

BUCKINGHAM GROUP CONTRACTING LIMITED DEMOLITION AND CONSTRUCTION MANAGEMENT PLAN FOR

Contract Name	West Drayton Leisure Centre		
Contract Address	Rowlheys Place, Harmondsworth Road, Uxbridge, London UB7 9NQ		
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Approved by			
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Revised following comments from Hillingdon Council Highways Team.			
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Glossary

Acronyms and abbreviations	
COSHH	Control Of Substances Hazardous to Health
CEMP	Construction Environmental Management Plan
CDM	Construction Design & Management [Regulations]
PD	Principal Designer
SPG	Supplementary Planning Guidance
BGCL	Buckingham Group Contracting Ltd
RA	Risk Assessment
CITB	Construction Industry Training Board
HSEQ	Health, Safety, Environmental, Quality
CPCS	Construction Plant Competence Scheme
NPORS	National Plant Operators Registration Scheme
EDR	Environmental Daily Report
HGV	Heavy Goods Vehicle
SYPOL	COSHH risk management system
MS	Method Statement
HSE	Health and Safety Executive
GP.XXXX.FXX	Buckingham Contracting Group Ltd standard form reference

Demolition and Construction Management Plan read and understood by:

Name	Position	Date	Signature	Revision Number

1.0 Introduction

This Demolition and Construction Management Plan has been prepared in response to planning condition 24 of the planning permission for the redevelopment of the West Drayton Leisure Centre (planning ref. 75127/APP/2019/3221).

Condition 24:

Prior to development commencing, the applicant shall submit in writing a demolition and construction management plan to the Local Planning Authority for its written approval in consultation with Highways England. The plan shall detail:

- (i) The phasing of development works*
- (ii) The hours during which development works will occur.*
- (iii) Measures to mitigate against noise during construction.*
- (iv) Measures to prevent mud and dirt tracking onto footways and adjoining roads (including wheel washing facilities).*
- (v) Traffic management and access arrangements (vehicular and pedestrian) and parking provisions for contractors during the development process (including measures to reduce the numbers of construction vehicles accessing the site during peak hours).*
- (vi) Measures to reduce the impact of the development on local air quality and dust through minimising emissions throughout the demolition and construction process.*
- (vii) The storage of demolition/construction materials on site.*

The approved details shall be implemented and maintained throughout the duration of the demolition and construction process.

REASON

To safeguard the amenity of surrounding areas and manage highways impacts in accordance with Policy DMHB 11, DMT2 and DME14 of the Hillingdon Local Plan: Part Two - Development Management Policies (2020).

This Demolition and Construction Management Plan has been compiled by the Buckingham Group Contracting Limited project management team to comply with the following regulations;

- Section 23 of the Construction Design and Management Regulations 2014 (CDM)
- The Mayor's SPG The Control of Dust and Emissions During Construction and Demolition July 2014.
- London Plan 2016 Policy 7.14
- London Borough of Hillingdon Local Plan 2020 Policies 6 and 8.

Demolition and construction works are due to commence in May 2022 and take place on site between the hours of:

Monday to Friday, 8:00am to 6:00pm

Saturday, 8:00am to 1:00pm

Ordinarily works are not planned for Sundays or bank holidays although some specific activities may require works to be carried out beyond normal working hours.

There will be certain activities that will potentially require late night working, typically concrete finishing operations that are atmospheric dependant. These activities are pre-planned, the details will be communicated to stakeholder groups in advance including the Hillingdon Council Environmental Protection Team. The necessary Section 61 application will be made.

HGV deliveries via road will be scheduled to arrive during the site working hours set out above.

Scope of Work & Programme

Design and construction of the new West Drayton Leisure Centre and associated works.

Brief Description:

- The project consists of the demolition of two Buildings either side of Rowlhey Place including the removal of the existing concrete slab and hard standings etc the majority of which are to be crushed for re-use. The existing buildings were built in 1969 and 1996, asbestos surveys have been carried and specialist contractors engaged for the removal.
- The site is then to be remediated using a system of CMC screw piles to consolidate the existing ground. The new building is to have a sheet piled basement and then a steel framed superstructure with both precast and in-situ concrete floors to an amenity area and is two storeys' tall housing a Swimming Pool, Leisure areas and football pitch which will be open to the public. Generally, the roof structure is flat with a slight crossfall and the perimeter walls are clad with both brickwork and metal cladding. The walls on the ground floor are Blockwork with lightweight wall to the first-floor area.
- The works also include external drainage and the construction of a new 130 space carpark on the opposite side of the road. The overall project duration of the works is 98 weeks with an early Pre-Construction period of 20 weeks commencing on 31st January 2022.
- Section 278 works to be completed on junction at site access.

Activity	Start	Finish
Site investigations/enabling works	April 2022	June 2022
Demolition works	May 2022	June 2022
Piling	July 2022	August 2022
S278 Works	August 2022	October 2022
Below ground construction works	July 2022	September 2022
Above ground construction works	September 2022	February 2024

Summary Programme

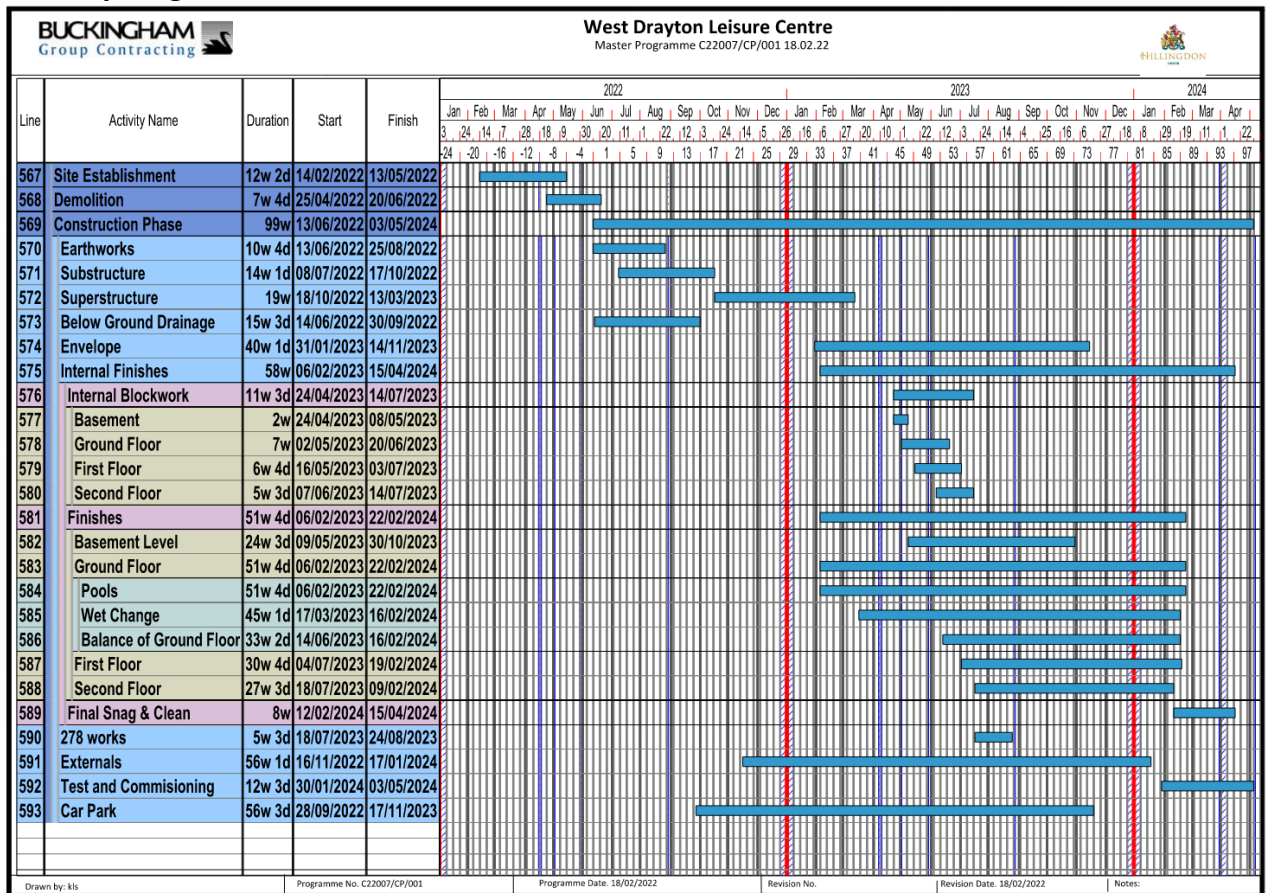


Figure 1 – Summary Construction Programme

Permissions and Consents

As the project progresses Buckingham Group Contracting Ltd will gain / apply for the correct environmental permissions or consents from the correct governing body (Environment Agency, Local Government).

A list of the consents that have been applied for and the date of consent are listed below:

Permission / Consent	Consenting Body	Date Submitted	Date of Consent	Reference:
Planning Approval	London Borough Hillingdon	September 2019	March 2020	75127/APP/2019/3221
Building Control	London Borough Hillingdon	TBA		
Demolition Notice	Section 80	TBA		
Trade Effluent Licence	Thames Water	TBA		
Project Notification	HSE – F10	February 2022		
Section 61 Agreement		TBA		
Heathrow Airport Crane & other Tall Construction Equipment Permit		TBA		

Contract Directory

Client			
Name	London Borough of Hillingdon		
Address	London Borough of Hillingdon, Civic Centre, High Street, Uxbridge	Contact	J Evans
		Tel. No	07717 318097
Post Code	UB8 1UW	Email	Jevans2@hillington.gov.uk

Architect			
Name	Hunters Architects		
Address	Space One, Beadon Road, London	Contact	Tom Smith
		Tel. No	+44 20 82378200
Post Code	W6 0EA		

Client Project Manager and Principal Designer			
Name	Philip Pank Partnership		
Address	Quantum House, 113 Euston Street, London	Contact	C Henry
		Tel. No	+44 7736 900193
Post Code	NW1 2EX	Email	carolhenry@philippank.com

Principal Contractor			
Name	Buckingham Group Contracting Ltd		
Address	Blackpit Farm, Silverstone Road, Stowe, Buckingham	Contact	Mr Richard Charman
		Tel. No	01280 823355
Post Code	MK18 5BT	Email	Richard.Charman@buckinghamgroup.co.uk

Structural Engineer			
Name	Buro Happold Consulting Engineers Ltd		
Address	17 Newport Street London	Contact	Julian McFarland
		Tel. No	+44 1225 320600
Post Code	W1T 1PD		

Health Safety Environment & Quality (HSEQ) Advisor			
Name	Buckingham Group Contracting Ltd		
Address	Blackpit Farm, Silverstone Road, Stowe Buckingham		Shane Fielder
		Tel. No	01280 823355
Post Code	MK18 5BT	Email	Shane.Fielder@buckinghamgroup.co.uk

Project Organisation Structure

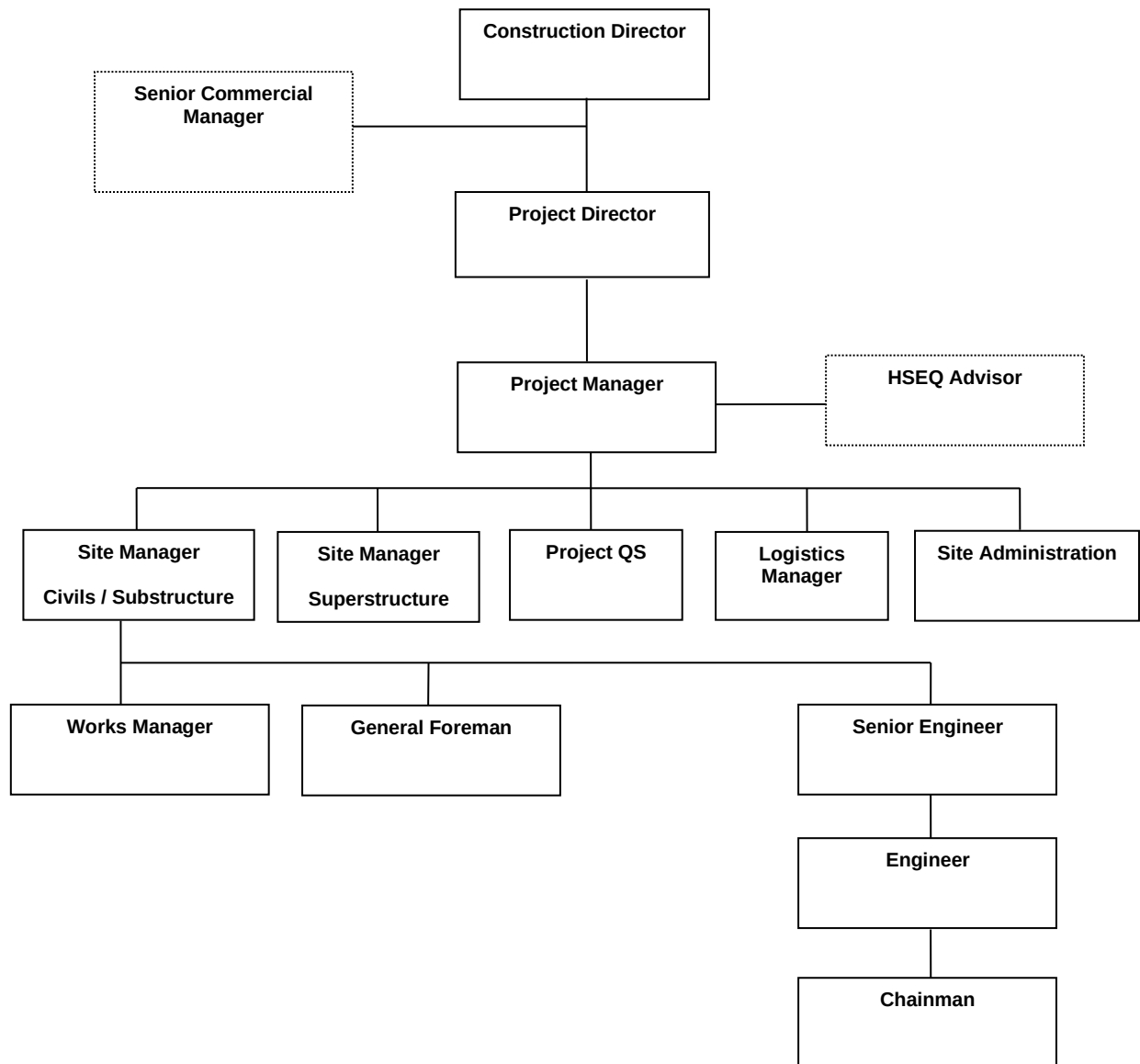


Figure 2 – Organisation Chart

Project Management Team (Company Level)

POSITION	NAME	LOCATION	PHONE No.
Construction Director	Richard Charman	Head Office	01280 823355
Senior Commercial Manager	Simon Turner	Head Office	01280 823355
Project Director	Andrew Mackintosh	Onsite	01280 823355
Project Manager	Will Kiddle	Onsite	01280 823355
Quantity Surveyor	Andy Whittaker	Onsite	01280 823355
Site Manager	TBA		

Site Manager	TBA		
Logistics Manager	TBA		
Health, Safety Environment and Quality Advisor	Shane Fielder	Head Office/ Onsite	01280 823355
General Foreman	TBA		
General Foreman	TBA		
Senior Engineer	TBA		

Location of Temporary Accommodation and Welfare

A Fire and Emergency Plan, part of the Construction Phase Health, Safety, Environmental and Quality Plan, will be drawn up for the Development. All fire points and emergency assembly points will be marked and signed. The project manager will contact the emergency services to inform them of the work activities during mobilisation. Our site set-up proposals are as shown on figure 3 below for site set up and site facilities.

The site welfare and offices will be situated on the south side of Rowhleys Place within the existing Family Centre building. During the final months of the programme temporary accommodation will be brought in to enable demolition of the existing family centre and construction of the car park. All access will be through the Contractor's Entrance turnstiles and into the Site Compound /working area. Access to the site will be through controlled access points to ensure all personnel have been inducted and have the appropriate PPE.

There will be limited parking for essential users, all staff, operatives and visitors will be encouraged to utilise local public transport.

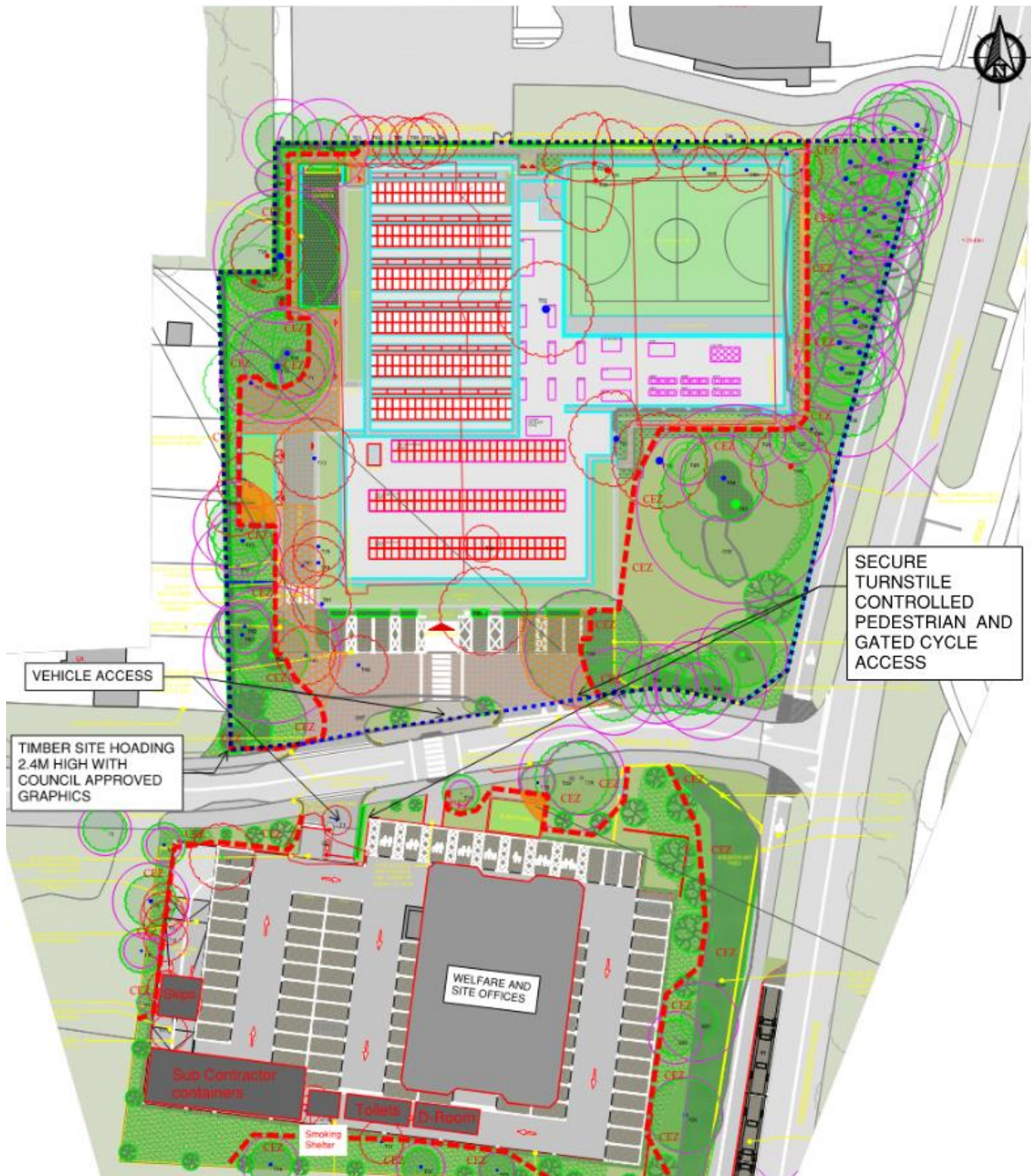


Figure 3 - Plan View of Site Compound

Site Security

The main point of delivery to the site will be via Rowheys Place, where we propose to bring road deliveries for unloading.

Smaller delivery vehicles, pedestrians and cyclists will be controlled by gate staffed off the main road. All gates to all site access points will be kept closed and locked when not in use or supervised. All visitors will report to the site office and sign in before proceeding onto site. All relevant safety signs will be displayed at all times.

Fencing

The compound area will be segregated using timber hoarding with concrete foundations where tree protection zones are not present as shown below:

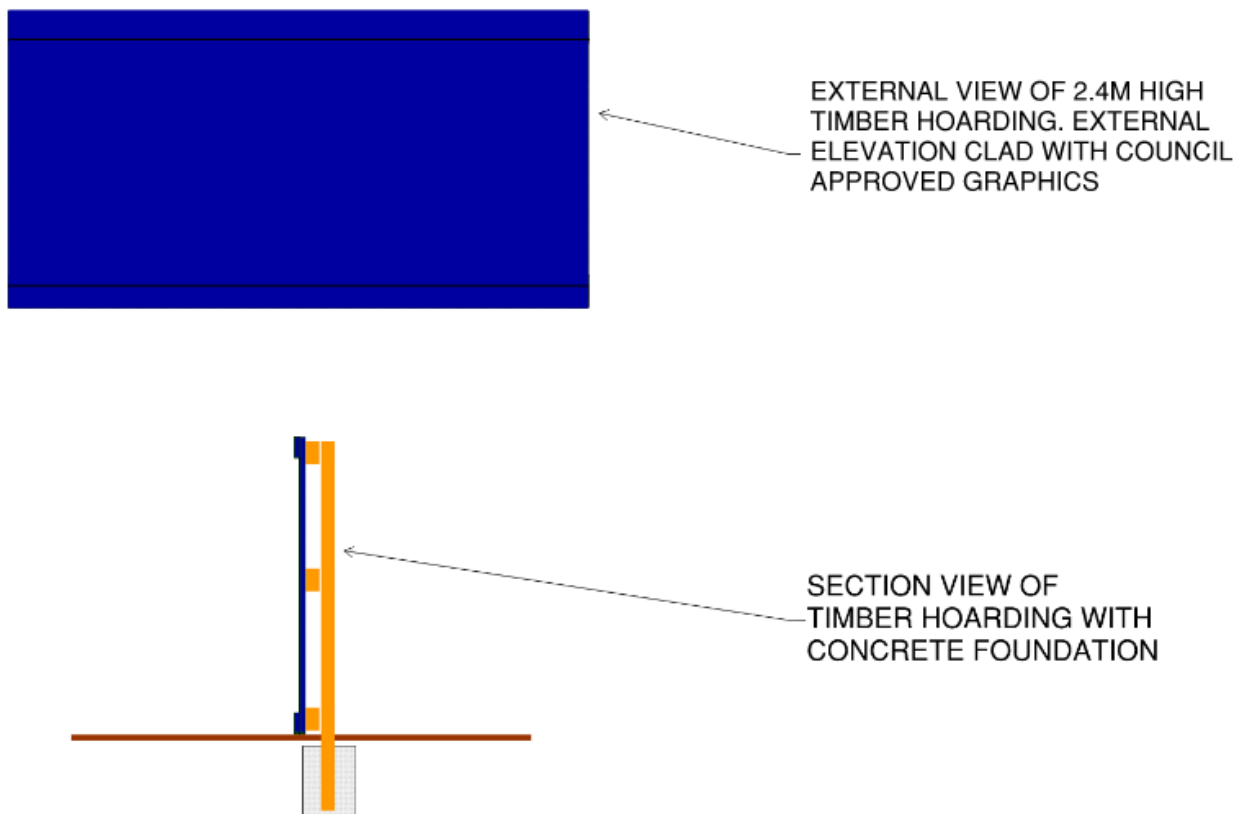


Figure 4 – Hoarding Details

An acoustic fence will be installed between the development area and residential properties, details of this fencing is contained within appendix 4.

Lighting Scheme

The compound will be lit during working hours of darkness with low level safety lighting remaining during non-working hours of darkness to provide lighting for security staff.

2.0 Vehicle Routing and Site Access

Heavy Goods Vehicles (HGVs) will be advised to use the following route:

M4 to Stockley Road to Holloway Lane to Harmondsworth Road turning left onto Rowheys Place.

Turning around will be carried out onsite, HGVs will not be permitted to go beyond the site entrance

into the residential area of Rowlheys Place.

HGV route shown below in figure 5.

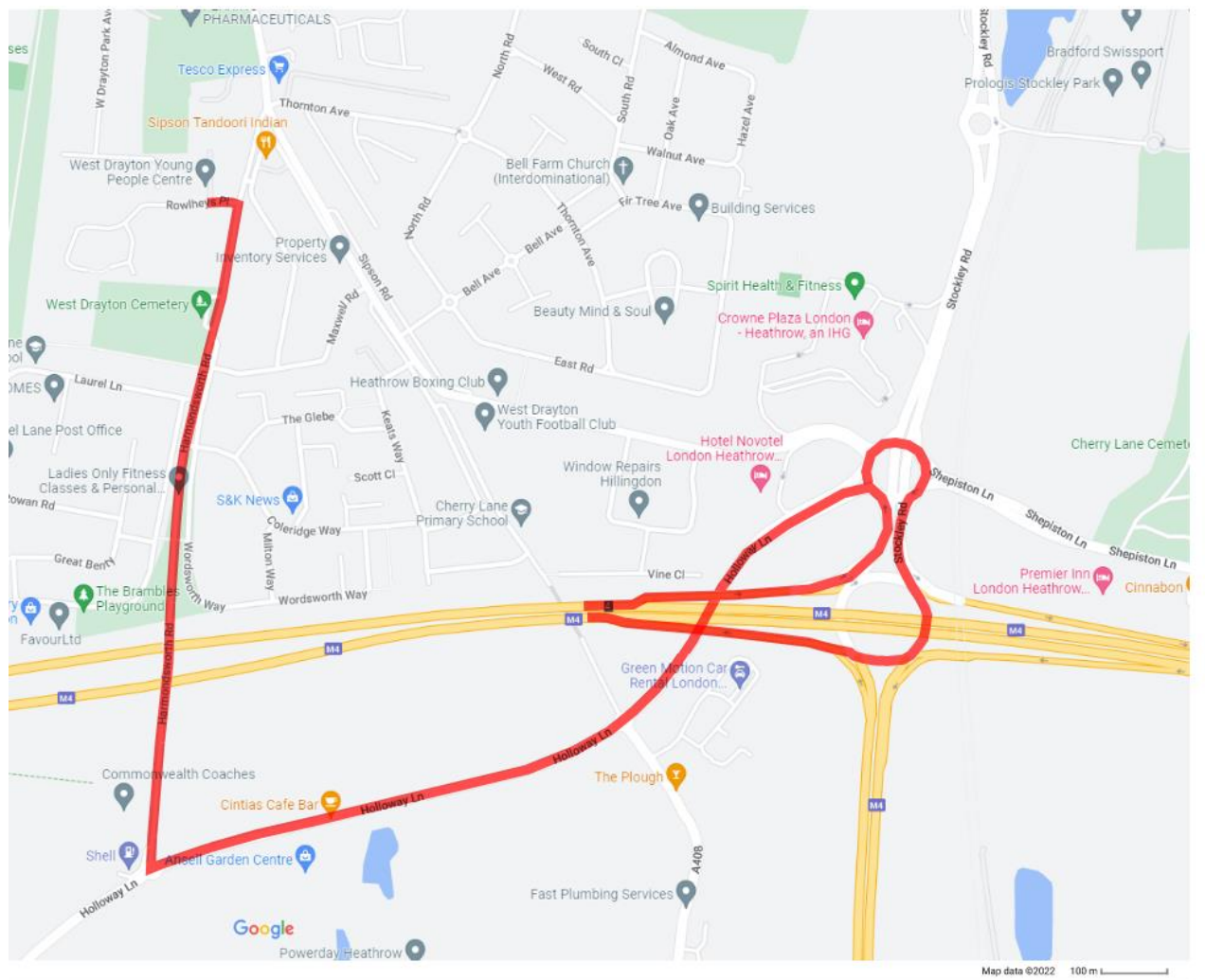


Figure 5 – HGV Access Route

HGV deliveries via road will be scheduled to arrive during site operation hours, primarily 8:00am to 6:00pm Monday to Friday and 8:00am to 1:00pm on Saturdays. Occasional abnormal loads (very large cranes etc..) will be scheduled between 7:00pm and 7:00am due to the requirements of Police movement orders.

