3 - 6 Spring Place

Spring Place Ltd

DRAFT Construction Management Plan

Arcadis

September 2016

34 York Way
London N1 9AB

Telephone
+44 (0)20 78122000

info@arcadis.com
www.arcadis.com

Construction Management Plan – for Planning Application

3-6 Spring Place, London

Camden

Contents

Revisions & additional material

Please list all iterations here:

Date	Version	Produced by
31 August 2016	**Planning**	**Arcadis**

Additional sheets

Please note – the review process will be quicker if these are submitted as Word documents or searchable PDFs.

Date	Version	Produced by

Introduction

The purpose of the **Construction Management Plan (CMP)** is to help developers to minimise construction impacts, and relates to both on site activity and the transport arrangements for vehicles servicing the site.

It is intended to be a live document whereby different stages will be completed and submitted for application as the development progresses.

The completed and signed CMP must address the way in which any impacts associated with the proposed works, and any **cumulative impacts of other nearby construction sites**, will be mitigated and managed. The level of detail required in a CMP will depend on the scale and kind of development. Further policy guidance is set out in Camden Planning Guidance **(CPG)** 6: Amenity and **(CPG)** 8: Planning Obligations.

This CMP follows the best practice guidelines as described in Transport for London's (TfL's Standard for Construction Logistics and Cyclist Safety (**CLOCS**) scheme) and Camden's Minimum Requirements for Building Construction **(CMRBC)**.

The approved contents of this CMP must be complied with unless otherwise agreed with the Council in writing. The project manager shall work with the Council to review this CMP if problems arise in relation to the construction of the development. Any future revised plan must also be approved by the Council and complied with thereafter.

It should be noted that any agreed CMP does not prejudice or override the need to obtain any separate consents or approvals such as for road closures or hoarding licences.

If your scheme involves any demolition, you need to make an application to the Council's Building Control Service. Please complete the "**Demolition Notice.**"

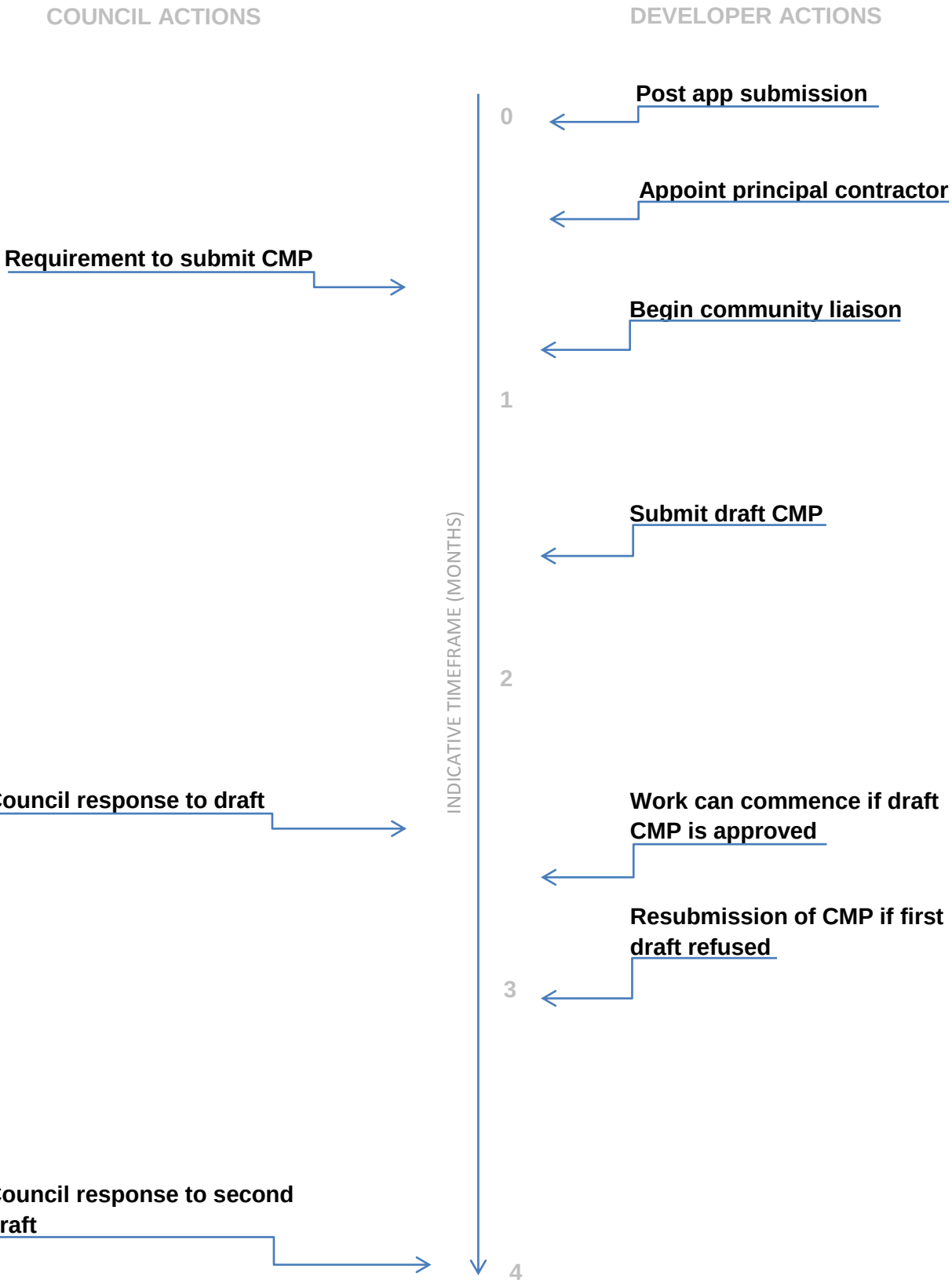
Please complete the questions below with additional sheets, drawings and plans as required. The boxes will expand to accommodate the information provided, so please provide as much information as is necessary. **It is preferable if this document, and all additional documents, are completed electronically and submitted as Word files to allow comments to be easily documented. These should be clearly referenced/linked to from the CMP.**

Please notify that council when you intend to start work on site. Please also notify the council when works are approximately **3 months from completion.**

(Note the term 'vehicles' used in this document refers to all vehicles associated with the implementation of the development, e.g. demolition, site clearance, delivery of plant & materials, construction, etc.)

Revisions to this document may take place periodically.

Timeframe


COUNCIL ACTIONS
DEVELOPER ACTIONS
Post app submission
0
Appoint principal contractor
Requirement to submit CMP
Begin community liaison
1
Submit draft CMP
INDICATIVE TIMEFRAME (MONTHS)
2
Council response to draft
Work can commence if draft CMP is approved
Resubmission of CMP if first draft refused
3
Council response to second draft
4

Contact

1. Please provide the full postal address of the site and the planning reference relating to the construction works.

Address: 3-6 Spring Place, London, NW5 3BH

Planning ref: **to be confirmed upon registration**

Type of CMP - Section 106 planning obligation/~~Major sites framework~~:

2. Please provide contact details for the person responsible for submitting the CMP.

Name: Arcadis – Michael Jordan

Address: 34 York Way, London, N1 9AB

Email: michael.jordan@arcadis.com

Phone: 0207 812 2000

3. Please provide full contact details of the site project manager responsible for day-to-day management of the works and dealing with any complaints from local residents and businesses.

Name: TBC

Address:

Email:

Phone:

4. Please provide full contact details of the person responsible for community liaison and dealing with any complaints from local residents and businesses if different from question 3. In the case of **Community Investment Programme (CIP)**, please provide contact details of the Camden officer responsible.

Name: TBC

Address:

Email:

Phone:

5. Please provide full contact details including the address where the main contractor accepts receipt of legal documents for the person responsible for the implementation of the CMP.

Name: TBC

Address:

Email:

Phone:

Site

6. Please provide a site location plan and a brief description of the site, surrounding area and development proposals for which the CMP applies.

The site is currently occupied by Addison Lee for use as garages to repair and maintain their fleet of vehicles.

It is located either side of London Overground line.

The surrounding area is a mixture of residential, commercial uses. There is a LB of Camden depot on the opposite side of Spring Place.

Please see Appendix A for the site location plan.

7. Please provide a very brief description of the construction works including the size and nature of the development and details of the main issues and challenges (e.g. narrow streets, close proximity to residential dwellings etc).

The Proposed Development will involve the demolition of the existing buildings and structures and redevelopment to provide flexible office space including restaurant, café and event space of up to 6 storeys including a basement level for start up businesses and SMEs.

Overall area of the building is 45,876 sq ft/4262m2 GIA. A piled wall will be constructed to the basement perimeter and the building will have a concrete frame. The facades will be a mixture of brickwork, curtain walling, windows and metal panels.

The main issues and challenges are:

- Working adjacent to a live railway line
- Close proximity to residential properties
- Restricted headroom of existing railway bridges
- Access route to and from the site including areas to turn vehicles around
- The new building line is at the site boundaries.

8. Please identify the nearest potential receptors (dwellings, business, etc.) likely to be affected by the activities on site (i.e. noise, vibration, dust, fumes, lighting etc.).

Residential properties on Spring Place/Gilles road
Autograph Sound Recording, 2 Spring Place
Star House and Annroy Gallery, Grafton Road
LB of Camden Depot
London Overground line

9. Please provide a scaled plan detailing the local highway network layout in the vicinity of the site. This should include details of on-street parking bay locations, cycle lanes, footway extents and proposed site access locations.

Please see TPP drawing reference 30895/AC/002 – Appendix C

10. Please provide the proposed start and end dates for each phase of construction as well as an overall programme timescale. (A Gantt chart with key tasks, durations and milestones would be ideal).

Please see programme in Appendix B

11. Please confirm the standard working hours for the site, noting that the standard working hours for construction sites in Camden are as follows:

- 8.00am to 6pm on Monday to Friday
- 8.00am to 1.00pm on Saturdays
- No working on Sundays or Public Holidays

The site will operate within the standard working hours for the LB of Camden.

On occasions there will be the requirement to work outside of these hours such as piling rig delivery/removal and tower crane erection/dismantle. These will be discussed and agreed with LB of Camden and the local neighbourhood will be notified.

12. Please indicate if any changes to services are proposed to be carried out that would be linked to the site during the works (i.e. connections to public utilities and/or statutory undertakers' plant). Larger developments may require new utility services. If so, a strategy and programme for coordinating the connection of services will be required. If new utility

services are required, please confirm which utility companies have been contacted (e.g. Thames Water, National Grid, EDF Energy, BT etc.) You must explore options for the utility companies to share the same excavations and traffic management proposals. Please supply details of your discussions.

There is a requirement to relocate an existing UKPN substation from its current location to the Grafton Road side of the site. Discussions have commenced with UKPN and are currently ongoing.

At present contact has not been made with the other statutory providers.

Community Liaison

A neighbourhood consultation process must have been undertaken prior to submission of the CMP first draft. This consultation must relate to construction impacts, and should take place following the grant of planning permission in the lead up to the submission of the CMP. A consultation process specifically relating to construction impacts must take place regardless of any prior consultations relating to planning matters. This consultation must include all of those individuals that stand to be affected by the proposed construction works. These individuals should be provided with a copy of the draft CMP, or a link to an online document. They should be given adequate time with which to respond to the draft CMP, and any subsequent amended drafts. Contact details which include a phone number and email address of the site manager should also be provided.

Significant time savings can be made by running an effective neighbourhood consultation process. This must be undertaken in the spirit of cooperation rather than one that is dictatorial and unsympathetic to the wellbeing of local residents and businesses.

These are most effective when initiated as early as possible and conducted in a manner that involves the local community. Involving locals in the discussion and decision making process helps with their understanding of what is being proposed in terms of the development process. **The consultation and discussion process should have already started, with the results incorporated into the CMP first draft submitted to the Council for discussion and sign off.** This communication should then be ongoing during the works, with neighbours and any community liaison groups being regularly updated with programmed works and any changes that may occur due to unforeseen circumstances through newsletters, emails and meetings.

Please note that for larger sites, details of a construction working group may be required as a separate S106 obligation. If this is necessary, it will be set out in the S106 Agreement as a separate requirement on the developer.

Cumulative impact

Sites located within high concentrations of construction activity that will attract large numbers of vehicle movements should consider establishing contact with other sites in the vicinity in order to manage traffic routeing and volumes. Developers in the Tottenham Court Road area have done this to great effect.

The Council can advise on this if necessary.

13. Consultation

The Council expects meaningful consultation. For large sites, this may mean two or more meetings with local residents **prior to submission of the first draft CMP**.

Evidence of who was consulted, how the consultation was conducted and a summary of the comments received in response to the consultation. Details of meetings including minutes, lists of attendees etc. must be included.

In response to the comments received, the CMP should then be amended where appropriate and, where not appropriate, a reason should be given. The revised CMP should also include a list of all the comments received. Developers are advised to check proposed approaches to consultation with the Council before carrying them out. If your site is on the boundary between boroughs then we would recommend contacting the relevant neighbouring planning authority.

Please provide details of consultation of draft CMP with local residents, businesses, local groups (e.g. residents/tenants and business associations) and Ward Councillors.

Prior to the Planning Application there have been a number of public consultations and meetings with local representatives, details have been appended, In addition, there are on-going discussions with Network Rail during the design process with regard to working adjacent and beneath the arches.

14. Construction Working Group

Please provide details of community liaison proposals including any Construction Working Group that will be set up, addressing the concerns of the community affected by the works, the way in which the contact details of the person responsible for community liaison will be advertised to the local community, and how the community will be updated on the upcoming works i.e. in the form of a newsletter/letter drop, or weekly drop in sessions for residents.

Periodic Neighbourhood Meetings - every three months with attendance by Network Rail, TfL and LB Camden, if required. These meetings will concentrate on key issues, including programme overview, activities which may have a significant impact, such as tower crane erection, and review the coordination and sequencing of works. The focus will be on minimising disruption to neighbours and their businesses. An updated list of project contacts will be distributed.

15. Schemes

Please provide details of any schemes such as the 'Considerate Constructors Scheme', such details should form part of the consultation and be notified to the Council. Contractors will also be required to follow the "Guide for Contractors Working in Camden" also referred to as "Camden's Considerate Contractors Manual".

The project will be registered with the Considerate Constructors Scheme

16. Neighbouring sites

Please provide a plan of existing or anticipated construction sites in the local area and please state how your CMP takes into consideration and mitigates the cumulative impacts of construction in the vicinity of the site. The council can advise on this if necessary.

At present, we are unaware of any other existing or anticipated construction sites in the local area.

It is noted that planning was granted for student accommodation in Holmes Road in March 2014, ref: 2013/7130/P. If these works do commence prior or during our project then we would liaise with the Client and their Principal Contractor with regard to the traffic management.

Transport

This section must be completed in conjunction with your principal contractor. If one is not yet assigned, please leave the relevant sections blank until such time when one has been appointed.

Camden is a CLOCS Champion, and is committed to maximising road safety for Vulnerable Road Users (VRUs) as well as minimising negative environmental impacts created by motorised road traffic. As such, all vehicles and their drivers servicing construction sites within the borough are bound by the conditions laid out in the CLOCS Standard.

This section requires details of the way in which you intend to manage traffic servicing your site, including your road safety obligations with regard to VRU safety. It is your responsibility to ensure that your principal contractor is fully compliant with the terms laid out in the CLOCS Standard. It is your principal contractor's responsibility to ensure that all contractors and sub-contractors attending site are compliant with the terms laid out in the CLOCS Standard.

Checks of the proposed measures will be carried out by the council to ensure compliance. Please refer to the CLOCS Standard when completing this section. Guidance material which details CLOCS requirements can be accessed here, details of the monitoring process are available here.

Please contact CLOCS@camden.gov.uk for further advice or guidance on any aspect of this section.

Please refer to the CLOCS Overview and Monitoring Overview documents referenced above which give a breakdown of requirements.

CLOCS Considerations

17. Name of Principal contractor:

TBC

18. Please submit the proposed method for checking operational, vehicle and driver compliance with the CLOCS Standard throughout the duration of the contract (please refer to our CLOCS Overview document in the appendix and CLOCS Standard point 3.4.7).

The Main Contractor will be required as part of the contract to comply with the CLOCS Standard.

As part of their subcontractor selection process they will be required to demonstrate that their subcontractors and suppliers comply with the CLOCS Standard, providing documentary evidence.

Random checks will be made during the duration of the contract to ensure that the CLOCS Standard is adhered to.

19. Please confirm that you as the client/developer and your principal contractor have read and understood the CLOCS Standard and included it in your contracts. Please sign-up to join the CLOCS Community to receive up to date information on the standard by expressing an interest online.

I confirm that I have included the requirement to abide by the CLOCS Standard in my contracts to my contractors and suppliers:

We would confirm that we will abide by the CLOCS Standard and these will be included in the contracts with our contractors and suppliers.

Please contact CLOCS@camden.gov.uk for further advice or guidance on any aspect of this section.

Site Traffic

Sections below shown in blue directly reference the CLOCS Standard requirements. The CLOCS Standard should be read in conjunction with this section.

20. Traffic routing: *"Clients shall ensure that a suitable, risk assessed vehicle route to the site is specified and that the route is communicated to all contractors and drivers. Clients shall make contractors and any other service suppliers aware that they are to use these routes at all times unless unavoidable diversions occur."* (P19, 3.4.5)

Routes should be carefully considered and risk assessed, taking into account the need to avoid where possible any major cycle routes and trip generators such as schools, offices, public buildings, museums etc. Where appropriate, on routes that use high risk junctions (i.e. those that attract high volumes of cycling traffic) installing Trixi mirrors to aid driver visibility should be considered.

Consideration should also be given to weight restrictions, low bridges and cumulative impacts of construction (including neighbouring construction sites) on the public highway network. The route(s) to and from the site should be suitable for the size of vehicles that are to be used.

a. Please indicate routes on a drawing or diagram showing the public highway network in the vicinity of the site including details of links to the Transport for London Road Network (TLRN).

> The main through routes in this part of Camden, from which vehicles can access the development site, are the A400 Kentish Town Road to the west and Prince of Wales Road to the south. Taking into account the existing road widths, on street parking and traffic calming measures already in place, the most suitable route providing access to the site is via Prince of Wales Road and Grafton Road. The most suitable route when leaving the site will be via Holmes Road and Kentish Town Road. These routes are shown on Drawing No. 30895/AC/011. Further details are provided in the response to question 22. There are no impacts on the Transport for London Road Network (TLRN).

b. Please confirm how contractors, delivery companies and visitors will be made aware of the route (to and from the site) and of any on-site restrictions, prior to undertaking journeys.

The delivery route will be included within the tender documents issued to the Main Contractors. It will then be incorporated into the Contract documents successful contractor is appointed.

The Main Contractor will be required to include the vehicle route in all subcontract and suppliers orders. This will mean that they all fully aware of the route and make due allowance for this with regard to the size of vehicle.

On site the delivery routes will be displayed on the site noticeboards and on the hoarding

21. Control of site traffic, particularly at peak hours: "*Clients shall consider other options to plan and control vehicles and reduce peak hour deliveries*" (P20, 3.4.6)

Construction vehicle movements are generally acceptable between 9.30am to 4.30pm on weekdays and between 8.00am and 1.00pm on Saturdays). If there is a school in the vicinity of the site or on the proposed access and/or egress routes, then deliveries must be restricted to between 9.30am and 3pm on weekdays during term time. (Refer to the *Guide for Contractors Working in Camden*).

A delivery plan should ensure that deliveries arrive at the correct part of site at the correct time. Instructions explaining such a plan should be sent to all suppliers and contractors**.** Consideration should be given to the location of any necessary holding areas for large sites with high volumes of traffic. Vehicles must not wait or circulate on the public highway. Whilst deliveries should be given set times to arrive, dwell and depart, no undue time pressures should be placed upon the driver at any time.

a. Please provide details of the typical sizes of all vehicles and the approximate frequency and times of day when they will need access to the site, for each phase of construction. You should estimate the average daily number of vehicles during each major phase of the work, including their dwell time at the site. High numbers of vehicles per day and/or long dwell times may require vehicle holding procedures.

Please see Appendix D

b. Please provide details of other developments in the local area or on the route.

At present we are unaware of any other existing or anticipated construction sites in the local area

It is noted that planning was granted for student accommodation in Holmes Road in March 2014, ref: 2013/7130/P. If these works do commence prior or during our project then we would liaise with the Client and their Principal Contractor with regard to the traffic management.

c. Please outline the system that is to be used to ensure that the correct vehicle attends the correct part of site at the correct time.

All deliveries will have to be pre booked with the Logistics Manager a minimum of seven days before. Subcontractors/suppliers will be required to provide details regarding size of vehicle, registration and time required for unloading.

The subcontractor/supplier will then be allocated a delivery time slot and advised whether the delivery is to Grafton Road or Spring Place. This information will then be included on a weekly delivery schedule.

As deliveries arrive on site they will be checked and verified by the Traffic Marshalls in the holding area in Athlone Street. From there they will be escorted into the unloading bays.

d. Please identify the locations of any off-site holding areas (an appropriate location outside the borough may need to be identified, particularly if a large number of delivery vehicles are expected) and any measures that will be taken to ensure the prompt admission of vehicles to site in light of time required for any vehicle/driver compliance checks. Please refer to question 24 if any parking bay suspensions will be required for the holding area.

As discussed a holding area for larger vehicles is proposed in Athlone Street. However, it is not anticipated that this would be used by a large number of vehicles. It would only be employed when larger vehicles are scheduled to service the site and the assistance of traffic marshalls is required.

e. Please provide details of any other measures designed to reduce the impact of associated traffic (such as the use of construction material consolidation centres).

This will be discussed with the Main Contractors during the tendering and selection process

22. Site access and egress: *"Clients shall ensure that access to and egress from the site is appropriately managed, clearly marked, understood and clear of obstacles."* (P18, 3.4.3)

Vehicles entering and leaving the site should be carefully managed, using gates that are clearly marked and free from obstacles. Traffic Marshalls must ensure the safe passage of pedestrians, cyclists and other traffic when vehicles are entering and leaving site, particularly if reversing.

a. Please detail the proposed access and egress routes to and from the site

The most suitable route providing access to the site was deemed to be via Prince of Wales Road and Grafton Road. The most suitable route when leaving the site was considered to be via Holmes Road and Kentish Town Road. On Holmes Road, with the exception of two schools, the majority of properties are occupied by businesses. These routes are shown in Drawing No's 30895/AC/002 as well as 30895/AC/011 and 30895/AC/012, which also include swept path analysis for a 10.2m tipper truck and an articulated vehicle respectively.

An alternative route via Queens Crescent was also considered, as shown in Drawing No. 30895/AC/013. However, this was considered unsuitable because of the need to suspend residential parking bays, the risk of vehicles over-running the kerbs and over-hanging the footway.

The sequence of activities for a large vehicle accessing the development site will be as follows:

Step A: vehicles arrives and waits in holding area in Athlone Road

Step B: vehicle turns at the Spring Place/Holmes Road junction and reverses into Spring Place with assistance of traffic marshalls

Step C: temporary barriers put in position around the vehicle

Step D: vehicle is unloaded

Step D: temporary barriers removed

Step E: vehicle leaves the area via Holmes Road and Kentish Town Road.

It should be noted that the above arrangements require the suspension of metered parking bays in Spring Place.

This sequence is shown on Drawings No: 30895/AC/014 and 30895/AC/015 for a 10.2m tipper truck and a 13.55m articulated vehicle respectively. Drawing No: 30895/AC/020 shows that a council waste vehicle accessing the depot in Spring Place would be able to pass the large delivery vehicle when parked with temporary barriers in place.

b. Please describe how the access and egress arrangements for construction vehicles will be managed.

Traffic Marshalls will escort the vehicles to the unloading bays. Whilst one Marshall assists the delivery vehicle in reversing into the unloading bay in Spring Place other Marshalls will control other road users and pedestrians.

Once the vehicle is in the unloading bay, temporary barriers will be placed in position around the vehicle whilst it is unloaded. These temporary barriers will then be removed and the vehicle will be escorted by the Traffic Marshall to the junction with Holmes Place where the vehicle will turn left back towards Kentish Town Road.

c. Please provide swept path drawings for any tight manoeuvres on vehicle routes to and from the site including proposed access and egress arrangements at the site boundary (if necessary).

During construction it will not be possible for larger vehicles accessing the development to turn around within the site. Therefore, vehicles will make a turning manoeuvre at the Spring Place/Holmes Road junction and reverse into Spring Place. Swept path analysis for a 10.2m tipper truck and an articulated vehicle are shown on Drawing Nos. 30895/AC/014 and 30895/AC/015. This junction has a raised pavement treatment and bollards to prevent casual parking of vehicles near to the Collège Français Bilingue de Londres. However, the swept path analysis indicates that turning of large vehicles is possible without any vehicle overhang onto the footway.

The turning manoeuvre at the Kentish Town Road/Holmes Road junction (shown in the photograph below) will be difficult for larger vehicles. Drawing No. 30895/AC/018 shows the left turn for an articulated vehicle heading north out of London. Vehicles will cross on the southbound traffic lane on Kentish Town Road when turning left out of Holmes Road. Whilst this is common for larger vehicles throughout London, during times of high vehicle flows it may be necessary for this junction to be managed by traffic marshals in order to reduce vehicle conflict.

In order to alleviate the pressure on the Spring Place loading area, and to reduce the number of vehicles reversing along Spring Place, it will be beneficial to provide an additional loading area on Grafton road adjacent to the development (shown in the photograph below). Drawing No. 30895/AC/019 shows that, following the suspension of the existing parking bays, a standard transit van and an 8m rigid lorry can access the proposed loading area on Grafton Road and leave the area via Holmes Road.

d. Provision of wheel washing facilities should be considered if necessary. If so, please provide details of how this will be managed and any run-off controlled.

