Construction Management Plan

pro forma v2.2

Camden

Contents

Revisions & additional material

Please list all iterations here:

Date	Version	Produced by

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 Community 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

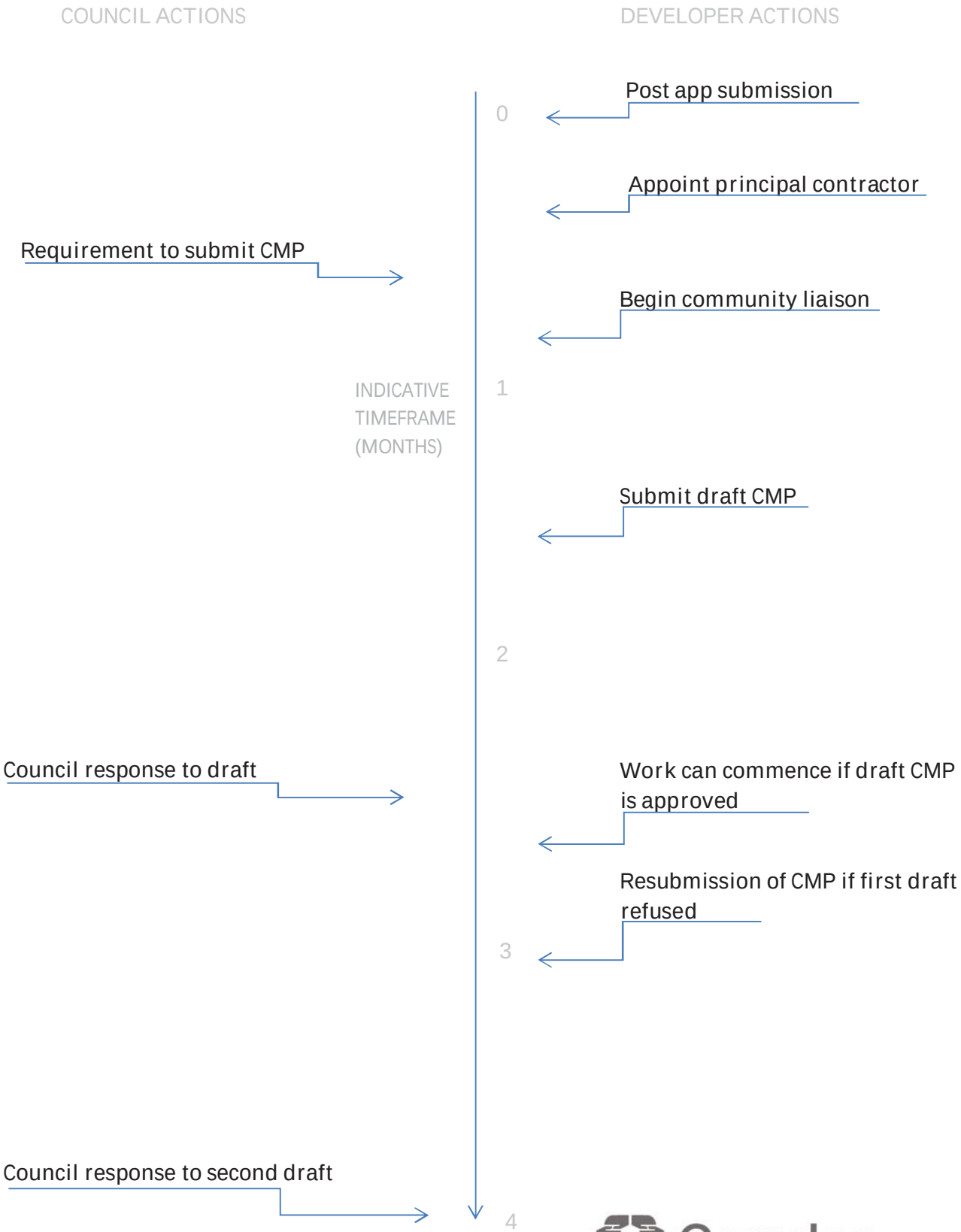
comments to be easily documented. These should be clearly referenced/linked to from the CMP.

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
INDICATIVE TIMEFRAME (MONTHS)
1
Submit draft CMP
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: 22 Frognal Way, London, NW3 6XE

Planning reference number to which the CMP applies: 2015/3530/P

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

Name: David Lewis

Address: Motion, 8 Duncannon Street, London, WC2N 4JF

Email: dlewis@motion.co.uk

Phone: 020 7031 8147

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: Martin Zubcak

Address: My Construction, Unit 5 Sayer House, Oxgate Lane, London. NW2 7JN

Email: martinz@myconstruction.co.uk

Phone: 020 8450 5747/ 07891046285

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: Martin Zubcak

Address: My Construction, Unit 5 Sayer House, Oxgate Lane, London. NW2 7JN

Email: martinz@myconstruction.co.uk

Phone: 020 8450 5747/ 07891046285

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: MY Construction and Carpentry Ltd

Address: Unit 5 Sayer House, Oxgate Lane, London. NW2 7JN

Email: info@myconstruction.co.uk

Phone: 020 8450 5747

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 application site is located at the eastern end of Frognal Way, within the London Borough of Camden, approximately 300 metres south west of Hampstead underground station. Frognal Way is an unadopted private road with a gravel surface, grass verges and some street trees. The road is approximately 160 metres long and serves 11 houses and also provides access to two garages owned by residents of Church Row. Frognal Way is a cul-de-sac with vehicular access provided from Frognal to the west by way of a priority junction. Vehicular access is controlled by a rising arm barrier. An adopted pedestrian footpath forms part of Frognal Way at the end of the cul-de-sac where it provides access to Church Row. A site location plan is attached.

The site benefits from a driveway which is accessed from Frognal Way. In the vicinity of the site, Frognal Way widens to provide a turning area, which enables vehicles, including heavy goods vehicles such as refuse vehicles, to turn. This area also provides vehicle and pedestrian access to adjoining properties, as well as Church Row. A plan showing the existing highway arrangement in the vicinity of the site is attached at Appendix A.

The proposals include the demolition of the existing detached house and redevelopment to provide a single detached family dwelling house and all other necessary works.

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 proposals include the demolition of the existing property on site and redevelopment to provide a single detached family dwelling house and all other necessary works. The site falls away from the site entrance towards the south and has a high point to the north-east corner. The design of the building works with the natural topography of the site and provides accommodation at upper ground, lower ground and basement levels.

Given that access to Frognal Way is barrier controlled, traffic flows are relatively light and a 5 mile an hour speed limit is in operation. The footpath on Frognal Way is paved and clearly defined over some of the length of the road, although in other areas, Frognal Way operates as a shared surface. It has been observed that pedestrians can be encountered over any part of the road, including groups of school children travelling to and from local schools. The management of construction vehicles on Frognal Way to maintain safety for all road users, specifically pedestrians is a key objective of this CMP.

The property is bound to the north, south and east by residential properties. To the west the site is bound by Frognal Way and the access to the adjacent Church Row garages. Frognal Way is private and managed by FWRA on behalf of residents. The CMP will also need to ensure that any adverse effects of construction work on residents is minimised and that access along Frognal Way and to properties is not obstructed at any time.

This CMP has been drafted to reflect the key principles and requirements of FWRA as specified in their document "Construction Management for Large Developments", November 2014.

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.).

The property is bound to the north, south and east by residential developments, which will be the nearest receptors likely to be affected by activities on site.

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.

Motion drawing 150431-02 attached at Appendix A shows the existing highway arrangement in the vicinity of the site.

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).

The overall timescale is currently estimated March 2018 to December 2019.
The construction of the scheme will be a continuous operation.

An outline programme of work phases is attached 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 provisional working hours for the site will be between 08:00 and 18:00 Monday to Friday and 08:00 and 13:00 on Saturdays.

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 are not expected to be any changes to services as a result of the development proposals.

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 granting 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 and/or generate significant sustained noise levels should consider establishing contact with other sites in the vicinity in order to manage these impacts.

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 should be included. Details of meetings including minutes, lists of attendees etc. should be appended.

In response to the comments received, the CMP should then be amended where appropriate and, where not appropriate, a reason 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.

Consultation is ongoing with the Frognal Way Residents Association. Consultation and liaison with the FWRA will continue throughout the planning and build process.

The principal contacts for the FWRA are:

Douglas Maxwell – resident and FRWA Honorary Secretary
Tel – 020 7435 2162
Mobile – 07801 418616
Email douglas@fwra.org.uk

Neil Norris – Road Manager
Mobile – 07941 071403
Email – neilnorris@sky.com

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.

Consultation and liaison with the FWRA will continue throughout the planning and build process. There will be a project meeting with the FWRA, main contractor, project manager and scheme architect. Further meetings will take place from time to time as required.

At the start of work on site, traffic marshals, site agent and relevant main contractor staff will attend an induction on the operation of the Frognal Way access barrier and action to be taken if problems occur. This will include requirements for essential access and arrangements if attendance of the emergency services should be required. If emergency services attend Frognal Way, the barrier is to be raised and left up and construction traffic movements suspended until emergency vehicles have left the road or confirmation has been given the movements can resume.

15. Schemes

Please provide details of your 'Considerate Constructors Scheme' registration, and details of any other similar relevant schemes as appropriate. Contractors will also be required to follow the "Guide for Contractors Working in Camden" also referred to as "Camden's Considerate Contractors Manual".

The Contractor will follow the Guide for Contractors Working in Camden.

The Contractor will register the site 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.

We are not aware of any other large development or works in prospect in, or accessed from, Frognal Way. However, we are aware of consented developments at numbers 1A, 2, 28, 40, 50 and 63 Frognal and 44 Frognal Lane. The Construction Project Manager will liaise with the Project Managers of the consented developments to ensure that deliveries are coordinated where possible. The contractor will continue to monitor the progress of planning applications in the area and will ensure that deliveries are coordinated with any consented schemes if appropriate.

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 Contractual Considerations

17. Name of Principal contractor:

To be confirmed following appointment

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 and Q18 example response).

FORS Bronze accreditation as a minimum will be a contractual requirement, FORS Silver or Gold operators will be appointed where possible. Where FORS Bronze operators are appointed, written assurance will be sought from contractors that all vehicles over 3.5t are equipped with additional safety equipment, and that all drivers servicing the site will have undertaken an approved Safe Urban Driving course. This will be included as a contractual requirement.

Where doubt exists, desktop checks will be made against the FORS database for relevant training details as outlined in the CLOCS Standard Managing Supplier Compliance guide.

A delivery booking system will be used which will require the entry of a FORS ID number in order for a delivery to be booked onto site. Where this isn't appropriate, checks of FORS ID numbers will form part of the periodic checks and will be carried out as per an appropriate risk scale.

Random spot checks will be carried out by site staff on vehicles and drivers servicing the site at a frequency based on this risk scale.

Where the Contractor's own vehicles and drivers are used the above approach will be modified accordingly.

Collision reporting will be requested periodically from operators and acted upon when necessary

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:

The appointed Contractor will be required to confirm this on behalf of Ironside & Malone Design & Build 2 Limited

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 how vehicles will be routed to the Transport for London Road Network (TLRN) on approach and departure from the site.

Vehicles will access the site from the A41 and travel eastbound on Arkwright Road making a left turn onto Frognal. Vehicles will continue in a northbound direction and turn right into Frognal Way. The site egress route will be the reverse of the access route. A vehicle routeing plan is shown in Appendix C. Due to the proximity of the site to schools, deliveries will be limited to between 09:30 and 15:00 on weekdays during term-time and between 08:30 and 13:00 on Saturdays. Outside of term time, deliveries will be permitted during the week between 09:30 and 16:30.

It will be required that all HGVs call a minimum of 20 minutes prior to arrival at the site to ensure that the loading area on site is available and arrange to be met by a traffic marshal.

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.

All contractors, delivery companies and visitors will be advised of and required to adhere to the specified route and all other measure detailed in this plan prior to journeys being undertaken. No contractors or visitors will be permitted to park on Frognal Way and will be instructed to travel to the site by public transport, by foot or cycle. The CPM will provide all site personnel with details of local public transport services and locations where parking can occur away from Frognal Way.

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.

- 3 axle, 26 tonne G.V.W, Grab Lorry
  These vehicles are approximately 8 metres long and 2.5 metres wide. They will be used to remove demolition material and spoil from the site during the demolition and excavation phases of the project. The maximum dwell time of the vehicle will be 30 minutes and up to 16 vehicles per day could be expected to visit the site during the demolition and excavation phases of the project.
- 3 axle, 26 tonne G.V.W, Concrete lorry
  These vehicles are typically 8.4 metres long and 2.5 metres wide. Deliveries will take place during the structural phase of the programme and up to 16 vehicles could be expected on the day of a concrete pour. There would typically be 3-4 days between concrete pours. Concrete lorries would have a dwell time of approximately 30 minutes.
- 4 wheel, 18 tonne G.V.W, Flat-bed truck
  These vehicles are typically 8.0 metres long and 2.4 metres wide. Flat bed vehicles will be used to deliver various materials including scaffolding, steelwork, timber, reinforcement, brick and block work, roofing materials, plaster, joinery etc. Deliveries are likely to be expected on average 4-6 per day during site setup, structural works and fit out/clear up phases of the programme with an average dwell time of 30 minutes. When scaffolding is erected and dismantled the vehicle would need to be onsite for up to 5 hours.
- Box van (luton)
  This will be a vehicle with length of up to 6 metres and a width of 2 metres. We anticipate a maximum of 2 deliveries per day throughout the works with a maximum dwell time of 30 minutes.
- 2 axle, 18 tonne GVW, Skip Lorry
  Skip lorries are approximately 7.5 metres in length with a width of 2.5m and a height of 4.0m. There will likely be 1 or 2 skip delivery/collection movements per week throughout the contract. Typical dwell time would be 15 minutes.

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

We are aware of consented developments at numbers 1A, 2, 28, 40, 50 and 63 Frognal and 44 Frognal Lane.

The Construction Project Manager will liaise with the Project Managers of the consented developments to ensure that deliveries are coordinated where possible. There are no known large developments or works in prospect in, or accessed from, Frognal Way. The contractor will continue to monitor the progress of planning applications in the area and will ensure that deliveries are coordinated with any consented schemes if appropriate.

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.

It will be required that all HGVs call a minimum of 20 minutes prior to arrival at the site to ensure that the loading area on site is available and arrange to be met by a traffic marshal.

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.

If loading space is unavailable on site then construction vehicles shall not proceed to the site and will be given an alternative delivery slot. Therefore, there is no requirement for any off-site holding areas.

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).

The Contractor will investigate the potential for using construction material consolidation centres and other measures such as electric vehicles to reduce the impact of traffic associated with the development works, but no conclusions have yet been reached.

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 marshals must ensure the safe passage of all traffic on the public highway, in particular pedestrians and cyclists, when vehicles are entering and leaving site, particularly if reversing.

Traffic marshals, or site staff acting as traffic marshals, should hold the relevant qualifications required for directing large vehicles when reversing. Marshals should be equipped with 'STOP – WORKS' signs (not STOP/GO signs) if control of traffic on the public highway is required. Marshals should have radio contact with one another where necessary.

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

Vehicles will access the site from the A41 and travel eastbound on Arkwright Road making a left turn onto Frognal. Vehicles will continue in a northbound direction and turn right into Frognal Way. The site egress route will be the reverse of the access route.

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

All traffic associated with the development will be managed by the Construction Project Manager. The following measures will be put in place:

- All deliveries shall be pre-booked and allocated set arrival times;
- Delivery instructions shall be sent to all suppliers and contractors including the maximum dwell times;
- Suppliers shall call the Construction Project Manager a minimum of 20 minutes before their vehicle arrives at site to confirm that there is space to accommodate the vehicle on site;
- The loading/collection area within the site shall be clear of vehicles and materials before the next lorry arrives;
- Suitably qualified traffic marshals will be used;
- If loading space is unavailable construction vehicles shall not proceed to the site and will be given an alternative delivery slot;
- Vehicles shall not wait or stack on any road within the Borough;
- Vehicles will not obstruct Frognal Way at any time.

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).

Please refer to Appendix D. The swept path analysis demonstrates that there is room for construction vehicles to manoeuvre along Frognal Way and turn outside the site without conflicting with cars that have been observed to park outside properties in the turning area at the end of the cul-de-sac.

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.

Wheel and chassis wash facilities will also be provided on site for delivery and muck away vehicles in order to limit the potential for any transfer of material from the site. Any material transferred from the site to Frognal Way will be promptly removed and any rutting or damage to the road surface promptly repaired by the raking of any loose surface materials.

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.

All construction vehicles will park and load within the site boundary. Construction vehicles are able to access Frognal Way in a forward gear and manoeuvre at the eastern end of Frognal Way so as to reverse into the site. All HGV manoeuvres will be supervised. Drawings 150431-TK01 – TK06, attached at Appendix D, shows swept path analysis of an 8.4 metre long concrete lorry (the largest vehicle expected on site) and an 8 metre grab lorry manoeuvring to and from the site in this way.

The property benefits from a large garden and materials, site accommodation and plant will be stored on site. Where necessary, suitable ground protection such as ground-guards will be used to protect the underlying ground from compaction and will also protect tree roots from damage. Drawing 150431-01, attached at Appendix E, shows the proposed site plan showing the points of access to the site and site compound.

Demolition material and spoil will be removed from the site by grab lorries and concrete delivered directly to the site using ready mix lorries.

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.

If the site is on or adjacent to the TLRN, please provide details of preliminary discussions with Transport for London in the relevant sections below.

