Transport for London

LONDON DEVELOPMENT AGENCY

DALSTON JUNCTION

Environmental Statement

Volume 1

Main Report

HEPHER DIXON
PLANNING AND REGENERATION

Transport for London

Dalston Junction Interchange, London

Environmental Statement

In accordance with:

Town and Country Planning Act 1990
Town and Country Planning (Environmental Impact Assessment) (England and Wales) Regulations 1999 (as amended)

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Volume IV

Non-Technical Summary

1. Background

1.1. Introduction

1.1.1. Transport for London (TfL) has commissioned Hepher Dixon to co-ordinate a formal Environmental Impact Assessment (EIA) including the preparation of an Environmental Statement (ES) and Non-Technical Summary (NTS)[1]. The EIA has been carried out in association with Arup and Drivers Jonas. The EIA accompanies a detailed planning application submitted to the London Borough of Hackney Council (the Council) proposing the redevelopment of land east of the A10 Kingsland Road and south of the A104 Dalston Lane (Figure 1.1). The proposed development will provide a mixed-use development including a public transport interchange, commercial, retail and residential uses.

1.1.2. TfL are the regional transport authority for London including railways, the underground network, buses, pedestrian and cycles, and the strategic road network. Their stated objectives in relation to rail are:

- To implement the rail objectives in the Mayor's transport strategy;
- To develop a focused rail plan for London in conjunction with the Strategic Rail Authority's (SRA) national strategy;
- To work with the SRA and the rail industry to improve national rail services in London;
- To progress major new rail projects; and
- To develop national rail's contribution to an integrated public transport system for London.

1.2. Development Context

1.2.1. As part of the Government's drive to increase public transport provision, the East London Line Project (ELLP) was granted deemed planning permission under the Transport and Works Act 1992 on 20th January 1997.

1.2.2. When originally built in the 1800s, the line ran from Liverpool street and continued north to Dalston, joining the North London Line at Kingsland Dalston Station, which provides regular services between North Woolwich to the southeast and Richmond to the southwest. Currently the East London Line provides services between New Cross and New Cross Gate in the London Borough of Lewisham to Shoreditch in the London Borough of Tower Hamlets.

1.2.3. The ELLP will rebuild the East London Line to the proposed development site where a new Dalston Junction Station will be built below ground level. The proposed development will be constructed above the permitted but yet to be built Dalston Junction Station, providing a public interchange for the line terminus.

Development Plan

1.2.4. The adopted Development Plan for Hackney currently comprises the Borough's Unitary Development Plan (UDP)[2] and the London Plan[3]. It also includes a number of Supplementary Planning Guidance (SPG) documents and Planning Briefs. One such

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1 All the abbreviations included in this document are set out in Appendix 1.1.

2 London Borough of Hackney Council. (June 1995). *Unitary Development Plan*.

3 Greater London Authority. (February 2004). *The London Plan: Spatial Development Strategy for Greater London.*

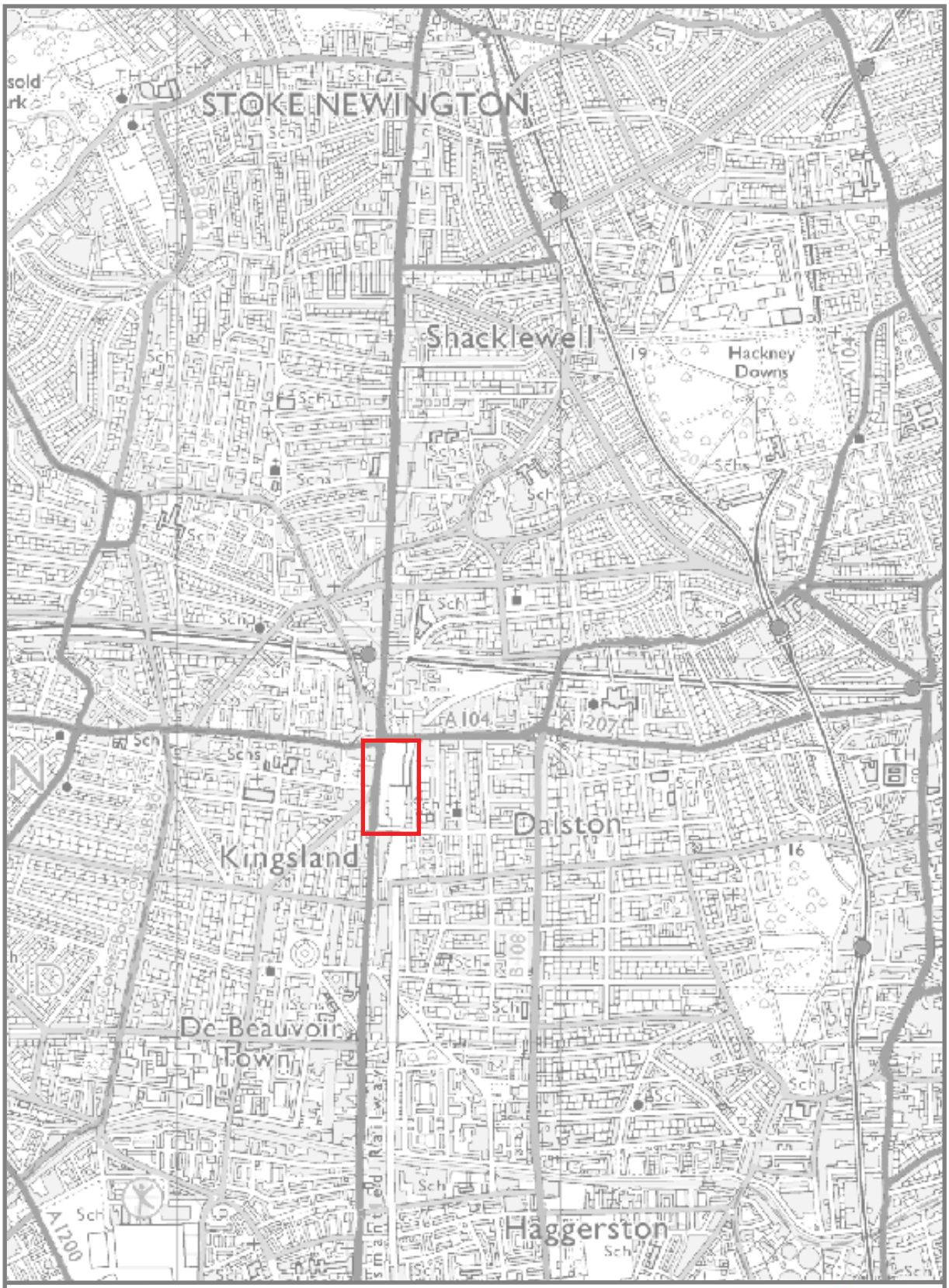

Figure 1.1: Location of the Proposed Development Site (not to scale)

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planning brief, discussed further below, specifically relates to the East London Line and the proposed development site[4].

1.2.5. Town Planning is currently in a transitional phase, whereby Development Plans are slowly changing over to Local Development Frameworks (LDF), which are now required by the Planning and Compulsory Purchase Act 2004. The Borough's UDP will continue as part of the LDF until September 2007 when it will be replaced by a series of Local Development Documents (LDD).

1.2.6. Relevant Development Plan policies to the proposed development are discussed through out this report and are set out in full in Appendix 1.2.

Dalston Area Action Plan

1.2.7. As part of the new LDF, the Council are promoting an Area Action Plan (AAP) covering the centre of Dalston, including the proposed development site. The purpose of the AAP is to:

- Co-ordinate transport and public realm proposals within the area;
- Identify opportunities to deliver development, growth and regeneration;
- Manage funding to enable private sector resources to benefit the area; and
- Guide future economic development and regeneration programmes.

1.2.8. The Council have now selected a preferred option for the AAP, which is subject to consultation until 16th December 2005[5].

Development Brief

1.2.9. The Council are also concurrently producing a Planning Brief for the combined East London Line Project and Dalston Lane South sites. The Brief covers two further sites in addition to the proposed development site. The first is located on Roseberry Place, opposite the proposed development site and is currently derelict. It is bounded to the north by Dalston Lane and to the east by Beechwood Road. To the south is the Holy Trinity Church of England Primary School. Second and smallest site lies to the east of Beechwood Road. It is also bound to the north by Dalston Lane with Woodland Street to the east and Crosby Walk to the south. This site is currently occupied by two and three story buildings in community and retail uses.

1.2.10. The purpose of the Brief is to facilitate the comprehensive redevelopment of all the sites and has the following stated objectives:

1.2.11. Development will provide a complementary mix of uses that will meet both local and London wide needs, contributing towards a sustainable town centre.

1.2.12. Development will improve public transport infrastructure to provide a range of choices to users, facilitate patterns of movement to give priority to pedestrians, cyclists and public transport, and increase permeability and public safety.

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[4] London Borough of Hackney Council. (July 2005). Planning Brief Supplementary Planning Guidance East London Line Project and Dalston Lane South Sites.

[5] London Borough of Hackney Council. (October 2005). Dalston Area Action Plan Preferred Option.

1.2.13. Development will be designed to the highest architectural, urban and environmental design standards in a manner that is in keeping with the current town centre setting and in a way that development will be well integrated with links to the surrounding area.

1.2.14. Development will be undertaken comprehensively under a phased, partnership development approach resulting in the successful delivery of the planned ELLP transport interchange.

1.2.15. The partnership approach will set to identify and make available funding in addition to enabling development and s106 obligations.

1.3. What Is Environmental Impact Assessment

1.3.1. EIA is a systematic and objective process through which the likely significant effects of a development proposal can be identified, assessed and, wherever possible, mitigated. This process and its outcomes are then reported in the ES to decision makers, the Council and its advisors, and the public. The NTS is provided to allow a wider public understanding of the environmental effects of the development proposal.

1.3.2. EIA is a statutory process that is governed by UK and European law. On 3rd March 1997 the Council of the European Union amended Directive 85/337/EEC through Council Directive 97/11/EC, which was given legal effect in England and Wales through the Town and Country Planning (Environmental Impact Assessment) (England and Wales) Regulations 1999 in so far as it relates to development under the Town and Country Planning Act 1990. These Regulations came into effect on 14th March 1999.

1.3.3. The 1997 amending Directive has several purposes including, the introduction of provisions to "clarify, supplement and improve the rules on the assessment procedure" and enabling developers to obtain an opinion from the competent authority on the need for EIA. The Directive also extends the range of projects to which EIA applies and requires an outline of the main alternatives considered to the development proposed.

1.3.4. Council Directive 2003/35/EC further amended Directive 85/337/EEC on 26th May 2003, with the Town and Country Planning (Environmental Impact Assessment) (England) (Amendment) Regulations 2005 anticipated in the near future. The amending Directive and Regulations bring EIA public consultation procedures in line with the UN/ECE 'Århus' Convention on Access to Information, Public Participation in Decision-Making and Access to Justice in Environmental Matters, which was signed on 25th June 1998.

1.4. Screening – Is EIA Required

1.4.1. Development that falls within Schedule 1 of the Regulations always requires EIA and is referred to as 'Schedule 1 development'. Development listed in Schedule 2 that is located in a 'sensitive area' (Regulation 2(1)), or, exceeds one of the relevant criteria or thresholds given in Schedule 2 is referred to as 'Schedule 2 development'. Not all 'Schedule 2 development' will require an EIA, only that development likely to have significant environmental effects due to its size, location or nature. Development that requires EIA is referred to as 'EIA development'.

1.4.2. The proposed development falls within Schedule 2 section 10(b) 'Urban Development Projects' but is not located in a 'sensitive area' as defined by the Regulations. However, the proposed development site exceeds the applicable threshold of 0.5ha identified in Schedule 2, paragraph 10(b), column two. The test for the need for EIA is therefore whether the development would be likely to give rise to significant effects on the environment by virtue of its size, nature or location.

1.4.3. A Screening Opinion has not been requested of the Council as it is considered by TfL that the proposed development is likely to give rise to potentially significant environmental

effects.

1.5. Scoping – What Should the EIA Include

1.5.1. Detailed discussions were undertaken with the Council and statutory consultees on the information the EIA should include. Table 1.1 sets out the assessments that have been specified by the Council in their final Scoping Opinion. Full details of the correspondence on scoping are included in Appendix 1.3.

Table 1.1: Scope of the EIA

Topic	Chapter in this report	Undertaken by
Air Quality	5	Arup
Archaeology and Cultural Heritage	6	Arup
Drainage and Flood Risk	7	Arup
Ecology	8	Arup
Electronic Interference	9	Arup
Ground Conditions	10	Arup
Landscape and Visual Amenity	11	Arup
Microclimate	12	Arup
Noise and Vibration	13	Arup
Overshadowing, Daylight and Sunlight	14	Drivas Jonas
Society and Economics	15	Hepher Dixon
Transportation	16	Arup

Describing the Baseline Conditions

1.5.2. The Dalston area is currently in a state of flux with a large number of developments likely to be constructed in the near future. As such it is important to understand what the area is likely to be during the construction and operation of the proposed development since it will almost certainly be different from the existing. The two major developments that will affect this are the ELLP and the anticipated scheme for the Dalston Lane South site to the east of the proposed development site. The ELLP will occur and therefore will form part of the baseline.

The ELLP scheme

1.5.3. A request for Transport and Works Act Order for the ELLP works was made on the 30th November 1993 and a public local inquiry was held in October and November 1994. Planning permission for the East London Line Project was deemed to have been granted through Statutory Order 1997 No. 264 Transport and Works Transport entitled, 'The London Underground (East London Line Extension) Order 1997'. This Order was made on the 20th January 1997 and came into force on the 10th February 1997. The permitted scheme drawings are those marked by the Secretary of State as "Plans and Sections" for the purposes of this Order dated 1993-1994.

1.5.4. The Order specifies in Schedule 1 the works that are permitted and Article 4 of Part II of the Order sets out the powers to construct these and other works. In the Dalston Junction area the permission specifies limits of lateral deviation and therefore incorporates a degree of flexibility. The limits of deviation allow works up to the rear boundary between the properties along the eastern side of Kingsland Road and up to the western edge of Roseberry Place, north of the retained cottages.

1.5.5. Reference Design proposals for Dalston Junction station have been prepared have recently been issued for tender so that the provision of the railway and station at the Dalston Junction side can proceed should this planning application not be approved. The reference Design drawings are included in Appendix 1.4. The purpose of these drawings is to indicate

the required form of station that can be achieved. The permission for the works does allow flexibility, as stated above, for the successful contractor to vary the main works.

Dalston Lane South

1.5.6. At this time it is understood that the details of the Dalston Lane South scheme are still being development and it is unlikely that a planning application will be submitted and permitted in advance of the Dalston Junction Interchange proposals. Therefore, the Dalston Lane South scheme can only be considered cumulatively in qualitative terms with the proposed development.

2. The Site and Its Setting

2.1. The Site

2.1.1. The proposed development site is located to the east of the A10 Kingsland Road and south of the A104 Dalston Lane in Dalston, Hackney (see Figure 2.1). These roads are both part of the primary road network of the inner part of northeast London. To the east, the site is bound by Roseberry Place with Forest Road to the south. The site comprises approximately 1.8ha and, as previously discussed, is located above the approved East London Line route and station site.

2.1.2. The site itself is currently a vacant former railway corridor and station, a former scrap yard located along side Roseberry Place, a warehouse at the southern corner of the site along with a section of adopted public highway south of the site and a snooker hall fronting onto Kingsland Road. The vacant railway corridor is a railway cutting that is approximately 240m long, 60m wide and between 4m and 5m deep.

2.1.3. There are five cottages towards the southeast corner of the site fronting onto Roseberry Place, which will not form part of the proposed development site. The southeast corner of the site is occupied by warehouses owned by The London Borough of Hackney. To the south the site is bounded by the Forest Road Bridge. This is a single span reinforced concrete through a girder bridge, approximately 5 years old. The majority of the site is currently surrounded by hoardings as work on the permitted East London Line route and station works has commenced.

2.1.4. The area of the cutting is mostly bare with short ephemeral rough grassland species present with ruderal species and scrub vegetation at the edges. An area of trees is located on an area of embankment towards the southern end of the site. The former station and platforms/scrapyard area are becoming colonised by brambles and buddleia. Japanese knoweed is located towards the western margin of the site.

2.2. Land Use Context and Designations

2.2.1. The adopted UDP proposals map (see Figure 2.2) shows that areas to the north, south and west of the proposed development site are largely designated for shopping and town centre uses with the core frontage located to the north adjacent to the Dalston Kingsland Railway Station. Immediately to the east of the proposed development site is the Dalston Lane South site as discussed previously. Beyond this and to the southeast are predominantly residential areas, including the Holly Street Estate, which is designated for estate improvement. To the northeast, north of Dalston Lane is the Ramsgate Street defined employment area, which includes a variety of business uses.

2.2.2. Kingsland Road to the west of the site is a red route and forms the main north-south road link on the western side of Hackney borough with the A104 Dalston Lane being a main east-west road link between Hackney and Islington to the west. The junction of Kingsland Road and Dalston Lane at the northwest corner of the site is signal controlled. This junction is constrained by the alignment of the road and the location of adjacent buildings that contribute to the congested nature of the road during peak traffic flow times of the day. In addition footways in the vicinity of this junction are narrow, in particular along Dalston Lane.

2.2.3. Forest Road has a priority junction with Kingsland Road and Roseberry Place; Roseberry Place has a priority junction with Dalston Lane to the north of the site. Both roads have footways between two and three metres in width.

2.2.4. To the north of the site the North London Line railway provides links to Richmond and North Woolwich. This lines services Kingsland Station located 250m north of the site and provides links to the underground rail network at Highbury and Islington station to the west. The site itself is served by nine bus routes providing a range of routes into the centre of London as

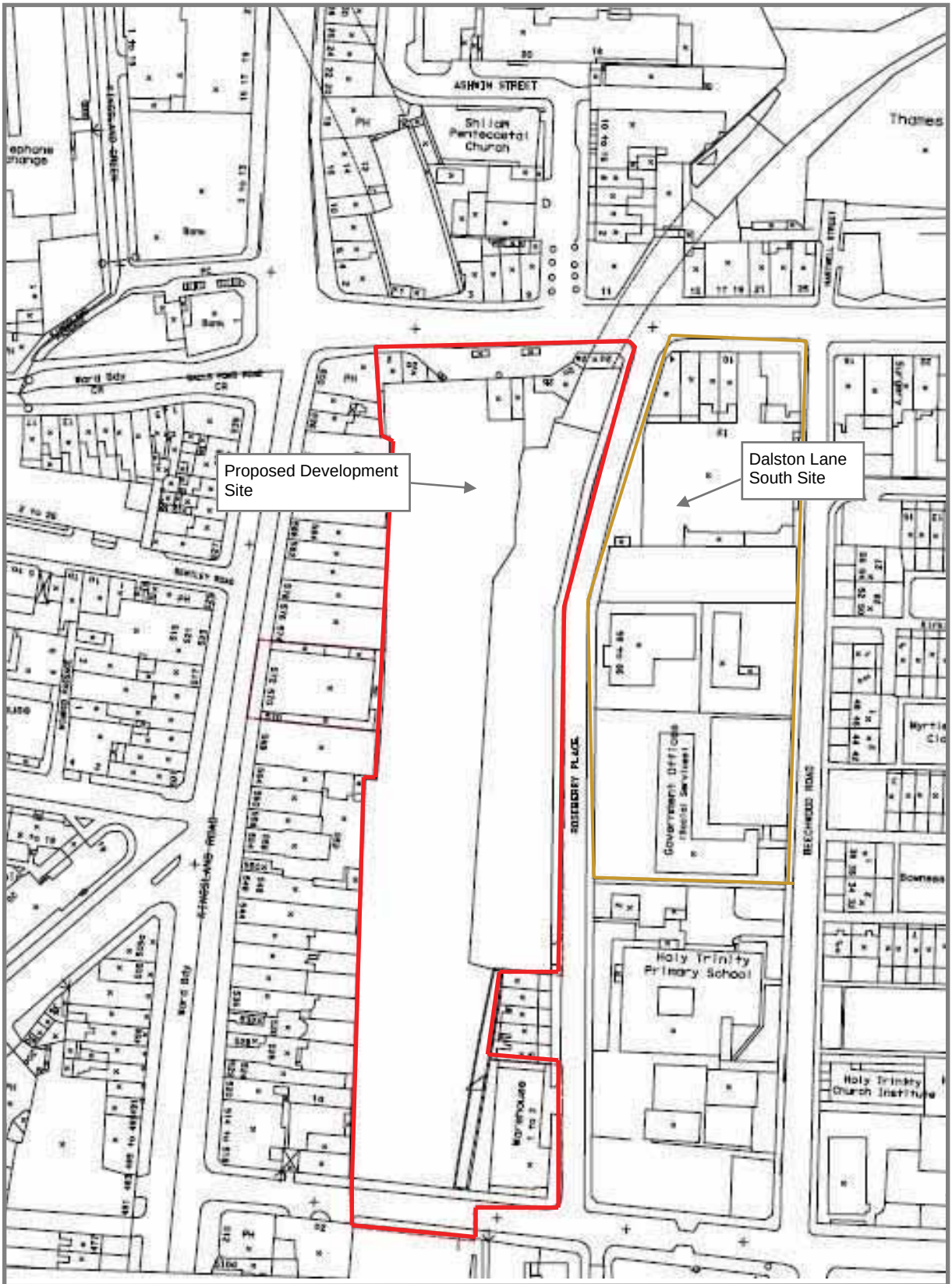

Figure 2.1: Indicative Location of the Existing Site

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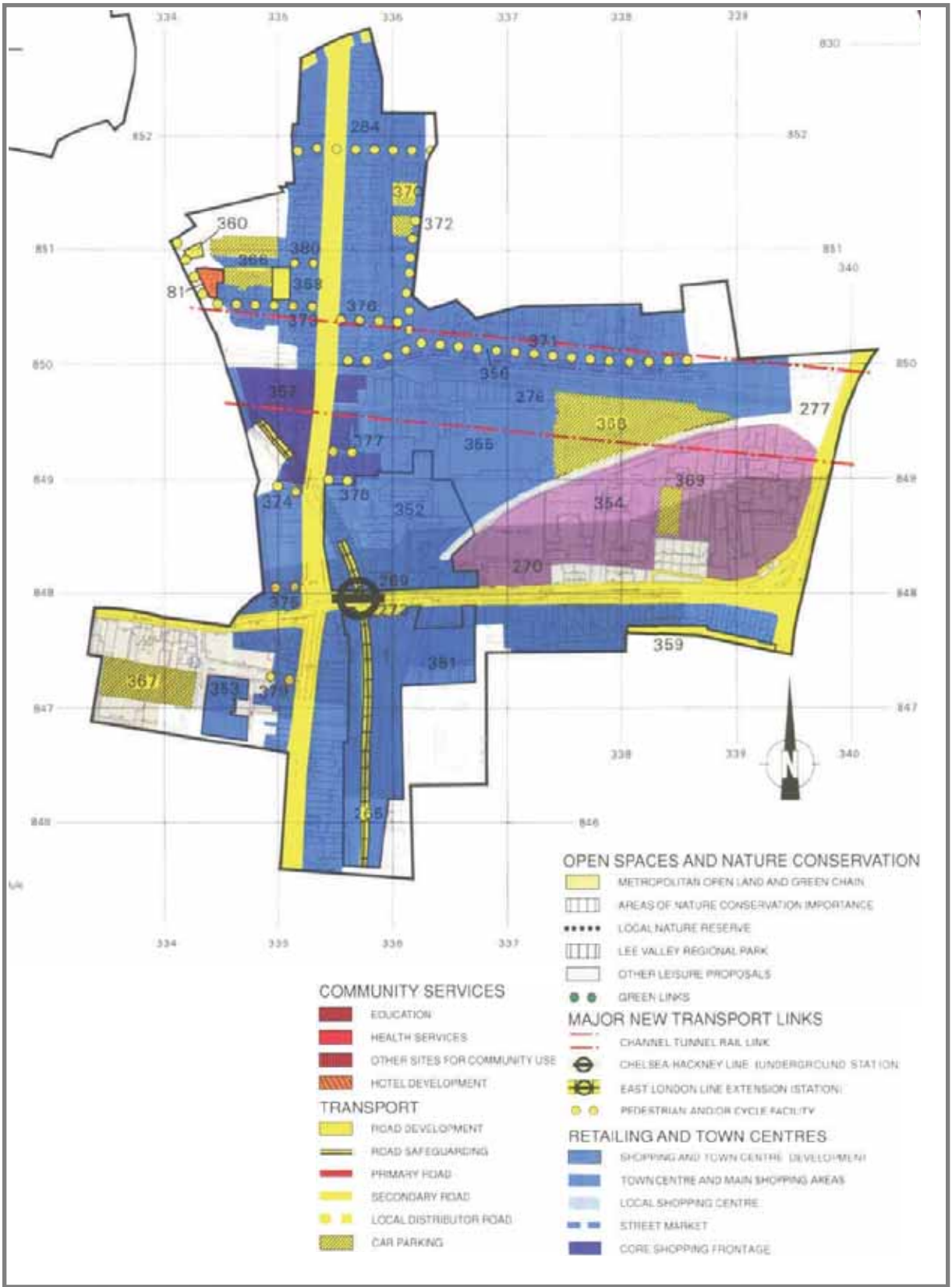

Figure 2.2: UDP Proposals Map Dalston Insert Area

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well as surrounding boroughs.

2.2.5. The Department for Environment, Food and Rural Affairs (DEFRA) geographical information website6 confirms that there are no Sites of Special Scientific Interest (SSSI) or National Nature Reserves (NNR) within 1km of the proposed development site (see Figure 2.3). There are ten non-statutorily designated Sites for Nature Conservation – Sites of Importance for Nature Conservation (SINCs). A SINC of Borough Importance (Grade 1) is located 200m northwest of the site and is the North London Line corridor in Islington borough. Two sites of Borough Importance (Grade 2) are located 300m and 500m northwest of the site at the Jewish Burial Ground, Kingston Road and Dowcras Buildings Wood respectively. The nearest site of Metropolitan Importance is located 850m south of the site at Regents Canal.

2.2.6. Although the site is not within a Conservation Area, it is located between the Kingsland Conservation Area to the west and the Dalston Lane West Conservation Area to the east with the De Beauvoir Conservation Area further to the west. In the wider area there are three additional Conservation Areas at Queensbridge Road to the east, Graham Road/Mapledene further east and Albion Square to the south and east. Kingsland Road follows the line of the Roman and post-Roman road known as Ermine Street. However, the proposed development does not fall within a designated Area of Archaeological Priority. The nearest such area being located to the northwest in Islington Borough. Descriptions of these Conservation Areas are set out in Chapter 6.

2.2.7. Two Listed Buildings are located to the southeast of the site adjoining Roseberry Place and Beechwood Road respectively. The first of these Listed Building is the Holy Trinity Junior School, which is a late 19th Century building; the second is Holy Trinity Church Institute, which abuts Holy Trinity Church.

2.2.8. There are also three groups of listed buildings to the west of the site at 540-558 Kingsland Road, 560-568 Kingsland Road and 590-592 Kingsland Road. All these date from the 18th and 19th centuries and are Grade II listed. There is also a listed building to the north at 41 Kingsland High Street and a listed 19th century gun post at the corner of Ashwin Street some 10m from Kingsland Cover Way.

2.2.9. There are no Scheduled Monuments or Registered Battlefields within 1km of the proposed development site. There are three Registered Parks and Gardens just within the 1km of the site, namely Abney Park Cemetery and Clissold Park to the north, and Victoria Park to the southeast.

2.2.10. The whole of Hackney Borough was designated as an Air Quality Management Area (AQMA) in respect of nitrogen dioxide (NO_2) and particulate matter (PM_{10}) in 2004. Air quality monitoring undertaken across the borough has indicated that the annual mean objective for NO_2 has been exceeded on a regular basis and the 24-hour objective for PM_{10} was exceeded in 2002.

2.3. Site History

2.3.1. By the time the 1830 Greenwood Map was published, considerable development had already taken place on the periphery of the proposed development site with the central area being shown as two fields. Kingsland Road, Dalston Lane, Roseberry Place and Forrest Road7 exist largely in their current positions at this time.

2.3.2. In the wider area, the Greenwood Map shows that development was largely centred on the Kingsland Road/Dalston Lane crossroads. By 1862, considerable change had taken place

6 http://www.magic.gov.uk

7 Note the change in the name of this road from 'Forrest' to 'Forest'.

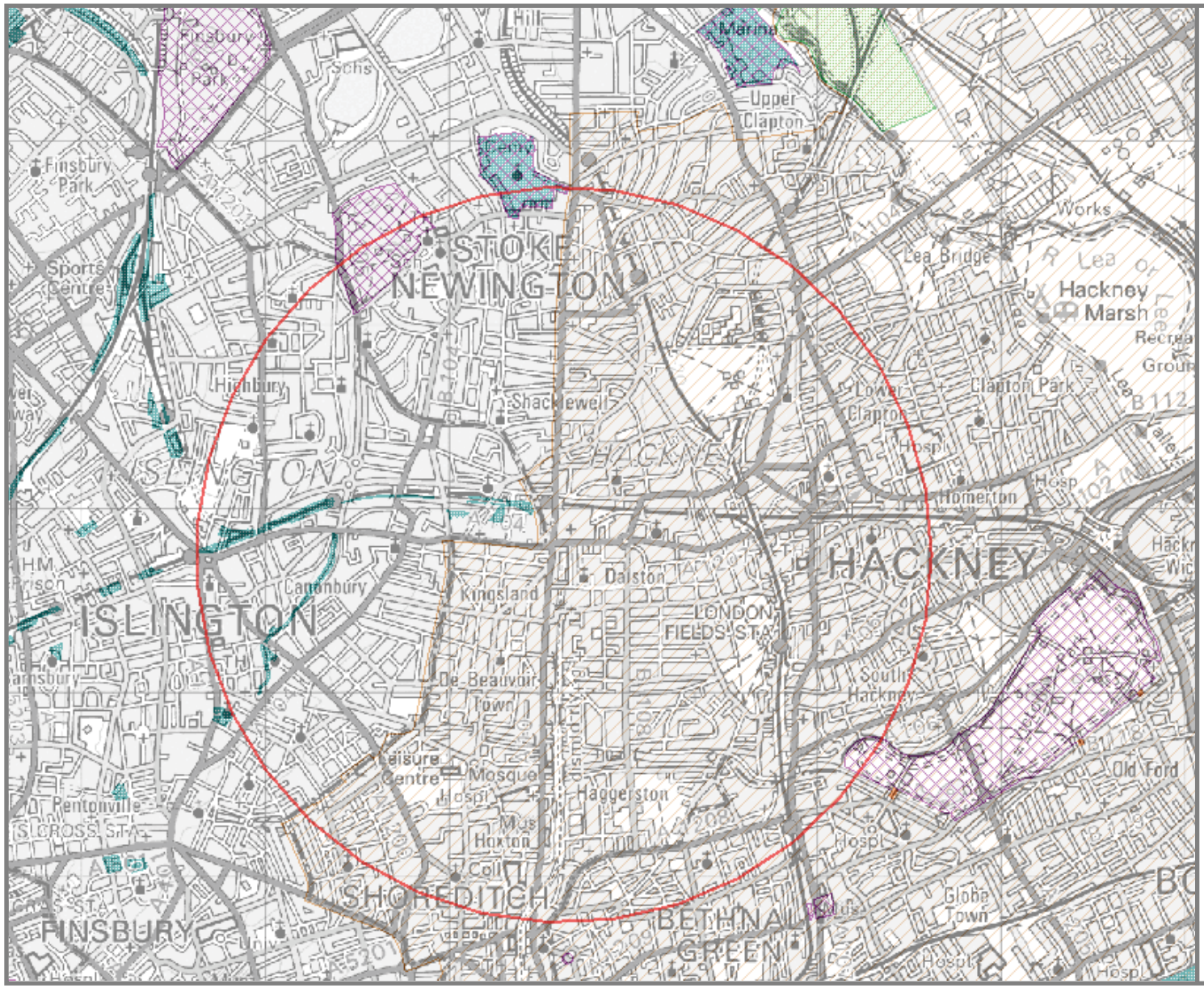

Figure 2.3: Environmental Protection Designations within 1km of the Proposed Development Site.

Source: http://www.magic.gov.uk

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including the Beauvoir Town residential area to the southwest. By 1876, the East and North London Lines had been constructed, and were connected by both east and west spurs.

2.3.3. The area remained largely unchanged until WWII; the 1949 map indicates the loss of some terraces, presumably from bomb damage. However, by 1957 these areas had already been developed. Between 1966 and 1972, a considerable number of terraces were demolished to make way for the Holly Street Estate. In addition, during this period the eastern spur of the East London Line joining the North London Line fell into disuse. With the exception of the Kingsland Shopping Centre and the intensification of development on the Holly Street Estate, there have been few significant changes to the built form of the area since the 1970s.

2.4. Geology and Hydrology

2.4.1. Site investigations indicate that the site is underlain by minimal drift deposits with considerable clay deposits beneath (see Table 2.1).

Table 2.1: Approximate Description of Geology beneath the Proposed Development Site

Stratum	Thickness (m)	Depth, top of stratum in metres above ordnance datum (mAOD)
Made Ground	0.2 to 2.7	+14.0 to +15.4 (within the cutting)
Terrace Deposits	Nil to 7.7	+13.5 to +14.5
London Clay	9.0 to 11.1	+12.0 to +13.8
Lambeth Clay	8.9 to 13.6	+1.7 to +3.2
Upnor Formation	4.4 (proven) to 6.1	-10.4 to -6.4
Thanet Sand	7.5 (proven)	-13.5 to -12.7
Chalk	Not proven	N/A

Source: Arup

2.4.2. There are two aquifers below the proposed development site, in the Terrace Deposits and the Upper Chalk/Thanet Sand Deposits. Investigations have found that within the upper aquifer the groundwater level is approximately 13.5mAOD, whilst in the lower aquifer the level is approximately -15.0mAOD. Groundwater levels in the lower aquifer are in the process of rebounding following a considerable decline in abstractions and the Upper Chalk is classified as a major aquifer by the Environment Agency. The London Clay and Lambeth Group are classified as an aquiclude. There are no Groundwater Source Protection Zones near the proposed development site. Within the railway cutting groundwater levels are approximately 1m to 1.5m below ground level. There are no abstraction licenses within 1km of the site.

2.4.3. The Environment Agency website[8] indicates that the proposed development site is outside the extent of the extreme floodplain. Generally this means that the chance of flooding each year from rivers or the sea is 0.1% (1 in 1000) or less. The indicative tidal floodplain of the River Thames lies approximately 4km to the south. The nearest surface water body is the Grand Union Canal approximately 1km to the south of the proposed development site. The intensely urbanised nature of the area results in drainage being predominantly to the local sewerage network. The sewerage network around the site is predominantly combined sewers.

[8] http://maps.environment-agency.gov.uk/wiyby/mapController

3. The Proposed Development

3.1. The Planning Application

3.1.1. The planning application is in full, a copy of the application drawings can be found in Appendix 3.1. The application is also accompanied by the following documents:

- Planning Statement by Hepher Dixon;
- Sustainability Statement by Arup;
- Design Statement by John McAslan and Partners;
- Energy Statement by Arup;
- Community Consultation Statement by Dialogue;
- Transport Assessment by Arup, and
- Visualisations by John McAslan and Partners.

3.2. Description of Development

The Railway Station

3.2.1. The proposals seek to achieve the development of the area above the soon to be built Dalston Junction railway station with as little change to the station proposals as possible. On this basis, only where the station interfaces with the proposed development will it influence the permitted station proposals. The proposed development will also safeguard a) an eastern curve, which retains the possibility, albeit unlikely, that the East London Line could ultimately join the North London Line, for journeys to Stratford, and b) the future alignment of the proposed Crossrail Line 2.

3.2.2. Changes to the railway station that form part of the propose development comprise a new station ticket hall at grade level with entrances onto Dalston Lane to the north, the new cross route to the south and Roseberry Place to the east. The Dalston Lane entrance will include a large canopy over the pavement 5.7m in height. The hall will be linked to the platforms by stairs and lifts, with passive provision made for future escalators. The station will also incorporate 108 cycle parking spaces.

3.2.3. Without this scheme the station facilities would all be located at platform level with a single entrance from Dalston Lane.

The Podium

3.2.4. The Podium will cover the railway station, between the existing masonry retaining walls that bound the site to the east and west, and the bridge carrying Dalston Lane to the north. The Forest Road Bridge will be replaced by a new bridge to allow bus access from the south.

3.2.5. In the northern part of the proposed development site, the safeguarded alignment of Crossrail 2 precludes the use of piling, with the tunnel crowns being only 13m below the East London Line surface level. As such, this part of the site will be founded on a reinforced concrete raft. This places a physical constraint of the height of structures that can be built in this part of the site.

3.2.6. The remainder of the podium (made up of four different plates) will be founded on reinforced concrete bored piles, with toe levels within the Lambeth Group stratum. This part of the podium will comprise a grid of concrete beams running north-south and east-west to

correspond with the buildings proposed above.

3.2.7. To the south, where the podium meets the new Forest Road Bridge, another reinforced concrete slab is used. This allows for compliance with statutorily required clearance above the railway line from north to south.

3.2.8. The western boundary wall will be refurbished as required. A separate line of columns will support the podium in front of the wall so no additional loading is made on it. In the area of the bus station the podium will be higher than Kingsland Road and a gradient of 1:20 will be used to enable the podium to become contiguous with Kingsland Road. To the north, the remains of the derelict station and the podium on which it sits will be removed. The length of fill between the two Dalston Lane bridges will then be supported by new reinforced concrete retaining walls. To the east, along Roseberry Place, a reinforced concrete wall will be cast against the existing masonry wall. Basement cross walls will then provide support for the podium.

3.2.9. The podium would incorporate five 3m tall transparent vents as part of the safety strategy requirements for the station. However, these vents would also allow natural light to the station area beneath the podium. Between the vents it is proposed to include a 2.4m high acoustic fence to reduce potential noise levels at properties along Kingsland Road emanating from the bus standing area. The southern part of the podium would also include two emergency egress/access stairwells to the rear of the retained cottages fronting onto Roseberry Place. The small area of decking will be retained behind the cottages.

Forest Road Bridge

3.2.10. To allow bus access from the bridge to the proposed development site, the existing single span bridge will be replaced by a three span bridge. This will effectively be an extension of the reinforced concrete slab forming the southern part of the podium, and carried on wall supports. It is proposed that the existing abutment piles would be reused to support the new bridge structure.

Bus Station

3.2.11. The proposed development will include seven 12m and two 18m bus standing spaces along the central road orientated north to south through the site. Two passenger pick-up and set-down points to accommodate 18m articulated buses will be located in the new bus station (currently the location of the Snooker Hall) just to the south of the of the Railway Station; thereby facilitating an easy interchange between rail, bus, taxi and cycle. Buses will access the proposed development from Kingsland Road via Forest Road to the south of the site; the lay-over spaces are orientated north-south along either side of the roadway. Buses passing through this bus standing area would turn west to pick-up and set-down passengers. Buses would then exit the site through a signalised ‘T’ junction onto Kingsland Road. The proposed development will include measures such as signage and surface treatments to discourage the public from using the bus layover as a thoroughfare.

3.2.12. London Buses has confirmed that the bus station will be used by all northbound buses terminating to the north and east. These services are the 67 (northbound), 149 (northbound), 242 (eastbound), 243 (northbound), three new terminating services from the north, and one new terminating service from the east.

3.2.13. The bus operational facilities will be positioned close to the bus station between the two southern residential blocks to the rear of the retained cottages fronting onto Roseberry Place.

Southern Blocks

3.2.14. The southernmost block is located in the southeastern corner of the proposed development

site. It is bounded by existing houses to the north, Roseberry Place to the east, Forest Road to the south and the bus interchange access road to the west. Along Roseberry Place at ground floor are three 2-storeys, 3-bedroom residential units. Due to the difference in height from Forest Road, which rises to bridge the railway, to Roseberry Place the ground floor of these residential units is below podium level.

3.2.15. To the rear of these residential properties, at ground level, is an area allocated for plant. At first floor (podium) level is an enclosed car park, which is accessed from Forest Road and will be gated and secure. This includes 13 car parking spaces and 58 bicycle spaces. The access road continues out of the north of the building to provide access to further car parking in the second southern block, discussed below.

3.2.16. Above the podium level the southern most block rises a further six storeys. At the first level, there are three 1-bedroom units, three 2-bedroom units and two 3-bedroom units. There is also access to two terraces on the roofs of the car park and residential units below. For levels two to six, each level has one 1-bedroom unit, five 2-bedroom units and two 3-bedroom units.

3.2.17. The southern most block is located partially (by approximately 2m) within the highway. As a consequence the highway has been reduced in width.

3.2.18. The second southern block is bounded by the pedestrian square to the north, Roseberry Place to the east; existing houses to the south and the bus interchange access road to the west. Similar to the southern most block, this block has four 2-storey, 3-bedroom units plus a small community unit fronting onto the pedestrian square. To the rear at ground floor is the railway station, with a large portion of the northern part of the block comprising plant. At first floor (podium) level to the rear of these residential units is the second car parking area, comprising 22 car parking spaces and 86 bicycle spaces.

3.2.19. Above the podium level this block rises as two components. The southern most rises to seven storeys above the podium with first floor comprising three 1-bedroom unit, three 2-bedroom units and two 3-bedroom units. Floors two to six comprise one 1-bedroom unit, five 2-bedroom units and two 3-bedroom units.

3.2.20. The second component resembles the southernmost block with one 1-bedroom unit, two 2-bedroom units and one 3-bedroom unit at levels one to six. This component then continues to rise to level seventeen with two 1-bedroom units, one 2-bedroom unit and one 3-bedroom units per floor.

Northern Block

3.2.21. The northern block is bound to the north by Dalston Lane, the east by Roseberry Place, to the south by the pedestrian square and to the east by existing commercial and retail units fronting onto Kingsland Road. The entire block is located at podium level (with the exception of one retail unit fronting onto Roseberry Place), above the level of Roseberry Place, which is accessed by pedestrians via steps and ramps. At podium level the block comprises the new station ticket hall, which is surrounded by retail units to the north, east and west. The retail units could include use classes including shops (A1), restaurants and cafes (A3), drinking establishments (A4) and hot food takeaways (A5).

3.2.22. Above, on levels one to six are six 1-bedroom units, six 2-bedroom units and eight 3-bedroom units per floor. On level seven, the building contracts into a short tower at the southernmost end of the building. Levels seven to nine each comprise three 1-bedroom units and three 2-bedroom units.

Residential Summary

3.2.23. In total the proposed development will comprise 78 1-bedroom units, 135 2-bedroom units

and 96 3-bedroom units. The blocks, particularly within the residential light wells, will be clad with reflective materials to increase light into habitable rooms. In addition, windows will be obscured glass where there are sight lines into residential rooms to ensure privacy.

Services

3.2.24. The proposed development will have its heating requirements provided predominantly by a biomass boiler system, which is proposed to be located within the basement of the development. This system would be powered by wood chippings. It is understood that a boiler system to serve the proposed development would require three to four deliveries of wood chip per week. These deliveries would be discharged through an access hatch adjacent to the northern end of the southern block along Roseberry Place. A stack located on the side of the 18-storey southern block will disperse emissions from the boiler; this will be approximately 3m higher than the block.

3.2.25. Within the basement levels of the proposed development 360m^3 of water storage will be included, sufficient to mitigate a 1:30 year return period storm event.

Highway Works

3.2.26. A number of amendments to the existing highway network around the site are proposed. These are shown on drawing 115041-70-14 in Appendix 3.1. These changes are detailed in the Transport Assessment and are described in outline below:

- Dalston Lane is narrowed from two lanes to one at its junction with Kingsland Road, Kingsland High Street and Balls Pond Road to enable the widening of the footways either side to improve safety and access to the proposed station.

- A new signalised junction from the proposed bus station to Kingsland Road to include pedestrian facilities on all junction arms. The signals are to be linked to the existing traffic management system.

- The signalisation of the Kingsland Road/Forest Road junction to reduce delay to buses entering the bus station. Pedestrian facilities would be provided on all arms; the signals are to be linked to the existing traffic management system. The existing northbound bus stop to the north of this new junction will be removed, as all buses would use the bus station.

- Forest Road would be made one way eastbound between Kingsland Road and the bus station entrance to accord with the wishes of London Buses. This route would be available to all traffic and it removes the right turn ban from Kingsland Road. Works to the bell mouth of Forest Road are proposed to facilitate the use of the junction by articulated buses. Westbound traffic in Forest Road would be rerouted via Dalston Lane or Richmond Road.

- A signalised pedestrian crossing is proposed across Dalston Lane to the west of Roseberry Place to facilitate passengers from the proposed station crossing Dalston Lane to catch eastbound buses at the existing bus stop.

- Due to the provision of pedestrian crossing facilities at the bus station exit and at the Kingsland Road/Forest Road junction, it is proposed to remove the existing pedestrian crossing at Forest Road/Stamford Road. It is also proposed to allow for loading bays on the eastern side of Kingsland Road.

- Parking arrangements along the western side of Roseberry Place are proposed to be amended to allow for the servicing of the proposed development and to provide a taxi rank for five taxis.

3.3. Alternatives to the Development Proposed

Do Nothing

3.3.1. In the absence of the proposed development the site would be partially redeveloped to provide the ELLP station. The permitted railway scheme at the site would entail the provision of a new station and associated platforms and other infrastructure located predominantly within the existing railway cutting. The permitted scheme would provide rail and bus interchange facilities this interchange would be with the existing arrangements of bus stops around the site. Also, while the site is within the designated Dalston town centre and shopping area and over two thirds of the site is located within the core shopping frontage area the permitted scheme would provide little retail.

Alternative Locations

3.3.2. The purpose of the proposed development is to provide an efficient public transport interchange linked to a new Dalston Junction railway station. The proposed development site enables a new station interchange to be provided at an appropriate location without further increasing the development pressures on land nearby. At the same time it provides a quantum of residential and retail development that would contribute to the regeneration of Dalston in a sustainable manner, by reducing the need to use private transport and contributing to the vitality of Dalston. Such provision is consistent with extant and emerging national, regional and local policy. As such, there are no alternative locations to provide such this transport interchange and associated regenerative benefits.

Alternative Uses and Scales of Development at the Site

3.3.3. The constrained nature of the surrounding road network and surrounding intensely development land, along with the limited extent of the TfL land holding means that provision of improved transport interchange facilities could only be provided above the existing railway cutting. However, the proposed development must be designed to ensure the railway and station beneath can be implemented free of any constraints. Not only does this mean that structural columns upon which the development sits must be located without affecting the station, but the intersection of the station and the development proposed must be sympathetic to the scheme already permitted. This adds to the cost of the provision of the interchange facility and places constraints on the location of development upon to podium.

3.3.4. It is evident that not all of the podium area is required for bus and rail stations interchange facilities. The remainder could, in theory be used for a range of other uses. However, the provision of the podium and improved transport interchange along with consequential changes to the ELLP scheme would cost in the order of £35.5 million. Other less intensely developed and/or less commercially valuable uses would be unable to support the cost of the podium structure.

3.3.5. The inclusion of retail and residential uses on the site is necessary to help fund the cost of the podium. The proposed development has been configured to provide the required value of development while retaining a scale that can be considered acceptable within policy and environmental constraints of the site. Alternative uses have been considered including various employment uses. However, it is unlikely that these uses would generate sufficient revenue to offset the costs.

3.3.6. With these considerations in mind, the alternative layouts and scales of buildings on the site are limited. The amenity of existing buildings located on the east and west sides of the proposed development site were an important consideration and the result is that the majority of development could only be located along the eastern side of the site.

3.3.7. The height of the various buildings has been given significant consideration. Overall, the design has allowed sufficient development to ensure the proposed development is

financially viable. This has led to the inclusion of a single tall building, the location of which has been carefully considered to minimise its overshadowing effects whilst providing a landmark for the station and interchange. These issues are considered in detail later in this document.

3.3.8. Overall, the proposals are considered to reflect an efficient development for the site that improves transport interchange facilities and contributes to regeneration aspirations within the Borough.

4. Implementation and Phasing

4.1. Introduction

4.1.1. The construction of the proposed development will be influenced by the construction of the ELLP works in the railway cutting and also the construction of the anticipated redevelopment of the Dalston Lane South proposals. As the ELLP scheme is permitted and construction work is scheduled to begin in 2006, it is clear that the ELLP scheme will influence the baseline conditions that should be taken into account and applied to the assessment of the proposed development.

4.1.2. The ELLP scheme seeks to increase accessibility in areas relatively poorly served by public transport. Phase 1 of the project provides significant new transport capacity for Dalston. Phase 2 will provide a northern extension to the East London Line through the London Borough of Hackney to Highbury and Islington station in Islington Borough. This extension will run predominantly in a former railway corridor and in the vicinity of the application site this corridor runs in a cutting.

4.1.3. As referred to above the ELLP permission for Dalston Junction station is flexible. However, the Reference Design scheme identifies the elements of the station can be expected to contain and the likely alignment of station areas, access routes, platforms and railway lines (see Appendix 1.4). The permitted Dalston Junction scheme, in the absence of the proposed development will include the following:

- Demolition of any remains of the original station and provision of a covered station area within the existing cutting;
- Clearance of the cutting and bulk excavation in it down to the track bed formation level;
- Refurbishment of the western, eastern and northern cuttings retaining walls and the northern portals;
- Installation of railway track bed and track;
- Provision of a surface level access from Dalston Lane with stair and lift access to the station facilities and platforms, which would be located in the cutting; and
- Provision of two (circa 110m long) platforms with canopies above approximately 3m in height.

4.2. Construction Scheme Relationships

4.2.1. The anticipated construction programme and methodology for the proposed development is integrated with that of the ELLP works to the railway route and station facilities. The close physical relationship between these works results in the need to construct the podium element of the proposed development and the permitted station works as one construction activity. Therefore the consideration of the construction of the proposed development divides the development into two parts. These are the ‘station works’ and the ‘air rights’ developments.

4.2.2. The station works include the already permitted railway works, the podium with foundations, supports, demolition of the snooker hall, waterproofing and finishes, station buildings at street level, the bus station and the removal and replacement of the Forest Road Bridge. It would also include the provision of basement areas along the western side of Roseberry Place to the north and south of the retained cottages.

4.2.3. The air rights development comprises the retail and residential development buildings on the

podium and along the western side of Roseberry Place.

4.3. Construction Programme

4.3.1. The construction timetable is included in Appendix 4.1. It is anticipated that the design and build contract for the station works described above would be confirmed in the winter of 2006. The contract will require completion for all the contracted works at a date to allow the opening of the station by mid October 2009.

4.3.2. The construction of the podium is programmed to take place from mid October 2006 through to August 2008. The northern section being constructed from the north in a southward direction between October 2006 and June 2008 and the southern part of the podium constructed from its northern end in a southward direction between November 2006 and August 2008. It is envisaged that the required works to the Forest Road Bridge that are described below will be carried out between November 2006 and April 2008.

4.3.3. It is evident from this that construction of these elements would occur simultaneously for most of their construction periods. Works to the railway station itself would begin in June 2008 and continue through to October 2009 at which point the station would be opened for use. The bus station would be constructed over 9 months from July 2008 and March 2009 at which point it would be opened for use.

4.3.4. The timescale for the delivery of the air rights scheme is more flexible as the delivery of this development will be by a third party developer. However, it is anticipated that any developer would wish to progress the development promptly and therefore it is envisaged that the air rights scheme would be developed as soon as the station works allow. It is therefore anticipated that works on the air right northern element would begin in June 2008 with completion in March 2010. Construction of the southern element of the air rights scheme is envisaged to be undertaken between August 2008 and February 2011.

4.3.5. As the station works and ELLP works are programmed to be completed in October 2009 the assessments have considered the station to be operational in 2010. The noted above delivery of the air rights element of the proposal will be by a party other than TfL. The developer has not yet been identified and therefore, while the programme for the delivery of the scheme by early 2011 is considered to be the likely delivery timescale the assessment year for the operation of the scheme has been taken to be 2012.

4.4. Method of Working

Preliminary Works

4.4.1. There will be the need for some works to be carried out in advance of the main construction activities. These advance works would comprise the permanent diversion of services along Roseberry Place, the erection of a temporary services bridge across the track bed at Forest Road and the temporary diversion of Forest Road services onto this bridge, and site clearance to form a piling platform and allow raft formation in the northern part of the site in the area of the Cross Rail tunnels exclusion zone. These works would also include the erection of site hoarding at the top of the boundary retaining walls. This hoarding could be designed to act as a noise attenuation barrier. It would also limit the spillage of artificial light from the site.

The Main Construction Works

4.4.2. In order to create an access to the bus station from the south it is necessary to replace the existing Forest Road Bridge to allow access to the podium. This is a result of the existing bridge crossing the railway route with a single span reinforced concrete through girder bridge with a crest height above the level required.

4.4.3. The demolition of the bridge is expected to be by cutting the structure rather than explosive demolition. Once the replacement bridge structure has been put into place service diversions can be removed and original routings reinstalled. Forest Road would be required to be closed for the duration of these works.

4.4.4. A site investigation of the area of the site to the west of Roseberry Place would be undertaken to determine the amount of full extent of contamination on the site and determine the appropriate means by which to manage its removal.

4.4.5. Land drainage would be installed under the raft area in the northern section of the site and a reinforced concrete raft installed. At the same time in the central and southern portions of the site bored piles would be employed and pile caps and the basement slab would be formed. In the southeast corner of the site secant piles would be used along the site boundary rather than sheet piling. Walls and columns and the podium beams and slab would then be constructed using cast in-situ concrete along with the basement areas to the west of Roseberry Place.

4.4.6. Once the above works have been completed it will be possible to continue the construction works both above and below the podium simultaneously. These works would include the waterproofing and finishes to the podium, drainage to the central and southern parts of the podium, demolition of the snooker club building on Kingsland Road to allow bus egress from the podium, construction of the station buildings and construction of the bus station.

4.4.7. For the construction of these station works it is anticipated that concrete would be batched to the south of the site. The batching plant would be located at track bed level outside the site near the Richmond Road overbridge. Concrete would be pumped to the location of use. It is envisaged that the piles to be used would be 900mm by 1200mm bored reinforced concrete piles approximately 25m in length. The in-situ pile caps, columns and walls would be of standard construction including the use of concrete pokers to ensure comprehensive distribution of the concrete around the reinforcing steel within the shuttering.

Air Rights Development

4.4.8. On completion of the podium structure access would be available to facilitate the construction of the air rights development. This would be of conventional construction being concrete framed on the southern art of the site and steel framed on the northern part.

4.5. Environmental Management during the Construction Phase

Management Details

4.5.1. Construction of the station works would be carried out under ELLP Code of Construction Practice (CoCP) that will be separately agreed with the Council. All further references in this section are to the air rights development.

4.5.2. For the air rights construction, liaison with the Council would be maintained throughout the construction process. The main contractor would be required to nominate a representative to act as a contact point with the Council, to ensure that any construction issues that may arise are dealt with effectively and promptly. Sub-contractors would also nominate or appoint a suitable team member responsible for liaison with the lead contractor's representative and to ensure that sub-contractor construction activities are managed effectively.

4.5.3. Details of the proposed methodology for achieving this and procedures to follow would be set out in a Construction Environmental Management Plan (CEMP). This would be held on-site and could be viewed by all interested parties with contact names, details, lines of communication, and mitigation action plans. All site personnel who would be made aware of

its existence and undertake to adhere to the guidance.

Site Access and Traffic Routing

4.5.4. Kingsland Road and Dalston Lane are both part of the trunk road network of the inner part of northeast London. Therefore site access directly from these roads will be avoided if possible. In addition, the locations at which access is taken to the track bed will influence traffic routing adjacent to the site. Access to the site at trackbed level is best achieved along the trackbed under Forest Road Bridge from the south with access from the street network via a temporary ramp at the Richmond Road overbridge.

4.5.5. The nature of the Forest Road Bridge demolition is such that the access through the bridge site could be maintained during the demolition process. In addition, direct access to the cutting could be achieved via one or more temporary ramps from Roseberry Place until such time that the construction works required removal of the ramp(s). Access could then be switched to a street level point across a part-completed podium slab. This would be in addition to continued access at trackbed level from the south. In addition, materials could be offloaded directly from one or more loading bays on Roseberry Place. Once the new Forest Road Bridge and transfer plate have been completed there will be access to the Air Rights Development construction at transfer plate level to/from the Forest Road Bridge.

4.5.6. The routes taken to the site will need to be agreed with the Council. However it is anticipated from the above that construction traffic would approach the site and leave the area via the A10 Kingsland Road to travel north and south and the A1207 Graham Road and A104 Balls Pond Road to the A1 Holloway Road to travel east and west respectively. In the vicinity of the site access to the site would be taken via Richmond Road to the south and from Roseberry Place from the north. It is anticipated that as the construction process progresses it also be necessary to gain access via Forest Road and Beechwood Road.

On Site Traffic and Dust Management

4.5.7. To reduce dust and particulate matter emission from the site the following measures would be implemented:

- Site access routes would be watered as necessary using a water bowser and surfaces kept in good order. Additionally, dampening of exposed soil and material stockpiles using sprinklers and hoses when necessary. This would prevent dust and particulate matter becoming mobile.

- Regular inspection and, if necessary, cleaning of local highways and site boundaries to check for dust deposits (and removal if necessary). Additionally, a visual inspection of the site perimeter to check for dust deposition (evident as soiling and marking) on vegetation, cars and other objects and taking remedial measures if necessary.

- Stockpiles of materials should be located as far as possible from sensitive properties, taking account of prevailing wind directions and seasonal variations in the prevailing wind.

- Observation of wind speed and direction prior to conducting dust-generating activities to determine the potential for dust nuisance to occur, avoiding potentially dust-generating activities during periods when wind direction may carry dust into sensitive areas and avoiding dust-generating operations during periods of high or gusty winds.

- Windbreak netting should be positioned around materials stockpiles and vehicle loading/unloading areas, as well as exposed excavation and material handling operations. Additionally, minimise surface areas of stockpiles (subject to health and safety and visual constraints regarding slope gradients and visual intrusion) to reduce

area of surfaces exposed to wind pick-up.

- Scaffolding should be covered with polythene sheets to form a barrier between the site and the surrounding locality.

- Additionally, construction machinery would include the following measures:

- Vehicles carrying loose aggregate and workings would be sheeted at all times. Construction operatives would use appropriately designed vehicles when handling material and design controls for the use of construction equipment and vehicles. Additionally it should be ensured that all construction plant and equipment is maintained in good working order.

- Short-term releases may occur during start up of diesel engines, etc. Regular visual checks and routine maintenance should be applied in accordance with the plant specification, to minimise releases. Faulty site plant should be decommissioned until repairs have been carried out and it has been tested and found to be operating satisfactorily.

- On-site cement and concrete batching (if required) would be undertaken in enclosed areas, with suitable water dowsing and wind shielding measures applied as appropriate.

- On-site aggregate handling should be carried out in enclosed areas and transfer should be completed in a way that minimises the requirements to deposit material from height.

- It is particularly relevant to ensure that site clearance materials, which may contain contamination due to previous uses of the site, are safely removed from the site.

Hours of Operation

4.5.8. It is anticipated that hours of working would be 8.00am to 6.00pm Monday to Friday and 8.30am to 2pm on Saturday. No working would be undertaken on Sunday or bank holidays. There will be a need for extended working hours during the piling phase of the development to ensure that piles are completed in one pour. However, such extended working would be limited as far as possible by detailed management of the pile construction programme.

4.5.9. In order to maintain these working hours, the contractor(s) may require a period of up to half an hour before and up to one hour after normal working hours for start up and close down of activities. This does not include operation of plant or machinery giving rise to noise likely to disturb nearby residents or the arrival of any HGV at site before 07:30 hrs.

Pollution Controls

4.5.10. All on site potential sources of pollution will be assessed and managed in such a way as to limit the potential for pollutant escapes. Pollution Prevention Guidance from the Environment Agency on the safe storage of fuels and oils will be implemented.

4.5.11. Piles will be designed such that they do not extend down into the Thanet Sand beneath the site. This and the method of piling envisaged would minimise the risk of the proposed piling acting as a conduit for the downward migration of any contaminated material.

Site Offices

4.5.12. These would be located at ground level in the southeast corner of the site, bounded by Roseberry Place and Forest Road. When sufficient podium is completed these offices would be relocated onto an area of the slab, if the initial siting was needed for development

the plant compound would be located at track bed level within the site.

Construction Traffic Air Emissions

4.5.13. Construction traffic would use a predefined route agreed with the relevant authorities. Discussions would be held with the Council in order to establish the most suitable access route for site traffic. Vehicle movements would where ever possible avoid peak hours on the local road network

Construction Noise Emissions

4.5.14. CEMP would also require noise emissions to the limited and the following measures would be implemented:

- General induction training for site operatives and specific training for staff having responsibility for particular aspects of controlling noise from the site.
- A noise monitoring / auditing programme.
- Procedures for ensuring compliance with statutory or other identified noise control limits and that procedures for ensuring that all works are carried out according to the principle of “Best Practicable Means” as defined in the Control of Pollution Act 1974. “Best Practical Means” would include the use of most environmentally acceptable and quietly operating plant and equipment appropriate to the works with emission levels limited to relevant EC Directive/UK Statutory Instrument levels and levels quoted in BS5228. Intermittently operating plant should be shut down in the intervening periods between operation. For example:
  - Any compressors brought on to site would be silenced or sound reduced models fitted with acoustic enclosures.
  - All pneumatic tools would be fitted with silencers or mufflers.
  - The excavation and demolition of existing structures would, wherever possible, be undertaken without the use of pneumatic breakers.
  - Wherever possible, the use of hydraulic attachments or other means of crushing concrete and hard materials would be used in preference to pneumatic breakers. Where the use of impact hammers is necessary, their attachment to larger and heavier excavators often can reduce the level of vibration.
- Care would be taken when erecting or striking scaffolds to avoid impact noise from banging steel. All operatives undertaking such activities would be instructed on the importance of handling the scaffolds to reduce noise to a minimum.
- Deliveries would be programmed to arrive during daytime hours only. Care would be taken when unloading vehicles to minimise noise. Delivery vehicles would be routed so as to minimise disturbance to local residents. Delivery vehicles would be prohibited from waiting on the highway or within the site with their engines running.
- No radios or music would be played on the site.
- The maintenance and location of plant would be such as to minimise noise levels and screening would be used as necessary. The use of particularly noisy plant equipment would be restricted to between agreed times. Adherence to noise limits would be included in contractual agreements with contractors.

5. Air Quality

5.1. Introduction

5.1.1. This chapter addresses the potential effects the proposed development may have on the air quality of the area surrounding the proposed development site. The assessment includes a summary of the current air quality conditions found within the area and identifies mitigation measures where appropriate for negative effects that may arise due to the proposed development.

5.2. Assessment Criteria and Methodology

Air Quality Objectives and Limit Values

5.2.1. Air quality limit values and objectives are quality standards for clean air. They can be used as assessment criteria for determining the significance of any potential changes in local air quality resulting from the development proposals.

5.2.2. European Union (EU) air quality policy sets the scene for national policy. The air quality 'framework' Directive on Ambient Air Quality Assessment and Management came into force in September 1996 and is intended as a strategic framework for tackling air quality consistently, through setting European-wide air quality limit values in a series of daughter directives, superseding and extending existing European legislation. The first four daughter directives have already been placed into national legislation.

5.2.3. In a parallel national process, the Environment Act was published in 1995[9]. The Act required the preparation of a national air quality strategy setting air quality standards and objectives for specified pollutants and outlining measures to be taken by local authorities (through the system of Local Air Quality Management (LAQM) and by others "to work in pursuit of the achievement" of these objectives. A National Air Quality Strategy (NAQS) was published in 1997 and subsequently reviewed and revised in 2000, as the Air Quality Strategy for England, Scotland, Wales and Northern Ireland and an addendum to the Strategy was published in 2002. The objectives which are relevant to local air quality management have been set into Regulations (Air Quality Regulations 2000 and 2002).

5.2.4. Some pollutants have standards expressed as annual average concentrations due to the chronic way in which they affect health or the natural environment (i.e. effects occur after a prolonged period of exposure to elevated concentrations) and others have standards expressed as 24-hour, one-hour or 15-minute average concentrations due to the acute way in which they affect health or the natural environment (i.e. after a relatively short period of exposure). Some pollutants have standards expressed in terms of both long-term and short-term concentrations (e.g. nitrogen dioxide and PM_{10}).

5.2.5. Table 5.1 sets out these EC air quality limit values and national air quality objectives for the main pollutants relevant to this study. The relevant pollutants were identified from the Design Manual for Roads and Bridges[10] (DMRB). This suggests that five pollutants are assessed (benzene, 1,3-butadiene, carbon monoxide, nitrogen dioxide (NO_2) and fine particulate matter (PM_{10})). However, the review and assessment process for the London Borough of Hackney showed that only concentrations of NO_2 and PM_{10} are likely to exceed the objectives. Therefore, the study concentrated on these two pollutants.

[9] HMSO. (1995). The Environment Act.

[10] Highways Agency. (February 2003). Volume 11 Environmental Assessment, Section 3 Environmental Assessment Techniques, Part 1 Air Quality.

5.2.6. Performance against these objectives is monitored where people are regularly present and might be exposed to air pollution and it is the responsibility of each local authority to undertake such duties. Each local authority is required to undertake a review and assessment of local air quality. The process considers the current air quality situation and the likely future air quality situation, assessing whether the prescribed objectives are likely to be achieved by their target dates.