As vehicles will not be entering the site, wheel wash facilities will not be required.

During the excavation works any spoil that falls onto the road will be picked up by the Traffic Marshall to prevent it going onto the public highway. In addition a Scarab will visit the site periodically during the course of these works

23. Vehicle loading and unloading: *"Clients shall ensure that vehicles are loaded and unloaded on-site as far as is practicable."* (P19, 3.4.4)

If this is not possible, Traffic Marshalls must ensure the safe passage of pedestrians, cyclists and motor traffic in the street when vehicles are being loaded or unloaded.

Please provide details of the parking and loading arrangements for construction vehicles with regard to servicing and deliveries associated with the site (e.g. delivery of materials and plant, removal of excavated material). This is required as a scaled site plan, showing all points of access and where materials, skips and plant will be stored, and how vehicles will access and egress the site. If loading is to take place off site, please identify where this is due to take place and outline the measures you will take to ensure that loading/unloading is carried out safely. Please outline in question 24 if any parking bay suspensions will be required.

The majority of loading and unloading will take place in Spring Place as indicated on the drawings referenced above, with the exception of a low number of smaller vehicles which will be able to utilise Grafton Road. Safe loading and unloading will be ensured through the use of traffic marshalls. The location for storage of materials, skips and plant within the site is not known at this time.

Highway interventions

Please note that Temporary Traffic Orders (TTOs) and hoarding/scaffolding licenses may be applied for prior to CMP submission but won't be granted until the CMP is signed-off.

- **24. Parking bay suspensions and temporary traffic orders**

Please note, parking bay suspensions should only be requested where absolutely necessary. Parking bay suspensions are permitted for a maximum of 6 months, requirement of exclusive access to a bay for longer than 6 months you will be required to obtain Temporary Traffic Order (TTO) for which there is a separate cost.

Please provide details of any proposed parking bay suspensions and TTO's which would be required to facilitate construction. **Building materials and equipment must not cause obstructions on the highway as per your Considerate Contractors obligations unless the requisite permissions are secured.**

Information regarding parking suspensions can be found here.

Parking bay suspensions will be necessary in Spring Place as shown on Drawing No. 30895/AC/014. This will involve the metered parking opposite the development site and the motorcycle bays.

It will probably also be necessary to suspend the parking bay(s) next to the development in Grafton Road occasionally during construction. The timing, frequency and duration of these suspensions cannot be determined at this stage.

25. Scaled drawings of highway works

Please note that use of the public highway for storage, site accommodation or welfare facilities is at the discretion of the Council and is generally not permitted. If you propose such use you must supply full justification, setting out why it is impossible to allocate space on-site. You must submit a detailed (to-scale) plan showing the impact on the public highway that includes the extent of any hoarding, pedestrian routes, parking bay suspensions and remaining road width for vehicle movements. We prefer not to close footways but if this is unavoidable, you should submit a scaled plan of the proposed diversion route showing key dimensions.

- a. Please provide accurate scaled drawings of any highway works necessary to enable construction to take place (e.g. construction of temporary vehicular accesses).

At this present time no highways works are envisaged. This will be reviewed once the Principal Contractor has been appointed.

b. Please provide details of all safety signage, barriers and accessibility measures such as ramps and lighting etc.

TBC

26. Diversions

Where applicable, please supply details of any diversion, disruption or other anticipated use of the public highway during the construction period (alternatively a plan may be submitted).

Delivery and removal of the piling rig will have to be undertaken at night

Spring Place will have to be closed for the erection and dismantling of the tower crane.

The Spring Place pavement will have to be closed for the duration of the works. Pedestrians will be directed to the other side of the road by signage.

27. VRU and pedestrian diversions, scaffolding and hoarding

Pedestrians and/or cyclist safety must be maintained if diversions are put in place. Vulnerable footway users should also be considered. These include wheelchair users, the elderly, those with walking difficulties, young children, those with prams, the blind and partially sighted. Appropriate ramping must be used if cables, hoses, etc. are run across the footway.

Any work above ground floor level may require a covered walkway adjacent to the site. A licence must be obtained for scaffolding and gantries. The adjoining public highway must be

kept clean and free from obstructions. Lighting and signage should be used on temporary structures/skips/hoardings etc.

A secure hoarding will generally be required at the site boundary with a lockable access.

a. Please provide details describing how pedestrian and cyclist safety will be maintained, including any proposed alternative routes (if necessary), and any Traffic Marshall arrangements.

During the working hours the Traffic Marshalls will control pedestrians and other road users whilst deliveries are being made.

The hoarding will be adequately lit and no materials or skips will be left on the public highway over night at weekends or holiday periods.

b. Please provide details of any temporary structures which would overhang the public highway (e.g. scaffolding, gantries, cranes etc.) and details of hoarding requirements or any other occupation of the public highway.

An access scaffold will be located on the Spring Place pavement. Given the width of the pavement it is not feasible to create a pedestrian tunnel. Therefore the pavement will be closed and the pedestrians re directed.

During the latter stages of the project a goods hoist will be located at ground level partly on the pavement and partly within the suspended parking bay. Baulk timbers and a hoarding will be erected around the goods hoist.

SYMBOL IS FOR INTERNAL USE

Environment

To answer these sections please refer to the relevant sections of **Camden's Minimum Requirements for Building Construction (CMRBC).**

28. Please list all noisy operations and the construction method used, and provide details of the times that each of these are due to be carried out.

Demolition
Bored Piling
The demolition and construction methods and timings will be advised once the Main Contractor has been appointed

29. Please confirm when the most recent noise survey was carried out (before any works were carried out) and provide a copy. If a noise survey has not taken place please indicate the date (before any works are being carried out) that the noise survey will be taking place, and agree to provide a copy.

Please see Appendix E

30. Please provide predictions for noise and vibration levels throughout the proposed works.

TBC

31. Please provide details describing mitigation measures to be incorporated during the construction/demolition works to prevent noise and vibration disturbances from the

activities on the site, including the actions to be taken in cases where these exceed the predicted levels.

TBC

32. Please provide evidence that staff have been trained on BS 5228:2009

TBC

33. Please provide details on how dust nuisance arising from dusty activities, on site, will be prevented.

Dampening down
External scaffold sheeted in monaflex
Plant and tools fitted with dust collectors

34. Please provide details describing how any significant amounts of dirt or dust that may be spread onto the public highway will be prevented and/or cleaned.

Unloading bay cleaned at the end of each day
Scarab visits during the excavation works

35. Please provide details describing arrangements for monitoring of noise, vibration and dust levels.

TBC

36. Please confirm that a Risk Assessment has been undertaken at planning application stage in line with the GLA's Control of Dust and Emissions Supplementary Planning Guidance (SPG), and the risk level that has been identified, with evidence. Please attach the risk assessment as an appendix if not completed at the planning application stage.

An Air Quality Assessment is currently in the process of being undertaken. This assessment will be issued as part of the tender enquiry to the Main Contractors to ensure that the mitigation measures identified are adopted and implemented.

37. Please confirm that all of the GLA's 'highly recommended' measures from the SPG document relative to the level of risk identified in question 36 have been addressed by completing the GLA mitigation measures checklist.

TBC

- 38. If the site is a 'High Risk Site', 4 real time dust monitors will be required. If the site is a 'Medium Risk Site', 2 real time dust monitors will be required. The risk assessment must take account of proximity to sensitive receptors (e.g. schools, care homes etc), as detailed in the SPG. Please confirm the location, number and specification of the monitors in line with the SPG and confirm that these will be installed 3 months prior to the commencement of works, and that real time data and quarterly reports will be provided to the Council detailing any exceedances of the threshold and measures that were implemented to address these.

TBC

39. Please provide details about how rodents, including rats, will be prevented from spreading out from the site. You are required to provide information about site inspections carried out and present copies of receipts (if work undertaken).

All drainage pipework will have temporary bungs whilst being constructed.
Any food waste from the canteen area will be cleared on a daily basis. It will also be placed in solid dustbins instead of bin liners

40. Please confirm when an asbestos survey was carried out at the site and include the key findings.

Yes an asbestos survey has been carried out. Please see Appendix F

The key finding is that the corrugated cement roof contains asbestos

41. Complaints often arise from the conduct of builders in an area. Please confirm steps being taken to minimise this e.g. provision of a suitable smoking area, tackling bad language and unnecessary shouting.

All site personnel will have a site safety induction which will include where the designated smoking areas are located and conduct on site.
Anybody found not complying with these requirements will be given an initial warning.
Following this they will be prevented from working on site and their employer informed.
Smoking areas will be located in positions where they will not affect local residents and will be within the site boundary.

42. If you will be using non-road mobile machinery (NRMM) on site with net power between 37kW and 560kW it will be required to meet the standards set out below. The standards are applicable to both variable and constant speed engines and apply for both PM and NOx emissions.

From 1st September 2015

(i) Major Development Sites – NRMM used on the site of any major development will be required to meet Stage IIIA of EU Directive 97/68/EC

(ii) Any development site within the Central Activity Zone - NRMM used on any site within the Central Activity Zone will be required to meet Stage IIIB of EU Directive 97/68/EC

From 1st September 2020

(iii) Any development site - NRMM used on any site within Greater London will be required to meet Stage IIIB of EU Directive 97/68/EC

(iv) Any development site within the Central Activity Zone - NRMM used on any site within the Central Activity Zone will be required to meet Stage IV of EU Directive 97/68/EC

Please provide evidence demonstrating the above requirements will be met by answering the following questions:

a) Construction time period (mm/yy - mm/yy): 04/17 – 11/18

b) Is the development within the CAZ? (Y/N): No

c) Will the NRMM with net power between 37kW and 560kW meet the standards outlined above? (Y/N): TBC

d) Please provide evidence to demonstrate that all relevant machinery will be registered on the NRMM Register, including the site name under which it has been registered:

e) Please confirm that an inventory of all NRMM will be kept on site and that all machinery will be regularly serviced and service logs kept on site for inspection:

f) Please confirm that records will be kept on site which details proof of emission limits, including legible photographs of individual engine plates for all equipment, and that this documentation will be made available to local authority officers as required:

SYMBOL IS FOR INTERNAL USE

Agreement

The agreed contents of this Construction Management Plan must be complied with unless otherwise agreed in writing by the Council. This may require the CMP to be revised by the Developer and reapproved by the Council. The project manager shall work with the Council to review this Construction Management Plan if problems arise in relation to the construction of the development. Any future revised plan must be approved by the Council in writing and complied with thereafter.

It should be noted that any agreed Construction Management Plan does not prejudice further agreements that may be required such as road closures or hoarding licences.

Please notify that council when you intend to start work on site. Please also notify the council when works are approximately 3 months from completion.

Signed: ……

Date: ……..

Print Name: ……..

Position: ……

Please submit to: planningobligations@camden.gov.uk

End of form.

Appendices

Appendix A : **Site Location Plan**

Appendix B : **Outline Programme**

Appendix C : **TPP Vehicle Route Drawings**

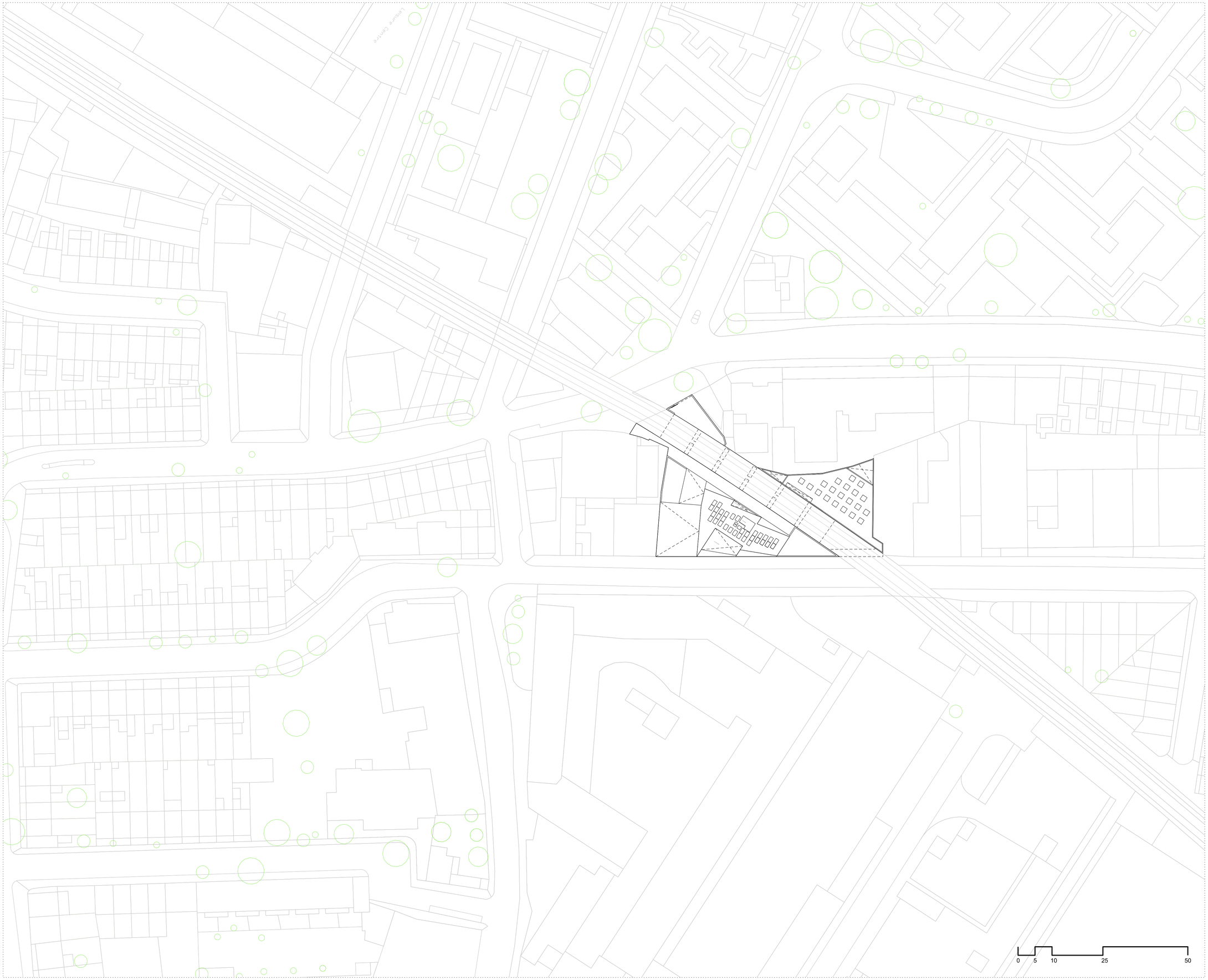
Appendix D : **Vehicle Movements**

Appendix E : **Acoustic Survey**

Appendix F : **Asbestos Survey**

Appendix G : **Community Liaison**

Appendix A:
Site Location Plan



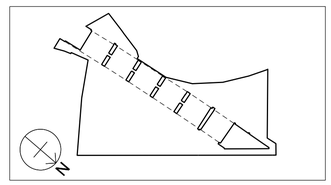
Notes

This drawing is copyright Piercy&Company.
Do not scale from this drawing.
All dimensions and levels to be checked on site by the contractor and such dimensions to be his responsibility.
Report all drawing errors, omissions and discrepancies to the architect.

DISCLAIMER
This document may be issued in an editable digital CAD format to enable others to use it as background information to make alterations and/or additions. In that instance the file will be accompanied by a PDF version as a record of the original file. It is for those parties making such alterations and/or additions to ensure that they make use of current background information.

Piercy&Company accepts no liability for either: any such alterations and/or additions to the background information by others; or any other changes made by others to the architectural content of the background information itself.

Rev	Date	Description
A	02.09.16	Planning



Project
3-6 Spring Place

Client
Brockton Capital

Date
02.09.16

Scale
1:500 at A1
1:1000 at A3

Proposed Site Plan
General Arrangement Plan

Drawn JMG
Checked IM
Approved PJ

Drawing Status
For Information

Project	Discipline	Level	Series	Dwg No	Rev
13498	A	L06	03	002	A

122 Arlington Road
London NW1 7HP

Telephone
+44(0)2074249611

info@piercyandco.com
www.piercyandco.com

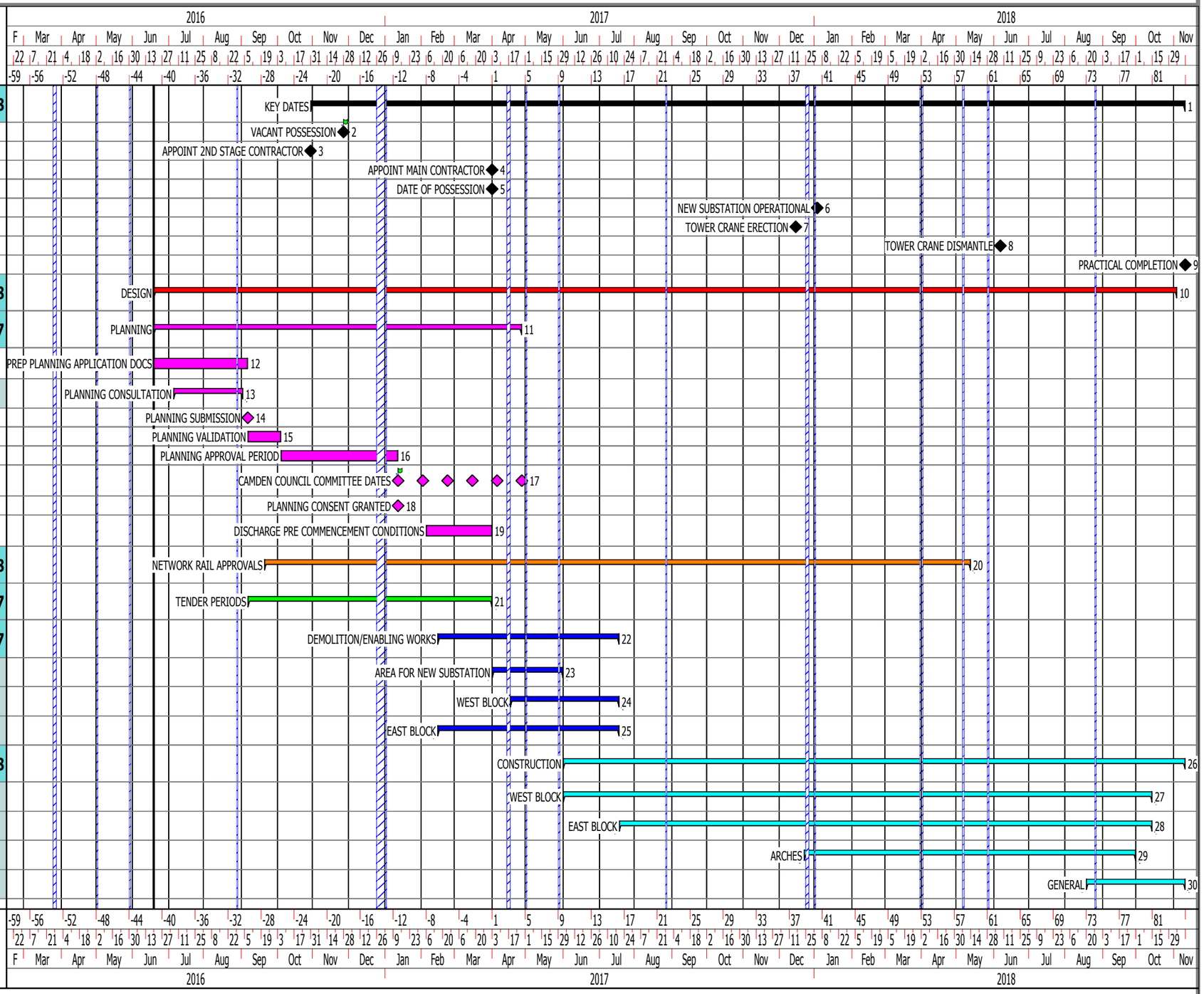
Piercy&Company

Appendix B: Outline Programme

3-6 SPRING PLACE

VolkerFitzpatrick

Line	Name	Start	Duration	Finish
1	**KEY DATES**	**31/10/2016**	**102w 1d**	**12/11/2018**
2	VACANT POSSESSION	28/11/2016		28/11/2016
3	APPOINT 2ND STAGE CONTRACTOR	31/10/2016		31/10/2016
4	APPOINT MAIN CONTRACTOR	03/04/2017		03/04/2017
5	DATE OF POSSESSION	03/04/2017		03/04/2017
6	NEW SUBSTATION OPERATIONAL	03/01/2018		03/01/2018
7	TOWER CRANE ERECTION	15/12/2017		15/12/2017
8	TOWER CRANE DISMANTLE	07/06/2018		07/06/2018
9	PRACTICAL COMPLETION	12/11/2018		12/11/2018
10	**DESIGN**	**20/06/2016**	**120w**	**02/11/2018**
11	**PLANNING**	**20/06/2016**	**42w 4d**	**27/04/2017**
12	PREP PLANNING APPLICATION DOCS	20/06/2016	11w 1d	06/09/2016
13	**PLANNING CONSULTATION**	**06/07/2016**	**8w 1d**	**02/09/2016**
14	PLANNING SUBMISSION	07/09/2016		07/09/2016
15	PLANNING VALIDATION	07/09/2016	4w	04/10/2016
16	PLANNING APPROVAL PERIOD	05/10/2016	13w	11/01/2017
17	CAMDEN COUNCIL COMMITTEE DATES	12/01/2017		27/04/2017
18	PLANNING CONSENT GRANTED	12/01/2017		12/01/2017
19	DISCHARGE PRE COMMENCEMENT CONDITIONS	06/02/2017	8w	31/03/2017
20	**NETWORK RAIL APPROVALS**	**21/09/2016**	**82w 1d**	**11/05/2018**
21	**TENDER PERIODS**	**07/09/2016**	**28w 2d**	**03/04/2017**
22	**DEMOLITION/ENABLING WORKS**	**15/02/2017**	**21w 1d**	**18/07/2017**
23	**AREA FOR NEW SUBSTATION**	**03/04/2017**	**7w 4d**	**31/05/2017**
24	**WEST BLOCK**	**18/04/2017**	**12w 4d**	**18/07/2017**
25	**EAST BLOCK**	**15/02/2017**	**21w 1d**	**18/07/2017**
26	**CONSTRUCTION**	**01/06/2017**	**73w 3d**	**12/11/2018**
27	**WEST BLOCK**	**01/06/2017**	**69w 3d**	**12/10/2018**
28	**EAST BLOCK**	**19/07/2017**	**62w 4d**	**12/10/2018**
29	**ARCHES**	**22/12/2017**	**38w 3d**	**28/09/2018**
30	**GENERAL**	**20/08/2018**	**11w 4d**	**12/11/2018**



PQQ

KEY DATES | DESIGN | PLANNING | NETWORK RAIL | TENDER | DEMO ENABLING WKS | CONSTRUCTION

Programme Ref: E13809/OP/02
Revision A

Programme Created:
Programme revision date:

Revision Comment
Planning Dates Changed

REVISED OUTLINE PROGRAMME with VALIDATION PERIOD

VOLKERFITZPATRICK
Hertford Road
Hoddesdon
Herts EN11 9BX
Tel: 01992 305000 Fax: 01992 305006

Appendix C: TPP Vehicle Route Drawings

Street market on a Thursday

Site

KEY:

- **Incoming construction traffic**
- **Alternative route for arriving traffic**
- **Exiting construction traffic**
- **School**

This drawing has been prepared for planning purposes and should not be used for construction. It should be read in conjunction with TPP e-mail of 04/08/16.