All companies making HGV deliveries to the site will be provided with instruction on the designated routing. Adherence to the route will be a contractual requirement of any company working on the project.

All Heavy Goods Vehicles shall comply with the Direct Vision Standard. A rating of 3 stars (or more) will be required. The Direct Vision Standard came into force on 1st March 2021 and forms part of the Safety Permit for all HGVs entering London (an area bounded by the M25 Motorway). It is the haulier's responsibility to comply with these regulations prior to entering the Enforcement Zone. Enforcement operates 7 days a week, 24 hours a day.

Freight Operators Recognition Scheme (FORS) Silver standard is to be mandated by all freight operators delivering to this site.

All deliveries, particularly Heavy Goods Vehicles, to site shall be made using vehicles which have a Class VI mirror fitted in accordance with EU directive 2007/38/EC. This is to ensure improved fields of vision across the front of the vehicles.

For swept path analysis showing the tracking of HGV vehicles entering and exiting site see appendix 1 Temporary crossovers will be arranged with Hillingdon Council's Highways Team to enable access for an articulated HGV and smaller vehicles, logistics on site will be carefully considered to ensure this is maintained throughout.

Traffic management is an integral aspect of the construction process to provide arrangements for the movements of vehicles both on and in the vicinity of the site.

Delivery Management

All deliveries will be pre-planned to a timed schedule to ensure that road congestion is minimised and that deliveries can be managed efficiently. Deliveries will primarily be booked 10am to 4pm to avoid peak traffic periods.

Expected construction delivery / plant vehicle types:

Vehicle Type	Size
Articulated HGV	40t
Rigid HGV	20t
7.5t Van	7.5t
3.5t Van	3.5t
Mobile Crane	Up to 250t Capacity
Concrete Lorry	30t
Tipper lorry (8 Wheel)	30t
Road Sweeper	15t

All companies making deliveries to the site will be provided with instruction on the agreed routing to be provided to their drivers. Adherence to the logistics route will be a contractual requirement of any company working on the West Drayton Leisure Centre development.

The delivery vehicle access and egress will be via Harmondsworth Road. This will be manned by a Security Guard/Traffic Marshal with RoSPA training. Trained Traffic Marshals will control third party traffic movements when construction vehicles arrive and depart site.

Upon arrival at the site access point vehicles will be taken off the road into site by a Traffic Marshal, who will be in possession of a daily delivery schedule. If the load is compliant with the delivery schedule, the Traffic Marshal will firstly ensure that the driver is familiar with the site rules. The Traffic Marshal will then advise the relevant trade package contractor by radio/mobile telephone of the delivery and arrange for a Banks person to supervise the onsite offloading. The Banks person will stay with the vehicle at all times whilst on site until it returns to the site entrance and is booked out.

If an unscheduled delivery arrives on site, it will be held on site within the site area, vehicles will not be allowed to 'stack' outside of the site.

Booking systems

Buckingham group operates a delivery management system coordinated by our logistics manager. All parties requiring deliveries to site will submit a delivery request form a minimum of 72 hours prior to the delivery due date giving details of the delivery vehicle, the load, driver information and any offloading requirements. A delivery timed slot will be allocated to each delivery to prevent congestion onsite and the surrounding area.

Strategies to Reduce Impacts

High Impact Site Planned Measures Checklist	Committed	Proposed	Considered
Measures influencing construction vehicles and deliveries			
Safety and environmental standards and programmes	X		
Adherence to designated routes	X		
Delivery scheduling	X		
Re-timing for out of peak deliveries	X		
Re-timing for out of hours deliveries			X
Use of holding areas and vehicle call off areas		X	
Use of logistics and consolidation centres			X
Measures to encourage sustainable freight			
Freight by Water			X
Freight by Rail			X
Material procurement measures			
DfMA and off-site manufacture		X	
Re-use of material on site		X	
Smart procurement		X	
Other Measures			
Collaboration amongst other sites in the area			X
Implement a staff travel plan	X		

Adherence to designated routes

Traffic and delivery management is vital in avoiding the negative impact the build-up of traffic can have on a project's perception as well as adversely effecting construction progress.

Buckingham group will determine the appropriate strategy, quantity and positioning of Traffic Marshals to be deployed on a daily basis dependent upon delivery schedules. On-site operations will be directed by a dedicated Logistics Manager supported by trained banks persons and Traffic Marshalls.

The Traffic Marshals will be responsible for supervising and directing all vehicles and pedestrian operations around the site entrance, whilst roving Marshals will be positioned to safely direct traffic within the site and to the correct loading/unloading zone.

To ensure delivery drivers follow prescribed traffic routes to site all delivery and collection drivers will be given an instructional leaflet with the vehicle delivery route. Any drivers not complying will be subject to a warning card system, yellow on the first offence and red for repeat offenders meaning that they will not be allowed to visit the site again.

Delivery scheduling

Deliveries will be pre-booked using a web-based system provided by our logistics partner.

At the start of each day, Traffic Marshals will be presented with a daily delivery schedule; outlining which deliveries are booked in and when they are due. They will also turn un-booked deliveries away if the site cannot accommodate the delivery at that time, confirm that trade Contractor's deliveries have been

accepted, record vehicle details and ensure that vehicles are safely banked out of site onto Rowleys Place and are instructed to turn right onto Harmondsworth Road.

Re-timing for out of hours deliveries

Deliveries out of hours has been considered but due to the site being close to a residential area it has been decided that this is not a viable option.

Use of logistics and consolidation centres

Mechanical and electrical materials will be consolidated by the contractor with their subcontractors at a location outside of London and delivered to site in consolidated deliveries where possible.

Parking

Due to the site constraints, there will be no parking onsite for the workforce with the exception of essential users. Site visitors and workers will be advised to take public or park in a pay and display car park, the closest is Brandville Road Car Park which is around 800 metres from site.

3.0 Storage of plant and materials

All plant and materials will be stored in segregated and controlled areas to all site areas. The movement of plant and materials in/out of these areas will be controlled by the traffic marshals / banks persons assigned to each site area.

COSHH

A file will be kept on site containing all COSHH Assessments with the COSHH register (S05) containing ALL materials to be used on the site. (This file will be updated as new products are used on the project).

The Safety data Sheets will be required from the suppliers of materials and a full COSHH assessment can be supplied by the HSEQ Advisor to the project using the SYPOL COSHH system. Sub-contractors are to supply their own COSHH assessments that they are to use before the start of works. The COSHH assessment will be briefed out to the workforce prior to the start of the works.

Storage of Flammable /Explosive Materials

Secure storage facilities will be provided within the site compound designated materials storage area. The specific storage requirements will be in line with the manufacturer's guidelines. Cartridge tools to be stored in lockable site security boxes retained in steel container stores. Access to the security boxes will be in a controlled manner by an authorised person. Subcontractors proposing the use of such equipment are to forward supporting Risk Assessments / Method Statements to BGCL for comments / approval.

Gas and Fuel Storage

All spills, regardless of size will be reported to the project management. All refuelling activities will be conducted away from water courses and drains.

On the project Buckingham Group Contracting Ltd will ensure all hazardous substances i.e. fuels, oils and greases will be stored in accordance with the COSHH regulations 2002 and The Control of Pollution (Oil Storage) Regulations 2004. This will protect any contaminates reaching groundwater or a watercourse if a spillage or leakage occurs.

Fuel / oil storage will be retained within a designated, secured lockable area of the site compound. All fuels, lubricants and other potentially harmful liquids shall be stored within this area either in bunded tanks, on drip trays or with residue collection sumps with a minimum capacity of 110% of the contents of the vessel.

Petrol to be in 5ltr Petrol Canisters or 20ltr Metal Jerry Cans. Maximum volume of petrol in any location to be 1 nr Jerry can. Storage areas to be shown on Traffic Management Plan and Fire Plan.

Should gas canisters be required, then they shall be secured in a lockable vented area.

Spill kits, drip trays and other emergency equipment shall be maintained on site at all times.

All static plant shall have a drip tray provided.

Bunding will be regularly inspected and emptied into appropriate waste receptacle as required. Inspections and emptying shall be recorded in the site's diary.

Construction Waste

In the Site Waste Management Plan, we will highlight our licensed waste contractor that will be used on this contract to remove all waste from site. This contractor will have the relevant licenses for the types of waste to be removed. Duty of Care Waste Transfer Notes and Waste Carrier Licenses will be held on site in the Plan for inspection on request.

4.0 Site Environmental Issues

Noise, Vibration and Dust Management

Monitoring

Noise, vibration and dust monitoring equipment will be installed at the site boundary closest to the most sensitive receptors which have been identified on West Drayton Park Avenue. See figure 6 below for environmental monitoring location plan and drawing showing receptors with a potential for significant adverse effect from construction noise or vibration.

Monitoring equipment will be owned and managed by Buckingham Group Contracting Ltd. All monitoring equipment will be in place full time providing real time monitoring and reporting. Notification levels will be set with automatic email and SMS alerts sent on first and second action levels. These alerts will be sent to the BGCL site team and BGCL environmental team.

Recorded data will be provided to Hillingdon Council on request.

Noise Monitoring Equipment

Model: LiveNoise LNT-SE with ethernet & Wifi

Compliance: IEC 61672-2:2002 Class 2, ANSI S1.4 Type 2

Frequency Range: 20 Hz to 20 kHz

Measuring Range: 30 to 120 dB

Deviation: ± 0.5 dB

Frequency Weighting: "A"

Time Weighting: Fast

Measurements: LAeq, LAFmin, LAFmax, L5, L10, L50, L90, L95, L99 over periods 5, 10, 15, 30 and 60 minutes

Time history noise profile: LAeq every second

Dust Monitoring Equipment

Model: BlueSky Precision data – TSI factory-calibrated PM sensor.

Real-time map of live data – ability to stream and display real-time data from the cloud using WiFi, without additional software or an app.

laser-based light scattering particle sensors – simultaneously outputs PM1.0, PM2.5, PM4.0, PM10, temperature and humidity.

Vibration Monitoring Equipment

Model: FLIR SV87 Vibration Monitor

Sensitivity range: ± 32 g

Frequency range: 10 Hz to 1 kHz

Velocity data: mm/s or in/s derived from Fast Fourier Transform (FFT)

Capture rate: One data point/90 sec

Temperature range: Display measurement trend of contact temperature: -30°C to 80°C (-22°F to 176°F)

Data export format: CSV

Data visualization: Min, Max, live, historical data and trending charts on mobile devices and Windows®

Alerts: When a user defined vibration or temperature threshold is exceeded, a warning alert or email is issued.

Monitoring Action Limits**Dust**

A red trigger level of $250\text{ }\mu\text{g}/\text{m}^3$ will be set as a 15-minute mean for concentrations of PM10.

An amber PM10 alert will be set at $150\text{ }\mu\text{g}/\text{m}^3$ (15-minute mean) in order that activities on site can be modified to avoid breaches of the $250\text{ }\mu\text{g}/\text{m}^3$ limit. Action in the event an alert occurs is as follows:

Amber alert – site manager to review activities to identify any potential dust or particulate sources and if cause of alert relates to a site activity, mitigation will be put in place immediately to reduce impacts. Some of the possible mitigation measures that could be employed are detailed below in the Environmental Mitigation and Controls section.

Red alert – site manager to review activities to identify any potential dust or particulate sources.

If the cause of any alert relates to a site activity, mitigation will be put in place immediately to reduce impacts; and If the mitigation is identified as insufficient then activities causing the elevated dust / particulate levels will cease immediately.

Alerts will be in the form of an SMS text message to the Site Environmental Manager.

Should a monitored concentration of $250\text{ }\mu\text{g}/\text{m}^3$ be exceeded on two consecutive 15-minute periods. then dust producing activities will be stopped and action taken to mitigate the emissions immediately.

The incident shall be reported to the Hillingdon Council Environmental Health team within 24 hours.

The monitoring system will also provide alerts at $200\text{ }\mu\text{g}/\text{m}^3$ in order that activities on site can be modified to avoid breaches of the $250\text{ }\mu\text{g}/\text{m}^3$ limit.

All alerts will be in the form of SMS messages to the site Environmental Manager.

Noise

(a) The 1st Action level shall be 75 dBLeq1hr at the boundary.

(b) The 2nd Action Level shall be 78dBLeq1hr at the boundary.

Vibration

(a) The 1st Action level shall be 3.0 mm/s in any axis at the boundary.

(b) The 2nd Action Level shall be 5.0 mm/s in any axis at the boundary.

Where the 1st Action Level is triggered, a report form of incidents of noise or vibration reaching the 1st Action Trigger Level shall be completed. Any such reports shall include, investigation of the causes of the exceedance(s), a review of Best Practicable Means used at the time of the exceedance(s) and any corrective actions identified and implemented. These reports shall be emailed to the Hillingdon Council Environmental Health team within 24 hours.

Where the 2nd Action Level is triggered, work shall temporarily cease works while reviewing and investigating whether Best Practicable Means are in place and implement additional identified mitigation measures where practicable. A report form of incidents reaching the 2nd Action Trigger Level shall be completed. Any such reports shall include a review of the Best Practicable Means measures used at the time of the exceedance(s), the working methods and any corrective action implemented. Triggering of the 2nd Action Level shall be reported to the Hillingdon Council Environmental Health team within 24 hours.

Noise, vibration and dust monitoring equipment will be installed at the site boundary in two locations shown in figure 6 below on the site boundary with properties on West Drayton Park Avenue and site boundary with Harmondsworth Road. These locations have been chosen because the majority of the demolition and construction work is being carried out on the Youth Centre plot, the Family Centre plot will be used for offices and lay down area for the majority of the programme period. The Family Centre plot will become a construction zone during the last ten weeks of the programme when it will be formed into a car park for the final development.

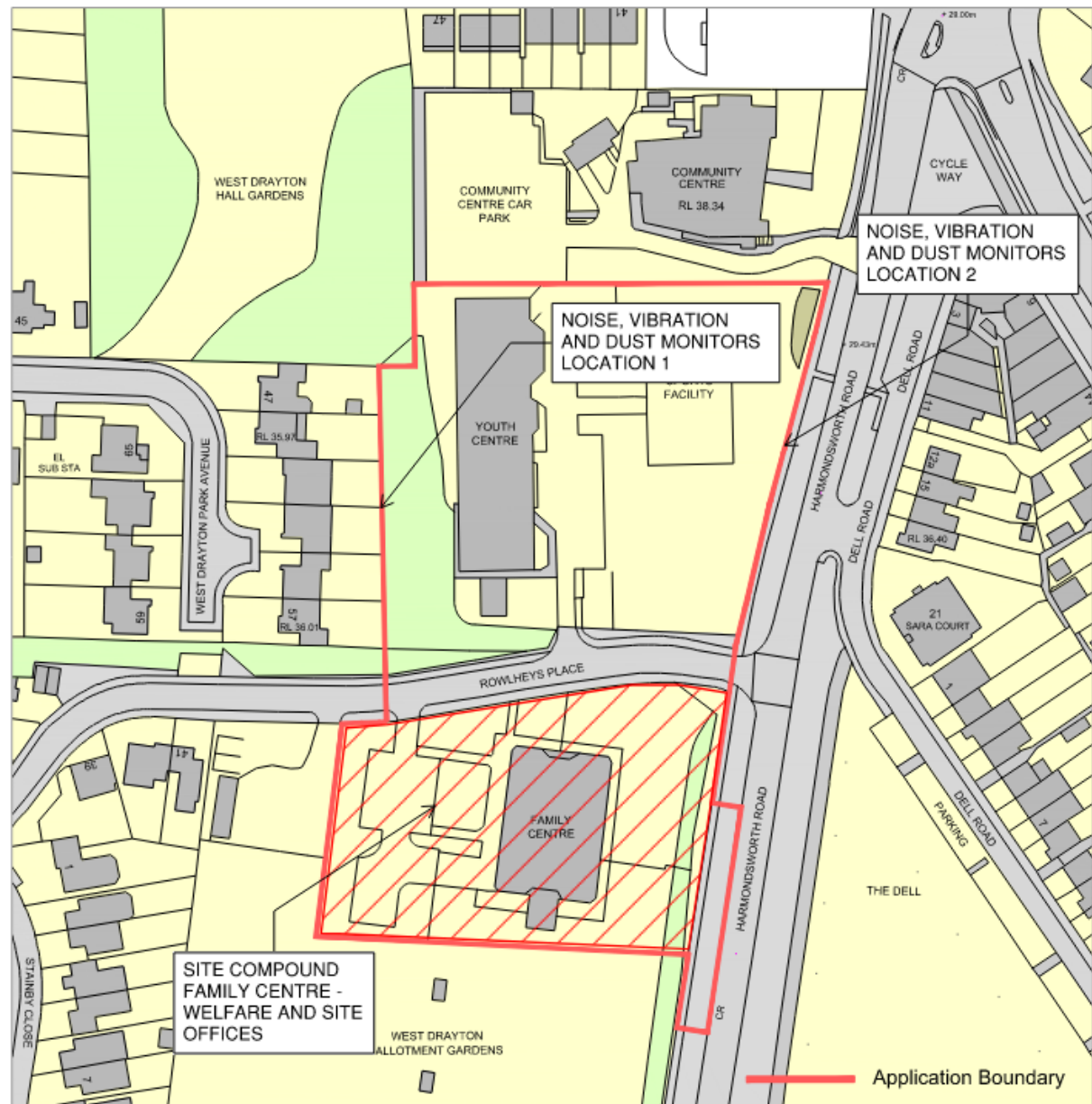


Figure 6 – Monitoring Equipment Location 1 – Site boundary with properties on West Drayton Park Avenue. – Monitoring Equipment Location 2 – Site boundary with Harmondsworth Road.

Environmental Mitigation and Controls

Dust and Trackout

The site management team are fully aware that the development is within an Air Quality Management Area (AQMA). This Demolition and Construction Management Plan has been written considering the recommendations contained within the REC Air Quality Assessment AQ107192-3 – see appendix 3. A dedicated wheel wash will not be provided onsite because the site access and compound will be hard paved with asphalt. Wheel washes require a straight run on and off the wheel wash machine, given the footprint of the building a wheel wash is impractical. Hardstanding and road sweeper are the most feasible solution.

The compound haul route will be hard paved to prevent trackout as far as possible. The haul road will be kept clean by road sweeper.

All vehicles carrying dusty materials will be covered before leaving the site, to prevent dust spilling on to the road and becoming airborne.

If the onsite delivery road becomes a source of dust a mobile bowser with water pump will be used between road sweeper visits to dampen the site roads, this would be necessary several times per day during the warmer months.

Demolition

Water suppression will be used where deemed appropriate, the demolition is of a small brick building with concrete floors and flat roof.

Construction

Materials likely to result in dust release ie. cement, sand, fine aggregates and other fine powders are to be sealed after use and if necessary stored in enclosed or bunded containers or silos.

Some materials should be kept damp to reduce the risk of drying out. There will not be any onsite concrete or mortar batching, these materials will be delivered to site premixed wet.

Earthworks

Due to the excavation work being scheduled for the summer months reduced trackout is expected.

For the earthworks phase an area will be designated within the construction area where current gradients fall to a stormwater gulley, the gulley outlet will be sealed with two expanding bungs to prevent run off from wheel washing entering the stormwater drainage system. Pressure washers will be used to clean vehicle wheels. A road sweeper (Scarab Merlin or equivalent) provided by a licenced contractor will be onsite to remove wash water from the wheel wash area and clean surrounding roads if required during the excavation period.

The haul road will be monitored by the site manager and kept clean by road sweeper as required.

All vehicles carrying dusty materials will be covered before leaving the site, to prevent dust spilling on to the road and becoming airborne. Gate staff will not allow vehicles to leave site until waste transfer documents been completed, wheels checked for cleanliness and body cover sheet installed.

If the onsite delivery road becomes a source of dust a mobile water bowser with integral water pump and sprayer towed by a telehandler will be used between road sweeper visits to dampen the site roads, this would be necessary several times per day during the warmer months.



Figure 7 – Scarab Merlin Road Sweeper and Water Bowser with Pump and Spray Bar

Measures to Minimise and Mitigate Dust Caused by Construction Activities

- Develop and implement a stakeholder communications plan that includes community engagement before work commences on site. Please refer to the Construction Phase Community Liaison Strategy issued pursuant to planning condition 22
- Display the name and contact details of persons accountable for air quality and dust issues

- on the site boundary with head office contact information
- Record all dust and air quality complaints, identify causes and take appropriate action and record measures to reduce emissions. Make complaints log available to the Local Authority when requested
 - Undertake daily on-site and off-site inspection where receptors are nearby to monitor dust;
 - Carry out regular site inspections to monitor compliance with the CEMP, record inspection results, and make an inspection log available to the local authority when requested
 - Increase the frequency of site inspections by the person accountable for air quality and dust issue on site when activities with a potential to produce dust are being carried out during dry or windy conditions
 - Erect solid screens or barriers around dusty activities or the application site boundary that are at least as high as any stockpiles on site. Keep clean using wet methods
 - Fully enclose site or specific operations where there is a high potential for dust production and the site is active for an extensive period
 - Avoid site run-off of water or mud. A record of any site run off should be kept and actions to prevent reoccurrence
 - Remove materials that have a potential to produce dust from site as soon as possible unless being re-used on site
 - Cover stockpiles to prevent wind whipping
 - Only use cutting, grinding or sawing equipment fitted or in conjunction with suitable dust suppression techniques
 - Ensure an adequate water supply on the site for effective dust / particulate matter
 - Suppression / mitigation using non-potable water where possible and appropriate
 - Use enclosed chutes and conveyors and covered skips
 - Minimise drop heights from conveyors, earth loading plant, hoppers and other loading or handling equipment and use fine water sprays on such equipment where appropriate
 - Ensure equipment is readily available on site to clean any dry spillages;
 - No burning of waste
 - Ensure all vehicles switch off engines when stationary - no idling vehicles; and avoid the use of diesel or petrol powered generators and use mains electricity or battery powered equipment where practicable.
 - Soft strip inside building before demolition
 - Ensure effective water suppression is used during demolition operations; and bag and remove any biological debris or damp down such material before demolition.

Non Road Mobile Machinery (NRMM)

From 1st September 2015 there are new requirements for non-road mobile machinery (NRMM). This applies to plant with net power between 37kW and 560kW, this includes all plant that requires a driver; included but not limited to dumpers, rollers, excavators, piling equipment. Construction equipment being operated within greater London is required to meet EU Stage IIIA as a minimum, all applicable plant on this development will be registered at www.nrmm.london. This development falls within the NRMM registration zone of greater London, the development was registered on 14th March 2022.

Odour

Due to the nature of the material being excavated and the proposed constructional methodology, the operations on site are unlikely to lead to malodour being experienced outside the site boundary.

The Environmental Representative will monitor the site on a full-time basis, making note of any odours or operations with the potential to give rise to odours. Working methods will then, where feasible, be modified.

A record of all activities will be held in the Environmental Daily Report (EDR), which will be made available to Third Parties, including Regulatory Authorities as required.

A record of weather conditions will also be made, including wind speed and direction and pressure so as to validate potential offsite issues.

All domestic waste (canteen / office) will be placed in a correct disposal facility and removed from site.

Noise

Prior to commencement of any deconstruction and construction works an application for consent under Section 61 of the Control of Pollution Act 1974 will be submitted.

Pre-Start Noise Survey

Please refer to Appendix 2 for Acoustic Assessment for Planning produced by Bloc Consulting.

A pre-start noise survey has been carried out, monitoring will be carried out through the demolition and construction phases.

Operational Controls

The following good practice operational controls will be implemented to reduce noise levels produced by the works.

- All work will be undertaken during the permitted site operating hours.
- Where the operational risk levels illustrated within The Control of Noise at Work Regulations 2005 could be exceeded, the precautions set out to eliminate or reduce noise levels are to be implemented. Details of maximum exposure times are to be conveyed to the relevant Site Personnel and strictly adhered to.
- All engine powered plant will be fitted with modern silenced exhaust systems; in addition, stationary plant such as generators will be housed in acoustic enclosures.
- Plant will be regularly maintained, serviced and greased up according to manufacturer's recommendations to ensure squeaking, rattling and other unnecessary noise is kept to a minimum.
- Machines will be correctly selected and sized to ensure they are capable of carrying out the required work without over revving or straining the power unit.
- Machines will not be permitted to stand idling.
- Wherever possible drop heights during demolition will be minimised.

- Where possible rubber tracked machines will be used to reduce track clatter.
- Mobile plant items will be fitted with white noise type reversing alarms and not the conventional bleeper type.

Vibration

BS 5288-1:2009+A1:2014 Code of practice for noise and vibration control on construction and open sites Part 2: Vibration, references BS 7385:1993 Evaluation and measurement for vibration in buildings part 2: Guide to damage levels from ground borne vibration which indicates that damage should not occur to property if transient vibration does not exceed 15mm/s at low frequencies rising to 20mm/s at 15Hz. These guidelines refer to relatively modern buildings and therefore, these values should be reduced by 50% or less for more sensitive buildings.

- It would be reasonable to consider the buildings local to the West Drayton Leisure Centre development as being more “modern” construction, however Buckingham Group believe that it is prudent to take a more conservative approach and therefore when assessing the maximum ground borne vibration we will utilize a 50% reduction to the maximum value stated in BS 7385:1993.
- It is worth noting that the human body can detect vibration from as low as 0.15-0.3mm/s which is well below the accepted building damage threshold, our site team will be aware of this so that should concerns be raised by neighbouring properties these could be alleviated immediately.

Minimisation and Mitigation of Vibration in Deconstruction and Construction Activities

Deconstruction

- Perception of deconstruction works is often one of disruption including ground transmitted vibration. Buckingham Group recognize that to effectively carryout the deconstruction works while causing minimal disruption to the surrounding residents & environment, careful selection of the method, plant and process is required. To this end the deconstruction plant and method has been selected over more traditional methods, Building sections will be carefully cut and lowered to ground then a machine mounted hydraulic grab will be utilized to load the sections for transport to the recycling centre or crushing onsite. A grab transmits negligible additional vibration to ground when in use.
- We have assessed that activities likely to cause vibration in order of severity are;
 - i. Piling Equipment
 - ii. Compaction plant
 - iii. Heavy plant (excavators / dumpers)
 - iv. Heavy vehicle movements.

