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NORTHERN LINE EXTENSION

MAIN WORKS CONTRACT

CODE OF CONSTRUCTION PRACTICE PART B NINE ELMS



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CONTENTS

1.0	INTRODUCTION	7
2.0	AREA AND SCOPE	8
3.0	TEMPORARY WORK SITE	8
4.0	SUMMARY OF MAIN WORKS	8
4.1	SITE CLEARANCE AND DEMOLITION WORKS.....	8
4.2	GROUND TREATMENT.....	9
4.3	TUNNELING WORKS.....	9
4.4	STATION BOX CONSTRUCTION.....	10
5.0	PUBLIC ACCESS AND HIGHWAYS	11
6.0	WATER RESOURCES	12
6.1	SITE DRAINAGE.....	12
6.2	DEWATERING.....	12
6.3	SURFACE WATER POLLUTION CONTROL.....	12
6.4	GROUNDWATER POLLUTION CONTROL.....	13
7.0	NOISE AND VIBRATION	13
7.1	NOISE AND VIBRATION RECEPTORS.....	14
7.2	CONSTRUCTION ACTIVITIES.....	14
7.3	NOISE AND VIBRATION MITIGATION MEASURES.....	14
7.4	PRE-CONSTRUCTION AMBIENT NOISE AND VIBRATION SURVEY.....	16
7.4.1	<i>Provision of Noise Insulation</i>	17
7.5	NOISE AND VIBRATION MONITORING.....	17
8.0	DUST AND AIR QUALITY	18
8.1	SENSITIVE DUST RECEPTORS.....	19
8.2	ACTIVITIES REQUIRING SPECIFIC DUST MITIGATION MEASURES.....	19
8.3	CATEGORY TIER 2 DUST MITIGATION MEASURES FOR NINE ELMS DURING CONSTRUCTION.....	19
8.4	CATEGORY TIER 3 DUST MITIGATION MEASURES FOR NINE ELMS DURING DEMOLITION.....	20
8.5	DUST MONITORING.....	20
9.0	ENERGY	22
10.0	CONTAMINATED LAND	22
11.0	MATERIALS AND WASTE MANAGEMENT	23
12.0	ECOLOGY AND NATURE CONSERVATION	24
12.1	TERRESTRIAL.....	24
12.2	AQUATIC.....	24
12.3	PROTECTION OF HABITATS.....	24
12.4	PROTECTION OF TREES.....	24
13.0	LIGHTING	24
14.0	ARCHAEOLOGY	25
15.0	LISTED BUILDING AND CONSERVATION AREAS	25
16.0	SETTLEMENT	25
17.0	COMMUNITY AND STAKEHOLDER LIAISON	26
APPENDIX 1 - NINE ELMS WORKSITE LOCATION		28
APPENDIX 2 – FIGURES		30
GLOSSARY AND ABBREVIATIONS		

Alluvium Soil - Deposited by river processes

Ambient - Background levels

Aquifer - A below ground, water-bearing layer of soil or rock

BAP - Biodiversity Action Plan. A plan highlighting a species of concern within a specific geographical area

Baseline - Existing environmental conditions present on, or near a site, against which future changes may be measured or predicted

Bentonite – a type of absorbent clay formed by breakdown of volcanic ash, used especially as a filler

Best Practicable Means (BPM) – A methodology having regard to the current state of technical knowledge, the local conditions and circumstances and the financial implications. It must also include consideration health and safety, design, installation, maintenance and manner and periods of operation, plant and machinery, and the design, construction and maintenance of buildings and structures.

BREEAM – BRE Environmental Assessment Method; an independently assessed scheme designed to improve the environmental performance of building projects.

CEEQUAL – Civil Engineering Environmental Quality assessment scheme, an independently verified assessment tool used to improve environmental performance of civil engineering projects

CoCP - Code of Construction Practice. Document providing mitigation to reduce or eliminate adverse effects and enhance beneficial effects

Code of Construction Practice Part A – Sets out the general principles and requirements to be applied during construction and are applicable project-wide

Code of Construction Practice Part B – Sets out the site-specific measures applied during construction, in addition to the general requirements indicated in Part A.

Contamination - Contamination is the addition, or the result of addition, or presence of a material or materials to, or in, another substance to such a degree as to render it unfit for its intended purpose

Crushers - Deconstruction plant used to reduce the volume of demolition waste

Cumulative Impacts - Impacts that result from incremental changes caused by other past, present or reasonably foreseeable actions

dB - Decibel. The ratio of sound pressures, which we can hear, is a ratio of 106 (one million: one). For convenience, therefore, a logarithmic measurement scale is used. The resulting parameter is called the 'sound pressure level' (Lp) and the associated measurement unit is the decibel (dB). As the decibel is a logarithmic ratio, the laws of logarithmic addition and subtraction apply.

dB(A) - The unit of noise measurement (measured on a logarithmic scale), which expresses the loudness in terms of decibel (dB) scale and the frequency factor (A)

Demolition - Deconstruction of buildings and other structures

Dewatering - The removal of water from the soil to enable work to be carried out below the groundwater level

Dust - Fine particles of solid materials ranging in size from 1 to 75 micron diameter (see British Standard 3405) capable of being re-suspended in air and settling only slowly under the influence of gravity where it may cause nuisance

Ecology - The study of living organisms in relation to their surroundings

Environmental Statement (ES) - The outcome of the Environmental Assessment presented in a formal document or documents in accordance with EC Directive 85/337. Includes such information that is reasonably required to assess the environmental effects of a development

Environmental Impact - Positive or negative impact of a project component or activity on the surrounding environment

FLO – the contractor joint venture between Ferrovia Agroman UK and Laing O'Rourke Construction Ltd appointed by Transport for London to carry out the Northern Line Extension Project.

Grade I Listed - A listed building of exceptional interest

Grade II* Listed - Particularly significant buildings of more than local interest

Grade II Listed – A building of special architectural or historic interest

Habitat - The living place of an organism characterised by its physical or biotic properties

Hazardous - A substance that is potentially damaging to the environment and harmful to humans and other living organisms

Head house - The above ground structure which is associated with and either directly above or off set from a below ground shaft

Heritage Structures - Buildings of historic significance

Hoarding - A temporary board fence set up on the perimeter of a building site

Hydrocarbon - An organic compound consisting entirely of hydrogen and carbon

In-situ - In the natural, original or appropriate position

Listed building - Buildings of special architectural or historic interest listed by the Secretary of State for Culture, Media and Sport on the advice of English Heritage - Buildings are graded to indicate their relative importance

LU – London Underground.

M&E - Mechanical and Electrical

Made Ground - Soils or other material that has been deposited by man rather than natural processes, for example to make up ground levels

Mitigation (measure) - The measures put forward to prevent, reduce and where possible, offset any adverse effects on the environment

NOx – Oxides of nitrogen

PAH - Polycyclic Aromatic Hydrocarbon

Particulate matter - Discrete particles in ambient air, sizes ranging between nanometres (nm, billionths of a metre) to tens of micrometres (µm, millionths of a metre)

PM₁₀ – Particulate Matter of 10 microns or less

Passive Deposition Monitoring - is the collection of a representative sample of particulate matter over a known area without any active intervention e.g. dust slides or sticky pads.

pH - A measure of the acidity or basicity of a solution

Pre-cast - cast (an object or material, typically concrete) in its final shape before arriving on site and positioning.

Pile - A timber, steel or concrete post that is driven jacked or cast (bored) into the ground to carry vertical or horizontal loads

Plant - A building's generator, heating, ventilation, and / or electricity production system, or the machinery used in demolition and construction

PPV - Peak Particle Velocity in metres per second. The vibration measurement parameter that based on a form of acceleration that is frequency weighted to reflect human sensitivity to various frequencies.