3-6 SPRING PLACE

Construction Traffic routeing

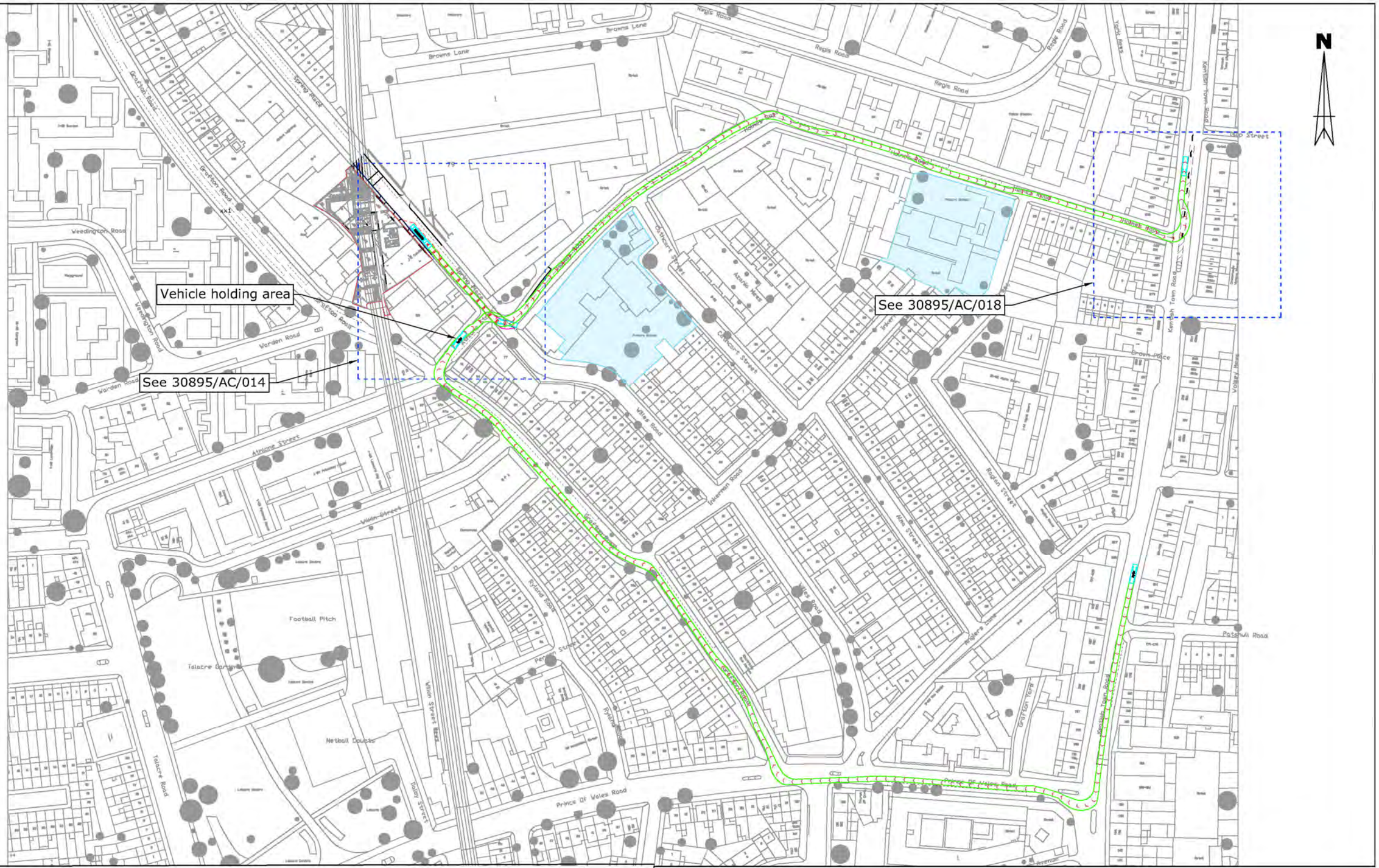
TRANSPORT PLANNING PRACTICE

70 Cowcross Street
London, EC1M 6EL

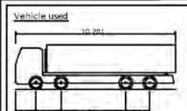
t: 020 7608 0008
w: www.tppweb.co.uk

SCALE @ A3	DATE	DRAWN BY	CHECKED	DRAWING NUMBER	REV
NTS	04/08/16	REV	REV	30895/AC/002	-

T:\30000_projects\30895 3-6 Spring Place\ACAD\002.dwg



Vehicle used



Large Tipper	
Overall Length	10.201m
Overall Width	2.495m
Overall Body Height	2.890m
Min Body Ground Clearance	0.341m
Track Width	2.471m
Lock to Lock Time	6.00s
Kerb to Kerb Turning Radius	11.550m

Key

- Local Schools

This drawing has been prepared for planning purposes and should not be used for construction. It should be read in conjunction with TPP document D03.

Based on drawing number 160810_Proposed_Plan_Level_00.
TPP REF - IN_09.

3-6 SPRING PLACE

Route overview:
Swept path analysis of 10.2m tipper truck accessing site

SCALE @ A3	DATE	DRAWN BY	CHECKED
1:2000	25/08/16	LD	REV

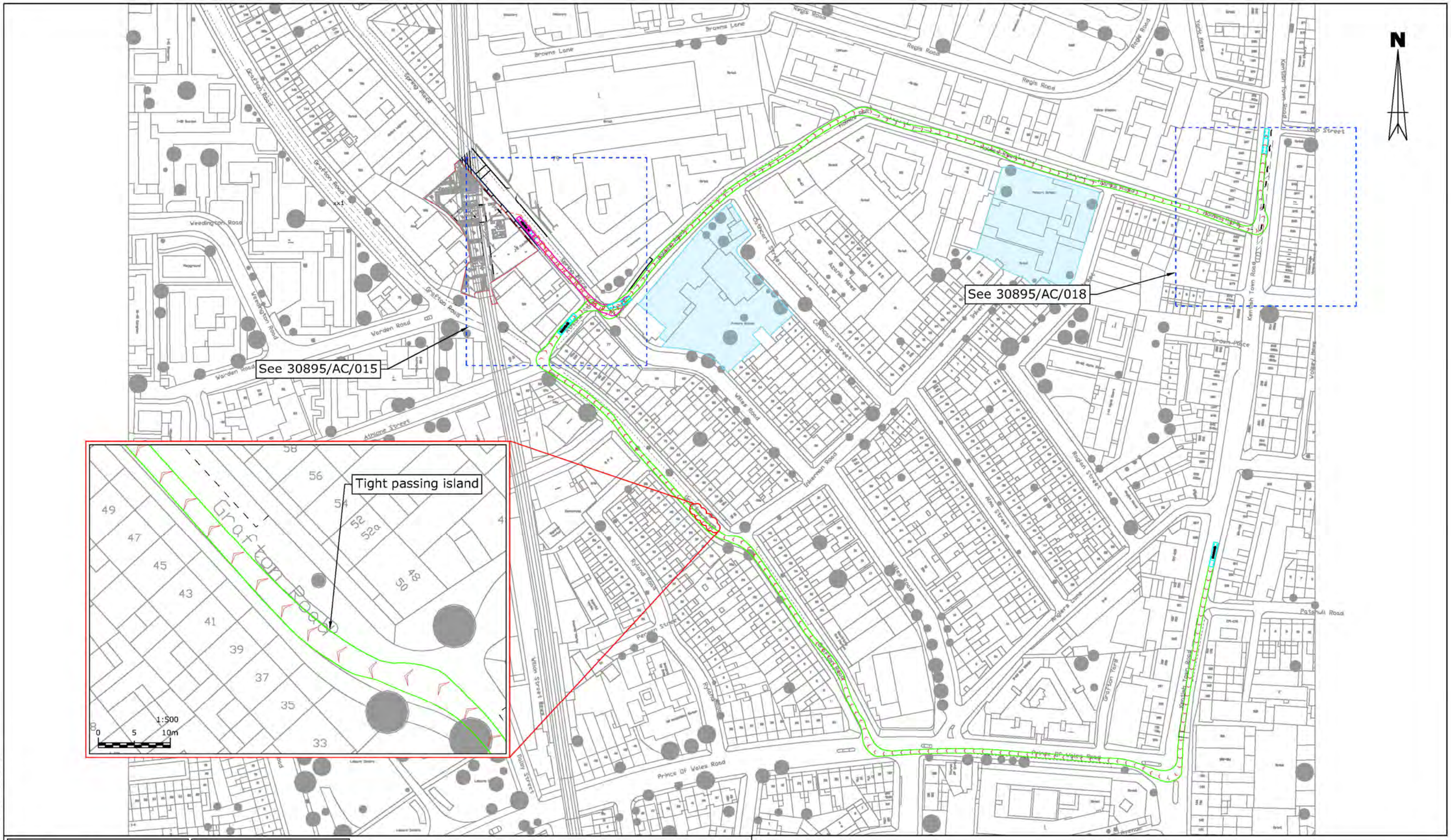
TRANSPORT PLANNING PRACTICE

70 Cowcross Street
London, EC1M 6EL

t: 020 7608 0008
w: www.tppweb.co.uk

DRAWING NUMBER	REV
30895/AC/011	-

T:\30000_projects\30895 3-6 Spring Place\ACAD\011 - 018.dwg



This drawing has been prepared for planning purposes and should not be used for construction. It should be read in conjunction with TPP document D03.

Based on drawing number 160810_Proposed_Plan_Level_00.
TPP REF - IN_09.

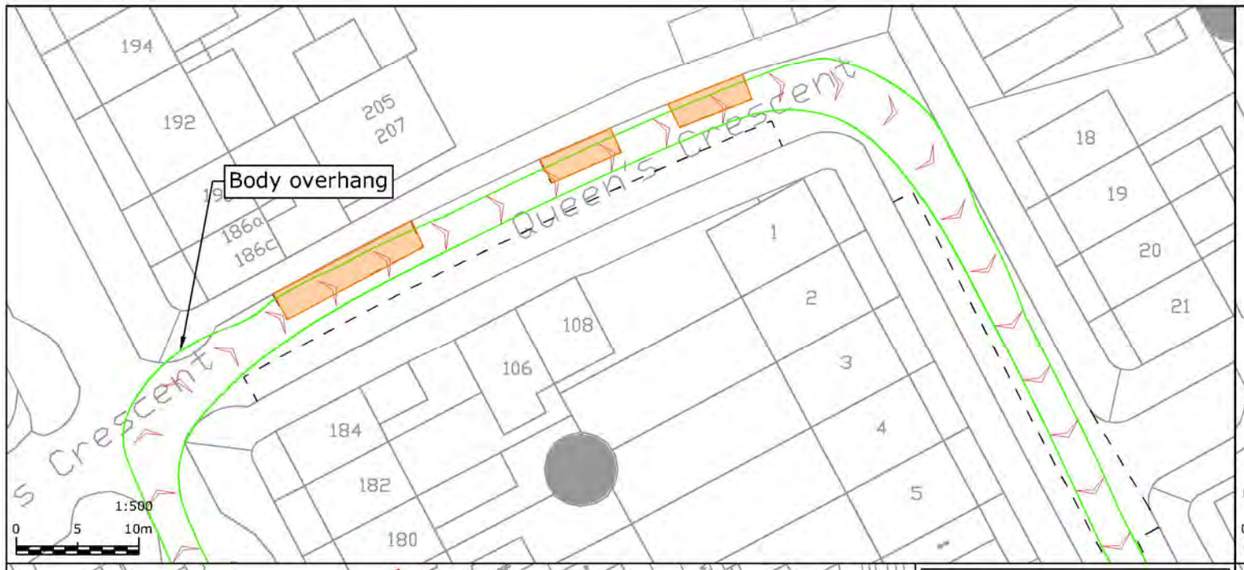
3-6 SPRING PLACE

Route overview:
Swept path analysis of 13.55m articulated vehicle accessing site

TRANSPORT PLANNING PRACTICE
70 Cowcross Street
London, EC1M 6EL
t: 020 7608 0008
w: www.tppweb.co.uk

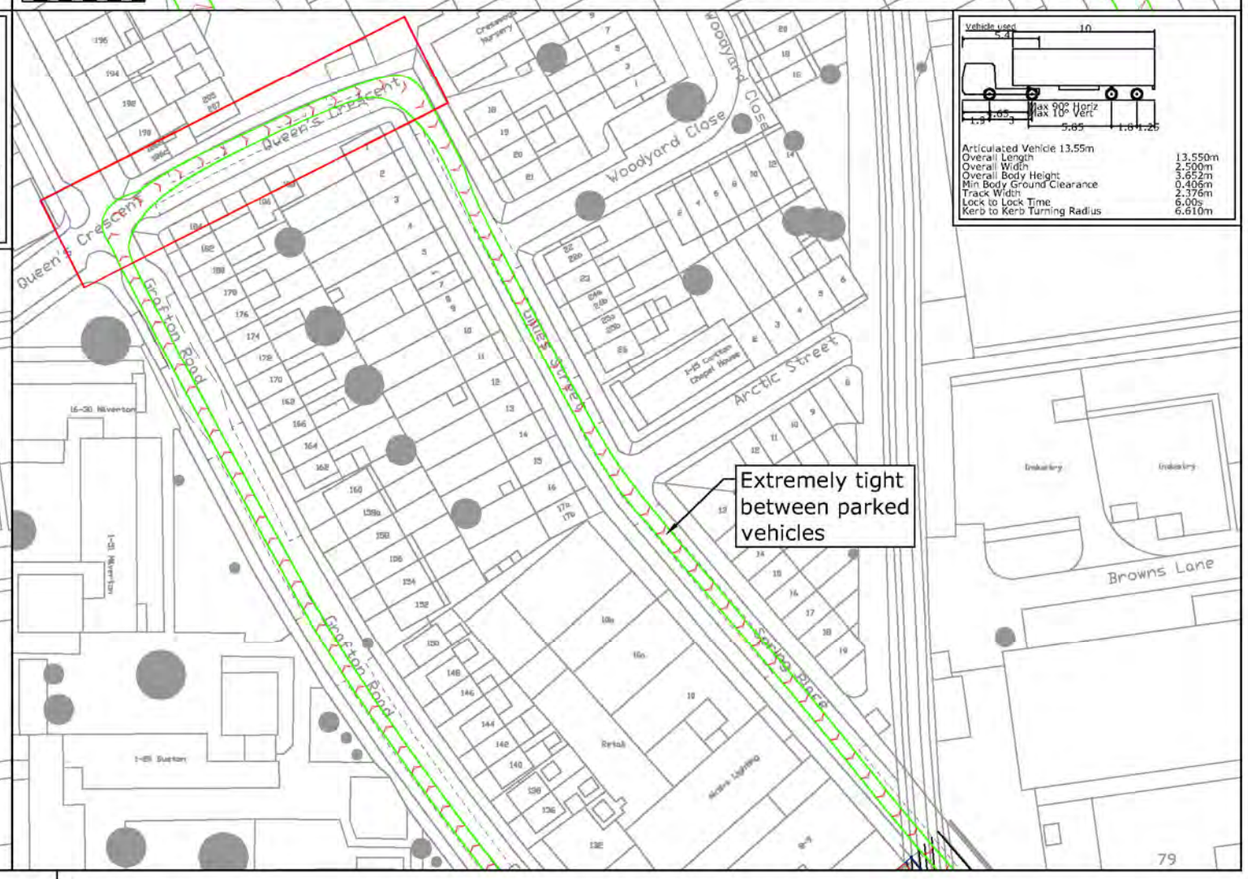
SCALE @ A3	DATE	DRAWN BY	CHECKED	DRAWING NUMBER	REV
1:2000	25/08/16	LD	REV	30895/AC/012	-

T:\30000_projects\30895 3-6 Spring Place\ACAD\011 - 018.dwg



Vehicle used

Large Tipper
Overall Length 10.201m
Overall Width 2.495m
Overall Body Height 2.890m
Min Body Ground Clearance 0.341m
Track Width 2.471m
Lock to Lock Time 6.00s
Kerb to Kerb Turning Radius 11.550m



Vehicle used

Articulated Vehicle 13.55m
Overall Length 13.550m
Overall Width 2.500m
Overall Body Height 3.652m
Min Body Ground Clearance 0.406m
Track Width 2.376m
Lock to Lock Time 6.00s
Kerb to Kerb Turning Radius 6.610m

Key

- Bays to be suspended

This drawing has been prepared for planning purposes and should not be used for construction. It should be read in conjunction in TPP document D03.

Based on drawing number 160810_Proposed_Plan_Level_00.
TPP REF - IN_09.

3-6 SPRING PLACE

Swept path analysis of 10.2m tipper and 13.55m articulated vehicle attempting to access site via Queen's Crescent

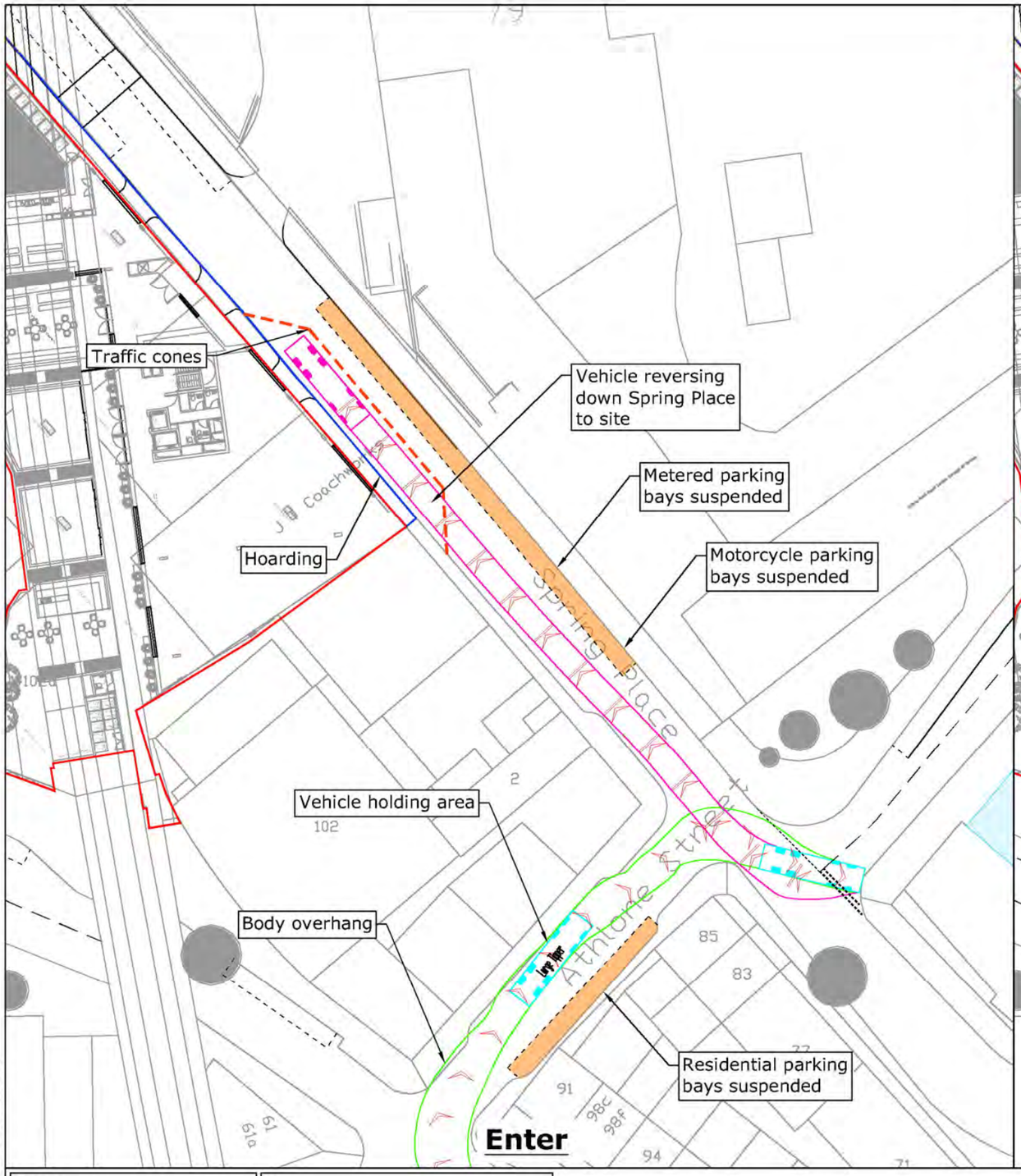
TRANSPORT PLANNING PRACTICE

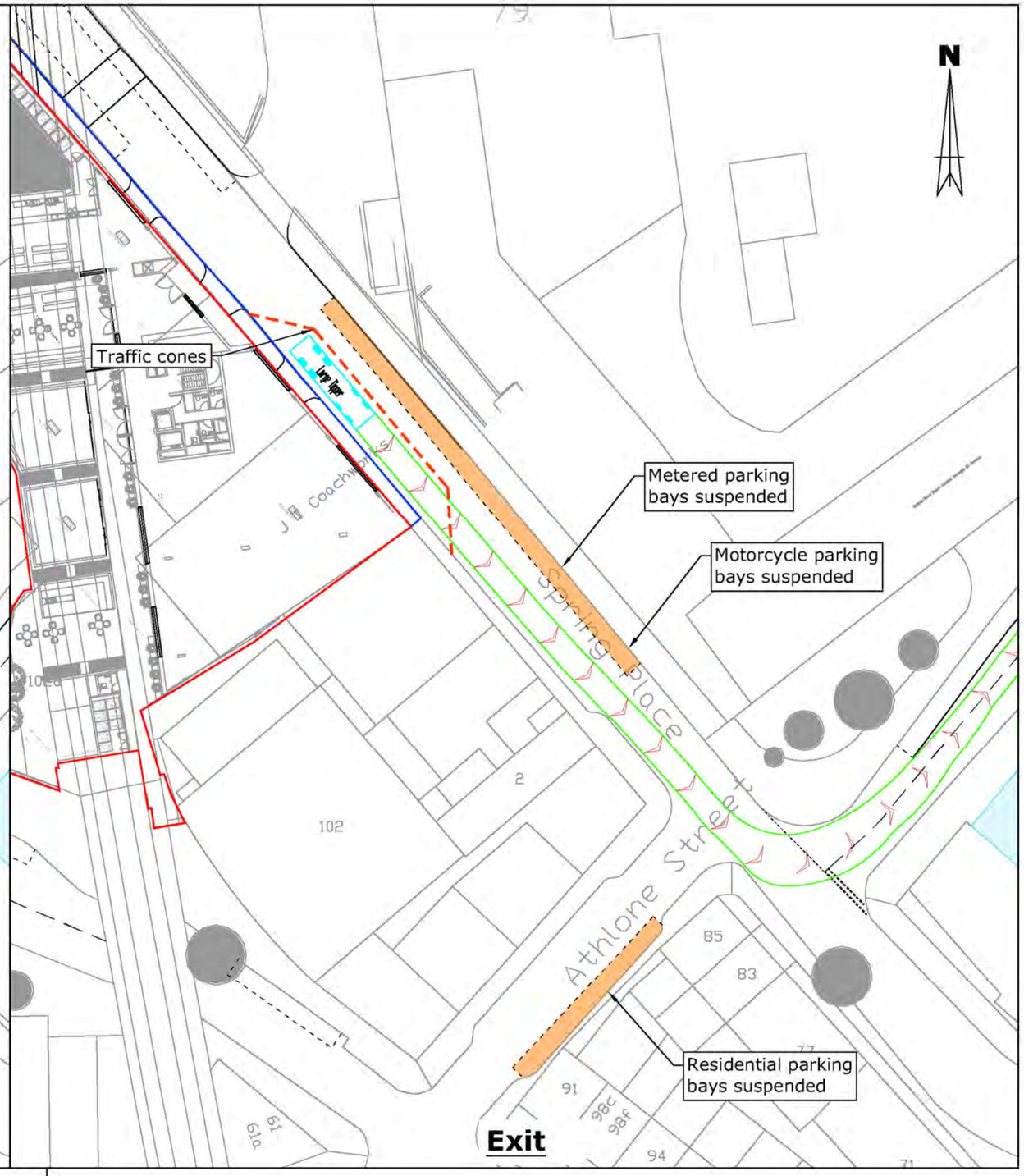
70 Cowcross Street
London, EC1M 6EL

t: 020 7608 0008
w: www.tppweb.co.uk

SCALE @ A3	DATE	DRAWN BY	CHECKED	DRAWING NUMBER	REV
1:1250 (0 10 20m)	25/08/16	LD	REV	30895/AC/013	-

T:\30000_projects\30895 3-6 Spring Place\ACAD\011 - 018.dwg





Vehicle used

Large Tipper	
Overall Length	10.201m
Overall Width	2.495m
Overall Body Height	2.880m
Min Body Ground Clearance	0.341m
Track Width	2.471m
Lock to Lock Time	6.00s
Kerb to Kerb Turning Radius	11.550m

Key

- Bays to be suspended
- Local Schools

This drawing has been prepared for planning purposes and should not be used for construction. It should be read in conjunction with TPP document D03.

Based on drawing number 160810_Proposed_Plan_Level_00.
TPP REF - IN_09.

3-6 SPRING PLACE

Swept path analysis of 10.2m tipper truck accessing site (Including holding area in Athelone Street)

TRANSPORT PLANNING PRACTICE
70 Cowcross Street
London, EC1M 6EL
t: 020 7608 0008
w: www.tppweb.co.uk

SCALE @ A3	DATE	DRAWN BY	CHECKED	DRAWING NUMBER	REV
1:500 (0 5 10m)	25/08/16	LD	REV	30895/AC/014	-

T:\30000_projects\30895 3-6 Spring Place\ACAD\011 - 018.dwg

Traffic cones

Vehicle reversing down Spring Place to site

Metered parking bays suspended

Motorcycle parking bays suspended

Hoarding

Vehicle holding area

Body Overhang

Residential parking bays suspended

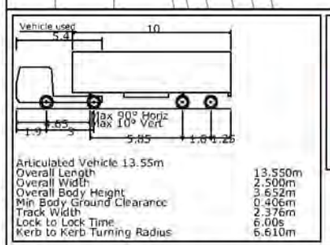
Enter

Exit

N

Spring Place

Athlone Street



Articulated Vehicle 13.55m

Overall Length	13.550m
Overall Width	2.500m
Overall Body Height	3.652m
Min Body Ground Clearance	0.406m
Track Width	2.376m
Lock to Lock Time	6.00s
Kerb to Kerb Turning Radius	6.610m

Key

- Bays to be suspended
- Local Schools

This drawing has been prepared for planning purposes and should not be used for construction. It should be read in conjunction with TPP document D03.

Based on drawing number 160810_Proposed_Plan_Level_00. TPP REF - IN_09.