Table 5.1: UK and EU Air Quality Standards and Guidelines

Pollutant	Averaging Period	Limit Value/Objective	Date for Compliance	Basis
Nitrogen dioxide	1 hour mean	200µg/m^3, not to be exceeded more than 18 times a year (99.8th percentile)	31st Dec 2005	UK
			1st Jan 2015*	EC
	Annual mean	40µg/m^3	31st Dec 2005	UK
			1st Jan 2015*	EC
Fine particulates (PM_{10}) Measurement technique: Gravimetric	Daily mean	50µg/m^3, not to be exceeded more than 35 times a year (90th percentile)	31st Dec 2004	UK
			31st Dec 2009* (Stage 1)	EC
	Annual mean	40 µg/m^3	31st Dec 2004	UK
			31st Dec 2009* (Stage 1)	EC

Note * Not yet included in Regulations, subject to review

5.2.7. Proposed changes to the EC limit values have recently been announced[11]. These changes will result in the extension of 5 years to the attainment dates for all the limit values and the proposed Stage 2 limit values for PM_{10} have been abandoned.

Planning Policy

5.2.8. Planning policies particularly relevant to air quality management are set out in PPG13 'Transport'[12] and PPS23 'Planning and Pollution Control'[13], and in the air quality guidance notes: Local Air Quality Management Policy Guidance Use Planning[14] and the National Society for Clean Air (NSCA) Guidance – Development Control: Planning for Air Quality[15].

5.2.9. A revised version of PPG13 was published in March 2001, updating the Government's transport planning policies, with the objectives of delivering an integrated transport policy, extending transport choices and securing mobility in a way that supports sustainable development. The aim is to integrate planning and transport at a number of levels to promote more sustainable transport choices (for people and freight), to promote accessibility to services and to reduce the need to travel, especially by car. PPG13 states that local air quality is a key consideration in the integration between planning and transport. This is particularly relevant in areas where the Government's national air quality objectives are not expected to be met and air quality action plans are formulated. The PPG advises that well designed traffic management measures are able to contribute to reducing local air pollution and improving the quality of local neighbourhoods.

[11] Provisional Directive: Ambient Air Quality and Cleaner Air for Europe, COM (2005) 447.

[12] HMSO. (1997). Planning Policy Guidance Note 13: Transport.

[13] HMSO. (2004). Planning Policy Statement 23: Planning and Pollution Control

[14] DEFRA. (February 2003). Part IV of the Environment Act 1995: Local Air Quality Management: Policy Guidance, LAQM.PG(03), Department for Environment, Food and Rural Affairs.

[15] National Society for Clean Air (November 2004) Development Control: Planning for Air Quality.

5.2.10. PPS23 replaces PPG23 and is intended to complement the new pollution control framework under the Pollution Prevention and Control Act 1999 and The Pollution Prevention and Control (England and Wales) Regulations 2000. PPS23 sets out the Government's core policies and principles on land use planning. It contains an Annex on 'Pollution Control, Air and Water Quality' which considers the links between the land use planning and pollution control systems and how these interactions should be dealt with in planning. Policies and advice contained within PPS23 (including Annexes) should be taken into account in preparing policies relevant to potentially polluting developments or development near to polluted or potentially polluting sites by Regional Planning Bodies, Regional Spatial Strategies and Local Planning Authorities and in determining applications for planning permission.

5.2.11. Policy guidance note LAQM.PG(03) provides additional guidance on the links between transport and air quality. LAQM. PG(03) describes how road transport contributes to local air pollution and how transport measures may bring improvements in air quality. Key transport related Government initiatives are set out, including regulatory measures and standards to reduce vehicle emissions and improve fuels, tax-based measures and the development of an integrated transport strategy.

5.2.12. Local Air Quality Management Policy Guidance (LAQM.PG(03)) also provides guidance on the links between air quality and the land use planning system. The guidance advises that air quality considerations should be integrated within the planning process at the earliest stage, and is intended to aid local authorities in developing action plans to deal with specific air quality problems and create strategies to improve air quality generally. It summarises the main ways in which land use planning system can help deliver air quality objectives.

5.2.13. The recently produced National Society for Clean Air (NSCA) Guidance – Development Control: Planning for Air Quality responds to the need for closer integration between air quality and development control. It provides a framework for air quality considerations within local development control processes, promoting a consistent approach to the treatment of air quality issues within development control decisions.

5.2.14. The guidance includes a method for assessing the significance of the impacts of development proposals in terms of air quality and how to make recommendations relevant to the development control process in light of this assessment. The need for early and effective dialogue between the developer and local authority is identified to allow air quality concerns to be addressed as early in the development control process as possible. The guidance also provides some clarification as to when air quality constitutes a material consideration.

5.2.15. The London Plan sets out, in Policy 4A.6 (Improving Air Quality), London-specific measures to integrate planning and transport and other measures to deliver air quality improvements through the strategic design and location of new developments.

5.2.16. The London Plan states that:

"Boroughs should implement the Mayor's Air Quality Strategy and achieve reductions in pollutant emissions by:

- *Improving the integration of land use and transport policy and reducing the need to travel especially by car;*
- *Promoting sustainable design and construction;*
- *Identifying environmental constraints on polluting activities to ensure protection of local air quality, setting out criteria in respect of different pollutants against which plans and policies can be appraised and proposals assessed;*
- *Ensuring at the planning application stage, that air quality is taken into account along with other material considerations and that formal air quality assessments are undertaken where appropriate, particularly in designated Air Quality Management*

Areas;

- *Seeking to reduce the environmental impacts of transport activities by supporting the increased provision of cleaner transport fuels, particularly with respect to the refuelling infrastructure; and*
- *Working in partnership with relevant organisations, taking appropriate steps to achieve an integrated approach to air quality management and to achieve emissions reductions through improved energy efficiency and energy use."*

5.2.17. The GLA has produced an Air Quality Strategy for London[16], which contains proposals and policies for implementing the national strategy's policies and for achieving national air quality objectives in London. It focuses on the main pollutants of concern in London – nitrogen dioxide (NO_2) and particulate matter (PM_{10}). The main source of emissions is road traffic and the main focus of the Strategy is therefore on reducing traffic-related emissions, primarily through the promotion of cleaner vehicles and technologies.

5.2.18. In addition to an Air Quality Strategy, the Greater London Authority Act 1999 requires the Mayor of London to publish a number of other London-wide strategies and the Mayor is also producing a number of non-statutory strategies. These include a Transport Strategy (published in 2001), and an Energy Strategy (published in February 2004). These strategies also contain measures to improve air quality.

5.2.19. The Town and Country Planning Act 1990 as amended and the Development Plan Regulations together require local authorities to include policies in their development plans to improve the physical environment. The Hackney Unitary Development Plan (adopted in June 1995) includes policy EQ42 that relates specifically to air pollution. It states that the council will not permit development proposals that would give rise to unacceptable levels of atmospheric pollution. This policy is supported by the use of planning powers that will discourage any proposals for industrial processes or commercial activities that would contribute to air pollution. Other policies within the UDP seek to ameliorate the effects of transport on the environment by ensuring that the development proposals assess their impact on existing traffic and congestion.

The Assessment

5.2.20. The overall approach to the air quality assessment comprises:

- A review of the existing air quality in the area;
- An assessment of the potential changes in air quality arising from the construction and operation of the proposed development; and
- Formulation of mitigation measures, where appropriate, to ensure any adverse effects on air quality are minimised.

5.2.21. The existing air quality situation has been reviewed using data provided in the local air quality review and assessment reports, produced by the Council. Consultation has been carried out with an Environmental Health Officer (EHO) at the Council. This determined the pollutants to be assessed as NO_2 and PM_{10}. These pollutants have already been identified as exceeding the air quality objectives (with AQMAs being declared for both). Supplementary to this the extent of the traffic network was confirmed as was the use of an appropriate background monitoring site and meteorological year for the model.

5.2.22. The construction effects have been assessed through a qualitative assessment of potential sources of air pollutant emissions from construction activities and through the formulation of appropriate mitigation and control measures to be placed within a formal CEMP.

[16] Mayor of London. (2002). Cleaning London's Air: The Mayor's Air Quality Strategy. Greater London Authority, London.

5.2.23. Operational traffic effects have been assessed using the modelling programme, CALINE4, to forecast pollution concentrations with and without the proposed extension. CALINE4, an update of CALINE3 (recommended by the US Environmental Protection Agency) is a dispersion model which predicts air pollutant concentrations near roadways. Air quality modelling results were then compared with relevant air quality criteria.

Significance Criteria

5.2.24. The assessment of potential and residual effects has used a seven-level scale of significance as detailed below in Table 5.2. These criteria have been applied to the quantified traffic effects.

Table 5.2 Description of Seven Level Scale of Significance Criteria

Major Adverse Effect	Major detrimental effect on local air quality, in relation to short-term and long-term local air quality standards (national objectives and EC limit values). Predicted environmental concentrations (i.e. scheme contribution plus background) exceed the standard with an increase in concentration between no-scheme and with scheme scenarios of greater than 10%.
Moderate Adverse Effect	Moderate detrimental effect on local air quality, in relation to short-term and long-term local air quality standards (national objectives and EC limit values). Predicted environmental concentrations (i.e. scheme contribution plus background) exceed the standard with an increase in concentration between no-scheme and with scheme scenarios of between 2.5% and 10%.
Minor Adverse Effect	Slight detrimental effect on local air quality, in relation to short-term and long-term local air quality standards (national objectives and EC limit values). Predicted environmental concentrations (i.e. scheme contribution plus background) exceed the standard with an increase in concentration between no-scheme and with scheme scenarios of less than 2.5%; or predicted environmental concentrations below the standard with an increase in concentration between no-scheme and with scheme scenarios of greater than 2.5%.
Negligible	No appreciable impact on local air quality. Predicted environmental concentrations below the standard with an increase or decrease in concentration between no-scheme and with scheme scenarios of less than 2.5%.
Slight Beneficial Effect	Slight beneficial effect on local air quality, in relation to short-term and long-term local air quality standards (national objectives and EC limit values). Predicted environmental concentrations (i.e. scheme contribution plus background) exceed the standard with a decrease in concentration between no-scheme and with scheme scenarios of less than 2.5%; or predicted environmental concentrations below the standard with a decrease in concentration between no-scheme and with scheme scenarios of between 2.5% and 10%.
Moderate Beneficial Effect	Moderate beneficial effect on local air quality, in relation to short-term and long-term local air quality standards (national objectives and EC limit values). Predicted environmental concentrations (i.e. scheme contribution plus background) exceed the standard with a decrease in concentration between no-scheme and with scheme scenarios of greater than 2.5%; or predicted environmental concentrations below the standard with a decrease in concentration between no-scheme and with scheme scenarios of between 10% and 25%.
Major Beneficial Effect	Substantial beneficial effect on local air quality, in relation to short-term and long-term local air quality standards (national objectives and EC limit values). Predicted environmental concentrations below the standard with a decrease in concentration between no-scheme and with scheme scenarios of greater than 25%.

Environmental Risk Assessment

5.2.25. The London working group on Air Pollution Planning and the Environment (APPLE) recently published guidance on undertaking an assessment of risk of exposure to pollutants emitted from a construction site. The guidance[17] is a London wide document that contains input from many London Boroughs.

5.2.26. This document provides a risk assessment matrix, as shown below in Table 5.3, which ranks the severity of impact on a five point scale together with a risk rating factor. This has been used to assess the significance of the potential construction air quality impacts.

Table 5.3: Example of APPLE Risk Assessment Matrix

Severity of impact on receptors		**Probability of releasing dust or particles**				
		Improbable	**Unlikely**	**Likely**	**Very likely**	**Almost certain**
		1	**2**	**3**	**4**	**5**
Negligible	1					
Slight	2					
Moderate	3					
High	4					
Very high	5					

	High Risk
	Medium Risk
	Low Risk

5.2.27. Additionally, the recently published National Society for Clean Air and Environmental Protection (NSCA) guidance provides an approach for assessing the significance of air quality impacts associated with a given development. This approach uses textual descriptors of significance which are contained within a flow chart as shown in Figure 5.1.

5.2.28. The approach assumes that the air quality impacts have been assessed and quantified. The significance of the impacts is then assessed through a series of questions with closed (yes and no) answers. Each question is addressed in descending order until the arrow points to one of the outcomes in the right hand column. This gives the relative priority which air quality considerations should be afforded with respect to the development proposal.

5.2.29. Existing or baseline ambient air quality refers to the concentration of relevant substances that are already present in the environment – these are present from various sources, such as industrial processes, commercial and domestic activities, traffic and natural sources. This section describes the existing ambient air quality situation in the area of the proposed development.

5.2.30. The following data sources have been employed in this assessment:

- Review and Assessment of Air Quality for Hackney (February 2004);
- Consultation Draft Air Quality Action Plan for Hackney (February 2004);
- Unpublished Updating and Screening Assessment for Hackney (July 2005);
- National Air Quality Archive; and

[17] Draft London Code of Practice – Part 1: The Control of Dust from Construction, May 2005

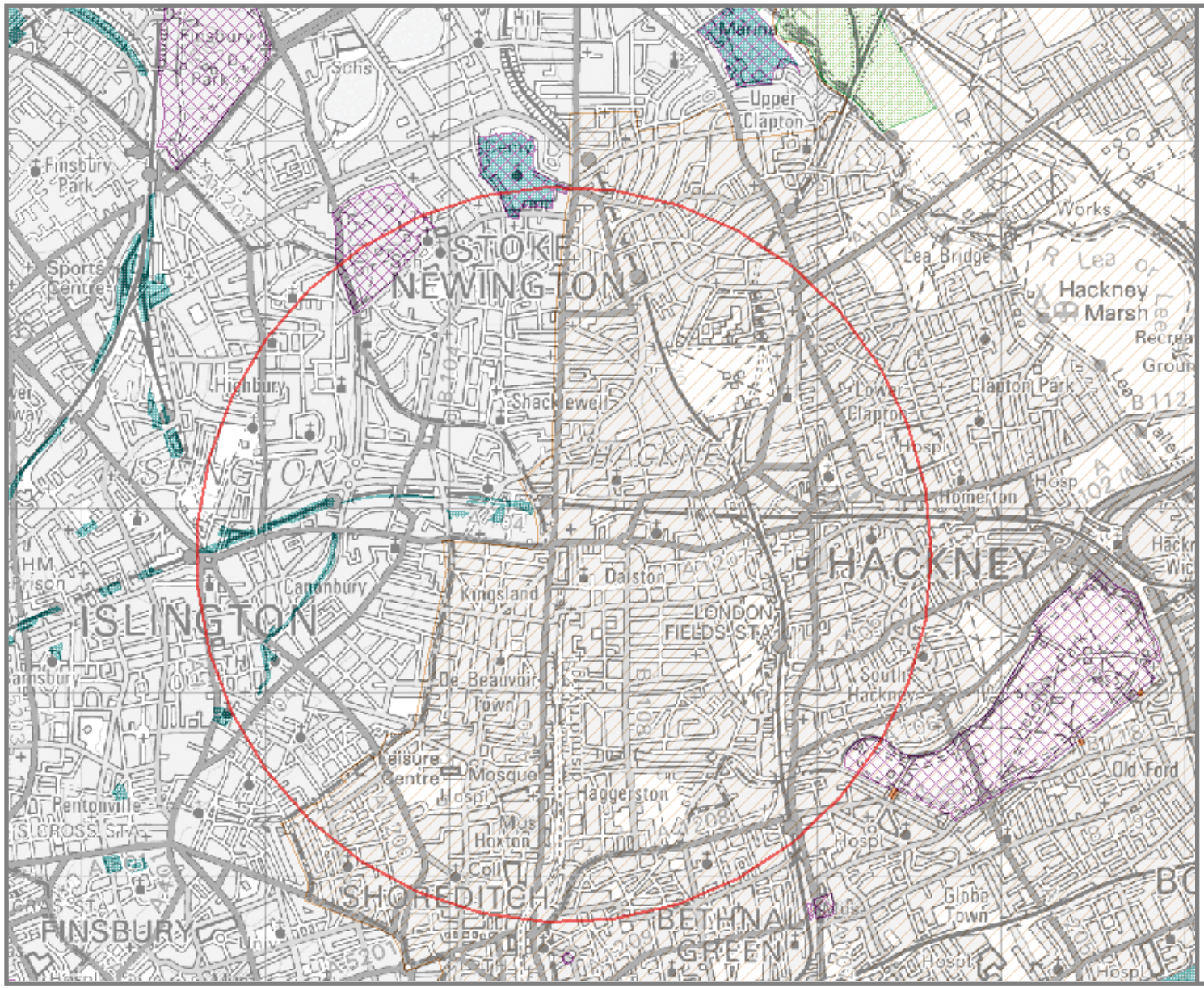

Figure 2.3: Environmental Protection Designations within 1km of the Proposed Development Site.

Source: http://www.magic.gov.uk

HEPHER DIXON
PLANNING AND REGENERATION

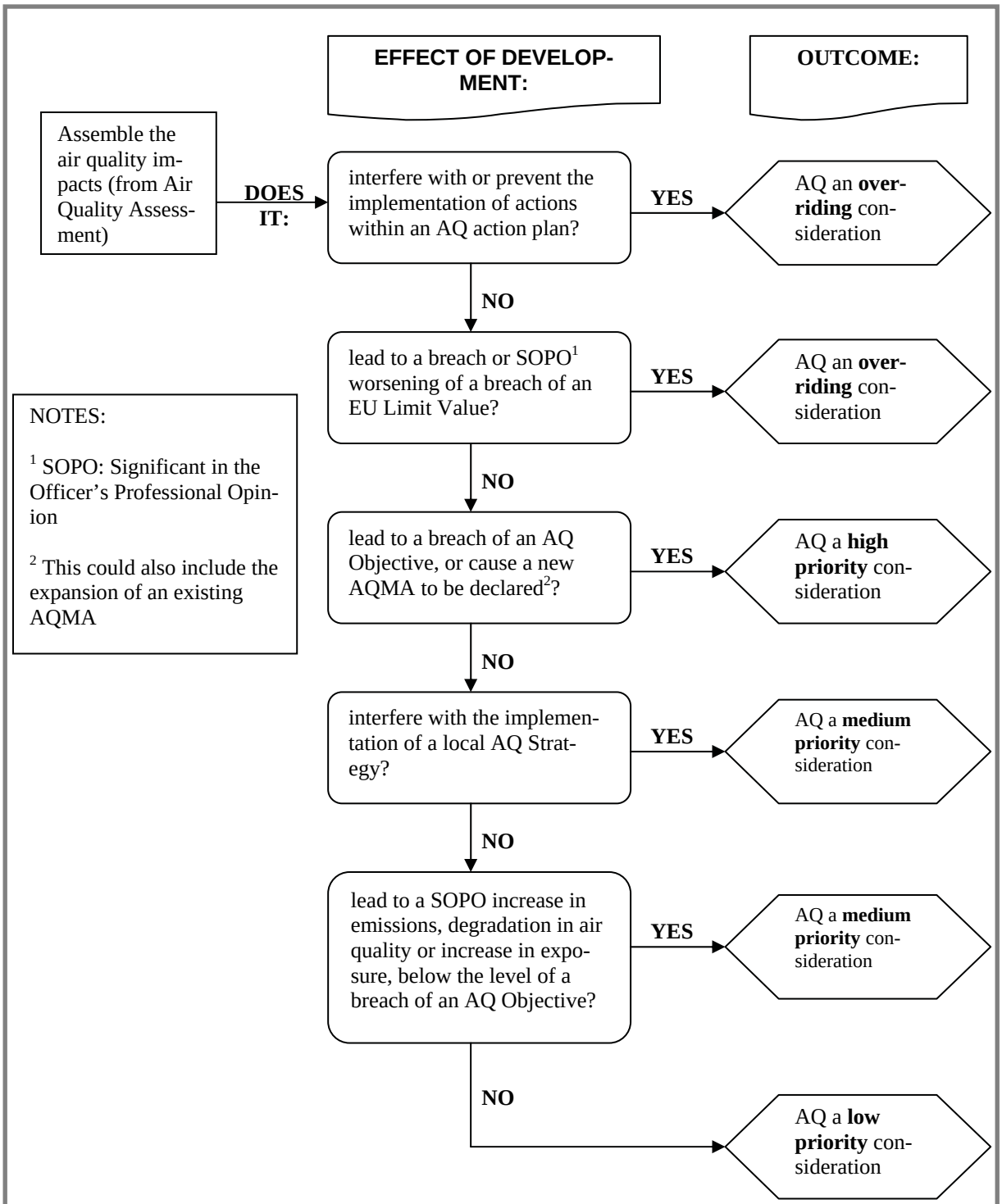

Figure 5.1: Assessment of Significance of Air Quality Impacts

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- Correspondence with an Environmental Health Officer at the Council.

5.3. Baseline Conditions

Air Pollution Sources – Industrial Sources

5.3.1. Industrial air pollution sources are regulated through a system of operating permits or authorisations, requiring stringent emission limits to be met and ensuring that any releases are minimised or rendered harmless. Regulated (or prescribed) industrial processes are classified as Part A or Part B processes. Part A processes, regulated through the Integrated Pollution Prevention and Control (IPPC) system (EC Directive 96/91/EC on Integrated Pollution Prevention and Control) fall into two categories - Part A1 processes which are regulated by the Environment Agency and Part A2 processes which are regulated by the local authorities. Part A processes have the potential for release of prescribed substances to air, land and water, and as such require an IPPC permit to operate. Part B processes are those regulated by the local authority through the Pollution Prevention and Control (PPC) system under the Pollution Prevention and Control (England and Wales) Regulations 2000. Part B processes are smaller in scale than Part A processes and have the potential for release of prescribed substances to air only, requiring a PPC authorisation or permit to operate.

5.3.2. The Borough has no Part A processes within its boundaries. Smaller Part B processes located within the Borough include 13 service stations, one dry cleaners, one cement batching works, a timber associated process and two waste oil burners (under 0.4Mw). Those located within close vicinity of the development are shown in Table 5.4 and are predominantly petrol stations. The two waste oil burners have negligible emissions and so do not have the potential to emit significant quantities of NO_2 and NO_x.

Table 5.4: Part B Processes within the Vicinity of the Proposed Development

Name	Address	Process	Distance from centre of Proposed Development (m)	OS Grid Reference
The Steam Room	Kingsland Road	PG6/46 (04) Dry Cleaning	1100	533493,183608
JC Motors Ltd	Arbutus Street	PG1/1 Waste Oil Burner (under 0.4Mw)	800	533567,183984
BSD Motors Ltd	Barrett's Grove	PG1/1 Waste Oil Burner (under 0.4Mw)	800	533334,185451
Shacklewell Lane Service Station	Shacklewell Lane	PG1/14 Service Station	1100	533865,185713
Mare Street Service Station	Mare Street	PG1/14 Service Station	1550	534889,184011
Ambassador Service Station	Stoke Newington Road	PG1/14 Service Station	1200	533605,185844
Thames Service Station	Mare Street	PG1/14 Service Station	1500	534870,184067

Road Traffic

5.3.3. Road traffic is a major source of air pollution in the UK. In recent decades, transport atmospheric emissions have become one of the main sources of pollutants in urban areas. The principal pollutants relevant to this assessment produced because of traffic emissions and leading to poor air quality is considered in the Highways Agency guidance to be NO_2 and PM_{10}. Fine particulate matter has been identified as being 'of most concern by the UK

Government's Air Quality Strategy and by UK and EU legislation, being of greatest relevance to human health. The fraction of suspended matter that has been considered is PM_{10}; this is the fraction to which the NAQS objective for particulate matter refers.

Local Authority Review and Assessment of Air Quality

5.3.4. As required by the Environment Act 1995, the Council has been evaluating local air quality through the review and assessment process and has determined areas where air quality objectives for NO_2 are likely to be exceeded by their target years. In 2001 the Council declared an Air Quality Management Area (AQMA) for nitrogen dioxide in the south of the Borough.

5.3.5. Following the designation of an AQMA, local authorities are required to undertake a number of tasks, including carrying out a Stage 4 assessment, preparing an Air Quality Action Plan, and reviewing the air quality in the Borough at two yearly intervals. The Stage 4 Review and Assessment in 2004 made use of the increased monitoring data available to make more accurate predictions on which to base air quality management decisions. The Stage 4 Report confirmed the findings of the Stage 3 Report and subsequently the AQMA was increased to cover the whole of the Borough with respect to NO_2 and PM_{10}. A Consultation Draft Action Plan was issued to coincide with this, which includes a range of initiatives and measures to improve the air quality within the AQMA. Key proposed measures include promotion of sustainable transport through park and ride schemes, walk and cycle schemes, improved local bus services through the continued support of the London Bus Priority Network, efficient fuel use and cleaner vehicles for all Council owner vehicles. Additional schemes include roadside vehicle emissions testing and Sustainable Travel Plans. The action plan aims to ensure that new developments encourage the use of sustainable transport and undergo a detailed air quality assessment where needed. Following a review of the proposed measures for the AQMA it is not considered that the proposed development would conflict with or hinder the implementation of any of the proposed actions.

5.3.6. The second round of review and assessment for air quality required an Updating and Screening Assessment of the local air quality. The aim of this stage was to identify any significant changes that may have occurred since the initial Review and Assessment. This concluded since the previous round of Review and Assessment little has changed in terms of air quality within the Borough's boundary and consequently a further Detailed Assessment was deemed unnecessary for any pollutants.

Local Air Quality Monitoring

5.3.7. The Council has been monitoring air quality at Clapton since 1993 and expanded the air quality monitoring programme during 2001, (as a result of the Stage 3 Review and Assessment) to include a second continuous air quality monitoring site at Old Street. This monitoring site is just over 2km south of the proposed development at a busy roadside location; it monitors both PM_{10} and NO_2. A second continuous monitoring site is an urban background monitor approximately 35m from the roadside, located northeast of the proposed development and monitors NO_2.

5.3.8. Air quality monitoring of NO_2 is also undertaken using diffusion tubes at twelve locations throughout the Borough. The urban background site at Britannia is located approximately 1.25km southwest of the proposed development site and a further site at a roadside location on Millfields Road is approximately 1.9km northwest of the proposed development site. The annual means for these sites from recent years for NO_2 are shown in Table 5.5 and for PM_{10} in Table 5.6.

Table 5.5: Annual Mean Nitrogen Dioxide concentrations from Local Monitoring ($\mu g/m^3$)

Monitoring Site	**Type of Site**	**1999**	**2000**	**2001**	**2002**	**2003**	**2004**[18]
Continuous Sites:							
HK4 Clapton	Urban Background	60	50.9	47.9	46.6	50.5	48.4
HK6 Old Street	Roadside	No Data	58.9	No Data	64.2	64.5	60.6
Diffusion Tube Sites:							
Britannia	Urban Background	53.9	35.7	31.4	41.6	34.5	33.9
Millfields Road	Roadside	64.9	35.5	47.1	55.4	59.5	38.8

Table 5.6: Annual Mean PM_{10} Concentrations from Old Street Monitoring Site ($\mu g/m^3$)

	1999	**2000**	**2001**	**2002**	**2003**	**2004**
Annual Mean	No Data	32.6	No Data	40.2	36.5	33.7
Number of Exceedences of 24 hour Mean	No Data	1	No Data	7	40	31

5.3.9. The annual mean objective for NO_2 has been consistently exceeded at the continuous monitoring sites. The exceedences are less consistent from the diffusion tube data, although there have been more exceedences at the roadside site over the recent years. The data for PM_{10} does not show a consistent trend throughout recent years. The 24–hour objective has been met in every year except 2002. These exceedences observed for both pollutants are expected in an area that has been declared an AQMA.

Background Pollutant Mapping

5.3.10. In the National Air Quality Archive operated by the National Environmental Technology Centre (NETCEN), the Department of Environment, Food and Rural Affairs (DEFRA) has produced estimated background air pollution data for 2001 and projections for other years, for several pollutants.

5.3.11. Estimated pollutant concentrations at the nearest background site to the development site for 2005 (baseline year), and 2010 are presented in Table 5.7. The proposed development lies within the grid square 533500, 184500.

Table 5.7: Background Annual Mean Air Pollution Concentration at Proposed Development Site

Pollutant	Units	Annual Mean 2005	Annual Mean 2010
NO2	$\mu g/m^3$	40.3	34.9
PM10	$\mu g/m^3$	24.55	22.4

5.4. Potential Effects

Assessment of Construction Effects

5.4.1. Atmospheric emissions from construction activities will depend on a combination of the potential for emission (the type of activities) and the effectiveness of control measures. In general terms, there are two sources of emissions that will need to be controlled to minimise the potential for adverse environmental effects:

- Exhaust emissions from site plant, equipment and vehicles; and

[18] Data for 2004 for the two diffusion tubes are not bias corrected.

- Fugitive dust emissions from site activities – including contaminated construction dust (any buildings containing asbestos would be demolished under appropriate guidelines as agreed in the CEMP and would only be carried out by the suitable specialists)

5.4.2. The operation of vehicles and equipment powered by internal combustion engines results in the emission of waste exhaust gases containing the pollutants NO_x, PM_{10}, VOCs, and CO. The quantities emitted depend on factors such as engine type, service history, pattern of usage and composition of fuel. The operation of site equipment, vehicles and machinery would result in emission to the atmosphere of un-quantified levels of waste exhaust gases but such emissions are unlikely to be significant, particularly in comparison to levels of similar emissions from road traffic.

5.4.3. The traffic effect of construction of the development would be along the traffic routes employed by haulage vehicles, construction vehicles and employees. The principal construction activities with transportation implications are:

- Removal of materials from demolition of some existing buildings;
- Delivery of materials for new development; and
- Movement of heavy plant.

5.4.4. At present, it is difficult to assess the effect of construction traffic on the sensitive receptors within the vicinity of the development. Entry to the construction site for labour and vehicles will be by dedicated access points only, however, these are still to be agreed however the 'most used' approach roads to the site have been anticipated. Looking at the worst-case scenario in June 2007 (identified as the peak month of construction from the construction programme) if major routes are used there are less significant increases in traffic flows experienced along Kingsland Road, Kingsland High Street and Balls Pond Lane. However, if residential roads such as Roseberry Place, Beechwood Road and Forest Road are used, increases in traffic would be much greater. Therefore, recommendations should be made to ensure that construction traffic is restricted to the main routes within the vicinity of the proposed development and smaller residential routes are avoided where possible.

Dust Nuisance

5.4.5. Dust is the generic term which the British Standard document BS 6069 (Part Two) used to describe particulate matter in the size range 1-75µm (micrometers) in diameter. Dust nuisance is the result of the perception of the soiling of surfaces by excessive rates of dust deposition. Under provisions in the Environmental Protection Act 1990, dust nuisance is defined as a statutory nuisance. There are currently no standards or guidelines for the nuisance of dust in the UK, nor are formal dust deposition standards specified. This reflects the uncertainties in dust monitoring technology, and the highly subjective relationship between deposition events, surface soiling and the perception of such events as a nuisance. However an informal criterion of 200-250 mg/m²/day (as a monthly average) is often applied in the UK as an indicator of potential nuisance.

5.4.6. Fugitive dust emissions from construction activities are likely to be variable and would depend upon type and extent of the activity, soil conditions (soil type and moisture) road surface condition and weather conditions. Soils are inevitably drier during the summer period and periods of dry weather combined with higher than average winds have the potential to generate the most dust. The construction activities that are the most significant sources of fugitive emissions are:

- Demolition activities, due to the breaking up and size reduction of concrete, stone and compacted aggregates;
- Earth moving, due to the excavation, handling, storage and disposal of soil and subsoil

materials;

- Construction aggregate usage, due to the transport, unloading, storage and use of dry and dusty materials (such as cement powder and sand);
- Movement of heavy site vehicles on dry untreated or hard surfaced surfaces; and
- Movement of vehicles over surfaces contaminated by muddy materials brought off the site - for example, over public roads.

5.4.7. Fugitive dust arising from construction activities is generally of particle size greater than the human health-based PM_{10} fraction. The former relates to the amount of dust falling onto and soiling surfaces (or rate of dust deposition) and the latter to the concentration of dust in suspension in the atmosphere. If not effectively controlled, fugitive dust emissions can lead to dust nuisance. Most of the dust emitting activities outlined above respond well to appropriate dust control/mitigation measures and adverse effects can be greatly reduced or eliminated.

5.4.8. The sensitivity of different land uses and facilities to dust can be categorised from low to high - examples are shown in Table 5.8.

Table 5.8: Example of Dust Sensitive Facilities

High Sensitivity	**Medium Sensitivity**	**Low Sensitivity**
Hospitals and Clinics High-tech industries Painting and finishing Food processing	Schools Residential areas Food Retailers Greenhouses and nurseries Horticultural land Offices	Farms Light and heavy industry Outdoor storage

5.4.9. The dust sensitive properties within the vicinity of the Dalston Interchange site are predominantly medium sensitivity facilities:

- Residential areas surrounding the proposed development site, particularly the five cottages fronting Roseberry Place;
- Primary School – Holy Trinity Primary School approximately 15m east of the proposed development site;
- Churches – two within 80m of the proposed development site (Shiloh Pentecostal Church is approximately 50m north and Holy Trinity Church is approximately 80m east of the proposed development site).

5.4.10. Airborne dust has a limited ability to remain airborne and readily drops from suspension as a deposit. Research undertaken for the Department of the Environment[19] concluded that large particulate matter (particles over 30μm in diameter), return to the surface quite rapidly. Under average wind conditions (mean wind speed of 2-6m/sec), these particles, which comprise around 95% of total dust emissions were found to return to the surface within 60-90m of the emission source[20].

[19] Study by Arup Environmental for Department for Environment, Environmental Effects of Dust from Surface Mineral Workings, HMSO, 1995

[20] Cowheard et al. (1990). Control of Fugitive and Hazardous Dusts, Pollution Technology Review, Noyes Data Corporation.

5.4.11. The US EPA research suggests that the potential for dust effects is greatest within 90m of construction activities. However, this potential risk can be reduced by effective use of dust control measures with the result that adverse effects are unlikely. The dust control measures proposed are outlined below. Some properties are within 90m of the construction activities and therefore could be affected by dust if no mitigation measures are applied.

Environmental Risk Assessment

5.4.12. The London working group on Air Pollution Planning and the Environment (APPLE) recently published guidance on undertaking an assessment of risk of exposure to pollutants emitted from a construction site. The guidance[21] is a London wide document which contains input from many London Boroughs. Ten criteria are provided, against which the construction effects of the proposed development have been considered and are listed below:

- Existing environment – The site is located on a former railway and station site, a scrap yard warehouse and a small residential development and is adjacent to major (A) roads.

- The scale of activity – The proposed development will consist of a several residential buildings, providing 309 flats. The site covers an area of 0.8ha.

- Potential for fugitive emissions – There is a possibility for fugitive emissions particularly in the demolition stages, however it is expected that these will be able to be controlled.

- Potential for construction site traffic emissions – Given its scale, the development is expected to generate some traffic during construction. The adjacent road network includes two A roads and hence existing traffic flows are high, if these routes are used the additional traffic generated by construction will not represent a big increase, in percentage terms. If however smaller residential roads are used, there is the potential for increased adverse effects.

- Potential for off-road plant emissions – no major sources anticipated on-site.

- Proximity of sensitive receptors - The site of construction is surrounded by residential buildings such as those on Roseberry Place. Additionally, the Holy Trinity Junior School is located 15m from the proposed development and there are two churches within 80m of the site; located to the north and east of the proposed development site.

- Potential for discharge of toxic fumes or dangerous substances – Examination of the ground contamination report has shown that although the Made Ground and Terrace Gravel Deposits might be locally contaminated by the former uses of the site, there was no evidence of significant soil contamination. Therefore it is assumed that there are no significant levels of contaminants on site with the potential to discharge toxic fumes/dangerous substances.

- Levels of air pollution in surrounding area – The proposed development site falls within a borough which is designated in its entirety as an AQMA. This includes some of the major traffic routes including Kingsland Road and Dalston Road. The northern part of the proposed development site is also included within the AQMA.

- Cumulative impacts of other developments in the vicinity – The East London Line Railway will pass under the proposed development and without this the proposed scheme will not be undertaken. Also it is anticipated that a planning application will be submitted on the Dalston Lane South Site for a mixed use development of retail,

[21] Draft London Code of Practice – Part 1: The Control of Dust from Construction, May 2005.

residential, leisure and training components. Therefore, there is the potential for cumulative effects.

- Prevailing meteorology and seasonal conditions – The prevailing wind direction is south westerly, properties to the north–east on Dalston Lane are therefore likely to be most affected. This currently comprises the Dalston Lane South site and properties north of Dalston Lane.

5.4.13. Overall, the construction of the proposed development is considered to have a medium to high environmental risk in terms of air quality. This has been determined using the risk assessment matrix shown in Table 5.3; where the probability of releasing dust or particles was viewed as very likely, given the nature of the proposed development. This, combined with the close proximity of sensitive receptors on Rosberry Place is likely to result in an impact of moderate to high severity, thus creating a medium to high risk. The potential risk can however be reduced by effective use of dust control measures as outlined in the next section, resulting in a medium risk.

Traffic Effects

5.4.14. The main effects during the operation of the development will be changes to the local road and bus network. The railway/bus interchange will bring the existing bus flows into the site; this will be limited to a single direction but will involve rebuilding the Forest Road Bridge and a proposed new link from Kingsland Road. Additionally Roseberry Place will be realigned to make it straighter. The proposed development does not include plans for significant parking provision for the commercial or residential elements, although it is likely that some additional local car trips will be generated. The effects of these traffic movements on local air quality in the vicinity of the development has been assessed using the modelling approach described in section 5.2.

Facility Emissions

5.4.15. The development of the Dalston Junction Interchange includes options for a biomass boiler or biomass CHP boiler. These will generate additional emissions to atmosphere.

Assessment Approach

5.4.16. In order to assess the impact that traffic generated by the proposed development may have on air quality, concentrations of traffic related pollutants have been forecast using dispersion modelling and compared to appropriate guidelines. The relevant UK and EC air quality standards and guidelines are presented in Table 5.1.

5.4.17. The detailed air quality assessment has been undertaken using the computer programme CALINE4. This is a dispersion model for predicting air pollutant concentrations near roadways and is recommended for use by the US Environmental Protection Agency. The CALINE4 model calculates one-hour average concentrations. For this study the model has been run using hourly meteorological data for a calendar year and the results processed to calculate the percentile values and averaging periods required.

5.4.18. It was agreed with the Council that the pollutants to be assessed within the detailed modelling would be NO_2 and PM_{10}. These are the main pollutants of concern within the Borough relative to meeting air quality standards, with AQMAs being designated for both pollutants as a result of predicted exceedences of the 2004 and 2005 objectives.

5.4.19. To assess impacts of the operational phase of the proposed development, pollutant concentrations have been forecast for the existing year (2005) and the future years of 2010 and 2012 with and without the development in place. 2012 is the anticipated completion date with the air rights development (residential buildings and retail) finished; for the 2010

scenario the station is open.

Properties Assessed

5.4.20. Pollutant concentrations have been forecast at selected properties (from hereon referred to as receptors), where exposure of residents to traffic emissions from vehicles travelling to the site is potentially the greatest, related to operational phase traffic. Pollutant concentrations decrease significantly with distance from a road source and, provided there are no other major sources nearby, are therefore lower at properties located further than the receptors from the roads.

5.4.21. The receptor locations chosen for this study are listed below in Table 5.9 and shown in Figure 5.2. The locations chosen are the closest residential or public properties to the roads affected by the development and have been selected to be representative of the various types of properties found within the surrounding vicinity. These receptors are located where identified changes in traffic flow (+/-5%) are likely to occur as a result of the proposed development, determined from the traffic data and site visit.

Table 5.9: Location of Properties Modelled

Receptor Number	Receptor Location
1	Holy Trinity Primary School
2	6 Kingsland Road (first floor flats)
3	539 Kingsland High Street (first floor flats)
4	19 Tottenham Road (ground floor flat)
5	514-518 Kingsland Road (first floor flats)
6	5 Roseberry Place
7	55 – 60 Mayfield Close (ground floor flats)
8	600 Kingsland Road (first floor flat)

Data used in Air Quality Modelling

5.4.22. Inputs in to the CALINE4 model include:

- Traffic Data consisting of vehicle flows, speeds and %HGVs;
- Vehicle exhaust emission rates;
- Background pollution concentrations; and
- Meteorological data.

5.4.23. Details of these are given in the following sections.

Traffic Data and Assumptions

5.4.24. Arup Transportation has provided traffic information relating to the local road network that surrounds the proposed development site. Traffic data consisted of flows and percentage of HGVs on the local road network.

5.4.25. The traffic flows were supplied as baseline flows for 2005 representing the existing traffic on the local road network. Data were also supplied for the future year of 2010 and 2012 with and without the proposed development.

5.4.26. It was assumed that the percentage of HGVs on all roads will remain constant for future years assessed, with and without the proposed development. It was also assumed that vehicles were travelling at an average speed of 20km/hr when turning at junctions and 30-40

km/hr when on the subsidiary roads such as Stamford Road and Roseberry Place. The traffic changes between the existing, do minimum and do something scenarios were not large and hence the expected air quality changes would be small also.

Pollution Emission Rates

5.4.27. For this study a network of links was developed which represented vehicle movements on the local road system. Pollutant emission rates from vehicles on each of these links were calculated using the latest DEFRA emission factors using the vehicle speeds and the percentage HGVs on each link together with the year of assessment.

5.4.28. The calculation of the emissions takes into account the percentage HGV content on each link as given above. The emission factors were based on a default average fleet composition assumed by DEFRA for an urban area. Within the default fleet composition are assumptions regarding the different types of HGVs in the vehicle fleet based on the year of assessment.

5.4.29. Emission rates were calculated for 2005, 2010 and 2012 for the operational phase assessment. Emission rates are forecast to reduce with time due to improvements in vehicle emission control technologies and legislative requirements.

Background Pollution Concentrations

5.4.30. The modelling procedure requires a value for the background pollutants concentrations to take account of emissions from sources other than vehicles on the roads modelled in the assessment.

5.4.31. Long-term (annual) average background concentrations for 2004 were taken from the background continuous monitoring undertaken by the Council at grid reference 534910, 186220 (Clapton Road, A107), as requested by the EHO, for the pollutant NO_2. The continuous background site does not monitor PM_{10} and thus annual average background concentrations were taken from the National Air Quality Archive from the relevant grid square, also for 2004. These background concentrations were factored up to the modelled years using appropriate factors in the technical guidance[22] and then were added to the predicted model results to determine if air quality objectives were likely to be met or exceeded.

Meteorological Data

5.4.32. The meteorological data used in this assessment comprised hourly averages of wind speed and direction, temperature, mixing height and stability recorded at the London Heathrow met station in 2003. This met station was used for consistency with the Stage 3 and 4 Review and Assessments for the Borough, as well as being agreed with the EHO.

Model Data Processing and Road Network

5.4.33. The modelling results have been processed to calculate the percentile values and averaging periods required.

5.4.34. NO_X emissions from combustion sources (including vehicle exhausts) comprise principally nitric oxide (NO) and a small percentage of nitrogen dioxide (NO_2). The emitted nitric oxide reacts with oxidants in the air (mainly ozone) to form nitrogen dioxide. Since only nitrogen dioxide is associated with effects on human health, the air quality standards for the

[22] Part IV of the Environment Act 1995: Local Air Quality Management: Technical Guidance. LAQM.TG(03), Department for Environment, Food and Rural Affairs, February 2003.

protection of human health are based on NO_2 and not total NO_X or NO. A suitable NO_X:NO_2 conversion needs to be applied to the modelled NO_X concentrations.

5.4.35. There are a variety of different approaches to dealing with NO_X:NO_2 relationships and Government guidance indicates that the use of any of these is acceptable. The method applied to the annual mean NOx in this study is the approach set out in Box 6.9 of the Government technical guidance document for air quality review and assessment. This method is based on the observed ratios of NO_X and NO_2 at roadside locations but is only applicable to annual mean concentrations.

Predicted Pollutant Concentrations

5.4.36. Pollutant concentrations were predicted for the following do-minimum (without proposed development) and do-something (with the proposed development in place) scenarios:

- Existing 2005 scenario
- Do–minimum 2010 scenario
- Do–something 2010 scenario
- Do-minimum 2012 scenario
- Do-something 2012 scenario

5.4.37. Forecast concentrations of pollutants from the CALINE4 modelling are presented in Table 5.10 (which includes background concentrations) for comparison with relevant air quality standards and guidelines.

Nitrogen Dioxide

5.4.38. In all cases, NO_2 concentrations in 2010 and 2012 are forecast to be lower than in 2005 due to expected improvements in vehicle emission control technologies. Forecasts for the NO_2 annual mean concentrations exceed the national objective for all receptors in 2005; this is expected in an area where the Borough has been declared an AQMA. Additionally, it should be noted that the Hackney 4 background monitoring site used, as requested by the EHO, has high annual mean concentrations of NO_2 and this is reflected in the results. The highest concentration was located at receptor 3 with an annual mean concentration of 53.5 $\mu g/m^3$ in 2005.

5.4.39. Looking at the differences in NO_2 concentration owing to the proposed development in 2010 and 2012, there are either no changes or only small changes in concentrations. The highest increase of 0.2 $\mu g/m^3$ occurs at receptors 2, 3 and 8 in 2010. All these receptors are first floor flats along Kingsland Road (A10). The higher concentrations found at these receptors are likely to be a result of the close proximity to the road (maximum 5m) which acts as a main route through Dalston to London city and will continue to do so in 2010 and 2012. Forecast concentrations do however remain unchanged at the majority of receptors.

5.4.40. The modelling indicates that hourly NO_2 mean concentrations will remain well within the 200 $\mu g/m^3$ objective value at all receptors for all scenarios.

5.4.41. The effect of the development at the receptors is negligible to minor adverse in 2010 and 2012, with concentrations being just below or above the air quality standards and only experiencing an increase in concentration by less than 2.5% when compared between scheme and no scheme.

Table 1 – Summary of Forecast Pollutant Concentrations at Modelling Receptors (µg/m^3)

Pollutant	Nitrogen dioxide		Fine particulate matter (PM_{10})	
Objective/ Value	Annual mean	99.8th% of hourly means	Annual mean	90.4th% of daily means
National	40 by 12/2005	200 by 12/2005	40 by 12/2004	50 by 12/2004
Receptor 1 – 4 Holy Trinity Primary School				
2005 Existing	47.9	69.0	24.7	0.22
2010 Do- Minimum	41.1	63.0	22.5	0.16
2010 Do-Something	41.1	63.2	22.5	0.17
2012 Do - Minimum	39.0	60.4	22.4	0.12
2012 Do - Something	39.0	60.6	22.4	0.13
Receptor 2 – 6 Kingsland High Street				
2005 Existing	51.0	76.8	25.4	1.52
2010 Do-Minimum	43.4	71.4	23.0	1.09
2010 Do-Something	43.6	72.0	23.1	1.17
2012 Do-Minimum	40.4	66.2	22.8	0.84
2012 Do-Something	40.4	66.7	22.8	0.90
Receptor 3 – 539 Kingsland Road				
2005 Existing	53.5	79.4	26.1	2.83
2010 Do-Minimum	45.5	74.4	23.5	2.03
2010 Do-Something	45.7	75.0	23.6	2.16
2012 Do-Minimum	41.6	68.6	23.2	1.52
2012 Do-Something	41.8	69.2	23.2	1.63
Receptor 4 – 19 Tottenham Road				
2005 Existing	48.9	71.4	24.9	0.68
2010 Do-Minimum	41.8	65.5	22.7	0.49
2010 Do-Something	41.8	65.7	22.7	0.52
2012 Do-Minimum	39.5	62.0	22.5	0.37
2012 Do-Something	39.5	62.2	22.5	0.40
Receptor 5 – 514 – 518 Kingsland Road				
2005 Existing	50.0	73.8	25.2	1.04
2010 Do-Minimum	42.7	67.9	22.8	0.75
2010 Do-Something	42.7	68.4	22.9	0.78
2012 Do-Minimum	40.0	63.7	22.6	0.58
2012 Do-Something	40.0	64.0	22.7	0.60
Receptor 6 – 5 Roseberry Place				
2005 Existing	48.1	69.1	24.7	0.24
2010 Do-Minimum	41.1	63.2	22.5	0.17
2010 Do-Something	41.1	63.4	22.5	0.19
2012 Do-Minimum	39.0	60.5	22.4	0.14
2012 Do-Something	39.0	60.7	22.4	0.15
Receptor 7 – 55 – 60 Mayfield Close				
2005 Existing	48.1	69.5	24.7	0.28
2010 Do-Minimum	41.1	63.5	22.5	0.20
2010 Do-Something	41.1	63.5	22.5	0.17
2012 Do-Minimum	39.0	60.8	22.4	0.16
2012 Do-Something	39.0	60.8	22.4	0.14
Receptor 8 – 600 Kingsland Road				
2005 Existing	52.4	77.7	25.8	2.18
2010 Do-Minimum	44.6	72.4	23.3	1.56
2010 Do-Something	44.9	72.8	23.4	1.66
2012 Do-Minimum	41.1	66.9	23.0	1.17
2012 Do-Something	41.4	67.3	23.0	1.25

Fine Particulate Matter (PM_{10})

5.4.42. In all cases, PM_{10} concentrations in 2010 and 2012 are forecast to be lower than in 2005 due to improvements in vehicle emission controls and a reduction in background concentration. Forecasts for the PM_{10} annual mean concentrations are within the national objectives limit value (40μg/m^3) at all receptors for all years.

5.4.43. Comparison between the annual concentrations with and with out the development in 2010 and 2012 show little change, with concentrations at the majority of receptors remaining unchanged. The highest increase is 0.1μg/m^3 again seen at Kingsland Road.

5.4.44. Predictions of the absolute daily average PM_{10} concentrations are very complex since a wide variety of sources must be taken into account and these sources behave in different ways. Therefore, it is difficult to compare the forecast 36th daily mean (90.4th percentile) to the objectives due to the lack of suitable background value. However, the results in Table 5.10 enable comparison between 2010 and 2012 with development and 2010 and 2012 without development forecast daily mean concentration. Only small changes in percentile daily mean concentrations (up to 0.1 μg/m3) are predicted with the development in place.

5.4.45. Hence, the overall effect of the development on the surrounding air quality for PM_{10} is negligible.

Significance

5.4.46. In terms of assessing the significance of the air quality impacts according to the NSCA guidance, the following points are noted:

- The proposed development will not interfere with or prevent the implementation of the proposed actions detailed in the Council's Air Quality Action Plan. In particular, the proposed development actively supports policy AP5 by minimising the number of car parking spaces available within the development. Additionally, the nature of the project is such that it provides a bus interchange facility aiding the implementation of policy AP6 by assisting the London Bus Initiative (an initiative launched in 2000 that aims to improve key bus services within London).

- Modelling shows that the development does not lead to the breach of the provisional revised EC limit value with the 2010 limit value (40 μg/m^3) met both without and with the proposed development in place;

- It is not anticipated that the proposed development would interfere with the implementation of a local air quality strategy; and

- Given that scale of the changes in pollutant concentrations between 'without scheme' and 'with scheme' scenarios, the proposed development will not lead to a significant increase in emissions, degradation in air quality or a significant increase in exposure below the level of a breach of an air quality objective.

5.4.47. Based on this, it is therefore concluded that in the case of the proposed development, air quality would be a low priority consideration.

Operational Plant and Ventilation Systems

5.4.48. There are currently options for a biomass boiler or a biomass boiler CHP plant included within the proposed development. Using ADMS Screen 3, it was assessed whether the potential emissions from the plants would create significant contributions of air pollution; the inputs to the model are shown in Table 5.11. The Arup Building London Sustainability Group provided the data; as the chimney flue would be at the top of the 18 storey building within the proposed development, it was assumed that the height of the chimney would be

approximately 80mAOD. The results of the assessment have shown the local impacts associated with these small processes (250- 370kW) to be very little (with predicted highest increase in annual PM_{10} of 0.06µgm^3 from the biomass boiler and 0.04µgm^3 for NO_x annual mean from the CHP biomass boiler plant). These are not considered significant, nor will they contribute to adverse air quality impacts.

Table 5.11: Summary of Model Inputs to Assess the Impact of Boiler Emissions on Site

Inputs	**CHP Biomass Boiler**	**Biomass Boiler**
Internal Diameter (M)	0.46	0.36
Gas Emission Temperature (°C)	478	215 (average value)
Nominal Flue Velocity (M/S)	5	15
Emissions Data (G/S) Particulate Matter Carbon Monoxide Nitogen Oxides	 N/A 0.25 0.12	 0.13 0.11 N/A

Cumulative and Interactive Effects

5.4.49. In addition to the consented East London Line extension, the other anticipated proposal within the vicinity of the proposed development is the Dalston Lane South redevelopment. This planning application is expected to be for a mixed use residential and retail development to the east of the Dalston Junction Interchange and covers 7000m^2. Currently it is not possible to identify the cumulative impacts resulting from the projects, but it is likely that there will an overlap between the construction phases of the developments between 2006 and 2008. The additional operational traffic as a result of the Dalston Lane South development may also contribute to adverse air quality impacts.

5.5. Mitigation Measures and Residual Effects

Construction Mitigation

5.5.1. The dust emitting activities outlined above respond well to appropriate dust control/mitigation measures and any adverse effects can be greatly reduced or eliminated. Effective dust mitigation measures prevent dust becoming airborne or contain dust within enclosures to prevent dispersion beyond the emission source.

5.5.2. Prior to commencement of construction activities, agreement will be reached with the Council to ensure the potential for adverse environmental effects on local receptors is minimised. This includes measures to control traffic routing, site access points and hours of noisy operations. The following measures, for controlling dust and general pollution nuisance from the site construction operations will be included within a CEMP:

- Wheel washing facilities on site to prevent mud from construction operations being transported on to adjacent public roads;
- Damping down of site haul roads by water bowser during prolonged dry periods;
- Regular cleaning of hard-surfaced site entrance roads;
- Ensuring that dusty materials are stored and handled appropriately (e.g. wind shielding or complete enclosure, storage is away from site boundaries, drop heights of materials are restricted, water sprays are used where practicable to reduce dust emissions);
- Ensuring that dusty materials are transported appropriately (e.g. sheeting of vehicles carrying spoil and other dusty materials);

- Confinement of vehicles to designated haul routes within the site;
- Restricting vehicle speeds on haul roads and other un-surfaced areas of the site;
- Hoarding and gates to prevent dust breakout; and
- Appropriate dust site monitoring is included within the site management practices to inform site management of the success of dust control measures used.

5.5.3. These controls would be applied throughout the construction period to ensure that dust emissions are mitigated. Thus the construction activities would be controlled to reduce as far as possible the potential environmental impacts.

5.5.4. The traffic effect of the proposed development during the construction phase is limited to a finite period and would be along the traffic routes employed by haulage vehicles, construction vehicles and employees. Implementation of the agreed CEMP would ensure that effects would be of limited duration and significance.

Operational Mitigation

5.5.5. The predicted effects on local air quality as a result of the proposed development are shown to be negligible to minor adverse, as outlined in the significance criteria in Table 5.2, therefore no mitigation measures are proposed with respect to operational traffic or facility related emissions.

Residual Impact

5.5.6. With the proposed construction mitigation measures in place is it expected that the construction of the proposed development will have a minor adverse effect on local air quality, although this would be short- to medium-term and temporary. No long-term residual effects are expected as a result of the construction of the proposed development.

5.5.7. In accordance with the significance criteria set out in Table 5.2, this assessment has determined that the operation of the proposed development would result in a negligible to minor adverse effect on local air quality.

5.5.8. The results of the assessment are summarised in Table 17.1 at the end of this document.

6. Archaeology and Cultural Heritage

6.1. Introduction

6.1.1. This chapter addresses the potential effects of the proposed development on the known and unknown potential for archaeology on the site and the cultural heritage of the area. The assessment provides a summary of known archaeological and cultural heritage information and identifies any deposits and features that may be affected by the development.

6.2. Assessment Criteria and Methodology

Legislation and Guidance

6.2.1. Statutory protection for archaeology is principally provided by the Ancient Monuments and Archaeological Areas Act (1979) as amended by the National Heritage Act (1983). The Secretary of State for Culture Media and Sport maintains a schedule of nationally important sites and areas. No Scheduled Ancient Monuments are located within the study area.

6.2.2. The Planning (Listed Buildings and Conservation Areas) Act 1990 contains the primary legislation controlling development within the historic environment. It provides for the listing of buildings of special architectural or historic interest by the Secretary of State and for the designation of areas of special architectural or historic interest (conservation areas) by local planning authorities. It also provides for the desirability of preserving or enhancing the character and appearance of listed buildings and their settings and for the consideration of the desirability of preserving or enhancing the character and appearance of conservation areas and their settings.

6.2.3. PPG15[23] sets out policies for the identification, protection and development control of buildings, conservation areas and other elements of the historic environment, for example parks and gardens, battlefields, listed buildings and the wider historic landscape. It compliments that for archaeology, and sets out the need for effective protection for all aspects of the historic environment which should be valued and protected for their own sake.

6.2.4. PPG15 highlights the special regard to matters including the desirability of preserving the setting of the building. The setting is often an essential part of the building's character. Also, the economic viability as well as the character of historic buildings may suffer and they can be robbed of much of their interest, and of the contribution they make to townscape, if they become isolated from their surroundings.

6.2.5. The wider historic landscape is also dealt with in PPG15. In defining planning policies, authorities should take account of the historical dimension of the landscape as a whole rather than concentrate on selected areas. Adequate understanding is an essential preliminary and authorities should assess the wider historic landscape at an early stage in development plan preparation. Plans should protect its most important components and encourage development that is consistent with maintaining its overall historic character.

6.2.6. PPG16[24] is the key planning guidance and consolidates previous Government advice to local authorities on the safeguarding of the archaeological resource within the planning process. PPG16 emphasises the fragility and finite nature of archaeological remains and the desirability of preserving such remains in situ where appropriate. However, it recognises that preservation in situ is not appropriate mitigation in all cases and that archaeological field investigation and preservation by record may be acceptable in some instances. PPG16 also

[23] DoE. (September 1994). Planning Policy Guidance 15: Planning and the Historic Environment.

[24] DoE. (November 1990). Planning Policy Guidance 16: Archaeology and Planning.

highlights the importance of early consultation with the local authority in the development process and suggests a framework for the process of archaeological mitigation.

6.2.7. There are a number of UDP policies relevant to archaeology and cultural heritage, see Appendix 1.2 for further details.

6.2.8. In addition, archaeological guidance papers of the Greater London Archaeology Advisory Service (GLAAS) (revised June 1998) have been followed, as have the Institute of Field Archaeologists' (IFA) guidance for desk based assessment (1994, revised 2001). Policy statements and papers from CABE and English Heritage relating to environmental sustainability, the built environment and tall buildings have also been reviewed.

Sources of Information and Consultation

6.2.9. A range of sources have been accessed to provide a comprehensive understanding of the archaeological and heritage resource and the impact that the development will have on aspects of it. Although separated out into separate sections (archaeology and built heritage), many of the sources and research required overlap.

6.2.10. The GLAAS officer responsible for the Hackney area has been contacted to ascertain if any recent significant work was on-going in the area and if there was any specific issues relating to the locality. No new archaeological findings of note have been carried out and no specific issues of concern were raised. A meeting was held with English Heritage to inform the built heritage officers of the nature of the development and to gain initial feedback on aspects they considered to be issues.

Archaeological, Listed Building and Conservation Area Data

6.2.11. Data was collected from the Greater London Sites and Monuments Record for a 1km radius, to provide the archaeological context for the site and for 500m radius for built heritage. A gazetteer for the archaeological sites and features is presented in Appendix 6.1. Details on conservation areas and listed buildings were obtained for the Council website[25]. The Council also maintain a list of buildings of local importance; although these buildings have no statutory protection, they are of local significance and make a special contribution to the character of a street or locality. Data was also collected from the London Borough of Islington from the 'Images of England', English Heritage website[26] as the borough boundary lies to the northwest of the Kingsland Road/Ball Pond Road crossroads.

Archival Research

6.2.12. The London Metropolitan Archives and the Hackney Local History Archives have been visited to review historic maps and documentary sources about the area, for example the Victoria County History for Middlesex, and texts on the history of the area. Previous desk-based assessment work was also consulted, specifically the East London Line (Northern Extension) report by the Museum of London Archaeology Service (MoLAS) (November 2001). Historic cartographic resources were reviewed to chart the progression of the landscape from rural hamlet to urban community.

[25] http://www.hackney.gov.uk/

[26] http://www.imagesofengland.org.uk/

Study Area

6.2.13. A visit was made to the site and surrounding area, to gain an appreciation of the locality, note any extant features of potential historic interest and areas of apparent survival or truncation. A further visit was made to consider setting issues.

Assessment Methodology

6.2.14. There is no established methodology for this field. The study will draw upon knowledge of existing practice and professional judgment to predict the likely extent and significance of potential impacts.

6.2.15. The archaeological and built heritage resources may be nationally or locally designated, for example a scheduled monument or locally listed building. As such features of interest may appear in national or local heritage records or may be identified in the course of the assessment. The importance of an archaeological or heritage receptor is based on a number of criteria, for example its designation and/or contribution to educational or cultural appreciation. The Table 6.1 summarises this.

6.2.16. The sensitivity of the receptor to absorb and accept change of the type and scale proposed has also been considered. This includes matters such as tranquillity, retention or loss of distinctiveness, rarity and conservation interests.

Table 6.1: Importance of the Archaeological and/or Built Heritage Receptor

Importance	**Equivalent to**
International/national	• World Heritage Site • Scheduled monument • Grade I or II* listed building/structure • Site of national importance
Regional/Greater London	• Registered Park and Garden • Registered Battlefield • Conservation Area • Grade II listed building/structure • Site/feature/structure of regional or county importance
Metropolitan	• Site/feature/structure with district value or interest for education or cultural appreciation
Local	• Site/feature/structure with local (parish) value or interest for educational or cultural appreciation
Negligible	• Site/feature/structure with no significant value or interest
Uncertain	• Potential archaeological sites (usually below ground) for which there is limited information and for which it has not been possible to determine the importance of the site based on current knowledge

Types of Impacts

6.2.17. The archaeological resource comprises the cumulative remains of human culture over much of the last 500,000 years.

6.2.18. Below ground archaeological remains are vulnerable to a number of different impacts. Fundamentally, any activity that disturbs or destroys archaeological remains can have a direct negative impact to the resource. Impacts can occur from activities such as ground consolidation causing damage to buried archaeological deposits, loss of access to archaeological resources including buried deposits restricting the potential for future research, physical excavation, removal, alteration or damage to archaeological resources. Indirect negative impacts can include the contamination of resources and changes to the groundwater regime.

6.2.19. Positive impacts can also occur and include the protection of the resource, increased knowledge resulting from the recording and analysis of archaeological sites as part of the mitigation strategy and/or the improvement of the setting of a feature. There is also the opportunity to involve and inform the local community about the findings of the archaeological investigations.

6.2.20. Direct impacts have been considered within the direct footprint of the development. The zone of impact as advised by other specialists for indirect impacts for example dewatering and settlement has also been considered.

6.2.21. Potential impacts on the archaeological resource would occur mainly during the construction process due to ground disturbance. Other direct physical destruction and disturbance can occur over a longer period of time caused, for example, by compaction and desiccation.

6.2.22. There is a great deal of overlap between the visual intrusion of the townscape and the built heritage. The built heritage takes account of the assessment undertaken on the townscape and visual amenity of the development. Chapter 11 provides details on the assessment methodology and close cognisance has been taken of the results of that study.

6.2.23. The heritage resource contributes to the character of the townscape. Individual buildings or areas are valued for their overall significance, rarity, exemplary form or style or historic associations and condition. The heritage resource includes conservation areas, listed buildings, locally listed buildings and London Squares. Consideration has also been given to route ways which reflect the historical development of the locality.

6.2.24. Impacts may occur during construction, for example the presence of temporary lighting and temporary landtake, demolition of a structure and the introduction of haul roads and construction sites. Impacts that could occur during operation include the permanent loss or alteration of structures, introduction of new buildings, infrastructure and the provision of new landscaping resulting in the alteration of the townscape and its setting.

6.2.25. Impacts can be negative or positive. In some cases the opportunity exists to enhance the setting and architectural character of a building, to promote access and appreciation of the area as a whole, and/or improve the understanding of a building's or areas history as a result of the works.

Assessment of Significance

6.2.26. The method used to assess the significance of the affect of the proposals on the receptor either directly or indirectly is determined by two variables; the importance of the receptor, as set out in Table 6.1 above and the magnitude of change upon the receptor. This takes into account the severity of impact of the proposals together with the vulnerability of the receptor to change. Table 6.2 summarises the type of change and its magnitude.

6.2.27. Significance of environmental effect is then calculated and Table 6.3 below provides a guide to how this is achieved. The effects may be either adverse or beneficial, depending on the nature of the impact. It should be noted that the effect is given without mitigation. An appropriate programme of mitigation seeks to reduce the severity of a negative effect or remove it completely.

Table 6.2: Magnitude of Change Affecting Archaeological and Built Heritage Receptors

Magnitude of Change	Description of Change
High	• Complete destruction/demolition of site or feature. • Change to the site or feature resulting in a fundamental change in our ability to understand and appreciate the resource and its historical context and setting.
Medium	• Change to the site or feature resulting in a appreciable change in our ability to understand and appreciate the resource and its historical context and setting.
Low	• Change to the site or feature resulting in a small change in our ability to understand and appreciate the resource and its historical context and setting.
Negligible	• Negligible change or no material change to the site or feature. No real change in our ability to understand and appreciate the resource and its historical context and setting.
Uncertain	• Level of survival/condition of receptor in specific locations is not known. Therefore the magnitude of change is not known.