Receptor – something or someone that could be affected (beneficially or adversely) by changes caused as a result of a development of a scheme

Reinforced concrete - Concrete reinforced with steel bars to increase tensile strength

Running Tunnels - Basic sections of tunnels between stations, shafts and turnouts

Runoff - Rainwater flowing off the ground surface

Secant Pile – a way of constructing retaining walls and are formed by a series of interlocking bored concrete piles

Section 61 Agreement - A Consent with the local authority issued under the Control of Pollution Act 1974 to agree 'best practicable means' associated with reducing the noise and vibration impacts for activities with the potential to cause nuisance from a worksite

SCL - Sprayed Concrete Lining

Shaft - A vertical excavation used as a passage from the surface to the below ground works, used for ventilation, travelling, hoisting, or all three. Shafts are usually of limited cross section in relation to their depth.

Stakeholder - A person, group, or organisation that affects or can be affected by an organisation's actions

Station Box - A deep cut and cover box below ground level which will contain the station concourse and relevant facilities

Step Plate Junction - A junction where two tunnels lined with plates of different diameters meet, and vertical plates are used to close the vertical faces, to form a step

TBM - Tunnel Boring Machine

TPH - Total Petrol Hydrocarbons

TWAO - Transport and Works Act Order. Can authorise railways, tramways, guided transport schemes and certain other types of infrastructure project in England and Wales

Threshold - A level of effect above which an assessment will be taken of whether any changes to procedures need to be made

Trial Pits - Intrusive investigation positions excavated by a mechanical Excavator

VNEB - Vauxhall Nine Elms and Battersea. This is identified as an 'Opportunity Area' in the London Plan for regeneration and redevelopment, as an integral part of the Central Activities Zone.

1.0 Introduction

This Code of Construction Practice (CoCP) Part B has been prepared by FLO (joint venture between two companies Ferrovial Agroman UK and Laing O'Rourke Construction Ltd) for the construction of the Northern Line Extension (NLE) and covers the environmental impacts relating directly to the construction activity within Nine Elms site boundary, but also within the local area that may be affected by the construction works. .

This document takes into account the nature of the works, the local environmental 'receptors' and the results of ongoing engagement with the London boroughs of Lambeth and Wandsworth, as well as with other stakeholders. Through the CoCP Part B, FLO aims to inform stakeholders of our proposed approach and mitigation to reducing adverse effects from the works.

The site specific measures detailed within this CoCP Part B (in addition to the mitigation measures specified in the CoCP Part A which are denoted by the use of italics) will ensure that the environmental impacts resulting from the NLE construction at Nine Elms are effectively controlled and where possible eliminated. FLO will not only comply with all relevant environmental legislation and wider requirements but seek to exceed current industry best practice where possible. This will in part, be achieved, through our NLE environmental objectives below which ensures continual improvement of our environmental and sustainability performance. We will seek to:

- reduce greenhouse gas emissions;
- reduce pollutant emissions to the air (NOx and PM10);
- reduce resource consumption and improve green procurement;
- reduce the waste generated by applying the principles of "reduce, reuse and recycle";
- reduce water consumption
- BREEAM 'Very Good' score for the two stations
- CEEQUAL 'Excellent' score for civil engineering works

The CoCP Part B will be submitted to the relevant local planning authority for approval before starting works at Nine Elms worksite. This document should be read in conjunction with the following documents that describe aspects of the project environmental management in more detail.

Title of Document	Reference
Code of Construction Practice (CoCP) Part A	TfL 13E/1 20/12/13
CoCP Part B – Battersea	FLO_N205-2360000-HSE-PLN-00001
CoCP Part B - Kennington Park	FLO_N202-2360000-HSE-PLN-00001
CoCP Part B - Kennington Green	FLO_N202-2360000-HSE-PLN-00002
Noise and Vibration Management Plan	FLO-N001-2360000-HSE-PLN-00006

Resource Efficiency Plan	FLO-N001-2360000-HSE-PLN-00007
Air Quality Plan	FLO-N001-2360000-HSE-PLN-00008
Water Management Plan	FLO-N001-2360000-HSE-PLN-00009
Sustainable Travel Plan	FLO-N001-2360000-HSE-PLN-00010
Archaeology and Heritage Management Plan	FLO-N001-2360000-HSE-PLN-00013
Energy Management Plan	FLO-N001-2360000-HSE-PLN-00011
Ecology Management Plan (including reinstatement)	FLO-N001-2360000-HSE-PLN-00012
Traffic Management Plan	FLO-N001-2360000-CON-PLN-00004

2.0 Area and Scope

The Northern Line Extension (NLE) will create a new underground line as an extension to the existing Charing Cross branch of the Northern line between Kennington and a terminus station to the south of Battersea Power Station. The extension will consist of new twin bore running tunnels of 5.2m internal diameter and covering a distance of approximately 3.3km with new stations at Battersea and Nine Elms.

The Nine Elms Station works covered by the CoCP Part B includes demolition, civil engineering, interface with tunneling, fit-out and services installations to provide the following:-

- A new station at the corner of Wandsworth Road and Pascal Street;
- 1 bank of escalators comprising 3 escalators;
- New lifts providing step free access for persons of reduced mobility (PRM) between the street, ticket hall and platform levels.

3.0 Temporary Work Site

The illustrations contained within Appendix 1 identifies the construction worksite for the NLE activities at Nine Elms. Please refer to diagram III within Appendix 1 for the proposed initial layout of the worksite.

4.0 Summary of Main Works

A high level summary of the works at Nine Elms is included below. Detail of how site specific mitigation is to be applied for each environmental aspect on the Nine Elms Station scheme is included in the relevant section of this document.

In parallel with the initial construction activities, the perimeter hoarding, substation relocation, services works and site accommodation (offices, welfare, workshops etc.) will be assembled within the site boundary.

4.1 Site Clearance and Demolition Works

The following demolition works are required as part of the scheme, commencing early 2015:

- Pascal Street wall demolition works and ramp build;
- Demolition of electrical substation;
- Demolition of the Covent Garden Market Boiler House, Chimney and Underground storage tanks;
- Demolition of the 2 storey Covent House;
- Demolition of the 2 storey Banhams Patent Locks Building.

Site clearance activities for the Covent Garden Market Boiler House, Chimney and Underground storage tanks involves disconnection of services, hazardous material surveys, removal of hazardous materials (if applicable) and soft strip. FLO will then remove the boiler units, carry out a demolition survey and the demolition of the building using an excavator fitted with hydraulic jaws (this method produces less noise than using a percussive breaker), this will then be followed by the removal of the building foundation. The crushed material will be temporarily stockpiled and removed offsite by lorry. All temporary stockpiles will be sighted away from sensitive receptors and dampened down (if required) to minimise dust.

The demolition sequence will comprise the removal of the roof, followed by the walls and columns on a bay-by-bay basis. The chimney demolition may require erection of full-height scaffold however this will not be confirmed until further structural investigations have been completed. If required FLO will sheet the full height scaffold to minimise the visual impact of the demolition and to keep the dust to a minimum.

The underground storage tanks and connected pipework will be removed after removal of residual fuel and the cleaning and de-gassing of the tanks. All three tanks will be demolished using a large excavator with hydraulic jaws, which will progressively cut the tanks into manageable pieces for subsequent loading into a metal recycling skip. Any residual contamination will be removed and the void will be filled with clean material and compacted, to ensure the ground is structurally suitable for the following construction works.

The demolition and clearance of the Covent House and Banhams Patent Locks Building will include disconnection of services, hazardous material surveys, removal of hazardous materials (if applicable) and soft strip (soft strip maximises opportunities for the recycling of the internal building fabric and fittings). FLO will install a sheeted demolition scaffold to shield the demolition of the two storey building which will be carried out by a excavator fitted with hydraulic jaws. The demolition sequence will comprise the removal of the roof, followed by the walls and columns on a bay-by-bay basis. The demolition and site clearance material will be removed offsite by lorry.