3-6 SPRING PLACE

Swept path analysis of 13.55m articulated vehicle accessing site (Including holding area in Athelone Street)

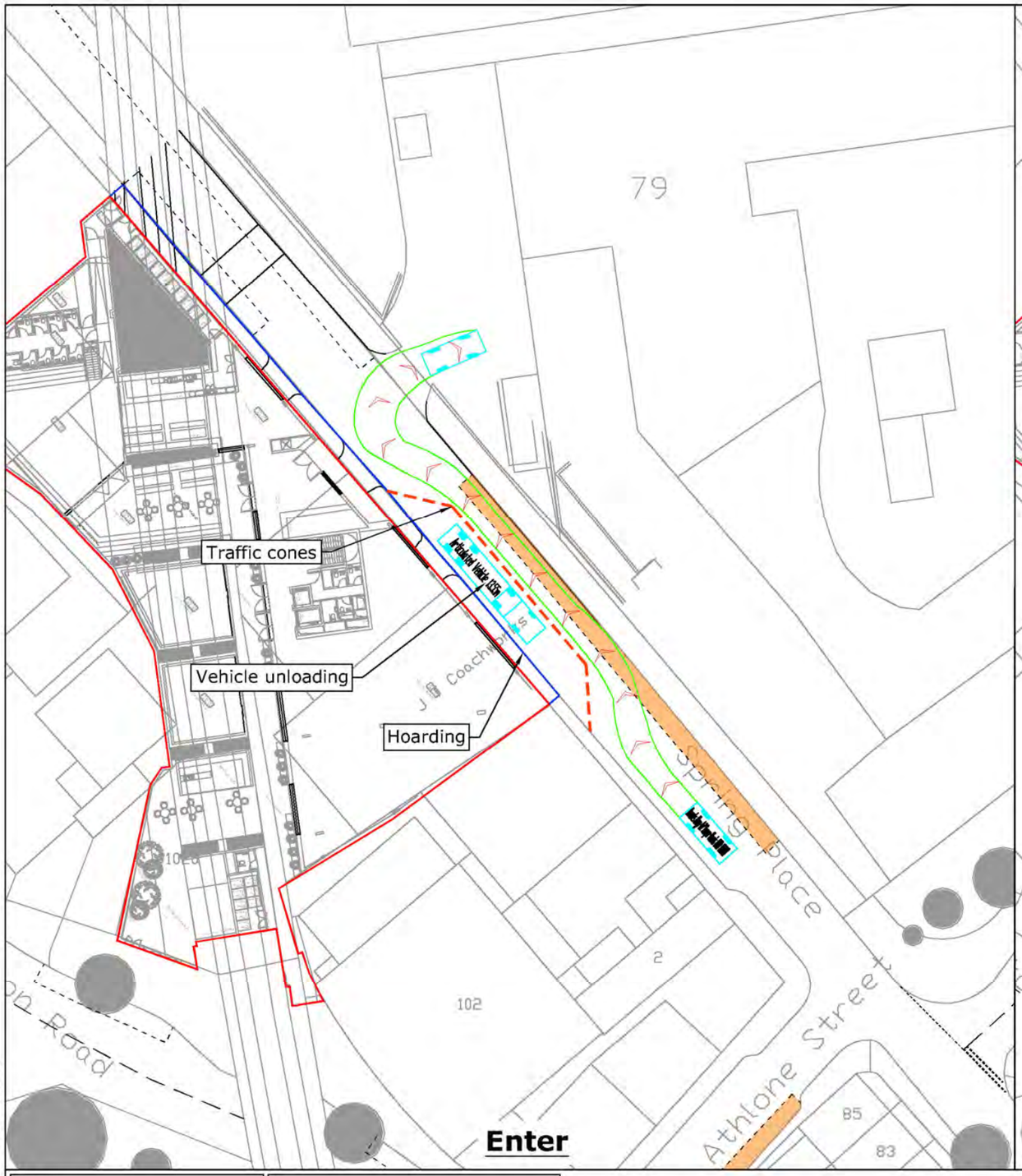
TRANSPORT PLANNING PRACTICE

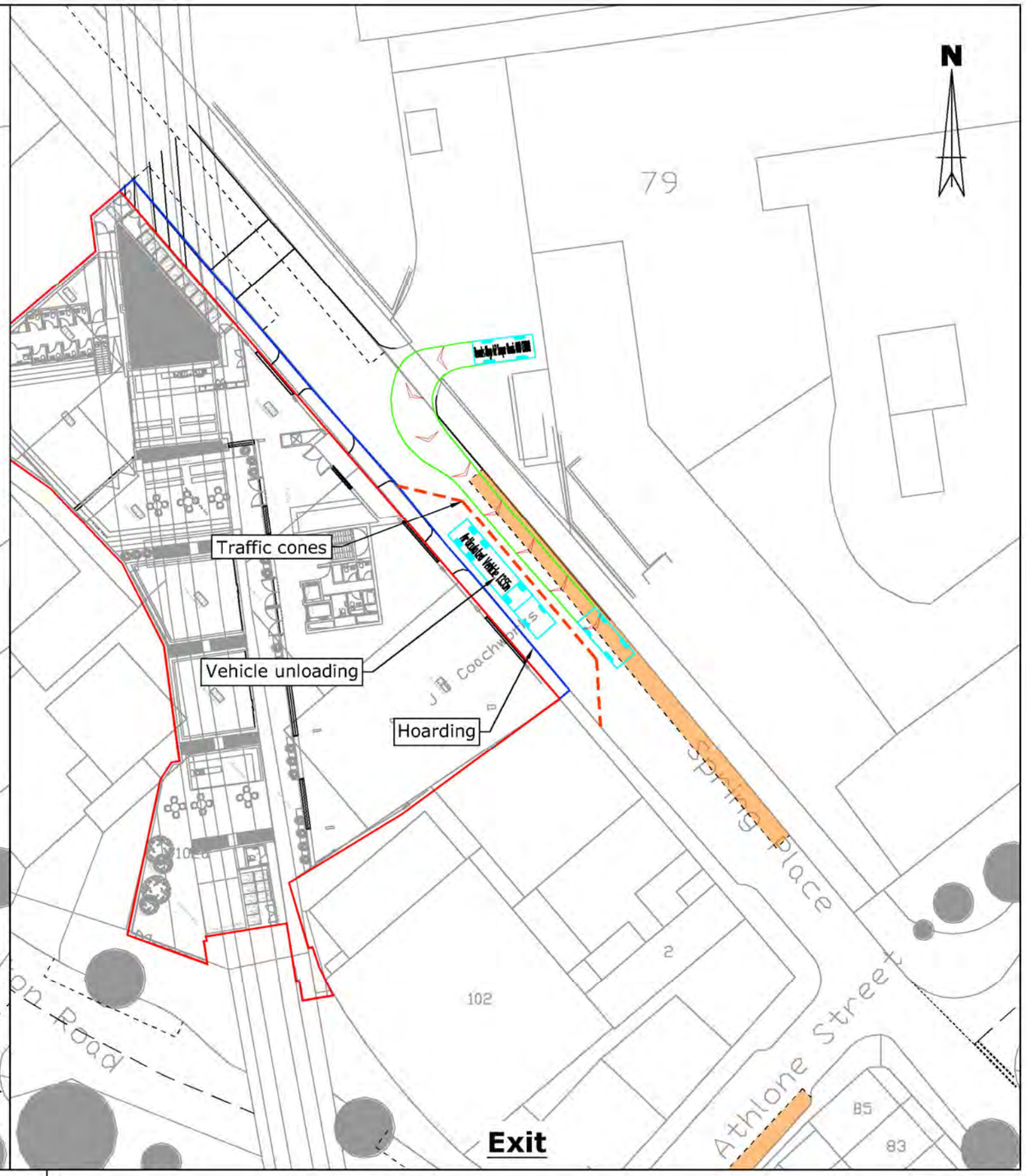
70 Cowcross Street
London, EC1M 6EL

t: 020 7608 0008
w: www.tppweb.co.uk

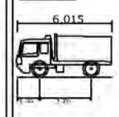
SCALE @ A3	DATE	DRAWN BY	CHECKED	DRAWING NUMBER	REV
1:500 (0 5 10m)	25/08/16	LD	REV	30895/AC/015	-

T:\30000_projects\30895 3-6 Spring Place\ACAD\011 - 018.dwg





Vehicle used



Mercedes Atego 4x2 Sweeper Chassis (LHD) 1318LKO	
Overall Length	6.015m
Overall Width	2.321m
Overall Body Height	2.730m
Min Body Ground Clearance	0.233m
Track Width	2.321m
Lock to Lock Time	5.00s
Wall to Wall Turning Radius	7.200m

Key

- Bays to be suspended
- Local Schools

This drawing has been prepared for planning purposes and should not be used for construction. It should be read in conjunction with TPP document D03.

Based on drawing number 160810_Proposed_Plan_Level_00.
TPP REF - IN_09.

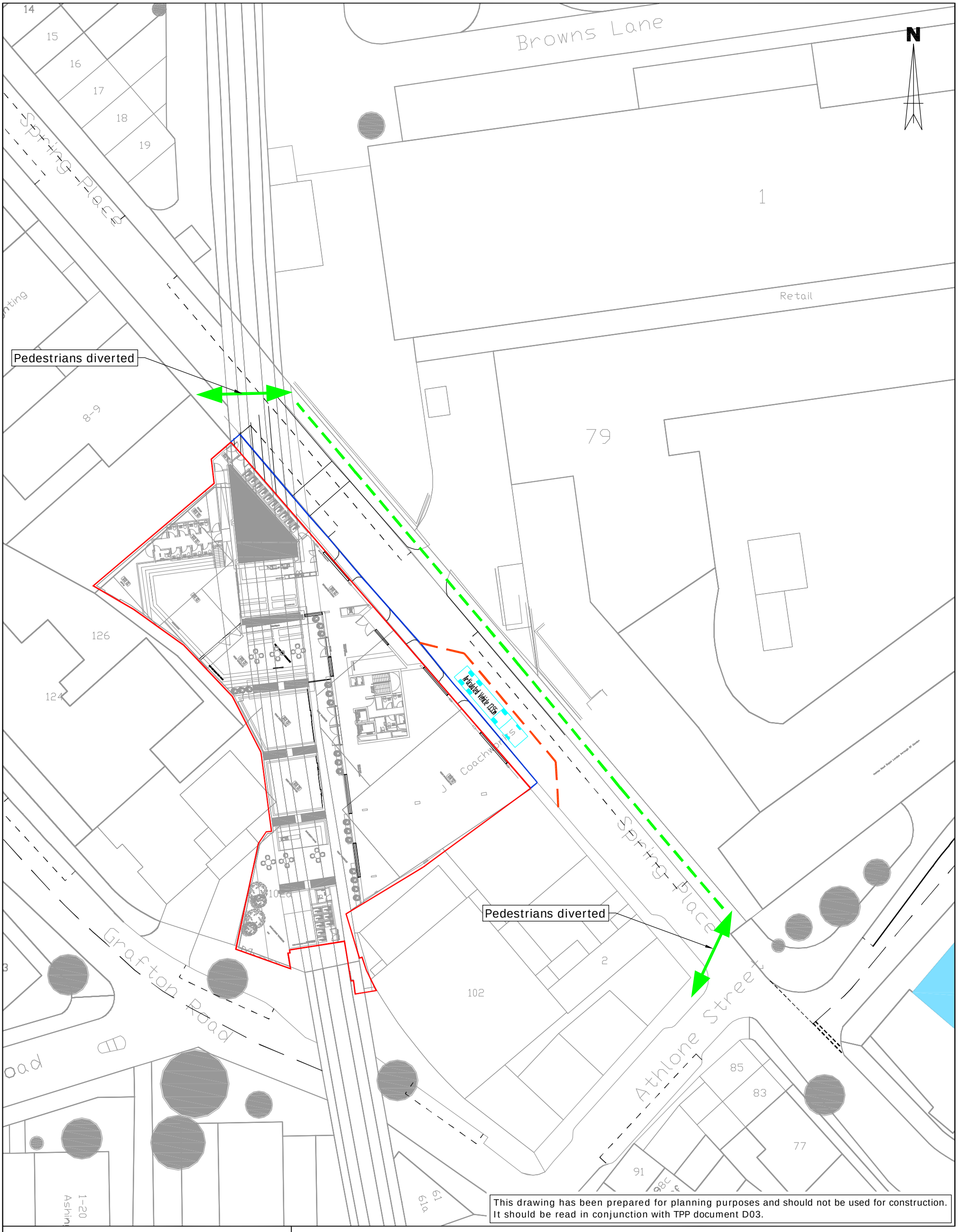
3-6 SPRING PLACE

Swept path analysis of waste disposal vehicle accessing LB Camden Depot with 13.55m articulated vehicle unloading next to site

TRANSPORT PLANNING PRACTICE
70 Cowcross Street
London, EC1M 6EL
t: 020 7608 0008
w: www.tppweb.co.uk

SCALE @ A3	DATE	DRAWN BY	CHECKED	DRAWING NUMBER	REV
1:500 (0 5 10m)	25/08/16	LD	REV	30895/AC/016	-

T:\30000_projects\30895 3-6 Spring Place\ACAD\011 - 018.dwg



This drawing has been prepared for planning purposes and should not be used for construction.
It should be read in conjunction with TPP document D03.

Based on drawing number 160810_Proposed_Plan_Level_00.
TPP REF - IN_09.

T:\30000_projects\30895 3-6 Spring Place\ACAD\011 - 018.dwg

3-6 SPRING PLACE

Temporary arrangement for pedestrians

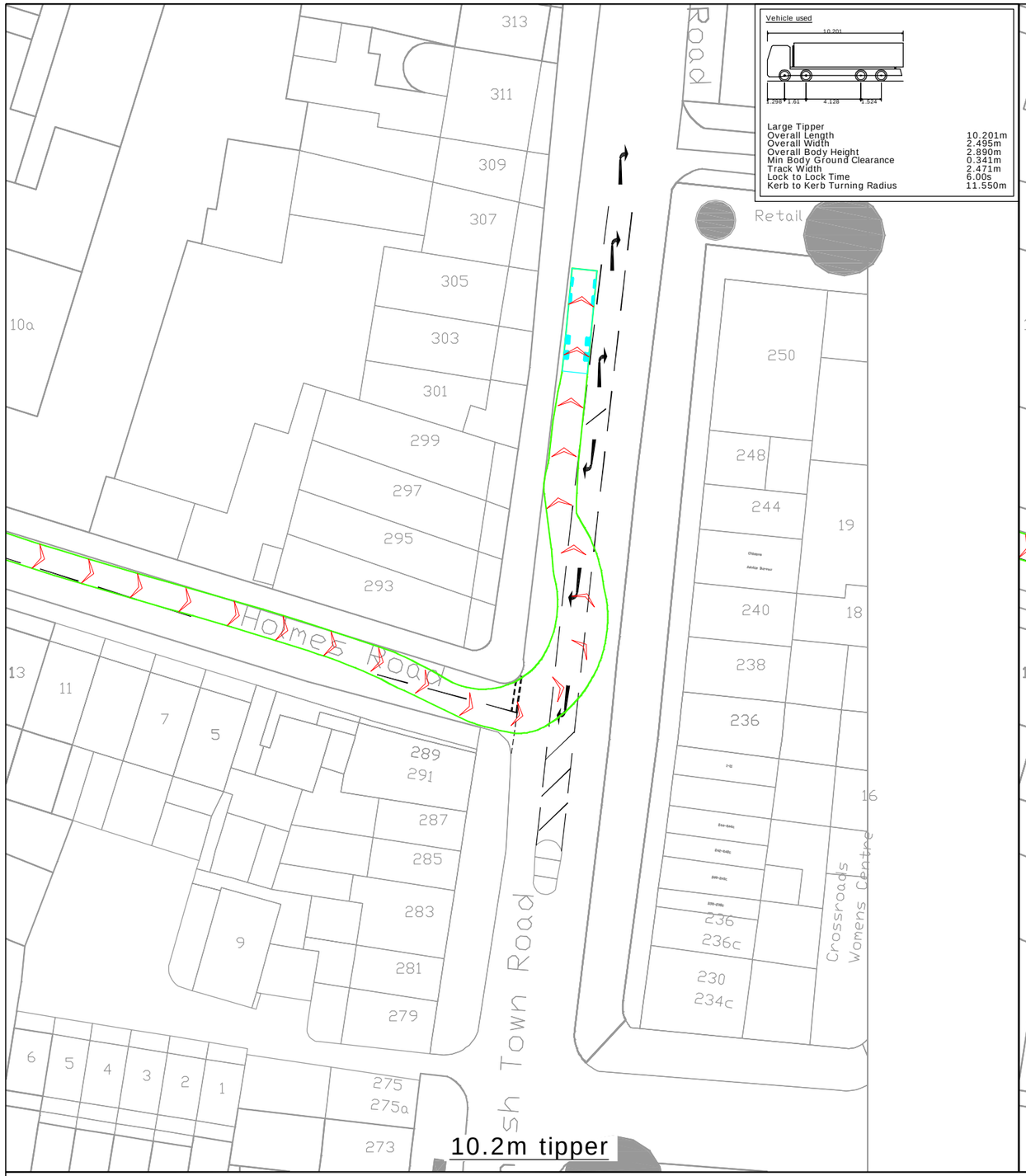
TRANSPORT PLANNING PRACTICE

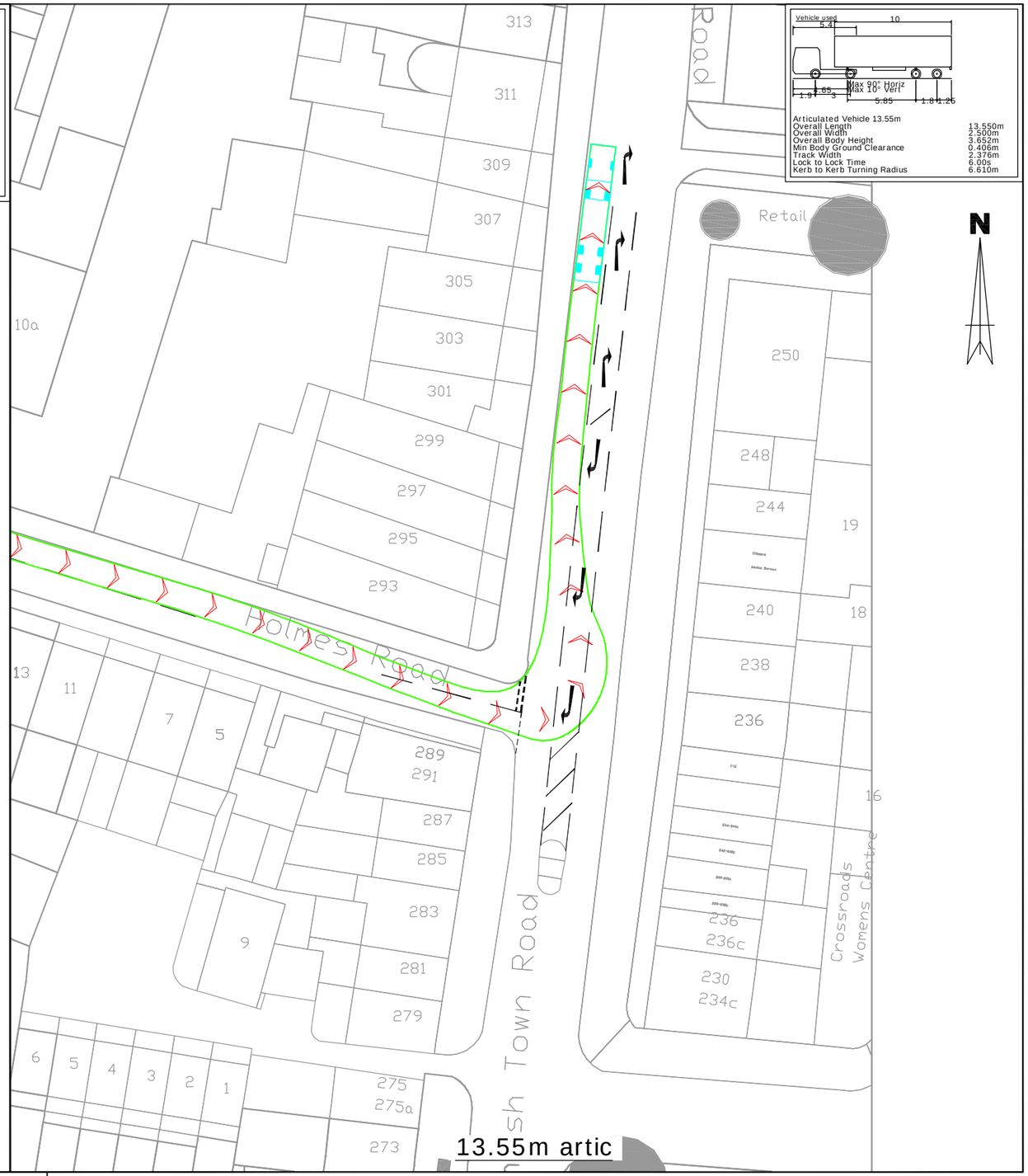
70 Cowcross Street
London, EC1M 6EL

t: 020 7608 0008
w: www.tppweb.co.uk

TPP
transport planning practice

SCALE @ A3	DATE	DRAWN BY	CHECKED	DRAWING NUMBER	REV
1:500 (0 5 10m)	25/08/16	LD	REV	30895/AC/017	-





This drawing has been prepared for planning purposes and should not be used for construction. It should be read in conjunction with TPP document D03.

Based on drawing number 160810_Proposed_Plan_Level_00.
TPP REF - IN_09.

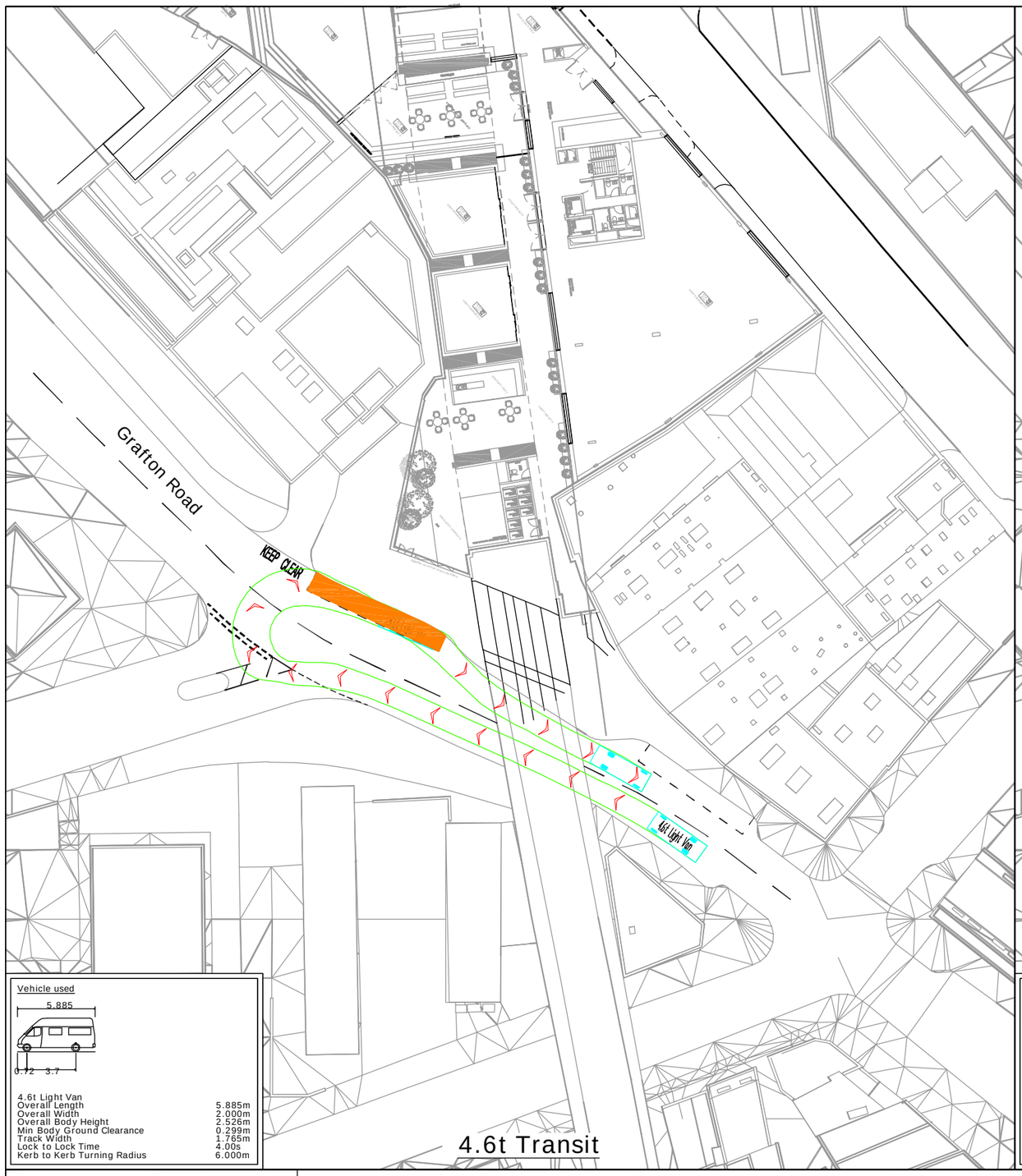
3-6 SPRING PLACE

Swept path analysis of 10.2m tipper and 13.55m articulated vehicle accessing Kentish Town Road.

