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Land to the North of Middlefield

Redevelopment for Three Mews Houses

Construction Traffic Management Plan (CTMP)

October 2015

A report prepared on behalf of Mr M Ofori

Contents

1 Introduction

1.1 Background

1.1.1 This document sets out the logistics and traffic management arrangements associated with the demolition of a series of garages and the construction of three terraced mews houses with basement provision and a further three storeys (ground to second). These properties would form an additional cul-de-sac off of the existing Middlefield residential development area and within the wider St John's Wood Park residential area.

1.1.2 The site of the construction project would occupy a plot which currently comprises seventeen of the twenty-four garage units at the northern end of Middlefield, to the north of Nos. 1-13 Middlefield (the odd-numbered houses), and part of the hardstanding immediately in front of these units. The easternmost seven of this set of garages and the land adjacent to these form part of a separate proposed single residential dwelling of No. 1b St John's Wood Park.

1.1.3 The general site area is shown on the OS extract below outlined in red, with the adjacent separate proposed single residential dwelling outlined in green.

Plan 1: General Site Area

1.1.4 The site area measures at around 400sqm.. The sub-structure basement level within the new-build construction would extend across the full extent of the site footprint other than the front strip of 1.8m in width which, whilst to be excavated, would form a lightwell to the basement level. The super-structure would comprise three storeys each comprising a footprint of around 300sqm., with the upper two storeys marginally set back at either end.

1.1.5 The overall programme for the works has an anticipated duration of around twenty-four months (two years), with an anticipated start during the early part of 2018 and full completion anticipated by the end of 2019. The current timetable is based on the proposed construction of the separate proposed single residential dwelling adjacent to the site, and under the ownership of the applicant, being fully-completed prior to the works on the mews houses.

1.1.6 This programme includes the initial preparation phases and the removal of the existing garage units, with a corresponding duration of around two months; the sub-structure (basement) works including the underpinning / retaining wall installation and subsequent excavation totalling around six months; the super-structure works including the flooring and internal walls totalling between ten months; and full fit-out totalling six months.

1.1.7 This document accompanies the planning application for the construction of three terraced mews houses with basement provision and a further three storeys (ground to second), as an infill between existing properties at Middlefield to the south and Court Close to the north. This is to provide the Council (London Borough of Camden – LBC) with the level of comfort that the impacts of the construction work have been assessed and a control mechanism for the Contractor to use as a template to adhere to when constructing the scheme.

1.1.8 Given the anticipated start date of the works, it should be noted that no contractor has been appointed at this planning stage but TPHS and the project team have significant experience and understanding of the logistics issues of this type of construction to be able to provide this initial report, which will be taken on board by the contractor and as necessary updated and enhanced with their own methods when they are appointed to undertake the works.

1.1.9 It is expected that this document is a live document to be updated by the contractor regularly to ensure conformity to good practice and considerate contractor principles, thus to ensure the minimum impact of the construction on the local area.

1.1.10 This version of the CTMP has been prepared based upon the information presented in the series of planning drawings prepared by Shaun Knight Architecture, with particular reference to the floor plans and elevation drawing, and typical structural engineering details in relation to matters such as the form and extent of piling works and related features.

1.2 Structure of the CTMP

1.2.1 Following this introductory section of the CTMP, there are a further four sections contributing to this 'live' document. These sections are as follow:

- Section 2, '*Objectives and Benefits*', which details the overarching objectives of the implementation of the CTMP, the benefits which the CTMP shall support and the anticipated outputs of having implemented and maintained the CTMP.

- Section 3, '*Construction Programme & Phasing*', which considers the current anticipated different phases of construction, the anticipated vehicle activity and the role of local sourcing and consolidation to maximise efficiencies and reduce vehicle movements.

- Section 4, '*Construction Access Arrangements*', which details the access arrangements, routings and controls for vehicles and non-vehicle groups, as well as presenting an overview risk assessment for the access arrangements.

- Section 5, '*Monitoring & Review*', which outlines the roles and responsibilities of the key parties, both for the site and for the interface with other local bodies, as well as the form of monitoring to be adopted for particular work-related activities.

2 Objectives & Benefits

2.1 Objectives of the CTMP

2.1.1 This Construction Traffic Management Plan (CTMP) provides a framework to support better management of all construction-related activity at the Middlefield site, in particular considering how the impacts of the construction activity can be mitigated and lessened as they relate to movements to and from the site. In line with good practice, the overarching objectives of this CTMP are five-fold:

- Demonstrate how construction materials and construction waste will be delivered and removed safely, efficiently and sustainably respectively.

  This objective will be demonstrated by presenting details of the access and delivery layout arrangements for the site, the typical timetabling associated with the movement of materials and waste and the use of local material sourcing.

- Identify those deliveries which could be reduced, re-timed or consolidated, particularly during busy periods.

  This objective will be demonstrated by the use of local sourcing and consolidation, to reduce the number of vehicles likely to be travelling on the local highway network, as well presenting details of the pre-booking system which will seek to ensure that those operations which don't require peak hour travel will not travel at those times.

- Help cut congestion and ease any environmental pressures.

  This objective will be demonstrated by considering the potential reductions in typical vehicle movements that the use of local material sourcing and consolidation will support, of the role of the pre-booking system to maximise non-peak movement where practical to do so and of the staff travel strategy.

- Improve reliability of deliveries to the site.

  This objective will be demonstrated by presenting details of the routing strategy where these routes can be fixed and the pre-booking system which will support non-peak travel where practical to do so and efficiency in terms of access arrangements for the site.

- Reduce the fuel costs of the freight operators.

  This objective will be demonstrated again by considering in particular the role of local sourcing and consolidation in reducing vehicle movements, as well as the types of vehicles which will best support the scope to minimise vehicle movements to and from the site.

2.2 Benefits of the CTMP

2.2.1 This document, whilst working towards supporting the broad objectives, seeks to provide benefits to a number of key groups: the London Borough of Camden and its residents, particularly residents in Middlefield and the surrounding streets of St John's Wood Park, the site works contractor and the individual freight operators and suppliers then engaged.

2.2.2 These benefits will come forward by means of facilitating a well-managed construction site, a managed access strategy and the managed movement of construction materials.

2.2.3 As a result of the measures which will be brought forward to support the broad objectives, it is anticipated that the general public in the local area, residents and businesses, and the local planning and highway authorities, will benefit from:

- less congestion on the local highway network;
- reduced emissions to limit the environmental impacts relating to freight movement;
- reduced risk of collisions (vehicle-vehicle and vehicle-pedestrian);
- no additional traffic and parking enforcement costs;
- sustained quality of life for local residents, workers and visitors.

2.2.4 Similarly, as a result of the measures which will be brought forward to support the objectives, it is anticipated that the site works contractor and the supporting freight operators and suppliers will benefit from:

- reduced vehicle delivery costs, through more reliable deliveries and less disruption to the construction programme;
- time savings by identifying local sources for materials and consolidation, as well as through operating a pre-booking system for vehicle movements;
- avoidance of risk of penalty charges through provision of a defined and dedicated area for the purpose of loading and unloading of goods and materials;
- fuel savings through reduced vehicle movements and timed deliveries;
- increased certainty over delivery times allowing better route and day planning;
- reduced risk of collisions involving vehicle fleet with appropriate specifications.

2.2.5 These benefits will arise from a number of measures, but in particular underpinned by the local sourcing of staff and materials as appropriate, the consolidation of pick-up and deliveries at the site, the use of a pre-booking system to maximise those movements which can be undertaken outside of the peaks, appropriate access and arrangements for the loading and unloading of vehicles, the identification of vehicle routing strategies and the implementation of a staff travel policy.

2.3 Anticipated Outputs of the CTMP

2.3.1 This is a 'live' document. As such, it is anticipated that as a contractor is appointed by the client to undertake the works they will update and refine this document and submit this to the planners at LB Camden to update any specific details that they consider would enhance this plan and update any working methodology to align with the general practices outlined to achieve the program; otherwise, they will confirm that there are no material changes.

2.3.2 Also, as the construction programme progresses this CTMP will be regularly reviewed prior to key work stages and updated accordingly if required, to ensure that the measures and strategies put forward for implementation at this stage continue to be those most appropriate to balance the needs of the contractor to deliver the development in a timely and costly manner and the needs to support the local community and the environment in reducing and mitigating the construction impacts.

2.3.3 Specifically, it is anticipated that the CTMP will deliver the following:

- maximisation of the number of vehicles to be removed from the highway network as a result of the consolidation of materials and goods and the use of larger-sized vehicles;
- maximisation of the number of vehicles to be travelling locally only as a result of sourcing specific materials directly from local suppliers, where consolidation not viable;
- removal of the likelihood of construction vehicles waiting inappropriately on-street as a result of dedicated arrangements for loading / unloading and the pre-booking system;
- maximisation of non-peak movements and minimisation of peak movements, by having those not needing to deliver during the peak hours restricted to the non-peak periods;
- minimisation of staff travel by private vehicle by virtue of the car parking strategy associated with the site and the obligation of contractor staff to use non-car modes.