- 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.

At this stage, it is not anticipated that parking bay suspensions or temporary traffic management orders are required.

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).

No highway works will be necessary to enable construction to take place. All materials, site accommodation and welfare facilities will be stored on site.

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

The Contractor will ensure that all mandatory safety signage will be displayed at the site access. As all deliveries will take place on site no ramps, signage or barriers are considered necessary on the public highway.

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).

No diversions to the public highway are expected during construction

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.

The potential risks to both cyclists and pedestrians have been considered and vehicles with appropriate safety equipment will be used. This equipment will include safety bars, additional mirrors and advisory signage. In addition, all movements into and out of the site, and movements into and out of Frognal Way, will be supervised by trained traffic marshals in order to manage the interaction between construction vehicles and other road users.

A traffic marshal will be permanently stationed at the junction of Frognal Way with Frognal during site working hours. This traffic marshal will operate the barrier to enable construction vehicles to enter Frognal Way. When an HGV (over 7.5 tonnes) is due to access the site a second traffic marshal will be stationed on Frognal to supervise and assist manoeuvres onto Frognal Way and through the entrance barrier. From this point, this second traffic marshal will escort HGVs to the site at walking pace (less than 5 miles per hour).

At the turning area at the end of Frognal Way, a third traffic marshal will be deployed and both marshals will supervise turning and reversing manoeuvres on Frognal Way and manage the interaction between construction vehicles, other vehicles and pedestrians. When leaving the site, the third traffic marshal will escort the HGV back to the barrier at walking pace.

All marshals will be senior, trained personnel who are able to communicate clearly in English. Traffic marshals will wear high visibility yellow clothing with the contractors name and the words “traffic marshal” front and back. All marshals will communicate with the site, and with each other, by mobile phones or radios.

Due to the close proximity of the site to the school, all deliveries will be limited on weekdays to between 09:30 and 15:00 during term time and to between 09:30 and 16:30 outside of term-time.

A secure and lockable hoarding will be provided within the site boundary.

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.

No temporary structures will overhang the public highway.

Secure and lockable hoarding will be provided along the frontage of the property within the boundary of the site. The hoarding will display a 24/7 emergency contact number and second back up number available for out of hours emergencies. The numbers will connect to an operator without the need for voicemail, queuing or menu navigation. Motion Drawing 150431-01 at Appendix E shows the location of the hoarding.

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.

The following measures will be implemented:

- Noisy work will be restricted to between 08:00 and 18:00 Monday to Friday and between 08:00 and 13:00 on Saturdays. No works will be carried out on Sundays and Bank Holidays.
- Where possible and practical, contractors will use well-maintained and silenced plant and equipment including compressors, generators and power tools.
- The Best Practicable Means (BPM), as defined in Section 72 of the Control of Pollution Act 1974, shall be employed at all times to reduce noise (including vibration) to a minimum, with reference to the general principles contained in British Standard BS5228: 2009 'Noise and Vibration Control on Construction and Open Sites'.

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.

A noise survey has been carried out by KP Acoustics and a copy is attached at Appendix F, ref. 16093.NVM.Baseline

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

Noise levels will be monitored in accordance with Camden's Minimum Requirements, with reference to Predicted Levels in BS 5228.2009 Part 1, as indicated in the attached report 16093.NVM.Baseline.

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.

General measures:

Coordinated delivery times and efficient traffic management to prevent delays accessing the site.

Ensuring all plant has sound reduction measures (mufflers, baffles or silencers).

Utilising construction techniques that minimise the production of noise.

Utilisation, where possible of pre-fabricated components.

Utilisation of baffle system during the demolition process.

Strict adherence to the site working hours.

Devise and implement an action plan if noise levels exceed acceptable levels:

Specific noise mitigation measures will be incorporated during the demolition and construction if considered necessary as indicated in the attached Noise Report.

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

Following formal and/or informal training, the Contractor's management staff will be familiar with the recommendations in BS 5228:2009 and will be able to pursue solutions to any excessive noise levels in consultation with the Contractor's appointed consultants.

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

Hoardings bordering the frontage of the property along Frognal Way will help contain any dust. Where required, scaffolding and sheeting can be erected to further contain dust. Water dampening will also be used if considered necessary.

Air quality procedures will be established to minimise dust generation and control plant and vehicle exhaust emissions.

The principal contractor will undertake regular air quality sampling to ensure that works to not impact on existing air quality levels.

Ensure that all materials transported to and from site are in enclosed containers or fully sheeted.

Ensuring stock piles of topsoil etc. are kept below hoarding heights and kept damp in dry windy conditions. Once weeds and grass have grown again on the piles this will reduce the risk.

Loose materials will be stored in separated bays, and the division partitions will be lower than any adjacent boundary hoardings.

During dry periods, the works will be dampened down to control the generation of dust.

Ensuring materials have a minimum of packaging.

Ensuring all polystyrene and similar lightweight materials are weighted down.

Making sure all dust generating materials are adequately packaged.

Ensure all vehicles leaving the site have been through the wheel wash and that loads are covered where spoil or demolition material is being removed.

Provide road cleaning using road sweepers or brushes to control dust and mud as required.

Keeping the loading drop heights of spoil into lorries as low as possible.

Implementing an effective procedure to deal with complaints from third parties to ensure issues are dealt with efficiently and quickly, via an advised and dedicated telephone number.

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.

Wheel and chassis wash facilities will also be provided on site for delivery and muck away vehicles in order to limit the potential for any transfer of material from the site. Any material transferred from the site to Frognal Way will be promptly removed and any rutting or damage to the road surface promptly repaired by the raking of any loose surface materials.

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

We propose the installation of a monitor station running 24/7 during all phases of the project. The monitors will measure airborne noise, vibration and dust. The equipment installed on site will be:

1 no. Svantek Type 958A Noise and Vibration Monitors 1 No. Gras Environmental Microphones 1 No. PCB Tri-axial accelerometers, Type 356B18 1 No. Siemens TC65 GSM Modems 1 No. OSIRIS Dust Monitors

Alert threshold response will be available by SMS text or e-mail facility. The system will be set up such that the site's Project Manager will be notified when noise, vibration or dust levels reach the proposed project action levels.

36. Please confirm that a Risk Assessment has been undertaken at planning application stage in line with the GLA policy. The Control of Dust and Emissions During Demolition and Construction 2104 (SPG), that the risk level that has been identified, and that the appropriate measures within the GLA mitigation measures checklist have been applied. Please attach the risk assessment and mitigation checklist as an appendix.

A Dust Risk Assessment has been undertaken, and a copy is attached at Appendix F - ref. J0144_Frognal Way, Camden_F3_24Aug17

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.

The measures will be addressed by compliance with the mitigation measures listed in the attached Dust Risk Assessment, para. 4.1.3

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.

The site is identified as a 'Low Risk Site' in the attached Dust Risk Assessment

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).

A site survey will be carried out by an approved Pest Control specialist before commencement of construction. A Method Statement for pest control will be prepared and implemented by the specialist, in accordance with Camden's Minimum Requirements.

Any redundant drains will be removed and any connections sealed with concrete.

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

A demolition asbestos survey will be carried out before demolition commences, and the findings will be attached

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.

Contractors and site personnel will be required to behave in a considerate and respectful manner towards the FWRA, residents and members of the public at all times. Contractors and personnel will not smoke on Frognal Way or gather on verges in front of properties on Frognal Way. All litter and waste will be disposed of on site and meals consumed in on-site welfare facilities.

Smoking will not be permitted in working areas. If possible, a compliant smoking area may be provided in a remote area of the site which does not cause nuisance to workers or neighbours.

Bad language will not be permitted, and unnecessary shouting will be monitored by advice from site supervisory staff

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): 07/17 - 07/19

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): Yes

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:
N/A

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:
N/A

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:
N/A

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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: 8 MARCH 2018

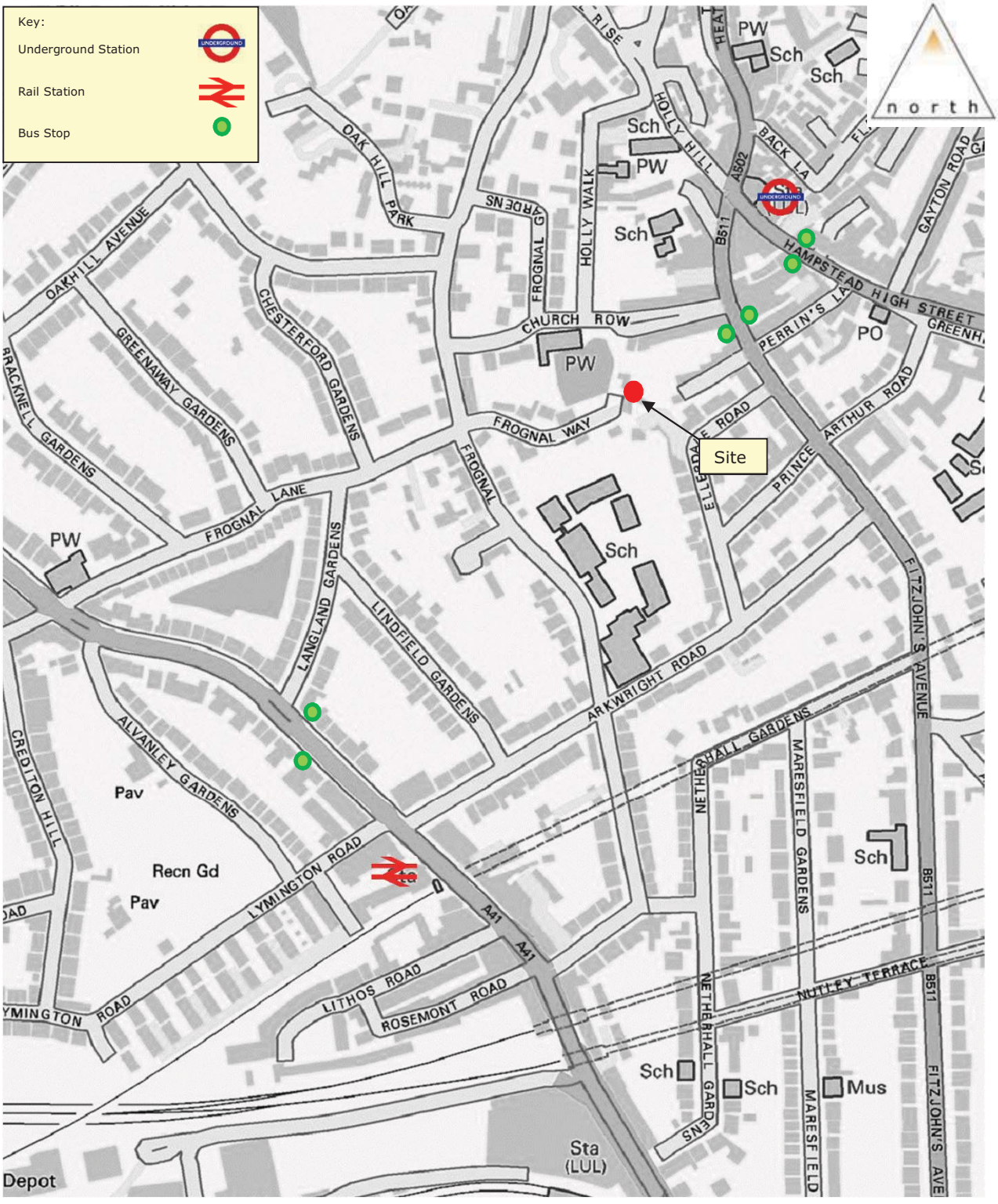
Print Name: YOAV TAL

Position: DIRECTOR,
MY CONSTRUCTION & CARPENTRY LTD.

Please submit to: planningobligations@camden.gov.uk

End of form.

Figures



motion

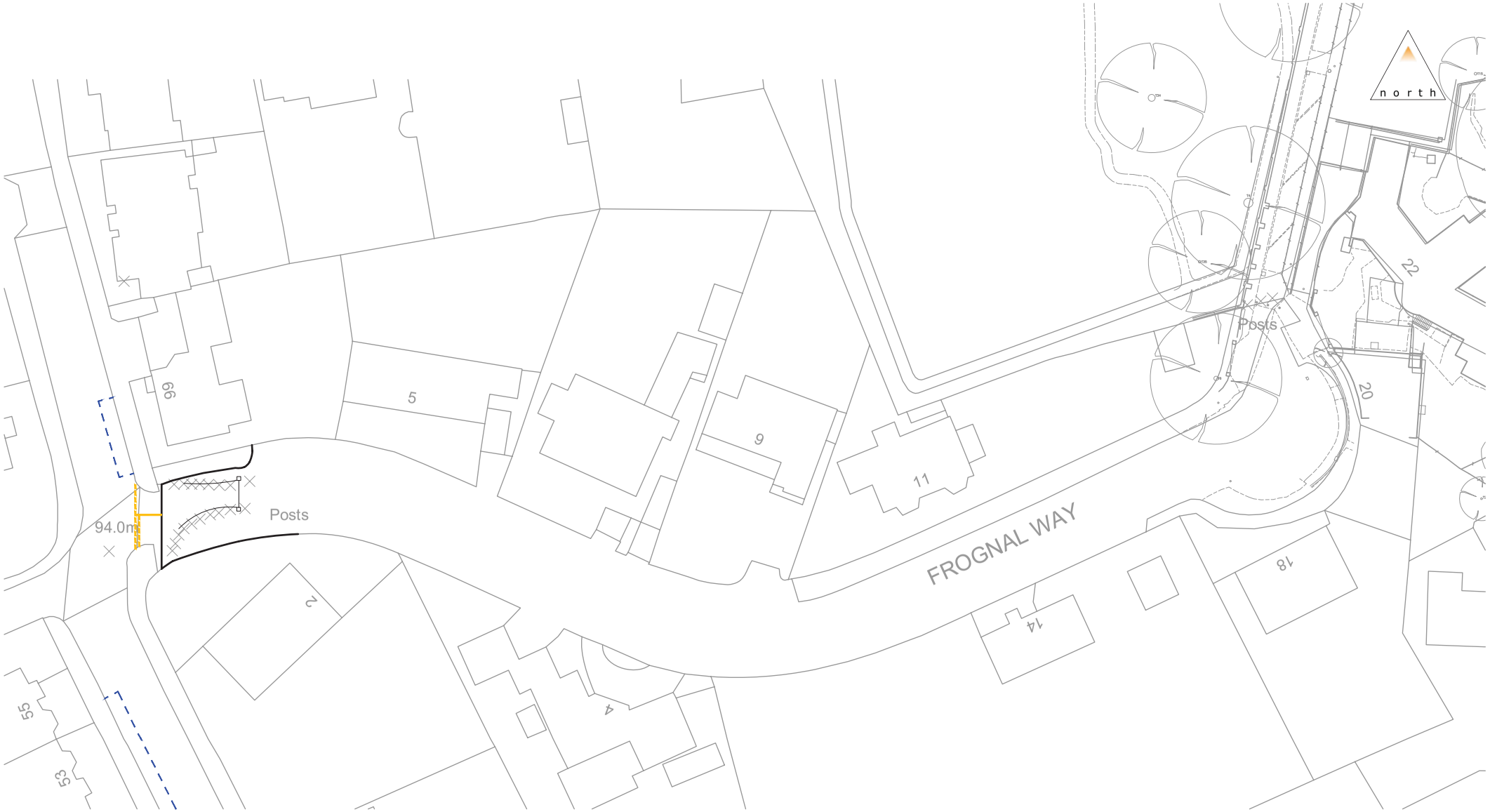
22 Frognal Way, London

Site Location Plan

Not to Scale

Appendix A

Existing Highway Arrangement



LEGEND

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Project:
22 Frognal Way

Title:
Existing Highway Arrangement

Scale: 1:500 (@ A3)

Notes:

Drawing:
170338-02

Revision:
-

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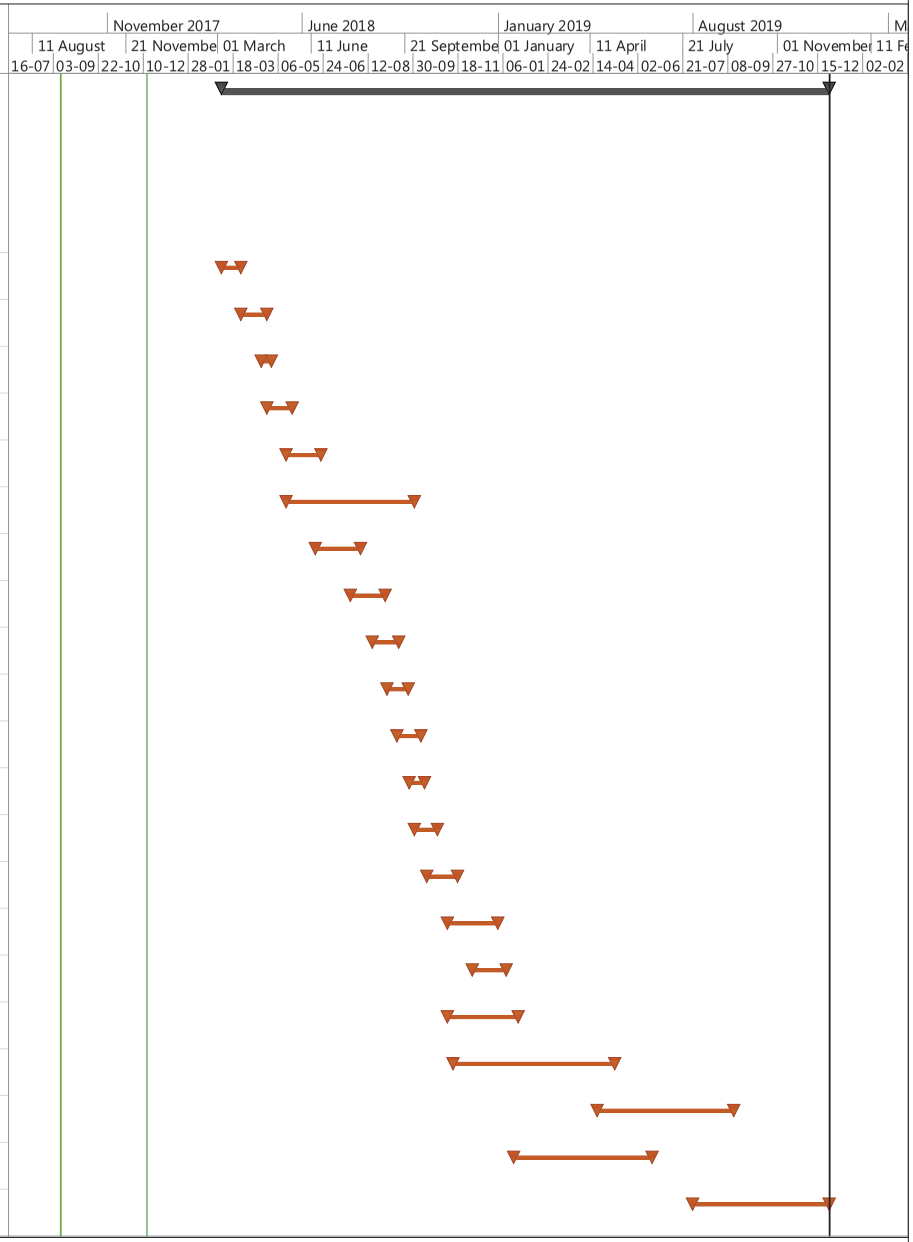
Appendix B

Programme of Works

ID	Task Name	Duration	Start	Finish	Predecessors
1	**22 FROGNAL CONSTRUCTION PROGRAM - Overall Build Period**	**526 days**	**Mon 05-03-18**	**Fri 27-12-19**	
2	SITE MOBILISATION & ENABLING	17 days	Mon 05-03-18	Mon 26-03-18	
3	DEMOLITION OF EXISTING STRUCTURE TO BASEMENT LEVEL	21 days	Mon 26-03-18	Mon 23-04-18	2
4	BACK FILL BASEMENT TRENCH FOR PILING MAT	10 days	Tue 17-04-18	Sat 28-04-18	3FS-5 days
5	CFA PILING & CAPPING BEAM	21 days	Mon 23-04-18	Mon 21-05-18	4FS-5 days
6	EXCAVATION TO BASEMENT LEVEL	30 days	Mon 14-05-18	Thu 21-06-18	5FS-5 days
7	TEMPORARY PROPPING TO RETAINIG STRUCTURES	110 days	Mon 14-05-18	Mon 01-10-18	6SS
8	CONSTRUCT BASEMENT RAFT	40 days	Fri 15-06-18	Fri 03-08-18	6FS-5 days
9	CONSTRUCT BASEMENT RW & COLUMNS	30 days	Mon 23-07-18	Thu 30-08-18	8FS-10 days
10	CONSTRCUT LOWER GROUND SLAB	22 days	Thu 16-08-18	Fri 14-09-18	9FS-10 days
11	CONSTRUCT LOWER GROUND RW & COLUMNS	18 days	Sat 01-09-18	Mon 24-09-18	10FS-10 days
12	CONSTRUCT UPPER GROUND SLAB	21 days	Wed 12-09-18	Mon 08-10-18	11FS-10 days
13	CONSTRUCT UPPER GROUND WALL COLUMNS	14 days	Tue 25-09-18	Fri 12-10-18	12FS-10 days
14	CONSTRUCT ROOF - CONCRETE & STRUCTURAL STEEL FRAME	21 days	Mon 01-10-18	Fri 26-10-18	13FS-10 days
15	ROOF CARCASS INSULATION & WATERPROOFING	28 days	Mon 15-10-18	Sat 17-11-18	14FS-10 days
16	EXTERNAL ENVELOPE	42 days	Tue 06-11-18	Mon 31-12-18	15FS-10 days
17	EXTERNAL WINDOWS	28 days	Mon 03-12-18	Wed 09-01-19	16FS-20 days
18	PERIMETER SCAFFOLD	60 days	Tue 06-11-18	Tue 22-01-19	16SS
19	INTERNAL FINISHES - CARCASS	140 days	Mon 12-11-18	Tue 07-05-19	15FS-5 days
20	INTERNAL FINISHES - 2ND FIX	120 days	Thu 18-04-19	Sat 14-09-19	19FS-15 days
21	EXTERNAL WORKS & LANDSCAPING	120 days	Thu 17-01-19	Mon 17-06-19	16FS+15 days
22	FINAL FINISHES & COMMISSIONING	120 days	Wed 31-07-19	Fri 27-12-19	20FS-37 days

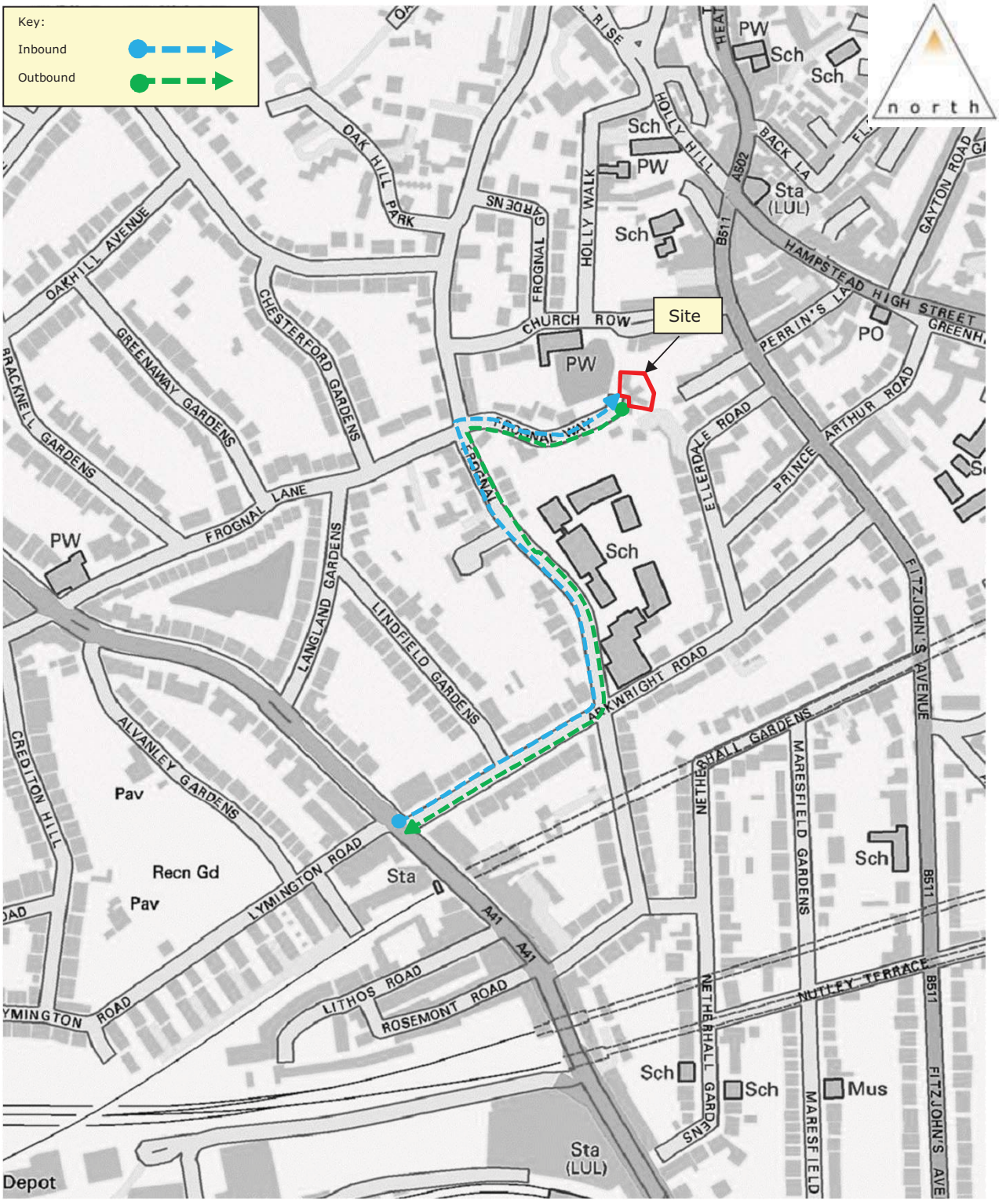


22 FROGNAL - CTMP PROGRAM

Task	Project Summary	Manual Task	Start-only	Deadline
Split	Inactive Task	Duration-only	Finish-only	Progress
Milestone	Inactive Milestone	Manual Summary Rollup	External Tasks	Manual Progress
Summary	Inactive Summary	Manual Summary	External Milestone	

Appendix C

Vehicle Routing Plan



motion

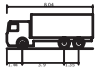
22 Frognal Way, London

Vehicle Routeing Plan

Not to Scale

Appendix D

Swept Path Analysis



Mercedes Actros Rigid Tipper 6x4 2632K

Overall Length	8.040m
Overall Width	2.490m
Overall Body Height	3.191m
Min Body Ground Clearance	0.257m
Track Width	2.490m
Lock-to-lock time	5.00s
Wall to Wall Turning Radius	8.750m

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Project:
22 Frognal Way

Title:
Swept Path Analysis
3 Axle Tipper

Scale: 1:500 (@ A3)

Notes:

Drawing:
170338-TK01

Revision:
B

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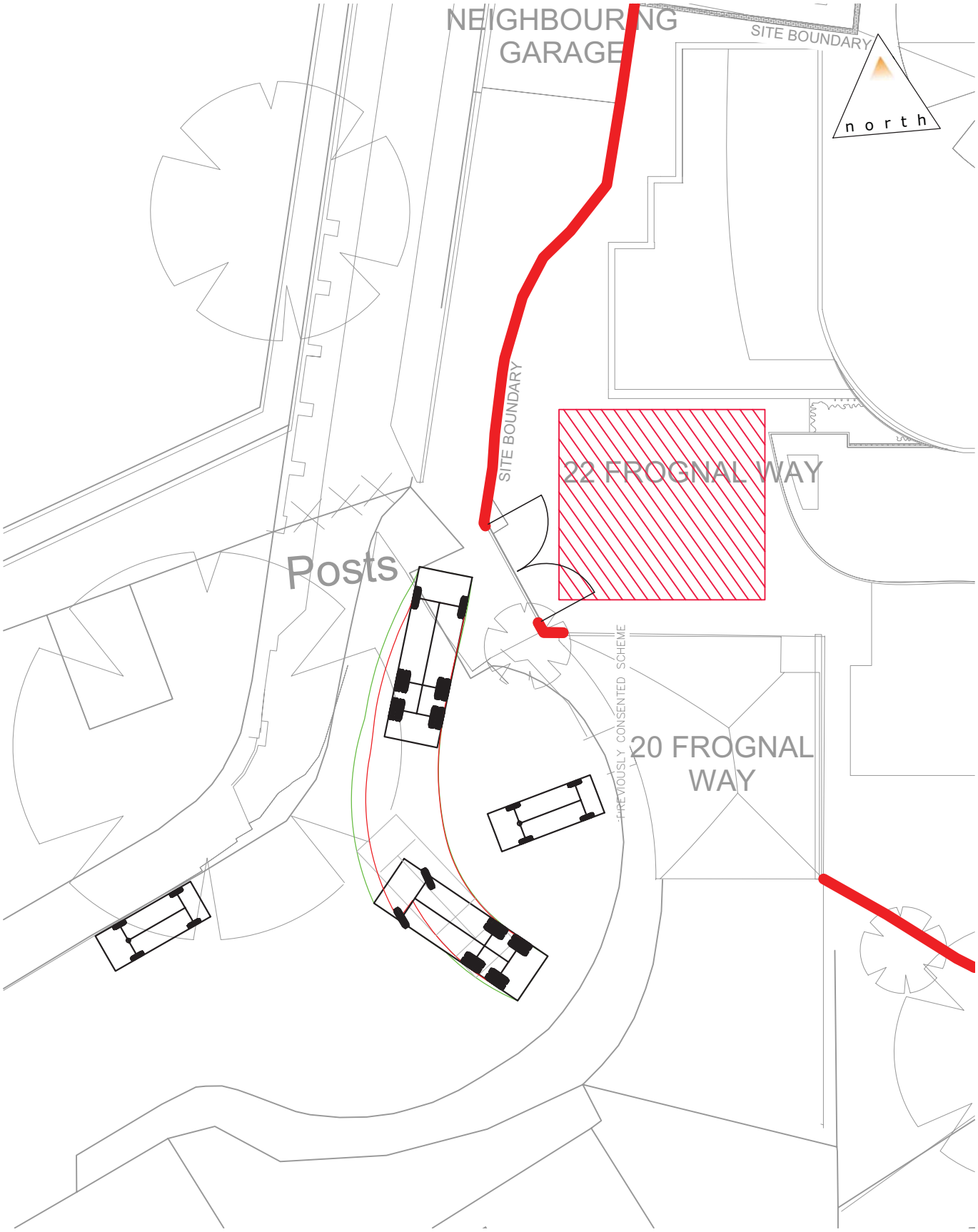

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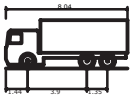

Mercedes Actros Rigid Tipper 6x4 2632K

Overall Length	8.040m
Overall Width	2.490m
Overall Body Height	3.191m
Min Body Ground Clearance	0.257m
Track Width	2.490m
Lock-to-lock time	5.00s
Wall to Wall Turning Radius	8.750m

Project:
22 Frognal Way

Title:
Swept Path Analysis
Entry Manoeuvre Pt 1

Scale: 1:250 (@ A4)

Drawing:
170338-TK02

Revision:
B

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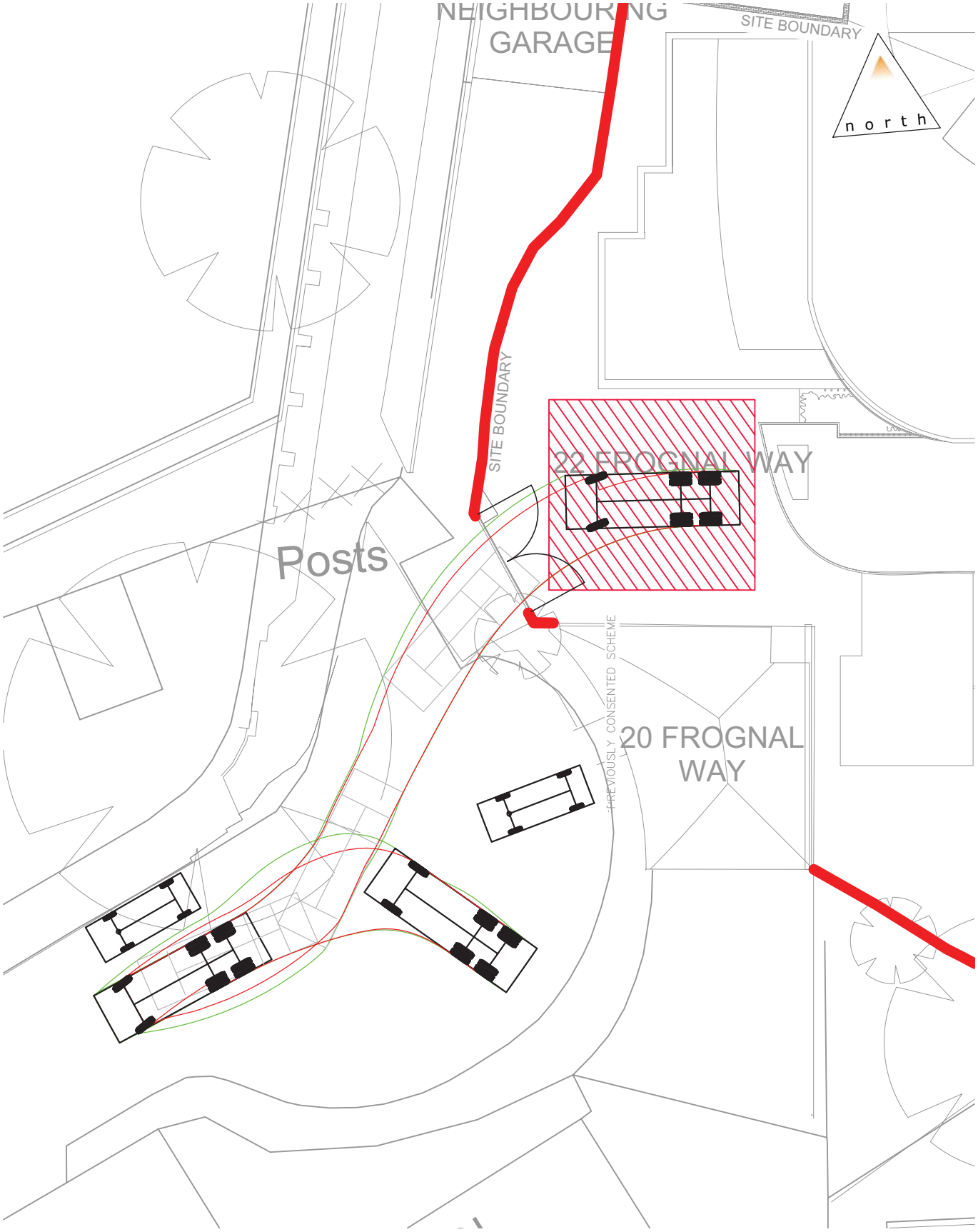