Table 6.3: Significance of Effect on Archaeological and Built Heritage Receptors

Magnitude of Change	Importance of Receptor					
	International / national	Regional/ Greater London	Metropolitan	Local	Negligible	Uncertain
High	Severe	Major	Major	Moderate	Minor	Uncertain
Medium	Major	Major	Moderate	Minor	None	Uncertain
Low	Moderate	Moderate	Minor	Minor or None	None	Uncertain
Negligible	Minor	Minor or None	None	None	None	Uncertain
Uncertain	Uncertain	Uncertain	Uncertain	Uncertain	Uncertain	Uncertain

Evaluation Criteria

6.2.28. The scale and seriousness of the effects on the heritage resource in specific terms will be assessed as set out in Table 6.4.

Table 6.4: Evaluation Criteria for Archaeological and Built Heritage Effects

Magnitude of Effect	The proposals would:
Major beneficial (positive) effect	• Result in the removal relocation or substantial mitigation of very damaging or discordant existing impacts (direct or indirect) on the heritage. • Result in extensive restoration or enhancement of characteristic features or their setting. • Form a major contribution to government policies for the protection or enhancement of the heritage resource. • Remove or successfully mitigate existing visual intrusion such as that the integrity understanding and sense of place of a site or group of sites is re-established.
Moderate beneficial (positive) effect	• Provide potential for significant restoration of characteristic features or their setting through the removal, relocation or mitigation of existing damaging or discordant impacts on the heritage resource. • Contribute to regional or local policies for the protection or enhancement of the heritage resource. • Enhance the integrity, understanding and sense of place of a site or group.

Magnitude of Effect	The proposals would:
Slight beneficial (positive) effect	• Restore or enhance the sense of place of a heritage feature through good design and mitigation. • Remove or mitigate visual intrusion (or other indirect impacts) into the context of heritage features such as that appreciation and understanding of them is improved. • Not be in conflict with national regional or local policies for the protection of the heritage. • Marginally enhance the integrity understanding and sense of place of a site or group of sites.
Neutral effect	• Maintain existing historic features in the townscape. • Have no appreciable impacts either positive or negative on any known or potential heritage assets. • Result in a balance of positive and negative impacts. • Not result in severance or loss of integrity context or understanding within a historic landscape. • Not be in conflict with and do not contribute to policies for the protection or enhancement of the heritage.
Slight adverse (negative) effect	• Have a detrimental impact on the context of a heritage feature such that its integrity is compromised and appreciation and understanding of it is diminished. • Not fit perfectly with the form scale pattern and character of a heritage resource or Conservation area. • Be in conflict with local policies for the protection of the local character of the heritage resource.
Moderate adverse (negative) effect	• Be out of scale with or at odds with the scale pattern or form of the heritage resource or conservation area. • Be intrusive in the setting (context) and adversely affect the appreciation and understanding of the resource. • Result in loss of features such that their integrity of the heritage resource is compromised, but not destroyed and adequate mitigation has been specified. • Be in conflict with local or regional policies for the protection of the heritage.
Major adverse (negative) effect	• Result in the loss of or damage to heritage assets and no adequate mitigation can be specified • Be highly intrusive and would seriously damage the setting of the heritage resource such that its context is seriously compromised and can no longer be appreciated or understood • Be strongly at variance with the form scale and pattern of a heritage resource or conservation area • Be in serious conflict with government policy for the protection of the heritage resource as set out in PPG15 or PPG16.

6.3. Baseline Conditions

Geology and Topography

6.3.1. London occupies part of the Thames Basin, a broad syncline of chalk filled in the centre with Tertiary sands and clays. In the City and in most of London this Tertiary series of bedrock consists of London Clay. Above the bedrock lies the Pleistocene (quaternary) fluvial deposits of the River Thames arranged in gravel terraces. These terraces represent the remains of former floodplains of the river, the highest being the oldest with each terrace becoming progressively younger down the valley side (MoLAS, 2001, 11).

6.3.2. The site lies over a railway cutting which was approximately 5m below the surrounding ground level of 120mAOD. The site is overlain by Made Ground which, in turn, is underlain by a thin discontinuous layer of Terrace Gravel Deposits and these are in turn underlain by the London Clay Formation. The River Terrace Deposits are gravelly, sandy and clayey in

part and described as the Hackney River Terrace Gravel. Chapter 10 provides further detail.

Archaeology and Historical Background

6.3.3. There are no Scheduled Ancient Monuments within the locality. The Archaeological Priority Area designated by the London Borough of Islington (APA12) for the medieval hamlet of Kingsland lies close to border of the two Borough's, to the northwest of the development site. There is no designation for the site itself.

6.3.4. Appendix 6.1 presents the gazetteer of archaeological remains for approximately one kilometre around the development site. Figure 6.1 plots these sites, remains and features.

Prehistory

6.3.5. There are no known prehistoric remains or features recorded on the site or in close proximity to it. The gravel terraces would however have been attractive to early settlement activity. A number of Palaeolithic artefacts have been recovered in the locality. A quantity of flint handaxes, flakes and other flint objects were found at Hackney Brook (Appendix 6.1, no. 08001) in the 19th Century and also at London Fields (no. 80022). These finds are believed to date from the Lower Palaeolithic which ranges from approximately 500,000-150,000 BC. To the north west of Dalston Junction in Kingsland High Street five handaxes (no. 080342) have been recorded. A lithic working site at the manor house to the south of Shacklewell Grove was identified again in the 19th Century.

6.3.6. Other occasional finds of prehistoric activity include a Mesolithic (12,000-4,000 BC) pebble macehead, blades, flints and scrapers (no. 080042) and a Neolithic (4,000-2,000 BC) leaf-shaped arrowhead (no.080026). The area is devoid of any known Bronze Age (2,000-600 BC) artefacts or remains. The only possible Iron Age remains (no. 080875) relate to the conjecture of an Iron Age origin for the later Roman road between London and Silchester in the west and Colchester in the east. However this road lies to the southeast of the site, approximately 1km away from it.

6.3.7. The potential for the discovery of prehistoric remains on the site is considered to be negligible.

Roman

6.3.8. For the Roman period (AD 43-410) Kingsland High Street follows the line of Ermine Street the road north from London to Lincoln and on to York. During the Roman Invasion, Ermine Street was constructed to provide a main arterial route north into the country for the military. Ermine Street was a key transport link and has remained so up to the present day. However, there is no evidence of any Roman remains in the immediate vicinity; no burials or settlement activity have been found adjacent to the road.

6.3.9. Other accounts of the Romans in the area include a drawing of Roman pottery found at Downs Park Road in Tyssen College (no. 080091) and findspots both relating to pottery; twelve sherds of Samian pottery from Springfield (no. 080097) and Homerton and also sherds found in the mid 19th Century at Shrubland/Queens Road.

6.3.10. None of these finds indicate the likelihood of significant Roman activity on or near the site, despite the presence of such a key routeway.

Saxon and Medieval

6.3.11. The hamlet of Dalston was recorded in AD 1294 and at that time was centred around the junction of Dalston Lane and Kingsland Road (no. 080121). The name Dalston is likely to have derived from 'Deorlaf's tun' (farm). Nearby Hoxton is another Saxon placename meaning farm of 'Hoch' and is recorded in Domesday Book as 'Hochestone' and the site of

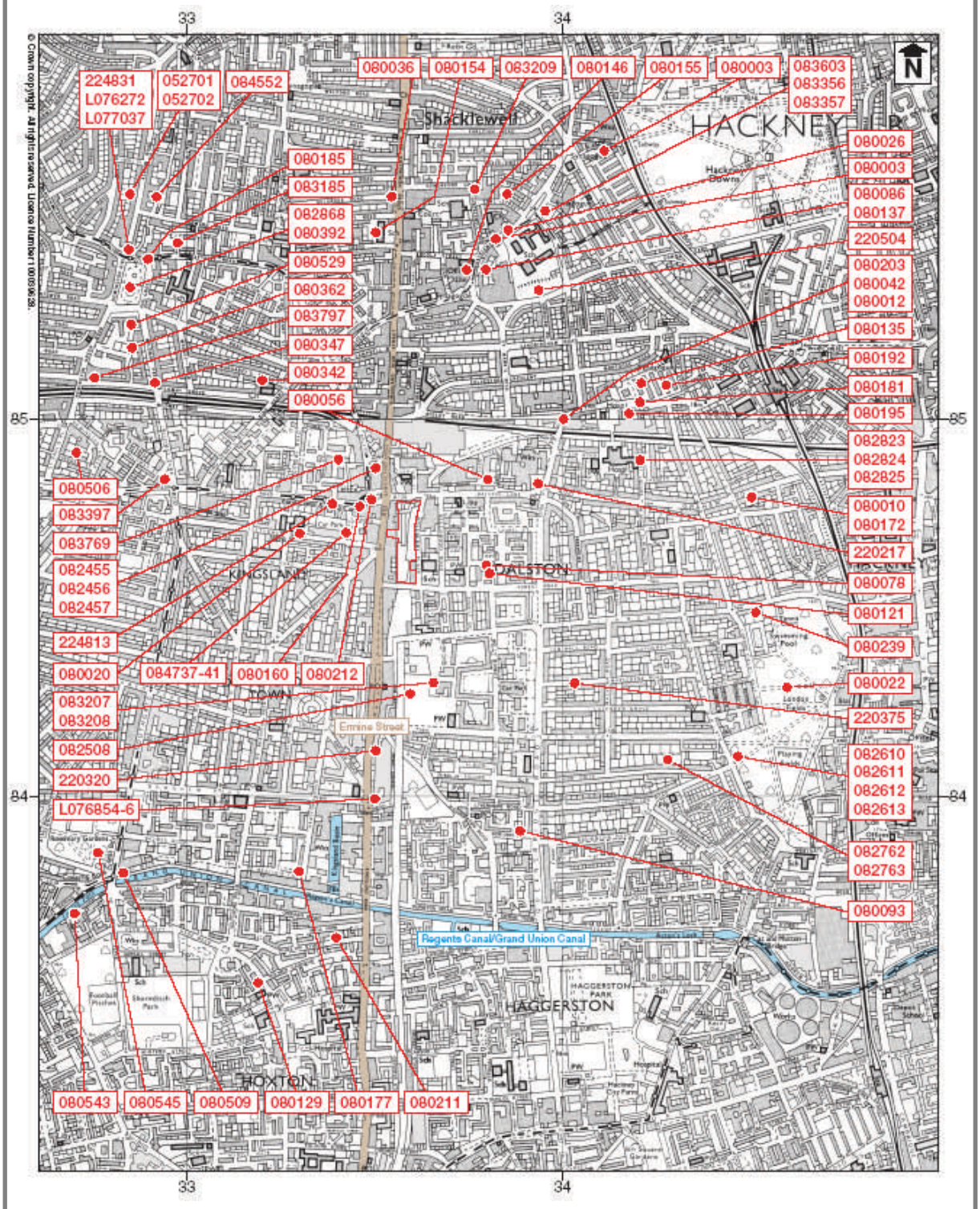

Figure 6.1: Archaeological and Historical Sites, Remains and Features (see Appendix 6.1 for gazetteer)

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Hoxton Manor (no. 080177). Rural settlements for the Saxon period are rare in the Greater London area.

6.3.12. The Victoria County History relates that the manor of Hackney was said in 1294 to have been held by the bishops of London as a member of their manor at Stepney. The manor was accounted for separately from the 14th Century and had its own courts in the 1580s. There was a leper hospital founded by the citizens of London in about AD 1280 (no. 080160). It was attached to the chapel of St Bartholomew in 1549 as an outhouse and was at the junction of Balls Pond Road and Kingsland Road. Ermine Street continued to be the major road north from the City. Dalston Lane was the only road from Kingsland to Hackney village until the 19th Century.

6.3.13. There is no archaeological evidence relating to the site for this period. There is negligible potential for the presence of medieval remains. This takes account of the extremely limited presence of in situ land.

Post Medieval

6.3.14. The available historic maps and documentary sources which cover this area provide an appreciation of the character of the area and the rapid development that it underwent during the post medieval period. From the early 18th Century to the 19th Century, the area changed from an agricultural, rural landscape of hamlets and villages interlinked by roads and trackways, to become part of London's urban sprawl. Since the 17th Century, the land beside Kingsland Road was used as brickfields, pasture and market gardens. To the west of the road, there was more arable land.

6.3.15. John Rocque's map of about 1746 (Figure 6.2) depicts a row of buildings along Kingsland High Street. What then became the crossroad of Kingsland Road/Balls Pond Road/Dalston Lane, can be seen in an early form, with the north side of Dalston Lane further back than it is now. A building is shown at the centre of the crossroads and is likely to be a toll. Some speculative development began along the main arterial roads, driven to a large extent by the local brick making industry which flourished on the east of Kingsland Road exploiting the clays beneath the market gardens. Greenwood's map of 1830 (Figure 6.3) shows the development of terrace buildings and roads around Kingsland Road, Dalston Lane, and Roseberry Place, although there are still substantial areas of market garden, notably Bassington's Nursery.

6.3.16. The opening of the Regent's Canal to the south enabled goods to be transported more easily and cheaply to the centre of London than by road and became an important arterial route as part of the industrialisation of London. The canal together with the construction of the North London Line and the creation of the Dalston Junction railway station in the 1860s, ensured rapid urban development. The construction of the railway in a cutting would have removed any earlier archaeological remains at this location. The 1870 Ordnance Survey map (Figure 6.4) clearly shows the new railway and substantial urban development on either side of it. Roseberry Place was moved over slightly to accommodate the railway.

6.3.17. Booth's poverty map of 1889 (Figure 6.5) characterised inhabitants into categories, for example as lower middle class, shopkeepers, clerks, small employers ("a hardworking sober energetic class"), those earning between 22s-30s a week, the middle class "whose wives as a rule did not work but the children did", to poor regular earning people such as factory, dock and warehouse labourers ("as a general rule they have a hard struggle to make ends meet but as a body, decent steady men").

6.3.18. The North London Colosseum and National Hippodrome was built in 1886 to the designs of Alfred Brandreth. Built close to the site at the corner of Roseberry Place and Dalston Lane, it was the largest of three theatres in the Dalston Hackney area during the 19th Century. The theatre was constructed behind the 19th Century houses, in what was originally their gardens. In around 1920 the theatre was converted to a cinema and renamed the Dalston

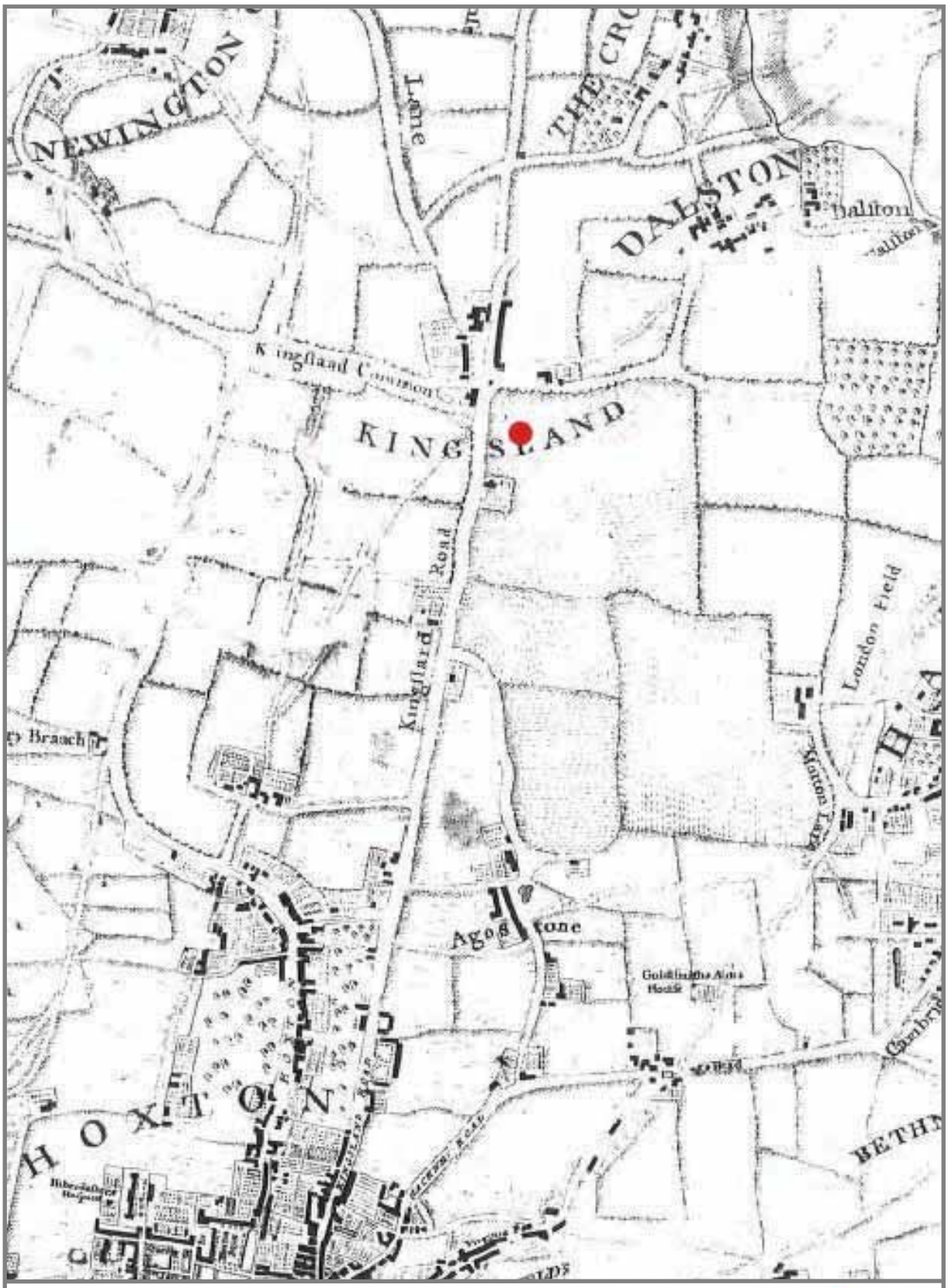

Figure 6.2: John Rocque's Map of Circa 1746

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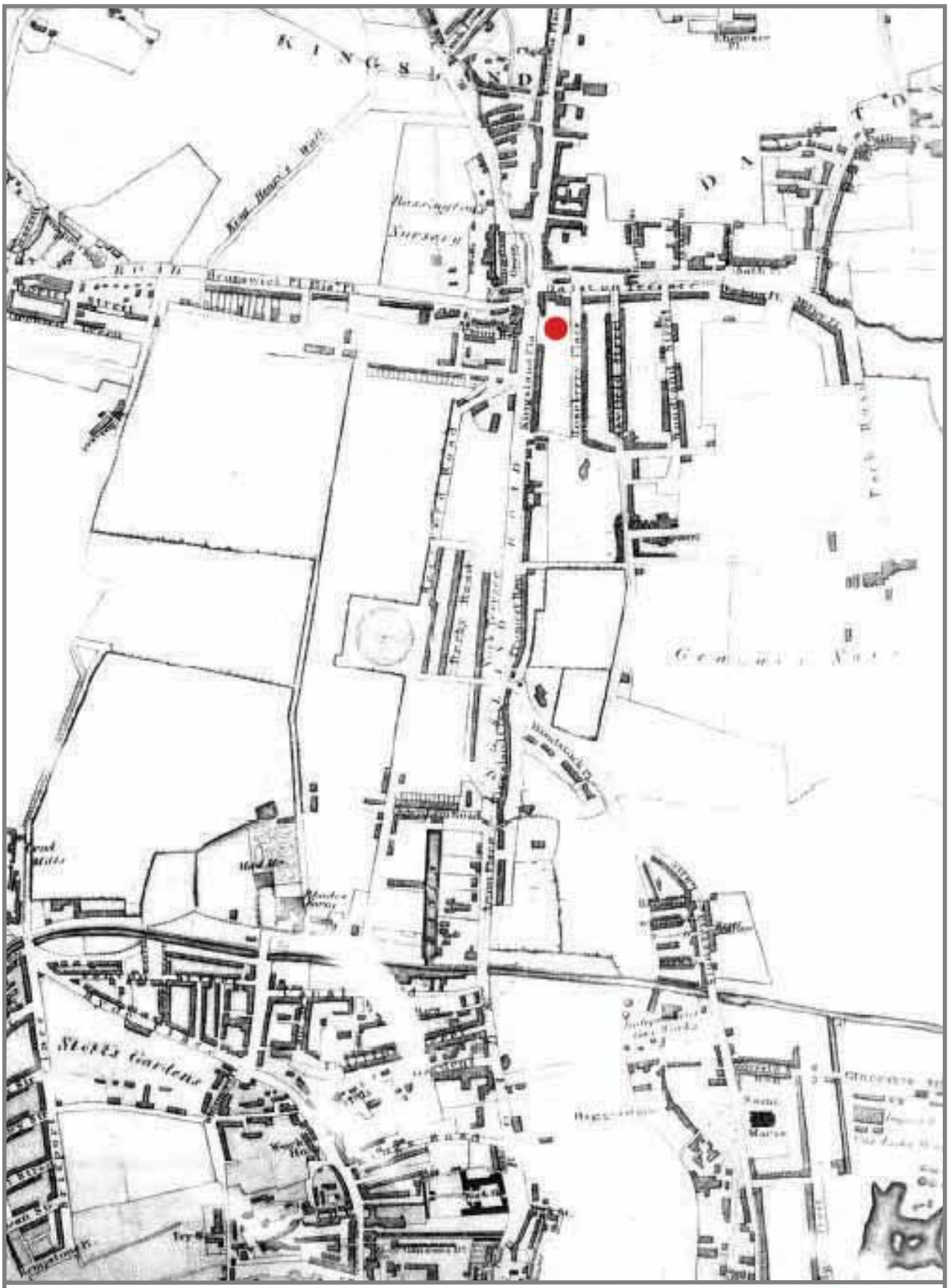

Figure 6.3: Greenwood's Map of 1830

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Figure 6.4: Ordnance Survey Map of 1870

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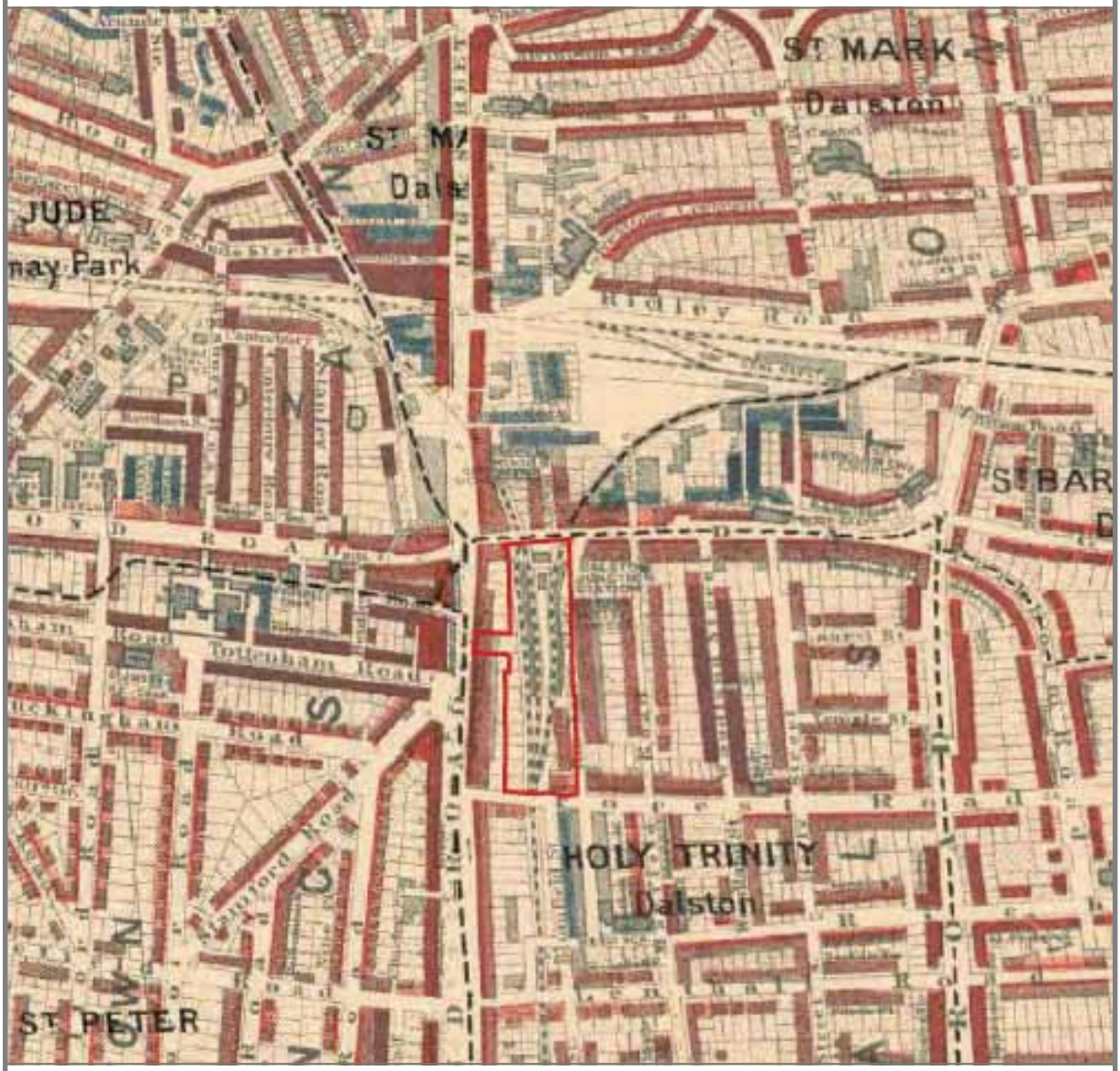

Figure 6.5: Booth's Map of 1889

Note: site boundary indicative

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Picture House. Mid and later 20th Century uses of the building have included a warehouse, car auction room and more recently a nightclub. The theatre is now unsafe and derelict and, together with numbers 4-14 Dalston Lane, are hoarded off from access and view.

6.3.19. The area is shown as generally unchanged on the 1894 OS map except for the widening of the railway. Similarly the 1913 OS map indicates very few changes. The area sustained some bomb damage in 1940 although not at the development site. More recent 20th Century construction of housing estates, replacing Victorian terraces and structures has led to a diluting of the earlier housing pattern. This breaking up of the strong urban grain has led to a great deal of contrast and variation in the urban form; some areas are cohesive and these tend to have been designated as conservation areas.

6.3.20. One remaining area of apparently intact land lies to the south east of the site at the corner of Forest Road and Roseberry Place. It measures approximately 17m by 35m. There was housing fronting Forest Road by at least 1865. It has not been established if they had basement, but back gardens are mapped in Stanford's map of 1862. At least a pair of semi-detached houses survived after the railway was constructed to 1964 where they are still shown on the OS map of that year. However by 1971 the OS map indicates that a warehouse had been constructed. That warehouse currently distributes shoes. The land to the west of the warehouse falls steeply away into the railway cutting.

Conservation Areas

6.3.21. Following on from the overview of archaeological and historical development of the area set out above this section specifically summarises the built heritage interest of the locality, focusing on the conservation areas which surround the site, which are (Figure 6.6):

- Kingsland Road, which borders the western edge of the site;
- De Beauvoir, a large conservation area to the west of the site, but immediately adjacent to Kingsland Road Conservation Area;
- Dalston Lane West, a small conservation area to the east of the site;
- Queensbridge Road, is another linear conservation area lying to the east of the site;
- Graham Road/Mapledene is adjacent to Queensland Road Conservation Area and is the most easterly; and
- Albion Square is a small conservation area to the south and east of the site.

Kingsland Road

6.3.22. Kingsland Road Conservation Area is a long corridor which extends from the junction of Old Street in the south to Dalston Lane/Kingsland Road junction in the north and broadly follows the line of Roman Ermine Street. Designated in 1998, the following is a summary derived mainly from the conservation area appraisal, but also a consideration of the historic maps and site visits. The spinal quality of its character and its distinct history distinguishes this road from its hinterland and there are six character areas, from north to south these are: Dalston town centre fringe, market zone, crescent zone, canal area, museum quarter and the city fringe zone. The first two are most applicable to the development site and contain a range of listed and locally listed structures.

6.3.23. The Dalston Town Centre Fringe Zone is defined by the stretch of Kingsland Road from Stamford Street and Forest Road in the south to the junction with Dalston Lane in the east and Kingsland Road Passage in the west. The rears of these properties form a boundary to the development site.

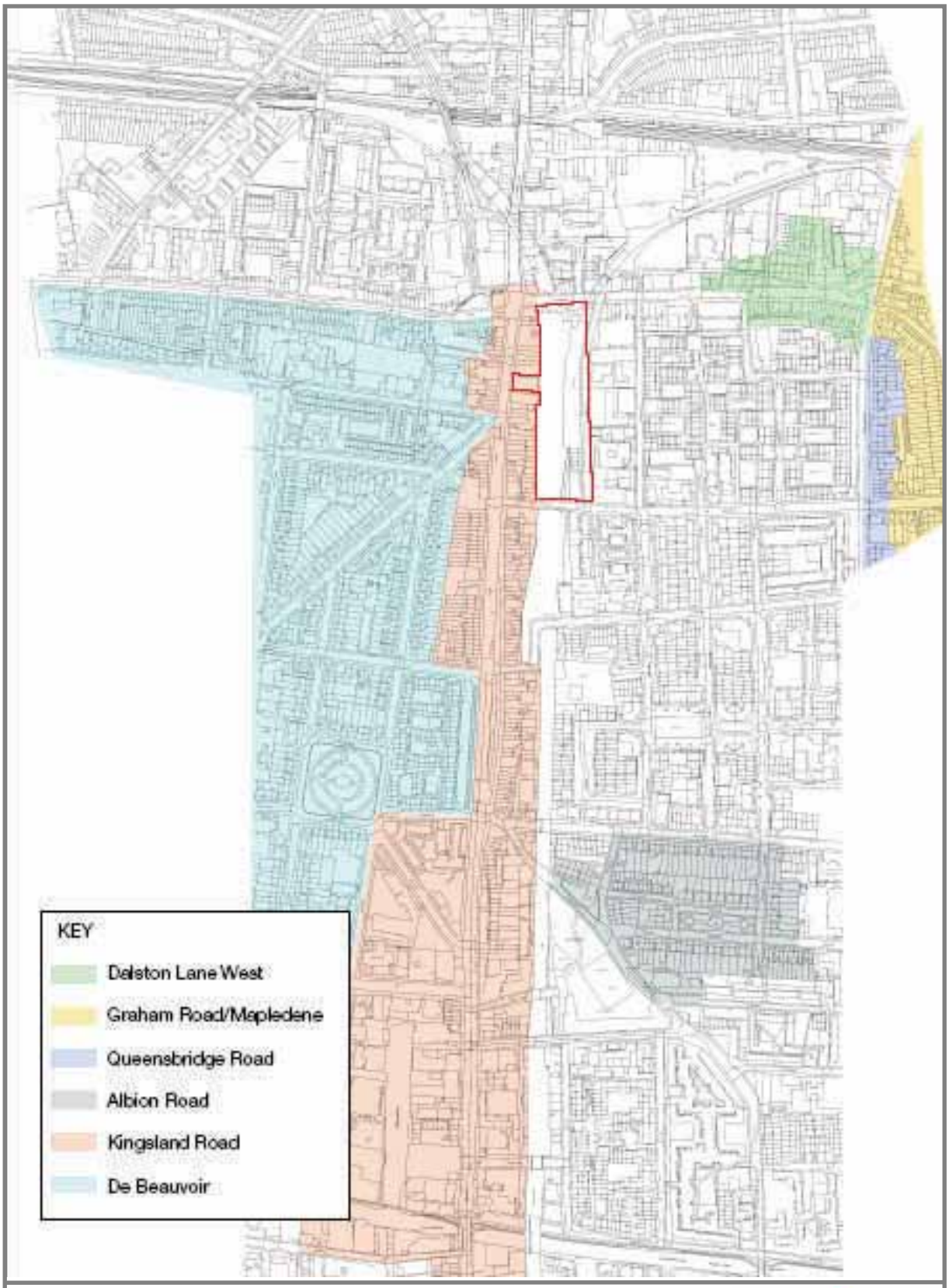

Figure 6.6: Conservation Areas

Note site boundary indicative

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6.3.24. It has many important listed and landmark buildings set back from the main road with projecting shop fronts. On the corner of Forest Road and the eastern side of Kingsland Road there is an imposing group of four terraced buildings dating from the mid-late 19th Century in a single composition. They have three floors of yellow stock brick with stucco lintels, band courses and cornice and a mansard with rounded headed arched dormers set into the roof. Modern shop fronts and facia however detract from the various features of the buildings.

6.3.25. The listed pairs of early 19th Century houses (including numbers 540-544) with recessed side entrance bays (obscured by later projecting shop fronts) have some interesting characteristics, particularly the 'Diocletian' half round windows on the flanking recessed side extensions. There are three pairs of these compositions with various additions and would have had much more grand garden settings originally.

6.3.26. The four storey terrace of seven buildings, that is slightly forward of the listed buildings, are of the mid 19th Century. Almost all of these (numbers 574-586) still retain many of their original features, including sash windows with margin lights.

6.3.27. The Crown and Castle mid-Victorian public house is a good example of a strong robust building holding a landmark position within the townscape at the busy crossroads. Its ground level is used as a noodle bar. On the opposite side of the road is a mid to late 19th Century terrace of three storey buildings with mansard. The heightened sense of enclosure of the buildings at this end of Kingsland Road, on both sides presents a natural gateway to Dalston town centre.

6.3.28. Number 1 Kingsland High Street is a landmark building and is locally listed. The end of the conservation area is demarcated by the former bank. This building is a flamboyant render and stucco mid 19th Century purpose built bank building of three storeys with French Renaissance mansard and corner pyramidal roofs. The building is chamfered at the corners and has a heavily rusticated ground floor with a clear differentiation between the importance of the architectural features on each floor.

6.3.29. The Market Zone stretches from the junction of St Peter's Way and Middleton Road in the south to the junction of Stamford Road to the west and Forest Road to the east. It is called the market zone as the Kingsland Waste is a street market. The conservation area character assessment notes that the individual architectural quality of the buildings is not outstanding but that the relatively consistent scale of buildings presents a coherent townscape composition. The buildings have narrow plot frontages and in general have three storeys with ground floor shop fronts and simple two window bays above. There are parapet fronted buildings with the roof set behind. There is a mix of render and yellow stock and the primary window type is vertical sliding slash. There are occasional exceptions with the odd four storey building or mansard roof, but there is a general consistency from numbers 374-512, although the building line of numbers 442-512 is much tighter to the Kingsland Road. The buildings set a strong vertical rhythm along the length of the zone. Numbers 478-480 are unusual three storey buildings set much further back from the adjoining buildings and probably date from the 1700s.

6.3.30. On the opposite side of the road are the residential buildings. Numbers 419-445 and numbers 457-477 are all locally listed buildings and date from around the 1840s. These are two separate sets of terraces of three storey and basement houses with parapets and rusticated stucco on the ground floor. There is a central pair to the composition at numbers 431-433 and at numbers 465-467 both with pediment parapets.

6.3.31. As reflected in the zones, the character of the Kingsland Road Conservation Area comprises many elements. In the section closest to the development site there is the hustle and bustle of community life, with retail and commercial premises fronting the Victorian structures which the conservation area seeks to protect. There is significant traffic and pedestrian

activity particularly focused on the historic crossroads.

De Beauvoir

6.3.32. The De Beauvoir central and south conservation areas were declared in 1971 and 1977 and extended again in 1998. The central area focuses on De Beauvoir Square (a scheduled London Square), the centrepiece of Richard Benyon De Beauvoir's unique development built from the 1830s. The area consists mostly of houses dating from a relatively short space of time in the early Victorian period, from the 1830s to the 1840/50s and as a whole forms a fairly homogenous unit and a coherent locality.

6.3.33. De Beauvoir's Town was the first large scale housing development built to a formal plan in Hackney. It was built on the estate that had been attached to the Balmes House (a house built in about 1540 for two Spanish brothers between the canal and Downham Road).

6.3.34. Development was stimulated by the cutting of the Regent's canal south of Balmes House, by which time the house was an asylum and much of its land had been leased to the Rhodes family. William Rhodes secured a building lease in 1821, from Peter de Beauvoir which unusually made no stipulations about the buildings and this lead to lawsuits. The lease covered 150 acres and in 1834 was said to have been the largest single amount conveyed to a speculative builder in London.

6.3.35. Rhodes planned a grid pattern, with four squares on diagonal streets intersecting at an octagon. However, development was piecemeal and mainly along the fringe, where modest buildings could most easily finds tenants: by the canal, along or off Kingsland Road, and in Tottenham Road. The diagonals partly survive in Enfield, Stamford, and Ardleigh roads and the projecting De Beauvior Square survives in the south east. For the land then leased by R. B. de Beauvoir, a more spacious layout was devised, with terraces mainly in short blocks and many semi detached villas demonstrating an Italianate style.

6.3.36. In De Beauvoir Town semi-professionals lived and the marriage register of 1894 indicates a notable change from rural occupations to more urban ones, from fathers to sons.

6.3.37. Although the mass of the housing is fairly dense and urban in character, the width of the roads is more rural with generous front gardens and mature trees. Once within the conservation area, the sub-urban residential nature of the 'town' is apparent and traffic reduction measures have assisted in this. It is only towards the edges of the conservation area that noise of traffic and views to more modern tower blocks detract from the feel of the neighbourhood.

Dalston Lane (West)

6.3.38. This conservation area centres on a small core of important 19th Century buildings around the widening of Dalston Lane, and displays a cohesive townscape of buildings. The conservation area is over 250m from the development site. The early 19th Century buildings to the south are complimented by later Victorian and Edwardian development. There are two grade II listed buildings within the conservation area: number 57 Dalston Lane and St Bartholomew's Vicarage.

6.3.39. Number 57 Dalston Lane is a well preserved house from around 1800 of stock brick with three storey and a formal three-bay façade and centrally placed open porch, although its setting has been spoiled by hard landscaping to its forecourt and inappropriate boundary treatment. St Bartholomew's Vicarage was originally attached to the main church building (since demolished) and was built in 1884/5. It was constructed in the early English style of brick with stone dressings. The building was restored in the 1990s as flats. The Victoria Public House (number 451 Queensbridge Road) is locally listed and is a good example of a mid 19th Century east London pub. It is built of stock brick with a roof hidden behind a

corniced parapet.

6.3.40. To the south of Dalston Lane, numbers 46-52 is a short terrace of three storey early 19th Century houses. Along with all the buildings to the south of Dalston Lane they have distinctive projecting single storey shops covering what would have been their front gardens.

6.3.41. The buildings to the north of Dalston Lane are less uniform, but they retain coherent landscape qualities. Numbers 31-33 Dalston Lane are a remaining pair of a short terrace of four houses, probably dating from the mid 19th Century. Numbers 39-41 form a complex with Number 1 Ramsgate Street, which was originally constructed as a police station around the 1900s. Number 55 Dalston Lane is a good example of inter-war commercial architecture which maintained the consistent building line of the adjacent terrace. Atlas Mews retains its character as a semi-industrial mews type area.

6.3.42. The widened Dalston Lane with its constant traffic detracts from ones appreciation of the buildings.

Queensbridge Road

6.3.43. Queensbridge Road Conservation Area was designated in 1985, and comprises the mid-Victorian terraced houses and villas on the east side of Queensbridge Road, from Dalston Lane in the north to Brownlow Road in the south, incorporating a number of listed buildings. The majority of the houses were constructed between the 1850s and 1870s. The listed structures within this linear conservation area tend to be early 19th Century. The conservation area is over 350m from the centre of the development site.

6.3.44. Numbers 1 to 15 (odd) are in fact an early 19th Century terrace, each of three storeys with a first floor cill band and stuccoed basements. They have long first floor windows to cast iron balconies with a pattern of gothic arches. Hope Cottage (numbers 204 and 206) form part of a group from 204 to 212. The cottage is a pair of two storeys and an attic and there is the date of 1844 on a plaque on the second floor.

Graham Road/Mapledene

6.3.45. Graham Road and Mapledene is Hackney's largest conservation area. It abuts Queensbridge Road on its west side and extends in places to London Fields; to the north it reaches Dalston Lane and to the south, Brownlow Road. The western edge of the conservation area is over 350m from the edge of the development site.

6.3.46. The area as a whole is noticeable in that it consists mostly of houses dating from a relatively short space of time in the Victorian period and its street layout is the result of individual speculative house builders developing plots of land leased as part of a larger redevelopment along the street. The overriding feature of the area is its uniformity of proportion, scale and style of built fabric. There is a remarkable homogeneity in the houses and a surprising variety of architectural details.

6.3.47. There is a strongly defined grid pattern, most marked in a succession of streets running west to east, from Forest Road in the north to Shrubland Road in the south. This orientation continues in wider thoroughfares up to Dalston Lane. Then there is a succession of streets running north to south, from Parkholme Road right across to Horton Road. This grid layout has seen large-scale development, which have respected the street pattern; for example, Wilton Way School and the Wilton Estate.

Albion Square

6.3.48. Designated in 1975 and includes Albion Square itself and Stonebridge Road, both of which are scheduled London Squares and further protected by London Squares Preservation Act 1931, together with their residential properties. These houses comprise pairs of semi-

detached houses dating from the 1840s built of yellow stock brick with stucco dressings and classical decorative features. It is over 400m from the centre of the development site.

6.3.49. Numbers 21 and 22 Albion Square are typical and form a consecutive group (numbers 13-22). They are a pair of early-mid 19th Century semi-detached villas of stock brick. They are two storeys with a basement, three windows and a low pitched hipped slate roof with eaves soffit. Seven steps lead to a four-panel door, with rectangular fanlights, in prostyle porches with square columns.

6.3.50. This small conservation area retains an air of tranquillity and has many mature gardens and trees creating a sense of enclosure.

Other Structures of Interest

6.3.51. Outside the protection of the conservation areas noted above are a number of individual structures and features of interest.

6.3.52. In particular are the five two storey cottages which abut the development site, fronting Roseberry Place, opposite the school. Their back 'gardens' or 'decks' extend into the railway cutting. These are the remaining structures of terraces that were removed to allow the construction of the London Railway. Stanford's map of 1862 shows the area just before the construction of the railway and four blocks of housing can be seen. On the 1873 Ordnance Survey these cottages (although seven can be seen), together with a pair fronting Forest Road are all that remained.

6.4. Potential Effects

Archaeology

6.4.1. There are no known archaeological remains on the site or in the immediate vicinity. Therefore the potential likelihood for remains of significance to exist is considered to be low.

6.4.2. There will be no operational impacts.

Built Heritage

6.4.3. The majority of the site lies within a railway cutting and the development will be built on a slab at approximately the same level as Roseberry Place. There will be no direct impact on any built heritage features. The indirect impacts will relate to issues such as the visual intrusion on the setting of heritage buildings, alterations of their views, caused by for example the heights, massing and finishes of new structures, and loss of traditional scale. This loss of traditional scale will also affect people's perceptions of their surroundings. The area around the development is varied, a complex mix of building styles and ages of structures. However there are a high number of listed and locally listed structures, as well as a number of conservation areas both adjacent and at some distance from the development. Some areas of historic buildings which form part of the townscape offer tranquillity, such as the conservation areas of Albion Square and De Beauvoir, whilst others, notably the market zone of Kingsland Road Conservation Area form a vibrant mix of modern commercial activity against the backdrop of Victorian terraces.

6.4.4. The development will introduce a new series of structures of varying heights and forms within the site. New routeways will be created, routeways for the bus interchange, across the Snooker Hall site on Kingsland Road and a pedestrian connection to Roseberry Place. The development will create a substantial change in the area. The massing and bulk of the blocks will introduce new and highly visible elements into the townscape, which includes elements of the built heritage.

Kingsland Road Conservation Area

6.4.5. The development is adjacent to the conservation area. The access for the new bus station deck area will be from Forest Road Bridge and egress through the snooker hall (which is a modern introduction into the Victorian terrace) onto Kingsland Road. A new routeway will be introduced east-west from Kingsland Road to Roseberry Place and beyond which seek to re-establish the Victorian urban grain and allow a more pedestrian friendly environment. There will be a new public space to the north east of the site.

6.4.6. The development will introduce new structures of scale, notably the 18-storey block, beyond the mainly three and four storey buildings which comprise the conservation area and will alter the setting of it.

6.4.7. From the northern section of this conservation area the operational impact on its setting will constitute a major adverse effect due to the scale of the proposed structure, especially of the 18-storey block and the impact this will have on the historic setting of the conservation area. Progressing south down Kingsland Road from approximately Richmond Road to Middleton Road and beyond, the impact of the new structures will reduce.

Queensbridge Road Conservation Area

6.4.8. This conservation is over 300m from the edge of the development site. Even its northern extent (from approximately Forest Road) which parallels the development has only intermittent views to the new tall structures. The change to the setting of this conservation area will be negligible. Therefore there will be no significant effect on it from the development.

Graham Road/Mapledene Conservation Area

6.4.9. This conservation area is over 330m from the development. There will only be very limited and intermittent views of the development from the western edge of the area which will be lost against the general background of roof lines due to this distance. The change to the setting of this conservation area will be negligible. Therefore there will be no significant effect on it from the development.

Dalston Lane West Conservation Area

6.4.10. There will be views, particularly from the north side of the conservation area and the impact on the setting of the conservation area is considered to be minor adverse.

De Beauvoir Conservation Area

6.4.11. The northeast portion of the conservation area from approximately Stamford Road to Balls Pond Road lies closest to the development site. The scale of the development will ensure that it is visible from within the conservation area particularly its eastern edge; the operational impact is considered to be minor adverse.

Regents Canal

6.4.12. There are no views from the canal towpath to the development unless one is standing on a footbridge. The footbridge over the Kingsland Basin is approximately one kilometre from the development site and there would be limited views of the tallest structures.

6.4.13. There would be no impact on the setting of the Regent's Canal from the Dalston Junction development.

19th Century Cottages, Roseberry Place

6.4.14. The five 19th Century cottages will remain and be incorporated into the development. The cottages will be bordered by the new apartment structures of the south block which will be arranged as 'twin blocks' between six to eight storeys high. The tallest block located approximately 45m to the north of the cottages will extend up to 18-storeys. The introduction of new retail and residential structures, together with the new north-south route of the bus interchange will fundamentally alter the setting and environment of these properties. The impact on the setting of these buildings of local interest would therefore be moderate adverse.

Dalston Theatre and Numbers 4-14 Dalston Lane

6.4.15. The proposed development would not physically affect the late 19th Century theatre or numbers 4-14 Dalston Lane. However, it should be noted that the Council propose to demolish these buildings of local interest. The baseline for the proposed development assumes that these structures no longer exist.

Routeways and Roads

6.4.16. Roseberry Place forms the eastern edge of the site. It is currently a poorly used and uninspiring road, bounded on either side by hoarding. On completion of the development, there will be more pedestrian movement as new routes are made between Roseberry Place and the development. The impact will be the reintroduction of this street into active usage and is considered to be minor, leading to a slight beneficial effect due to rejuvenation of this routeway.

6.4.17. Kingsland Road/Balls Pond Road/Dalston Lane cross roads: this historic crossroads is, in its modern form, an extremely busy traffic junction with high traffic flows and a significant number of bus movements. There are also substantial pedestrian demands. There is little sense of the history of this routeway and the continuity it provides back to at least the Roman period.

6.4.18. The pedestrian demand will increase when the new station and development are complete and the design proposals for the junction will seek to increase pavement width to allow better pedestrian access at the expense of traffic flows. There will be a slight beneficial impact on this junction.

Cumulative Impacts

6.4.19. Cumulative impacts would also arise from the emerging proposals for the neighbouring Dalston Lane South development immediately to the east of Roseberry Place.

6.4.20. The Dalston Lane South development site does not have any known archaeological remains on it. The theatre had a partial basement which will have removed any potential archaeological deposits, however much of the site is likely to be relatively undisturbed. There are no known archaeological remains on the site or in the immediate vicinity. Therefore the potential likelihood for remains of significance to exist is considered to be low.

6.4.21. Cumulatively the impact remains unchanged for the conservation areas of Kingsland Road, Queensbridge Road, Graham Road/Mapledene, De Beauvoir Town as the contribution of the Dalston Lane South site is negligible.

6.4.22. On the Dalston Lane (West) Conservation Area, the Dalston Lane South development will increase the impact on its setting to moderate adverse.

6.4.23. With the development of the Dalston Lane South site, Roseberry Place will become a key conduit between the new public space, the interchange and the various residential and retail

outlets. The northern end of the road would be straightened and this straightening reinstates the line which was 'bent' to accommodate the railway in the late 19th Century. The reintroduction of this street into active usage is considered to be a minor beneficial impact, leading to a slight beneficial effect due to rejuvenation of this routeway.

6.4.24. There would be no impact on the setting of the Regent's Canal from the interchange or the Dalston Lane South development.

6.4.25. The construction on the Dalston Lane South site will not add significantly/appreciably to the setting of the 19th Century cottages this but the oblique views of the cottages to the north east will be possible to the southern end of that development. The cumulative significance of the effect on the setting of these buildings is therefore assessed at none.

6.5. Mitigation Measures and Residual Effects

Archaeology

6.5.1. Archaeological mitigation relates only to the southeast corner of the site, at the junction of Forest Road and Roseberry Place. It is recommended that an archaeological watching brief be undertaken during construction activity to record any features which may survive. A written scheme of investigation would be developed for agreement with the local authority and the GLAAS. This would include recording mechanisms and provision for the analysis, dissemination and deposition of results of the work.

6.5.2. The potential for the likely discovery of remains of significance is considered to be low.

Built Heritage

6.5.3. The impact of the development on the built heritage has been mitigated in a number of ways. The design of the development over the slab has taken into account the nature of the surrounding area, while at the same time introducing a series of new structures into the urban landscape of Dalston. The development masterplan aims to intensify and repair the urban grain, particularly to the south of Dalston Lane where it has been eroded by 20th Century development and to re-establish the predominantly early Victorian pattern removed by the railway.

6.5.4. Good design has encompassed the principles of historic conservation as part of the overall evaluation of local context and policy. The southern block has been staggered to create the impression of reduced mass, although it is recognised that the development will introduce a fundamental change.

6.5.5. In advance of any construction activities which alter the current environment, a photographic survey could be undertaken of the immediate locality. The aim of such a survey would be to provide a snapshot of the neighbourhood, prior to a time of significant change. This would record existing structures and features and could also include areas of current dereliction as this represents a phase in the development of the neighbourhood. This idea arose from consultation with English Heritage and in recognition of the dynamic nature of the historic environment. This It is suggested that such a record be deposited with the Hackney Archives Department who look after the archive records of the Council.

6.5.6. As part of the above survey, the opportunity could be taken to involve the local community to record their own memories of their environment and to mount an exhibition as part of the overall provision of information about the proposed development.

6.5.7. Despite the design measures there will remain a major adverse effect on the Kingsland Road Conservation Area due to the size and scale of the development.

6.5.8. There will be a neutral effect on the Queensbridge Road Conservation Area.

6.5.9. There will be a neutral effect on the Graham Road/Mapledene Conservation Area.

6.5.10. The size and scale of the development will result in a slight adverse effect on the setting of the Dalston Lane (West) Conservation Area.

6.5.11. The scale of the development along the eastern edge of the De Beauvoir Conservation Area to a slight adverse effect on the setting of the conservation area.

6.5.12. The scheme will have no consequence on the Regent's Canal, the effect is therefore neutral.

6.5.13. The treatment of the southern residential block's east elevation has been designed to respond to the five existing two storey 19th Century cottages at Roseberry Place. Despite this, the introduction of these new structures will have a moderate adverse effect on their setting.

6.5.14. The reintroduction of Roseberry Place into active usage and alterations to the street pattern, results in a slight beneficial effect.

6.5.15. The Kingsland Road/Balls Pond Road/Dalston Lane crossroads will remain a busy junction despite the improvements, but the overall development scheme will assist in enhancing the space. This will result in a slight beneficial effect.

6.5.16. The results of the assessment are summarised in Table 17.1 at the end of this document.

7. Drainage and Flood Risk

7.1. Introduction

7.1.1. This chapter addresses the potential hydrological effects the proposed development may have on the area surrounding the proposed development site. The assessment includes a summary of the current conditions found within the area and identifies mitigation measures where appropriate for significant effects that may arise as part of the proposed development.

7.2. Assessment Criteria and Methodology

Legislation and Guidance

7.2.1. Any proposals that could impact upon surface water may be liable for consideration by the Environment Agency under the Land Drainage Act (1991) and the Water Resources Act (1991). Under new powers given to the Environment Agency in the Anti-Pollution Regulations (1999) the Agency is able to stop construction activities at any time should a significant risk be posed to the environment. However, there are no surface water features on the site or in the surrounding area and surface water will be discharged to the local Thames Water Utilities (TWU) network.

7.2.2. Guidance on addressing flood risk is contained in PPG25[27]. This guidance states that the developer of a particular scheme is responsible for assessing whether any proposed development is likely to be affected by flooding and whether it will increase flood risk elsewhere and should propose measures to deal with these effects and risks. However, as the development is less than 1 hectare in area and lies out of the floodplain in Flood Zone 1, the Environment Agency's Flood Risk Matrix (see Appendix 7.4) recommends that "general surface water drainage information" is provided. The full details of requested information is included in Appendix 7.1 and is summarised below:

"Surface water run-off should be controlled as near to its source as possible through a sustainable drainage approach to surface water management. This approach involves using a range of techniques including soakaways and trenches etc to reduce flood risks by attenuating the rate and quantity of surface water run-off from a site…. Approved Document Part H of the Building Regulations 2000 sets out a hierarchy for surface water disposal which encourages a sustainable urban drainage system (SUDS) approach:

- *The first option for surface water disposal should be the use of SUDS methods which limit flows through infiltration.*
- *Flow balancing SUDS methods which involve the retention and controlled release of surface water from a site may be an option for some developments where uncontrolled water flows would otherwise exceed the local greenfield run-off rate.*
- *Where it is intended that disposal be made to public sewer, the Water Company or its agents should confirm that there is adequate spare capacity in the existing system taking future development requirements into account."*

7.2.3. Changes in runoff from the site and the possible link to increased flood risk are assessed in this chapter.

7.2.4. A flood risk assessment has been carried out and included as Appendix 7.5. In this instance, as the site is in flood zone 1, indicating that the development is outside the flood plain, the flood risk considered will be as a result of drainage from the site.

[27] DEFRA. (July 2001). Planning Policy Guidance 25: Development and Flood Risk.

7.2.5. There are a number of UDP policies relevant to drainage and flood risk, see Appendix 1.2 for further details.

Sources of Information and Consultation

7.2.6. The following sources of information obtained either directly or indirectly, have been used for baseline information:

- Arup geotechnical desk study report including Envirocheck Report;
- Groundwise search;
- Hackney UDP;
- Ordnance Survey maps;
- Environment Agency Website; and
- Site visit.

7.2.7. The following parties have been consulted or have provided information:

- Environment Agency;
- Thames Water Utilities; and
- London Borough of Hackney Council.

7.2.8. In addition, policies and guidance relevant to this assessment have been reviewed.

Work Undertaken

7.2.9. The work has included the following:

- Undertaking a site visit;
- Reviewing existing data for baseline including reports, maps, survey, internet;
- Obtaining/calculating predictions of surface water discharges using Flood Estimation Handbook (FEH) rainfall data;
- Review of drainage information from water companies and historical archives;
- Identification of hydrological, hydrogeological, flood risk and drainage issues;
- Consultation with the Environment Agency;
- Assessment of impacts, including during construction, during operation and proposal of mitigation measures;
- Assessment of residual effects after mitigation.

Significance Descriptors and Terms

7.2.10. The following significance descriptors are used in this assessment:

- Major: effects of the development of greater than local scale, that cannot be mitigated;

- Moderate: effects of the development that may be judged to be important at a local scale (i.e. in the local planning context);
- Slight: effects that are of low importance in the decision making process;
- Negligible: effects that are below normal levels of perception.

7.2.11. The following terms are used to identify the time-scale of impacts:

- Short-term: < 12 months
- Medium term: 1 – 5 years
- Long term: + 5 years

Criteria for Assessment

7.2.12. Risk of flooding to the site from the storm-water sewerage network needs to be considered to meet the requirements of adoption. It must not surcharge in a 1 in 2 year flood, or flood the ground in a 1 in 30 year flood. These are detailed design considerations, but are useful to consider as they are part of mitigation measures.

7.2.13. The Environment Agency classifies water quality in rivers and canals using the General Quality Assessment scheme (GQA). The chemical GQA describes quality in terms of three chemical measurements: biochemical oxygen demand, ammonia and dissolved oxygen. These are considered to detect the most common types of organic pollution from sewage treatment works, agriculture and industry. A grade is assigned to each length of river according to the lowest standard achieved by any of the three measurements, averaged over three years. The standards are summarised as follows:

- Very good quality (suitable for all fish species);
- Good quality (suitable for all fish species);
- Fairly good quality (suitable for high-class coarse fisheries);
- Fair quality (suitable for coarse fisheries);
- Poor quality (likely to limit fish populations).

7.2.14. The Environment Agency also specifies water quality constraints for discharge of trade effluent under the Water Resources Act 1991.

7.3. Baseline Conditions

Site Location and Description

7.3.1. The site is currently vacant and cleared of all infrastructure associated with the original railway line. The surface of the site is generally loose granular material with some vegetation along the external walls. There is a paved area on the eastern edge of the site where a scrap yard was located. For photos of the site, see Appendix 7.2.

Surface Water

7.3.2. There are no significant water bodies in the vicinity; the Grand Union Canal lies 1km to the south of the site; the River Lee runs about 3km to the east of the site and the River Thames lies approximately 4km to the south of the site. The entire area is heavily urbanised and

therefore drainage is predominantly to the local sewer network.

Flooding from Surface Waters

7.3.3. The site lies outside of any indicative floodplains of the River Thames and River Lee as designated by the Environment Agency (see Figure 7.1). The indicative tidal floodplain of the Thames lies some 4km to the south. Due to the distance of the site from any rivers, fluvial flooding is considered a negligible risk and is not considered further.

Surface Water Drainage

7.3.4. The site currently consists generally of loose granular material with some vegetation along the western retaining wall. All rainwater drains naturally through the ground to the upper aquifer (Made Ground and Terrace Deposits) which is approximately 1-2m below the surface. Along the western wall the ground is up to 0.5m lower and there is a large amount of standing surface water, indicating the ground water level is very high.

7.3.5. An area on the eastern side of the site, the former scrap yard, has hard standing underneath a layer of loose material. A visit to the site also identified a section of grated channel drain running along the western edge of the cleared railway route; however, it is not clear if this is effective in draining the site, nor if it is connected to the sewer.

7.3.6. The EIA carried out for the East London Line states in relation to permanent drainage alterations that:

"The area to be occupied by the new station sites along the route is considered small enough so as not to be significant in this respect."

7.3.7. However, at the scale of the Dalston Junction site, the station is significant and therefore it is necessary to assess the impermeable area for the existing site and for the baseline condition.

Consents and Licences

7.3.8. An Envirocheck report undertaken for the area in 2005 indicates that the site itself does not currently benefit from any discharge consents.

7.3.9. The nearest trade discharge consent to the site is for trade effluent discharge-site drainage into land via a soakaway operated by Railtrack East Anglia Zone, approximately 920m east of the site.

7.3.10. There are no abstraction licenses within 1,000m of the site. There are six abstraction licenses within 2,000m of the site. Four of these are held by British Waterways. The other two are held by Griffin Housing Association Limited and OCS Smarts Group Limited for groundwater remediation and commercial and public services (laundry) respectively.

Groundwater

7.3.11. Background geological and ground information for the site is summarised here.

7.3.12. Geological sections indicate the site as being underlain by a layer of River Terrace Deposits overlying London Clay. In this area of London, the London Clay is known to be underlain at depth by the Lambeth Clay, Upnor Formation, Thanet Sand and Chalk. The stratigraphy beneath the site is set out previously in Table 2.1.

7.3.13. The Environment Agency groundwater vulnerability map for the area shows a minor aquifer of variable permeability underlies the site. This relates to the Terrace Gravel deposits.

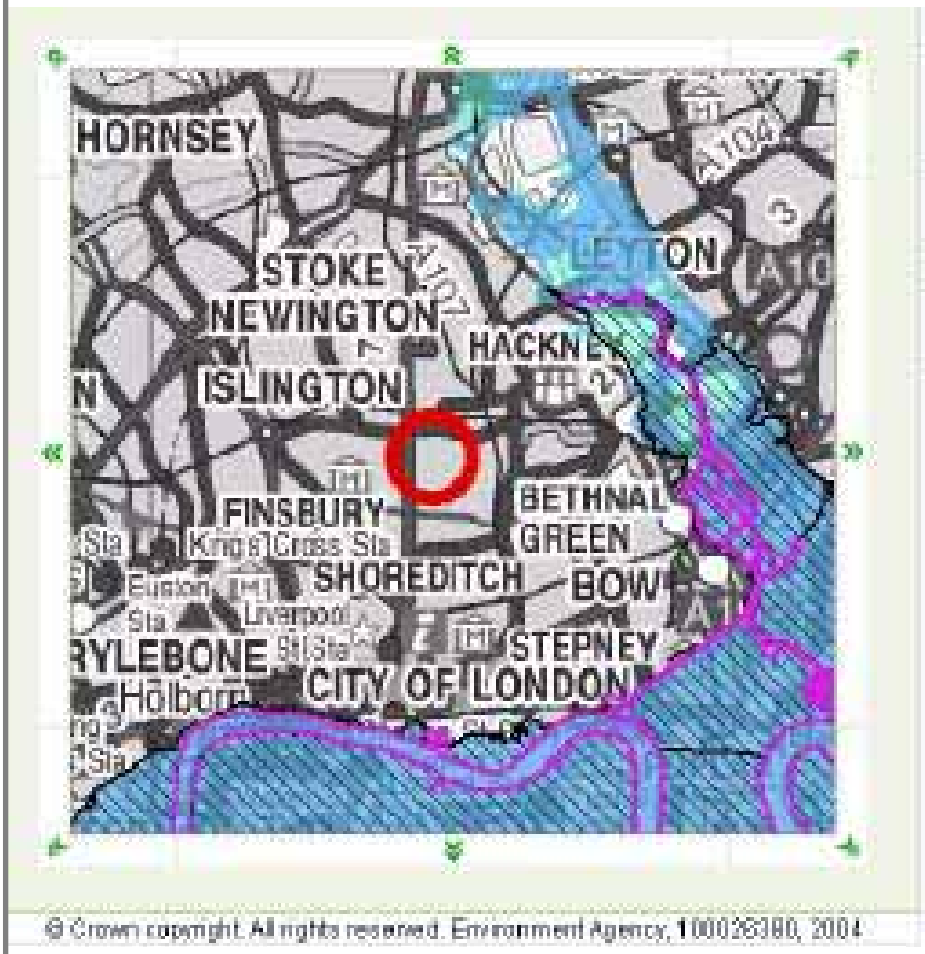

Figure 7.1: Designated Indicative Floodplain Maps

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7.3.14. The Chalk and Thanet Sand are hydraulically connected and classified by the Environment Agency as a major aquifer. This is used as a major water supply across the region, and is confined by the overlying clay (non-aquifer). The Environment Agency 2005 report 'Rising Groundwater levels in the Chalk-Basal Sands Aquifer of the Central London Basin' confirms that groundwater levels within the deep chalk aquifer below the site are currently at approximately -24mAOD, flowing in a northerly direction. These water levels are estimated as having a current rate of rise of approximately 0.0m/year, i.e. currently static at the site (May 2005).

Waste Water

7.3.15. All existing sewers in the vicinity of the development are combined sewers carrying both foul and storm water flows, see Figure 7.2 for Thames Water sewer drawings.

7.3.16. A brick sewer runs across the northern end of the site in Dalston Lane. The sewer runs from west to east along Dalston Lane starting as 1,150mm by 800mm at the junction with the sewer from Kingsland High Street, and reducing to 950 by 800mm as it passes the site.

7.3.17. At the northern end of Roseberry Place, there is a short section of 150mm diameter sewer running south to north and connecting with the brick sewer in Dalston Lane. There is a further drain running north to south in Roseberry Place. This starts as 225mm diameter pipe and increases to 300mm as it passes the Government offices and school. The sewer turns east along Forest Road.

7.3.18. A 950 by 650mm sewer runs from south to north from Mayfield Close across Forest Road where it receives the 300mm diameter sewer from Roseberry Place as described above. The sewer continues the length of Beechwood Road and connects with the brick sewer in Dalston Lane.

Water Quality

7.3.19. The Envirocheck report register records one pollution incident to controlled waters about 200m southwest of the site. It was recorded as a Category 3 minor incident involving unknown chemicals, in January 1997. There is one other recorded pollution incident to controlled waters between 250m and 1,000m from the site.

7.3.20. Groundwater quality of the lower aquifer, the chalk, is good and it is used for water supply throughout the region. The Environment Agency have data for two monitoring points in the vicinity; 1415, approximately 3km southwest of the site, and 1416, approximately 3km south of the site. The most up to date water quality data available from the Environment Agency website is given in Appendix 7.3.