3 Construction Programme & Phasing

3.1 Summary Programme

3.1.1 The current programme for the construction works, including full fit-out, is anticipated to run from around the start of 2018 through to the end of 2019 inclusive, subject to planning. This is an overall period of around 24 months (two years) based on the delivery of three terraced mews houses with basement provision and a further three storeys (ground to second), with the programme dates following those for the proposed single residential dwelling adjacent.

3.1.2 Should the full construction and build works related to the proposed single residential dwelling adjacent to the development be completed earlier than the end of 2017, which is the current anticipated completion date put forward based on similarly a two-year works timeframe, the scheme promoter for the terraced mews houses (which is the same as single dwelling) would look to bring forward the start date but with the same duration thereafter.

3.1.3 The programme comprises four key stages: site preparatory works prior to excavation and thus including the removal of the existing garage units, excavation and sub-structure works including steel erection and piling / concrete works, super-structure works similarly including steel, concrete and brick works, and the full fit-out and final decoration works.

3.2 Phasing Details

3.2.1 As referenced in relation to the summary programme, the construction works at the site would comprise a number of distinct stages. It is currently planned that the full development would be built over a period of approximately twenty-four months through to final fit-out, with initial enabling works planned and anticipated to commence around the start of 2018 but with this start date brought forward should works on the adjacent finish earlier.

Phase 1 – Administrative & Preparatory Works

3.2.2 During this first phase, the initial site set-up to install the contractors' equipment, welfare facilities, erecting of hoardings and general preparation of the site would be undertaken. Site preparation would include also the removal of the existing garage units to provide a clear site. These full preparatory works would have a duration of approximately 8 weeks (two months).

3.2.3 The initial preparatory works would involve deliveries of plant and equipment by smaller HGV vehicles, such as short flat-bed or grab lorries, or panel vans daily and with several trips per day, with similarly the removal of the waste associated with the existing garage units to be demolished involving the use of smaller-sized HGV vehicles with several trips per day.

3.2.4 Also, it will be during this initial phase that a number of administrative tasks would be undertaken, such as the application for licences and/or orders as appropriate but only for those required at that stage. Such licences may relate to the implementation of the hoarding line and the undertaking of the demolition works. At the start of this period, if not prior, there would be engagement with neighbours with regard to management of parking along the stretch of Middlefield between Boundary Road and site, which would need to be restricted.

Phase 2 – Excavation & Sub-Structure Works

3.2.5 The next phase of work would be to install the retaining wall around the perimeter of the site build area as a series of underpinned sections, so as to provide the support to allow the basement excavation to follow and not to have the excavations fall in. Installation of the contiguous piled wall would take approximately 12 weeks (three months) and require, as an estimate, around 380 cubic metres of concrete as well as the corresponding steel columns.

3.2.6 Following completion of the underpinning and retaining wall works, with the casting of the capping beams, steel work would be installed progressively across the ground floor level, which would prop the external perimeter of the basement within the end-state build. Excavation can commence once the steelwork has been set up. The basement construction methodology would allow for retention of an opening sufficiently sized to provide access for machinery and spoil removal during the subsequent excavation.

3.2.7 The excavation to form the basement area extending across the full extent of the site would require the removal of around 1,840 cubic metres of material. The excavation would be undertaken by equipment appropriately sized such that transhipment to and from the site would be undertaken using smaller-sized flat-bed or grab lorries appropriate to reflect the local constraints of access via the stretch of Middlefield between Boundary Road and the site. This work would again take around 12 weeks (three months).

Phase 3 – Super-Structure Works

3.2.8 The next phase of work would be to complete any outstanding steel works at the basement / ground floor interface, followed by the installation of the metal deck which would form the ground floor flooring within the super-structure and the installation. The basement-ground floor slab would cover an area of around 400sqm., commensurate to the basement footprint.

3.2.9 Prior to the steel beams, metal work and other materials being brought to the site, the site contractor would confirm with the supplier the use of the smaller-sized flat-bed or grab lorries and the maximum lengths and/or loads for each material type which these vehicles would be able to accommodate. If required, certain material types would be delivered in section and fabricated on site, subject to agreement with a qualified engineer. The concrete volume required for the basement – ground floor slab would be around 180 cubic metres.

3.2.10 The structural work at the basement / ground floor interface and the installation of the permanent ground floor decking and slab would take around twelve weeks (three months) to complete, with some potential overlap with the preceding sub-structure works.

3.2.11 Following on from these initial works during this phase, the work would move on to the building the three-storey super-structure upwards from ground floor level and then the roof terrace, with the installation of the intervening ground-to-first, first-to-second and second-to-roof floors, envisaged again to be based on metal deck structures and of the internal walls at each level within the new-build structure. In addition to the shell and core works, this phase would include further works to the external facades and to the roof level.

3.2.12 The core works within this super-structure build phase would take around a further twenty-eight weeks (seven months), with the potential scope for some overlap with the subsequent full fit-out and final decoration works.

Phase 4 – Full Fit-Out & Final Decoration

3.2.13 Following on from the core construction works of both the sub-structure and the super-structure there would be final phase of full fit-out and decoration, including making good the groundworks, installing damp proof course, plastering and decoration of each floors, installing the internal services and having these connected to the external supplies.

3.2.14 This subsequent full fit-out and final decoration phase of work would have an overall duration of around twenty-six weeks (six months).

Summary

3.2.15 The following table provides an approximate breakdown of the two-year (twenty-four months) construction programme for the site, defining the key work stages in sequence and by approximate duration, again against the current timeframe of preparation and enabling works commencing January 2018 (Week 1) and with final fit-out by around November / December 2019 (Week 98), depending upon the start date. This construction programme is based on the routing and access strategy, as discussed further in later sections of the CTMP.

Activity	Approx. Works Period (weeks)
Site set-up and preparation, incl. clearance	Weeks 1 – 8
Underpinning / retaining wall installation	Weeks 9 – 20
Basement excavation	Weeks 21 – 32
Ground floor structural works	Weeks 33 – 44
Main super-structure works	Weeks 45 – 72
Full fit-out and final decoration	Weeks 73 – 98
Site handover	*Week 99*

Table 3.1: Construction Programme Summary

3.2.16 In summary, the route for construction vehicles accessing the site would be from and to the A41 Swiss Cottage gyratory, thus upon the approach travelling southbound along the A41 south of Swiss Cottage and then eastbound along Boundary Road, to access the stretch of Middlefield running between Boundary Road and the site at the northern end, and thus upon exit using the same stretch of Middlefield back to Boundary Road, then continuing eastbound along Boundary Road and then northbound along St John's Wood Park to return to the Swiss Cottage gyratory. This would apply for all construction material deliveries and removals.

3.2.17 This route would access a hoarded area at the northernmost end of Middlefield, within which both the temporary waste storage area and the materials storage area would be located. Similarly, the vehicles accessing the space would utilise space within the hoarded area for the purpose of loading and unloading, thus at no stage waiting along the Middlefield. These access arrangements would be subject to the management of existing traffic and parking demands along this private road during the construction programme.

3.3 Phasing Vehicle Activity

3.3.1 Based on experience of vehicular activity at other comparable and similar constrained sites that TPHS have been involved with, the following table provides details of the week-by-week construction vehicles through to the end of the two-year programme. This information has then been disaggregated by construction activity, with the vehicles related to each activity being classified as either HGVs or LGVs.

3.3.2 For activities using HGVs the largest vehicles regularly used would be a mini-tipper, or equivalent shorter flat-bed or grab lorries, with typical capacity of around 7t, and a mini-mixer concrete lorry, with a typical capacity of around 4m^3. These vehicles would typically be no more than around 7m in length and a width of no more than 2.5m. For activities using LGVs the largest vehicles regularly used would be 4.6t panel van and similar smaller Transit-type vans, since these vehicles would be no longer than the typical HGVs seeking access.

3.3.3 The delivery of certain materials, such as the steel and metal work, and equipment, such as the mechanical digger and scaffolding, which may normally be undertaken using larger-sized HGVs, would be undertaken against the background of the limits that the site access arrangements would impose in terms of vehicle lengths. As referenced previously, only equipment and materials which can be transhipped using the smaller-sized HGVs suitable to access the site via the stretch of Middlefield running from Boundary Road would be used.

3.3.4 The figures presented in the following table, firstly in terms of weekly vehicles, have been extrapolated into equivalent daily and hourly vehicle numbers, based on weekday working only and the implementation of a pre-booking system to regularise access.

PERIOD	Weekly VEHICLES*		DAILY VEHICLES*		HOURLY VEHICLES*	
	HGVs	LGVs	HGVs	LGVs	HGVs	LGVs
Weeks 1-8	10-15	15	2-3	3	<1	<1
Weeks 9-20	20	15	4	3	<1	<1
Weeks 21-32	30	15-20	6	3-4	1	<1
Weeks 33-44	15	15	3	3	<1	<1
Week 45-72	15	20	3	4	<1	<1
Week 73-98	5	25	1	5	<1	<1

** Note: These figures equate to the construction vehicles accessing the site, for which each vehicle would have a corresponding arrival movement and departure movement.*

Table 3.2: Construction Vehicle Activity Summary

3.3.5 Overall two-way movements for the site would equate to double these figures as for each vehicle there would be an arrival movement and departure movement, though due to the one-way nature of the routing strategy from and to the A41 Swiss Cottage gyratory there would not be both an arrival movement and a departure movement on the same stretch of the local network of Boundary Road and St John's Wood Park. Only along the stretch of Middlefield between Boundary Road and the site would there be both arrivals and departures.