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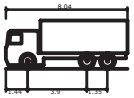

Mercedes Actros Rigid Tipper 6x4 2632K

Overall Length	8.040m
Overall Width	2.490m
Overall Body Height	3.191m
Min Body Ground Clearance	0.257m
Track Width	2.490m
Lock-to-lock time	5.00s
Wall to Wall Turning Radius	8.750m

Project:
22 Frognal Way

Title:
Swept Path Analysis
Entry Manoeuvre Pt 2

Scale: 1:250 (@ A4)

Drawing:
170338-TK03

Revision:
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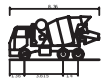

Concrete Mixer	
Overall Length	8.360m
Overall Width	2.390m
Overall Body Height	4.002m
Min Body Ground Clearance	0.358m
Max Track Width	2.413m
Lock-to-lock time	6.00s
Curb to Curb Turning Radius	8.210m

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Project:
22 Frognal Way

Title:
Swept Path Analysis
Concrete Mixer

Scale: 1:500 (@ A3)

Notes:

Drawing:
170338-TK04

Revision:
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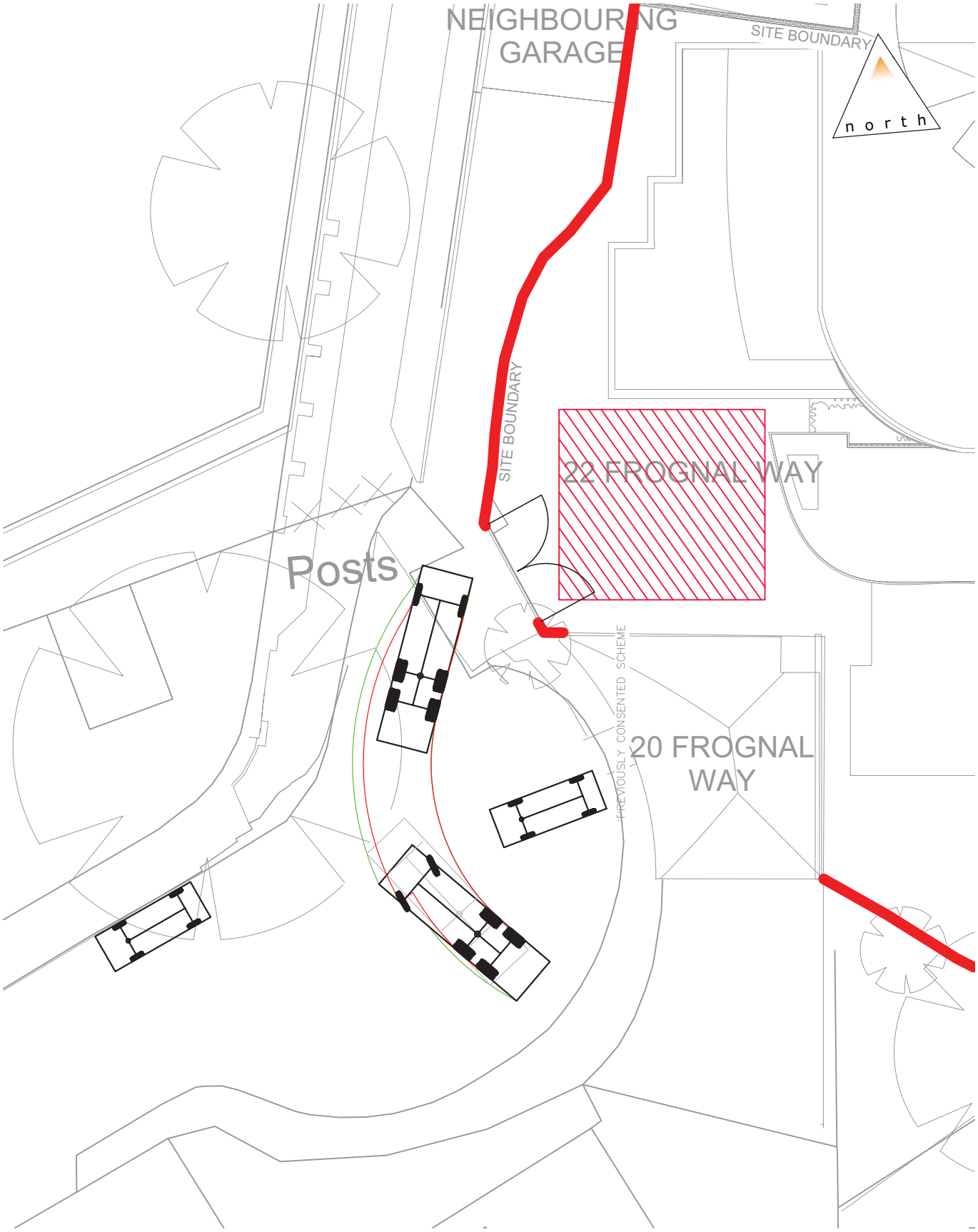

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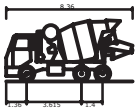

Concrete Mixer	
Overall Length	8.360m
Overall Width	2.390m
Overall Body Height	4.027m
Min Body Ground Clearance	0.358m
Max Track Width	2.413m
Lock-to-lock time	6.00s
Curb to Curb Turning Radius	8.210m

Project:
22 Frognal Way

Title:
Swept Path Analysis
Entry Manoeuvre Pt 1

Scale: 1:250 (@ A4)

Drawing: 170338-TK05

Revision: B

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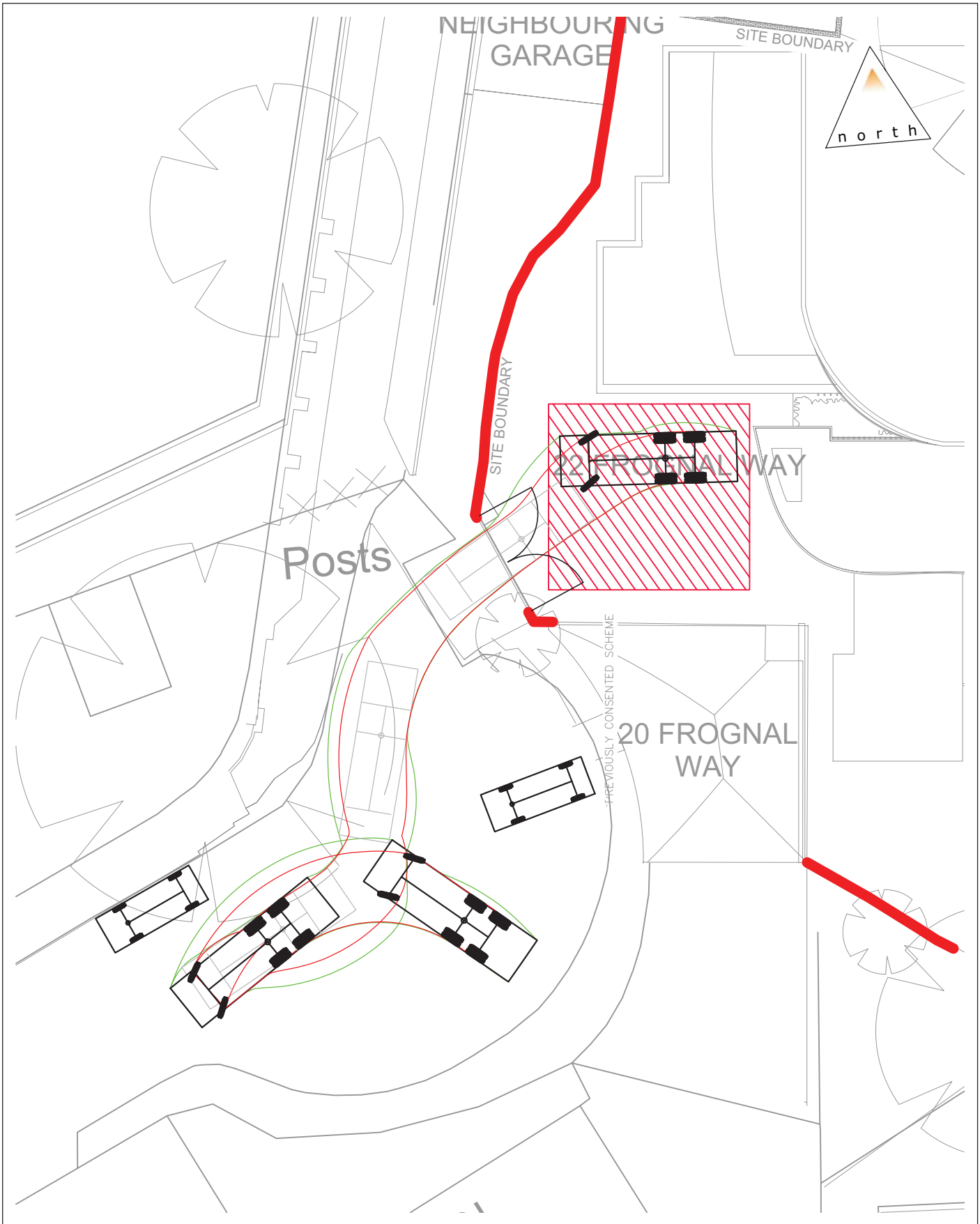

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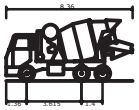

Concrete Mixer	
Overall Length	8.360m
Overall Width	2.390m
Overall Body Height	4.027m
Min Body Ground Clearance	0.358m
Max Track Width	2.413m
Lock-to-lock time	6.00s
Curb to Curb Turning Radius	8.210m

Project:
22 Frognal Way

Title:
Swept Path Analysis
Entry Manoeuvre Pt 2

Scale: 1:250 (@ A4)

Drawing:
170338-TK06

Revision:
B

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Skip Lorry	
Overall Length	7.500m
Overall Width	2.390m
Overall Body Height	3.650m
Min Body Ground Clearance	0.396m
Max Track Width	2.435m
Lock-to-lock time	3.00s
Curb to Curb Turning Radius	6.340m

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Project:
22 Frognal Way

Title:
Swept Path Analysis
Skip Lorry

Scale: 1:500 (@ A3)

Notes:

Drawing:
170338-TK07

Revision:
A

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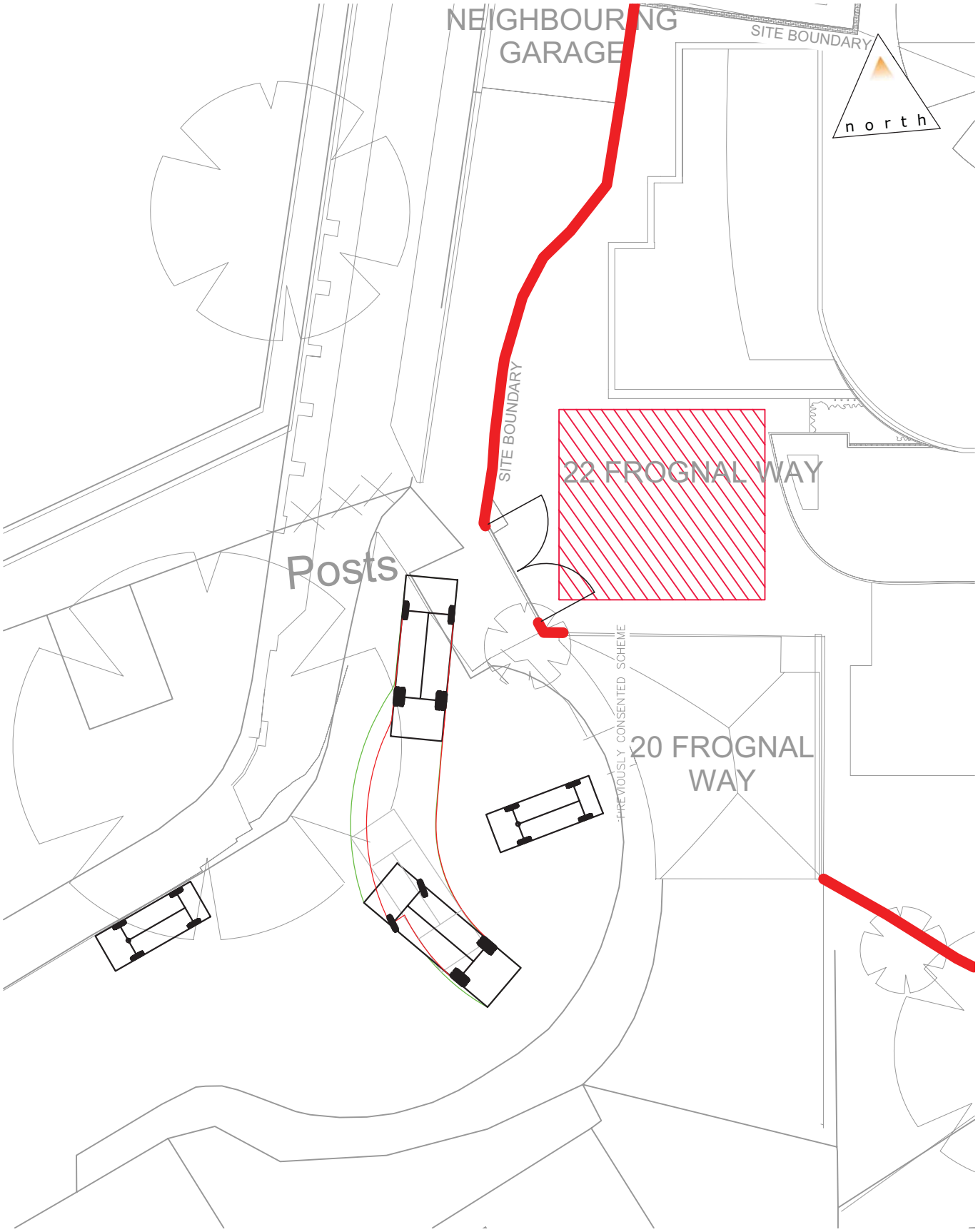

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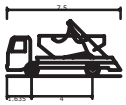

Skip Lorry	
Overall Length	7.500m
Overall Width	2.390m
Overall Body Height	3.650m
Min Body Ground Clearance	0.396m
Max Track Width	2.435m
Lock-to-lock time	3.00s
Curb to Curb Turning Radius	6.340m

Project:
22 Frognal Way

Title:
Swept Path Analysis
Entry Manoeuvre Pt 1

Scale: 1:250 (@ A4)

Drawing:
170338-TK08

Revision:
A

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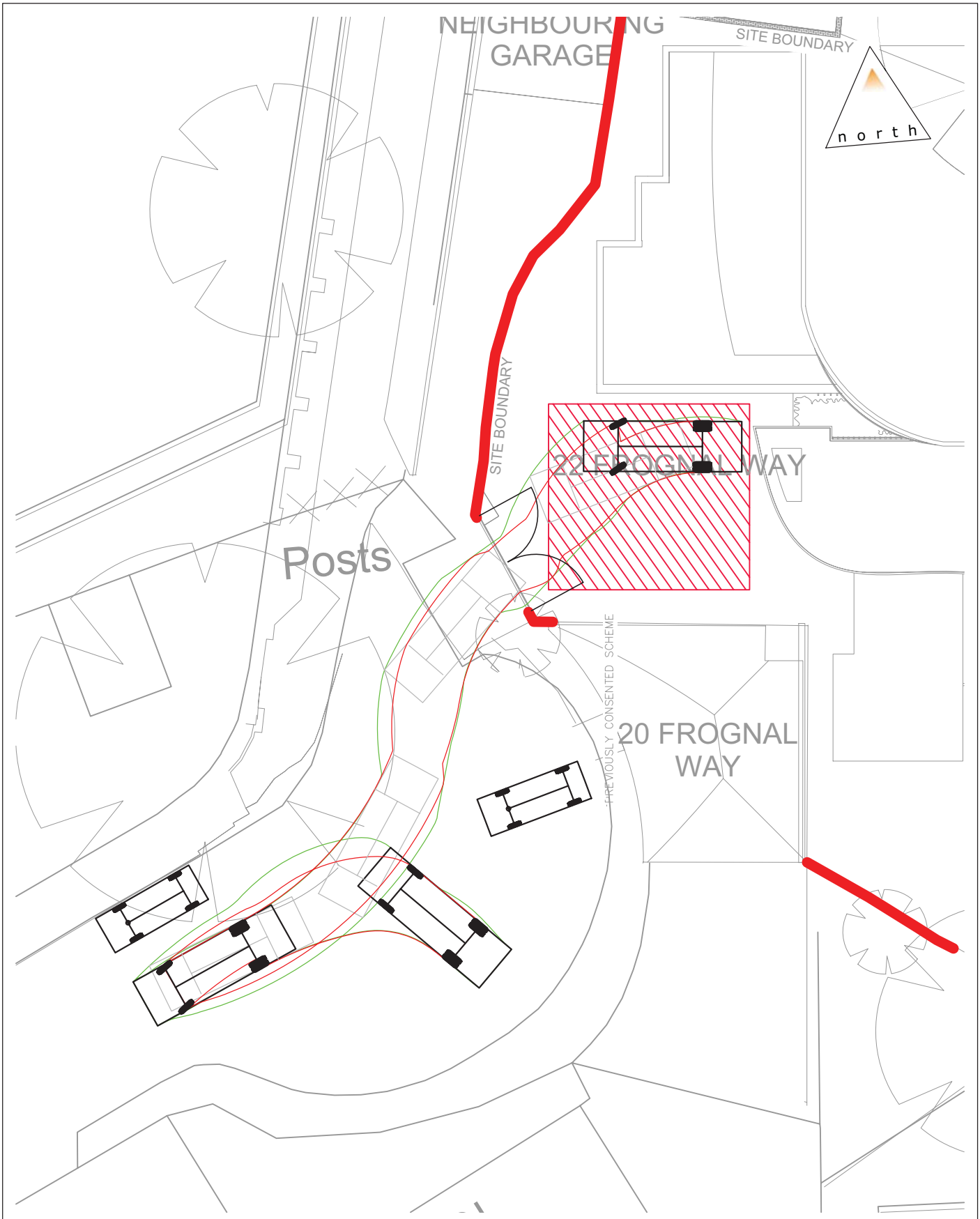