4.2 Ground Treatment

Not applicable

4.3 Tunneling Works

The general tunneling activities are covered within the Battersea CoCP Part B, however specific measures relating to settlement arising from the tunnel route passing underneath buildings and properties in the vicinity of the Nine Elms worksite is covered in Section 16.

4.4 Station Box Construction

Initial demolition works will be carried out to the boiler house, chimney and Covent House. Piling preparation works will then be carried out at the east end, including surveys for unexploded ordnance, obstruction removal, pile mat and guide wall construction. In parallel with the above works, a bentonite plant will be set up on the Covent Garden Market land 'Apex' site.

Bentonite is commonly used in construction projects to retain the sides of excavations in sandy, wet or unstable soil. It is integral to the construction of the station box retaining walls because it ensures the foundation remains stable during excavation and while the concrete is poured. Bentonite will be delivered to site as bentonite powder and added to a pre-determined volume of water. When mixing is complete, the bentonite is pumped into silos for hydration and storage.

At a later date demolition works will then be carried out to the Banham building to allow the piling works to progress.

The pile walls will be installed, working from east to west with (at least) two piling rigs along with attendant mobile cranes. FLO will use a bored-driven piling technique instead of driven piling which will reduce the noise and vibration from this activity.

The Nine Elms station will be constructed using a form of top down methodology (which helps to reduce noise and visual impacts) with permanent internal floor slab beams acting as the temporary propping, as the excavation progresses. During this process our programme will be phased to enable the TBM to be driven through the end walls of the Station Box, and on towards the Kennington Shafts, prior to the completion of the excavation down to the B2 slab level. Before we can complete the excavation down to this level the TBM must have met the south sides to provide an alternative means of escape for the TBM operatives.

Construction of the station will require large concrete pours which may on occasion result in works overrunning requiring these activities to continue outside of the Core Working Hours, should this happen FLO will notify the Local Authorities in advance where practicable.

The base slab will then be completed which will allow the start of the vertical concrete works above. On completion of the vertical concrete works the platform will be constructed.

The overall top-down construction methodology will be modified slightly at the west end of the station box where the precast concrete lattice planks at roof slab level will be installed and the in situ concrete slab topping poured. All the precast materials will be manufactured off site and delivered by lorry as necessary.

The superstructure frames at the west and east ends of the station box will be constructed using precast wall, beam and slab units (where possible). The aim is to create a watertight environment, at the earliest possible stage, for the fit-out and mechanical and engineering installation.

Following the completion of the construction activities, the architectural finishes and services (mechanical, electrical, power and communications) installation will commence in a phased manner. Landscaping and external works will be the final stage of FLO works.

5.0 Public Access and Highways

The Transport and Works Act Order (TWAO) authorises certain matters concerning highways as set out in the relevant articles and Schedules of the Order, the Deposited Plans and planning direction Drawings. The matters include the formation of accesses (temporary and permanent) as shown on the plans, temporary stopping up of streets as listed in Schedule 2 and temporary changes to traffic regulations as listed in Schedule 9. These do not therefore require the further approval of the highway authority, although in all cases FLO will consult with them on the timing and scope of any highway works (and conditions 12 and 18 of the deemed planning permission require approval of certain highway matters). Where works are not authorised by the TWAO, FLO will obtain approval of the highway authority for any highway works, including permits under the London Permit Scheme, the need for which is not disapplied by the Order.

FLO participates fully in the Vauxhall Nine Elms Battersea (VNEB) site level meeting (monthly frequency) and has regard for the VNEB Construction Charter. This forum is set up to coordinate the projects that are being delivered in the Vauxhall Nine Elms Battersea development area.

FLO will discuss with all relevant stakeholders, including local residents and businesses regarding the proposed traffic management arrangements required to facilitate the Nine Elms station construction. This will allow alternative arrangements (if necessary) to be agreed and implemented in a timely manner. All traffic management will have prior approval from the Local Authorities before implementation and the arrangements will be clearly defined within the Traffic Management Plan.

Traffic management arrangement drawings and overall traffic management detail such as the movement of materials by road, will be prepared as defined in the Traffic Management Plan. Pertinent discussions will be held with the appropriate parties as further information is developed.

All of the traffic management schemes being developed for the construction phase will ensure that all the construction related traffic avoids the Vauxhall Gyratory.

From early 2015 until approx. early 2019 there will be a suspension of car parking bays and 5 motorcycle bays in place for all of Pascal Street, this is to enable the flow of vehicles from residents and construction egress to pass along Pascal Street with the minimum amount of impact. Parking bays located adjacent to Banham's are also to be suspended in a phased approach (to minimise disruption) and agreed with Banham Security Ltd.

Two signalised pedestrian crossings at the junction of Wandsworth Road and Pascal Street will be closed and the pedestrians will be diverted to use the crossing to the west of the road junction and facilitate the safe movement of pedestrians. Coordination is required with both London Boroughs of Lambeth and Wandsworth and Transport for London on the requirements of amended pedestrian routes.

Changes to pedestrian routes will be communicated by FLO through the quarterly newsletter, community liaison group, email bulletins and activity notifications (letter drops). The construction worksite access and exit will vary depending on the phase of the works. During the first phase of construction, the access and exit points will be via the Apex landsite.

Access for all FLO construction vehicles will be provided within the construction compound in order to ensure construction traffic impacts on local residents and businesses are minimised. Controls shall be put in place by FLO on roads adjoining the site if necessary to prevent parking by site workers. The Sustainable Travel Plan sets out FLO's strategy to encourage site workers to travel by public transport or to walk or cycle. FLO will make available motorcycle parking areas at the main site office location and provision will be made for parking of bicycles as well. Further details can be found in the NLE Sustainable Travel Plan.

6.0 Water Resources

There are no surface watercourses within the immediate area of the Nine Elms site and the site drainage is connected to existing combined sewers.

6.1 Site Drainage

Waste water is expected from site cabins, dewatering (if necessary) and the bentonite plant, as well as from other general construction operations. Appropriate licences will be obtained from Thames Water to permit the necessary discharge to the foul sewer and any offsite disposal (e.g. bentonite slurry) will be managed by a licensed waste contractor.

6.2 Dewatering

Construction processes will minimise the requirement for dewatering, however investigations are ongoing to determine whether dewatering (or de-pressurisation) will be required during the construction of the station box. Water from this process will be discharged to the sewer with an appropriate permit, controls and monitoring regimes as required by the permit.

6.3 Surface Water Pollution control

The only surface water receptor that could potentially be affected by works at Nine Elms is the River Thames through the drainage/sewer network with potential to enter the Thames via the Combined Sewer Outfall (CSO) during heavy rain.

The FLO team will ensure that the protection measures deployed (identified in section 7.5 of the CoCP Part A) to control the risk of pollution to surface water include:

- a) *securing fuel and oil containers in bunded areas*
- b) *careful management of refuelling activities*
- c) *preventative maintenance regimes and use of drip trays under static plant*
- d) *management of waters from any vehicle washing (PPG13 – Pollution Prevention Guidance on Vehicle washing and cleaning)*
- e) *management of silty runoff from earthworks*

In addition the following steps will be implemented where appropriate and reasonably practicable:

- Any container with contaminative potential will be kept within a lockable and bunded store with the lid securely tightened. These measures will be checked and audited during site inspections
- Secondary bunding and plant nappies (or similar) will be used to minimise the risk of spillages from semi-static plant, temporary storage of fuels and during re-fuelling
- A wheel wash facility or localised jet washing of wheels on hard standing
- Road sweepers deployed as required within the site and on roads leaving the site
- Settlement tanks (e.g. silt busters), water filters and hessian matting to drains will be used to ensure that silt does not enter the surface water drainage network
- Temporary blocking of drains to prevent runoff entering the CSO
- Spill response including access to site drainage plans and regular spill response training
- Management of bentonite slurry

6.4 Groundwater Pollution control

Any potentially contaminative materials (such as oils and lubricants) that may be used or stored on site during the construction will be controlled and managed in accordance with the CoCP Part A in order to minimise the risk to groundwater resources. *Measures to control the risk of pollution in the CoCP Part A include:*

- *Avoidance of materials that can pollute groundwater where practicable*

Water containing silt will be minimised and intercepted as specified in the CoCP Part A in order to minimise the risk to surface and ground waters.