Piling and Compaction Plant

- The use of piling and compaction plant is unavoidable for this civil engineering project but its use

can be controlled to minimize its impact on the surrounding environment.

- Use is expected to be frequent during the enabling works phase of the project.
- The piling plant will cause the highest level of ground transmitted vibration.

Heavy plant & vehicle movements

- The use of heavy plant is unavoidable on this project but its use will be controlled to minimize its impact on the surrounding environment.
- The use of heavy plant and the movement thereof is likely to be site wide and frequent during the demolition works phase with reduced movements during the construction phase.

Further mitigation measures to reduce vibration nuisance

- Vehicles will only use pre-defined routes which have been assigned by Buckingham Group management to limit movements near to the site boundary and sensitive vibration receptors.
- Suitability of plant and vehicles for all construction activities will be assessed by a competent person, a vibration assessment will be carried out and included within the relevant Safe System of Work (SSoW) package, detailing activity specific vibration mitigation requirements.
- All personnel will be reminded of good practice through inductions at the start of works and subsequent task briefings and 'toolbox talks' during the course of the works.
- Plant operatives will be trained in the operation of their particular piece of plant and will be certified accordingly.
- Daily plant inspections will be carried out, with servicing and maintenance being carried out based on the findings. A record of the relevant certificates and inspections will be held by BGCL on site throughout the project.
- Buckingham Group will only permit the use of plant and equipment that have been fully serviced & inspected, with certification to be used as per the manufacturer's handbook.
- Machines in intermittent use will be shut down in intervening periods or will be throttled down to a minimum. Plant and machinery will be started up sequentially rather than all at the same time to avoid a sudden unexpected increase in vibration.

Reference Sources

BS 5288-1:2009+A1:2014 Code of practice for noise and vibration control on construction and open sites Part 1: Noise.
BS 7385:1993 Evaluation and measurement for vibration in buildings. Guide to damage levels from ground-borne vibration
BS ISO 4866:2010 Mechanical vibration and shock - vibration of fixed structures - guidelines for the measurement of vibrations and evaluation of their effects on structures
BS 5228-2:2009+A1:2014 Code of practice for noise and vibration control on construction and open sites –Part 2: Vibration

5.0 Appendices

Appendix 1 – HGV Access Swept Path Drawing

Appendix 2 – Bloc Consulting Acoustic Assessment for Planning

Yiewsley and West Drayton Leisure Centre Acoustic Assessment for Planning

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Yiewsley and West Drayton Leisure Centre
Acoustic Assessment for Planning

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The consultancy guidance provided in this report relates only to acoustic considerations, and no account has been taken by Bloc Consulting of considerations relating to other disciplines. It is the responsibility of the design team to consider any other considerations that may arise, including, but not limited to, structural or fire engineering.



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Yiewsley and West Drayton Leisure Centre
Acoustic Assessment for Planning

1 Introduction

Bloc Consulting has been appointed by the London Borough of Hillingdon to provide acoustic consultancy services in the development of Yiewsley and West Drayton Leisure Centre.

The project comprises the development of a new car park and leisure centre, incorporating a number of different sports and leisure activities, including a swimming pool and rooftop football pitch.

This report considers the following acoustic aspect(s):

- Existing noise climate in the vicinity of the development
- The effects of noise from internal and external leisure activities on local sensitive receptors
- The effects of changes to road traffic flows on Harmondsworth Road and Rowlheys Place
- The effects of noise from external building services on local sensitive receptors

Whilst every effort has been made to ensure that this report is easy to understand, it is technical in nature. To assist the reader, a glossary of terminology is [available on our website](#).

2 Site Description

The proposed development site is located in West Drayton in the London Borough of Hillingdon and is bounded by Yiewsley and West Drayton Community Centre to the north, Harmondsworth Road to the east, Rowlheys Place and West Drayton Family Centre to the south and West Drayton Park Avenue to the west.

The surrounding area is predominantly urban in character.

The site plan in Figure 1 details the proposed development location in its local context, with relevant major noise sources highlighted in red.

The nearest noise sensitive properties to the development site have been identified as residential properties located on West Drayton Park Avenue, Stainby Close, and on the opposite (east) side of Harmondsworth Road.

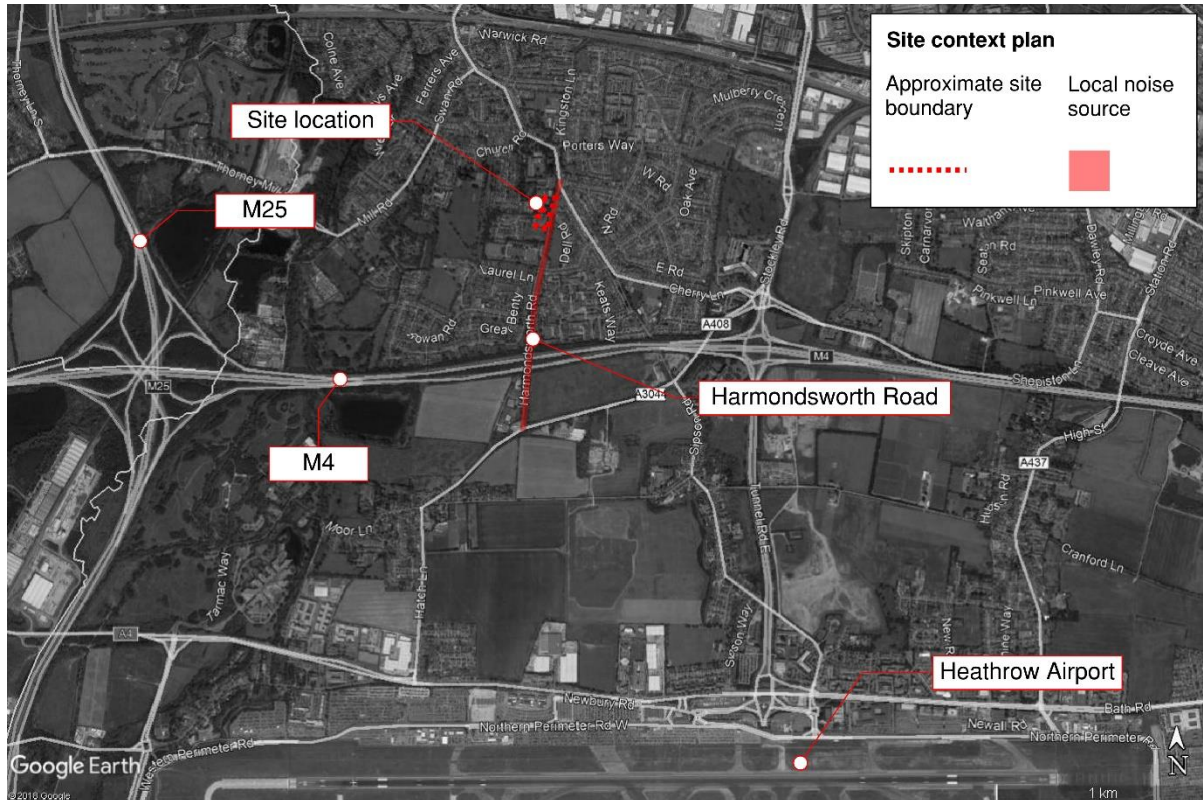


Figure 1: Site and context plan

3 Relevant Standards and Guidance

The following sections set out a list of the relevant standards and guidance that have been considered in this assessment. It should be noted that this list is not exhaustive.

3.1 London Borough of Hillingdon UDP, 2007

The Unitary Development Plan (UDP) for the London Borough of Hillingdon sets out the saved policies for development within the Borough, and addresses a number of different planning considerations. The policies identified that relate to this particular development and the effects of noise on existing properties have been reproduced here.

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Policy OE1:

“Planning permission will not normally be granted for uses and associated structures which are, or are likely to become, detrimental to the character or amenities of surrounding properties or the area generally, because of:

[...]

(iv) noise and vibration or the emission of dust, smell or other pollutants,

Unless sufficient measures are taken to mitigate the environmental impact of the development and ensure that it remains acceptable.”

Policy OE3:

“Buildings or uses which have the potential to cause noise annoyance will only be permitted if the impact is mitigated within acceptable levels by engineering, lay-out or administrative measures.”

Policy R3:

“The council will promote a network of accessible local sports halls and centres throughout the borough. Accordingly it will regard proposals in the developed area for buildings for indoor sports and leisure and entertainment facilities as acceptable in principle provided:

[...]

(iii) they are not detrimental to the amenity of the surrounding area.”

Policy R12:

“The local planning authority will permit proposals for the use of premises to provide either full or sessional day care for preschool children, or childminding services, provided:

[...]

(iv) the proposal, by reason of noise and general activity, does not adversely affect the amenities of nearby residential properties.”

The UDP also states that *“London Plan Policy 4A.14 Reducing Noise and its supporting text to be used (instead of Policy OE4). Other relevant Documents: Planning Policy Guidance Note 24 Noise (2006) and Hillingdon’s Supplementary Planning Document Noise (2006) to be used.”*

Given that this report relates specifically to the noise emissions from the proposed development to the surrounding noise sensitive receptors, the SPD Noise has been consulted only in this case.

3.2 SPD Noise, London Borough of Hillingdon, 2006

The Supplementary Planning Document *Noise* sets out approaches to the assessment of various considerations of noise, depending on the type and situation of the development that is proposed.

In this case, the primary consideration is the amenity of the noise sensitive receptors in the vicinity of the proposed development. Key Point 4 of the SPD specifically discusses residential amenity, and provides objective criteria that are based on a number of statutory standards. It is noted that the criteria for ‘indoor living areas’ are expected to be achieved with windows open. Table 2 of the SPD is reproduced below.

Table 1: Residential noise criteria (from table 2, SPD Noise)

		Recommended Noise Level (dB)
Daytime Noise (07:00 - 23:00)	Outdoor living areas	As low as practicable, and < 50 $L_{Aeq,T}$ *(free field)
	Indoor living areas	< 35 $L_{Aeq,T}$ *
Night-time Noise (23:00 - 07:00)	Outside bedroom windows	< 45 $L_{Aeq,T}$ *(façade) < 60 L_{AFmax} (façade)
	Inside bedrooms	< 30 $L_{Aeq,T}$ * < 45 L_{AFmax}

Notes to table: Source: Derived from BS8233:1999 and “Guidelines for Community Noise”, World Health Organisation, 1999 * Time base T should be appropriate for the circumstances, typically 1 hour day and 5 minutes night

Key Point 6 discusses ‘industrial uses’. While this may not directly relate to the proposed development, it is relevant in setting a criterion for the assessment of external noise emissions from building services equipment. It states that:

“[...] the development should be controlled such that the rating level of the noise from the proposed development determined according to BS4142 is at least 5 dB below the background noise level $L_{A90,T}$. Ideally, the assessment of noise should give a positive indication that complaints are unlikely.”

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This has been understood to imply that a criterion of 5 dB below the background sound level is acceptable, but it is preferred that 10 dB below is achieved where possible, according to the assessment method provided in BS 4142.

3.3 National Planning Policy Framework (NPPF, 2012)

The NPPF set out the Government's planning policy for England. The NPPF states, with respect to noise that planning policies and decisions should aim to:

- *“Avoid noise giving rise to significant adverse impacts on health and quality of life as a result of new development;*
- *Mitigate and reduce to a minimum other adverse impacts on health and quality of life arising from noise from a new development, including through the use of conditions;*
- *Recognise that development will often create some noise and existing businesses wanting to develop in continuance of their business should not have unreasonable restrictions put upon them because of changes in nearby land uses since they were established; and*
- *Identify and protect areas of tranquillity which have remained relatively undisturbed by noise and are prized for their recreational and amenity value for this reason.”*

3.4 Noise Policy Statement for England (NPSE)

The Noise Policy Statement for England was published in March 2010 and provides the overarching statement of noise policy for England applying to all forms of noise other than occupational noise, and setting out the long term vision of Government noise policy which is to:

“Promote good health and a good quality of life through the effective management of noise within the context of Government policy on sustainable development.”

This vision is supported by the following aims:

“Through the effective management and control of environmental, neighbour and neighbourhood noise within the context of Government policy on sustainable development:

- *avoid significant adverse impacts on health and quality of life;*
- *mitigate and minimise adverse impacts on health and quality of life; and*
- *where possible, contribute to the improvement of health and quality of life.”*

3.5 Artificial Grass Pitch (AGP) Acoustics – Planning Implications, Sport England

Given that the proposed development incorporates a roof top football pitch, the guidance in this document has also been considered in this assessment. It provides appropriate criteria and assessment methods, and outlines practical measures that can be applied to reduce noise in sensitive areas.

The criteria set out in the AGP document are similar to those required by Hillingdon, in that they relate to the WHO Guidelines for external noise in amenity areas and internal noise within residential properties. The AGP states an external upper criterion in outdoor living areas of 50 dB $L_{Aeq,T}$, which is equivalent to that required by Hillingdon. However, the document also states that as a result of research by the National Physics Laboratory:

“Exceedance of the WHO guideline values does not necessarily imply significant noise impact and indeed, it may be that significant impacts do not occur until much higher levels of noise exposure are reached.”

The document provides a derived average sound level of 58 dB $L_{Aeq,1hour}$ at 10 m from the sideline halfway marking, for use in an assessment. It is noted that this level is composed mainly of voices, and that the 1 hour period represents the average AGP session length.

The document also suggests that ball impacts against perimeter railings should also be considered, and provides various methods to achieve this.

3.6 British Standard (BS) 4142:2014

BS 4142:2014 *Methods for rating and assessing industrial and commercial sound* (BS 4142) describes a method for assessing the likelihood of complaints from noise sources that are of an industrial nature (e.g. fans, pumps, chillers, air handling units etc.). The assessment methodology is based upon determining a ‘rating level’ for the equipment being assessed, which is the level of noise from the item or items of plant being assessed (expressed as a rating level $L_{Ar,Tr}$).

- The rating level is then compared with the underlying measured $L_{A90,T}$ background noise level in the absence of noise from the item or items of plant being assessed. A difference of around +10 dB or more is likely to be an indication of a significant adverse impact, depending on the context of the installation site (rural or urban, etc.).

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- A difference of around +5 dB is likely to be an indication of an adverse impact, depending on the context.
- The lower the rating level is relative to the measured background sound level, the less likely it is that the specific sound source will have an adverse impact or a significant adverse impact. Where the rating level does not exceed the background sound level, this is an indication of the specific sound source having a low impact, depending on the context.

BS 4142 states that a correction should be added for any plant which gives rise to noise features that may increase disturbance such as tonal, impulsive or intermittent characteristics. With respect to the acoustic feature correction, BS 4142 states that:

“Certain acoustic features can increase the significance of impact over that expected from a basic comparison between the specific sound level and the background sound level. Where such features are present at the assessment location, add a character correction to the specific sound level to obtain the rating level.”

4 Site Sound Surveys

Site sound surveys have been carried out by Bloc Consulting. The results of the surveys have enabled review of the applicability of the various stated criteria, and will feed in to various aspects of the ongoing design of the proposed development.

Day and night surveys were carried out on the 29th November and 2nd December 2019 respectively. The night survey sought only to capture sound levels between 05:00 and 07:00, to correspond with the intended operating hours of the facility which Bloc Consulting understands to be 06:00 to 23:00. For reference, the ordinary day time period used for assessment is 07:00 to 23:00, and the night time period is 23:00 to 07:00.

The site plan in Figure 2 details the measurement positions used in the survey.

The major noise source observed on site during the day and the night was road traffic noise from Harmondsworth Road and surrounding road network.

Measurements were made in accordance with BS 7445.

Sound levels were measured using a 01dB Solo Blue, UKAS calibrated Class 1 precision integrating sound level meter.

Calibration checks were carried out both before and after the measurements with no significant variance observed. Noise was measured in terms of broadband A-weighted indices.

Weather conditions during the survey were dry and calm with wind speeds of less than 5 ms^{-1} .

The microphone was fitted with an outdoor weather proof windshield, attached to a tripod or extendable pole, and with a capsule height of 1.2 m.



Figure 2: Site sound survey plan

Table 2: Position A survey measured sound levels summary, all values in dB

Period	Average noise level, $L_{Aeq,T}$	Representative background, $L_{A90,T}$
Daytime, 07:00 – 23:00	46	40
Night time, 23:00 – 07:00	41	-

Table 3: Position B survey measured sound levels summary, all values in dB

Period	Average noise level, $L_{Aeq,T}$	Representative background, $L_{A90,T}$
Daytime, 07:00 – 23:00	63	45
Night time, 23:00 – 07:00	59	-

Table 4: Position C survey measured sound levels summary, all values in dB

Period	Average noise level, $L_{Aeq,T}$	Representative background, $L_{A90,T}$
Daytime, 07:00 – 23:00	52	37
Night time, 23:00 – 07:00	48	-

Each measurement position was located in the free-field, as they were all more than 3.5 m from a reflecting surface.

A summary of the measured sound levels for each measurement position is shown in Table 2, Table 3 and Table 4 respectively.

The average sound levels for the day and night time periods have been derived using the shortened method provided in CRTN (Calculation of Road Traffic Noise). The representative background noise levels are shown only for the day time period. These $L_{A90,T}$ levels are intended to cover the whole period from 06:00 to 23:00. This is due to the $L_{A90,T}$ levels measured during the early morning (2nd December) survey being uniformly greater than those measured on the day time survey, and actually quite close to the average $L_{Aeq,T}$ levels. This was due to an elevated background sound level from the surrounding motorway network, and potentially caused by atmospheric conditions different to those on the 29th November.

The results show that the noise climate in the vicinity is principally dictated by noise from the Harmondsworth Road, and that noise levels drop with increasing distance from the road, but also depend on the presence of minor roads in the area. The noise climate at position A was relatively low during the day survey. There is also influence from the M25 and M4 however.

The full set of data for both surveys can be found in Appendix 1.

5 Assessments

5.1 External Noise Emissions as a Result of Internal Leisure Activities

Broad estimations of internal activity noise levels breaking out through the building envelope have been made through assessment, assuming receivers located in the back gardens of the properties on West Drayton Park Avenue.

The following spaces have been reviewed:

- Creche (ground floor)
- Climbing centre (ground floor with section up to second floor)
- Gym/Stretching, Group Training (first floor)
- Sports hall (first and second floors, with section exposed to the building envelope only on the second floor)

An internal average noise level range of 80 – 90 dB $L_{Aeq,T}$ has been used in the assessment for all spaces. This is backed by previous noise data held by Bloc Consulting for various similar activities. In the case of the Climbing Centre, this is expected to be unrepresentative, with the actual sound levels being lower in reality.

The following assumptions have been made in the assessments:

- The glazing to the façade facing the residential has been assumed to be standard thermal grade double glazing only, offering a sound insulation performance of 30 dB R_w . It is expected that due to the thermal requirements placed on the glazing, that the sound insulation performance will be higher than this value in reality.
- Opaque wall sections offer 40 dB R_w or greater.
- Sufficient reverberation time control treatment will be applied to the relevant rooms; this will have the effect of reducing internal noise levels that can then break-out to the atmosphere.
- 2100 mm high acoustic fencing is proposed to be installed to the boundaries of the residential gardens with the grounds of the leisure centre.
- The use of any doors located in the building envelope will be appropriately managed by the Staff so as not to create undue noise nuisance if open to the atmosphere.

On this basis, the results are as follows:

- Creche 41 – 53 dB

- Climbing centre: 40 – 51 dB
- Gym/Stretching, Group Training: 19 – 29 dB
- Sports hall: 29 – 39 dB

Assuming that all spaces are in simultaneous use, the cumulative noise levels from the activities in the back gardens of the properties could then be expected to be between 44 – 55 dB $L_{Aeq,T}$. At the top of the range, this cumulative level would represent an exceedance over the Hillingdon SPD criterion of 5 dB.

Taking in to account the additional distance between the receiving point in the garden and the rear façade of the property, an internal level assuming an open window can also be estimated. Using the distance correction and assuming an open window provides a reduction to the interior of -15 dB (as per BS 8233:2014), the above result range would be reduced to 27 – 38 dB, within living spaces during the day.

The upper level of this range would be 3 dB over the criterion set in the Hillingdon SPD.

As has been stated however, the assumptions for the sound insulation performances of the building envelope elements such as the glazing and opaque sections can be assumed to be ‘worst-case’, and the actual performances are expected to be greater than those used in the assessment.

For example, on the basis that the façade elements are specified to be 5 dB greater than those used in the assessment, the cumulative noise levels would fall to 39 – 50 dB $L_{Aeq,T}$, in the back garden, and 22 – 33 dB internally, and therefore within the criteria. Clearly with greater façade performances come lower resultant levels at the residential property.

Additionally, the cumulative assessment assumes that all occupants in all spaces will be constantly generating the maximum average sound level all at the same time, which is unlikely, and so adds to the ‘worst-case’ nature of the assessment.

The ongoing design of the building envelope will take this assessment in to consideration, and will drive the acoustic performance specifications for the various construction elements on this side of the building.

Details of the calculations undertaken are available on request.

5.2 External Noise Emissions From the Roof-top Football Pitch

The effects of noise levels from the external roof-top pitch have been broadly assessed, in line with the requirements of Hillingdon and using the Sport England AGP document as a basis for the methodology.

There are several factors that will assist acoustic mitigation that are already incorporated in to the design of the leisure centre and the roof-top football pitch. These include:

- The height of the roof in relation to the surrounding sensitive properties, coupled with;
- The height of the pitch perimeter barrier (7.8 m from the level of the pitch) and;
- The proposed masonry (dense) composition of the perimeter barrier between the pitch and the properties on West Drayton Park Avenue.
- Shielding from the football pitch is afforded by the intervening roof section and building mass to the residential properties on the quieter side of the site on West Drayton Park Avenue.
- Ball impact mitigation measures.

Using the sound level data provided by the Sport England AGP document, an assessment of the noise levels from the rooftop pitch has been made to the nearby residential properties, and the resultant level compared with the criteria. It has been assumed that roof-top pitch activities will only be permitted between the hours of 07:00 and 23:00, corresponding to a day time assessment.

It is estimated that the resulting noise level over a 1 hour period (relating to the length of an activity on the pitch) will be 31 dB $L_{Aeq,1hour}$, at the boundary of the residential properties on West Drayton Park Avenue.

This level is significantly below the 50 dB level required by Hillingdon (-19 dB), and as suggested in the Sport England document. At 31 dB $L_{Aeq,1hour}$, it is suggested that the noise levels from roof-top sports activity will be almost, if not inaudible in external amenity spaces such as back gardens.

In terms of the anticipated residential properties above the commercial units located along Harmondsworth Road, the situation is slightly different to the properties on West Drayton Park Avenue. Firstly, the section of envelope forming the barrier facing these properties is proposed to be a louvred steel frame wall, offering much less sound insulation than the solid masonry construction on the opposite side of the building.

Secondly, assuming there are bedrooms to the west facing elevation of these properties, they would be subject to the more stringent criteria, to achieve 35 dB $L_{Aeq,T}$ internally during the day and assuming windows are open. However, the daytime sound survey has demonstrated that these properties are already subject to high day time average noise levels from road traffic, in the region of 63 dB $L_{Aeq,16hour}$. It is suggested therefore that the Hillingdon criteria relating to internal noise levels are not appropriate in this location. The calculated noise level from roof-top activity in this location is 49 dB $L_{Aeq,1hour}$, which is significantly below (-14 dB) the existing traffic noise levels, enough to be masked by it so as to be inaudible at the facades in this location, with the exception of maximum noise events.

The result of the assessment is that sufficient measures have been put in to place in the design of the building to minimise the noise impact of the roof-top football pitch. The calculated noise levels are expected to meet appropriate and varying conditions around the building.

Measures to minimise ball impacts at the perimeter have also been incorporated to the design, and these include:

- Ball netting
- Rebound fencing that will be resiliently installed to the steel structure.

Details of the calculations undertaken are available on request.

5.3 Changes in Noise Levels due to Changes in Road Traffic Flows

It is understood that queries have been raised by respondents in the planning process regarding noise from road traffic, and how this might vary with the entrance to a proposed new car park located on Rowlheys Place. An assessment has been undertaken to determine the likely change in traffic noise levels assuming the proposed development is in place, using the measured noise levels on site, and predicted traffic flow data.

The current sound climate in the vicinity of the proposed development is dominated by the immediate road network, and predominantly Harmondsworth Road. As was discovered on the early morning sound survey, the area is also subject to varying noise contribution from more distant major roads, including the M25 and M4 which are believed to vary depending on the atmospheric conditions at a given time. The influence of these motorways was at a minimum (e.g. inaudible over the noise from the Harmondsworth Road) during the main survey that has provided the estimates of long term noise levels and that forms part of the basis of this assessment.

The methods described in the *Calculation of Road Traffic Noise* (CRTN, from the Department of Transport and Welsh Office, 1988) and *Converting the UK traffic noise index $L_{A10,18h}$ to EU noise indices for noise mapping* from the Transport Research Laboratory (TRL) documents have been used as the basis for the road traffic noise calculations.

The 'shortened method' from CRTN was used in the sound survey and measurements over suitable periods were obtained in order to calculate noise metrics for the whole day, evening and night periods, as well as for the specific measurement periods.

Current and projected traffic flow data in the form of both 1 hour and 18 hour sample periods have also been obtained from the appointed Traffic Consultant, i-Transport. The data for the current situation (before development) have been used to calculate the expected noise levels from road traffic on Harmondsworth Road at positions B and C used in the sound survey. This is due to Harmondsworth Road being the major contributor of noise to all three positions.



Figure 3: Site sound survey plan (reproduced to show assessment positions)

It should be noted that there is a difference in what each set of hourly data represents, however:

- The traffic flow data represents the two peak hours in the day, between 08:00 and 09:00, and 17:00 and 18:00.
- The measurement results used in this particular assessment reflect an average $L_{Aeq,1hour}$ level from noise levels measured over 3 hours over the period between 10:00 and 14:00, in accordance with CRTN.

The measured levels are therefore expected to be lower than the calculated levels, as they account for quieter periods than the two peak hours described by the traffic flow data.

The *differences* between the calculated results and the survey measurements at positions A, B, and C are shown in Table 5 to demonstrate the correlations.

Table 5: Relationship between measured data in relation to the calculated data for positions B and C, all values in dB

Position	Position B, $L_{Aeq,1hour}$	Position C, $L_{Aeq,1hour}$
Difference	-3	-1

The measured levels are less than the calculated levels. The differences in the levels are expected to be due to a combination of +/- tolerances relating to both the measurements and the calculations, as well as the fact that the data used in the calculations reflect periods busier than those encountered during the measurements. However, the results for both positions show a good correlation to the measured data (within 3 dB is considered to be a 'good' correlation).

In order to maintain objectivity in the calculations for post-proposed development, the differences between the calculated results for both pre- and post-development scenarios using the peak one hour traffic flow data are reported in Table 6. This has enabled a comparative assessment to be undertaken, the results of which are expected to be representative of the variation in noise level at position C.