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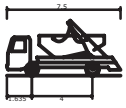

Skip Lorry	
Overall Length	7.500m
Overall Width	2.390m
Overall Body Height	3.650m
Min Body Ground Clearance	0.396m
Max Track Width	2.435m
Lock-to-lock time	3.00s
Curb to Curb Turning Radius	6.340m

Project:
22 Frognal Way

Title:
Swept Path Analysis
Entry Manoeuvre Pt 2

Scale: 1:250 (@ A4)

Drawing:
170338-TK09

Revision:
A

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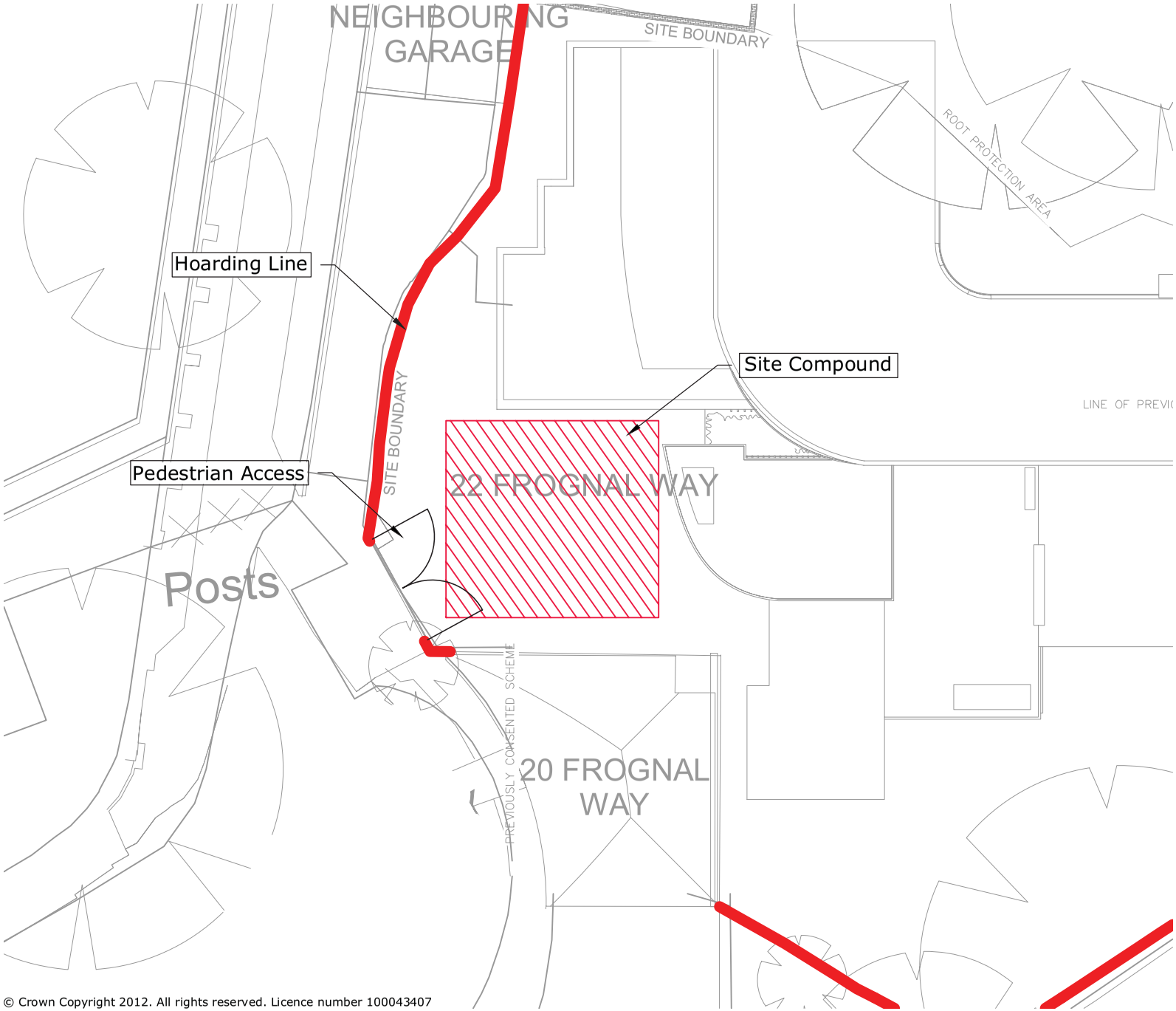
Appendix E

Site Set-Up Plan



north

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Project:
22 Frognal Way

Title:
Site Set-Up

Scale: 1:250 (@ A4)

Drawing:
170338-01

Revision:
B

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Appendix F

Noise & Vibration Report

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22 FROGNAL, LONDON

NOISE AND VIBRATION BASELINE SURVEY

Report 16093.NVM.Baseline

Prepared on 22 August 2017

For:

Ironside & Malone Design & Build 2 Ltd.

64 New Cavendish Street,

London,

W1G 8TB

Contents

List of Attachments

1.0 INTRODUCTION

KP Acoustics Ltd have been appointed by Ironside & Malone Design & Build 2 Ltd. 64 New Cavendish Street, London, W1G 8TB, to undertake a monitoring survey to assess the background noise and vibration footprint of the area at 22 Frognal, London.

Measured noise and vibration levels will be compared against the set criteria stipulated in BS5228: 2009. This is the report of the noise and vibration baseline surveys from 1 June 2017 to 2 June 2017 prior to the commencement of all on-site operations.

2.0 ENVIRONMENTAL NOISE SURVEY

2.1 Procedure

An environmental noise survey has been undertaken on the proposed site as shown in Figure 16098.SP1. The location was chosen in order to collect data representative of the worst-case levels expected on the site due to all nearby sources.

Continuous automated monitoring was undertaken for the duration of the survey between 1st June – 2nd June 2017.

Weather conditions were generally dry with light winds and therefore suitable for the measurement of environmental noise. The measurement procedure complied with ISO 1996-2:2007 Acoustics "*Description, measurement and assessment of environmental noise - Part 2: Determination of environmental noise levels*".

2.2 Equipment

The equipment calibration was verified before and after use and no abnormalities were observed. The equipment used was as follows.

- 1 No. Svantek Type 958A Class 1 Sound Level Meter (S/N : 36655)
- B&K Type 4231 Class 1 Calibrator
- Bruel & Kjaer Calibrator Type 4294

3.0 RESULTS

3.1 Noise Survey

The $L_{Aeq:\,5min}$, $L_{Amax:\,5min}$, $L_{A10:\,5min}$ and $L_{A90:\,5min}$ acoustic parameters were measured throughout the duration of the survey. Measured levels are shown as a time history in Figure 16093.NTH1, respectively.

Measured noise levels are representative of the background noise footprint of the area, are shown in Table 3.1.

	Average L_{Aeq} dB(A)	Minimum L_{A90} dB(A)	Maximum $L_{A,max}$ dB(A)
Daytime$_{,16hour}$ (7:00-23:00)	48	36	84
Night-time$_{,8hour}$ (23:00-7:00)	45	31	75
Operation Hours$_{,8hour}$ (8:30-16:30)	50	37	84

Table 3.1 Site average L_{Aeq}, minimum L_{A90} and maximum L_{Amax} noise levels for daytime, night-time and operation hours

3.2 Vibration Survey

A vibration survey was also undertaken on site in parallel to the noise survey. The daily vibration levels (Peak Particle Velocity) of the background road traffic measured over the baseline monitoring period are shown in Figure 16093.Baseline.VTH1.

4.0 DISCUSSION

4.1 Noise

The site is bounded by Church Row approximately 70 meters to the north, Frognal Way, immediately to the west and Ellerdale Close to the east, the background noise climate was distant road traffic noise.

The criterion of 70dB(A) at the closest noise sensitive receiver was adopted from BS5228: 2009. The document dictates the following:

"Noise from construction and demolition sites should not exceed the level at which conversation in the nearest building would be difficult with the windows shut. The noise can be measured with a simple sound level meter, as we hear it, in A-weighted decibels (dB(A))- see note below. Noise levels, between say 7.00 and 19.00 hours, outside the nearest window of the occupied room closest to the site boundary should not exceed:

- *70 decibels (dBA) in rural, suburban and urban areas away from main road traffic and industrial noise;*
- *75 decibels (dBA) in urban areas near main roads in heavy industrial areas."*

Due to the fact that the exact operations that will take place on site are not currently confirmed, data from a similar scenario will be preliminarily used and updated once the proposed operations are confirmed.

The operations on-site will be done in 3 phases, the 3 phases of site works and details of machinery that will be used are shown below:

Phase of proposed works	Details for each phase of proposed works
Phase 1 Demolition Works	110V Heavy Breakers
	110V Medium Duty Breakers
	110V 9V" Grinders
	13 Tonne Excavator with pecker/breaker
	5 Tonne Dumper
	Muck Away Lorry
	Site Concrete Crusher
	Diesel Compressor with 25kg Sullair Breakers
Phase 2 Piling Works	CFA Piling Rig
	13 Tonne Excavator
	5 Tonne Dumper
	Concrete Lorry
	Static Concrete Pump
Phase 3 RC Frame Works	13 Tonne Excavator
	Muck Away Lorry
	Petrol Grinders
	110V Hammer Drills
	Static Concrete Pump
	Concrete Lorries
	110V Concrete Vibrator/Poker
	Hand Tools/Impact Battery Cordless

Table 4.1: Proposed work phases and work details for the project

Taking all acoustic corrections into consideration, including distance corrections and screening due to building's envelope, the noise level expected at the closest residential windows would be as shown in Table 4.2. Detailed calculations are shown in Appendix B.

Phase Of Operations and Nearest Noise Sensitive Receiver's locations	Criterion	Predicted Noise Level at Receiver $L_{Aeq,10hours}$
Phase 1 Demolition Works	70dB(A)	65dB(A)

Phase 2 **Piling Works**		64dB(A)
Phase 3 **RC Frame Works**		61dB(A)

Table 4.2: Predicted noise level and criterion at nearest noise sensitive locations

As shown in Appendix B and Table 4.2, transmission of noise to the nearest residential windows due to the works on the aforementioned site would fully satisfy the set noise emissions criterion.

These calculations were undertaken with the assumption of 5 hours on-time for all machinery apart from trucks with a transient, on and off site operation and an assumed overall on-time of 30mins. In order to ensure that the set criterion could be met, it was deemed necessary to incorporate the use of a movable acoustic barrier around all handheld machinery.

4.2 Vibration

This section presents an assessment of the potential risk regarding vibration generated by the construction works detailed in this document, and the associated adverse effects on the surrounding area.

Guidance Vibration Limits

Estimated vibration levels have been evaluated against guidance presented in relevant British Standards in order to assess the likelihood of both structural damage to neighbouring buildings and the human response of the occupants.

Building Damage

According to BS 7385 Part 2 for residential or light commercial buildings, the threshold for the onset of potential cosmetic damage (such as formation of hairline cracks on drywall surfaces or the growth of existing cracks in plaster or drywall surfaces) to buildings varies with frequency. This ranges from a PPV of 15 mm/s at 4Hz, rising to 20mm/s at 15 Hz, and to 50 mm/s at and above 40Hz for transient vibration. BS 7385: Part 2 also states that the probability of building damage tends towards zero at 12.5 mm/s peak component particle velocity.

Line (see Figure 4.1)	Type of Building	Peak component particle velocity in frequency range of predominant pulse	
		4Hz to 15Hz	15Hz and above
1	Reinforced or framed structures. Industrial and heavy commercial buildings	50mm/s at 4Hz and above	
2	Unreinforced or light framed structures. Residential or light commercial type buildings	15mm/s at 4Hz increasing to 20mm/s at 15Hz	20mm/s at 15Hz increasing to 50mm/s at 40Hz and above
Note 1: Values referred to are at the base of the building			
Note 2: For Line 2, at frequencies below 4Hz, a maximum displacement of 0.6mm (zero to peak) should not be exceeded			

Table 4.3: Transient Vibration Guide Values for Cosmetic Damage (from BS 7385: Part 2:1993)

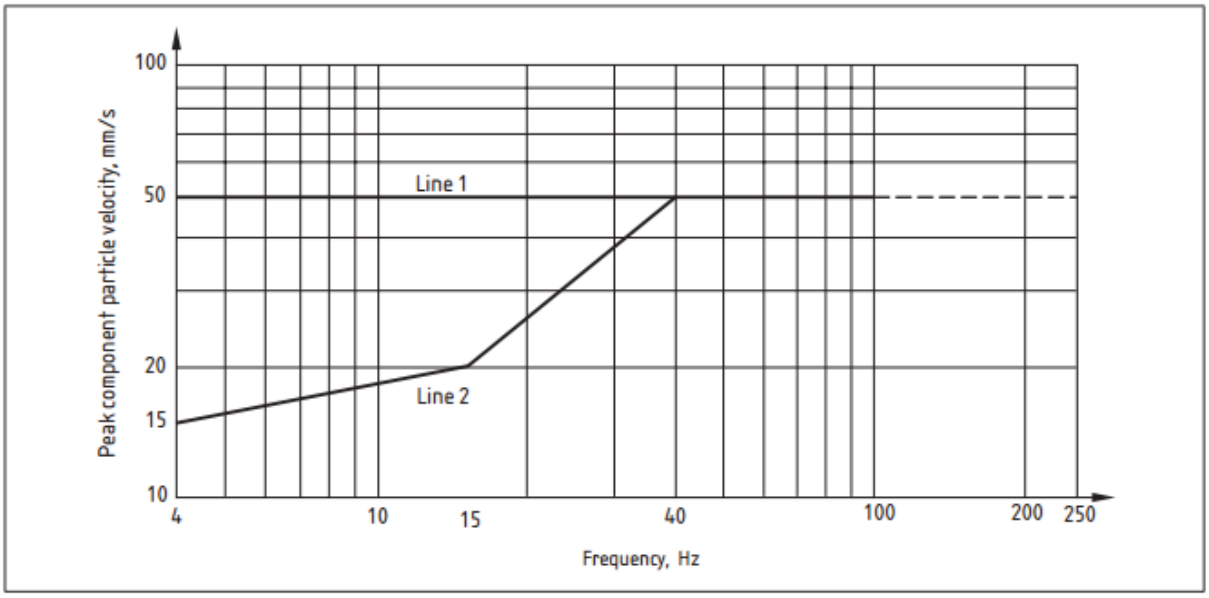

Figure 4.1: Summary of Damage Thresholds for Transient Vibration on Domestic Structures

Subjective Response

According to guidance provided in BS 5228 Part 2 , the threshold of vibration perceptible to humans lies around 0.14 to 0.3 mm/s. The Standard also indicates that a PPVs of around 1 mm/s in residential environments, as a first estimate, are likely to cause complaints, but can be tolerable provided prior warning and explanation of the works is given to residents; whilst, vibration magnitudes of around 10 mm/s are likely to be intolerable for more than a very brief exposure to this level.

As in the case above, the nature of all machinery due to be used is not known. This makes the prediction of vibration levels at adjacent dwellings very difficult.

On consideration of the above, a two-stage criterion is recommended:

- 5 mm/s PPV 'soft' limit; when exceeded, the contractor should temporarily halt works. Works should only be resumed after consultation with the local residents, and with extreme caution

- 10 mm/s PPV 'hard' limit; when exceeded, the contractor should stop work. Works should only continue after a thorough structural examination of the adjacent property, subsequent consultation with the local residents, and then with extreme caution. Should significant damage be identified, alternative methods of land remediation operations should be adopted.

5.0 CONCLUSIONS

Noise and vibration monitoring undertaken at 22 Frognal Way, London have been undertaken so as to establish the ambient noise and vibration profile of the site prior to the commencement of all on-site works. L_{Aeq}, L_{Amax}, L_{A10} and L_{A90} levels were measured between 1st and 2nd June 2017. Representative vibration data has also been used to establish the vibration profile of the area prior to any on-site operations.

With regards to the proposed works on the above site, the report has identified that the contribution of noise to the nearest noise sensitive receivers (residential windows) would be comparable to the ambient noise footprint in the area. Based on the proposed works on site and existing data, vibrations received at the nearest sensitive receivers would not be expected to have any impact on the amenity of residents.

A combination of measured noise levels in-situ, as well as calculations have shown that the operations would be unlikely to cause complaints due to noise emissions, according to BS5228. As a proactive strategy, we would recommend to monitor noise and vibration throughout the works, in order to minimize any eventualities which could cause complaints due to noise and vibration.

Report by

Ben Ford AMIOA

KP Acoustics Ltd.