Discharge of water will be undertaken to sewer subject to the necessary approvals being obtained from Thames Water and in accordance with the CoCP Part A.

7.0 Noise and Vibration

FLO will apply best practicable means (BPM) for the management of noise and vibration. This includes the control of working hours, selection and use of quiet or low noise equipment, measures agreed with the London Boroughs of Lambeth and Wandsworth (as appropriate) for the Section 61 consent under the Control of the Pollution Act 1974 and monitoring.

Normal working hours will be 0800 to 1800 weekdays and 0800 to 1300 on Saturdays. Where practicable, operations with the potential for causing material disturbance and/or disruption will be limited to these hours. There is one hour either side of these hours for quiet preparatory start-up and shut down activities only.

BPM techniques will be used to minimise the risk of impacts from noise and vibration such as selection of quiet/low noise equipment, controlling noise and vibration at source,

screening, provision of acoustic enclosures and correct orientation of plant and equipment i.e. ensure that the piling rig is facing away from sensitive receptors during piling operations.

7.1 Noise and Vibration Receptors

The location of the Nine Elms Station is situated north of Pascal Street and west of Wandsworth Road. The area comprises a number of sensitive receptors, including;

- residential properties in Pascal Street;
- residential properties on Bramley Crescent; and
- residential properties along Wandsworth Road (A3036).

FLO commissioned a noise monitoring exercise to validate the Environmental Statement predictions for the existing baseline ambient noise environment, by measuring noise levels at locations that are considered to be representative of the surrounding noise sensitive receptors, which may be exposed to changes in ambient noise due to the construction of the scheme.

The monitoring locations identified in 7.5 were selected to ensure that a “realistic worst case” assessment of noise and vibration impacts can be undertaken. This will facilitate an accurate prediction of the impact on receptors is maintained throughout the works and appropriate mitigation measures (discussed in 7.4) can be implemented to minimise the likelihood that the thresholds, as agreed with the local authorities, are not exceeded.

7.2 Construction Activities

The Nine Elms works (described in section 4) include construction activities that have the potential to cause a noise and/or vibration nuisance unless appropriately mitigated.

The noisiest activities for the construction of the new station at Nine Elms are predicted to occur during the early phases of the construction programme. These being:

- enabling/demolition works – including concrete breaking, demolition and piling works (approximate duration 12 months); and
- station box structure – including station box excavation (approximate duration 18 months).

Vibration will be generated from the secant/perimeter wall piling and concrete breaking, although predicted levels are not considered to pose a material risk of causing a nuisance, nor pose a risk of property damage. Where possible FLO will mitigate further through selection of plant.

7.3 Noise and Vibration Mitigation Measures

FLO will strive to minimise the impacts from the NLE Nine Elms worksite. All relevant and practicable measures as outlined within the CoCP Part A will be employed. At Nine Elms the following site specific measures will be implemented:

- Temporary super silent generators during the initial site setup for use during daytime only with additional acoustic screening if necessary, the orientation and location will be selected to minimise impacts to local sensitive receptors.

- Top down construction will provide more attenuation from construction noise due to the work activity being below ground and therefore providing a shielding effect
- Sheeted demolition scaffold will be used during demolition works
- Use of alternative low noise demolition equipment where practicable including concrete munchers, wire sawing, sectional removal
- Location of semi-permanent plant such as the concrete crusher away from sensitive receptors
- Location of site cabins to provide a screen from noisy activities
- Implementation of site haulage routes to minimise the requirement to reverse vehicles, (thereby reducing noise from reversing alarms)

Specific provisions as per the CoCP Part A (section 5.3) to minimise noise and vibration during construction are summarised below:

- *Each item of plant used on the project will comply with the noise limits quoted in the relevant European Commission Directive 2000/14/EC/United Kingdom Statutory Instrument (SI) 2001/1701 The Noise Emission in the Environment by Equipment for Use Outdoors Regulations (as amended)*
- *FLO will adopt the recommendations for the control of noise, as set out in BS 5228-1:2009 section 8, and for the control of vibration, as set out in BS 5228-2:2009 section 8 or alternative industry guidelines*
- *Plant and equipment liable to create noise and/or vibration whilst in operation will, as far as reasonably practicable, be located away from sensitive receptors. The use of barriers to absorb and/or deflect noise away from noise sensitive areas will be employed where required and reasonably practicable*
- *All plant, equipment, and noise control measures applied, shall be maintained in good and efficient working order and operated such that noise emissions are minimised as far as reasonably practicable. Any plant, equipment, or items fitted with noise control equipment found to be defective will not be operated until repaired.*
- *Where reasonably practicable, fixed items of construction plant shall be electrically powered in preference to being diesel or petrol driven*
- *Vehicles and mechanical plant utilised on site for any activity associated with the construction works will be fitted with effective exhaust silencers and shall be maintained in good working order and operated in a manner such that noise emissions are controlled and limited as far as reasonably practicable*
- *Machines in intermittent use will be shut down or throttled down to a minimum during periods when not in use. Static noise-emitting equipment operating continuously will be housed within suitable acoustic enclosure, where appropriate.*

FLO will assess the impact on residents following the completion of the Barratts development on the Sainsbury's site.

7.4 Pre-construction Ambient Noise and Vibration Survey

A pre-construction ambient noise and vibration survey has been undertaken by FLO's noise and vibration specialists during November 2014. An ambient noise and vibration survey measures the back ground levels of noise and vibration that occurs over a period of time. This is done to establish the 'normal' level of noise and vibration occurring in the surrounding area, which informs the strategy for managing noise and vibration arising from FLO's activities within the worksite.

Attended noise and vibration measurements were taken at four survey locations (refer to Appendix 2 for a location plan of the survey locations) over a period of six separate days and nights. The measurement locations were chosen to be representative of sensitive receptors around the Nine Elms worksite. The table below summarises the measurement locations.

Nine Elms		
ID	Location	Co-ordinates
NE1	Bramley Crescent	529920/177300
NE2	46 Pascal Street	529979/177331
NE3	Wandsworth Road A3036	530061/177264
NE4	Charman House, Pascal Street	530015/177300

Attended monitoring was taken during the following time periods:

- Monday to Friday 07:00- 19:00;
- Monday to Friday 19:00- 23:00; and
- Monday to Friday 23:00- 07:00.

The attended noise measurements comprised a sequence of 10 minute duration periods at each location over three consecutive hours during the daytime and two each during the evening and night time periods. Vibration measurements were undertaken simultaneously with the noise monitoring.

The table below compares the 2014 FLO baseline survey data with the 2008 data reported in the Environmental Statement (ES).