The results therefore show that noise levels during the peak hours are not expected to change along the Harmondsworth Road with the projected changes to traffic flow.

Table 6: Calculated changes in peak hour noise levels, all values in dB

Period	Position B	Position C
AM (08:00 to 09:00) peak difference	0	+1
PM (17:00 to 18:00) peak difference	0	+4

A calculation has also been undertaken using the 18 hour flow data, to compare to the original 16 hour derived average value from the survey at position C, using the CRTN shortened method. This enables a comparison of the change in average noise levels across the entire day.

The change to the $L_{Aeq,16hour}$ has been calculated to be +3 dB.

Table 7: Impact criteria for changes in road traffic noise related to the proposed development

Category	Noise change band	Description
Negligible Impact	<3 dB	Not discernible – Marginal changes in noise levels of less than 3 dB in residential areas or outdoor recreational areas in close proximity to main roads
Minor Impact	3 to <5 dB	Adverse – Noise levels of 3-5 dB in residential areas or at outdoor recreational areas Beneficial – Reductions in noise level of 3-5 dB at residential communities
Moderate Impact	5 to <10 dB	Adverse – Noise level warrants mitigation of residential properties on a widespread basis in a community, or where outdoor recreation areas close to roads may be inappropriate Beneficial – Where reductions in noise level of more than 5 dB at residential communities or more than 10 dB at small groups of housing occur
Major Impact	10 to <15 dB or more	Adverse – Noise increases to a level continued residential use of individual properties is inappropriate or where the use of community building could be inappropriate Beneficial – A reduction of traffic noise to a level where it does not have a significant influence on the ambient noise in the area

Noise levels on Rowlheys Place are projected to increase during the AM peak hour period by 1 dB. Noise levels are projected to increase by up to 4 dB during the peak PM hourly period.

The one hour assessment results can be considered to be the ‘worst case’ expected changes through the day.

The criteria for the assessment of traffic noise changes arising from the proposed development have been adapted from the Joint IEMA and the Institute of Acoustics (IoA) draft guidelines for noise impact assessment categories and are provided in A calculation has also been undertaken using the 18 hour flow data, to compare to the original 16 hour derived average value from the survey at position C, using the CRTN shortened method. This enables a comparison of the change in average noise levels across the entire day.

The change to the $L_{Aeq,16hour}$ has been calculated to be +3 dB.

Table 7.

The change to the peak AM period of 1 dB is therefore expected to result in a ‘negligible’ impact.

The maximum calculated change of 4 dB, to be expected during the PM peak hour therefore relates to a ‘minor adverse’ impact.

Over the course of the entire day, the change in noise level is expected to also be of a ‘minor adverse’ impact with a 3 dB increase.

Once in the car park building itself, vehicles are expected to travel at slower speeds than when on the road, and to be shielded by the car park structure which will include timber cladding and climbing vegetation. Noise levels at Stainby Close and Rowlheys Place to the west from vehicles in the car park are expected to be lower than those projected to be experienced at the Rowlheys Place car park entrance, and noise levels from Harmondsworth Road will remain dominant. The massing of the car park will also provide additional shielding to the properties on Stainby Close from noise from Harmondsworth Road, and noise levels to the west boundary of the car park can be expected to be either approximately the same level as they are currently, or perhaps less.

Details of the calculations of road traffic noise are available on request.

5.4 External Noise Emissions from Building Services

The noise survey data have been used to assess the underlying background noise level in the vicinity of the proposed development area. These levels can be used to determine appropriate criteria according to the methodology given in BS 4142:2014.

The nearest and most noise sensitive receptor (NSR) identified by Bloc Consulting during the survey were the residential properties located on West Drayton Park Avenue.

Based on the development site's context, the external noise criteria in Table 8 are proposed in line with the guidance provided in BS 4142.

It should be noted that the criteria have been offered on the basis of the guidance provided in the London Borough Hillingdon SPD, and are based on an operational period for the building of 06:00 to 23:00. The day and night background sound $L_{A90,T}$ levels have been obtained as is described earlier in this document.

Table 8: External noise criteria, all values in dB

Identified noise sensitive receptor	Daytime		'Night-time'	
	07:00 – 23:00		06:00 – 07:00	
	Measured typical $L_{AF90,5min}$	Proposed rating level $L_{Ar,Tr}$	Measured typical $L_{AF90,5min}$	Proposed rating level $L_{Ar,Tr}$
Residential properties located on West Drayton Park Avenue	37	≤ 32	37	≤ 32

Note to table: Where the noise exhibits tonal, impulsive or intermittent characteristics, a reduction in the above limits is imposed in line with the guidance given in BS 4142:2014.

All supplied noise rating levels are cumulative, and are therefore to be met by the summation of individual noise levels from all relevant M&E equipment working at duty load.

It is recommended that any plant terminations immediately facing public areas (including pedestrian pavements) do not exceed 55 dB $L_{Aeq,T}$ at 1m.

Bloc [Consulting]

Yiewsley and West Drayton Leisure Centre Acoustic Assessment for Planning

Due to the project design currently being at an early stage, details including layouts and noise data for building services plant equipment is not available for acoustic assessment. However, following an outline review of the proposed installation, it is expected that:

- No single item of plant presents a risk in terms of noise exceedance at any surrounding noise sensitive property
- The cumulative noise emissions from both the internal and external plant equipment can be sufficiently mitigated through the use of ‘ordinary’ noise attenuation (i.e. without the use of enclosures or similar) such as in-duct attenuators to AHUs
- The substation can be sufficiently attenuated using a proprietary or traditionally built enclosure.

This assessment will be monitored and confirmed through ongoing acoustic input to the design of the building services equipment.

6 Conclusions

Bloc Consulting has been appointed by the London Borough of Hillingdon to provide acoustic consultancy services in the development of Yiewsley and West Drayton Leisure Centre. The project comprises the development of a new leisure centre incorporating a number of different sports and leisure activities, including a swimming pool and rooftop football pitch.

This report has considered the following acoustic aspect(s):

- Existing noise climate in the vicinity of the development
- The effects of noise from internal and external leisure activities on local sensitive receptors
- The effects of noise from external building services on local sensitive receptors

It has been concluded that:

- The existing sound levels vary across the site. Ambient sound levels are high in locations close to the Harmondsworth Road, and decrease at receptor locations further away from this road. Noise from the surrounding motorway network does influence the sound climate, with varying effects.
- The noise emissions as a result of internal leisure activity break-out through the building envelope to nearby residential properties can be suitably controlled through appropriate specification of acoustic fencing to the boundary, internal reverberation control treatment in the leisure centre and external glazing to the building envelope,

and ensuring that use of the external doors is appropriately controlled through management.

- Noise emissions from the roof-top pitch are expected to either be significantly below the required criteria at the properties to the west on West Drayton Park Avenue, and significantly below the existing ambient sound levels at the properties on the opposite (east) side of Harmondsworth Road.
- Changes in road traffic noise due to increases in traffic flows due to the proposed development are expected to be a ‘minor adverse’ impact to the properties on Rowlheys Place and Stainby Close.
- The car park building massing is also expected to provide some shielding from noise from Harmondsworth Road.
- Noise emissions from the building services plant installation could not be appropriately assessed at this stage in the project. However, it is expected that all plant equipment can be suitably mitigated using usual methods where required as the project progresses, with ongoing monitoring of the mechanical and electrical design.

It is expected that the requirements set out in the SPD *Noise* document from the London Borough of Hillingdon can be met through ongoing acoustic input to the building and mechanical and electrical services design.

Appendix 1 Site Sound Survey Data

Table 9: Day survey measurement results, 29th November

Measurement number	Measurement Position	Period start	$L_{Aeq,T}$	L_{AFmax}	$L_{A90,T}$	$L_{A10,T}$
1	1	29/11/2019 10:20	47	55	44	49
1	1	29/11/2019 10:25	48	59	43	51
1	1	29/11/2019 10:30	49	60	44	51
1	1	29/11/2019 10:35	47	57	44	49
1	1	29/11/2019 10:40	47	56	43	49
2	2	29/11/2019 10:46	67	87	49	68
2	2	29/11/2019 10:51	63	75	47	69
2	2	29/11/2019 10:56	63	73	49	67
2	2	29/11/2019 11:01	64	76	47	69
2	2	29/11/2019 11:06	64	72	53	68
3	3	29/11/2019 11:09	52	66	40	55
3	3	29/11/2019 11:14	50	65	39	48
3	3	29/11/2019 11:19	53	69	40	57
3	3	29/11/2019 11:24	50	64	38	51
3	3	29/11/2019 11:29	49	50	46	50
4	1	29/11/2019 11:33	46	65	40	47
4	1	29/11/2019 11:38	46	59	42	48
4	1	29/11/2019 11:43	46	56	41	49
4	1	29/11/2019 11:48	47	57	42	51
4	1	29/11/2019 11:53	46	55	43	47
5	2	29/11/2019 11:58	63	76	50	67
5	2	29/11/2019 12:03	63	73	50	67
5	2	29/11/2019 12:08	61	71	48	66
5	2	29/11/2019 12:13	62	74	48	66
5	2	29/11/2019 12:18	62	64	56	64
6	3	29/11/2019 12:23	50	69	40	52
6	3	29/11/2019 12:28	55	69	39	61
6	3	29/11/2019 12:33	51	63	38	58
6	3	29/11/2019 12:38	47	61	38	47
6	3	29/11/2019 12:43	40	43	38	42

Measurement number	Measurement Position	Period start	$L_{Aeq,T}$	L_{AFmax}	$L_{A90,T}$	$L_{A10,T}$
7	1	29/11/2019 12:48	47	62	42	49
7	1	29/11/2019 12:53	48	60	42	51
7	1	29/11/2019 12:58	46	62	40	48
7	1	29/11/2019 13:03	44	53	41	46
7	1	29/11/2019 13:08	44	48	42	48
8	2	29/11/2019 13:12	63	75	48	67
8	2	29/11/2019 13:17	63	75	50	67
8	2	29/11/2019 13:22	61	74	45	66
8	2	29/11/2019 13:27	62	75	48	67
8	2	29/11/2019 13:32	52	57	48	57
9	3	29/11/2019 13:36	53	66	37	57
9	3	29/11/2019 13:41	47	63	37	45
9	3	29/11/2019 13:46	53	63	39	59

Table 10: 'Night' survey results, 2nd December

Measurement number	Measurement Position	Period start	$L_{Aeq,T}$	L_{Amax}	$L_{A90,T}$
1	1	02/12/2019 05:38	48	55	47
1	1	02/12/2019 05:43	49	51	48
1	1	02/12/2019 05:48	49	52	48
1	1	02/12/2019 05:53	49	53	48
1	1	02/12/2019 05:58	49	51	48
2	2	02/12/2019 06:04	62	76	50
2	2	02/12/2019 06:09	63	78	51
2	2	02/12/2019 06:14	62	74	50
2	2	02/12/2019 06:19	61	72	51
2	2	02/12/2019 06:24	66	72	54
3	3	02/12/2019 06:29	54	68	49
3	3	02/12/2019 06:34	56	70	48
3	3	02/12/2019 06:39	57	68	46
3	3	02/12/2019 06:44	52	62	47
3	3	02/12/2019 06:49	54	65	47
3	3	02/12/2019 06:54	58	72	47

Appendix 3 – REC Air Quality Assessment AQ107192-3

AIR QUALITY ASSESSMENT ROWLHEYS PLACE, WEST DRAYTON

REC REFERENCE: AQ107192-3

**REPORT PREPARED FOR: LONDON BOROUGH OF
HILLINGDON**

DATE: AUGUST 2019



**DELIVERING ENVIRONMENTAL
AND RISK MANAGEMENT SOLUTIONS**



Issue/revision	Issue	Revision 1	Revision 2	Revision 3
Remarks				
Date	19/08/2019			
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EXECUTIVE SUMMARY

Resource and Environmental Consultants Limited was commissioned by the London Borough of Hillingdon to undertake an Air Quality Assessment in support of a proposed Sport and Leisure Centre at Rowlheys Place, West Drayton.

The Proposed Development comprises the demolition of the existing buildings and construction of a new sport and leisure centre with associated infrastructure and parking.

The Proposed Development site is located within the London Borough of Hillingdon Air Quality Management Area and West Drayton/Yiewsley Air Quality Focus Area. Subsequently, the development has the potential to introduce future site users to an area of poor air quality, as well as to cause air quality impacts at nearby sensitive locations. These may include fugitive dust emissions from construction works and road vehicle exhaust emissions associated with traffic generated by the site during the operational phase. Subsequently, an Air Quality Assessment was required to quantify pollution levels across the site, consider its suitability for the proposed end-use and assess potential impacts as a result of the development.

Potential construction phase air quality impacts from fugitive dust emissions were assessed as a result of earthworks, construction and trackout activities. It is considered that the use of good practice control measures would provide suitable mitigation for a development of this size and nature and reduce potential impacts to an acceptable level.

Dispersion modelling was undertaken in order to quantify potential impacts as a result of the development, and verified using London Borough of Hillingdon monitoring data.

The dispersion the assessment concluded that impacts on pollutant levels as a result of operational phase pollutant emissions were predicted to be **not significant** at any sensitive location in the vicinity of the site. The use of robust assumptions, where necessary, was considered to provide sufficient results confidence for an assessment of this nature.

The London Plan states that new developments must be considered Air Quality Neutral. Pollutant emissions associated with traffic generated by the development were compared to relevant benchmarks. This indicated that transport emissions from the proposals were below the benchmarks and as such, no further action will be required to tackle excess development emissions.

Based on the assessment results, air quality issues are not considered a constraint to planning consent for the proposed development.



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1. INTRODUCTION

1.1 Background

Resource and Environmental Consultants (REC) Limited (Ltd) was commissioned by London Borough of Hillingdon (LBoH) to undertake an Air Quality Assessment in support of a proposed Sport and Leisure Centre at Rowlheys Place, West Drayton. . Herein after referred to as the 'Proposed Development'.

The Proposed Development comprises the demolition of the existing buildings and construction of a new sport and leisure centre with associated infrastructure and parking.

1.2 Site Location and Context

The Proposed Development is located at Rowlheys Place, West Drayton at approximate National Grid Reference (NGR): 506430, 179180. Reference should be made to Figure 1 within Appendix I for a location plan.

The Proposed Development is located within the LBoH Air Quality Management Area (AQMA), which has been declared for exceedances of the annual mean Air Quality Objective (AQO) for nitrogen dioxide (NO₂). Additionally, the Proposed Development is located within the vicinity of the West Drayton/Yiewsley Air Quality Focus Area (AQFA) in which air quality is predicted to be poor and public exposure is at its highest. Subsequently, the development has the potential to introduce future site occupants to elevated pollution levels. The Proposed Development may also cause impacts at nearby sensitive receptors as a result of fugitive dust releases during the construction phase and additional road vehicle exhaust emissions associated with traffic generated during operation.

An Air Quality Assessment is therefore required in order to define baseline conditions, assess site suitability for the proposed end-use and consider potential impacts as a result of the development. This is detailed within the following report.

1.3 Limitations

This report has been produced in accordance with REC's standard terms of engagement. REC has prepared this report solely for the use of the Client and those parties with whom a warranty agreement has been executed, or with whom an assignment has been agreed. Should any third party wish to use or rely upon the contents of the report, written approval must be sought from REC; a charge may be levied against such approval.



2. LEGISLATION AND POLICY

2.1 European Legislation

European Union (EU) air quality legislation is provided within Directive 2008/50/EC, which came into force on 11th June 2008. This Directive consolidated previous legislation which was designed to deal with specific pollutants in a consistent manner and provided new air quality objectives for particulate matter with an aerodynamic diameter of less than 2.5µm (PM_{2.5}). The relevant consolidated Directives include:

- ▶ Directive 99/30/EC - the First Air Quality "Daughter" Directive - sets ambient Air Quality Limit Values (AQLVs) for NO₂, oxides of nitrogen (NO_x), sulphur dioxide, lead and PM₁₀;

2.2 UK Legislation

The Air Quality Standards (Amendment) Regulations (2016) came into force on 31st December 2016. These Regulations amend the Air Quality Standards Regulations 2010 and transpose the EU Directive 2008/50/EC into UK law. AQLVs were published in these regulations for 7 pollutants, as well as Target Values for an additional 6 pollutants.

Part IV of the Environment Act (1995) requires UK government to produce a national Air Quality Strategy (AQS) which contains standards, objectives and measures for improving ambient air quality. The most recent AQS was produced by the Department for Environment, Food and Rural Affairs (DEFRA) and published in July 2007¹. The AQS sets out AQOs that are maximum ambient pollutant concentrations that are not to be exceeded either without exception or with a permitted number of exceedances over a specified timescale. These are generally in line with the AQLVs, although the requirements for compliance vary slightly.

Table 1 presents the AQOs for pollutants considered within this assessment.

Table 1 Air Quality Objectives

Pollutant	Air Quality Objective	
	Concentration (µg/m ³)	Averaging Period
NO ₂	40	Annual mean
	200	1-hour mean; not to be exceeded more than 18 times a year
PM ₁₀	40	Annual mean
	50	24-hour mean; not to be exceeded more than 35 times a year
PM _{2.5}	25	Annual Mean

Table 2 summarises the advice provided in the Greater London Authority (GLA) guidance LLAQM (TG16)² on where the AQOs for pollutants considered within this report apply.

¹ The Air Quality Strategy for England, Scotland, Wales and Northern Ireland, DEFRA, 2007.

² London Local Air Quality Management Technical Guidance 2016 LLAQM.TG (16), GLA, 2016.



Table 2 Examples of Where the Air Quality Objectives Apply

Averaging Period	Objectives Should Apply At	Objectives Should Not Apply At
Annual mean	All locations where members of the public might be regularly exposed Building façades of residential properties, schools, hospitals, care homes etc.	Building façades of offices or other places of work where members of the public do not have regular access Hotels, unless people live there as their permanent residence Gardens of residential properties Kerbside sites (as opposed to locations at the building façade), or any other location where public exposure is expected to be short term
24-hour mean	All locations where the annual mean objective would apply, together with hotels. Gardens of residential properties	Kerbside sites (as opposed to locations at the building façade), or any other location where public exposure is expected to be short term
1-hour mean	All locations where the annual mean and 24-hour mean objectives apply. Kerbside sites (for example, pavements of busy shopping streets) Those parts of car parks, bus stations and railway stations etc. which are not fully enclosed, where members of the public might reasonably be expected to spend one hour or more Any outdoor locations where members of the public might reasonably be expected to spend one hour or longer	Kerbside sites where the public would not be expected to have regular access

2.3 Local Air Quality Management

Under Section 82 of the Environment Act (1995) (Part IV), Local Authorities (LAs) are required to periodically review and assess air quality within their area of administration under the system of Local Air Quality Management (LAQM). This review and assessment of air quality involves considering present and likely future air quality against the AQOs. If it is predicted that levels at sensitive locations where members of the public are regularly present for the relevant averaging period are likely to be exceeded, the LA is required to declare an AQMA. For each AQMA the LA is required to produce an Air Quality Action Plan (AQAP), the objective of which is to reduce pollutant concentrations in pursuit of the AQOs.

2.4 Dust

The main requirements with respect to dust control from industrial or trade premises not regulated under the Environmental Permitting (England and Wales) Regulations (2018) are those provided in Section 79 of Part III of the Environmental Protection Act (1990). The Act defines nuisance as:

"any dust, steam, smell or other effluvia arising on industrial, trade or business premises and being prejudicial to health or a nuisance."



Enforcement of the Act, in regard to nuisance, is currently under the administration of the local Environmental Health Department, whose officers are deemed to provide an independent evaluation of nuisance. If the LA is satisfied that a statutory nuisance exists, or is likely to occur or happen again, it must serve an Abatement Notice under Part III of the Environmental Protection Act (1990). Enforcement can insist that there be no dust beyond the boundary of the works. The only defence is to show that the process to which the nuisance has been attributed and its operation are being controlled according to best practice measures.

2.5 National Planning Policy

2.5.1 National Planning Policy Framework

The National Planning Policy Framework (NPPF) was published on 24th July 2018 (updated on 19th February 2019)³ and sets out the Government's core policies and principles with respect to land use planning, including air quality. The document includes the following considerations which are relevant to this assessment:

"Planning policies and decisions should contribute to and enhance the natural and local environment by:

[...]

Preventing both new and existing development from contributing to or being put at unacceptable risk from, or being adversely affected by unacceptable levels of soil, air, water or noise pollution or land instability. Development should, wherever possible, help to improve local environmental conditions such as air and water quality.

Planning policies and decisions should sustain and contribute towards compliance with relevant limit values or national objectives for pollutants, taking into account the presence of Air Quality Management Areas and Clean Air Zones, and the cumulative impacts from individual sites in local areas. Opportunities to improve air quality or mitigate impacts should be identified, such as through traffic and travel management, and green infrastructure provision and enhancement. So far as possible these opportunities should be considered at the plan-making stage, to ensure a strategic approach and limit the need for issues to be reconsidered when determining individual applications. Planning decisions should ensure that any new development in Air Quality Management Areas and Clean Air Zones is consistent with the local air quality action plan."

The implications of the NPPF have been considered throughout this assessment

2.5.2 National Planning Practice Guidance

The National Planning Practice Guidance⁴ (NPPG) web-based resource was launched by the Department for Communities and Local Government to support the NPPF and make it more accessible. The air quality chapters were produced on 6th March 2014 and the relevant sections are highlighted below:

³ National Planning Policy Framework, Department for Communities and Local Government

⁴ <http://planningguidance.planningportal.gov.uk/>



Paragraph 001 states that: *"Defra carries out an annual national assessment of air quality using modelling and monitoring to determine compliance with EU Limit Values" and "It is important that the potential impact of new development on air quality is taken into account, where the national assessment indicates that relevant limits have been exceeded or are near the limit". The role of Local Authorities under LAQM are stated and that Air Quality Action Plans should "identify measures that will be introduced in pursuit of the objectives"*

Paragraph 005 states that *"Whether or not air quality is relevant to a planning decision will depend on the proposed development and its location. Concerns could arise if the development is likely to generate air quality impact in an area where air quality is known to be poor. They could also arise where the development is likely to adversely impact upon the implementation of air quality strategies and action plans and/or, in particular, lead to a breach of EU legislation"*

Paragraph 007 states that *"Assessments should be proportional to the nature and scale of development proposed and the level of concern about air quality". In terms of mitigation, it states that "Mitigation options where necessary will be location specific, will depend on the proposed development and should be proportionate to the likely impact".*

Paragraph 009 shows a flow chart highlighting how the assessment of air quality impacts should fit into the development management process. It makes it clear that air quality impact risks, AQLVs and AQOs should be considered in the decision-making process.

These were reviewed and the relevant guidance considered as necessary throughout the undertaking of this assessment.

2.6 Local Planning Policy

2.6.1 The London Plan

The Minor Alterations to The London Plan⁵ was published in March 2016 and sets out a fully integrated economic, environmental, transport and social framework for the development of the capital until 2031. London boroughs' local plans need to be in general conformity with the London Plan, and its policies guide decisions on planning applications by councils and the Mayor.

The London Plan policies relating to air quality are outlined below:

- ▶ **Policy 3.2 Improving health and addressing health inequalities**
- ▶ **Policy 5.3 - Sustainable design and construction**
- ▶ **Policy 7.14 - Improving air quality**

These policies have been considered throughout the completion of this Air Quality Assessment.

2.6.2 The Draft London Plan

The Draft New London Plan sets out the proposed development strategy for London from 2019 to 2041. It was consulted from 29th November 2017 until 2nd March 2018. A review of the Draft New London Plan indicated the following policy in relation to air quality:

- ▶ **Draft Policy SI1 Improving air quality**

⁵ The London Plan, Minor Alterations to the London Plan, Greater London Authority, March 2016.



This policy has been considered throughout the undertaking of this Air Quality Assessment.

2.6.3 Local Planning Policy

London Borough of Hillingdon's Local Development Framework (LDF) consists of a portfolio of documents, of which the Local Plan is the principal overarching section. The Hillingdon Local Plan consists of two parts; Part 1: Strategic Policies, which was adopted in November 2012 and Part 2, which is due to replace the existing Unitary Development Plan. The Hillingdon Local Plan - Part 1: Strategic Policies sets out the spatial vision, objectives, development strategy and a series of key policies that will guide the scale, location and type of development in the borough until 2026. As such, the policies contained within the Local Plan - Part 1 provide the current basis for the determination of planning applications within LBoH's area of administration.

A review of the Local Plan-Part 1 indicated the following policies in relation to air quality that are relevant to this assessment:

"Policy E2 - Location of Employment Growth

The council will promote development in highly accessible locations that delivers sustainable travel patterns and contributes to the improvements of existing networks to reduce emissions and impacts of air quality."

And

"Policy EM1 - Climate Change and Adaption and Mitigation

The council will ensure that climate change mitigation is addressed at every stage of the development process by:

[...]

6. Targeting areas with high carbon emissions for additional reductions through low carbon strategies. These strategies will also have an objective to minimise other pollutants that impact the local air quality. Targeting areas of poor air quality for additional emission reductions."

And

"Policy EM8 - Land, Water, Air and Noise

[...]

Air Quality

All developments should not cause deterioration to the local air quality levels and should ensure the protection of both existing and new sensitive receptors.

All major development within the Air Quality Management Area (AQMA) should demonstrate air quality neutrality (no worsening of impacts) where appropriate; actively contribute to the promotion of sustainable transport measures such as vehicle charging points and the increased provision for vehicles with cleaner transport fuels; deliver increased planting through soft landscaping and living walls and roofs; and provide a management plan for ensuring air quality



impacts can be kept to a minimum.

The council seeks to reduce the levels of pollutants referred to in the Government's national Air Quality Strategy and will have regard to the mayor's Air Quality Strategy. London Boroughs should also take account of the findings of the Air Quality Review and Assessments and Action plans, in particular where AQMAs have been designated.

The council has a network of Air Quality Monitoring stations but recognises that this can be widened to improve understanding of air quality impacts. The Council may therefore require new major developments in an AQMA to fund additional air quality monitoring stations to assist in managing air quality improvements."

These policies have been considered throughout this report by assessing potential air quality impacts as a result of the proposed development.



3. METHODOLOGY

This section details the methodology used to assess exposure of future site occupants to elevated pollution levels, as well as impacts during both the construction and operational phases.

3.1 Construction Phase Assessment

There is the potential for fugitive dust emissions to occur as a result of construction phase activities. These have been assessed in accordance with the methodology outlined within the GLA document 'The Control of Dust and Emissions during Construction and Demolition Supplementary Planning Guidance'⁶.

Activities on the proposed construction site have been divided into four types to reflect their different potential impacts. These are:

- ▶ Demolition
- ▶ Earthworks;
- ▶ Construction; and
- ▶ Trackout

The potential for dust emissions was assessed for each activity that is likely to take place and considered three separate dust effects:

- ▶ Annoyance due to dust soiling;
- ▶ Harm to ecological receptors; and
- ▶ The risk of health effects due to a significant increase in exposure to PM₁₀.

The assessment steps are detailed below.