3.3.6 Details provided for the most-intensive period of construction activity associated with the site, that during the first part of the programme in relation to the sub-structure works and peaking with the excavation activity, have been based on estimates of material volumes both coming onto the site (concrete and metal work) and leaving from the site (spoil), which have been built upon the greater detail available for these works from the planning material.

3.3.7 The information put forward for the subsequent construction phases correspond to projections based on current known information and experience from other comparable sites, but which would be reviewed at a later stage as part of a periodic review of the CTMP as works progress on the site and move from the sub-structure to the super-structure works.

3.3.8 The use of the smaller-sized mini-tipper (or equivalent) and the smaller-sized mini-mixer concrete mixer vehicles are put forward to reflect the constrained nature of access via Middlefield, thus the corresponding vehicle numbers travelling to and from the site have been set at a level to ensure that the use of their corresponding capacities are maximised and thus overall numbers and programme minimised as much as is practicable.

3.3.9 Within the 'busy' period, peaking during the basement excavation programmed to run between weeks 21 and 32, the peak daily number of vehicles would be typically no more than ten vehicles (split between 6 smaller-sized HGVs and 4 LGVs), which is of a magnitude which has been seen on other sites undertaking similar works. These numbers can be managed and controlled such that the maximum amount of spoil can be removed on a daily basis, which may be best undertaken by means of having the smaller-sized HGVs running in pairs.

3.3.10 The scope to run with paired smaller-sized HGVs would be reviewed and managed by means of a stringent pre-booking system, such that spoil removal would continue to be undertaken on a timed basis to avoid overlap of arriving and departing vehicles along Middlefield. Additionally, should a service provider be able to utilise a tipper vehicle (or equivalent) matching the specifications of the smaller-sized HGVs identified as being appropriate to access this site, but with a greater capacity, these would be used to minimise vehicle numbers.

3.3.11 The majority of vehicles during this period, during which around 1,840 cubic metres (around 2,655 tonnes) of spoil material would be removed as a result of the basement excavation, would be smaller-sized mini-tippers (or equivalent), estimated as up to six vehicles each day over the course of a 12-week period and with each vehicle having up to 7 tonne capacity. This is based on a five-day working week and thus an overall total of sixty working days.

3.3.12 In terms of other vehicle types and volumes associated with the distinct construction activity stages at the site, these would comprise:

- during initial site set-up (weeks 1 to 8) the deliveries of plant and equipment would be undertaken on a daily basis, several times a day, primarily using LGVs such as panel vans but with occasional smaller-sized HGVs, with the main use of smaller-sized HGVs during this period being in relation to the demolition of the existing garage units and the removal of the corresponding waste from the site;

- during the underpinning / retaining wall installation (weeks 9 to 20) there would be at the start the delivery of bespoke piling equipment as required, again sized so as to be transhipped by smaller-sized HGVs, but then followed by regular concrete deliveries by $4m^3$ lorries and corresponding steel / metal work deliveries to install the retaining wall, with these resulting in up to four smaller-sized HGVs on a daily basis, with a lesser three LGVs;

- during installation of concrete slabs and steel beams / metal work (weeks 33 to 44), as the final stage of the sub-structure construction runs into the initial stage of the super-structure construction, there would be again regular concrete deliveries by $4m^3$ lorries and corresponding steel / metal work deliveries, with these resulting in up to three smaller-sized HGVs on a daily basis, with a similar number of LGVS;

- where practicable, the above-referenced concrete deliveries and corresponding steel / metal work deliveries would be undertaken on alternate days to minimise HGV activity, and with regard to the latter delivery group the size of vehicle would be selected to both maximise the load brought to site but against the background of the local access constraint;

- during the main super-structure works, to bring forward the core and shell of this (including floors and walls), there would be the delivery of a number of materials such as concrete, steel / metal work, brick and wood by HGV, with the overall number of smaller-sized HGVs per day again not exceeding three but with the scope to be less through timetabling;

- during the full fit-out and final decoration stage, vehicles would be primarily panel vans and Transit-type vans, of around five per day typically, and with no more than one smaller-sized HGV per day typically, but with the occasional likelihood of a swap up from LGV.

3.3.13 The period of 'peak' activity in terms of HGVs supports manageable demands in terms of entry and exit requirements to the site, with a peak of no more than six smaller-sized HGVs requiring access of the site each day and as an average less than one such HGV requiring access within any hour, but with the consideration allowing paired entry and exit to maximise the amount of spoil removal achievable on a daily basis and to avoid the overlap of entry and exit vehicles.

3.3.14 During this period there would be a corresponding three to four LGVs requiring access, again considered manageable concurrently on a daily basis. Outside of the 'peak' period, there would be lesser HGV activity with other activities.

3.3.15 The period of 'peak' activity in terms of LGVs similarly supports manageable demands in terms of entry and exit requirements to the site, with a peak of no more than five LGVs requiring access of the site each day and as an average less than one LGV requiring access within any hour. During this period there would be a corresponding single HGV requiring access, again considered manageable concurrently on a daily basis. Outside of the 'peak' period, there would be lesser LGV activity with other activities.

3.3.16 The vehicle volumes associated with the distinct construction activity stages make no allowance for the contribution of the local sourcing of materials, which may result in the trip to / from the site being part of an existing delivery route, or the consolidation of local deliveries in particular to reduce vehicle movements to and from the site.

3.3.17 When allowing for a 25% margin of error, which is a standard adopted by many contractors, the average daily number of vehicles would increase to a maximum of thirteen vehicles – thus both thirteen vehicle arrivals and thirteen vehicle departures.

3.3.18 The site working hours would be restricted generally to between 08:00 and 18:00 Monday to Friday and between 08:00 and 13:00 on Saturday if required, with no working on either Sundays or bank / public holidays. The restricted hours would be written into all supply chain orders with sub-contractors, but with further consideration of avoiding peak periods.

3.3.19 The site's Logistics Manager would co-ordinate all deliveries to ensure smooth flow of vehicles to and from the site, with all deliveries to and from the site being subject to strict compliance with a pre-booking system which would identify the time slot when the vehicle could arrive at the site. This system would be in place throughout the construction period to ensure that no stretch of the local highway network would become congested at any time as a result of the construction activity at the site and that no vehicles pull-up and wait on the local network.

3.3.20 Given the estimates of typical daily vehicular activity associated with the distinct construction stages at the site, and typical durations at the site of around thirty minutes, there would be the scope to manage the pre-booking system to avoid as much as is practicable construction vehicular activity during the initial working day period of 08:00-09:00 and the final working day period of 15:00-18:00, leaving a window of six hours. Outside of term times, the additional hour of 15:00-16:00 would be considered.

3.3.21 This would generally avoid conflict with both general peak traffic travelling to and from and through the local area and specific school-related traffic given the proximity of a number of schools to the site, including those along Marlborough Hill (George Eliot Junior School and St John's Wood Nursery & Pre-School) adjacent to the A41 and those along Avenue Road (Swiss Cottage School and the UCL Academy) close to the gyratory.

3.3.22 Whilst there are certain deliveries and vehicle movements which would have to be undertaken during these network peaks, such as early morning concrete pours, a tipper lorry coming to site to ensure capacity is left in the waste storage area and/or early morning / late afternoon deliveries to avoid any delays to the start of construction activity on a particular day, these would again be subject to the pre-booking system to ensure that any such movements would be kept to an absolute minimum relating to the specific work activity.

3.3.23 As such, as much as it is practicable to do so, the pre-booking system would take out of the peak periods and/or those periods most-sensitive to key neighbours such as the local schools those deliveries and movements which do not need to be undertaken during these hours and allocate them instead a slot at an alternative time during the remainder of the working day, to ensure that peak period movements are minimised.

3.3.24 The implementation of the construction delivery booking system would ensure that construction traffic travelling to and from the site would be effectively co-ordinated and managed, with vehicles not having a pre-arranged booking not being permitted access.

3.4 Role of Local Sourcing & Consolidation

3.4.1 As standard good practice, the site works contractor would be encouraged to source both operatives and materials from local areas whenever possible, the former as a mechanism to maximise the number of staff-based trips which can then be undertaken practically by walking, cycling or public transport, and the latter to work with the local suppliers so as to co-ordinate any site requirements with their general routings and delivery strategies.

3.4.2 During the later stages of each construction phase, when deliveries are likely to be lower than during the main part of the stage, and also in the latter full fit-out and final decoration work stage, when smaller-sized LGVs would be more used than the smaller-sized HGVs, the works contractor would be encouraged to use a single vehicle to pick-up materials from suppliers and bring to the site as a single larger delivery, thus removing a number of smaller deliveries into one single larger delivery as much as is practicable.

3.4.3 This scope for future consolidation would be investigated further by the site works contractor with the various suppliers as the project proceeds during the various distinct stages. Additionally, the site works contractor would consider employing its own vehicle to undertake multi-collection from suppliers of required equipment and materials, as much of these as are practicable from local suppliers, to reduce vehicle numbers and travel distances.