TRANSPORT PLANNING PRACTICE
70 Cowcross Street
London, EC1M 6EL
t: 020 7608 0008
w: www.tppweb.co.uk
TPP transport planning practice

SCALE @ A3	DATE	DRAWN BY	CHECKED	DRAWING NUMBER	REV
1:1250 (0 10 20m)	25/08/16	LD	REV	30895/AC/018	-

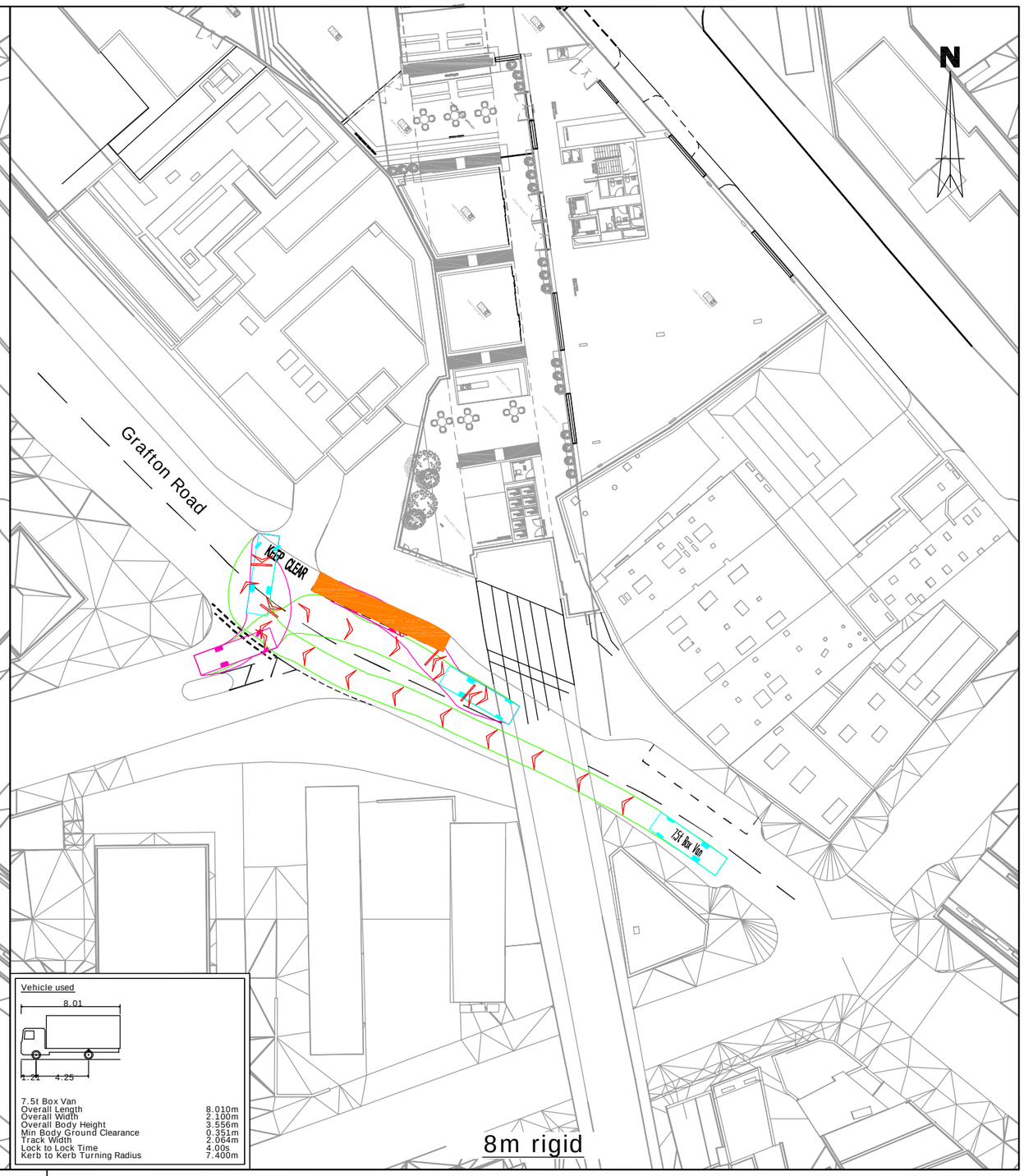
T:\30000_projects\30895 3-6 Spring Place\ACAD\011 - 018.dwg



Vehicle used

4.6t Light Van	
Overall Length	5.885m
Overall Width	2.000m
Overall Body Height	2.526m
Min Body Ground Clearance	0.299m
Track Width	1.765m
Lock to Lock Time	4.00s
Kerb to Kerb Turning Radius	6.000m

4.6t Transit



Vehicle used

7.5t Box Van	
Overall Length	8.010m
Overall Width	2.100m
Overall Body Height	3.556m
Min Body Ground Clearance	0.351m
Track Width	2.064m
Lock to Lock Time	4.00s
Kerb to Kerb Turning Radius	7.400m

8m rigid

Key

- Bays to be suspended

This drawing has been prepared for planning purposes and should not be used for construction. It should be read in conjunction with TPP document D03.

Based on drawing number 160810_Proposed_Plan_Level00.
TPP REF - IN_09.

T:\30000_projects\30895 3-6 Spring Place\ACAD\019.dwg

3-6 SPRING PLACE

Swept path analysis of 4.6t transit van and an 8m rigid accessing servicing bay

TRANSPORT PLANNING PRACTICE

70 Cowcross Street
London, EC1M 6EL

t: 020 7608 0008
w: www.tppweb.co.uk

TPP transport planning practice

SCALE @ A3	DATE	DRAWN BY	CHECKED	DRAWING NUMBER	REV
1:500 (0 5 10m)	25/08/16	LD	REV	30895/AC/019	-

Appendix D: Vehicle Movements

3-6 SPRING PLACE, LONDON
TYPE & NUMBER OF VEHICLE BY ACTIVITY

ACTIVITY	VEHICLE TYPE	No AND FREQUENCY	TIME ON SITE PER LORRY
Soft Strip	High sided skip vehicles	1 a day	2 hours
	Vans	2 per day	15 mins
Main demolition	High sided skip vehicles	2 a day	2 hours
	Rigid vehicle	1 a week	1 hour
	Vans	2 per day	15 mins
Piling	Ready Mix Concrete vehicles	2 per day	30 mins
	Ready Mix Concrete vehicles	1 per day	1.5 hours
	Vans	2 per day	15 mins
Excavation	Muck away vehicles	10 a day	45 mins
Substructure	Lorry Mounted Concrete pump	2 a week	6 hours
	Ready Mix Concrete vehicles	2 per day	30 mins
	Rigid vehicle	1 a day	1 hour
	Vans	2 per day	15 mins
Concrete Frame	Lorry Mounted Concrete pump	2 a week	6 hours
	Ready Mix Concrete vehicles - verticals	2 per day	30 mins
	Ready Mix Concrete vehicles - slabs	8 per pour	20 mins
	Rigid vehicle	1 a day	1 hour
	Vans	2 per day	15 mins
Steel frame structure	Semi Trailer vehicles	2 a day	2 hours
	Vans	1 per day	15 mins
Envelope and roof	Semi Trailer vehicles	2 a day	2 hours
	Rigid vehicle	2 per day	30 mins
	Vans	2 per day	15 mins
Internal works	Semi Trailer vehicles	1 per day	1 hour
	Rigid vehicle	4 per day	1 hour
	Vans	4 per day	15 mins
Tower crane erection and dismantle	ROAD CLOSURE REQUIRED DECMBER 2017 AND JUNE 2018. DATES TBC		

3-6 SPRING PLACE, LONDON
NUMBER OF VEHICLE BY WEEK NUMBERS

WEEK NR	VEHICLE TYPE	No/FREQUENCY	TIME ON SITE	VEHICLES PER WEEK	TOTAL PER WEEK
1 to 4	High sided skip vehicles	1 a day	2 hours	5	
	Vans	2 a day	15 mins	10	
					15
5 to 16	High sided skip vehicles	2 a day	2 hours	10	
	Rigid vehicles	1 a week	1 hour	5	
	Vans	2 per day	15 mins	10	
					25
16 - 28	Ready Mix Concrete vehicles	2 per day	30 mins	10	
	Rigid vehicles	1 per day	1.5 hours	5	
	Vans	2 per day	15 mins	10	
					25
29-35	Muck away vehicles	10 a day	45 mins	50	
					50
36-42	Lorry Mounted Concrete pump	2 a week	6 hours	2	
	Ready Mix Concrete vehicles	2 per day	30 mins	10	
	Rigid vehicles	1 a day	1 hour	5	
	Vans	2 per day	15 mins	10	
	Site waste vehicles	1 a week	1 hour	1	
					28
42-51	Lorry Mounted Concrete pump	2 a week	6 hours	2	
	Ready Mix Concrete vehicles - verticals				
		2 per day	30 mins	10	
	Ready Mix Concrete vehicles - slabs	8 per pour	20 mins	16	
	Rigid vehicles	1 a day	1 hour	5	
	Vans	2 per day	15 mins	10	
	Site waste vehicles	1 a week	1 hour	1	
					44

52-59	Lorry Mounted Concrete pump	2 a week	6 hours	2	
	Ready Mix Concrete vehicles - verticals	2 per day	30 mins	10	
	Ready Mix Concrete vehicles - slabs	8 per pour	20 mins	16	
	Rigid vehicles	1 a day	1 hour	5	
	Vans	6 per day	15 mins	10	
	Semi Trailer vehicles	3 a day	2 hours	15	
	Rigid lorries	3 per day	30 mins	15	
	Site waste vehicles	1 a week	1 hour	1	
					74
59-66	Semi Trailer vehicles	3 a day	2 hours	15	
	Rigid vehicles	6 per day	30 mins	30	
	Vans	6 per day	15 mins	30	
	Site waste vehicles	2 a week	1 hour	2	
					77
66-76	Semi Trailer vehicles	1 per day	1 hour	5	
	Rigid vehicles	4 per day	1 hour	20	
	Vans	4 per day	15 mins	20	
	Site waste vehicles	2 a week	1 hour	2	
					47
76-84	Vans	3 a day	15 mins	15	
	Site waste vehicles	2 a week	1 hour	2	

Appendix E: Acoustic Survey

3-6 SPRING PLACE

NOISE IMPACT ASSESSMENT

BROCKTON CAPITAL

19 August 2016
Revision 00

CONTENTS

1 INTRODUCTION

1.1 Proposals are in place to develop the site at 3-6 Spring Place into a commercial office building. The site is currently occupied by vehicle workshops which will be demolished.

1.2 To support the planning application for this development a noise impact assessment has been undertaken and is presented in this document.

1.3 As part of the assessment an external noise survey has been carried out at the site and the findings of this survey have been considered in the context of appropriate noise criteria and standards relevant to the development and guidance provided by the London Borough of Camden. Recommendations have been provided, which when adopted within the development, will enable the criteria and standards to be achieved.

1.4 Chapter 2 of this report considers the guidance on noise intrusion and noise emission relevant to the project. An external noise survey required for the assessment is presented in Chapter 3, whilst Chapters 4 and 5 present the assessments of noise intrusion and noise emission respectively.

1.5 Measurement data from the noise survey are presented in Appendix A. A completed copy of the London Borough of Camden's self-certified acoustic report checklist is included in Appendix B.

2 CRITERIA & GUIDANCE

2.1 LOCAL AUTHORITY REQUIREMENTS

2.1.1 The London Borough of Camden's policy for addressing noise and vibration when considering planning applications is set down in *Policy DP28 - Noise and Vibration* within the *Camden Development Policies, 2010-2025, Local Development Framework*.

2.1.2 The guidance provided within Policy DP28 states:

> *The Council will seek to ensure that noise and vibration is controlled and managed and will not grant planning permission for:*
>
> *a) development likely to generate noise/pollution; or*
>
> *b) development sensitive to noise in locations with noise pollution, unless appropriate attenuation measures are provided.*
>
> *Development that exceeds Camden's Noise and Vibration Thresholds will not be permitted. The Council will only grant permission for plant or machinery if it can be operated without cause harm to amenity and does not exceed our noise thresholds.*

2.1.3 The development at Spring Place is generally considered insensitive to noise as it is a commercial office development and not a residential or educational building. Consequently, the objective standards imposed by the London Borough of Camden concerning noise intrusion are not strictly relevant to this development. These standards have however been included in Table 2.1 below for information.

Table A: Noise levels on residential sites adjoining railways and roads at which planning permission will not be granted

Noise description and location of measurement	Period	Time	Sites adjoining railways	Sites adjoining roads
Noise at 1 metre external to a sensitive façade	Day	0700-1900	74 dB L_{Aeq} 12h	72 dB L_{Aeq} 12h
Noise at 1 metre external to a sensitive façade	Evening	1900-2300	74 dB L_{Aeq} 4h	72 dB L_{Aeq} 4h
Noise at 1 metre external to a sensitive façade	Night	2300-0700	66 dB L_{Aeq} 8h	66 dB L_{Aeq} 8h

Table B: Noise levels on residential streets adjoining railways and roads at and above which attenuation measures will be required

Noise description and location of measurement	Period	Time	Sites adjoining railways	Sites adjoining roads
Noise at 1 metre external to a sensitive façade	Day	0700-1900	65 dB L_{Aeq} 12h	62 dB L_{Aeq} 12h
Noise at 1 metre external to a sensitive façade	Evening	1900-2300	60 dB L_{Aeq} 4h	57 dB L_{Aeq} 4h
Noise at 1 metre external to a sensitive façade	Night	2300-0700	55 dB L_{Aeq} 1h	52 dB L_{Aeq} 1h
Individual noise events several times an hour	Night	2300-0700	>82 dB L_{Amax} (S time weighting)	>82 dB L_{AMAX} (S time weighting)

Table 2.1: Noise intrusion standards advised by London Borough of Camden

2.1.4 As it is a commercial development, noise intrusion standards have been selected on the basis of good practice guidance on noise intrusion into offices as set down in British Council for Offices : *Guide to Specification 2014* and BS 8233 : 2014 *Guidance on sound insulation and noise reduction for buildings.*

2.1.5 The London Borough of Camden can be expected to impose conditions, should they grant planning permission, which control the level of noise emission from fixed building services plant. The objective standards they require for noise emission are set down in the Table 2.2, taken from Policy DP28.

Table E: Noise levels from plant and machinery at which planning permission will not be granted

Noise description and location of measurement	Period	Time	Noise level
Noise at 1 metre external to a sensitive façade	Day, evening and night	0000-2400	5dB(A) <LA90
Noise that has a distinguishable discrete continuous note (whine, hiss, screech, hum) at 1 metre external to a sensitive façade.	Day, evening and night	0000-2400	10dB(A) <LA90
Noise that has distinct impulses (bangs, clicks, clatters, thumps) at 1 metre external to a sensitive façade.	Day, evening and night	0000-2400	10dB(A) <LA90
Noise at 1 metre external to sensitive façade where LA90>60dB	Day, evening and night	0000-2400	55dBL_{Aeq}

Table 2.2: Noise emission standards advised by London Borough of Camden

2.1.6 Although not specifically referenced, the manner in which the Authority require any acoustic character of the noise emission to be accounted for is similar to the methodology set down in BS 4142 : 1997. Consequently, other aspects of the methodology in BS 4142 : 1997 have been considered in the noise emission assessment presented here.

2.2 BS 4142

2.2.1 BS 4142 : 1997 *Method for rating industrial noise affecting mixed residential and industrial areas,* provides guidance on the assessment of the likelihood of complaints relating to noise. The standard presents a method of rating noise levels by comparing the noise level of the new source (the specific noise level) with that of the existing background noise level in the area in the absence of the new source (the background noise level).

2.2.2 The rating method according to BS 4142 accounts for unusual acoustic features such as a whine, hiss, impulsive or irregular noise by the addition of a single 5 dB correction to the specific noise level. The corrected specific noise level is the rating level.

2.2.3 The BS 4142 rating is determined by arithmetically subtracting the background noise level from the rating level. A difference of around +10 dB or more indicates that complaints relating to noise are likely. A difference of +5 dB is said to be of marginal significance. If the rating is more than 10 dB below the measured background noise level it is a positive indication that complaints are unlikely.

2.2.4 BS 4142 : 1997 was revised in 2014 and the latest edition BS 4142 : 2014 presents an entirely different assessment methodology and now rates the impact of the noise as opposed to the likelihood of complaint. Given Policy DP28 has limits based upon the former edition, BS 4142 : 2014 has not been considered further in this assessment.

2.3 ENVIRONMENTAL PROTECTION ACT 1990

2.3.1 In addition to meeting the Local Authority's requirements, it must also be considered that there is always the potential that neighbours may take direct noise nuisance action under the provisions of the Environmental Protection Act 1990, if they believe they have been subjected to noise nuisance. Usually if any Conditions to Planning concerning noise emission are complied with, the risk of such action is satisfactorily minimised.

2.4 CONCLUSION

2.4.1 From the guidance presented above it is considered inappropriate to review the prevailing external noise climate at the site in the light of the guideline levels in Table 2.1 as the development is not considered sensitive to noise. Instead noise intrusion will be assessed on the basis of the guidance provided by British Council for Offices and guidance in BS 8233.

2.4.2 Noise emission limits will be established on the basis of the limits advised in Table 2.2 using the methodologies set down in BS 4142.

3 EXTERNAL NOISE SURVEY

3.1 INTRODUCTION

3.1.1 In order to inform the acoustic design of the proposed office development an external noise survey was undertaken at two locations at the site. The data from this survey have been used to assess both noise intrusion into the proposed offices as well as noise emission from building services plant associated with the development.

3.2 MEASUREMENT METHODOLOGY

3.2.1 Continuous, unattended noise level measurements were conducted at a single location on the roof of the existing workshops to the rear of the site. The measurement microphone was about 3m from the nearside railway track and about 2m above the roof and track level in free field conditions.

3.2.2 Additional attended measurements were also undertaken in Spring Place as a secure measurement location was not available here. These measurements were made in free-field conditions about 1.2m above the pavement.

3.2.3 The measurement locations are shown superimposed upon an aerial view of the existing site in Figure 3.1.

3.2.4 The unattended measurements on the roof were undertaken between 11:20 on Tuesday 9 August through to 11:00 on Thursday 11 August 2016. Statistical and spectral data were recorded continuously throughout the measurement period in 10-minute samples.

3.2.5 The attended measurements at street level were undertaken between 11:15 and 12:55 on Thursday 11 August 2016. Statistical and spectral data were recorded continuously throughout this measurement period in 5-minute samples.

3.2.6 The following equipment was used for the noise survey:

Equipment	Type	Serial No.
Norsonic 139	Environmental Noise Meter	1392774
Norsonic 1218	Microphone protection system	12182517
Bruel & Kjaer 4231	Calibrator	2291098

Table 3.1: Noise measurement equipment

3.2.7 The calibration of the sound level meter and associated microphone were checked prior to and on completion of the measurement period in accordance with recommended practice. No significant drift in calibration occurred during the measurement period. The accuracy of the calibrator can be traced to National Physical Laboratory Standards.

3.2.8 The weather conditions throughout the measurement period were dry with a gentle to moderate breeze. The weather conditions are not considered to have had a detrimental influence on the measurement results.

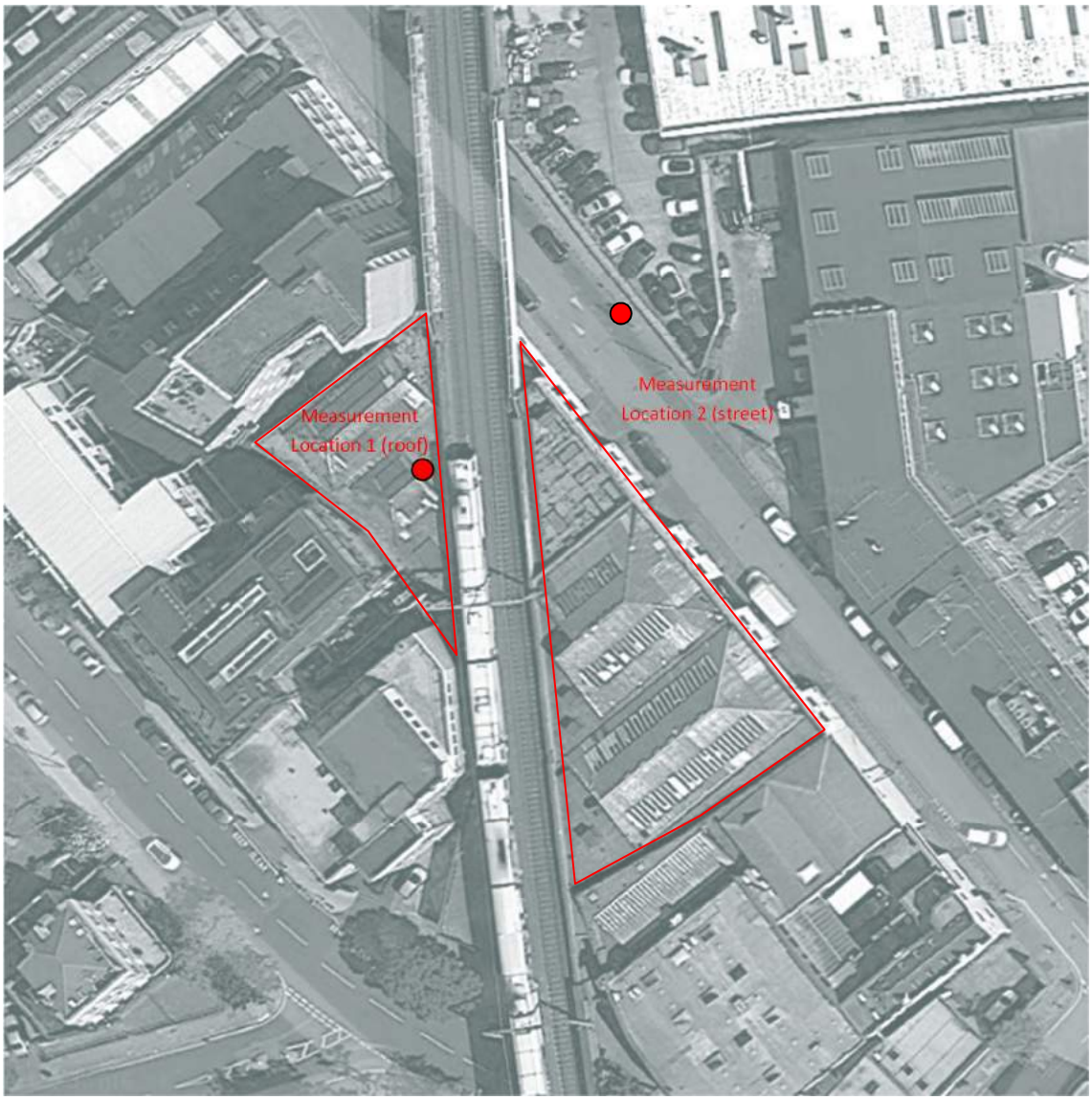


Image courtesy of Google Maps

Figure 3.1: Existing site plan showing measurement locations

3.3 MEASUREMENT RESULTS

3.3.1 The measurement results are presented in Appendix A. Graphs showing the time histories for the measurements at the two locations are presented in Figure 3.2 and Figure 3.3.

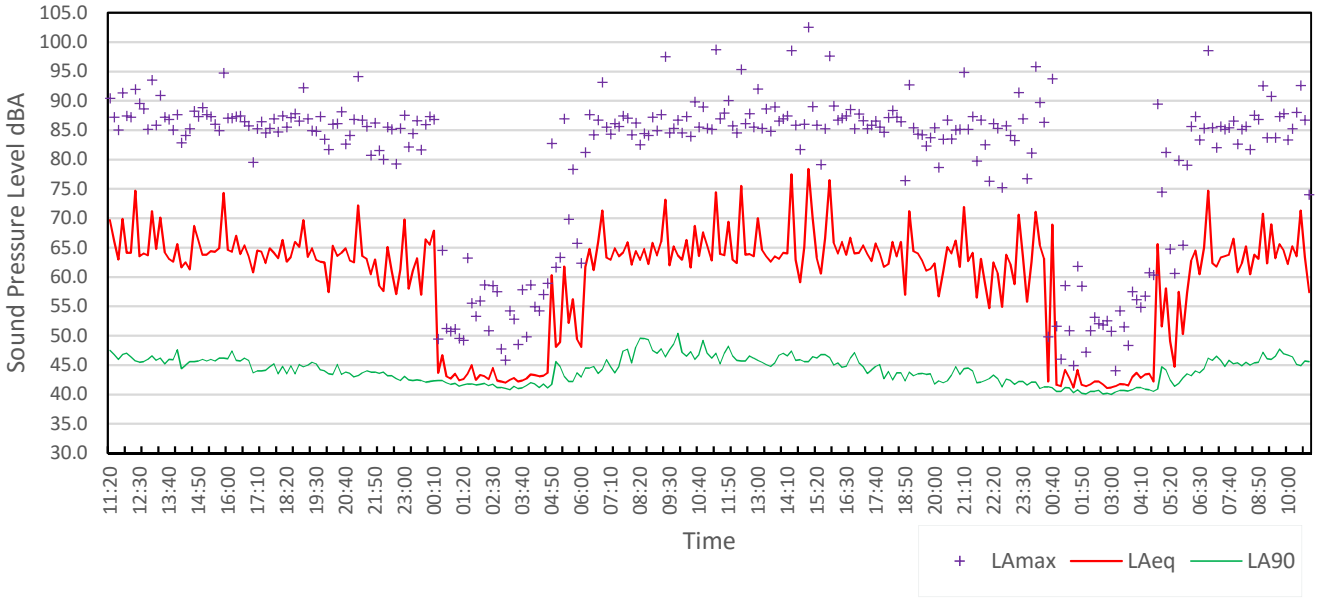


Figure 3.2: External noise levels, rooftop location

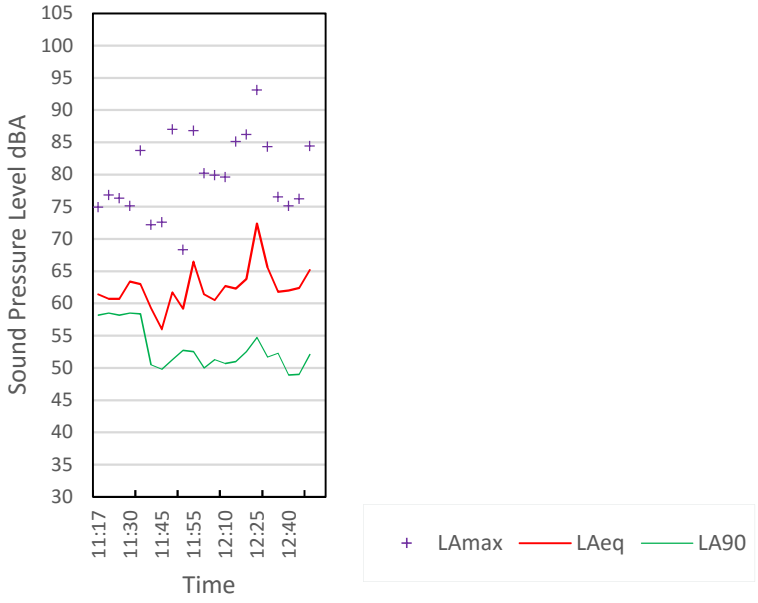


Figure 3.3: External noise levels, street location

3.3.2 The lowest measured background noise levels typically expected to occur during the daytime, evening and night-time at the nearest noise sensitive properties around the development are set down in Table 3.2. These have been determined from the survey data and are considered representative of the underying background noise levels at the facades of the residential properties overlooking the site.