ID (2008/2014)	Time Period	2014 Survey Data			2008 Survey Data		
		Typical L _{Aeq T} dB	Typical L _{A90 T} dB	Typical L _{AFmax T} dB	Typical L _{Aeq T} dB	Typical L _{A90 T} dB	Typical L _{AFmax T} dB
-/NE1	Daytime	59.3	49.8	73.8	-	-	-
	Evening	46.3	45.6	66.3	-	-	-

	Night-time	42.2	40.0	48.0	-	-	-
S5/NE2	Daytime	61.4	52.8	78.7	58.0	43.0	-
	Evening	57.7	52.9	74.2	53.0	-	-
	Night-time	49.2	43.4	58.8	50.0	38.0	-
S6/NE3	Daytime	71.5	60.5	86.9	65.0	44.0	-
	Evening	62.2	54.9	77.2	-	-	-
	Night-time	60.1	49.5	66.5	-	-	-
-/NE4	Daytime	63.9	55.5	77.7	58.0	43.0	-
	Evening	55.8	50.9	70.6	53.0	-	-
	Night-time	48.3	42.9	56.0	50.0	38.0	-

Comparison of the measured noise levels reported in the ES against our new survey data shows that the baseline conditions measured are broadly consistent. However the FLO survey did identify a significant increase in the daytime noise levels at Wansdworth Road (NE3) and Charman House on Pascal Street (NE4), than stated within the ES. Therefore for these two locations the ambient noise levels are higher than predicted by the ES therefore the effect of noise from our works may be less.

Levels of vibration during the vibration survey were below a perceptible level to the technician at the measurement locations.

7.4.1 Provision of Noise Insulation

In accordance with the CoCP part A sensitive receptors likely to be subject to noise levels above the trigger levels identified in the NLE Construction Noise and Vibration Mitigation Scheme will be identified prior to works commencing on site and the appropriate action taken.

7.5 Noise and Vibration Monitoring

Noise

As described previously, monitoring locations have been selected on Pascal Street and Wandsworth Road to facilitate an accurate assessment of the likely effects experienced by residents in those areas, their location is illustrated in Appendix 2.

There are two types of noise monitoring – manned and unmanned. Manned measurements, facilitate the collation of data associated with specific construction activities, and allow detailed observations to be made concurrently regarding other (non related) noise sources. Unmanned measurements, also called continuous measurements, enable long term, 24/7 data to be collated for use in reporting, analysis of incidents, and to assist proactive management of BPM.

Unmanned noise monitors shall be positioned at locations agreed with the local authorities to represent sensitive receptors for the duration of the potentially noisy construction activities. These receptors have been selected due to their close proximity to the construction activities that may generate noise and vibration. To the North side of the site there is an existing

construction site (Barratt Homes) where noise from FLO's activities is unlikely to have an impact.

Unmanned monitoring will be undertaken using a real time noise monitors and data downloaded a minimum of once a week, but also after any complaints have been received to aid investigation and resolution of the complaint. Noise monitors that detect an elevated noise reading (averaged over the appropriate timescale will send an automated alert to the Nine Elms site manager and environmental manager so that appropriate action can be taken to mitigate impact. This enables an instant response to a potential problem. Noise monitors are fitted with alarms to enable monitoring against trigger levels. The trigger levels are defined in the Section 61 agreement with the Local Authorities.

FLO shall also measure construction noise levels using a hand-held meter (manned) where works require it (for instance when starting new potentially noisy activities), to both verify the unmanned results and also to provide supplemental measurement data at additional locations. The frequency and location of these surveys will be dependent upon the nature and sensitivity of the works being undertaken.

Vibration

FLO will undertake attended vibration monitoring should it be discerned by the environment team that vibration associated with certain activities extends beyond site boundaries, or complaints are received.

Vibration monitors will have their alarms set at a trigger level defined by the agreement with the building owner / occupier or best practice. These will also be enabled to provide real-time alerts of breaches so that action can be taken to rectify the problem.

All noise and vibration monitoring will be made available to the Local Boroughs as per arrangements outlined within the Section 61 consents. The data shall be presented in a format which shall be agreed with the London Borough of Lambeth and Wandsworth.

8.0 Dust and Air Quality

FLO will comply with the general measures to control air quality impacts as detailed within the CoCP Part A section 6 and the Air Quality Management Plan which details the general controls to limit dust emissions, such as the use of water suppression and regular cleaning and hard standing areas. FLO will use the Supplementary Planning Guidance (SPG) document on 'the control of dust and emissions during construction and demolition' as the basis of site specific controls to manage dust.

The FLO Air Quality specialists have completed an assessment of the potential dust generating activities at Nine Elms and have assessed the Nine Elms worksite as a Tier 3 category during demolition activities and Tier 2 category during construction thereafter (Tier 1 = Low risk, Tier 2 = Medium risk, Tier 3 = High risk). This corresponds with the tiered mitigation measures specified in the CoCP Part A section 6.3. If the works methodology assumptions on which the air quality assessment was based upon, changes sufficiently to render the assessment unreliable, then FLO will arrange for a reassessment.

8.1 Sensitive Dust Receptors

Considering their proximity to the works, the following properties have been identified by FLO's Air Quality specialists as potentially the most sensitive receptors in the proximity of the Nine Elms worksite:

- residential properties on Apple Blossom Court to the south
- residential properties on Bramley Crescent to the south
- residential properties on Pascal Street to the south
- residential properties along Wandsworth Road

8.2 Activities Requiring Specific Dust Mitigation Measures

The following activities at Nine Elms have been identified as requiring specific dust mitigation measures:

Demolition

The controlled demolition works at Nine Elms will be undertaken in accordance with the control measures described in the CoCP Part A. Such measures include, but are not limited to, the appropriate hoarding of the worksite, sheeted demolition scaffold, the use of water suppression, hard standing site roads, the consideration of material storage locations and the stripping of buildings from the inside out.

Due to the proximity of residential properties on Bramley Crescent to the Nine Elms station demolition works, additional mitigation will be implemented, such as the sheeting off of the southern façade of the demolished buildings.

Earthworks and Piling

Early phases of the works at Nine Elms are likely to involve removal of obstructions, piling mat preparation works, secant piling and top down excavation activities, followed by construction and trackout of material and the movement of construction related road vehicles. These activities are likely to be the principal sources of dust during the construction phase.

If temporary stockpiles are required, FLO will locate them away from receptors where practicable, however FLO will at all times endeavour to remove surplus material from site as soon as possible to mitigate any dust and run off impacts from stockpiles.

FLO will make maximum use of precast concrete to reduce the need for grinding, sawing and cutting on site to further reduce dust emissions.

The nearest sensitive receptors to these works are the residential properties on Apple Blossom Court and Bramley Crescent 15m to the south.

8.3 Category Tier 2 Dust Mitigation Measures for Nine Elms during Construction

The CoCP Part A (section 6.3) provides a range of mitigation measures corresponding to the relevant tier number (1-3) / dust raising potential of the works. Nine Elms has been allocated a Tier 2 (medium risk category) during construction activities. In addition to the Tier 1

standard dust control procedures, the site specific dust control procedures for a Tier 2 worksite (applicable to Nine Elms during construction) as described in the CoCP A are outlined below:

- 1) strip insides of buildings, as far as reasonably practicable, before demolition;
- 2) bag and remove biological debris (such as birds' nests and droppings) or damp down such material prior to demolition;
- 3) wherever reasonably practicable, retain walls and windows while the rest of the building is demolished to provide a screen against dust;
- 4) screen buildings, where dust producing activities are taking place, with debris screens or sheeting;
- 5) avoid carrying out earthworks during dry weather if reasonably practicable having regard to programme and contracting arrangements for the relevant works or provide and ensure appropriate use of water sprays to control dust;
- 6) ensure slopes on stockpiles are no steeper than the natural angle of the material and maintain a smooth profile;
- 7) ensure appropriate equipment is readily available on site and clean up any spillages as soon as reasonably practicable after the event using wet cleaning methods;
- 8) ensure mixing of cement, bentonite, grout and other similar materials takes place in enclosed areas remote from site boundaries and potential receptors.