3.4.4 The contractor would liaise with the suppliers to ensure that the vehicles being used maximise their potential, but remain appropriate to the purpose and to the access arrangements.

3.4.5 To support the use of appropriate-sized vehicles whilst in parallel seeking to minimise vehicular movements overall, as much as is practicable the main works contractor would seek to ensure that all vehicles bringing materials and equipment to the site as a single-drop trip would be fully-loaded and similarly that all vehicles taking materials and equipment from the site as a single pick-up would be fully-loaded, so as not to waste vehicle capacities.

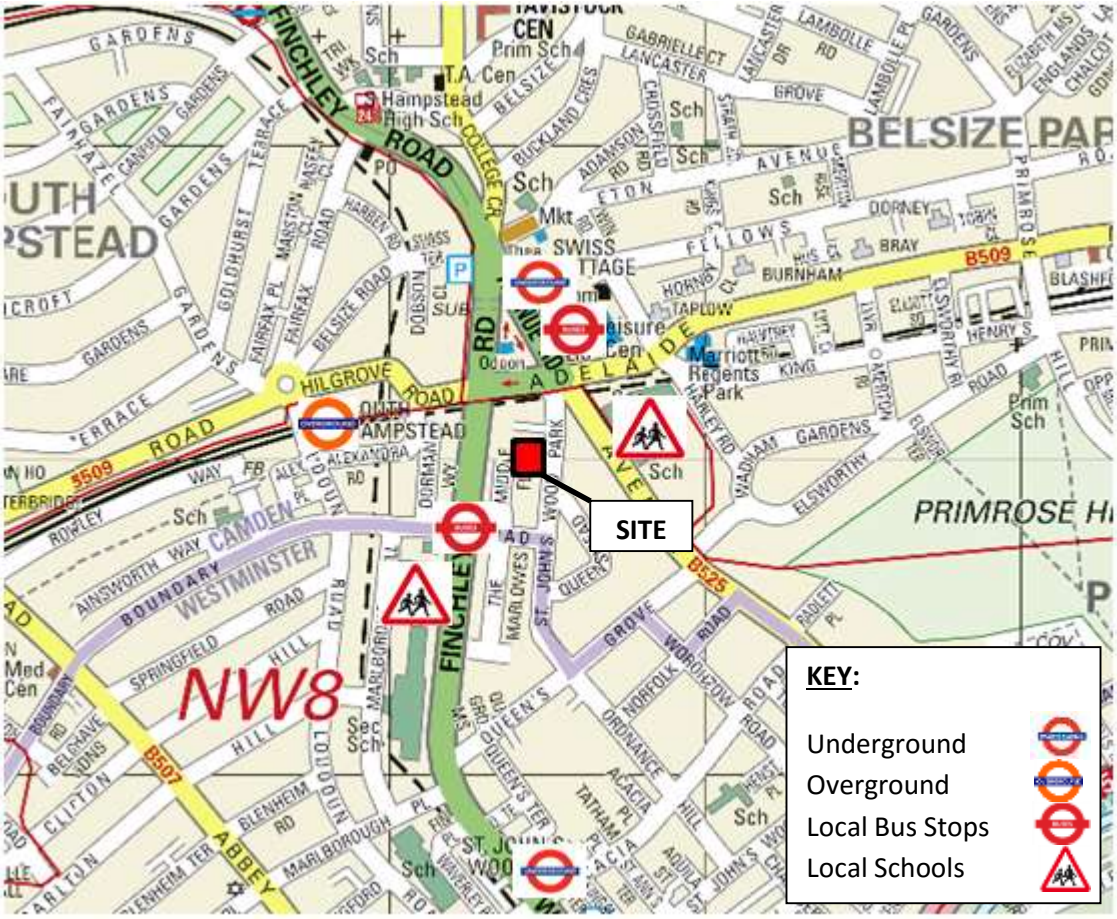
4 Construction Access Arrangements

4.1 Site Location

4.1.1 The construction site would occupy a small plot accessed at the northern end of the Middlefield cul-de-sac. The northern boundary of the site abuts the Court Close development and the eastern boundary a site subject to separate proposals for the construction of a single residential dwelling fronting onto St John's Wood Park. An area of hardstanding to rear of Nos. 1-13 Middlefield (the odd-numbered houses) would run to the immediate south.

4.1.2 The stretch of Middlefield running between Boundary Road to the south and the site at the northern road measures around 110m in length and has a typical width of around 5m kerb-to-kerb. This road is a private road along which on-street parking is currently permitted, with this running along the eastern side and reducing the effective carriageway width to between 2.75m and 3m typically. The management of the road is under the control of the applicant.

4.1.3 The plan below identifies the location of the site within the context of the wider area. Further plans will illustrate the location of the site against the background of the local highway network, in particular in terms of both the routing and access strategies.



Plan 2: Site Location & Surrounding Area

4.1.4 In terms of the current traffic management and parking arrangements within the vicinity of the site, along the local routing from and to the A41, these are subject to waiting and loading restrictions in the form of a CPZ, which restricts parking outside of marked bays between the hours of 08:30 and 18:30 Monday to Saturday and thus generally covering the works duration. The marked bays are available to residents with permits only. As referenced, along Middlefield the on-street parking is permitted by means of a separate private agreement.

4.1.5 Other than along Middlefield, the presence of on-street parking is most prevalent along the eastern side of St John's Wood Park between Boundary Road to the south and the A41 to the north and the western side of St John's Wood Park between opposite Park Lodge and the A41 to the north, with a small number of spaces along the southern side of Boundary Road and along the western side of St John's Wood Park south of the access.

4.1.6 The construction site is well-served by public transport, with eight high-frequency bus routes running within 400m of the site (a typical walk time of five minutes) - five along the A41 Finchley Road via stops within the vicinity of Boundary Road and three via stops close to Swiss Cottage underground station. Additionally, Swiss Cottage underground station is similarly about 400m of the site and South Hampstead overground station about 600m, which equate to typical walk times of five minutes and between seven and eight minutes respectively. Finchley Road underground station is also within a walk of twelve minutes.

4.1.7 The cumulative bus frequency in each direction (based on services 13, 31, 46, 82, 113, 187, 268 and C11) is approaching sixty buses every hour during the daytime period, thus a service every minute in each direction, whilst the underground frequency in each direction through Swiss Cottage station on the Jubilee line is twenty-four services every hour during the daytime, thus a service approaching every other minute in each direction. The London Overground services complement the bus and underground, with three services each hour.

4.2 Vehicular & Other Access Arrangements

4.2.1 Drawings TPHS/096/TR/004 and TPHS/096/TR/005, both attached at **Appendix A**, illustrate the general site access arrangements via Middlefield from and to Boundary Road, the first relating to access by means of a smaller-sized tipper vehicle, equivalent to a mini-tipper, and the second relating to access by means of a smaller-sized concrete mixer vehicle, equivalent to a mini-mixer.

4.2.2 Both scenarios confirm that all loading and unloading activity would be undertaken wholly on-site. There would be sufficient space for such activity to be undertaken during the busier periods by two vehicles concurrently, whilst also continuing to work with the principle of the storage of equipment and materials wholly on-site.

4.2.3 For each scenario the means of access is based upon the vehicle turning into Middlefield from Boundary Road in forward gear and continuing forwards along the length of Middlefield to a short distance ahead of the stretch running off to the west. The vehicle would then reverse into the side arm of Middlefield and then drive in forward gear a short distance to the south of this side arm, prior to reversing along the upper stretch of Middlefield into the site. The vehicle would exit the site wholly in forward gear, travelling along the north-south stretch of Middlefield to Boundary Road. These movements would be under the guidance of banksmen.

4.2.4 Whilst it is acknowledged that these access arrangements would require vehicles to reverse firstly into the side arm of Middlefield and then along the northernmost stretch into the site, this would be undertaken under strict management across a private network and a lightly-trafficked area. The reverse distance would be acceptable for the types of vehicle requiring access of the site and would be a significant distance away from the public highway of Boundary Road. There would be no reverse manoeuvres undertaken either off from or onto the public highway network within the vicinity of the site.

4.2.5 The appropriateness of the general principles of these arrangements for the purpose of construction access, as referenced, has been assessed by means of a series of swept paths of the typical smaller-sized HGVs likely to be used on a regular basis during certain periods, namely the smaller-sized concrete mixer and the smaller-sized tipper vehicle which are both between 6.5m and 7m in length and around 2.5m in width.

4.2.6 The general principles of the access arrangements would not require the temporary closure of any part of the carriageway, neither the public highway nor the private network, and similarly there would be no requirement for the temporary closure of any part of the footway network, again neither the public highway nor the private network.

4.2.7 With regard to the proposed access arrangements, however, there would be the requirement to suspend the private arrangements which permit on-street parking along the eastern side of Middlefield for the initial stretch of 20m or so running northwards from the junction with Boundary Road, the stretch running 15m to the south and 10m to the north of the access to Nos. 1-14 Middlefield (thus a length of around 25m) and northernmost stretch of 10m or so.