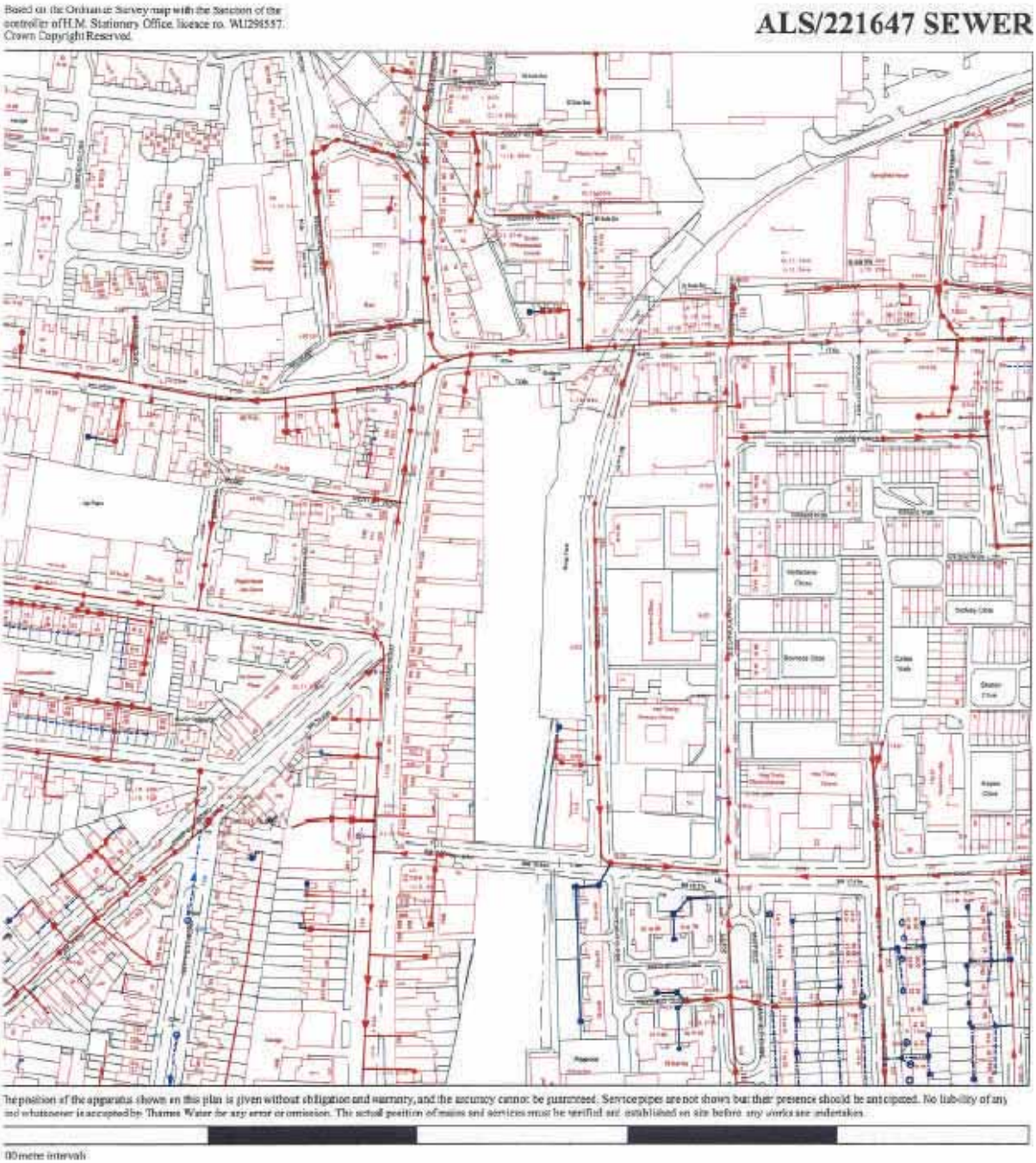

Figure 7.2: Thames Water Sewer Infrastructure

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7.4. Potential Effects

7.4.1. Predicted impacts may be classified as occurring during construction and operation. The majority of impacts would take place during operation.

Surface Water

7.4.2. Construction activities on site may increase the amount of surface run off. This could lead to flooding of the site and increase the risk of flooding of the combined sewer. These effects would be considered to be short-term, slight, adverse in the absence of any mitigation.

7.4.3. Currently the majority of the site is permeable with rainwater filtering into the ground. With the implementation of the ELLP scheme the extent of hard surfacing on the site would be increased. However, the proposed development would be almost entirely impermeable and, therefore, would lead to considerable surface water to discharge from the site.

7.4.4. Using the FEH data, a peak rainfall of 108mm/hr (1 in 30 year return period) has been estimated for the site. A peak discharge of 240l/s has been calculated for the site, assuming a run-off coefficient of 1, i.e. the whole site is impermeable. See Appendix 7.5 for calculations. Brown roofs are proposed for the development which would reduce runoff for low return period events. However, these are less effective at higher return periods so a worst case has been assumed in the design.

7.4.5. If these flows were to enter the TWU combined sewer they could cause flooding and backing up of the system creating flooding elsewhere. These effects could potentially be long-term, moderate, adverse if the design did not account for them.

7.4.6. Consultation with TWU (see Appendix 7.1 for correspondence) has confirmed that the surface water discharge from the site to the combined sewer system would be restricted to green field development rates of 5 litres per second per hectare. The drainage system of the development would be designed so it does not flood the site in a 1 in 30 year storm event in the form of oversized pipes. Attenuation of approximately 360m3 of stormwater in a combination of attenuation tanks in the building basements and ‘Stormcell Storage System’ in the roadway would be included to ensure the discharge to sewer is reduced to acceptable levels (see Appendix 7.4 for Stormcell Storage System). This mitigation measure would ensure that the operational impacts on surface water are negligible.

Groundwater

7.4.7. Excavation of any localised pockets of contaminated Made Ground could impact groundwater in the Terrace Gravels (shallow gravel aquifer). Effects can be fully mitigated by selective excavation of any contaminated ground and control of handling and storage. The impacts on the shallow aquifer may be considered to be slight adverse to negligible.

7.4.8. Penetration of the lower aquifer during piling may also cause pollutants to enter the ground water. However, the piles have been designed to end in the London Clay. This is unlikely to cause penetration of the deep chalk aquifer and therefore the impacts on groundwater quality may be considered to be negligible.

7.4.9. Borehole abstractions for water supply may reduce the impact of rising groundwater levels beneath London while reducing demand from the water supply system. However, as the rate of rise of groundwater beneath the site has slowed significantly in recent years, and other means of reducing water use are being considered, borehole abstraction is not currently being proposed for the site and therefore the impacts are negligible.

Waste Water

7.4.10. Construction activities would generate small amounts of waste water on site which if not

conveyed to the sewer may cause pollution of the site. However, by ensuring that suitable measures are in place for dealing with waste water, and ensuring that the drainage system is installed early in the construction programme the effects would be negligible.

7.4.11. The site is currently unoccupied and the proposed development is for a large number of residential units, some retail units and the station and bus interchange. Waste water would be generated from toilets, bathrooms and kitchens. Foul water discharge from the site has been estimated by the design team with a peak flow of 25l/s. It has been agreed with TWU that all foul water can be discharged into the existing sewer in Roseberry Place without any need for upgrade or repair (see correspondence in Appendix 7.1).

7.4.12. The surrounding area is currently drained by a combined sewer system. TWU are responsible for regulating the sewers and have confirmed there is sufficient capacity to accommodate flows from the proposed development. Therefore the resultant impact on the capacity of the sewerage system would be negligible.

Water Quality

7.4.13. Sediments or hydrocarbons may be washed into the sewers during construction causing pollution of the sewer. This may then lead to pollution of water courses. Such effects are considered to be medium-term, slight, adverse. Mitigation of this is discussed below.

7.4.14. All runoff from the site would go to the combined sewer system. Any hydrocarbon spills from parked cars or buses on the development would drain to the sewer and may cause potential pollution of water courses if the sewer were to flood. Such effects could potentially be medium-term, slight, adverse. The designed drainage system would include petrol interceptors to reduce these effects so the impact is negligible.

7.4.15. The additional discharge into the sewer from the development may lead to the sewer overflowing and discharging pollutants into a water course. This impact is could potentially be medium-term, slight, adverse. However, TWU are responsible for regulating the sewers and therefore the resultant impact on the sewer system would be negligible.

Cumulative Impacts

7.4.16. A number of developments in the area are likely to seek to discharge surface run-off to the combined sewer system. This could lead to overloading the system and subsequent sewer flooding. The cumulative impact of increased discharges due to increased impermeable area would lead to long-term, slight, adverse impacts.

7.4.17. TWU and Environment Agency regulation would ensure that surface water runoff is not increased from proposed developments. Other developments would also have to attenuate rainwater through the use of attenuation tanks and SUDS, such as green or green roofs, to mitigate any effects from those developments, resulting in negligible impacts.

7.4.18. Excavation of any localised pockets of contaminated Made Ground could impact groundwater in the Terrace Gravels (shallow gravel aquifer). Effects can be fully mitigated by selective excavation of any contaminated ground and control of handling and storage. The impacts on the shallow aquifer may be considered to be slight adverse to negligible.

7.4.19. Pile design for this development indicates the base of piles would be founded in the London Clay and would not penetrate the lower aquifer. Assuming that the other developments are of similar construction, it is unlikely that there would be cumulative impacts on the groundwater.

7.4.20. The new developments are likely to increase wastewater flows to the system. The effects outlined above would therefore be cumulative and could overload the sewers causing increased foul flooding. This effect is long-term, moderate, adverse. As stated above there is

currently capacity for the Dalston Junction Interchange flows.

7.4.21. Use of low-use fixtures within the other developments would help to reduce the flows into the sewer, but there would still be in overall increase in flows compared with the existing situation. This increase would have a knock-on effect across the whole sewer network. The overall impact is considered to be long-term, slight, adverse.

7.4.22. Increased surface water and waste-water discharges into the sewer from all developments could lead to increased frequency of overflows from the sewers within the wider Thames catchment. The overall impact is considered to be long-term, slight, adverse.

7.5. Mitigation Measures and Residual Effects

Surface water

7.5.1. It would be ensured that the drainage system is installed early in the construction programme to mitigate the effects of construction on surface water to be negligible.

Groundwater

7.5.2. Groundwater impacts due to this development are slight adverse to negligible. Pile design has ensured that there is little risk of polluting the lower aquifer.

Waste Water

7.5.3. Estimated peak waste water flows have been agreed by TWU and may be discharged to the sewer with negligible impact. Low use fixtures may result in lower peak flows to be discharge to the sewer. Increased flows from other developments may result in cumulative long-term, slight adverse impacts.

Water Quality

7.5.4. Water quality impacts on watercourses need to be particularly considered during construction to ensure that best practices such as implementation of sediment traps and petrol interceptors are used. These should ensure that water quality remains high. With the implementation of good construction practices, these effects would be negligible.

7.5.5. Good construction practices should include the following:

- Minimising the amount of bare, stripped soil on site at any one time;
- Installation of adequate drainage during construction;
- Use of sediment traps or settlement tanks and petrol interceptors prior to discharge of water;
- Appropriate storage of potential contaminants within bunds away from drains and remedial action using absorbent materials if spillage occurs;
- Control of spoil and other materials to prevent spillage and appropriate selection of storage location.

7.5.6. Due to cumulative increases in foul flows, there could potentially be long-term, slight, adverse water quality impacts from increased frequency of overflows from the sewers within the wider Thames catchment.

7.5.7. The results of the assessment are summarised in Table 17.1 at the end of this document.

8. Ecology

8.1. Introduction

8.1.1. This chapter addresses the potential ecological effects the proposed development may have on the proposed development site and surrounding area. The assessment includes a summary of the current conditions found within the area and identifies mitigation measures where appropriate for significant effects that may arise as part of the proposed development.

8.2. Assessment Criteria and Methodology

National Legislation and Guidance

8.2.1. The primary legislation relating to the assessment of ecological impacts are as follows:

- Wildlife and Countryside Act 1981 (as amended)[28];
- Conservation (Natural Habitats &c.) Regulations 1994[29;] and
- Countryside and Rights of Way Act 2000[30]

8.2.2. These pieces of legislation relate to the protection of certain habitats and species as defined within the legislation, and are integral to the ecological assessment.

8.2.3. A review of the relevant policies and guidance has been undertaken and is set out below to inform the ecological assessment process.

8.2.4. The key principles of the PPS9[31] state that:

"…(vi) the aim of planning decisions should be to prevent harm to biodiversity and geological conservation interests."

"…the re-use of previously developed land for new development makes a major contribution to sustainable development by reducing the amount of countryside and undeveloped land that needs to be used. However, where such sites have significant biodiversity or geological interest of recognised local importance, local planning authorities, together with developers, should aim to retain this interest or incorporate it into any development of the site."

8.2.5. PPS9 goes on to state:

"Development proposals provide many good opportunities for building-in beneficial biodiversity or geological features as part of good design. When considering proposals, local planning authorities should maximise such opportunities in and around developments, using planning obligations where necessary."

8.2.6. In respect of Species Protection, PPS9 states that:

"…planning authorities should ensure that these species are protected from the adverse effects of development, where appropriate, by using planning conditions or obligations.

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[28] Wildlife and Countryside Act 1981 (as amended) HMSO, London.

[29] The Conservation (Natural Habitats &c.) Regulations 1994, HMSO, London

[30] Countryside and Rights of Way Act 2000, HMSO, London

[31] ODPM. (2005). Planning Policy Statement 9: Biodiversity and Geological Conservation.

Planning authorities should refuse permission where harm to the species or their habitats would result unless the need for, and benefits of, the development clearly outweigh that harm."

8.2.7. There are a number of UDP policies relevant to ecology, see Appendix 1.2 for further details.

Information Sources and Consultation

8.2.8. Information on ecological resources has been obtained from the following sources:

- Data gathered through review of existing information available in publications, reports and from the Internet;
- Consultations with statutory and non-statutory bodies with responsibility for nature conservation issues;
- Original surveys; and
- Aerial photographs.

8.2.9. An extended Phase 1 Habitat Survey has been undertaken based on the standard methodology according to the Joint Nature Conservation Committee's Guidelines[32].

8.2.10. Consultation has been undertaken with the following organisations:

- English Nature;
- Environment Agency;
- London Wildlife Trust (LWT);
- Greater London Authority (GLA); and
- London Borough of Hackney Council.

8.2.11. These organisations have been contacted and consulted with, in respect of the proposals and nature conservation, such that relevant information could be obtained for the site and immediate surrounding area.

8.2.12. Information sought includes the presence of designated sites, protected species, other species and habitats of conservation concern (for example those listed on the Biodiversity Action Plan), and other relevant issues and considerations in respect of the ecological impact assessment of the proposed development.

8.2.13. Additionally Greenspace Information for Greater London (GIGL) was contacted and an ecological data search undertaken for the site and a 1km search area.

8.2.14. Other sources of information referred to include aerial photographs and internet mapping systems. Additionally, the following East London Line Documents were referred to:

- East London Line northern extension and Silwood servicing facility Environmental Statement (ERM, 1993)[33];

[32] Joint Nature Conservation Committee. (1993). Phase 1 Habitat Survey Guidelines.

- East London Line Black Redstart Survey (Arup, 2004)[34], (Gedge, 2005)[35]; and
- East London Line Ecology Strategy (Arup, 2004)[36].

Field Survey

8.2.15. A walkover survey of the site has been undertaken. This involved identifying and mapping those habitats present and additionally making note of any features of significance. The survey was undertaken following the Phase 1 Habitat Survey Methodology (JNCC 1993) and included scoping for the presence of any species or features of ecological concern. No further protected species surveys were deemed necessary for the satisfactory completion of this assessment.

8.2.16. The habitats were mapped and are shown on the attached Figure 8.1. Additionally the dominant vegetation types and species were recorded and are presented within the site description text.

Assessment

8.2.17. The ecological assessment has been undertaken using the baseline as informed by the consultation exercise, desk study and field survey as described above. The assessment method has involved the following:

- Identification of ecological resources;
- Evaluation of significance of ecological resources;
- Identification of potential impacts and effects resulting from the proposed development; and
- Determination of significance of effects.

8.2.18. The ecological resources present have been considered in respect of the design, construction and operation of the scheme. The likely impacts and effects on the ecological resource resulting from the scheme have been identified and assessed in accordance with the Institute of Ecology and Environmental Management's Ecological Impact Assessment Guidelines[37].

8.2.19. Assessment of the significance of the effects of the scheme on ecological resources has initially been made assuming that no mitigation measures would be applied. This gives an indication of the need for mitigation and enables a subsequent assessment of the effectiveness of that mitigation to be made in assessing residual effects of the scheme. In addition to the required mitigation, residual effects include consideration of ecological enhancement measures that would be included as part of the completed scheme. Residual effects are presented in Section 5 of this chapter.

8.2.20. Determination of significance of impacts and effects has been made taking into account the following:

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[33] ERM. (1993). East London Line northern extension and Silwood servicing facility Environmental Statement.

[34] Ove Arup & Partners. (2004). East London Line Black Redstart Survey.

[35] Gedge, D. (2005). East London Line Black Redstart Survey.

[36] Ove Arup & Partners. (2004). East London Line Ecology Strategy.

[37] Institute of Ecology and Environmental Management. (2005). Guidelines for Ecological Impact Assessment.

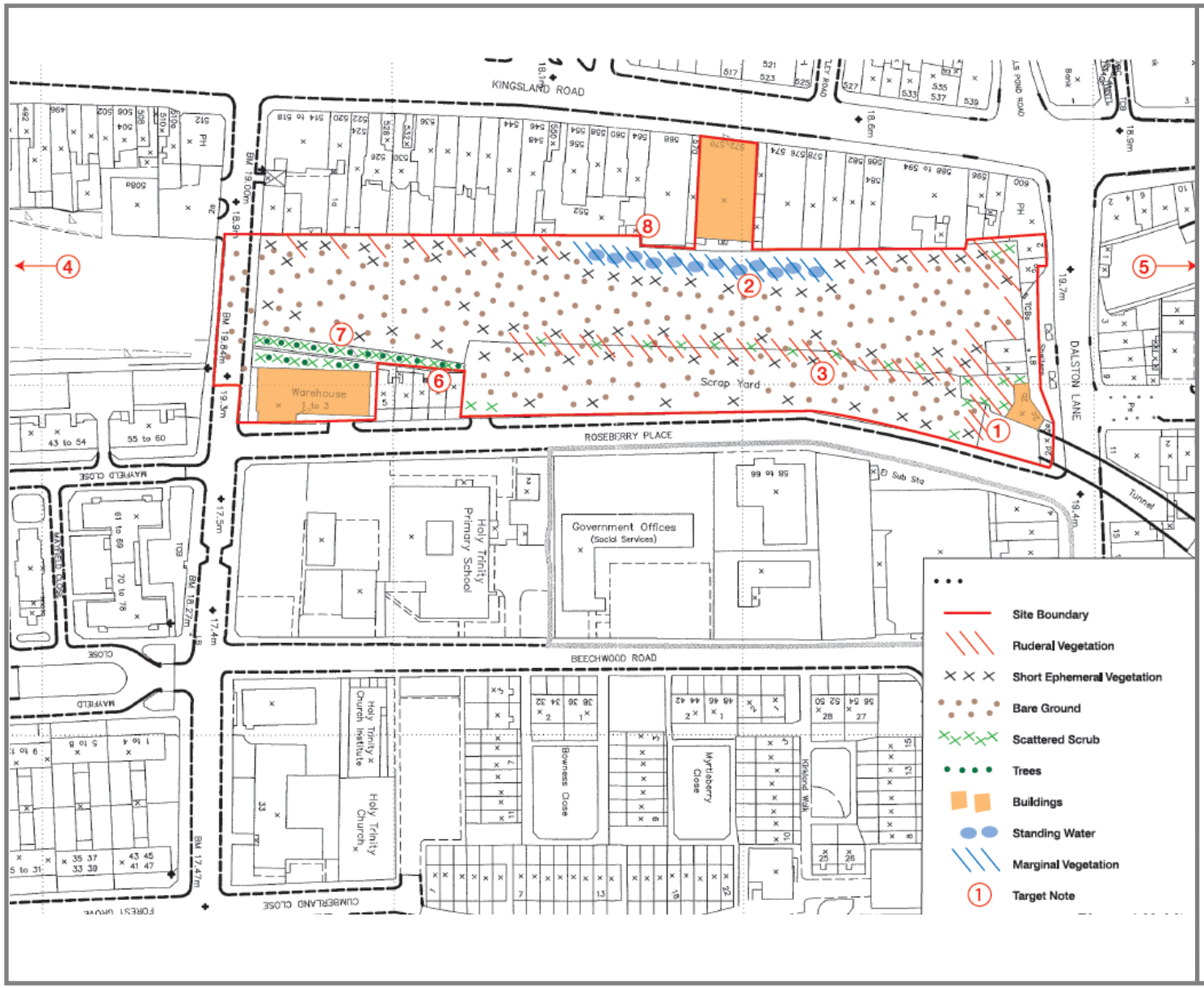

Figure 8.1: Phase 1 Habitat Plan

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- The size, value and sensitivity of the ecological resource;
- Duration of impacts;
- The severity of potential impacts;
- Interactive and cumulative effects and impacts;
- The ability of the ecological resource to recover from temporary effects; and
- The potential for effective implementation of appropriate mitigation or amelioration options.

Limitations, Constraints and Assumptions

8.2.21. The baseline conditions presented in this study represent those at the time of survey and reporting. However, the assessment has been made assuming the development of the ELLP being completed, such that this assessment considers those impacts and effects likely to result over and above those resulting from the consented ELLP.

8.2.22. The baseline conditions as reported in this study represent those conditions at the site at the time of survey. These conditions may change throughout the seasons and over time in general. Additionally, no account can be made for the presence or absence of protected species on any one survey occasion, since they may travel over wide areas and/or have large home ranges. Protected species may return to or colonise a site at any future time.

8.3. Baseline Conditions

Consultation

8.3.1. The results of the ecological data search have been obtained from GIGL[38], see Appendix 8.1.

8.3.2. Consultation with English Nature revealed that in respect of species records, GIGL hold all relevant data. English Nature would like to see enhancements of the accessible natural greenspace in the area. Additionally, although not recorded at the site, English Nature would like to see the provision of reptile habitat and enhancement of those habitats present in the area for reptiles.

8.3.3. Responses received from the Environment Agency confirmed that they do not hold data for this site and referred to GIGL as holding relevant data for this area.

Designated Sites

8.3.4. Information received has revealed that there are no statutorily designated sites for nature conservation within the site and wider search area (1km). Furthermore, no Local Nature Reserves are present within the site or wider search area.

8.3.5. The search area does not contain any Wildlife Trust reserves, but does contain ten non-statutorily designated sites for nature conservation, Sites of Importance for Nature Conservation (SINCs).

8.3.6. Sites of Importance for Nature Conservation in London are divided into three tiers of sites:

[38] Greenspace Information for Greater London. (2005). Data Search for Dalston Junction.

- Sites of Metropolitan Importance
- Sites of Borough Importance
- Sites of Local Importance

8.3.7. Sites of Metropolitan Importance receive the highest priority for protection, followed by Sites of Borough Importance (also further divided into Grade 1 and Grade 2), and then Sites of Local Importance (for full details on the SINC designations please see Appendix 8.1).

8.3.8. The nearest of these sites is the 'North London Line in Islington Site of Borough Importance' (Grade 1), located to the north west of the site at approximately 200m from the site boundary.

8.3.9. Two sites of Borough Importance (Grade 2) are located to the northwest of the site: the Jewish Burial Ground, Kingston Road (300m northwest), and Dowcras Buildings Wood (500m northwest).

8.3.10. The nearest Site of Metropolitan Importance is the London's Canals (Regents Canal) located 850m directly to the south of the site. (See Appendix 8.1).

Biodiversity Action Plan and Protected Species

8.3.11. The consultation information received contained information and records held for the following species and habitats listed within the Greater London Biodiversity Action Plan (BAP), for which individual Action Plans have been produced:

- Bats. Four records are held in respect of bats: at 350m north, 860m southwest, 1,060m southeast, and 1,070m northeast of the site). All species of bats are protected under the Wildlife and Countryside Act 1981 and the Conservation (Natural Habitats &c.) Regulations 1994.
- House sparrow (1,300m northwest of the site). Additionally during surveys for the ELLP, the Dalston Junction site was reported to be an important habitat area for house sparrows.
- Stag beetle (820m northwest of the site).

8.3.12. All records for these species are outside of the boundary of the site, with the closest records being a record of bat roosts to the north of the site dating back to 1996.

8.3.13. The site is located within a known key area for black redstarts, with a record of the species (post 2001) located 1,160m to the south of the site. Black Redstarts are listed on Schedule 1 of the Wildlife and Countryside Act 1981 (as amended), and, as such receive special protection. In addition to the nests being protected from damage or destruction (as applicable to all nesting birds), they are also afforded protection from any disturbance whilst at or building a nest.

8.3.14. Additionally, although no records are held for reptiles within either the site or the wider search area, the site does contain some suitable habitat for reptiles, for which a Species Action Plan has been produced within the Greater London BAP, and all UK species receive some level of protection.

East London Line Desk Study

8.3.15. Relevant East London Line ecological documents were reviewed in respect of the baseline conditions at the site. The documents make reference to the presence of Japanese Knotweed within the site area, and the potential presence of suitable habitat for black

redstarts, bats and reptiles (as highlighted above). In addition, these documents highlight the potential for nesting birds within the site, where suitable vegetation and habitats exist, including the presence of good numbers of house sparrows using the site.

Field Survey

8.3.16. The results of the Phase 1 Habitat Survey are presented on Figure 8.1. The alpha-numeric codes cross-refer to those in the site description text below and indicate target notes of observations or features of note.

Site Description

8.3.17. The Dalston Junction site comprises a former railway cutting, the derelict Dalston Station building and platform area (formerly used as a scrap yard TN1), an existing warehouse to the south of the site, and an existing snooker hall fronting onto Kingsland High Street. The site is a brownfield site, characterised by wasteland-type habitat including bare ground, short ephemeral and tall ruderal vegetation. The site additionally contains some flooded/damp areas with localised standing water (relatively shallow, up to 10cm in depth) likely to be due to impeded drainage in this area (TN2). The vegetation present in these areas comprises species typical of damp ground conditions including dominant great willowherb, water cress, reedmace rushes and redshank.

8.3.18. The substrate and ground conditions are generally sandy and stony and predominantly bare in most places, or otherwise with short ephemeral and sparse rough grassland vegetation. The margins of the site and the raised banks near the former scrapyard and station platform (TN3) support more ruderal and young scrub vegetation, typified by the following species: michaelmas daisy, red clover, white clover, plantains, black medick, redshank, bramble, prickly lettuce, Cruciferae sp., thistles, mugwort, wild carrot, rosebay willowherb, young goat willow and young sycamore. The former station and platform (scrapyard area) comprise the remains of the station building which is now derelict and becoming colonised by bramble and buddleia.

8.3.19. The site meets the disused railway viaduct to the south of Forest Road Bridge (TN4). The permitted East London Line development will be located along this viaduct, before descending at the end of the viaduct to follow the route through the site and continuing northwards through the Kingsland Covered Way (TN5) before joining the existing North London Line. With the exception of the linkages to the north and south via the disused/former railway line, the site is otherwise surrounded by dense urban built development, with no greenspace or open space within the vicinity. The site is therefore relatively isolated, but for the connections to the north and south.

8.3.20. The snooker hall and warehouse comprise existing buildings with very little ecological interest.

8.3.21. Several private gardens back onto the site (TN6), with some additional areas of wooded embankments present towards the southern end of the site (TN7) dominated by sycamore trees.

8.3.22. The boundaries/margins of the site comprise mostly brick walls or hoardings, with buddleia beginning to colonise parts of the brick walls in places.

8.3.23. Japanese Knotweed was identified as present on the western margin of the site within the East London Line documentation (TN8). This was present to the rear of one of the properties along Kingsland Road, above the existing brick wall.

Protected Species

8.3.24. During the Phase 1 Habitat Survey no evidence of any protected species was recorded;

however, the habitats present at the time of survey do provide conditions that are potentially suitable for the following species: reptiles, nesting birds, black redstarts, and foraging bats.

8.3.25. A black redstart survey has been undertaken for the ELLP which included the proposed development site (Gedge 2005). Black redstarts have not been recorded nesting within the site, although some suitable habitat exists for this species. Black redstarts have been recorded nesting further south of the site along the disused railway viaduct. There exists scope within the development for the enhancement of the area for black redstarts in association with the East London Line development.

8.3.26. The site contains some suitable habitat for nesting birds in general, including house sparrows (a London BAP species) as reported by Gedge (2005), Further survey of the site for nesting birds was not required for the completion of this assessment and for the provision of appropriate recommendations for mitigation measures.

8.3.27. No potential bat roost sites were identified during the Phase 1 Habitat Survey. Habitat conditions are such that some limited bat foraging may take place within the site. No further survey of the site in respect of bats was necessary in order to complete this assessment.

8.3.28. The site provides some potential for reptiles, albeit quite limited and likely to be restricted to very low numbers of either common lizard and/or slow worm. Previous information compiled for the ELLP has not identified the presence of reptiles within this particular area, and although some potential exists, further surveys were not deemed necessary in order to complete this assessment and provide recommendations for mitigation measures appropriate to this group.

Ecological Resources/Appraisal

8.3.29. The site does not contain any designations for nature conservation, either statutory or non-statutory. No records have been received of protected or BAP species (or habitats) within the site, although potentially suitable habitat exists that could support several protected species. The site comprises predominantly brownfield and wasteland habitat, forming part of the disused railway corridor, located within dense urban development.

8.3.30. The site is located within a known key area for black redstarts, with a record of this species to the south of the site, and additional records of black redstarts along the East London Line Viaduct further south.

8.3.31. The habitats present within the site are suitable for black redstarts and hence, although no records exist for the species within the site, there is the potential for this species to use the site.

8.3.32. The site additionally contains habitat suitable for invertebrates with bare areas suitable for basking and nectar rich plants such as buddleia providing foraging opportunities for invertebrates such as butterflies.

8.3.33. The site does not contain any habitat identified as providing possible bat roost sites, however, the site is likely to provide some foraging opportunities for bats particularly when considered in the local context and as part of the wildlife corridor of the disused railway line. The disused railway corridor provides a limited but potential resource for foraging bats, with ruderal vegetation and wasteland habitats present providing habitat for invertebrates upon which bats may forage. The Dalston site, whilst relatively lacking in dense vegetation, does have some foraging potential, and additionally is linked to the remainder of the disused railway corridor via which bats may reach and move through the area.

8.3.34. The site also contains some suitable habitat for reptiles, with basking areas and some vegetation providing cover and foraging opportunities, albeit quite limited, and corridor linkages to areas to the north and south of the site. The site is, however, quite isolated from

other semi-natural and suitable habitat, with much of the site comprising bare and sparsely vegetated substrate. Therefore although the site has potential for reptiles to be present, it is most likely that they would be present in very low numbers, and would potentially move through the site to more suitable areas further along the railway corridor.

8.3.35. In addition, although the overall ecological value of the site is relatively low, with few habitats present, the site is relatively undisturbed and does form part of a corridor through the city. Furthermore, the Dalston area in particular is significantly deficient in open spaces of any kind, and as such it is considered to be of local value to wildlife.

8.4. Potential Effects

8.4.1. The activities associated with the development of Dalston Junction would result in a number of impacts and effects on the ecological resources present within the site.

8.4.2. These may result from the construction phases and/or the operational phases of the development, and are detailed in the sections below.

8.4.3. Whilst the baseline conditions of the site at present (September 2005) have been described within Section 8.3, the site will accommodate the consented East London Line Extension regardless of this scheme going ahead. As such, the assessment of effects of the Dalston Junction scheme considers those effects of the scheme over and above those effects resulting from the ELLP. The Dalston Junction site lies within the limits of deviation of the ELLP, and so will be developed within the existing construction site and development area. The relevance of the existing baseline conditions as described in Section 8.3 will be primarily to inform the recommendation of the appropriate mitigation and enhancement measures to be incorporated into the scheme with respect to the ecological resources considered within this assessment.

General

8.4.4. The landtake associated with the construction of the development will not result in removal of and destruction of any semi-natural habitat within the site, based on the assumption that the scheme will be developed in conjunction with the ELLP, and that any semi-natural habitat present within the site will be removed as a result of the development of the ELLP. Therefore, in the absence of mitigation this is predicted to be not significant.

8.4.5. The construction works associated with the development will result in disturbance to the surrounding areas, and any species and habitats associated with those adjacent areas, for example the gardens adjacent to the site. However, the surrounding areas that would be subject to disturbance are very limited and much of the area would have been subject to development in association with the ELLP. Therefore this effect is considered to be not significant.

8.4.6. The construction of Dalston Junction may additionally result in some severance of the disused railway line and its function as a wildlife corridor through the area. This would be likely to result from both the site clearance and construction activities, and also from disturbance within the area, preventing fauna from moving through the area. However, the effects would be likely to be limited to the local area, and most, if not all of the corridor function will have been lost as a result of the East London Line development. Therefore, in the absence of mitigation, this is considered to be not significant.

Protected Species/BAP Species

8.4.7. The proposals will additionally result in activities that have the potential to cause adverse impacts on protected species.

8.4.8. The site does not contain any known black redstart nest sites, and hence the effects of the

development activities in respect of nesting black redstarts would be not significant. The design of the scheme will incorporate the provision of green roof areas, and additionally incorporate the provision of features such as nest boxes. These features can be designed specifically to encourage species such as black redstarts and invertebrates, and, as such in view of the likely condition of the site once the East London Line has been developed, the scheme has the potential to provide significant positive effects.

8.4.9. All species of bird in the UK are protected whilst nesting under the Wildlife & Countryside Act 1981 (as amended). This protection makes it illegal to damage or destroy a nest while it is actively being used. Therefore, the works have the potential to cause significant impacts in the absence of mitigation in respect of clearance of any remaining suitable vegetation within the site and hence potential conflicts with nesting birds.

8.4.10. All native species of bat are strictly protected in the UK by the Wildlife & Countryside Act 1981 (as amended) and the Conservation (Natural Habitats, &c.) Regulations 1994. No sites have been identified as potential roost sites, and therefore, effects on roosting bats are predicted to be not significant. The site does provide some limited suitable foraging habitat within the area, and in addition, the corridor of the disused railway does link with areas identified as areas where bat activity has been recorded in the past. However, the ELLP works will have resulted in the removal of the habitat suitability for foraging and commuting bats, and therefore, the construction activities will not result in any further significant impacts. The impacts of the proposals are therefore considered to be not significant.

8.4.11. The proposed scheme may incorporate beneficial features such as bat bricks and provision of suitable foraging habitat, which when considered in view of the site conditions once the ELLP has been developed, have the potential to make a significant positive contribution to the ecological resource of the area.

8.4.12. All reptiles native to the UK are afforded at least some level of protection under the Wildlife and Countryside Act 1981 (as amended). Common lizard, slow worm, adder and grass snake are all listed on Schedule 5 of the Act, and are protected in respect of Section 9(1) partially and Section 9(5) only. This protection prohibits the killing and injuring of these species, and additionally prohibits trade in these species. It is unlikely that any habitat suitable for reptiles will remain following the development of the ELLP, although there is a small possibility that reptiles may still move through the area, and therefore may be present within the site during site clearance and construction.

8.4.13. Generally however, the site will be unsuitable for reptiles once the works commence, and although the construction and development activities could have some limited potential to cause risk of killing and injury to individual reptiles, the likelihood of this impact occurring is minimal. In spite of this, in the absence of any mitigation such an impact would be a significant adverse effect of the works.

8.4.14. The ELLP is providing mitigation for the presence of Japanese knotweed within the site, such that this will not be an issue for the development of this project.

8.4.15. The base case for the site once the ELLP has been developed in readiness for the implementation of this scheme is such that the current proposals will not be likely to result in any further significant adverse impacts and effects upon the ecological resource present. Indeed, the current proposals provide opportunities for ecological enhancement within the site.

Cumulative and Interactive Effects

8.4.16. A number of other developments are proposed within the surrounding area of Dalston Junction. Whilst the existing area is built-up, some of these additional proposals when considered cumulatively with the Dalston Junction proposals may lead to additional effects on ecological resources. In particular, the development of the Dalston Lane South site has

the potential to result in some cumulative impacts due to its proximity to Dalston Junction.

8.4.17. In the short term, the combination of the two developments may result in some significant adverse effects on the local ecological resource as a result of losses of areas of semi-natural habitat within an area with a severe deficiency of any such habitats. However, in the longer term, once the landscaping and ecological mitigation measures of the Dalston Junction development along with the anticipated mitigation or enhancement measures provided by the Dalston Lane South proposals become established, the cumulative effects have the potential to make a significant positive contribution to the local ecological resource, resulting from enhanced habitat creation and open space provision.

8.5. Mitigation Measures and Residual Effects

8.5.1. The main ecological mitigation measures, which have been identified in order to alleviate the likely adverse impacts and effects, are as follows:

- Habitat creation through appropriate design and management;
- To take measures to provide new, and enhance remaining, habitats in accordance with the objectives of the relevant BAPs;
- Where adverse effects are anticipated on a species of conservation concern, to provide such measures which are required by the law and which are practicable within the scope of the proposed works, in order to alleviate and/or eliminate the risk of these effects. These measures will include replacement of habitat, provision of protection measures, and/or provision of other ecological features appropriate to the species concerned;
- Incorporate general protection measures for habitats or species inhabiting land adjacent to or within the construction/development site;
- To take measures to minimise risks to ecological resources, according to the law and which are practicable within the scope of the proposed scheme, either through the incorporation of detailed design features, or through the timing and phasing of construction activities;
- To take all feasible opportunities to include ecological design measures into the proposed scheme and landscape design in order to maximise ecological benefits and enhancements of the scheme;
- To undertake a watching brief in respect of protected species during site clearance and construction activities. This would primarily relate to black redstarts and other potentially present species, such as reptiles;
- To implement measures during construction to minimise impacts including fencing off adjacent areas to protect from encroachment, avoiding works at sensitive times, implementing pollution control and prevention, and preventing dust and debris pollution.

<u>Habitat Creation</u>

8.5.2. The proposals will include the provision of some habitat creation works comprising landscaping/tree and shrub planting around the development. Landscape planting should aim to use species native to the UK and locally appropriate wherever possible. Additionally, some areas should be subject to creation of species rich and rough grassland where practicable, with appropriate areas of native scrub incorporated within the habitat creation and landscape areas.

8.5.3. Species should also include nectar rich and berry bearing species to maximise the benefits

to fauna, with night-scented herbs and shrubs being incorporated to provide particularly suitable conditions for foraging bats (by encouraging nocturnal invertebrates upon which bats feed).

8.5.4. The key opportunities and areas for habitat creation, however, relate primarily to the provision of green roofs within the development (see below).

Black Redstarts

8.5.5. The following mitigation measures are recommended in respect of black redstarts and the losses of suitable foraging habitat coupled with the potential presence of this species within the area:

- Provision of green roofs in appropriate locations within the development, to be designed specifically to provide optimal black redstart foraging conditions;
- Provision of suitable nesting habitat including nest boxes sited in appropriate locations.

Other Breeding Birds

8.5.6. Any necessary site clearance activities should be avoided during the bird-breeding season. The peak-breeding season falls between March and July (inclusive). It should be recognised that some bird species have been known to breed outside of this period and that active nests are protected at whatever time of year they are encountered. If these activities are programmed to take place within this time period, an ecologist must be present to ensure that those areas being cleared do not contain any breeding birds/nests. If nests are present, then works must cease in that area, and the area must be protected from any disturbance until the nestlings have fledged (in accordance with the Wildlife & Countryside Act 1981).

8.5.7. Landscape treatments should additionally aim to incorporate suitable nesting habitat including areas of scrub, trees and shrubs, with nest boxes also being provided in appropriate locations within the development.

Bats

8.5.8. The landscape and habitat creation proposals should include provision of trees, linear vegetated features and planting blocks (in appropriate locations), which may be used for foraging by bats. The site (and surrounding area) is currently limited in its value for bat species. If sited appropriately, bat boxes and/or bat bricks could be used in association with the development and landscaping works as an opportunity for enhancing the site for bats. Flora should include night-scented herbs and shrubs (see above Habitat Creation).

Terrestrial Invertebrates

8.5.9. The habitats currently present within the site offer limited potential for invertebrates. The creation of habitats for ecological mitigation should aim to include vegetation that would provide suitable foraging and nesting habitat for these species and additionally for other invertebrates. The inclusion of native and nectar rich species of flora where practicable within the site, will help to encourage invertebrates within the site.

8.5.10. The incorporation of green roofs within the development would provide suitable habitat for invertebrates, as well as the provision of appropriate vegetation for landscaping purposes.

Reptiles

8.5.11. Although no records of reptiles are held for the site, the current conditions provide suitable habitat for reptiles and it is therefore possible that reptiles (albeit likely low numbers) use the site and pass through the site. Therefore, although most of the site will be cleared as a

result of the construction of the East London Line, any remaining site clearance activities (including, for example, dismantling of features such as rubble piles) should be undertaken under an ecological watching brief, such that in the event that individual reptiles are present, they may be rescued and moved to an appropriate area of safety.

8.5.12. Furthermore, inclusion of features and habitats suitable for reptiles is recommended where possible. This could include, for example, landscaped areas (preferably located with suitable links to the railway corridor) to include appropriate shrub and groundcover planting, linear vegetative features, and suitable bare areas for basking.

Construction

8.5.13. During construction, the following mitigation measures should be implemented to mitigate for adverse effects:

- Avoiding works at sensitive times;
- Implementing pollution prevention and control measures; and
- Preventing dust and debris pollution.

Further Ecological Enhancement

8.5.14. In addition to the mitigation measures recommended above, the following measures could be incorporated into the development to provide ecological enhancement and benefits:

- Where practicable within the development, green walls could be provided, and could include planting appropriate climbing species to provide vertical habitats within the development. Locations appropriate for the provision of green walls may include, for example, the fence-line along the south-western periphery of the site in the vicinity of the rear of the existing properties along Kingsland Road;

Residual Effects

8.5.15. Assuming the successful implementation of the mitigation measures and incorporation of the recommended ecological enhancement measures above, it is anticipated that the overall residual effects for the development will be not significant, with some potential for overall positive effects. This is summarised in Table 17.1 at the end of this document.

9. Electronic Interference

9.1. Introduction

9.1.1. This chapter addresses the potential impacts the proposed development may have on electronic interference to buildings surrounding the site. The assessment includes a summary of the existing conditions found within the area and identifies mitigation measures where appropriate for effects arising as part of the proposed development.

9.2. Assessment Criteria and Methodology

Signal Transmission

9.2.1. In the UK, terrestrial television signals are transmitted as electromagnetic waves in the Ultra-High Frequency (UHF) band of the electromagnetic spectrum.

9.2.2. Cable television is transmitted via underground fibre optic cables. Not being an air-borne electromagnetic wave, it should not be affected by the construction of any new structures.

9.2.3. Satellite television services in the UK are transmitted at SHF (super high frequency) at around 10 GHz. The transmitting antennas are located on satellites which are in a geo-stationary orbit above the equator. As such, from the northern hemisphere, they form an arc in the southern sky. BSkyB, the only satellite television provider in the UK, transmits from the Astra 2 satellite, located above the equator at 28.2 degrees east. From London, this satellite is visible on an azimuth of approximately 145 degrees east from north, with an elevation of approximately 25 degrees.

9.2.4. In the UK, broadcast radio signals are transmitted at VHF (very high frequency) using frequency modulation (FM) from a network of radio transmitters, and also at lower radio frequencies: short wave (SW), medium wave (MW), and long wave (LW), all of which are amplitude modulated signals (AM). Radio signals are affected in a similar manner to television signals, although due to the wavelengths involved, can diffract around corners, and propagate through materials more easily. In addition, the reduced signal strength is less noticeable to the listener compared with television signals.

9.2.5. Each type of service, i.e. radio, terrestrial television, and satellite television, is transmitted using a different frequency and wavelength, which means that each type of signal will behave differently in certain situations.

Signal Shadows

9.2.6. Electromagnetic waves propagate in straight lines; visible light is an electromagnetic wave with a range of frequencies much higher than those used for television and radio transmission. Just as something obstructing a light source creates an optical shadow, objects in the line-of-sight of any electromagnetic transmitter create a shadow of electromagnetic signal behind them. These obstructions may be natural, for example a hill, or man-made, as in the case of a tall building. Within a signal shadow the received strength of a signal will be reduced. The shadow produced using straight-line geometry is called the ‘hard’ shadow.

9.2.7. There are, however, two factors that affect the strength and size of the signal shadow.

9.2.8. Electromagnetic signals can diffract around obstacles, the amount of diffraction being dependent on its frequency. Low frequency (long wavelength) signals diffract through the largest angles and high frequencies the least. Radio frequency signals (LW, MW, SW and VHF) have longer wavelengths than light and therefore can diffract through larger angles. The diffraction effects of super high frequencies (satellite signals) are minimal. In this case, the receiving antenna, the satellite dish, requires a clear line of sight to the transmitting

satellite. Due to diffraction, the length of a signal shadow is effectively reduced, and the hard shadow region is tapered as seen in Figure 9.1.

9.2.9. The second factor that can affect the signal strength within the hard shadow area is the materials used in the structure's composition. Solid concrete and brick constructions absorb far more of the incident signal, permitting only a small percentage through, yet with buildings that are non-solid such as metallic lattice towers, the signal reduction is dependent on the density of the lattice and the signal's wavelength.

9.2.10. Hence the overall effect is a shadow of varying signal strength graded such that in the near vicinity of a building the signal is greatly reduced, and further away the signal strength is diminished and in the distance the shadow can be described as negligible.

Signal Reflections

9.2.11. As in the case of light, any electromagnetic signal can be reflected. Thus, a receiver may receive two or more signals from the same source, a direct signal and one or more reflected signals. The reflected signals travel further and arrive at the receiver later than the direct signal. In the case of analogue terrestrial television, these delayed signals create a 'ghost' of the television image, slightly to the right of the main image, and this phenomenon is commonly known as ghosting.

9.2.12. The method of reception of digital terrestrial and satellite television has the ability to reject the relatively weaker reflected signals, and so the presence of reflected signals has far less impact.

9.2.13. A standard directional aerial usually receives signals only from within about 30° on either side of the direction in which the antenna points. In many cases where reflected signals are present, the aerial should therefore reject the reflected signal, as shown in Figure 9.2.

9.2.14. The composition of the reflecting material also has an impact on the strength of the signal reflection, with metal impregnated glass and flat polished metallic structures being the most reflective surfaces.

9.2.15. For the effect of ghosting to be noticeable, the strength of the reflected signal must be at least 5% of the direct signal strength. This relates to a difference in signal power between direct and reflected signals of 26dB.

Assessment Methodology

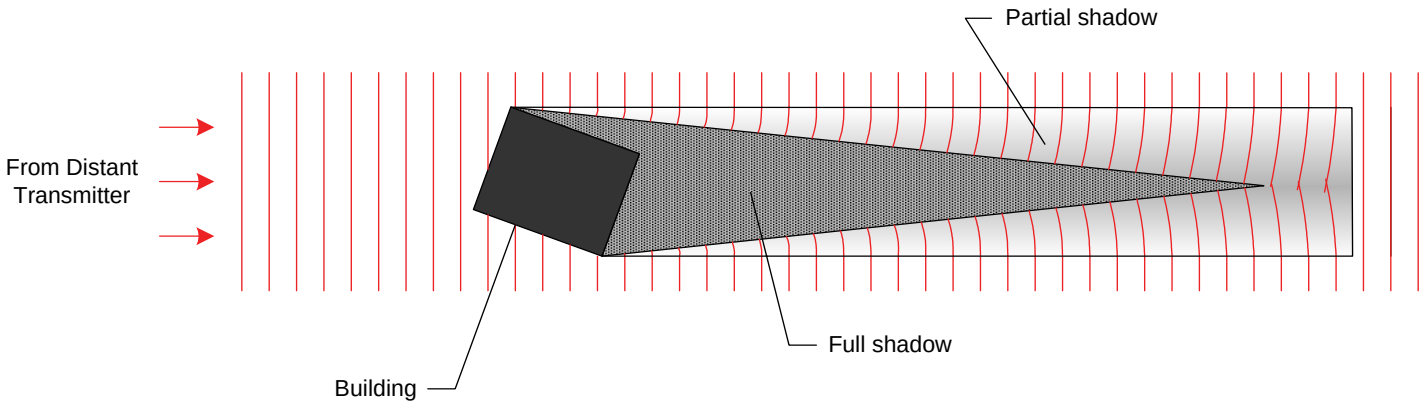
9.2.16. The study is based on:

- The location of the proposed development in relation to the location of the main television and radio transmitters;
- Design development documentation; and
- Principles of electromagnetic wave propagation.

9.2.17. A three-dimensional model of the development was used in this study, and is shown in Figure 9.3.

9.2.18. Principles of radio signal transmission from transmitting to receiving antennas are then used to study the impact of the major structures in the proposed development on radio and TV reception in the area surrounding the development. The study of impacts is based on first applying geometrical optics to identify broadly the areas around the development where television and radio reception could be affected. Principles of electromagnetic wave

Figure 9.1: Signal Shadows



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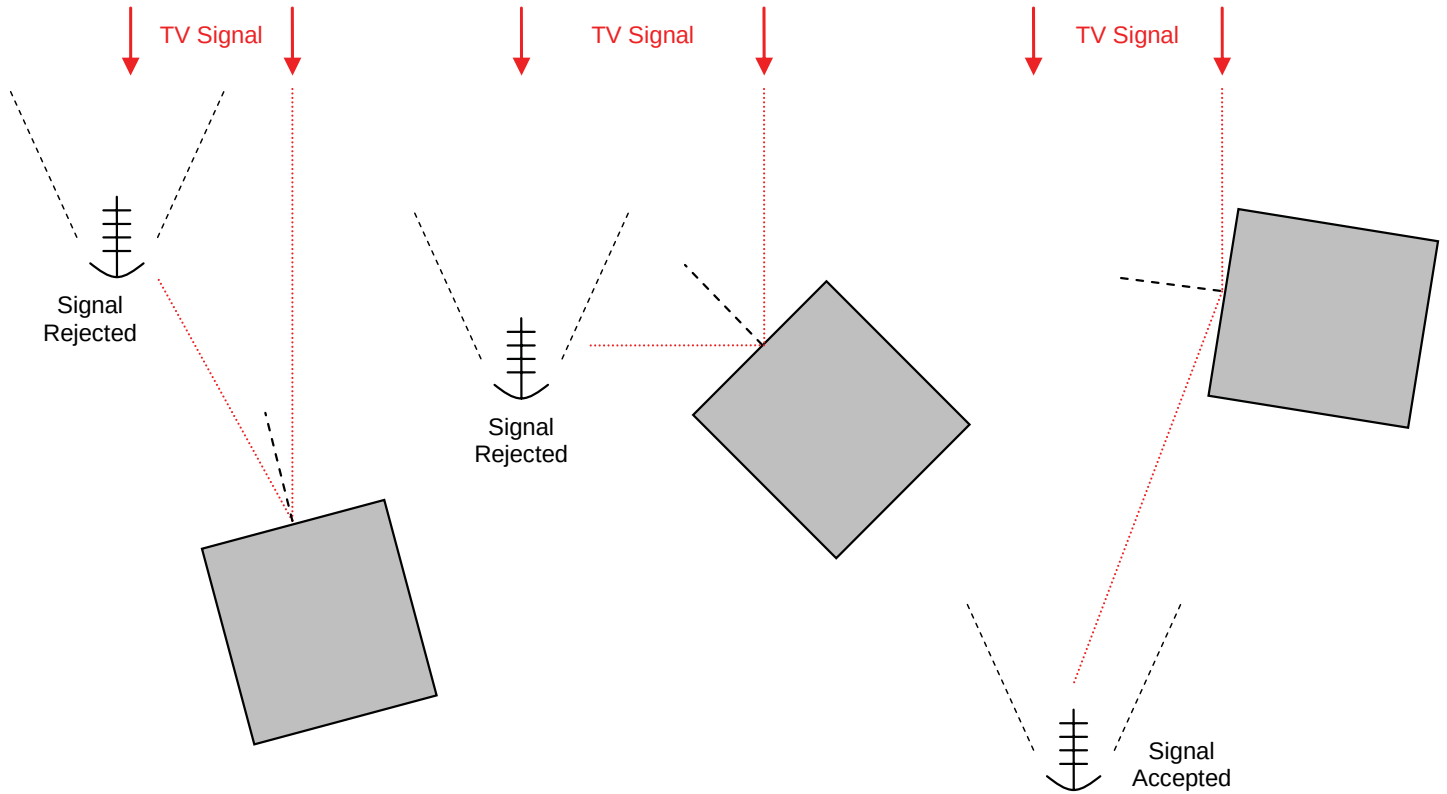

Figure 9.2: Signal Reflections

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propagation are then used to assess the potential impact in such areas.

Significance Criteria

9.2.19. The significance of the impacts is assessed by considering the area, number, and types of properties affected, the type of television service commonly employed in the affected area, as well as the predicted effect on the signal reception. The significance criteria shall relate to the approximate cost of mitigation.

9.2.20. Less than 30 households with significant signal disruption shall be considered negligible.

9.2.21. Up to 100 households with significant signal disruption shall be considered slight.

9.2.22. Up to 500 households with significant signal disruption shall be considered moderate.

9.2.23. More than 500 households with significant signal disruption shall be considered major.

9.2.24. Although, in general, the effect on signals can be considered permanent, market trends, such as the take-up of digital television and the planned “switch-off” of analogue terrestrial television, and emerging technologies, will result in the effects being medium or long-term.

9.3. Baseline Conditions

9.3.1. Publicly accessible transmitter information is used to deduce the current profile of television reception in the London area.

9.3.2. Terrestrial TV reception in the London area is mainly from signals received from the Crystal Palace transmitter, located approximately 9.3km south of the site (OS National Grid Reference TQ339712). Analogue BBC1, BBC2, ITV1 and Channel 4 signals, as well as all Digital Terrestrial Television signals are transmitted from Crystal Palace. Analogue terrestrial Channel Five signals are transmitted from the Croydon transmitter, located approximately 15km from the site on a similar bearing to the Crystal Palace transmitter (TQ332696).

9.3.3. Propagation modelling performed by the transmission companies ensures that the coverage achieved from both these sites covers the entire London area. However, the continually changing urban landscape has given rise to varying coverage levels due to signal shadowing and ghosting. A number of low power repeater transmitters are in existence to fill in these coverage gaps. These low power repeaters typically transmit analogue terrestrial signals only.

9.3.4. In the area in question, the repeater transmitters at Alexandra Palace and Poplar in particular may provide alternative analogue broadcasts to an extremely small number of households. These repeater stations are likely to become defunct past 2011, when analogue broadcasts are currently scheduled for decommissioning. Any affects on the signals from these repeater stations are therefore considered negligible and not subject to detailed investigation in this study.

9.3.5. The quality of terrestrial television reception achieved is also dependent on the equipment used at the receiving site. In many cases, a standard roof-top directional Yagi-type antenna is sufficient to obtain adequate signal reception, although in some cases, a high gain, more directional antenna, and / or masthead amplifier is employed.

9.3.6. In the area, main FM radio signals are received from the Wrotham transmitter. A number of other transmitters, including Crystal Palace, transmit a variety of FM and AM (MW) broadcasts.

9.3.7. As previously mentioned, BSkyB’s satellite television signals are received from the Astra 2

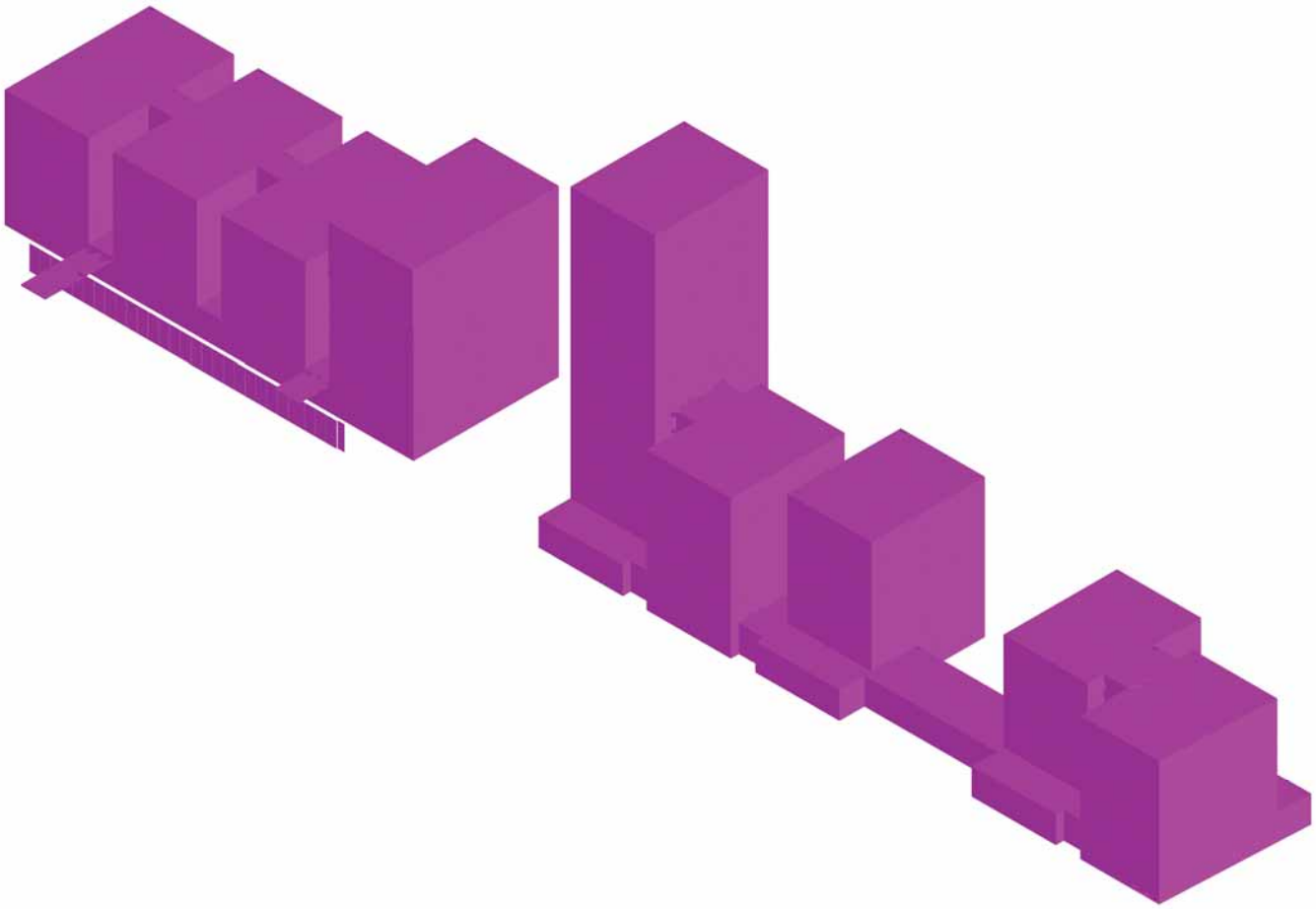

Figure 9.3: 3D Model of the Proposed Development

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satellite, which from London is located on an azimuth of approximately 145 degrees east from north, and an elevation of 25 degrees.

9.3.8. It is likely that there is already a deterioration of radio telecommunications signals caused by a number of existing tall buildings in the area, especially the tall buildings in the City of London, such as 30 St Mary Axe. Additional, smaller structures may cause more localised signal disruption.

9.3.9. In practice, it is quite difficult and almost impossible to identify the existing structures that cause such deleterious effects because they may be located anywhere within a large radius from the area under consideration.

9.4. Potential Effects

Radio

9.4.1. The radio frequencies used for the transmission of broadcast radio - LW to VHF - are such that signals can penetrate to some extent through obstacles and signals readily diffract around corners. In addition, there is no phenomenon similar to ghosting in the case of radio reception. Thus, the proposed development is unlikely to cause any significant interference to radio reception.

Satellite Television

9.4.2. Given the location and height of the proposed development in relation to the Astra 2 satellite, the satellite used for BSkyB services, a signal shadow would be created for a maximum of 110m to the northwest of the proposed development.

9.4.3. As shown in Figure 9.4, the shadow would fall across a small number of neighbouring properties on Kingsland Road and Dalston Lane. The number of properties in the shadow area would be less than 10.

9.4.4. By applying the proportion of households that subscribe to satellite television services, and considering that the receiving dishes are typically mounted at significant height, the number of satellite dishes located in the shadow zone is expected to be extremely small, if any. However, satellite subscribers in this area whose satellite dish is located in the shadow created, would find satellite services essentially permanently interrupted.

9.4.5. Due to the small number of properties potentially affected, the effect of the proposed development on satellite television services can be described as negligible.

Cable Television

9.4.6. The proposed development would have no impact on local cable television services.

Terrestrial Television

9.4.7. Both analogue and digital television transmissions are affected by shadows, and as such the transmissions from the transmitters at Crystal Palace and Croydon are subject to a detailed investigation as part of this study.

9.4.8. The position and massing of the proposed development in relation to the position and height of the television transmitters at Crystal Palace and Croydon dictates that signal shadows are created to the north of the development. The position of the development in relation to the transmitters can be seen in Figure 9.5.

9.4.9. The “hard” signal shadow, where receiving antennas do not have line of sight of the

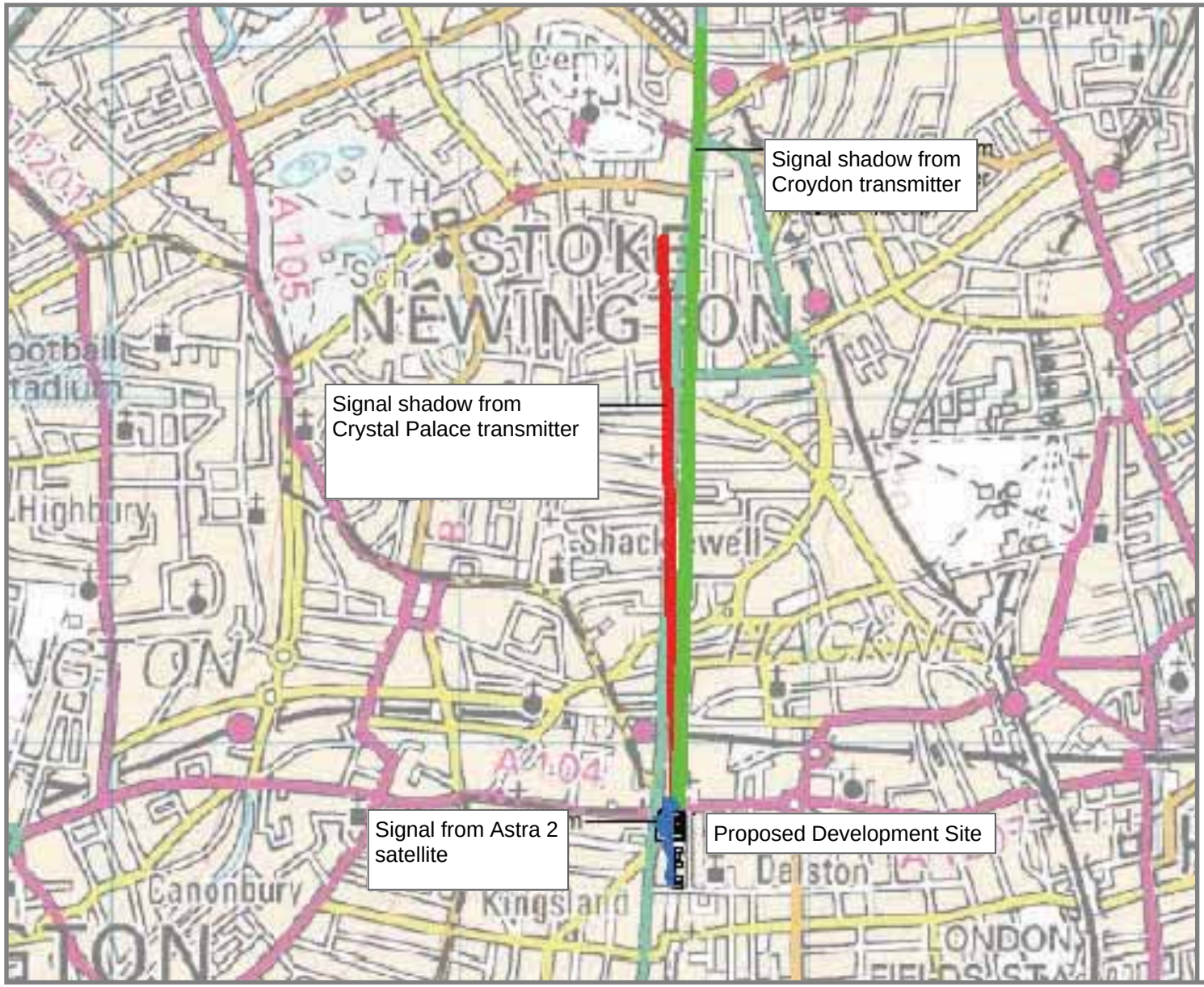

Figure 9.4: Proposed Developments Signal Shadow

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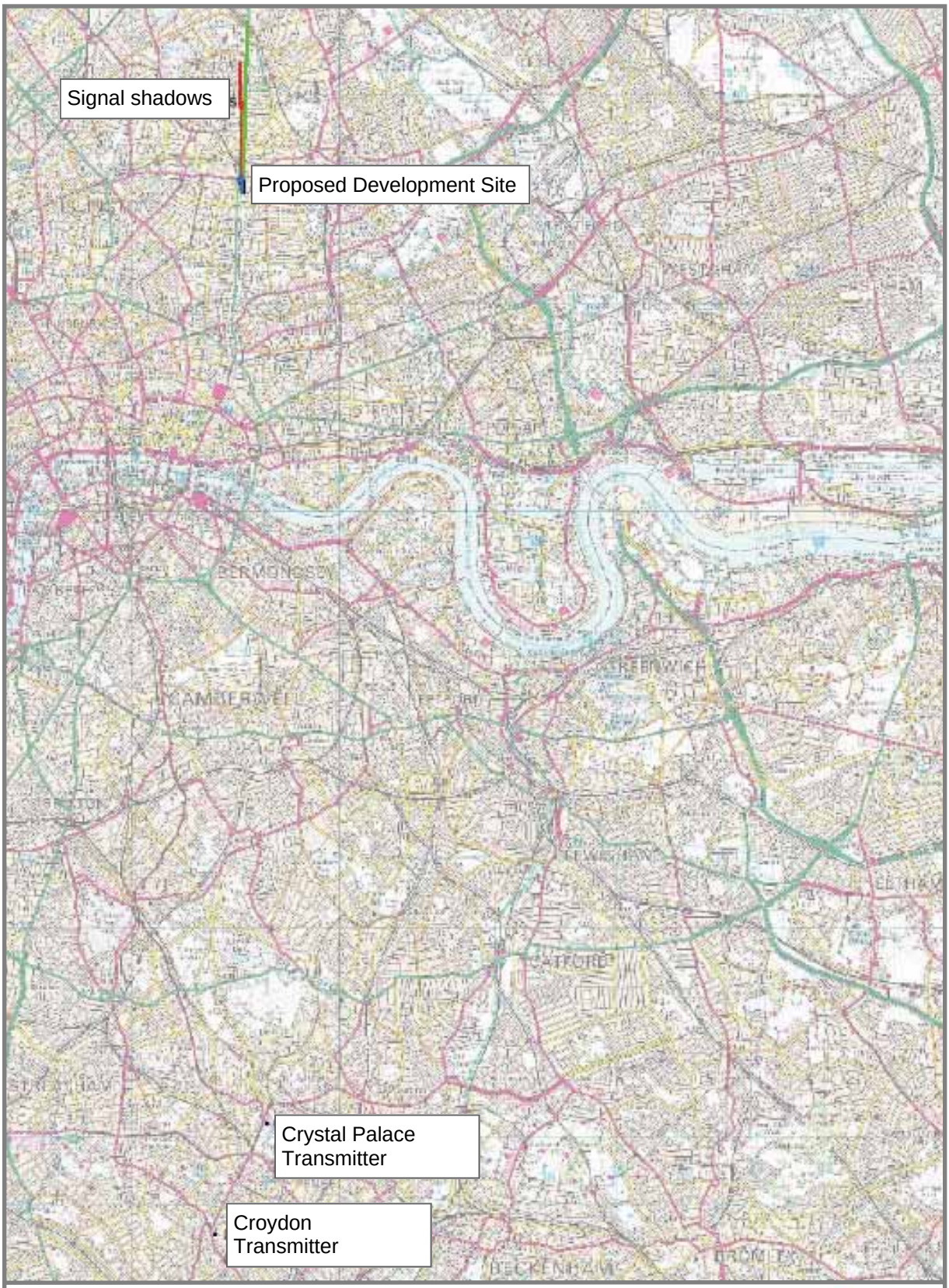

Figure 9.5: Proposed Developments Signal Shadow Overview

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transmitting antenna, is shown in more detail in Figure 9.4.