Checked by

Kyriakos Papanagiotou MIOA

KP Acoustics Ltd.

Title:

Indicative site plan showing noise monitoring position

Date: 02 June 2017

FIGURE 16093.SP1

Noise Survey Monitoring Position

KP acoustics

22 Frognal Lane, London
Environmental Noise Time History
1st June to 2nd June 2017

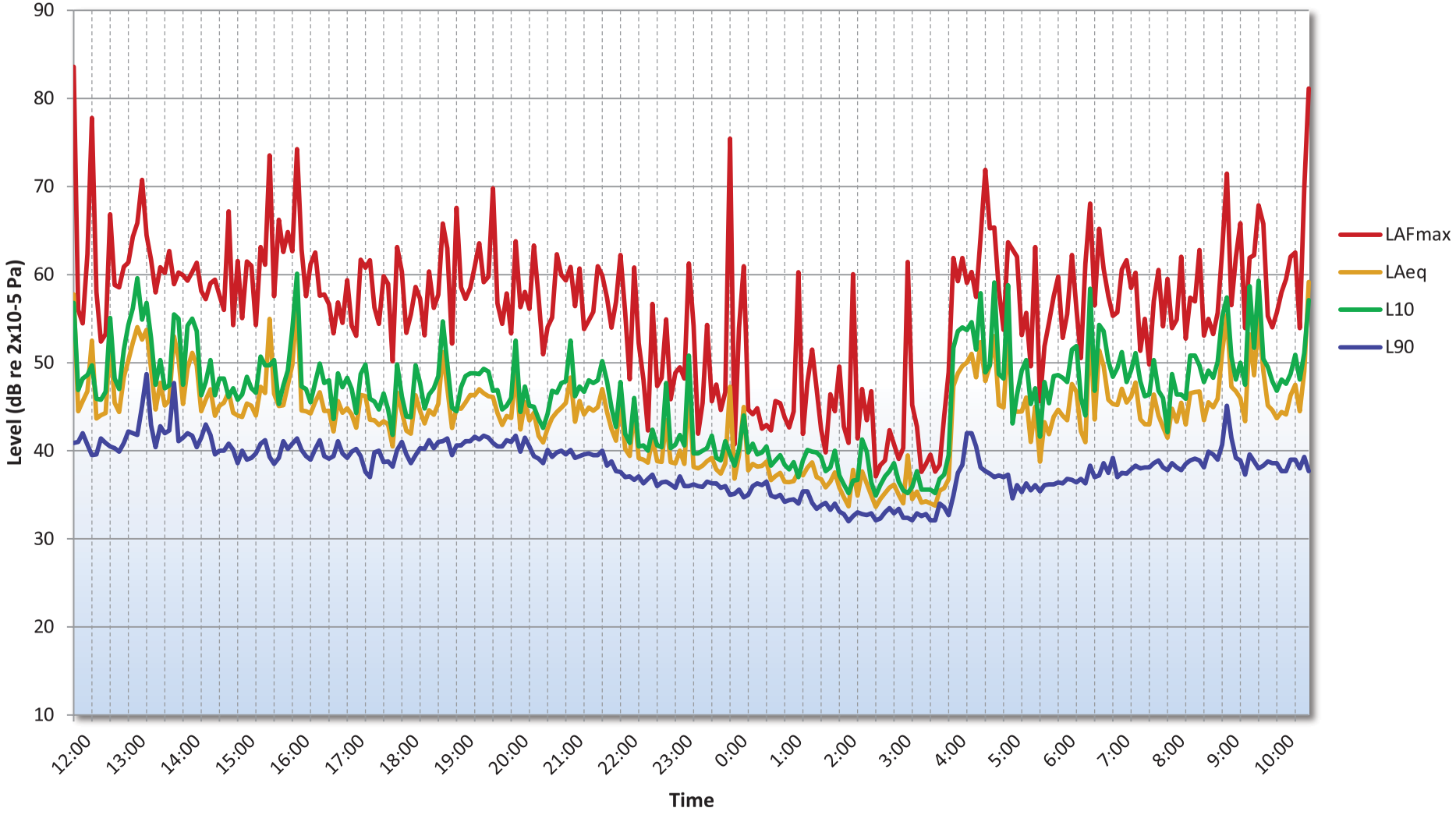

Figure 16093.TH1

22 Frognal, London
Environmental Noise Time History
1st June to 2nd June 2017

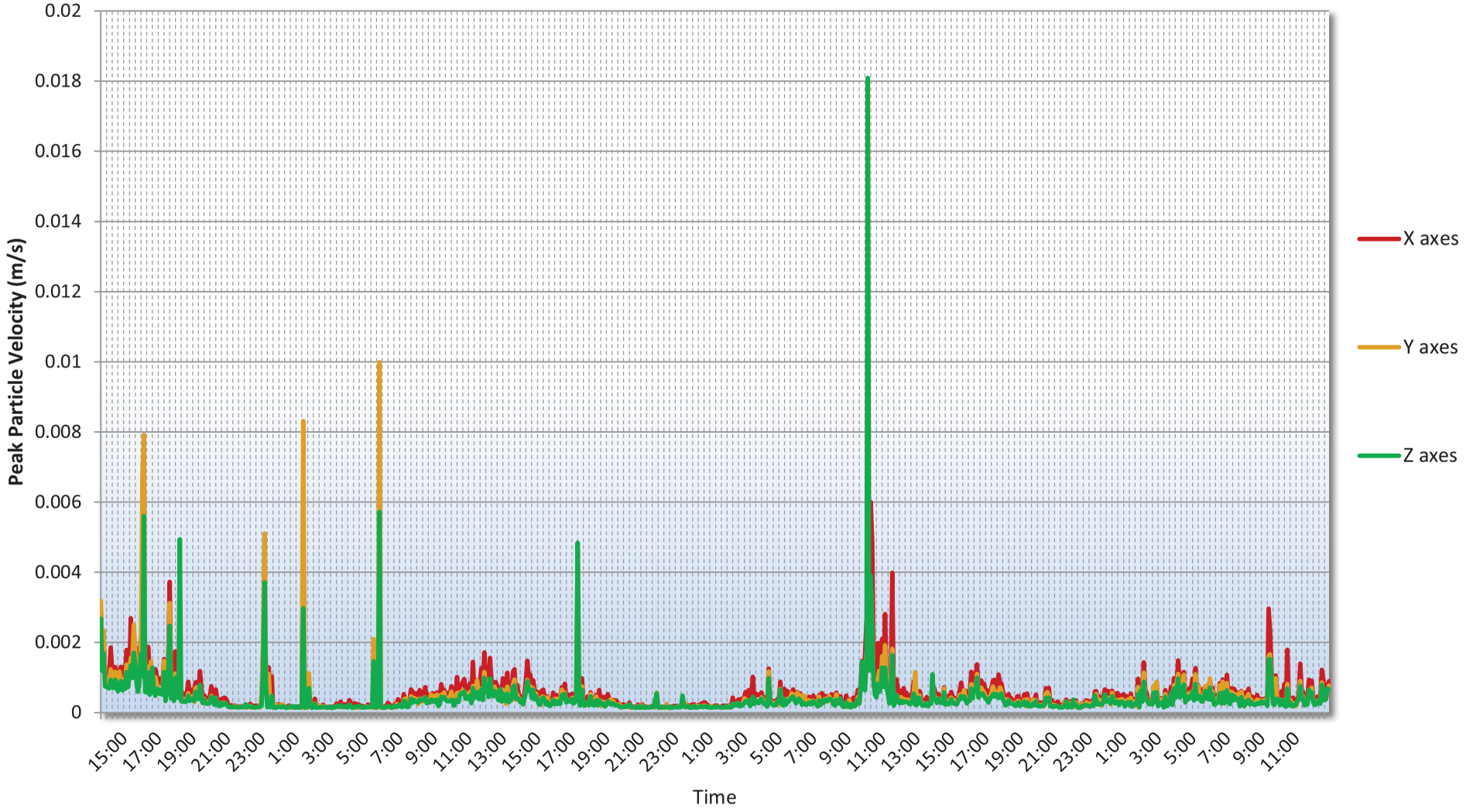

Figure 16093.VTH1

APPENDIX A

GENERAL ACOUSTIC TERMINOLOGY

Decibel scale - dB

In practice, when sound intensity or sound pressure is measured, a logarithmic scale is used in which the unit is the 'decibel', dB. This is derived from the human auditory system, where the dynamic range of human hearing is so large, in the order of 10^{13} units, that only a logarithmic scale is the sensible solution for displaying such a range.

Decibel scale, 'A' weighted - dB(A)

The human ear is less sensitive at frequency extremes, below 125Hz and above 16Khz. A sound level meter models the ears variable sensitivity to sound at different frequencies. This is achieved by building a filter into the Sound Level Meter with a similar frequency response to that of the ear, an A-weighted filter where the unit is dB(A).

L_{eq}

The sound from noise sources often fluctuates widely during a given period of time. An average value can be measured, the equivalent sound pressure level L_{eq}. The L_{eq} is the equivalent sound level which would deliver the same sound energy as the actual fluctuating sound measured in the same time period.

L_{10}

This is the level exceeded for no more than 10% of the time. This parameter is often used as a "not to exceed" criterion for noise.

L_{90}

This is the level exceeded for no more than 90% of the time. This parameter is often used as a descriptor of "background noise" for environmental impact studies.

L_{max}

This is the maximum sound pressure level that has been measured over a period.

Octave Bands

In order to completely determine the composition of a sound it is necessary to determine the sound level at each frequency individually. Usually, values are stated in octave bands. The audible frequency region is divided into 11 such octave bands whose centre frequencies are defined in accordance with international standards. These centre frequencies are: 16, 31.5, 63, 125, 250, 500, 1000, 2000, 4000, 8000 and 16000 Hertz.

Environmental noise terms are defined in BS7445, *Description and Measurement of Environmental Noise*.

APPENDIX A

APPLIED ACOUSTIC TERMINOLOGY

Addition of noise from several sources

Noise from different sound sources combines to produce a sound level higher than that from any individual source. Two equally intense sound sources operating together produce a sound level which is 3dB higher than a single source and 4 sources produce a 6dB higher sound level.

Attenuation by distance

Sound which propagates from a point source in free air attenuates by 6dB for each doubling of distance from the noise source. Sound energy from line sources (e.g. stream of cars) drops off by 3dB for each doubling of distance.

Subjective impression of noise

Hearing perception is highly individualised. Sensitivity to noise also depends on frequency content, time of occurrence, duration of sound and psychological factors such as emotion and expectations. The following table is a guide to explain increases or decreases in sound levels for many scenarios.

Change in sound level (dB)	Change in perceived loudness
1	Imperceptible
3	Just barely perceptible
6	Clearly noticeable
10	About twice as loud

Transmission path(s)

The transmission path is the path the sound takes from the source to the receiver. Where multiple paths exist in parallel, the reduction in each path should be calculated and summed at the receiving point. Outdoor barriers can block transmission paths, for example traffic noise. The effectiveness of barriers is dependent on factors such as its distance from the noise source and the receiver, its height and construction.

Ground-borne vibration

In addition to airborne noise levels caused by transportation, construction, and industrial sources there is also the generation of ground-borne vibration to consider. This can lead to structure-borne noise, perceptible vibration, or in rare cases, building damage.

Sound insulation - Absorption within porous materials

Upon encountering a porous material, sound energy is absorbed. Porous materials which are intended to absorb sound are known as absorbents, and usually absorb 50 to 90% of the energy and are frequency dependent. Some are designed to absorb low frequencies, some for high frequencies and more exotic designs being able to absorb very wide ranges of frequencies. The energy is converted into both mechanical movement and heat within the material; both the stiffness and mass of panels affect the sound insulation performance.

APPENDIX B1

22 Frognal Road, London - Demolition and construction Works

BS5228 CALCULATIONS OF ACTIVITY NOISE

Source: Demolition/Construction Site	*Frequency, Hz*								
Receiver: Nearest Noise Sensitive façade	***63***	***125***	***250***	***500***	***1k***	***2k***	***4k***	***8k***	***dB(A)***
Phase 1: Demolition works (21 days)									
110V Heavy Breakers - (SPL@10m)	82	81	89	89	88	86	83	87	
Attenuation provided by moveable acoustic screen, dB	0	-6	-9	-10	-17	-25	-28	-30	
Correction due to on- time (5 hours per day)	-3	-3	-3	-3	-3	-3	-3	-3	
Total	**79**	**72**	**77**	**76**	**68**	**58**	**52**	**54**	**75**
110V Medium duty breakers - (SPL@10m)	83	83	81	74	73	76	78	77	
Attenuation provided by moveable acoustic screen, dB	0	-6	-9	-10	-17	-25	-28	-30	
Correction due to on- time (5 hours per day)	-3	-3	-3	-3	-3	-3	-3	-3	
Total	**80**	**74**	**69**	**61**	**53**	**48**	**47**	**44**	**65**
110V 9" grinders - (SPL@10m)	57	51	52	30	70	77	73	73	
Attenuation provided by moveable acoustic screen, dB	0	-6	-9	-10	-17	-25	-28	-30	
Correction due to on- time (5 hours per day)	-3	-3	-3	-3	-3	-3	-3	-3	
Total	**54**	**42**	**40**	**17**	**50**	**49**	**42**	**40**	**54**
13 tonne excavator with pecker/breaker - (SPL@10m)	74	70	68	67	64	62	58	50	
Distance correction (min. 8m)									
Correction due to on- time (5 hours per day)	-3	-3	-3	-3	-3	-3	-3	-3	
Total	**71**	**67**	**65**	**64**	**61**	**59**	**55**	**47**	**67**
5 Tonne Dumper - (SPL@10m)	90	86	72	71	71	71	66	59	
Distance correction (min. 8m)									
Correction due to on- time (30 minutes per day)	**-13**	**-13**	**-13**	**-13**	**-13**	**-13**	**-13**	**-13**	
Total	**77**	**73**	**59**	**58**	**58**	**58**	**53**	**46**	**64**
Muck Away Lorries - (SPL@10m)	73	78	78	78	74	73	68	66	
Distance correction (min. 8m)									
Correction due to on- time (30 minutes per day)	-13	-13	-13	-13	-13	-13	-13	-13	
Total	**60**	**65**	**65**	**65**	**61**	**60**	**55**	**53**	**67**
Site Concrete Crusher (SPL@10m)	86	84	84	81	78	75	71	66	
Correction due to on- time (5 hours per day)	-3	-3	-3	-3	-3	-3	-3	-3	
Total	***83***	***81***	***81***	***78***	***75***	***72***	***68***	***63***	**81**
Diesel Compressor with 25kg Sullair Breakers (SPL@10m)	82	81	89	89	88	86	83	87	
Correction due to on- time (5 hours per day)	-3	-3	-3	-3	-3	-3	-3	-3	
Attenuation provided by moveable acoustic screen, dB	0	-6	-9	-10	-17	-25	-28	-30	
Total	***79***	***72***	***77***	***76***	***68***	***58***	***52***	***54***	**75**
Attenuation due to site barrier	10	13	15	18	21	24	27	30	
Predicted Daily Airborne Noise Level, dB $L_{Aeq,10h}$ at the nearest sensitive façade	**77**	**70**	**68**	**64**	**56**	**49**	**42**	**34**	**65**
Phase 2: Piling works (27 days)									
CFA Piling Rig (SPL@10m)	84	92	81	80	78	76	68	61	
Distance correction (min. 6m)									
Correction due to on- time (5 hours per day)	-3	-3	-3	-3	-3	-3	-3	-3	
Total	***81***	***89***	***78***	***77***	***75***	***73***	***65***	***58***	**81**
13 Tonne excavator (SPL@10m)	74	70	68	67	64	62	58	50	
Distance correction (min. 6m)									
Correction due to on- time (5 hours per day)	-3	-3	-3	-3	-3	-3	-3	-3	
Total	***71***	***67***	***65***	***64***	***61***	***59***	***55***	***47***	**67**
5 tonne dumper (SPL@10m)	90	86	72	71	71	71	66	59	
Correction due to on- time (30 minutes per day)	-13	-13	-13	-13	-13	-13	-13	-13	
Total	***77***	***73***	***59***	***58***	***58***	***58***	***53***	***46***	**64**

Concrete lorry (SPL@10m)	73	78	78	78	74	73	68	66	
Correction due to on- time (30 minutes per day)	-13	-13	-13	-13	-13	-13	-13	-13	
Total	***60***	***65***	***65***	***65***	***61***	***60***	***55***	***53***	**67**
Static concrete pump (SPL@10m)	82	82	72	71	69	68	62	54	
Correction due to on- time (5 hours per day)	-3	-3	-3	-3	-3	-3	-3	-3	
Attenuation provided by moveable acoustic screen, dB	0	-6	-9	-10	-17	-25	-28	-30	
Total	***79***	***73***	***60***	***58***	***49***	***40***	***31***	***21***	**61**
Attenuation due to site barrier	10	13	15	18	21	24	27	30	
Predicted Daily Airborne Noise Level, dB $L_{Aeq,10h}$ at the nearest sensitive façade	**74**	**77**	**63**	**59**	**54**	**49**	**39**	**29**	**64**