4.2.8 These localised suspensions would be to permit the turning movement into Boundary Road, the turning movements into and out from the site and the turning of the vehicle within the access to Nos. 1-14 Middlefield to facilitate the change of direction. These suspensions would only be applicable during the weekday working hours of 08:00 to 18:00, thus would be available to residents outside of these hours, and indeed subject to programming could be available up to 09:00 and from 15:00.

4.2.9 As the works progress and volume of the smaller-sized HGVs decrease the need for these suspensions would be continually reviewed and if not required would no longer be sought.

4.2.10 Without a contractor engaged, it cannot be confirmed how access of any specialist equipment would be facilitated. By means of the CTMP the contractor would be obligated to seek to work within the proposed access arrangements and the corresponding restrictions on vehicle sizes before requesting additional temporary measures.

4.2.11 The pre-booking system referenced in Section 3 of this CTMP would work under the principle that a vehicle seeking ingress would not be timetabled at a time when a preceding vehicle is likely to be already within the loading / unloading area and not due to egress, thus one vehicle using the area at any one time only being the key objective of pre-booking, with a secondary objective being to distribute the vehicle activity across the working day.

4.2.12 However, during the busier excavation period, as referenced previously there may be some benefit to allow vehicles to arrive and depart in pairs for a number of reasons, which would include maximising the volume of spoil which could be removed on a daily basis to assist in minimising the overall duration of the work and avoiding the scope for overlap between an arriving vehicle and a departing vehicle, particularly the smaller-sized HGVs. Only during this period would the operation of paired arrivals and paired departures be considered.

4.2.13 These objectives of the pre-booking system would be applicable equally to each aspect of the access strategy. A delivery schedule would be established and co-ordinated by the member of staff who would be appointed by the Site Project Manager to be responsible for the day-to-day organisation and monitoring of construction logistics for the site, in liaison with the Site Project Manager, with all bookings agreed between the site personnel and the supplier / sub-contractor no less than 48-hours in advance. There would be regular communication between site personnel and the suppliers / sub-contractors as to the vehicle numbers needed.

4.2.14 The proposed access arrangements, with corresponding temporary localised parking suspensions solely along the private network of Middlefield, have been designed to sufficiently accommodate the typical smaller-sized HGVs for the different construction stages, albeit that the vehicles which have determined the design may not be those most frequently used during the latter stages of the construction works in particular when the use of smaller-sized LGVs would be more prevalent. There would, however, continue to be the scope for the smaller-sized HGVs to access the site throughout these latter stages.

4.2.15 All suppliers and site operatives would be notified that no temporary waiting of the vehicles or the loading / unloading of the vehicles is to be permitted at any location along either the public highway of Boundary Road and St John's Wood Park or the private network of Middlefield, other than within the proposed access arrangements referenced and in accordance with the agreed pre-booking timetabling system. This would be to ensure that the infrastructure and management arrangements brought forward are used appropriately, again so as to not impact upon the operation of the existing highway network.

4.2.16 During site working hours the site access and loading / unloading arrangements would be manned by banksmen (or equivalent personnel) throughout to prevent unauthorised access of the construction site and to assist as required with the management and manoeuvrability of vehicles through the access and the management and manoeuvrability of other road users within the vicinity. Suitable signage would be erected at appropriate locations for all user groups, to advise of the presence of reversing vehicles and of the local parking suspensions.

4.2.17 Additionally, a banksman would be located at the junction of Boundary Road and Middlefield between the hours of vehicular access, thus typically between 09:00 and 15:00 on weekdays, to manage the interaction between construction vehicles seeking access of the site and general vehicles seeking access of Middlefield and to minimise the likelihood of vehicles seeking to travel in opposing directions at the same time. This banksman would be in radio communication with the banksmen located around the access arrangements.

4.2.18 When the site is closed a security system would be in place and monitored accordingly. Should an intrusion onto the site by means of the hoarded area be attempted or occur outside of working hours, the monitoring personnel would arrange for the site to be visited or for a serious incident alert to be made to the police.

4.2.19 The site would have a single personnel entrance for all operatives and staff incorporated into the hoarding arrangements but separate from the vehicular access. This would be the access for those travelling on foot, by bicycle and by public transport. This access will be located to best correspond with the location of the project office and welfare facilities, but also to provide separation from the proposed storage area and also the proposed on-site loading / unloading area. However, staff would share the same route to and from Boundary Road.

4.2.20 Within the vicinity of the personnel access and staff facilities, there would be dedicated facilities provided for cyclists, which would include the provision of cycle stands as well as changing and equipment storage facilities within the staff welfare area. There would be adequate storage space for no less than two cycles for site personnel within a secure space.

4.2.21 The main works contractor would be registered with TfL's Freight Operator Recognition Scheme (FORS) and would seek that all sub-contractors and suppliers are similarly registered, such that the drivers of all vehicles are suitably trained and that all vehicles are fitted with safety equipment appropriate for the use for which it is intended.

4.2.22 Contractors and suppliers operating vehicles under the FORS should ensure that side guards are fitted to the vehicle, unless it has been demonstrated to the highway authority that the vehicle cannot perform the intended function if fitted, that a proximity sensor and warning system are installed, that the vehicle has a Class VI mirror and that prominent signage is displayed on the vehicle, particularly to warn cyclists of the danger of passing on the inside.

4.3 Vehicle Access Routings & Controls

4.3.1 All subcontractors and suppliers orders would include details with regard to the routes to be used when arriving at and leaving from the site. This would be the principal means of how these key parties would be informed of the routing guidance and controls but it would also be reiterated to site supervisors when they are inducted prior to commencing work on site.

4.3.2 Until such time that a principal works contractor is on board to undertake and co-ordinate the works, as well as the sub-contractors and suppliers requiring access the site, it is not practical to be fully prescriptive with regard to the routing strategy. However, an overview strategy of the local routing strategy can be put forward, with this reconfirmed and/or updated during a subsequent version of the CTMP prior to commencement of construction.

4.3.3 In summary, the routing within the vicinity of the site would be for all vehicles to approach from the direction of the A41 Swiss Cottage gyratory and similarly depart in the direction of the A41 Swiss Cottage gyratory.

4.3.4 The inbound route would be along the A41 Finchley Road between the gyratory and Boundary Road, then along Boundary Road and turning left into Middlefield and running north into the site. The outbound route would trace the route back along Middlefield, turning left into Boundary Road and then turning left again into St John's Wood Park, to continue northbound along St John's Wood Park to the gyratory.

4.3.5 This general circuit adopts an anti-clockwise route from and to the A41 Swiss Cottage gyratory, as shown in summary on the overview plan overleaf. The appropriateness of this core routing strategy has been assessed previously against the background of the manoeuvrability through the local network from and to the strategic A41 of the typical larger-sized construction vehicles requiring regular access of the adjacent construction site during certain construction periods – the standard concrete mixer and the medium-sized tipper (or equivalent).

4.3.6 Since the manoeuvring requirements of these larger-sized construction requirements are more onerous than those of the smaller-sized HGVs which would be appropriate for access of the site via Middlefield, these confirm the appropriateness of the wider access routing strategy for this separate site. These previous routing assessments are presented on Drawing TPHS/096/TR/003, attached at **Appendix B**.

4.3.7 For completeness, however, a further route assessment drawing for the smaller-sized construction vehicles being those seeking access of this construction site has been prepared, with this drawing (TPHS/096/TR/006) attached at **Appendix C**.

4.3.8 The routing to and from the site from further afield will be dependent upon the origin / destination of the service provider, but the route from and to the A41 Swiss Cottage gyratory connects the directly with the strategic TLRN 'A' road network which is that best suited to accommodate construction traffic and generally avoiding sensitive areas.

Plan 3: Summary Local Routing

4.3.9 The four typical routes which would set the principles for those to be adopted at a later stage in terms of the routing strategy further afield are as summarised, based on the use of the wider TLRN network to and from the A41 Swiss Cottage gyratory:

North: From the site, the connection from Boundary Road into St John's Wood Park then runs onto the A41 Swiss Cottage gyratory, which links directly into the route to the north along the A41 Finchley Road heading towards the strategic North Circular route around the inner London area.

East: From the site, again the connection from Boundary Road into St John's Wood Park then runs onto the A41 Swiss Cottage gyratory, which links directly into the route to the south along the A41 Finchley Road heading towards central London, travelling along this to the A501 Marylebone Road and then turning left in the direction of Euston and King's Cross.

South: As to the south, travelling in the direction of central London and the A501 Marylebone Road.

West: As to the east, but turning right onto the A501 Marylebone Road in the direction of Paddington and the A40 Westway.

4.3.10 Where the origin and destination of the supplier / contractor is further afield, the longer-distance routing strategy would be to direct these to use the stretch of the A41 north of the Swiss Cottage gyratory, between that location and the Brent Cross interchange which provides direct access with the strategic North Circular route around the inner London area.

4.3.11 Where a vehicle arriving at or departing from the site is on a 'single drop' delivery, then the vehicle would be directed to use one of the four general routes or the longer-distance North Circular route, as there would be no need for deviation off of the route other than for the ultimate origin / destination at either end.