Time Period	Background noise level)
Daytime (07:00-19:00)	42 dB $L_{A90,10min}$
Evening (19:00-23:00)	42 dB $L_{A90,10min}$
Night-time (23:00-07:00)	41 dB $L_{A90,10min}$

All values are sound pressure levels in dB re: $2x10^{-5}$Pa

Table 3.2: Measured background noise levels

3.4 COMMENTARY

3.4.1 Noise levels at the proposed development site are influenced predominantly by trains passing through the site and road traffic on Spring Place.

3.4.2 Based on the current Overground timetables from Transport for London there are about 140 Overground train movements on this line between 8am and 6pm on a weekday. This does not include freight movements which occur about ten times a day. Trains pass more than once every 5 minutes during the daytime and increase in frequency towards the late afternoon. There are also signals nearby and freight trains were observed to come to a stop on the viaduct at times. This activity is particularly noisy with the squeal from the train's brakes.

3.4.3 Maximum noise levels on Spring Place are lower than towards the rear of the site and are influenced by the noise of road traffic and vehicles and activity in the nearby Camden Council, Holmes Road depot. There is also noise from the railway as trains pass over the bridge over Spring Place.

3.4.4 It is considered that the measurement data is representative of both the highest noise levels typically encountered at the site during the daytime and also the quietest levels likely to be experienced overnight for both weekdays and weekends.

4 EXTERNAL NOISE INTRUSION

4.1 CRITERIA

4.1.1 There are no regulations which set specific acoustic standards for an office space, however in order to promote the creation of effective office spaces the British Council for Offices (BCO) have published their *Guide to Specification 2014.* This document provides guidance regarding office design and presents standards for external noise intrusion which have been deemed suitable for an office environment.

4.1.2 Consideration has also been given to the desire of the developer of 3-5 Spring Place, for a less traditional office environment, however in the absence of specific objective standards the guidance within the BCO document is considered a suitable starting point for considering external noise intrusion.

4.1.3 Guide to Specification recommends that when averaged over a typical working day of eight hours, noise intrusion should be controlled to a level of NR38 $L_{eq,8hr}$ within a speculative office environment. In addition, L_{AFmax} noise levels in open plan offices should not regularly exceed 55dB.

4.2 REFERENCE NOISE LEVELS

4.2.1 In order to assess the level of noise intrusion into the new development, reference noise spectra for use in façade calculations have been determined from the measurement data and these are presented in Table 4.1.

Daytime 07:00-19:00	Frequency Hz						
	63	125	250	500	1000	2000	4000
Spring Place elevation $L_{eq,10min}$	74.5	73.2	66.4	62.7	66	66.6	65.4
Spring Place elevation $L_{Fmax,10min}$	91.3	78.8	73	74	83.4	81	70.8
Rear elevation $L_{eq,10min}$	73.9	72	68.2	67.4	67.1	62.2	56
Rear elevation $L_{Fmax,10min}$	94.1	88.6	85.9	89.4	87	80.4	72.9

All values are sound pressure levels in dB re: $2x10^{-5}$Pa

Table 4.1: Rreference noise levels for use in façade sound insulation assessments

4.3 REQUIRED FAÇADE PERFORMANCE

4.3.1 Based on achieving the external noise intrusion limits in 4.1.3, the required sound insulation performance of the façades for the development have been established using the relevant reference noise levels in Table 4.1. Preliminary, minimum sound reduction indices are set down in Table 4.2.

	Frequency Hz						
	63	125	250	500	1000	2000	4000
Spring Place elevation	24	26	31	36	44	46	56
Elevations facing railway	27	29	36	42	50	50	62

All values are sound reduction indices, *R,* measured in accordance with BS EN ISO 10140-2

Table 4.2: Required façade sound reduction indices

4.3.2 The proposed façade constructions have not yet been finalised, however where large areas of curtain walling or glazing are proposed, the required sound insulation performance should be achievable with substantial double glazed units. To Spring Place this would typically require a glazing configuration such as 8mm laminate glass / 22mm cavity / 10mm glass. Upper floors on elevations facing the railway will require a glazing configuration such as 12mm laminate glass / 22mm cavity / 12mm laminate glass.

5 NOISE EMISSION

5.1 CRITERIA

5.1.1 The London Borough of Camden require noise emission to be controlled in line with the limits set down in Table E of Policy DP28 and presented in Table 2.2 of this report. For non-specific building services plant the noise emission should be controlled to 5dBA below the background noise level, however, if this plant noise includes some acoustic feature such as a distinctive tone or impulsive character, then the limit is made more onerous and reduced to 10dB below the underlying background noise level.

5.2 BUILDING SERVICES EQUIPMENT

5.2.1 The principal items of noise generating plant associated with the development are expected to be air source heat pumps and kitchen, restaurant, toilet and office ventilation plant. The air source heat pumps are to be located on the 5th floor roof in a compound and also in a small compound at ground level to the north west of the site. The majority of the ventilation plant will be located internally but will have intakes and discharges at roof level.

5.2.2 Specific plant selections have not yet been undertaken at this stage of the design and so an approach of establishing a maximum noise level limit at the nearest noise sensitive neighbours has been adopted.

5.3 BACKGROUND NOISE LEVELS

5.3.1. The London Borough of Camden do not specify a particular assessment duration for establishing background noise levels or the noise emission limit for building services equipment. The measurement data obtained from the survey was recorded in 10 minute samples as this provides a good balance between detail and quantity of data over a 48 hour measurement period. The methodology in BS 4142 : 1997, however, requires that a 5 minute assessment period be used at night and an hourly period be used during the daytime. In practice it is expected that the difference in noise level between these two sample periods at night is negligible and unlikely to be more than 1dB. During the daytime the lowest $L_{A90,10min}$ will be lower than the lowest $L_{A90,1hr}$ and so using this lower value in any assessment will give a more conservative estimate of the likely noise impact.

5.3.2 The lowest background noise levels, as reported in Table 3.2 are considered to be suitable for setting noise emission limits from the building services plant serving the development and the lowest of these has been taken as 41dB L_{A90}.

5.4 NEAREST NOISE SENSITIVE NEIGHBOURS

5.4.1 The nearest noise sensitive façades to the proposed development site are considered to be the rear of the properties at 110-114 and 116 Grafton Road and 7 Spring Place. These properties have rear elevations which overlook the site. The air source heat pumps located at ground level to the north west of the site will be about 3m away from the nearest noise sensitive windows at 116 Grafton Road and 7 Spring Place.

5.4.2 For the roof top plant compound, the nearest noise sensitive facades are expected to be on the upper floors of the property at 110-114 Grafton Road on the opposite side of the railway from the compound. At its closest, the plant will be about 30m from these facades.

5.5 NOISE EMISSION LIMITS

5.5.1 At this time there is no reason to expect the proposed building services plant to have any particular acoustic feature or distinctive character and so, based on the requirements set out in Policy DP28, a limit of 5dB below the prevailing background noise level has been considered appropriate. Should it be established that particular plant will have an acoustic feature as the design develops, the noise emission limit will be revised to be 5dB more onerous.

5.5.2 Based on the lowest measured background noise levels of 42dB L_{A90} during the daytime and 41dB L_{A90} overnight, and the limitation of 5dB below the underlying background noise level, noise emission limits have been determined and are set down in Table 5.1.

Time Period	Rear of properties in Grafton Road	Rear of properties at 7 Spring Lane
Daytime (07:00-23:00)	37 dB $L_{Aeq,1hr}$	37 dB $L_{Aeq,1hr}$
Night-time (23:00-07:00)	36 dB $L_{Aeq,5min}$	36 dB $L_{Aeq,5min}$

All values are sound pressure levels in dB re: $2x10^{-5}$Pa

Table 5.1: Noise emission limits for all building services plant operating simultaneously

5.6 COMMENTARY

5.6.1 The limits determined at the residential facades are relatively onerous and it is likely that the air source heat pumps located close to the residential neighbours will require careful selection to ensure they are quiet enough. If they are still not quiet enough additional noise control will be required and it is quite common to utilise “bolt-on” noise control packages on this type of equipment to provide additional attenuation.

5.6.2 The air source heat pumps and ventilation plant located on the 5th floor roof will be some 30m away from the noise sensitive neighbours resulting in about 30dB of attenuation as a result of the propagation distance. With this in mind it is expected that this plant can be readily selected and screened to achieve the noise emission limits.

6 VIBRATION

6.1 CRITERIA

6.1.1 The London Borough of Camden have advised maximum vibration levels which should not be exceeded at residential sites. These are set down in *Policy DP28 - Noise and Vibration* within the *Camden Development Policies, 2010-2025 Local Development Framework, and repeated in Table 6.1 below.*

Table C: Vibration levels on residential sites adjoining railways and roads at which planning permission will not be granted

Vibration description and location of measurement	Period	Time	Vibration levels
Vibration inside critical areas such as a hospital operating theatre	Day, evening and night	0000-2400	0.1 VDV ms-1.75
Vibration inside dwellings	Day and evening	0700-2300	0.2 to 0.4 VDV ms-1.75
Vibration inside dwellings	Night	2300-0700	0.13 VDV ms-1.75
Vibration inside offices	Day, evening and night	0000-2400	0.4 VDV ms-1.75
Vibration inside workshops	Day, evening and night	0000-2400	0.8 VDV ms-1.75

Table 6.1: Vibration standards advised by London Borough of Camden

6.1.2 The commercial office development proposed for 3-5 Spring Place is far less sensitive to vibration than a residential development and the standard advised by London Borough of Camden for offices in residential developments reflects this.

6.1.3 It is important to understand that the criterion of $0.4ms^{-1.75}$ VDV does not result in vibration being imperceptible. The VDV, or vibration dose value, considers the level and regularity of sources of intermittent vibration averaged over a particular period. Fewer vibration events with a greater magnitude may have a similar VDV to more vibration events with a lower magnitude.

6.1.4 The VDV can be used to consider the likelihood of disturbance from vibration and guidance in BS 6472- 1 : 2008 provides some direction on this. For example, a VDV of $0.4ms^{-1.75}$ may be quite acceptable in an office during the daytime but would give rise to adverse comment in a bedroom overnight.

6.2 COMMENTARY

6.2.1 Site visits have been made on a number of occasions to 3-5 Spring Place whilst Overground and freight trains were passing on the viaduct. No vibration was perceptible from these train passes either at ground level below or to the side of the viaduct, or at roof level of the existing building within a couple of meters of the tracks.

6.2.2 This is not surprising as any vibration energy generated by the trains will be transferred down through the viaduct with some attenuation before propagating in the ground. This is unlike railway tracks laid at grade which can induce high levels of vibration within the ground to either side of the tracks. Consequently, as long as the new development is not supported directly off the existing viaduct the levels of vibration from trains is expected to remain the same as for the current buildings on site.

6.2.3 Vibration levels are therefore expected to be sufficiently low in the new development that they will be generally imperceptible and would therefore be expected to be in line with the standards for offices in residential developments advised by the London Borough of Camden.

7 CONCLUSIONS

7.1 A noise impact assessment has been undertaken for the proposed co-worker office development at the former workshops at 3-6 Spring Place. As part of this assessment a noise survey has been undertaken at two locations about the proposed development site. This information is essential for determining the levels of noise ingress into the development and the limits to noise emission.

7.2 Consideration has been given to available guidance from London Borough of Camden and other sources and appropriate criteria for noise intrusion established for the offices. It is highlighted that the development is not residential in nature and the objective external noise level limits advised within *Policy DP28 - Noise and Vibration* are not strictly applicable. The office is, however, to be designed in accordance with good practice and in line with standards set down in BS 8233 : 2014.

7.3 The required sound insulation performances for the various facades of the development have been established based on the findings of the survey. It is concluded that if these sound insulation performance specifications are achieved, noise intrusion into the development will be controlled to acceptable levels.

7.4 Noise emission from fixed building services equipment associated with the development has also been considered in line with guidance advised by London Borough of Camden. Noise emission limits have been set on the basis of the lowest measured background noise levels at the site. These limits are not to be exceeded at the nearest noise sensitive facades to the development. These have been identified as residential properties to the rear of the site.

7.5 The precise selections of façade elements and building services equipment are not yet available but the criteria and specifications proposed in this assessment will be incorporated as the design of the development progresses.

7.6 As the office is to be developed adjacent to a railway viaduct there are concerns about vibration from the passing trains. The levels of vibration currently experienced at the site are imperceptible and this is accounted for by the fact the railway is on a viaduct and not at grade.

7.7 It is therefore concluded that the levels of vibration within the development will be commensurate with the commercial office development and the criteria identified within Policy DP28 for offices within residential accommodation.

APPENDIX A - NOISE LEVEL DATA

A selection of the measured noise level data are presented in the tables in this appendix. The full set of data are available in electronic form on request.

All values are sound pressure levels in dB re $2x10^{-5}$Pa.

Time	L_{Amax}	L_{Aeq}	L_{A10}	L_{A90}	L_{Amin}
11:20 - 11:30	90.4	69.7	60.4	47.5	45.6
11:30 - 11:40	87.2	66.1	53.2	46.8	44.8
11:40 - 11:50	85.0	63.0	52.9	46.0	43.9
11:50 - 12:00	91.3	69.9	66.6	46.8	45.4
12:00 - 12:10	87.4	64.1	54.4	47.0	45.2
12:10 - 12:20	87.2	64.1	53.3	46.4	44.0
12:20 - 12:30	91.9	74.7	76.2	45.7	43.6
12:30 - 12:40	89.5	63.5	50.1	45.5	43.6
12:40 - 12:50	88.6	64.0	51.7	45.6	43.7
12:50 - 13:00	85.1	63.7	54.8	46.0	44.0
13:00 - 13:10	93.5	71.2	70.6	46.6	44.9
13:10 - 13:20	85.8	64.8	53.4	45.8	43.6
13:20 - 13:30	90.9	70.1	69.7	46.2	44.3
13:30 - 13:40	87.2	64.2	52.2	45.2	43.0
13:40 - 13:50	86.8	63.1	52.0	46.0	44.1
13:50 - 14:00	85.0	62.6	57.1	45.9	44.4
14:00 - 14:10	87.6	65.6	52.7	47.6	45.9
14:10 - 14:20	82.8	61.6	49.8	44.4	42.3
14:20 - 14:30	84.1	62.5	50.1	45.0	42.8
14:30 - 14:40	85.2	61.3	51.7	45.6	43.8
14:40 - 14:50	88.2	68.7	70.4	45.6	43.6
14:50 - 15:00	87.3	66.3	54.2	45.7	44.2
15:00 - 15:10	88.8	63.8	54.7	46.0	44.4
15:10 - 15:20	87.6	63.8	53.6	45.7	44.2
15:20 - 15:30	87.3	64.4	57.4	46.0	43.7
15:30 - 15:40	86.0	64.3	57.4	45.7	43.7
15:40 - 15:50	84.9	64.9	67.0	46.2	44.6
15:50 - 16:00	94.7	74.3	71.5	46.2	44.4
16:00 - 16:10	87.0	64.6	53.3	46.1	44.3
16:10 - 16:20	87.0	64.3	55.1	47.4	44.8
16:20 - 16:30	87.3	67.0	56.8	45.8	43.9
16:30 - 16:40	87.4	63.9	52.8	45.7	43.7
16:40 - 16:50	86.4	65.4	55.2	46.2	44.4
16:50 - 17:00	85.7	63.5	56.8	45.8	42.5
17:00 - 17:10	79.5	60.8	51.1	43.7	41.9
17:10 - 17:20	85.2	64.5	51.6	44.0	42.4
17:20 - 17:30	86.4	64.3	51.8	44.0	42.0
17:30 - 17:40	84.5	62.4	54.6	44.1	41.2
17:40 - 17:50	85.3	64.9	54.8	44.7	42.6
17:50 - 18:00	86.9	64.1	55.0	45.2	42.3
18:00 - 18:10	84.7	63.2	51.5	43.5	41.3
18:10 - 18:20	87.4	66.3	55.1	44.8	42.3
18:20 - 18:30	85.5	62.6	52.7	43.5	40.6
18:30 - 18:40	87.1	63.4	54.2	44.9	43.4
18:40 - 18:50	87.8	66.0	51.6	43.5	42.0
18:50 –19:00	86.5	65.1	55.1	45.1	43.2
19:00 - 19:10	92.2	69.7	67.4	44.7	43.0
19:10 - 19:20	86.9	63.4	54.0	45.0	43.3
19:20 - 19:30	84.9	64.9	54.0	45.5	43.8
19:30 - 19:40	84.8	62.9	51.8	45.2	43.3
19:40 - 19:50	87.3	62.6	52.7	44.2	42.7
19:50 - 20:00	83.4	62.5	50.7	44.0	42.5
20:00 - 20:10	81.7	57.4	51.6	43.5	41.9
20:10 - 20:20	86.0	65.3	52.4	43.4	41.9
20:20 - 20:30	86.1	63.6	56.1	45.1	43.4
20:30 - 20:40	88.1	64.1	50.5	43.4	41.5
20:40 - 20:50	82.6	64.9	69.4	43.8	41.6
20:50 - 21:00	84.1	62.8	50.0	43.6	41.8
21:00 - 21:10	86.8	62.5	49.1	43.0	41.4
21:10 - 21:20	94.1	72.2	70.7	43.2	41.5
21:20 - 21:30	86.7	63.6	49.7	43.7	42.1
21:30 - 21:40	85.6	63.1	55.2	44.0	42.4
21:40 - 21:50	80.7	60.5	59.1	43.8	42.2
21:50 - 22:00	86.2	63.0	49.0	43.8	42.4
22:00 - 22:10	81.5	58.5	52.4	43.6	41.6
22:10 - 22:20	80.0	57.6	51.2	43.8	41.7
22:20 - 22:30	85.5	65.1	52.1	43.2	42.1
22:30 - 22:40	85.1	61.0	46.3	43.2	41.9
22:40 - 22:50	79.2	57.1	46.7	42.7	41.4
22:50 - 23:00	85.3	61.3	49.1	42.4	40.8
23:00 - 23:10	87.5	69.8	62.3	43.1	41.7
23:10 - 23:20	82.1	58.0	45.9	42.5	41.0
23:20 - 23:30	84.4	61.1	45.4	42.4	41.4
23:30 - 23:40	86.6	63.2	46.7	42.5	41.5
23:40 - 23:50	81.6	57.0	44.8	42.4	41.4
23:50 - 00:00	85.9	66.4	61.9	42.1	40.5

Time	L_{Amax}	L_{Aeq}	L_{A10}	L_{A90}	L_{Amin}
00:00 - 00:10	87.3	65.5	56.4	42.2	41.1
00:10 - 00:20	86.8	67.9	71.0	42.3	40.1
00:20 - 00:30	49.4	43.7	44.8	42.4	41.2
00:30 - 00:40	64.5	46.7	47.1	42.4	41.3
00:40 - 00:50	51.2	43.1	44.1	42.0	40.7
00:50 - 01:00	50.7	42.7	43.7	41.7	40.3
01:00 - 01:10	51.1	43.5	44.5	41.9	40.7
01:10 - 01:20	49.5	42.4	43.4	41.4	40.1
01:20 - 01:30	49.2	42.6	43.6	41.6	40.1
01:30 - 01:40	63.2	43.5	44.2	41.8	40.4
01:40 - 01:50	55.5	45.0	46.6	41.8	40.6
01:50 - 02:00	53.3	42.5	43.3	41.6	40.6
02:00 - 02:10	55.9	43.3	44.2	41.7	40.2
02:10 - 02:20	58.6	43.1	43.8	41.9	39.9
02:20 - 02:30	50.8	42.6	43.5	41.5	40.0
02:30 - 02:40	58.5	44.5	45.7	41.7	40.6
02:40 - 02:50	57.5	42.4	43.5	41.2	40.0
02:50 - 03:00	47.7	42.2	43.3	41.2	40.2
03:00 - 03:10	45.8	42.0	43.2	41.0	40.0
03:10 - 03:20	54.2	42.5	43.9	40.8	39.7
03:20 - 03:30	52.8	42.8	44.0	41.4	39.8
03:30 - 03:40	48.5	42.2	43.2	41.0	40.0
03:40 - 03:50	57.8	42.4	43.4	41.1	39.8
03:50 - 04:00	49.8	42.7	43.7	41.5	40.4
04:00 - 04:10	58.6	43.4	44.4	42.0	40.2
04:10 - 04:20	54.9	43.3	44.2	41.8	40.5
04:20 - 04:30	54.2	43.1	44.5	41.2	40.1
04:30 - 04:40	57.0	43.2	43.9	41.8	40.4
04:40 - 04:50	58.9	43.7	44.6	41.1	39.8
04:50 - 05:00	82.7	60.3	50.0	41.7	40.5
05:00 - 05:10	61.6	48.1	49.4	45.6	44.1
05:10 - 05:20	63.3	48.9	52.0	44.8	42.6
05:20 - 05:30	86.9	61.8	63.8	43.1	41.5
05:30 - 05:40	69.8	52.2	49.8	42.2	40.8
05:40 - 05:50	78.3	56.2	46.7	42.2	40.5
05:50 –06:00	65.7	49.4	51.0	43.7	41.1
06:00 - 06:10	62.3	48.1	51.2	43.0	41.6
06:10 - 06:20	81.2	61.7	56.2	44.5	41.2
06:20 - 06:30	87.6	64.8	56.3	44.5	42.2
06:30 - 06:40	84.2	61.2	51.9	44.8	42.4
06:40 - 06:50	86.7	66.0	54.8	43.6	40.8
06:50 - 07:00	93.1	71.3	69.2	44.3	42.2
07:00 - 07:10	85.5	63.3	56.0	45.9	43.5
07:10 - 07:20	84.3	62.9	53.5	44.7	43.0
07:20 - 07:30	86.1	64.9	52.5	43.7	42.3
07:30 - 07:40	85.6	63.5	54.5	44.8	42.6
07:40 - 07:50	87.4	64.2	53.4	47.4	44.2
07:50 - 08:00	87.0	65.9	57.1	47.7	44.5
08:00 - 08:10	84.2	62.1	52.2	45.4	43.2
08:10 - 08:20	86.2	64.4	54.4	48.1	43.9
08:20 - 08:30	82.5	62.9	57.2	49.6	48.4
08:30 - 08:40	84.4	64.8	59.0	49.5	48.0
08:40 - 08:50	84.1	62.2	54.8	49.3	47.6
08:50 - 09:00	87.2	65.8	56.5	47.5	45.4
09:00 - 09:10	84.9	63.7	60.4	47.0	44.4
09:10 - 09:20	87.6	66.0	56.2	47.8	45.9
09:20 - 09:30	97.5	73.2	69.2	46.4	44.8
09:30 - 09:40	84.5	62.0	54.9	47.6	45.7
09:40 - 09:50	85.3	65.2	58.7	48.6	45.8
09:50 - 10:00	86.7	63.7	53.5	50.4	49.1
10:00 - 10:10	84.5	62.9	55.6	47.2	44.8
10:10 - 10:20	87.3	66.3	55.2	46.5	44.4
10:20 - 10:30	83.9	61.6	54.4	47.3	45.3
10:30 - 10:40	89.8	68.7	65.7	46.0	44.4
10:40 - 10:50	85.5	63.6	54.7	46.8	45.3
10:50 - 11:00	88.9	67.6	68.3	49.2	47.2
11:00 - 11:10	85.3	65.4	57.5	47.0	45.1
11:10 - 11:20	85.1	62.8	52.6	46.2	44.3
11:20 - 11:30	98.7	74.4	74.6	47.0	45.1
11:30 - 11:40	86.9	63.9	51.0	45.2	43.5
11:40 - 11:50	87.9	63.7	53.2	47.0	45.4
11:50 - 12:00	90.0	69.4	68.8	48.2	46.2