Phase 3: RC Frameworks (135 days)									
13 Tone Excavator	82	82	80	72	71	74	76	75	
Correction due to on- time (5 hours per day)	-3	-3	-3	-3	-3	-3	-3	-3	
Total	***79***	***79***	***77***	***69***	***68***	***71***	***73***	***72***	**79**
Muck Away Lorry	82	82	80	72	71	74	76	75	
Correction due to on- time (30 minutes per day)	-13	-13	-13	-13	-13	-13	-13	-13	
Total	***69***	***69***	***67***	***59***	***58***	***61***	***63***	***62***	**69**
Petrol Grinders	72	72	69	72	73	72	71	71	
Correction due to on- time (5 hours per day)	-3	-3	-3	-3	-3	-3	-3	-3	
Total	***69***	***69***	***66***	***69***	***70***	***69***	***68***	***68***	**76**
110V Hammer Drills	69	75	77	74	71	70	74	69	
Correction due to on- time (5 hours per day)	-3	-3	-3	-3	-3	-3	-3	-3	
Total	***66***	***72***	***74***	***71***	***68***	***67***	***71***	***66***	**76**
Static Concrete Pump	78	76	62	63	60	59	58	49	
Correction due to on- time (5 hours per day)	-3	-3	-3	-3	-3	-3	-3	-3	
Total	***75***	***73***	***59***	***60***	***57***	***56***	***55***	***46***	**64**
Concrete Lorry	83	77	70	70	70	68	64	58	
Correction due to on- time (30 minutes per day)	-13	-13	-13	-13	-13	-13	-13	-13	
Total	***70***	***64***	***57***	***57***	***57***	***55***	***51***	***45***	**62**
110V Concrete Vibrator/Poker	83	77	70	70	70	68	64	58	
Attenuation provided by moveable acoustic screen, dB	0	-6	-9	-10	-17	-25	-28	-30	
Correction due to on- time (5 hours per day)	-3	-3	-3	-3	-3	-3	-3	-3	
Total	***80***	***68***	***58***	***57***	***50***	***40***	***33***	***25***	**59**
Hand tools/ Impact battery cordless	83	77	70	70	70	68	64	58	
Attenuation provided by moveable acoustic screen, dB	0	-6	-9	-10	-17	-25	-28	-30	
Correction due to on- time (5 hours per day)	-3	-3	-3	-3	-3	-3	-3	-3	
Total	***80***	***68***	***58***	***57***	***50***	***40***	***33***	***25***	**59**
Attenuation due to site barrier	10	13	15	18	21	24	27	30	
Predicted Daily Airborne Noise Level, dB $L_{Aeq,10h}$ at the nearest sensitive façade	**75**	**69**	**64**	**57**	**53**	**50**	**49**	**44**	**61**

Appendix G

Construction Dust Assessment

Construction Dust Assessment	
Frognal Way, Camden	
Job number:	J0144
Document number:	J0144/1/F1
Date:	21 June 2017
Client:	MY Construction
Prepared by:	Mr Bob Thomas

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Contents

1 Introduction

1.1.1 Air Quality Assessments Ltd (AQA) has been commissioned by MY Construction to undertake an air quality and construction dust risk assessment for the development at 22 Frognal Way, Camden (see **Figure 1**). The construction phase will involve the demolition of existing buildings at the site followed by the construction of a new building. The site is bounded by Frognal Way to the west, with neighbouring dwellings and gardens to the north, east and south.

1.1.2 The relevant air quality legislation and the background air quality are presented to provide context with regard to fine particulate matter (PM_{10}).

1.1.3 The construction dust risk assessment describes the potential for construction activities to impact upon existing properties. The main pollutants of concern related to construction activities are dust and PM_{10}. The risk assessment has been prepared taking into account all relevant local and national guidance and regulations and follows the methodology in the London Plan SPG on The Control of Dust and Emissions During Construction and Demolition (GLA, 2014). The risk assessment will be used to inform the Construction Management Plan for the site.

1.1.4 The references and a glossary of common air quality terminology used in this assessment are shown in **Section 7** and **Section 8** respectively.

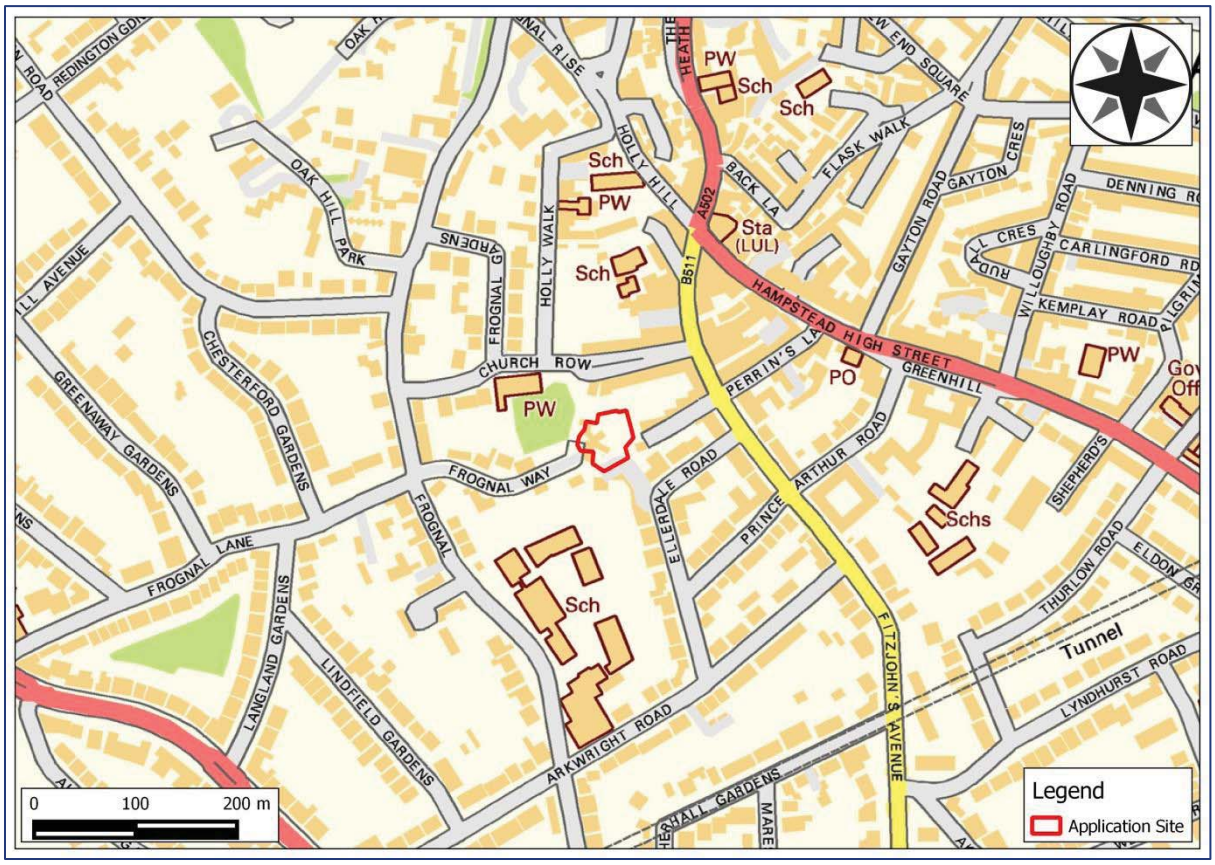

Figure 1: Site Location
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2 Air Quality Legislation

2.1. EU Limit Values

2.1.1 The European Union's Directive on ambient air quality and cleaner air for Europe (European Parliament, Council of the European Union, 2008) set legally binding limit values for PM_{10}. The Air Quality Standards Regulations 2010 (The Stationary Office, 2010) implement the EU Directive limit values in English legislation. Achievement of the limit values is a national obligation rather than a local one.

2.1.2 The limit values are the same as the objective values (see **Table 1**) however, the compliance dates differ, and the limit values apply at all locations (apart from where the public does not have access, where health and safety at work provisions apply and on the road carriageway). The PM_{10} limit value applied from 2005.

2.2. The Air Quality Strategy

2.2.1 Part IV of The Environment Act 1995 required the UK Government to prepare an Air Quality Strategy. The Air Quality Strategy (Defra, 2007), provides an overview and outline of ambient air quality policy in the UK and the devolved administrations. The strategy sets out air quality standards and objectives intended to protect human health and the environment.

2.2.2 Standards are the concentrations of pollutants in the atmosphere, below which there is a minimum risk of health effects or ecosystem damage; they are set with regard to scientific and medical evidence. Objectives are the policy targets set by the Government, taking account of economic efficiency, practicability, technical feasibility and timescale, where the standards are expected to be achieved by a certain date.

2.2.3 The Air Quality Strategy also describes the system of Local Air Quality Management (LAQM), introduced in Part IV of the Environment Act 1995, which requires every local authority to carry out regular review and assessments of air quality in its area. Where an objective has not been, or is unlikely to be achieved, the local authority must declare an Air Quality Management Area (AQMA), and prepare an action plan which sets out appropriate measures to be introduced in pursuit of the objectives.

2.2.4 The objectives for PM_{10}, as prescribed by the Air Quality (England) Regulations 2000 and the Air Quality (England) (Amendment) Regulations 2002 (The Stationary Office, 2000; The Stationary Office, 2002), are shown in **Table 1**. The objectives for PM_{10} were to have been achieved by 2004, and continue to apply in all future years thereafter.

Table 1: The Objectives for PM_{10}

Pollutant	Concentration Measured As	Objective
PM_{10}	24-hour Mean	50 µg/m^3 not to be exceeded more than 35 times a year
	Annual Mean	40 µg/m^3

2.2.5 The objectives apply at locations where members of the public are likely to be regularly present and are likely to be exposed for a period of time appropriate to the averaging period of the objective. Examples of where the objectives should apply are provided in the Local Air Quality Management Technical Guidance (Defra, 2016) issued by the Department for Environment, Food and Rural Affairs (Defra). The annual mean PM_{10} objectives should apply at the building façades of residential properties, schools, hospitals, care homes etc.; they should not apply at the building façades of places of work, hotels, gardens or kerbside sites. The 24-hour mean PM_{10} objective should apply at all locations where the annual mean objective applies, as well as the gardens of residential properties and hotels.

3 Air Quality and Dust Risk Assessment

3.1. Introduction

3.1.1 Without mitigation, there is a risk that the construction phase of the development will lead to dust soiling and elevated concentrations of PM_{10}. These impacts may occur during demolition, earthworks and construction, as well as from trackout of dust onto the public highway, as vehicles leave the construction site.

3.2. Existing Conditions

LAQM Review and Assessment

3.2.1 Camden Council has declared the entire borough an air quality management area (AQMA) due to exceedences of the annual mean nitrogen dioxide and 24-hour mean PM_{10} objectives.

Local Air Quality Monitoring

3.2.2 Camden Council operates four automatic monitoring sites within its area that measure PM_{10} concentrations. Measured data from the closest monitoring site, at Swiss Cottage, approximately 1.2 km south of the construction site, are shown in **Table 2,** and the monitoring site location is shown in **Figure 2**.

Table 2: Summary of PM_{10} Monitoring Data (2009 to 2016) [a]

Site Name	Site Type	2009	2010	2011	2012	2013	2014	2015	2016
Annual Mean (µg/m^3)									
Swiss Cottage	Kerbside	25	26	27	23	21	22	20	21
Objective		**40**							
Number of Days > 50 µg/m^3									
Swiss Cottage	Kerbside	25	26	31	21	8	12 (40.8) [b]	8	7
Objective		**35**							

a The data have been taken from Camden Councils LAQM reports and the London Air website (London Borough of Camden, 2014; London Borough of Camden, 2015; ERG, Kings College London, 2017).

b The number in parenthesis is the 90th percentile of 24-hr mean concentrations as data capture was less than 90%.

3.2.3 The data in **Table 2** shows that the annual mean and 24-hour mean objectives for PM_{10} have been achieved at the kerbside monitoring site at Swiss Cottage between 2009 to 2016. The monitoring site is located adjacent to the heavily trafficked Finchley Road (A41) close to a congested junction. The construction site is in a residential area adjacent to a quiet road, where PM_{10} concentrations are likely to be much lower, and close to background levels.

Figure 2: Camden Council's Swiss Cottage PM_{10} Monitoring Site
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Background Concentrations

3.2.4 The estimated annual mean background concentration of PM_{10} at the construction site, taken from background pollutant concentration maps published by Defra (Defra, 2017), are shown in **Table 3**. The estimated background concentration is well below the annual mean objective.

Table 3: Estimated Annual Mean Background Concentrations in 2017 (µg/m^3)

Grid	PM_{10}
526500,185500	18.7
Objective	**40**

3.3. Dust Risk Assessment

Methodology

3.3.1 A construction dust risk assessment has been undertaken following the guidance in the London Plan SPG on The Control of Dust and Emissions During Construction and Demolition (GLA, 2014), which utilises the methodology in the Institute of Air Quality

Management (IAQM) Guidance on the Assessment of Dust from Demolition and Construction (IAQM, 2014).

3.3.2 The guidance divides activities on construction sites into four main types: demolition, earthworks, construction and trackout. The methodology is based on a sequence of steps. Step 1 screens the requirement for more detailed assessment; if there are no receptors within 50 m of the site boundary, or within 50 m of roads used by construction vehicles, then there is no need for further assessment. Step 2 assesses the risk of dust impacts from each of the four activities, considering the scale and magnitude of the works (Step 2A), and the sensitivity of the area (Step 2B). Site-specific mitigation for each of the four activities is then determined based on a dust risk category defined at Step 2C. **Appendix A1** sets out the construction dust assessment methodology in more detail.

Screening

3.3.3 There are human receptors within 50 m of the construction site to the north, east, south and west. There are also receptors within 50 m of the route used by construction vehicles on the public highway, up to 500 m from the site entrance. Therefore, further assessment of the construction phase impacts is necessary. There are no ecological receptors within 50 m of the construction site, and the effects on ecology will not be considered further.

Risk of Dust Impacts

Potential Dust Emission Magnitude

3.3.4 Buildings with a total volume of around 3,500 m^3 will need to be demolished. These buildings are made of potentially dusty materials, such as brick and concrete; however, the buildings are a single storey. Given the low volume and height of the buildings to be demolished and based on the example definitions in **Table A1** in **Appendix A1**, the dust emission class for demolition is considered to be small.

3.3.5 Earthworks are estimated to be required across an area of around 1,000 m^2 during landscaping works, and the preparation of the ground for the construction of the basement. Data from the UK Soil Observatory (NERC, 2017) have been used to determine that the soil at the site has a medium to light (silty) to heavy clayey-loam to silty-loam texture, and may be prone to suspension when dry. Given the small size of the site, based on the example definitions in **Table A1** in **Appendix A1**, the dust emission class for earthworks is considered to be small.

3.3.6 The new building, including the basement, will have a total volume of around 8,000 m^3. Piling will be used, and the building will be constructed using brick and concrete; however, given the small scale of the construction, and based on the example definitions in **Table A1** in **Appendix A1**, the dust emission class for construction is considered to be small.

3.3.7 The number of daily outward heavy duty vehicle (HDV) movements from the application site during the construction phase has been estimated at no more than 10 during the height of the construction phase. Vehicle movements on the site will be limited to a small, dedicated unloading/loading area at the site boundary and

there will be no trackout from the construction site itself. Based on the example definitions in **Table A1** in **Appendix A1**, the dust emission class for trackout is considered to be small.

3.3.8 A summary of the likely dust emission magnitudes is shown in **Table 4**.

Table 4: Likely Dust Emission Magnitudes

Source	Dust Emission Magnitude
Demolition	Small
Earthworks	Small
Construction	Small
Trackout	Small

Sensitivity of the Area

3.3.9 The sensitivity of the area depends on the specific sensitivities of local receptors, the proximity and number of receptors, local PM_{10} background concentrations and other site specific factors, e.g. natural screening by trees.

Sensitivity of the Area to Dust Soiling

3.3.10 Residential properties are considered to be 'high' sensitivity receptors to dust soiling (see **Table A2** in **Appendix A1**).

3.3.11 There are approximately 10 residential buildings within 20 m of the application site boundary to the north, east and south; however, the distance to any construction activity will be further. With reference to **Table A5** in **Appendix A1**, the area is thus considered to be of medium sensitivity to dust soiling.

3.3.12 **Table 4** shows that the dust emission magnitude for trackout is small; therefore there is a risk of material being tracked up to 50 m from the site exit. Site traffic will access the site along Frognal Way. There are around four residential properties on Frognal Way within 20m of the road up to 50 m from the site along which material could be tracked. With reference to **Table A5** in **Appendix A1**, the area is thus considered to be of medium sensitivity to dust soiling from trackout.

Sensitivity of the Area to the Health Effects of PM_{10}

3.3.13 Residential properties are considered to be 'high' sensitivity receptors to the health effects of PM_{10} (see **Table A3** in **Appendix A1**).

3.3.14 The construction site is located in a residential area, away from any significant PM_{10} emissions sources (i.e. road traffic), and air quality at receptors near the site is likely to be close to the annual mean background level of 18.7 $\mu g/m^3$ (see **Section 3.2**).

3.3.15 With reference to **Table A6** in **Appendix A1**, the area is thus described to be of low sensitivity to the health effects of PM_{10}.

3.3.16 Frognal Way is a cul-de-sac and very lightly trafficked, with PM_{10} concentrations likely to remain close to background levels. The area adjacent to the surrounding

roads along which material could be tracked is thus described to be of low sensitivity to the health effects of PM_{10}.