4.3.12 Where it is a multi-drop vehicle (only part of the load is specifically for the project), the vehicle would be recommended to use one of the general routes as much as is practicable, but this cannot be fully enforced as there would be prior and/or subsequent drops.

4.3.13 As referenced previously in this plan, all deliveries to site would be required to be pre-booked into a timed delivery slot operated by the site's logistics manager. Vehicles which arrive without a booked slot or miss their timed slot would be turned away from the site, unless the proposed access arrangements are clear and the vehicle can be accommodated without impacting upon the remainder of the timetable for that day.

4.4 Parking Arrangements & Staff Travel Access

4.4.1 There would be no car parking spaces provided on-site for staff and staff would not be permitted to access the site by car. The CPZ and its hours of operation would be adequate to enforce any issues that this may have as the on-street parking banks along the local roads are allocated generally for resident permit holders only and are subject to controls between the hours of 08:30 and 18:00 Monday to Friday.

4.4.2 Staff and visitor groups would be notified that there is no available car parking on-site and also that they would not be permitted to park on the adjoining local roads, with all site user groups encouraged to use the range of public transport services, cycle or walk. This would be explicitly referenced in the terms of engagement and reiterated during induction for site staff personnel. This would form an integral part of the site's *'Travel & Parking Strategy'*, which would have the overarching objective of minimising vehicle-based activity for all.

4.4.3 Prior to commencement of employment, all employees would be notified of the *'Travel & Parking Strategy'* for the site, whilst similarly all contractors and suppliers / delivery companies would be notified of the restrictions. The *'Travel & Parking Strategy'* would comprise a double-sided A4 sheet detailing how the site can be accessed by each of the non-car modes of travel, identifying the local bus and underground / overground services as well as links to key journey planning websites, confirming how the site can be accessed by foot and by cycle, and listing the 'dos' and 'don'ts' specifically in relation to driving and parking.

4.4.4 The strategy would reiterate that employees should not be driving to and from work, but instead using the other modes.

4.5 Risk Assessment Considerations

4.5.1 The main potential risk associated with the construction logistics would be the risk of a collision between construction vehicles and those user groups travelling in proximity to the site, in particular vehicles and pedestrians requiring general access via Middlefield which would share the same access route as the vehicles to and from the site.

4.5.2 When the site is to be hoarded off for construction it would have a dedicated security guard and/or banksman stationed full-time at the proposed access arrangements, to ensure that vehicles arrive safely and are supervised during their period of delivery, as well to prevent unauthorised vehicles or members of the public entering the site.

4.5.3 As referenced earlier in this plan and as illustrated on the vehicle tracking plans, vehicles would reverse firstly for a short distance to use the side arm of Middlefield to turn the vehicle and then secondly for a short distance along the uppermost stretch of Middlefield to enter the proposed site access arrangements, before then continuing to exit in forward gear. Hence there would be the use of additional banksmen to assist with the reverse manoeuvres of the construction vehicles, to ensure that the vehicle does not come into any conflict with other road users, be these other vehicles using the upper stretch of Middlefield or pedestrians.

4.5.4 Similarly as referenced earlier in this plan, there would be a further banksman located at the junction between Boundary Road and Middlefield. This banksman would ensure safe and appropriate manoeuvring of vehicles through this junction and manage the entry and exiting of these and other general vehicles along Middlefield to avoid as much as is practicable vehicles travelling in opposing directions concurrently. There would be radio communication between the banksmen to ensure co-ordinated management of traffic along Middlefield.

4.5.5 Banksmen (and equivalent personnel) would all have completed mandatory and best practice training before commencing work on site and training would be maintained throughout their time at the project. The training of this staff group would ensure that vehicles safely manoeuvre between the general traffic stream and the proposed access arrangements.

4.5.6 Prior to the arrival of a vehicle at the site, banksmen would locate themselves at the above-referenced locations and start to initiate arrangements to manage the activity of other road users along Middlefield. These banksmen would remain in-situ for the duration of the vehicle being travelling between Boundary Road and the site. These arrangements would be further engaged prior to the departure of a vehicle at the site, with the banksmen in-situ for the duration of the vehicle travelling between the site and Boundary Road.

5 Monitoring & Review

5.1 Key Parties – Roles & Responsibilities

5.1.1 The main works contractor's Project Manager would appoint a member of staff who would be responsible for the day-to-day organisation and monitoring of construction logistics for the site. Part of the responsibilities of this individual would be the implementation and management of the Construction Traffic Management Plan (CTMP) for the lifetime of the construction works on the project.

5.1.2 As well as planning and co-ordinating the day-to-day site deliveries, this manager would liaise with nominated representatives of key stakeholders and interested parties to discuss and agree where practical to do so consolidation of vehicle activity and other measures to support the running of the CTMP. This would include representatives of the residents' groups which would continue to require access via Middlefield during the construction works.

5.1.3 A notice board would be provided on site which would contain contact telephone numbers for information and complaints and in the event of an emergency occurring. These boards would also display the latest copy of the newsletter which would be issued regularly to neighbours, to inform them of key activity dates and key contacts. This information would be updated monthly and also prior to the step-changes between different work activities.

5.1.4 At this stage the appointment of the Logistics Manager has not been made, since the main works contractor has not been appointed. Until such time that the main works contractor has been engaged TPHS (as the lead author of this draft CTMP) would be the main point of contact for any queries and comments relating to the further development of the CTMP.

5.1.5 The London Borough of Camden would be notified of the nominated representative appointed to implement and manage the CTMP within a month of the appointment. This appointment would also be notified on the site boards available for the public to view.

5.2 Plan Updating

5.2.1 The CTMP and its associated documents are 'live' documents and would be regularly reviewed with the key stakeholders and updated throughout the project's construction lifespan, either as events dictate such as a result of comments being brought forward from local representatives or additional local construction sites coming online and thus increasing the opportunity to consider consolidation and shared practices or if there is a substantial change to the phasing of the works which would require changes to the CTMP practices.

5.2.2 After implementation of the CTMP at the start of the construction works, envisaged to be around January 2018, the CTMP will be first reviewed in the run-up to the end of the excavation works, thus by week 32 and by no later than eight months into the project.

5.2.3 Within the main super-structure works, the CTMP would be reviewed again after a further four-months duration, thus by the end of the first year of the two-years construction programme, and then with a further review in the run-up to the full fit-out and final decoration stage thus by Week 73 and with six months or so to scheme completion.

5.2.4 Should an update to the CTMP be required as a result of any of these reviews, these would be undertaken and an updated version issued to the London Borough of Camden and other key stakeholders for review and information. Should the review identify that no material changes are required, this would also be notified to the Borough and other key stakeholders.

5.3 Monitoring Activity

5.3.1 The logistics manager would monitor vehicle movements on a daily basis and would also carry out a survey of vehicle movements and routes at regular (three-monthly) intervals throughout the project, as well as at the time of the previously-referenced CTMP reviews when different, and produce a summary sheet for information. The contents of this summary would be agreed at the start of the project and form part of the review process.

5.3.2 Specific aspects to be picked up in the general monitoring of site activity would include:

- monitoring of early delivery / pick-up arrivals and those seeking to wait on the local approach routes, so that the sub-contractor or supplier can be notified and warned of the inappropriate behaviour and the need to follow good practice;

- monitoring of the number of vehicle movements during peak periods, to ensure that these are being kept to an absolute minimum and are essential to support operations at the site, with use of the six-hour window being maximised;

- monitoring of the number and timetabling of paired arrivals and departures during the excavation period, to ensure that these are being appropriately regulated and controlled, as well as being used only when other benefits are maximised;

- monitoring of staff travel patterns to ensure that the facilities initially brought forward (cycle parking and welfare facilities) continue to be adequate and to identify any inappropriate car travel, so that the individual can be advised.

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APPENDICES

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APPENDIX A

N

TEMPORARY PARKING SUSPENSION:
10m

TEMPORARY PARKING SUSPENSION:
25m

TEMPORARY PARKING SUSPENSION:
20m

MIDDLEFIELD

1 to 78

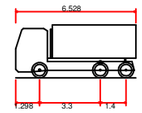
Blair Court

ROAD

Small Tipper

MAIN BUILD SITE

HOARDED AREA FOR
LOADING / UNLOADING
AND STORAGE AREA



Small Tipper	
Overall Length	6.528m
Overall Width	2.495m
Overall Body Height	2.877m
Min Body Ground Clearance	0.327m
Track Width	2.393m
Lock to Lock Time	6.00s
Kerb to Kerb Turning Radius	7.850m

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CLIENT:
MR M OFORI

PROJECT:
ST JOHN'S WOOD PARK

TITLE:
CTMP LOGISTICS
REAR SITE ACCESS
SMALL TIPPER

SCALE:	PLOT SIZE:	DATE:
1:500	A3	05/10/15

DRAWING No.	REV.
TPHS/096/TR/004	A

N

TEMPORARY PARKING SUSPENSION:
10m

TEMPORARY PARKING SUSPENSION:
25m

TEMPORARY PARKING SUSPENSION:
20m

MIDDLEFIELD

1 to 78

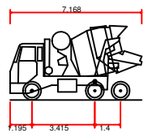
Blair Court

ROAD

MAIN BUILD SITE

HOARDED AREA FOR
LOADING / UNLOADING
AND STORAGE AREA

Small Concrete Mixer



Small Concrete Mixer	
Overall Length	7.168m
Overall Width	2.491m
Overall Body Height	4.027m
Min Body Ground Clearance	0.358m
Max Track Width	2.503m
Lock to Lock Time	6.00s
Curb to Curb Turning Radius	8.210m