8.4 Category Tier 3 Dust Mitigation Measures for Nine Elms during Demolition

Nine Elms has been allocated a Tier 3 (high risk category) during demolition activities. In accordance with the CoCP Part A, during the demolition works the highest standard of dust control reasonably achievable will be adopted by FLO which incorporates all relevant Tier 1, Tier 2 and Tier 3 techniques, the site specific dust control procedures for a Tier 3 worksite as described in the CoCP A are outlined below:

Advanced Dust Control Procedures for Sites /Operations with a High Risk of Dust Emissions (Tier 3) are as follows:

- 1) *These procedures are relevant where there is a high risk of significant adverse impact from dust emissions due to the proximity of receptors, the type of activity on site or the duration of operations. In such cases the highest standard of dust control reasonably achievable will be adopted, which will incorporate all relevant Tier 1 and Tier 2 techniques as set out above, as well as additional relevant monitoring measures as outlined below. Measures to be used will be site specific and will be proportionate to the level of risk arising, such as having personnel on site to monitor and manage dust emissions. Techniques such as total enclosure of certain operations to protect vulnerable receptors would be implemented where appropriate.*

8.5 Dust Monitoring

Nine Elms has been allocated a Tier 3 (high risk category) during demolition activities and Tier 2 (medium risk category) during construction activities. Therefore the below monitoring

techniques (Tier 2 and 3) (as stated with the CoCP Part A) will be adopted during demolition and reduced accordingly for construction activities according to specific site conditions;

Tier 2 Category monitoring

Passive deposition monitoring techniques will be adopted at appropriate locations (site boundaries/local receptors). Passive systems collect and measure deposited dust and are best suited for measuring over days weeks and months.

A comprehensive site survey will be undertaken to determine the prevailing wind direction (using available meteorological data) and a minimum of two permanent PM10 monitoring stations will be installed along the line of the average wind direction and to make data readily available to the local authority.

Tier 3 Category monitoring

In addition to the monitoring outlined above for a Tier 2 category, existing baseline dust levels will be established prior to the commencement of any potentially significant dust-creating activities. Where practicable, such baselines will make reference to data sourced from local background PM10 concentrations (such as measured by the Automatic Urban and Rural Network (AURN) monitoring sites and appropriate local authority automatic monitoring sites and those established by dust monitoring in the neighbourhood) and will ideally refer to data from the preceding 12 month period.

As part of this baseline work, FLO is required, as far as is reasonably practicable, to ensure that:

- I. Monitoring data is available for a suitable duration prior to construction.
- II. Data is collected as PM10 $\mu\text{g.m}^{-3}$, the same units as suggested for the site action level in the SPG.
- III. Any unusual activity in the vicinity of monitoring sites that may affect monitoring results and/or create a false baseline (e.g. local construction activity) are avoided or noted by local monitoring site operators.
- IV. Dust monitoring commences as soon as reasonably practicable to provide localised data to augment the data obtained from the AURN/local authority sites.

During the “high risk” demolition events themselves, particulate monitoring will be undertaken using appropriate survey instruments such as Osiris, Topaz, DustScan or similar devices sited at appropriate locations such as site boundaries, potential receptors or in a transect orientated to the prevailing wind, as required by specific site characteristics.

The survey instruments used will operate an alarm (PC based or mobile phone) should a predetermined site action level be reached. This level will be established in consultation with the relevant local authority and by reference to both local authority and AURN PM10 monitoring data. Subject to such consultation, a preliminary site action level of $250\mu\text{g.m}^{-3}$ (15 minute average) is proposed for both Total Suspended Particulates (TSP) - a leading indicator of PM10 - and PM10.

If the alarm is triggered the following actions will be taken:

- (a) The nominated person or someone delegated by the nominated person will as quickly as reasonably practicable investigate activities on the site to ascertain if any visible dust is emanating from the site or activities are occurring that are not in line with dust control procedures.*
- (b) Any identified causes will be rectified where practicable. Actions will be recorded in the site logbook and the relevant local authority notified of the incident and actions by telephone or email as soon as practicable after or during the incident.*
- (c) If no source of the incident is identified the local authority and/or AURN monitoring sites will be contacted to establish if there is a wider area increase in particulate concentrations.*
- (d) If the cause of the alarm is not related to site operations the outcome of any investigation will be recorded in the site logbook and reported to the relevant local authority at an appropriate time.*

To ensure plans are co-ordinated and dust and particulate matter emissions are minimised, regular liaison meetings with site managers and /or environmental managers of other high risk construction sites within 500m of the site boundary will occur.

With the provisions specified in the CoCP Part A (section 6.3) coupled with the mitigation and monitoring measures specified above it is not expected that significant dust deposition will occur as a direct result of the works. However should dust deposition occur as a direct result of the works, FLO will make efforts to address the concerns raised.

If dust depositions occur because of a build-up emanating from the NLE Nine Elms worksite and the adjoining construction sites – Nine Elms Point by Barratt Homes and a development by Mace, FLO will co-operate with the other contractors to address the problem of cumulative build up.

9.0 Energy

General procedures to reduce energy consumption across the whole NLE scheme is detailed within the Energy Management Plan however FLO is committed to being as energy efficient and environmentally responsible as possible through specific methods that will include but not be limited to: early connection to mains power where practicable, purchasing/hiring energy efficient equipment and lighting, avoiding unnecessary lighting, provision of energy efficient and well insulated site accommodation, metering and sub-metering for data collection, regular communication and reporting and exploring options to procure energy from renewable sources.

10.0 Contaminated Land

The ES states that the area of Nine Elms has been occupied by industrial activities since earliest mapping data. Onsite activities have included timber yards, various works, factories and depots. Surrounding land use has historically been heavily industrialised particularly in relation to the former Nine Elms Goods Depot (a large railway depot) and the high

concentration of railway lines associated with it as well as the Banham building being formally part of the railway engineering works.

Other potentially contaminative industries in the vicinity have included garages, numerous works, factories, depots and breweries. It is also assumed that an underground oil storage tank is present at Nine Elms which supplies the existing Boiler House. Taking this into consideration a moderate to high potential for contamination exists in this area.

A separate Resource Efficiency Plan has been produced to set out the management process to reduce the risks associated with any contaminated material identified at the site, and how to deal with any previously unidentified contaminants. Contaminated land issues will be addressed in a separate site specific Contaminated Land Management Plan which will be produced once all the ground investigation data has been assessed.

Potential contaminants that could arise from the sites industrial history include:

- Polycyclic Aromatic Hydrocarbons (PAHs), Total Petroleum Hydrocarbons (TPH), metals, ground-gas and hazardous material from the existing fuel tank;
- Contaminants within the Made ground imported to the site as part of its historic development;
- PAHs, TPH and metals from the former works, factories and depots; and
- TPH, PAHs and metals from the former railway lines.

In accordance with the CoCP Part A, where the investigation reveals any presence of contaminated land, an appropriate remedial strategy will be developed, submitted to and approved by London Borough of Lambeth or Wandsworth (as appropriate) to identify the most appropriate option for managing the contamination. If material contamination is discovered during the investigation or construction the most likely course of action would be to halt works, make any excavation safe, segregate all contaminated material, and investigate the type and level of contamination. Once established this will be used to inform an appropriate remediation strategy which will be agreed with the local authority.

11.0 Materials and Waste Management

The general material resource management and reduction of waste is detailed within the Resource Efficiency Plan. Contaminated Land issues will be addressed in a separate site specific Contaminated Land Management Plan which will be produced once all the ground investigation data has been assessed. However the specific measures FLO are implementing on the Nine Elms worksite are detailed below.

Clean excavated material will arise from the construction of the station box at Nine Elms, this will be loaded onto lorries during the day and transported offsite for beneficial reuse by road. The following structures will be demolished during construction of the Nine Elms Station;

- Banham Security building
- Covent House
- Boiler house

- Underground oil tank
- Electrical sub-station

Where practicable FLO will maximise all opportunities for the onsite reuse of the demolition material, for example on site crushing of clean demolition material for the construction of temporary haul roads and/or piling mats. This is preferable to re-using the material off site.