Table A1: Location 1, Statistical data, 9-10 August 2016

Time	L_{Amax}	L_{Aeq}	L_{A10}	L_{A90}	L_{Amin}
12:00 - 12:10	85.7	63.0	52.0	46.6	44.4
12:10 - 12:20	84.5	62.4	51.4	45.8	44.3
12:20 - 12:30	95.3	75.5	77.3	45.7	44.1
12:30 - 12:40	86.1	63.8	54.1	45.7	44.4
12:40 - 12:50	87.8	63.9	53.5	46.6	44.5
12:50 - 13:00	85.5	63.5	57.2	46.2	44.3
13:00 - 13:10	92.0	70.0	71.3	45.8	44.2
13:10 - 13:20	85.3	64.6	55.1	45.5	43.9
13:20 - 13:30	88.6	63.5	51.1	45.1	43.3
13:30 - 13:40	84.8	62.6	51.5	44.8	42.9
13:40 - 13:50	88.9	63.5	56.3	45.4	43.5
13:50 - 14:00	86.5	63.1	54.3	46.7	44.7
14:00 - 14:10	86.9	64.1	54.7	47.0	44.9
14:10 - 14:20	87.4	64.0	55.5	46.6	44.8
14:20 - 14:30	98.5	77.5	63.5	47.4	46.2
14:30 - 14:40	85.8	62.9	54.9	45.8	44.0
14:40 - 14:50	81.7	59.1	53.4	45.9	44.4
14:50 - 15:00	86.0	65.1	55.7	45.6	44.0
15:00 - 15:10	102.5	78.4	69.8	45.6	43.7
15:10 - 15:20	89.0	70.1	75.4	46.4	44.2
15:20 - 15:30	85.8	63.3	55.3	46.2	43.4
15:30 - 15:40	79.1	60.6	56.7	46.8	44.6
15:40 - 15:50	85.2	66.6	70.1	46.8	44.8
15:50 - 16:00	97.6	76.5	68.1	46.3	44.0
16:00 - 16:10	89.1	65.8	53.7	45.0	43.0
16:10 - 16:20	86.7	64.0	54.8	45.4	43.5
16:20 - 16:30	87.0	66.0	56.6	44.6	42.6
16:30 - 16:40	87.4	63.8	53.0	44.8	42.5
16:40 - 16:50	88.5	66.7	56.8	46.2	44.3
16:50 - 17:00	85.2	64.0	58.3	47.1	44.2
17:00 - 17:10	87.7	64.1	58.0	45.4	42.6
17:10 - 17:20	86.6	65.4	55.1	44.7	42.7
17:20 - 17:30	85.2	63.9	54.5	43.6	41.2
17:30 - 17:40	85.8	62.7	56.0	44.2	42.1
17:40 - 17:50	86.5	65.7	54.8	44.8	42.3
17:50 - 18:00	85.5	64.0	57.5	45.1	41.3
18:00 - 18:10	84.6	61.7	52.7	42.7	41.1
18:10 - 18:20	87.1	62.2	54.1	43.9	42.1
18:20 - 18:30	88.3	66.0	54.2	42.5	40.7
18:30 - 18:40	87.2	63.5	55.0	43.7	41.6
18:40 - 18:50	86.4	66.0	51.9	43.7	41.9
18:50 –19:00	76.4	57.0	52.9	42.3	40.5
19:00 - 19:10	92.7	71.2	71.4	43.8	42.0
19:10 - 19:20	85.4	64.4	54.5	43.2	40.8
19:20 - 19:30	84.3	64.0	58.1	43.5	41.1
19:30 - 19:40	84.2	62.8	55.5	43.6	41.6
19:40 - 19:50	82.3	61.1	53.9	43.4	41.9
19:50 - 20:00	83.7	61.4	53.7	43.5	41.6
20:00 - 20:10	85.4	62.3	55.1	41.8	40.0
20:10 - 20:20	78.6	56.7	49.2	42.3	40.7
20:20 - 20:30	83.4	60.9	53.0	42.0	40.3
20:30 - 20:40	86.7	65.1	53.7	42.3	40.8
20:40 - 20:50	83.5	64.0	62.7	43.3	40.5
20:50 - 21:00	85.0	66.2	61.5	44.7	42.0
21:00 - 21:10	85.1	61.7	53.5	43.4	40.9
21:10 - 21:20	94.8	71.9	65.4	44.4	42.4
21:20 - 21:30	85.1	62.7	53.9	44.5	42.8
21:30 - 21:40	87.3	64.1	52.2	44.0	42.3
21:40 - 21:50	79.7	56.5	48.8	42.0	40.2
21:50 - 22:00	86.7	63.1	47.0	42.1	40.7
22:00 - 22:10	82.5	58.8	47.5	42.4	40.6
22:10 - 22:20	76.3	54.7	49.2	42.7	41.0
22:20 - 22:30	86.1	62.5	54.5	43.3	41.0
22:30 - 22:40	85.3	60.7	48.8	42.7	40.9
22:40 - 22:50	75.2	54.9	48.0	41.3	40.1
22:50 - 23:00	85.7	63.8	49.7	42.6	41.1
23:00 - 23:10	84.1	62.2	45.9	42.4	41.2
23:10 - 23:20	83.2	58.8	44.1	41.7	40.4
23:20 - 23:30	91.4	70.6	62.6	42.2	40.7
23:30 - 23:40	86.9	63.5	45.8	42.2	41.1
23:40 - 23:50	76.7	55.8	47.3	41.6	40.2
23:50 - 00:00	81.1	62.6	63.0	42.1	40.8

Time	L_{Amax}	L_{Aeq}	L_{A10}	L_{A90}	L_{Amin}
00:00 - 00:10	95.8	71.1	60.5	42.1	40.5
00:10 - 00:20	89.7	65.5	65.3	41.0	39.7
00:20 - 00:30	86.3	63.2	60.0	41.3	39.8
00:30 - 00:40	49.8	42.2	43.0	41.3	40.3
00:40 - 00:50	93.7	68.9	53.1	41.1	39.8
00:50 - 01:00	51.6	41.6	42.4	40.5	39.0
01:00 - 01:10	46.0	41.4	42.1	40.5	39.2
01:10 - 01:20	58.5	44.2	45.3	41.2	39.8
01:20 - 01:30	50.8	42.8	44.3	41.1	39.8
01:30 - 01:40	44.9	41.2	42.0	40.3	39.2
01:40 - 01:50	61.8	44.2	43.7	40.8	39.7
01:50 - 02:00	58.4	41.6	42.3	40.2	38.7
02:00 - 02:10	47.2	41.4	42.5	40.1	38.8
02:10 - 02:20	50.8	41.7	42.7	40.5	39.3
02:20 - 02:30	53.1	42.2	43.5	40.5	39.4
02:30 - 02:40	52.0	42.2	43.6	40.7	39.2
02:40 - 02:50	51.8	41.7	43.1	40.1	38.3
02:50 - 03:00	52.5	41.1	41.8	40.2	39.1
03:00 - 03:10	50.7	41.2	42.0	40.0	39.0
03:10 - 03:20	44.0	41.4	42.3	40.4	38.9
03:20 - 03:30	54.2	41.8	42.6	40.7	38.8
03:30 - 03:40	51.5	41.7	42.7	40.7	39.5
03:40 - 03:50	48.3	41.5	42.2	40.6	39.2
03:50 - 04:00	57.5	43.0	43.9	40.8	39.4
04:00 - 04:10	56.1	43.7	45.8	41.2	39.8
04:10 - 04:20	54.8	42.8	43.9	41.2	39.5
04:20 - 04:30	56.7	43.4	44.0	40.9	39.6
04:30 - 04:40	60.7	43.5	43.2	40.8	39.4
04:40 - 04:50	60.3	42.2	42.6	40.5	38.8
04:50 - 05:00	89.4	65.6	45.9	40.9	39.4
05:00 - 05:10	74.4	51.6	50.4	44.7	42.3
05:10 - 05:20	81.2	58.1	50.1	44.2	42.3
05:20 - 05:30	64.7	49.1	52.4	42.5	39.9
05:30 - 05:40	60.6	44.7	46.5	41.4	39.8
05:40 - 05:50	79.8	57.5	46.5	41.9	40.3
05:50 –06:00	65.4	50.3	53.6	42.8	41.2
06:00 - 06:10	79.0	57.3	56.4	43.5	41.9
06:10 - 06:20	85.6	62.8	52.7	43.2	41.1
06:20 - 06:30	87.3	64.5	54.2	44.0	41.7
06:30 - 06:40	83.3	60.5	53.9	43.7	42.2
06:40 - 06:50	85.3	65.0	53.4	44.4	42.4
06:50 - 07:00	98.5	74.7	68.7	46.2	44.6
07:00 - 07:10	85.4	62.4	54.9	45.8	43.2
07:10 - 07:20	82.0	61.8	55.8	46.5	45.5
07:20 - 07:30	85.6	63.3	53.1	45.8	44.1
07:30 - 07:40	85.1	63.5	58.2	44.8	42.7
07:40 - 07:50	85.4	63.8	52.6	45.8	42.0
07:50 - 08:00	86.5	66.5	55.9	45.2	43.5
08:00 - 08:10	82.6	60.8	54.2	45.4	43.1
08:10 - 08:20	85.1	62.3	52.3	44.9	42.9
08:20 - 08:30	85.6	65.2	55.8	45.5	43.6
08:30 - 08:40	81.7	60.5	51.4	45.0	43.6
08:40 - 08:50	87.5	63.8	55.0	45.4	43.6
08:50 - 09:00	86.8	63.1	55.6	45.5	44.0
09:00 - 09:10	92.5	70.8	66.4	47.2	45.4
09:10 - 09:20	83.7	62.3	51.2	46.1	44.7
09:20 - 09:30	90.7	69.0	65.3	46.0	44.6
09:30 - 09:40	83.7	63.2	61.8	46.5	44.0
09:40 - 09:50	87.3	65.6	58.7	47.7	45.7
09:50 - 10:00	87.8	64.5	54.4	46.9	45.0
10:00 - 10:10	83.3	62.2	52.7	46.7	45.0
10:10 - 10:20	85.2	65.2	51.3	46.4	44.1
10:20 - 10:30	88.0	63.5	51.7	45.1	43.5
10:30 - 10:40	92.6	71.3	65.5	44.9	43.2
10:40 - 10:50	86.7	63.4	51.7	45.7	43.9
10:50 - 11:00	74.0	57.4	53.9	45.6	44.1

Table A2: Location 1, Statistical data, 10-11 August 2016

Time	L_{Amax}	L_{Aeq}	L_{A10}	L_{A90}	L_{Amin}
11:15 - 11:20	74.9	61.4	63.6	58.2	57.6
11:20 - 11:25	76.8	60.7	61.0	58.5	57.7
11:25 - 11:30	76.3	60.7	62.5	58.2	57.2
11:30 - 11:35	75.1	63.4	67.1	58.5	57.8
11:35 - 11:40	83.7	63.0	65.6	58.4	57.0
11:40 - 11:45	72.2	59.3	62.3	50.5	47.5
11:45 - 11:50	72.6	56.0	58.7	49.8	47.3
11:50 - 11:55	87.0	61.7	63.1	51.3	47.8
11:55 - 12:00	86.8	66.5	68.9	52.5	49.4
12:00 - 12:05	80.2	61.4	64.9	50.0	48.3
12:05 - 12:10	79.9	60.5	63.2	51.3	49.4
12:10 - 12:15	79.6	62.7	65.0	50.7	49.0
12:15 - 12:20	85.1	62.3	65.1	51.0	48.7
12:20 - 12:25	86.2	63.8	64.8	52.5	49.1
12:25 - 12:30	93.1	72.4	74.2	54.7	49.3
12:30 - 12:35	84.3	65.6	69.7	51.7	48.8
12:35 - 12:40	76.5	61.8	65.5	52.3	49.0
12:40 - 12:45	75.1	62.0	66.4	48.9	46.5
12:45 - 12:50	76.2	62.4	66.4	49.0	47.1
12:50 - 12:55	84.4	65.2	65.7	52.1	48.1

Table A3: Location 2, Statistical data, 11 August 2016

	Frequency Hz								Frequency Hz							
	63Hz	125Hz	250Hz	500Hz	1kHz	2kHz	4kHz	8kHz	63Hz	125Hz	250Hz	500Hz	1kHz	2kHz	4kHz	8kHz
11:20 - 11:30	67.1	63.0	65.3	66.4	64.1	59.3	63.6	54.2	85.1	80.8	81.8	85.0	85.1	77.6	88.9	78.8
11:30 - 11:40	61.2	59.0	60.0	62.8	60.2	53.1	56.6	61.3	82.4	79.8	81.6	86.7	83.6	74.0	80.6	85.9
11:40 - 11:50	60.8	59.1	58.4	61.3	59.5	51.5	46.0	44.1	79.8	78.7	78.8	83.3	82.5	73.3	69.1	69.6
11:50 - 12:00	73.0	71.3	68.4	67.8	66.0	59.8	54.7	46.2	92.2	95.0	91.0	87.1	88.6	82.1	75.4	68.9
12:00 - 12:10	62.6	61.0	60.4	62.7	60.6	52.8	47.3	38.3	82.6	80.5	81.5	85.7	84.9	76.0	69.4	59.9
12:10 - 12:20	62.8	59.6	59.4	62.8	60.4	53.0	48.4	40.3	82.8	80.7	81.7	86.1	84.4	75.0	69.3	64.0
12:20 - 12:30	68.7	69.6	70.4	66.7	65.4	65.0	67.3	71.5	82.7	83.0	84.9	86.3	83.6	83.4	87.2	92.5
12:30 - 12:40	60.6	57.9	58.1	62.3	59.4	50.9	46.2	47.6	79.2	77.9	79.6	89.0	84.8	75.7	69.5	73.6
12:40 - 12:50	61.5	58.6	59.6	62.5	60.6	52.7	46.8	37.7	81.2	78.3	81.7	87.0	85.7	75.5	68.4	59.4
12:50 - 13:00	72.1	63.7	62.5	60.9	59.7	54.2	49.5	40.8	96.8	86.1	86.6	80.5	83.1	74.8	69.5	62.2
13:00 - 13:10	72.0	71.0	70.9	69.0	66.2	62.5	58.0	54.5	93.4	93.0	91.0	89.9	89.8	86.0	79.7	74.9
13:10 - 13:20	62.6	60.6	61.8	63.3	60.7	52.9	51.1	51.6	82.5	78.8	81.9	83.6	83.8	71.6	74.5	79.1
13:20 - 13:30	68.3	65.2	62.9	62.9	59.9	57.5	67.5	55.8	84.6	80.0	80.8	81.9	82.7	79.2	89.9	79.5
13:30 - 13:40	62.6	59.8	60.4	62.4	61.0	52.9	49.2	44.9	81.2	80.5	82.3	85.8	85.0	74.6	70.9	68.1
13:40 - 13:50	61.9	59.1	59.0	61.3	59.9	52.0	48.1	45.3	81.7	79.1	81.8	83.5	85.2	73.7	70.4	70.4
13:50 - 14:00	62.2	59.0	59.9	61.2	58.5	51.5	46.6	38.0	82.7	79.3	82.6	83.5	81.9	71.8	67.1	61.6
14:00 - 14:10	62.2	59.4	59.7	63.0	60.5	53.1	55.5	59.1	82.5	80.2	82.1	86.7	84.4	74.3	78.7	84.1
14:10 - 14:20	60.6	58.4	57.5	59.7	56.9	50.5	49.8	51.5	79.8	77.8	79.0	80.8	80.7	70.7	73.2	76.0
14:20 - 14:30	61.7	59.7	59.8	61.5	58.2	51.3	46.6	41.5	82.5	81.1	82.1	83.2	81.5	72.0	68.2	67.6
14:30 - 14:40	61.6	58.9	59.6	60.1	56.9	49.6	45.6	40.0	82.4	80.3	81.7	83.7	82.2	71.4	69.0	66.2
14:40 - 14:50	69.2	67.1	67.7	66.5	63.9	60.1	55.3	50.0	91.0	86.7	88.0	85.0	85.9	78.4	74.5	75.4
14:50 - 15:00	63.7	61.9	61.8	64.9	62.7	54.9	50.9	47.6	84.0	82.1	82.3	86.0	84.3	75.5	71.0	69.8
15:00 - 15:10	62.1	60.2	58.9	61.3	58.4	53.2	54.4	54.3	79.7	79.5	79.4	87.5	84.0	74.7	78.3	78.1
15:10 - 15:20	60.8	59.0	59.1	62.2	60.2	52.8	49.2	46.1	81.3	79.6	81.7	86.3	84.8	75.2	70.6	69.6
15:20 - 15:30	62.0	59.4	59.9	62.6	60.9	52.8	50.9	50.4	81.5	79.5	82.2	85.2	84.8	74.4	75.9	77.8
15:30 - 15:40	62.5	59.7	59.4	62.5	60.6	53.5	50.4	49.5	80.6	79.8	81.4	83.6	83.7	71.8	71.5	73.0
15:40 - 15:50	68.3	65.4	62.5	62.3	60.2	55.2	54.0	52.3	83.8	80.4	81.7	82.5	81.8	75.7	79.5	80.5
15:50 - 16:00	68.2	67.6	67.9	66.8	65.1	63.8	70.8	65.2	84.6	81.3	82.5	85.4	85.3	82.6	93.1	87.0
16:00 - 16:10	62.4	60.1	60.1	63.3	61.0	53.4	48.4	43.0	81.6	80.1	82.0	85.7	84.2	73.9	68.7	66.9
16:10 - 16:20	61.9	59.3	59.1	62.3	60.7	53.2	49.8	50.2	81.4	80.8	80.9	85.4	84.4	73.3	72.1	72.8
16:20 - 16:30	63.9	61.3	62.2	65.3	62.7	55.4	54.2	56.2	82.5	79.2	82.0	85.6	84.8	74.4	76.2	80.3
16:30 - 16:40	61.6	59.2	59.2	62.2	60.4	52.0	49.4	49.6	81.2	80.5	81.3	85.2	85.0	74.3	72.2	73.0
16:40 - 16:50	63.4	61.4	61.5	63.8	61.1	54.0	51.3	52.3	84.1	81.3	81.9	83.9	83.4	74.2	75.6	77.1
16:50 - 17:00	63.7	61.4	60.7	61.5	59.3	54.0	49.6	47.6	82.5	80.1	81.5	83.7	82.9	74.2	70.5	70.3
17:00 - 17:10	60.8	59.1	59.5	59.0	56.1	51.7	45.6	35.5	78.5	78.2	82.9	80.3	76.9	70.4	64.3	54.0
17:10 - 17:20	63.4	61.4	62.0	63.2	60.1	53.8	50.8	47.4	82.3	80.5	82.5	84.2	83.2	74.0	70.7	69.5
17:20 - 17:30	61.6	59.5	59.2	62.7	59.1	53.0	52.1	53.8	79.7	78.2	79.1	84.2	82.2	76.2	75.5	76.8
17:30 - 17:40	61.7	59.7	59.9	61.2	58.0	51.1	48.2	45.7	82.0	79.6	82.2	82.9	81.7	71.4	70.1	68.9
17:40 - 17:50	65.0	61.3	60.8	63.3	60.6	53.7	50.1	53.0	80.7	80.3	81.7	84.0	83.0	73.5	74.0	82.6
17:50 - 18:00	62.6	60.8	61.1	62.7	59.2	53.0	51.9	51.2	81.3	79.3	82.4	85.3	84.0	73.3	73.9	74.5
18:00 - 18:10	60.4	58.5	59.1	61.0	58.7	51.8	52.7	54.2	80.9	79.5	82.0	82.2	82.4	73.3	76.9	78.3
18:10 - 18:20	62.7	61.5	62.4	64.3	62.4	55.3	53.3	54.7	81.5	79.7	82.7	86.0	84.9	73.9	76.7	79.2
18:20 - 18:30	61.0	59.3	59.5	61.0	58.5	52.6	48.6	46.3	80.5	80.9	82.0	84.8	82.2	72.9	72.6	72.7
18:30 - 18:40	62.0	59.7	59.6	61.4	59.6	53.4	49.7	47.9	80.7	79.2	81.7	85.6	84.7	73.6	70.6	70.7
18:40 - 18:50	62.9	61.1	61.8	64.6	62.4	54.6	50.6	47.8	81.2	81.0	82.1	86.4	84.7	74.7	71.0	72.0
18:50 –19:00	61.3	59.6	59.8	63.1	59.7	53.2	54.1	57.5	80.1	79.2	80.8	84.8	83.9	73.5	78.2	80.8
19:00 - 19:10	73.4	73.9	68.0	65.7	65.4	62.0	55.1	48.3	95.3	96.9	89.6	88.3	89.1	85.1	77.4	70.2
19:10 - 19:20	61.1	59.7	59.4	62.3	59.4	52.3	47.3	38.7	81.3	81.1	82.1	85.5	83.6	75.2	69.0	61.4
19:20 - 19:30	63.2	61.3	62.3	64.0	60.3	53.7	49.5	42.1	81.8	80.0	82.6	83.7	81.4	72.6	69.5	63.5
19:30 - 19:40	60.7	58.5	59.0	61.6	58.5	52.1	49.0	48.1	81.2	79.1	81.6	83.5	82.2	73.0	75.1	78.3
19:40 - 19:50	59.9	58.7	57.8	60.1	57.4	50.6	52.6	54.8	78.6	79.3	79.4	85.0	83.5	73.8	76.1	79.1
19:50 - 20:00	61.5	59.4	60.3	61.1	57.7	51.5	48.1	44.7	82.3	81.1	82.5	81.8	80.7	70.6	73.7	74.2
20:00 - 20:10	55.0	53.0	52.7	57.2	51.5	47.2	41.2	32.5	73.7	72.2	73.1	83.0	73.0	68.7	62.2	53.2
20:10 - 20:20	61.9	60.4	61.3	63.7	61.7	54.2	50.6	49.1	79.7	79.5	81.6	83.9	83.8	72.7	72.7	73.7
20:20 - 20:30	62.1	59.9	59.8	62.1	60.0	52.4	48.0	44.6	80.3	80.0	82.9	84.2	83.8	72.7	70.5	71.8
20:30 - 20:40	59.1	57.7	58.4	61.6	59.0	51.2	53.8	57.0	79.2	78.4	81.1	87.1	84.4	72.0	78.1	81.8
20:40 - 20:50	64.9	64.1	63.6	62.3	59.0	57.9	52.6	42.9	80.2	80.0	82.6	81.2	79.0	79.9	74.1	63.5
20:50 - 21:00	60.2	58.4	59.1	61.5	58.8	52.1	47.0	40.8	79.5	79.8	81.3	83.3	81.9	72.4	68.2	67.7
21:00 - 21:10	58.2	57.0	58.2	60.9	59.4	50.3	47.0	43.6	79.8	80.1	81.6	84.9	84.7	72.8	69.6	69.3
21:10 - 21:20	73.0	72.4	69.0	66.0	69.3	64.0	59.1	54.6	96.3	93.4	92.3	89.4	92.8	85.8	81.3	78.3
21:20 - 21:30	60.5	58.8	59.2	62.3	60.0	52.7	48.3	40.6	83.0	80.5	83.3	85.9	84.2	74.3	69.6	66.2
21:30 - 21:40	64.4	62.9	61.4	61.2	58.7	52.7	50.0	44.1	85.1	85.6	82.3	84.3	82.5	72.0	70.7	67.5
21:40 - 21:50	61.8	59.9	60.2	58.5	55.4	52.1	47.2	35.8	82.1	78.2	82.2	79.2	76.9	71.2	67.0	56.6
21:50 - 22:00	60.2	58.5	59.2	61.7	59.0	52.6	47.8	40.8	81.6	80.3	83.3	85.1	83.1	74.1	69.2	65.3
22:00 - 22:10	57.9	56.7	57.8	56.7	53.4	46.8	47.3	47.1	78.3	77.6	79.4	79.0	77.7	68.6	72.1	70.7
22:10 - 22:20	57.0	54.3	52.7	57.0	52.2	47.8	41.7	33.3	77.3	76.0	74.2	80.8	73.1	69.6	62.8	54.4
22:20 - 22:30	69.2	62.9	64.1	62.8	60.5	55.7	52.7	49.2	91.7	83.5	85.1	83.3	82.9	76.9	76.1	72.4
22:30 - 22:40	58.0	56.6	57.7	59.2	57.8	49.6	46.1	44.0	79.5	78.3	80.9	82.6	82.8	75.5	70.6	71.2
22:40 - 22:50	57.8	53.3	51.8	56.2	52.1	47.9	41.8	32.9	77.9	74.5	73.4	80.2	74.5	70.5	62.4	54.0
22:50 - 23:00	59.2	57.8	59.0	58.5	55.2	51.1	53.1	49.7	79.1	78.8	82.3	81.7	79.4	73.2	79.7	75.6
23:00 - 23:10	67.2	73.5	67.1	65.3	65.7	61.7	59.4	55.7	81.8	88.9	83.6	85.7	85.2	76.8	80.1	80.9
23:10 - 23:20	58.3	53.7	51.9	57.1	53.4	47.5	41.5	33.0	79.3	76.3	73.7	81.1	78.1	69.9	62.7	54.3
23:20 - 23:30	58.5	56.6	58.9	60.1	56.6	49.3	45.3	40.8	79.7	78.4	82.0	83.6	80.8	70.8	67.6	66.5
23:30 - 23:40	60.1	58.3	59.2	61.8	59.7	52.5	47.7	40.0	80.7	80.2	83.4	85.1	84.4	75.1	69.2	64.5
23:40 - 23:50	55.7	52.2	51.1	56.7	51.3	46.8	41.6	32.4	74.5	73.3	73.6	83.0	73.8	68.2	62.4	54.7
23:50 - 00:00	72.6	67.6	64.0	62.0	62.0	59.0	55.3	51.1	92.7	87.6	84.4	82.2	82.4	79.4	78.8	78.5