3.1.1 Step 1

Step 1 screens the requirement for a more detailed assessment. Should human receptors be identified within 350m from the site boundary or 50m from the construction vehicle route up to 500m from the site entrance, then the assessment should proceed to Step 2. Additionally, should ecological receptors be identified within 50m of the boundary site or 50m from the construction vehicle route up to 500m from the site entrance, then the assessment should also proceed to Step 2.

Should sensitive receptors not be present within the relevant distances then **negligible** impacts would be expected and further assessment is not necessary.

3.1.2 Step 2

Step 2 assesses the risk of potential dust impacts. A site is allocated to a risk category based on two factors:

- ▶ The scale and nature of the works, which determines the magnitude of dust arising as: small, medium or large (Step 2A); and
- ▶ The sensitivity of the area to dust impacts, which can be defined as low, medium or high sensitivity (Step 2B).

⁶ The Control of Dust and Emissions During Construction and Demolition Supplementary Planning Guidance, GLA, 2016.



The two factors are combined in Step 2C to determine the risk of dust impacts without the application of best practice mitigation measures.

3.1.3 Step 3

Step 3 requires the identification of site-specific mitigation measures within the GLA guidance to reduce potential dust impacts based upon the relevant risk categories identified in Step 2. For sites with **negligible** risk, mitigation measures beyond those required by legislation are not required. However, additional controls may be applied as part of good practice.

3.1.4 Step 4

Once the risk of dust impacts has been determined and the appropriate mitigation measures identified, the final step is to determine the significance of any residual impacts. For almost all construction activity, the aim should be to control effects through the use of effective mitigation. Experience shows that this is normally possible. Hence the residual effect will normally be '**not significant**'.

The determination of significance relies on professional judgement and reasoning should be provided as far as practicable. This has been considered throughout the assessment when defining predicted impacts.

The relevant GLA construction phase assessment criteria are provided in Appendix III, which details the magnitude of dust emissions, as well as the sensitivity of the surrounding area with regards to dust soiling and to human health impacts. The GLA guidance⁶ also suggests the provision of details of the assessor's qualifications and experience. These are provided in Appendix IV.



3.2 Operational Phase Impact Assessment

3.2.1 Future Exposure

The Proposed Development comprises the construction of a D2 sport and leisure centre with associated infrastructure and parking.

There are no proposed sensitive uses to annual mean concentrations across the D2 uses. In accordance with the guidance provided in Table 2 exposure to the annual mean NO₂, PM₁₀ and PM_{2.5} concentrations do not apply. Subsequently, this has not been considered in further detail during the preparation of the assessment.

3.2.2 Road Vehicle Exhaust Emissions

The development has the potential to impact on existing air quality as a result of road traffic exhaust emissions, such as NO₂, PM₁₀ and PM_{2.5}, associated with vehicles travelling to and from the site. Potential impacts have been defined by predicting pollutant concentrations at existing sensitive locations using dispersion modelling for the following scenarios:

- ▶ 2018 Verification;
- ▶ Opening year do-minimum (DM) (predicted traffic flows in 2022 should the proposals not proceed including committed developments as well as traffic flows associated with the additional Yiewsley and West Drayton schemes); and
- ▶ Opening year do-something (DS) (predicted traffic flows in 2022 should the proposed development be completed including committed developments as well as traffic flows associated with the additional Yiewsley and West Drayton schemes, with the addition of traffic flows generated by the development).

Committed schemes considered within the traffic data include:

- ▶ Horton Road, Yiewsley (Ref - 71582/APP/2016/4582)
- ▶ Station Road, West Drayton (Ref - 65480/APP/2015/1862)
- ▶ The Grand Union Office Park (Ref - 1197/APP/2015/4164)

It should be noted that air quality is predicted to improve in the future. However, in order to provide a robust assessment, emission factors for 2021 were utilised within the dispersion model. The use of 2022 traffic data and 2021 emission factors is considered to provide a worse case sensitivity analysis for fleet renewal delay, which may lead to overestimations of actual pollutant concentrations during the operation of the proposals. Therefore, a sufficient level of confidence can be placed within the predicted pollution concentrations. This approach was requested by LBoH during the initial consultation.

Reference should be made to Appendix II for assessment input data.

Receptors potentially sensitive to changes in NO₂, PM₁₀ and PM_{2.5} concentrations were identified within 200m of the affected highway network. LLAQM (TG16)² provides the following examples of where annual mean AQOs should apply:

- ▶ Residential properties;
- ▶ Schools;
- ▶ Hospitals; and



- ▶ Care homes.

The sensitivity impact significance of each receptor was defined in accordance with the criteria shown in Table 3. These are based upon the guidance provided within the Environmental Protection UK (EPUK) and IAQM guidance 'Land-Use Planning and Development Control: Planning for Air Quality'⁷.

Table 3 Operational Traffic Exhaust Emissions - Assessment of Impact

Long Term Average Concentration	% Change in Concentration Relative to AQO			
	1	2-5	6-10	>10
75% or less of AQO	Negligible	Negligible	Slight	Moderate
76 - 94% of AQO	Negligible	Slight	Moderate	Moderate
95 - 102% of AQO	Slight	Moderate	Moderate	Substantial
103 - 109% of AQO	Moderate	Moderate	Substantial	Substantial
110% or more of AQO	Moderate	Substantial	Substantial	Substantial

The criteria shown in Table 3 is adapted from the EPUK and IAQM guidance⁷ with sensitivity descriptors included to allow comparisons of various air quality impacts. It should be noted that changes of 0%, i.e. less than 0.5%, will be described as negligible in accordance with the EPUK and IAQM guidance⁷.

Following the prediction of impacts at discrete receptor locations utilising the criteria in Table 3, the EPUK and IAQM⁷ document states that this framework is to be used as a starting point to make a judgement on significance of effect but other influences might need to be accounted for. Whilst impacts might be determined as 'slight', 'moderate' or 'substantial' at individual receptors, overall effect might not necessarily be deemed as significant in some circumstances. The following factors may provide some assistance in determining the overall significance of a development:

- ▶ Number of properties affected by significant air quality impacts and a judgement on the overall balance;
- ▶ Where new exposure is introduced into an existing area of poor air quality, then the number of people exposed to levels above the objective will be relevant;
- ▶ The percentage change in concentration relative to the objective and the descriptions of the impacts at the receptors;
- ▶ Whether or not an exceedance of an objective is predicted to arise or be removed in the study area due to a substantial increase or decrease; and
- ▶ The extent to which an objective is exceeded e.g. an annual mean NO₂ concentration of 41µg/m³ should attract less significance than an annual mean of 51µg/m³.

These factors were considered and an overall significance determined for the impact of operational phase road traffic emissions. It should be noted that the determination of significance relies on professional judgement and reasoning should be provided as far as practicable. This has been considered throughout the assessment when defining predicted impacts.

⁷ Land-Use Planning and Development Control: Planning for Air Quality, Environmental Protection UK and Institute of Air Quality Management, 2017.



3.3 Air Quality Neutral

An assessment was undertaken to compare benchmark emissions with the proposed site use emissions in accordance with the methodology outlined within the GLA 'Air Quality Neutral Planning Support'⁸. The methodology is outlined below:

The following potential scenarios have been considered within the assessment:

- ▶ Benchmark; and
- ▶ Development.

The benchmark scenario is representative of annual NO_x and PM₁₀ benchmark emissions, which are target emissions as defined by the GLA guidance⁸. The development scenario is representative of the annual NO_x and PM₁₀ emissions from the operation of the proposed development only.

The following emission source was considered during the assessment:

- ▶ **Transport Emissions** - road vehicles travelling to and from the site

3.3.1 Benchmark

The Transport Emissions Benchmark (TEB) for the development is calculated using the GLA guidance⁸ based on the land use classes associated with the proposed development. The TEBs for each land use class for a development within Outer London are provided in the GLA guidance⁸ and are summarised in Table 4.

It should be noted that the floor area for the proposed D2 land use category associated with the development have been assessed with the A1 (Retail) land use category. This is because there are no TEBs available for the D2 land use categories and as such, the TEB for the A1 land use category has been utilised, as stated within the GLA Air Quality Neutral Planning Support document.

Table 4 Transport Emission Benchmarks

Land Use Category	NO _x TEB (g/m ² /year)	PM ₁₀ TEB ((g/m ² /year)
A1 - Retail	249	42.9

⁸ Air Quality Neutral Planning Support: GLA 80371, Air Quality Consultants Ltd in association with ENVIRON UK Ltd, 2014.



3.3.2 Development Emissions

The development Total Transport Emissions is compared against the development specific TEB in order to determine if the development site is considered to be Air Quality Neutral. Annual vehicle emissions for the development are calculated based on the anticipated traffic generation for the development, with the standard emission factors and the average distance travelled by car per trip for a development within Outer London. The emissions factors and the average distance travelled were taken from the GLA guidance⁸ and are summarised in Table 5 and Table 6, respectively.

Table 5 Air Quality Neutral Road Transport Emission Factors

Pollutant	g/vehicle-km in Outer London
NO _x	0.353
PM ₁₀	0.0606

Table 6 Average Distance Travelled by Car per Trip

Land Use Category	Average Distance (km)
A1 - Retail	5.4



4. BASELINE

Existing air quality conditions in the vicinity of the application site were identified in order to provide a baseline for assessment. These are detailed in the following sections.

4.1 Local Air Quality Management

As required by the Environment Act (1995), LBoH has undertaken Review and Assessment of air quality within their area of administration. This process has indicated that annual mean concentrations of NO₂ are above the AQOs within the borough. As such, one AQMA has been declared, and described as:

"Hillingdon AQMA – The area from the southern boundary north to the border defined by, the A40 corridor from the western borough boundary, east to the intersection with the Yeading Brook north until its intersection with the Chiltern-Marylebone railway line."

LBoH have also designated AQFAs in the borough which are selected hotspots where air quality is predicted to be poor and public exposure is at its highest. The development site is located within the West Drayton/Yiewsley AQFA and the Hillingdon AQMA, and therefore has the potential to introduce future site users to elevated pollutant concentrations as well as to cause adverse impacts to air quality within this area. This has been considered within this report.

LBoH has concluded that concentrations of all other pollutants considered within the AQS are currently below the relevant AQOs and as such no further AQMAs have been designated.

4.2 Air Quality Monitoring

Monitoring of pollutant concentrations is undertaken by LBoH using continuous and periodic methods throughout their areas of administration. A review of the most recent Air Quality Annual Status Report⁹ indicated that the closest continuous monitor to the proposed development is the London Hillingdon analyser, situated approximately 800m south of the proposed development.

Recent monitoring results from this location are shown in Table 7. Exceedances of the AQO are shown in **bold**.

Table 7 Automatic Monitoring Results

Site ID	Site Name	Type	NGR (m)		Annual Mean NO ₂ Concentration (µg/m ³)		
			X	Y	2016	2017	2018
HIL	London Hillingdon	Urban background	506951	178605	51	53	46

As indicated in Table 7 the annual mean AQO for NO₂ was exceeded at London Hillingdon site in recent years.

LBoH also utilise passive diffusion tubes to monitor NO₂ concentrations throughout the borough. A review of the most recent monitoring data provided by LBoH indicated three diffusion tubes located in the vicinity of the site. Recent monitoring results from the locations are shown in Table 8. Exceedances of the annual mean AQO are highlighted in **bold**.

⁹ Air Quality Annual Status Report for 2018, London Borough of Hillingdon, July 2019



Table 8 Diffusion Tube Monitoring Results

Site Name		Type	NGR (m)		O ₂		
			X	Y	2016	2017	2018
HD205	1 Porters Way	Background	506503	179510	35.9	37.9	36.6
HD31	AURN Site, Keats Way	Roadside	506926	178614	34.3	45.3	40.1
HD206	5-7 Mulberry Crescent	Background	507141	179628	29.6	34.7	34.9

As indicated in Table 8, there were exceedances of the annual mean AQO for NO₂ at the, Keats Way (HD31) diffusion tubes over the last two years, other monitoring sites in the vicinity remain below the annual mean AQO. Reference should be made to Figure 2 within Appendix I for a graphical representation of the monitoring locations.

4.3 Background Pollutant Concentrations

The total concentration of a pollutant is comprised of explicit local emission sources (such as roads and industrial sources) and the background component. The background component consists of indeterminate sources which are transported into an area from further away by meteorological conditions. Background pollutant concentrations are therefore the ambient level of pollution that is not affected by local sources of pollution.

Predictions of background pollutant concentrations on a 1km by 1km grid basis have been produced by DEFRA for the entire of the UK to assist LAs in their Review and Assessment of air quality. The Proposed Development site is located at grid square NGR: 506500, 179500. Background data was downloaded from the DEFRA website¹⁰ for the purpose of this assessment and is summarised in Table 9 for the verification year (2018) and the predicted development opening year (2022).

Table 9 Predicted Background Pollutant Concentrations

Pollutant	Predicted Background Concentration (µg/m ³)	
	2018	2022
NO _x	38.90	32.06
NO ₂	24.73	21.22
PM ₁₀	16.15	15.35
PM _{2.5}	11.24	10.60

As shown in Table 9, background pollutant concentrations do not exceed the relevant AQOs. Comparison with the monitoring results indicates the impact that vehicle exhaust emissions from the highway network have on pollutant concentrations at roadside locations, specifically with AQMAs and AQFAs.

Reference should be made to Figure 2 within Appendix I for a graphical representation of the diffusion tube monitoring locations.

¹⁰ <http://laqm.defra.gov.uk/review-and-assessment/tools/background-maps.html>.



4.4 Sensitive Receptors

A sensitive receptor is defined as any location where AQOs may apply (See Table 2) as well as being susceptible to changes in local pollutant concentrations. Receptors have been defined for both construction and operational scenarios.

4.4.1 Construction Phase Sensitive Receptors

There are no nationally or European designated ecological receptors within 50m of the Site boundary, or within 50m from a route used by construction vehicles on the public highway (up to 500m from the Site entrance). Therefore, the risk of dust effects at a nationally or European designated ecological receptor site from construction impacts is not considered further in this assessment.

Human receptors are considered sensitive to potential dust impacts during demolition, earthworks and construction and have been identified from a desk-top study of the area up to 350m from the development boundary. These are summarised in Table 10.

Table 10 Demolition, Earthworks and Construction Dust Sensitive Receptors

Distance from Site Boundary (m)	Approximate Number of Human Receptors	Approximate Number of Ecological Receptors
Less than 20	1 - 10	0
20 - 50	10 - 100	0
50 - 100	More than 100	-
100 - 350	More than 100	-

Reference should be made to Figure 3 within Appendix I for a graphical representation of demolition, earthworks and construction dust buffer zones.

Receptors sensitive to potential dust impacts from trackout were identified from a desk-top study of the area up to 50m from the road network within 500m of the site access route. These are summarised in Table 11. The construction vehicle access route is currently unknown, for the use of this assessment it was assumed that construction traffic would access and exit the site from Rowlheys Place via Harmondsworth Road. This was to ensure a maximum potential trackout distance was considered.

Table 11 Trackout Dust Sensitive Receptors

Distance from Site Access Route (m)	Approximate Number of Human Receptors	Approximate Number of Ecological Receptors
Less than 20	10 - 100	0
20 - 50	More than 100	0

Reference should be made to Figure 4 within Appendix I for a graphical representation of trackout dust buffer zones.

A number of additional factors have been considered when determining the sensitivity of the surrounding area. These are summarised in Table 12.



Table 12 Additional Area Sensitivity Factors

Guidance	Comment
Whether there is any history of dust generating activities in the area	The proposal is located in a residential area. As such, there is likely to have been a history of dust generating activities due to redevelopment in the locality, as well as dust generated from commuting activities
The likelihood of concurrent dust generating activity on nearby sites	A review of the London Development Database indicated that there are three ongoing large-scale developments within 500m of the development site. Should the above schemes gain planning approval, there is potential risk of concurrent dust generation from nearby developments
Pre-existing screening between the source and the receptors	There is vegetation present along the boundaries of the site, with dense areas to the northern boundary. If retained, this could provide limited natural protective screening to receptors in this direction
Conclusions drawn from analysing local meteorological data which accurately represent the area: and if relevant the season during which works will take place	The wind direction is predominantly from the south west, west and north east of the development, as shown in Figure 5 within Appendix I. As such, properties to the north east, east and south west of the site would be most affected by dust emissions
Conclusions drawn from local topography	The topography within the immediate area of the Proposed Development appears to be relatively flat. As such, there are no constraints to dust dispersion
Duration of the potential impact, as a receptor may become more sensitive over time	Currently it is unclear as to the duration of the construction phase. However, given the 2022 opening year, the development is unlikely to extend over two years
Any known specific receptor sensitivities which go beyond the classifications given in the document.	No specific receptor sensitivities identified during the baseline

4.4.2 Operational Phase Sensitive Receptors

A desk-top study was undertaken in order to identify any sensitive receptor locations in the vicinity of the site that require specific consideration during the assessment and are summarised in Table 13.

Table 13 Existing Sensitive Receptors

Receptor		NGR (m)		Height (m)
		X	Y	
R1	1 Sipson Road	506542	179293	1.5
R2	4A Sipson Road	506521	179243	4.5
R3	5A Harmondsworth Road	506513	179210	1.5



Receptor		NGR (m)		Height (m)
		X	Y	
R4	18 Harmondsworth Road	506402	178880	1.5
R5	131 Wordsworth Way	506458	178564	1.5
R6	109 Wordsworth Way	506429	178585	1.5
R7	43 Cherry Lane	507107	178834	1.5
R8	2 Blossom Way	507058	178818	1.5
R9	24 Sipson Road	506544	179212	1.5
R10	Coppinger Court	506483	179518	1.5
R11	130A Station Road	506293	179604	1.5
R12	23 Hanson Close	506527.3	179478.7	1.5
R13	Garden Court	506152	179812	1.5
R14	33 Sipson Road	506603.3	179196.1	1.5
R15	68 Sipson Road	506624	179084.9	1.5

The sensitive receptors identified in Table 13 represent worst-case locations. However, this is not an exhaustive list and there may be other locations within the vicinity of the site that may experience air quality impacts as a result of the proposed development that have not been individually identified above. Reference should be made to Figure 6 within Appendix I for a graphical representation of operational phase emission sensitive receptor locations.



5. ASSESSMENT

5.1 Construction Phase Assessment

5.1.1 Step 1 – Screening

The undertaking of activities such as demolition, excavation, ground works, cutting, construction, concrete batching and storage of materials has the potential to result in fugitive dust emissions throughout the construction phase. Vehicle movements both on-site and on the local road network also have the potential to result in the re-suspension of dust from haul road and highway surfaces.

The desk-study detailed in Section 3.1 identified a number of highly sensitive receptors within 350m of the site boundary, and within 50m of the anticipated trackout routes. As such, a detailed assessment of potential dust impacts was required, and summarised in the below sections.

Reference should be made to Appendix III for details of the relevant GLA guidance⁶ construction phase assessment criteria, which were utilised in conjunction with site specific information.

5.1.2 Step 2A – Magnitude

The scale and nature of the works was determined to assess the magnitude of dust arising from each construction phase activity. The determination of magnitude was based upon the criteria detailed in Appendix III, with the outcome of Step 2A is summarised below in Table 14.

Demolition

The Proposed Development will include the full demolition of the current youth centre on site. The volume of buildings to be demolished is therefore likely to be less than 20,000m³. With this considered the magnitude of potential dust emissions related to demolition activities is **small**.

Earthworks

The Proposed Development site is estimated to cover an approximate area of 11,000m². Based on this information the magnitude of potential dust emissions related to earthwork activities is therefore considered **large**.

Construction

The proposals comprise the construction of a new sport and leisure centre with associated infrastructure, given the scale of the development the total building volume is likely to be between 25,000m³ and 100,000m³. The magnitude of potential dust emissions related to construction activities is therefore considered **medium**.

Trackout

Information on the number of HDV trips to be generated during the construction phase of the development was not available at the time of assessment. Similarly, the surface material and unpaved road length was not known at this stage of the project. Based on the site area, it is anticipated that the unpaved road length is likely to be between 50m and 100m. The magnitude of potential dust emissions from trackout is therefore **medium**.



Table 14 Dust Emission Magnitude

Magnitude of Activities			
Demolition	Earthworks	Construction	Trackout
Small	Large	Medium	Medium

5.1.3 Step 2B – Sensitivity

The next step (Step 2B) is to determine the sensitivity of the surrounding area, based on general principles such as amenity and aesthetics, as well as human exposure sensitivity.

Dust Soiling

As shown in Table 10 and Table 11, the desk top study indicated that there are approximately **1 - 10** sensitive receptors within 20m of the Proposed Development boundary, and **10 - 100** within 20m of the anticipated trackout routes. Based on the assessment criteria detailed in Appendix III, the sensitivity of the receiving environment to potential dust soiling impacts was considered to be **high** for trackout activities and **medium** for demolition, earthworks and construction activities. This is because users would expect to enjoy a reasonable level of amenity and residents would be expected to be present for extended periods of time

Human Health

The annual mean concentration of PM₁₀ is 16.50µg/m³ as detailed in Table 9.

Given the presence of **1 - 10** sensitive receptors within 20m of the Proposed Development boundary, and **10 - 100** within 20m of the anticipated trackout routes, the area is considered to be of **low** sensitivity for all construction phase activities.

The sensitivity of the receiving environment to specific potential dust impacts, based on the criteria detailed in Appendix III is summarised in Table 15.

Table 15 Sensitivity of the Surrounding Area

Potential Impact	Sensitivity of the Surrounding Area			
	Demolition	Earthworks	Construction	Trackout
Dust Soiling	Medium	Medium	Medium	High
Human Health	Low	Low	Low	Low

5.1.4 Step 2C – Risk

Both the magnitude and sensitivity factors are combined in Step 2C to determine the risk of dust impacts without the application of best practice mitigation measures.

It should be noted that the potential for impacts depends significantly on the distance between the dust generating activity and receptor location. Risk was predicted based on a worst-case scenario of works being undertaken at the site boundary closest to each sensitive area. Therefore, actual risk is



likely to be lower than that predicted during the majority of the construction phase. A summary of the risk from each dust generating activity is provided in Table 16.

Table 16 Summary of Potential Unmitigated Dust Risks

Potential Impact	Risk			
	Demolition	Earthworks	Construction	Trackout
Dust Soiling	Low	Medium	Medium	Medium
Human Health	Negligible	Low	Low	Low

5.1.5 Step 3 – Mitigation

The GLA guidance⁶ provides a number of potential mitigation measures to reduce impacts during the construction phase. These measures have been adapted for the development site as summarised in Table 17. The mitigation measures outlined below can be reviewed prior to the commencement of construction works incorporated into the existing strategies as applicable.

Table 17 Fugitive Dust Mitigation Measures

Issue	Control Measure
Site Management	• Develop and implement a stakeholder communications plan that includes community engagement before work commences on site. • Develop a Dust Management Plan. • Display the name and contact details of person(s) accountable for air quality pollutant emissions and dust accountable for air quality pollutant emissions and dust issues on the site boundary. • Display the head or regional office contact information. • Record and respond to all dust and air quality pollutant emissions complaints. • Make a complaint log available to the local authority when asked. • Carry out regular site inspections to monitor compliance with air quality and dust control procedures, record inspection results, and make an inspection log available to the local authority when asked. • Increase the frequency of site inspections by those accountable for dust and air quality pollutant emissions issues when activities with a high potential to produce dust and emissions and dust are being carried out, and during prolonged dry or windy conditions. • Record any exceptional incidents that cause dust and air quality pollutant emissions, either on or off the site, and the action taken to resolve the situation is recorded in the log book.



Issue	Control Measure
Preparing and Maintaining the Site	• Plan site layout: machinery and dust causing activities should be located away from receptors. • Erect solid screens or barriers around dust activities or the site boundary that are, at least, as high as any stockpiles on site. • Fully enclosure site or specific operations where there is a high potential for dust production and the site is active for an extensive period. • Install green walls, screens or other green infrastructure to minimise the impact of dust and pollution. • Avoid site runoff of water or mud. • Keep site fencing, barriers and scaffolding clean using wet methods. • Remove materials from site as soon as possible. • Cover, seed or fence stockpiles to prevent wind whipping. • Carry out regular dust soiling checks of buildings within 100m of site boundary and cleaning to be provided if necessary. • Agree monitoring locations with the Local Authority. • Where possible, commence baseline monitoring at least three months before phase begins. • Put in place real-time dust and air quality pollutant monitors across the site and ensure they are checked regularly.
Operating Vehicle/ Machinery and Sustainable Travel	• Ensure all on-road vehicles comply with the requirements of the London Low Emission Zone. • Ensure all non-road mobile machinery (NRMM) comply with the standards set within this guidance. • Ensure all vehicles switch off engines when stationary – no idling vehicles. • Avoid the use of diesel- or petrol-powered generators and use mains electricity or battery powered equipment where possible. • Impose and signpost a maximum-speed-limit of 10mph on surfaced haul routes and work areas (if long haul routes are required these speeds may be increased with suitable additional control measures provided, subject to the approval of the nominated undertaker and with the agreement of the local authority, where appropriate). • Produce a Construction Logistics Plan to manage the sustainable delivery of goods and materials. • Implement a Travel Plan that supports and encourages sustainable travel (public transport, cycling, walking, and car-sharing).



Issue	Control Measure
Operations	• Only use cutting, grinding or sawing equipment fitted or in conjunction with suitable dust suppression techniques such as water sprays or local extraction, e.g. suitable local exhaust ventilation systems. • Ensure an adequate water supply on the site for effective dust/particulate matter mitigation (using recycled water where possible). • Use enclosed chutes, conveyors and covered skips. • Minimise drop heights from conveyors, loading shovels, hoppers and other loading or handling equipment and use fine water sprays on such equipment wherever appropriate. • Ensure equipment is readily available on site to clean any dry spillages, and clean up spillages as soon as reasonably practicable after the event using wet cleaning methods.
Waste Management	• Reuse and recycle waste to reduce dust from waste materials • Avoid bonfires and burning of waste materials.
Demolition	• Soft strip inside buildings before demolition (retaining walls and windows in the rest of the building where possible, to provide a screen against dust). • Ensure water suppression is used during demolition operations. • Avoid explosive blasting, using appropriate manual or mechanical alternatives. • Bag and remove any biological debris or damp down such material before demolition.
Earthworks and Construction	• Re-vegetate earthworks and exposed areas/soil stockpiles to stabilise surfaces. • Use Hessian, mulches or trackifiers where it is not possible to re-vegetate or cover with topsoil to re-vegetate or cover with topsoil. • Only remove secure covers in small areas during work and not all at once. • Avoid scabbling (roughening of concrete surfaces) if possible • Ensure sand and other aggregates are stored in bunded areas and are not allowed to dry out, unless this is required for a particular process, in which case ensure that appropriate additional control measures are in place • Ensure bulk cement and other fine powder materials are delivered in enclosed tankers and stored in silos with suitable emission control systems to prevent escape of material and overfilling during delivery. • For smaller supplies of fine powder materials ensure bags are sealed after use and stored appropriately to prevent dust.