3.3.17 A summary of the sensitivity of the area to the effects of the construction works is shown in **Table 5**.

Table 5: Summary of the Area Sensitivity

Potential Effect	Sensitivity of the Area	
	On-site Works	Trackout
Dust Soiling	Medium	Medium
Health	Low	Low

Risk of Impact and Significance

3.3.18 The dust emission magnitudes in **Table 4** have been combined with the area sensitivities in **Table 5** and a risk category has been assigned to each construction activity using the matrix in **Table A8** in **Appendix A1**. The resultant risk categories, shown in **Table 6**, have then been used to determine the appropriate level of mitigation necessary.

Table 6: Summary of the Risk of Impacts Without Mitigation

Construction Activity	Dust Soiling	Health
Demolition	Low	Negligible
Earthworks	Low	Negligible
Construction	Low	Negligible
Trackout	Negligible	Negligible

4 Mitigation

4.1.1 Overall, the construction site has been identified as a low risk site for dust soiling and a negligible risk site for health effects, as set out in **Table 6**. The dust risk categories have been used, along with the professional judgement of the consultant, to determine the appropriate level of mitigation at the site. The professional experience of the consultant preparing the report is set out in **Appendix A2**.

4.1.2 The mitigation measures, taken from the London Plan SPG on The Control of Dust and Emissions During Construction and Demolition (GLA, 2014), are described below.

4.1.3 The mitigation measures will be included in an Air Quality and Dust Management Plan (AQDMP), which should be submitted to the local planning authority for approval prior to commencement of work on site.

Site Management

- Display the name and contact details of person(s) accountable for air quality pollutant emissions and dust issues on the site boundary;
- Display the head or regional office contact information;
- Record and respond to all dust and air quality pollutant emissions complaints;
- Make a complaints log available to the local authority when asked;
- Carry out regular site inspections to monitor compliance with air quality and dust control procedures, record inspection results, and make an inspection log available to the local authority when asked;
- Increase the frequency of site inspections by those accountable for dust and air quality pollutant emissions issues when activities with a high potential to produce dust and emissions and dust are being carried out, and during prolonged dry or windy conditions; and
- Record any exceptional incidents that cause dust and air quality pollutant emissions, either on or off the site, and the action taken to resolve the situation in the log book.

Preparing and Maintaining the Site

- Plan the site layout: machinery and dust-causing activities should be located away from receptors;
- Erect solid screens or barriers around dust activities or the site boundary that are, at least, as high as any stockpiles on site;
- Avoid site runoff of water or mud;
- Keep site fencing, barriers and scaffolding clean using wet methods;
- Remove materials from site as soon as possible; and
- Cover, seed or fence stockpiles to prevent wind whipping.

Operating Vehicle/Machinery and Sustainable Travel

- Ensure all on-road vehicles comply with the requirements of the London Low Emission Zone;

- Ensure all non-road mobile machinery (NRMM) comply with the standards set within the London Plan SPG on The Control of Dust and Emissions During Construction and Demolition;
- Ensure all vehicles switch off their engines when stationary – no idling vehicles;
- Avoid the use of diesel- or petrol-powered generators and use mains electricity or battery-powered equipment where possible; and
- Implement a Travel Plan that supports and encourages sustainable travel (public transport, cycling, walking, and car-sharing).

Operations

- Only use cutting, grinding or sawing equipment fitted or in conjunction with suitable dust suppression techniques such as water sprays or local extraction, e.g. suitable local exhaust ventilation systems;
- Ensure an adequate water supply on the site for effective dust/particulate matter mitigation (using recycled water where possible);
- Use enclosed chutes, conveyors and covered skips; and
- Minimise drop heights from conveyors, loading shovels, hoppers and other loading or handling equipment and use fine water sprays on such equipment wherever appropriate.

Waste Management

- Reuse and recycle waste to reduce dust from waste materials; and
- Avoid bonfires and burning of waste materials.

Measures Specific to Demolition

- Soft strip inside buildings before demolition (retaining walls and windows in the rest of the building where possible, to provide a screen against dust);
- Ensure water suppression is used during demolition operations;
- Avoid explosive blasting, using appropriate manual or mechanical alternatives; and
- Bag and remove any biological debris or damp down such material before demolition.

Measures Specific to Construction

- Avoid scabbling (roughening of concrete surfaces) if possible; and
- Ensure sand and other aggregates are stored in bunded areas and are not allowed to dry out, unless this is required for a particular process, in which case ensure that appropriate additional control measures are in place.

Measures Specific to Trackout

- Ensure vehicles accessing the site are covered to prevent escape of materials during transport.

5 Conclusion

5.1.1 The IAQM guidance is clear that, with appropriate mitigation in place, the residual effect will normally be 'not significant'.

5.1.2 During adverse weather conditions, or where there is an interruption to the water supply, there may be occasional, short-term dust annoyance; however, the likely scale and duration of these effects would not change the conclusion that the residual effects are insignificant.

6 References

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The Stationary Office (2010) *Statutory Instrument 2010, No 1001, The Air Quality Standards Regulations 2010*, London.

7 Glossary

AQMA	Air Quality Management Area
Defra	Department for Environment, Food and Rural Affairs
Exceedence	A period of time when the concentration of a pollutant is greater than the appropriate air quality objective. This applies to specified locations with relevant exposure
HDV	Heavy Duty Vehicles (> 3.5 tonnes)
IAQM	Institute of Air Quality Management
LAQM	Local Air Quality Management
µg/m^3	Microgrammes per cubic metre
Objectives	A nationally defined set of health-based concentrations for nine pollutants, seven of which are incorporated in Regulations, setting out the extent to which the standards should be achieved by a defined date. There are also vegetation-based objectives for sulphur dioxide and nitrogen oxides
PM_{10}	Small airborne particles, more specifically particulate matter less than 10 micrometres in aerodynamic diameter
Standards	A nationally defined set of concentrations for nine pollutants below which health effects do not occur or are minimal

8 Appendices

A1 Air Quality and Dust Risk Assessment Methodology

A1.1. Introduction

A1.1.1 The London Plan SPG on the Control of Dust and Emissions During Construction and Demolition (GLA, 2014) divides activities on construction sites into four types to reflect their different potential impacts:

- demolition;
- earthworks;
- construction; and
- trackout.

A1.1.2 A series of steps then consider the potential impact due to:

- the risk of health effects from an increase in exposure to PM_{10} and $PM_{2.5}$;
- annoyance due to the deposition of dust;
- harm to the natural environment.

A1.2. Step 1: Screen the Need for a Detailed Assessment

A1.2.1 An assessment is required where there is a human receptor within 50 m of the site boundary, and/or within 50 m of the route(s) used by construction vehicles on the public highway, up to 500 m from the site entrance(s), or where there is an ecological receptor within 50 m of the site boundary, and/or within 50 m of the route(s) used by construction vehicles on the public highway, up to 500 m from the site entrance(s).

A1.2.2 Where the need for a more detailed assessment is screened out, it can be concluded that the level of risk is negligible, and any effects will be not significant.

A1.3. Step 2: Assess the Risk of Dust Impacts

A1.3.1 A site is allocated to a risk category based on two factors:

- the scale and nature of the works, which determines the potential dust emissions magnitude (Step 2A); and
- the sensitivity of the area to dust impacts (Step 2B).

A1.3.2 These two factors are combined at Step 2C to determine the risk of dust impacts from each type of construction activity, with no mitigation applied.

Step 2A: Potential Dust Emissions Magnitude

A1.3.3 The dust emission magnitude is classified as small, medium or large. Examples of how the potential dust emission magnitude for each activity can be defined are shown in **Table A1**.

Table A1: Examples of How the Dust Emission Magnitude can be Defined

Class	Example
Demolition	
Large	Total building volume >50,000 m^3, potentially dusty construction material (e.g. concrete), on site crushing and screening, demolition activities >20 m above ground level.
Medium	Total building volume 20,000 m^3 – 50,000 m^3, potentially dusty construction material, demolition activities 10-20 m above ground level.
Small	Total building volume <20,000 m^3, construction material with low potential for dust release (e.g. metal cladding or timber), demolition activities <10 m above ground, demolition during wetter months.
Earthworks	
Large	Total site area >10,000 m^2, potentially dusty soil type (e.g. clay, which will be prone to suspension when dry to due small particle size), >10 heavy earth moving vehicles active at any one time, formation of bunds >8 m in height, total material moved >100,000 tonnes.
Medium	Total site area 2,500 m^2 – 10,000 m^2, moderately dusty soil type (e.g. silt), 5-10 heavy earth moving vehicles active at any one time, formation of bunds 4 m – 8 m in height, total material moved 20,000 tonnes – 100,000 tonnes.
Small	Total site area <2,500 m^2, soil type with large grain size (e.g. sand), <5 heavy earth moving vehicles active at any one time, formation of bunds <4 m in height, total material moved <20,000 tonnes, earthworks during wetter months.
Construction	
Large	Total building volume >100,000 m^3, piling, on site concrete batching; sandblasting.
Medium	Total building volume 25,000 m^3 – 100,000 m^3, potentially dusty construction material (e.g. concrete), on site concrete batching.
Small	Total building volume <25,000 m^3, construction material with low potential for dust release (e.g. metal cladding or timber).
Trackout [a]	
Large	>50 HDV (>3.5t) outward movements in any one day, potentially dusty surface material (e.g. high clay content), unpaved road length >100 m.
Medium	10-50 HDV (>3.5t) outward movements in any one day, moderately dusty surface material (e.g. high clay content), unpaved road length 50 m – 100 m.
Small	<10 HDV (>3.5t) outward movements in any one day, surface material with low potential for dust release, unpaved road length <50 m.

a These numbers are for vehicles that leave the site after moving over unpaved ground.

Step 2B: Define the Sensitivity of the Area

A1.3.4 The sensitivity of the area takes account of:

- the specific sensitivities of receptors in the area;
- the proximity and number of those receptors;
- in the case of PM_{10}, the local background concentrations; and
- site-specific factors, such as whether there are natural shelters, such as trees, to reduce the risk of wind-blown dust.

A1.3.5 The specific sensitivities of different types of receptor to dust soiling and PM_{10} are shown **Table A2**, **Table A3** and **Table A4**. Professional judgement should be used to identify where on the spectrum of sensitivity a receptor lies, taking account of specific circumstances, i.e. the first occupants of residential units on a phased development may be expected to be less sensitive to dust soiling.

A1.3.6 The sensitivity of the area is then determined from the specific sensitivities of the receptors using the matrices set out in **Table A5**, **Table A6** and **Table A7**. Professional judgement should be used to determine the final sensitivity of the area, taking account of:

- any history of dust generating activities in the area:
- the likelihood of concurrent dust generating activity on nearby sites;
- any pre-existing screening between source and receptors;
- any conclusions drawn from analysing local meteorological data which accurately represents the area; and if relevant, the season during which the works will take place;
- any conclusions drawn from local topography;
- duration of the potential impact, as a receptor may become more sensitive over time; and
- any other known specific receptor sensitivities.

Step 2C: Define the Risk of Impacts

A1.3.7 The dust emission magnitude determined at Step 2A is combined with the sensitivity of the area determined at Step 2B to determine the risk of impacts with no mitigation applied. The level of risk for each activity is determined using the matrix in **Table A8**.

A1.4. Determine Site Specific Mitigation

A1.4.1 The dust risk category determined at Step 2C has been used, along with the professional judgement of the consultant, to determine the appropriate level of mitigation at the site. The highly recommended and desirable mitigation measures set out in the London Plan SPG form the basis of the mitigation set out in **Section 4**.

A1.4.2 The mitigation measures will inform an Air Quality and Dust Management Plan (AQDMP), which will be submitted to the local authority for approval prior to works commencing on-site.

A1.4.3 The London Plan SPG is clear that the primary aim of the risk assessment is to identify site specific mitigation that, once adopted, will ensure that there will be no significant effect.

Table A2: Sensitivities of People to Dust Soiling

Class	Principles	Examples
High	Users can reasonably expect enjoyment of a high level of amenity; or the appearance, aesthetics or value of their property would be diminished by soiling; and the people or property would reasonably be expected a to be present continuously, or at least regularly for extended periods, as part of the normal pattern of use of the land.	Dwellings, museum and other culturally important collections, medium and long term car parks and car showrooms.
Medium	Users would expect to enjoy a reasonable level of amenity, but would not reasonably expect to enjoy the same level of amenity as in their home; or the appearance, aesthetics or value of their property could be diminished by soiling; or the people or property wouldn't reasonably be expected to be present here continuously or regularly for extended periods as part of the normal pattern of use of the land.	Parks and places of work.
Low	The enjoyment of amenity would not reasonably be expected; or property would not reasonably be expected to be diminished in appearance, aesthetics or value by soiling; or there is transient exposure, where the people or property would reasonably be expected to be present only for limited periods of time as part of the normal pattern of use of the land.	Playing fields, farmland (unless commercially-sensitive horticultural), footpaths, short term car parks and roads.

Table A3: Sensitivities of People to PM_{10}

Class	Principles	Examples
High	Locations where members of the public may be exposed for eight hours or more in a day.	Residential properties, hospitals, schools and residential care homes.
Medium	Locations where the people exposed are workers, and where individuals may be exposed for eight hours or more in a day.	Office and shop workers, but will generally not include workers occupationally exposed to PM_{10}
Low	Locations where human exposure is transient.	Public footpaths, playing fields, parks and shopping streets.

Table A4: Sensitivities of Receptors to Ecological Effects

Class	Principles	Examples
High	Locations with an international or national designation and the designated features may be affected by dust soiling; or locations where there is a community of a particularly dust sensitive species.	Special Areas of Conservation (SAC) with dust sensitive features.
Medium	Locations where there is a particularly important plant species, where its dust sensitivity is uncertain or unknown; or locations with a national designation where the features may be affected by dust deposition.	Sites of Special Scientific Interest (SSSI) with dust sensitive features.
Low	Locations with a local designation where the features may be affected by dust deposition.	Local Nature Reserves with dust sensitive features.

Table A5: Sensitivity of the Area to Dust Soiling Effects on People and Property[1]

Receptor Sensitivity	Number of Receptors	Distance from the Source (m)			
		<20	<50	<100	<350
High	**>100**	High	High	Medium	Low
	10-100	High	Medium	Low	Low
	1-10	Medium	Low	Low	Low
Medium	**>1**	Medium	Low	Low	Low
Low	**>1**	Low	Low	Low	Low

Table A6: Sensitivity of the Area to Human Health Effects[1]

Receptor Sensitivity	Annual Mean PM_{10}	Number of Receptors	Distance from the Source (m)				
			<20	<50	<100	<200	<350
High	**>32 µg/m^3**	**>100**	High	High	High	Medium	Low
		10-100	High	High	Medium	Low	Low
		1-10	High	Medium	Low	Low	Low
	28-32 µg/m^3	**>100**	High	High	Medium	Low	Low
		10-100	High	Medium	Low	Low	Low
		1-10	High	Medium	Low	Low	Low
	24-28 µg/m^3	**>100**	High	Medium	Low	Low	Low
		10-100	High	Medium	Low	Low	Low
		1-10	Medium	Low	Low	Low	Low
	<24 µg/m^3	**>100**	Medium	Low	Low	Low	Low
		10-100	Low	Low	Low	Low	Low
		1-10	Low	Low	Low	Low	Low
Medium	**-**	**>10**	High	Medium	Low	Low	Low
	-	**1-10**	Medium	Low	Low	Low	Low
Low	**-**	**>1**	Low	Low	Low	Low	Low

[1] For demolition, earthworks and construction, the distances are measured from the dust source, or the application site boundary. For trackout, the distances are measured from the side of the roads used by construction traffic. Without site-specific mitigation, trackout may occur from roads up to 500 m from large sites, 200 m from medium sites and 50 m from small sites, as measured from the site exit. The impact declines with distance from the site, and it is only necessary to consider trackout impacts up to 50 m from the edge or the road.

Table A7: Sensitivity of the Area to Ecological Effects[1]

Receptor Sensitivity	Distance from the Source (m)	
	<20	<50
High	High	Medium
Medium	Medium	Low
Low	Low	Low

Table A8: Defining the Risk of Dust Impacts

Sensitivity of the Area	Dust Emission Magnitude		
	Large	Medium	Small
Demolition			
High	High Risk	Medium Risk	Medium Risk
Medium	High Risk	Medium Risk	Low Risk
Low	Low Risk	Low Risk	Negligible
Earthworks			
High	High Risk	Medium Risk	Low Risk
Medium	Medium Risk	Medium Risk	Low Risk
Low	Low Risk	Low Risk	Negligible
Construction			
High	High Risk	Medium Risk	Low Risk
Medium	Medium Risk	Medium Risk	Low Risk
Low	Low Risk	Low Risk	Negligible
Trackout			
High	High Risk	Medium Risk	Low Risk
Medium	Medium Risk	Low Risk	Negligible
Low	Low Risk	Low Risk	Negligible

A2 Professional Experience

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Bob Thomas is a Director at AQA, with over nine years' experience in the field of air quality management and assessment. He has carried out air quality assessments for a wide range of developments, including residential, commercial, industrial, minerals and waste developments. He has been responsible for air quality projects that include ambient air quality monitoring of nitrogen dioxide, dust and PM_{10}, the assessment of nuisance odours and dust, and the preparation of Review and Assessment reports for local authorities. He has extensive dispersion modelling experience for road traffic, energy centre and industrial sources, and has completed many stand-alone reports and chapters for inclusion within an Environmental Statement. Bob has worked with a variety of clients to provide expert air quality services and advice, including local authorities, planners, developers, architects and process operators, and has provided expert witness services at public inquiry. He is a Chartered Scientist, a Member of the Institute of Air Quality Management and a Member of the Institution of Environmental Sciences.

A full CV for Bob Thomas is available at http://aqassessments.co.uk/about