12.0 Ecology and Nature Conservation

General procedures to control and limit disturbance to areas of nature conservation interest, protected species and habitats, and measures to be adopted in the event of the discovery of protected species across the whole NLE scheme are detailed within the Ecology Management Plan. However site specific information is detailed below.

The Nine Elms worksite is located in an area which includes no designated sites of conservation or ecological importance.

12.1 Terrestrial

FLO will carry out a pre-demolition emergence survey on the sub-station adjacent to Covent House (Electricity substation) approximately 6 weeks prior to it being demolished, to confirm the absence of any bats. If bats are recorded during the survey, a Natural England development licence may be required.

12.2 Aquatic

Not applicable

12.3 Protection of Habitats

Not applicable

12.4 Protection of Trees

An arboriculture assessment has identified that within the Nine Elm site boundary there are trees to be removed to facilitate the development. All tree removals are to be mitigated by the post-construction re-planting programme, with the intention of replacement with a higher standard than currently exists.

13.0 Lighting

Site lighting and signage will be provided to ensure the safety and security of the construction sites and will be at the minimum luminosity necessary. Where appropriate, lighting to site boundaries will be provided and illumination will be sufficient to provide a safe route for the passing public and the lux levels on footways shall be at least equal to those provided by the existing street lighting. In particular, precautions will be taken to avoid, light spill into adjacent properties, roads and amenity areas, shadows cast by the site hoarding on surrounding footpaths.

Site specific lighting measures to minimise the adverse impacts on adjacent buildings, wildlife sites and land uses at Nine Elms will be taken from the 'Guidance Notes for the

Reduction of Obtrusive Light GN01:2011' (published by the Institution of Lighting Professionals).

14.0 Archaeology

Where possible, FLO will minimise all potential impacts to archaeology and will take a proactive approach to handling both buried and above ground archaeology should it arise. General procedures to control and limit disturbance to Archaeology across the whole NLE scheme is detailed within the Archaeology and Built Heritage Management Plan, however pertinent archaeological considerations relating to the Nine Elms worksite are detailed below.

At Nine Elms there is potential to discover the following archaeological remains:

- Palaeoenvironmental remains (a resource assumed to extend beyond the site); and
- Previously unrecorded archaeological remains.

It is expected that no buried archaeological remains, of sufficient significance to merit preservation in-situ, will be discovered within the Nine Elms area. However, FLO will engage with an archaeological contractor to provide a Written Scheme of Investigation which will detail our strategy should we make a discovery. This will be submitted to the London Boroughs of Lambeth and Wandsworth prior to material ground break within the site.

15.0 Listed Building and Conservation Areas

General procedures to control and limit disturbance to built heritage across the whole NLE scheme is detailed within the Archaeology and Heritage management plan.

There are no specific buildings of historical or architectural significance that could be impacted by the activities at the Nine Elms worksite and the Nine Elms worksite is not within a Conservation Area. However prior to the demolition of the Banham Building, FLO will ensure that this building is recorded in consultation with English Heritage.

16.0 Settlement

Robust control of ground movement is essential on the NLE due to the critical infrastructure and residential areas above, below and adjacent to the works. FLO will carry out a comprehensive regime of settlement monitoring prior to and during relevant construction activities as described in the Ground Movement Strategy. This will provide real time alerts of any significant movement is detected.

FLO will further develop its response to sensitive buildings and infrastructure and will liaise directly with any potentially affected parties.

17.0 Community and Stakeholder Liaison

FLO will provide a dedicated stakeholder management team and resources to enable the successful delivery of the NLE project. FLO will achieve this by establishing and maintaining positive relationships with the project stakeholders and contributing to maintaining and improving the reputation of the FLO JV and London Underground. This will create a lasting legacy after the works have been completed.

FLO shall provide the following parties with information relating to construction activities that are likely to affect them:

- All Nine Elms and Oval NLE Community Liaison Group Members
- Business and residential properties on Pascal Street
- Business, residential properties and other organisations on Wandsworth Road
- Schools, churches and other organisations around the above listed areas as appropriate
- Barratt development including future residents
- CGMA tenants

As the project progresses additional stakeholders may emerge and they will be included in works notifications and other project communications as appropriate.

These communications would typically be to inform parties of any proposed works, the nature, timing and planned disruption, measures to reduce the impact of these works, the helpline telephone number and address to which any enquiries should be directed. Advance notice of works will be sent out at least two weeks prior to their commencement where possible (exceptions may occur such as short-notice utility works).

FLO will maintain regular communication to ensure that the wider community and other stakeholders and affected parties are kept well informed. Regular newsletters providing information on the works will be distributed to local residents and businesses and other key stakeholders. The works update page on the NLE website will be updated on a monthly basis or as appropriate. FLO will also provide on a regular basis an update of the schedule of work to London Boroughs of Lambeth and Wandsworth.

The Nine Elms and Oval NLE Community Liaison Group is an established forum through which a timely and informed discussion of the works can take place. This Community Liaison Group aims to keep representatives of local residents and businesses informed about the work and provide an opportunity to raise matters of interest or concern. It is chaired by the local councilor from the London Borough of Lambeth and is comprised of representatives from FLO, LU, London Boroughs of Lambeth and Wandsworth, local resident and community groups, local landowners and businesses, and aims to meet a minimum of four times per year and more frequently if necessary. Pertinent issues raised within the Nine Elms and Oval NLE Community Liaison Group meeting will be escalated to the Core Liaison Group meeting.

The FLO complaints procedure will be approved by LU (as required by the CoCP Part A) and has been developed to ensure that all complaints received, relating to the construction of the project, are dealt with efficiently and in an appropriate timeframe.

We recognise the importance of enquiries and complaints as a valuable form of feedback and we are committed to using this information to help drive forward improvements. FLO is responsible for maintaining a complaints register up to date and available for review at internal and external meetings.

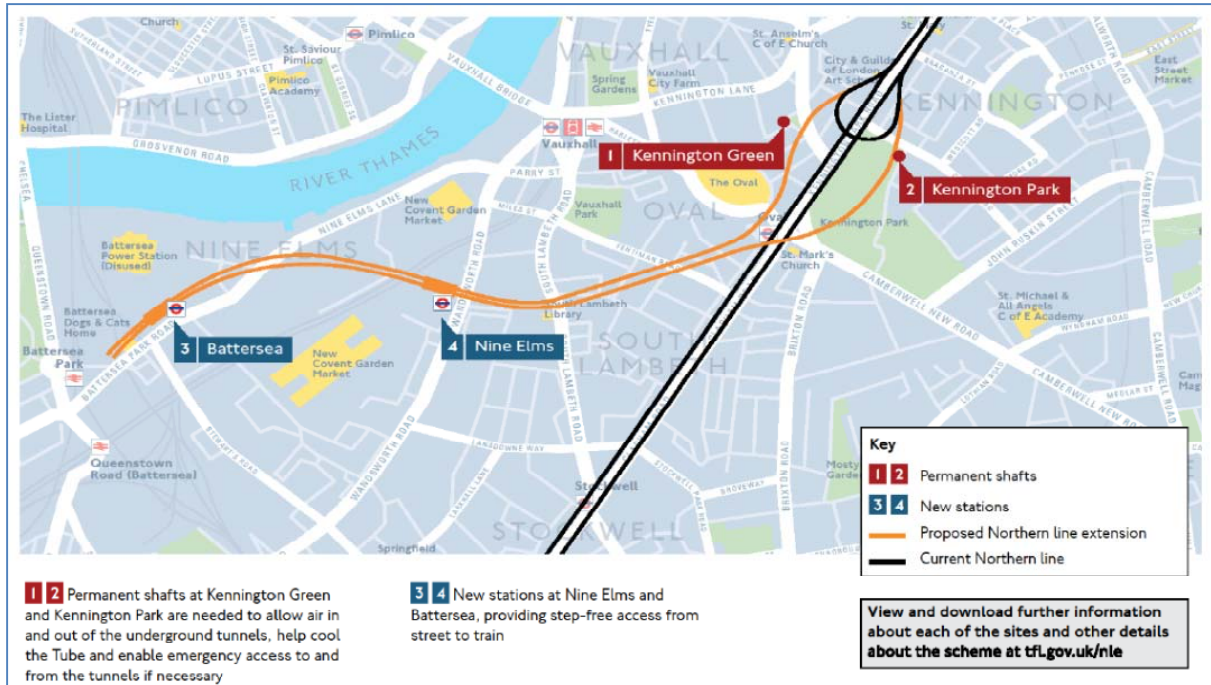
The FLO Community Liaison Manager will undertake proactive engagement with local residents through the established community liaison groups and newsletter drops to advise of up and coming works.