Issue	Control Measure
Trackout	• Regularly use a water-assisted dust sweeper on the access and local roads, as necessary, to remove any material tracked out of the site. • Avoid dry sweeping of large areas. • Ensure vehicles entering and leaving sites are securely covered to prevent escape of materials during transport. • Record all inspections of haul routes and any subsequent action in a site log book. • Install hard surfaced haul routes, which are regularly damped down with fixed or mobile sprinkler systems and regularly cleaned. • Inspect haul routes for integrity and instigate necessary repairs to the surface as soon as reasonably practicable; • Implement a wheel washing system (with rumble grids to dislodge accumulated dust and mud prior to leaving the site where reasonably practicable). • Ensure there is an adequate area of hard surfaced road between the wheel wash facility and the site exit, wherever site size and layout permits. • Access gates to be located at least 10m from receptors where possible. • Apply dust suppressants to locations where a large volume of vehicles enter and exit the construction site

5.1.6 Step 4 – Residual Impacts

Assuming the relevant mitigation measures outlined in Table 17 are implemented, the residual effect from all dust generating activities is predicted to be **not significant**, in accordance with the GLA guidance⁶.

5.2 Operational Phase Assessment

Additional vehicle movements associated with the operation of the proposed development from both HDVs and cars will generate exhaust emissions, such as NO₂, PM₁₀ and PM_{2.5} on the local and regional road networks. An assessment was therefore undertaken using dispersion modelling in order to quantify potential changes in pollutant concentrations at sensitive locations in the vicinity of the site.

The assessment considered the following scenarios:

- ▶ 2018 Verification;
- ▶ 2022 Do-Minimum (DM); and
- ▶ 2022 Do-Something (DS).

The DM (i.e. without development) scenario is representative of anticipated traffic data for 2022, inclusive of committed developments within the area as well as traffic flows associated with the additional Yiewsley and West Drayton schemes. The DS (i.e. with development) scenario is representative of anticipated traffic data for with the addition of predicted variations in traffic flow patterns as a result of the proposals, inclusive of committed developments within the area as well as traffic flows associated with the additional Yiewsley and West Drayton scheme.

For the purpose of this assessment traffic data representative of the development opening year was utilised. Air quality is predicted to improve in the future. However, in order to provide a robust



assessment, emission factors for 2021 were utilised within the dispersion model. The use of 2022 traffic data and 2021 emission factors is considered to provide a worst-case sensitivity analysis for fleet renewal delay, and therefore a sufficient level of confidence can be placed within the predicted pollution concentrations.

Reference should be made to Appendix II for full assessment input details.

Predicted Concentrations at the Development Site

As discussed previously in Section 3.2.1, it should be noted that the proposed development does not include any relevant exposure to long term pollutant concentrations, such as residential units. As a result, consideration of annual mean NO₂, PM₁₀ and PM_{2.5} concentrations are not required across the development as in accordance with LLAQM (TG16)² and has not been considered further in the context of pollutant exposure.

5.2.1 Nitrogen Dioxide

Predicted Concentrations at Sensitive Receptor Locations

Annual mean NO₂ concentrations were predicted for the 2022 DM and DS scenarios and are summarised in Table 18.

Table 18 Predicted Annual Mean NO₂ Concentrations

Sensitive Receptor		Predicted Annual Mean NO ₂ Concentration (µg/m ³)		
		DM	DS	Change
R1	1 Sipson Road	31.26	31.64	0.38
R2	4A Sipson Road	29.52	29.82	0.30
R3	5A Harmondsworth Road	31.19	31.68	0.49
R4	18 Harmondsworth Road	36.19	36.32	0.13
R5	131 Wordsworth Way	39.43	39.47	0.04
R6	109 Wordsworth Way	38.38	38.44	0.06
R7	43 Cherry Lane	37.27	37.44	0.17
R8	2 Blossom Way	37.47	37.64	0.17
R9	24 Sipson Road	29.19	29.46	0.27
R10	Coppinger Court	28.89	29.06	0.17
R11	130A Station Road	28.55	28.66	0.11
R12	23 Hanson Close	28.60	29.01	0.41
R13	Garden Court	28.71	28.82	0.11
R14	33 Sipson Road	28.93	29.16	0.23



Sensitive Receptor		Predicted Annual Mean NO ₂ Concentration (µg/m ³)		
		DM	DS	Change
R15	68 Sipson Road	28.51	28.68	0.17

As indicated in Table 18, predicted annual mean NO₂ concentrations did not exceed the AQO at any sensitive receptor location during either the DM or DS scenario.

Predicted impacts on annual mean NO₂ concentrations at the sensitive receptor locations are summarised in Table 19.

Table 19 Predicted NO₂ Impacts

Sensitive Receptor		% Change in Concentration Relative to AQO	Long Term Average Concentration	Impact
R1	1 Sipson Road	0.95	76-94% of the AQO	Negligible
R2	4A Sipson Road	0.75	75% or Less of the AQO	Negligible
R3	5A Harmondsworth Road	1.23	76-94% of the AQO	Negligible
R4	18 Harmondsworth Road	0.33	76-94% of the AQO	Negligible
R5	131 Wordsworth Way	0.10	95-102% of the AQO	Negligible
R6	109 Wordsworth Way	0.15	95-102% of the AQO	Negligible
R7	43 Cherry Lane	0.42	76-94% of the AQO	Negligible
R8	2 Blossom Way	0.43	95-102% of the AQO	Negligible
R9	24 Sipson Road	0.67	75% or Less of the AQO	Negligible
R10	Coppinger Court	0.42	75% or Less of the AQO	Negligible
R11	130A Station Road	0.27	75% or Less of the AQO	Negligible
R12	23 Hanson Close	1.03	75% or Less of the AQO	Negligible
R13	Garden Court	0.27	75% or Less of the AQO	Negligible
R14	33 Sipson Road	0.58	75% or Less of the AQO	Negligible
R15	68 Sipson Road	0.42	75% or Less of the AQO	Negligible

As indicated in Table 19, the significance of impacts on annual mean NO₂ concentrations as a result of the development was predicted to be **negligible** at all sensitive receptor locations considered.

It is therefore considered that the overall impacts as a result of the proposed development on NO₂ concentration are **not significant**. Further justification on the overall significance is provided in Section 5.2.4.



5.2.2 Particulate Matter – PM₁₀

Predicted Concentrations at Sensitive Receptor Locations

Annual mean PM₁₀ concentrations were predicted for the 2022 DM and DS scenarios and are summarised in Table 20.

Table 20 Predicted Annual Mean PM₁₀ Concentrations

Sensitive Receptor		Predicted Annual Mean PM ₁₀ Concentration (µg/m ³)		
		DM	DS	Change
R1	1 Sipson Road	17.55	17.64	0.09
R2	4A Sipson Road	17.22	17.29	0.07
R3	5A Harmondsworth Road	17.76	17.89	0.13
R4	18 Harmondsworth Road	18.90	18.93	0.03
R5	131 Wordsworth Way	19.50	19.51	0.01
R6	109 Wordsworth Way	19.30	19.32	0.02
R7	43 Cherry Lane	18.89	18.94	0.05
R8	2 Blossom Way	18.94	18.99	0.05
R9	24 Sipson Road	17.26	17.33	0.07
R10	Coppinger Court	17.02	17.06	0.04
R11	130A Station Road	17.17	17.20	0.03
R12	23 Hanson Close	16.97	17.05	0.08
R13	Garden Court	17.22	17.25	0.03
R14	33 Sipson Road	17.23	17.29	0.06
R15	68 Sipson Road	17.12	17.17	0.05

As indicated in Table 20, annual mean PM₁₀ concentrations were below the relevant AQO at all sensitive receptor locations for both scenarios considered.

Predicted impacts on annual mean PM₁₀ concentrations at the sensitive receptor locations are summarised in Table 21.

Table 21 Predicted PM₁₀ Impacts

Sensitive Receptor		% Change in Concentration Relative to AQO	Long Term Average Change	Impact
R1	1 Sipson Road	0.23	75% or Less of AQO	Negligible



Sensitive Receptor		% Change in Concentration Relative to AQO	Long Term Average Change	Impact
R2	4A Sipson Road	0.18	75% or Less of AQO	Negligible
R3	5A Harmondsworth Road	0.32	75% or Less of AQO	Negligible
R4	18 Harmondsworth Road	0.08	75% or Less of AQO	Negligible
R5	131 Wordsworth Way	0.03	75% or Less of AQO	Negligible
R6	109 Wordsworth Way	0.05	75% or Less of AQO	Negligible
R7	43 Cherry Lane	0.13	75% or Less of AQO	Negligible
R8	2 Blossom Way	0.12	75% or Less of AQO	Negligible
R9	24 Sipson Road	0.17	75% or Less of AQO	Negligible
R10	Coppinger Court	0.10	75% or Less of AQO	Negligible
R11	130A Station Road	0.07	75% or Less of AQO	Negligible
R12	23 Hanson Close	0.20	75% or Less of AQO	Negligible
R13	Garden Court	0.08	75% or Less of AQO	Negligible
R14	33 Sipson Road	0.15	75% or Less of AQO	Negligible
R15	68 Sipson Road	0.13	75% or Less of AQO	Negligible

As indicated in Table 21, impacts on annual mean PM₁₀ concentrations as a result of road vehicle exhaust emissions associated with the development were predicted to be **negligible** at all sensitive receptor locations considered.

It is therefore considered that the overall impacts as a result of the proposed development are **not significant**. Further justification on the overall significance is provided in Section 5.2.4.

5.2.3 Particulate Matter (PM_{2.5}) – Annual Mean

PM_{2.5} has not been modelled within the assessment as the predicted concentrations relating to annual mean PM₁₀ remain below the AQO for PM_{2.5} (25 µg/m³). Since PM₁₀ accounts for all particulate matter with an aerodynamic diameter of less than 10µm, PM_{2.5} is effectively included within these predictions; and at worst could be considered that PM_{2.5} concentrations would be equal to the predicted PM₁₀ concentrations.

5.2.4 Impact Significance

The overall significance of operational phase road traffic emission impacts was determined as **not significant**. This was based on the predicted impacts at discrete receptor locations and the considerations outlined in Section 0. Further justification is provided in Table 22.



Table 22 Overall Road Emissions Impact Significance

Guidance	Comment
Number of properties affected by slight, moderate or substantial air quality impacts and a judgement on the overall balance	Impacts on NO ₂ and PM ₁₀ concentrations were predicted to be negligible at all sensitive receptors considered. The sensitive locations represent worst-case locations and therefore it is unlikely that any other receptors would be significantly affected by the proposed development.
Where new exposure is introduced into an existing area of poor air quality, then the number of people exposed to levels above the objective or limit value will be relevant	The proposed development will not result in any new exposure to pollutant concentrations above the relevant AQOs at sensitive locations.
The percentage change in concentration relative to the objective and the descriptions of the impacts at the receptors	The change in concentration relative to the AQO was predicted to range from: ▶ -0.1% to 1.225% for NO ₂ , ▶ -0.03% to 0.32% for PM ₁₀ ; Therefore, overall impacts were predicted to be negligible at all receptor locations
Whether or not an exceedance of an objective is predicted to arise or be removed in the study area due to a substantial increase or decrease	There were no exceedances of the annual mean AQO for NO ₂ or PM ₁₀ concentrations at any location within the modelling extent
The extent to which an objective is exceeded e.g. an annual mean NO ₂ concentration of 41µg/m ³ should attract less significance than an annual mean of 51µg/m ³	There were no exceedances of the annual mean AQO for NO ₂ and PM ₁₀ at any sensitive receptor location within the modelling extents

It should also be noted that the use of 2022 traffic data and 2021 emission factors is considered to provide a worse case sensitivity analysis for fleet renewal delay, which may lead to overestimations of actual pollutant concentrations during the operation of the proposals. As such, the overall significance of operational phase road traffic emission impacts on pollutant concentration was determined **not significant**.

5.3 Air Quality Neutral Assessment

The proposals comprise the development of a commercial scheme with the provision of a new sport and leisure centre with associated parking and infrastructure. The impact of which is assessed in the following Sections.

5.3.1 Benchmarks

The development specific TEB has been calculated using the GLA Air Quality Neutral Planning Support Guidance⁸ standard TEB for the proposed land use of the development, as outlined in Table 23 and the floor area of proposed land use.

The floor area was provided by Hunters. The development specific TEB is detailed in Table 23.



Table 23 Development Specific Transport Emission Benchmark

Land Use Category	Quantity (m ²)	TEB - NO _x per Land Use (kg/year)	TEB - PM ₁₀ per Land Use (kg/year)
A1 - Retail	7,794.00	1,940.71	334.36

As indicated in Table 23, the total annual NO_x and PM₁₀ emission TEB is **1,940.71kg/year** and **334.36kg/year**, respectively.

5.3.2 Development Emissions

The Total Transport Emissions for the proposed development were calculated based on the standard emission factors and the average distance travelled by car per trip outlined in Table 5 and Table 6, respectively and utilising the traffic data provided by i-Transport.

The development Total Transport Emissions are summarised in Table 24.

Table 24 Development Total Transport Emissions

Land Use Category	Net 24-hour AADT Flow	NO _x Emission (kg/year)	PM ₁₀ Emission (kg/year)
A1 - Retail	3,910	2,720.43	467.02

The development specific TEBs was then subtracted from the development Total Transport Emissions to determine if the development transport emissions are within the benchmark. The results are summarised in Table 25.

Table 25 Comparison of Total Transport Emissions with Transport Emission Benchmarks

Scenario	NO _x Emission (kg/year)	PM ₁₀ Emission (kg/year)
Development Specific TEB	1,940.71	334.36
Development Total Transport Emission	2,720.43	467.02
Difference	779.73	132.66

As indicated in Table 25, annual NO_x and PM₁₀ road vehicle exhaust emissions associated with the development are predicted to be **above** the TEB by **779.73kg/yr** for NO_x and **132.66kg/yr** for PM₁₀.

As such, the development is not considered to be Air Quality Neutral and further action is required to reduce excess emissions. Mitigation measures to reduce excess emissions may be applied on-site or off-site. Where this is not practical or desirable, some form of pollutant off-setting could be applied.



6. MITIGATION

There are a number of air quality offsetting or mitigation options available to reduce the excess NO_x and PM₁₀ emissions associated with the operation of the proposed developments.

6.1 Air Quality Neutral Mitigation

The proposed development will affect both NO_x and PM₁₀ emissions when compared with the current situation. This change was therefore quantified through an Air Quality Neutral assessment, the result of which are detailed in Section 0. This assessment showed that total annual NO_x and PM₁₀ emissions are predicted to be above the combined benchmark level by **779.73kg/yr** and **132.66kg/yr** respectively. As such, further action is required to tackle the excess emissions.

In order to offset development emissions, the following best practice mitigation options are to be implemented into the scheme design. It is considered that for a scheme of this scale and nature the following measures will be proportionate to the required level of offsetting.

Best Practice Offsetting Measures

- ▶ *Provision of Electric Vehicle (EV) charging points;*
- ▶ *The provision of a detailed residential travel plan (with provision to measure its implementation and effect);*
- ▶ *On site Cycle parking infrastructure;*
- ▶ *Green infrastructure/landscaping, such as additional planting or green walls utilising species that would aid absorption of pollutants; as recommended/advised by Phytosensor¹¹;*
- ▶ *All gas-fired boilers to be ultra-low NO_x (<40mgNO_x/kWh); and*
- ▶ *All gas-fired CHP plant to meet minimum emission standard of:*
 - *Spark ignition engine 250mgNO_x/Nm³*
 - *Compression ignition engine 400mgNO_x/Nm³*
 - *Biomass boiler 275mgNO_x/Nm³ & 25mgPM/Nm³.*

Once implemented into the scheme, the above measure will assist towards reducing excess NO_x and PM₁₀ emissions associated with the proposed development.

¹¹ Phyto-Sensor Toolkit, Citizen Sense, 2018



7. CONCLUSION

REC Ltd was commissioned by the London Borough of Hillingdon to undertake an Air Quality Assessment in support of a proposed commercial redevelopment at Rowlheys Place, West Drayton.

During the construction phase of the development there is the potential for air quality impacts as a result of fugitive dust emissions from the site. These were assessed in accordance with the IAQM methodology. Assuming good practice dust control measures are implemented, the residual significance of potential air quality impacts from dust generated by earthworks, construction and trackout activities was predicted to be not significant.

Dispersion modelling was undertaken in order to predict air quality impacts associated with additional traffic generated as a result of the proposals. Results were subsequently verified using monitoring results obtained from LBoH.

Predicted impacts on NO₂ and PM₁₀ concentrations as a result of operational phase exhaust emissions were predicted to be **negligible** at all 15 receptor locations within the vicinity of the site. The overall significance of potential impacts was determined to be **not significant**, in accordance with the EPUK and IAQM guidance.

The GLA states that new developments must be considered Air Quality Neutral. Pollutant emissions associated with anticipated traffic flow were compared to relevant benchmarks. This indicated that NO_x and PM₁₀ emissions from the proposals were above the development specific TEB and as such, further action has been recommended to tackle the excess NO_x and PM₁₀ emissions.

Based on the assessment results the site is considered suitable for the proposed end use subject to the inclusion of relevant mitigation measures, and complies with the London Plan, the LBoH Local Plan and relevant legislation.

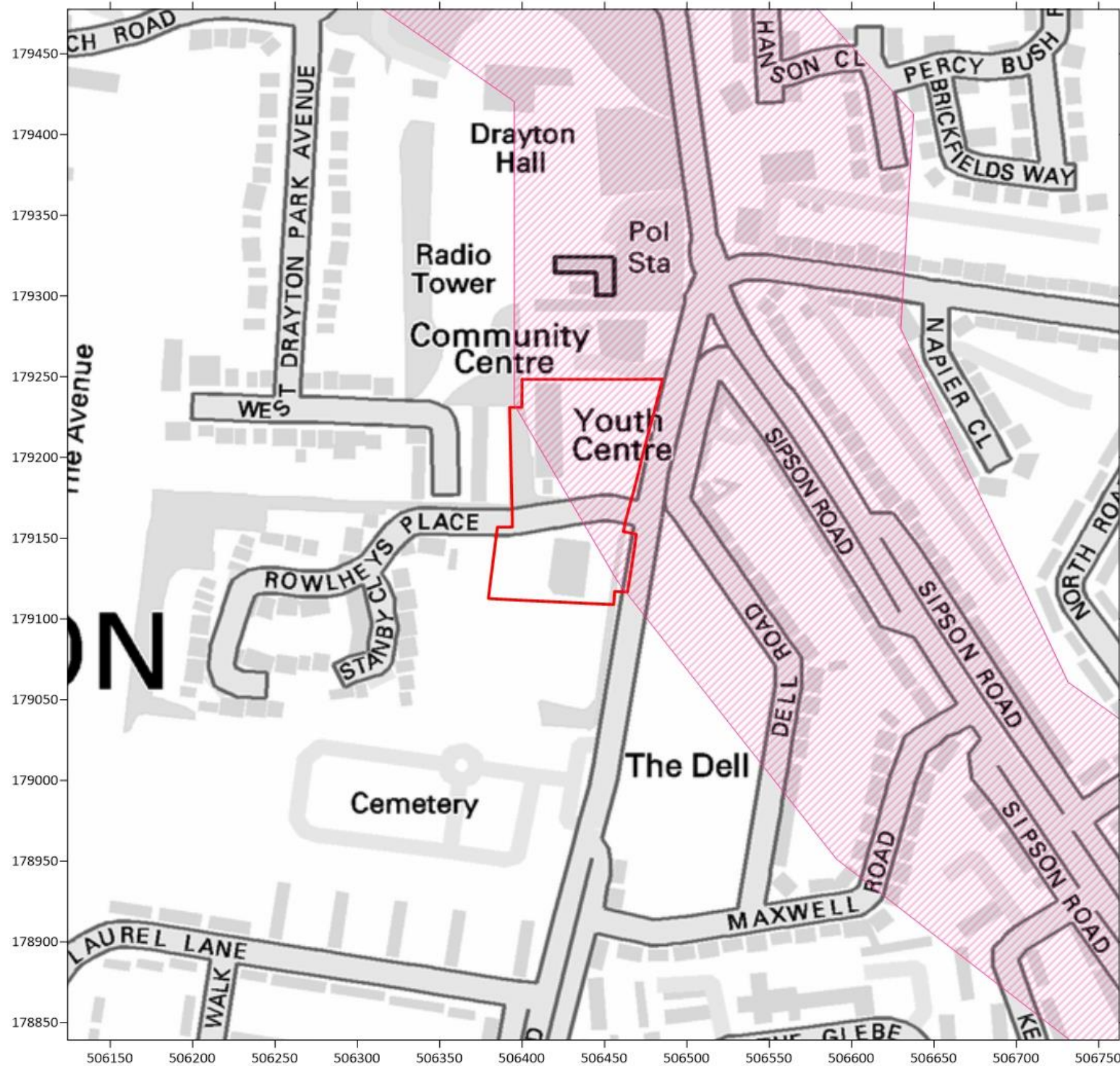


8. ABBREVIATIONS

AADT	Annual Average Daily Traffic
ADM	Atmospheric Dispersion Modelling
AQAP	Air Quality Action Plan
AQLV	Air Quality Limit Value
AQMA	Air Quality Management Area
AQO	Air Quality Objectives
AQS	Air Quality Strategy
CERC	Cambridge Environmental Research Consultants
DEFRA	Department for Environment, Food and Rural Affairs
DfT	Department for Transport
DMP	Dust Management Plan
EPUK	Environmental Protection UK
EU	European Union
GLA	Greater London Authority
HDV	Heavy Duty Vehicle
IAQM	Institute of Air Quality Management
LA	Local Authority
LLAQM	London Local Air Quality Management
LBoH	London Borough of Hillingdon
NGR	National Grid Reference
NO ₂	Nitrogen dioxide
NO _x	Oxides of nitrogen
NPPF	National Planning Policy Framework
NPPG	National Planning Practice Guidance
PM _{2.5}	Particulate matter with an aerodynamic diameter of less than 2.5µm
PM ₁₀	Particulate matter with an aerodynamic diameter of less than 10µm
REC	Resource and Environmental Consultants
TEB	Transport Emissions Benchmark
TEMPRO	Trip End Model Presentation Program
z ₀	Roughness Length



APPENDIX I - FIGURES



Legend

-  Site Boundary
-  Air Quality Focus Area

Title

Figure 1
Site Location

Project

Air Quality Assessment
Rowlheys Place, West Drayton

Project Number

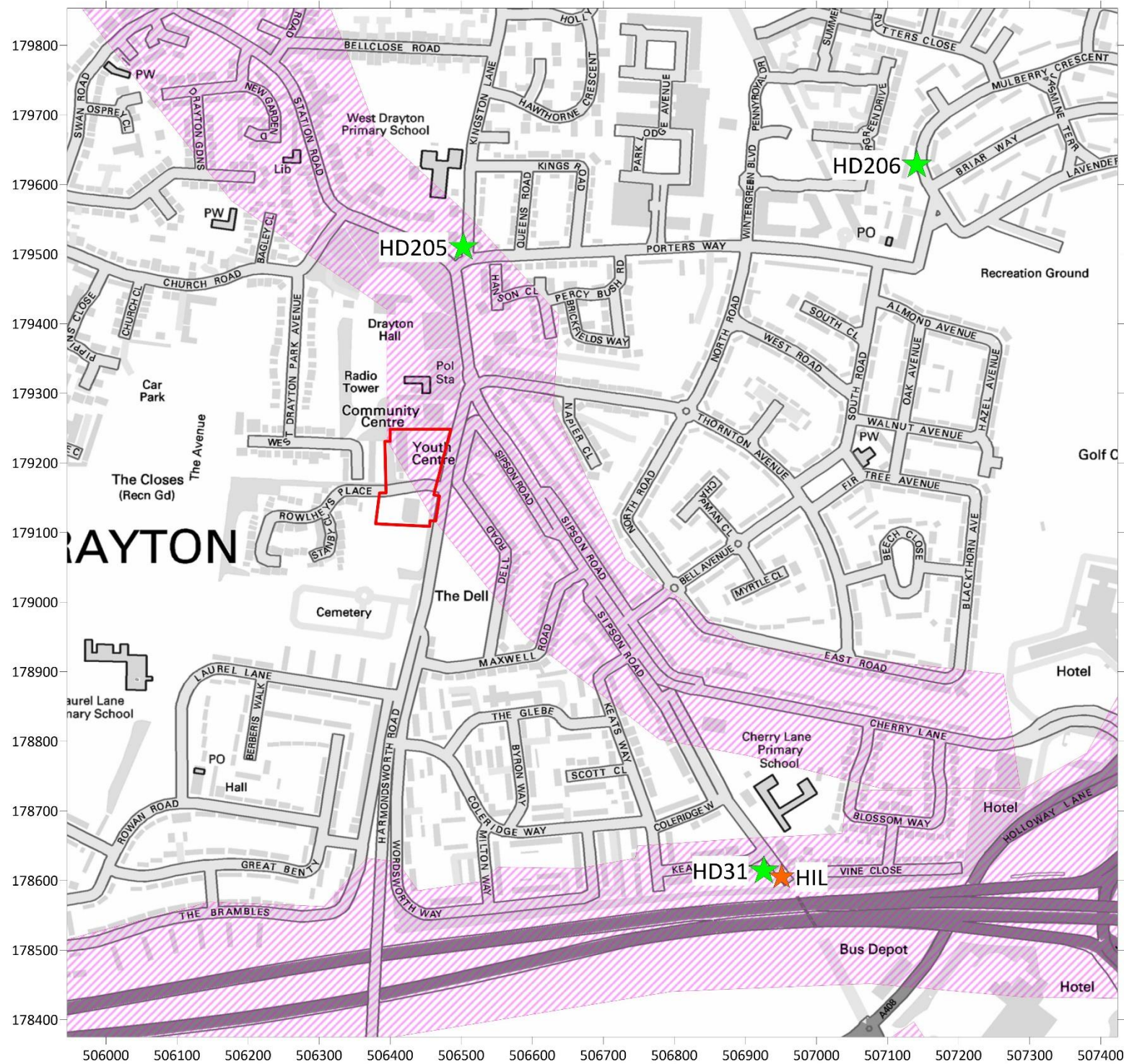
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Resource and Environmental Consultants Ltd
Osprey House, Broadway, Manchester M50 2UE
Tel – 0161 868 1300 Fax – 0161 868 1301
www.recitd.co.uk



Legend

-  Site Boundary
-  Diffusion Tube Monitoring Locations
-  Automatic Analyser Monitoring Location