Table A4: Location 1, Statistical data, 9 August 2016

	Frequency Hz								Frequency Hz							
	63Hz	125Hz	250Hz	500Hz	1kHz	2kHz	4kHz	8kHz	63Hz	125Hz	250Hz	500Hz	1kHz	2kHz	4kHz	8kHz
00:00 - 00:10	70.2	66.6	61.8	63.6	60.6	56.7	53.0	43.4	87.4	83.1	84.1	86.2	84.0	74.7	71.7	71.6
00:10 - 00:20	76.7	72.5	68.0	65.6	61.8	58.3	56.2	50.3	99.3	90.5	86.4	84.6	83.0	78.7	78.3	74.5
00:20 - 00:30	53.0	46.0	43.5	41.5	39.3	34.0	25.2	17.2	68.7	55.4	48.5	46.6	46.0	42.9	39.9	33.2
00:30 - 00:40	53.2	47.8	46.5	45.7	42.1	35.1	25.3	16.9	65.6	60.2	61.6	64.2	61.5	49.9	35.7	23.9
00:40 - 00:50	51.6	45.3	43.0	41.1	38.4	33.6	25.4	17.0	65.5	54.3	48.6	47.5	47.6	45.5	38.1	32.7
00:50 - 01:00	51.3	45.1	42.6	40.9	38.0	33.5	24.4	16.8	60.7	50.2	48.9	45.5	46.3	49.0	34.4	25.7
01:00 - 01:10	50.9	45.5	43.0	41.3	39.3	33.8	25.2	16.7	65.8	56.4	50.1	47.8	49.7	44.6	37.0	25.4
01:10 - 01:20	50.2	44.9	42.4	40.6	37.9	32.5	24.6	17.0	63.0	52.5	51.3	50.3	46.4	41.0	42.8	31.9
01:20 - 01:30	52.7	45.2	42.6	40.6	37.9	32.9	24.5	16.8	67.8	54.5	54.0	49.5	46.0	40.8	36.6	22.2
01:30 - 01:40	52.6	45.3	43.0	41.3	39.2	33.9	25.5	16.9	66.4	52.0	54.0	61.9	61.0	51.6	39.3	33.1
01:40 - 01:50	54.6	50.7	47.2	43.3	39.3	33.7	25.5	17.1	69.1	65.8	62.5	55.7	52.3	49.6	38.1	31.0
01:50 - 02:00	49.9	44.8	42.5	40.7	38.0	32.6	24.5	16.6	58.6	54.4	55.9	52.2	48.1	42.1	37.9	23.6
02:00 - 02:10	51.0	45.2	42.9	40.8	38.1	34.5	31.3	22.3	65.3	52.5	50.5	50.9	51.5	50.4	52.3	41.6
02:10 - 02:20	50.6	45.2	43.2	41.0	38.1	33.9	29.6	21.2	61.3	51.5	49.3	53.2	47.3	52.3	55.0	48.4
02:20 - 02:30	50.1	45.0	42.6	40.5	37.8	33.4	27.1	18.4	60.9	54.4	46.1	46.8	45.0	45.1	45.6	34.5
02:30 - 02:40	51.1	44.8	43.2	41.8	39.5	35.7	33.5	28.8	66.2	55.1	56.3	58.1	53.3	51.9	53.7	50.7
02:40 - 02:50	51.0	46.0	43.7	40.3	37.4	32.5	24.2	16.5	66.7	63.3	60.4	55.6	51.6	44.5	35.8	34.0
02:50 - 03:00	52.3	45.3	43.1	40.4	37.3	32.2	24.0	16.7	68.6	60.0	50.0	44.1	41.6	38.1	28.5	23.2
03:00 - 03:10	49.9	44.2	42.3	40.2	37.3	32.0	23.6	16.5	61.6	49.3	46.3	43.2	41.5	39.7	27.9	20.0
03:10 - 03:20	50.7	46.2	43.4	40.5	37.4	32.9	25.1	16.6	58.6	64.5	57.1	53.8	52.9	50.9	45.0	34.8
03:20 - 03:30	49.9	44.8	43.0	40.9	38.2	33.1	26.0	16.9	62.3	53.2	52.2	49.2	52.2	45.2	42.9	25.1
03:30 - 03:40	51.8	44.7	42.3	40.3	37.5	32.4	24.9	16.8	71.7	59.6	49.0	46.4	47.0	40.6	40.6	32.0
03:40 - 03:50	50.3	44.6	42.5	40.5	37.7	32.8	24.3	16.8	60.6	53.5	48.8	55.2	55.2	48.6	39.4	27.1
03:50 - 04:00	49.5	44.4	42.6	40.6	38.0	33.3	26.0	17.0	69.1	52.3	46.6	45.6	47.5	45.7	43.4	29.2
04:00 - 04:10	50.8	45.5	43.1	41.2	38.8	34.2	27.0	19.0	62.9	57.7	52.4	55.1	57.2	49.7	47.2	37.5
04:10 - 04:20	51.6	45.4	42.9	41.3	38.5	34.1	27.0	18.5	66.9	57.7	52.5	52.0	49.2	48.3	47.4	37.3
04:20 - 04:30	51.0	45.0	42.8	40.7	38.3	34.1	26.6	18.1	63.1	55.4	49.1	49.8	50.6	49.3	45.9	36.8
04:30 - 04:40	51.3	45.5	43.1	40.8	38.1	34.4	28.4	19.2	67.9	52.0	49.2	45.5	46.4	51.7	53.7	27.4
04:40 - 04:50	52.7	44.2	42.2	40.4	39.7	35.3	27.6	17.0	66.0	55.9	57.1	53.8	57.2	52.9	46.3	34.4
04:50 - 05:00	70.9	63.4	60.9	57.7	55.2	51.0	48.0	39.5	96.9	87.3	84.3	81.9	79.5	72.1	69.2	63.8
05:00 - 05:10	52.9	48.3	45.6	44.3	43.9	40.2	35.2	28.7	64.9	59.4	55.1	53.7	57.5	55.9	56.8	52.7
05:10 - 05:20	53.8	49.3	45.5	43.4	44.2	42.6	37.2	27.6	66.5	58.2	54.0	52.7	56.0	57.5	57.8	54.4
05:20 - 05:30	65.9	60.8	58.5	59.1	56.0	54.1	52.0	49.5	83.9	77.1	76.8	78.7	77.6	79.5	81.4	82.1
05:30 - 05:40	56.2	53.4	52.2	51.2	47.4	42.0	30.1	16.8	71.2	69.7	69.7	70.5	65.1	62.8	47.1	33.5
05:40 - 05:50	57.4	53.7	51.5	55.6	50.1	47.5	41.8	33.2	78.5	76.2	72.5	79.5	72.2	68.6	62.1	53.1
05:50 –06:00	55.7	50.5	49.4	48.2	44.3	39.9	29.5	20.1	67.7	65.5	66.6	66.8	60.5	52.0	48.3	38.7
06:00 - 06:10	55.5	51.5	48.6	46.5	42.8	38.6	31.4	24.3	65.8	66.4	63.3	62.8	58.3	55.5	48.7	54.7
06:10 - 06:20	68.8	61.2	58.4	59.1	56.4	54.0	50.3	45.5	92.3	85.0	79.1	81.3	76.7	76.0	72.1	70.3
06:20 - 06:30	71.3	63.7	61.1	62.7	60.8	55.9	50.3	41.2	95.3	85.4	83.0	86.6	84.5	76.5	69.4	61.5
06:30 - 06:40	59.0	57.7	59.6	60.2	56.7	49.6	45.4	36.3	80.4	79.1	82.2	82.7	80.8	70.9	68.3	62.1
06:40 - 06:50	62.8	61.1	62.5	64.8	62.1	54.7	50.0	43.0	81.8	79.7	83.2	85.3	83.6	75.2	70.5	70.6
06:50 - 07:00	74.4	71.6	68.1	68.2	66.9	62.5	58.7	61.0	95.4	92.2	89.6	91.0	89.9	84.5	84.7	91.7
07:00 - 07:10	61.2	59.0	59.8	62.2	59.2	52.6	47.7	39.3	81.8	79.9	82.6	84.4	82.9	72.1	68.6	62.8
07:10 - 07:20	60.4	58.8	59.6	62.2	58.3	51.9	47.3	40.1	81.4	79.6	82.3	83.3	81.2	72.4	70.1	68.6
07:20 - 07:30	62.1	60.3	62.4	63.7	60.9	54.0	49.3	40.3	80.5	78.8	83.5	84.5	83.8	73.0	68.5	61.1
07:30 - 07:40	62.2	60.0	59.6	62.1	59.3	53.7	48.7	42.1	79.7	79.7	81.6	84.2	83.4	72.9	69.2	66.7
07:40 - 07:50	61.3	59.2	60.6	63.1	60.6	52.9	48.1	40.7	81.9	79.4	83.2	86.2	84.5	73.8	70.1	67.0
07:50 - 08:00	63.8	61.7	62.7	64.8	61.6	55.3	50.3	42.0	82.1	79.6	82.5	86.0	83.8	75.5	69.0	67.0
08:00 - 08:10	61.5	58.8	59.6	61.0	57.8	50.9	46.5	37.4	78.8	79.1	81.1	84.6	80.5	70.2	66.6	58.4
08:10 - 08:20	63.5	65.5	61.7	63.1	60.0	53.6	48.6	40.6	80.9	80.0	82.0	85.3	83.5	75.2	68.6	59.4
08:20 - 08:30	63.2	63.0	59.9	62.4	57.6	51.9	47.1	40.7	78.9	78.3	79.6	81.8	80.5	70.0	69.5	66.7
08:30 - 08:40	65.2	66.2	64.2	64.1	59.8	53.3	47.3	39.0	83.0	82.7	82.8	84.0	80.5	72.8	68.6	64.6
08:40 - 08:50	61.4	62.3	58.7	61.4	57.7	50.6	45.9	39.1	78.9	77.8	79.3	83.2	80.6	70.3	66.5	62.0
08:50 - 09:00	63.1	62.2	62.5	64.7	61.6	54.8	49.9	40.5	81.0	78.7	84.6	85.7	84.3	75.0	69.6	60.2
09:00 - 09:10	64.3	59.7	60.6	62.0	59.1	54.0	49.6	38.7	82.4	80.1	83.4	83.9	81.3	71.5	67.7	60.8
09:10 - 09:20	64.9	62.0	62.6	65.0	62.0	54.9	49.8	40.5	82.2	81.6	82.2	86.7	84.2	75.5	69.4	60.0
09:20 - 09:30	74.8	75.7	70.7	70.0	69.5	64.4	58.8	50.2	93.7	100.2	97.6	93.7	93.5	89.7	84.5	76.7
09:30 - 09:40	61.6	58.9	59.4	60.9	57.9	51.6	47.2	37.7	80.2	79.2	81.6	83.3	82.1	72.3	68.3	59.0
09:40 - 09:50	63.8	65.0	62.6	63.9	61.1	54.1	49.5	41.7	81.2	79.5	82.3	84.5	82.4	72.2	70.7	66.9
09:50 - 10:00	61.8	63.3	59.7	61.9	59.5	52.3	52.2	52.0	80.5	79.4	81.8	84.6	84.6	73.7	78.1	78.6
10:00 - 10:10	63.0	63.6	61.1	61.6	58.1	52.4	47.7	40.3	81.7	80.7	84.1	83.5	80.9	72.0	68.6	67.2
10:10 - 10:20	63.3	60.9	62.1	65.1	62.6	54.9	50.9	45.5	81.2	79.8	82.5	86.5	84.6	74.7	73.6	74.8
10:20 - 10:30	61.4	59.1	58.8	59.8	57.8	51.7	47.9	42.3	79.5	78.3	81.6	82.4	81.9	71.4	69.1	67.8
10:30 - 10:40	75.0	71.4	68.1	65.6	63.3	61.0	55.6	53.0	96.8	94.0	91.0	86.2	85.0	83.4	76.7	74.9
10:40 - 10:50	63.8	59.5	60.0	62.1	59.9	53.4	48.1	39.8	80.5	79.7	82.5	83.6	83.4	75.8	69.0	59.5
10:50 - 11:00	73.7	69.7	66.7	64.4	62.9	58.4	55.6	52.4	95.3	87.2	88.4	86.8	86.0	80.4	77.9	76.3
11:00 - 11:10	74.0	66.2	63.6	63.6	60.8	55.5	51.3	42.9	98.5	88.4	85.7	83.6	81.3	75.8	70.7	63.2
11:10 - 11:20	61.4	58.4	59.6	61.9	58.5	51.6	46.7	37.6	80.4	79.2	81.4	84.3	82.5	72.8	68.3	59.7
11:20 - 11:30	67.0	65.6	67.6	67.0	65.6	62.6	71.6	61.6	82.7	79.5	83.1	83.6	82.9	84.2	97.6	87.3
11:30 - 11:40	61.3	59.1	59.5	62.6	60.4	52.6	47.8	43.3	82.6	80.5	82.9	85.3	84.3	75.6	70.6	69.4
11:40 - 11:50	62.4	60.0	59.4	62.1	60.1	53.0	48.5	42.9	81.9	81.0	82.7	86.5	85.5	75.3	69.5	67.5
11:50 - 12:00	73.6	71.0	67.1	67.1	65.6	59.9	55.1	49.9	92.2	93.6	87.5	85.4	87.2	81.5	75.7	70.7

Table A5: Location 1, L_{eq} and L_{max} frequency data, 10 August 2016

	Frequency Hz								Frequency Hz							
	63Hz	125Hz	250Hz	500Hz	1kHz	2kHz	4kHz	8kHz	63Hz	125Hz	250Hz	500Hz	1kHz	2kHz	4kHz	8kHz
12:00 - 12:10	61.9	59.0	59.1	62.0	59.1	51.8	47.6	41.3	81.8	79.6	81.8	84.6	83.0	73.1	70.1	67.1
12:10 - 12:20	61.3	58.7	59.3	60.8	58.1	51.8	49.4	47.4	79.4	79.3	81.5	83.1	81.6	71.5	72.2	72.3
12:20 - 12:30	70.4	68.3	71.0	67.6	64.5	64.1	70.2	72.1	86.3	82.1	87.5	84.8	84.6	81.3	94.3	94.7
12:30 - 12:40	61.1	58.8	58.1	61.6	58.8	51.6	54.6	53.7	79.4	79.1	79.2	85.0	82.4	73.0	78.4	76.5
12:40 - 12:50	61.6	59.6	59.5	62.4	60.6	52.7	48.5	41.9	81.6	80.3	83.0	86.8	84.4	74.8	69.4	65.0
12:50 - 13:00	61.0	59.5	59.7	61.9	59.5	51.5	50.1	50.5	79.8	79.3	81.0	83.6	83.1	71.7	73.0	73.6
13:00 - 13:10	72.5	69.8	70.1	66.0	66.5	60.5	56.2	52.9	96.2	91.6	88.7	84.5	90.9	82.1	77.4	74.4
13:10 - 13:20	64.2	63.6	62.2	62.9	60.3	54.5	49.6	43.6	82.6	85.7	82.1	83.9	81.9	73.7	68.4	68.3
13:20 - 13:30	61.2	58.8	58.1	61.9	58.7	51.2	51.7	52.1	79.7	79.2	79.6	87.7	83.8	74.8	76.2	77.9
13:30 - 13:40	61.7	59.2	59.3	61.5	58.6	51.7	47.1	38.2	83.1	81.7	82.6	83.8	82.6	72.7	69.2	60.5
13:40 - 13:50	62.5	59.4	59.7	62.1	59.8	52.5	47.9	42.8	81.9	78.5	81.9	87.8	85.7	75.0	69.9	67.7
13:50 - 14:00	62.0	58.9	59.2	61.6	59.5	52.0	47.8	45.9	80.7	79.3	82.0	84.6	84.4	73.3	69.4	69.9
14:00 - 14:10	62.5	60.0	60.0	62.7	60.5	53.0	47.8	44.1	82.9	80.0	82.2	85.1	84.2	76.2	69.7	68.8
14:10 - 14:20	63.0	60.8	60.0	62.7	60.1	52.7	48.6	45.2	83.4	81.6	82.9	86.3	84.8	74.9	69.7	68.4
14:20 - 14:30	72.3	78.0	71.9	66.7	65.2	63.0	75.7	63.2	90.0	94.7	88.5	86.8	84.8	82.3	97.5	84.1
14:30 - 14:40	61.7	60.7	59.8	61.6	59.1	52.3	47.4	39.8	81.8	80.8	82.3	85.1	82.9	73.2	68.3	61.4
14:40 - 14:50	58.6	54.4	53.0	57.9	54.7	49.6	41.7	33.3	77.3	75.4	73.5	80.5	77.5	76.5	62.7	54.1
14:50 - 15:00	62.2	61.0	62.0	63.9	61.3	53.5	49.7	49.0	80.4	79.1	82.5	83.6	84.1	72.8	69.2	70.5
15:00 - 15:10	72.1	66.9	63.7	62.8	61.0	62.4	75.8	72.0	93.3	82.3	82.3	83.6	82.6	85.0	100.0	96.5
15:10 - 15:20	71.5	70.0	70.2	68.1	65.5	61.0	54.5	47.6	93.0	90.1	92.9	86.0	87.0	82.2	73.7	71.7
15:20 - 15:30	62.1	59.7	59.5	62.1	59.6	51.9	47.1	45.5	80.7	80.6	81.2	83.8	83.4	72.8	68.1	69.6
15:30 - 15:40	62.9	60.1	59.2	58.6	55.7	51.5	48.1	40.4	79.7	77.2	80.1	77.5	76.1	70.0	69.4	67.1
15:40 - 15:50	67.8	66.2	64.4	64.4	61.6	56.4	54.7	55.9	86.3	84.0	82.8	83.5	82.6	73.8	77.3	81.6
15:50 - 16:00	68.2	69.4	67.4	65.2	63.4	63.2	73.9	69.6	84.7	84.9	81.9	84.0	82.9	81.7	96.5	89.7
16:00 - 16:10	63.2	60.5	60.3	64.6	62.1	53.9	48.9	45.7	81.1	80.6	82.0	87.9	86.0	75.9	70.5	68.8
16:10 - 16:20	61.2	58.7	59.5	62.6	60.3	52.8	48.0	45.1	81.5	81.3	81.4	85.4	84.5	74.4	70.5	68.8
16:20 - 16:30	64.2	62.0	63.1	64.7	61.9	55.0	51.1	48.9	82.7	80.9	82.3	85.5	84.4	73.7	70.5	71.8
16:30 - 16:40	61.5	59.0	59.7	62.7	60.1	52.1	47.3	44.5	81.5	80.5	82.3	86.1	84.4	73.9	68.9	67.4
16:40 - 16:50	64.8	62.5	62.3	65.4	63.0	55.2	50.5	48.8	84.5	81.2	82.3	87.4	84.7	74.9	70.6	70.8
16:50 - 17:00	65.4	63.7	61.0	63.0	59.7	53.0	48.5	42.9	82.5	81.7	81.8	84.4	82.4	72.8	68.5	65.3
17:00 - 17:10	61.9	61.4	60.6	62.3	60.6	53.2	49.3	47.6	81.5	79.8	82.3	86.3	85.0	74.2	70.3	70.1
17:10 - 17:20	62.0	60.7	61.8	64.2	61.1	53.5	50.7	51.9	81.3	80.3	82.4	85.4	83.8	73.3	71.8	76.3
17:20 - 17:30	61.7	60.1	59.3	62.2	59.1	52.3	52.2	53.6	80.0	78.9	80.2	83.2	81.4	72.9	75.5	76.5
17:30 - 17:40	61.9	60.0	60.2	61.7	58.5	51.8	47.5	38.9	81.7	80.6	81.9	85.2	82.5	73.8	68.1	61.4
17:40 - 17:50	63.5	61.4	61.8	64.3	61.8	54.4	50.7	50.7	83.1	80.3	81.9	85.4	83.8	75.8	70.4	73.5
17:50 - 18:00	62.6	61.1	59.8	62.3	59.7	53.1	50.1	50.7	80.7	79.1	78.9	83.7	82.3	73.4	73.0	74.2
18:00 - 18:10	60.3	58.2	59.3	60.4	57.5	50.4	46.4	45.2	81.8	81.3	82.1	83.1	81.7	73.7	70.4	71.1
18:10 - 18:20	61.4	59.6	58.5	60.7	57.4	52.2	48.4	47.5	80.7	79.0	80.5	85.9	82.5	75.7	71.7	70.7
18:20 - 18:30	64.0	62.3	62.4	64.9	61.8	54.9	50.8	47.3	82.7	80.5	82.5	86.8	85.4	75.5	70.1	70.4
18:30 - 18:40	60.8	59.9	60.0	62.2	59.6	52.3	47.9	44.8	80.4	79.6	81.8	85.6	84.2	74.0	69.6	67.6
18:40 - 18:50	63.0	61.2	62.2	64.4	62.3	54.7	50.9	49.5	82.2	80.5	82.6	85.1	83.9	75.1	71.5	73.2
18:50 –19:00	59.4	56.6	55.5	54.1	51.1	50.3	46.0	37.7	78.8	77.8	73.8	75.2	70.9	69.6	65.3	56.2
19:00 - 19:10	74.0	72.8	70.3	68.2	66.5	62.6	57.8	53.2	95.1	94.9	89.1	88.8	89.5	85.1	78.4	76.3
19:10 - 19:20	62.9	61.8	61.9	62.8	60.5	53.8	49.5	45.8	81.9	80.4	82.1	83.6	83.2	72.9	70.0	69.8
19:20 - 19:30	62.7	61.2	61.2	62.8	59.1	53.4	49.9	46.2	81.2	80.0	82.9	83.1	80.6	74.1	71.4	68.1
19:30 - 19:40	63.1	59.4	59.4	61.7	58.1	51.2	49.1	47.4	80.4	79.1	81.3	82.2	81.2	70.8	73.2	73.0
19:40 - 19:50	60.6	58.8	58.6	58.6	54.7	50.1	53.0	50.7	79.6	78.3	82.7	80.2	78.3	70.2	77.0	75.1
19:50 - 20:00	62.0	59.8	59.9	60.4	55.9	50.7	48.8	43.3	81.1	79.7	82.4	82.0	78.9	72.2	75.6	71.2
20:00 - 20:10	59.7	58.6	58.4	60.5	58.6	51.0	48.6	46.0	80.4	80.5	81.0	83.3	83.5	73.5	73.2	71.0
20:10 - 20:20	58.6	55.0	53.3	55.0	51.9	47.6	42.9	32.3	78.6	76.2	75.5	77.9	75.2	69.2	65.2	51.8
20:20 - 20:30	59.5	58.3	57.7	59.0	56.6	50.3	49.5	49.6	78.9	79.0	79.0	81.5	80.1	70.4	76.3	75.0
20:30 - 20:40	62.0	60.7	61.1	63.7	61.2	54.1	50.2	49.2	81.2	80.1	83.0	84.9	83.3	76.0	70.9	71.1
20:40 - 20:50	65.3	63.0	62.0	61.9	58.6	54.3	54.2	46.1	83.1	82.6	82.6	82.3	80.6	74.7	80.6	75.3
20:50 - 21:00	64.9	62.1	59.7	60.0	56.0	62.4	58.0	46.2	81.9	77.7	80.6	81.9	77.3	82.9	80.8	67.5
21:00 - 21:10	59.7	57.8	59.2	60.6	57.5	49.9	45.6	38.2	79.8	78.0	82.0	83.8	82.2	72.3	68.4	61.8
21:10 - 21:20	71.9	72.2	68.8	67.0	68.6	64.0	58.5	52.2	94.1	92.1	89.1	90.3	92.0	86.3	79.7	73.3
21:20 - 21:30	62.1	59.5	60.1	60.9	58.9	52.9	48.3	39.1	81.5	80.4	82.4	83.1	82.7	74.8	68.9	63.9
21:30 - 21:40	63.7	61.6	60.7	62.6	60.2	53.5	49.2	39.6	82.7	80.6	82.2	86.1	84.7	74.8	69.4	62.1
21:40 - 21:50	54.9	51.9	50.9	56.0	51.1	46.4	42.4	32.3	73.2	69.7	72.4	80.8	73.0	67.7	65.2	52.0
21:50 - 22:00	58.5	57.6	58.7	61.9	59.3	51.7	48.3	43.8	80.0	79.7	82.2	84.4	84.1	73.5	72.9	68.7
22:00 - 22:10	56.8	55.7	56.4	57.4	55.0	47.3	45.2	42.6	78.5	77.6	79.6	81.2	79.8	70.2	69.7	66.5
22:10 - 22:20	58.1	55.4	51.2	51.3	50.7	46.6	43.2	37.0	78.0	78.1	70.6	72.0	75.7	67.3	65.7	69.9
22:20 - 22:30	60.9	59.5	59.1	61.0	58.9	51.6	47.3	38.8	79.5	80.1	80.8	84.5	83.7	72.9	68.5	64.1
22:30 - 22:40	57.4	56.4	56.3	59.2	57.2	48.5	45.1	42.6	78.9	79.1	78.9	84.0	83.2	73.3	69.7	67.4
22:40 - 22:50	57.9	54.0	52.3	51.3	49.7	48.2	43.8	32.6	77.4	74.8	74.2	72.4	72.5	68.9	65.2	59.4
22:50 - 23:00	74.2	68.2	62.5	61.4	59.2	53.9	49.6	45.3	95.0	91.1	83.1	84.5	82.5	74.5	74.6	71.8
23:00 - 23:10	61.1	58.6	59.7	61.3	57.6	51.8	46.9	37.7	81.8	79.7	82.4	82.4	81.1	72.5	68.9	59.6
23:10 - 23:20	55.5	52.8	51.9	57.6	54.8	47.6	41.6	33.3	75.8	75.0	72.8	81.1	82.0	68.8	62.4	53.9
23:20 - 23:30	67.2	72.7	66.0	63.7	64.0	62.4	60.3	66.7	82.2	90.5	82.8	81.0	78.6	76.9	78.0	92.6
23:30 - 23:40	60.1	58.7	59.5	62.0	60.0	52.9	48.5	42.1	81.9	80.6	83.0	84.6	84.9	75.9	71.5	67.0
23:40 - 23:50	55.2	52.7	51.9	50.4	53.1	47.8	44.8	29.6	72.5	71.7	75.2	70.3	76.1	67.5	64.8	50.0
23:50 - 00:00	68.6	67.3	63.6	61.6	56.3	51.7	46.7	37.2	84.2	84.3	81.9	82.5	75.9	68.9	66.6	59.1

Table A6: Location 1, L_{eq} and L_{max} frequency data, 10 August 2016