There is a 24 hour helpline for enquiries and complaints (0343 222 2424) and an email account (nle@tfl.gov.uk) to receive complaints and enquiries from the public which is monitored on a daily basis.

- All calls to be logged and complaints tracked through to resolution
- Every complaint to be acknowledged within 24 hours of being received
- The complaint will be forwarded to the relevant person to action within 24 hours
- FLO will endeavor to resolve all issues within 10 days
- Weekly reports to be provided to the LU Stakeholder Manager and the LU Project Manager
- Quarterly reports to be shared at Community Liaison Groups

Project web pages can be found at www.tfl.gov.uk/northern-line-extension providing general information on the project, regular progress updates, details of forthcoming works, any impacts on travel arrangements, relevant publications including minutes of the Nine Elms and Oval NLE Community Liaison Group meetings and contact details.

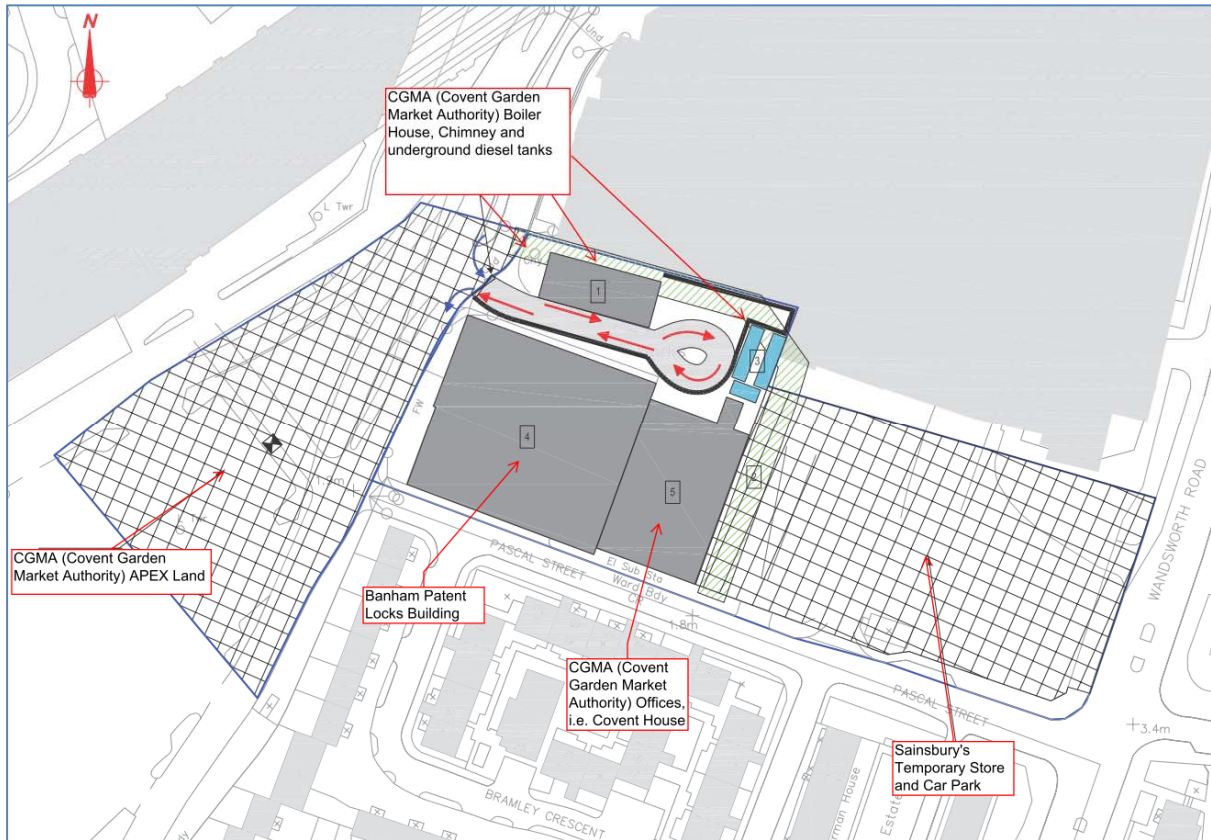
Appendix 1 - Nine Elms Worksite Location



I Site Location Plan

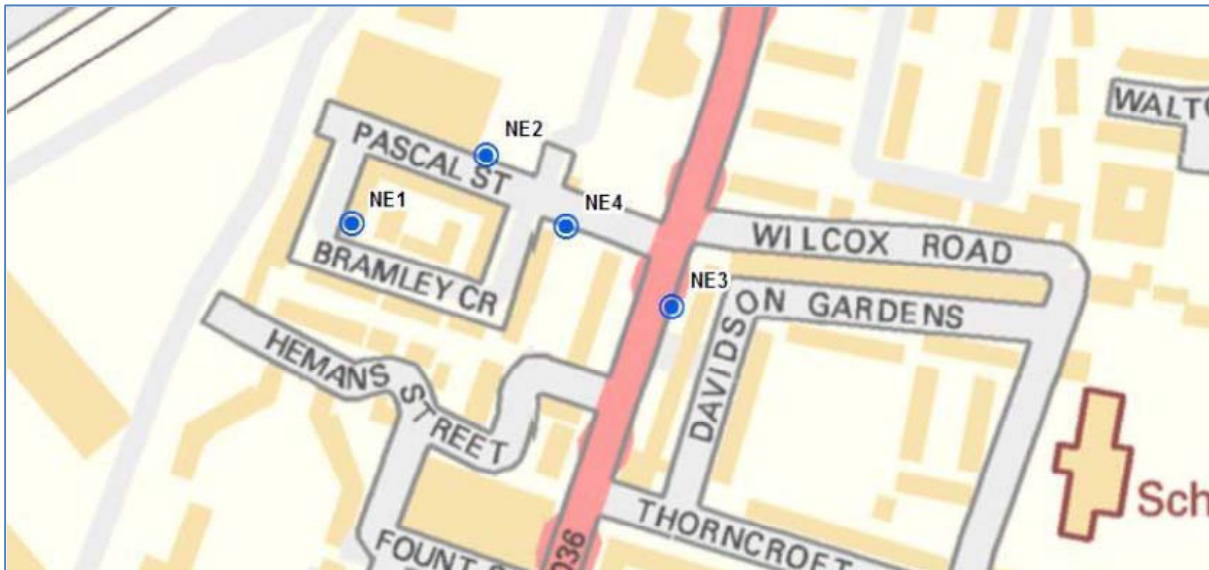


II Nine Elms



III Site Layout Plan

Appendix 2 – Figures



I. Location of four noise and vibration four baseline survey locations (NE 1, 2, 3, 4)



II. Location of proposed unmanned noise monitoring locations

The noise monitors will be located at points within the two areas shaded pale green. The exact locations will be determined following consultation with the local authority.