9.4.10. The hard shadows created from both Crystal Palace and Croydon transmitters fall mainly on properties on Kingsland Road and neighbouring streets.

9.4.11. The hard optical shadow from the Crystal Palace transmitter continues for 1.7km from the proposed development. Due to the smaller height of the Croydon transmitter, its hard shadow continues for 2.3km.

9.4.12. Whilst any terrestrial TV receiver outside these actual impact areas is not likely to be affected by the shadows caused by the development, within the shadowed areas there is some likelihood that terrestrial TV services may be affected. However, within the region identified any adverse effect due to the development will decrease with the distance of the TV receiver from the development. When diffraction effects are considered, the impact areas will be generally narrower and foreshortened. Therefore, the proposed development has less of an effect the further the receiving antenna is from the site.

9.4.13. Due to diffraction effects, and the resulting complex radiation pattern that occurs in this “hard” shadow zone, not all viewers in this area will experience noticeable deterioration in their television signal. The resulting area that may experience disruption in its Crystal Palace signal is approximately 4.5 hectares. Using housing density statistics, and the Ofcom figures, the maximum number of both analogue and digital terrestrial households that may be affected is in the order of 70.

9.4.14. The “hard” shadow produced by the development from the Croydon transmitter continues for 2.3km from the site of the proposed development. As above, and also considering that the Croydon transmitter transmits at a lower power than the Crystal Palace transmitter, the resulting area that may experience disruption in the Croydon signal is approximately 7.3 hectares. The maximum number of households that may have noticeable deterioration in their analogue Channel Five signal is in the order of 40.

9.4.15. However, there is a slight overlap in the two shadow areas. Hence, the total number of households who have any significant deterioration in any of their television signal is likely to be in the order of 100 (an estimated 30 of which may only have deterioration in their Analogue Five picture).

9.4.16. Not all buildings in the shadowed area will currently be using terrestrial television. In general it can be assumed that large commercial establishments and new residential accommodation are less likely to depend on terrestrial TV reception and are more likely to have cable and satellite TV services.

9.4.17. It is also true that not all households and other buildings in the area are dependent on terrestrial television as their primary source of television. Using the most recent Ofcom figures, approximately 55% of households within the UK have terrestrial television (including both analogue and digital) as their primary source of television. Approximately one third of these are digital terrestrial viewers.

9.4.18. The increasing uptake of digital TV services is likely to further reduce the number of households affected in the future. The Government plans to switch-off analogue terrestrial television once the availability and affordability of digital television has reached certain criteria; for the London area, this is scheduled to occur in 2011.

9.4.19. Increasing uptake of cable, satellite, and ADSL TV services is also likely to further reduce the number of households affected by shadows to terrestrial TV caused by the development once it is completed.

9.4.20. It is concluded that the proposed development is likely to have a long-term slight negative impact, due to shadowing effects, on terrestrial TV services in a small number of households

to the north of the development.

9.4.21. Potential mitigation measures in the areas affected by the shadows caused by the development are identified in Section 9.5 below.

9.4.22. As is the case with light, television signals can be reflected when they encounter obstacles. The reflectivity of the material will dictate how much of the signal is reflected, but in general the reflected signal strength will be much less that of the original incident signal. The reflected signals cause the phenomenon of ghosting in analogue terrestrial television. Digital terrestrial television is less affected and satellite television is unaffected by signal reflections.

9.4.23. The planned switch-off of analogue terrestrial television, scheduled in 2011, will force current viewers of analogue terrestrial to upgrade to digital terrestrial, or other television services. As these services are less affected by signal reflections, the effect of any signal reflections will be insignificant past this date.

9.4.24. The orientation of the proposed development's facades with respect to the transmitters dictates that signals will be incident on and almost perpendicular to the south facing facades.

9.4.25. Where reflections are cast south of the development, an adequate and correctly directed receiving antenna should reject the reflected signal (a standard domestic-type aerial rejects signals outside a 30 degree angle off the direction in which it points).

9.4.26. Any small amount of signal that is reflected from any other facades is likely to be insignificant.

9.4.27. Hence, the effect of any signal reflections caused by the development is likely to be negligible.

9.5. Mitigation Measures and Residual Effects

Satellite TV

9.5.1. In the small number of properties where the proposed development blocks the required line of sight required for satellite TV, the problem should be overcome by relocating the dish to another, perhaps higher, location on the building. Residents can obtain advice on this from their installer.

Terrestrial TV

9.5.2. Shadows and reflections are created by the placement of a solid object in the line of propagating waves. As such once a building or structure is in place, the shadows and reflections themselves cannot be mitigated. The only factors that can be introduced in order to minimise the effect on local reception in the shadow area are to the actual reception sites themselves.

9.5.3. The mitigation measures that can be introduced in the affected area to overcome the adverse effects due to the signal shadowing and reflections caused by the proposed development are:

- Improving the receiving antenna. This involves the installation of a new higher gain antenna, with improved directionality. A high gain will increase the received signal strength, which will reduce the effect of shadows; and improved directionality will improve the antenna directional response, thus reducing the impact of reflected signals. The effect of shadows may be circumvented in some instances by making better use of diffracted direct signals and/or using reflected signals from other buildings.

- Installing a mast-head amplifier. In some cases, the received signal might be improved by using a mast-head amplifier. This boosts the received signal at the antenna location. This solution does not rectify the phenomenon of ghosting as unwanted signals are not discriminated against.

- Relocating or redirecting the receiving antenna. In some circumstances the interference is extremely localised and relocating the receiving antenna at another point in a building may be able to improve the received signal strength sufficiently. This may be because the effect of shadows is obviated by making better use of diffracted direct signals and/or using reflected signals off other buildings.

- Making use of relay transmitters. Analogue TV signals from an alternative transmitter may be available at the receiving antenna and they may not be affected by the proposed development. The relays at Alexandra Palace and Poplar may provide adequate substitute services. However at present, these relays do not transmit Channel Five or any digital channels. An improved, higher gain antenna may be needed to make use of the low power signal.

9.5.4. With the mitigation measures mentioned above in place, there may be a small number of residences where their preferred primary source of television is still not available.

9.5.5. Viewers in this situation may have to receive TV from an alternative service. This could be in any one of the five following forms, with the choice of service in a particular instance being based on service availability and the cost of implementation:

- In the case where an analogue terrestrial viewer's picture is affected by signal reflections, an upgrade to digital terrestrial television may restore their picture;

- A digital cable television service;

- A digital satellite television service (BSkyB's new free-to-view service, "FreeSat from Sky", is now available).

Residual Effects

9.5.6. With the outlined mitigation measures in place it is anticipated that all residences in the area should be able to receive an adequate television service (either by terrestrial, satellite or cable), hence there are no residual effects. This is summarised in Table 17.1 at the end of this document.

10. Ground Conditions

10.1. Introduction

10.1.1. This chapter addresses the potential effects the proposed development may have on the ground conditions of the site. The assessment includes a summary of the current ground conditions and the potential for effects on groundwater, and identifies mitigation measures where appropriate for negative effects that may arise as part of the proposed development.

10.2. Assessment Criteria and Methodology

National Legislation and Guidance

10.2.1. Land contamination is regulated under several regimes, including environmental protection, pollution prevention and control, waste management, planning and development control, and health and safety. The principal legislation and policies are described below.

10.2.2. Specific UK legislation on contaminated land is principally contained in Part IIA of the Environmental Protection Act (EPA) 1990, which was retrospectively inserted as Section 57 of the Environment Act 1995. This legislation came into force on 1st April 2000 when the Government issued its Circular 02/2000, dated 20 March 2000.

10.2.3. The legislation endorses the principle of a "suitable for use" approach to contaminated land, where remedial action is only required if there are unacceptable risks to health or the environment, taking into account the use of the land and its environmental setting.

10.2.4. The legislation places a responsibility on the local authority to determine whether the land in its area is contaminated by consideration of whether:

- Significant harm is being caused; or
- There is a significant possibility of significant harm being caused; or
- Significant pollution of controlled waters is being, or is likely to be, caused.

10.2.5. The statutory guidance describes a risk assessment methodology in terms of "significant pollutants" and "significant pollutant linkages" within a source-pathway-receptor model of the site. The model comprises:

- The principal pollutant hazards associated with the site (the sources);
- The principal receptors at risk from the identified hazards, and
- The existence, or absence, of plausible pathways which may exist between the identified hazards and receptors.

10.2.6. For land to be determined as "contaminated" in a regulatory sense, and thereby require remediation (or possibly a change to less sensitive use), all three elements (source-pathway-receptor) of a significant pollutant linkage must be present.

10.2.7. Local authorities rely heavily on the advice of the Environment Agency in relation to environmental matters generally, and particularly (for contaminated land) for their advice on 'pollution of controlled waters'.

10.2.8. Under Section 161 of the Water Resources Act 1991, the Environment Agency can serve a Works Order on a person or persons who cause or knowingly permit pollution of controlled waters (which includes both surface waters and groundwater).

10.2.9. The Water Act 2003 modernises water legislation and gives powers to the Environment Agency that enables it to better manage the balance between the needs of society and the environment. The Water Act revises definitions in Part IIA of the EPA 1990 (referred to above) by defining contaminated land in terms of 'significant pollution', rather than simply 'pollution'. The Act also clarifies that groundwaters above the saturated zone (perched waters) are not 'controlled waters'.

10.2.10. Remediation of historic land contamination has been, and will continue to be, managed through the planning regime. PPS23[39] deals with planning and pollution control, and Annex 2 deals with development on land affected by contamination. PPS23 Annex 2 describes the roles of the parties involved in the development process, the information to be provided where ground contamination is known, or suspected, to be an issue, and the process of assessing planning applications and imposing planning conditions.

10.2.11. A planning authority may require remediation works additional to those that they would require under Part IIA of the EPA 1990 obligations, for example, in situations where the new land use is more 'sensitive' in health and safety terms than the existing land use, or where the process of ground disturbance due to redevelopment leads to increased environmental risks. Remediation works are usually imposed through planning conditions which require site investigation, consultation and/or actual remediation works. The planning authority must seek guidance from the Environment Agency as a statutory consultee in determining appropriate measures to deal with land contamination and groundwater pollution.

10.2.12. There are a number of UDP policies relevant to ground conditions, see Appendix 1.2 for further details.

Methodology

10.2.13. The baseline ground conditions at the site have been assessed through a desk-based study of available and researched information listed below.

10.2.14. The qualitative assessment of the effects of the development arising from the ground conditions has considered the extent and methods of proposed construction of the foundations, the anticipated degree of disturbance of the ground, the final form of the development, and the relevant national and local policies for contaminated land management. The assessment of the significance of impact has used the 7-level significance scale described in this section.

Source Data

10.2.15. The information used to establish the baseline ground conditions for the ground resources and contamination assessment has comprised:

- Site investigation reports for previous investigations carried out on and near the site, including:
  - East London Line Project – Non Operational Land, Factual Report on Preliminary Ground Investigation, Harrison Geotechnical Engineering (HGE), May 2005;
  - East London Line Northern Extension, Volumes 1 and 2, Factual Report on Ground investigation, Foundation Exploration Services (FES), May – June 2001;

[39] ODPM. (2005). Planning Policy Statement 23: Planning and Pollution Control.

- Site investigation for a proposed extension to the existing East London Line between Dalston and Shoreditch Station, Soil Mechanics (SML), Volumes 1, 2 & 3, July 1993, Revision 1;

- Historical Ordnance Survey maps;
- Historical aerial photographs of the site;
- A Landmark Envirocheck report, providing comprehensive public domain information on Environment Agency licences, consents, pollution notification and mapping; potentially contaminative land uses; sensitive land uses; British Geological Survey borehole locations, and other relevant information;
- The Environment Agency website;
- BGS 1:10,000 Solid and Drift edition map, Sheet TQ38SW (1992);
- Previous Environmental Statements:
  - East London Line Northern Extension and Silwood Servicing Facility, Volume 1, Environmental Statement, ERM, November 1993.
  - East London Line Northern Extension and Silwood Servicing Facility, Volume 2, Technical Annexes, ERM, November 1993.
- Enquiries to Hackney Borough Council and the Environment Agency for any site-specific information on ground conditions at the site.

Identification of Impacts and Significance

10.2.16. The assessment of potential and residual impacts has used a 7-level scale of significance as detailed in Table 10.1 below.

Table 10.1: Significance Scale of Ground Resources and Contamination Impacts

Major Adverse Impact	• Severe or irreversible moderate detrimental effect to human health. • Severe temporary or irreversible reduction in the quality of a potable groundwater or surface water resource of local, regional or national importance. • Irreversible or severe temporary detrimental effect on animal or plant populations. • Irreversible detrimental effect to nationally important geological feature. • Irreversible detrimental effect to building structure resulting in collapse or demolition.
Moderate Adverse Impact	• Long-term minor or short-term moderate detrimental effect to human health. • Slight or moderate, local-scale reduction in the quality of potable groundwater or surface water resources of local, regional or national importance, reversible with time. • Reversible widespread reduction in the quality of groundwater or surface water resources used for commercial or industrial abstractions. • Medium-term, reversible detrimental effect on animal or plant populations. • Medium-term, reversible detrimental effect to nationally important geological feature. • Detrimental effect to building structure requiring remedial engineering works.

Minor Adverse Impact	• Short-term minor detrimental effect to human health. • Temporary, slight or moderate detrimental effect in the quality of groundwater or surface water resources that are used for, or have the potential to be used for, commercial or industrial abstractions. • Short-term, reversible detrimental effect on animal or plant populations. • Short-term, reversible detrimental effect to nationally important geological feature. • Detrimental effect to building structures not requiring remedial engineering works.
Negligible Impact	• No appreciable impact on human, animal or plant health, potable groundwater or surface water resources or geological feature of importance.
Minor Beneficial Impact	• Minor reduction in risk to human, animal or plant health. • Slight, local-scale improvement to the quality of potable groundwater or surface water resources. • Moderate, local-scale improvement to groundwater or surface water resources that are used for, or have potential to be used for, industrial or commercial abstractions.
Moderate Beneficial Impact	• Moderate reduction in risk to human, animal or plant health. • Moderate local-scale improvement to the quality of potable groundwater or surface water resources. • Significant local-scale, or moderate wide-scale, improvement to the quality of groundwater or surface water resources used for commercial or industrial abstraction only.
Major Beneficial Impact	• Major reduction in risk to human, animal or plant health. • Significant local-scale/ moderate to significant regional scale improvement to the quality of potable groundwater or surface water resources.

10.3. Baseline Conditions

Site Investigations Undertaken

10.3.1. Three site investigations have been undertaken across the site since 1993 and have been used to inform the present ground conditions. These investigations were all undertaken for the proposed East London Line extension and contain borehole information both north and south of the site. The scopes of these investigations are summarised below.

- Harrison Geotechnical Engineering (May 2005), see Appendix 10.1. This investigation comprised six boreholes and 37 trial pits, of which six deep trial pits and three cable percussion boreholes were within the site area for the proposed development. Chemical testing of soil and groundwater was carried out in addition to geotechnical testing.

- Foundation Exploration Services (May – June 2001), see Appendix 10.2. This investigation comprised 12 trial pits, six window sample boreholes, 26 inspection pots and two brickwork cores. The investigation was for geotechnical purposes and no chemical testing was carried out for the site investigation.

- Soil Mechanics (July 1993), see Appendix 10.3. This investigation comprised 39 boreholes and 17 trial pits, of which three boreholes and seven trial pits were within the site area of the proposed development. The investigation was mainly for geotechnical purposes but limited chemical testing of soil and groundwater was carried out in addition to geotechnical testing.

Geology

10.3.2. A review of the 1992 1:10,000 geology map (Sheet TQ38SW) and the past site investigation data in and around the site has revealed that the site is overlain by Made Ground which, in turn, is underlain by a thin discontinuous layer of Terrace Gravel Deposits. The Terrace Gravel Deposits are underlain by the London Clay Formation, followed by the Lambeth

Group which comprises the Lambeth Clay, underlain by the Upnor Formation which forms the basal beds of the Lambeth Group. Thanet Sands and Upper Chalk underlie the Lambeth Group, respectively.

10.3.3. The thickness, depth and elevation of strata, as revealed by the logs of past site investigation boreholes are summarised in Table 10.2 below. It should be noted that this data does not include investigation points across all parts of the site.

Table 10.2: Stratigraphy

Stratum	Top of Stratum (mAOD)	Thickness (m)
Made Ground	+14.0 to +15.4 (within cutting)	0.2 to 2.7
Terrace Gravel	+13.5 to +14.5	Nil to 7.7
London Clay	+12.0 to +13.8	9.0 to 11.1
Lambeth Clay	+1.7 to +3.2	8.9 to 13.6
Upnor Formation	-10.4 to -6.4	4.4 (proven) to 6.1
Thanet Sands	-13.5 to -12.7	7.5 (proven)

Groundwater

10.3.4. The principal groundwater bearing strata in the upper groundmass beneath the site is the Terrace Gravels which is classified by the Environment Agency as a 'minor aquifer'. In addition, groundwater was encountered in the overlying Made Ground of some boreholes and trial pits in the site area, which indicates the presence of localised perched water.

10.3.5. Beneath the London Clay Formation and the Lambeth Group, which together are classified as an aquiclude, groundwater occurs in the Thanet Sands and the Upper Chalk. The Chalk is designated by the Environment Agency as a 'major aquifer' and is in hydraulic continuity with the overlying Thanet Sands.

10.3.6. Groundwater level data obtained from previous ground investigations indicate that the groundwater level in the Terrace Gravels and Chalk are +13.5mAOD and -15.0mAOD, respectively. The groundwater table occurs at 1m to 1.5m below ground level in the railway cutting.

10.3.7. Environment Agency online records indicate that the application site does not fall within any groundwater Source Protection Zone (SPZ) for potable water supply. In addition, there are no groundwater abstractions across the site. The nearest groundwater abstraction is 1,050m south of the site. Groundwater is being abstracted from the Terrace Gravels by Griffin Housing Association Ltd for the purpose of groundwater remediation.

10.3.8. There are no surface water features within 500m of the site.

Historical Uses and Contamination

10.3.9. Throughout its history, much of the site has been used for industrial purposes that could have contaminated the ground. Extracts of historical maps of the site, and a summary of the historical uses of the site, are presented in Appendix 10.4. Table 10.3 provides a chronological summary of the industrial uses which have occupied parts of the site and the potentially contaminative materials associated with those industries.

Table 10.3: Summary of the Site's Industrial History

Date	Industry	Potentially Contaminative Materials
1873 to 1983	Railway	Asbestos, ferrous and non-ferrous metals, hydrocarbons, solvents, transformer fluids, sulphates and chemicals.
c.1971 to c.1993	Car Breakers Yard / Scrapyard	Hydrocarbons, transformer fluids, paints, solvents, phenols, ammoniacal liquors, asbestos, chemical residues and metals or metallic compounds.
1970 to Present day	Shoe Distribution Warehouse	Possibly hydrocarbons from any leaked or spilled fuels.

10.3.10. The area at the eastern edge of the site is noted as a 'scrapyard' on the historical OS maps from 1971 to circa 1993. Aerial photography from 1981 and 1984, reviewed for this assessment, show numerous cars in the 'scrapyard' area. Also, the ERM Environmental Statement (1993) states that "the breakers yard will be the northernmost worksite on the Northern Extension". It would therefore seem that the 'scrapyard' was a car breakers yard.

10.3.11. In addition to potentially contaminative industrial uses on the site, several potentially contaminative industries have taken place within 250m of the site. These include:

- Goods and Coal Depot;
- Artists' Colour Works;
- Chemical Works;
- Factories;
- Plastic and Leather Works;
- Glass Bottle Works;
- Dynamo and Electric Lamp Works;
- Light Engineering Works;

10.3.12. The times and locations of these industries are indicated on the maps included in Appendix 10.4.

10.3.13. The site is currently disused and although the current OS map shows the scrapyard still present on the site, this scrapyard is no longer present. The warehouse and five terraced houses are still present in the southeast corner of the site.

Existing Soil and Groundwater Contamination

10.3.14. Chemical testing was carried out on 11 soil samples from 11 locations on site for the Harrisons and Soil Mechanics investigations. The samples were taken from 0.15 to 1.2m depth on all parts of the site except the southeast area and in the location of the snooker hall. No significant soil contamination was identified at any of the 11 locations. The scrapyard has been identified as containing the most potentially contaminative materials. DTP 1002 and CP1101 from the Harrisons investigation were excavated within the scrapyard area and samples were submitted from both for chemical testing. No significant contamination was identified from either sample. In the Soil Mechanics investigation, two trial pits (TP1 and TP4) were excavated in the scrapyard area and samples were submitted for limited chemical analyses. No significant contamination was identified from either sample. It is recognised that the Soil Mechanics investigation was carried out over 10 years ago, however, as there was no significant contamination and the findings were the same in

the recent Harrisons investigation, it is considered to be valid data.

10.3.15. Chemical testing was carried out on groundwater samples from the Made Ground, Terrace Gravels and the Lambeth Group for the Harrisons and the Soil Mechanics site investigations. The results of the testing are shown in Table 10.4 below. For the purpose of assessing the quality of groundwater, the following guidelines and standards have been referred to:

- The UK Environmental Quality Standards (EQS) for freshwater.
- The UK Drinking Water Standards (DWS), or where no EQS values are available, the Dutch Intervention Values.

Table 10.4: Summary of Laboratory Groundwater Results and Screening Criteria

Determinand	**Units**	**TP5 (SML) 0.3m**	**TP5B (SML) 0.5m**	**DTP1003(HGE) 2.10**	**CP1100 (HE 16.75)**	**Screening Values**
Strata		Made Ground	Terrace Gravel	Not Known	Lambeth Group	
Arsenic	µg/l	180	30	13	9	501
Cadmium	µg/l	60	<10	<1	<1	51
Chromium	µg/l	390	10	<10	<10	5-2501
Copper	µg/l	8730	60	<5	<5	2,0002
Iron	µg/l	-	-	<20	<20	1,0001
Lead	µg/l	11,780	110	<10	<10	4-2501
Mercury	µg/l	**<30**	**<30**	<0.05	<0.05	11
Nickel	µg/l	840	60	<10	<10	50-2001
Selenium	µg/l	170	70	<10	<10	102
Zinc	µg/l	10,730	170	<10	<5	2,0002
Molybdenum	µg/l	<10	-	-	-	3002
Boron	mg/l	-	-	0.23	0.20	21
Free Cyanide	µg/l	10	75	<30	<30	15003
Sulphate as SO4	mg/l	-	-	160	40	4001
Sulphide	µg/l	200	**<100**	**<50**	**<50**	0.251
Phenol	µg/l	<10	<10	<0.5	<0.5	30 (300)1
Total Hydrocarbons	µg/l	4000	**<2000**	-	-	6003
Naphthalene	µg/l	-	-	<0.1	<0.1	101
Benzo(a)pyrene	µg/l	-	-	<0.1	<0.1	0.012
Phenanthrene	µg/l	-	-	<0.1	<0.1	53
Anthracene	µg/l	-	-	<0.1	<0.1	53
Flouranthene	µg/l	-	-	<0.1	<0.1	13
Benz(a)anthracene	µg/l	-	-	<0.1	<0.1	0.53
Chyrsene	µg/l	-	-	<0.1	<0.1	0.23
Benzo(k)fluoranthene	µg/l	-	-	<0.1	<0.1	0.053
Indeno(123cd)pyrene	µg/l	-	-	<0.1	<0.1	0.053
Benzo(ghi)perylene	µg/l	-	-	<0.1	<0.1	0.053
Total PAH	µg/l	-	-	ND	ND	0.12
pH value	pH units	-	-	7.2	8.0	6.5 – 102

Key:
1. Environmental Quality Standards for freshwater.
2. UK Drinking Water Standard.
3. Dutch Intervention Values.

Blank Exceeds Screening Criteria
Bold Detection level>screening value.

10.3.16. No testing for ground gases has been carried out, however, ground gases are not expected in the strata beneath the site and there is no evidence of organic material in the Made Ground from borehole and trial pit logs from previous site investigations in the site area. Due to the proposed development being constructed over the top of the East London Line, ground gas would not be an issue for the proposed development.

10.3.17. No groundwater contamination was identified in the two samples taken for the Harrisons site investigation. One of these samples was from shallow depth and the other was from 16.5m depth. Of the two groundwater samples tested within the site boundary during the Soil Mechanics investigation, one sample (TP5) taken in the Made Ground, showed slightly elevated concentrations of a number of metals in addition to Sulphide and Total Hydrocarbons, by comparison with the strict screening criteria applied. Sample TP5B, taken from the Terrace Gravel layer during the SML investigation showed a slightly elevated concentration of Selenium. TP5 and TP5B were both taken from the southwest part of the site in the location of former railway tracks.

10.4. Potential Effects

General

10.4.1. It is assessed that the Made Ground and Terrace Gravel Deposits might be locally contaminated by the former uses of the site, in particular by spills and leaks of hydrocarbon products, solvents and other liquid chemicals and by metals and metallic compounds. However, on the basis of available information, the near-surface soils are not expected to be contaminated. No evidence of any significant soil contamination was noted in the chemical test results from the HGE and SML ground investigations and no evidence of contamination was reported on the logs of boreholes and trial pits from these investigations within the site boundary.

10.4.2. Evidence of slight groundwater contamination was noted for a sample of perched groundwater from the Made Ground, however, no significant groundwater contamination was noted in any of the other chemical test results from groundwater in the Terrace Gravel Deposits and Lambeth Group. It is therefore assessed that the groundwater in the Made Ground (perched water) might be locally contaminated from the former uses of the site. It is likely that any local contamination will have been vertically confined by the low permeability London Clay and Lambeth Clay, which together form an aquitard and provide protection to the underlying Chalk aquifer.

10.4.3. Due to the proposed development being constructed over the top of the future railway, the air-rights buildings will be supported on piled foundations in the southern two thirds of the site and on columns supported by a shallow raft foundation in the northern third of the site. The buildings will therefore not be in contact with any potentially contaminated ground. In addition, in the northern third of the site, all of the Made Ground will be excavated to enable the installation of the raft foundation, removing the source of any potential contamination in this part of the site. It is likely that the raft foundation will extend into the Terrace Gravel Deposits and to the top of the London Clay Formation in places. The depth of the raft foundation has not yet been confirmed but it is thought that the base of the raft will lie at approximately 1.5m depth below ground level. It has not yet been confirmed what contamination remediation works (if any) are planned as part of the ELLP works at the Dalston Interchange site.

10.4.4. Construction of the development will involve bored piling (which will produce arisings), excavation for pilecaps and construction of the raft foundation, excavations beneath the shoe warehouse and excavation of the slightly raised ground in the east of the site to the level of the disused track to the west. Much of the excavation for the shallow raft foundation will be within the previously disturbed ground, overlying Made Ground layer.

10.4.5. Overall there will be a net export of fill from the development site.

10.4.6. Much of the excavation will be within the zone of perched water in the Made Ground to the groundwater level in the Terrace Gravel. The excavation for the development is likely to generate small quantities of groundwater for disposal.

Construction Phase

10.4.7. The principal environmental effects of any existing contamination of the ground will occur during the construction period. Any contaminated spoil and groundwater arising from excavations will require additional precautionary measures in their handling, storage and disposal, by comparison with uncontaminated materials. The requirements for handling contaminated soils and groundwater, controlling airborne dust emissions, and ensuring the health and safety of site workers, visitors and the general public neighbours to the site (and along site access roads) from risks posed by contaminated land, will be set out in the Construction Environmental Management Plan (see Section 4.5 of this Environmental Statement). It is essential that appropriate health and safety and disposal measures be planned and implemented as necessary.

10.4.8. The proposed piling will terminate above the lower aquifer, in either the London Clay or the Lambeth Group. There should therefore not be a potential for the creation of pathways into the lower aquifer. The absence of potential pathways will need to be confirmed during the detailed foundation design stage.

After Development

10.4.9. Following completion of the development, there will not be any long term adverse effects from the ground conditions arising from redevelopment. The development will be constructed over the top of the proposed East London Line railway and the buildings will not be in contact with the ground or groundwater. In fact, development may achieve a beneficial effect in removing any localised pockets of contaminated soil, and perched groundwater. Any contaminated spoil arisings must be disposed of to a licensed site in covered lorries. Similarly, groundwater must be disposed of to foul sewer under consent, or to a licensed wastewater treatment plant.

10.5. Mitigation Measures and Residual Effects

10.5.1. Mitigation measures will be necessary as follows:

- Pre-Construction: None required
- During Construction: Implementation of construction works, including piling, excavation, spoil handling and disposal in accordance with an approved CEMP, appropriate to the ground risks on the site, to prevent pollution of ground and surface waters, and to protect human health.
- After Construction: None required.

10.5.2. Subject to implementation of the mitigation measures outlined above, it is assessed that the development will have no residual adverse effects on the environment due to ground conditions or contamination, and may have a net beneficial effect from necessary removal of some of the slightly contaminated perched groundwater in the Made Ground during construction.

10.5.3. This is summarised in Table 17.1 at the end of this document.

11. Landscape and Visual Amenity

11.1. Introduction

11.1.1. This chapter addresses the potential effects the proposed development may have on the landscape and visual amenity in the area of the proposed development site. The assessment includes a summary of the current conditions found within the area and identifies mitigation measures where appropriate for negative effects that may arise from the proposed development.

11.2. Assessment Criteria and Methodology

11.2.1. The existing townscape and visual baseline conditions have been identified from desktop studies, site survey and a review of relevant planning documentation, publications and maps to evaluate the townscape and visual effects of the proposed development. Reference has been made to London Borough of Hackney Council UDP (1995), The London Plan (2004) and SPG documents - LB Hackney Council Planning Brief Supplementary Planning Guidance East London Line Project and the emerging Dalston Lane Area Action Plan.

11.2.2. The assessment has been undertaken in accordance with relevant guidance including:

- 'Guidelines for Landscape and Visual Impact Assessment' published by the Landscape Institute and Institute of Environmental Management and Assessment, 2002 (GLVIA);
- 'Design Manual for Roads and Bridges - Landscape Assessment Methodology' published by The Highways Agency (DMRB).

11.2.3. The study area has been defined as the area over which the physical components or changes caused by its introduction could affect peoples' views of the townscape within the wider area surrounding the development. This area has been evaluated in terms of its existing townscape quality and sensitivity to change.

Townscape

11.2.4. The townscape assessment examines the natural and built topography of the site and immediate area to establish its quality, character, and specific features noting any protected or designated landscapes. The impact assessment considers the significance of the potential impact on the townscape character (built form, open space and natural environment) relative to townscape quality and sensitivity to change. Townscape quality and sensitivity to change have been determined as part of the baseline study.

11.2.5. The assessment of townscape quality is the process of evaluating the character, condition, value, importance and aesthetic qualities of the townscape of the study area and attaching a value to this. The townscape quality of the study area has been defined using a five point scale as recommended in the DMRB and this is indicated in Table 11.1. An assessment of townscape value has been added as recommended by GLVIA.

11.2.6. 'Sensitivity to Change' is the capacity of the townscape to accept change of the type and scale proposed and its vulnerability to degradation or improvement through the introduction of new features or the loss of existing components. This may include visual impact for residents and people visiting or staying in the area, encroachment or effects on the setting of features or areas and the impact on character. Sensitivity to change has been assessed using a three-point scale based upon the DMRB guidelines as follows:

- Very Sensitive to Change;
- Sensitive to Change; and

- Not Sensitive to Change.

11.2.7. For 'Very Sensitive' townscape, mitigation may be limited or unlikely to maintain the townscape quality of the area; for 'Sensitive' townscape mitigation measures are possible, may be effective, it may take time to develop; and for 'Not Sensitive' townscapes mitigation measures are likely to be effective and improve townscape quality. Sensitivity to change has been incorporated into Table 11.1 indicating townscape quality.

Table 11.1: Townscape Quality

Category	Criteria	Typical Example
Exceptional	• Strong townscape structure • Good balance between built form and open space • Distinctive features and buildings worthy of conservation • Appropriate management • No detracting features • A 'sense of place' • Very Sensitive to change	Internationally or nationally designated
High	• Strong townscape structure • Balance between built form and open space • Distinctive features and buildings worthy of conservation • Appropriate management • Occasional detracting features • A 'sense of place' • Very Sensitive to change	Nationally or regionally recognised
Good	• Recognisable townscape structure, characteristic pattern still evident • Scope to improve management • Some features worthy of conservation • Some detracting features • A 'Sense of Place' • Sensitive to change	Regionally or locally recognised e.g. all or great majority of area of local townscape importance
Ordinary	• Distinguishable townscape structure • Scope to improve management • Some features worthy of conservation • Prominent detracting features • Not sensitive to change	Not designated
Poor	• Weak or disjointed townscape structure • Low level of management resulting in degradation • Frequent discordant and detracting features • Derelict buildings and open space • Not sensitive to change	Not designated

11.2.8. Ordinary and Poor quality townscapes are likely to require enhancement to raise quality, whilst higher quality townscapes may require protection as well as enhancement.

Visual Assessment

11.2.9. The visual assessment examines the main views of the proposed development from the neighbouring environment and considers short range, middle distance and longer views. The visual impact assessment determines the change in the view brought by the development i.e. a comparison of the existing view against the view following construction.

11.2.10. The survey identifies 'sensitive receptors' principally residential areas and streets, properties and public spaces that may be affected by the proposals. Due to its height the proposed development will have an impact on a wide area and this assessment has considered the impact from specific viewpoints. The locations of the viewpoints have been agreed with the

Council.

11.2.11. Photomontages have been prepared from each of the agreed viewpoints in order to assist in the assessment of the changes from the existing conditions to the proposed.

11.2.12. For the purposes of the assessment, definitions in Table 11.2 are used to categorise the significance of predicted impacts of the proposed development for visual receptors.

11.2.13. The following standards are used in assessing whether the effects will be short, medium or long term:

- Short term: < 12months
- Medium term: 1 to 5 years
- Long term: + 5 years

Significance Criteria- Townscape and Visual Effects

11.2.14. The significance of the effects on townscape character/quality and visual effects are a function of the sensitivity of the affected townscape and the magnitude of change that will be experienced. There is no standard methodology for the quantification of the scale or magnitude of relative townscape and visual effects. However it is generally based on the sensitivity of the affected townscape and the magnitude of change that will be experienced and its duration. For effects on the townscape a ranking is given depending on the extent to which the proposals improve, cause damage or are neutral with respect to townscape.

11.2.15. The description of significance criteria is set out in Table 11.2.

Table 11.2: Significance Criteria Townscape and Visual Effects

Severe Adverse
The proposed development would result in effects that: • Are at a complete variance with the pattern and scale and form of the townscape; • Would permanently degrade, diminish or destroy the integrity of valued characteristic features, elements and/or their setting; • Would cause a very high quality townscape to be permanently changed and its quality diminished; • Would cause a considerable deterioration in the existing view; and/or • Be in conflict with government environmental policies for the protection and enhancement of the built environment.
Major Adverse
The proposed development would result in effects that: • Cannot be fully mitigated and may cumulatively amount to a severe adverse effect; • Are at a considerable variance to the townscape, degrading its integrity; • Would be substantially damaging to a high quality townscape; • Would cause a substantial deterioration in the existing view; and/or • Be in conflict with regional or local environmental policies for the protection and enhancement of the built environment.
Moderate Adverse
The proposed development would: • Be out of scale with the townscape or at odds with the local pattern and landform; • Leave an adverse impact on a townscape of recognised quality; • Cause a noticeable deterioration in the existing view; and/or • Be in conflict with local environmental policies for the protection and enhancement of the built environment.

Minor Adverse
The proposed development would: • Not quite fit into the form and scale of the townscape; • Affect an area of recognised townscape character; • Cause a slight deterioration in the existing view.
Neutral
The proposed development would: • Complement the scale, form and pattern of the townscape and maintain existing landscape quality; • Cause no overall discernable deterioration or improvement in the existing view.
Minor Beneficial
The proposed development would have the potential to: • Improve and enhance the townscape quality and character; • Cause a slight improvement in the existing view.
Moderate Beneficial
The proposed development would have the potential to: • Fit very well with the townscape character; • Noticeably improve and enhance the townscape quality and character; • Cause a noticeable improvement in the existing view.

11.2.16. The determination of predicted effects relies upon professional judgement and is based upon the data gathered during baselines studies and the magnitude of the impacts...

Consultation

11.2.17. The Council was consulted to agree the locations of photomontage viewpoints.

11.3. Baseline Conditions

11.3.1. The site lies within a highly urbanised area of east London in an area of contrasting townscape characters. The site is close to the lively and cluttered shopping streets of Dalston that includes Kingsland High Street, Kingsland Shopping Centre, Dalston Lane and Ridley Road Market, but close too are more tranquil residential areas such as De Beauvoir and Albion Square that retain a strong Victorian legacy.

11.3.2. The urban areas surrounding the site have a rich and varied historical legacy and diverse character containing areas of industry, commerce, retail and large residential areas. The area underwent rapid development in the 18th and 19th Centuries and this is reflected in the traditional Victorian street pattern that still remains in many areas. However the area was significantly affected by grand development carried out in the 1960s and this has resulted in a dilution of the pattern of mainly Victorian terraces, villas and squares that grew mainly during the mid 19th Century. This strong breaking up of the urban grain has led in places to a great deal of contrast and variation in urban form with areas of mixed development. However much of the original street pattern still remains and this is reflected in large areas of land to the east and west of the site being designated as Conservation Areas. Whilst some parts of the Conservation Areas contain unsympathetic developments that do not contribute positively to the characteristics on which their designation was justified, there are still many good quality residential streets and buildings of historical or architectural merit.

11.3.3. The site is currently a vacant former railway corridor and station which is located approximately 5m below the surrounding ground level. Part of the site was also a formerly a scrap yard. The majority of the site is currently surrounded by hoardings as work on the permitted East London Line and station works are due to commence. The site area also includes the Dalston Snooker Hall building on Kingsland Road that is due for demolition to create a new access for the bus interchange. This building has no particular townscape or historical interest and is currently in poor condition. Given the vacant and derelict state the

existing townscape character of the site area is judged to be Poor.

11.3.4. In order to examine the townscape effects of the development the townscape areas surrounding the site have been divided into specific character areas and given an alphabetical reference (A to H). The Conservation Areas have been designated as specific townscape areas and therefore form distinct townscape character areas. The following conservation areas lie within the study area:

- Area A: Kingsland Road which borders the western edge of the site;
- Area B: De Beauvoir, a large conservation area to the west of the site immediately adjacent to Kingsland Road;
- Area C: Dalston Lane West, a small conservation area to the east of the site;
- Area D: Queensbridge Road another linear conservation area lying to the east of the site;
- Area E: Graham Road/Mapledene is adjacent to Queensland Road conservation area and is the most easterly;
- Area F: Albion Square is a small conservation area to the south east of the site.

11.3.5. Other non-designated townscape areas surrounding the site include:

- Area G: The area between Roseberry Place and Queensbridge Road to the east, Dalston Lane to the north and south down to the Regent's Canal excluding the Albion Square conservation area.
- Area H: The area along Dalston Lane and Balls Pond Road (A104) to the north/ northwest of the development including shopping, industrial and residential areas in Kingsland, Dalston Lane, Kingsland High Street, Kingsland Shopping Centre and Dalston Kingsland Station.

Area A: Kingsland Road Conservation Area

11.3.6. This area is a long corridor of Victorian 3 to 4 storey terraces extending from the junction of Old Street in the south to the junction of Kingsland Road and Dalston Lane in the north. The Conservation Area is zoned into six character areas from north to south and these are described in Section 6.3 of this ES. In the section closest to the site the rears of the 3 to 4 storey Victorian properties bound the site. There is significant traffic and pedestrian activity and community life with retail and commercial premises fronting the large scale Victorian structures. Most of the historical building frontages have been appended with modern shop fronts and fascias. Whilst these add life and colour to the street they give an 'ad-hoc' and incoherent appearance to the street. Some are well maintained but other poorly maintained frontages downgrade the overall townscape quality. The terraced buildings form a significant visual barrier between the Kingsland Road and the development site to the north and east. Further south along Kingsland Road the character of the street changes. The street is wider and terraces tend to be 3 storeys and whilst not of outstanding quality, their presence gives the street a coherent character. Some areas of large street planting help to raise the townscape quality. Here there is less pedestrian activity and more residential and commercial property. Overall the townscape quality of the area is judged to be Ordinary to Good.

Area B: De Beauvoir Conservation Area

11.3.7. This area consists mainly of housing dating from the early Victorian period (1830s- 50s) and as a whole forms a fairly homogenous and coherent locality. The central area focuses on De

Beauvoir Square (a Scheduled London Square). The mass of housing is fairly dense and urban in character but the width of roads and generous front gardens with mature trees give a more suburban quality. Traffic control measures have improved the character of the area. At the edges of the Conservation Area road noise is more prevalent and views of later tower blocks add detracting elements to the overall character area. Views from this area towards the site are significantly restricted due to the existing terraced buildings running along the streets in this area and by the large Victorian terraces and more recent commercial buildings along Kingsland High Street and in the area between Kingsland Road and Balls Pond Road. Overall the townscape quality of the area is judged to be Good to High.

Area C: Dalston Lane West Conservation Area

11.3.8. This area centres on a small core of cohesive 19th Century buildings around the widening of Dalston Lane. Views to the development site are restricted by the by alignment of Dalston Lane and built development between Beechwood Road and Laurel Street. The constant and busy traffic in this area is a detracting element and reduces the townscape quality. However overall the townscape quality of the area is judged to be Good.

Area D: Queensbridge Road Conservation Area

11.3.9. This area is a linear in nature and is comprised of mid-Victorian terraced houses and villas on the east side of Queensbridge Road. Towards the northern end of the Conservation Area the Victorian building frontages have been appended with modern shop fronts and fascias. These add life and colour to the street but give an incoherent appearance to the street especially as a number are poorly maintained and this downgrades the overall townscape quality. There are gaps within the Victorian street frontage infilled with later development, and whilst in scale with the original terraces they detract from the overall coherence and street quality. Views towards the site are restricted from Queensbridge Road by urban development in the streets between Roseberry Place and Queensbridge Road. Overall the townscape quality of the area is judged to be Ordinary to Good.

Area E: Graham Road/ Mapledean Conservation Area

11.3.10. This area is adjacent to Queensbridge Road Conservation Area and is Hackney's largest conservation area extending east to London Fields. As with De Beauvoir the area is notable in that it contains houses dating from a relatively short space of time in the Victorian period. The streets have a strong grid pattern with a succession of streets running north to south. The scale of development is uniform in terms of scale and style and this strong homogeneity of design gives a strong townscape character. Later larger scale development has respected the street pattern and this has retained townscape quality. As with Area D views to the site are restricted by the existing urban development to the west and within this conservation area. Overall the townscape quality of the area is judged to be Good to High.

Area F: Albion Square Conservation Area

11.3.11. This is a small conservation area comprising well maintained two storey semi-detached villas. The mature garden and trees create a strong green and tranquil character to the area. Views to the site area restricted by urban development between Middleton Road and Forest Road. Overall the townscape quality of the area is judged to be High.

Area G: Roseberry Place East and South

11.3.12. This is the undesignated area between Roseberry Place and Queensbridge Road to the east, Dalston Lane to the north and the area to the south down to Dunston Road/Regent's Canal but excludes the Albion Square conservation area. This area has been affected by redevelopment since Victorian times and there is a great deal of contrast and variation in urban form with areas of mixed development, industry, schools and vacant land giving a very discordant and degraded character in many areas. Some more modern housing

developments to the south of Richmond Road have improved and raised the townscape quality in some areas. As previously stated the proposed development site is currently derelict, as is the area immediately to the east of the development site which is characterised by the burnt out 19th century theatre, more recently used as a nightclub, now lying vacant and derelict. The area to the east of the theatre up to Queensbridge Road is characterised by large scale modern estate development with two to four storey brick houses and terraced housing that occupies land over to Queensbridge Road. Some original Victorian development remains - a row of five cottages along Roseberry Place that appear incongruous next to later warehouse development. The development site is clearly visible from Roseberry Place and Forest Road but further south beyond Richmond Road the mass of urban development restricts views to site. It is considered that the townscape quality of the study area is generally Ordinary with vacant and derelict areas Poor.

Area H: Dalston Lane North

11.3.13. This area north of the site is the lively, busy and cluttered shopping streets of Dalston including Kingsland High Street, Kingsland Shopping Centre, Dalston Lane, Dalston Kingsland station and Ridley Road Market. The area largely maintains the Victorian street pattern and is characterised largely by 3 to 4 storey Victorian terraces with occasional later infill development. There is a mix of retail, commercial with some residential areas. Most of the historical building frontages along Kingsland High Street have been appended with modern shop fronts and fascias, together with street and commercial signs they give a lively but 'ad-hoc' and incoherent appearance to the street. Some frontages are well maintained but other poorly maintained and they downgrade the overall townscape quality. Although grand in architectural terms many buildings are in poor condition and this gives the area a somewhat neglected character. Notable features along Dalston Lane include the 'Peace Carnival'; a prominent anti-war mural by Ray Walker completed in 1985. The development site is clearly visible from Dalston Lane close to the junction with Kingsland High Street/Balls Pond Road. Further east terraced development along the southern side of Dalston Lane restricts views towards the site. This area is very hard and urban in character with no or very few street trees or green areas to improve the environment. Whilst it retains a strong original Victorian street pattern the condition of the area in general reduces its quality. The townscape quality is judged to be Ordinary.

11.4. Potential Effects

General

11.4.1. Tall buildings have not traditionally been a feature of the Hackney skyline, and the large scale of the development will create substantial change in the area. The massing and bulk of the proposed building blocks will introduce new and highly visible elements into the townscape. It should be noted that new development of the height and scale proposed is likely to be regarded by individuals in different ways - whilst some may view this scale of redevelopment as a positive catalyst for regeneration others may take the opposite view. The views taken in the assessment are based on professional judgement and take into account the positive contribution that new development can make to the existing townscape character and quality of the site and its environs, particularly where the townscape quality requires improvement. This is covered further below.

11.4.2. Given the large scale of this development and the different ways such developments can be viewed, as discussed above, below assesses the likely impact of the development on each character area, but does not assess whether the impacts can be considered positive or negative in terms of townscape or visual impact. This judgement on positive or negative impact is made later following consideration of planning advice on tall buildings contained in the UDP and the London Plan.

11.4.3. Most of the site comprises a vacant railway cutting and the development will be built on a slab over this cutting. Direct townscape impacts include the demolition of the Dalston

Snooker Centre to allow construction of the bus interchange access road and demolition of an existing warehouse on Roseberry Place to allow construction of the housing blocks to the south. Impacts relating to the visual impact of the proposals are more significant and this includes a consideration of the height, massing, design and finishes of the new structures and the effects these will have on the existing quality of the surrounding townscape including the quality of the many conservation areas that surround the site.

11.4.4. Whilst the southern end of the development will be at the same level as Roseberry Place, there will be a notable level change north of the bus interchange access road of 2.87m due to Roseberry Place falling below the level of the slab half way along its length. This level change runs out to meet existing levels further north at Dalston Lane. To overcome these level changes a series of proposed walls, steps and ramps including new planting works would provide pedestrian access from the upper level of the development to Roseberry Place.

11.4.5. Photomontages have been prepared from each of the agreed viewpoints in order to assist in the assessment of the changes from the existing conditions to the proposed. The photomontages have been vertically verified to ensure that they are accurate representations of the scheme:

- Figure 11.1: From Kingsland High Street looking south east.
- Figure 11.2: From Forest Road close to Holy Trinity Primary School at junction of Beechwood Road looking northwest.
- Figure 11.3: From Kingsland Road looking north east.

Area A: Kingsland Road Conservation Area

11.4.6. The development will require the removal of Dalston Snooker Centre to allow construction of the proposed bus interchange. This building is not part of the traditional Victorian Terrace along Kingsland Road as this is a later more modern infill building. It is of relatively poor quality and therefore it is considered that the change created by its removal would not be significant in terms of effects on existing townscape quality. New construction here will give the opportunity for local townscape improvements. Other townscape benefits are improved local pedestrian access with new east-west links to Roseberry Place, Dalston Lane and beyond. These access changes are in keeping as they help re-establish the traditional Victorian urban grain within the area. Figure 11.3 shows the view from Kingsland Road looking north east towards the proposed development. It is evident that the main visual impact will be the 18-storey block and this will create a major new skyline feature. From the southern part of the Kingsland Road area the visual impact of the new development will be reduced by the alignment of terraced Victorian frontages and these will obscure the lower parts of the new development along the street frontage up to Dalston Lane. Further north the existing terraced frontage will also act to obscure much of the new development although closer to Dalston Lane in the proximity to the site the taller structures rise above the Victorian frontages to create major new elements in the skyline (See Figure 11.1). Whilst the existing terraces reduce the potential impact there would be significant change to the townscape character in the northern part of the Conservation Area due to the development. There would also be significant effects from the rear views of buildings that back onto the site. Being so close to the development there is no screening from existing urban development and the full height and form of the new buildings will be visible from these locations and thus the new development will create a complete change to the existing townscape character

View from south east aspect of site showing proposed building outline beyond . NOTE: View not verified

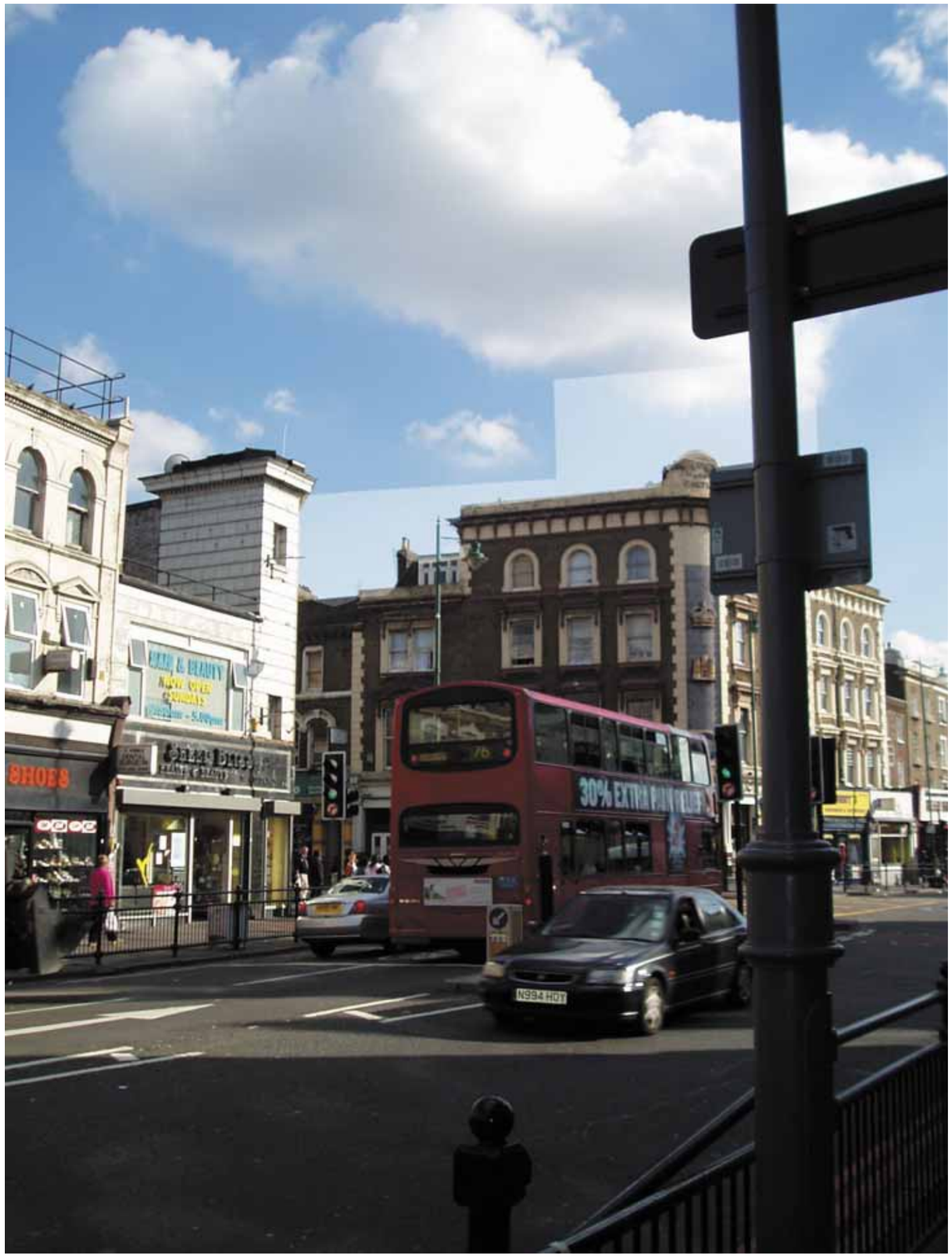
DALSTON JUNCTION
PHOTOMONTAGE VIEW

FIGURE 11.1

View from south west along Kingsland rd aspect . NOTE: View not verified

DALSTON JUNCTION
PHOTOMONTAGE VIEW

FIGURE 11.2



View from north west aspect of site showing proposed building outline. NOTE: View not verified

DALSTON JUNCTION
PHOTOMONTAGE VIEW

FIGURE 11.3

Area B: De Beauvoir Conservation Area

11.4.7. The north east portion of this area lies closest to the development. As with Area A the existing terraces on Kingsland Road and commercial properties between Balls Pond Road and Kingsland Road will act to significantly screen the lower parts of the development thus the main impact will be the taller structures of the development creating new skyline features. In the remaining area the mass of existing terraces will significantly obscure the development and from many locations the development will have negligible or no visual effect. Whilst the eastern edge will experience some change to the townscape character the overall existing quality of the conservation area would be maintained.

Area C: Dalston Lane West Conservation Area

11.4.8. There will be intermittent views of the development from the northern side of this area and the development will form significant new elements in the view. However views are restricted to the south by the alignment of Dalston Lane and existing buildings. Overall the quality of the Conservation Area would be maintained as overall impact of the development is restricted.

Area D: Queensbridge Road Conservation Area

11.4.9. This area is over 300m from the edge of the development site and because of existing urban development between this location and the site, only intermittent views of taller structures would be apparent. Whilst the northern end of this area will experience some visual change to the townscape character the overall existing quality of the Conservation Area would be maintained.

Area E: Graham Road/ Mapledean Conservation Area

11.4.10. As with Area D there would be only very limited and intermittent views of the development from the western edge of the area and the impact would be negligible. The majority of the Conservation Area would not experience any visual impact or changes in townscape quality due to the development.

Area F: Albion Square Conservation Area

11.4.11. As with Area B this area would experience negligible or no impact due to screening effect of existing urban development between the development site and Albion Square. Large new residential areas between Albion Square and Richmond Road would be effective in screening and limiting views of the development.

Area G: Roseberry Place East and South

11.4.12. The northern half of this area along with Area H would experience the most significant change due to the development particularly from the area between Dalston Lane and Richmond Road. Close to the development here is no screening from existing urban development and the full height and form of the new buildings will be visible from these locations and the new development will create a complete change to the existing townscape character. Figure 11.2 indicates the impact from Forest Road. It is noted that occasional street elements like the large oak tree within the primary school grounds in this instance can have a local screening effect. Views from the Kirkland Walk housing estate to the east will be evident on the western edge in particular although there will be some partial screening of lower elements of the development within the housing area due to screening effect of existing buildings. Further south beyond Richmond Road the screening effect of existing urban development would be effective and only partial or intermittent views of taller structures would be apparent. There are no views from Regent's Canal.

Area H: Dalston Lane North

11.4.13. As with Area G the southern half of this area particularly Dalston Lane Ashwin Street and Tyssen Street and the southern end of Kingsland High Street would experience the most significant change due to the close proximity of the development. There is little screening from existing urban development and the full height and form of the new buildings will be visible from these locations and here the new development will create a complete change to the existing townscape character. Further north in Area H the screening effect of existing urban development and the Victorian terraces along Kingsland High Street would be effective and only partial or intermittent views of taller structures would be apparent from the High Street, Ridley Road. Figure 11.1 shows the visual impact from Kingsland High Street with the taller structures of the new development creating notable new skyline elements above the Victorian townscape.

Significance of Effects on Townscape and Visual Impact

11.4.14. The large scale of the development will create substantial change in the townscape character as the proposed buildings, whilst aligned in terrace style in keeping with the traditional street pattern, are not of traditional scale being substantially higher than their surroundings. Major changes to the townscape character will be particularly evident from the northern parts of Area A, Area C, Area G and the southern part of Area H. This includes principally Dalston Lane, Ashwin Street, Tyssen Street and Tyssen Passage, Kirkland Walk, Roseberry Place, Beechwood Road, Forest Road and Kingsland Road and southern end of Kingsland High Street including views from the backs of properties facing the new development. In other areas and with distance away from the site the screening effect of existing urban development and the terraces along Kingsland Road and Queensbridge Road becomes more significant. Generally most of the development will be screened although the visual impact of the upper structures, in particular the 18 storey tower, would be a notable new townscape feature in views closer to the site. Further from the site, i.e. the southern parts of Area B and D and in Areas E and F, there will generally be limited, intermittent or no views depending on the urban layout from these conservation areas.

11.4.15. In considering the significance of the changes and whether these can be judged adverse or beneficial in terms of townscape or visual impact, it is useful to consider planning advice on tall buildings contained in the UDP and advice from the London Plan.

11.4.16. Policy EQ3 of the UDP states that:

"The Council will resist proposals for tall buildings that are significantly higher than their surroundings, but will consider exceptions in circumstances where the building will:

a) Identify with and emphasise a point of civic or visual significance;
b) Be carefully related to the massing and profile of other nearby buildings and building groups;
c) Not detract from the character or appearance of conservation areas and/or listed buildings;
d) Would not adversely affect the setting of St Paul's Cathedral."

11.4.17. Regarding point a) the development would emphasise and mark the location of the proposed East London Line Dalston Junction Station. Because of the height of the structures this would create an important sense of place in this location that would be visible from Kingsland High Street, Kingsland Road and Dalston Lane.

11.4.18. On point b) the building arrangement in terraced form would relate to the existing urban fabric by recreating the Victorian street pattern in this location. The proposed new pedestrian connections would be of positive benefit by freeing up access between Roseberry Place, Beechwood Road and Kirkland Walk and Dalston Lane and beyond.

11.4.19. On c) the visual and townscape assessment has shown that effects on the conservation areas are generally low or negligible with the exception of the northern Kingsland Road Conservation Area and Dalston Lane West Conservation Area. From Kingsland Road Conservation Area there would be a significant effect in the northern part of the Conservation Area in proximity to Dalston Lane. However this should be balanced against the opportunity for townscape enhancement with the removal of the Snooker Centre and creation of new public realm links and lower or negligible impact across much of the Conservation Area to the south. Overall it is considered that the existing character of the Conservation Area would be maintained. At Dalston Lane West there is an impact but views are restricted here and overall it is considered that the quality of the Conservation Area would be maintained.

11.4.20. On d) the development would not affect the setting of St Paul's Cathedral.

11.4.21. The London Plan also gives strategic advice on tall buildings (Policy 4B.8):

"The Mayor will promote the development of tall buildings where they create attractive landmarks enhancing London's character, provide a coherent location for economic cluster of related activities and/or act as a catalyst for regeneration and where they are also acceptable in terms of design and impact on their surroundings."

11.4.22. Policy 4B.9 considers the design and impact of large-scale buildings. All large-scale buildings should be of the highest quality design. Various criteria (in italics) have been listed in the policy those applying to townscape and visual effects are as follows:

"a) Meet the requirements of the View Protection Framework set out in Policy 4B.15 of this plan. "

11.4.23. On a) The Mayor of London designates a selected set of strategically important views in The London Plan. (These are listed in Table 4B.2 of that document). These views include London Panoramas, river prospects, townscape and linear views. It is considered that the development would not have a detrimental affect on any of these strategic London views.

"b) Be suited in their wider context in terms of proportion and composition and in terms of their relationships to other buildings, streets, public and private open spaces, the waterways and other townscape elements."

11.4.24. On b) In terms of proportion it is considered that whilst the development is tall the buildings are not out of context with the local environment. Many of the historic buildings follow and reinforce the traditional street pattern particularly along Kingsland Road. The intersection between Dalston Lane and Kingsland Road remains well defined in townscape terms with the strong urban form of the historic street pattern intact. This definition is rapidly diluted moving eastwards along Dalston Lane. The development would give the opportunity to mend the urban fabric in this location and create a strong sense of place at the junction relating to the station. The proposed new pedestrian connections would be of benefit by creating a more permeable environment with more choices of routes for pedestrians by introducing new east-west links.

"c) Be attractive elements as viewed from all angles and where appropriate contribute to an interesting skyline, consolidating clusters within that skyline or providing key foci within views."

11.4.25. On c) The buildings are arranged in varied cluster form with a central taller building that would give an interesting key focal point.

"d) Provide high quality spaces, capitalise on opportunities to integrate green space and planting and support vibrant communities both around and within the building."

11.4.26. On d) The development would create new urban space through the introduction of new pedestrian connections between Dalston Lane, Kingsland Road and Roseberry Place.

11.4.27. Given the criteria above the following considerations have been made. The proposed development would regenerate a derelict site and create a focal point for the station, would bring improvements in townscape quality by introducing new urban space, local links and planting into the area. Despite the Victorian legacy of fine buildings in places, the area particularly in the vicinity of the site is in poor and somewhat neglected condition. Regeneration is vital in order to bring environmental improvements and raise the townscape quality. The proposed buildings are of a high quality in terms of design and it is considered that the new development of well designed buildings and open spaces will create a new focus for the area, emphasising a point of civic significance (Dalston Junction Station) and this will raise the townscape quality of the area. It is concluded that the development would be considered beneficial in terms of effects on the townscape quality and visual impact.