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CLIENT:
MR M OFORI

PROJECT:
ST JOHN'S WOOD PARK

TITLE:
CTMP LOGISTICS
REAR SITE ACCESS
SMALL CONCRETE MIXER

SCALE:	PLOT SIZE:	DATE:
1:500	A3	05/10/15

DRAWING No.	REV.
TPHS/096/TR/005	A

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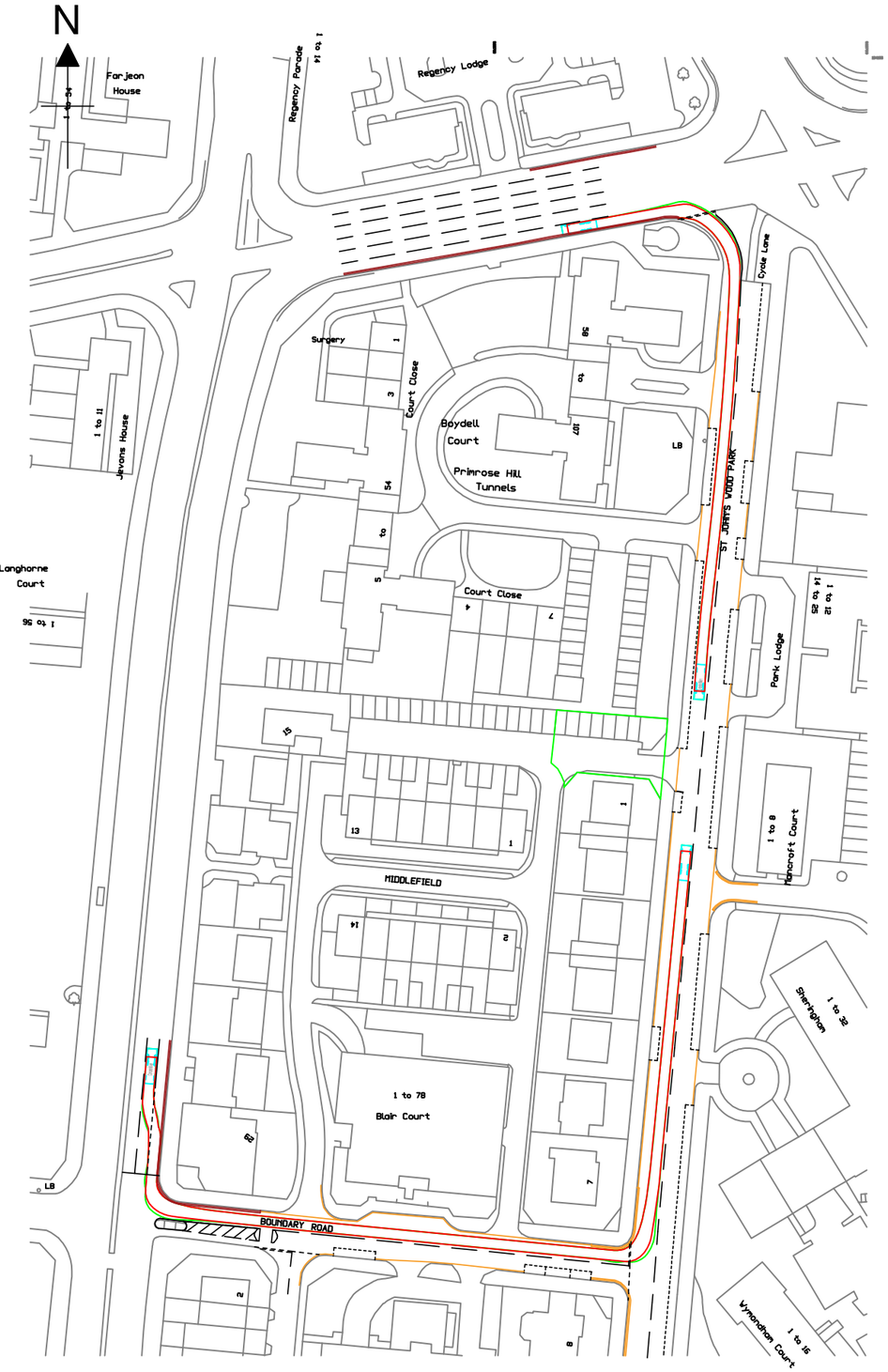
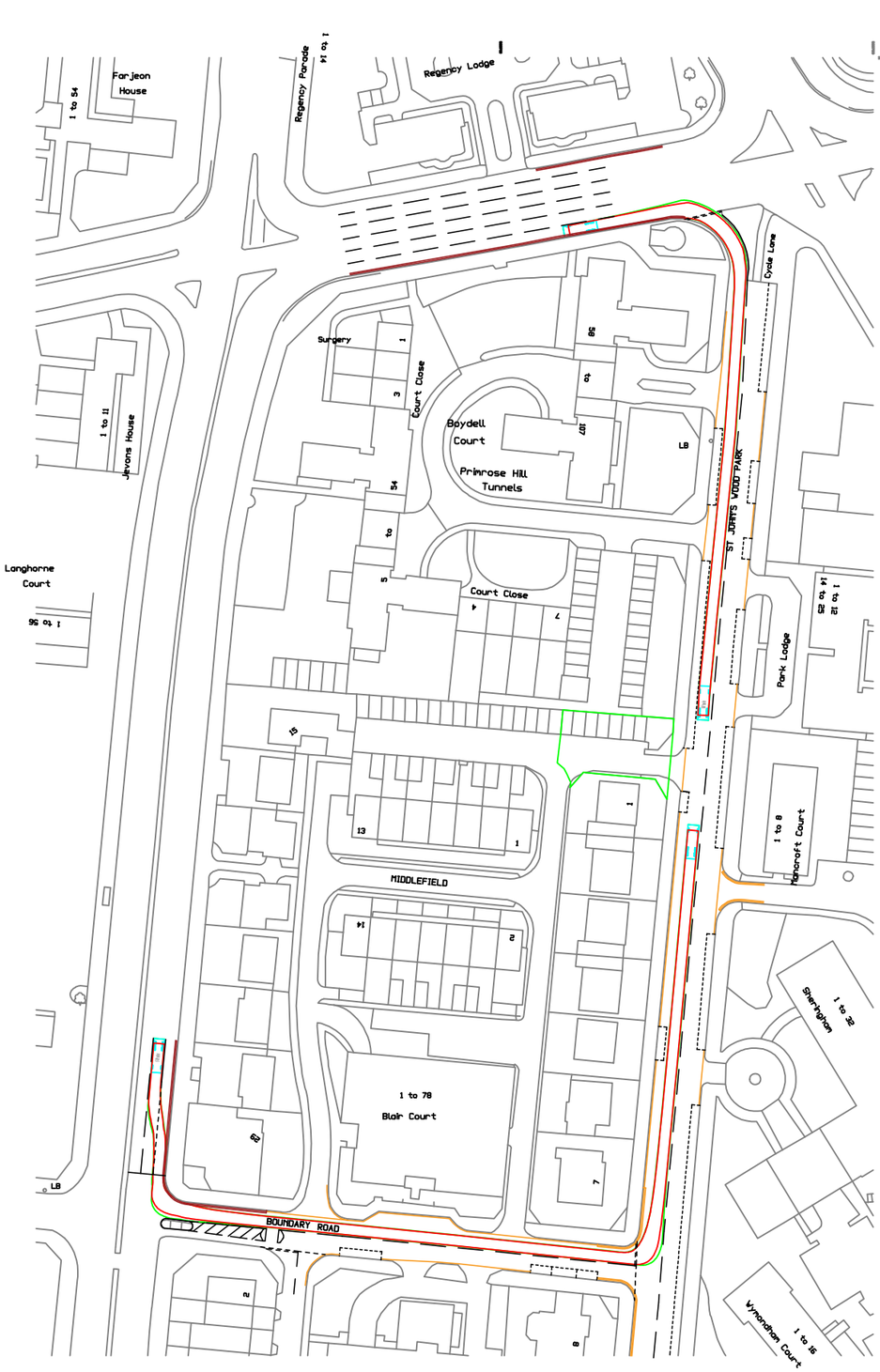
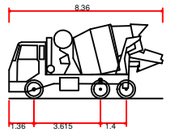
APPENDIX B



Concrete Mixer

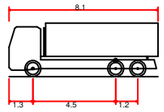


Six Wheeler



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
Kerb to Kerb Turning Radius	8.210m



6 Wheeler

Overall Length	8.100m
Overall Width	2.600m
Overall Body Height	2.896m
Min Body Ground Clearance	0.346m
Track Width	2.500m
Lock to Lock Time	6.00s
Kerb to Kerb Turning Radius	7.850m