Title

Figure 2
Diffusion Tube and Automatic Analyser
Monitoring Locations

Project

Air Quality Assessment
Rowhleys Place, West Drayton

Project Number

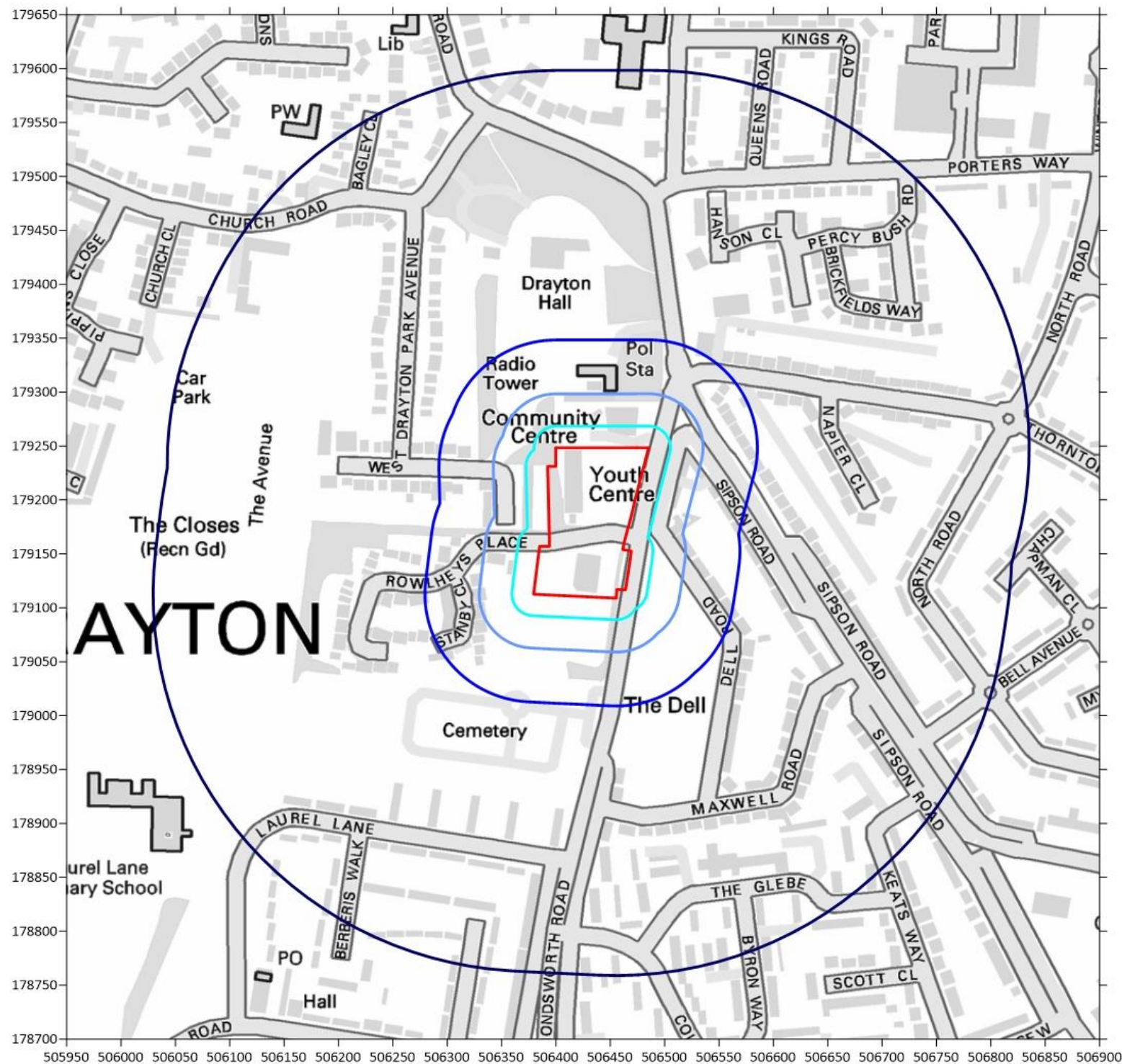
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Legend

-  Site Boundary
-  20m from Site Boundary
-  50m from Site Boundary
-  100m from Site Boundary
-  350m from Site Boundary

Title

Figure 3
Demolition, Earthworks and Construction
Dust Buffer Zones

Project

Air Quality Assessment
Rowhleys Place, West Drayton

Project Number

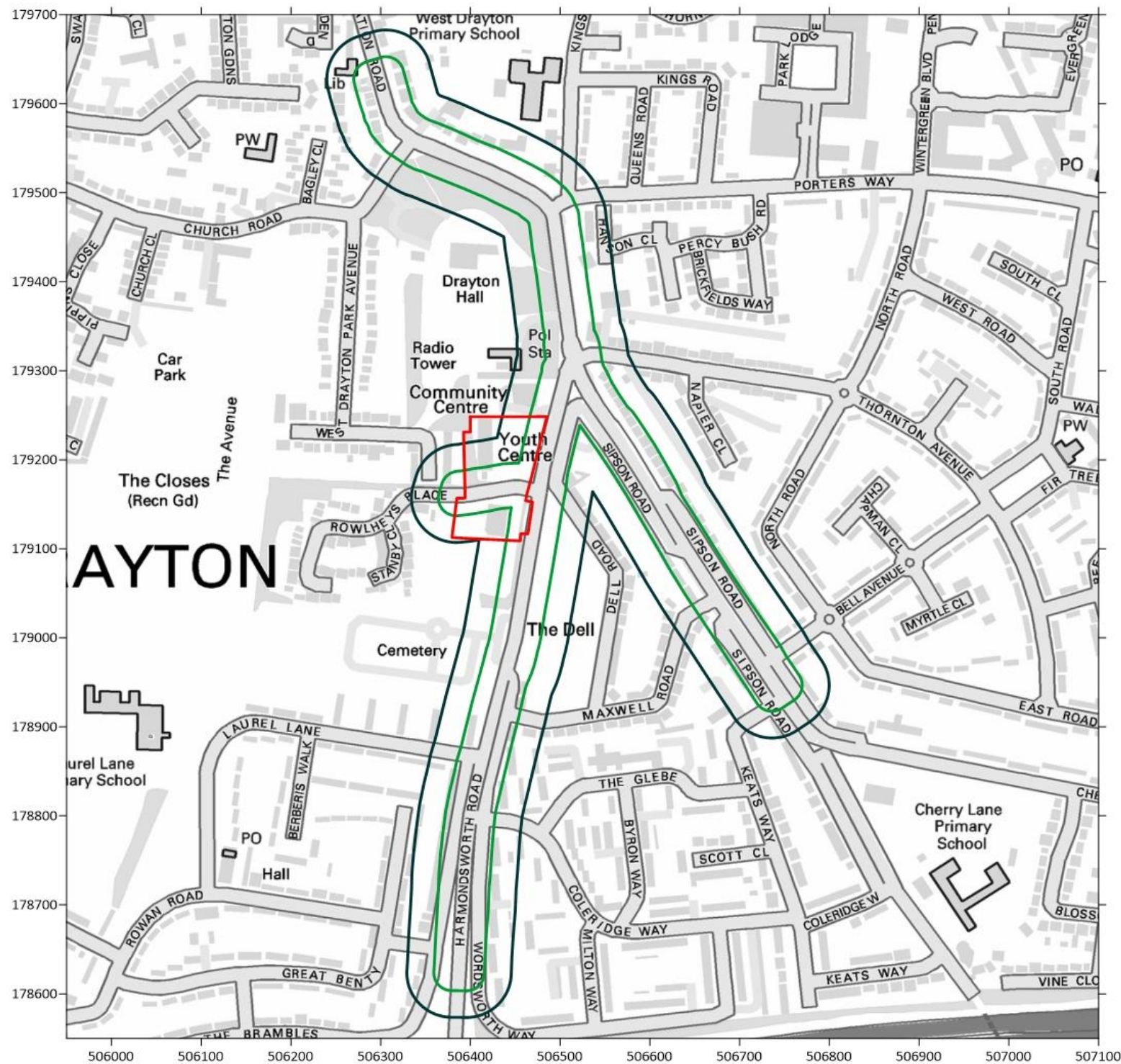
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Legend

-  Site Boundary
-  20m from Site Access Route
-  50m from Site Access Route

Title

Figure 4
Trackout Dust Buffer Zones

Project

Air Quality Assessment
Rowhleys Place, Wesy Drayton

Project Number

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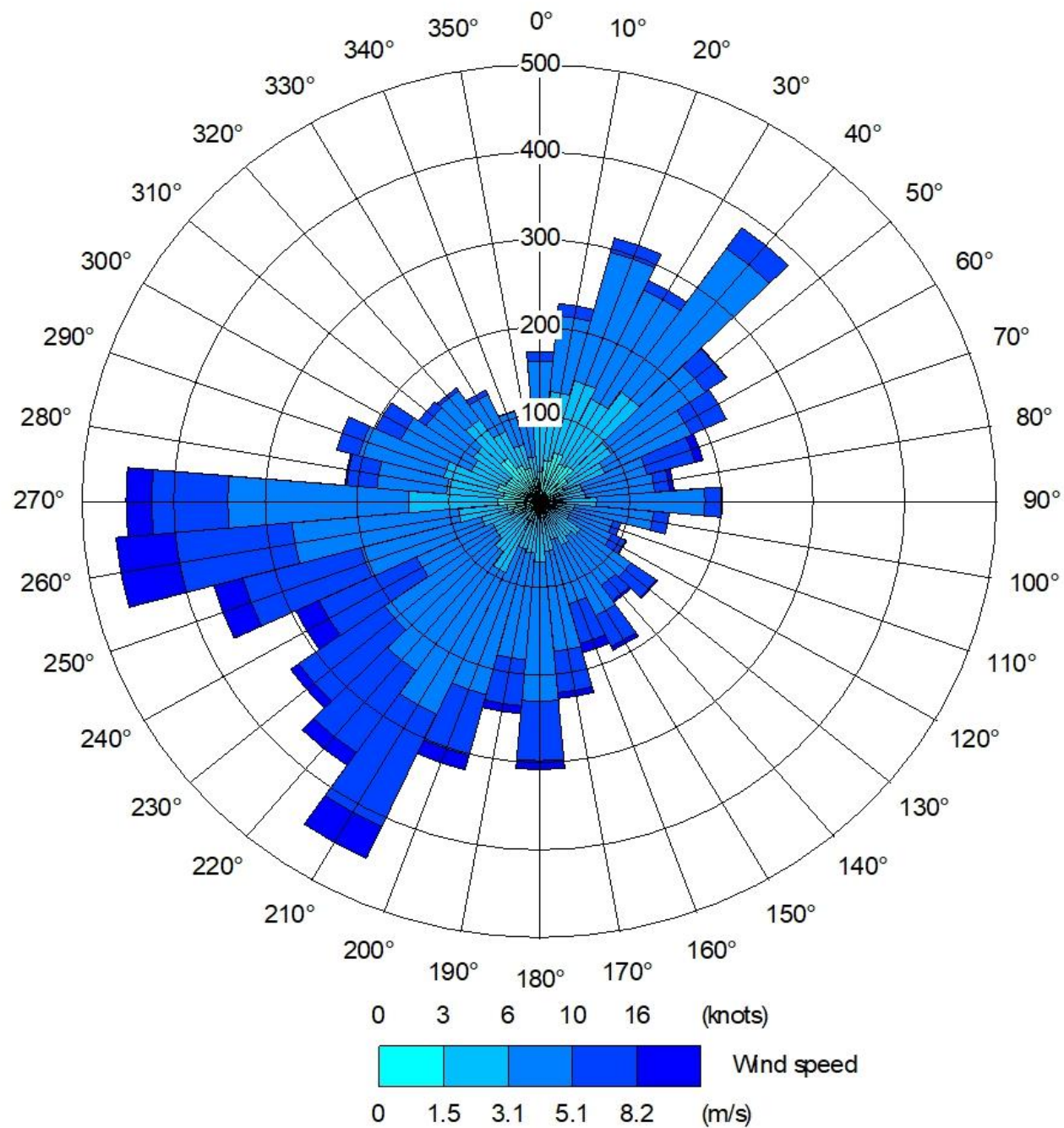
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Title

Figure 5
Wind Rose 2018
Heathrow Airport
Meteorological Station

Project

Air Quality Assessment
Rowhleys Place, West Drayton

Project Number

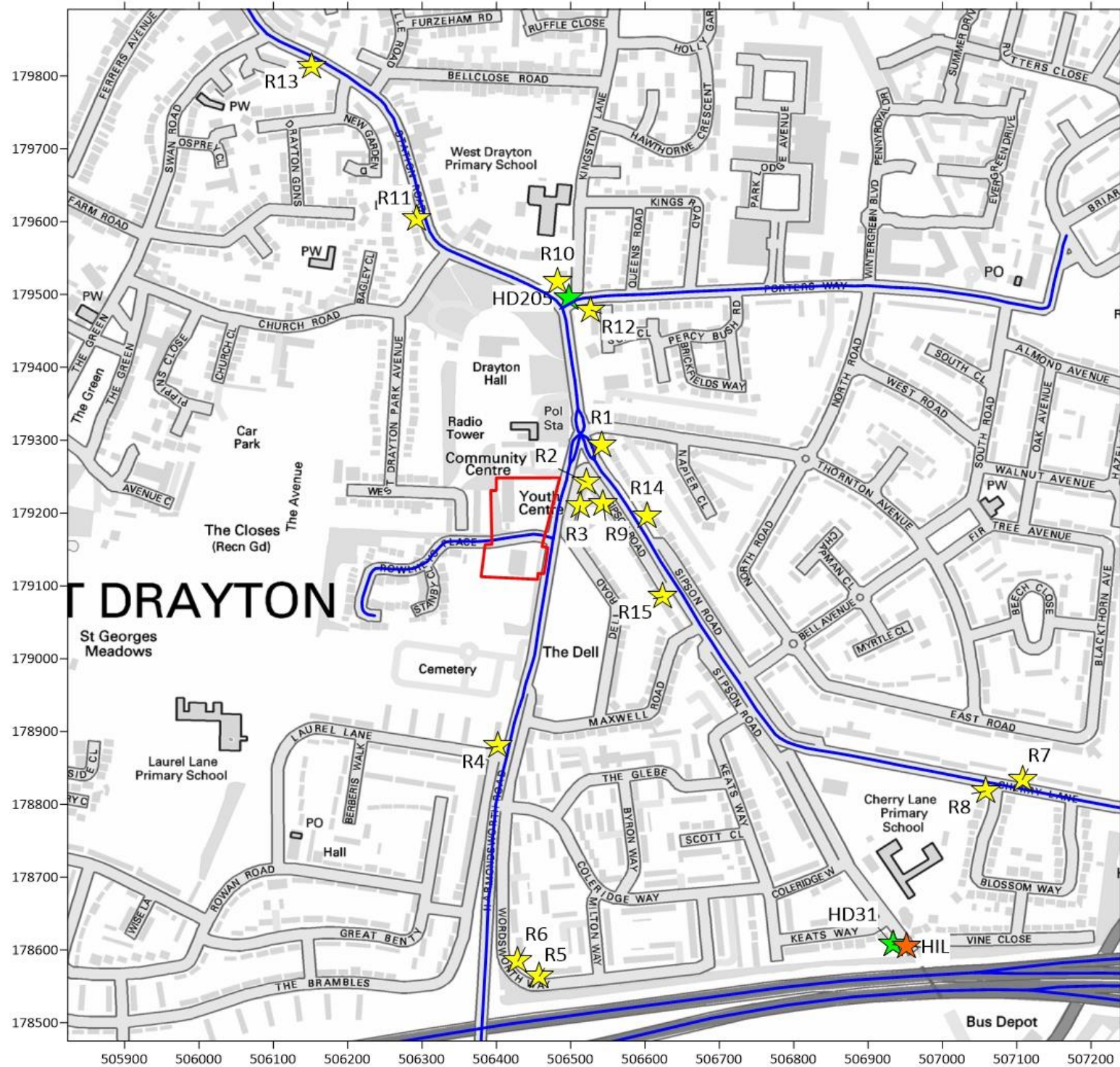
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 Site Boundary
 Modelled Road Link
 Diffusion Tube Monitoring
 Automatic Monitoring Location
 Sensitive Receptor Locations

Figure 6
ADMS-Roads Input

Air Quality Assessment
Rowhleys Place, West Drayton

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London Borough of Hillingdon

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APPENDIX II - ASSESSMENT INPUTS



ASSESSMENT INPUTS

The proposed development has the potential to expose future site users to elevated pollutant levels, as well as cause impacts to sensitive locations. In order to assess NO₂ and PM₁₀ concentrations across the site and to quantify impacts as a result of the development, detailed dispersion modelling was undertaken in accordance with the following methodology.

The assessment was undertaken in accordance with the technical guidance contained within the LLAQM TG(16)² and the Environmental Protection UK (EPUK) and Institute of Air Quality Management (IAQM) 'Land-Use Planning & Development Control: Planning for Air Quality (2017)⁷.

Dispersion Model

Dispersion modelling was undertaken using the ADMS Roads dispersion model (version 4.0.1.0). ADMS Roads is developed by Cambridge Environmental Research Consultants (CERC) and is routinely used throughout the world for the prediction of pollutant dispersion from road sources. Modelling predictions from this software package are accepted within the UK by the Environment Agency and DEFRA.

The dispersion model requires input data that details the following parameters:

- ▶ Traffic flow data;
- ▶ Vehicle emission factors;
- ▶ Spatial co-ordinates of emissions;
- ▶ Street width;
- ▶ Meteorological data;
- ▶ Roughness length; and
- ▶ Monin-Obukhov length.

Traffic Flow Data

Traffic data for use in the assessment, including development flows, was provided by i-transport, the appointed Transport Consultants for the scheme.

The provided data did not include a number of roads within the surrounding road network. As such, 24-hour flows and fleet composition were obtained from the London Atmospheric Emissions Inventory (LAEI). The updated version of the LAEI (2013) was released by the Greater London Authority (GLA) in 2016 and provides information on emissions from all sources of air pollutants in the Greater London area.

Additionally, baseline traffic data for Horton Road was obtained from traffic provided in Prologis Park West London – Air Quality Assessment¹² which was submitted to LBoH for a development at Prologis Park, West London (37977/APP/2015/1004).

Growth factors provided by the Trip End Model Presentation Program (TEMPRO) software package were utilised to allow for conversion from the obtained 2013 traffic flow year to 2018, for model verification, and to 2022 which was used to represent the operational year of the proposed development.

¹² Prologis Park, West London – Air Quality Assessment, AECOM, 2015



Road widths were estimated from aerial photography and UK highway design standards. Reference should be made to Figure 8 within Appendix I for a graphical representation of the road link locations. Vehicle speeds were estimated based on the free flow potential of each link and local speed limits.

A summary of the traffic data used in the verification scenario is provided in Table AII.1.

Table AII.1 2018 Verification Traffic Data

Road Link		Road Width (m)	24-hour AADT Flow	HDV Prop. (%)	Mean Vehicle Speed (km/h)
L1	Station Road, North of Swan Road	8.2	19,709	7.9	48
L2	Station Road, South of Swan Road	7.5	16,943	8.1	48
L3	Station Road, Slowdown, North of Porters Way	12.0	16,943	8.1	24
L4	Station Road, Slowdown, South of Porters Way	11.5	16,768	7.1	24
L5	Station Road, South of Porters Way	10.5	16,768	7.1	40
L6	Station Road, Slowdown, North of Thornton Avenue	11.0	16,768	7.1	24
L7	Station Road, Speed Up, North of Thornton Avenue	3.0	8,384	7.1	24
L8	Harmondsworth Road, Northbound, Slowdown	5.0	18,697	1.7	24
L9	Harmondsworth Road, Southbound, Speed Up	3.0	13,860	1.7	24
L10	Station Road, Slowdown, North of Thornton Avenue	4.6	8,384	7.1	24
L11	Sipson Road, Slowdown	4.0	7,210	9.5	24
L12	Sipson Road, Speed Up	3.0	7,210	9.5	24
L13	Harmondsworth, Slowdown	5.8	32,557	1.7	32
L14	Harmondsworth Road, North of Rowlheys Place	6.0	32,557	1.7	48
L15	Harmondsworth Road, South of Rowlheys Place	7.5	32,083	1.7	48
L16	Harmondsworth Road, South of Laurel Lane	8.0	32,083	1.7	48
L17	Slowdown between Sipson Road and junction intersect with Station Road	6.5	14,420	9.5	24
L18	Sipson Road (between Station Road and Blossom Way)	6.0	14,420	9.5	48
L19	Slowdown between Rowlheys Place and Harmondsworth Road	4.9	1,917	0.0	16
L20	Rowlheys Place	5.2	1,917	0.0	32
L21	Porters Way, Slowdown	8.0	6,608	1.7	24
L22	Porters Way (between Station Road and Percy Bush Road)	5.0	6,608	1.7	48



Road Link		Road Width (m)	24-hour AADT Flow	HDV Prop. (%)	Mean Vehicle Speed (km/h)
L23	Porters Way (between Percy Bush Road and South Road)	8.0	6,608	1.7	48
L24	Porters Way (between South Road and Mulberry Parade)	6.8	6,608	1.7	40
L25	Slowdown between Mulberry Parade and Mulberry Crescent	6.5	6,608	1.7	24

A summary of the 2022 traffic data used for the proposed site operational phase scenarios is shown in Table AII.2. The road width and mean vehicle speed remained the same for this scenario.

Table AII.2 2022 Traffic Data

Road Link		DM		DS	
		24-hour AADT	HDV Prop. (%)	24-hour AADT	HDV Prop. (%)
L1	Station Road, North of Swan Road	20,614	7.9	21,203	7.7
L2	Station Road, South of Swan Road	17,721	8.1	18,310	7.8
L3	Station Road, Slowdown, North of Porters Way	17,721	8.1	18,310	7.8
L4	Station Road, Slowdown, South of Porters Way	17,538	7.1	18,782	6.7
L5	Station Road, South of Porters Way	17,538	7.1	18,782	6.7
L6	Station Road, Slowdown, North of Thornton Avenue	17,538	7.1	18,782	6.7
L7	Station Road, Speed Up, North of Thornton Avenue	8,769	7.1	9,343	6.7
L8	Harmondsworth Road, Northbound, Slowdown	19,494	1.7	20,855	1.6
L9	Harmondsworth Road, Southbound, Speed Up	14,453	1.6	16,044	1.4
L10	Station Road, Slowdown, North of Thornton Avenue	8,769	7.1	9,439	6.6
L11	Sipson Road, Slowdown	7,541	9.5	8,097	8.8
L12	Sipson Road, Speed Up	7,541	9.5	8,017	8.9
L13	Harmondsworth, Slowdown	33,946	1.7	36,898	1.5
L14	Harmondsworth Road, North of Rowlheys Place	33,946	1.7	36,898	1.5
L15	Harmondsworth Road, South of Rowlheys Place	33,448	1.7	34,387	1.7
L16	Harmondsworth Road, South of Laurel Lane	33,448	1.7	34,387	1.7
L17	Slowdown between Sipson Road and Junction Intersect with Station Road	15,082	9.5	16,113	8.9
L18	Sipson Road (between Station Road and Blossom Way)	15,082	9.5	16,113	8.9



Road Link		DM		DS	
		24-hour AADT	HDV Prop. (%)	24-hour AADT	HDV Prop. (%)
L19	Slowdown between Rowlheys Place and Harmondsworth Road	2,013	0.0	5,923	0.0
L20	Rowlheys Place	2,013	0.0	2,013	0.0
L21	Porters Way, Slowdown	6,841	1.7	8,585	1.4
L22	Porters Way (between Station Road and Percy Bush Road)	6,841	1.7	8,585	1.4
L23	Porters Way (between Percy Bush Road and South Road)	6,841	1.7	8,585	1.4
L24	Porters Way (between South Road and Mulberry Parade)	6,841	1.7	8,585	1.4
L25	Slowdown between Mulberry Parade and Mulberry Crescent	6,841	1.7	8,585	1.4

Emission Factors

Emission factors for each link were calculated using the relevant traffic flows and the Emissions Factor Toolkit (version 9.0) released in May 2019, which incorporates updated COPERT 5 vehicle emissions factors for NO_x and PM and EURO 6 vehicle fleet sub-categories.

There is current uncertainty over NO₂ concentrations within the UK, with roadside levels not reducing as previously expected due to the implementation of new vehicle emission standards. Therefore, 2021 emission factors have been utilised for the prediction of pollution levels for all scenarios in preference to the development opening year (2022) in order to provide a robust assessment.

Meteorological Data

Meteorological data used in this assessment was taken from Heathrow Airport meteorological station over the period 1st January 2018 to 31st December 2018 (inclusive). Heathrow Airport meteorological station is located at approximate NGR: 507060, 176500, which is approximately 2.8km south of the Proposed Development and is therefore considered to provide a reasonable representation of conditions at the development site.

All meteorological records used in the assessment were provided by Atmospheric Dispersion Modelling (ADM) Ltd, which is an established distributor of data within the UK. Reference should be made to Figure 5 within Appendix I for a wind rose of utilised meteorological data.

Roughness Length

A roughness length (z_0) of 0.5m was used in the dispersion modelling study. This value z_0 is considered appropriate for the morphology of the assessment area and the meteorological station location, it is suggested within ADMS-Roads as being suitable for 'open suburbia, parklands'.



Monin-Obukhov Length

The Monin-Obukhov length provides a measure of the stability of the atmosphere. A minimum Monin-Obukhov length of 30m was used in this dispersion modelling study. This value is considered appropriate for the nature of the assessment area and the meteorological station location, it is suggested within ADMS-Roads as being suitable for 'cities/large towns'.

Background Concentrations

Since both the monitoring locations used in the verification process and the receptor locations used in the operational phase assessment were located in several grid squares, predicted concentrations from their respective grid squares were used to represent their respective background concentrations for the modelling process.

Table AII.3 displays the specific background concentrations used for the monitoring locations utilised in the verification process. This data was used to ensure an accurate and robust model.

Table AII.3 Predicted Diffusion Tube Monitoring Background Pollutant Concentrations

Tube	Pollutant	2018 Predicted Background Concentration ($\mu\text{g}/\text{m}^3$)
HD31, HIL	NO _x	50.93
	NO ₂	30.67
HD205	NO _x	38.90
	NO ₂	24.73

Table AII.4 displays the predicted background concentrations by DEFRA used in the operational phase assessment for the sensitive receptor locations.

Table AII.4 Predicted Background Pollutant Concentrations for Receptors

Receptor Grid Square	Receptors	Pollutant	Predicted Background Concentration ($\mu\text{g}/\text{m}^3$)
			2018
506500, 179500	R1 to R3 & R9 to R15	NO _x	38.90
		NO ₂	24.73
		PM ₁₀	16.15
506500, 178500	R4 to R6	NO _x	50.93
		NO ₂	30.67
		PM ₁₀	17.45



Receptor Grid Square	Receptors	Pollutant	Predicted Background Concentration ($\mu\text{g}/\text{m}^3$)
			2018
506500, 178500	R7 & R8	NO _x	54.88
		NO ₂	32.38
		PM ₁₀	17.60

Background concentrations for 2018 were utilised in preference to the development opening year of 2022. This provided a robust assessment considering sensitivity analysis for fleet renewal delay, which is likely to overestimate actual pollutant concentrations during the operation of the proposals.

NO_x to NO₂ Conversion

Predicted annual mean NO_x concentrations from the dispersion model were converted to NO₂ concentrations using the spreadsheet provided by DEFRA, which is the method detailed within GLA guidance LLAQM TG(16)².

Verification

The predicted results from a dispersion model may differ from measured concentrations for a large number of reasons, including:

- ▶ Estimates of background concentrations;
- ▶ Uncertainties in source activity data such as traffic flows and emission factors;
- ▶ Variations in meteorological conditions;
- ▶ Overall model limitations; and
- ▶ Uncertainties associated with monitoring data, including locations.

