roots and are intending to undertake works for this purpose.

Concerns around the sheer number and weight/axle weight/point loads and this would require further technical discussion.

Heights of vehicles would also need consideration to avoid interaction with low branches. It was accepted that light 'foliage' could be driven through.

A full length granite sett line should be created and some minor works to address the levels between the public highway and Millfield Lane 'a ramp'.

CoL are satisfied that the root survey they have is accurate for the purposes of any design work.

Part of the lane is unregistered, the section between the access from the public highway and the pedestrian access to the north.

Any proposal should seek to actively reduce the use of the lane for construction and alternatives should be considered.

Any construction traffic should be limited to walking speed and would support the use of Dashcams and bankspeople

Cannon Consulting Engineers Limited Company No. 05852651 VAT No. 895 2156 93
Registered Office Cambridge House Lanwades Business Park Kentford Newmarket CB8 7PN

Safety zones for pedestrians should be considered

It may be necessary to encourage / enforce that dogs must be on leads.

Hazard lights should be in operation at all times

Ongoing maintenance will be required and this would need to be agreed with CoL

Seasonal variation in weather will have an impact and this would need to be considered.

CoL would be ok without additional limitations on times works are carried out.

A Construction Working Group would be of benefit.

CoL have undertaken a CBR analysis in the past 12 months and are willing to share this information with us to support the development of the CMP.

Key Points raised by Colin and Christine Hall-Cooper

Would not want the entrance to the lane to be a vehicle holding area

Want to ensure that there wall and garden which is immediately adjacent to the lane is not damaged. Would welcome a condition survey and would like to know if this cost would be covered and agreements in place to make good.

Would like to discuss a tree removal in their garden adjacent to the lane and opportunity to make good their boundary edging.

Key points raised by Fitzroy Park Residents Association

Fitzroy Par Residents Association are happy to liaise on behalf of the residents affected, if it is considered helpful.

Would require that a full arboriculture and and topographical survey be commissioned to be fully satisfied that the condition and extent of the lane was fully understood as part of any discussions and prior to progression of a detailed construction solution and would want agreement on the acceptability of these surveys by CoL.

Will happily take forward any reasonable discussion in relation to Fitzroy Park. Reasonable would be the possibility of arrivals on foot only, no goods.

Will continue to be concerned about large vehicles access Millfield Lane but also when entering / exiting from the public highway and the fact that a swept path analysis is not an accurate representation of vehicles will actually use road space e.g. vehicles over-running kerbs is not acceptable.

Would like to see bankspeople similar to the Dams project.

Feel that dogs on leads will be useful and that a temporary licence for the section in question to enforce.

Would want to see information boards erected to publicise the project and construction activity and a local stakeholder group.

Would wish for no activity on weekends.

They identified a strong set of principles was required and would need to be contained. She identified some activities that had occurred previously that could be reasonably construed as unlawful as it occurred on private land without permission - AGREED

It was clearly and reasonably stated that nothing should be taking place without prior notification to adjacent land owners and that we must respect land owners rights - AGREED

Key points raised by Ladies Pond

The Ladies Pond representatives explained how on certain days the invitation is taken up by hundreds, if not more and that at these times queuing can occur and they manage a very high number of people. These days simply happen and they would wish that there was always a point of contact and noting that in Dec/Jan opening times are 7.30 and rest of the year is 7am.

The point of contact would need to be readily available around their needs as much as the construction activity.

In the winter months the lane is less well lit and could be considered 'dark' as early as 3pm. They would want to see this taken into consideration and they also identified that during the winter months attendees to the pond can be of a habitual nature and would welcome any discussions in ensuring that the most loyal patrons can have an unfettered journey. For example if there was a specific window in every hour where it was very clear and known that no traffic was on the lane – boards for example stating times or inferring the same.

Women arrive on all forms of transport, foot, bicycle, motor cycle, mobility scooter and the lane should continue to offer this during a construction phase and any necessary mitigation to the lane must not lower the offer that is currently provided.

Emergency access needs to be provided and a clear emergency strategy must come through that can be discussed and disseminated to the ladies pond prior to activity taking place.

Requested that any update be provided so that they can inform their members and next newsletter.