Significance

11.4.28. Significance criteria for Townscape and Visual Effects is as follows:

11.4.29. It is concluded that the development would be considered beneficial and therefore would have a positive rather than negative effect.

11.4.30. For Area A whilst there will be significant changes to the townscape character in the northern part of the Conservation Area the new development will create a new focus for the area that emphasises the station location. Given the high quality design and detailing proposed for the buildings and other townscape benefits in terms of new open space links and public realm improvements this can be judged overall as Minor Beneficial.

11.4.31. For Area B the effects of the new development are significantly reduced by the mass of existing terraces and from many locations in this area the development will have negligible or no effect. Whilst the eastern edge will experience some change to townscape character the overall quality of the Conservation Area would be maintained. The significance is judged to be Neutral.

11.4.32. For Area C there will be intermittent views of the development from the northern part of the area however views are restricted to the south by the alignment of Dalston Lane and existing buildings. It is considered that the overall quality of the Conservation Area would be maintained and therefore the significance is judged to be Neutral.

11.4.33. For Area D the distance from the edge of the development means that only intermittent views would be apparent. Given that the existing quality of the Conservation Area will be maintained the significance is judged to be Neutral.

11.4.34. For Area E and F there would be negligible or no impact due to the screening effect of existing urban development. Given this the significant is judged to be Neutral.

11.4.35. The northern half of Area H and southern half of Area G would experience the most significant changes due to the development. The proposed development would however regenerate a derelict site; bring improvements in townscape quality by introducing a new high quality development, new urban space, local links and planting into the area. Despite the historical legacy of fine buildings the area is in poor condition and the neglected character of the townscape is particularly evident from these areas. Given that the new development will raise the townscape quality of the area the significant from these areas is judged to be Moderate Beneficial.

Table 11.3: Summary of Townscape and Visual Effects.

Area	Townscape & Visual Effects
A	Minor beneficial
B	Neutral
C	Neutral
D	Neutral
E	Neutral
F	Neutral
G	Moderate beneficial
H	Moderate beneficial
Overall	Neutral to minor beneficial

11.5. Mitigation Measures and Residual Effects

11.5.1. The previous section concluded that the development would be considered beneficial in terms of effects on townscape quality and visual impact. The proposed high quality design and detailing proposed for the development were important factors in considering the development as a positive addition in terms of townscape and visual quality.

11.5.2. The buildings will generally be glazed with timber or lightweight metal louvres and glass balustrades. This will give them a light appearance and this will help visually reduce their mass. Roof gardens are proposed on the seven storey blocks for use by building residents. These will contain areas of lawn edged with medium height native herbaceous and shrub planting. A few small tree specimens will be planted in raised mounds or planters where structural capacities allow. These features will provide useful amenity and fit with current initiatives from the Lord Mayor for the installation of green roofs in new developments in London.

11.5.3. The proposal includes the provision of public space improvements comprising a new public space linking to the consolidated bus interchange. The new plaza will consist of medium canopy height trees in planter with integral seating. Retail along the edges will have an opportunity to spill out with café seating along the periphery of the space. These improvements will be of high specification using natural stone paving, timber seating and pedestrian and feature lighting and will be of benefit to the local area.

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11.5.6. This is summarised in Table 17.1 at the end of this document.

12. Microclimate

12.1. Introduction

12.1.1. This chapter addresses the potential effects the proposed development may have on the wind microclimate within the immediate environs of the proposed development site. The assessment includes a summary of the existing onsite wind conditions and identifies mitigation measures where appropriate for impacts that may arise as part of the proposed development.

12.2. Assessment Criteria and Methodology

Wind Tunnel Modelling

12.2.1. The wind tunnel studies were undertaken by BMT Fluid Mechanics. The architects provided the scheme information for the wind tunnel model and attended the wind tunnel studies.

12.2.2. A 1:400 scale model of the Development and its surroundings was constructed and placed in the boundary layer wind tunnel. A view of the model is shown in Figure 12.1. More detail of the wind tunnel studies is given in the BMT report, attached as Appendix 12.1.

12.2.3. Measurements of gust and mean wind speeds were obtained using Irwin-Cook probes for sixteen equal increments of wind direction at locations chosen either due to wind sensitivity of the expected activity in the area (building entrances, external seating etc.) or because the site geometry suggested the possibility of undesirable wind conditions.

12.2.4. The measured wind speed ratios were combined with statistics for wind strength and direction obtained from the Holborn Weather Centre to obtain levels of windiness for each season of the year based on the Lawson 'comfort' and 'distress' criteria described below.

Lawson Criteria

12.2.5. The acceptability of windiness is subjective and depends on a number of factors, most notably the activities to be performed. Acceptable conditions for various activities in order of increasing windiness are described in Table 12.1 below.

Table 12.1: Comfort Criteria as defined by TV Lawson

Criteria	Description
Long term 'Sitting'	Reading a newspaper and eating and drinking
'Standing' or short term sitting	Appropriate for bus stops, window shopping and building entrances
Walking or 'Strolling'	General areas of walking and sightseeing
'Business walking'	Local areas around tall buildings where people are not expected to linger

12.2.6. These conditions are the limiting criteria for comfort. For ideal conditions the windiness will be a category better than the limiting conditions above.

12.2.7. In the following assessment, the words 'Sitting', 'Standing', 'Strolling' and 'Business walking' are used to describe the comfort levels of windiness of Table 12.1.

12.2.8. Windiness is less critical for activities which occur by choice only when conditions are suitable, such as eating lunchtime sandwiches outside. Clearly the opportunities for such casual use will be fewer in windier areas.

12.2.9. The comfort criteria above describe more frequent wind conditions. There is also a distress criterion for 'general access'; equivalent to a mean speed of 15m/s and a gust speed of

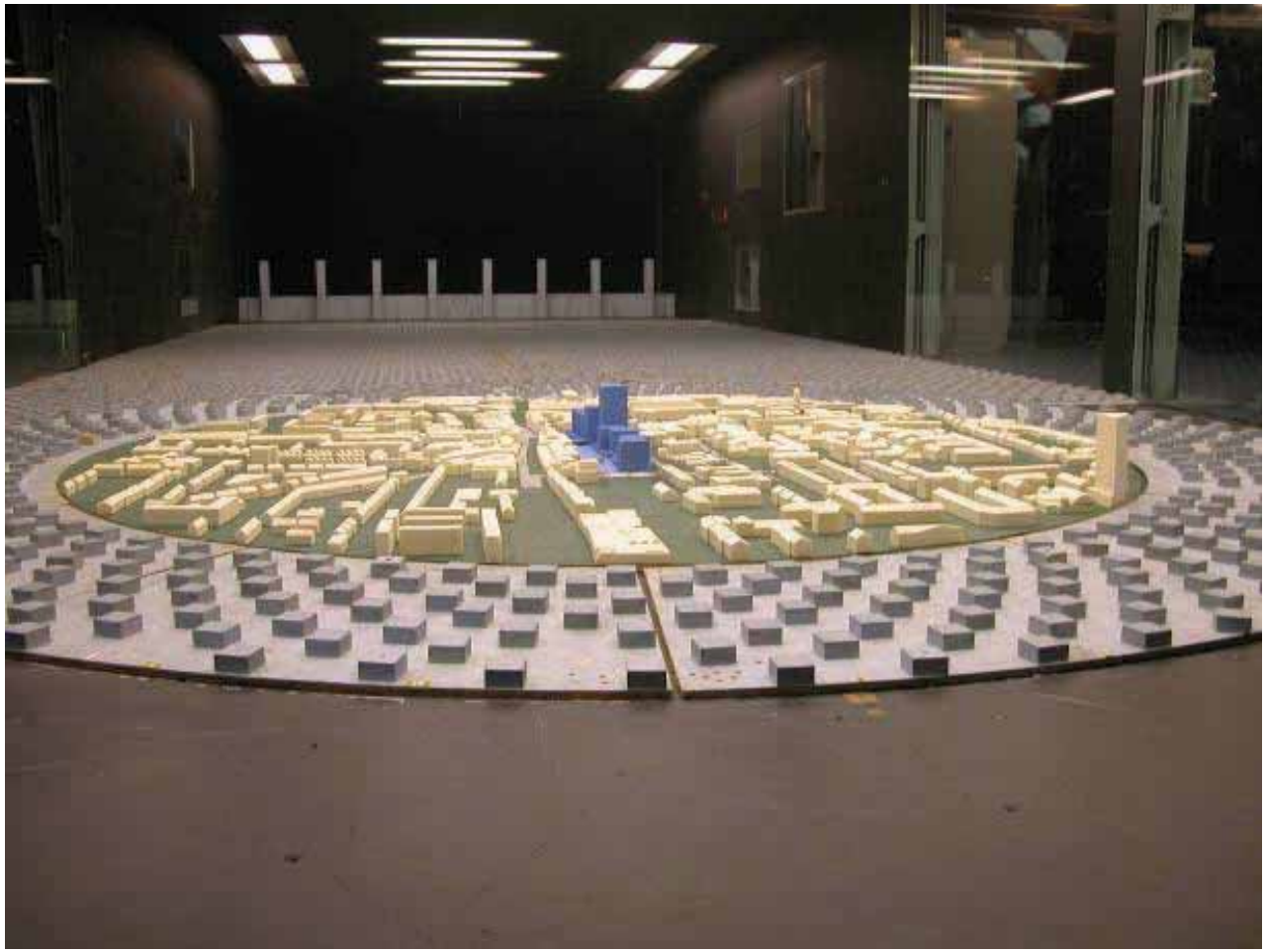

Figure 12.1: Photo of the Wind Tunnel Model from the South

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28m/s (62 mph) to be exceeded less often than once a year. Conditions in excess of this limit may be acceptable for optional routes and routes which less physically able individuals are unlikely to use.

12.2.10. There is a further limiting distress criterion beyond which even 'able-bodied' individuals may find themselves in difficulties at times. This corresponds to a mean speed of 20m/s and a gust speed of 37m/s (83 mph) to be exceeded less often than once a year.

12.2.11. The distress criterion is not exceeded in any areas around the proposed development.

Wind Climate

12.2.12. The most frequent and strongest winds of the UK at all times of the year blow from a quadrant centred on WSW (240°E of N) (see Figure 12.2). These winds are relatively warm and wet. Almost all cases of serious annoyance due to strong winds around buildings are caused by winds from this direction.

12.2.13. NE winds are almost as common as the SW winds during the spring but are weaker. NE winds are relatively cold and dry. These winds are often associated with poor internal conditions due to cold air infiltrating through doors.

12.2.14. Winds from the NW can be as strong as the SW winds but are less frequent. They are relatively cold and can bring snow in winter.

12.2.15. SE winds are generally warm and light and are rarely associated with adverse ground level winds.

Visualisation of Wind Results

12.2.16. The results of the wind tunnel study on pedestrian safety and comfort are graphically displayed in figures. For ease of identification, comfort conditions at each measurement location are indicated by the colour of the spot (see Figure 12.3). The shade of the colour indicates whether the conditions are in the upper or lower end of that range. Red circles around a spot indicate an exceedence of the distress criteria.

12.2.17. 'Summer' and 'worst season' conditions are presented. 'Worst season' is typically winter (December to February) but, at some locations, may be spring (March to May) depending on the geometry of the buildings. The 'worst season' conditions should be considered for activities likely to take place at all times of the year. 'Summer' (June to August) conditions are representative of the effect on activities that are only likely to occur outdoors in the warmer months.

12.3. Baseline Conditions

12.3.1. The Dalston Junction development is to be located above the East London Line railway, bounded to the north by Dalston Lane. The site is currently derelict and closed to the public. It is surrounded by a high density of low rise buildings. Figure 12.4 show the wind tunnel model of the existing site and its surroundings.

12.3.2. Figure 12.5 and Figure 12.6 show the worst season and summer season results for the current open site.

12.3.3. Worst season conditions in and around the site are observed to be generally in the 'standing' range. 'Strolling' range conditions are measured only at the north end of Roseberry Place, at the corner of an exposed building. Conditions along Dalston Lane are in the 'standing' range and suitable for the current retail and bus stops use. Conditions in the 'standing' range and suitable for a school playground are generally measured around the Holy Trinity Primary School primary school. "Sitting" range conditions and suitable for all

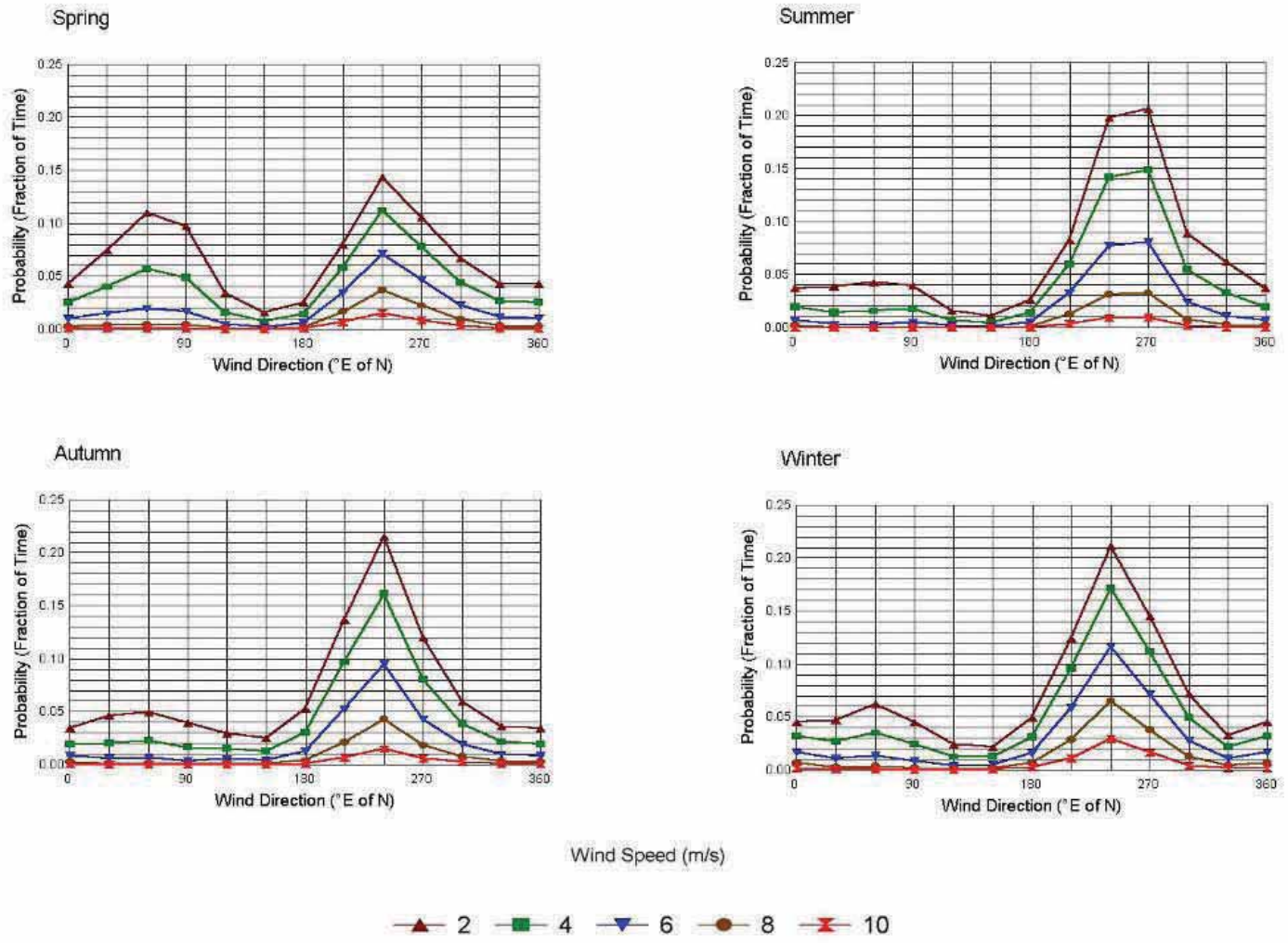

Figure 12.2: Probability of Wind Speed for Each Season

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Figure 12.3: Visual Representation of the Lawson Criteria

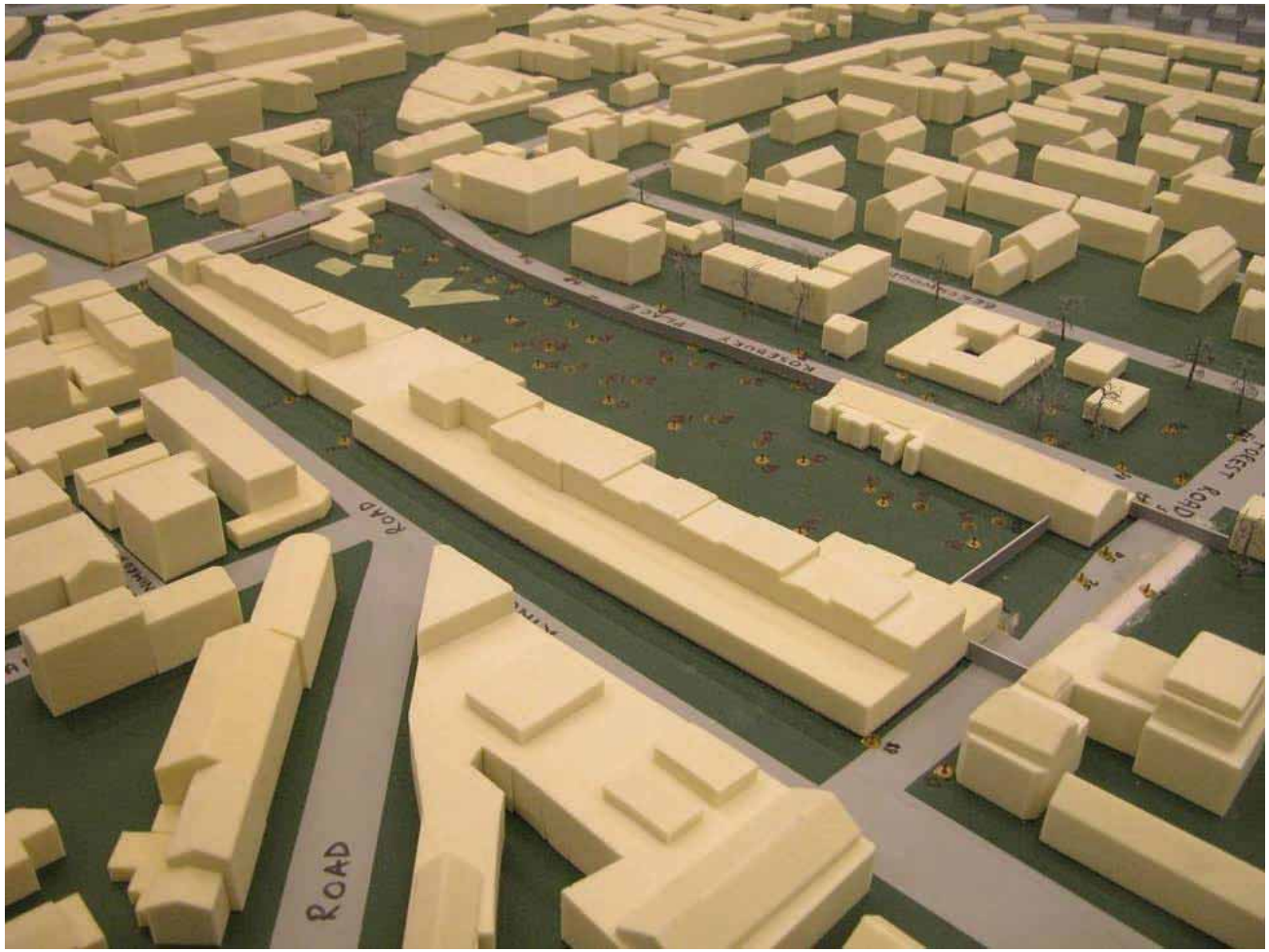

Figure 12.4: Photo of the Existing Model from the South-west

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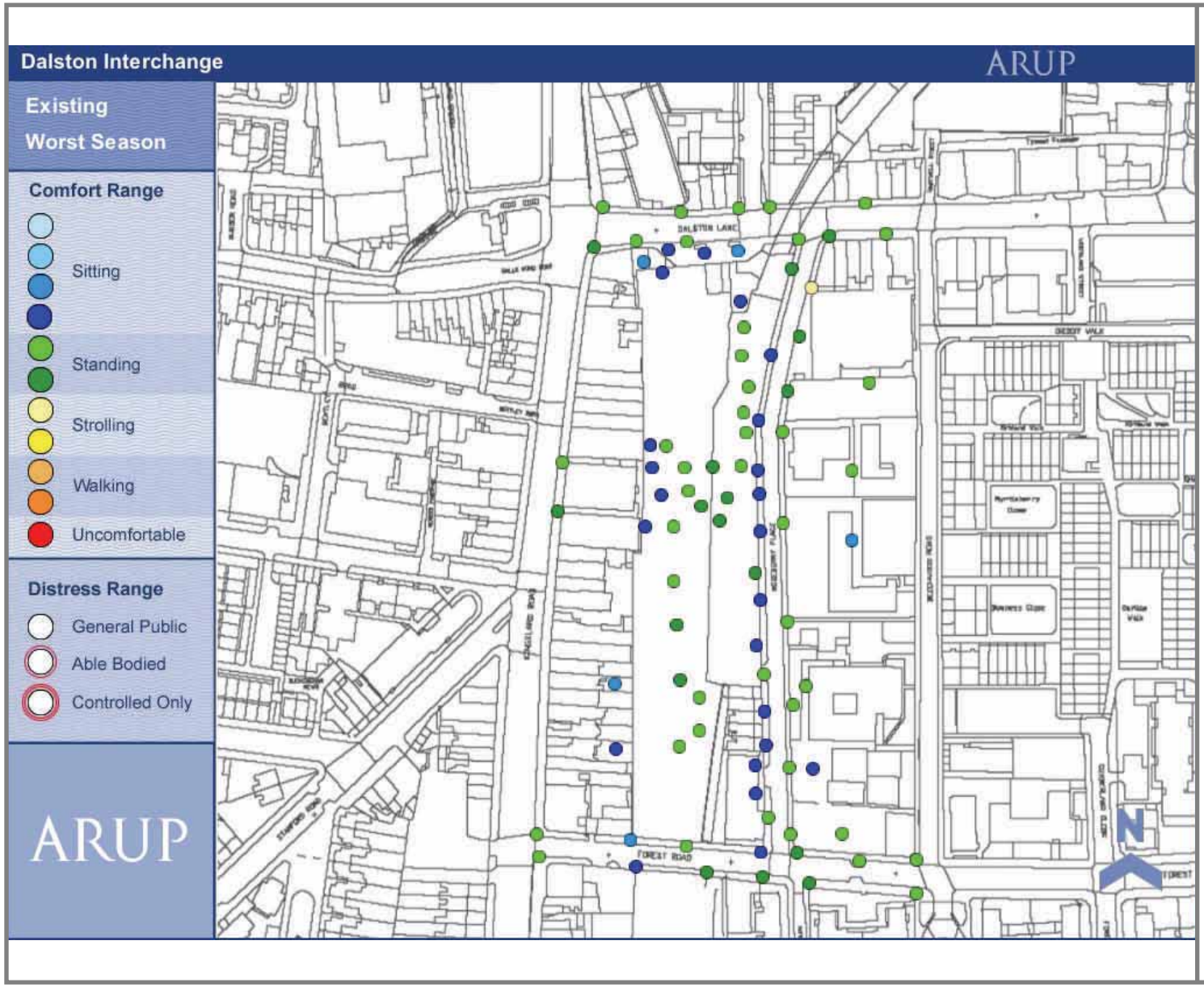

Figure 12.5: Worst Season Conditions for the Existing Site

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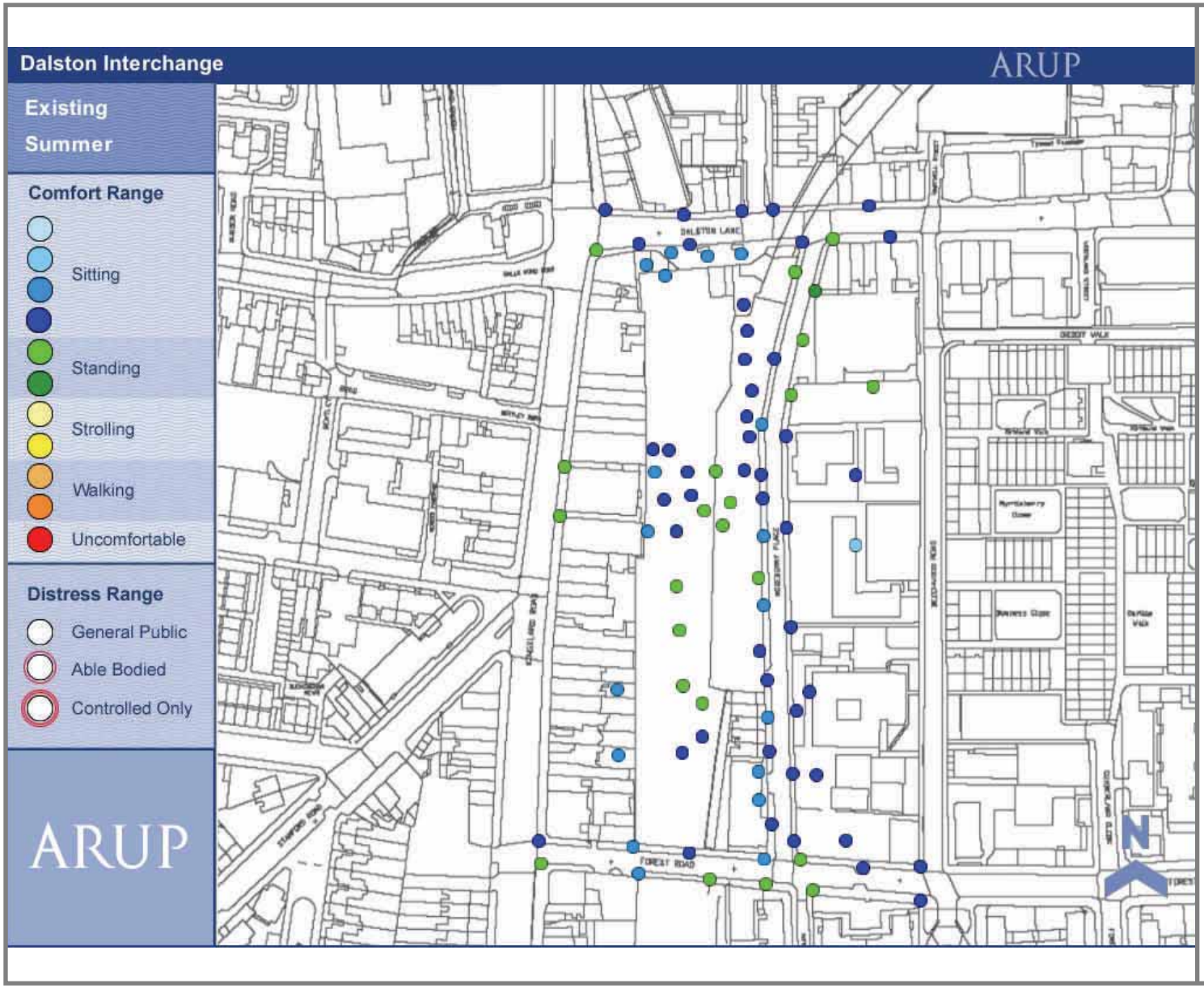

Figure 12.6: Summer Season Conditions for the Existing Site

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activities, are observed in the garden of the cottages on Rosberry Place and in the backyard of Kingsland Road's properties.

12.3.4. Summer season conditions in the 'sitting' range are measured to the south west of the site, and especially in the playground of the Primary School, in the garden of existing cottages, and in the backyard of Kingsland Road's properties. Similarly conditions in the 'sitting' range are observed to the north of the site, along Dalston Lane. Elsewhere, conditions are generally in the 'standing' range.

12.4. Potential Effects

12.4.1. The proposed development, which consists of buildings ranging from 5 to 18 storeys, has been tested with its surroundings. Photos of the model are shown in Figures 12.7 to 12.9.

12.4.2. Results for the worst and summer seasons are presented in Figure 12.10 and Figure 12.11, and discussed in the paragraphs below.

Worst Season Conditions

12.4.3. The central plaza is exposed to the prevailing winds which are accelerated in between the two tall buildings (10 and 18 storeys) and is observed to be windy. Conditions measured are generally in the 'Strolling' range. 'Business walking' range conditions are measured at the northwest corner of the southern block and on top of the stairs. 'Business walking' conditions would be marginally acceptable for access. Mitigation in the form of landscaping is shown to be beneficial (see Section 12.5).

12.4.4. To the west of the central plaza, the bus station is sheltered. Conditions are observed to be in the "standing" or "sitting" range, and acceptable for bus stop use. The bus station is an open space and air movement through cross-ventilation, which can facilitate dispersion of the vehicle emissions, is expected.

12.4.5. To the north east, conditions along the eastern façade are observed to be in the 'sitting' range and are suitable for the intended terraces and cafes use. This is an improvement compared with the existing conditions and is considered to be a beneficial effect.

12.4.6. To the south east, conditions are generally in the 'standing' range and suitable for the intended access, private gardens and entrances use.

12.4.7. Along the northern façade (by Dalston Lane), conditions are observed to be in the 'strolling' range, windier than existing conditions, and excessively windy for the intended bus stops in this area. This is a significant change and is considered to be a negative effect. Mitigation measures have been developed (see Section 12.5).

12.4.8. Conditions in the playground of Holy Trinity Primary School are observed to be slightly windier, but remain generally in the 'standing' range and suitable for the intended outdoor activities. Therefore no significant effects are predicted.

12.4.9. Conditions in the gardens of existing cottages on Roseberry Place are observed to be slightly windier, with conditions moving from the upper 'sitting' to the low 'standing' range. Existing landscape in the garden (such as hedges and low rise planting) was not modelled and is expected to improve the conditions to the 'sitting' range. Therefore no significant effects are predicted.

12.4.10. Conditions to the south along Forest Road are slightly windier than existing with conditions in the low 'strolling' range. These conditions are acceptable for the intended access and therefore no significant effects are predicted.

12.4.11. Conditions along Kingsland Road are similar to existing and in the 'standing' range.

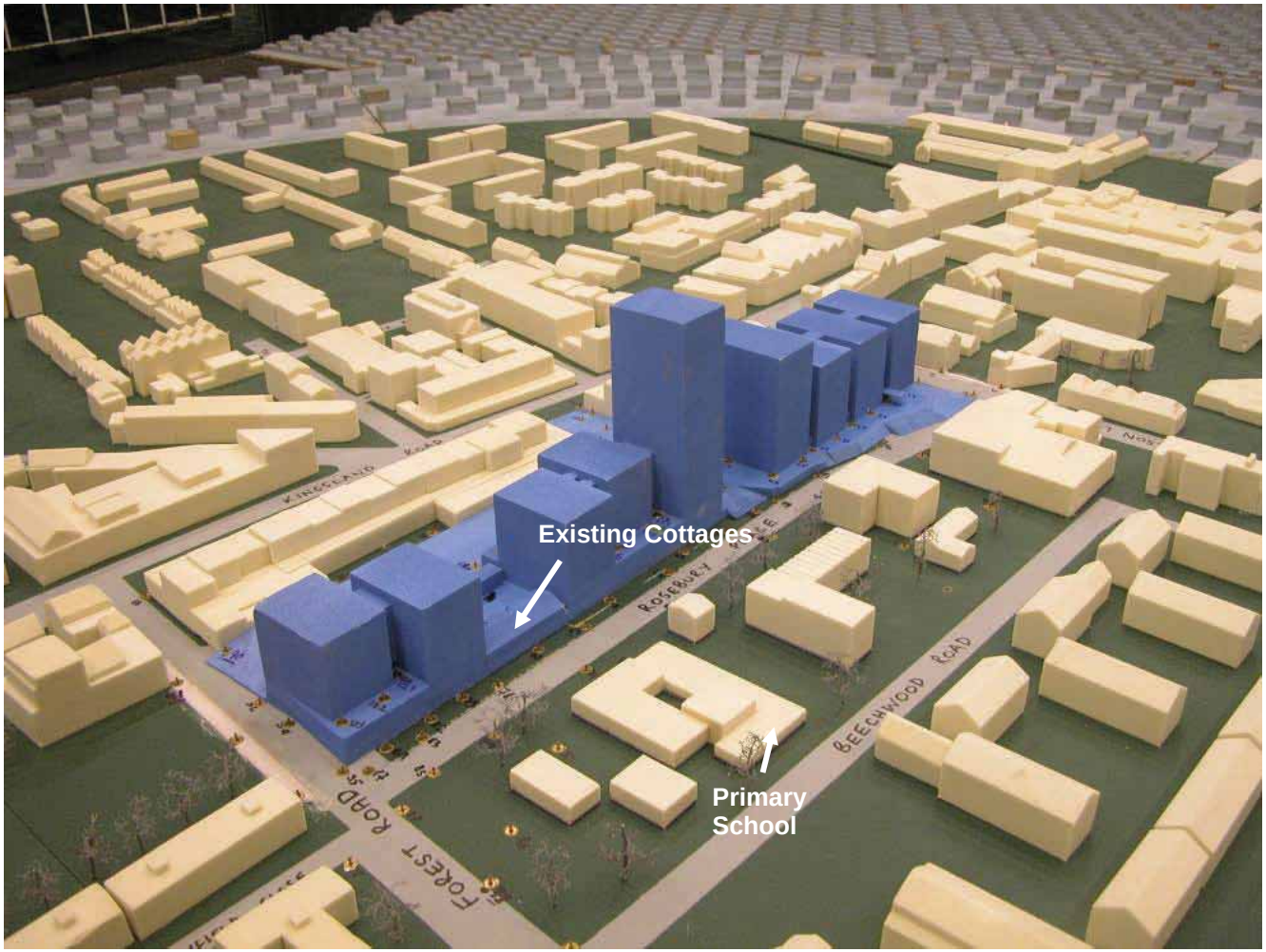

Figure 12.7: Photo of the Proposed Development Model from the Southwest

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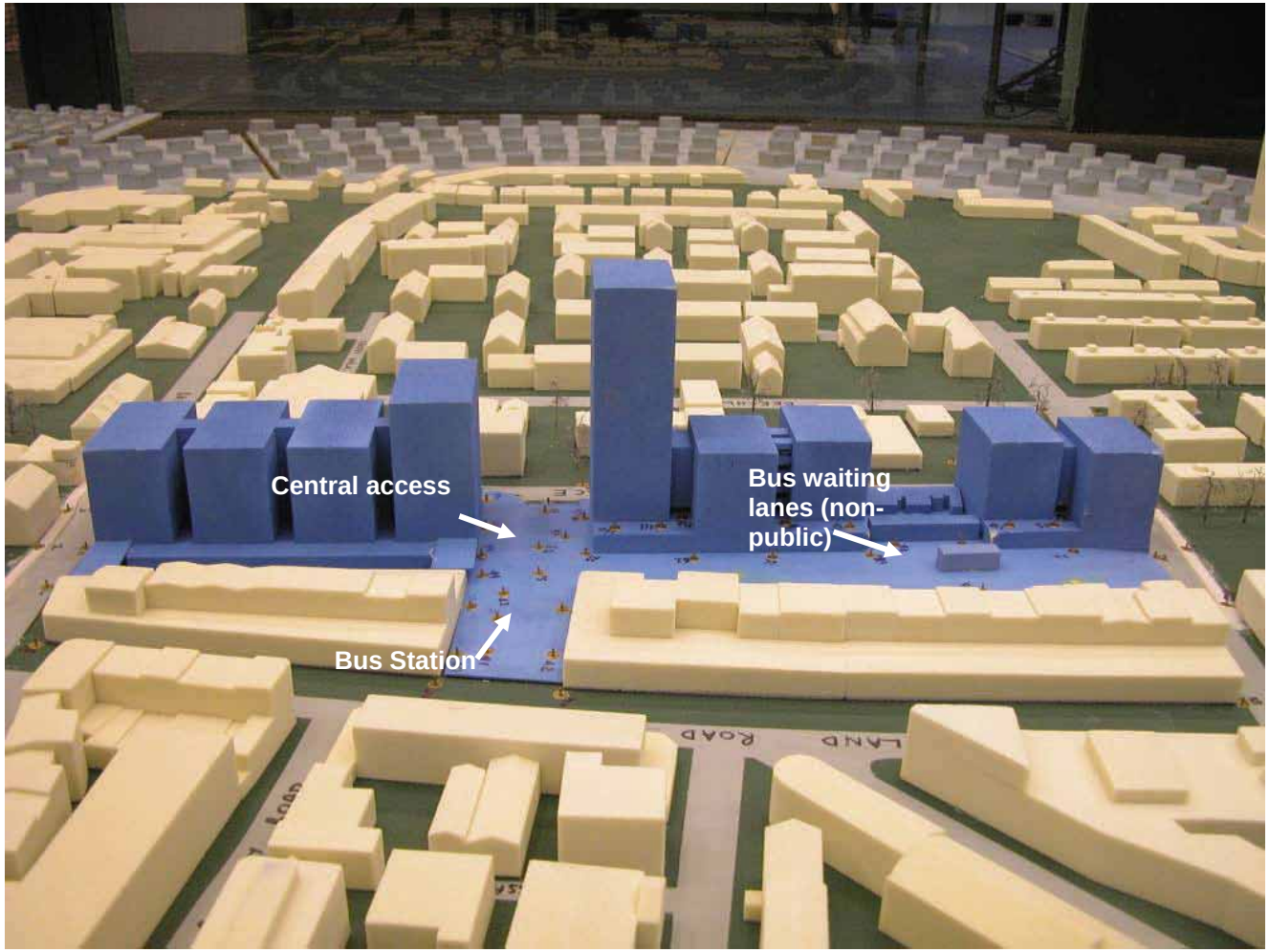

Figure 12.8: Photo of the Proposed Development Model from the East

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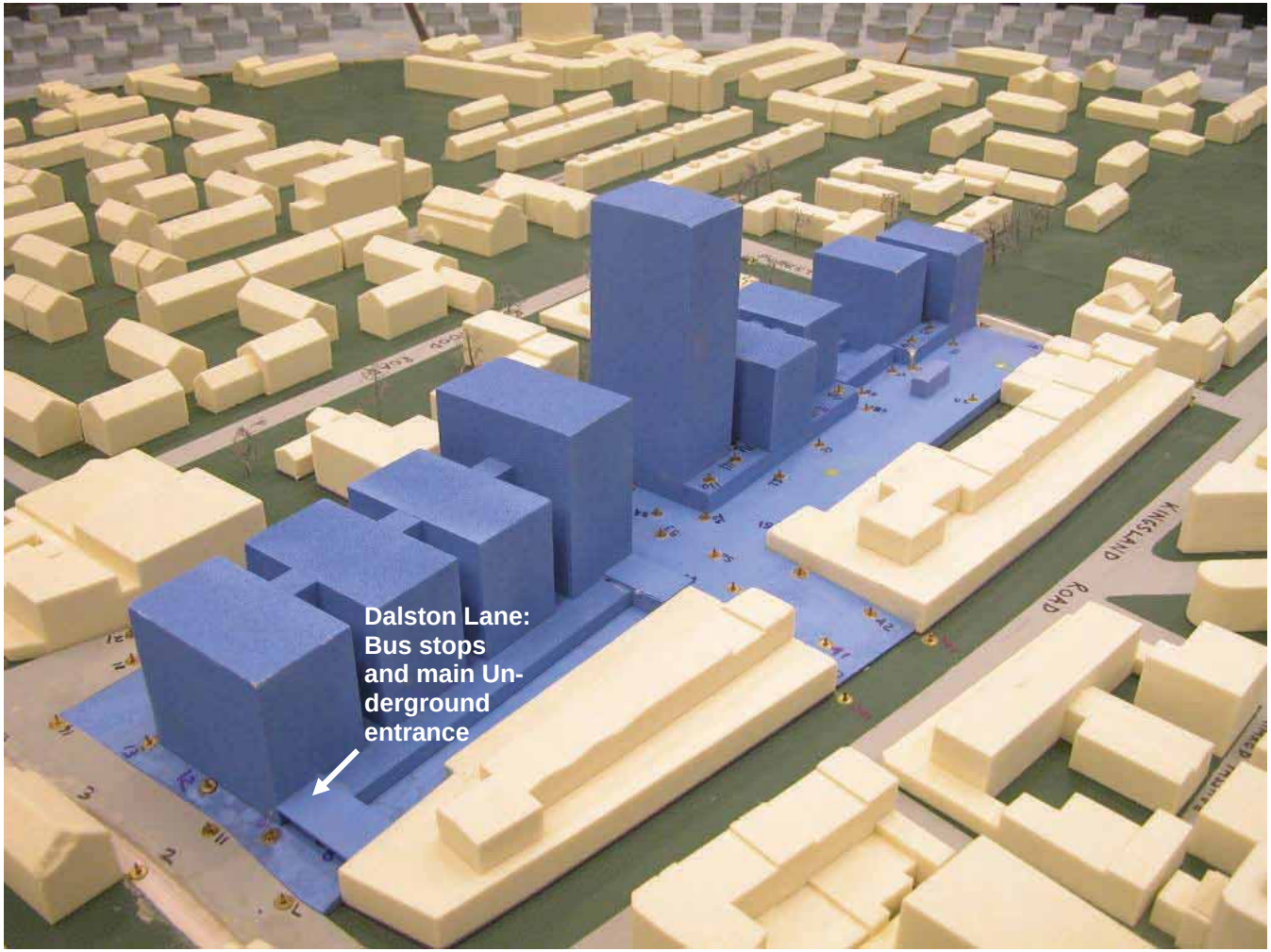

Figure 12.9: Photo of the Proposed Development Model from the North

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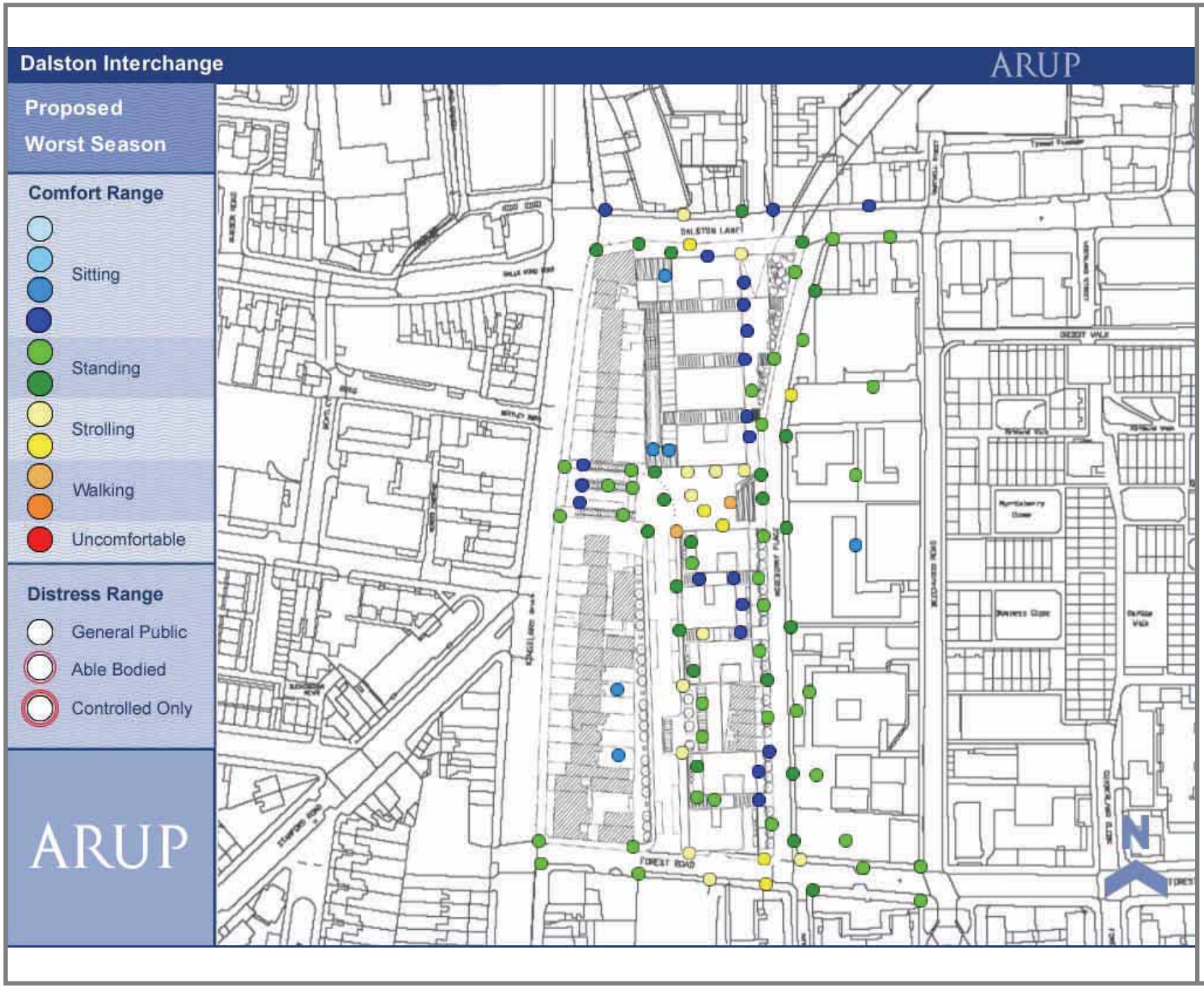

Figure 12.10: Worst Season Conditions for the Proposed Development

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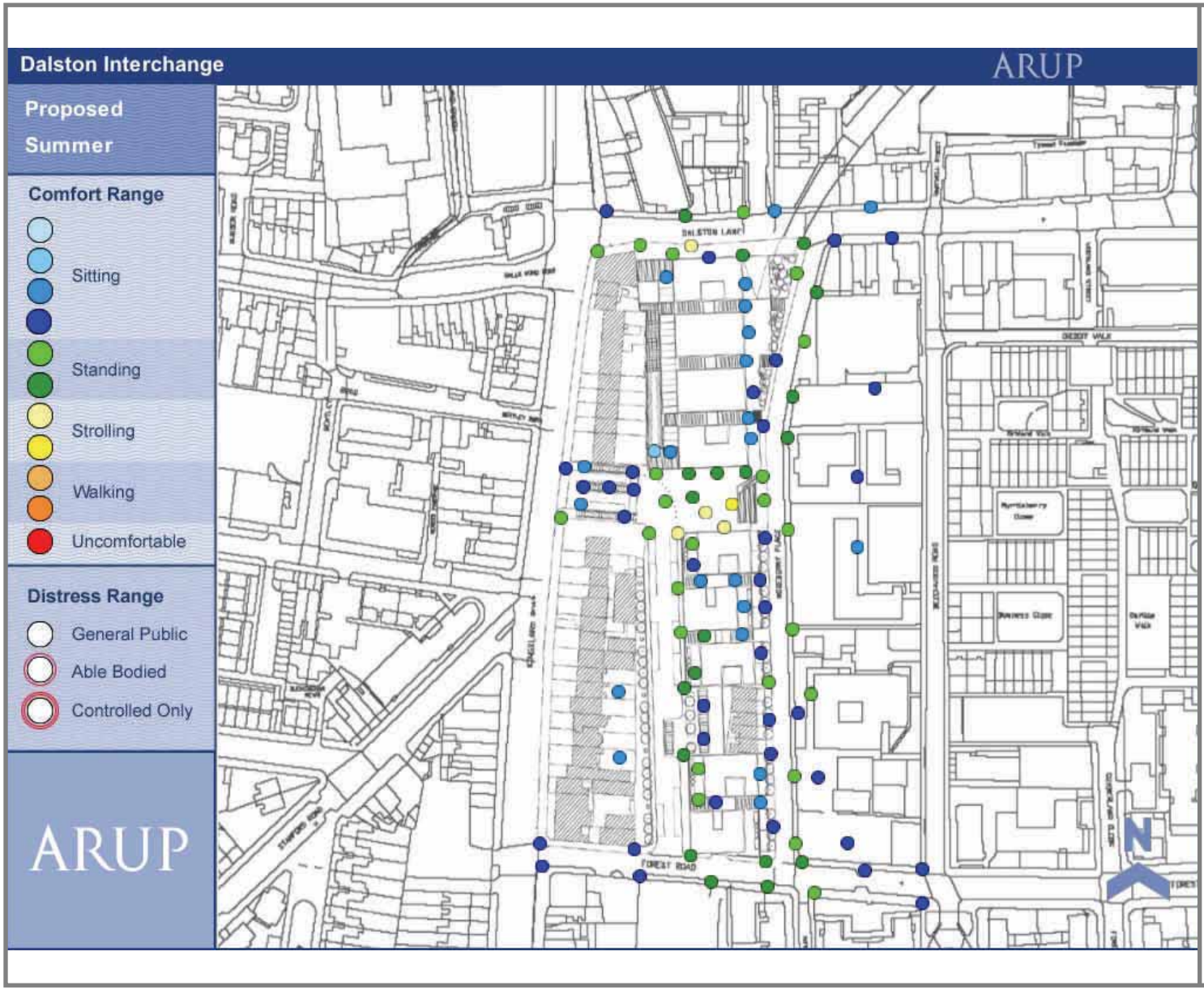

Figure 12.11: Summer Season Conditions for the Proposed Development

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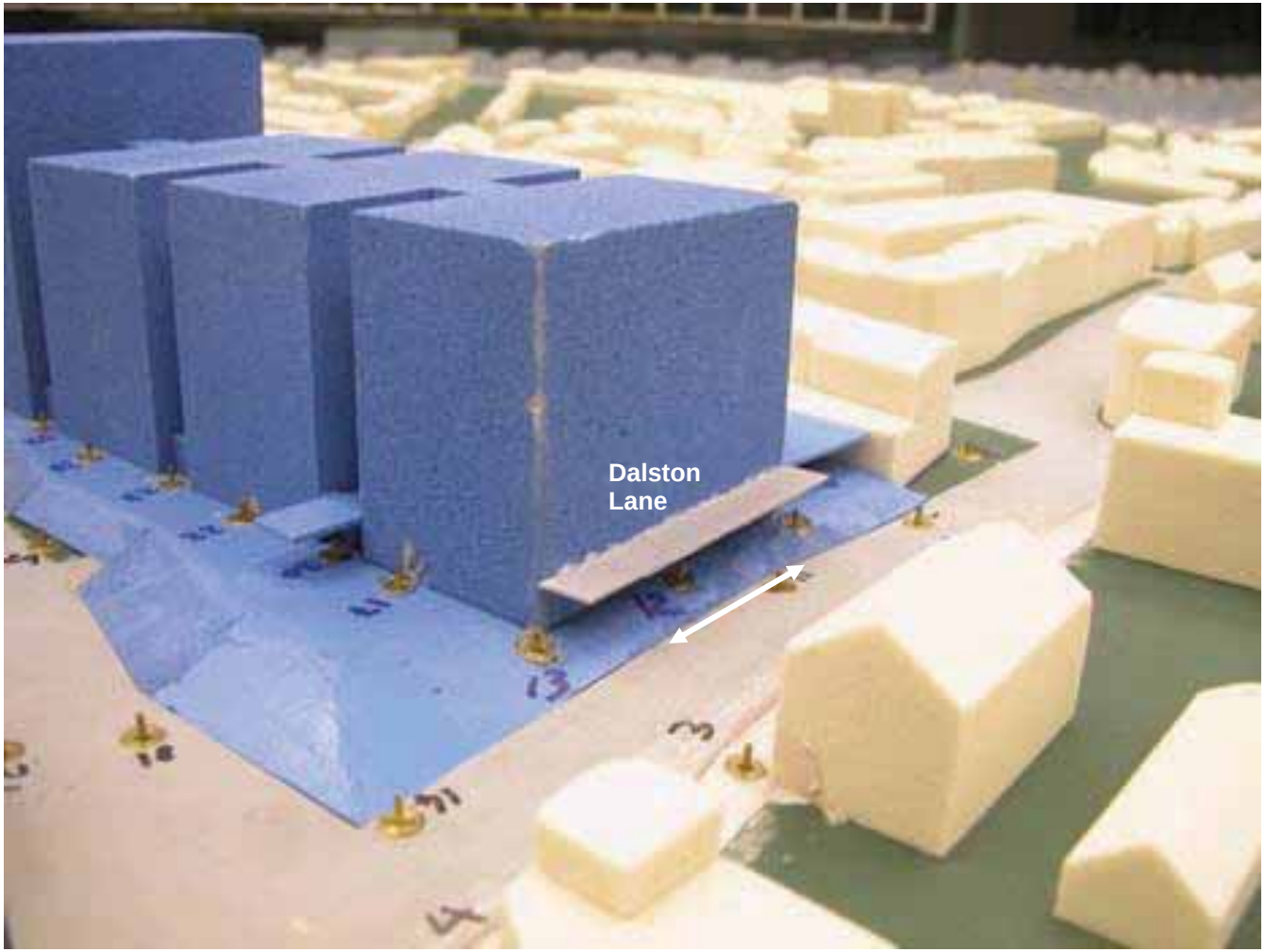

Figure 12.12: Photo of the Model with Canopy Along the Northern Façade

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Figure 12.13: Photo of the Model with Tree Planting in the Central Open Space

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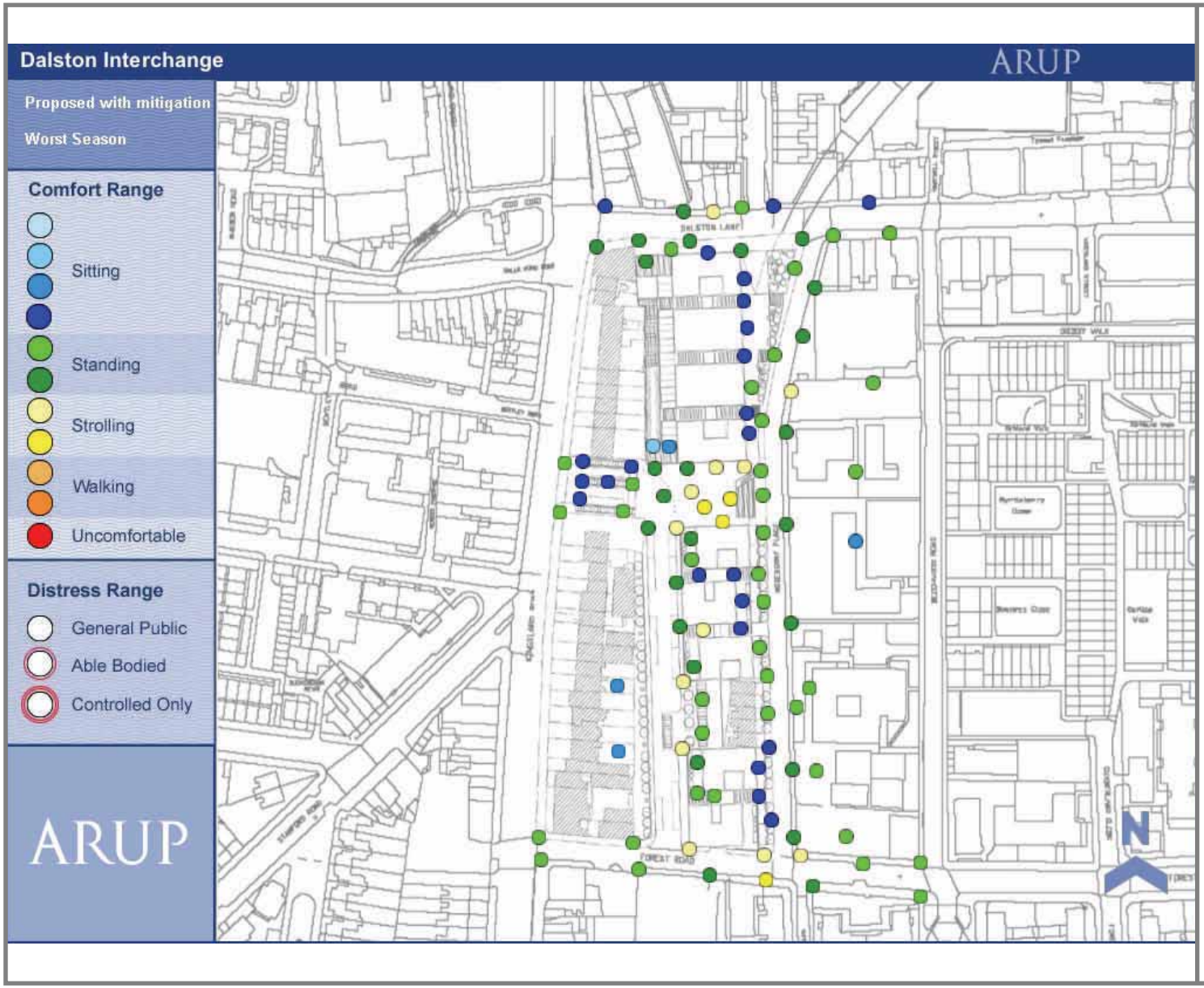

Figure 12.14: Worst Season Conditions for the Proposed Development with Mitigation

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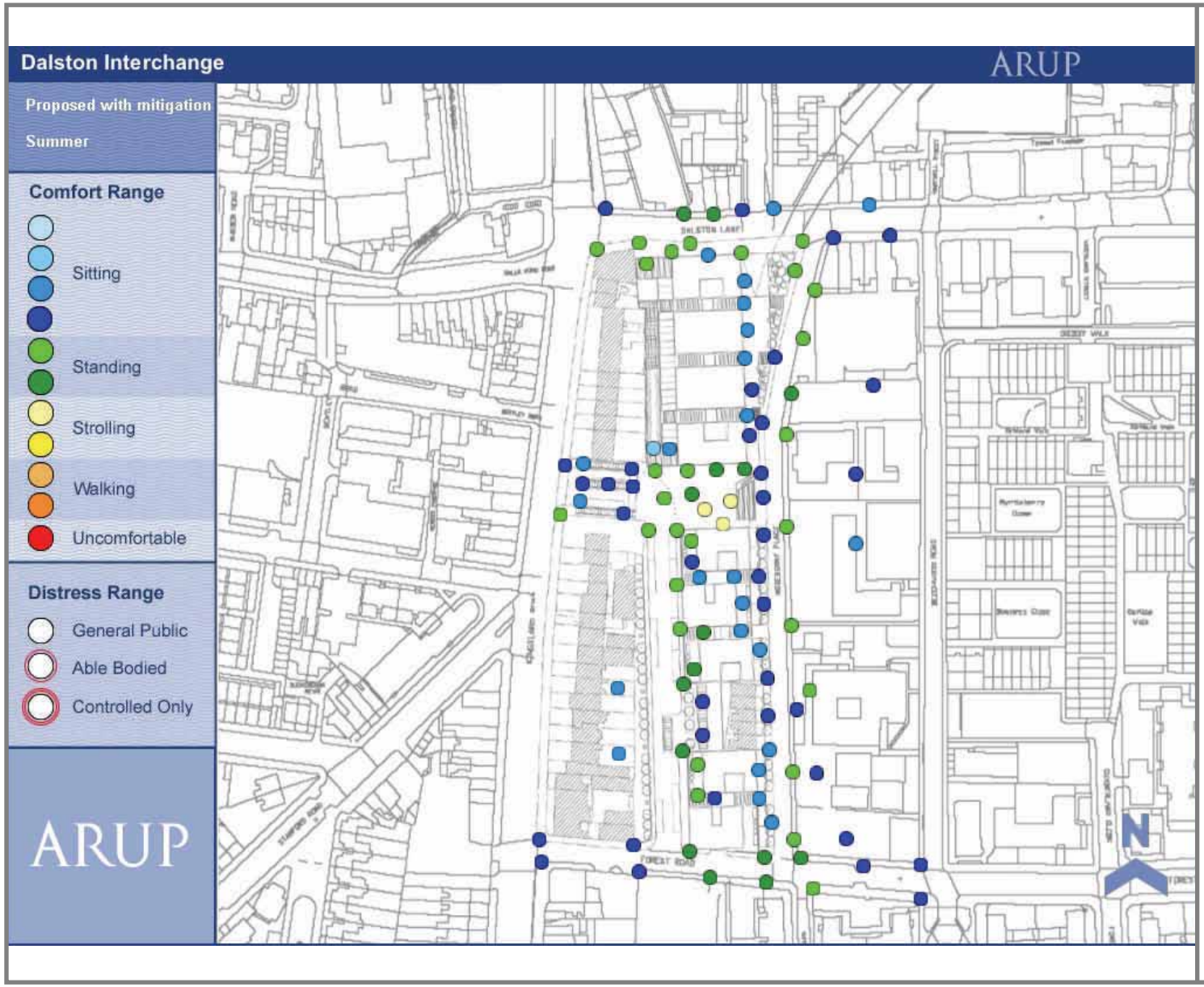

Figure 12.15: Summer Season Conditions for the Proposed Development with Mitigation

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Conditions in the back yards of properties on Kingsland Road, are similar to existing, in the 'sitting' range and suitable for all activities. Again, no significant effects are predicted.

Summer Season Conditions

12.4.12. Conditions well into the 'sitting' range and suitable for the intended terraces and cafes use are observed along the eastern façade.

12.4.13. Conditions in the central plaza remain relatively windy with conditions in the 'standing' and 'strolling' range.

12.4.14. Conditions in the bus station are well in the acceptable 'sitting' range.

12.4.15. Summer season conditions in the Holy Trinity Primary School playground, garden of existing cottages and backyard of properties along Kingsland Road remain in the 'Sitting' range and acceptable for all activities.

12.5. Mitigation Measures and Residual Effects

12.5.1. Several tests were carried out to develop the most appropriate mitigation measures in order to improve conditions in areas where conditions were initially found to exceed the desired levels of windiness.

12.5.2. Results achieved along with a description of the proposed mitigation measures are discussed below. Photos of the model (with mitigations) are shown in Figure 12.12 and Figure 12.13. Worst and summer season results are presented in Figure 12.14 and Figure 12.15.

Proposed Mitigation Measures and Residual Impacts

12.5.3. To the north of the site, a canopy is proposed to improve conditions at the bus stops along Dalston Lane (see Figure 12.12). Conditions achieved below the canopy are in the 'Standing' range and suitable for the intended bus stops.

12.5.4. The proposed canopy also helps to reduce the windiness along the northern side of Dalston Lane. Conditions achieved are in the 'standing' and low 'strolling' range. These conditions are slightly windier than existing; however they remain acceptable for the intended access in this area. Residual impact is therefore negligible in this area.

12.5.5. In the central plaza, the proposed landscape, as seen in Figure 12.13, (trees distributed over the square and tall hedge located at the northwest corner of the southern block), improves conditions. Worst season conditions achieved with landscape in place are in the 'standing' or 'strolling' range, and acceptable for general access. It is proposed to introduce handrails along the stairs (or local mitigation) to ensure safe access on very windy days. It is also proposed to recess all shop entrances in the plaza in order to ensure acceptable conditions in the 'standing' range. Residual impact is therefore negligible.

12.5.6. Summer season conditions in this central open space with landscape in place are generally in the 'standing' range with some 'strolling' conditions locally. Local shelter will need to be provided in any areas intended for seating.

Cumulative Effects

12.5.7. The proposed development has also been tested within future surroundings to include the effect of the emerging Dalston Lane South development. A planning application for this has not yet been submitted and the design may change.

12.5.8. A photograph of the wind tunnel model is given in Figure 12.16.

12.5.9. In this test, the conditions are observed to become marginally windier along Roseberry Place and especially at the northeast corner of the Dalston Junction site. In the proposed café and terraces area along the eastern façade of the northern block, conditions move just into the 'standing' from the upper 'sitting' range. It should be noted however that the anticipated landscaping associated with the Dalston Lane South development was not modelled as the layout may change, but it is likely to provide some shelter. Conditions are therefore expected to remain suitable for the intended external seating use.

12.5.10. Conditions are expected to be slightly less windy in the central plaza, with conditions moving from the upper 'strolling' to the low 'strolling' range. These conditions would be acceptable for walk through use only and recessing of entrances would continue to be necessary.

12.5.11. Conditions along Dalston Lane are expected to be slightly improved, with conditions in the low 'standing' range.

Summary

12.5.12. Wind tunnel studies have been carried out to assess the wind conditions in and around the Dalston Junction development.

12.5.13. Initial studies have shown that conditions within the development were generally acceptable for the intended pedestrian activities. However, some areas were found to be excessively windy and mitigation measures were developed. Proposed mitigation measures include a canopy along the northern facade of the development (by Dalston Lane). Conditions achieved below the canopy are suitable for the intended bus stops use. It is also proposed to recess entrances located in the central plaza (between northern and southern blocks) in order to ensure suitable conditions. The proposed landscape (trees distributed over the square) has also shown to improve conditions and ensure acceptable conditions for general public access.

12.5.14. Around the proposed site, and especially in the school playground, existing cottages gardens and Kingsland Road properties' backyard, conditions have found to be generally similar to existing. Conditions are shown to be windier on Forest Road but remain acceptable for the intended access use. Similarly on Dalston Lane, while the proposed canopy is shown to reduce the windiness along the street, conditions are found to be slightly windier than existing but remain suitable for the intended access.