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CLIENT:
MR M OFORI

PROJECT:
ST JOHN'S WOOD PARK

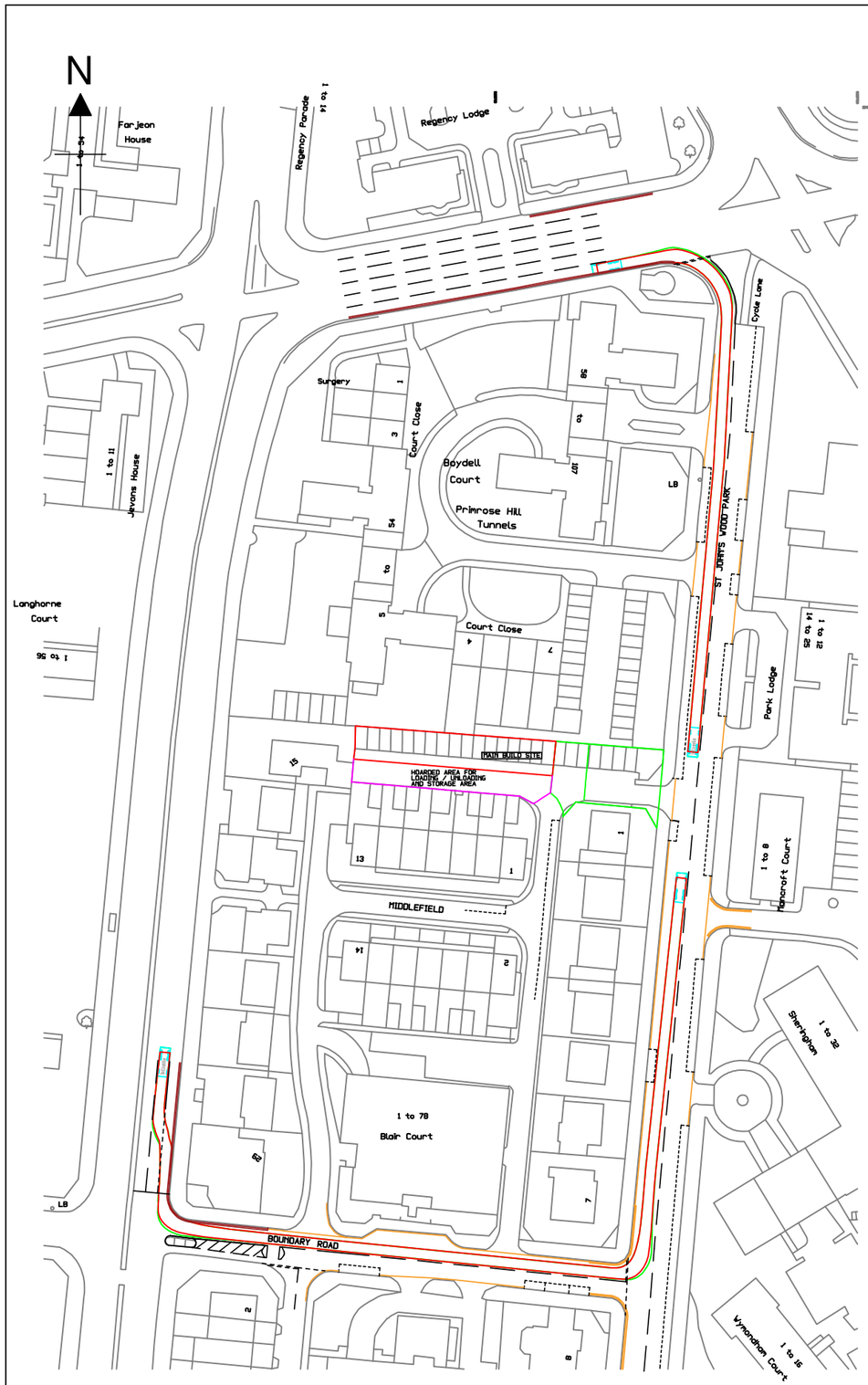
TITLE:
CTMP LOGISTICS
ROUTING ASSESSMENT
SWEPT PATH SERIES

SCALE:	PLOT SIZE:	DATE:
N.T.S.	A3	28/08/15

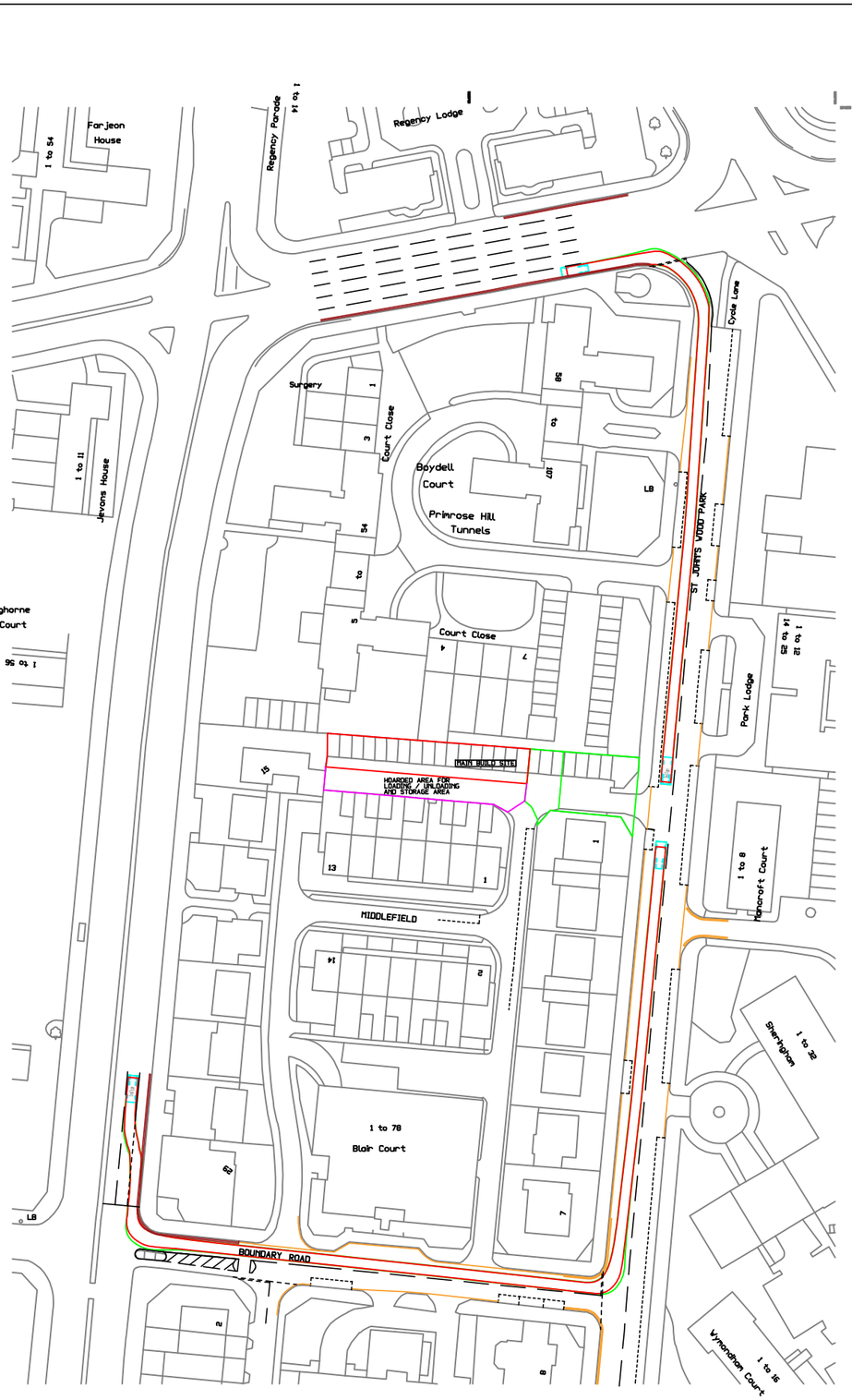
DRAWING No.	REV.
TPHS/096/TR/003	A

TPHS
Transport Planning & Highway Solutions

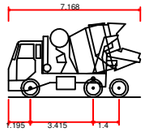
APPENDIX C



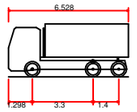
Small Concrete Mixer



Small Tipper



Small Concrete Mixer	
Overall Length	7.168m
Overall Width	2.491m
Overall Body Height	4.027m
Min Body Ground Clearance	0.358m
Max Track Width	2.503m
Lock to Lock Time	6.00s
Curb to Curb Turning Radius	8.210m



Small Tipper	
Overall Length	6.528m
Overall Width	2.495m
Overall Body Height	2.877m
Min Body Ground Clearance	0.327m
Track Width	2.393m
Lock to Lock Time	6.00s
Kerb to Kerb Turning Radius	7.850m

TPHS

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CLIENT:
MR M OFORI

PROJECT:
ST JOHN'S WOOD PARK

TITLE:
CTMP LOGISTICS
ROUTING ASSESSMENT
SWEPT PATH SERIES

SCALE:	PLOT SIZE:	DATE:
N.T.S.	A3	08/10/15

DRAWING No.	REV.
TPHS/096/TR/006	A