Model verification is the process by which these and other uncertainties are investigated and where possible minimised. In reality, the differences between modelled and monitored results are likely to be a combination of all of these aspects.

The road contribution to total NO_x concentration was calculated from the monitored NO₂ result for use in the verification process. This was undertaken following the methodology contained within GLA guidance LLAQM (TG16)².

LBoH undertakes diffusion tube monitoring of NO₂ concentrations at three monitoring locations suitable for verification purposes. Traffic data for Mulberry Crescent was unavailable as such diffusion tube HD206 was not included in the verification.

The dispersion model was run with 2018 meteorological data, monitoring results and traffic input data to predict the NO_x concentration at the monitoring locations. The results are shown in Table All.5.



Table All.5 Monitoring Results

Site ID	Monitoring Location	Monitored Road NO _x Concentration (µg/m ³)	Modelled Road NO _x Concentration (µg/m ³)	Change %
HD31	AURN Site, Keats Way	24.83	21.85	-13.62
HIL	London Hillingdon	24.83	37.02	32.94
HD205	1 Porters Way	15.19	26.87	43.46

The monitored and modelled NO_x road contribution concentrations were graphed and the equation of the trendline based on the linear progression through zero was calculated, as shown in Graph 1. This indicated that a verification factor of **1.2776** was required to be applied to all NO_x modelling results showing the model has a tendency to underestimate pollutant concentrations throughout the assessment extents

Graph 1 – NO_x Verification Factor

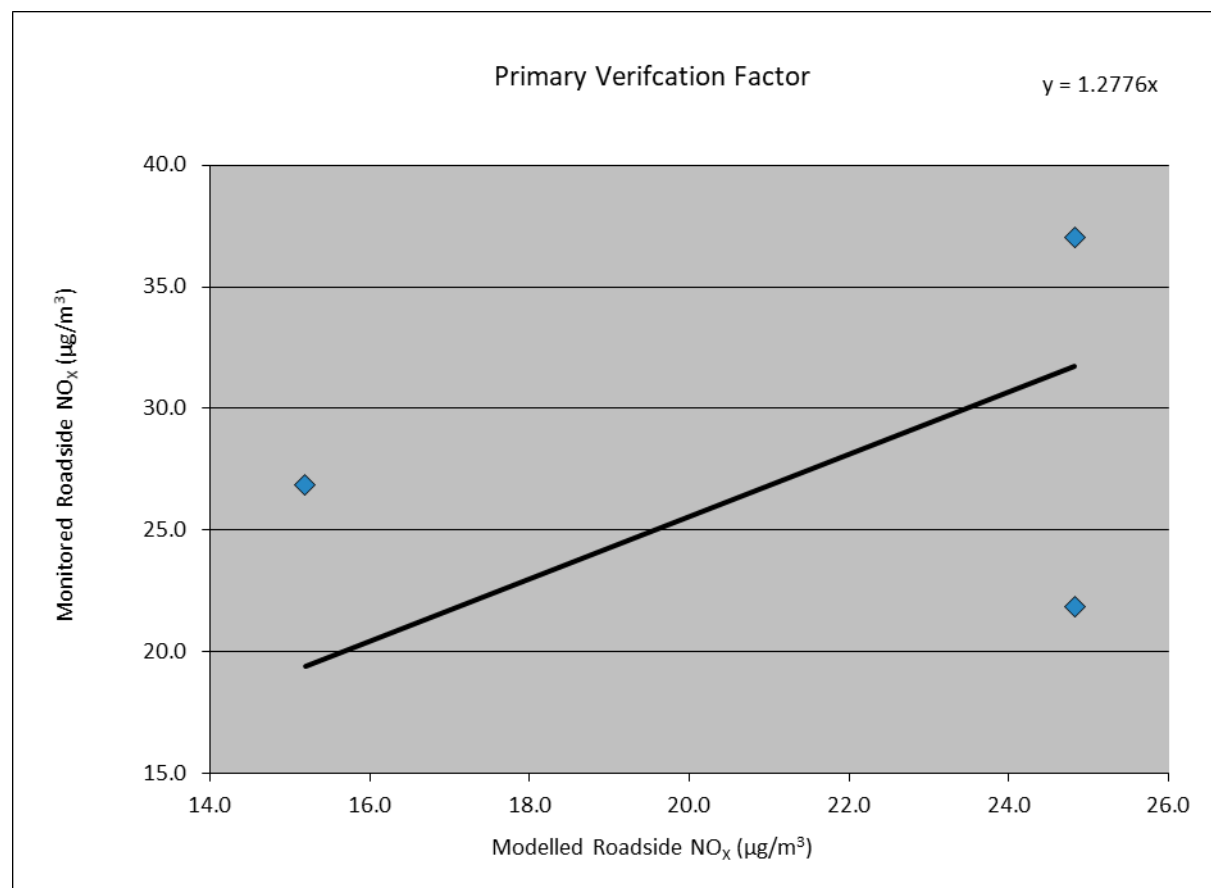


Table All.6 presents the monitored annual mean NO₂ concentrations and the adjusted modelled total NO₂ concentration based on the above verification factor. Exceedances of the relevant AQO are highlighted in **bold**.



Table AII.6 Modelled Concentrations

Site ID	Monitoring Location	Monitored NO ₂ Concentration (µg/m ³)	Adjusted Modelled Total NO ₂ Concentration (µg/m ³)	Change (%)
HD31	AURN Site, Keats Way	40.10	43.99	-9.71
HIL	London Hillingdon	46.00	43.99	4.36
HD205	1 Porters Way	36.59	33.48	8.50

As PM₁₀ monitoring is not undertaken within the assessment extents, the verification adjustment factor of **1.2776** applied for NO_x was also used to adjust model predictions of PM₁₀ in accordance with the guidance provided within LLAQM TG(16)².

Root Mean Square Error

The root-mean-square error is a measure of the differences between values and was used in this assessment to test the accuracy of the model compared to monitored values. The adjusted modelled NO₂ concentrations have a root-mean-square error of **3.10** when compared to the monitored NO₂ concentrations in accordance with the guidance provided within LLAQM TG(16)². The results are shown in Table AII.6. Exceedances of the relevant AQO are highlighted in **bold**.

Table AII.6 RMSE Results

Monitoring Location		Monitoring Result (Tube)	Secondary Adjusted Total NO ₂	Difference
HD31	AURN Site, Keats Way	40.10	43.99	-3.89
HIL	London Hillingdon	46.00	43.99	2.01
HD205	1 Porters Way	36.59	33.48	3.11
Root Mean Square Error Value				3.10

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APPENDIX III CONSTRUCTION PHASE ASSESSMENT CRITERIA



CONSTRUCTION PHASE METHODOLOGY

There is the potential for fugitive dust emissions to occur as a result of construction phase activities. These have been assessed in accordance with the methodology outlined within the GLA document 'The Control of Dust and Emissions during Construction and Demolition Supplementary Planning Guidance'¹⁶.

Activities on the proposed construction site have been divided into four types to reflect their different potential impacts. These are:

- ▶ Demolition;
- ▶ Earthworks;
- ▶ Construction; and
- ▶ Trackout.

The potential for dust emissions was assessed for each activity that is likely to take place and considered three separate dust effects:

- ▶ Annoyance due to dust soiling;
- ▶ Harm to ecological receptors; and
- ▶ The risk of health effects due to a significant increase in exposure to PM₁₀.

The assessment steps are detailed below.

Step 1

Step 1 screens the requirement for a more detailed assessment. Should human receptors be identified within 350m from the site boundary or 50m from the construction vehicle route up to 500m from the site entrance, then the assessment should proceed to Step 2. Additionally, should ecological receptors be identified within 50m of the boundary site or 50m from the construction vehicle route up to 500m from the site entrance, then the assessment should also proceed to Step 2.

Should sensitive receptors not be present within the relevant distances then negligible impacts would be expected and further assessment is not necessary.

Step 2

Step 2 assesses the risk of potential dust impacts. A site is allocated to a risk category based on two factors:

- ▶ The scale and nature of the works, which determines the magnitude of dust arising as: small, medium or large (Step 2A); and
- ▶ The sensitivity of the area to dust impacts, which can be defined as low, medium or high sensitivity (Step 2B).

The two factors are combined in Step 2C to determine the risk of dust impacts without mitigation applied.

Step 2A defines the potential magnitude of dust emission through the construction phase. The relevant criteria are summarised in Table AIII.1.



Table AIII.1 Construction Dust - Magnitude of Emission

Magnitude	Activity	Criteria
Large	Demolition	- Total building volume greater than 50,000m³ - Potentially dusty construction material (e.g. concrete) - On-site crushing and screening - Demolition activities greater than 20m above ground level
	Construction	- Total building volume greater than 100,000m³ - On site concrete batching - Sandblasting
	Trackout	- More than 50 Heavy Duty Vehicle (HDV) trips per day - Potentially dusty surface material (e.g. high clay content) - Unpaved road length greater than 100m
Medium	Demolition	- Total building volume 20,000m³ to 50,000m³ - Potentially dusty construction material - Demolition activities 10m to 20m above ground level
	Construction	- Total building volume 25,000m³ to 100,000m³ - Potentially dusty construction material (e.g. concrete) - On site concrete batching
	Trackout	10 to 50 HDV trips per day - Moderately dusty surface material (e.g. high clay content) - Unpaved road length 50m to 100m
Small	Demolition	- Total building volume under 20,000m³ - Construction material with low potential for dust release (e.g. metal cladding or timber) - Demolition activities less than 10m above ground level - Demolition during wetter months
	Construction	- Total building volume less than 25,000m³ - Construction material with low potential for dust release (e.g. metal cladding or timber)
	Trackout	- Less than 10 HDV trips per day - Surface material with low potential for dust release - Unpaved road length less than 50m

Step 2B defines the sensitivity of the area around the development site for demolition, construction, earthworks and trackout. The factors influencing the sensitivity of the area are shown in Table AIII.2.



Table AIII.2 Examples of Factors Defining Sensitivity of an Area

Sensitivity	Examples	
	Human Receptors	Ecological Receptors
High	• Users expect of high levels of amenity • High aesthetic or value property • People expected to be present continuously for extended periods of time • Locations where members of the public are exposed over a time period relevant to the AQO for PM₁₀ e.g. residential properties, hospitals, schools and residential care homes	• Internationally or nationally designated site e.g. Special Area of Conservation
Medium	• Users would expect to enjoy a reasonable level of amenity • Aesthetics or value of their property could be diminished by soiling • People or property wouldn't reasonably be expected to be present here continuously or regularly for extended periods as part of the normal pattern of use of the land e.g. parks and places of work	• Nationally designated site e.g. Sites of Special Scientific Interest
Low	• Enjoyment of amenity would not reasonably be expected • Property would not be expected to be diminished in appearance • Transient exposure, where people would only be expected to be present for limited periods. e.g. public footpaths, playing fields, shopping streets, playing fields, farmland, footpaths, short term car park and roads	• Locally designated site e.g. Local Nature Reserve

The guidance also provides the following factors to consider when determining the sensitivity of an area to potential dust impacts during the construction phase:

- ▶ Any history of dust generating activities in the area;
- ▶ The likelihood of concurrent dust generating activity on nearby sites;
- ▶ Any pre-existing screening between the source and the receptors;
- ▶ Any conclusions drawn from analysing local meteorological data which accurately represent the area; and if relevant the season during which works will take place;
- ▶ Any conclusions drawn from local topography;
- ▶ Duration of the potential impact, as a receptor may become more sensitive over time; and
- ▶ Any known specific receptor sensitivities which go beyond the classifications given in the document.

These factors were considered in the undertaking of this assessment.

The sensitivity of the area to dust soiling effects on people and property is shown in Table AIII.3.



Table AIII.3 Sensitivity of the Area to Dust Soiling Effects on People and Property

Receptor Sensitivity	Number of Receptors	Distance from the Source (m)			
		Less than 20	Less than 50	Less than 100	Less than 350
High	More than 100	High	High	Medium	Low
	10 - 100	High	Medium	Low	Low
	1 - 10	Medium	Low	Low	Low
Medium	More than 1	Medium	Low	Low	Low
Low	More than 1	Low	Low	Low	Low

Table AIII.4 outlines the sensitivity of the area to human health impacts.

Table AIII.4 Sensitivity of the Area to Human Health Impacts

Receptor Sensitivity	Annual Mean PM ₁₀ Concentration	Number of Receptors	Distance from the Source (m)				
			Less than 20	Less than 50	Less than 100	Less than 200	Less than 350
High	Greater than 32µg/m ³	More than 100	High	High	High	Medium	Low
		10 - 100	High	High	Medium	Low	Low
		1 - 10	High	Medium	Low	Low	Low
	28 - 32µg/m ³	More than 100	High	High	Medium	Low	Low
		10 - 100	High	Medium	Low	Low	Low
		1 - 10	High	Medium	Low	Low	Low
	24 - 28µg/m ³	More than 100	High	Medium	Low	Low	Low
		10 - 100	High	Medium	Low	Low	Low
		1 - 10	Medium	Low	Low	Low	Low
	Less than 24µg/m ³	More than 100	Medium	Low	Low	Low	Low
		10 - 100	Low	Low	Low	Low	Low
		1 - 10	Low	Low	Low	Low	Low
Medium	-	More than 10	High	Medium	Low	Low	Low
		1 - 10	Medium	Low	Low	Low	Low
Low	-	1 - 10	Low	Low	Low	Low	Low

Table AIII.5 outlines the sensitivity of the area to ecological impacts.



Table AIII.5 Sensitivity of the Area to Ecological Impacts

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

Step 2C combines the dust emission magnitude with the sensitivity of the area to determine the risk of unmitigated impacts. Table AIII.6 outlines the risk category from demolition activities

Table AIII.6 Dust Risk Category from Demolition

Sensitivity of Area	Dust Emission Magnitude		
	Large	Medium	Small
High	High	Medium	Medium
Medium	High	Medium	Low
Low	Medium	Low	Negligible

Table AIII.7 outlines the risk category from earthworks and construction activities.

Table AIII.7 Dust Risk Category from Earthworks and Construction

Sensitivity of Area	Dust Emission Magnitude		
	Large	Medium	Small
High	High	Medium	Low
Medium	Medium	Medium	Low
Low	Low	Low	Negligible

Table AIII.8 outlines the risk category from trackout.

Table AIII.8 Dust Risk Category from Trackout

Sensitivity of Area	Dust Emission Magnitude		
	Large	Medium	Small
High	High	Medium	Low
Medium	Medium	Low	Negligible
Low	Low	Low	Negligible



Step 3

Step 3 requires the identification of site-specific mitigation measures within the IAQM guidance to reduce potential dust impacts based upon the relevant risk categories identified in Step 2. For sites with **negligible** risk, mitigation measures beyond those required by legislation are not required. However, additional controls may be applied as part of good practice.

Step 4

Once the risk of dust impacts has been determined and the appropriate mitigation measures identified, the final step is to determine the significance of any residual impacts. For almost all construction activity, the aim should be to control effects through the use of effective mitigation. Experience shows that this is normally possible. Hence the residual effect will normally be 'not significant'.



APPENDIX IV - ASSESSOR'S CURRICULUM VITAE



JOSHUA DAVIES

Senior Air Quality Consultant

BSc (Hons)

KEY EXPERIENCE:

Josh is an Environmental Consultant with specialist experience in the air quality sector. His key capabilities include:

- ▶ Production of Air Quality Assessments to the Department for Environment, Food and Rural Affairs (DEFRA), Environment Agency and Environmental Protection UK (EPUK) methodologies for clients from the residential, retail and commercial sectors.
- ▶ Detailed dispersion modelling of road vehicle emissions using ADMS-Roads. Studies have included impact assessment of pollutant concentrations at various floor levels and assessment of suitability of development sites for proposed end-use.
- ▶ Assessment of road vehicle exhaust emissions using the Design Manual for Roads and Bridges (DMRB) calculation spreadsheet.
- ▶ Assessment of dust impacts from construction sites to the Institute of Air Quality Management (IAQM) methodology.
- ▶ Production of air quality mitigation strategies for developments throughout the UK.
- ▶ Defining baseline air quality conditions and identification of sensitive areas.

QUALIFICATIONS:

- ▶ Bachelor of Science
- ▶ Member of the Institute of Environmental Science (IES)

SELECT PROJECTS SUMMARY:

Residential Developments

Back Lane, Congleton - AQA for a residential development of 140 dwellings.

Helenvale Newbank - AQA for a residential development in the city-wide Glasgow AQMA.

Chestnut Tree Farm, Twigworth - AQA for a residential development

Radwinter Road, Saffron Walden - AQA in close proximity to and AQMA.

Sutton Way - AQA for a residential development in close vicinity to the Whitby Road AQMA

Chester Road, Manchester - EIA for a large-scale mixed use multi storey building, within close vicinity to an AQMA.

Newton Farm, Perth - EIA for a medium scale residential development in close vicinity to the A9.

Norwich Road, Attleborough - AQA for large scale residential development of 350 dwellings.

Carleton Village, Penrith - AQA for a residential development, in line with Eden Councils Local Plan.

Fairfax Steet, Coventry - Exposure assessment for Coventry University student accommodation.

Nags Head, Urmston - AQA for small residential development in vicinity to the Trafford AQMA.

Odour Assessments

Cedars Park, Stowmarket - Quantitative assessment in support of a large-scale residential development in close proximity to Stowmarket Sewage Treatment Works

Clipsone House Farm - Quantitative odour and ammonia assessment in support of a proposed extension to a large-scale poultry farm.

SELECT PROJECTS SUMMARY:

London Borough of Southwark Experience

Camberwell Road, Southwark - Exposure assessment for a proposed gym within an AQMA, 24 hour and 1 hour mean AQOs assessed.

Pelier Street - AQA for a residential development located within the Southwark AQMA

Haddonfield Estate - AQA for a residential development located within the Southwark AQMA

Goschen Estate - AQA for a medium scale residential development located within the Southwark AQMA

Lavington Street - AQA for mixed use scheme in AQMA in Southwark, including an AQN assessment.

Rye Lane - AQA for a residential development within the Southwark AQMA

Commercial Way - AQA for a residential development within the Southwark AQMA

Daniels Road - AQA for a residential development within the Southwark AQMA

Educational Developments

Brinsworth Comprehensive School, Rotherham - Baseline and Construction phase assessment related to a planning application for an extension and new Sports Hall. The site suitability was assessed due to the Schools close proximity to the M1 Motorway.

St Marys and Johns CE School, Barnet - AQA for the refurbishment of the existing school and the construction of a 3 storey classroom block, within the borough wide Barnet AQMA.

St Peters Catholic School, Guildford - AQA for the redevelopment of the existing site, and the construction of a two storey classroom block.

Monitoring Experience

Co-ordination and management of NO₂ diffusion tube monitoring surveys in accordance with DEFRA guidance.

Appendix 4 - Acoustic Fence

REFLECTIVE SOUND SCREENS

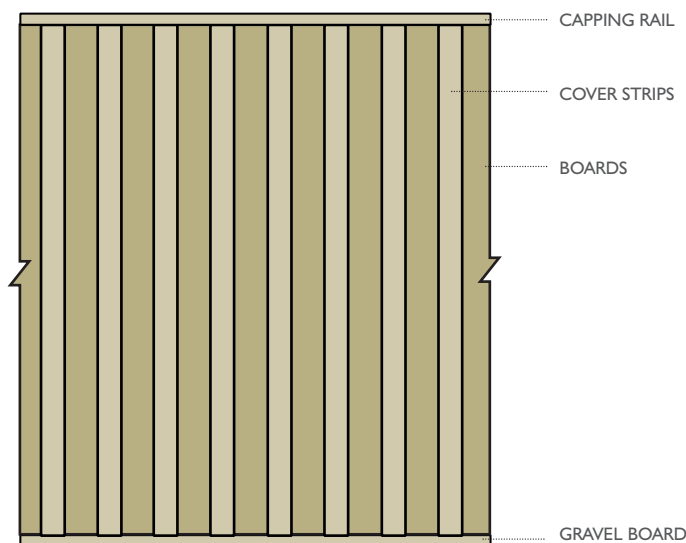
HEIGHTS: 2050 - 2450 - 2550mm

AUGUST 2014

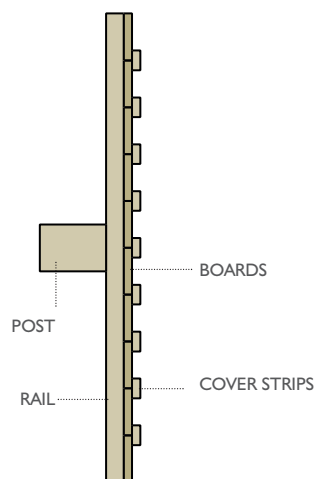
PLEASE NOTE:

1. STRUCTURAL CALCULATIONS MAY BE REQUIRED BY QUALIFIED PERSONS, NO RESPONSIBILITY CAN BE ACCEPTED BY USING THIS DESIGN WITHOUT PROFESSIONAL ADVICE.
2. DESIGN IN ACCORDANCE WITH SPECIFICATION FOR HIGHWAY WORKS CLAUSE 2504. TREATMENT TO SECTOR SCHEME 4.
3. REFLECTIVE SOUND SCREEN FITTED TO TIMBER POSTS (FOR ILLUSTRATION PURPOSES ONLY). STEEL POSTS CAN BE AN ALTERNATIVE.
4. HEIGHT OF SOUND SCREEN VARIABLE TO SUIT SPECIFIC LOCATIONS. POST CENTRES AT 3.0M UNLESS OTHERWISE SPECIFIED.
5. CONFORMS AND TESTED TO BS EN 1793. ALSO TESTED AND COMPLIES TO BS EN 1794-1 AND BS EN 1794-2.
6. COMPLIES WITH HIGHWAYS SECTOR SCHEME 2C FOR THE PREFABRICATION OF ENVIRONMENTAL BARRIERS.
7. AVERAGE DENSITY 26.4 KG/M² (EXCLUDING POSTS).

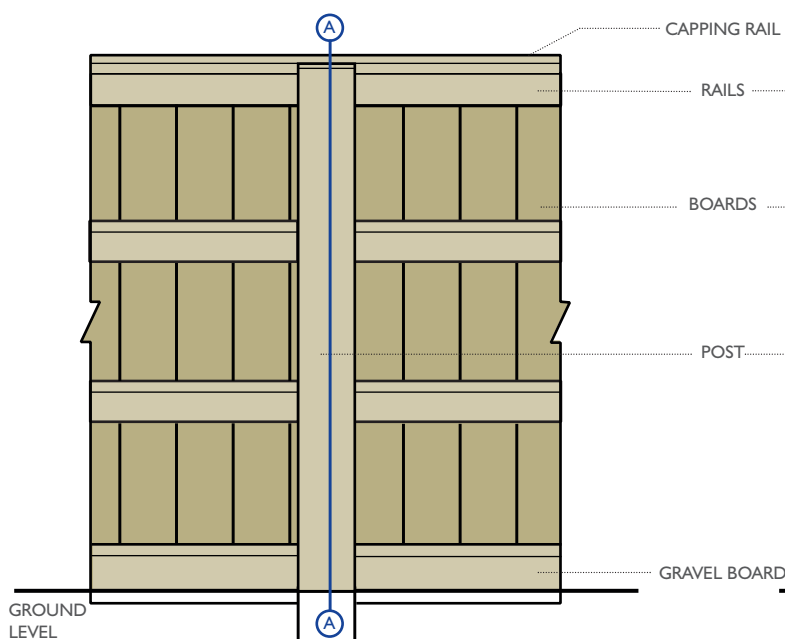
FRONT VIEW



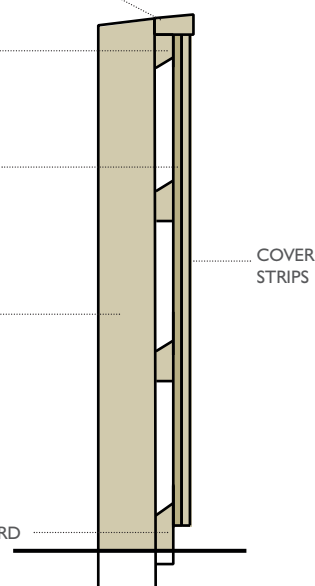
PLAN VIEW
 (Capping omitted)



REAR VIEW



SECTION
 A-A



GROUND
 LEVEL

HALES, MARKET DRAYTON
 SHROPSHIRE, TF9 2PP
 TEL: **01630 653359**
 FAX: **01630 658859**
www.halesawmills.co.uk



REFLECTIVE SOUND SCREEN

BS EN 1793-2: 1998

Acoustics - Road traffic noise reducing devices

Test method for determining the acoustic performance

AUGUST 2014

SIZE: 8.64m²

SOURCE ROOM

Volume: 136m³
 Condition: clean
 Type: small reverberation room
 Location: acoustic transmission suite

RECEIVING ROOM

Volume: 220m³
 Condition: clean
 Type: large reverberation room
 Location: acoustic transmission suite

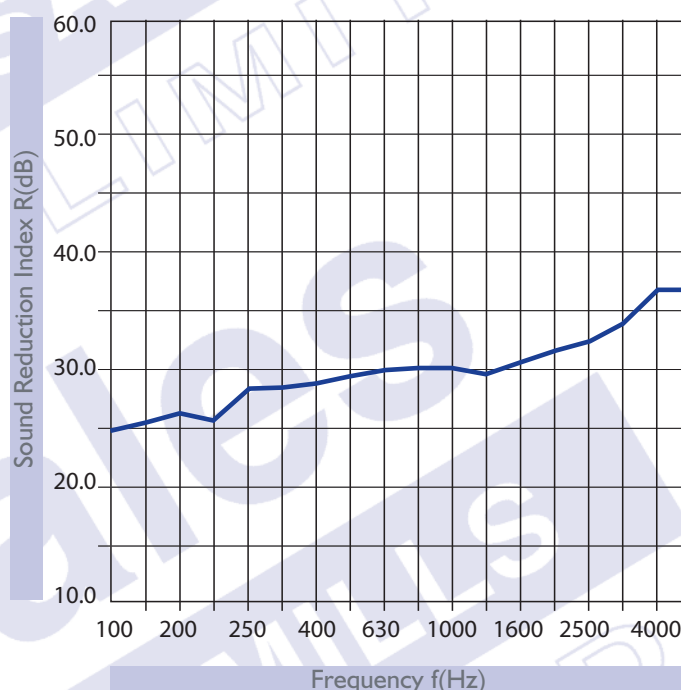
TEMPERATURE: 17.8°C

HUMIDITY: 58.6%

DL_R: 30

CATEGORY: B3

FREQUENCY HZ	R
100	24.7
125	25.3
160	26.3
200	25.8
250	28.5
315	28.4
400	29.0
500	29.6
630	30.0
800	30.1
1000	29.8
1250	29.7
1600	30.6
2000	31.6
2500	32.1
3150	33.7
4000	36.9
5000	37.1



Test results for HALES SAWMILLS LTD - REFLECTIVE SOUND SCREEN, issued by:

University of Salford (Acoustics Test Laboratory)

UKAS accredited test laboratory No. 1262

Test reference number: AC09/215/06

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