12.5.15. This assessment is summarised in Table 17.1 at the end of this document.

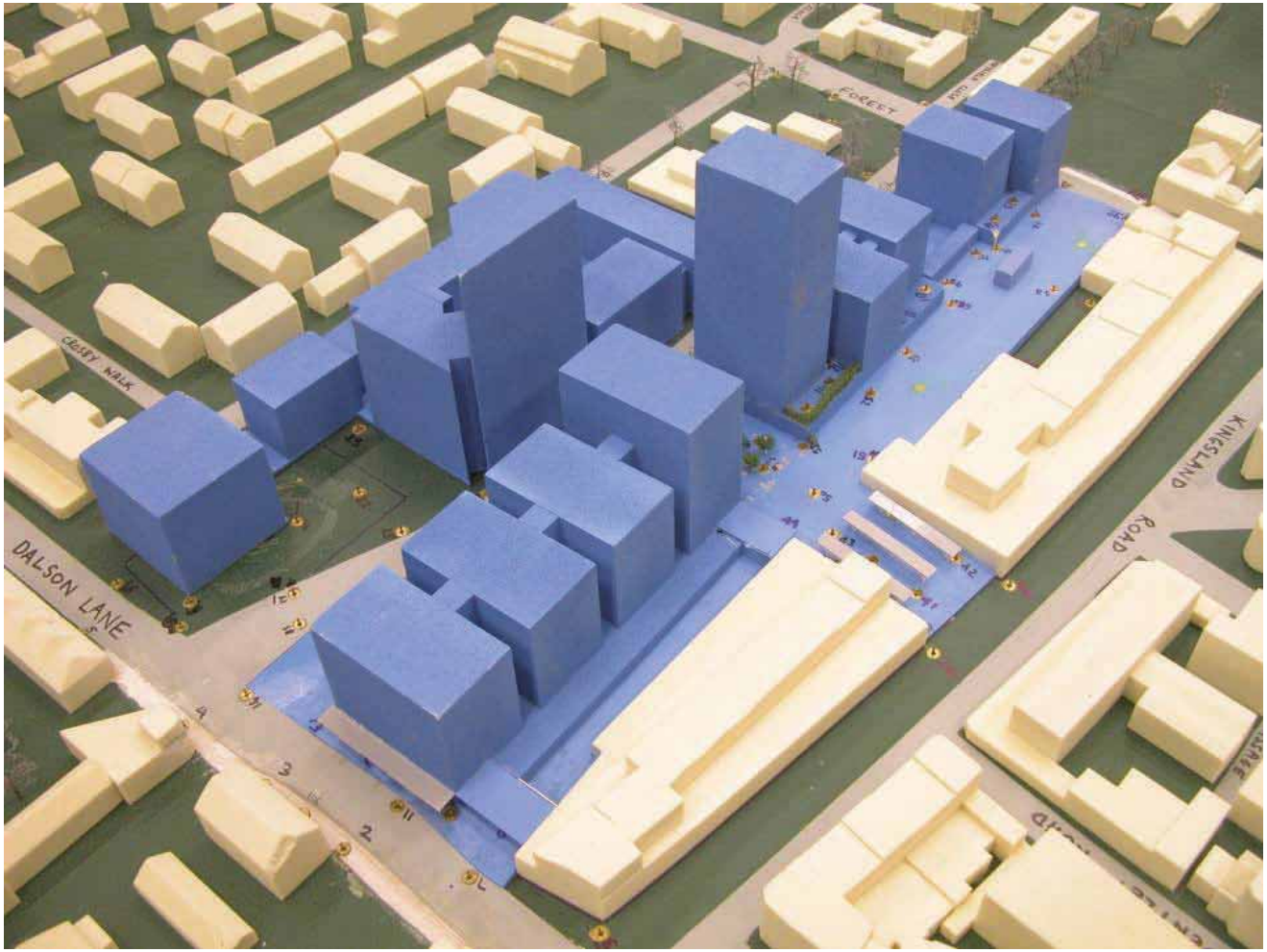

Figure 12.16: Photo of the Model with the Emerging Dalston Lane South Development

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PLANNING AND REGENERATION

13. Noise and Vibration

13.1. Introduction

13.1.1. This chapter addresses the potential effects the proposed development may have on the noise and vibration environment in the area of the proposed development site. The assessment includes a summary of the current conditions found within the area and identifies mitigation measures where appropriate for negative effects that may arise as part of the proposed development.

13.2. Assessment Criteria and Methodology

13.2.1. The criteria used to assess the impact of noise and vibration fall into two main categories:

- Absolute noise criteria: these are maximum criteria required by the Local Authority to which the development must be designed (e.g. maximum noise criteria for plant noise emissions etc).

- Significance criteria: these are used to determine the impact of a particular noise source, and usually consider the significance of a change in noise level (e.g. would the change in noise level due to an increase in road traffic flow be noticeable etc).

13.2.2. The criteria will be discussed in relation to construction noise and vibration (temporary) and long term noise and vibration (permanent) in the following sections.

Construction Noise and Vibration (Temporary)

13.2.3. The Control of Pollution Act provides local authorities with the power to control noise from construction sites. The powers include prosecution for failure to comply with the requirements of a notice served under the act, and a system of providing consents for works to be carried out in a specified manner so as to reduce the likelihood of causing a nuisance. This approach will inform the CEMP, which is similar to the approach adopted for the ELLP.

13.2.4. BS 5228 ‘Noise and Vibration Control on Construction and Open Sites: Part 1: Code of Practice for Basic Information and Procedures of Noise and Vibration Control’, provides practical guidance on the control of construction site noise. The legislative background to noise and vibration controls is described, and recommendations are given regarding procedures for creating effective liaison between developers, site operators and local authorities. Methods for predicting and measuring noise are presented, and guidance is given concerning the measurement of vibration.

13.2.5. This standard presents information on likely noise sources and on potential methods of noise control suitable to construction sites. These include selection of quiet machines; in particular those complying with the appropriate EU directives, machinery enclosure, work within acoustic sheds and acoustic screens. The effect of working hours on noise sensitive premises is discussed, and it is recommended that any work outside normal weekday working hours will require special consideration.

13.2.6. BS 7385 Part 2 (1993) ‘Evaluation and Measurement for Vibration in Buildings Part 2: Guide to Damage Levels from Ground Borne Vibration’, provides guidance on damage to buildings in relation to both the magnitude and frequency of vibration. For example, for domestic properties in a good state of repair, the threshold for cosmetic damage for transient vibrations (those caused by buildings close to percussive piling, for example) increases from 20mm/s at 15Hz, up to 50mm/s at 40Hz and above. For continuous vibration (such as that caused by vibratory compaction or vibro-driving of piles) it is recommended that these levels are reduced by a factor of two. A conservative level of 10mm/s may therefore be taken as a vibration level at which consideration may need to be given to the possibility of building

damage.

13.2.7. BS6472 (1992) 'Guide to Evaluation of Human Exposure to Vibration in Buildings (1Hz to 80Hz)' provides guidance on assessment of vibration levels affecting people within buildings. Assessment criteria for a variety of building environments are given. For the assessment of intermittent vibration, the vibration dose value is described.

Long Term Noise and Vibration (Permanent)

13.2.8. Fixed Plant Noise Criteria: It is understood that the Council require that the total L_{Aeq} noise level of all plant associated with the development does not exceed the background L_{A90} noise level minus 10dB.

13.2.9. Internal Noise Criteria: It is understood that the Council criteria for internal noise levels in dwellings are based on the World Health Organisation (WHO) 'Guidelines for Community Noise' document which suggests the following target noise criteria for dwellings:

- 30dB$L_{Aeq,8hr}$ night-time for bedrooms, and 35dB$_{LAeq,16hr}$ for other areas; and
- 45dB$_{LAmax,\ fast}$ night-time for bedrooms.

13.2.10. Road Traffic Noise: The Design Manual for Roads and Bridges (DMRB), Volume 11 'Environmental Assessment' (Department of Transport 1994) requires that the change in noise exposure of a noise sensitive receiver be considered when a change of 1dB is reached, this equates to a change in traffic volume of around 20 to 25%.

13.2.11. Differences in road traffic noise become perceptible for increases or decreases in vehicle flow where the flow changes by around a factor of two or more, which can be equated to a change in level of around 3dB.

13.2.12. PPG24, published by the Department of the Environment, sets out the Government's policies relating to noise as it affects development control. PPG24 outlines the considerations to be taken into account in determining planning applications for noise sensitive uses, and activities that generate noise. PPG24 uses noise exposure categories (NECs) for proposed residential development affected by transportation noise or mixed source (those where no one source is considered dominant), and recommends appropriate levels for exposure to different sources of noise. The guidance also advises on the use of planning conditions to minimise the impact of noise.

13.2.13. One of the general principles of PPG24 is that, where practicable, noise sensitive developments should be separated from major sources of noise, and new developments involving noisy activities should, if possible, be sited away from noise sensitive land uses. However, it does recognise that there will be circumstances where it is acceptable or even desirable in order to meet other planning objectives to permit noise generating activities on land near noise sensitive uses. Nevertheless, the local planning authorities must ensure that development does not cause an unacceptable degree of disturbance. In such cases it is suggested that local authorities consider the use of planning conditions or obligations to safeguard amenity. It is recommended that the noisiest activities are kept away from the boundaries in such cases, or that measures are provided to reduce the impact of the noise.

13.2.14. The noise exposure categories and the levels of road traffic noise that apply to new residential property are given in Tables 13.1 and 13.2.

Table 13.1: Noise Exposure Categories from PPG24

NEC	
A	Noise need not be considered as a determining factor in granting planning permission, although the noise level at the high end of the category should not be regarded as a desirable level.
B	Noise should be taken into account when determining planning applications and, where appropriate, conditions imposed to ensure an adequate level of protection against noise.
C	Planning permission should not normally be granted. Where it is considered that permission should be given, for example because there is no alternative quieter site available, conditions should be imposed to ensure a commensurate level of protection against noise.
D	Planning permission should normally be refused.

Table 13.2: Recommended Noise Exposure Categories for New Dwellings near Existing Noise Sources from PPG24

Noise levels corresponding to the Noise Exposure Categories for new dwellings $L_{Aeq,T}$ dB				
Noise source (road traffic) and time of day	**Noise Exposure Category**			
	A	**B**	**C**	**D**
07:00 – 23:00	<55	55 – 63	63 – 72	>72
23:00 – 07:00	<45	45 – 57	57 – 66	>66

13.3. Baseline Conditions

13.3.1. Baseline noise surveys were carried out in June and September 2005 to determine typical existing noise levels at key locations on and around the site. Full details of these noise surveys, including a location plan of measurement points, can be found in Appendix 13.1, the relevant information is summarised below.

13.3.2. Continuous (unmanned) noise measurements were carried out at Positions 1A and 2A (see Figure 1A, Appendix 13.1); a summary of the results of these measurements is shown in Table 13.3 below.

Table 13.3: Summary of Continuous Noise Measurements (free-field)

Position	**Minimum dB, L_{A90}**	**Daytime dB, $L_{AEQ,0700 – 23:00hrs}$**	**Night-time dB, $L_{AEQ,2300 – 07:00hrs}$**
1A – Dalston Lane	39	66	63
2A – Rear of cottages on Roseberry Place	32	53	54

13.3.3. From the graph of the noise measurements taken at Position 2A it can be seen that a non-typical event occurred during the early hours of the morning (i.e. between 0400 and 0600hrs), and this is reflected in the night-time L_{AEQ}. In order to assess the typical night-time L_{AEQ} the spurious events have been removed and calculate the noise level to be 44dB$L_{AEQ,2300 – 07:00hrs}$.

13.3.4. Sample (manned) daytime noise measurements were taken at Positions 1 to 5 (see Figure 1A, Appendix 13.1); a summary of these results is shown in Table 13.4.

Table 13.4: Summary of Sample Noise Measurements (free-field), Arithmetic Averages for $L_{A90,}$ L_{A1} and L_{AMAX}, Logarithmic Averages for L_{AEQ}

Position	dB, L_{A90}	dB, L_{AEQ}	dB, L_{A1}	dB, L_{AMAX}
1 – Beechwood Road	45	58	71	81
2 – Dalston Lane	65	75	83	98
3 – Kingsland Road	62	74	83	97
4 – Roseberry Place	46	59	72	77
5 – Forest Road *	53	65	76	86

Note * indicates façade noise levels

13.3.5. During the noise surveys the dominant sources of noise were noted to be due to traffic flow along Kingsland Road and Dalston Lane and occasional aircraft noise. Traffic flows along Beechwood Road, Roseberry Place and Forest Road were intermittent and significantly lower than those along Kingsland Road and Dalston Lane.

13.4. Potential Effects

Receptors

13.4.1. Direct:

- There are residential properties located along Kingsland Road and Roseberry Place.
- A house is located in the grounds of Holy Trinity Primary School.
- Mixed residential and commercial areas located along Dalston Lane.
- Residential areas located along Forest Road.
- The Holy Trinity Primary School and the Hephzibah Christian Centre.

13.4.2. Indirect:

- Mixed residential and commercial properties located along Kingsland Road.
- Other residential properties in the wider vicinity of the site, along roads where the traffic could change as a consequence of the development.

13.4.3. Internal

- Residential occupants of the completed development.

Sources of Noise and Vibration

13.4.4. Construction Noise: Construction activity would occur across the full area of the site. Onsite sources of construction noise may include:

- Piling;
- Excavation;
- Construction of buildings;
- Construction of on-site roads and hard standings; and

- Offloading materials.

13.4.5. Off site sources:

- The main offsite noise source would be Heavy Goods Vehicles (HGVs) delivering materials.

13.4.6. Construction Vibration: Vibration during construction work may arise from use of the following activities;

- Piling (e.g. for building foundations);
- Ground improvement; and
- Vibratory compaction (for road construction).

13.4.7. Selection of plant and methods will need to consider the possible effects of vibration on adjacent buildings and their occupants if these methods are used.

13.4.8. Operational direct impacts:

- Fixed plant on retail and residential buildings
- Bus movements within the development
- Deliveries to and the operation of commercial uses
- Car parking
- Biomass boiler system. The noise associated with this has the following three aspects: noise associated with the boiler system (internal noise), noise associated with the boiler flue system (external noise), and HGV deliveries to the boiler (external noise).

13.4.9. Indirect impacts:

- Changes in traffic flows on roads around the proposed development.

13.4.10. Secondary impacts

- Changes in bus flows on roads around the proposed development.

<u>Potential Operational Effects - Fixed Plant Associated with Retail and Residential Buildings</u>

13.4.11. It is required by the Council that the total L_{Aeq} fixed plant noise level must not exceed the minimum background L_{A90} noise level minus 10dB, to protect residential amenity and to reduce the risk of complaints.

13.4.12. The noise must not have a character that will draw attention to it, i.e. there must be no tones, rattles or whistles and the noise must not be intermittent. If any of these conditions cannot be met, the plant noise limits set out below shall be reduced by 5dB(A).

13.4.13. Based on the environmental noise survey, Table 13.5 sets out the maximum noise criteria that will be met by the sum of all the items of plant on the site.

Table 13.5: Plant Noise Criteria

Location	Maximum day-time noise level dB, $L_{Aeq,0700-2300hrs}$	Maximum night-time noise level dB, $L_{Aeq,2300-0700hrs}$
Residential areas along Dalston Lane	39	29
Other residential areas	28	22

13.4.14. Noise from fixed plant is not predicted to give rise to significant impacts because it can be adequately and successfully controlled through its design and specification.

13.4.15. For internal effects, the noise from fixed plant can be adequately and successfully controlled to achieve the Local Authority noise criteria specified above. Therefore, this noise source is not expected to give rise to significant impacts.

Potential Operational Effects - Bus Movements within the Development

13.4.16. Bus movements in the development will be around one bus per minute during the daytime and approximately one bus every 4 minutes during the night-time.

13.4.17. The two main considerations are the impact of bus noise on the existing cottages on Roseberry Place and the impact of bus noise on rooms at the rear of the residential properties located along Kingsland Road.

13.4.18. In considering the impact of the noise of bus movements on these dwellings it is important to note that the current noise climate in these locations will change as a result of the permitted ELLP. It is understood that the predicted noise levels from the permitted ELLP are as shown in Table 13.6.

Table 13.6: Predicted Noise Levels at 10m from the Railway

Distance to centre line of north and south bound tracks (m)	$L_{Aeq, 24hr}$	$L_{Aeq,18h,0600 to 0000}$	L_{Amax}
10	63	64	82-87

13.4.19. The above predicted noise levels relate to the current ELLP scheme, in which the railway is located in an open cutting (i.e. without the concrete deck above).

13.4.20. Based on the above information, and assuming an average L_{Amax} value, the noise levels at the nearby properties are predicted as shown in Table 13.7.

Table 13.7: Predicted ELLP Noise Levels at the Nearest Properties

Location	$L_{Aeq, 24hr}$	$L_{Aeq,18h,0600 to 0000}$	L_{Amax}
Rear of the properties on Kingsland Road (24m)	59	60	81
Rear of the Cottages (10m)	63	64	85

Potential Operational Effects - Potential Impact at the Existing Cottages, Roseberry Place

13.4.21. At their closest point, the buses will be located at least 30m away from the cottages, and will also be heavily screened from the bus noise by proposed new buildings. Therefore, the effect of bus noise on the cottages is not expected to give rise to significant impact when assessed against the existing noise climate, or the ELLP baseline noise climate.

13.4.22. In this case the proposed development would have a positive impact, as it would significantly reduce the noise levels from the permitted ELLP.

Potential Operational Effects - Potential Impact at Rooms at the Rear of Properties Located Along Kingsland Road

13.4.23. From noise measurements taken of busses, typical noise levels due to movements were found to be as shown in Table 13.8.

Table 13.8: Typical Noise Levels of Bus Manoeuvres

Event	Distance at closest point (m)	Duration (seconds)	dB, L_{AEQ}	dB, L_{AMAX}
Bus pull away	4	9	81	88
Bus pull away	4	8	77	87
Bus arrive, passengers alight, bus pull away	4	36	74	82
Bus pull away	4	8	79	83
Small bus arrive, passengers alight, bus pull away	4	24	73	79
Small bus arrive, passengers alight, bus pull away	4	34	73	86
Arithmetic average	4	20	76	84

13.4.24. At their closest location the buses could operate at around 20m from the rear of these dwellings. Based on the above average bus noise level, and taking a worst case assumption that this is constant throughout the daytime, the resultant noise levels at these dwellings are predicted to be 62dB$L_{AEQ, 16hr}$ with L_{AMAX} noise levels of up to 70dB. From Section 13.3 it can be seen that the existing daytime noise levels at the rear of these dwellings are around 53dB$L_{AEQ, 16hr}$ with L_{AMAX} noise levels generally between 65 and 70dB. Therefore, the likely L_{AEQ} bus noise levels could be around 9dB higher than the L_{AEQ} existing noise levels; and the likely L_{AMAX} bus noise levels could be similar to the existing L_{AMAX} noise levels, although such noise levels would occur more frequently due to the bus movements.

13.4.25. The reduction in bus noise levels that could be achieved by introducing an acoustic barrier between the interchange and these dwellings has been considered (see Section 13.5 for further details). The calculations show that a 2.5m high acoustic barrier, located at 2m from the buses, is capable of achieving a 10dBA reduction in bus noise level at the second floor windows of the existing dwellings (assuming the noise source is located at 1m above the deck height). Therefore, such a barrier should be able to reduce the bus noise levels at these windows to around 52dB$L_{AEQ, 16hr}$ with L_{AMAX} noise levels of around 60dB; and such noise levels would be:

- Similar to the existing noise climate, i.e. 53dB$L_{AEQ, 16hr}$ with L_{AMAX} noise levels generally between 65 and 70dB;
- Within the maximum noise target suggested by the WHO for external areas (i.e. 55dB$L_{AEQ, 16hr}$); and
- Less than the train noise levels predicted from the ELLP at this location (i.e. 60dB$L_{AEQ, 18hr}$ and 81dBL_{Amax}). Also the bus interchange would have the added benefit of significantly reducing the ELLP noise levels, and would provide some shielding to the existing road traffic noise levels

13.4.26. The above considers the case for the second floor dwelling windows. It is worthwhile noting that the bus noise levels at the windows lower down these properties would be even lower as they would benefit from a higher degree of screening.

13.4.27. The predicted night-time bus noise levels at the second floor windows of these dwellings are predicted to be 49dB$L_{AEQ, 8hr}$ with L_{AMAX} noise levels of around 60dB with the barrier discussed above and assuming a flow of four buses per hour, with each bus taking 5

minutes to pass through the development. The predicted worst case night-time bus noise levels would compare to the existing noise climate (refer to Section 13.3) as follows:

- The $L_{AEQ,8hr}$ bus noise level would be 5dB above the existing night-time $L_{AEQ,8hr}$ (i.e. 44dB$L_{AEQ,8hr}$);
- the L_{AMAX} bus noise levels could be around 10dB above the existing night-time noise levels.

13.4.28. Therefore, in overall terms (i.e. the $L_{AEQ,8hr}$ values) the night-time bus noise levels might be considered to be of marginal significance. However, if considered in terms of individual events, then each bus pass-by could produce a maximum noise level around 10dB higher than the existing values, and this could be considered to be an adverse impact. These comments relate to the worst case (i.e. the second floor windows); the bus noise levels would be lower at the first and ground floor windows of these properties, as they would benefit from a higher degree of screening.

Potential Operational Effects - Potential Internal Impacts

13.4.29. The noise levels due to bus movements are likely to be higher at the proposed new dwellings, as they are located closer to the buses. The application drawings (Appendix 3.1) show that the living rooms of some of the apartments could be located at around 5m from the buses.

13.4.30. From the noise levels given in Table 13.8 it can be seen that typical worst case noise levels during bus manoeuvres could be up to 88dBL_{AMAX} and 81dBL_{Aeq} outside these rooms. However, it should be possible to design the external building envelopes of these dwellings to achieve internal noise levels that comply with the Council noise criteria. Also, some of the affected rooms are likely to require either acoustic ventilators or mechanical ventilation, to alleviate the need to open their windows for ventilation purposes.

13.4.31. In the worst cases high performance noise control measures are likely to be required (e.g. high performance glazing constructions, mechanical ventilation). However, the extent of such measures might be reduced by careful space planning, to ensure that the most noise sensitive rooms (i.e. bedrooms), or their windows, face away from the bus interchange.

Potential Operational Effects - Deliveries to Retail Units

13.4.32. The retail uses are located in the block at the north end of the site. Deliveries to these units will be made via a loading zone located adjacent to them on Roseberry Place. At this stage details of the frequency and times of the proposed deliveries are not available. However, since there are no existing residential properties in the proximity of this loading zone, noise impacts are not expected. If deliveries occur during the daytime they are not likely to give rise to significant internal impacts within the development.

Potential Operational Effects - Noise Transfer within the Development

13.4.33. In some cases retail uses will share a party wall or floor with the residential areas. These walls/floors will be appropriately designed and constructed to control noise intrusion from the commercial uses, and so is not expected to give rise to significant impacts.

Potential Operational Effects - Car Parking

13.4.34. There will be two resident's car parks at deck level within the southern residential blocks. The access to the first car park is via a ramp off Forest Road, and access to the second is via an external access road from the first car park. Since the majority of car manoeuvres will be within the buildings noise impacts from car parking manoeuvres are not expected.

13.4.35. The short section of external road that connects the two car parks together is located approximately 7m behind the existing cottages on Roseberry Place. Assuming that a low speed car pass-by (i.e. 10mph or less) produces a noise level of around 68dBL_{Amax} at 3m, the resultant noise level at the cottages would be around 61dBL_{Amax}. It can be seen from Figure 4A (Appendix 13.1) that the existing noise levels at the rear of these cottages are regularly between 60 and 70dBL_{Amax} and so the noise produced by an occasional car pass-by on this section of road is not expected to constitute a noise impact. It is also worth noting that the car park served by this section of road only contains 24 parking spaces, and so it is reasonable to assume that car pass-bys will be infrequent.

13.4.36. Some residential apartments will be located directly above the car park areas. The floor of the apartments will be appropriately designed and constructed to control noise intrusion from the car park. Therefore, this is not expected to give rise to significant impacts.

Potential Operational Effects - Biomass Boiler System

13.4.37. Noise associated with this boiler system will be considered as three main aspects, which are discussed in the following:

13.4.38. Offsite receivers - Internal Noise Produced by the Boiler System:

- According to manufacturers literature the biomass boiler system could produce noise levels in its plant room of the order of 92dB(A). This plant room is proposed to be located within the basement of the proposed development at a distance of in excess of 30m from any existing noise sensitive areas. Therefore, this aspect of the biomass boiler noise is not considered to constitute a noise impact as the building envelope of its plantroom can be readily designed and constructed to control the internal noise levels produced by the boiler, and the boiler can be located on suitable antivibration mounts to control any vibration it produces being transmitted to surrounding areas and to the building above.

13.4.39. Offsite receivers - External Noise Emitted by the Boiler Flue:

- According to manufacturers literature the flue noise levels could be around 108dB(A) at 1m from the flue outlet, and it is understood that the flue will discharge at high level (i.e. above the roof of the tallest block). As noted above, the nearest existing noise sensitive area to the proposed flue would be in excess of 30m away. This aspect of the biomass boiler noise is not considered to constitute a noise impact as silencers can readily be designed and installed in the flue system to control its noise, and ensure it achieves the Local Authority noise criteria (specified in Table 13.5).

- Additionally the flue can be fitted with anti-vibration measures to mitigate vibration transfer to the building structure.

13.4.40. Offsite receivers- HGV Deliveries:

- It is understood that the biomass boiler would require 3-4 HGV deliveries per week, and that these would discharge their load into an access hatch adjacent to the 19-storey block along Roseberry Place. It is currently proposed for the HGVs to enter and exit the access hatch area via the proposed bus routes through the development. The access hatch area, where the majority of the activity will take place (e.g. HGV reversing) is at least 35m from the nearest existing noise sensitive area, and the majority of the surrounding noise sensitive areas are substantially screened from this area by the buildings of the proposed development. This aspect of the biomass boiler noise is not considered to constitute a noise impact as there are only a small number of deliveries per week, and they will be managed to ensure that they only take place during the daytime.

13.4.41. Potential Internal Impacts:

- There are residential areas proposed to be located adjacent to the plantroom of this boiler, in close proximity to its flue outlet and adjacent to its loading hatch. Significant impacts are not expected since:
  - The plantroom can be designed and constructed to control its noise breakout;
  - The Biomass boiler can be fitted with vibration isolation measures to control its vibration emission to the building structure;
  - The flue of the Biomass boiler can be fitted with silencers to control its external noise emissions and anti-vibration measures to mitigate vibration transfer to the building structure; and
  - HGV deliveries to the Biomass boiler are only likely to total four per week and will be managed to ensure that they only occur during the daytime.

Potential Operational Effects - Changes in Road Traffic Flows

13.4.42. Assessments of traffic noise impacts have been based on the 18 hour traffic flows, as required by CRTN. Table 13.9 presents the total traffic flows (i.e. bus, HGV and car) on which the traffic noise predictions have been based.

Table 13.9: Traffic Flows for 2010, With and Without Development, 18hr Flows

Road	**Without Development**	**With Development**	**Increase**	**% Increase**
Dalston Lane	19784	20299	515	3
Kingsland Road	18249	20260	2011	11
Forest Road	2576	759	-	-
Roseberry Place	607	726	119	20

13.4.43. From the above it can be seen that the highest increase in traffic flow would be along Roseberry Place, along which the flow would increase by around 20%. Such a percentage increase in road traffic flow would result in an increase in road traffic noise of less than 1dB. It can therefore be concluded that the proposed development will not cause any significant indirect effect in this regard.

Potential Operational Effects - Impact of Existing Noise Sources on the Development

13.4.44. From the application drawings (Appendix 3.1) it can be seen that dwellings are proposed to be located along the three roads that bound the site, namely Dalston Lane, Roseberry Place and Forest Road. Therefore road traffic is the key noise source affecting the site. In addition, a section of the permitted East London Line railway will run under the site, and so the impact on the proposed dwellings of any structure-borne noise caused by train movements will also be considered.

Potential Operational Effects - Residential Areas Overlooking Dalston Lane

13.4.45. The noise surveys showethat the noise levels measured in the vicinity of these proposed dwellings were 66dB$L_{Aeq,16hr}$ daytime and 63dB$L_{Aeq,8hr}$ night-time; these noise levels would place the dwellings in NEC C. The advice given in PPG24 for this category is that planning permission can be granted, but conditions should be imposed to ensure a commensurate level of protection against noise.

13.4.46. Assuming a typical façade constructed of 50% plastered masonry wall (260kg/m^2, typical

sound reduction of 41dBR_{W+Ctr}) and 50% of 10/12/6 glazing (typical sound reduction of 32dBR_{W+Ctr}), the internal noise levels (with windows closed) could be around 32dB$L_{Aeq,16hr}$ daytime and 29dB$L_{Aeq,8hr}$ night-time. These typical internal noise levels (with windows closed) would achieve the noise criteria required by the Council, which are 35dB$L_{Aeq,16hr}$ daytime and 30dB$L_{Aeq,8hr}$ night-time.

13.4.47. If the windows to these dwellings were to be opened (i.e. for ventilation) then the internal noise levels could increase to around 56dB$L_{Aeq,16hr}$ daytime and 53dB$L_{Aeq,8hr}$ night-time (according to BS8233 an open window provides a sound reduction of 10 to 15dB). Therefore, the internal noise levels with windows open would significantly exceed the Local Authority internal noise criteria. However, acoustic ventilators or mechanical ventilation systems could be provided to alleviate the need to open the windows for ventilation purposes.

13.4.48. From the above it can be seen that it is possible to achieve internal noise levels that comply with the Local Authority noise criteria, by appropriate design of the building envelope and ventilation strategy.

Potential Operational Effects - Residential Areas Overlooking Forest Road

13.4.49. The external noise levels in the vicinity of these dwellings are predicted to be 65dB$L_{Aeq,16hr}$ daytime and 62dB$L_{Aeq,8hr}$ night-time. These noise levels would place the dwellings in NEC C, and the advice given for this category is that planning permission can be granted, but conditions should be imposed to ensure a commensurate level of protection against noise. The latter is discussed above.

Potential Operational Effects - Residential Areas Overlooking Roseberry Place

13.4.50. The external noise levels in the vicinity of these dwellings are lower than those discussed above, and are predicted to be 56dB$L_{Aeq,16hr}$ daytime and 53dB$L_{Aeq,8hr}$ night-time. These noise levels fall into NEC B, and the advice given for this category is that noise should be taken into account, and where appropriate, conditions imposed to ensure an adequate level of protection against noise.

13.4.51. As discussed above, it should be possible to achieve an acceptable internal noise level (i.e. that achieves the Local Authority criteria) by appropriate design of the building envelope. These dwellings are also likely to require either acoustic ventilators or a suitable mechanical ventilation system to alleviate the need to open their windows for ventilation purposes.

Potential Operational Effects - Train Noise and Vibration

13.4.52. The foundations of the proposed new dwellings are to be located close to the ELLP rails, and so there is a potential issue with train vibration being transmitted to these foundations and being retransmitted as audible noise within the new dwellings. The most effective method of mitigating this is to vibration isolate the rail track. To achieve a maximum noise level in the nearest dwelling of 35dBL_{Amax} the maximum vibration velocity due to a train pass-by at the point of entry to the foundations must not exceed the values set out in Table 13.10.

Table 13.10: Maximum Train Vibration Levels

1/3 Octave Band Centre Frequency									
Hz	31.5	40	50	63	80	100	125	160	200
mm/s	0.014	0.011	0.009	0.008	0.006	0.006	0.004	0.004	0.001

13.4.53. Design of the track by the ELLP technical advisors will take into account these limits.

Potential Operational Effects - Changes in Bus Flows

13.4.54. Generally it is understood that any increase in bus flow along the roads around the proposed interchange will be less than 100%, and so the resultant increase in noise level would be less than 3dB. Such an increase in noise level would not be noticeable and so the increase in bus flow is not expected to give rise to significant noise impacts.

13.4.55. The main increase in bus flow will be along Forest Road. The proposal is to divert all northbound Kingsland Road buses along a short section of Forest Road and then through the bus interchange. The only existing dwellings located on this section of Forest Road are the side facades of those fronting Kingsland Road. Although there would be a significant increase in bus flow along this road no noise impact is expected at these dwellings, as the bus noise levels at their side facades would be similar to those currently experienced at their front facades.

Construction Noise and Vibration - Onsite Sources

13.4.56. There is a risk that vibration from some of the construction activities (e.g. piling) will have an impact upon some of the buildings close to the site. However, use of Best Practicable Means can ensure there will be no vibration impact at these receivers. No other vibration effects have been identified.

Construction Noise and Vibration Offsite Sources

13.4.57. The main offsite noise source would be HGVs delivering materials. It is understood that during the peak months of construction there could be approximately 107 HGV deliveries to the site per day.

13.4.58. No noise impact would be expected from these HGVs travelling along Dalston Lane and Kingsland Road, as the overall increase in HGV noise level is likely to be less than 3dB (ie an increased flow of less than 100%). As discussed above, an increase in noise level of less than 3dB would not be noticeable.

13.4.59. A significant noise impact could be expected from these HGVs travelling along Beechwood Road, Forest Road and Roseberry Place, as they would significantly increase the numbers of HGVs travelling along these roads. The impact of this would be most significant during the peak construction months.

13.5. Mitigation Measures and Residual Effects

Operational Mitigation

13.5.1. Mitigation in the form of noise and vibration control hardware will be fitted to all plant associated with the development to ensure that it achieves the Local Authority environmental noise criteria.

13.5.2. An acoustic barrier will be constructed approximately 2m from the kerb of the internal road, at a height of approximately 2.5m above deck level. This barrier will be designed and constructed in accordance with DMRB Volume 10, Section 5, Part 1, HA65/94 ‘Design Guide for Environmental Barriers’.

13.5.3. The plantroom of the biomass boiler will be designed to control its breakout noise to external areas, to ensure compliance with the Council noise criteria.

13.5.4. Deliveries to the retail areas and biomass boiler should be managed such that they do not occur during the night.

Construction Mitigation

13.5.5. The following points will be considered in preparing a scheme of work for the construction, in order to minimise the chance of adverse comment due to construction works. This scheme of work would be included as a condition to the planning approval.

13.5.6. Details of construction activities, prediction levels and assessments will be discussed with the relevant authority, both prior to construction and during construction. Detailed construction programmes will be available in advance of work starting onsite. Ongoing discussion on the management of construction effects between the management team and Council, should be a continuous activity throughout the construction period.

13.5.7. Control of working hours is, where reasonably practicable, a fundamental means of minimising the likelihood of complaint arising from noise and vibration. Works should be carried out in such a way as to limit, as far as reasonably practicable, the adverse noise and vibration impact of the construction activities.

13.5.8. Normal working hours should be defined: typical hours should be 08:00 to 18:00 hrs on weekdays (excluding public and/or bank holidays), from 08:00 to 14:00 hrs on Saturdays with no working on Sundays and bank holidays. The contractors should adhere to these normal working hours as far as reasonably practicable and, where practicable, operations anticipated to cause disturbance would be limited to these hours. A condition should be imposed on the planning application to this effect.

13.5.9. In order to maintain the above working hours, the contractor(s) may require a period of up to half an hour before and up to one hour after normal working hours for start up and close down of activities (not including operation of plant or machinery giving rise to noise likely to disturb nearby residents nor the arrival of any HGV at site before 07:30 hrs).

13.5.10. The list below sets out the foreseeable specific activities expected to be carried out in the start up and close down periods:

- Arrival and departure of workforce and site staff;
- Maintenance and checking of plant and machinery;
- General refuelling;
- Site inspections and safety checks prior to commencing work;
- Site meetings; and
- Site clean up.

13.5.11. Start up and close down periods are not an extension of normal working hours, and particular care should be taken to limit and control disturbance to local residents during such periods.

13.5.12. All repairs and maintenance should be undertaken during normal working hours. However, by exception, repair and maintenance may need to be carried out on Sundays, limited to between 09:00 and 16:00 hrs, or during extended working hours during the week. Activities outside normal working hours that could give rise to disturbance should be kept to a practicable minimum.

13.5.13. Where construction noise or vibration is likely to have an effect on residents or on other noise sensitive receptors, including listed structures around the site, best practicable means should be used to minimise noise, to achieve compliance with the relevant applicable

legislation and standards, and ensure there are no significant vibration impacts.

13.5.14. Measures to be considered in implementing best practicable means will be consistent with the recommendations of BS5228 and should, where reasonably practicable, include as appropriate careful selection of plant, construction methods and programming. Only plant conforming to relevant national or international standards, directives and recommendations on noise and vibration emissions should be used. Specific measures to be employed may include, where reasonably practicable:

- Provision of lined and sealed acoustic covers for equipment, which must be in place during use of equipment;
- Regular maintenance of all equipment;
- Operation of equipment in the mode of operation that minimises noise;
- Shutting down equipment when not in use;
- Avoiding waiting or queuing on the public highway with engines running;
- Construction of temporary infrastructure to minimise noise and vibration;
- Selection of piling and other construction methods which minimise noise and vibration;
- Breaking out concrete by means other than percussion;
- Noise reduction measures for temporary ventilation equipment;
- Handling all materials in a manner which minimises noise;
- Where audible warnings are necessary for reversing vehicles, operations will be planned to minimise reversing;
- Fitting of silencers to all plant, machinery and vehicles;
- Design and use of site hoardings and screens, where practicable and necessary, to provide acoustic screening at the earliest opportunity. Where practicable, doors and gates should not be located opposite occupied noise-sensitive buildings; and
- Choice of routes and programming for the transport of construction materials, spoil and personnel.

13.5.15. Unless otherwise agreed with the Council, any prediction of noise and vibration levels will be in accordance with the methods set out in BS5228. However, source levels for items of plant or activities should, where practicable, be based upon measured levels or other authoritative sources agreed with the Council rather than those estimated from the generic tables in BS5228. Also where noise and vibration measurements during the works give rise to more accurate information on levels and propagation characteristics, this information should be used in addition to or instead of the generic assumptions in BS5228.

13.5.16. The contractors should comply with the guidance and procedures given in BS5228 Parts 1, 2 and 4 and in the case of vibration, reference should be also be made to BS7385 and BS6472 as necessary. Where alternative authoritative guidance and procedures are thought to be more reasonable and have been agreed in advance with the Local Authority, these could be adopted instead.

Residual Effects

13.5.17. There are a number of noise and vibration producing activities associated with operation of the development that fall into three main categories: fixed plant, vehicular movements associated with the commercial and residential areas and bus movements. Noise and vibration from these and from construction of the development will be controlled to avoid disturbance to local residents.

- Noise from fixed plant will be mitigated through local control, to be agreed by condition.
- Noise from vehicle movements has been assessed and will not provide a significant increase on existing noise levels from traffic at existing noise sensitive receivers.
- Operational noise from vehicles moving into, out of and around the car park and delivery areas, for occupational or commercial use, has been assessed and will not provide a significant increase on existing noise levels around the site.

13.5.18. Overall it is expected that any noise impact and vibration from the site can be controlled to acceptable levels through good design, mitigation and best practicable means. Consequently, no significant operational residual impacts of noise or vibration are anticipated.

13.5.19. In terms of construction noise and vibration and taking account of the above mitigation measures, there would be a slight adverse effect residual effect due to the proposed development.

13.5.20. This assessment is summarised in Table 17.1 at the end of this document.

14. Overshadowing, Daylight and Sunlight

14.1. Introduction

14.1.1. This chapter addresses the potential overshadowing, daylight and sunlight effects the proposed development may have on the area surrounding the proposed development site. The assessment includes a summary of the current conditions found within the area and identifies mitigation measures where appropriate.

14.1.2. Drivers Jonas has undertaken the daylight and sunlight assessment to the adjoining properties. Arup Lighting has undertaken the internal daylighting analysis to the proposed bedrooms facing into the light wells within both the northern and southern blocks. The full daylight, sunlight and overshadowing assessment report is presented in Appendix 14.1 for the adjoining properties, with the average daylight factor analysis for the proposed development included in Appendix 14.2.

14.2. Assessment Criteria and Methodology

Policy Context

14.2.1. There are no national planning policies specifically relating to daylight, sunlight and overshadowing issues.

14.2.2. The London Plan - Policy 4B.9 of the London Plan (Ref. 11.1) considers the impact of large-scale buildings requiring them to "…be sensitive to their impact on micro-climates in terms of wind, sun, reflection and overshadowing".

14.2.3. Hackney's UDP - EQ1 Development Requirements – Section G seeks to provide adequate sunlight, daylight and open aspects to all parts of the development and adjacent buildings and land. Note: (i) Adequate daylight will be determined using the Department of the Environment's "Site Layout Planning for Daylight and Sunlight: A Guide to Good Practice" published by Building Research Establishment 1991.

Guidance Documents

14.2.4. This daylight, sunlight and overshadowing assessment has followed the Building Research Establishment (BRE) Report (BRE209) 'Site Layout Planning for Daylight and Sunlight: A Guide to Good Practice', Appendix C (1991), which is widely recognised and adopted by developers and local authorities. General adherence to these guidelines gives the potential to achieve good daylighting and sunlighting in new buildings and also to retain adequate daylighting in existing buildings nearby.

14.2.5. The guidance is primarily directed towards residential properties, as they are typically the most sensitive land uses. The report provides a recommended calculation technique to quantify the available daylight and sunlight and provides clear criteria for assessment. Guidance on assessing the impact of new developments on existing dwellings and buildings nearby is also provided.

14.2.6. Guidance is provided on overshadowing issues which relate to gardens and open spaces. It identifies parks, playing fields, children's playgrounds, swimming pools and sitting out areas as important open spaces. The guidelines provide an assessment methodology and suggest target criteria for sunlight penetration.

14.2.7. BS8206 Part II: 1992 'Light for Buildings – Code of Practice for Daylighting' gives guidance on the design of buildings for good interior daylighting. Interior spaces within buildings designed to the recommendations of this Code will be brightened and enlivened by daylight and sunlight. It presents criteria intended to ensure the well-being and satisfaction of people in buildings. Simple graphical and numerical methods are given to test whether the criteria

are satisfied.

Daylight/Sunlight Assessment to Neighbouring Residential Properties

14.2.8. The basis for the methodology of daylight and sunlight assessments is the BRE publication (BRE 209). This guide gives advice on site layout planning to:

"Achieve good sunlighting and daylighting within buildings and in the open spaces between them. It is intended to be used in conjunction with the interior daylight recommendations in the British Standard BS8206 Part II. The guide is intended to be used by building designers, architects and planning officials and the advice given in it "is not mandatory and the document should not be seen as an instrument of planning policy. Its aim is to help rather than constrain the designer. Although it gives numerical guidelines, these should be interpreted flexibly because natural lighting is only one of many factors in site layout design. In special circumstances the developer or planning authority may wish to use different target values".

14.2.9. With regard to the assessment of daylight and sunlight, the methods prescribed primarily relate to adjoining domestic buildings where the occupants have a reasonable expectation of daylight and sunlight.

14.2.10. The BRE document provides numerical values, which are advisory, and suggests that different criteria may be used based upon the requirements for daylighting in an area viewed against other site layout constraints.

14.2.11. To assess the impact of new development upon an existing dwelling, the BRE guidelines suggest the methods of assessment are, firstly the Vertical Sky Component (VSC) method and secondly the Distribution of Daylight within the building. In summary, the document states the following:

"If any or part of a new building… measured in a vertical section perpendicular to a main window wall or an existing building, from the centre of the lowest window, subtends an angle of more the 25º to the horizontal, then the diffused daylighting of the existing building may be adversely affected. This will be the case if either: The VSC measured at the centre of an existing main window is less than 27% and less than 0.8 times its former value, the area of the working plane in a room which can receive direct sunlight is reduced to less than 0.8 times its former value."

14.2.12. The internal configuration information of the neighbouring adjoining properties is not available, therefore the working plane analysis has not been undertaken, however the vertical sky component calculations has been undertaken as this is an external analysis.

14.2.13. With regard to the Kingsland Road residential properties, we were unable to determine exactly what properties were of residential usage. Therefore, based on the findings of the site visit a selection of windows to the rear of Kingsland Road have been assessed, using the first floor level lowest habitable window. We have assumed that the habitable rooms occur within the original Kingsland Road properties and that any new extensions to the rear of the properties are not of residential usage.

14.2.14. In relation to sunlight the BRE guidance primarily relates to residential properties, and for existing buildings. The guidance highlights the following:

"If a living room of an existing dwelling has a main window facing within 90º of due south, and any part of a new development subtends an angle of more than 25º to the horizontal measured from the centre of the window in a vertical section perpendicular to the window, then the sunlighting of the existing dwelling may be adversely affected.

This will be the case if a point at the centre of the window in the plane of the inner window

wall, receives in the year less than one quarter of the Annual Probable Sunlight Hours including at least 5% of annual probable sunlight hours between the 21st September and the 21st March, and less than 0.8 times its former sunlight hours during either period.

It is therefore necessary for both daylight and sunlight assessments to consider the impact of the proposed development by reference to the existing condition. One first has to therefore establish the existence of any adjoining residential accommodation or other buildings where daylight and sunlight may be of primary importance, and then measure the existing levels. The proposed levels must then be calculated to see whether or not the change is within the guidance given within the BRE document."

14.2.15. Another assessment criteria which can be used for assessing internal daylight distribution, is the Average Daylight Factor (ADF) method which is given in Appendix C of the BRE document and within British Standard BS8206 Part II.

14.2.16. ADF is a measure of the amount of daylight that can be found in a room, it is an average for the whole space. The average daylight factor is defined as "the ratio of total daylight flux incident on the working plane to the area of the working plane", expressed as a percentage of the outdoor illuminance on a horizontal plane due to an unobstructed CIE standard overcast sky. (CIE is the Commission Internationale de l'Eclairage). British standards state that the average daylight factor for bedrooms should be 1%, for living rooms, 1.5% and for kitchens 2%, where layouts of the apartments permit, these values will be used for the assessment.

14.2.17. For this development, the living rooms generally are dual aspect and it is therefore considered that daylight to these rooms would be at an adequate level. The bedrooms face into the open light wells and it is these that have been tested.

14.2.18. For the assessment of the ADF a 3D model was created of the apartment blocks, light wells and the bedrooms. Two areas were considered these were the north block and the south block.

The North Block

14.2.19. The bedrooms in the third block from the north end were analysed. These were chosen as one set faced into the light well bounded by the 9-storey block and a 6-storey block, whilst the other bedrooms were considered more typical as they faced into a light well bounded by two 6-storey blocks. Bedrooms on the lowest level and on the top level (6th) were analysed. Average daylight factors were calculated for both levels and then the results were interpolated to determine the average daylight factors for the intervening levels.

14.2.20. Average surface reflectances were used. (70% ceiling; 50% wall; 20% floor). The analysis was carried out using RADIANCE and an overcast sky model. Locations of the test points are shown in Figure 14.1.

The South Block

14.2.21. The layout of the blocks is different in that they "slide" past each other and the light wells are generally open at each end, exposing more rooms to direct daylight. In this case those bedrooms in heart of the light wells were considered. The locations are shown in Figure 14.2.

Overshadowing

14.2.22. Part 3.3 of the BRE Guide provides specific guidance on the overshadowing of gardens and amenity areas for both existing and new spaces. For the purpose of this proposed scheme, the impact of the buildings upon the proposed amenity areas has been considered as well

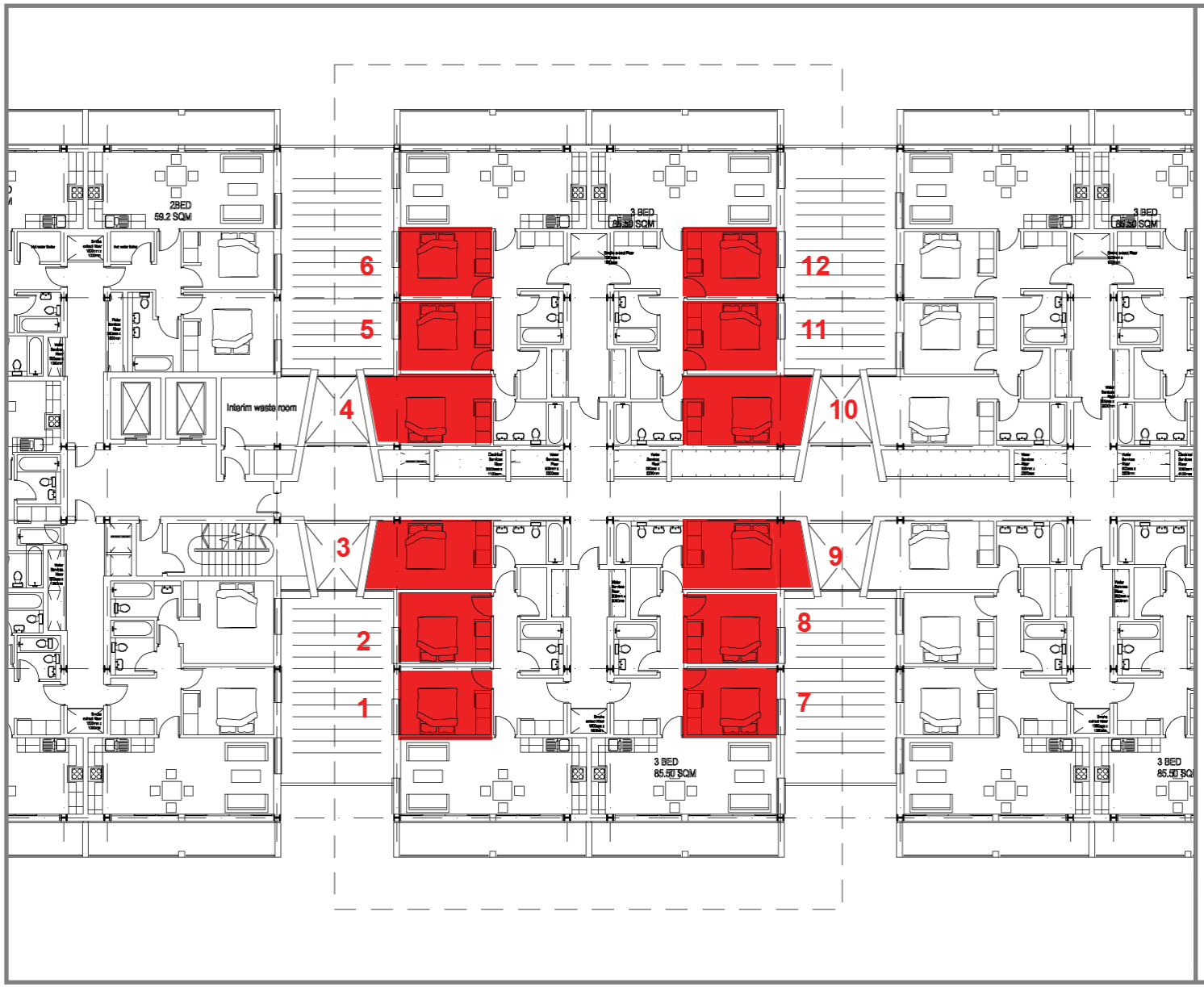

Figure 14.1: Northern Block Daylighting Test Points

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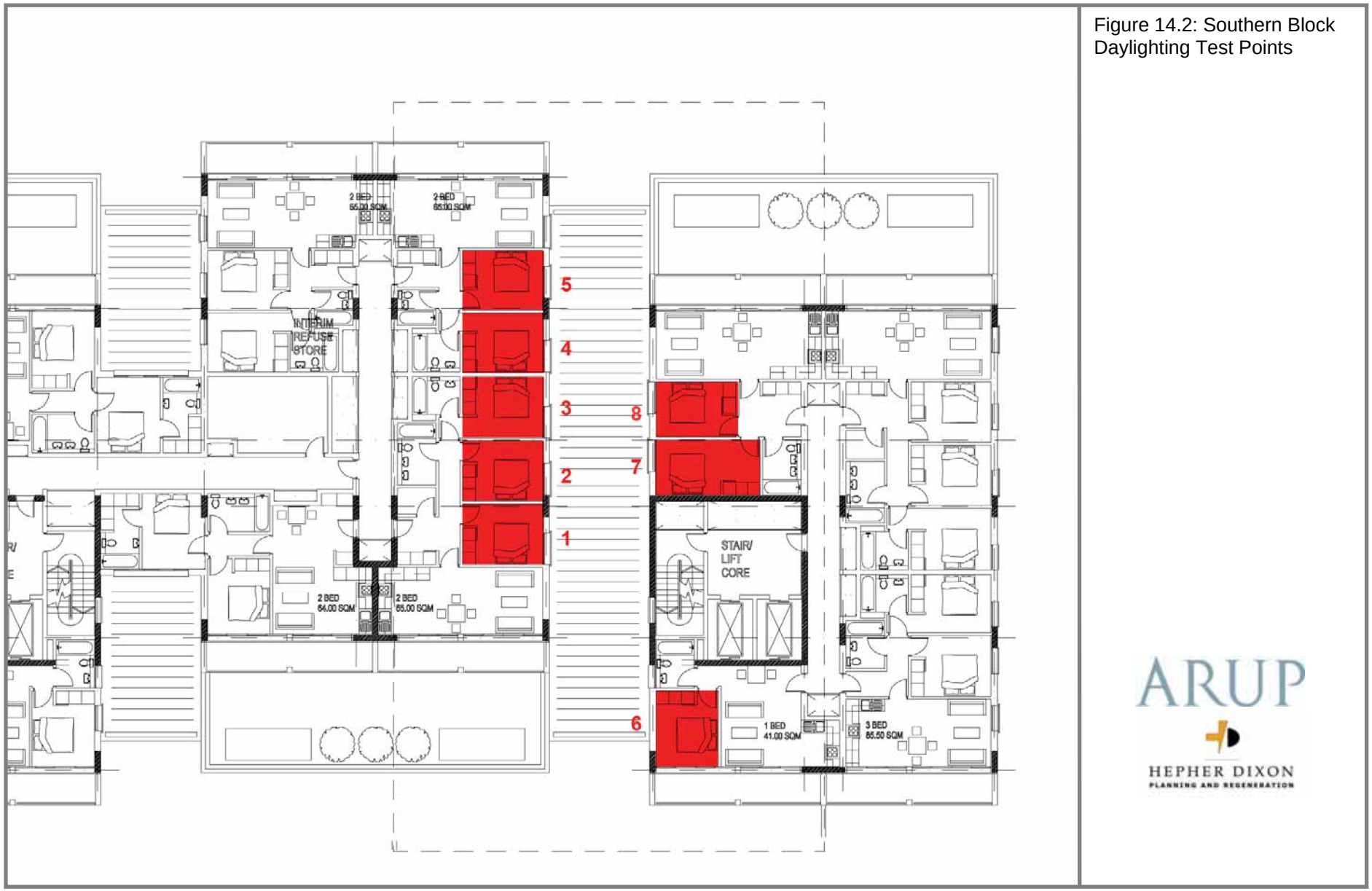

Figure 14.2: Southern Block Daylighting Test Points

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as the gardens to the neighbouring adjoining properties.

14.2.23. The guidelines state:

"…it is suggested that no more than two fifths and preferably more than a quarter, of any of the amenity areas should be prevented by buildings from receiving any sunlight at all on 21st March. Sunlight at an altitude of 10^{o} or less does not count. In working out the total area to be considered, driveways and hard standing for cars should be left out. Around housing, front gardens which are relatively small and visible from the public footpaths should be omitted; only the main back garden for each dwelling in a block should be considered separately."

14.3. Baseline Conditions

14.3.1. The baseline conditions for the surrounding residential properties are compliant with the BRE guidelines with regard to daylighting, sunlighting and overshadowing. This is because the proposed site is not developed significantly above surrounding ground level and where buildings do exist they are some distance from residential uses and therefore the daylighting and sunlighting levels experienced are uncharacteristic for the locality within an inner city environment.

14.3.2. Previous experience of assessing daylighting levels indicates vertical sky component levels of around 20% are consistent with an area such as this. This opinion is based on the vast number of daylighting calculations analysed in the local neighbourhood and other local authority boroughs across London.

14.3.3. The BRE guideline pass rate of 27% vertical sky component has been determined from a suburban environment based on terraced houses 12m apart, at ground and first floor level. Clearly the local area is very different from this baseline situation.

14.3.4. Additionally, when applying the vertical sky component ratio test the comparison between an empty site and a development proposal will always exceed the ratio level of 0.8. Therefore the ratio test will not provide a meaningful comparison in the context of an inner city environment.

14.3.5. As stated in paragraph 14.3.2 the introduction to the BRE guidelines state different target criteria can be used. It is considered that a vertical sky component level of 20% is a good level of daylight for an inner city environment such as this and this has been applied as our target value.

14.4. Potential Effects

Daylight/Sunlight Assessment to Neighbouring Residential Properties

14.4.1. The majority of the residential properties assessed pass the daylighting and sunlighting analysis using the alternative daylighting criteria stated in the daylighting/sunlighting report. The Kingsland Road properties, Dalston Lane properties, Roseberry Cottage and the school classroom windows all attain good levels of daylight and sunlight with the proposed development in place for an inner city environment.

14.4.2. Assessment points I and J represent the potential residential properties to the rear of Kingsland Road towards the northern end of the site. Both these points achieve daylighting levels below the alternative daylighting criteria achieving 16.5% at second floor level to point I and 15.5% at first floor level to point J.

14.4.3. Assessment points P and T represent the two end residential cottages on Roseberry Place. Both these points achieve daylighting levels below the alternative daylighting criteria achieving 15% at ground floor level to point P and 12.5% at ground and first floor levels to

point T.

14.4.4. The headmasters house shown as point K in the daylighting/sunlighting report, which is situated on the school land does not attain the required level of daylight using the vertical sky component level calculations. The ground and first floor level windows achieve vertical sky component levels of 11% and 13% respectively. This is partially due to the uncharacteristic openness of the application site and the proposed situation and partially due to the height and bulk of the proposed development.

Average Daylight Factor

14.4.5. Results of the North Block analysis are given in Table 14.1 below. The values in the grey columns are interpolated values.

Table 14.1: Results of the Northern Block ADF Analysis

Room	**Level**					
	1	**2**	**3**	**4**	**5**	**6**
1	0.7	1.0	1.3	1.7	2.0	2.3
2	0.5	0.7	1.0	1.2	1.5	1.7
3	0.7	0.9	1.0	1.2	1.3	1.5
4	0.8	0.9	1.1	1.3	1.4	1.6
5	0.5	0.8	1.1	1.4	1.7	2.0
6	0.8	1.0	1.3	1.6	1.9	2.1
7	0.7	1.3	1.9	2.5	3.1	3.6
8	0.5	1.1	1.7	2.3	3.0	3.6
9	0.8	1.1	1.5	1.8	2.2	2.5
10	0.9	1.2	1.6	1.9	2.3	2.6
11	0.6	1.3	2.0	2.8	3.5	4.2
12	1.0	1.7	2.3	3.0	3.7	4.3

14.4.6. It should be noted that the windows of opposite bedrooms are staggered to prevent direct viewing from one to the other. This has an effect on the results as the windows are at different distance from the open end of the light well.

14.4.7. From level 3 to the level 6 all the bedrooms meet or exceed the 1% target value for average daylight factor. For level 2, 67% of the bedrooms meet or exceed the 1% target, whilst the remaining 33% are just below the target value of 1%. For level 1, the lowest level with the exception of room 12, all the other bedrooms do not meet the target value. Changes were made to the layouts of the bedrooms and the window design to achieve the values calculated. Apart from three bedrooms with a value of 0.5% the remaining bedrooms are reasonably close to the target value.

14.4.8. Results of the South Block analysis are given in Table 14.2 below. The values in the grey columns are interpolated values.

Table 14.2: Results of the Southern Block ADF Analysis

Room	Level					
	1	2	3	4	5	6
1	0.7	0.9	1.1	1.2	1.4	1.6
2	0.5	0.7	0.9	1.2	1.4	1.6
3	0.5	0.7	0.9	1.1	1.3	1.5
4	0.8	0.9	1.1	1.3	1.5	1.7
5	2.0	2.1	2.2	2.3	2.4	2.5
6	1.7	2.0	2.3	2.6	2.9	3.2
7	0.8	1.2	1.6	2.0	2.4	2.8
8	1.0	1.5	2.0	2.5	3.0	3.6
9	1	2	3	4	5	6
10	0.7	0.9	1.1	1.2	1.4	1.6
11	0.5	0.7	0.9	1.2	1.4	1.6
12	0.5	0.7	0.9	1.1	1.3	1.5

14.4.9. It should be noted that the windows of opposite bedrooms are staggered to prevent direct viewing from one to the other. This has an effect on the results as the windows are at different distance from the open end of the light well

14.4.10. For levels 4 to 6 all the bedrooms meet or exceed the target value of 1%. For level 3, bedrooms 2 & 3 are just below the target value, whilst the remaining 6 bedrooms exceed the target value. For level 2, 4 bedrooms are just below the target value whilst the remaining 4 bedrooms exceed the target value. For level 1, 2 bedrooms have a value of 0.5% whilst 3 bedrooms are just below the target value and 3 bedrooms equal or exceed the target value.

14.4.11. For the very few bedrooms where the average daylight factor is 0.5% the daylight conditions will be significantly below the value given in the British standard. As bedrooms are normally occupied at night this reduction should not have a major effect. For all the other bedrooms the conditions will be reasonable to very good.

Overshadowing

14.4.12. The overshadowing assessment shows that public open spaces and the majority of the gardens to the neighbouring residential properties pass the BRE guideline tests.

14.4.13. The rear gardens to the Roseberry Place Cottages do not attain the required sunlighting levels at any time in the assessment month of March. This is partially due to the proposed development projecting past the line of the rear façade of the cottages and partly due to the orientation of the site. However, we consider the front garden to be the main amenity area to the cottages, which achieve a very good level of sunlight, well above the BRE guidelines.

14.5. Mitigation Measures and Residual Effects

Daylight/Sunlight Assessment to Neighbouring Residential Properties

14.5.1. The majority of the neighbouring residential properties pass the daylighting analysis attaining good levels of daylight for an inner city environment

14.5.2. Points I and J to the rear of Kingsland Road, the headmasters house at point K and points P and T which are the two end residential cottages on Roseberry Place do not achieve the required daylighting levels.

14.5.3. However we do not suggest any mitigation measures as the introduction to the BRE guidelines, states:

"The advice here is not mandatory and the document should not be seen as an instrument of planning policy. Its aim is to help rather than constrain the designer. Although it gives numerical guidelines, these should be interpreted flexibly because natural lighting is only one of many factors in site layout design."

14.5.4. An area of the proposed development could be removed in order to ensure the failing properties pass the daylighting analysis but this would have significant effects on the urban design, streetscape and massing which is contrary to the guidance quoted above and would also adversely affect the financial viability of the proposal and as a consequence prevent the bus station and other regenerative development.

14.5.5. As we have not been able to obtain the internal configurations of the failing properties we have been able to ascertain whether these properties will achieve the required internal daylighting levels for their use. If these properties did not achieve the required internal daylighting levels, alteration to the window sizes may improve internal daylight levels. If this is not possible then there would be residual effect of daylighting levels below the BRE guidelines. However, in the context of the number of assessment points taken around the site the number of failing windows is minimal, especially for an inner city environment.

Average Daylight Factor

14.5.6. Through the early design process mitigation measures have been put into place to achieve the conditions described above. These have included the increase in the size of windows, re orientation of some windows and the specification of a highly reflecting surface for the walls of the lightwells. There are now no more mitigation measures that can be taken without affecting the number of apartments being constructed.

Overshadowing

14.5.7. The majority of the neighbouring residential properties pass the overshadowing analysis, attaining good levels of sunlight to the neighbouring gardens and proposed amenity areas.

14.5.8. The rear gardens to the Roseberry Cottages do not attain the required sunlighting levels. The guidelines state:

"Around housing, front gardens which are relatively small and visible from the public footpaths should be omitted; only the main back garden for each dwelling in a block should be considered separately."

14.5.9. In this instance the rear gardens are extremely small decking areas, they are not grassed but are used for pot plants with visible links from the proposed development. As such the significance of the failure is reduced. Therefore we believe it is the front garden that should be the focus of the overshadowing assessment for the cottages. The front gardens obtain a very good level of sunlight, well above the BRE guidelines.

14.5.10. The current decking over sails land owned by TfL and so could be removed by TfL. However, the proposed development would facilitate the retention of this decking and would allow limited extensions to these areas, which would benefit the occupiers.

14.5.11. Therefore no mitigation measures are proposed. The residual effect will be such that some of the rear amenity areas to the Roseberry Cottages will experience overshadowing in the winter months and early spring.

14.5.12. This assessment is summarised in Table 17.1 at the end of this document.

15. Society and Economics

15.1. Introduction

15.1.1. This chapter addresses the potential socio-economic effects the proposed development may have on the area around the proposed development site. The assessment includes a summary of the current conditions found within the area and identifies mitigation measures where appropriate for significant negative effects that may arise as part of the proposed development.

15.2. Assessment Criteria and Methodology

15.2.1. Good practice guidance for EIA makes recommendations for the analysis of the effects on 'Human Beings'[40]. The guidance recommends that two main topic areas should be considered. The first is an exercise in cross-referencing with the rest of the EIA to assemble an overall measure of the impact on human health and well being. The second covers particular impacts that relate to society or economy, such as population changes and consequent demands on services or the effect on employment and town centre vitality and viability.

15.2.2. For the purposes of this assessment, the study area covers the wards of Canonbury, Dalston, De Beauvoir, Hackney Central, Mildmay and Queensbridge (see Figure 15.1). Canonbury and Mildmay are located in the London Borough of Islington with the remainder located in the London Borough of Hackney.

Additionality

15.2.3. Additionality is a process of assessing the effect of regeneration projects that has been developed by English Partnerships (EP) and advocated by both HM Treasury[41] and the Office of the Deputy Prime Minister (ODPM)[42]. EP's additionality guide[43] sets out a methodology for assessing a variety of potential impacts through a common framework.

15.2.4. In simple terms, the methodology compares the impact of the proposed project to the impact of the base case (i.e. the impact of the uses already occurring on the proposed development site). The difference is the net additional effect of the proposed development, or the effect that can be attributed to the proposed development that would not have occurred in any case.

15.2.5. A number of parameters are used to describe the effect of the proposed development and the base case (also known as deadweight) so they can be compared on a like for like basis. In the EP guide, those relevant to the proposed development are defined as:

15.2.6. Leakage: "the proportion of outputs that benefit those outside of the projects target area". For example, the number of jobs that are filled by people outside the area immediately surrounding the proposed development.

15.2.7. Displacement: "the proportion of the projects outputs/outcomes accounted for by reduced outputs/outcomes elsewhere in the target area". For example, the amount of a new

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[40] DETR. (1995). Preparation of Environmental Statements for Planning Projects that Require Environmental Assessment: A Good Practice Guide. HMSO.

[41] HM Treasury. (January 2003). Appraisal and Evaluation in Central Government.

[42] ODPM. (September 2003). Assessing the Impacts of Spatial Interventions: Regeneration, Renewal and Regional Development.

[43] EP. (September 2004). Additionality Guide 2nd Edition.

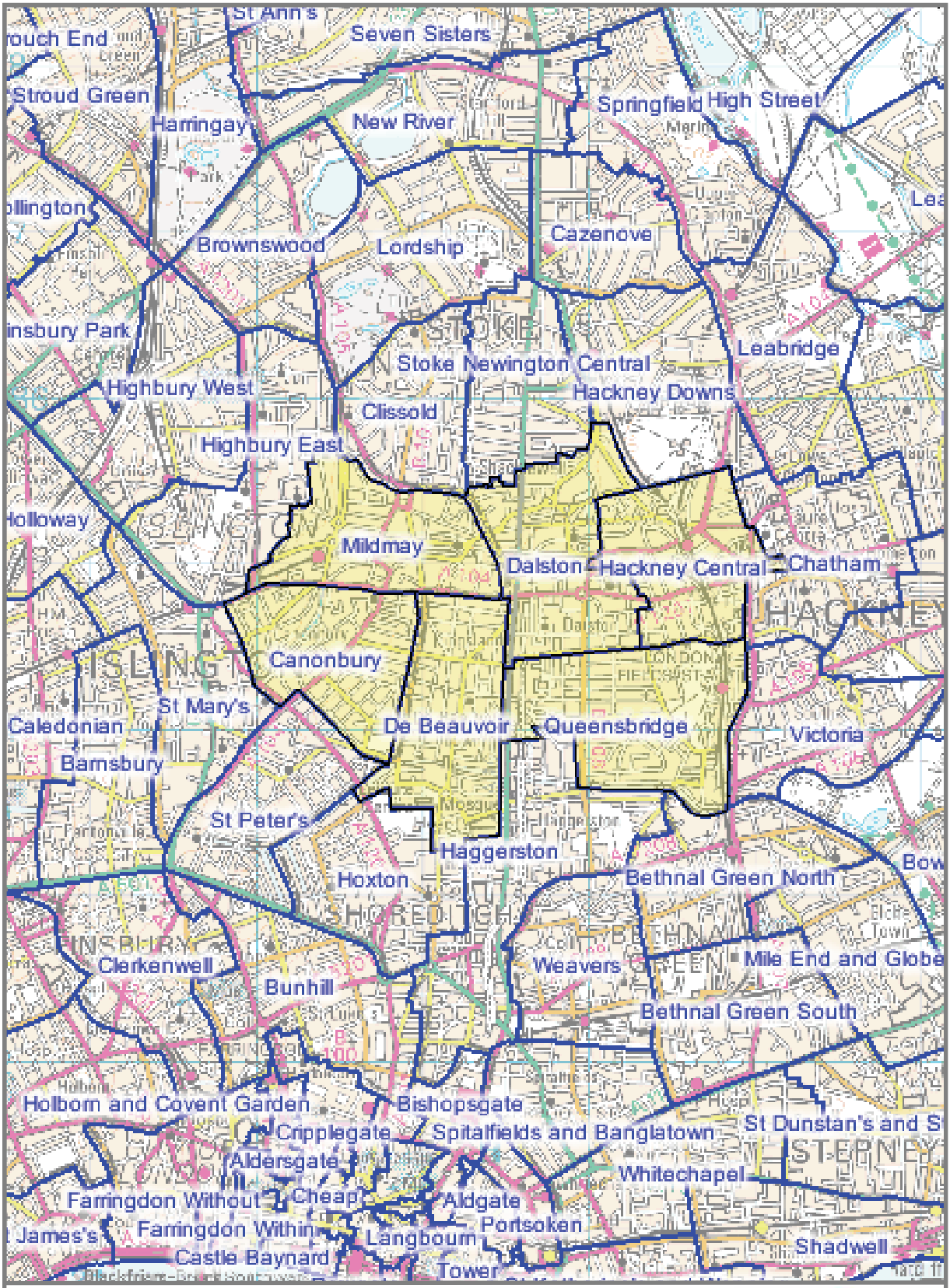

Figure 15.1: Socio-Economic Study Area

Source: Office of National Statistics

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business' income is likely to be generated from competition with similar businesses in the local area.

15.2.8. Economic Multiplier Effects: "further economic activity (jobs, expenditure, income) associated with additional local income and local supplier purchases".

15.2.9. The additionality methodology is not used in isolation. Relevant research and experience of other projects is used to validate inputs into the assessment and its results.

Society

15.2.10. Many social effects cannot be submitted to quantitative analysis, as many of the benefits and disbenefits that arise from development are subjective, relating to the quality of life of existing future residents, visitors and employees. Therefore, although systematic examinations can be undertaken in the context of the additionality framework, the conclusions must necessarily be descriptive in nature, indicating whether a defined impact is expected to be positive or negative, significant or insignificant. Following on from this, particular aspects of the impact that might indicate appropriate mitigation needs to be undertaken will then be highlighted.

15.2.11. Throughout the baseline chapter, references are made to the Indices of Deprivation[44]. These provide an up to date assessment of the relative deprivation levels found in the study area compared to the rest of the country. Each Index is measured at Lower Super Output Area (Lower SOA) level; a small statistical area (totalling 34,378 across England) defined by the Office of National Statistics (ONS). For each Lower SOA a score and rank is given. The rank allows a direct comparison with the rest of the country with '1' being the most deprived and '34,378' being the least. A full list of the Indices of Deprivation for the study area is given in Appendix 15.1.

Population

15.2.12. For most society effects, the magnitude is measured in the change in population caused by the proposed development. Hepher Dixon has produced a generic methodology for calculating the likely population of new residential developments based on the 2001 Census. For developments in London, standard multipliers have been developed that focus on the tenure and type of accommodation proposed. These are set out in Table 15.1.

Table 15.1: Multipliers Used to Calculate the Population of the Proposed Development

Age	**Typical Unit Sizes**			
	1-bedroom	**2-bedroom**	**3-bedroom**	**4-bedroom**
Market Flats/Apartments				
0-4 (pre-school)	0.003	0.067	0.141	0.304
5-11 (primary school)	0.000	0.025	0.114	0.277
12-16 (secondary school)	0.000	0.014	0.045	0.156
17+ (adult)	1.239	1.801	2.426	3.060
Total	1.242	1.907	2.727	3.797

Source: Hepher Dixon, based on the 2001 Census for London

15.2.13. The age splits are focussed on those required to identify the magnitude of effect on particular social infrastructure, namely schools.

15.2.14. Other characteristics of the population are discussed as appropriate throughout the assessment (for example, health, employment, educational achievements). These additional

[44] ODPM. (June 2004). The English Indices of Deprivation 2004.

characteristics are more difficult to determine as they often relate specifically to an area. Consequently, it is assumed that the population generated by the proposed development will largely reflect the local area.

Education

15.2.15. An increase in housing in an area may increase demand on educational facilities. Consequently, it is necessary to consider how the proposed development may alter the age structure in the local area and how this would indirectly affect educational demands for different age groups.

15.2.16. This quantitative assessment uses both 2001 Census and local education authority data to overlay the population of the proposed development on the existing base population. Consideration will then be given to the effect this may have on nearby schools in the context of current initiatives and capital investment programmes, before identifying mitigation measures as appropriate.

Health

15.2.17. Increasing residential development may put greater demand on nearby healthcare facilities. Therefore, it is important to consider the capacity of these local facilities (namely GP surgeries and hospitals) and the effect the additional population may have on them.

15.2.18. An inventory of nearby facilities is used to assess the existing capacity in the context of the relevant NHS Trust performance. Once the capacity has been measured, the effect of the demand generated by the proposed development is considered qualitatively.

Open Space and Amenity

15.2.19. Open space is recognised as an important resource and contributes to where people choose to live[45]. Consequently, it is necessary to consider the potential effect the proposed development may have on the level of provision of open space in the local area. This may occur by changing the demand on existing open space or by changing the provision of open space.

15.2.20. Consideration will be given to the Council's policies regarding the provision of open space in the context on the local area surrounding the proposed development site. Where a deficit in the supply of open space is identified, this will be identified as well as appropriate mitigation measures.

Economy

15.2.21. Economic effects are considered primarily in terms of effects on employment since this is a good indicator for the well being of the local economy as well as significantly contributing to social well being. In addition, economic effects can be considered in terms of local business competition and linkages.

15.2.22. The unit(s) included in the proposed development will generate both competition with similar businesses and linkages to suppliers. These changes in expenditure patterns can result in changes in the income of some businesses and their employment requirements.

15.2.23. In addition, the proposed development will generate household expenditure that is new to the local area. Consideration will be given to how this is likely to be spent and the effect it may have on local businesses and resulting employment.

[45] ODPM. (September 2002). Planning Policy Guidance (PPG) 17: Planning for Open Space and Recreation. See also ODPM. (September 2002). Assessing Needs and Opportunities: A Companion Guide to PPG17.

15.2.24. A full PPS6 Retail Impact Assessment (RIA) is not required given the relatively small amount of retail floorspace proposed as part of the development and its location within a designated shopping area.

Employment

15.2.25. The number of workplaces provided in a development can be calculated by using standard employment density multipliers produced for EP[46]. For the purposes of this assessment, it is assumed that one workplace equates to one full time equivalent job (FTE), which is defined as "one [job] that involves working a standard 30 hour week or longer (excluding breaks) and is filled"[47].

15.2.26. The additionality of these jobs is then calculated with the result indicating the number of new jobs likely to be provided in the local area. The significance of these is then considered qualitatively in the context of the employment needs of the local population.

15.2.27. Jobs will also be generated during the construction of the proposed development. These jobs will be short-term in that they will last some or all the construction period. These are measured in jobs per year and are calculated using data from the Office of National Statistics (ONS) relating to the number of jobs created per unit value of the overall cost of construction[48].

15.3. Baseline Conditions

Population

15.3.1. According to the 2001 Census, the study area closely represents the population demographic found across London (see Table 15.2). The only difference is a slightly lower proportion of people aged over 65 and a correspondingly higher proportion of people aged between 17 and 64.

Table 15.2: Population Age Demographic

Area	All People (No)	Aged 0-4 (%)	Aged 5-11 (%)	Aged 12-16 (%)	Aged 17-64 (%)	Aged 65+ (%)
Dalston	10,359	6.98	8.27	6.17	69.99	8.00
Hackney Central	10,291	7.43	9.50	6.36	67.53	8.52
Mildmay	11,339	6.71	8.13	5.52	69.97	9.08
Canonbury	9,900	6.63	8.98	5.55	66.43	11.62
De Beauvoir	9,926	7.09	9.50	5.87	66.75	10.23
Queensbridge	10,180	6.46	9.44	7.33	65.98	10.00
Study Area	61,995	6.88	8.95	6.12	67.83	9.55
Hackney	202,824	8.26	9.81	6.64	65.96	8.73
Islington	175,797	6.33	7.81	5.27	70.36	9.58
London	7,172,091	6.67	8.78	5.96	66.16	11.69

Source: 2001 Census

15.3.2. Table 15.3 indicates that within the study area population densities vary from 94.27 to 137.31 people per hectare in Queensbridge and Mildmay wards respectively. However, Queensbridge includes London Fields parkland and sports fields, which has led to the ward

[46] English Partnerships. (September 2001). *Employment Densities: A Full Guide.*

[47] DETR. (1998). *Single Regeneration Budget Bidding Guidance: Guide For Partnerships*.

[48] ONS. (September 2005). *Monthly Digest of Statistics*.

wide density being reduced. In reality, there is unlikely to be significant differences in population density in residential areas across the study area.

Table 15.3: Population Density

Area	All People (No)	Area (Hectares)	Density (Number of Persons per Hectare)
Dalston	10,358	93	111.79
Hackney Central	10,291	78	131.92
Mildmay	11,339	83	137.31
Canonbury	9,899	81	122.62
De Beauvoir	9,928	89	111.76
Queensbridge	10,179	108	94.27
Study Area	61,994	532	116.53
Hackney	202,824	1,906	106.39
Islington	175,797	1,486	118.30
London	7,172,091	157,205	45.62

Source: 2001 Census

15.3.3. Despite the population demographics of the study area being similar to that of London as a whole, the way this is split between households is significantly different. Table 15.4 indicates that the study area has a high proportion of people living by themselves in comparison to the London average. The difference appears to be caused by people aged 17 to 64 rather than those of pension age, which is at a similar percentage to the London average.

15.3.4. In addition the study area has a lower proportion of family households, with half the proportion of pensioner households and households without children. There is also proportionately a third less couples with children, although there is a slightly higher proportion of lone parent families.

Table 15.4: Household Composition

Area	All Households (No)	One person (%)	One Person: Pensioners (%)	One Family: All Pensioners (%)	One Family: Couple with no Children (%)	One Family: Couple with Children (%)	One Family: Lone Parent (%)
Dalston	4,552	41.98	11.12	1.76	3.98	16.45	13.95
Hackney Central	4,607	42.33	12.50	1.85	4.32	14.91	14.78
Mildmay	5,477	44.31	10.99	2.43	4.49	13.05	13.68
Canonbury	4,736	43.16	13.79	3.74	6.17	15.75	13.77
De Beauvoir	4,303	38.28	11.25	3.16	5.65	16.85	14.85
Queensbridge	4,485	41.87	13.82	2.97	4.59	16.16	15.03
Study Area	28,160	42.11	12.22	2.64	4.85	15.44	14.31
Hackney	86,042	40.45	12.00	2.43	4.76	17.73	13.73
Islington	82,281	44.12	11.68	2.72	5.55	14.12	12.88
London	3,015,997	34.71	12.67	5.37	8.47	22.81	11.14

Source: 2001 Census

Education

15.3.5. The proposed development site is located in primary school planning area 2, adjacent to planning area 1 (see Figure 15.2). Table 15.5 indicates that there is currently a large surplus of primary school spaces available in the study area. However, the Council's School

Figure 15.2: Primary Schools

Source: Hackney School Organisation Plan 2003-2008

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Organisation Plan[49] indicates that a large proportion of these would be taken up by 2008.

Table 15.5: Primary Schools

School	Net Capacity	Demand (2003)	Surplus (2003)	Demand (2008)	Surplus (2008)
Planning Area 1: Dalston & Shoreditch					
Burbage	411	209	202 (49%)	-	-
De Beauvoir	418	282	136 (33%)	-	-
Our Lady & St Joseph	210	214	0 (0%)	-	
St John the Baptist	311	266	45 (14%)	-	-
St Monica's	210	238	0 (0%)	-	-
Thomas Fairchild	315	272	43 (14%)	-	-
Whitmore	420	381	39 (9%)	-	-
Total	2,295	1862	425 (20%)	1,997	298 (13%)
Planning Area 2: Haggerston					
Gayhurst	511	517	-6 (0%)	-	-
Holy Trinity	197	204	-7 (0%)	-	-
Leburnum	249	164	85 (34%)	-	-
London Fields	372	381	-9 (0%)	-	-
Queensbridge	90	88	2 (2%)	-	-
Randel Cremer	315	297	18 (6%)	-	-
St Paul's with St Michael's	210	200	10 (5%)	-	-
Sebright	416	348	68 (16%)	-	-
Total	2,360	2,199	161 (7%)	2,300	60 (3%)
Planning Area 4: Central Hackney					
Amhurst	525	460	65 (12%)	-	-
Baden Powell	210	211	-1 (0%)	-	-
Benthal Infants	180	180	0 (0%)	-	-
Benthal Juniors	234	225	9 (4%)	-	-
Colverstone	210	207	3 (1%)	-	-
Nightingale	210	201	9 (4%)	-	-
Shacklewell	399	392	7 (2%)	-	-
Total	1,968	1,876	92 (5%)	1,897	71 (4%)
Planning Area 7: Stoke Newington					
Grasmere	210	209	1 (0%)	-	-
Princess May	469	370	99(21%)	-	-
St Matthias	315	272	43 (14%)	-	-
William Patten	420	416	4 (1%)	-	-
Total	1,414	1,267	147 (10%)	1,356	58 (4%)

Source: London Borough of Hackney Council

15.3.6. The School Organisation Plan also identifies considerable surplus in secondary schools in the Borough. The Plan indicates that the Council seeks to achieve a surplus of no greater than 4% across the Borough; however, this stood at 10.4% in 2003. Whilst one school has closed since then, another has increased its intake. It is unclear therefore exactly how many surplus spaces are currently available, but it is still likely to be greater than 4% given the net change in spaces is likely to be small.

[49] London Borough of Hackney. (2003). School Organisation Plan 2003-2008.

Health

15.3.7. The proposed development site lies within the jurisdiction of the City and Hackney Teaching Primary Care Trust (PCT), which currently has a two star rating having achieved all key targets. Part of the study area is within the jurisdiction of the Islington PCT, which also has a two star rating.

15.3.8. The nearest hospital trust is the Homerton University Hospital Foundation Trust, based at Homerton University Hospital located approximately 1.9km to the east of the proposed development site. The Trust has a three star rating having achieved all key targets and above average scores in the majority of indicators.

15.3.9. Table 15.6 and Figure 15.3 provide details of the GP provision in the area surrounding the proposed development site. This indicates that within the study area there are 35 GPs, equating to approximately 29.75 FTE GPs. This equates to one FTE GP per 2,084 people within the study area; almost 16% higher than the nationally recognised standard of one per 1,800 people. To reach this a further 4.69 FTE GPs would be required.

Table 15.6: GP provision in the Study Area

No.	Practice Name	Distance to Site (km)[50]	No. GPs	FTE GPs[51]
1*	Dattani RT & Ghosh T	0.5	2	1.70
2*	Dalston Practice	0.5	2	1.70
3*	Sandringham Practice	0.5	2	1.70
4*	Queensbridge (branch surgery)[52]	0.5	0	0
5*	Richmond Road Practice	0.7	2	1.70
6*	Gangola RL	0.8	1	0.85
7*	Somerford Grove Group Practice	0.9	5	4.25
8*	Dr Beaumont BR & Partners	0.9	5	4.25
9	Dr Houssain A & Partners	1.1	3	2.55
10*	Whiston Road Surgery	1.3	4	3.40
11*	London Fields Medical Centre	1.3	4	3.40
12*	Lawson Practice	1.4	4	3.40
13*	Dr Dock VJ & Partners	1.4	4	3.40
14	Dr Furness A & Partners	1.4	4	3.40
15	Mukhopadhyay DN (branch surgery)	1.5	1	0
16	Rizk Fam[53]	1.5	0	0
17	Well Street Surgery	1.5	7	5.95
18	Prasad SN	1.6	1	0.85
19	Lower Clapton Group Practice	1.6	8	6.67
20	Choudry & Nathans	1.7	2	1.70
21	Shoreditch Park Surgery	1.7	3	2.55
22	Hoxton Surgery	1.7	2	1.70
23	Statham Grove Surgery	1.7	5	4.25
24	Latimer Health Centre	1.7	2	1.70
25	Roy & Roy	1.9	2	1.70

Source: http://www.nhs.uk/England/Default.aspx

Notes * Practices within the study area.

[50] Taken from the NHS website based on the distance from the site post code (E8 3DE) to each practice.

[51] It is assumed that 30% of all GPs are part time, working half the hours of a full time GP.

[52] Branch surgeries are assumed to be zero as practitioners would be split between more than one practice.

[53] Insufficient information available from the NHS website, therefore assumed to be zero to represent a worst-case scenario.

Figure 15.3: GP Surgeries

Key: see text

Source: NHS

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15.3.10. However, these calculations are unlikely to be truly representative of the situation. In the wider area there are some large practices just beyond the study area boundary (for example, No. 19, the Lower Clapton Group Practice that has 8 GPs). Only 15% of the combined capacity of these peripheral surgeries would be required for the study area to achieve the national standard. It is therefore highly likely that part of the study area population travels outside the boundary to visit a GP, resulting in the actual ratio of GPs per population being much closer to the national standard.

15.3.11. Table 15.7 shows that the study area has a higher proportion of people who consider themselves to not be in good health in comparison to the London average. This correlates with the ODPM's Index of Health Deprivation and Disability, which indicates that the study area average rank is 5,439; within the 16% most deprived lower SOAs in England (see Appendix 15.1). This level of health deprivation is however not uncommon in inner-city areas, as indicated by comparable proportions across both the Hackney and Islington local authority areas.

Table 15.7: General Health

Area	All People (No)	Good Health (%)	Fairly Good Health (%)	Not Good Health (%)
Dalston	10,358	67.81	21.63	10.56
Hackney Central	10,291	66.67	22.02	11.31
Mildmay	11,339	68.15	21.49	10.35
Canonbury	9,899	67.54	21.06	11.40
De Beauvoir	9,928	68.04	21.70	10.26
Queensbridge	10,179	64.51	22.94	12.56
Study Area	61,994	67.14	21.80	11.06
Hackney	202,824	68.36	20.99	10.65
Islington	175,797	68.01	21.22	10.78
London	7,172,091	70.82	20.90	8.28

Source: 2001 Census

Open Space

15.3.12. The only large area of open space within the study area is London Fields, to the southeast of the proposed development site. Just beyond the study area boundary is considerably more open space, namely, Hackney Downs, Clissold Park, Hackney Marshes and Victoria Park.

15.3.13. Whilst the Council's parks strategy highlights that participation in sport is particularly low, this does not appear to be due to a lack of open space. The Strategy does however indicate that the poor quality of the facilities is likely to be a factor and indicates that an improvement programme has been implemented by the Council. The Council is also looking at ways of improving health and sports promotion across the Borough.

Economy

15.3.14. The Hackney economy is currently in a state of flux. With the decline of the manufacturing industries in recent decades, rapid growth in other sectors is needed to compensate. The loss of the manufacturing base has left Hackney with an economy comprising predominantly small to medium businesses, a large proportion of which are located in the southern part of the Borough, on the City fringe.

15.3.15. The Hackney Community Strategy[54] notes that the retail sector is significantly underdeveloped for the size of the Borough's population. The Strategy also underlines the importance of the creative and cultural sectors to the Borough.

15.3.16. The centre of Dalston, focussed on Kingsland Road, is designated for retail and town centre uses in the Adopted UDP. This designation covers a considerable area, including the northern part of the proposed development site. Whilst not a major retail centre in a London context, it is an important focus in Hackney and has the potential to increase its share in the North London market.

Employment

15.3.17. The 2001 Census indicates that economic activity within the study area is lower than the London average, although higher than Hackney as a whole (see Table 15.8). In addition, unemployment is higher than the London average for both the study area and the Borough. This corresponds with the ODPM's Index of Employment, which indicates that the study area has an average rank of 5,716; within the top 17% most deprived lower SOAs in England (see Appendix 15.1). In addition, the ODPM's Index of Income indicates that the study area has an average rank of 3,558; within the top 11% most deprived lower SOAs in England.

Table 15.8: Economic Activity

Area	All People (No)	Economically Active (%)	Economically Active: Part Time (%)	Economically Active: Full Time (%)	Unemployed (%)	Economically Active: Full Time Students (%)	Economically Inactive: Retired (%)	Economically Inactive: Student (%)
Dalston	7,939	63.67	7.28	36.54	7.39	3.73	7.48	8.83
Hackney Central	7,618	62.60	7.63	35.31	7.46	3.58	7.44	8.39
Mildmay	8,645	66.99	6.60	42.59	5.70	2.35	6.98	6.74
Canonbury	7,317	64.97	6.72	41.34	5.44	1.74	9.09	5.99
De Beauvoir	7,362	63.16	7.38	36.06	6.70	3.37	8.45	7.72
Queensbridge	7,509	59.53	7.63	31.83	7.74	3.42	8.98	8.52
Study Area	46,390	63.57	7.20	37.39	6.73	3.03	8.03	7.69
Hackney	146,865	61.81	8.18	34.99	6.91	3.51	7.54	9.16
Islington	135,661	65.30	6.79	40.29	5.80	2.95	7.84	8.13
London	5,300,332	67.55	8.62	42.64	4.36	2.96	9.81	6.57

Source: 2001 Census

15.4. Potential Effects

Population

15.4.1. The proposed development will generate 614 people as shown in Table 15.9. In Dalston ward, the additional population would result in an increase in density to 117.98pp/ha (5.54% increase) and 117.68pp/ha (0.99% increase) in the study area. Overall, the population of the study area will increase to 62,608.

[54] London Borough of Hackney. (2004). Mind the Gap: Community Strategy 2005-2015.

Table 15.9: Population Generated by the Proposed Development

Beds	Population (No)					Density (No)	
	Aged 0-4	Aged 5-11	Aged 12-16	Aged 17+	Total	Per Unit	Per Room
1	0	0	0	110	111	0	0
2	8	3	2	223	236	8	3
3	14	11	4	238	267	14	11
4	0	0	0	0	0	0	0
Total	22	14	6	571	614	22	14

Source: Hepher Dixon

15.4.2. The limited number of children is a result of the proposed development comprising apartments rather than houses.

15.4.3. It is considered likely that the majority of this population will be new to the area. Therefore no population deadweight reductions are made in the following calculations.

Education

15.4.4. The proposed development is predicted to generate demand for an additional 14 primary school places. Based on the current situation, this is unlikely to cause a significant adverse effect as local schools, particularly De Beauvoir Primary School, show high levels of surplus spaces.

15.4.5. Assumptions on the growth of demand for primary school places in 2008 have been derived from LDA population forecasts. Whilst these indicate that much of the surplus spaces would be taken up by the time the proposed development is constructed, the remainder will be sufficient to meet the needs of the development and retain some flexibility within the provision.

15.4.6. In addition, it is likely that the LDA population forecasts already take account of the proposed development, which would mean there would be no greater growth than that already compensated for in the School Organisation Plan. The LDA forecasts are calculated mainly on the basis of the known volume of housing development likely to come forward during a year. Given that the proposed development has been known by the LDA for sometime, it is more than likely that it was included in their calculations.

15.4.7. The proposed development is predicted to generate demand for an additional 6 secondary school places, which equates to an increase in demand across the Borough of only 0.08% based on 2003 demand. Such a small increase in demand is considered to be negligible.

15.4.8. The cumulative effect with the Dalston Lane South proposals is likely to be minimal given the considerable provision available for both primary and secondary school provision.

Health

15.4.9. The proposed development will cause an increase in demand of 0.34 FTE GPs. Given that the current provision of GPs within the PCT is at or near capacity, it is likely that this small additional demand will a minor adverse effect.

15.4.10. The cumulative effect with the Dalston Lane South development is only likely to be slightly greater than the minor adverse effect of the proposed development. This is due to the relatively small size the Dalston Lane South development, which means its additional demand on GPs is unlikely to be significant.

Open Space

15.4.11. The proposed development has made provision for rooftop gardens where possible to seek to address this; however, it is recognised that this makes no contribution towards sporting activities. Despite the urban environment immediately surrounding the proposed development, there are large areas of open space relatively nearby such as Hackney Downs, London Fields, Clissold Park and Hackney Marshes.

15.4.12. Given the relatively small population generated by the proposed development, the inclusion of informal rooftop amenity space and the existing open space provision in the wider area, it is considered that the proposed development would have at most a minor adverse effect on open space demand.

15.4.13. Similarly, the cumulative effect with Dalston Lane South is only likely to result in a minor adverse effect as the total population is unlikely to be considerable.

Economy

15.4.14. The proposed development is likely to affect the local economy in three distinct ways:

- Additional competition from the new retail floorspace created as part of the proposed development;
- Additional expenditure from new households introduced to the area by the proposed development; and
- The effect of improving transport linkages to and from the area.

15.4.15. The additional retail competition created by the proposed development is considered to be more than compensated by the additional expenditure generated by the residential component of the proposed development (see Table 15.10). Its inclusion within the designated retail area is likely to contribute to the vitality and viability of the town centre.

Table 15.10: Additionality of Residential Expenditure

Factor	Proposed	Deadweight	Comments
Gross direct effect (£)	£7,841,184	0	Weekly expenditure £488[55] x 52 x 309 households.
Estimated Leakage (%)	25	25	Whilst Dalston has a very good retail offer, the close proximity of the centre of London means many people will travel out of the study area for comparison shopping.
Gross local direct effect (£)	£5,880,888	0	
Estimated displacement (%)	0	0	Displacement is not an appropriate measure in the case of residential expenditure since it is not in competition with other residential units in the study area.
Net local direct effect (£)	£5,880,888	0	
Composite multiplier	1	1	It is standard practice to assume that residential developments do not result in multiplier effects.
Total net local effect (£)	£5,880,888	0	
Total net additional local effect (£)	£5,880,888		Proposed less the deadweight.

Source: Hepher Dixon

[55] Office of National Statistics. (2005). Region in Figures: London Winter 2004/05.

15.4.16. Furthermore, the improvements to transport infrastructure are likely to improve the kudos of the area. By allowing shoppers easier access to the centre, not only are more people likely to be attracted to the area but they are likely to stay longer with the confidence that they can travel home more easily. In addition, the proposed development will significantly reduce the opportunities for crime in the area, thus improving the reputation of the area generally. Overall, the proposed development is considered to have a significant beneficial effect on the local economy.

Employment

15.4.17. The proposed development includes a small amount of retail floorspace (1,665m^2 in total located in the northern part of the site), the in context of the town centre, that is likely to generate approximately 83 FTEs based on standard employment densities[56]. The net additional effect of these is calculated in Table 15.11. This shows that approximately 77 FTEs will be new to the study area, which is considered to be a minor positive effect of the proposed development.

Table 15.11: Additionality of Employment

Factor	Proposed	Deadweight	Comments
Gross direct effect (FTE)	83	0	See text
Estimated Leakage (%)	10	0	Leakage is likely to be particularly low as the area suffers from relatively high unemployment.
Gross local direct effect (FTE)	74.70	0	
Estimated displacement (%)	10	0	Given the high levels of unemployment, it is unlikely that much employment would be displaced from else where in the study area.
Net local direct effect (FTE)	67.23	0	
Composite multiplier	1.15	0	This is a generic composite multiplier for small commercial schemes as provided by EP.
Total net local effect (FTE)	77.31	0	
Total net additional local effect (FTE)	77.31		Proposed less the deadweight.

Source: Hepher Dixon

15.4.18. The proposed development is currently predicted to cost approximately £104.75m. Assuming the development costs approximately £78,000[57] to employ one person on average in the construction sector per annum, and will take approximately 6 years to build, it is estimated that 224 people would be employed per year. This average level is likely to vary considerably depending on the construction phase.

15.4.19. It is likely that the vast majority of these jobs will be onsite as the proposed development is unlikely to include many pre-cast components. As such, it is likely that many of these job opportunities could benefit the local population. This is considered to be a significant positive short term effect of the proposed development.

[56] Assumes a worst-case scenario that all jobs are in retailing rather than restaurant uses.

[57] Based on national employment sector budget statistics generated by the Office of National Statistics.

15.5. Mitigation Measures and Residual Effects

15.5.1. The negative social effects of the proposed development are predicted to be minimal. Therefore, no mitigation is necessary. In addition, the proposed development includes 175m^2 of community floorspace, which will make a positive contribution to the area.

15.5.2. The proposed development makes a positive contribution to the local economy and local employment prospects. Therefore, no mitigation is necessary.

15.5.3. This assessment is summarised in Table 17.1 at the end of this document.

16. Transportation

16.1. Introduction

16.1.1. This chapter addresses the potential effects of the proposed development on transportation modes in the area surrounding the proposed development site. The assessment identifies mitigation measures where appropriate for significant negative effects that may arise from this proposed development. Figures referred to in this chapter can be located in Appendix 16.1 in Volume 3 of the ES.

16.2. Assessment Criteria and Methodology

16.2.1. The Transport Assessment provides a study of transport issues surrounding the proposal to construct a bus station above this sub-surface station. In addition, this report investigates the transport impacts of the proposal to construct a number of residential units and associated retail adjacent to the bus station and above the train station

16.2.2. The purpose of the Transport Assessment was to measure the impact that the development would have upon the transport network. The scope of the study was agreed with the local highway authority (London Borough of Hackney) and TfL.

16.2.3. In order to measure the impact, it was first necessary to determine a baseline situation. This involved research and surveys of the existing transport facilities. The likely changes, including generated flows from the proposed development, were calculated based on available data for the ELLP and research of residential and retail developments. The impact was then calculated using a variety of calculation methods and computer analysis programs.

16.3. Baseline Conditions

16.3.1. The site is bounded by Dalston Lane, Roseberry Place, Forest Road and properties on Kingsland Road. A location plan is shown on Figure 1 (in Appendix 16.1). The existing highway network is shown on Figure 2 along with the limits of the proposed study area.

Highways

16.3.2. Kingsland Road and Kingsland High Street form the A10, a radial route connecting to the City of London. Dalston Lane and Balls Pond Road form an east to west route along the northern edge of the site. Both roads are bus routes and are congested during peak periods. Geometric details are provided in the Transport Assessment.

16.3.3. Forest Road, running along the southern edge of the site, is a local road serving one of the residential areas of Dalston and connecting to Kingsland Road with a priority junction. Roseberry Place connects Dalston Lane to Forest Road. A school lies to the east with frontage to the road as do some industrial units at the south west corner. Beechwood Road also connects Dalston Lane to Forest Road. Residential properties lie to the east and the aforementioned school to the west.

16.3.4. Pedestrian facilities are available at the Junction of Dalston Lane/Kingsland Road/Balls Pond Road/Kingsland High Street. Additionally, there is a pelican crossing on Kingsland Road just to the south of the junction with Stamford Road and a further two pelican crossings are available on Kingsland High Street between Dalston Kingsland Station and Abbott Street.

Public Transport

16.3.5. The North London Line runs from Richmond to North Woolwich at a frequency of four trains per hour rising to five or six trains per hour in the peak period. This line serves Dalston Kingsland Station on Kingsland High Street 250 metres walking distance from the site.

Connections from this service are available to underground lines at Highbury and Islington for the Victoria Line and Stratford for the Jubilee Line, Central Line and Docklands Light Railway.

16.3.6. The East London Line currently connects Shoreditch through Whitechapel to New Cross and New Cross Gate. The northern part of the extension (ELLP works) is delivered in two phases. The first will extend the line to Dalston Station and the second will extend further to Highbury and Islington. A frequency of 12 trains per hour will be provided, rising to 16 trains per hour when the Clapham Junction and Highbury & Islington branches are added in Phase II.

Table 16.1 Train Services

			Morning Peak Hour		Evening Peak Hour	
Service	**Operator**	**Direction**	**Arrivals**	**Departures**	**Arrivals**	**Departures**
North London Line	Silverlink	Eastbound	4	4	4	4
	Silverlink	Westbound	4	4	4	4
East London Line Phase I	-	Northbound	12	12	12	12
	-	Southbound	12	12	12	12
East London Line Phase II	-	Northbound	16	16	16	16
	-	Southbound	16	16	16	16

16.3.7. The site is served by nine bus routes. These are summarised below in Table 16.2 and the routes are shown in Figure 3.

Table 16.2 Bus Routes

Service Number	Route	2-Way Peak Hour Frequency
30	Marble Arch to Hackney Wick	13
38	Victoria to Clapton Pond	30
56	St. Bartholomew's Hospital to Whipps Cross	14
67	Aldgate to Wood Green	12
76	Waterloo to Tottenham	16
149	London Bridge Station to Edmonton Green	18
242	Tottenham Court Road to Homerton Hospital	18
243	Waterloo to Wood Green	16
277	Leamouth to Highbury and Islington	13
	Total	150

Cycle Facilities

16.3.8. The nearest London Cycle Network (LCN) route to the site is provided on Culford Road, Balls Pond Road, Kingsbury Road, St. Jude Street and Boleyn Road. This is LCN route 10 providing a north to south connection to the City of London. LCN Route 8 is also available, providing an east/west connection along Northchurch Road and Middleton Road. These routes are shown on Figure 4.

16.4. Potential Effects

16.4.1. Four scenarios have been identified in order to measure the impact of the development. These are:

- 2005 existing base case;
- 2010 no development;

- 2010 phase I development; and
- 2012 phase II development.

Highways

16.4.2. For the purposes of this report, only the critical links within the TRANSYT network are tabled and discussed. Critical links are defined as those approaching or exceeding normal capacity, or links that have an excessive queue length. In the TRANSYT output, a link is shown 'at capacity' when the Degree of Saturation (DoS) is 100%. Normal practice is to achieve 90% DoS to allow for daily fluctuations. An excessive queue would be one that stretches beyond the preceding junction. The full TRANSYT outputs are included in Appendix B of the Transport Assessment.

16.4.3. Traffic surveys were undertaken in February and October 2005. Additional traffic data for the Kingsland Road/Richmond Road/Englefield Road junction was used from a survey undertaken in February 2004. The traffic flows have been balanced and these have been agreed with NAT. The morning and evening peak hours were identified as follows:

- Morning Peak hour – 08:00 to 09:00; and
- Evening peak hour – 17:00 to 18:00.

16.4.4. The peak hour flows have been calculated for each of the four scenarios. These are shown in Figures 5 to 12 shown in Appendix 16.1 for both the morning and evening peak hours. Further description of these calculations is included in the Transport Assessment.

16.4.5. Tables 16.3 to 16.6 below, describe the critical links of the TRANSYT runs for each scenario with Degree of Saturation (DoS) and queue length (Q).

Table 16.3: 2005 Base Model Critical Links

		AM Peak		PM Peak	
Road	**Movement**	**DoS**	**Q**	**DoS**	**Q**
Kingsland High Street	Ahead/Left	103	40	67	12
Dalston Lane	Ahead/Left	101	33	130	96
Kingsland Road	Ahead/Left	59	8	60	8
	Right Turn	101	10	76	5
Balls Pond Road	Ahead	80	14	121	65

Table 16.4: 2010 No Development Model Critical Links

		AM Peak		PM Peak	
Road	**Movement**	**DoS**	**Q**	**DoS**	**Q**
Kingsland High Street	Ahead/Left	109	59	69	12
Dalston Lane	Ahead/Left	106	46	142	123
Kingsland Road	Ahead/Left	61	9	62	8
	Right Turn	106	13	80	5
Balls Pond Road	Ahead	84	15	133	88

Table 16.5: 2010 Phase 1 Development Model Critical Links

		AM Peak		PM Peak	
Road	**Movement**	**DoS**	**Q**	**DoS**	**Q**
Kingsland High Street	Ahead/Left	108	62	94	17
Dalston Lane	Ahead/Left	119	86	103	41
Kingsland Road	Ahead/Left	77	10	102	31

	Right Turn	123	24	146	40
Balls Pond Road	Ahead	76	14	79	16

Table 16.6: 2012 Phase 2 Development Model Critical Links

		AM Peak		PM Peak	
Road	**Movement**	**DoS**	**Q**	**DoS**	**Q**
Kingsland High Street	Ahead/Left	110	71	96	26
Dalston Lane	Ahead/Left	122	95	105	45
Kingsland Road	Ahead/Left	78	10	104	35
	Right Turn	124	25	160	47
Balls Pond Road	Ahead	78	14	81	16

16.4.6. A significant amount of the impact occurs in 2010 as a result of the application of forecast traffic growth. The narrowing of Dalston Lane leads to an increase in queue length on Dalston Lane westbound. The development proposals also include the signalisation of the Kingsland Road/Forest Road junction to aid the entry of buses into the bus station and the provision of a new signalisation junction at the exit of the bus station to Kingsland Road. No links on these junctions become critical in any of the four scenarios. Congestion occurs only at the Kingsland High Street/Dalston Lane/Kingsland Road/Balls Pond Road junction.

16.4.7. Whilst the signalisation of the Kingsland Road/Forest Road junction and the new signalled bus station exit junction are a requirement of the bus station, the narrowing of Dalston Lane to allow more footway space is a balance between pedestrian and vehicular requirements. The saturation measurement included in Appendix B of the Transport Assessment shows that this modification, in isolation, would not adversely affect the operation of the junction. There is no further scope to improve the capacity of this junction without the acquisition of third party land.

Pedestrians

16.4.8. In order to assess the impact the development will have on the surrounding pedestrian areas, it is necessary to measure the existing levels of comfort experienced by pedestrians. The Level of Service (LoS) is a measure of pedestrian comfort devised by JJ Fruin . This is measured as levels A to F of which each are described as follows:

- LoS A: free circulation;
- LoS B: for one-directional flows and free circulation. For reverse and crossing flows, minor conflicts;
- LoS C: some restriction in selection of walking speed and ability to pass others. High probability of conflict;
- LoS D: restricted and reduced walking speed for most pedestrians. Difficulties in passing. Multiple conflicts, momentary stoppages in flow;
- LoS E: restricted and reduced walking speed for all pedestrians. Shuffling progress at higher densities. Extreme difficulties in reverse or cross flows; and
- LoS F: circulation reduced to shuffling. Reverse and cross flows near impossible. Frequent contact. Sporadic forward flow.

16.4.9. Surveys of the existing pedestrian movement within the study area have been undertaken. The morning peak hour period has been identified as the worst case and the modelling work contained in this report covers that period. Figure 13 details the morning peak hour pedestrian flow. The future pedestrian flow for phases I and II of the Dalston Junction

development have been calculated and are shown in Figures 14 and 15. The calculations for these movements is described in more detail in the Transport Assessment

16.4.10. The Fruin 'Level of Service' has calculated for the existing pedestrian facilities and proposed pedestrian facilities. These are shown diagrammatically as follows in Appendix 16.1:

- Figure 16: Existing Pedestrian scenario;
- Figure 17: Phase I Existing Pedestrian Areas;
- Figure 18: Phase II Existing Pedestrian Areas;
- Figure 19: Phase I Future Pedestrian Areas; and
- Figure 20: Phase II Future Pedestrian Areas.

16.4.11. Level of Service A to C is considered a comfortable environment for pedestrians. It can be seen that the existing footway widths would lead to uncomfortable conditions in Figures 17 and 18. In particular, the area in front of the station exit on Dalston Lane and the waiting areas for the pedestrian crossing on Dalston Lane would become particularly busy.

16.4.12. Figures 19 and 20 show that the increased footway width on Dalston Lane allows the LoS to improve to B in front of the station and a LoS of C in the waiting areas for the crossing over Dalston Lane.

Impact on Public Transport

16.4.13. The site will enjoy an exceptionally high Public Transport Accessibility Level (PTAL) due to the provision of the new train station and bus station. However the impact on how public transport will operate has been considered in this section.

Trains

16.4.14. It is expected that a large proportion of the trips from the residential blocks will be to the ELLP. The forecast flows show that there is spare capacity for new trips over and above those predicted. This fulfils the objective of the provision of this service to promote development in this area.

Buses

16.4.15. Some impact on buses is expected with the provision of the residential blocks. This is likely to be to the east and west after Phase II of the ELLP with some impact on northbound services between Phase I and Phase II.

16.4.16. The provision of the new bus station means that there will be delay to both northbound and southbound buses along Kingsland Road due to the necessity to provide signalled junctions for the entrance and exit. In addition, the provision of the pedestrian crossing on Dalston Lane and the narrowing of Dalston Lane at the junction with Kingsland Road, Balls Pond Road and Kingsland High Street will introduce further delay to services. These delays are measured in the TRANSYT output in Appendix B of the Transport Assessment. Whilst these delays may be a disadvantage to these services, they are a consequence of the design to provide the bus station facility.

Significance

16.4.17. Based on the findings of this assessment, the key impacts can be summarised in terms of their significance as follows, taking account of proposed mitigation measures.

16.4.18. The traffic modelling shows that the proposals would have a moderate negative effect on traffic flows in the area, arising principally from the re-allocation of highway space for pedestrians and the introduction of additional signalised junctions to facilitate bus movements into and out of the new bus station.

16.4.19. The proposals would have a moderate negative effect on bus journey times in the area, arising from the additional delays incurred on the highway network and the alteration to northbound bus routes.

16.4.20. The proposals would have a significant positive effect on bus interchange facilities and the ability of passengers to access buses and new rail services, as a result of the creation of the new bus station facility.

16.4.21. The proposals would have a moderate positive benefit on pedestrian movement in the area, through the creation of additional footway space on Dalston Lane outside the new ELLP station and the creation of a permeable development allowing access between rail, bus and taxi services and surrounding facilities.

16.4.22. The additional traffic generated by the development itself will have an insignificant effect on conditions in the area, and any impacts are the result of highway network changes rather than additional generated traffic.

16.4.23. The small number of car parking spaces provided in the scheme can be considered a moderate positive benefit when set against local and regional policy or the provision of car parking at new developments.

16.4.24. The proposed regime for deliveries and servicing will have a slight negative impact on existing occupiers of properties fronting Roseberry Place and on existing properties on the east side of Kingsland Road.

16.4.25. Construction traffic activity will have a slight negative impact on existing occupiers of Roseberry Place during the construction period.

16.5. Mitigation Measures and Residual Effects

16.5.1. As part of the highway proposals, TRANSYT analysis has been undertaken. This effects the existing heavy congestion at the Dalston Lane/Kingsland Road/Balls Pond Road/Kingsland High Street junction. Traffic growth calculations have shown this congestion to increase due to general background traffic growth and the provision of new bus services. Traffic generation from the residential and retail units is minimal and is shown to have only a small impact upon this junction. Further mitigation against traffic growth is not possible without the acquisition of third party land. All other junctions in the study area are shown to operate satisfactorily.

16.5.2. Some improvements are proposed for pedestrian facilities. These include the widening of footways on Dalston Lane and new crossing facilities on Kingsland Road and Dalston Lane. Fruin Level of Service calculation has been undertaken that show these proposals will benefit pedestrian comfort on the studied footways.

16.5.3. Some impact is expected on bus services due to the increased congestion at the Dalston Lane/Kingsland Road/Balls Pond Road/Kingsland High Street junction. Furthermore, the provision of the new signalised junctions will add to delay but only as a consequence of the provision of the new bus station.

17. Conclusion

17.1.1. Table 17.1 sets out the potentially significant effect of the proposed development. This shows that the only major significant adverse effect of the proposed development is on the setting of the Kingsland Road Conservation Area. The remaining adverse effects are all minor and negligible following mitigation. The effect on transport in terms of road congestion is balanced against the provision of a new public transport interchange.

17.1.2. There are also a number of significant positive effects of the proposed development including improvements in visual amenity to Roseberry Place and reduction in noise from the railway station.

The EIA has shown that concerns relating to air quality, archaeology, ecology, electronic interference, drainage and flood risk, ground conditions, microclimate, noise and vibration, society and economy will be effectively mitigated so that residual effects are minor or negligible.

Table 17.1: Summary of Effects

Effect	Description of Effect		Description of Mitigation Measures	Description of Residual Effect	
	Description in Words	Significance Criteria		Description in Words	Significance Criteria
Key: +ve – positive; -ve – negative; D – direct; I – indirect; C – cumulative; P – permanent; T – temporary; ST – short-term; MT – medium term; LT – long-term.					
Chapter 5: Air Quality					
Construction impacts	Dust nuisance and vehicle and construction plant exhaust emissions	Moderate, -ve, D, T, ST-MT	Various dust and nuisance control measures	No long term residual effects	Minor –ve, D, T, ST-MT
Operational - traffic	Operational vehicle exhaust emissions,	Negligible to minor adverse, -ve D, P, LT	None required	Very small residual effects	Negligible to minor – ve, D, P, LT
Operational - other	Operational plant emissions	Negligible to minor, - ve, D, P, LT	None required	Very small Residual effects	Negligible to minor, - ve, D, P, LT
Chapter 6: Archaeology and Cultural Heritage					
Archaeology					
SE corner of Forest Rd/ Roseberry Pl & Snooker Hall	Potential for the removal of archaeological deposits	Slight/ Negligible -ve, D, P	Watching brief during construction	A record of remains would be made	Negligible -ve, D, P
Cultural Heritage					
Kingsland Road Conservation Area (CA)	Impact on the historic setting due to the scale of the development	Major -ve, I, P, LT	Design	Development will alter the setting of this feature	Major -ve, I, P, LT
Dalston Lane West CA	Impact on the historic setting due to the scale of the development	Minor -ve, I, P, LT	Design	Development will alter the setting of this feature	Slight -ve, I, P, LT
De Beauvoir CA	Impact on the historic setting due to the scale of the development	Minor -ve, I, P, LT	Design	Development will alter the setting of this feature	Slight -ve, I, P, LT
C19th cottages Roseberry Place	Impact on the historic setting due to the scale of the development Setting	Moderate -ve, I, P, LT	Design	Development will alter the setting of this feature	Moderate -ve, I, P, LT

Effect	Description of Effect		Description of Mitigation Measures	Description of Residual Effect	
	Description in Words	Significance Criteria		Description in Words	Significance Criteria
Key: +ve – positive; -ve – negative; D – direct; I – indirect; C – cumulative; P – permanent; T – temporary; ST – short-term; MT – medium term; LT – long-term.					
Roseberry Place	Impact on the setting of the road and its alteration	Slight +ve, I, D, P, LT	Design, traffic and pedestrian management	New development will bring this road into more active usage	Slight +ve, I, D, P, LT
Kingsland Rd/ Balls Pond Rd/ Dalston Lane	Impact on the setting of the historic cross roads and its alteration	Slight +ve, I, D, P, LT	Traffic and pedestrian management	The new scheme will assist public access	Slight +ve, I, D, P, LT
Chapter 7: Drainage and Flood Risk					
Surface Water - Construction					
Increased surface run-off	Increased risk of site flooding from rainfall event.	D, T, ST, -ve, Moderate	Ensure installation of drainage system is early in construction programme	N/A	Negligible
Increased surface run-off	Increased risk of sewer flooding.	D, T, ST, -ve Moderate	Ensure installation of drainage system is early in construction programme	N/A	Negligible
Surface Water - Operation					
Increased surface run-off	Increased risk of site flooding from rainfall event.	D, P, LT, -ve, Moderate	Design system so it does not flood in 1 in 30 year flood and oversize pipes	N/A	Negligible
Increased surface run-off	Increased risk of sewer flooding.	D, P, LT, -ve Moderate	Provide attenuation in system	N/A	Negligible
Surface Water - Cumulative					
Increased surface run-off	Increased risk of sewer flooding.	D, C, LT, -ve, Slight	Attenuation of rainwater through the use of SUDS and attenuation tanks	N/A	Negligible
Groundwater - Construction					
Contamination of surface aquifer	Spread of contaminants to surface aquifer	I, P, LT,-ve Slight	Good construction practices	N/A	Negligible

Effect	Description of Effect		Description of Mitigation Measures	Description of Residual Effect	
	Description in Words	Significance Criteria		Description in Words	Significance Criteria
Key: +ve – positive; -ve – negative; D – direct; I – indirect; C – cumulative; P – permanent; T – temporary; ST – short-term; MT – medium term; LT – long-term.					
Contamination of lower aquifer	Spread of contaminants to lower aquifer from piling operation	I, P, LT, -ve Moderate	Pile depths limited so base of pile remains in clay layer	N/A	Negligible
Groundwater - Operation					
Borehole abstraction	Reduction of groundwater level	D, P, LT -ve Moderate	Borehole abstraction not necessary for development water supply	N/A	Negligible
Groundwater - Cumulative					
Contamination of surface aquifer	Spread of contaminants to surface aquifer	I, P, LT,-ve Slight	Good construction practices	N/A	Negligible
Waste Water - Construction					
Pollution of site	Pollution of site during construction phase due to flows not draining.	D, T, ST, -ve Slight	Ensure site drainage system and connections to sewers installed early in construction programme	N/A	Negligible
Waste Water – Cumulative					
Overloading of sewers from numerous development	Increased flows in sewers leading to overflowing onto site and backing up elsewhere.	D, C, LT, -ve Moderate	Regulation by TWUL. Minimise flows by inclusion of low-use fixtures.	N/A	D, C, LT, -ve Slight
Water Quality – Construction					
Pollution of water courses	Fuel leaks from construction plant and solids washed into sewer system	I, T, MT, -ve Slight	Install petrol interceptors and settlement pits to remove pollutants from storm water	N/A	Negligible
Water Quality – Operation					

Effect	Description of Effect		Description of Mitigation Measures	Description of Residual Effect	
	Description in Words	Significance Criteria		Description in Words	Significance Criteria
Key: +ve – positive; -ve – negative; D – direct; I – indirect; C – cumulative; P – permanent; T – temporary; ST – short-term; MT – medium term; LT – long-term.					
Pollution of water courses	Fuel leaks from bus station and car parking	I, T, MT, -ve Slight	Install petrol interceptors to remove pollutants from storm water	N/A	Negligible
Pollution of water courses	Overflow of combined sewers	I, T, MT, -ve Slight	Regulation of CSOs by TWUL.	N/A	Negligible
Water Quality – Cumulative					
Pollution of water courses	Overflow of combined sewers	I, C, LT, -ve Moderate	Regulation of CSOs by TWUL.	N/A	I, C, LT, -ve Slight
Chapter 8: Ecology					
Landtake and associated habitat loss	All semi-natural habitats likely to be removed by the development of the East London Line	Not significant	Provision of suitable planting within the landscape scheme, and incorporation of green roofs within the development to provide ecological enhancement	Once landscape treatments and green roofs become established it is considered that residual effects will be not significant, potentially beneficial	Not significant possible +ve P Possible +ve C with Dalston Lane South
Disturbance	Some disturbance of surrounding areas	Not Significant	General measures during construction		Not Significant
Severance of Wildlife Corridor	Some severance of the wildlife corridor along the former railway line, however, development of the East London Line will have the most significant impact to the wildlife corridor function	Not significant	Provision of habitat and landscape treatments in appropriate locations	Once landscape and habitat creation treatments become established, the wildlife corridor function of the site should return	Not significant

Effect	Description of Effect		Description of Mitigation Measures	Description of Residual Effect	
	Description in Words	Significance Criteria		Description in Words	Significance Criteria
Key: +ve – positive; -ve – negative; D – direct; I – indirect; C – cumulative; P – permanent; T – temporary; ST – short-term; MT – medium term; LT – long-term.					
Black redstarts	No nest sites to be affected Provision of foraging habitat	Not Significant Significant positive	Provision of nesting features Provision of green roof habitat designed for black redstart	Potential to encourage black redstarts to the site +ve significant	Not significant – possible +ve +ve significant
Nesting birds	Potential loss of nest sites	Significant –ve P, D	Any site clearance and enabling works over and above the works for the East London Line to avoid breeding season, provision of landscape treatments suitable for nesting birds	Avoidance of bird nesting season and habitat provision = No Significant effects	Not Significant
Bats	No foraging habitat likely to remain following development of the ELL No roost sites to be affected	Not significant	Provision of habitat and bat roost sites	+ve significant	+ve significant
Reptiles	Some minor potential for risks to individual reptiles during site clearance	Significant -ve, T, D	Provision of habitat Watching brief	N/A	Not significant
Japanese knotweed	N/A	Not significant	N/A	N/A	Not significant
Chapter 9: Electronic Interference					
Radio Reception	Deterioration in radio reception caused by signal shadows	Negligible	None	None	None

Effect	Description of Effect		Description of Mitigation Measures	Description of Residual Effect	
	Description in Words	Significance Criteria		Description in Words	Significance Criteria
Key: +ve – positive; -ve – negative; D – direct; I – indirect; C – cumulative; P – permanent; T – temporary; ST – short-term; MT – medium term; LT – long-term.					
Terrestrial Signal	Deterioration in analogue and digital terrestrial television caused by signal shadowing.	Slight, -ve, LT	Repositioning receiving antenna Use of alternative services	None	None
	"Ghosting" of television picture caused by signal reflections.	Negligible	None	None	None
Satellite Signal	Blocking of satellite signal to receivers.	Negligible	Repositioning dish Use of alternative services	None	None
Chapter 10: Ground Conditions					
Human exposure to contamination	Disturbance of any localised pockets of contaminated Made Ground could result in construction workers and visitors to the site being exposed to contaminated soil, dust or slightly contaminated perched groundwater.	Minor Adverse ST	Use of appropriate health and safety procedures.	Effects can be fully mitigated by the measures proposed.	Negligible
Contamination of the shallow gravel aquifer	Excavation of any localised pockets of contaminated Made Ground could impact groundwater in the Terrace Gravels.	Minor Adverse to Negligible ST	Selective excavation of contaminated ground and control of handling and storage.	Effects can be fully mitigated by the measures proposed	Negligible

Effect	Description of Effect		Description of Mitigation Measures	Description of Residual Effect	
	Description in Words	Significance Criteria		Description in Words	Significance Criteria
Key: +ve – positive; -ve – negative; D – direct; I – indirect; C – cumulative; P – permanent; T – temporary; ST – short-term; MT – medium term; LT – long-term.					
Contamination of the deeper chalk aquifer	The proposed piling will terminate above the lower aquifer and therefore no pathways into the lower aquifer will be created. The possibility of potential pathways will need to be confirmed once the detailed design has been completed.	Minor Adverse in the southern two thirds of the site where piling is proposed. LT	Use of appropriate piling systems	Effects can be fully mitigated by the measures proposed	Negligible
Chapter 11: Landscape and Visual Amenity					
Area A Kingsland Road	Removal of Dalston Snooker Centre to allow construction of proposed bus interchange. Major new skyline features of 18 storey and other taller blocks above the Victorian street frontages. Visual impact from backs of properties on Kingsland Road that face onto the development	Slight +ve, D/I,P,LT	Design and finishes of buildings, particularly tallest structures, and access/ link to Roseberry Place	New development would regenerate the area and raise townscape quality. Creation of new open space and improved public access	Slight +ve, D/I,P,LT
Area B De Beauvoir	Tall structures create new skyline features above Victorian frontages to NE portion of CA.	Neutral, I, P, LT	Design and finishes of buildings, particularly tallest structures	Limited, negligible or no impact from area due mostly to screening by existing urban development	Neutral, I, P, LT

Effect	Description of Effect		Description of Mitigation Measures	Description of Residual Effect	
	Description in Words	Significance Criteria		Description in Words	Significance Criteria
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Area C Dalston Lane West	Intermittent views of development from N side of this area.	Neutral, I, P, LT	Design and finishes of buildings, particularly tallest structures	New development would regenerate the area and raise townscape quality.	Neutral, I, P, LT
Area D Queensbridge Road	Limited or intermittent views of development.	Neutral, I, P, LT	Design and finishes of buildings, particularly tallest structures	Limited, negligible or no impact from area due mostly to screening by existing urban development	Neutral, I, P, LT
Area E Graham Road/ Mapledean	Limited, negligible or intermittent views of development.	Neutral, I, P, LT	Design and finishes of buildings, particularly tallest structures	Limited, negligible or no impact from area due mostly to screening by existing urban development	Neutral, I, P, LT
Area F Albion Square	Negligible or limited views of development	Neutral, I, P, LT	Design and finishes of buildings, particularly tallest structures	Limited, negligible or no impact from area due mostly to screening by existing urban development	Neutral, I, P, LT
Area G Roseberry Place East & South	N part of area would experience significant change due to new development.	Moderate +ve, D/I, P, LT	Design and finishes of buildings, public links and new open spaces outside station	New development would regenerate the area and raise townscape quality.	Moderate +ve, D/I, P, LT
Area H Dalston Lane North	Southern half of area would experience significant change due to development	Moderate +ve, I, P, LT	Design and finishes of buildings, open spaces	New development would regenerate the area and raise townscape quality.	Moderate +ve, I, P, LT
Chapter 12: Microclimate					

Effect	Description of Effect		Description of Mitigation Measures	Description of Residual Effect	
	Description in Words	Significance Criteria		Description in Words	Significance Criteria
Key: +ve – positive; -ve – negative; D – direct; I – indirect; C – cumulative; P – permanent; T – temporary; ST – short-term; MT – medium term; LT – long-term.					
Impact on the existing surrounds	Conditions on Dalston Lane are slightly windier than existing, and in the 'strolling' range.	Slight	Canopy along northern facade	None. Conditions are suitable for the intended access and bus stop use.	None
	Conditions in Holy Trinity school playground, garden of existing cottages, and Kingsland road properties' backyard remain in the 'standing' or 'sitting' range and suitable for the intended outdoor activities.	Negligible	None	None	None
	Elsewhere, conditions around the site are generally slightly windier than existing but remain suitable for the current pedestrian activities.	Negligible	None	None	None
Impact on activities to be performed within the proposed development	Some areas are expected to require mitigation in order to ensure suitable conditions for the intended pedestrian activities.	Slight	Canopy , recess of entrances, planting	None	None
Chapter 13: Noise and Vibration					

Effect	Description of Effect		Description of Mitigation Measures	Description of Residual Effect	
	Description in Words	Significance Criteria		Description in Words	Significance Criteria
Key: +ve – positive; -ve – negative; D – direct; I – indirect; C – cumulative; P – permanent; T – temporary; ST – short-term; MT – medium term; LT – long-term.					
	Noise from demolition and construction on local noise sensitive receivers	Moderate, -ve, D, T	Use of Best Practicable Means; Public liaison; Enforcement of noise control measures on contractor; Use of silenced, well maintained plant and noise enclosures and barriers, where necessary; Limiting hours of site working.		Slight, -ve, D, T
	Vibration from demolition and construction on local residents and adjacent structures	Slight, D, -ve, T	Use of Best Practicable Means		Negligible, D, -ve, T
	Increase in traffic noise on local residents and other noise sensitive receptors	Negligible	Not required		Negligible
	Traffic vibration on local residents and buildings	Negligible	Not required		Negligible
	Vehicle noise from car parking and deliveries.	Negligible	Not required		Negligible
	Noise emissions from fixed plant on local residents and other noise sensitive receptors	Negligible	Compliance with criteria by incorporating noise control measures into design of fixed plant		Negligible

Effect	Description of Effect		Description of Mitigation Measures	Description of Residual Effect	
	Description in Words	Significance Criteria		Description in Words	Significance Criteria
Key: +ve – positive; -ve – negative; D – direct; I – indirect; C – cumulative; P – permanent; T – temporary; ST – short-term; MT – medium term; LT – long-term.					
	Bus movements within the Interchange	Moderate, -ve, D, LT	2.5m high noise barrier	Night-time bus movements are likely to increase existing ambient noise levels	Slight, -ve, D, LT
	Concrete slab over ELLP – the concrete slab would significantly reduce ELLP train noise levels at the nearby dwellings	Moderate, +ve, D, LT	None		Moderate, +ve, D, LT
	Noise from demolition and construction on local noise sensitive receivers	Moderate, -ve, D, T	Use of Best Practicable Means; Public liaison; Enforcement of noise control measures on contractor; Use of silenced, well maintained plant and noise enclosures and barriers, where necessary; Limiting hours of site working.		Slight, -ve, D, T
Chapter 14: Overshadowing, Daylight and Sunlight					
Daylight/sunlight	Effect to neighbouring residential properties	-ve, D, P, LT	None	Effect to neighbouring residential properties	-ve, D, P, LT
Average daylight factor	Effect on proposed residential properties	-ve, D, P, LT	Increased size of windows, orientation, reflective surfaces.	Effect on proposed residential properties	Reduced impact
Overshadowing	Effect on existing rear gardens	-ve, D, P, LT	None	Effect on existing rear gardens	-ve, D, P, LT
Chapter 15: Society and Economics					

Effect	Description of Effect		Description of Mitigation Measures	Description of Residual Effect	
	Description in Words	Significance Criteria		Description in Words	Significance Criteria
Key: +ve – positive; -ve – negative; D – direct; I – indirect; C – cumulative; P – permanent; T – temporary; ST – short-term; MT – medium term; LT – long-term.					
Primary school provision	Increase in demand for spaces	Not significant	N/A	Not significant	Not significant
Secondary school provision	Increase in demand for spaces	Not significant	N/A	Not significant	Not significant
GP provision	Increase in demand for GPs	Minor -ve, D, P, LT	N/A	Increase in demand for GPs	Minor –ve, D, P, LT
Open space provision	Increase in demand for open space provision	Minor -ve, D, P, :LT	N/A	Increase in demand for open space provision	Minor –ve, D, P, LT
On local economy	Increase in household expenditure etc	Moderate +ve, D, P, LT	N/A	Increase in retail expenditure etc	Moderate +ve, D, P, LT
Employment	Creation of retail employment	Minor +ve, D, P, LT	N/A	Creation of retail employment	Minor +ve, D, P, LT
Construction employment	Creation of construction employment	Minor -ve, D, T, ST	N/A	Creation of construction employment	Minor -ve, D, T, ST